

Well-Sample Descriptions
Anadarko Basin

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OKLAHOMA GEOLOGICAL SURVEY
CARL C. BRANSON, *Director*
GUIDE BOOK XIII

Sample Descriptions and Correlations for
Wells on a Cross Section from
Barber County, Kansas,
to
Caddo County, Oklahoma

by

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U. S. Geological Survey

Published by agreement with the U. S. Geological Survey

The University of Oklahoma
Norman
1963

FOREWORD

Seldom is a detailed description of important deep wells available. The rocks penetrated in 19 key wells were shown diagrammatically by Dr. Adkison in 1960. Oklahoma Geological Survey makes available in this report the lithologic descriptions of these rocks.

The stratigraphic terminology used does not in all cases correspond with that used by Oklahoma Geological Survey. Cimarron Group is unofficial in the sense employed, even for Kansas. Some units classed as formations or members are now considered as ranking only as beds. Dornick Hills Formation is the Dornick Hills Group, consisting of Golf Course Formation (below) and Bostwick Formation (above). The Springer Formation is considered Pennsylvanian in age. Woodford and Chattanooga Shales are classed as Upper Devonian by Oklahoma Geological Survey.

The carefully logged sequences here printed should be of great assistance in future interpretation of subsurface information.

Carl C. Branson

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SAMPLE DESCRIPTIONS AND CORRELATIONS FOR WELLS ON A CROSS SECTION FROM BARBER COUNTY, KANSAS, TO CADDO COUNTY, OKLAHOMA

W. L. ADKISON and MARY G. SHELDON

INTRODUCTION

LOCATION AND PURPOSE OF REPORT

Subsurface stratigraphic investigations to aid in the search for oil and gas have been made intermittently since the late forties by the U. S. Geological Survey in parts of the Anadarko basin of western Oklahoma and the Texas Panhandle. One of the reports resulting from these investigations is a cross section of rocks of Paleozoic age between Barber County, Kansas, and Caddo County, Oklahoma (Adkison, 1960), which was published as U. S. Geological Survey Oil and Gas Investigations Chart OC-61. The present report is a supplement to Chart OC-61, in that it presents detailed logs of the wells on that chart. The locations of the wells are shown on figures 1 and 2.

The detailed logs are published so that lithologic data not given on the chart will be available to the reader who wishes to know more about the lithology of the strata or to make different stratigraphic correlations. Except for the Pleasanton Formation and Cherokee Shale, which have been raised to group status in Kansas by the U. S. Geological Survey, the stratigraphic names and correlations on the well logs are the same as those shown on Chart OC-61 and are not necessarily those used by the State Geological Survey of Kansas or the Oklahoma Geological Survey. Many of the stratigraphic correlations are tentative, and many of the contacts are approximate because of the relatively long distances between wells, the lithologic changes and pinch-outs of many of the strata, and the sparse paleontological data.

ACKNOWLEDGMENTS

Some of the well cuttings from the Oklahoma wells were lent by the Superior Oil Co. and the Pure Oil Co. The State Geological Survey of Kansas lent the cuttings from the Kansas wells. The Ramsey Petroleum Corp. provided the electrical log for the Ramsey Petroleum Co. No. 1 Mansfield well in Canadian County, Oklahoma. The cooperation of these companies and of the State Geological Survey of Kansas is gratefully acknowledged. The samples from the Camco Oil and Trust Co. No. 1 Parrington well, Kingfisher County, Oklahoma, were examined by Boyd R. Haley, U. S. Geological Survey.

SAMPLE-EXAMINATION PROCEDURE

The lithologic descriptions in this report are based on detailed microscopic examination of the well cuttings. The samples were examined with a binocular microscope using 6.3x magnification; magnifications of 18x and 27x were used for minute features. The microscopic examination consisted of describing the kind and character of the rocks by their color, hardness, mineral composition, texture, cementing material, and the type and characteristics of the included chert, oolites, casts, microfossils, glauconite, pyrite, calcite, and siderite. The *Rock-color chart* of the National Research Council (Goddard and others, 1948) was used to describe rock

colors. The Wentworth grade scale was used to determine the mean grain size of clastic rocks, and it was also used as a guide to the crystallinity of the carbonate rocks.

The term "shale" is used in this report for clastics composed largely of clay and fine to medium silt-size particles regardless of bedding characteristics. The term "siltstone" designates siliceous clastics composed mainly of coarse silt-size particles. The carbonate rocks are described as silty if an appreciable residue of coarse silt-size or smaller particles remains after treatment with hydrochloric acid. The term "dense" describes carbonates and chert that are composed of particles too small to be seen under 6.3x magnification. The dense rocks commonly break with a smooth conchoidal fracture.

All the wells in this report were drilled by rotary methods. Each sample of rotary cuttings contains fragments of many different rock strata, most of which have been cut from a depth shallower than that indicated on the sample bag. Generally the depth of a bed, as determined from the samples, is greater than the actual depth because of the time necessary to pump the cuttings to the surface. This inaccuracy in sampling is negligible at shallow depths, but it commonly increases with depth and may be as much as 50 feet in a deep (10,000-foot) well in western Oklahoma.

The interpretive method of logging rotary cuttings was used in this report, and, with one exception, the Galt-Brown Co. No. 1 Campbell well, Kingfisher County, Oklahoma, the logging of each well consisted of the concurrent study of the well cuttings and the electrical log. The electrical log used in this way is a great aid in determining the kind of rock drilled, the bed-for-bed succession, and the approximate amount of lag in the samples. This logging procedure has been described in detail by Maher (1959), and the product is termed a composite interpretive log. Because this technique involves interpretation, the logs prepared from rotary samples are subject to the personal equation of the geologist, and complete agreement by different geologists regarding details cannot be expected.

OUTLINE OF STRATIGRAPHY

Rocks of Permian age, chiefly redbeds, crop out in the vicinity of the wells in this report. Below the Permian beds, rocks of Pennsylvanian, Mississippian, Devonian, Silurian, Ordovician, and Cambrian ages were penetrated. The stratigraphically deepest well, the Superior Oil Co. No. 81-17 H. W. Norris, Blaine County, Oklahoma, was drilled 1,287 feet into the Arbuckle Group of Cambrian and Ordovician age.

The rocks penetrated in well 1 on Chart OC-61, the Pure Oil Co. No. 1 William Palmer, Barber County, Kansas, were described by Lee (1949). Most of the larger stratigraphic subdivisions (groups, or larger units) and many of the smaller ones, as defined by Lee

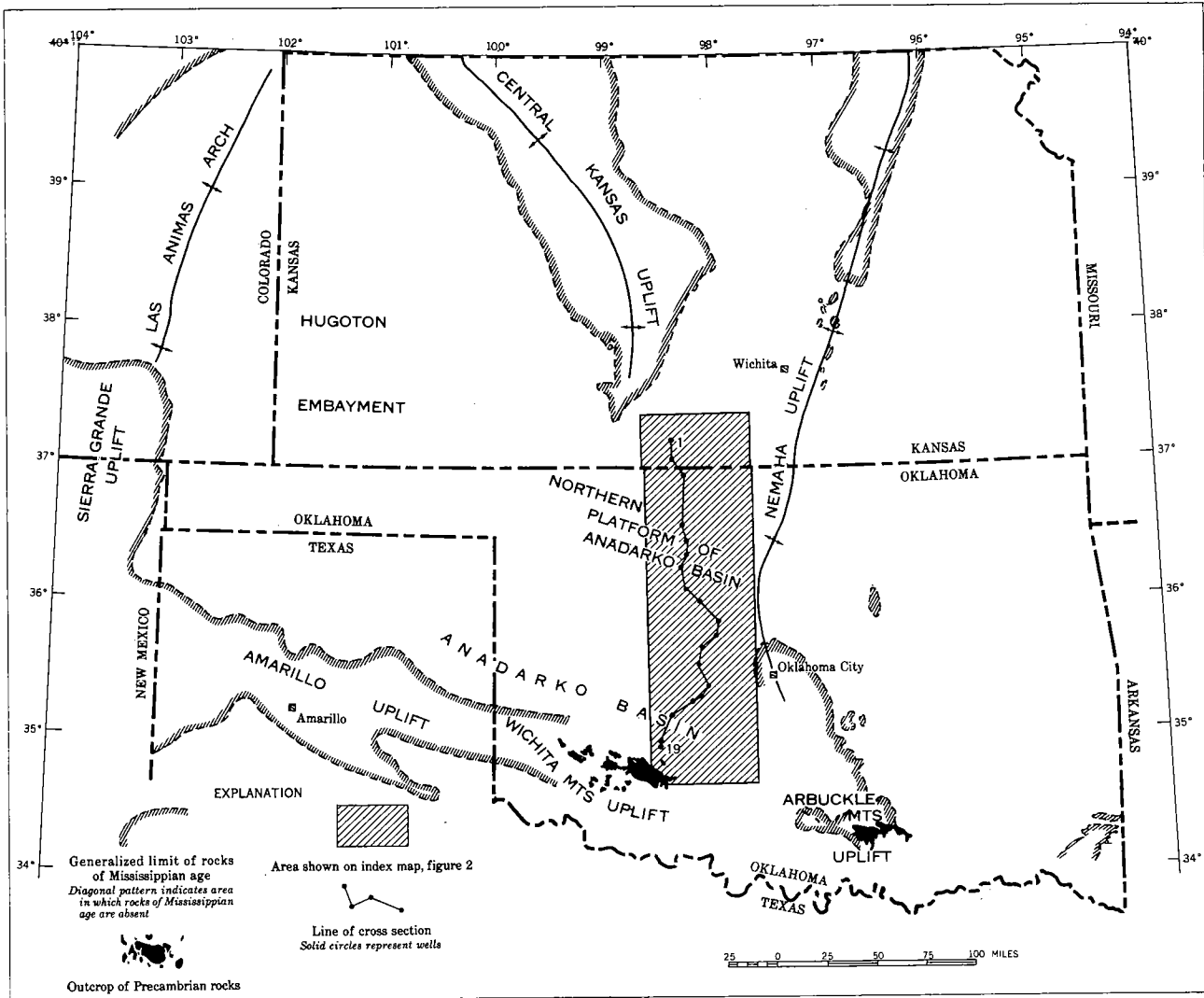
STRUCTURAL SETTING

and modified in part by Adkison, were traced southward into Oklahoma. Some of the rocks have such distinctive lithologic characteristics that they could be traced over great distances, and these beds aided in the correlation of thick sequences of less distinctive or less persistent strata. Most of the larger stratigraphic subdivisions were traced into the trough of the Anadarko basin, but to the south of the trough, on the north flank of the Wichita Mountains uplift, the post-Mississippian rocks could be subdivided only in a general way. Work currently in progress in the Sedgwick basin of Kansas, about 55-65 miles north and northeast of well 1, indicates that the top of the Pennsylvanian rocks in that well may be about 100 feet too low. The stratigraphic names and approximate thicknesses of the units shown on Chart OC-61 are given in table 1.

The rocks of Paleozoic age thicken greatly southward from Barber County, Kansas, into the trough of the Anadarko basin in Caddo County, Oklahoma. The

thickening is the result of the addition of strata at the top and within the stratigraphic sequence as well as the gradual southward thickening of most of the formations in the Kansas wells. The major units added to the stratigraphic column south of well 1 are the Hunton Group (Silurian and Devonian), rocks of Chesterian age (Mississippian), and the Morrow and Atoka Series (Pennsylvanian). The greatest thickening occurs in the rocks of Pennsylvanian age, but rocks of Permian and pre-Pennsylvanian ages also become much thicker southward from Barber County, Kansas.

The increase in thickness is accompanied by a change in lithology of many of the stratigraphic units. The rocks of Early Permian and Pennsylvanian ages in Barber County are mainly limestone and shale; to the south, in the trough of the Anadarko basin, equivalent rocks contain much less limestone and more sandstone. Rocks of Mississippian age in Barber County, Kansas, are mainly light-colored cherty limestone and dolomite,



Structural features adapted from Fox and Sheldon, 1957

Figure 1. Map showing relations of the wells described in this report and in Adkison (1960) to the Anadarko basin and adjacent major structural features in Kansas and Oklahoma.

STRATIGRAPHIC NOMENCLATURE

TABLE 1.—NAMES AND THICKNESSES OF GEOLOGICAL UNITS
PENETRATED IN WELLS DESCRIBED IN THIS REPORT

Stratigraphic nomenclature is that of the U. S. Geological Survey and does not necessarily conform to that of the State Geological Survey of Kansas or the Oklahoma Geological Survey. Many of the thicknesses are approximate.

System	Series	Oklahoma		Kansas	
		Group or groups and thickness (feet)	Formation or member and thickness (feet)	Group or groups and thickness (feet)	Formation or member and thickness (feet)
PERMIAN		Whitehorse 390	Rush Springs Sandstone 250 Marlow Formation 140	Cimarron	Not present
		El Reno 685	Dog Creek Shale Blaine Gypsum Flowerpot Shale Duncan Sandstone		
			Hennessey Shale 845-1240 Garber Sandstone ¹ 627-827 Wellington Formation ¹ 786-1210		Beds of Cimarron Group present (no samples) Harper Sandstone 158+
		Chase ² 375-514	Nolans Limestone	Sumner	Ninnescah Shale 423
			Winfield Limestone		Wellington Formation 906-925
			Barneston Limestone		Nolans Limestone
			Wreford Limestone		Winfield Limestone
		Council Grove ² 413-620	Funston Limestone	Chase 370-398	Barneston Limestone
			Crouse Limestone		Wreford Limestone
			Bader Limestone, Stearns Shale, and Beattie Limestone		Funston Limestone
			Grenola Limestone		Crouse Limestone
			Red Eagle Limestone, Johnson Shale, and Foraker Limestone		Bader Limestone, Stearns Shale, and Beattie Limestone
		Admire ² 303-1111	Houchen Creek? Limestone Bed of Janesville Shale	Council Grove 354-390	Grenola Limestone
					Red Eagle Limestone, Johnson Shale, and Foraker Limestone
				Admire 263-270	Houchen Creek? Limestone Bed of Janesville Shale
					Five Point Limestone Member of Janesville Shale
PENNSYLVANIAN	Virgil ²	Wabaunsee Equiva- lent 476-1290		Wabaunsee 450-467	
		Shawnee Equiva- lent 470-1726	Topeka Limestone	Shawnee 424-455	Topeka Limestone
					Deer Creek Limestone
			Oread Limestone Member of Vamoosa Formation		Lecompton Limestone
		Douglas Equiva- lent 133-427		Douglas 143-226	Oread Limestone
	Missouri	Ochelata 327-837		Lansing 137	
				Kansas City 355-383	Drum Limestone
			Hogshooter Limestone		Winterset Limestone
		Skiatook 325-1405		Pleasanton 55-67	

STRATIGRAPHIC NOMENCLATURE

Table 1. --(Continued)

		Oklahoma		Kansas	
System	Series	Group or groups and thickness (feet)	Formation or member and thickness (feet)	Group and thickness (feet)	Formation or member and thickness (feet)
PENNSYLVANIAN	Des Moines ³	Marmaton 181-704		Marmaton 130-186	
		Krebs and Cabaniss 126-486		Cherokee 25-30	
	Atoka		Upper part of Dornick Hills Formation 0-2424		Not present
	Morrow		Lower part of Dornick Hills Formation 0-747 Springer Formation 0-1566+		
MISSISSIPPIAN ⁴	Upper		Rocks of Chesterian age 0-622 Rocks of Meramecian age 135 (well 3)		Rocks of Meramecian age 50-80
	Lower		Rocks of Osagean age 256 (well 3) Rocks of Kinderhookian? age		Rocks of Osagean age 167 Rocks of Kinderhookian? age
DEVONIAN and MISSISSIPPIAN			Woodford Shale 30-1044 ⁵ Misener Sand		Chattanooga Shale 40-45 Misener Sand
SILURIAN and DEVONIAN		Hunton 0-880		Hunton 0-53	
ORDOVICIAN			Sylvan Shale 0-222 Viola Limestone 22-760		Sylvan Shale 0-17 Viola Limestone 55-60
		Simpson 298-1907	Bromide Formation 179-440	Simpson 194-215	Bromide Formation 81-95
CAMBRIAN and ORDOVICIAN		Arbuckle 1287+		Arbuckle 57+	

¹ Garber Sandstone and Wellington Formation are approximately equivalent to the upper part of the Wichita Formation (maximum thickness about 558 feet) in wells 18 and 19 in Caddo County, Oklahoma.

² Chase, Council Grove, and Admire Groups of Early Permian age and Virgil Series of Late Pennsylvanian age are approximately equivalent to the Pontotoc Group (maximum thickness about 1,315 feet) in wells 18 and 19 in Caddo County, Okla.

³ Des Moines Series is represented by the Deese Formation (maximum thickness about 2,325 feet) in wells 15, 16, and 17 in Caddo County, Oklahoma.

⁴ Mississippian rocks in Oklahoma were not subdivided in all wells (maximum thickness 3,420 feet).

⁵ Thickness exaggerated because of structural deformation.

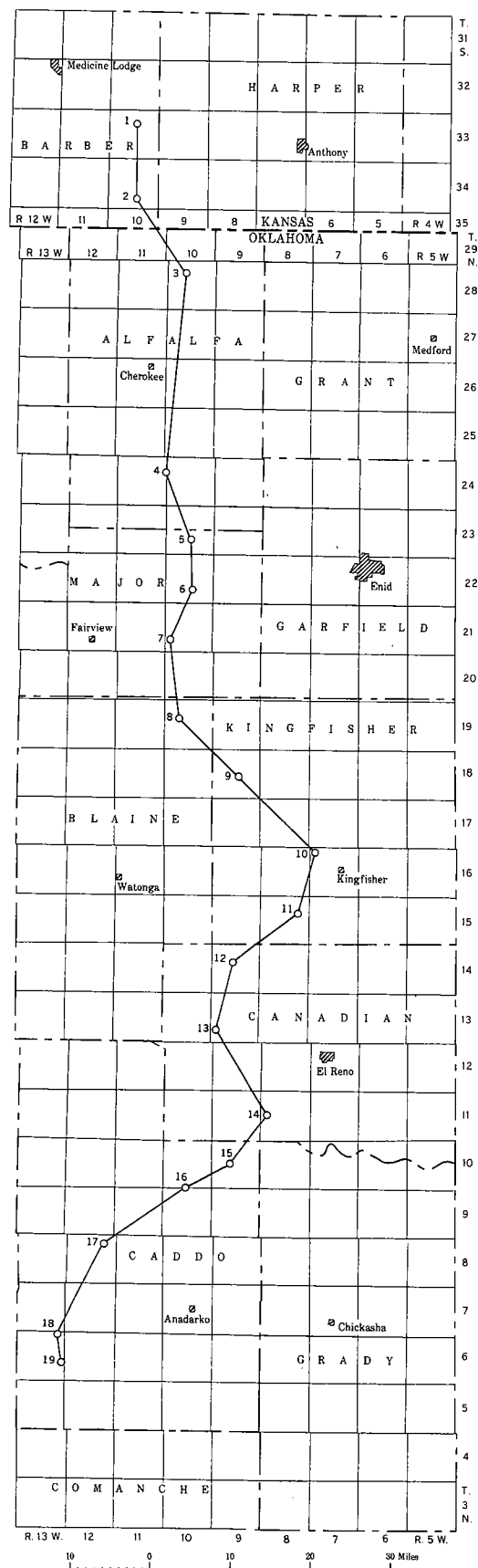
INDEX MAP

but to the south in Caddo County, Oklahoma, on the north flank of the Wichita Mountains uplift, they are largely dark-colored silty limestone and calcareous siltstone and shale. The changes in lithologic composition of the pre-Mississippian rocks are not so pronounced as in the younger beds.

REFERENCES

- Adkison, W. L.**, 1960, Subsurface cross section of Paleozoic rocks from Barber County, Kansas, to Caddo County, Okla: U. S. Geol. Survey, Oil and Gas Inv. Chart OC-61.
- Fox, Jeannette, and Sheldon, M. G.**, 1957, Index map of central Midcontinent region giving lines of sections that show detailed lithology of Paleozoic and Mesozoic rocks: U. S. Geol. Survey, Oil and Gas Inv. Map OM-184.
- Goddard, E. N.** (Chm.), and others, 1948, Rock-color chart: Washington, D. C., Natl. Research Council, 6 p.
- Lee, Wallace**, 1949, Subsurface geologic cross section from Barber County to Saline County, Kansas: Kans., State Geol. Survey, Oil and Gas Inv. no. 8, 16 p.
- Maher, J. C.**, 1959, The composite interpretive method of logging drill cuttings: Okla. Geol. Survey, Guidebook 8, 48 p.

Figure 2. Index map showing locations of the wells described in this report and in Adkison (1960).



SAMPLE DESCRIPTIONS

In the following descriptions the sample logs are numbered and listed in the north-to-south numerical order shown on U. S. Geological Survey Oil and Gas Investigations Chart OC-61. The tops of geologic units are indicated in the logs, and the depths to the bases of named units are given if the units are immediately underlain by unnamed units. In some logs only the top or base of a geologic unit could be recognized. The depths of geologic contacts are queried where poorly defined, and the geologic names are queried if the identification seems doubtful.

LOG 1
BARBER COUNTY, KANSAS
SE¼ NE¼ SW¼ sec. 10, T. 33 S., R. 10 W.

Operator: Pure Oil Co.
Lease: William Palmer No. 1
Elevation: 1,423 feet
Total depth: 5,061 feet
Completion date: Jan. 4, 1937
Initial production: Dry

Electrical log: 1,600 to 5,060 feet
Sample intervals:
10-foot
620 to 3,420 feet
5-foot
3,420 to 5,061 feet
Cored intervals: None

		Permian System	1,600-1,605	Dolomite, pale yellowish-brown, very fine-crystalline; anhydritic?
		Cimarron Group	1,605-1,607	Shale, gray
		Harper Sandstone	1,607-1,614	Dolomite, light-gray, spotted with dark-gray, very fine-granular; anhydritic?
0- 300?	No samples		1,614-1,616	Shale, gray
		Sumner Group	1,616-1,644	Anhydrite, grayish-white to medium-gray, fine-granular
		Ninnescah Shale	1,644-1,650	Dolomite, pale yellowish-brown, very fine-granular
300?- 620	No samples		1,650-1,666	Anhydrite, grayish-white to medium-gray, fine-granular
620- 640	Shale, moderate reddish-brown; olive-gray spots and streaks		1,666-1,676	Shale, gray
640- 650	Shale as above; greenish-gray shale			
650- 708	Shale, moderate reddish-brown; greenish-gray shale streaks			
708- 710	Dolomite, light olive-gray, fine-crystalline			
710- 750	Shale, moderate reddish-brown			
		Wellington Formation		
750- 757	Shale, medium-gray		1,676-1,680	Dolomite, pale yellowish-brown, fine-granular
757- 760	Dolomite, very light-gray, fine-crystalline		1,680-1,690	Dolomite, pale yellowish-brown, fine-granular, with medium-gray speckled chert
760- 770	Shale, medium-gray, dolomitic		1,690-1,700	Dolomite, medium light-gray, fine-granular; grayish-white to medium dark-gray mottled chert
770- 818	Shale, medium- to dark-gray		1,700-1,717	Dolomite, brownish-gray, fine- to medium-crystalline, vuggy
818- 820	Dolomite, pale yellowish-brown, fine-crystalline		1,717-1,730	Shale, gray, dolomitic
820- 840	Shale, medium-gray		1,730-1,740	Dolomite, medium light-gray, fine-granular
840- 880	Shale, medium-gray, slightly dolomitic		1,740-1,760	Dolomite, light-gray, fine-granular
880- 918	Shale, medium-gray		1,760-1,780	No samples
918- 920	Dolomite, light-gray, fine-crystalline			
920- 960	Shale, medium- to dark-gray			
960- 968	Anhydrite, light- to medium-gray, fine-granular		1,780-1,785	Limestone, medium light-gray, fine-crystalline, argillaceous; crinoids
968- 973	Shale, medium-gray		1,785-1,793	Limestone, medium-gray, fine-granular, argillaceous
973- 980	Anhydrite, light- to medium-gray, fine-granular		1,793-1,803	Shale, gray, calcareous
980- 987	Anhydrite, grayish-white to medium-gray, fine-granular; white gypsum		1,803-1,810	Limestone, pale yellowish-brown, fine-granular; light-gray granular chert
987- 995	Shale, medium-gray		1,810-1,820	Limestone as above; grayish-white to medium light-gray dense chert
995-1,005	Anhydrite, grayish-white to medium-gray, fine-granular		1,820-1,833	Limestone, medium light-gray, fine-granular
1,005-1,010	Shale, light-brown		1,833-1,843	Shale, gray, calcareous
1,010-1,016	Anhydrite, grayish-white to medium-gray, fine-granular		1,843-1,850	Limestone, light-gray with specks of dark-gray, fine-granular; pale yellowish-brown chert with dark-gray spots
1,016-1,020	Shale, medium-gray		1,850-1,854	Limestone, light-gray with specks of dark-gray, fine-granular
1,020-1,030	Anhydrite, light-gray, fine-granular; salt		1,854-1,865	Shale, gray, calcareous
1,030-1,036	Shale, medium-gray, anhydritic			
1,036-1,040	Anhydrite, light-gray, fine-granular; salt			
1,040-1,043	Shale, medium-gray			
1,043-1,070	Anhydrite, light-gray, fine-granular; salt			
1,070-1,072	Shale, moderate reddish-brown			
1,072-1,080	Anhydrite, light-gray, fine-granular; salt			
1,080-1,105	Salt; gray shale			
1,105-1,120	Salt; anhydrite; and gray shale			
1,120-1,122	Shale, gray		1,865-1,880	Limestone, medium-gray to brownish-gray, fine-granular, argillaceous; crinoids
1,122-1,128	Anhydrite; salt		1,880-1,890	Limestone, pale yellowish-brown, fine-granular
1,128-1,130	Shale, gray		1,890-1,910	Limestone, medium light-gray, fine-granular, argillaceous
1,130-1,133	Shale, moderate reddish-brown		1,910-1,920	Limestone, pale yellowish-brown, fine-granular; light-gray spicular dense to granular chert
1,133-1,138	Anhydrite, light-gray, fine-granular; salt		1,920-1,930	Limestone as above; light brownish-gray to medium-gray spicular chert with fusulinids; crinoids; ostracodes?
1,138-1,144	Shale, gray		1,930-1,945	Limestone as above; light brownish-gray to medium-gray spicular chert with fusulinids; crinoids
1,144-1,150	Anhydrite, light-gray, fine-granular		1,945-1,950	Limestone as above; light brownish-gray to medium-gray spicular chert with fusulinids; spines
1,150-1,160	Shale, gray		1,950-1,955	Limestone, pale yellowish-brown, fine-granular; small amount of chert; large fusulinids
1,160-1,180	Anhydrite, grayish-white, fine-granular; salt		1,955-1,968	Limestone, light brownish-gray, fine-crystalline; light brownish-gray spicular chert
1,180-1,184	Shale, gray		1,968-1,970	Shale, medium-gray
1,184-1,186	Anhydrite, light-gray		1,970-1,980	Limestone, light brownish-gray, fine-crystalline; light brownish-gray spicular chert
1,186-1,190	Shale, gray		1,980-1,987	Shale, medium-gray, slightly calcareous
1,190-1,410	Anhydrite, grayish-white, fine-granular; much salt		1,987-1,990	Shale, dusky yellow, slightly calcareous
1,410-1,460	Anhydrite, grayish-white to light-gray, fine-granular		1,990-1,993	Shale, gray
1,460-1,463	Shale, gray		1,993-2,000	Limestone, medium light-gray, argillaceous
1,463-1,478	Anhydrite, grayish-white to light-gray, fine-granular		2,000-2,010	Shale, gray
1,478-1,481	Shale, gray			
1,481-1,500	Anhydrite, grayish-white to light-gray, fine-granular			
1,500-1,502	Shale, gray			
1,502-1,524	Anhydrite, grayish-white to medium light-gray, fine-granular			
1,524-1,526	Shale, light greenish-gray			
1,526-1,560	Anhydrite, grayish-white to medium-gray, fine-granular			
1,560-1,562	Dolomite, pale yellowish-brown, very fine-granular			
1,562-1,600	Anhydrite, grayish-white to medium-gray, fine-granular			

Wreford Limestone 2,010-2,072 feet		Houchen Creek? Limestone Bed of Janesville Shale 2,440-2,487 feet	
2,010-2,020	Limestone, very pale-orange, fine-granular; light brownish-gray mottled with light-gray chert	2,440-2,450	Limestone, brownish-gray, fine-granular; trace of glauconite
2,020-2,030	Limestone, light- to medium-gray, mottled, fine-granular; brownish-gray to medium dark-gray spicular chert	2,450-2,460	Limestone, medium dark-gray with brownish tint, fine-crystalline
2,030-2,040	Limestone, medium light-gray, fine-granular; chert as above	2,460-2,470	Limestone, pale to dark yellowish-brown, fine-crystalline
2,040-2,050	Limestone, medium dark-gray, argillaceous, silty; spines (marl)	2,470-2,474	Shale, greenish-gray
2,050-2,056	Limestone, medium dark-gray, argillaceous, silty	2,474-2,477	Shale, gray
2,056-2,070	Shale, medium dark to dark-gray, calcareous	2,477-2,487	Limestone, pale yellowish-brown, fine-crystalline
2,070-2,072	Limestone, medium-gray, fine-crystalline	2,487-2,490	Sandstone, pale yellowish-brown, very fine-grained, calcareous, glauconitic
Council Grove Group		2,490-2,496	Shale, gray, calcareous; fusulinids
2,072-2,080	Shale, gray, calcareous	Five Point Limestone Member of Janesville Shale 2,496-2,528 feet	
Funston Limestone 2,085-2,106 feet		2,496-2,502	Limestone, medium-gray, fine-crystalline, argillaceous
2,085-2,090	Limestone, pale yellowish-brown to light olive-gray, fine-crystalline	2,502-2,508	Shale, gray, slightly calcareous
2,090-2,106	Limestone as above; dark-gray spots	2,508-2,528	Limestone, medium dark-gray, fine-crystalline, silty
2,106-2,109	Shale, grayish-black	2,528-2,538	Sandstone, very light-gray, very fine-grained, slightly calcareous; carbonaceous material
2,109-2,114	Shale, gray	2,538-2,540	Shale, gray
Crouse Limestone 2,114-2,130 feet		2,540-2,544	Limestone, pale yellowish-brown, fine-crystalline
2,114-2,130	Limestone, pale yellowish-brown, fine-crystalline	2,544-2,547	Shale, black
2,130-2,136	Shale, dark-gray, calcareous	2,547-2,552	Shale, gray, slightly calcareous
2,136-2,140	Shale, dusky yellow	2,552-2,557	Limestone, brownish-gray, fine-crystalline, silty, glauconitic
2,140-2,145	Shale, gray	2,557-2,570	Shale, gray, slightly calcareous
Bader Limestone, Stearns Shale, and Beattie Limestone, undifferentiated, 2,145-2,247 feet		2,570-2,576	Shale, greenish-gray
2,145-2,150	Limestone, pale yellowish-brown; fine to medium oölites	2,576-2,586	Shale, gray, slightly calcareous
2,150-2,165	Limestone, brownish-gray, fine-crystalline	2,586-2,593	Limestone, brownish-gray, fine-crystalline
2,165-2,175	Limestone, pale yellowish-brown, fine-crystalline	2,593-2,595	Shale, gray
2,175-2,180	Limestone, light-gray with dark-gray spots, fine-crystalline	2,595-2,600	Limestone, medium-gray, very finely sandy; coarse dark-gray oölites? or oölitoid pellets
2,180-2,190	Dolomite, pale yellowish-brown, calcareous, argillaceous	2,600-2,610	Limestone, brownish-gray, fine-crystalline
2,190-2,200	Limestone, light-gray, fine-crystalline	2,610-2,615	Shale, gray
2,200-2,203	Shale, gray	2,615-2,620	Shale, gray, calcareous
2,203-2,220	Limestone, brownish-gray, fine-crystalline	2,620-2,627	Shale, light-gray, calcareous
2,220-2,225	Shale, gray, calcareous	2,627-2,632	Sandstone, light olive-gray, very fine-grained, silty, calcareous
2,225-2,230	Limestone, pale yellowish-brown, fine-crystalline	2,632-2,638	Shale, greenish-gray
2,230-2,240	Limestone, brownish-gray, fine-crystalline; fusulinids	2,638-2,640	Shale, gray, calcareous
2,240-2,247	Limestone, pale yellowish-brown, fine-crystalline; crinoids	2,640-2,642	Limestone, light olive-gray, fine-crystalline
2,247-2,254	Shale, medium-gray, calcareous	2,642-2,650	Shale, gray, calcareous
Grenola Limestone 2,254-2,302 feet		2,650-2,654	Shale, greenish-gray
2,254-2,260	Dolomite, pale yellowish-brown, fine-crystalline, vuggy	2,654-2,657	Limestone, brownish-gray, very fine-crystalline
2,260-2,270	Dolomite, dark yellowish-brown, dense to very fine-crystalline	2,657-2,663	Shale, gray, calcareous
2,270-2,280	Dolomite, grayish-brown, fine-granular, argillaceous	2,663-2,666	Limestone, medium light-gray, fine-granular
2,280-2,283	Shale, gray	2,666-2,684	Shale, gray, slightly calcareous
2,283-2,290	Limestone, pale to dark yellowish-brown; fine to medium oölites and oölicasts	2,684-2,687	Limestone, brownish-gray, fine-crystalline
2,290-2,293	Shale, gray	2,687-2,695	Shale, gray, calcareous
2,293-2,302	Limestone, medium light-gray, fine-granular, argillaceous	Pennsylvanian System Virgil Series Wabunsee Group	
2,302-2,310	Shale, gray, calcareous	2,695-2,706	Limestone, pale to dark yellowish-brown, fine-crystalline; fusulinids
2,310-2,316	Shale, greenish-gray	2,706-2,711	Shale, gray, calcareous
Red Eagle Limestone, Johnson Shale, and Foraker Limestone, undifferentiated 2,316-2,425 feet		2,711-2,717	Limestone, grayish-brown, fine-crystalline; spines
2,316-2,320	Limestone, medium dark-gray, fine-crystalline, argillaceous	2,717-2,726	Shale, gray, slightly calcareous
2,320-2,330	Limestone, medium-gray, fine-crystalline	2,726-2,730	Limestone, brownish-gray, fine-crystalline
2,330-2,335	Limestone, yellowish-brown, fine-crystalline; fine oölites	2,730-2,734	Shale, gray
2,335-2,340	Limestone, pale yellowish-brown, fine-crystalline; very fine oölites; crinoids	2,734-2,758	Limestone, pale yellowish-brown, fine-crystalline
2,340-2,350	Limestone, pale yellowish-brown, fine-crystalline	2,758-2,760	Shale, gray
2,350-2,360	Limestone, dark yellowish-brown, fine-crystalline, slightly argillaceous	2,760-2,770	Limestone, pale yellowish-brown, fine-granular; ostracodes; crinoids
2,360-2,366	Limestone, brownish-gray, fine-crystalline, slightly argillaceous	2,770-2,775	Limestone, dark yellowish-brown, fine-crystalline
2,366-2,370	Shale, gray, calcareous	2,775-2,780	Limestone, medium-gray, fine-crystalline; grayish-brown dense chert
2,370-2,373	Shale, gray	2,780-2,788	Shale, gray, calcareous
2,373-2,388	Limestone, pale yellowish-brown, fine-granular	2,788-2,790	Limestone, medium dark-gray, fine-crystalline, argillaceous
2,388-2,390	Limestone as above; dark-gray limestone with fine to medium oölites	2,790-2,808	Shale, gray, calcareous
2,390-2,398	Limestone, light brownish-gray, fine-granular; fine oölites; fusulinids	2,808-2,814	Limestone, pale yellowish-brown; fine oölites
2,398-2,405	Shale, gray, calcareous; fusulinids	2,814-2,825	Limestone, pale yellowish-brown, fine-crystalline
2,405-2,410	Shale, gray, slightly calcareous	2,825-2,830	Limestone, dark yellowish-brown, fine-crystalline
2,410-2,420	Limestone, pale yellowish-brown, fine-crystalline; fusulinids and abraded fusulinids	2,830-2,848	Limestone, dark yellowish-brown, fine-crystalline
2,420-2,425	Limestone as above; fusulinids and brachiopods	2,848-2,852	Shale, gray
Admire Group		2,852-2,860	Limestone, pale yellowish-brown, fine-crystalline
2,425-2,440	Shale, gray, calcareous	2,860-2,869	Limestone, pale yellowish-brown to yellowish-gray, fine-granular, slightly oölicastic; fine oölites
		2,869-2,870	Shale, gray
		2,870-2,874	Limestone, pale yellowish-brown
		2,874-2,878	Shale, gray
		2,878-2,885	Limestone, brownish-gray, fine-crystalline
		2,885-2,895	Limestone, pale yellowish-brown, fine-crystalline
		2,895-2,905	Limestone, gray, fine-crystalline
		2,905-2,909	Shale, gray
		2,909-2,920	Limestone, pale yellowish-brown, fine-crystalline
		2,920-2,923	Shale, grayish-black
		2,923-2,939	Limestone, medium light-gray to pale yellowish-brown, fine-crystalline
		2,939-2,942	Shale, gray
		2,942-2,950	Limestone, brownish-gray, fine-crystalline

2,950-2,965	Limestone, medium light-gray, fine-crystalline	3,517-3,530	Limestone, pale yellowish-brown, fine-crystalline
2,965-2,976	Limestone, pale yellowish-brown, fine-crystalline	3,530-3,536	Shale, moderate-brown
2,976-2,982	Shale, gray, calcareous	3,536-3,538	Shale, moderate reddish-brown
2,982-2,990	Limestone, medium-gray, fine-crystalline; brachiopods	3,538-3,543	Shale, medium-gray
2,990-2,995	Limestone, medium-gray, fine-crystalline	3,543-3,550	Limestone, medium dark-gray, fine-crystalline, argillaceous
2,995-3,003	Shale, moderate reddish-brown to pale-brown	3,550-3,555	Sandstone, very light-gray, very fine-grained, calcareous
3,003-3,010	Shale, greenish-gray	3,555-3,560	Shale, brownish-gray, very finely sandy, calcareous
3,010-3,020	Limestone, pale yellowish-brown, fine-granular, very finely porous	3,560-3,564	Shale, medium-gray, calcareous
3,020-3,024	Shale, gray	3,564-3,576	Limestone, dark yellowish-brown, fine-crystalline
3,024-3,050	Limestone, pale yellowish-brown, granular, porous	3,576-3,581	Shale, medium-gray, calcareous
3,050-3,052	Shale, gray	3,581-3,586	Shale, olive-gray
3,052-3,060	Limestone, pale yellowish-brown, fine-crystalline	3,586-3,595	Shale, medium-gray
3,060-3,067	Limestone, medium light-gray; fine oolites	3,595-3,600	Limestone, pale yellowish-brown, fine-crystalline
3,067-3,084	Limestone, pale yellowish-brown, fine-crystalline; crinoids		
3,084-3,089	Shale, gray, calcareous		Douglas Group
3,089-3,096	Limestone, medium-gray, fine-crystalline	3,600-3,605	Shale, medium-gray, calcareous
3,096-3,100	Shale, gray, calcareous	3,605-3,610	Shale, greenish-gray
3,100-3,106	Shale, moderate reddish-brown	3,610-3,614	Limestone, dark yellowish-brown, fine-crystalline
3,106-3,110	Shale, gray	3,614-3,620	Shale, moderate-brown
3,110-3,114	Shale, black	3,620-3,625	Shale, medium-gray, slightly calcareous
3,114-3,117	Shale, gray	3,625-3,636	Shale, moderate brownish-gray, calcareous; very finely sandy
3,117-3,120	Shale, greenish-gray	3,636-3,638	Limestone, brownish-gray, fine-crystalline
3,120-3,126	Shale, moderate-brown and greenish-gray	3,638-3,645	Shale, medium-gray
3,126-3,130	Shale, gray; spines	3,645-3,650	Shale, greenish-gray
3,130-3,134	Shale, grayish-black	3,650-3,655	Shale, moderate reddish-brown
3,134-3,140	Shale, gray and greenish-gray	3,655-3,664	Shale, greenish-gray
3,140-3,145	Shale, gray	3,664-3,667	Shale, moderate reddish-brown
	Shawnee Group	3,667-3,673	Shale, medium-gray; brachiopods
	Topeka Limestone 3,145-3,190 feet	3,673-3,678	Shale, pale-brown
		3,678-3,686	Shale, greenish-gray
3,145-3,160	Limestone, pale yellowish-brown, fine-crystalline	3,686-3,710	Shale, medium dark-gray, silty, very finely micaceous
3,160-3,164	Limestone, pale yellowish-brown; fine to medium oolites	3,710-3,713	Shale, grayish-black
3,164-3,180	Limestone, pale yellowish-brown, fine-crystalline	3,713-3,735	Shale, medium-gray
3,180-3,190	Limestone, dark yellowish-brown, fine-crystalline	3,735-3,742	Shale, grayish-black
3,190-3,196	Shale, gray, calcareous		
3,196-3,215	Sandstone, light-gray, fine-grained, slightly calcareous		Missouri Series
3,215-3,220	Shale, medium-brown		Lansing Group
3,220-3,224	Shale, grayish-black		
	Deer Creek Limestone 3,224-3,298 feet	3,742-3,748	Limestone, dark yellowish-brown, fine-crystalline, argillaceous
		3,748-3,750	Shale, medium-gray
3,224-3,229	Limestone, medium-gray, argillaceous	3,750-3,752	Shale, moderate reddish-brown
3,229-3,240	Shale, dark-gray; coal stringers	3,752-3,756	Limestone, grayish-red, fine-crystalline, argillaceous
3,240-3,244	Limestone, brownish-gray, fine-crystalline	3,756-3,760	Shale, moderate reddish-brown
3,244-3,250	Shale, greenish-gray	3,760-3,764	Shale, grayish-red, calcareous
3,250-3,254	Shale, medium-gray	3,764-3,767	Shale, medium-gray
3,254-3,270	Shale, medium-gray, very finely sandy, calcareous	3,767-3,770	Shale, grayish-black
3,270-3,275	Shale, grayish-black	3,770-3,775	Shale, medium-gray
3,275-3,280	Limestone, pale yellowish-brown, fine-crystalline	3,775-3,785	Shale, medium-gray, very finely sandy
3,280-3,298	Limestone, brownish-gray, fine-granular, silty	3,785-3,800	Shale, medium-gray
3,298-3,310	Shale, medium-gray, calcareous; carbonaceous stringers	3,800-3,805	Limestone, pale yellowish-brown, fine-crystalline; fusulinids
3,310-3,314	Shale, dark yellowish-brown	3,805-3,815	Limestone, brownish-gray; medium oolites; many dark-gray oolites
	Lecompton Limestone 3,314-3,349 feet	3,815-3,820	Limestone as above, oolitic
		3,820-3,823	Limestone, pale yellowish-brown; very fine to fine oolites and oolcasts
3,314-3,316	Limestone, dark yellowish-brown, fine-crystalline	3,823-3,831	Shale, medium-gray, calcareous
3,316-3,320	Shale, medium-gray	3,831-3,834	Limestone, medium dark-gray, fine-crystalline
3,320-3,330	Shale, medium-gray, calcareous	3,834-3,837	Shale, medium dark-gray, calcareous
3,330-3,333	Shale, grayish-black	3,837-3,842	Limestone, dark brownish-gray, fine-granular, silty
3,333-3,345	Shale, medium-gray	3,842-3,844	Shale, medium-gray
3,345-3,349	Limestone, light-gray, fine-crystalline	3,844-3,854	Limestone, dark brownish-gray, fine-granular, silty
3,349-3,350	Shale, medium-gray	3,854-3,857	Shale, medium-gray
3,350-3,356	Sandstone, light-gray, very fine-grained, calcareous	3,857-3,860	Limestone, brownish-gray, fine-crystalline
3,356-3,370	Shale, medium-gray, slightly calcareous	3,860-3,880	Limestone, pale yellowish-brown to brownish-gray; very fine oolites and oolcasts
3,370-3,376	Shale, greenish-gray		
3,376-3,380	Shale, medium-gray		Kansas City Group
3,380-3,383	Limestone, pale yellowish-brown, fine-crystalline		
3,383-3,390	Shale, medium-gray	3,880-3,900	Limestone, brownish-gray to dusky yellowish-brown, fine-crystalline
3,390-3,400	Shale, greenish-gray	3,900-3,910	Limestone as above; fusulinids
3,400-3,406	Shale, grayish-red	3,910-3,920	Limestone as above; spines, crinoids
3,406-3,416	Shale, medium-gray	3,920-3,925	Limestone, dark yellowish-brown, fine-crystalline
3,416-3,420	Shale, grayish-black	3,925-3,930	Shale, medium-gray, calcareous
3,420-3,422	Shale, greenish-gray	3,930-3,958	Shale, medium-gray
3,422-3,425	Shale, moderate reddish-brown	3,958-3,965	Limestone, pale yellowish-brown, fine-granular
3,425-3,440	Shale, medium-gray and greenish-gray, calcareous	3,965-3,968	Shale, moderate reddish-brown
3,440-3,447	Shale, medium-gray	3,968-3,975	Shale, greenish-gray
3,447-3,455	Sandstone, light-gray, fine-grained, calcareous	3,975-3,981	Shale, medium-gray
3,455-3,460	Shale, grayish-black	3,981-3,990	Limestone, medium dark-gray, fine-crystalline, argillaceous
3,460-3,466	Shale, greenish-gray	3,990-4,000	Shale, medium-gray
3,466-3,470	Shale, medium-gray		Drum Limestone 4,000-4,047 feet
	Oread Limestone 3,470-3,600 feet		
3,470-3,474	Limestone, grayish-brown to medium dark-gray, fine-crystalline, argillaceous	4,000-4,010	Limestone, pale yellowish-brown, fine-crystalline
3,474-3,477	Shale, medium-gray	4,010-4,025	Limestone, brownish-gray, fine-crystalline
3,477-3,480	Limestone, pale yellowish-brown, fine-crystalline	4,025-4,030	Limestone, pale yellowish-brown, fine- to medium-crystalline
3,480-3,485	Shale, grayish-black	4,030-4,040	Limestone, light olive-gray, fine-granular; crinoids
3,485-3,500	Limestone, dark yellowish-brown, fine-crystalline	4,040-4,047	Limestone, medium light-gray, fine-granular, argillaceous; fusulinids
3,500-3,506	Limestone, medium dark-gray, fine-crystalline, argillaceous		
3,506-3,510	Shale, grayish-black		
3,510-3,515	Limestone, dusky brown, fine-crystalline		
3,515-3,517	Shale, medium-gray		

SEC. 10, T. 33 S., R. 10 W.

4,850-4,853	Dolomite, grayish-white, rhombic
4,853-4,865	Sandstone, grayish-white, fine- to medium-grained, subrounded, dolomitic
4,865-4,880	Sandstone, dark yellowish-brown, very fine- to fine-grained, dolomitic
4,880-4,891	Sandstone, light greenish-gray, very fine- to fine-grained, dolomitic
4,891-4,892	Shale, greenish-gray
4,892-4,897	Sandstone, grayish-white, fine-grained, subrounded; trace of glauconite and pyrite
4,897-4,900	Shale, greenish-gray
4,900-4,910	Shale, greenish-gray, very finely sandy, dolomitic
4,910-4,930	Shale, greenish-gray to medium dark-gray
4,930-4,940	Shale, medium-gray and greenish-gray
4,940-4,947	Shale, medium dark-gray to greenish-gray
4,947-4,950	Sandstone, grayish-white, very fine- to fine-grained, dolomitic, glauconitic
4,950-4,956	Sandstone, grayish-white, fine-grained, dolomitic; abundant dark-gray minerals
4,956-4,963	Shale, greenish-gray
4,963-4,970	Shale, medium-gray
4,970-4,976	Shale, greenish-gray

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4,976-4,980	Sandstone, light-gray to brownish-gray, very fine-grained, silty, dolomitic
4,980-5,000	Sandstone, grayish-white, fine- to medium-grained, subangular to subrounded
5,000-5,004	Sandstone, very light-gray, very fine- to fine-grained; pyrite
Cambrian and Ordovician Systems Arbuckle Group	
5,004-5,010	Dolomite, very pale-orange, medium- to coarse-crystalline, porous
5,010-5,018	Dolomite, pale yellowish-brown, fine-crystalline; light-gray mottled with brownish-gray and dark-gray chert
5,018-5,025	Dolomite, pale yellowish-brown, fine-crystalline
5,025-5,030	Dolomite, brownish-gray, fine- to medium-crystalline
5,030-5,033	Dolomite, brownish-gray, finely sandy
5,033-5,045	Dolomite, brownish-gray, fine-crystalline
5,045-5,050	Dolomite, pale yellowish-brown, fine- to medium-crystalline, oöclastic?
5,050-5,061	Dolomite, medium light-gray to brownish-gray, finely sandy
5,061	Total depth

LOG 2
BARBER COUNTY, KANSAS
SE¼ SE¼ NW¼ sec. 27, T. 34 S., R. 10 W.

Operator: Harbar Drilling and Atlantic Refining Co.
Lease: Knorp No. 1
Elevation: DF 1,321 feet
Total depth: 5,414 feet
Completion date: Feb. 1, 1948
Initial production: Dry

Electrical log: 259 to 5,410 feet
Sample intervals:
10-foot
250 to 3,000 feet
5-foot
3,000 to 5,414 feet
Cored intervals: None

Permian System
Cimarron Group

0- 250	No samples
	Harper Sandstone 250-407? feet
250- 280	Shale, moderate reddish-brown; silty shale; light greenish-gray spots; much cement
280- 290	Sandstone, pale-red, very fine-grained, silty, slightly dolomitic
290- 310	Shale, moderate reddish-brown; white soft gypsum 290-295 feet
310- 317	Shale, moderate reddish-brown; salt
317- 320	Shale, medium light-gray, very finely sandy
320- 330	Shale, moderate reddish-brown, very finely sandy
330- 340	Shale, moderate reddish-brown; salt
340- 344	Shale, moderate reddish-brown
344- 355	Shale, medium-gray
355- 365	Shale, moderate-brown
365- 370	Shale, moderate reddish-brown
370- 375	Shale, greenish-gray, smooth
375- 385	Shale, dark reddish-brown
385- 390	Shale, medium-gray
390- 407?	Shale, moderate reddish-brown
	Sumner Group
	Ninnescah Shale 407?-828 feet
407?- 416	Shale, greenish-gray, dolomitic
416- 420	Shale, moderate reddish-brown
420- 425	Shale, greenish-gray, dolomitic
425- 430	Shale, moderate reddish-brown
430- 460	Shale, moderate reddish-brown; greenish-gray spots
460- 466	Shale, light-brown, dolomitic
466- 470	Shale, moderate reddish-brown
470- 510	Shale, moderate reddish-brown; greenish-gray spots
510- 515	Shale, light-gray, dolomitic
515- 530	Shale, moderate reddish-brown
530- 538	Shale, greenish-gray
538- 565	Shale, moderate reddish-brown
565- 575	Shale, pale reddish-brown, dolomitic
575- 590	Shale, moderate reddish-brown
590- 595	Shale, greenish-gray
595- 610	Shale, moderate reddish-brown
610- 615	Shale, greenish-gray
615- 630	Shale, moderate reddish-brown
630- 640	Shale, moderate reddish-brown; light greenish-gray spots
640- 660	Shale, pale-red
660- 670	Shale, light-gray, dolomitic
670- 696	Shale, moderate reddish-brown
696- 700	Shale, medium-gray
700- 730	Shale, moderate reddish-brown
730- 736	Shale, greenish-gray
736- 740	Shale, moderate reddish-brown
740- 765	Shale, moderate reddish-brown; greenish-gray spots
765- 780	Shale, moderate reddish-brown
780- 790	Shale, medium-gray, dolomitic
790- 793	Dolomite, very light-gray, dense
793- 800	Shale, greenish-gray
800- 815	Shale, moderate reddish-brown
815- 818	Dolomite, medium light-gray, argillaceous
818- 828	Shale, moderate reddish-brown

Wellington Formation 828-1,734 feet

828- 830	Dolomite, medium-gray, fine-crystalline
830- 836	Shale, greenish-gray
836- 846	Shale, medium-gray
846- 850	Dolomite, pale yellowish-brown, dense
850- 880	Shale, medium- to dark-gray; slightly dolomitic in part; grayish-white fine-crystalline anhydrite (cave?)
880- 883	Dolomite, light olive-gray to pale yellowish-brown, very fine-crystalline
883- 890	Shale, medium-gray
890- 900	Shale, greenish-gray, dolomitic
900- 919	Shale, medium-gray
919- 921	Dolomite, light olive-gray to pale yellowish-brown, very fine-crystalline
921- 930	Shale, medium-gray
930- 935	Shale, greenish-gray, dolomitic
935- 950	Shale, medium-gray
950- 952	Dolomite, pale yellowish-brown, dense
952- 960	Shale, medium-gray, dolomitic
960- 963	Dolomite, light-gray, dense, argillaceous
963- 970	Shale, greenish-gray
970- 980	Shale, medium-gray
980- 990	Shale, medium-gray, dolomitic
990- 993	Dolomite, light-gray, dense
993-1,015	Shale, medium-gray
1,015-1,030	Shale, gray; medium-gray fine-crystalline anhydrite
1,030-1,033	Shale, gray
1,033-1,036	Anhydrite, medium-gray, fine-crystalline
1,036-1,048	Shale, gray; anhydrite as above
1,048-1,050	Anhydrite, medium-gray, fine-crystalline
1,050-1,083	Anhydrite, light- to medium-gray and brownish-gray, fine-crystalline to granular
1,083-1,105	Anhydrite, pale yellowish-brown; salt
1,105-1,130	Anhydrite, medium light-gray, fine-crystalline to granular
1,130-1,137	Salt; light-gray, fine- to medium-crystalline anhydrite
1,137-1,150	Anhydrite, light-gray, fine- to medium-crystalline
1,150-1,165	Anhydrite as above; salt
1,165-1,170	Anhydrite as above
1,170-1,175	Anhydrite as above; salt
1,175-1,180	Anhydrite, very light- to light-gray, fine-crystalline to granular
1,180-1,560	Anhydrite, very light- to light-gray, fine-crystalline to granular; much salt
1,560-1,580	Anhydrite, very light-gray, fine- to medium-crystalline
1,580-1,600	Anhydrite, light- to medium-gray, fine-crystalline
1,600-1,620	Anhydrite as above; salt
1,620-1,645	Anhydrite, light-gray, fine-granular to crystalline
1,645-1,650	Shale, medium-gray, dolomitic
1,650-1,660	Dolomite, medium light-gray, very fine-crystalline, argillaceous; many dark-gray spots (anhydrite crystals?)
1,660-1,666	Dolomite, pale yellowish-brown, very fine-crystalline, argillaceous
1,666-1,670	Shale, medium-gray
1,670-1,680	Anhydrite, very light- to medium-gray, fine-crystalline
1,680-1,690	Shale, medium-gray
1,690-1,697	Dolomite, light olive-gray, fine-crystalline, argillaceous; scattered dark spots; pyrite
1,697-1,703	Shale, medium-gray
1,703-1,720	Anhydrite, very light-gray, fine-crystalline
1,720-1,734	Shale, medium-gray

Chase Group
Nolans Limestone 1,734-1,780 feet

1,734-1,750	Dolomite, light-gray, fine-granular, argillaceous; grayish-white dense to semigranular chert
1,750-1,760	Dolomite, medium-gray, fine-crystalline, argillaceous; slight brownish tint; pinhole porosity
1,760-1,762	Shale, medium-gray
1,762-1,780	Dolomite, brownish-gray, fine-crystalline, porous; crinoids
1,780-1,790	Shale, greenish-gray to dark greenish-gray, dolomitic
Winfield Limestone 1,790-1,843 feet	
1,790-1,810	Dolomite, light-gray, fine-granular
1,810-1,830	Limestone, medium-gray to pale yellowish-brown, fine-granular, argillaceous; crinoids; little medium- to medium dark-gray chert
1,830-1,837	Shale, medium-gray, calcareous
1,837-1,843	Limestone, medium-gray, fine-granular, argillaceous; spines; crinoids; bryozoans
1,843-1,855	Shale, medium-gray, calcareous
1,855-1,865	Limestone, brownish-gray, very fine-crystalline
1,865-1,870	Shale, grayish-red, dolomitic
1,870-1,876	Shale, medium-gray

Barneston Limestone 1,876-1,994 feet

1,876-1,885	Limestone, medium light-gray, fine-granular, argillaceous
1,885-1,890	Shale, medium-gray
1,890-1,897	Shale, grayish-red
1,897-1,904	Dolomite, pale yellowish-brown, fine-granular, argillaceous
1,904-1,916	Limestone, light- to medium-gray, fine-granular, argillaceous; medium dark-gray chert
1,916-1,922	Shale, medium-gray
1,922-1,925	Limestone, medium light-gray, fine-granular
1,925-1,930	Limestone as above; light-gray spicular chert
1,930-1,937	Limestone, medium light-gray, fine-granular, argillaceous
1,937-1,945	Limestone, light olive-gray, fine-crystalline
1,945-1,960	Limestone, light-gray, fine-crystalline
1,960-1,977	Limestone, pale yellowish-brown to light-gray, fine-crystalline; light-gray spicular chert
1,977-1,980	Shale, medium-gray
1,980-1,994	Limestone, pale yellowish-brown to light-gray, fine-crystalline; light-gray spicular chert
1,994-2,000	Shale, moderate reddish-brown
2,000-2,007	Shale, moderate brown
2,007-2,014	Limestone, light-gray, fine-granular, argillaceous
2,014-2,020	Shale, medium-gray
2,020-2,026	Shale, moderate reddish-brown
2,026-2,034	Shale, medium-gray

Wreford Limestone 2,034-2,104 feet

2,034-2,040	Limestone, very pale-orange to pale yellowish-brown, fine-crystalline
2,040-2,045	Limestone as above, finely oölitic
2,045-2,058	Shale, medium-gray
2,058-2,068	Limestone, medium light-gray, fine-granular; dark-gray fusiform spots; grayish-white, dense to semigranular chert
2,068-2,070	Shale, medium-gray
2,070-2,075	Shale, moderate reddish-brown
2,075-2,098	Shale, medium-gray
2,098-2,104	Limestone, pale yellowish-brown, fine-crystalline

Council Grove Group

2,104-2,108	Shale, medium-gray
Funston Limestone 2,108-2,145 feet	
2,108-2,120	Limestone, pale yellowish-brown, fine-crystalline
2,120-2,124	Shale, medium-gray
2,124-2,134	Limestone, medium-gray, fine-granular, silty
2,134-2,136	Shale, medium-gray
2,136-2,145	Limestone, medium-gray, fine-granular, silty; medium-gray dense chert
2,145-2,155	Shale, medium-gray
Crouse Limestone 2,155-2,180 feet	
2,155-2,168	Limestone, medium dark-gray, fine-granular, silty
2,168-2,172	Shale, medium-gray
2,172-2,175	Limestone, medium-gray, fine-crystalline, argillaceous
2,175-2,180	Limestone, brownish-gray, very fine-crystalline
2,180-2,188	Shale, greenish-gray

Bader Limestone, Stearns Shale, and
Beattie Limestone, undifferentiated 2,188-2,306 feet

2,188-2,200	Limestone, pale yellowish-brown, fine-crystalline; fusulinids (weathered?)
2,200-2,207	Limestone, pale yellowish-brown, fine-crystalline to granular, very finely oölitic
2,207-2,214	Shale, medium-gray
2,214-2,220	Limestone, brownish-gray, fine-crystalline; crinoids
2,220-2,240	Limestone, light olive-gray to pale yellowish-brown, fine-granular, dolomitic
2,240-2,246	Limestone, pale yellowish-brown, pseudoölitic
2,246-2,250	Shale, light greenish-gray
2,250-2,256	Limestone, dark brownish-gray, very fine-crystalline
2,256-2,260	Shale, moderate brown
2,260-2,266	Shale, moderate reddish-brown
2,266-2,275	Shale, medium-gray
2,275-2,288	Dolomite, pale yellowish-brown, fine-granular, argillaceous; some pinhole porosity; some medium-gray vuggy dolomite
2,288-2,292	Shale, medium-gray
2,292-2,306	Limestone, pale yellowish-brown, fine- to coarse-crystalline, vuggy to porous; fusulinids
2,306-2,310	Shale, grayish-red
2,310-2,320	Shale, medium-gray

Grenola Limestone 2,320-2,388 feet

2,320-2,323	Limestone, medium light-gray, very fine-crystalline
2,323-2,326	Shale, medium-gray
2,326-2,340	Limestone, pale yellowish-brown, very fine-crystalline
2,340-2,350	Shale, gray and greenish-gray
2,350-2,354	Limestone, medium light-gray, fine-crystalline
2,354-2,364	Shale, medium-gray
2,364-2,376	Limestone, pale yellowish-brown, medium to coarsely oölitic, oölitic
2,376-2,378	Limestone, brownish-gray, fine-crystalline
2,378-2,382	Shale, grayish-black
2,382-2,388	Limestone, medium-gray, fine-crystalline, argillaceous; trace of pyrite
2,388-2,396	Shale, medium-gray

Red Eagle Limestone, Johnson Shale,
and Foraker Limestone, undifferentiated 2,396-2,495 feet

2,396-2,400	Limestone, medium-gray, fine-crystalline, argillaceous
2,400-2,408	Limestone, pale yellowish-brown, fine- to medium-oölitic, porous
2,408-2,413	Shale, medium-gray
2,413-2,423	Limestone, pale to dark yellowish-brown, very fine-crystalline; pyrite; fusulinids
2,423-2,426	Shale, medium-gray
2,426-2,433	Limestone, brownish-gray to medium-gray, fine-crystalline, argillaceous
2,433-2,450	Shale, medium-gray
2,450-2,460	Limestone, medium-gray, very fine-crystalline, argillaceous
2,460-2,470	Limestone, brownish-gray to grayish-brown, very fine-crystalline
2,470-2,474	Shale, medium-gray
2,474-2,478	Limestone, pale yellowish-brown, fine-crystalline
2,478-2,480	Shale, medium-gray
2,480-2,485	Limestone, very pale-orange, very fine-granular
2,485-2,495	Limestone, pale yellowish-brown, fine-crystalline; fusulinids

Admire Group

2,495-2,500	Shale, medium-gray; fusulinids
2,500-2,502	Limestone, pale yellowish-brown, fine-crystalline
2,502-2,505	Shale, medium-gray
2,505-2,509	Limestone, dark yellowish-brown, fine-crystalline
2,509-2,520	Shale, medium-gray
Houchen Creek? Limestone Bed of Janesville Shale 2,520-2,555 feet	
2,520-2,525	Limestone, brownish-gray, fine-crystalline; glauconite
2,525-2,533	Limestone, dark yellowish-brown, fine-crystalline
2,533-2,536	Shale, medium-gray
2,536-2,540	Limestone, dark yellowish-brown, fine-crystalline
2,540-2,545	Shale, medium-gray
2,545-2,555	Limestone, medium-gray, fine-crystalline, argillaceous
2,555-2,560	Shale, medium-gray
2,560-2,570	Sandstone, very light-gray, very fine-grained, silty, calcareous, glauconitic; some light olive-gray sandstone
2,570-2,575	Shale, medium-gray
2,575-2,585	Shale, pale-red to grayish-red
2,585-2,590	Shale, medium-gray
2,590-2,600	Shale, medium-gray, silty, micaceous
2,600-2,602	Shale, medium-gray

3,585-3,589	Limestone, grayish-brown, very fine-crystalline, argillaceous
3,589-3,602	Shale, medium-gray
3,602-3,606	Limestone, pale yellowish-brown, fine-granular; pinhole porosity; very pale-orange dense chert
3,606-3,615	Shale, medium-gray
3,615-3,620	Limestone, very pale-orange, fine-granular
3,620-3,627	Shale, medium-gray
3,627-3,630	Shale, grayish-black
3,630-3,632	Limestone, brownish-gray, fine-crystalline
3,632-3,636	Shale, medium-gray
3,636-3,638	Limestone, brownish-gray, fine-crystalline
3,638-3,646	Shale, medium-gray
3,646-3,648	Limestone, medium dark-gray, fine-crystalline, argillaceous

Douglas Group

3,648-3,680	Shale, medium-gray
3,680-3,690	Shale, greenish-gray
3,690-3,710	Shale, medium-gray
3,710-3,720	Shale, olive-gray
3,720-3,735	Shale, moderate-brown
3,735-3,750	Shale, greenish-gray
3,750-3,755	Shale, moderate-brown
3,755-3,760	Shale, greenish-gray
3,760-3,764	Shale, moderate reddish-brown
3,764-3,770	Shale, medium-gray
3,770-3,780	Shale, moderate reddish-brown to grayish-red
3,780-3,786	Shale, greenish-gray
3,786-3,790	Shale, moderate-brown
3,790-3,794	Shale, greenish-gray
3,794-3,800	Shale, grayish-red
3,800-3,805	Shale, medium-gray
3,805-3,810	Shale, grayish-black
3,810-3,815	Shale, medium-gray
3,815-3,820	Shale, greenish-gray
3,820-3,830	Shale, grayish-red
3,830-3,835	Shale, grayish-black
3,835-3,840	Shale, medium-gray
3,840-3,850	Shale, olive-gray
3,850-3,856	Shale, medium-gray
3,856-3,860	Shale, grayish-black; pyrite
3,860-3,864	Shale, medium-gray
3,864-3,874	Shale, grayish-black

Missouri Series
Lansing Group

3,874-3,884	Limestone, brownish-gray, fine-granular, very silty
3,884-3,890	Shale, medium-gray
3,890-3,900	Sandstone, very light-gray, very fine-grained, silty
3,900-3,910	Shale, dark-gray and grayish-black
3,910-3,914	Shale, grayish-black
3,914-3,940	Sandstone, very light-gray, very fine-grained, slightly calcareous, slightly micaceous
3,940-3,944	Shale, dark-gray, very finely sandy, glauconitic
3,944-3,962	Sandstone, very light-gray to pale yellowish-brown, very fine- to fine-grained
3,962-3,970	Sandstone, very light-gray, fine- to medium-grained, subangular, slightly calcareous; trace of coal fragments
3,970-4,015	Sandstone, very light-gray, fine- to medium-grained, subangular, slightly calcareous

Kansas City Group

4,015-4,025	Shale, medium-gray
4,025-4,034	Limestone, grayish-brown, very fine-crystalline, argillaceous
4,034-4,044	Shale, grayish-black
4,044-4,053	Shale, greenish-gray
4,053-4,060	Shale, black
4,060-4,070	Shale, greenish-gray
4,070-4,080	Shale, medium-gray
4,080-4,085	Shale, grayish-red
4,085-4,090	Shale, greenish-gray
4,090-4,094	Shale, medium-gray
4,094-4,100	Shale, grayish-black
4,100-4,106	Shale, greenish-gray
4,106-4,114	Shale, grayish-black
4,114-4,120	Shale, medium-gray
4,120-4,125	Shale, greenish-gray
4,125-4,130	Shale, grayish-black
4,130-4,140	Shale, grayish-red
4,140-4,150	Shale, medium-gray
4,150-4,156	Shale, grayish-black
4,156-4,167	Shale, medium-gray

Drum Limestone 4,167-4,180 feet

4,167-4,176	Limestone, brownish-gray, fine-crystalline, argillaceous
4,176-4,180	Limestone, grayish-brown to medium dark-gray, very fine-crystalline
4,180-4,190	Shale, olive-gray
4,190-4,198	Limestone, pale yellowish-brown, very fine-crystalline; some pinhole porosity

4,198-4,204	Limestone as above; light-gray dense calcareous or dolomitic spicular chert
4,204-4,210	Shale, greenish-gray
4,210-4,224	Shale, medium-gray
4,224-4,240	Limestone, pale yellowish-brown, fine-crystalline; light-gray dense chert; spicular chert (caving?)
4,240-4,248	Limestone, brownish-gray, fine-crystalline; crinoids; fusulinids
4,248-4,253	Shale, medium-gray
4,253-4,256	Limestone, medium- to medium dark-gray, slightly brownish, fine-crystalline
4,256-4,265	Limestone, pale yellowish-brown, fine-crystalline; medium light-gray to pale yellowish-brown spicular chert; fusulinids
4,265-4,270	Limestone, brownish-gray, fine-crystalline; chert as above
4,270-4,273	Shale, medium-gray
4,273-4,278	Shale, grayish-black

Winterset Limestone 4,278-4,316 feet

4,278-4,286	Limestone, pale yellowish-brown, fine-granular; medium light-gray to pale yellowish-brown spicular chert
4,286-4,290	Limestone, pale yellowish-brown, finely oolitic
4,290-4,310	Limestone, pale yellowish-brown, fine-granular
4,310-4,316	Limestone, dark brownish-gray, very fine-crystalline, silty
4,316-4,320	Shale, medium-gray
4,320-4,327	Shale, grayish-black
4,327-4,330	Shale, medium-gray
4,330-4,338	Shale, grayish-black
4,338-4,345	Limestone, medium-gray, fine-crystalline, silty
4,345-4,350	Limestone, dusky yellowish-brown, very fine-crystalline
4,350-4,364	Limestone, pale yellowish-brown to very pale-orange, fine-granular
4,364-4,368	Shale, medium-gray
4,368-4,374	Limestone, medium-gray, fine-crystalline
4,374-4,377	Shale, medium-gray
4,377-4,382	Limestone, pale yellowish-brown, fine- to medium-granular, finely oolitic; light-gray chert with dark-gray oolites
4,382-4,385	Shale, medium-gray
4,385-4,398	Limestone, brownish-gray, fine-crystalline

Pleasanton Group
(Pleasanton Formation on Chart OC-61)

4,398-4,400	Shale, medium-gray
4,400-4,403	Shale, grayish-black
4,403-4,408	Shale, medium-gray
4,408-4,410	Limestone, grayish-brown, very fine-crystalline
4,410-4,415	Shale, medium-gray
4,415-4,420	Shale, greenish-gray
4,420-4,430	Shale, medium-gray; coal stringer
4,430-4,435	Shale, grayish-brown
4,435-4,440	Limestone, greenish-gray and olive-gray, very fine-crystalline, argillaceous
4,440-4,450	Shale, medium-gray and grayish-black
4,450-4,453	Limestone, dark greenish-gray, very fine-crystalline, very silty
4,453-4,460	Shale, medium-gray and greenish-gray
4,460-4,464	Shale, medium-gray

Des Moines Series
Marmaton Group

4,464-4,472	Limestone, pale yellowish-brown, dense to very fine-crystalline
4,472-4,480	Shale, medium-gray
4,480-4,485	Limestone, brownish-gray, fine-crystalline
4,485-4,490	Limestone, pale yellowish-brown, dense
4,490-4,494	Limestone, pale yellowish-brown, fine-crystalline
4,494-4,496	Shale, medium-gray
4,496-4,504	Limestone, grayish-brown, fine-granular, argillaceous
4,504-4,510	Limestone, pale yellowish-brown, fine-crystalline
4,510-4,516	Limestone, medium dark-gray, fine-crystalline, silty
4,516-4,525	Shale, medium-gray
4,525-4,530	Limestone, pale yellowish-brown, fine-crystalline
4,530-4,534	Shale, medium-gray
4,534-4,540	Limestone, pale yellowish-brown, fine-crystalline; fusulinids (caving?)
4,540-4,548	Limestone, grayish-brown, fine-crystalline, argillaceous
4,548-4,550	Shale, medium-gray
4,550-4,557	Shale, medium-gray to grayish-black
4,557-4,568	Limestone, brownish-gray, fine-granular, very argillaceous
4,568-4,570	Shale, medium-gray
4,570-4,575	Shale, greenish-gray
4,575-4,580	Shale, grayish-black
4,580-4,585	Limestone, pale yellowish-brown, fine-crystalline
4,585-4,590	Shale, greenish-gray
4,590-4,596	Shale, medium-gray
4,596-4,604	Limestone, medium dark-gray, fine-granular, silty
4,604-4,610	Shale, medium-gray
4,610-4,614	Shale, greenish-gray
4,614-4,620	Shale, grayish-black
4,620-4,626	Shale, greenish-gray
4,626-4,630	Shale, medium-gray
4,630-4,635	Shale, grayish-black

4,635-4,638	Shale, medium-gray	5,040-5,055	Dolomite, light olive-gray to light-gray, fine-granular, very finely sandy, silty
4,638-4,650	Limestone, grayish-brown, fine-granular, silty	5,055-5,068	Dolomite, medium light-gray, fine-granular, very finely sandy, silty; medium light-gray figured chert
Cherokee Group (Cherokee Shale on Chart OC-61)		Ordovician System Sylvan Shale	
4,650-4,651	Shale, medium-gray	5,068-5,085	Shale, medium-gray to greenish-gray
4,651-4,659	Shale, grayish-red		
4,659-4,670	Shale, greenish-gray		
4,670-4,676	Shale, medium-gray		
Mississippian System Rocks of Meramecian Age			
4,676-4,680	Chert, grayish-white to pale yellowish-brown, dense, spicular and glauconitic, calcareous	5,085-5,090	Limestone, very light-gray, fine-crystalline, soft
		5,090-5,100	Limestone, very light-gray, medium-crystalline
4,680-4,690	Chert as above; pale yellowish-brown fine-crystalline glauconitic limestone	5,100-5,105	Limestone, very pale-orange, medium- to coarse-crystalline; medium light-gray spicular chert
		5,105-5,110	Dolomite, very pale-orange, fine-granular, calcareous
4,690-4,700	Dolomite, pale yellowish-brown, fine-granular, calcareous, silty; grayish-white granular chert; oil stain?	5,110-5,115	Limestone, pale yellowish-brown, fine-crystalline; light olive-gray chert
4,700-4,710	Dolomite, brownish-gray, medium-crystalline, silty	5,115-5,126	Limestone as above; light-gray spicular chert
4,710-4,715	Dolomite, medium dark-gray, fine-granular, very silty	5,126-5,130	Limestone, very pale-orange, fine-granular
4,715-4,720	Dolomite, pale yellowish-brown, fine-granular, silty, porous; grayish-white granular chert	5,130-5,135	Limestone, pale yellowish-brown to olive-gray, fine-granular, silty
4,720-4,730	Limestone, pale yellowish-brown, fine-granular; glauconite; grayish-white granular chert	5,135-5,140	Limestone, brownish-gray, fine-crystalline, argillaceous
		5,140-5,145	Dolomite, brownish-gray, very fine-crystalline, calcareous; brownish-gray dense and spicular chert
4,730-4,735	Chert, light- to medium-gray, mottled, spicular, calcareous	Simpson Group	
4,735-4,750	Dolomite, light-gray to pale yellowish-brown, fine-granular; grayish-white chert; glauconite	Bromide Formation 5,145-5,240 feet	
4,750-4,755	Limestone, light-gray, fine-granular, dolomitic	5,145-5,150	Dolomite, brownish-gray, dense
Rocks of Osagean Age		5,150-5,160	Limestone, brownish-gray, very fine-crystalline
4,755-4,785	Limestone, very pale-orange, fine-granular; glauconite; grayish-white spicular granular chert	5,160-5,170	Limestone, pale yellowish-brown, fine-crystalline
		5,170-5,179	Dolomite, brownish-gray, medium-granular; scattered fine sand grains
4,785-4,800	Limestone, grayish-white to very pale-orange, fine-granular; glauconite; crinoids; chert as above	5,179-5,182	Shale, greenish-gray, very finely sandy
4,800-4,804	Limestone, brownish-gray, fine-granular, dolomitic; medium light-gray mottled chert	5,182-5,186	Sandstone, light-gray, very fine- to fine-grained, dolomitic
		5,186-5,190	Shale, dark greenish-gray
4,804-4,825	Limestone, medium dark-gray, fine-granular, silty; medium light-gray to brownish-gray mottled chert	5,190-5,197	Sandstone, grayish-white, fine-grained, subrounded; some medium-grained sandstone; pyrite
4,825-4,836	Dolomite, medium-gray, fine-granular, silty, calcareous; light-gray mottled chert	5,197-5,202	Shale, greenish-gray
4,836-4,856	Limestone, medium light-gray, fine-granular, silty; light-gray mottled chert	5,202-5,206	Sandstone, medium light-gray, fine-grained, dolomitic
		5,206-5,210	Shale, dark greenish-gray
4,856-4,866	Limestone, light olive-gray, slightly brownish, fine-granular, silty, dolomitic; medium-gray chert	5,210-5,230	Sandstone, medium light-gray, fine- to medium-grained, dolomitic
		5,230-5,240	Sandstone, light-gray, medium-grained, subrounded, dolomitic
4,866-4,875	Dolomite, medium-gray, fine-crystalline to granular, silty, calcareous; trace of glauconite; medium light-gray mottled chert	5,240-5,252	Shale, dark greenish-gray, smooth; pyrite 5,248-5,252 feet
4,875-4,880	Dolomite, grayish-white, soft	5,252-5,258	Sandstone, grayish-white, very fine-grained; very fine fragments of greenish-gray shale?
4,880-4,886	Dolomite, pale yellowish-brown, fine-granular, silty, calcareous	5,258-5,262	Sandstone, light-gray, very fine-grained, glauconitic; some very fine- to medium-grained glauconitic sandstone
4,886-4,890	Dolomite, light-gray, fine-granular, silty, calcareous	5,262-5,269	Shale, medium-gray
4,890-4,900	Limestone, pale yellowish-brown, fine-granular, soft; trace of glauconite; medium light-gray mottled with brownish-gray spicular chert	5,269-5,274	Dolomite, medium-gray, very silty, fine- to medium-sandy (subrounded)
4,900-4,910	Limestone, light-gray, fine-granular, dolomitic, silty; medium-gray spicular chert	5,274-5,278	Shale, grayish-black
		5,278-5,280	Shale, greenish-gray
4,910-4,915	Shale, greenish-gray	5,280-5,285	Shale, medium-gray
4,915-4,920	Limestone, medium light-gray, fine-granular, silty; glauconite	5,285-5,290	Sandstone, medium light-gray, very fine- to medium-grained, subrounded, dolomitic
4,920-4,922	Shale, medium-gray; much glauconite	5,290-5,295	Sandstone, light-gray, medium- to coarse-grained, subangular; abundant fragments of black shale
		5,295-5,308	Shale, dark-gray to grayish-black
Rocks of Kinderhookian? Age		5,308-5,313	Shale, greenish-gray to dark greenish-gray, smooth
4,922-4,927	Shale, greenish-gray	5,313-5,320	Shale, medium-gray
		5,320-5,327	Shale, greenish-gray to dark greenish-gray
4,927-4,933	Shale, medium-gray	5,327-5,337	Sandstone, light-gray, fine- to medium-grained, subrounded, slightly dolomitic; pyrite
4,933-4,937	Shale, greenish-gray	5,337-5,342	Sandstone, grayish-white, medium- to coarse-grained, subrounded; frosted grains
4,937-4,950	Shale, medium-gray		
4,950-4,957	Limestone, light olive-gray, fine-crystalline	5,342-5,344	Shale, medium dark-gray, finely sandy
4,957-4,960	Shale, medium-gray	5,344-5,350	Sandstone, very light- to medium-gray, fine- to medium-grained, subrounded
4,960-4,970	Limestone, grayish-white, very quartzitic; pyrite	5,350-5,356	Sandstone, very light-gray, medium-grained, subrounded
4,970-4,976	Limestone, brownish-gray, fine-crystalline		
Devonian and Mississippian Systems Chattanooga Shale 4,976-5,015 feet		5,356-5,360	Shale, greenish-gray
Devonian and Mississippian Systems Chattanooga Shale 4,976-5,015 feet		Cambrian and Ordovician Systems Arbuckle Group	
4,976-4,980	Shale, medium-gray	5,360-5,370	Dolomite, pale yellowish-brown, fine-granular; pale yellowish-brown medium-crystalline dolomite
4,980-4,995	Shale, grayish-black; pyrite		
4,995-5,000	Shale, medium-gray		
5,000-5,008	Shale, grayish-black		
Misener sand of Chattanooga Shale		5,370-5,380	Dolomite, brownish-gray to grayish-brown, fine- to medium-crystalline; medium- to light-gray chert
5,008-5,015	Sandstone, light-gray, fine-grained; much pyrite	5,380-5,388	Dolomite, brownish-gray, fine-crystalline, fine- to medium-sandy
		5,388-5,400	Dolomite, grayish-brown, fine-crystalline
Silurian and Devonian Systems Hunton Group		5,400-5,408	Dolomite, pale yellowish-brown, fine-granular; brownish-gray sandy chert
5,015-5,030	Dolomite, light olive-gray to light-gray, fine-granular, very finely sandy, silty; some light greenish-gray figured chert (cave?)	5,408-5,414	Dolomite, brownish-gray, fine-crystalline, fine- to medium-sandy
		5,414	Total depth
5,030-5,040	Dolomite as above; calcite crystals		

LOG 3

ALFALFA COUNTY, OKLAHOMA

SE¼ SE¼ NW¼ sec. 9, T. 28 N., R. 10 W.

Operator: Ohio Oil Co.
Lease: W. O. Parr No. 1
Elevation: GL 1,208 feet
Total depth: 5,862 feet
Completion date: Dec. 1, 1954
Initial production: Dry (reworked; oil from Layton sand and Mississippi "chat")

Electrical log: 1,950 to 5,862 feet

Sample intervals:

10-foot
400 to 5,400 feet

5-foot

5,400 to 5,862 feet

Cored intervals:

5,487 to 5,526 feet (core chips)

Permian System	
Hennessey Shale and Garber Sandstone 0-710 feet	
0- 400	No samples
400- 415	Shale, moderate reddish-brown
415- 425	Shale, medium light-gray
425- 460	Shale, moderate reddish-brown
460- 465	Shale, medium light-gray
465- 515	Shale, moderate reddish-brown
515- 525	Shale, medium-gray to greenish-gray
525- 545	Shale, moderate reddish-brown
545- 550	Shale, medium-gray
550- 560	Shale, moderate reddish-brown
560- 565	Shale, moderate reddish-brown; light-gray fine-crystalline anhydrite
565- 570	Shale, medium-gray
570- 572	Dolomite, very pale-orange, fine-crystalline
572- 580	Shale, medium-gray and greenish-gray
580- 590	Shale, moderate reddish-brown
590- 600	Shale, greenish-gray; white fine-crystalline anhydrite in lower half
600- 610	Shale, moderate reddish-brown
610- 612	Dolomite, light olive-gray, fine-crystalline
612- 655	Shale, moderate reddish-brown
655- 660	Shale, moderate reddish-brown to brownish-gray; spines; crinoids (sample out of place?)
660- 710	Shale, moderate reddish-brown
Wellington Formation 710-1,705 feet	
710- 720	Shale, gray to black
720- 730	Shale, moderate reddish-brown
730- 740	Shale, greenish-gray
740- 750	Shale, medium-gray
750- 753	Dolomite, medium light-gray, fine-crystalline
753- 760	Shale, medium-gray
760- 765	Shale, moderate reddish-brown
765- 770	Shale, medium-gray
770- 773	Dolomite, pale yellowish-brown, very fine-crystalline
773- 780	Shale, medium-gray
780- 790	Shale, greenish-gray
790- 813	Shale, medium-gray
813- 816	Dolomite, light-gray, very fine-crystalline
816- 820	Shale, medium-gray
820- 830	Shale, greenish-gray
830- 840	Shale, medium-gray
840- 850	Shale, medium- to dark-gray
850- 860	Shale, greenish-gray
860- 863	Dolomite, pale yellowish-brown, fine-crystalline
863- 880	Shale, medium-gray
880- 883	Dolomite, medium-gray, fine-crystalline, argillaceous
883- 897	Shale, medium-gray
897- 900	Anhydrite, white, fine-crystalline
900- 910	Shale, medium-gray
910- 912	Dolomite, light- to medium light-gray, fine-crystalline
912- 920	Shale, medium-gray
920- 930	Shale, greenish-gray
930- 944	Shale, medium-gray
944- 947	Anhydrite, white, fine-crystalline
947- 990	Shale, medium-gray
990- 994	Anhydrite, medium light-gray, fine-crystalline
994-1,005	Shale, medium-gray
1,005-1,010	Anhydrite, medium light-gray, fine-crystalline
1,010-1,025	Shale, medium-gray
1,025-1,030	Anhydrite, white, fine-crystalline

1,030-1,036	Shale, medium-gray
1,036-1,050	Anhydrite, very light- to medium-gray, fine-crystalline
1,050-1,054	Shale, medium-gray
1,054-1,070	Anhydrite, very light- to medium-gray, fine-crystalline
1,070-1,074	Shale, medium-gray
1,074-1,100	Anhydrite, white to light-gray, fine-crystalline
1,100-1,570	Anhydrite, white to light-gray, fine-crystalline; much salt
1,570-1,590	Anhydrite, white to light-gray, fine-crystalline
1,590-1,594	Dolomite, medium-gray to olive-gray, very fine-crystalline, argillaceous
1,594-1,604	Anhydrite, white to light-gray, fine-crystalline
1,604-1,608	Dolomite, light olive-gray, fine-granular, argillaceous
1,608-1,610	Shale, medium-gray
1,610-1,630	Anhydrite, very light-gray, fine-crystalline
1,630-1,635	Dolomite, olive-gray, very fine-crystalline, argillaceous; dark-gray spots
1,635-1,648	Shale, medium-gray
1,648-1,655	Dolomite, medium-gray, argillaceous
1,655-1,667	Shale, medium-gray
1,667-1,675	Dolomite, light olive-gray to pale yellowish-brown, fine-crystalline, argillaceous; mottled with dark-gray
1,675-1,685	Shale, medium-gray
1,685-1,695	Anhydrite, very light-gray, fine-crystalline
1,695-1,700	Shale, greenish-gray
1,700-1,705	Shale, medium-gray

Chase Group Nolans Limestone 1,705-1,774 feet

1,705-1,718	Dolomite, medium-gray, argillaceous; very light-gray milky dense chert 1,705-1,712 feet
1,718-1,726	Shale, medium-gray
1,726-1,736	Dolomite, medium light-gray, fine-granular, argillaceous; pinhole porosity; some mottled with dark gray
1,736-1,740	Shale, medium-gray
1,740-1,750	Dolomite, light olive-gray, fine- to medium-crystalline; pinhole porosity
1,750-1,774	Dolomite, medium-gray, calcareous, very argillaceous
1,774-1,780	Shale, medium-gray

Winfield Limestone 1,780-1,830 feet

1,780-1,796	Limestone, medium- to medium dark-gray, fine-crystalline, argillaceous; spine 1,780-1,785 feet; bryozoan, brachiopod? 1,785-1,795 feet
1,796-1,800	Shale, medium-gray
1,800-1,810	Limestone, pale yellowish-brown, fine-crystalline; pinhole porosity
1,810-1,820	Shale, medium-gray; much caving
1,820-1,830	Limestone, medium light-gray, fine-crystalline, argillaceous
1,830-1,837	Shale, medium-gray
1,837-1,845	Limestone, medium-gray, argillaceous; light- to medium dark-gray mottled chert
1,845-1,850	Limestone, medium-gray, argillaceous
1,850-1,860	Shale, medium-gray

Barneston Limestone 1,860-1,991 feet

1,860-1,870	Limestone, medium-gray, argillaceous
1,870-1,880	Shale, medium-gray
1,880-1,888	Limestone, medium-gray, argillaceous

1,888-1,892	Limestone, medium light-gray, fine-crystalline, argillaceous; medium-gray dull chert	2,297-2,303	Limestone, pale yellowish-brown to very pale-orange, medium-oolitic and obolastic
1,892-1,900	Limestone, medium light-gray, fine-crystalline, argillaceous	2,303-2,308	Limestone, brownish-gray, fine-crystalline
1,900-1,910	Shale, medium-gray	2,308-2,312	Shale, medium-gray
1,910-1,927	Limestone, light- to medium light-gray, fine-crystalline, slightly argillaceous	2,312-2,322	Limestone, pale yellowish-brown to very pale-orange, fine-crystalline
1,927-1,932	Limestone as above; very light-gray dense chert	2,322-2,325	Shale, medium-gray
1,932-1,942	Limestone as above; crinoids	2,325-2,328	Limestone, medium-gray, fine-crystalline
1,942-1,975	Limestone, pale yellowish-brown, fine-crystalline; light- to medium light-gray spicular fossiliferous chert	2,328-2,330	Shale, medium-gray
1,975-1,991	Limestone, medium- to medium dark-gray, fine-crystalline, very argillaceous	2,330-2,334	Limestone, medium-gray, fine-crystalline
		2,334-2,343	Shale, medium-gray
		2,343-2,346	Limestone, medium-gray, fine-crystalline
		2,346-2,351	Shale, medium-gray
1,991-1,998	Shale, medium-gray, calcareous	2,351-2,355	Limestone, medium-gray, fine-crystalline, slightly brownish
1,998-2,002	Limestone, pale yellowish-brown, fine-crystalline	2,355-2,357	Shale, medium-gray
2,002-2,004	Shale, medium-gray	2,357-2,360	Limestone, medium-gray, fine-crystalline, slightly brownish
2,004-2,012	Limestone, medium-gray, fine-crystalline, slightly argillaceous		
2,012-2,037	Shale, medium-gray	2,360-2,364	Shale, medium-gray
		2,364-2,367	Limestone, pale yellowish-brown, very fine-crystalline, dolomitic
	Wreford Limestone 2,037-2,080 feet	2,367-2,369	Shale, medium-gray
2,037-2,041	Limestone, pale yellowish-brown to brownish-gray, very fine- to fine-crystalline		Red Eagle Limestone, Johnson Shale, and Foraker Limestone, undifferentiated 2,369-2,493 feet
2,041-2,045	Shale, medium-gray		
2,045-2,048	Limestone, pale yellowish-brown to brownish-gray, very fine- to fine-crystalline	2,369-2,380	Limestone, pale yellowish-brown to light olive-gray, fine-crystalline, oolitic?; trace of glauconite
2,048-2,051	Shale, medium-gray	2,380-2,386	Limestone, medium light-gray, fine-crystalline, porous
2,051-2,060	Limestone, medium-gray, fine-crystalline, argillaceous	2,386-2,392	Shale, medium-gray
2,060-2,068	Limestone, pale yellowish-brown to light olive-gray, very fine-crystalline	2,392-2,412	Limestone, pale yellowish-brown, fine-crystalline, porous
		2,412-2,416	Shale, medium-gray
2,068-2,075	Limestone, pale yellowish-brown, fine-crystalline; very light- to medium-gray spicular mottled chert	2,416-2,419	Dolomite, pale yellowish-brown, fine-crystalline
2,075-2,080	Limestone, medium-gray, fine-crystalline, argillaceous	2,419-2,425	Shale, medium-gray
	Council Grove Group	2,425-2,430	Limestone, light-gray, fine-crystalline, slightly argillaceous
		2,430-2,438	Limestone, very pale-orange to pale yellowish-brown, fine-crystalline
2,080-2,090	Shale, medium-gray	2,438-2,440	Shale, medium-gray
	Funston Limestone 2,090-2,119 feet	2,440-2,455	Limestone, light- to medium light-gray, fine-crystalline; fusulinids 2,440-2,445 feet
		2,455-2,470	Shale, medium-gray; fusulinids 2,455-2,460 feet
2,090-2,104	Limestone, medium-gray, fine-crystalline, argillaceous; light- to medium-gray chert	2,470-2,480	Limestone, pale yellowish-brown, fine-crystalline
2,104-2,110	Shale, grayish-red	2,480-2,488	Shale, medium-gray
2,110-2,119	Limestone, brownish-gray, fine-crystalline	2,488-2,493	Limestone, brownish-gray, fine-crystalline
2,119-2,133	Shale, greenish-gray		Admire Group
	Crouse Limestone 2,133-2,158 feet	2,493-2,499	Shale, medium-gray
		2,499-2,503	Limestone, medium-gray, fine-crystalline
2,133-2,144	Limestone, pale yellowish-brown, fine-crystalline	2,503-2,508	Shale, medium-gray
2,144-2,150	Shale, medium-gray	2,508-2,510	Limestone, medium-gray, argillaceous
2,150-2,155	Shale, black	2,510-2,520	Shale, medium-gray
2,155-2,158	Limestone, medium-gray, fine-crystalline		Houchen Creek? Limestone Bed of Janesville Shale 2,520-2,561 feet
2,158-2,167	Shale, medium-gray		
	Bader Limestone, Stearns Shale, and Beattie Limestone, undifferentiated, 2,167-2,272 feet	2,520-2,525	Limestone, brownish-gray, fine-crystalline
		2,525-2,530	Limestone, pale yellowish-brown, fine-crystalline
2,167-2,172	Limestone, brownish-gray, fine-crystalline	2,530-2,532	Shale, medium-gray
2,172-2,174	Shale, medium-gray	2,532-2,535	Limestone, pale yellowish-brown, fine-crystalline
2,174-2,179	Limestone, medium-gray, fine-crystalline, argillaceous	2,535-2,540	Shale, medium-gray
2,179-2,188	Shale, grayish-red	2,540-2,542	Limestone, medium dark-gray, fine-crystalline
2,188-2,192	Limestone, medium-gray, fine-crystalline	2,542-2,545	Shale, medium-gray
2,192-2,199	Shale, medium-gray	2,545-2,547	Limestone, medium dark-gray, fine-crystalline
2,199-2,207	Limestone, pale yellowish-brown, fine-crystalline	2,547-2,558	Shale, medium-gray
2,207-2,209	Shale, medium-gray	2,558-2,561	Limestone, brownish-gray, fine-crystalline
2,209-2,216	Limestone, medium-gray, fine-crystalline, slightly argillaceous		
		2,561-2,572	Siltstone, medium-gray, very finely sandy, calcareous
2,216-2,220	Shale, medium-gray	2,572-2,580	Sandstone, light- to medium light-gray, very fine- to fine-grained, slightly calcareous; silty in part
2,220-2,222	Limestone, light- to medium-gray, fine-crystalline	2,580-2,599	Shale, medium-gray
2,222-2,227	Shale, medium-gray	2,599-2,604	Limestone, pale yellowish-brown, fine-crystalline
2,227-2,235	Limestone, pale yellowish-brown, fine-crystalline, porous	2,604-2,612	Shale, medium-gray
2,235-2,241	Limestone, medium light-gray, fine-crystalline, slightly argillaceous	2,612-2,618	Limestone, light-gray, fine-crystalline; spotted and mottled with dark-gray
2,241-2,250	Dolomite, medium light-gray, fine-crystalline, calcareous, slightly argillaceous	2,618-2,624	Sandstone, light-gray, very fine- to fine-grained
2,250-2,254	Limestone, medium- to medium dark-gray, fine-granular, argillaceous	2,624-2,643	Shale, medium-gray
		2,643-2,645	Limestone, medium-gray, silty
2,254-2,260	Shale, medium-gray	2,645-2,655	Shale, greenish-gray
2,260-2,272	Limestone, pale yellowish-brown to medium light-gray, fine-crystalline; abraded fusulinids	2,655-2,659	Shale, medium-gray
		2,659-2,678	Sandstone, very light- to light-gray, very fine-grained, silty, slightly dolomitic, slightly micaceous
2,272-2,278	Shale, black	2,678-2,700	Shale, medium-gray
	Grenola Limestone 2,278-2,360 feet	2,700-2,702	Limestone, medium-gray, argillaceous
		2,702-2,718	Shale, medium-gray
2,278-2,280	Limestone, pale yellowish-brown, very fine-crystalline	2,718-2,723	Limestone, medium-gray, fine-crystalline, argillaceous
2,280-2,284	Limestone, light-gray to very pale-orange, very fine-crystalline; dark-gray pseudoolites?	2,723-2,733	Shale, medium-gray
		2,733-2,736	Limestone, brownish-gray, fine-crystalline
2,284-2,287	Shale, medium-gray	2,736-2,740	Sandstone, light-gray, very fine-grained, silty
2,287-2,290	Limestone, light-gray to very pale-orange, very fine-crystalline	2,740-2,748	Shale, medium-gray
2,290-2,297	Shale, medium-gray	2,748-2,752	Limestone, pale yellowish-brown, fine-crystalline
		2,752-2,766	Sandstone, very light- to light-gray, very fine-grained, slightly dolomitic and micaceous
		2,766-2,770	Shale, grayish-red
		2,770-2,773	Limestone, grayish-red, fine-crystalline, argillaceous
		2,773-2,783	Shale, medium-gray

2,783-2,791	Siltstone, light-gray, very finely sandy, calcareous	3,440-3,445	Shale, medium-gray
2,791-2,796	Sandstone, very light-gray, very fine- to fine-grained, calcareous	3,445-3,453	Sandstone, light- to medium light-gray, very fine-grained, silty
Pennsylvanian System			
Virgil Series			
Rocks equivalent to Wabaunsee Group			
2,796-2,806	Limestone, pale yellowish-brown, fine-crystalline	3,453-3,460	Sandstone, light-gray, fine-grained, calcareous
2,806-2,810	Shale, medium-gray	3,460-3,465	Shale, medium-gray
2,810-2,812	Dolomite, pale yellowish-brown, fine-crystalline, calcareous	3,465-3,471	Sandstone, light-gray, very fine-grained, silty
2,812-2,820	Limestone, pale yellowish-brown, fine-crystalline	3,471-3,485	Shale, medium-gray
2,820-2,827	Shale, medium-gray	3,485-3,490	Sandstone, very light-gray, very fine- to fine-grained, calcareous
2,827-2,833	Limestone, pale yellowish-brown, fine-crystalline, fine- to medium-oolitic	3,490-3,507	Sandstone, light-gray, very fine-grained, slightly calcareous and micaceous; trace of glauconite
2,833-2,836	Shale, medium-gray	3,507-3,515	Sandstone, light-gray, very fine-grained, silty, micaceous, slightly calcareous; carbonaceous material
2,836-2,840	Limestone, brownish-gray, fine-crystalline	3,515-3,520	Siltstone, medium light- to medium-gray, micaceous
2,840-2,844	Limestone, medium-gray, fine-crystalline	3,520-3,544	Sandstone, very light- to light-gray, very fine-grained, slightly calcareous, micaceous; scattered carbonaceous material
2,844-2,875	Shale, medium-gray	3,544-3,550	Shale, medium-gray
2,875-2,880	Limestone, medium light-gray, fine-crystalline	3,550-3,555	Shale, greenish-gray
2,880-2,892	Limestone, pale yellowish-brown, fine-crystalline	3,555-3,565	Shale, medium-gray
2,892-2,896	Shale, medium-gray	3,565-3,570	Shale, black
2,896-2,910	Limestone, very pale-orange to light-gray, fine-crystalline	3,570-3,580	Shale, medium-gray
2,910-2,920	Limestone, pale yellowish-brown, fine-crystalline	Oread Limestone Member of Vamoosa Formation 3,580-3,742 feet	
2,920-2,926	Limestone, very pale-orange, fine-crystalline	3,580-3,596	Siltstone, medium-gray, calcareous; resembles limestone
2,926-2,933	Shale, medium-gray	3,596-3,600	Shale, black
2,933-2,937	Limestone, light-gray, fine-crystalline	3,600-3,610	Shale, medium-gray
2,937-2,940	Shale, medium-gray	3,610-3,615	Limestone, medium- to medium dark-gray, fine-crystalline; argillaceous
2,940-2,955	Limestone, pale yellowish-brown, fine-crystalline	3,615-3,618	Shale, medium-gray
2,955-2,975	Limestone, very pale-orange, fine-crystalline	3,618-3,622	Limestone, medium- to medium dark-gray, fine-crystalline; argillaceous
2,975-2,980	Shale, medium-gray	3,622-3,633	Shale, medium-gray
2,980-2,988	Limestone, pale yellowish-brown, fine-crystalline	3,633-3,638	Limestone, pale yellowish-brown to very pale-orange, fine-crystalline
2,988-2,990	Limestone as above; finely oolitic	3,638-3,640	Shale, medium-gray
2,990-2,994	Shale, medium-gray	3,640-3,650	Limestone, light- to medium light-gray, fine-crystalline; very light-gray figured chert
2,994-3,015	Limestone, light-gray to very pale-orange, fine-crystalline	3,650-3,657	Limestone, pale yellowish-brown, fine-crystalline; yellowish-brown chert
3,015-3,026	Limestone, pale yellowish-brown, fine-crystalline	3,657-3,660	Shale, medium-gray
3,026-3,030	Shale, medium-gray	3,660-3,667	Limestone, pale yellowish-brown, fine-granular, dolomitic
3,030-3,038	Limestone, very pale-orange, fine-crystalline	3,667-3,670	Shale, medium-gray
3,038-3,040	Shale, medium-gray	3,670-3,675	Shale, greenish-gray
3,040-3,057	Limestone, very pale-orange to pale yellowish-brown, fine-crystalline	3,675-3,685	Shale, grayish-red
3,057-3,060	Shale, medium-gray	3,685-3,695	Shale, medium-gray
3,060-3,066	Limestone, very pale-orange to pale yellowish-brown, fine-crystalline	3,695-3,705	Shale, black
3,066-3,070	Shale, medium-gray	3,705-3,709	Dolomite, pale yellowish-brown to light olive-gray, fine-crystalline, calcareous
3,070-3,080	Limestone, pale yellowish-brown, fine-crystalline, porous	3,709-3,716	Shale, medium-gray
3,080-3,090	Limestone, light-gray, fine-crystalline, porous	3,716-3,718	Limestone, medium dark-gray, fine-crystalline
3,090-3,103	Limestone, very pale-orange, fine-crystalline	3,718-3,730	Siltstone, light- to medium light-gray
3,103-3,106	Shale, medium-gray	3,730-3,740	Shale, medium-gray
3,106-3,110	Limestone, light- to medium light-gray, fine-crystalline	3,740-3,742	Dolomite, light-gray, fine-crystalline, calcareous
3,110-3,125	Limestone, medium-gray, fine-crystalline	Rocks equivalent to Douglas Group	
3,125-3,130	Shale, medium-gray	3,742-3,750	Shale, medium-gray
3,130-3,145	Sandstone, light-gray, very fine-grained, silty, slightly dolomitic	3,750-3,755	Shale, black
3,145-3,150	Shale, medium-gray	3,755-3,775	Shale, medium-gray
3,150-3,160	Shale, greenish-gray	3,775-3,780	Shale, black
3,160-3,185	Shale, medium-gray	3,780-3,788	Shale, medium-gray
3,185-3,190	Shale, grayish-red	3,788-3,797	Siltstone, light-gray, very finely sandy
3,190-3,195	Shale, greenish-gray	3,797-3,800	Sandstone, light-gray, very fine-grained, silty
3,195-3,205	Shale, medium-gray	3,800-3,810	Siltstone, light-gray, very finely sandy, slightly calcareous
3,205-3,210	Shale, black	3,810-3,830	Shale, medium-gray
3,210-3,220	Shale, greenish-gray	3,830-3,835	Shale, greenish-gray
3,220-3,225	Shale, medium-gray, silty; fusulinids	3,835-3,850	Shale, medium-gray
3,225-3,235	Shale, medium-gray	3,850-3,857	Shale, grayish-red; very fine-crystalline argillaceous limestone at center
3,235-3,240	Shale, black	3,857-3,875	Shale, medium-gray
3,240-3,272	Shale, medium-gray	3,876-3,880	Siltstone, medium light-gray
Rocks equivalent to Shawnee Group			
Topeka Limestone 3,272-3,310 feet			
3,272-3,280	Limestone, pale yellowish-brown, fine-crystalline; crinoids	3,880-3,910	Shale, medium-gray
3,280-3,290	Limestone, very pale-orange, fine-crystalline	3,910-3,915	Shale, greenish-gray
3,290-3,300	Limestone, pale yellowish-brown, fine-crystalline	3,915-3,938	Shale, medium-gray
3,300-3,310	Limestone, very pale-orange, fine- to medium-crystalline	Missouri Series	
3,310-3,315	Shale, medium-gray	Ochelata Group	
3,315-3,320	Shale, grayish-red	Rocks equivalent to Lansing Group	
3,320-3,325	Shale, greenish-gray	3,938-3,943	Limestone, pale yellowish-brown to brownish-gray, fine-crystalline
3,325-3,340	Shale, medium-gray	3,943-3,957	Shale, medium-gray
3,340-3,345	Shale, black	3,957-3,975	Sandstone, very light- to light-gray, very fine-grained, silty, slightly micaceous
3,345-3,355	Shale, medium-gray	3,975-3,990	Sandstone, very light- to light-gray, very fine-grained
3,355-3,360	Shale, greenish-gray	3,990-3,998	Shale, medium-gray
3,360-3,366	Shale, medium-gray	3,998-4,010	Sandstone, very light-gray, very fine- to fine-grained, slightly dolomitic
3,366-3,370	Siltstone, light- to medium-gray, very finely sandy	4,010-4,040	Sandstone, very light-gray, fine-grained, slightly dolomitic
3,370-3,380	Shale, medium-gray	4,040-4,050	Sandstone, very light-gray, very fine-grained
3,380-3,385	Shale, black	4,050-4,075	Sandstone, very light-gray, fine-grained, slightly dolomitic; some medium grains
3,385-3,390	Shale, medium-gray	4,075-4,086	Sandstone, very light-gray, very fine-grained
3,390-3,397	Siltstone, light- to medium-gray, very finely sandy		
3,397-3,402	Limestone, brownish-gray, fine-crystalline, argillaceous		
3,402-3,410	Shale, medium-gray		
3,410-3,414	Limestone, brownish-gray to olive-gray, fine-crystalline		
3,414-3,427	Shale, medium-gray		
3,427-3,430	Siltstone, light-gray		
3,430-3,438	Shale, medium-gray		
3,438-3,440	Siltstone, light-gray		

5,120-5,150	Limestone, light-gray to very pale-orange, fine-granular, siliceous		
5,150-5,210	Limestone, light-gray to very pale-orange, fine-granular, siliceous; mottled with yellowish-brown; light-gray chert and spicular chert; trace glauconite at base	5,488-5,494	Limestone, pale yellowish-brown to brownish-gray, medium-crystalline; dolomite streaks
5,210-5,234	Limestone, brownish-gray, fine-granular, argillaceous; light- to medium-gray dense chert	5,494-5,500	Dolomite, greenish-gray, fine-crystalline; many greenish-gray shale streaks
5,234-5,265	Limestone, medium light-gray to very pale-orange, fine-granular; chert as above	5,500-5,508	Dolomite, light- to medium-gray, fine- to medium-crystalline; scattered fine to medium rounded sand grains; trace of fossils?
5,265-5,275	Limestone, medium light-gray, fine-granular, dolomitic; medium light-gray granular chert	5,508-5,525	Sandstone, white, fine-grained, porous
5,275-5,290	Limestone, pale yellowish-brown, fine- to medium-crystalline	5,525-5,535	Sandstone, light-gray, fine- to medium-grained, porous
		5,535-5,560	Sandstone, white to very light-gray, fine-grained, porous
		5,560-5,570	Sandstone, medium-gray, very fine- to fine-grained, dolomitic
		5,570-5,573	Shale, greenish-gray, smooth
		5,573-5,614	Sandstone, very light-gray, fine-grained
	Rocks of Kinderhookian? Age		
5,290-5,302	Shale, medium-gray	5,614-5,620	Shale, greenish-gray, smooth
5,302-5,312	Limestone, medium-gray, very fine- to fine-crystalline	5,620-5,623	Sandstone, very light-gray, fine-grained
	Devonian and Mississippian Systems	5,623-5,640	Shale, medium-gray
	Woodford Shale 5,312-5,413 feet	5,640-5,645	Shale, black
5,312-5,320	Shale, medium-gray	5,645-5,650	Shale, medium-gray
5,320-5,324	Shale, black	5,650-5,652	Sandstone, very light-gray, very fine-grained, glauconitic
5,324-5,328	Shale, greenish-gray	5,652-5,655	Shale, medium-gray
5,328-5,340	Shale, medium-gray	5,655-5,665	Shale, dark greenish-gray
5,340-5,355	Shale, black	5,665-5,670	Siltstone, medium-gray, very finely sandy
5,355-5,365	Shale, medium dark-gray; pyrite	5,670-5,673	Shale, greenish-gray
5,365-5,375	Shale, black	5,673-5,676	Shale, moderate-brown
5,375-5,385	Shale, medium dark-gray; pyrite	5,676-5,690	Shale, medium-gray
5,385-5,395	Shale, black; spore cases?	5,690-5,700	Sandstone, very light-gray, medium- to coarse-grained, subrounded, very friable?
5,395-5,408	Shale, medium dark-gray to black	5,700-5,710	Sandstone, very light-gray, fine- to medium-grained, subrounded, dolomitic
	Misener sand of the Woodford Shale 5,408-5,413 feet	5,710-5,716	Sandstone, very light-gray, fine- to medium-grained, subrounded, slightly dolomitic
5,408-5,413	Sandstone, grayish-white, very fine- to fine-grained; much pyrite; scattered medium sand grains (first sand in 25-30 samples)	5,716-5,719	Shale, greenish-gray
	Ordovician System	5,719-5,730	Sandstone, very light-gray, fine- to medium-grained, subrounded, dolomitic; some loose coarse sand grains
	Viola Limestone 5,413-5,435 feet	5,730-5,733	Shale, medium-gray
5,413-5,420	Limestone, medium light-gray to pale yellowish-brown, fine- to medium-crystalline		Cambrian and Ordovician Systems
5,420-5,426	Dolomite, light- to medium light-gray, fine- to medium-crystalline		Arbuckle Group
5,426-5,430	Limestone, pale yellowish-brown to very pale-orange, fine-crystalline; medium-gray dense and speckled chert	5,733-5,752	Dolomite, pale yellowish-brown, fine-crystalline; little light-gray chert 5,745-5,752 feet
5,430-5,435	Dolomite, brownish-gray, fine-crystalline to granular, calcareous; yellowish-brown granular chert	5,752-5,770	Dolomite, brownish-gray, fine-crystalline
	Simpson Group	5,770-5,777	Dolomite, pale yellowish-brown, fine-crystalline, fine- to medium-sandy
	Bromide Formation 5,435-5,614 feet	5,777-5,780	Dolomite, medium-gray, fine-crystalline
5,435-5,440	Limestone, pale yellowish-brown, very fine-crystalline	5,780-5,800	Dolomite, pale yellowish-brown, fine-crystalline
5,440-5,450	Limestone as above; medium-gray dense chert	5,800-5,810	Dolomite, light-gray to very pale-orange, fine-crystalline
5,450-5,460	Limestone, pale yellowish-brown to very pale-orange, fine-crystalline; light- to medium-gray chert	5,810-5,815	Dolomite, pale yellowish-brown, fine-crystalline; medium light-gray chert
5,460-5,470	Limestone, pale yellowish-brown, fine-crystalline; pale yellowish-brown dense chert	5,815-5,820	Dolomite, light olive-gray to very pale-orange, fine-crystalline
5,470-5,475	Limestone, as above; some greenish limestone	5,820-5,835	Dolomite, pale yellowish-brown, fine-crystalline
5,475-5,488	Limestone, light-gray to pale yellowish-brown, medium-crystalline	5,835-5,840	Dolomite, brownish-gray, fine-crystalline
		5,840-5,845	Dolomite, pale yellowish-brown to medium light-gray, fine-crystalline; light-gray dense chert
		5,845-5,850	Dolomite as above
		5,850-5,862	Dolomite, brownish-gray to pale yellowish-brown, fine-crystalline
		5,862	Total depth

LOG 4

ALFALFA COUNTY, OKLAHOMA

NE¼ SE¼ SE¼ sec. 12, T. 24 N., R. 11 W.

Operator: Olson Drilling Co.
 Lease: Atchison No. 1
 Elevation: DF 1,379 feet
 Total depth: 7,300 feet
 Completion date: September 1942
 Initial production: Dry

Electrical log: 100 to 7,299 feet
 Sample intervals:

10-foot
 40 to 2,610 feet
 2,700 to 4,900 feet
 4,980 to 5,310 feet
 5,420 to 5,780 feet
 5,880 to 6,230 feet
 5-foot
 2,610 to 2,700 feet
 4,900 to 4,980 feet
 5,310 to 5,420 feet
 5,780 to 5,880 feet
 6,230 to 7,300 feet

Cored intervals:

5,825 to 5,865 feet (no core chips)
 7,065 to 7,075 feet
 7,192 to 7,210½ feet
 7,243 to 7,284 feet

Permian System			
Hennessey Shale and Garber Sandstone			
0- 40	No samples	553- 560	Shale, moderate reddish-brown
40- 55	Shale, moderate reddish-brown; greenish-gray spots	560- 580	Shale, grayish-red
55- 60	Shale, pale reddish-brown, very finely sandy, gypsiferous	580- 590	Shale, pale reddish-brown, very finely sandy
60- 70	Shale, moderate reddish-brown	590- 596	Shale, greenish-gray
70- 90	Shale, light-brown, slightly reddish; salt	596- 600	Shale, moderate reddish-brown
90-100	Shale, moderate reddish-brown	600- 610	Shale, grayish-red
100-110	Shale, pale reddish-brown, silty, gypsiferous; anhydrite crystals	610- 614	Shale, moderate reddish-brown; grayish-white to pale-red fine-crystalline anhydrite
110-120	Sandstone, pale reddish-brown, very fine-grained, silty, gypsiferous	614- 640	Shale, moderate reddish-brown
120-125	Shale, pale reddish-brown; salt	640- 650	Shale, grayish-red
125-135	Shale, moderate reddish-brown	650- 660	Shale, pale reddish-brown, very finely sandy
135-140	Shale, pale reddish-brown, very finely sandy	660- 670	Shale, grayish-red; greenish-gray shale
140-154	Sandstone, pale reddish-brown, very fine-grained, silty	670- 674	Shale, moderate reddish-brown
154-165	Shale, moderate reddish-brown	674- 677	Sandstone, light-gray, very fine-grained, silty
165-178	Sandstone, light-gray, very fine-grained, silty; gypsiferous 165-170 feet	677- 685	Shale, medium-gray, dolomitic
178-180	Shale, moderate reddish-brown	685- 690	Shale, moderate reddish-brown
180-185	Sandstone, moderate reddish-brown, very fine-grained, silty	690- 695	Shale, medium-gray
185-193	Shale, moderate reddish-brown	695- 700	Shale, moderate reddish-brown
193-202	Sandstone, pale reddish-brown, very fine-grained, silty	700- 703	Shale, greenish-gray
202-217	Shale, moderate reddish-brown	703- 720	Shale, grayish-red
217-238	Shale, pale reddish-brown, very finely sandy	720- 723	Shale, greenish-gray
238-250	Sandstone, medium light-gray, very fine-grained, silty	723- 730	Shale, grayish-red
250-260	Shale, moderate reddish-brown	730- 744	Shale, moderate reddish-brown
260-275	Shale, moderate reddish-brown, sandy, gypsiferous	744- 750	Shale, medium light-gray, very finely sandy
275-280	Shale, moderate reddish-brown	750- 770	Shale, grayish-red
280-300	Shale, moderate reddish-brown; white gypsum and clear anhydrite	770- 830	Shale, moderate reddish-brown
300-310	Shale, moderate reddish-brown	830- 835	Shale, greenish-gray
310-330	Shale, pale reddish-brown, very finely sandy, silty	835- 850	Shale, moderate reddish-brown
330-334	Shale, greenish-gray	850- 852	Dolomite, light olive-gray, very silty
334-337	Shale, moderate reddish-brown	852- 872	Shale, moderate reddish-brown
337-349	Sandstone, pale reddish-brown, very fine-grained, silty	872- 882	Shale, pale reddish-brown, very finely sandy
349-380	Shale, moderate reddish-brown; much white gypsum	882- 930	Shale, moderate reddish-brown
380-398	Shale, moderate reddish-brown	930- 935	Shale, greenish-gray
398-410	Shale, pale reddish-brown, very finely sandy	935- 950	Shale, moderate reddish-brown
410-416	Shale, grayish-red	950- 959	Sandstone, light-gray, very fine-grained, silty, slightly dolomitic
416-434	Shale, moderate reddish-brown	959- 970	Shale, moderate reddish-brown
434-440	Shale, medium-gray, very finely sandy	970- 980	Shale as above; greenish-gray spots
440-460	Shale, grayish-red; greenish-gray spots	980-1,050	Shale, moderate reddish-brown
460-470	Sandstone, light-gray, very fine-grained, silty, gypsiferous	1,050-1,055	Shale, light greenish-gray, dolomitic
470-495	Shale, moderate reddish-brown	1,055-1,060	Shale, moderate reddish-brown
495-500	Shale, greenish-gray, very silty	1,060-1,063	Dolomite, pale-red, very fine-crystalline, argillaceous
500-530	Shale, moderate reddish-brown; greenish-gray spots	1,063-1,077	Shale, moderate reddish-brown
530-550	Shale, moderate reddish-brown; little very light-gray fine-crystalline anhydrite 535-540 feet	1,077-1,080	Shale, medium-gray, smooth
550-553	Shale, greenish-gray	1,080-1,090	Shale, moderate reddish-brown
		1,090-1,102	Siltstone, light-gray, very finely sandy, slightly dolomitic
		1,102-1,136	Shale, moderate reddish-brown
		1,136-1,140	Siltstone, light olive-gray, hard
		1,140-1,156	Shale, moderate reddish-brown
		1,156-1,160	Shale, greenish-gray
		1,160-1,170	Shale, moderate reddish-brown

1,170-1,175	Shale, medium-gray	2,361-2,385	Shale, medium-gray
1,175-1,190	Shale, moderate reddish-brown		
	Wellington Formation 1,190-2,308 feet		Winfield Limestone 2,385-2,440 feet
1,190-1,195	Shale, greenish-gray	2,385-2,390	Limestone, medium light-gray, very argillaceous; light-gray to glassy chert
1,195-1,198	Dolomite, very pale-orange, very fine-crystalline, argillaceous	2,390-2,395	Shale, medium-gray
1,198-1,205	Shale, medium-gray	2,395-2,400	Limestone, medium-gray, very argillaceous; crinoids
1,205-1,210	Shale, moderate reddish-brown	2,400-2,410	Limestone, pale yellowish-brown, fine-crystalline, slightly argillaceous; mottled with medium gray; crinoids
1,210-1,215	Shale, greenish-gray	2,410-2,417	Shale, medium-gray
1,215-1,220	Shale, moderate reddish-brown	2,417-2,425	Limestone, medium-gray, very argillaceous
1,220-1,227	Shale, medium-gray	2,425-2,440	Limestone, medium light-gray, fine-crystalline, slightly argillaceous; mottled with dark gray
1,227-1,230	Shale, grayish-black		
1,230-1,234	Shale, greenish-gray	2,440-2,450	Shale, grayish-red and greenish-gray
1,234-1,237	Shale, medium-gray	2,450-2,455	Limestone, brownish-gray, fine-crystalline; brownish-gray to medium-gray dense chert
1,237-1,240	Dolomite, pale yellowish-brown, very fine-crystalline, argillaceous	2,455-2,472	Shale, medium-gray
1,240-1,250	Shale, greenish-gray		Barneston Limestone 2,472-2,618 feet
1,250-1,260	Shale, medium-gray and greenish-gray	2,472-2,480	Limestone, medium light-gray, fine-crystalline, argillaceous; dark-gray chert mottled with light-gray chert
1,260-1,270	Shale, medium-gray	2,480-2,483	Shale, medium-gray
1,270-1,273	Dolomite, pale-red to yellowish-brown, fine-crystalline, argillaceous	2,483-2,490	Limestone, medium-gray, very argillaceous
1,273-1,285	Shale, medium-gray	2,490-2,500	Shale, medium-gray
1,285-1,300	Shale, greenish-gray	2,500-2,505	Limestone, medium light-gray, fine-crystalline, very argillaceous
1,300-1,312	Shale, medium-gray and greenish-gray	2,505-2,510	Limestone, medium light-gray, fine-crystalline, argillaceous; spotted with dark gray; milky dense chert
1,312-1,316	Shale, grayish-black	2,510-2,520	Shale, medium-gray
1,316-1,332	Shale, greenish-gray and medium-gray	2,520-2,524	Limestone, medium-gray, argillaceous
1,332-1,339	Shale, greenish-gray	2,524-2,531	Shale, medium-gray
1,339-1,342	Dolomite, pale yellowish-brown, very fine-crystalline	2,531-2,537	Limestone, medium-gray to brownish-gray, fine-crystalline, very argillaceous
1,342-1,360	Shale, medium-gray	2,537-2,547	Shale, medium-gray
1,360-1,368	Shale, greenish-gray	2,547-2,550	Shale, moderate reddish-brown
1,368-1,373	Shale, medium-gray	2,550-2,566	Shale, medium-gray
1,373-1,375	Dolomite, light-gray, very fine-crystalline	2,566-2,570	Limestone, pale yellowish-brown, fine-crystalline
1,375-1,382	Shale, medium-gray	2,570-2,575	Limestone, brownish-gray, argillaceous; medium light-gray rough spicular chert
1,382-1,386	Shale, grayish-black	2,575-2,596	Limestone, pale yellowish-brown, fine-crystalline; pale yellowish-brown to light-gray rough chert; some medium-gray spicular chert
1,386-1,396	Shale, greenish-gray	2,596-2,605	Limestone, medium light-gray, fine-crystalline, argillaceous; medium-gray chert
1,396-1,405	Shale, medium-gray	2,605-2,618	Limestone, medium-gray, fine-crystalline, argillaceous
1,405-1,407	Dolomite, pale yellowish-brown, very fine-crystalline	2,618-2,635	Shale, medium-gray
1,407-1,415	Shale, medium-gray	2,635-2,640	Limestone, very pale-orange, fine-crystalline; little light greenish-gray limestone
1,415-1,426	Shale, greenish-gray	2,640-2,645	Limestone, pale yellowish-brown, fine-crystalline
1,426-1,430	Shale, medium-gray	2,645-2,700	No samples From electrical log: 2,645-2,652 Limestone 2,652-2,686? Shale
1,430-1,436	Shale, greenish-gray		Wreford Limestone 2,686?-2,744 feet
1,436-1,464	Shale, medium-gray		2,686?-2,690 Limestone
1,464-1,466	Dolomite, medium-gray, very fine-crystalline, argillaceous		2,690-2,700 Shale
1,466-1,470	Shale, greenish-gray	2,700-2,703	Shale, medium-gray
1,470-1,474	Shale, grayish-black	2,703-2,706	Limestone, light olive-gray, fine-crystalline; spotted with orange
1,474-1,478	Shale, medium-gray	2,706-2,717	Limestone, light-gray to pale yellowish-brown, fine-crystalline
1,478-1,480	Dolomite, light-gray, dense to very fine-crystalline, argillaceous	2,717-2,720	Shale, greenish-gray
1,480-1,498	Shale, medium-gray	2,720-2,730	Limestone, pale yellowish-brown, fine-crystalline; pale yellowish-brown dense chert 2,720-2,725 feet
1,498-1,500	Dolomite, medium-gray, very fine-crystalline, argillaceous	2,730-2,732	Shale, medium-gray
1,500-1,513	Shale, medium-gray	2,732-2,740	Limestone, medium light-gray, fine-crystalline
1,513-1,517	Anhydrite, grayish-white to light-gray, fine-crystalline	2,740-2,744	Limestone, medium-gray, fine-crystalline, silty
1,517-1,520	Shale, medium-gray		Council Grove Group
1,520-1,525	Anhydrite, grayish-white to light-gray, fine-crystalline	2,744-2,750	Shale, medium-gray
1,525-1,527	Shale, medium-gray	2,750-2,752	Limestone, pale yellowish-brown, fine-crystalline
1,527-1,530	Anhydrite, grayish-white to light-gray, fine-crystalline	2,752-2,759	Shale, medium-gray
1,530-1,535	Shale, medium-gray		Top of Funston Limestone 2,759 feet
1,535-1,540	Anhydrite, grayish-white to light-gray, fine-crystalline	2,759-2,766	Limestone, medium-gray, fine-crystalline, argillaceous
1,540-2,105	Anhydrite, grayish-white to light-gray, fine-crystalline; salt; probably contains many gray and reddish-brown shale beds	2,766-2,777	Shale, medium-gray
2,105-2,145	Anhydrite, very light-gray, fine-crystalline	2,777-2,780	Limestone, pale yellowish-brown, very fine-crystalline
2,145-2,150	Anhydrite as above; salt	2,780-2,790	Shale, medium-gray
2,150-2,162	Anhydrite as above	2,790-2,798	Limestone, pale to dark yellowish-brown, fine-crystalline
2,162-2,167	Shale, medium-gray	2,798-2,800	Shale, medium-gray
2,167-2,173	Dolomite, olive-gray, fine-crystalline, argillaceous; dark-gray spots		
2,173-2,176	Shale, medium-gray		
2,176-2,190	Anhydrite, very light-gray, fine-crystalline; salt		
2,190-2,193	Dolomite, light olive-gray, fine-crystalline, argillaceous		
2,193-2,200	Anhydrite, very light-gray, fine-crystalline		
2,200-2,220	Anhydrite as above; salt		
2,220-2,246	Anhydrite, light- to medium-gray, fine-crystalline		
2,246-2,255	Dolomite, light olive-gray, fine-crystalline, argillaceous; very light-gray dense chert; pyrite		
2,255-2,260	Anhydrite, light- to medium-gray, fine-crystalline		
2,260-2,270	Shale, greenish-gray and medium-gray		
2,270-2,278	Anhydrite, light- to medium-gray, fine-crystalline		
2,278-2,280	Shale, medium-gray		
2,280-2,300	Anhydrite, very light-gray, fine-crystalline		
2,300-2,308	Shale, medium-gray, silty		
	Chase Group		
	Nolans Limestone 2,308-2,361 feet		
2,308-2,317	Dolomite, medium-gray, fine-crystalline, argillaceous; very light-gray dense chert		
2,317-2,320	Shale, medium-gray		
2,320-2,324	Dolomite, medium-gray, fine-crystalline, argillaceous		
2,324-2,348	Shale, medium-gray		
2,348-2,361	Limestone, light- to medium-gray, fine-crystalline, argillaceous; crinoids		

2,800-2,900	No samples	From electrical log:	3,253-3,260	Shale, medium-gray
		2,800-2,808 Shale	3,260-3,273	Shale, grayish-black
		2,808-2,810 Limestone	3,273-3,278	Siltstone, light-gray
		2,810-2,820 Shale	3,278-3,288	Shale, medium-gray
		2,820-2,827? Limestone	3,288-3,290	Limestone, brownish-gray, slightly argillaceous
			3,290-3,298	Shale, medium-gray
			3,298-3,304	Shale, grayish-black
			3,304-3,310	Siltstone, very light-gray, very finely sandy
			3,310-3,320	Shale, medium-gray
			3,320-3,326	Limestone, pale yellowish-brown to brownish-gray, fine-crystalline
			3,326-3,329	Shale, medium-gray
			3,329-3,337	Limestone, grayish-brown to brownish-gray, fine-crystalline, argillaceous
			3,337-3,355	Shale, medium-gray; coal stringers 3,337-3,343 feet
			3,355-3,360	Shale, grayish-black
			3,360-3,370	Shale, medium-gray
			3,370-3,379	Limestone, medium-gray, very silty, argillaceous; slight brownish tint
			3,379-3,385	Shale, medium-gray
			3,385-3,390	Shale, grayish-black
			3,390-3,399	Shale, medium-gray
			3,399-3,400	Limestone, medium-gray, very silty, argillaceous
			3,400-3,406	Shale, medium-gray
			3,406-3,415	Siltstone, medium light-gray, very finely sandy, calcareous
			3,415-3,420	Limestone, brownish-gray, fine-crystalline, argillaceous
			3,420-3,430	Shale, medium-gray
			3,430-3,435	Shale, greenish-gray
			3,435-3,456	Shale, medium-gray
			3,456-3,460	Limestone, medium light-gray, very silty; spines
			3,460-3,466	Shale, medium-gray
			3,466-3,472	Limestone, dark yellowish-brown, fine-crystalline, argillaceous
			3,472-3,480	Shale, medium-gray to grayish-black
			3,480-3,486	Limestone, pale to dark yellowish-brown, fine-crystalline
			3,486-3,494	Sandstone, light-gray, very fine-grained, silty, slightly dolomitic, micaceous
			3,494-3,500	Shale, grayish-black
			3,500-3,506	Siltstone, light-gray, very finely sandy
			3,506-3,530	Shale, medium-gray
			3,530-3,535	Shale, grayish-black
			3,535-3,552	Shale, medium-gray; coal stringers 3,542-3,544 feet
			3,552-3,555	Limestone, medium-gray, very silty
			3,555-3,565	Shale, medium-gray
				Pennsylvanian System
				Virgil Series
				Rocks equivalent to Wabauensee Group
			3,565-3,578	Limestone, medium light-gray, fine-crystalline, dolomitic, argillaceous
			3,578-3,588	Shale, medium-gray
			3,588-3,592	Limestone, pale yellowish-brown, fine-crystalline
			3,592-3,604	Limestone, light olive-gray, fine-crystalline; mottled with dark gray
			3,604-3,608	Shale, medium-gray
			3,608-3,614	Shale, grayish-black
			3,614-3,619	Sandstone, medium-gray, very fine-grained, silty, calcareous
			3,619-3,637	Shale, medium-gray
			3,637-3,640	Sandstone, light-gray to greenish-gray, very fine-grained, silty
			3,640-3,644	Shale, medium-gray
			3,644-3,646	Limestone, pale yellowish-brown, fine-crystalline
			3,646-3,650	Shale, medium-gray
			3,650-3,654	Shale, grayish-black
			3,654-3,660	Limestone, medium light-gray, fine-crystalline
			3,660-3,666	Limestone, brownish-gray, fine-crystalline
			3,666-3,672	Limestone, grayish-brown, fine-crystalline, silty
			3,672-3,680	Shale, medium-gray
			3,680-3,690	Shale, greenish-gray and grayish-red
			3,690-3,699	Shale, medium-gray
			3,699-3,700	Limestone, medium-gray, fine-crystalline
			3,700-3,711	Limestone, pale yellowish-brown, fine-crystalline
			3,711-3,733	Shale, medium-gray
			3,733-3,746	Sandstone, light-gray, very fine- to fine-grained, dolomitic; trace of glauconite
			3,746-3,757	Shale, medium-gray
			3,757-3,763	Limestone, medium dark- to dark-gray, very finely sandy; trace of glauconite
			3,763-3,770	Shale, medium-gray
			3,770-3,775	Shale, grayish-black
			3,775-3,815	Shale, medium-gray
			3,815-3,825	Shale, grayish-black
			3,825-3,840	Shale, medium-gray; plant imprints and coal stringers
			3,840-3,880	Shale, medium-gray
			3,880-3,885	Shale, grayish-black
			3,885-3,927	Shale, medium-gray
			3,927-3,935	Limestone, medium-gray, fine-crystalline, very silty, slightly brownish
			3,935-3,945	Shale, medium-gray
			3,945-3,950	Limestone, slightly brownish, fine-crystalline, very silty
			3,950-4,002	Shale, medium-gray; coal stringers 3,970-3,980 and 3,990-4,000 feet
			4,002-4,010	Limestone, pale yellowish-brown, fine-crystalline
			4,010-4,016	Limestone, brownish-gray, very fine-crystalline
2,900-2,908	Limestone, medium dark-gray, fine-crystalline, silty			
2,908-2,925	Shale, medium-gray			
2,925-2,927	Limestone, medium-gray, fine-crystalline			
2,927-2,930	Shale, medium-gray			
2,930-2,940	Shale, greenish-gray			
2,940-2,946	Shale, grayish-red			
2,946-2,955	Shale, medium-gray			
2,955-2,957	Limestone, light-gray, fine-crystalline; mottled with grayish-red			
2,957-2,980	Shale, grayish-red and greenish-gray			
2,980-2,984	Shale, medium-gray			
	Grenola Limestone 2,984-3,055 feet			
2,984-2,990	Limestone, medium light-gray to pale yellowish-brown, fine-crystalline			
2,990-3,010	Limestone, pale to dark yellowish-brown, fine-crystalline			
3,010-3,020	Limestone, medium-gray, fine-crystalline, argillaceous			
3,020-3,036	Shale, medium-gray			
3,036-3,040	Shale, grayish-black			
3,040-3,043	Shale, medium-gray			
3,043-3,050	Limestone, pale to dark yellowish-brown, fine-crystalline; calcite; finely oolitic and oolitic at top			
3,050-3,055	Limestone, medium light-gray, fine-crystalline			
3,055-3,060	Shale, medium-gray			
3,060-3,068	Shale, greenish-gray and medium-gray			
	Red Eagle Limestone, Johnson Shale, and Foraker Limestone, undifferentiated 3,068-3,172 feet			
3,068-3,072	Limestone, light olive-gray, fine-crystalline			
3,072-3,074	Shale, medium-gray			
3,074-3,080	Limestone, medium dark-gray, fine-crystalline, argillaceous			
3,080-3,090	Limestone, pale yellowish-brown, fine-crystalline			
3,090-3,101	Limestone as above; dark-gray spots			
3,101-3,106	Shale, grayish-red			
3,106-3,110	Shale, medium-gray			
3,110-3,121	Limestone, brownish-gray, silty, argillaceous			
3,121-3,127	Shale, medium-gray			
3,127-3,130	Limestone, medium-gray, fine-crystalline, argillaceous			
3,130-3,136	Shale, greenish-gray			
3,136-3,144	Shale, medium-gray; ostracod 3,140-3,144 feet			
3,144-3,150	Limestone, pale yellowish-brown, fine-crystalline; fusulinids; ostracods			
3,150-3,155	Limestone, brownish-gray, fine-crystalline			
3,155-3,160	Shale, medium-gray			
3,160-3,164	Shale, greenish-gray			
3,164-3,172	Limestone, pale yellowish-brown, fine-crystalline, slightly argillaceous			
	Admire Group			
3,172-3,178	Shale, olive-gray			
3,178-3,180	Limestone, medium-gray, argillaceous			
3,180-3,185	Shale, greenish-gray			
3,185-3,190	Shale, grayish-red			
3,190-3,200	Shale, medium-gray			
3,200-3,203	Shale, grayish-black			
3,203-3,208	Shale, medium-gray			
3,208-3,213	Limestone, pale yellowish-brown, fine-crystalline			
3,213-3,219	Shale, medium-gray			
3,219-3,226	Sandstone, light-gray, very fine-grained, silty			
3,226-3,228	Shale, medium-gray			
3,228-3,230	Limestone, grayish-brown, fine-crystalline, argillaceous			
3,230-3,235	Shale, grayish-black			
3,235-3,246	Shale, medium-gray			
3,246-3,248	Limestone, brownish-gray, fine-crystalline, argillaceous			
3,248-3,250	Sandstone, light-gray, very fine-grained, silty, calcareous			
3,250-3,253	Shale, grayish-brown, silty, micaceous			

4,016-4,027	Shale, medium-gray	4,646-4,650	Siltstone, olive-gray
4,027-4,032	Limestone, medium-gray, fine-crystalline, silty, slightly brownish	4,650-4,670	Shale, medium-gray
4,032-4,040	Shale, medium-gray	4,670-4,677	Siltstone, olive-gray; and silty shale
4,040-4,045	Shale, grayish-black	4,677-4,685	Limestone, brownish-gray, fine-crystalline
4,045-4,050	Shale, medium-gray	4,685-4,689	Shale, medium-gray
4,050-4,058	Shale, grayish-black	4,689-4,700	Limestone, dark yellowish-brown to brownish-gray, fine-crystalline
4,058-4,062	Limestone, medium-gray, fine-crystalline, silty, slightly brownish	4,700-4,710	Limestone, pale yellowish-brown, fine-crystalline
4,062-4,075	Shale, medium-gray	4,710-4,712	Limestone, pale yellowish-brown, medium-oolitic
4,075-4,088	Siltstone, medium-gray	4,712-4,720	Limestone, medium light-gray to light olive-gray, fine-crystalline; oil stain?
4,088-4,105	Limestone, pale yellowish-brown to medium light-gray, fine-crystalline; calcite; fusulinids 4,095-4,102 feet	Rocks equivalent to Douglas Group	
4,105-4,110	Limestone, medium-gray, fine-crystalline	4,720-4,727	Shale, medium-gray
4,110-4,116	Shale, medium-gray	4,727-4,740	Siltstone, medium-gray to olive-gray
4,116-4,121	Limestone, medium light-gray, fine-crystalline	4,750-4,750	Shale, gray and grayish-black
4,121-4,126	Shale, medium-gray	4,750-4,770	Limestone, brownish-gray, fine-crystalline, argillaceous
4,126-4,135	Limestone, pale yellowish-brown, fine-crystalline, porous	4,770-4,775	Limestone, medium dark-gray, very silty
4,135-4,140	Shale, grayish-black	4,775-4,804	Shale, medium-gray
Rocks equivalent to Shawnee Group		4,804-4,810	Shale, greenish-gray
Topeka Limestone 4,140-4,206 feet		4,810-4,835	Shale, medium-gray
4,140-4,150	Limestone, pale to dark yellowish-brown, fine-crystalline	4,835-4,836	Coal
4,150-4,163	Limestone, pale yellowish-brown to very pale-orange, very finely to finely oolitic and oolitic	4,836-4,882	Shale, medium-gray
4,163-4,171	Limestone, medium light-gray, fine-crystalline	4,882-4,884	Limestone, grayish-brown, fine-crystalline, slightly argillaceous
4,171-4,182	Shale, medium-gray	Missouri Series	
4,182-4,190	Limestone, medium-gray, very fine-crystalline	Ochelata Group	
4,190-4,200	Limestone, pale yellowish-brown, fine-crystalline	Rocks equivalent to Lansing Group	
4,200-4,206	Limestone, pale yellowish-brown, very fine-crystalline	4,884-4,896	Shale, medium-gray
4,206-4,220	Sandstone, very light-gray, very fine- to fine-grained	4,896-4,910	Siltstone, greenish-gray to olive-gray
4,220-4,232	Shale, medium-gray	4,910-4,920	Sandstone, light-gray, very fine-grained, silty
4,232-4,240	Siltstone, medium light-gray, very finely sandy	4,920-4,925	Sandstone, very light-gray, very fine- to fine-grained
4,240-4,252	Shale, medium-gray	4,925-4,935	Sandstone, very light-gray, very fine-grained, silty
4,252-4,258	Siltstone, light olive-gray	4,935-4,942	Sandstone, very pale-orange, very fine- to fine-grained
4,258-4,262	Shale, medium-gray	4,942-4,953	Shale, medium-gray
4,262-4,268	Shale, light olive-gray	4,953-4,960	Sandstone, very light-gray to very pale-orange, fine-grained
4,268-4,276	Shale, medium-gray	4,960-4,990	Sandstone, pale yellowish-brown to light-gray, very fine- to fine-grained, micaceous
4,276-4,280	Shale, grayish-black	4,990-5,000	Sandstone, pale yellowish-brown, fine-grained, micaceous
4,280-4,288	Shale, medium-gray	5,000-5,010	Shale, medium-gray
4,288-4,292	Sandstone, light-gray, very fine-grained, silty	5,010-5,018	Sandstone, pale yellowish-brown to light olive-gray, very fine-grained, silty
4,292-4,310	Shale, medium-gray	5,018-5,035	Sandstone, pale yellowish-brown, very fine- to fine-grained
4,310-4,325	Siltstone, olive-gray, very finely sandy	5,035-5,047	Sandstone, pale yellowish-brown, fine-grained; some medium-grained sandstone
4,325-4,355	Shale, medium-gray	5,047-5,070	Sandstone, very pale-orange, very fine- to fine-grained, slightly dolomitic
4,355-4,360	Shale, grayish-black	5,070-5,086	Siltstone, brownish-gray to olive-gray, very finely sandy
4,360-4,387	Shale, medium-gray	Rocks equivalent to Kansas City Group 5,086-5,665 feet	
4,387-4,393	Sandstone, light-gray, very fine-grained, calcareous, silty, tight	5,086-5,245	Shale, medium-gray
4,393-4,397	Shale, medium-gray	5,245-5,250	Shale, grayish-black
4,397-4,400	Sandstone, moderate-brown, very fine- to fine-grained, porous	5,250-5,265	Shale, medium-gray
4,400-4,404	Sandstone, very light-gray, very fine- to fine-grained, porous	5,265-5,274	Shale, grayish-black
4,404-4,412	Shale, medium-gray	Skiatook Group	
4,412-4,416	Sandstone, very light-gray, very fine- to fine-grained	Drum Limestone 5,274-5,285 feet	
4,416-4,424	Shale, medium-gray	5,274-5,280	Limestone, grayish-brown to medium dark-gray, fine-crystalline, silty; crinoids
4,424-4,427	Sandstone, very light-gray, very fine-grained, calcareous, silty	5,280-5,282	Shale, medium-gray
4,427-4,430	Shale, medium-gray	5,282-5,285	Limestone, grayish-brown to medium dark-gray, fine-crystalline, silty
4,430-4,433	Sandstone, very light-gray, very fine-grained, calcareous, silty	5,285-5,300	Sandstone, very light-gray, very fine- to fine-grained, slightly dolomitic, slightly micaceous
4,433-4,450	Shale, medium-gray	5,300-5,303	Sandstone, very light-gray, very fine-grained, silty
4,450-4,460	Shale, grayish-black	5,303-5,310	Shale, medium-gray
4,460-4,468	Shale, medium-gray	5,310-5,315	Shale, grayish-black
4,468-4,470	Limestone, medium dark-gray, fine-crystalline, very silty	5,315-5,335	Shale, medium-gray
4,470-4,482	Shale, medium-gray	5,335-5,348	Siltstone, light olive-gray, calcareous
4,482-4,484	Limestone, grayish-brown, dense, argillaceous	5,348-5,350	Limestone, medium-gray, very silty
4,484-4,495	Shale, medium-gray	5,350-5,355	Sandstone, light- to medium-gray, very fine-grained, silty, calcareous
4,495-4,500	Shale, grayish-black	5,355-5,365	Sandstone, very light- to light-gray, very fine- to fine-grained, slightly dolomitic
4,500-4,515	Shale, medium-gray	5,365-5,385	Sandstone, very light-gray, very fine-grained, slightly micaceous
4,515-4,520	Shale, grayish-black	5,385-5,395	Sandstone, very light-gray, fine-grained
4,520-4,526	Shale, medium-gray	5,395-5,410	Sandstone, very light-gray, very fine- to fine-grained, dolomitic
4,526-4,530	Siltstone, very light-gray, very finely sandy	5,410-5,425	Sandstone, very light-gray, fine-grained
4,530-4,533	Sandstone, very light-gray, very fine-grained, silty, slightly dolomitic	5,425-5,444	Sandstone, very light-gray, fine-grained; carbonaceous fragments
4,533-4,566	Shale, medium-gray	5,444-5,460	Shale, dark-gray to grayish-black
4,566-4,576	Shale, grayish-red; caving?	5,460-5,477	Shale, medium-gray
4,576-4,586	Shale, medium-gray	Hogshooter Limestone 5,477-5,510 feet	
4,586-4,590	Sandstone, light-gray to pale yellowish-brown, very fine- to fine-grained, calcareous	5,477-5,480	Limestone, brownish-gray, fine-crystalline
4,590-4,593	Shale, medium-gray	5,480-5,486	Shale, grayish-black
Oread Limestone Member of Vamoosa Formation 4,593-4,720 feet			
4,593-4,600	Limestone, medium light- to medium-gray, fine-crystalline		
4,600-4,605	Limestone, pale yellowish-brown, very fine- to fine-crystalline		
4,605-4,614	Limestone, pale yellowish-brown to very pale-orange, fine-crystalline; yellowish-brown to light-gray dense chert		
4,614-4,617	Shale, medium-gray		
4,617-4,623	Limestone, brownish-gray, fine-crystalline		
4,623-4,630	Shale, medium-gray		
4,630-4,640	Shale, grayish-red		
4,640-4,646	Shale, medium-gray		

6,520-6,530	Limestone, medium-gray, fine-crystalline, silty, slightly brownish	7,050-7,054	Shale, medium-gray
6,530-6,535	Limestone, brownish-gray, fine-crystalline; light-gray dense chert		Viola Limestone 7,054-7,100 feet
6,535-6,550	Limestone as above; medium-gray chert	7,054-7,064	Limestone, very light- to light-gray, medium-crystalline
6,550-6,556	Limestone, brownish-gray, fine-crystalline; medium-gray dense chert	7,064-7,066	Limestone, light olive-gray, fine- to medium-crystalline, slightly argillaceous
6,556-6,560	Limestone, medium- to medium dark-gray, very silty; medium dark-gray dense chert	7,066-7,070	Limestone, pale yellowish-brown, medium- to coarse-crystalline; crinoids
6,560-6,566	Limestone as above	7,070-7,073	Limestone, medium-gray, argillaceous
6,566-6,570	Limestone, medium-gray, fine-crystalline, silty; medium-gray dense chert	7,073-7,077	Limestone, brownish-gray, fine-crystalline, argillaceous; medium light- to medium-gray dense chert
6,570-6,580	Limestone, brownish-gray, fine-crystalline, very silty	7,077-7,080	Limestone, brownish-gray, fine- to medium-crystalline, argillaceous
6,580-6,587	Limestone, medium dark-gray, fine-crystalline, very silty		Limestone, pale yellowish-brown to brownish-gray, fine-crystalline; medium light-gray to yellowish-brown dense chert
6,587-6,600	Limestone, brownish-gray, fine-crystalline, argillaceous; light-gray to brownish-gray mottled spicular chert	7,080-7,085	Limestone, pale yellowish-brown, fine-crystalline; medium light-gray to yellowish-brown dense chert
6,600-6,610	Limestone, dark yellowish-brown, fine-crystalline, very silty	7,085-7,090	Limestone, pale yellowish-brown, fine-crystalline; medium-gray to yellowish-brown dense chert
6,610-6,620	Limestone, pale yellowish-brown, fine-crystalline, very silty	7,090-7,095	Limestone, very light-gray, fine-crystalline, soft
6,620-6,630	Limestone as above; yellowish-brown to light-gray calcareous chert	7,095-7,100	Limestone, brownish-gray, fine-crystalline, argillaceous
6,630-6,635	Limestone, light olive-gray, fine-crystalline, very silty		Simpson Group
6,635-6,650	Limestone, brownish-gray, fine-crystalline, very silty		Bromide Formation 7,100-7,300 feet
6,650-6,655	Limestone, medium dark-gray, very silty; medium-gray dense chert	7,100-7,105	Limestone, brownish-gray to dark yellowish-brown, very fine-crystalline; medium-gray dense chert
6,655-6,660	Limestone, medium-gray to brownish-gray, fine-crystalline, very silty; medium-gray pyritic chert	7,105-7,110	Limestone as above
6,660-6,678	Limestone, medium dark-gray, fine-crystalline, very silty; medium-gray dense chert	7,110-7,120	Limestone, light-gray to pale yellowish-brown, medium- to coarse-crystalline; mottled with dark gray; crinoids
6,678-6,685	Limestone, grayish-brown, fine-crystalline, very silty	7,120-7,130	Limestone, very pale-orange, medium- to coarse-crystalline
6,685-6,690	Limestone, brownish-gray, fine-crystalline, very silty	7,130-7,136	Limestone as above; medium light-gray chert
6,690-6,694	Limestone, pale yellowish-brown, fine-crystalline; caving?	7,136-7,140	Limestone, pale yellowish-brown, fine-crystalline, argillaceous
6,694-6,700	Limestone, brownish-gray, very fine-crystalline, silty		Limestone as above; light-gray to pale yellowish-brown spicular chert
6,700-6,710	Limestone, brownish-gray to medium dark-gray, fine-crystalline, very silty; medium light-gray dense chert	7,140-7,145	Limestone, brownish-gray, fine-crystalline, argillaceous; light-gray granular chert
6,710-6,720	Limestone as above	7,145-7,150	Limestone, pale yellowish-brown, fine-crystalline, argillaceous
6,720-6,730	Limestone, brownish-gray, fine-crystalline, very silty; medium-gray dense chert	7,150-7,160	Limestone, pale yellowish-brown, fine-crystalline; medium light-gray dense chert and grayish-white granular chert
6,730-6,735	Limestone, medium dark-gray, fine-crystalline, argillaceous	7,160-7,170	Limestone as above; yellowish-brown to medium-gray dense chert
6,735-6,750	Limestone, brownish-gray, dense to very fine-crystalline, argillaceous	7,170-7,175	Limestone, brownish-gray, fine-crystalline, argillaceous
6,750-6,764	Limestone, medium dark-gray, fine-crystalline, argillaceous	7,180-7,187	Limestone, pale yellowish-brown to brownish-gray, fine- to medium-sandy
6,764-6,775	Limestone, medium dark-gray, fine-crystalline, very silty	7,187-7,199	Limestone, medium dark-gray, very argillaceous
6,775-6,780	Limestone, brownish-gray, fine-crystalline, very silty	7,199-7,210	Sandstone, very light- to medium light-gray, very fine- to fine-grained, calcareous
6,780-6,786	Limestone as above; medium light-gray dense chert	7,210-7,215	Sandstone, very light-gray, fine- to medium-grained, subrounded; some medium- to coarse-grained subrounded calcareous sandstone
6,786-6,790	Siltstone, medium dark-gray, slightly calcareous	7,215-7,220	Sandstone, medium-gray, very fine- to medium-grained, slightly calcareous; "dirty" color (oil stain?)
6,790-6,800	No samples	7,220-7,227	Sandstone, very light-gray, fine- to medium-grained, subrounded
6,800-6,810	Limestone, medium dark-gray, fine-crystalline, very silty	7,227-7,233	Sandstone, light-gray, fine- to medium-grained, subrounded, very calcareous
6,810-6,813	Shale, dark-gray, silty, very glauconitic	7,233-7,238	Limestone, pale yellowish-brown, fine-crystalline, argillaceous
6,813-6,823	Limestone, medium dark-gray, fine-crystalline, very silty; medium- to dark-gray dense chert	7,238-7,248	Dolomite, pale yellowish-brown, fine-crystalline, argillaceous
6,823-6,830	Siltstone, brownish-gray, slightly calcareous, siliceous; resembles limestone	7,248-7,256	Limestone, pale yellowish-brown, dense; calcite veinlets
6,830-6,835	Siltstone, medium-gray, slightly calcareous; resembles limestone	7,256-7,260	Limestone, dark yellowish-brown, dense
6,835-6,845	Siltstone, brownish-gray, slightly calcareous, glauconitic; resembles limestone	7,260-7,267	Limestone, brownish-gray, dense
6,845-6,854	Limestone, brownish-gray, very fine-crystalline, silty	7,267-7,276	Limestone, medium dark-gray, fine-crystalline, argillaceous
	Rocks of Kinderhookian? Age	7,276-7,280	Dolomite, pale to dark yellowish-brown, fine-crystalline, argillaceous
6,854-6,870	Shale, medium-gray to grayish-black	7,280-7,300	Sandstone, white, medium-grained, subrounded, frosted, soft
6,870-6,874	Shale, greenish-gray	7,300	Total depth
6,874-6,889	Shale, medium-gray		
6,889-6,893	Limestone, olive-gray, very fine-crystalline, argillaceous		
6,893-6,912	Limestone, pale yellowish-brown, dense to very fine-crystalline, slightly argillaceous		
	Devonian and Mississippian Systems		
	Woodford Shale 6,912-6,960 feet		
6,912-6,918	Shale, grayish-black		
6,918-6,923	Shale, medium-gray		
6,923-6,936	Shale, grayish-black; pyrite		
6,936-6,948	Shale, medium-gray; white and yellow powder		
6,948-6,960	Shale, medium-gray to grayish-black		
	Misener sand of the Woodford Shale 6,960-6,965 feet		
6,960-6,965	Sandstone, very light- to medium light-gray, very fine- to fine-grained; much pyrite		
	Ordovician System		
	Sylvan Shale 6,965-7,054 feet		
6,965-6,988	Shale, medium- and dark-gray		
6,988-6,992	Shale, grayish-red to grayish-purple		
6,992-6,996	Siltstone, medium light-gray, slightly dolomitic; many smooth black grains		
6,996-7,040	Shale, medium-gray		
7,040-7,050	Shale, dark-gray, slightly dolomitic		

Log 5

MAJOR COUNTY, OKLAHOMA

SE1/4 SW1/4 SW1/4 sec. 22, T. 23 N., R. 10 W.

Operator: Superior Oil Co.
Lease: Schultz No. 28-22
Elevation: KB 1,361 feet
GL 1,348 feet
Total depth: Drillers 7,875 feet
Electrical log 7,871 feet
Completion date: 1951
Initial production: Dry

Electrical log: 451 to 7,871 feet

Sample intervals:

10-foot
2,000 to 5,255 feet
5,300 to 5,620 feet
5,640 to 6,000 feet
6,770 to 7,270 feet
5-foot
5,255 to 5,300 feet
5,620 to 5,640 feet
6,000 to 6,770 feet
7,270 to 7,875 feet

Cored intervals:

6,470 to 6,490 feet (core chips)

Permian System		Winfield Limestone 2,434-2,480 feet	
Hennessey Shale and Garber Sandstone			
0-1,215?	No samples	2,434-2,438	Limestone, medium light-gray, fine-crystalline, argillaceous
Wellington Formation 1,215?-2,342 feet		2,438-2,440	Shale, medium-gray
1,215?-2,000	No samples	2,440-2,445	Limestone, medium dark-gray, fine-crystalline, argillaceous; medium-gray speckled chert
2,000-2,090	Anhydrite, very light-gray, fine-crystalline; much salt; (samples mostly gray shale)	2,445-2,460	Shale, medium-gray
2,090-2,120	Anhydrite, grayish-white to medium light-gray, fine-crystalline	2,460-2,467	Limestone, pale yellowish-brown, fine-crystalline, porous; crinoids
2,120-2,150	Anhydrite, grayish-white to medium light-gray, fine-crystalline; probably some salt	2,467-2,475	Limestone, medium light-gray, fine-crystalline, slightly argillaceous, porous, pseudoöolitic?; crinoids
2,150-2,154	Dolomite, medium-gray, very argillaceous; very light- to light-gray dense chert	2,475-2,480	Limestone, light-gray, fine-crystalline, soft; dark-gray spots
2,154-2,200	Anhydrite, grayish-white to medium light-gray, fine-crystalline; salt	2,480-2,490	Shale, medium-gray
2,200-2,220	Anhydrite, grayish-white to medium light-gray, fine-crystalline	2,490-2,500	Dolomite, medium light-gray, fine-crystalline, argillaceous; medium-gray to yellowish-brown dense chert
2,220-2,222	Dolomite, medium-gray to light olive-gray, argillaceous	2,500-2,510	Shale, medium-gray
2,222-2,230	Shale, greenish-gray to medium-gray	Barneston Limestone 2,510-2,660 feet	
2,230-2,236	Dolomite, light olive-gray, fine-crystalline, argillaceous; anhydrite? crystals	2,510-2,520	Limestone, pale yellowish-brown, fine-crystalline, argillaceous
2,236-2,237	Shale, gray	2,520-2,525	Limestone, medium-gray, fine-crystalline, slightly argillaceous
2,237-2,243	Anhydrite, light-gray, fine-crystalline	2,525-2,530	Limestone, medium light-gray, fine-crystalline, argillaceous; medium light-gray mottled chert
2,243-2,245	Shale, gray	2,530-2,540	Shale, medium-gray
2,245-2,250	Anhydrite, light-gray, fine-crystalline	2,540-2,550	Limestone, medium dark-gray, fine-crystalline, very argillaceous; crinoids
2,250-2,285	Anhydrite, white to very light-gray, fine-crystalline; salt	2,550-2,560	Shale, medium-gray
2,285-2,294	Shale, medium-gray	2,560-2,568	Limestone, medium light-gray, fine-crystalline, argillaceous; dark-gray spots; milky chert
2,294-2,298	Dolomite, medium-gray, very argillaceous	2,568-2,570	Shale, medium-gray
2,298-2,300	Shale, medium-gray	2,570-2,574	Limestone, medium dark-gray, fine-crystalline, very argillaceous
2,300-2,312	Anhydrite, white to very light-gray, fine-crystalline	2,574-2,577	Shale, medium-gray
2,312-2,314	Shale, medium-gray	2,577-2,582	Limestone, medium-gray, fine-crystalline, argillaceous; crinoids
2,314-2,324	Anhydrite, light-gray, fine-crystalline	2,582-2,585	Shale, medium-gray
2,324-2,327	Dolomite, pale yellowish-brown, very fine-crystalline, argillaceous	2,585-2,588	Limestone, medium-gray, fine-crystalline, argillaceous
2,327-2,330	Shale, medium-gray	2,588-2,590	Shale, medium-gray
2,330-2,340	Anhydrite, white to very light-gray, fine-crystalline	2,590-2,600	Limestone, medium-gray, fine-crystalline, argillaceous; fusulinids
2,340-2,342	Shale, medium-gray	2,600-2,607	Limestone, medium light-gray to medium-gray, fine-crystalline, argillaceous; fusulinids
Chase Group		2,607-2,610	Shale, moderate-brown
Nolans Limestone 2,342-2,404 feet		2,610-2,620	Limestone, medium light-gray to medium-gray, fine-crystalline, argillaceous
2,342-2,346	Dolomite, medium- to medium dark-gray, fine-crystalline, argillaceous; light-gray milky chert	2,620-2,630	Limestone, medium light-gray, fine-crystalline, argillaceous
2,346-2,390	Shale, medium-gray	2,630-2,640	Limestone, pale yellowish-brown, fine-crystalline; medium light-gray calcareous fossiliferous chert
2,390-2,395	Limestone, medium light-gray, fine-crystalline, argillaceous; crinoids	2,640-2,644	Limestone as above
2,395-2,400	Limestone, pale yellowish-brown, fine-crystalline, slightly argillaceous, porous; crinoids; slightly oöolitic?	2,644-2,647	Shale, medium-gray
2,400-2,404	Limestone, light-gray, fine-crystalline, argillaceous; mottled with dark gray		
2,404-2,434	Shale, medium-gray		

2,647-2,655	Limestone, pale yellowish-brown, fine-crystalline; crinoids; brachiopods		Grenola Limestone 3,016-3,080 feet
2,655-2,660	Limestone, medium-gray, fine-crystalline, argillaceous; medium light-gray mottled spicular chert	3,016-3,020 3,020-3,030	Limestone, medium-gray, fine-crystalline; calcite crystals Limestone, pale yellowish-brown to light olive-gray, fine-crystalline; calcite crystals
2,660-2,675	Shale, medium-gray		Limestone, medium light-gray, very fine-crystalline
2,675-2,679	Limestone, pale yellowish-brown, very fine-crystalline	3,030-3,043	Limestone, yellowish-brown to brownish-gray, fine-crystalline, argillaceous; mottled with dark gray
2,679-2,685	Shale, medium-gray	3,043-3,050	Limestone, medium dark-gray, fine-crystalline, very argillaceous
2,685-2,690	Shale, greenish-gray; caving?		Shale, medium-gray
2,690-2,697	Limestone, dark-gray, very argillaceous	3,050-3,054	Shale, grayish-black
2,697-2,703	Shale, medium-gray		Limestone, medium-gray, fine-crystalline, argillaceous
2,703-2,710	Shale, greenish-gray	3,054-3,065	
2,710-2,716	Limestone, brownish-gray, fine-crystalline, argillaceous	3,065-3,070	
2,716-2,726	Shale, medium-gray	3,070-3,080	
	Wreford Limestone 2,726-2,788 feet	3,080-3,112 3,112-3,120	Shale, medium-gray Sandstone, light-gray to pale yellowish-brown, very fine-grained, silty, calcareous
2,726-2,730	Limestone, brownish-gray, fine-crystalline, argillaceous; much dark-gray mottling; crinoids	3,120-3,130	Shale, greenish-gray
2,730-2,735	Limestone, medium-gray, fine-crystalline, argillaceous; dark-gray fusulinids?		Red Eagle Limestone, Johnson Shale, and Foraker Limestone, undifferentiated, 3,130-3,230 feet
2,735-2,746	Shale, medium-gray		
2,746-2,750	Limestone, pale yellowish-brown, fine-crystalline		
2,750-2,751	Shale, medium-gray		
2,751-2,758	Limestone, pale yellowish-brown to very light-gray, fine-crystalline	3,130-3,135	Limestone, pale yellowish-brown to very pale-orange, fine crystalline
2,758-2,760	Shale, medium-gray	3,135-3,140	Limestone as above; mottled with dark gray
2,760-2,770	Limestone, pale yellowish-brown to very light-gray, fine-crystalline	3,140-3,150	Limestone, light-gray, fine-crystalline, soft
2,770-2,781	Shale, medium-gray	3,150-3,156	Limestone, pale yellowish-brown, fine-crystalline
2,781-2,788	Limestone, medium light-gray to medium-gray, fine-crystalline, argillaceous; fusulinids	3,156-3,160 3,160-3,170	Shale, medium-gray Limestone, pale yellowish-brown, fine-crystalline, argillaceous
	Council Grove Group	3,170-3,181	Limestone, light- to dark-gray mottled, fine-crystalline, very argillaceous
2,788-2,792	Shale, medium-gray	3,181-3,201	Limestone, very pale-orange to light-gray, fine-crystalline
2,792-2,806	Shale, greenish-gray	3,201-3,207	Shale, medium-gray
2,806-2,810	Shale, medium-gray	3,207-3,222	Limestone, pale yellowish-brown, fine-crystalline, argillaceous; medium-gray to brownish-gray spicular chert
2,810-2,820	Shale, grayish-red		Shale, medium-gray
2,820-2,823	Shale, moderate-brown	3,222-3,224	Limestone, pale yellowish-brown, fine-crystalline; fusulinids
2,823-2,829	Shale, medium-gray	3,224-3,230	
	Funston Limestone, Blue Rapids Shale, and Crouse Limestone, undifferentiated, 2,829-2,866 feet		Admire Group
2,829-2,838	Limestone, very light-gray, fine-crystalline, soft	3,230-3,235	Shale, medium-gray; fusulinids
2,838-2,840	Shale, medium-gray	3,235-3,245	Shale, grayish-black
2,840-2,843	Limestone, pale yellowish-brown, fine-crystalline	3,245-3,257	Shale, medium-gray
2,843-2,846	Shale, medium-gray	3,257-3,267	Limestone, medium light-gray to brownish-gray, fine-crystalline, argillaceous
2,846-2,850	Limestone, pale yellowish-brown, fine-crystalline, faintly oölitic	3,267-3,272	Shale, moderate yellowish-brown
2,850-2,852	Shale, medium-gray	3,272-3,276	Limestone, medium light-gray, fine-crystalline, argillaceous
2,852-2,860	Limestone, medium-gray, fine-crystalline, argillaceous; medium- to dark-gray chert	3,276-3,280 3,280-3,295 3,295-3,300	Shale, medium-gray Shale, grayish-red Limestone, brownish-gray, fine-crystalline, medium- to coarse-oölitic
2,860-2,862	Shale, grayish-black	3,300-3,304	Limestone, pale yellowish-brown, medium- to coarse-oölitic
2,862-2,866	Limestone, medium-gray, fine-crystalline, argillaceous	3,304-3,310	Shale, medium-gray
2,866-2,870	Shale, grayish-red	3,310-3,314	Shale, grayish-black
2,870-2,876	Shale, greenish-gray	3,314-3,317	Limestone, light olive-gray, fine-crystalline, argillaceous
2,876-2,880	Shale, grayish-red	3,317-3,325 3,325-3,330 3,330-3,350 3,350-3,355	Shale, medium-gray; fusulinids Shale, grayish-black Shale, medium-gray Limestone, medium light-gray to medium-gray, fine-crystalline, argillaceous
	Bader Limestone, Stearns Shale, and Beattie Limestone, undifferentiated, 2,880-2,948 feet		
2,880-2,885	Limestone, light olive-gray, fine-crystalline	3,355-3,362	Shale, medium-gray
2,885-2,890	Limestone, brownish-gray, very fine-crystalline	3,362-3,367	Limestone, brownish-gray, fine-crystalline
2,890-2,895	Shale, medium-gray	3,367-3,370	Limestone, medium light-gray, silty
2,895-2,898	Limestone, medium-gray, fine-crystalline, argillaceous	3,370-3,380	Shale, medium-gray
2,898-2,900	Shale, medium-gray	3,380-3,389	Shale, grayish-red
2,900-2,906	Limestone, medium-gray, fine-crystalline, argillaceous	3,389-3,391	Limestone, pale yellowish-brown, fine-crystalline
2,906-2,910	Shale, medium-gray	3,391-3,403	Shale, medium-gray
2,910-2,913	Limestone, medium-gray, fine-crystalline, argillaceous	3,403-3,408	Limestone, brownish-gray, fine-crystalline
2,913-2,916	Shale, medium-gray	3,408-3,410	Shale, medium-gray
2,916-2,922	Limestone, brownish-gray, fine-crystalline, argillaceous	3,410-3,416	Limestone, medium light-gray, fine-crystalline, silty
2,922-2,929	Limestone, pale yellowish-brown, fine-crystalline; mottled with dark gray	3,416-3,420 3,420-3,428 3,428-3,432 3,432-3,440 3,440-3,450 3,450-3,460 3,460-3,465 3,465-3,475 3,475-3,480 3,480-3,485 3,485-3,490 3,490-3,507 3,507-3,512 3,512-3,522 3,522-3,526	Shale, medium-gray Shale, greenish-gray Siltstone, light-gray, very finely sandy Shale, medium-gray Shale, greenish-gray Shale, medium-gray Shale, grayish-black Shale, medium-gray Limestone, brownish-gray, fine-crystalline, argillaceous Shale, medium-gray Limestone, pale yellowish-brown, fine-crystalline, argillaceous Shale, medium-gray Limestone, medium dark-gray, fine-crystalline, silty Sandstone, light olive-gray, very fine-grained, silty, slightly dolomitic
2,929-2,931	Shale, medium-gray		
2,931-2,939	Limestone, dark-gray, fine-crystalline, very argillaceous		
2,939-2,941	Shale, medium-gray		
2,941-2,948	Limestone, medium-gray, fine-crystalline, argillaceous		
2,948-2,950	Shale, medium-gray		
2,950-2,956	Shale, greenish-gray		
2,956-2,960	Shale, moderate reddish-brown		
2,960-2,970	Shale, grayish-red		
2,970-2,975	Shale, greenish-gray		
2,975-2,980	Shale, medium-gray		
2,980-2,986	Shale, greenish-gray		
2,986-2,993	Shale, medium-gray		
2,993-2,997	Sandstone, very light-gray, very fine-grained, slightly calcareous	3,526-3,530	
2,997-3,016	Shale, medium-gray	3,530-3,534 3,534-3,542	

3,542-3,549	Shale, medium-gray	4,104-4,109	Limestone, pale yellowish-brown, very fine-crystalline
3,549-3,550	Sandstone, light olive-gray, very fine-grained, silty, silty dolomitic	4,109-4,115	Shale, medium-gray
3,550-3,560	Shale, medium-gray	4,115-4,120	Shale, greenish-gray
3,560-3,570	Shale, greenish-gray	4,120-4,136	Limestone, very pale-orange to pale yellowish-brown, very fine-crystalline
3,570-3,589	Shale, medium-gray	4,136-4,141	Limestone, medium-gray, fine-crystalline, slightly argillaceous
3,589-3,592	Sandstone, light-gray, very fine-grained, silty, slightly calcareous	4,141-4,145	Shale, medium-gray
3,592-3,605	Shale, medium-gray	4,145-4,150	Limestone, brownish-gray, fine-crystalline
		4,150-4,158	Limestone, medium light-gray, fine-crystalline, slightly argillaceous
	Pennsylvanian System	4,158-4,164	Limestone, medium-gray, fine-crystalline, argillaceous
	Virgil Series	4,164-4,170	Shale, greenish-gray
	Rocks equivalent to Wabaunsee Group	4,170-4,180	Shale, medium-gray to grayish-black
3,605-3,608	Limestone, brownish-gray, fine-crystalline		Rocks equivalent to Shawnee Group
3,608-3,611	Limestone, brownish-gray, medium- to coarse-oölitic		Topeka Limestone 4,180-4,211 feet
3,611-3,616	Shale, medium-gray		
3,616-3,626	Limestone, medium light-gray to pale yellowish-brown, fine-crystalline	4,180-4,190	Limestone, pale yellowish-brown, fine-crystalline
3,626-3,630	Shale, medium-gray	4,190-4,195	Limestone, medium light-gray, fine-crystalline
3,630-3,636	Limestone, medium light-gray to medium-gray, fine-crystalline, argillaceous	4,195-4,206	Shale, medium-gray to grayish-black
3,636-3,638	Shale, medium-gray	4,206-4,211	Limestone, pale yellowish-brown to brownish-gray, fine-granular, porous
3,638-3,645	Limestone, light-gray to very pale-orange, fine-crystalline		
3,645-3,649	Limestone, brownish-gray, fine-crystalline, argillaceous	4,211-4,220	Shale, medium-gray
3,649-3,655	Shale, medium-gray	4,220-4,225	Shale, grayish-black
3,655-3,660	Shale, greenish-gray	4,225-4,230	Shale, greenish-gray
3,660-3,666	Shale, medium-gray	4,230-4,237	Shale, medium-gray
3,666-3,670	Limestone, medium-gray, fine-crystalline, argillaceous	4,237-4,243	Sandstone, very light- to light-gray, very fine- to fine-grained, slightly dolomitic, porous
3,670-3,680	Shale, medium-gray to greenish-gray	4,243-4,253	Sandstone, very light-gray, fine- to medium-grained, slightly calcareous
3,680-3,689	Shale, medium-gray	4,253-4,258	Sandstone, very light-gray, fine- to medium-grained, calcareous
3,689-3,702	Limestone, medium dark-gray, fine-crystalline	4,258-4,262	Sandstone, pale yellowish-brown, fine- to medium-grained, slightly dolomitic
3,702-3,708	Shale, grayish-black	4,262-4,267	Shale, grayish-black
3,708-3,715	Limestone, pale yellowish-brown to medium light-gray, fine-crystalline, dolomitic	4,267-4,270	Sandstone, moderate-brown, very fine-grained, silty
3,715-3,718	Limestone, medium dark-gray, fine-crystalline, argillaceous	4,270-4,280	Sandstone, light- to medium light-gray, very fine-grained
3,718-3,722	Limestone, brownish-gray, fine-crystalline, argillaceous	4,280-4,293	Sandstone, very light-gray, fine-grained
3,722-3,747	Shale, medium-gray	4,293-4,306	Shale, medium-gray
3,747-3,750	Shale, grayish-black	4,306-4,310	Shale, greenish-gray
3,750-3,789	Shale, medium-gray	4,310-4,316	Shale, medium-gray
3,789-3,793	Limestone, pale yellowish-brown to brownish-gray, fine-crystalline; crinoids	4,316-4,323	Sandstone, very light-gray, very fine- to fine-grained, slightly dolomitic
3,793-3,800	Shale, medium-gray	4,323-4,340	Sandstone, very light- to medium light-gray, fine-grained; some carbonaceous stringers, slightly dolomitic
3,800-3,805	Limestone, pale yellowish-brown, fine-crystalline	4,340-4,353	Sandstone, medium light-gray, very fine- to fine-grained
3,805-3,820	Shale, medium-gray	4,353-4,360	Shale, medium-gray
3,820-3,824	Limestone, brownish-gray, fine-crystalline, argillaceous; dark-gray oölitic?; pyrite	4,360-4,365	Shale, grayish-black
3,824-3,830	Limestone, medium dark-gray, fine-crystalline, argillaceous	4,365-4,375	Shale, medium-gray
3,830-3,836	Limestone, medium light-gray, fine-crystalline, slightly argillaceous; trace of glauconite	4,375-4,380	Shale, grayish-black
3,836-3,840	Limestone, pale yellowish-brown, fine-crystalline	4,380-4,390	Shale, medium-gray
3,840-3,850	Limestone, medium light-gray, fine-crystalline; fusulinids in upper half	4,390-4,392	Limestone, brownish-gray, fine-crystalline, argillaceous
3,850-3,855	Limestone, pale yellowish-brown, fine-crystalline	4,392-4,400	Shale, medium-gray
3,855-3,860	Limestone, medium light-gray, fine-crystalline; medium-gray oölitic?	4,400-4,405	Shale, grayish-black
3,860-3,873	Limestone, medium light-gray, fine-crystalline	4,405-4,420	Shale, medium-gray
3,873-3,880	Shale, medium-gray	4,420-4,425	Shale, dark olive-gray, silty
3,880-3,898	Limestone, pale yellowish-brown to very pale-orange, fine-crystalline; brachiopods and ostracods 3,880-3,885 feet; crinoids and fusulinids 3,890-3,898 feet	4,425-4,445	Shale, medium-gray
3,898-3,900	Shale, medium-gray	4,445-4,450	Shale, grayish-black
3,900-3,916	Limestone, medium light-gray, fine-crystalline; fusulinids 3,900-3,905 feet	4,450-4,460	Shale, medium-gray
3,916-3,925	Limestone, pale yellowish-brown, fine-granular, slightly silty, porous	4,460-4,466	Sandstone, light olive-gray to yellowish-brown, very fine-grained, silty
3,925-3,930	Shale, medium-gray	4,466-4,470	Shale, medium-gray
3,930-3,940	Limestone, medium- to medium dark-gray, fine-crystalline, very argillaceous	4,470-4,476	Shale, greenish-gray
3,940-3,946	Limestone, brownish-gray, fine-crystalline, argillaceous	4,476-4,480	Shale, grayish-black
3,946-3,950	Shale, medium-gray	4,480-4,485	Shale, medium-gray
3,950-3,965	Shale, greenish-gray	4,485-4,490	Sandstone, light-gray, very fine-grained, calcareous, silty
3,965-3,974	Shale, medium-gray	4,490-4,506	Shale, medium-gray
3,974-3,980	Limestone, medium light- to medium dark-gray, fine-crystalline, argillaceous	4,506-4,510	Sandstone, light olive-gray, very fine-grained, silty, tight
3,980-3,990	Limestone, medium dark-gray, fine-crystalline, argillaceous	4,510-4,515	Shale, medium-gray
3,990-3,995	Limestone, medium dark-gray, fine-crystalline, slightly brownish	4,515-4,520	Shale, grayish-black
3,995-4,000	Limestone, grayish-brown, very fine-crystalline	4,520-4,530	Shale, medium-gray
4,000-4,020	Limestone, pale yellowish-brown, fine-crystalline; fusulinids, weathered? fusulinids 4,000-4,005 feet	4,530-4,534	Sandstone, light olive-gray, very fine-grained, silty, tight
4,020-4,028	Limestone, pale yellowish-brown, fine-crystalline; fusulinids; "dirty" color -- oil stain?	4,534-4,552	Shale, medium-gray
4,028-4,032	Limestone, brownish-gray, fine-crystalline, argillaceous	4,552-4,560	Siltstone, olive-gray, very finely sandy
4,032-4,040	Shale, medium-gray	4,560-4,565	Shale, medium-gray
4,040-4,050	Shale, grayish-black	4,565-4,575	Siltstone, olive-gray, very finely sandy
4,050-4,062	Shale, medium-gray	4,575-4,577	Shale, medium-gray
4,062-4,068	Limestone, dark-gray, fine-crystalline, very silty	4,577-4,580	Limestone, grayish-brown, very fine-crystalline
4,068-4,085	Shale, medium-gray to grayish-black	4,580-4,585	Shale, medium-gray
4,085-4,096	Limestone, dark-gray, fine-crystalline, very silty	4,585-4,595	Shale, grayish-black
4,096-4,104	Shale, medium-gray to grayish-black	4,595-4,612	Shale, medium-gray
		4,612-4,618	Limestone, medium dark-gray, fine-crystalline, silty
		4,618-4,620	Shale, medium-gray
		4,620-4,625	Shale, grayish-black
		4,625-4,633	Shale, medium-gray
		4,633-4,637	Limestone, medium dark-gray, fine-crystalline, silty
		4,637-4,642	Shale, medium-gray
		4,642-4,644	Limestone, medium dark-gray, fine-crystalline, silty
		4,644-4,654	Shale, medium-gray
		4,654-4,660	Sandstone, light olive-gray to yellowish-brown, very fine-grained, silty
		4,660-4,666	Sandstone, pale yellowish-brown, very fine-grained, silty, calcareous

4,666-4,670	Shale, medium-gray	5,190-5,200	Sandstone, light-gray to yellowish-brown, fine-grained, slightly dolomitic
4,670-4,675	Shale, grayish-black	5,200-5,205	Sandstone, medium light-gray, very fine- to fine-grained; oil stain?
4,675-4,682	Shale, medium-gray	5,205-5,210	Sandstone, medium light-gray, fine- to medium-grained; oil stain?
4,682-4,688	Siltstone, olive-gray, very finely sandy	5,210-5,220	Sandstone, light-gray, very fine- to fine-grained
4,688-4,703	Shale, medium-gray	5,220-5,240	Sandstone, light-gray, fine- to medium-grained, porous; oil stain?
4,703-4,710	Siltstone, olive-gray, very finely sandy		Rocks equivalent to Kansas City Group
4,710-4,714	Shale, medium-gray		
4,714-4,716	Limestone, medium-gray, fine-crystalline, argillaceous		
4,716-4,720	Shale, medium-gray		
4,720-4,723	Sandstone, light olive-gray, very fine-grained, silty		
4,723-4,740	Sandstone, very light-gray, fine-grained; oil stain?; some yellowish-brown-fine-grained sandstone		
4,740-4,746	Sandstone, very light-gray, very fine-grained, slightly dolomitic	5,240-5,250	Shale, medium-gray
4,746-4,755	Shale, medium-gray	5,250-5,255	Shale, grayish-black
4,755-4,760	Shale, grayish-black	5,255-5,260	Shale, medium-gray
4,760-4,767	Shale, medium-gray	5,260-5,266	Shale, greenish-gray
	Oread Limestone Member of Vamoosa Formation 4,767-4,920 feet	5,266-5,340	Shale, medium dark-gray, silty
4,767-4,770	Limestone, light-gray, fine-crystalline, soft	5,340-5,370	Siltstone, medium light- to medium-gray
4,770-4,775	Limestone, pale yellowish-brown, very fine-crystalline	5,370-5,375	Shale, grayish-black
4,775-4,780	Shale, grayish-black	5,375-5,395	Shale, medium-gray
4,780-4,787	Shale, medium-gray	5,395-5,405	Siltstone, olive-gray
4,787-4,790	Limestone, pale yellowish-brown, dense	5,405-5,430	Shale, medium-gray
4,790-4,794	Limestone, medium-gray, fine-crystalline	5,430-5,445	Shale, dark-gray, silty
4,794-4,800	Limestone, pale yellowish-brown, fine-crystalline; brownish-gray dense chert	5,445-5,450	Shale, grayish-black
4,800-4,806	Limestone, pale yellowish-brown, fine-crystalline	5,450-5,470	Shale, medium-gray
4,806-4,808	Shale, medium-gray	5,470-5,505	Shale, dark-gray, silty
4,808-4,815	Limestone, pale yellowish-brown, very fine-crystalline	5,505-5,520	Shale, grayish-black
4,815-4,817	Limestone, light-gray, very finely sandy, silty		Skiatook Group
4,817-4,820	Sandstone, light-gray, very fine-grained, silty, calcareous, micaceous	5,520-5,524	Drum Limestone 5,520-5,532 feet
4,820-4,830	Shale, medium-gray	5,524-5,526	Limestone, grayish-brown, fine-crystalline, argillaceous; crinoids
4,830-4,835	Shale, grayish-black	5,526-5,532	Shale, medium-gray
4,835-4,860	Shale, medium-gray	5,532-5,568	Limestone, grayish-brown, dense, argillaceous; crinoids
4,860-4,865	Shale, grayish-black	5,568-5,572	Shale, medium-gray
4,865-4,870	Shale, medium-gray	5,572-5,588	Siltstone, light-gray, calcareous
4,870-4,878	Shale, greenish-gray	5,588-5,590	Siltstone, light olive-gray, very finely sandy, calcareous
4,878-4,881	Limestone, pale yellowish-brown, fine-crystalline	5,590-5,597	Sandstone, very light-gray, very fine- to fine-grained, calcareous
4,881-4,886	Shale, medium-gray	5,597-5,614	Sandstone, light-gray, very fine-grained, calcareous
4,886-4,893	Sandstone, very light-gray, very fine-grained, calcareous, micaceous	5,614-5,620	Sandstone, very light-gray, very fine- to fine-grained, slightly dolomitic, porous, slightly micaceous
4,893-4,900	Sandstone, light olive-gray, very fine-grained, silty, slightly dolomitic	5,620-5,645	Sandstone, very light-gray, fine-grained, porous
4,900-4,905	Shale, greenish-gray	5,645-5,650	Sandstone, yellowish-brown, fine-grained, porous
4,905-4,910	Limestone, pale yellowish-brown, fine-crystalline; bryozoans	5,650-5,672	Sandstone, very light-gray, very fine- to fine-grained, porous
4,910-4,920	Limestone, pale yellowish-brown, medium- to coarse-oölitic and oölicastic	5,672-5,690	Shale, medium-gray
	Rocks equivalent to Douglas Group	5,690-5,700	Shale, greenish-gray
4,920-4,930	Shale, medium-gray	5,700-5,710	Shale, medium-gray
4,930-4,935	Shale, greenish-gray	5,710-5,715	Shale, grayish-black
4,935-4,940	Shale, grayish-black	5,715-5,735	Shale, medium-gray
4,940-4,950	Shale, medium-gray	5,735-5,740	Shale, grayish-black
4,950-4,952	Siltstone, moderate-brown, very finely sandy	5,740-5,750	Shale, medium-gray
4,952-4,960	Shale, medium-gray	5,750-5,758	Shale, grayish-black
4,960-4,965	Shale, greenish-gray		Hogshooter Limestone 5,758-5,767 feet
4,965-4,977	Shale, medium-gray	5,758-5,767	Limestone, grayish-black, dense, argillaceous
4,977-4,980	Sandstone, light-gray to light olive-gray, very fine-grained, silty	5,767-5,770	Shale, medium-gray
4,980-4,984	Sandstone, brownish-gray, very fine-grained, silty	5,770-5,780	Siltstone, olive-gray to medium-gray, slightly calcareous
4,984-4,996	Shale, medium-gray	5,780-5,810	Shale, medium-gray
4,996-5,003	Sandstone, light olive-gray, very fine-grained, silty, slightly dolomitic	5,810-5,815	Shale, grayish-black
5,003-5,020	Shale, medium-gray	5,815-5,880	Shale, medium-gray
5,020-5,030	Limestone, pale yellowish-brown to brownish-gray, fine-crystalline	5,880-5,888	Limestone, brownish-gray to moderate-brown, very fine-crystalline, slightly argillaceous; crinoids
5,030-5,039	Limestone, medium-gray, fine-crystalline, argillaceous	5,888-5,904	Shale, medium-gray
5,039-5,050	Shale, medium-gray	5,904-5,908	Limestone, medium dark-gray, fine-crystalline, argillaceous
5,050-5,055	Shale, grayish-black	5,908-5,910	Shale, medium-gray
5,055-5,070	Shale, medium-gray	5,910-5,915	Limestone, brownish-gray, very fine-crystalline, argillaceous
5,070-5,075	Shale, grayish-black		Rocks equivalent to Pleasanton Group (Pleasanton Formation on Chart OC-61)
5,075-5,104	Shale, medium-gray	5,915-5,920	Shale, medium-gray
	Missouri Series	5,920-5,925	Shale, grayish-black
	Ochelata Group	5,925-5,930	Shale, greenish-gray
	Rocks equivalent to Lansing Group	5,930-5,940	Shale, medium-gray
5,104-5,115	Siltstone, medium light-gray to light olive-gray	5,940-5,950	Siltstone, medium-gray to olive-gray
5,115-5,120	Siltstone, yellowish-brown, very finely sandy	5,950-5,957	Shale, greenish-gray
5,120-5,130	Shale, medium-gray	5,957-5,970	Siltstone, medium-gray
5,130-5,140	Shale, greenish-gray	5,970-5,975	Shale, grayish-black
5,140-5,148	Shale, medium-gray	5,975-6,020	Shale, medium-gray
5,148-5,157	Sandstone, very light-gray, fine-grained; coal fragments		Des Moines Series
5,157-5,173	Sandstone, medium light-gray to yellowish-brown, very fine- to fine-grained	6,020-6,025	Marmaton Group
5,173-5,178	Shale, olive-gray	6,025-6,030	Limestone, brownish-gray to medium-gray, fine-crystalline
5,178-5,185	Sandstone, yellowish-brown, very fine- to fine-grained		Limestone, pale yellowish-brown, fine-crystalline, soft
5,185-5,190	Sandstone, medium light-gray, very fine- to fine-grained, micaceous		

7,110-7,118	Limestone as above	7,517-7,520	Limestone, yellowish-brown to brownish-gray, very silty
7,118-7,135	Limestone, medium dark-brownish-gray, fine-crystalline, silty, siliceous; brownish-gray dense chert	7,520-7,526	Limestone as above; medium-gray dense chert
7,135-7,145	Limestone, medium dark-gray, very fine-crystalline, very silty	7,526-7,540	Limestone, medium-gray, very silty
7,145-7,155	Limestone, medium dark-brownish-gray, very fine-crystalline, very silty	7,540-7,545	Limestone, medium-gray, fine- to medium-crystalline; brachiopods?
7,155-7,165	Limestone, medium dark-brownish-gray, dense, very silty; dark-gray dense chert	7,545-7,550	Limestone, very light- to medium light-gray, very fine- to fine-crystalline
7,165-7,180	Limestone, medium dark- to dark-gray, dense to very fine-crystalline, very argillaceous	7,550-7,555	Limestone, very pale-orange, fine-crystalline, soft
7,180-7,185	Limestone, grayish-brown, very fine-crystalline, very argillaceous	Simpson Group	
7,185-7,195	Limestone as above; medium- to dark-gray dense chert	Bromide Formation 7,555-7,875 feet	
7,195-7,205	Limestone, medium dark- to dark-gray, very fine- to fine-crystalline, very argillaceous, silty	7,555-7,575	Limestone, pale yellowish-brown, dense
7,205-7,225	Limestone as above; medium- to dark-gray dense chert	7,575-7,585	Limestone, very light-gray to very pale-orange, very fine-crystalline, soft
7,225-7,230	Limestone, medium dark-brownish-gray, very fine-crystalline, very argillaceous, silty; chert as above	7,585-7,590	Dolomite, very light-gray, fine-crystalline
7,230-7,245	Limestone, medium dark-gray, fine-crystalline, very argillaceous, silty	7,590-7,596	Limestone, medium-gray, dense
7,245-7,255	Siltstone, medium dark-gray, calcareous; much glauconite 7,250-7,255 feet	7,596-7,600	Limestone, brownish-gray, dense to very fine-crystalline, slightly argillaceous
7,255-7,275	Limestone, medium dark- to dark-gray, fine-crystalline, very silty, argillaceous; medium dark-gray dense chert	7,600-7,614	Limestone, grayish-brown, fine-crystalline, argillaceous
7,275-7,290	Limestone, brownish-gray, fine-crystalline, very silty; little glauconite at base	7,614-7,620	Dolomite, very light-gray, fine-crystalline; caving?
7,290-7,300	Siltstone, dark-gray, slightly calcareous, hard	7,620-7,630	Limestone, very pale-orange, fine-crystalline; grayish-white dense chert
Rocks of Kinderhookian? Age		7,630-7,645	Limestone, brownish-gray, fine-crystalline, argillaceous; medium light-gray dull chert
7,300-7,330	Shale, dark-gray to grayish-black, silty, hard	7,645-7,650	Limestone as above; with trace of medium light-gray rough spicular chert
7,330-7,340	Siltstone, dark-gray, slightly calcareous	7,650-7,660	Limestone, medium dark-brownish-gray, fine-crystalline, argillaceous
7,340-7,343	Shale, grayish-black	7,660-7,665	Limestone, pale yellowish-brown, fine-crystalline
7,343-7,356	Shale, medium-gray	7,665-7,670	Limestone, grayish-brown, very fine-crystalline
7,356-7,360	Limestone, pale yellowish-brown to light olive-gray, fine-crystalline	7,670-7,680	Limestone, brownish-gray, fine-crystalline, argillaceous
7,360-7,365	Limestone, brownish-gray, fine-crystalline, argillaceous	7,680-7,685	Limestone, pale yellowish-brown, dense to very fine-crystalline; very light-gray dense chert
7,365-7,380	Limestone, medium dark-gray, very fine-crystalline, very argillaceous	7,685-7,696	Limestone as above; medium dark-gray dense chert
7,380-7,400	Limestone, greenish-gray, very fine-crystalline, argillaceous	7,696-7,700	Limestone, brownish-gray, fine-crystalline, argillaceous
7,400-7,404	Shale, greenish-gray, slightly calcareous	7,700-7,705	Limestone as above; medium-gray to yellowish-brown mottled chert
Devonian and Mississippian Systems		7,705-7,710	Dolomite, medium light-gray, fine- to medium-crystalline, argillaceous; vugs
Woodford Shale 7,404-7,460 feet		7,710-7,716	Limestone, very pale-orange, medium- to coarse-crystalline, fine- to medium-sandy
7,404-7,425	Shale, medium-gray to grayish-black	7,716-7,720	Limestone, very pale-orange, medium- to coarse-crystalline
7,425-7,430	Shale, brownish-black	7,720-7,725	Limestone, medium-gray, fine-crystalline, argillaceous, dolomitic
7,430-7,440	Shale, grayish-black	7,725-7,734	Limestone, light- to medium dark-gray mottled, medium-crystalline, slightly argillaceous
7,440-7,445	Shale, grayish-black, silty; pyrite	7,734-7,745	Sandstone, very light-gray, fine- to medium-grained, slightly dolomitic; slight oil stain?
7,445-7,456	Shale, grayish-black	7,745-7,755	Sandstone, medium light-gray, very fine- to fine-grained, slightly dolomitic; slight oil stain?
7,456-7,460	Shale, dark-gray; scattered fine-sand grains	7,755-7,760	Sandstone, light-gray, fine-grained, slightly dolomitic
Misener sand of the Woodford Shale 7,460-7,464 feet		7,760-7,775	Sandstone, very light-gray, fine- to medium-grained, subrounded
7,460-7,464	Sandstone, very light- to medium light-gray, fine- to medium-grained, pyrite; tight	7,775-7,780	Sandstone, very light-gray, medium-grained, subrounded
Ordovician System		7,780-7,795	Limestone, pale yellowish-brown, light olive-gray, and grayish-brown, dense
Sylvan Shale 7,464-7,500 feet		7,795-7,806	Limestone, pale yellowish-brown, dense
7,464-7,470	Shale, medium-gray	7,806-7,810	Limestone, medium dark- to dark-gray, very fine-crystalline, very argillaceous; caving?
7,470-7,473	Shale, grayish-black	7,810-7,835	Sandstone, grayish-white, fine- to medium-grained, subangular to subrounded
7,473-7,500	Shale, medium-gray	7,835-7,840	Sandstone as above; friable
Viola Limestone 7,500-7,555 feet		7,840-7,855	Sandstone, grayish-white, medium-grained
7,500-7,510	Limestone, very light-gray to pale yellowish-brown, medium- to coarse-crystalline; dark-gray spots	7,855-7,875	Sandstone, white, fine- to medium-grained, subangular
7,510-7,514	Limestone, light olive-gray, fine- to medium-crystalline, argillaceous	7,875	Total depth
7,514-7,517	Limestone, medium light-gray, fine-crystalline, soft; yellowish-brown dense chert		

LOG 6

MAJOR COUNTY, OKLAHOMA

NE¼ NE¼ NW¼ sec. 27, T. 22 N., R. 10 W.

Operator: Superior Oil Co.
 Lease: Manning No. 41-27
 Elevation: DF 1,276 feet
 Total depth: 8,279 feet
 Completion date: 1945
 Initial production: 150 BOPD

Electrical log: 30 to 2,053 feet;
 2,322 feet to total depth
 Sample intervals:

25-foot
 1,175 to 1,800 feet
 2,100 to 2,350 feet
 10-foot
 20 to 1,175 feet
 2,350 to 6,450 feet
 5-foot
 6,450 to 8,036 feet
 8,040 to total depth
 1-foot
 8,036 to 8,040 feet

0- 20	No samples	800- 802	Limestone, medium light-gray, fine-crystalline
		802- 805	Shale, medium-gray
	Permian System	805- 818	Shale, moderate reddish-brown
	Hennessey Shale and Garber Sandstone 20-1,215 feet	818- 820	Dolomite, moderate reddish-brown, argillaceous; mottled with olive gray
20- 40	Siltstone, pale to moderate reddish-brown, calcareous to slightly calcareous; moderate reddish-brown shale	820- 825	Shale, medium light-gray
40- 60	Siltstone, pale to moderate reddish-brown, very finely sandy	825- 847	Shale, moderate reddish-brown
60-110	Siltstone, moderate reddish-brown	847- 850	Siltstone, medium light-gray
110-120	Siltstone, moderate reddish-brown, very finely sandy	850- 863	Sandstone, moderate reddish-brown, very fine-grained, silty
120-130	Siltstone, moderate reddish-brown	863- 924	Shale, moderate reddish-brown
130-156	Sandstone, light-gray to pale reddish-brown, very fine-grained, silty, calcareous	924- 930	Siltstone, moderate reddish-brown, very finely sandy
156-170	Shale, moderate reddish-brown, medium light-gray spots	930- 984	Shale, moderate reddish-brown
170-190	Siltstone, pale reddish-brown, slightly calcareous	984- 980	Shale, greenish-gray
190-200	Siltstone, pale reddish-brown, very finely sandy, calcareous	990-1,005	Shale, moderate reddish-brown
200-295	Shale, moderate reddish-brown	1,005-1,010	Siltstone, pale reddish-brown, very finely sandy
295-305	Siltstone, pale reddish-brown	1,010-1,013	Shale, moderate reddish-brown
305-310	Shale, moderate reddish-brown	1,013-1,021	Sandstone, pale reddish-brown, very fine-grained, silty
310-320	Shale, greenish-gray	1,021-1,038	Shale, moderate reddish-brown
320-380	Shale, moderate reddish-brown	1,038-1,040	Dolomite, medium-gray, very silty
380-385	Siltstone, pale reddish-brown, gypsiferous	1,040-1,045	Shale, medium-gray
385-416	Shale, moderate reddish-brown	1,045-1,059	Shale, moderate reddish-brown
416-420	Anhydrite, light-gray, fine-crystalline; gypsum	1,059-1,063	Sandstone, moderate reddish-brown, very fine-grained, silty
420-425	Shale, moderate reddish-brown	1,063-1,120	Shale, moderate reddish-brown
425-430	Siltstone, medium light-gray	1,120-1,125	Shale, olive-gray
430-433	Shale, medium-gray	1,125-1,130	Siltstone, olive-gray, dolomitic
433-450	Shale, moderate reddish-brown	1,130-1,160	Shale, moderate reddish-brown
450-460	Siltstone, pale to moderate reddish-brown	1,160-1,175	Siltstone, pale reddish-brown
460-470	Shale, moderate reddish-brown	1,175-1,200	Shale, moderate reddish-brown
470-485	Shale, moderate reddish-brown; greenish-gray spots	1,200-1,205	Sandstone, light-gray, very fine-grained, silty
485-488	Anhydrite, grayish-white to pale-red, fine-crystalline	1,205-1,210	Shale, medium-gray
488-510	Shale, moderate reddish-brown	1,210-1,215	Sandstone, light-gray, very fine-grained, silty
510-520	Siltstone, pale reddish-brown		
520-535	Shale, moderate reddish-brown		Wellington Formation 1,215-2,387 feet
535-540	Siltstone, pale reddish-brown		
540-545	Shale, medium-gray, slightly calcareous, silty	1,215-1,220	Shale, medium-gray
545-560	Siltstone, medium light-gray, very finely sandy, calcareous	1,220-1,230	Shale, moderate reddish-brown
560-570	Siltstone, pale-red, slightly calcareous	1,230-1,240	Shale, medium-gray
570-572	Anhydrite, grayish-white, fine-crystalline	1,240-1,250	Shale, moderate reddish-brown
572-580	Shale, moderate reddish-brown	1,250-1,276	Shale, medium-gray
580-590	Siltstone, pale reddish-brown	1,276-1,280	Dolomite, light olive-gray, fine-crystalline
590-596	Shale, moderate reddish-brown	1,280-1,290	Shale, medium-gray
596-600	Siltstone, medium-gray, calcareous	1,290-1,300	Shale, olive-gray
600-607	Siltstone, medium light-gray, very finely sandy, slightly calcareous	1,300-1,310	Shale, medium-gray
607-610	Anhydrite, medium light-gray, fine-crystalline; salt	1,310-1,320	Shale, greenish-gray
610-640	Shale, moderate reddish-brown	1,320-1,337	Shale, medium-gray
640-642	Anhydrite, medium light-gray, fine-crystalline	1,337-1,340	Dolomite, medium light-gray, very silty
642-670	Shale, moderate reddish-brown	1,340-1,360	Shale, medium-gray
670-675	Shale, medium light-gray, silty	1,360-1,370	Shale, greenish-gray
675-695	Shale, moderate reddish-brown	1,370-1,385	Shale, medium-gray
695-700	Shale, medium light-gray, silty	1,385-1,390	Shale, brownish-gray
700-740	Shale, moderate reddish-brown	1,390-1,402	Shale, medium-gray
740-745	Shale, medium-gray	1,402-1,404	Anhydrite, light-gray, fine-crystalline; caving?
745-775	Shale, moderate reddish-brown	1,404-1,420	Shale, medium-gray
775-780	Shale, medium-gray	1,420-1,430	Shale, greenish-gray
780-800	Shale, moderate reddish-brown	1,430-1,458	Shale, medium-gray
		1,458-1,460	Dolomite, medium-gray, silty

1,460-1,480	Shale, medium-gray	2,610-2,615	Shale, medium-gray
1,480-1,490	Shale, greenish-gray	2,615-2,618	Limestone, medium- to dark-gray mottled, fine-crystalline, very argillaceous; crinoids; fusulinids
1,490-1,498	Shale, medium-gray		
1,498-1,500	Dolomite, medium light-gray, silty	2,618-2,620	Shale, medium-gray
1,500-1,510	Shale, medium-gray	2,620-2,628	Limestone, pale yellowish-brown, fine-crystalline, slightly argillaceous; little dark-gray mottled limestone
1,510-1,520	Shale, greenish-gray		
1,520-1,536	Shale, medium-gray	2,628-2,630	Shale, medium-gray
1,536-1,540	Anhydrite, light- to medium-gray, fine-crystalline	2,630-2,650	Limestone, medium light-gray, fine-granular, slightly argillaceous; fusulinids 2,630-2,640 feet
1,540-1,560	Shale, medium-gray		
1,560-1,567	Anhydrite, light- to medium-gray, fine-crystalline	2,650-2,660	Limestone, light-gray, fine-crystalline, slightly argillaceous
1,567-1,583	Shale, medium-gray		
1,583-1,616	Anhydrite, light- to medium-gray, fine-crystalline	2,660-2,670	Limestone, pale yellowish-brown to very pale-orange, fine-granular; medium light-gray dense and granular chert
1,616-1,618	Shale, medium-gray		
1,618-1,634	Anhydrite, light- to medium-gray, fine-crystalline	2,670-2,680	Limestone, very light-gray to very pale-orange, fine-crystalline
1,634-1,640	Shale, medium-gray		
1,640-1,690	Anhydrite, light- to medium light-gray, fine-crystalline; salt	2,680-2,687	Limestone, light-gray, very fine-crystalline, slightly argillaceous; mottled with dark-gray
1,690-1,695	Shale, medium-gray		
1,695-1,800	Anhydrite, light- to medium light-gray, fine-crystalline; salt	2,687-2,690	Shale, dark greenish-gray
1,800-2,100	No samples	2,690-2,697	Shale, moderate-brown and pale reddish-brown
2,100-2,235	Anhydrite, very light- to medium-gray, fine-crystalline; salt	2,697-2,702	Limestone, pale yellowish-brown, very fine-crystalline; little moderate reddish-orange fine-crystalline limestone
2,235-2,237	Shale, medium-gray		
2,237-2,240	Dolomite, medium dark-gray, fine-crystalline, argillaceous	2,702-2,706	Shale, medium-gray
2,240-2,257	Anhydrite, very light- to medium-gray, fine-crystalline	2,706-2,713	Limestone, pale yellowish-brown, very fine-crystalline
2,257-2,260	Shale, medium-gray	2,713-2,719	Shale, medium-gray
2,260-2,264	Dolomite, light olive-gray, fine-crystalline, argillaceous; mottled with dark gray	2,719-2,724	Limestone, light-gray, fine-crystalline, slightly argillaceous; mottled with dark-gray; fusulinids
2,264-2,290	Anhydrite, very light- to medium-gray, fine-crystalline	2,724-2,730	Shale, medium-gray
2,290-2,293	Dolomite, medium-gray, fine-crystalline, argillaceous; dark-gray spots	2,730-2,735	Limestone, light-gray, fine-crystalline, slightly argillaceous; mottled with dark-gray; fusulinids
2,293-2,317	Anhydrite, very light- to medium-gray, fine-crystalline	2,735-2,738	Shale, medium-gray
2,317-2,320	Dolomite, medium light- to medium-gray, fine-crystalline, argillaceous	2,738-2,743	Shale, greenish-gray
2,320-2,323	Shale, medium-gray	2,743-2,746	Shale, grayish-red
2,323-2,340	Anhydrite, very light- to medium-gray, fine-crystalline	2,476-2,755	Sandstone, light-gray to medium-gray, very fine-grained, silty; calcareous in part
2,340-2,343	Shale, medium-gray	2,755-2,762	Sandstone, light greenish-gray, very fine-grained, silty
2,343-2,346	Dolomite, pale yellowish-brown, fine-crystalline, argillaceous		Wreford Limestone 2,762-2,807 feet
2,346-2,351	Shale, medium-gray		
2,351-2,360	Anhydrite, very light- to medium-gray, fine-crystalline	2,762-2,782	Shale, medium-gray
2,360-2,366	Shale, medium-gray	2,782-2,788	Limestone, light-gray to very pale-orange, fine-crystalline; crinoids
2,366-2,370	Shale, black		
2,370-2,373	Shale, medium-gray	2,788-2,793	Shale, medium-gray
2,373-2,383	Anhydrite, very light- to medium-gray, fine-crystalline	2,793-2,798	Shale, greenish-gray
2,383-2,387	Shale, medium-gray	2,798-2,800	Limestone, medium-gray, fine-crystalline, argillaceous
		2,800-2,807	Limestone, medium light-gray, fine-crystalline, argillaceous; light- to medium-gray dense to granular spicular chert
	Chase Group		
	Nolans Limestone 2,387-2,442 feet		
2,387-2,395	Dolomite, medium light- to medium-gray, fine-crystalline, argillaceous; grayish-white milky dense chert; little dark-gray chert		Council Grove Group
2,395-2,400	Shale, medium-gray	2,807-2,810	Shale, medium-gray
2,400-2,403	Dolomite, medium-gray, very argillaceous	2,810-2,818	Shale, moderate reddish-brown to grayish-red
2,403-2,430	Shale, medium dark-gray, very calcareous, marly	2,818-2,824	Sandstone, pale-red to light greenish-gray, very fine-grained, silty, calcareous
2,430-2,442	Limestone, medium-gray, fine-crystalline, very argillaceous; bryozoans?	2,824-2,828	Sandstone, light-gray, very fine-grained, calcareous, silty
2,442-2,458	Shale, medium-gray	2,828-2,837	Shale, grayish-red
		2,837-2,842	Shale, greenish-gray
		2,842-2,850	Shale, grayish-red
		2,850-2,854	Shale, moderate reddish-brown
	Winfield Limestone 2,458-2,511? feet	2,854-2,862	Sandstone, moderate reddish-orange, fine-grained, calcareous
2,458-2,462	Limestone, pale yellowish-brown to medium light-gray, fine-crystalline, argillaceous		Top of Funston Limestone 2,862 feet
2,462-2,466	Shale, medium-gray	2,862-2,867	Limestone, light- to medium light-gray, fine-crystalline
2,466-2,472	Limestone, medium- to medium dark-gray, very argillaceous; crinoids; brachiopods	2,867-2,874	Shale, medium-gray
2,472-2,475	Shale, medium-gray	2,874-2,877	Limestone, light- to medium light-gray, fine-crystalline
2,475-2,477	Shale, dark greenish-gray	2,877-2,880	Shale, black
2,477-2,490	Shale, medium-gray; ostracods	2,880-2,884	Shale, medium-gray
2,490-2,590	No samples From electrical log:	2,884-2,890	Limestone, pale yellowish-brown to medium-gray, dense to very fine-crystalline
	2,490-2,495 Shale		
	2,495-2,511 Limestone	2,890-2,893	Shale, medium-gray
		2,892-2,895	Limestone, brownish-gray, fine-crystalline, argillaceous
	2,511-2,520 Shale		Base of Crouse Limestone 2,895-2,913 feet
	2,520-2,528 Limestone		
	2,528-2,535 Shale		
	2,535-2,537 Limestone	2,895-2,900	Shale, medium-gray
	2,537-2,542 Shale	2,900-2,905	Shale, greenish-gray
		2,905-2,913	Shale, medium-gray
	Barneston Limestone 2,542?-2,687 feet		Bader Limestone, Stearns Shale, and Beattie Limestone, undifferentiated, 2,913-2,972 feet
	2,542?-2,558 Limestone		
	2,558-2,568 Shale		
	2,568-2,578 Limestone	2,913-2,920	Limestone, pale yellowish-brown, fine-crystalline
	2,578-2,582 Shale	2,920-2,926	Shale, medium-gray
	2,582-2,590 Limestone	2,926-2,930	Limestone, pale yellowish-brown, very fine-crystalline
		2,930-2,936	Limestone, medium-gray, fine-crystalline, argillaceous
2,590-2,593	Limestone, medium light-gray, fine-crystalline, argillaceous	2,936-2,947	Shale, medium-gray
2,593-2,606	Shale, medium-gray	2,497-2,950	Limestone, very pale-orange, fine-crystalline
2,606-2,610	Limestone, medium- to dark-gray mottled, fine-crystalline, very argillaceous; crinoids; fusulinids	2,950-2,956	Limestone, medium light-gray, fine-granular, slightly argillaceous
		2,956-2,960	Shale, olive-gray

3,996-4,014	Shale, medium-gray	4,860-4,870	Shale, medium-gray
4,014-4,020	Sandstone, light-gray, fine-grained, porous	4,870-4,877	Siltstone, light olive-gray, very finely sandy
4,020-4,028	Sandstone, very light-gray, very fine- to fine-grained, calcareous	4,877-4,900	Shale, medium-gray
		4,900-4,905	Shale, black
4,028-4,040	Shale, medium-gray	4,905-4,910	Shale, medium-gray
4,040-4,378	No samples From electrical log:	4,910-4,915	Shale, greenish-gray
	4,040-4,075 Shale	4,915-4,920	Shale, medium-gray
	4,075-4,090 Limestone		
	4,090-4,121 Shale		Oread Limestone Member of Vamoosa Formation 4,920-5,068 feet
	4,121-4,123 Limestone		
	4,123-4,153 Shale	4,920-4,925	Limestone, brownish-gray, fine-crystalline, very finely sandy, silty; crinoids
	4,153-4,197 Limestone	4,925-4,938	Limestone, pale yellowish-brown, very finely sandy, silty; mottled with dark gray; crinoids; brachiopods?
	4,197-4,254 Shale	4,938-4,946	Shale, medium-gray
	4,254-4,262 Limestone	4,946-4,955	Sandstone, light- to medium light-gray, fine-grained, dolomitic
	4,262-4,280 Shale		
	Shawnee Group Equivalent	4,955-4,964	Sandstone, very light-gray, fine-grained, calcareous
	Topeka Limestone 4,280?-4,308? feet	4,964-4,976	Shale, medium-gray
		4,976-4,987	Limestone, pale yellowish-brown, very fine- to fine-crystalline; trace yellowish-brown dense chert
	4,280?-4,295 Limestone	4,987-4,990	Limestone, brownish-gray, fine-granular, very finely sandy, argillaceous
	4,295-4,305 Shale		
	4,305-4,308 Limestone	4,990-5,012	Shale, medium-gray
		5,012-5,026	Limestone, pale yellowish-brown, fine-crystalline
	4,308-4,318 Shale	5,026-5,030	Limestone as above; few medium oolites
	4,318-4,328 Sandstone	5,030-5,040	Limestone, pale yellowish-brown, fine-crystalline
	4,328-4,338 Shale	5,040-5,050	Limestone, medium-gray, fine-crystalline, argillaceous
	4,338-4,348 Sandstone	5,050-5,062	Limestone, medium-gray, fine-granular, very silty
	4,348-4,350 Shale	5,062-5,068	Sandstone, light- to medium light-gray, very fine-grained, silty; calcareous in part
	4,350-4,365 Sandstone		
	4,365-4,378 Shale		
4,378-4,381	Sandstone, light-gray, very fine-grained, silty, calcareous		
4,381-4,399	Shale, medium-gray		Douglas Group Equivalent
4,399-4,405	Sandstone, light-gray, very fine-grained, silty	5,068-5,094	Shale, medium-gray
4,405-4,412	Shale, medium-gray	5,094-5,097	Shale, black
4,412-4,420	Sandstone, very light-gray to yellowish-brown, very fine- to fine-grained	5,097-5,132	Shale, medium-gray
4,420-4,427	Shale, medium-gray	5,132-5,140	Sandstone, brownish-gray to light greenish-gray, very fine-grained, silty, slightly calcareous
4,427-4,435	Sandstone, pale yellowish-brown, very fine- to fine-grained, slightly dolomitic	5,140-5,148	Sandstone, very light- to light-gray, fine-grained, slightly dolomitic; few medium grains
4,435-4,440	Shale, medium-gray	5,148-5,155	Limestone, medium-gray, fine-crystalline; slightly brownish tint
4,440-4,445	Shale, black	5,155-5,160	Limestone, pale yellowish-brown, very fine- to fine-crystalline
4,445-4,450	Shale, medium-gray	5,160-5,165	Limestone, brownish-gray, fine-crystalline, argillaceous
4,450-4,465	Shale, medium-gray, silty	5,165-5,177	Limestone, medium- to medium dark-gray, very silty; crinoids
4,465-4,480	Shale, medium-gray		
4,480-4,487	Shale, medium dark-gray, silty	5,177-5,190	Shale, medium-gray
4,487-4,540	Shale, medium-gray	5,190-5,205	Shale, medium-gray to black
4,540-4,558	Shale, medium light- to medium-gray, soft, fissile	5,205-5,230	Shale, medium-gray
4,558-4,562	Siltstone, greenish-gray		
4,562-4,570	Shale, black		
4,570-4,588	Shale, medium-gray		
4,588-4,600	Siltstone, medium-gray, calcareous		
4,600-4,604	Shale, medium-gray		Missouri Series
4,604-4,610	Limestone, medium-gray to grayish-brown, very fine-crystalline, argillaceous		Ochelata Group
			Lansing Group Equivalent
4,610-4,630	Shale, medium-gray		
4,630-4,637	Shale, medium dark-gray, silty	5,230-5,240	Shale, greenish-gray to moderate-brown, silty
4,637-4,647	Siltstone, medium light-gray, very finely sandy, calcareous	5,240-5,245	Shale, medium-gray
4,647-4,650	Limestone, light-gray, very finely sandy	5,245-5,250	Siltstone, light greenish-gray, very finely sandy
4,650-4,655	Shale, medium-gray	5,250-5,260	Siltstone, olive-gray to greenish-gray
4,655-4,663	Sandstone, light-gray, very fine-grained, slightly calcareous	5,260-5,274	Shale, medium-gray
		5,274-5,290	Sandstone, pale-red to very light-gray, fine-grained
4,663-4,673	Shale, medium-gray	5,290-5,298	Shale, medium-gray
4,673-4,678	Shale, black	5,298-5,306	Sandstone, very light-gray, very fine-grained, silty
4,678-4,686	Shale, medium-gray	5,306-5,312	Shale, medium-gray
4,686-4,690	Limestone, medium dark-gray, very silty	5,312-5,318	Sandstone, very light-gray, fine-grained
4,690-4,695	Shale, medium-gray	5,318-5,320	Sandstone, light- to medium light-gray, very fine-grained, silty, micaceous
4,695-4,700	Shale, black		
4,700-4,710	Shale, medium-gray to black	5,320-5,328	Sandstone, light-gray, fine-grained
4,710-4,713	Limestone, dark-gray, dense to very fine-crystalline, argillaceous	5,328-5,338	Sandstone, very light-gray, fine-grained, slightly dolomitic; carbonaceous fragments
4,713-4,717	Shale, medium-gray	5,338-5,350	Sandstone, very light-gray, fine-grained
4,717-4,720	Shale, black	5,350-5,360	Sandstone, light-gray, fine-grained
4,720-4,730	Shale, medium-gray	5,360-5,370	Shale, medium-gray
4,730-4,734	Limestone, medium dark-gray, very silty; pyrite; crinoids; fusulinids (small)	5,370-5,380	Shale, black
		5,380-5,385	Shale, medium-gray
4,734-4,742	Shale, medium-gray	5,385-5,390	Sandstone, medium-gray, fine-grained; oil stain?
4,742-4,746	Sandstone, light-gray, very fine-grained, calcareous; good oil stain (from drilling?)	5,390-5,395	Sandstone, very light-gray to pale reddish-orange, fine-grained, very calcareous
4,746-4,750	Shale, medium-gray		
4,750-4,755	Shale, black		
4,755-4,776	Shale, medium-gray		Kansas City Group Equivalent
4,776-4,784	Shale, grayish-red	5,395-5,410	Shale, medium-gray
4,784-4,794	Siltstone, light greenish-gray to light olive-gray, very finely sandy	5,410-5,430	Siltstone, medium light- to medium-gray, very finely sandy, micaceous
4,794-4,797	Shale, medium-gray	5,430-5,455	Siltstone, light-gray, very finely sandy
4,797-4,814	Sandstone, very light-gray to very pale-orange, fine-grained, porous	5,455-5,470	Shale, medium-gray
4,814-4,825	Shale, medium-gray	5,470-5,475	Shale, black
4,825-4,840	Sandstone, very light-gray, fine-grained, porous; slightly dolomitic in part	5,475-5,555	Shale, medium-gray
		5,555-5,560	Shale, black
4,840-4,846	Sandstone, light-gray to yellowish-brown, fine-grained, slightly dolomitic, porous	5,560-5,565	Shale, medium-gray
		5,565-5,575	Shale, olive-gray, silty
4,846-4,850	Shale, medium-gray	5,575-5,615	Shale, medium light- to medium-gray, silty
4,850-4,860	Shale, grayish-red; caving?	5,615-5,620	Shale, black
		5,620-5,668	Shale, medium-gray

Skiatook Group		6,360-6,373		Limestone, brownish-gray to pale yellowish-brown, very fine-crystalline; yellowish-brown to medium light-gray dense chert; fusulinid	
Drum Limestone 5,668-5,673 feet		6,373-6,377		Limestone, light-gray, fine-crystalline	
5,668-5,673	Limestone, medium dark-gray, very fine- to fine-crystalline, argillaceous; crinoids	6,377-6,380	Shale, medium-gray	6,380-6,390	Shale, black
5,673-5,680	Shale, medium-gray	6,390-6,394	Shale, medium-gray	6,394-6,397	Limestone, pale yellowish-brown, very fine-crystalline
5,680-5,685	Shale, black	6,397-6,400	Limestone, brownish-gray, very fine-crystalline	6,400-6,409	Limestone, medium- to medium dark-gray, fine-crystalline, argillaceous
5,685-5,705	Shale, medium-gray	6,409-6,417	Shale, medium-gray	6,417-6,420	Limestone, brownish-gray, very fine-crystalline
5,705-5,714	Siltstone, medium light- to medium-gray	6,420-6,422	Shale, medium-gray	6,422-6,428	Limestone, brownish-gray, dense to very fine-crystalline; brownish-gray dense chert
5,714-5,726	Shale, medium-gray	6,428-6,435	Limestone, medium dark-brownish-gray, very fine-crystalline	6,435-6,440	Shale, black
5,726-5,730	Siltstone, medium light- to medium-gray	6,440-6,455	Shale, medium- to dark-gray, silty	6,455-6,460	Shale, dark greenish-gray
5,730-5,735	Sandstone, very light-gray, very fine- to fine-grained, calcareous	6,460-6,470	Limestone, medium dark- to dark-gray, fine-crystalline, argillaceous	6,470-6,472	Limestone, medium dark-brownish-gray, very fine-crystalline
5,735-5,755	Sandstone, very light-gray, very fine- to fine-grained, slightly dolomitic	6,472-6,478	Shale, black; coal stringers	6,478-6,483	Limestone, dark-gray, silty
5,755-5,790	Sandstone, very light-gray, very fine-grained	Cabaniss and Krebs Groups			
5,790-5,800	Sandstone, light- to medium light-gray, fine-grained, porous; oil stain?	6,483-6,490	Shale, medium-gray	6,490-6,495	Shale, black
5,800-5,817	Sandstone, very light-gray, fine-grained, calcareous in part	6,495-6,505	Shale, medium-gray	6,505-6,510	Shale, black
5,817-5,820	Limestone, brownish-gray, very fine-crystalline	6,510-6,520	Shale, medium-gray	6,520-6,525	Shale, black
5,820-5,843	Shale, medium-gray	6,525-6,527	Limestone, dark-gray, fine-crystalline, silty	6,527-6,530	Shale, medium-gray
5,843-5,850	Shale, black	6,530-6,533	Limestone, brownish-gray, fine-crystalline	6,533-6,538	Shale, medium-gray
5,850-5,865	Shale, medium-gray	6,538-6,542	Limestone, grayish-brown, fine-crystalline, argillaceous; fossils (brachiopods?)	6,542-6,544	Shale, medium-gray
5,865-5,870	Shale, black	6,544-6,547	Shale, black	6,547-6,552	Shale, medium-gray
5,870-5,905	Shale, medium-gray	6,552-6,557	Limestone, brownish-gray, very fine-crystalline	6,557-6,560	Shale, medium-gray
5,905-5,915	Shale, black	6,560-6,567	Limestone, pale yellowish-brown and light olive-gray, fine-crystalline, slightly argillaceous	6,567-6,580	Shale, medium-gray
5,915-5,920	Shale, medium-gray	6,580-6,593	Siltstone, olive-gray to dark-gray	6,593-6,596	Shale, black
Hogshooter Limestone 5,920-5,928 feet		6,596-6,615	Shale, medium-gray; coal stringers 6,605-6,607 feet	6,615-6,625	Shale, black
5,920-5,928	Limestone, dark-gray, very fine-crystalline, argillaceous	6,625-6,634	Shale, medium-gray	6,634-6,640	Limestone, pale yellowish-brown to light olive-gray, fine-crystalline, slightly argillaceous
5,928-5,940	Siltstone, medium- to dark-gray, slightly calcareous	6,640-6,643	Limestone, medium dark-gray to brownish-gray, fine-crystalline; pinhole porosity	6,643-6,647	Shale, medium-gray
5,940-5,980	Shale, medium-gray	6,647-6,650	Shale, black	6,650-6,657	Shale, greenish-gray
5,980-5,985	Shale, black	6,657-6,660	Shale, black	6,660-6,673	Shale, olive-gray to greenish-gray
5,985-5,995	Shale, medium-gray	6,673-6,675	Limestone, greenish-gray, argillaceous	6,675-6,680	Siltstone, greenish-gray
5,995-6,000	Shale, black	6,680-6,688	Shale, grayish-red	6,688-6,695	Siltstone, greenish-gray
6,000-6,010	Shale, medium-gray	Mississippian System			
6,010-6,020	Shale, black	Rocks of Chesterian Age			
6,020-6,050	Shale, medium-gray; brachiopods 6,030-6,035 feet	6,695-6,700	Shale, medium-gray	6,700-6,710	Limestone, pale yellowish-brown, very fine-crystalline; trace glauconite
6,050-6,053	Limestone, medium dark-gray, fine-crystalline, argillaceous; crinoids; brachiopods	6,710-6,713	Limestone, very light-gray to light greenish-gray, silty	6,713-6,720	Siltstone, pale yellowish-brown
6,053-6,060	Limestone, brownish-gray, very fine-crystalline; spines	6,720-6,723	Limestone, light olive-gray to brownish-gray, medium-oölitic; bryozoans	6,723-6,726	Siltstone, pale yellowish-brown
6,060-6,066	Limestone, pale yellowish-brown, very fine-crystalline, medium-oölitic; flattened oölitic; some light olive-gray oolitic limestone; glauconitic at base	6,726-6,728	Limestone, medium dark-gray, fine-crystalline; oölitic?	6,728-6,735	Shale, greenish-gray
Pleasanton Group Equivalent		6,735-6,800	Shale, medium-gray	6,800-6,805	Limestone, brownish-gray, medium oölitic
(Pleasanton Formation equivalent on Chart OC-61)		6,805-6,812	Limestone, pale yellowish-brown, fine-crystalline, slightly argillaceous	6,812-6,823	Shale, medium-gray
6,066-6,235 feet		6,823-6,827	Limestone, medium dark-gray, fine-crystalline; dark-gray medium oölitic; slightly argillaceous	6,827-6,833	Shale, medium-gray
6,066-6,076	Shale, medium-gray	6,833-6,840	Limestone, medium dark-gray, fine-crystalline, argillaceous; crinoids at base	6,840-6,850	Shale, medium-gray
6,076-6,084	Siltstone, light greenish-gray; brown spots	6,850-6,860	Shale, black		
6,084-6,100	Shale, medium-gray				
6,100-6,110	Shale, black				
6,110-6,160	Shale, medium-gray				
6,160-6,170	Shale, greenish-gray				
6,170-6,195	Shale, medium-gray				
6,195-6,200	Shale, black				
6,200-6,215	Shale, medium-gray				
6,215-6,220	Shale, black				
6,220-6,235	Shale, medium-gray				
Des Moines Series					
Marmaton Group					
6,235-6,240	Limestone, brownish-gray to medium-gray, fine-crystalline, argillaceous				
6,240-6,251	Limestone, brownish-gray, very fine-crystalline				
6,251-6,260	Shale, medium-gray				
6,260-6,265	Shale, black				
6,265-6,279	Shale, medium-gray				
6,279-6,282	Limestone, dark-gray, fine-crystalline, very argillaceous				
6,282-6,288	Shale, medium-gray				
6,288-6,290	Limestone, medium-gray to brownish-gray, very fine-crystalline				
6,290-6,300	Limestone, pale yellowish-brown, very fine- to fine-crystalline; little medium-oölitic limestone				
6,300-6,307	Limestone, very light-gray, fine-crystalline; very light-gray chert				
6,307-6,310	Shale, medium-gray				
6,310-6,314	Shale, black				
6,314-6,317	Shale, medium-gray				
6,317-6,320	Shale, greenish-gray				
6,320-6,328	Shale, medium-gray				
6,328-6,338	Limestone, dark-gray, very fine- to fine-crystalline, argillaceous				
6,338-6,346	Shale, medium-gray				
6,346-6,350	Limestone, brownish-gray, very fine- to fine-crystalline				
6,350-6,356	Limestone as above; trace medium dark-brownish-gray dense chert				
6,356-6,360	Limestone, medium dark-gray, very fine-crystalline; slightly brownish tint				

6,860-6,886	Shale, medium-gray
6,886-6,890	Limestone, brownish-gray, fine-crystalline; spines
6,890-6,895	Limestone, medium- to dark-gray, fine-crystalline, argillaceous
6,895-6,904	Limestone, medium- to dark-gray, very silty
6,904-6,916	Shale, medium-gray
6,916-6,922	Limestone, light- to medium-gray, very silty; calcareous siltstone
6,922-6,960	Shale, medium-gray
6,960-6,965	Shale, black
6,965-6,983	Shale, medium-gray

Rocks of Meramecian and Osagean Ages

6,983-6,990	Limestone, light-gray, silty
6,990-6,995	Limestone, very light-gray, fine-crystalline, soft
6,995-7,000	Limestone, pale yellowish-brown, medium-crystalline, faintly oolitic?; trace glauconite
7,000-7,005	Limestone, pale yellowish-brown to light-gray, very finely sandy, silty
7,005-7,010	Limestone, brownish-gray, granular, very silty
7,010-7,016	Siltstone, medium-gray, calcareous
7,016-7,020	Limestone, pale yellowish-brown, very fine-crystalline, very faintly oolitic?; light-gray dense chert
7,020-7,025	Limestone, very light-gray, fine-crystalline
7,025-7,035	Limestone, very pale-orange to pale yellowish-brown, fine-crystalline; very light-gray dense chert
7,035-7,040	Limestone, light-gray, silty
7,040-7,044	Siltstone, medium-gray, calcareous
7,044-7,053	Limestone, brownish-gray, silty; brownish-gray to medium-gray dense chert
7,053-7,057	Siltstone, dark-gray, calcareous, hard; resembles limestone
7,057-7,060	Limestone, brownish-gray, very argillaceous and silty
7,060-7,066	Limestone, dark brownish-gray to dark-gray, fine-crystalline, argillaceous; brownish-gray dense chert
7,066-7,080	Limestone, pale yellowish-brown, fine-crystalline; pale yellowish-brown calcareous spicular chert
7,080-7,086	Limestone as above; light-gray calcareous spicular chert
7,086-7,090	Limestone, medium dark-gray, fine-crystalline, very argillaceous
7,090-7,100	Limestone as above; medium dark-gray dense chert
7,100-7,105	Limestone, dark-gray, fine-crystalline, very argillaceous
7,105-7,115	Limestone, brownish-gray, fine-crystalline, very argillaceous
7,115-7,125	Limestone, medium dark- to dark-gray, fine-crystalline, very argillaceous
7,125-7,140	Limestone, medium dark-brownish-gray, fine-crystalline, very argillaceous
7,140-7,150	Limestone, medium dark- to dark-gray, fine-crystalline, very argillaceous
7,150-7,175	Limestone, dark-gray, fine-crystalline, very argillaceous and silty
7,175-7,180	Limestone, medium dark-gray, fine-crystalline, very argillaceous; medium dark-gray dense chert
7,180-7,185	Limestone as above
7,185-7,195	Limestone, medium dark-brownish-gray, fine-crystalline, very argillaceous
7,195-7,203	Limestone, medium dark-brownish-gray, fine-crystalline, very argillaceous; medium dark-gray dense chert
7,203-7,212	Siltstone, dark-gray, calcareous; looks like silty limestone
7,212-7,230	Limestone, medium dark-gray, fine-crystalline, very argillaceous
7,230-7,240	Limestone, medium dark-brownish-gray, fine-crystalline, very argillaceous
7,240-7,250	Limestone, medium dark- to dark-gray, fine-crystalline, very argillaceous; medium- to dark-gray dense chert
7,250-7,258	Limestone, brownish-gray, fine-crystalline, very argillaceous
7,258-7,270	Siltstone, dark-gray, calcareous; looks like limestone
7,270-7,285	Limestone, medium dark-gray, fine-crystalline, very argillaceous; medium dark-gray dense chert
7,285-7,290	Limestone, dark-gray, fine-crystalline, very argillaceous
7,290-7,294	Limestone, medium dark-brownish-gray, fine-crystalline, very argillaceous
7,294-7,310	Siltstone, medium dark-brownish-gray, calcareous; looks like limestone; medium dark-gray dense chert
7,310-7,326	Limestone, dark-gray, fine-crystalline, very argillaceous
7,326-7,335	Siltstone, medium dark-brownish-gray, calcareous; looks like limestone
7,335-7,344	Siltstone, dark-gray, calcareous
7,344-7,355	Limestone, medium dark-gray, fine-crystalline, very argillaceous
7,355-7,360	Siltstone, dark-gray, calcareous
7,360-7,365	Limestone, medium dark-gray, fine-crystalline, very argillaceous
7,365-7,370	Siltstone, dark-gray, calcareous; dark-gray dense chert
7,370-7,385	Limestone, dark-gray, fine-crystalline, very argillaceous
7,385-7,392	Limestone, medium dark-brownish-gray, fine-crystalline, very argillaceous
7,392-7,410	Siltstone, dark-gray, calcareous; looks like limestone
7,410-7,415	Limestone, medium dark-gray, very fine-crystalline, argillaceous

7,415-7,430	Limestone, medium dark-brownish-gray, dense to very fine-crystalline, slightly argillaceous
7,430-7,435	Limestone, medium dark-gray, dense to very fine-crystalline, argillaceous; medium- to dark-gray dense chert
7,435-7,476	Limestone as above
7,476-7,480	Siltstone, medium dark- to dark-gray, calcareous
7,480-7,485	Siltstone, medium-gray, calcareous; looks like limestone; medium- to medium dark-gray chert
7,485-7,490	Siltstone, dark-gray, calcareous
7,490-7,495	Limestone, medium dark-brownish-gray, fine-crystalline, argillaceous; medium- to dark-gray dense chert
7,495-7,500	Siltstone, medium dark-brownish-gray, calcareous
7,500-7,505	Siltstone, dark-gray, calcareous
7,505-7,510	Limestone, dark-gray, fine-crystalline, very argillaceous
7,510-7,525	Limestone as above; medium-gray chert
7,525-7,529	Limestone, medium dark-gray, fine-granular, very argillaceous
7,529-7,534	Siltstone, dark-gray, calcareous, very glauconitic
7,534-7,550	Limestone, brownish-gray to medium dark-gray, fine-crystalline, very argillaceous; medium dark-gray dense chert
7,550-7,564	Siltstone, medium-gray, slightly calcareous; medium- to dark-gray dense chert
7,564-7,566	Siltstone, dark-gray, slightly calcareous; pyrite; very glauconitic
7,566-7,572	Siltstone, dark-gray, slightly calcareous

Rocks of Kinderhookian(?) Age

7,572-7,576	Shale, black
7,576-7,587	Shale, medium dark-gray
7,587-7,590	Shale, black
7,590-7,605	Shale, medium-gray
7,605-7,609	Siltstone, pale yellowish-brown
7,609-7,620	Siltstone, medium dark-gray to medium dark-brownish-gray
7,620-7,627	Limestone, pale yellowish-brown to light greenish-gray, very fine-crystalline
7,627-7,632	Siltstone, greenish-gray, slightly calcareous to calcareous

Mississippian and Devonian Systems
Woodford Shale 7,632-7,686 feet

7,632-7,645	Shale, black, dull, chunky
7,645-7,655	Shale, grayish-black, silty; pyrite
7,655-7,665	Shale, brownish-black, dull, blocky
7,665-7,680	Shale, grayish-black; pyrite
7,680-7,683	Shale, medium dark-gray; conodont
7,683-7,686	Shale, grayish-black

Devonian and Silurian Systems
Hunton Group

7,686-7,702	Dolomite, pale yellowish-brown to very pale-orange, fine- to medium-crystalline, hard; very pale-orange to grayish-white dense chert and granular chert; oil stain at top; trace medium-crystalline dolomite with scattered sand grains; chert at base
7,702-7,706	Limestone, very light- to light-gray, fine-crystalline; grayish-white spicular chert and granular chert; glauconite

Ordovician System
Sylvan Shale 7,706-7,820 feet

7,706-7,725	Shale, greenish-gray and medium-gray
7,725-7,755	Shale, medium-gray; slightly greenish in part
7,755-7,770	Shale, medium dark-gray, dolomitic; very fine black pellets
7,770-7,806	Shale, medium- to medium dark-gray
7,806-7,820	Dolomite, medium- to medium dark-gray, fine-granular, very silty, argillaceous; medium-gray dense chert

Viola Limestone 7,820-7,890 feet

7,820-7,823	Limestone, very light-gray, fine-crystalline, soft
7,823-7,826	Limestone, very light-gray, medium-crystalline; grayish-white dense chert
7,826-7,830	Limestone, pale yellowish-brown, medium-crystalline
7,830-7,835	Limestone, brownish-gray, fine-crystalline, argillaceous
7,835-7,840	Limestone, brownish-gray, medium-crystalline; medium-gray dense chert
7,840-7,845	Limestone, medium dark-gray, fine-crystalline, argillaceous
7,845-7,850	Limestone, dark-gray, fine- to medium-crystalline, argillaceous; crinoids
7,850-7,862	Limestone, medium dark-gray to brownish-gray, medium- to coarse-crystalline, argillaceous; crinoids; mottled
7,862-7,870	Limestone, pale yellowish-brown, medium- to coarse-crystalline
7,870-7,875	Limestone, pale yellowish-brown, fine-crystalline; grayish-white soft limestone
7,875-7,880	Limestone, pale yellowish-brown to very pale-orange, fine-crystalline
7,880-7,890	Limestone, pale yellowish-brown, very fine-crystalline

Simpson Group Bromide Formation 7,890-8,246 feet			
7,890-7,910	Limestone, pale yellowish-brown, dense to very fine-crystalline	8,055-8,060	Dolomite, medium dark- to dark-gray, fine-crystalline, slightly argillaceous
7,910-7,915	Limestone, dark yellowish-brown, dense	8,060-8,065	Dolomite, brownish-gray, fine-crystalline; light-gray dense to granular chert
7,915-7,920	Limestone, dusky yellowish-brown, dense, argillaceous	8,065-8,070	Dolomite, very pale-orange, fine-crystalline
7,920-7,925	Limestone, medium dark-gray, dense, argillaceous	8,070-8,075	Dolomite, medium light-gray, fine-crystalline, calcareous, argillaceous; medium-gray dense and spicular chert
7,925-7,930	Limestone, dusky yellowish-brown, dense, argillaceous	8,075-8,080	Dolomite, brownish-gray, fine-crystalline, calcareous, slightly argillaceous; chert as above
7,920-7,934	Dolomite, dusky yellowish-brown to dark-gray, fine-crystalline, argillaceous	8,080-8,090	Dolomite, pale yellowish-brown, fine-crystalline, calcareous, slightly argillaceous; chert as above
7,934-7,940	Limestone, brownish-gray, dense, argillaceous	8,090-8,096	Dolomite, pale yellowish-brown, fine-crystalline, calcareous, slightly argillaceous
7,940-7,945	Limestone, light- to medium dark-gray, fine-crystalline, slightly argillaceous	8,096-8,100	Limestone, pale yellowish-brown, fine-crystalline; dolomite rhombs
7,945-7,957	Limestone, brownish-gray to medium dark-gray, dense, argillaceous	8,100-8,104	Dolomite, brownish-gray, fine-crystalline; scattered fine- to medium subrounded-sand grains
7,957-7,965	Limestone, pale yellowish-brown, fine-crystalline	8,104-8,110	Sandstone, brownish-gray to pale yellowish-brown, fine- to medium-grained, subrounded, calcareous; trace asphalt?
7,965-7,970	Limestone, pale yellowish-brown, dense to very fine-crystalline	8,110-8,117	Sandstone, white to very pale-orange, fine- to medium-grained, subrounded
7,970-7,985	Limestone, brownish-gray to dusky yellowish-brown, dense, slightly argillaceous	8,117-8,165	Sandstone, white, fine- to medium-grained, subangular to subrounded
7,985-7,990	Limestone, pale yellowish-brown, dense; grayish-white dense chert	8,165-8,178	Limestone, moderate-brown, brownish-gray, and pale yellowish-brown, dense; caving?
7,990-7,996	Dolomite, pale yellowish-brown, fine-crystalline	8,178-8,200	Sandstone, white, fine- to medium-grained, subrounded to subangular
7,996-8,010	Limestone, pale yellowish-brown, fine-crystalline, argillaceous, dolomitic	8,200-8,246	Sandstone, white to very pale-orange, fine-grained
8,010-8,015	Limestone, pale yellowish-brown, fine-crystalline; medium light-gray chert	8,246-8,249	Shale, light greenish-gray
8,015-8,027	Limestone, grayish-brown, very fine to fine-crystalline	8,249-8,257	Sandstone, yellowish-brown to medium dark-gray, very fine- to fine-grained, argillaceous; pyrite; oil stain?
8,027-8,037	Limestone, brownish-gray to grayish-brown, fine-crystalline, dolomitic, slightly argillaceous	8,257-8,279	Siltstone and shale, medium dark- to dark-gray, very finely sandy
8,037-8,040	Dolomite, brownish-gray, fine- to medium-crystalline; medium-gray dense chert; trace grayish-white chert with black specks	8,279	Total depth
8,040-8,055	Dolomite, pale yellowish-brown to medium light-gray, fine- to medium-crystalline; medium light- to medium-gray spicular chert		

LOG 7

MAJOR COUNTY, OKLAHOMA NE¼ SW¼ NE¼ sec. 30, T. 21 N., R. 10 W.

Operator: Superior Oil Co.
Lease: Fuller No. 63-30
Elevation: DF 1,179 feet
GL 1,171 feet
Total depth: Drillers 7,307 feet
Electrical log 7,308 feet
Completion date: 1950
Initial production:

Electrical log: 418 to 7,308 feet
Sample intervals:

10-foot
2,000 to 6,680 feet
5-foot
6,680 to 6,900 feet
7,045 to total depth
1-foot
6,900 to 7,045 feet

Cored intervals:
6,093 to 6,099 feet (core chips)
6,899 to 6,911 feet (core chips)
6,939 to 7,075 feet (core chips)

Permian System

Hennessey Shale and Garber Sandstone 0-1,192? feet

0-1,192?	No samples
	Wellington Formation 1,192?-2,405 feet
1,192?-2,000	No samples
2,000-2,010	Anhydrite, very light-gray, fine-crystalline
2,010-2,020	Anhydrite as above; salt
2,020-2,030	Anhydrite, very light-gray, fine-crystalline
2,030-2,040	Anhydrite as above; salt
2,404-2,050	Salt
2,050-2,055	Anhydrite, very light-gray, fine-crystalline; salt
2,055-2,065	Anhydrite, very light-gray, fine-crystalline
2,065-2,070	Anhydrite as above; salt
2,070-2,075	Anhydrite, very light-gray, fine-crystalline
2,075-2,100	Anhydrite as above; salt
2,100-2,120	Anhydrite, very light-gray, fine-crystalline
2,120-2,130	Salt
2,130-2,175	Anhydrite, very light-gray, fine-crystalline
2,175-2,185	Anhydrite as above; salt
2,185-2,232	Anhydrite, very light-gray, fine-crystalline
2,232-2,234	Dolomite, olive-gray, fine-crystalline, argillaceous, finely oölitic?
2,234-2,242	Anhydrite, very light-gray, fine-crystalline
2,242-2,250	Anhydrite as above; salt
2,250-2,257	Shale, medium-gray
2,257-2,268	Anhydrite, very light-gray, fine-crystalline
2,268-2,272	Salt
2,272-2,310	Anhydrite, very light-gray, fine-crystalline
2,310-2,314	Dolomite, medium light-gray, fine-crystalline, argillaceous
2,314-2,340	Anhydrite, very light-gray, fine-crystalline
2,340-2,342	Dolomite, pale yellowish-brown, fine-crystalline, argillaceous
2,342-2,350	Shale, medium-gray
2,350-2,355	Dolomite, medium-gray, fine-crystalline, argillaceous; grayish-white dense chert; medium dark-gray chert mottled with light-gray chert
2,355-2,380	Anhydrite, very light-gray, fine-crystalline
2,380-2,390	Shale, medium-gray
2,390-2,405	Anhydrite, very light-gray, fine-crystalline

Chase Group

Nolans Limestone 2,405-2,468 feet

2,405-2,410	Dolomite, medium-gray, fine-crystalline, argillaceous; light- to dark-gray dense chert
2,410-2,415	Shale, medium-gray
2,415-2,420	Shale, yellowish-brown
2,420-2,425	Shale, olive-gray
2,425-2,442	Shale, medium-gray
2,442-2,445	Limestone, medium dark-gray, fine-crystalline, very argillaceous
2,445-2,460	Limestone, medium light- to medium-gray, fine-crystalline, very argillaceous; bryozoans; crinoids
2,460-2,468	Limestone, medium-gray, silty, argillaceous
2,468-2,478	Shale, medium-gray

Winfield Limestone 2,478-2,533 feet

2,478-2,481	Limestone, medium-gray, fine-crystalline, argillaceous
2,481-2,483	Shale, medium-gray
2,483-2,508	Limestone, medium-gray, fine-crystalline, very argillaceous
2,508-2,520	Limestone, pale yellowish-brown, fine-crystalline
2,520-2,533	Limestone, medium light-gray, fine-crystalline, argillaceous; spotted with dark gray
2,533-2,545	Shale, medium-gray
2,545-2,550	Shale, greenish-gray
2,550-2,553	Shale, medium-gray
2,553-2,560	Limestone, medium light-gray, fine-crystalline
2,560-2,563	Shale, medium-gray

Barneston Limestone 2,563-2,708 feet

2,563-2,575	Limestone, medium-gray, fine-crystalline, argillaceous; crinoids
2,575-2,585	Limestone, medium dark-gray, very argillaceous
2,585-2,591	Limestone, medium-gray, fine-crystalline, very argillaceous
2,591-2,597	Shale, medium-gray
2,597-2,602	Limestone, medium-gray, fine-crystalline, very argillaceous
2,602-2,609	Shale, medium-gray
2,609-2,615	Limestone, medium-gray, fine-crystalline, very argillaceous; medium-gray spicular chert
2,615-2,620	Limestone, medium light-gray, very argillaceous
2,620-2,627	Shale, medium-gray
2,627-2,630	Limestone, medium-gray, fine-crystalline, very argillaceous
2,630-2,645	Limestone, medium light-gray, fine-crystalline, slightly argillaceous, slightly brownish tinted; fusulinids; crinoids
2,645-2,680	Limestone, medium light- to medium-gray, fine-crystalline, argillaceous; crinoids 2,645-2,652 feet
2,680-2,695	Limestone, very light-gray, fine-crystalline
2,695-2,708	Limestone, medium light- to medium-gray, fine-crystalline, argillaceous
2,708-2,722	Shale, medium-gray
2,722-2,736	Limestone, medium-gray, fine-crystalline, argillaceous; glauconite 2,722-2,730 feet
2,736-2,740	Shale, medium-gray
2,740-2,743	Limestone, medium-gray, fine-crystalline, argillaceous
2,743-2,750	Shale, medium-gray

Wreford Limestone 2,750-2,822 feet

2,750-2,760	Limestone, pale yellowish-brown, fine-crystalline
2,760-2,770	Shale, medium-gray
2,770-2,780	Shale, medium light-gray, silty
2,780-2,784	Shale, medium-gray
2,784-2,792	Limestone, medium-gray, very silty
2,792-2,800	Limestone, pale yellowish-brown, fine-crystalline; light-gray dense chert; brachiopods?
2,800-2,805	Limestone, light olive-gray, fine-crystalline; light- to medium-gray spicular chert

2,805-2,809	Shale, medium-gray	3,281-3,310	Limestone, pale yellowish-brown, fine-crystalline; fusulinids 3,290-3,305 feet
2,809-2,815	Limestone, brownish-gray, fine-crystalline, argillaceous; crinoids	3,310-3,320	Limestone, medium light-gray, fine-crystalline
2,815-2,822	Limestone, medium-gray, fine-crystalline, argillaceous	3,320-3,324	Shale, medium-gray
	Council Grove Group	3,324-3,330	Limestone, medium-gray to light olive-gray, fine-crystalline
2,822-2,835	Shale, medium-gray		Admire Group
2,835-2,845	Shale, greenish-gray	3,330-3,345	Shale, medium-gray
2,845-2,865	Shale, medium-gray	3,345-3,350	Limestone, medium dark-gray, very fine-crystalline
2,865-2,870	Shale, grayish-red	3,350-3,354	Limestone, brownish-gray, fine-crystalline
2,870-2,876	Shale, medium-gray	3,354-3,360	Shale, medium-gray
	Top of Funston Limestone 2,876 feet	3,360-3,363	Sandstone, yellowish-brown to light olive-gray, very fine-grained, calcareous
2,876-2,880	Limestone, pale yellowish-brown, fine-crystalline; medium-gray dense chert	3,363-3,367	Shale, yellowish-brown
2,880-2,886	Siltstone, greenish-gray	3,367-3,373	Shale, olive-gray
2,886-2,890	Shale, medium-gray	3,373-3,380	Shale, medium-gray
2,890-2,898	Limestone, medium-gray, fine-crystalline; fusulinids	3,380-3,385	Limestone, pale yellowish-brown, very finely sandy, silty
2,898-2,903	Shale, grayish-black	3,385-3,390	Shale, medium-gray
2,903-2,905	Shale, medium-gray	3,390-3,393	Shale, grayish-black
2,905-2,915	Limestone, pale yellowish-brown to very pale-orange, fine-crystalline	3,393-3,398	Shale, medium-gray
2,915-2,925	Limestone, medium-gray, fine-crystalline, argillaceous; light- to medium dark-gray mottled fusulinid chert	3,398-3,407	Limestone, pale yellowish-brown, fine-crystalline
2,925-2,934	Limestone, medium-gray, fine-crystalline, argillaceous	3,407-3,413	Shale, medium-gray
2,934-2,943	Dolomite, pale yellowish-brown, fine-crystalline, soft	3,413-3,417	Shale, grayish-black
2,943-2,948	Limestone, pale yellowish-brown, fine-crystalline	3,417-3,452	Shale, medium-gray; fusulinids 3,417-3,420 feet
2,948-2,950	Shale, medium-gray	3,452-3,465	Limestone, pale yellowish-brown, fine-crystalline
2,950-2,955	Limestone, brownish-gray, fine-crystalline	3,465-3,470	Shale, medium-gray
2,955-2,960	Limestone, medium light-gray, fine-crystalline	3,470-3,475	Shale, grayish-red; caving?
2,960-2,970	Shale, medium-gray	3,475-3,486	Shale, olive-gray
2,970-2,980	Limestone, medium light- to medium-gray, fine-crystalline, argillaceous, slightly brownish-tinted	3,486-3,492	Shale, medium-gray
2,980-2,990	Limestone, brownish-gray, fine-crystalline, argillaceous	3,492-3,499	Limestone, brownish-gray, fine-crystalline, slightly argillaceous
	Base of Beattie Limestone 2,990 feet	3,499-3,508	Shale, medium-gray
2,990-3,000	Shale, grayish-red to moderate reddish-brown	3,508-3,512	Limestone, medium dark-gray, fine-crystalline, argillaceous
3,000-3,005	Shale, greenish-gray	3,512-3,522	Shale, medium-gray
3,005-3,010	Shale, medium-gray	3,522-3,528	Limestone, brownish-gray, fine-crystalline, argillaceous
3,010-3,015	Shale, grayish-black	3,528-3,555	Shale, medium-gray
3,015-3,025	Shale, medium-gray	3,555-3,560	Shale, grayish-black
3,025-3,030	Shale, greenish-gray	3,560-3,567	Shale, medium-gray
3,030-3,040	Shale, medium-gray	3,567-3,572	Limestone, brownish-gray to medium-gray, fine-crystalline, argillaceous
3,040-3,050	Shale, greenish-gray	3,572-3,578	Shale, medium-gray
3,050-3,055	Shale, medium-gray; fusulinids	3,578-3,580	Limestone, pale yellowish-brown, fine-crystalline
3,055-3,063	Shale, grayish-red; caving?	3,580-3,593	Shale, medium-gray
3,063-3,070	Sandstone, very light-gray to very pale-orange, very fine-grained, silty	3,593-3,616	Sandstone, very light- to light-gray, very fine- to fine-grained, slightly dolomitic; few carbonaceous fragments 3,593-3,600 feet
3,070-3,082	Shale, medium-gray	3,616-3,634	Shale, medium-gray
	Grenola Limestone 3,082-3,142 feet	3,634-3,644	Limestone, brownish-gray, fine-crystalline, slightly argillaceous; crinoids
3,082-3,088	Limestone, pale yellowish-brown, very fine- to fine-crystalline	3,644-3,650	Shale, medium-gray
3,088-3,090	Limestone, brownish-gray, fine-crystalline, slightly argillaceous; fusulinids	3,650-3,656	Limestone, brownish-gray, medium- to coarse-oölitic
3,090-3,100	Limestone, medium light- to medium-gray, very fine- to fine-crystalline	3,656-3,668	Shale, medium-gray
3,100-3,120	Shale, medium-gray	3,668-3,672	Limestone, pale yellowish-brown, fine-crystalline
3,120-3,125	Limestone, brownish-gray, very fine-crystalline, microfossils?	3,672-3,680	Shale, medium-gray
3,125-3,130	Limestone, light olive-gray, fine-crystalline, slightly argillaceous	3,680-3,682	Limestone, brownish-gray, fine-crystalline, argillaceous
3,130-3,142	Limestone, medium- to medium dark-gray, fine-crystalline, argillaceous	3,682-3,690	Shale, greenish-gray
3,142-3,160	Shale, medium-gray	3,690-3,695	Shale, medium-gray
3,160-3,165	Shale, greenish-gray	3,695-3,700	Shale, grayish-black
3,165-3,170	Shale, grayish-red	3,700-3,720	Shale, medium-gray
3,170-3,194	Shale, medium-gray	3,720-3,728	Limestone, medium-gray to brownish-gray, fine-crystalline, medium-oölitic
3,194-3,200	Sandstone, very light- to light-gray, very fine- to fine-grained, slightly calcareous	3,728-3,736	Shale, medium-gray
3,200-3,212	Shale, medium-gray	3,736-3,738	Limestone, dark-gray, medium-oölitic, argillaceous
	Red Eagle Limestone, Johnson Shale, and Foraker Limestone undifferentiated, 3,212-3,330 feet	3,738-3,745	Shale, medium-gray
3,212-3,215	Limestone, dark-gray, fine-crystalline, argillaceous; mottled with light-gray; crinoids; bryozoans?	3,745-3,750	Limestone, medium light- to medium-gray, very fine-crystalline
3,215-3,225	Limestone, brownish-gray, fine-crystalline, slightly argillaceous; mottled with dark-gray	3,750-3,755	Limestone, pale yellowish-brown, fine-crystalline
3,225-3,230	Limestone, very light-gray, fine-crystalline; dark-gray spots	3,755-3,760	Limestone, medium dark-gray, fine-crystalline
3,230-3,235	Limestone, very light-gray, fine-crystalline, soft	3,760-3,764	Siltstone, light olive-gray, calcareous
3,235-3,248	Limestone, pale yellowish-brown, fine-crystalline	3,764-3,770	Shale, medium-gray
3,248-3,252	Shale, medium-gray	3,770-3,774	Shale, grayish-black
3,252-3,260	Limestone, very pale-orange, fine-crystalline	3,774-3,780	Shale, medium-gray
3,260-3,265	Limestone, pale yellowish-brown, fine-crystalline	3,780-3,785	Sandstone, very light- to light-gray, very fine- to fine-grained; calcareous in part
3,265-3,268	Shale, medium-gray	3,785-3,790	Sandstone, very light- to light-gray, fine-grained, slightly calcareous
3,268-3,278	Limestone, medium-gray, fine-crystalline, argillaceous		Pennsylvanian System
3,278-3,281	Shale, medium-gray		Virgil Series
			Wabaunsee Group Equivalent
		3,790-3,800	Limestone, medium-gray to brownish-gray, fine-crystalline, slightly argillaceous
		3,800-3,812	Limestone, pale yellowish-brown, fine-crystalline
		3,812-3,825	Shale, medium-gray
		3,825-3,830	Shale, greenish-gray
		3,830-3,838	Shale, medium-gray
		3,838-3,844	Limestone, pale yellowish-brown, fine-granular, dolomitic
		3,844-3,850	Limestone, very light-gray, fine-crystalline, soft
		3,850-3,855	Limestone, pale yellowish-brown, fine-crystalline
		3,855-3,865	Limestone, medium- to medium dark-gray, argillaceous
		3,865-3,874	Limestone, medium-gray, very fine-crystalline, slightly brownish-tinted

3,874-3,880	Limestone, medium dark-gray, fine-crystalline, very argillaceous	4,528-4,534	Shale, olive-gray
3,880-3,883	Shale, medium-gray	4,534-4,537	Shale, medium-gray
3,883-3,885	Limestone, medium-gray, fine-crystalline	4,537-4,540	Shale, grayish-black
3,885-3,895	Limestone, pale yellowish-brown, fine-crystalline	4,540-4,554	Shale, medium-gray
3,895-3,905	Limestone, very light-gray to very pale-orange, fine-crystalline	4,554-4,560	Siltstone, medium-gray, calcareous
3,905-3,915	Limestone, pale yellowish-brown, very fine-crystalline	4,560-4,574	Shale, medium-gray
3,915-3,920	Limestone, pale yellowish-brown, dense	4,574-4,580	Shale, greenish-gray
3,920-3,930	Limestone, very light-gray to very pale-orange, fine-crystalline	4,580-4,595	Shale, medium-gray
3,930-3,934	Dolomite, pale yellowish-brown, fine- to medium-crystalline	4,595-4,600	Shale, grayish-black
3,934-3,940	Limestone, pale yellowish-brown, very fine- to fine-crystalline	4,600-4,610	Shale, greenish-gray
3,940-3,950	Limestone, very pale-orange, very fine-crystalline	4,610-4,635	Shale, medium-gray
3,950-3,970	Limestone, pale yellowish-brown, fine-crystalline	4,635-4,640	Shale, greenish-gray
3,970-3,976	Shale, medium-gray	4,640-4,644	Shale, medium-gray
3,976-3,978	Limestone, brownish-gray to medium dark-gray, fine-crystalline, argillaceous; crinoids; fusulinids?	4,644-4,646	Limestone, medium-gray, fine-crystalline, argillaceous
3,978-3,980	Shale, medium-gray	4,646-4,650	Shale, medium-gray
3,980-3,985	Shale, greenish-gray	4,650-4,655	Shale, greenish-gray
3,985-4,002	Shale, medium-gray	4,655-4,667	Shale, medium-gray
4,002-4,003	Limestone, dark-gray, fine-crystalline, argillaceous	4,667-4,670	Shale, grayish-black
4,003-4,010	Shale, medium-gray	4,670-4,675	Shale, medium-gray
4,010-4,020	Limestone, light- to medium light-gray, fine-crystalline	4,675-4,680	Shale, greenish-gray
4,020-4,022	Limestone, light olive-gray, very fine-crystalline; mottled with dark-gray	4,680-4,697	Shale, medium-gray
4,022-4,025	Shale, medium-gray	4,697-4,700	Shale, grayish-black
4,025-4,030	Limestone, medium-gray to brownish-gray, fine-crystalline, silty	4,700-4,713	Shale, medium-gray
4,030-4,040	Limestone, pale yellowish-brown, fine-crystalline	4,713-4,715	Siltstone, medium-gray, calcareous
4,040-4,055	Limestone, pale yellowish-brown, fine-crystalline; fusulinids	4,715-4,720	Shale, medium-gray
4,055-4,061	Limestone, brownish-gray, fine-crystalline; fusulinids	4,720-4,725	Sandstone, light olive-gray, very fine-grained, tight, silty, slightly calcareous
4,061-4,070	Shale, olive-gray	4,725-4,730	Sandstone, very light-gray to yellowish-brown, fine-grained, slightly calcareous, porous
4,070-4,075	Shale, brownish-gray	4,730-4,742	Sandstone, very light-gray to yellowish-brown, fine-grained, porous
4,075-4,085	Shale, medium-gray	4,742-4,753	Shale, medium-gray
4,085-4,093	Sandstone, light-gray, fine-grained, slightly dolomitic, porous; some yellowish-brown sandstone	4,753-4,760	Sandstone, very light-gray, fine-grained, porous
4,093-4,100	Sandstone, light-gray, very fine- to fine-grained; black coaly shale stringers	4,760-4,765	Sandstone, very light- to light-gray, very fine- to fine-grained
4,100-4,110	Sandstone, yellowish-brown, very fine- to fine-grained	4,765-4,770	Sandstone, light olive-gray to yellowish-brown, very fine- to fine-grained
4,110-4,130	Sandstone, light-gray, fine- to medium-grained, porous	4,770-4,775	Shale, olive-gray
4,130-4,140	Shale, medium-gray	4,775-4,796	Shale, medium-gray
4,140-4,150	Shale, greenish-gray	4,796-4,798	Limestone, brownish-gray, fine-crystalline
4,150-4,225	Shale, medium-gray	4,798-4,806	Shale, medium-gray
4,225-4,230	Limestone, medium-gray, fine-crystalline, slightly argillaceous, slightly brownish-tinted	4,806-4,808	Limestone, light olive-gray, fine-crystalline
4,230-4,240	Limestone, pale yellowish-brown, fine-crystalline; pin-point porosity	4,808-4,830	Shale, medium-gray
4,240-4,250	Limestone, very pale-orange, fine-crystalline	4,830-4,836	Siltstone, medium light-gray, very finely sandy, calcareous
4,250-4,270	Shale, medium-gray	4,836-4,840	Limestone, brownish-gray, very fine-crystalline
4,270-4,280	Shale, greenish-gray	4,840-4,845	Shale, medium-gray
4,280-4,285	Shale, medium-gray	4,845-4,850	Shale, grayish-black
4,285-4,290	Shale, grayish-black	4,850-4,856	Shale, medium-gray
4,290-4,300	Shale, greenish-gray	4,856-4,858	Sandstone, very light-gray, very fine-grained, calcareous
4,300-4,328	Shale, medium-gray	4,858-4,870	Shale, medium-gray
	Shawnee Group Equivalent	4,870-4,875	Sandstone, pale yellowish-brown, very fine- to fine-grained, porous
	Topeka Limestone 4,328-4,385 feet	4,875-4,880	Sandstone, very light-gray, very fine- to fine-grained, porous
4,328-4,337	Limestone, brownish-gray, very fine-crystalline	4,880-4,884	Sandstone, very light-gray, fine-grained, porous
4,337-4,340	Limestone, medium-gray, finely oölitic and oölastic; dark-gray oölitic	4,884-4,896	Shale, medium-gray
4,340-4,360	Limestone, pale yellowish-brown, fine-crystalline	4,896-4,900	Sandstone, very light-gray, fine-grained, porous
4,360-4,372	Shale, medium-gray	4,900-4,930	Sandstone as above; pink grains — feldspar?
4,372-4,380	Limestone, brownish-gray, fine-crystalline, argillaceous; dark-gray spots	4,930-4,940	Shale, medium-gray
4,380-4,385	Limestone, pale yellowish-brown, fine-crystalline	4,940-4,945	Shale, moderate-brown
4,385-4,388	Shale, greenish-gray, very finely sandy	4,945-4,955	Shale, medium-gray
4,388-4,395	Sandstone, very light-gray to yellowish-brown, very fine- to fine-grained; calcareous in part	4,955-4,967	Siltstone, greenish-gray
4,395-4,400	Sandstone, very light-gray, fine-grained, dolomitic	4,967-4,977	Shale, medium-gray
4,400-4,410	Shale, medium-gray	4,977-4,985	Shale, grayish-red to grayish-brown
4,410-4,418	Sandstone, very light-gray, fine-grained, dolomitic	4,985-4,995	Siltstone, light greenish-gray, very finely sandy
4,418-4,420	Shale, medium-gray	4,995-5,005	Sandstone, very light-gray, very fine- to fine-grained, slightly calcareous
4,420-4,435	Sandstone, light- to medium-gray, very fine- to fine-grained, silty, calcareous	5,005-5,015	Shale, medium-gray
4,435-4,440	Siltstone, medium-gray, very finely sandy, calcareous		Oread Limestone Member of Vamoosa Formation 5,015-5,160 feet
4,440-4,445	Shale, greenish-gray	5,015-5,029	Limestone, pale yellowish-brown to medium light-gray, fine-crystalline
4,445-4,450	Shale, medium-gray	5,029-5,034	Sandstone, medium-gray, fine-grained, calcareous, argillaceous; black grains
4,450-4,455	Shale, medium-gray, silty, calcareous	5,034-5,037	Shale, medium-gray
4,455-4,465	Shale, medium-gray	5,037-5,040	Shale, greenish-gray
4,465-4,468	Shale, grayish-black	5,040-5,047	Shale, medium-gray
4,468-4,470	Shale, grayish-black; trace of coal	5,047-5,068	Limestone, pale yellowish-brown to brownish-gray, fine-crystalline
4,470-4,480	Sandstone, very light- to light-gray, very fine- to fine-grained; carbonaceous material and coal fragments	5,068-5,075	Limestone, medium dark-gray, fine-crystalline, argillaceous
4,480-4,495	Sandstone, light-gray, very fine- to fine-grained; slightly calcareous in part	5,075-5,080	Shale, medium-gray
4,495-4,505	Sandstone, medium light-gray, very fine-grained, silty, calcareous	5,080-5,095	Shale, brownish-gray
4,505-4,510	Shale, greenish-gray	5,095-5,100	Shale, olive-gray
4,510-4,520	Shale, medium-gray	5,100-5,105	Shale, greenish-gray
4,520-4,528	Shale, grayish-red and moderate reddish-brown; caving?	5,105-5,113	Shale, medium-gray
		5,113-5,123	Sandstone, very light- to light-gray, very fine- to fine-grained, micaceous; silty in part
		5,123-5,130	Limestone, pale yellowish-brown, fine-crystalline
		5,130-5,150	Limestone, pale yellowish-brown, medium- to coarse-oölitic and oölastic
		5,150-5,160	Limestone, pale yellowish-brown, fine-crystalline

Douglas Group Equivalent			
5,160-5,176	Shale, medium-gray	5,965-5,970	Shale, grayish-black
5,176-5,180	Shale, grayish-black	5,970-5,985	Shale, medium-gray
5,180-5,190	Shale, medium-gray	5,985-5,995	Shale, grayish-black
5,190-5,200	Shale, grayish-red to very dusky-red	5,995-6,076	Shale, medium-gray
5,200-5,218	Shale, medium-gray		
5,218-5,228	Sandstone, very light- to light-gray, very fine-grained	6,076-6,080	Limestone, medium-gray, fine-crystalline, argillaceous
5,228-5,242	Shale, medium-gray	6,080-6,086	Shale, medium-gray
5,242-5,245	Limestone, brownish-gray, fine-crystalline	6,086-6,090	Limestone, medium-gray, fine-crystalline, argillaceous
5,245-5,250	Limestone, pale yellowish-brown, very fine-crystalline	6,090-6,093	Limestone, pale yellowish-brown, fine-crystalline, coarsely oolitic; crinoids; bryozoans
5,250-5,255	Limestone, medium- to medium dark-gray, fine-crystalline		
5,255-5,267	Limestone, pale yellowish-brown, fine-crystalline	6,093-6,098	Shale, medium-gray
5,267-5,274	Limestone, brownish-gray, fine-crystalline	6,096-6,098	Shale, dolomitic
5,274-5,285	Shale, medium-gray	6,098-6,100	Siltstone, medium-gray, calcareous
5,285-5,290	Shale, grayish-black	6,100-6,106	Shale, medium-gray
5,290-5,300	Shale, medium-gray	6,106-6,110	Shale, grayish-black
5,300-5,305	Shale, moderate-brown	6,110-6,130	Shale, medium-gray
5,305-5,328	Shale, medium-gray	6,130-6,140	Siltstone, light olive-gray
5,328-5,335	Shale, moderate-brown, silty	6,140-6,145	Shale, medium-gray
5,335-5,347	Shale, medium-gray	6,145-6,150	Shale, grayish-black
		6,150-6,160	Shale, medium-gray
		6,160-6,170	Siltstone, medium dark-gray to grayish-brown
		6,170-6,176	Shale, grayish-black
		6,176-6,200	Shale, medium-gray
		6,200-6,205	Shale, grayish-black
		6,205-6,230	Shale, medium-gray
		6,230-6,240	Shale, moderate-brown; caving?
		6,240-6,268	Shale, medium-gray
		6,268-6,275	Limestone, medium- to medium dark-gray, very fine-crystalline, argillaceous
Missouri Series			
Ochelata Group			
Lansing Group Equivalent			
5,347-5,350	Siltstone, olive-gray		
5,350-5,360	Siltstone, light olive-gray	6,275-6,286	Shale, medium-gray
5,360-5,370	Siltstone, light-gray to light olive-gray, very finely sandy	6,286-6,290	Shale, moderate-brown; brachiopods
5,370-5,380	Sandstone, light-gray, very fine-grained, very silty	6,290-6,318	Shale, medium-gray
5,380-5,388	Shale, medium-gray	6,318-6,325	Siltstone, medium light-gray, calcareous
5,388-5,400	Sandstone, light brownish-gray, very fine-grained, very silty	6,325-6,333	Siltstone, brownish-gray, calcareous, very finely sandy
		6,333-6,340	Limestone, medium dark-gray, very fine-crystalline, argillaceous
5,400-5,410	Sandstone, light-gray, very fine-grained, very silty	6,340-6,360	Shale, medium-gray
5,410-5,415	Shale, medium-gray	6,360-6,375	Shale, moderate-brown
5,415-5,421	Sandstone, yellowish-brown, fine-grained, slightly dolomitic	6,375-6,400	Shale, medium-gray
5,421-5,423	Shale, medium-gray		
5,423-5,431	Sandstone, light-gray, fine-grained		
5,431-5,433	Shale, medium-gray		
5,433-5,440	Sandstone, brownish-gray, very fine-grained, silty		
5,440-5,445	Sandstone, light-gray, very fine-grained, calcareous		
5,445-5,450	Sandstone, light-gray, fine-grained, calcareous		
5,450-5,455	Sandstone as above; coal stringers		
5,455-5,460	Sandstone, medium-gray to brownish-gray, fine- to medium-grained, angular, silty, slightly calcareous		
5,460-5,467	Sandstone, grayish-red, fine- to medium-grained, calcareous		
Kansas City Group Equivalent			
5,467-5,475	Shale, moderate-brown	6,400-6,405	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous
5,475-5,480	Shale, grayish-red	6,405-6,410	Limestone, pale yellowish-brown, fine-crystalline
5,480-5,500	Shale, medium-gray	6,410-6,423	Limestone, brownish-gray, very fine-crystalline
5,500-5,510	Shale, medium dark-gray, silty	6,423-6,425	Shale, medium-gray
5,510-5,513	Shale, grayish-black	6,425-6,430	Limestone, medium dark-gray, very fine-crystalline, argillaceous
5,513-5,600	Shale, medium-gray	6,430-6,459	Shale, medium-gray
5,600-5,605	Shale, grayish-black	6,459-6,465	Limestone, medium-gray, fine-crystalline, argillaceous
5,605-5,650	Shale, medium-gray	6,465-6,470	Limestone, medium light-gray, very fine-crystalline, argillaceous
5,650-5,660	Shale, moderate-brown; caving?	6,470-6,475	Limestone, pale yellowish-brown, fine-crystalline
5,660-5,670	Shale, medium-gray	6,475-6,480	Limestone, very light- to light-gray, fine-crystalline, soft; trace of light-gray chert
5,670-5,680	Shale, moderate-brown	6,480-6,490	Limestone, pale yellowish-brown, very fine-crystalline
5,680-5,685	Shale, medium-gray	6,490-6,504	Shale, medium-gray
5,685-5,695	Shale, grayish-black	6,504-6,514	Limestone, dark-gray, very fine-crystalline, slightly argillaceous
5,695-5,720	Shale, medium-gray	6,514-6,520	Shale, medium-gray
5,720-5,725	Shale, grayish-black	6,520-6,525	Limestone, medium-gray, fine-crystalline; dark-gray dense chert
5,725-5,765	Shale, medium-gray	6,525-6,530	Limestone, brownish-gray, fine-crystalline, slightly argillaceous
5,765-5,770	Shale, grayish-black	6,530-6,540	Limestone, light-gray, fine-crystalline, soft
5,770-5,783	Shale, medium-gray	6,540-6,550	Limestone, medium-gray, fine-crystalline
5,783-5,787	Siltstone, olive-gray	6,550-6,565	Limestone, medium light-gray to light olive-gray, fine-crystalline
5,787-5,803	Shale, medium-gray	6,565-6,574	Shale, medium-gray
		6,574-6,580	Limestone, brownish-gray, fine-crystalline
		6,580-6,584	Limestone, pale yellowish-brown, fine-crystalline
		6,584-6,598	Limestone, medium dark-gray, fine-crystalline, argillaceous
		6,598-6,600	Shale, medium-gray
		6,600-6,603	Shale, grayish-black
		6,603-6,607	Shale, medium-gray
		6,607-6,615	Limestone, brownish-gray, fine-crystalline
		6,615-6,622	Limestone, dark brownish-gray, fine-crystalline
		6,622-6,632	Shale, medium-gray
		6,632-6,634	Limestone, dark-gray, fine-crystalline, argillaceous
		6,634-6,645	Shale, medium-gray
		6,645-6,650	Shale, grayish-black
		6,650-6,654	Shale, medium-gray
		6,654-6,661	Limestone, brownish-gray, fine-crystalline
		6,661-6,665	Shale, medium-gray
		6,665-6,668	Shale, grayish-black
		6,668-6,672	Limestone, dark-gray, fine-crystalline, argillaceous
Skiatook Group			
Drum Limestone 5,803-5,810 feet			
5,803-5,810	Limestone, medium dark-gray, very silty		
5,810-5,815	Siltstone, olive-gray to moderate-brown		
5,815-5,846	Shale, medium-gray		
5,846-5,854	Siltstone, olive-gray, calcareous		
5,854-5,860	Limestone, olive-gray, very silty		
5,860-5,865	Limestone, dark-gray, fine-crystalline, very silty		
5,865-5,875	Siltstone, olive-gray, calcareous		
5,875-5,885	Sandstone, light-gray to yellowish-brown, very fine-grained, calcareous		
5,885-5,895	Sandstone, very light- to light-gray, very fine-grained, calcareous, slightly micaceous		
5,895-5,900	Sandstone, very light- to light-gray, very fine- to fine-grained, slightly dolomitic, slightly micaceous		
5,900-5,910	Sandstone, light-gray to yellowish-brown, fine-grained, slightly dolomitic, slightly micaceous		
5,910-5,915	Sandstone, very light-gray, very fine- to fine-grained, calcareous		
5,915-5,935	Sandstone, very light-gray, very fine- to fine-grained		
5,935-5,955	Sandstone, yellowish-brown, fine-grained		
5,955-5,965	Shale, medium-gray		

Cabaniss and Krebs Groups			
6,672-6,700	Shale, medium-gray	7,000-7,002	Limestone, pale yellowish-brown to brownish-gray, very fine- to fine-crystalline; bryozoans?
6,700-6,705	Shale, grayish-black	7,002-7,004	Shale, medium-gray
6,705-6,716	Shale, medium-gray	7,004-7,005	Limestone, medium-gray, fine-crystalline, slightly argillaceous; brachiopods
6,716-6,720	Limestone, medium dark-brownish-gray, fine-crystalline, slightly argillaceous	7,005-7,006	Siltstone, medium light-gray; carbonaceous plant fragments
6,720-6,724	Limestone, brownish-gray, fine-crystalline, slightly argillaceous	7,006-7,008	Limestone, medium dark-gray, fine-crystalline, very silty
6,724-6,733	Shale, medium-gray	7,008-7,012	Siltstone, medium light- to medium-gray; calcareous in part
6,733-6,735	Limestone, yellowish-brown, very argillaceous, soft	7,012-7,014	Limestone, medium dark-gray, fine- to medium-oolitic; brachiopods
6,735-6,738	Limestone, medium- to medium dark-gray, very silty	7,014-7,017	Shale, medium-gray
6,738-6,743	Shale, medium-gray	7,017-7,019	Limestone, pale yellowish-brown, fine-crystalline, slightly argillaceous; brachiopods, bryozoans
6,743-6,747	Limestone, dark-gray, fine-crystalline, very argillaceous	7,019-7,022	Shale, medium-gray
6,747-6,752	Shale, medium-gray	7,022-7,026	Limestone, medium dark-gray, fine-crystalline; scattered fine to medium oolites; brachiopods; medium-gray medium-oolitic limestone
6,752-6,755	Limestone, medium- to medium dark-gray, fine-crystalline, slightly argillaceous	7,026-7,030	Siltstone, medium dark-gray to pale yellowish-brown, calcareous
6,755-6,760	Shale, medium-gray	7,030-7,036	Limestone, medium-gray to pale yellowish-brown, fine-crystalline; some medium oolites; some medium dark-gray limestone; brachiopods; bryozoans; crinoids
6,760-6,765	Shale, greenish-gray	7,036-7,037	Siltstone, pale yellowish-brown, calcareous
6,765-6,780	Shale, medium-gray	7,037-7,040	Sandstone, moderate-brown, very fine-grained
6,780-6,785	Siltstone, olive-gray	7,040-7,042	Limestone, medium light-gray, very finely sandy
6,785-6,803	Siltstone, brownish-gray to olive-gray, very finely sandy	7,042-7,043	Limestone, medium- to dark-gray, fine-crystalline, argillaceous; brachiopods; bryozoans
6,803-6,835	Shale, medium-gray	7,043-7,085	Shale, medium-gray
6,835-6,840	Shale, grayish-black	7,085-7,090	Shale, greenish-gray
6,840-6,850	Shale, medium-gray	7,090-7,095	Shale, medium-gray
6,850-6,853	Limestone, light olive-gray, very fine-crystalline	7,095-7,100	Shale, grayish-black
6,853-6,857	Limestone, dark-gray, very fine-crystalline, argillaceous	7,100-7,117	Shale, medium-gray
6,857-6,868	Shale, medium-gray	7,117-7,120	Limestone, medium light- to dark-gray, fine-crystalline, silty
6,868-6,870	Limestone, dark-gray, very fine-crystalline, argillaceous	7,120-7,125	Limestone, brownish-gray, fine-crystalline, argillaceous; crinoids
6,870-6,877	Shale, medium-gray	7,125-7,135	Limestone, medium- to medium dark-gray, fine-crystalline, silty
6,877-6,879	Limestone, dark-gray, very fine-crystalline, argillaceous	7,135-7,145	Shale, medium-gray
6,879-6,880	Shale, medium-gray	7,145-7,150	Limestone, brownish-gray, fine-crystalline
6,880-6,885	Shale, grayish-black	7,150-7,157	Limestone, pale yellowish-brown, soft
6,885-6,890	Shale, medium-gray	7,157-7,164	Limestone, medium-gray, fine-crystalline, argillaceous
6,890-6,893	Limestone, brownish-gray, very fine-crystalline	7,164-7,180	Shale, medium-gray
6,893-6,903	Shale, grayish-brown to brownish-gray	7,180-7,190	Shale, olive-gray; trace of coal
6,903-6,906	Shale, medium-gray; brachiopods	7,190-7,192	Limestone, medium dark-gray, fine-crystalline, argillaceous
6,906-6,911	Shale, medium-gray; some grayish-red mottled shale; some shale fragments show possible slickensides	7,192-7,205	Shale, medium-gray
6,911-6,925?	No samples	7,205-7,210	Limestone, medium-gray, fine-crystalline, very silty
	Mississippian System	7,210-7,217	Limestone, medium light-gray, fine-crystalline, very silty
	Upper Mississippian Series	7,217-7,220	Shale, medium-gray
	Rocks of Chesterian Age	7,220-7,225	Siltstone, yellowish-brown, calcareous
6,925?-6,939	No samples	7,225-7,230	Shale, medium-gray
6,939-6,944	Shale, medium-gray; thin dark-gray limestone stringers; bryozoans? and crinoids	7,230-7,235	Limestone, medium- to medium dark-gray, fine-crystalline, argillaceous; crinoids
6,944-6,946	Limestone, pale yellowish-brown, very fine-crystalline; brachiopods	7,235-7,255	Shale, medium-gray
6,946-6,972	Shale, medium- to medium dark-gray, chunky, calcareous to slightly calcareous	7,255-7,260	Shale, moderate-brown; caving?
6,972-6,974	Limestone, medium dark-gray, very argillaceous; crinoids; bryozoans?; dark-gray oolitic pellets	7,260-7,295	Shale, medium-gray
6,974-6,977	Limestone, pale yellowish-brown to brownish-gray, very fine- to fine-crystalline; argillaceous at top; crinoids; brachiopods		
6,977-6,980	Limestone, brownish-gray, very fine-crystalline, argillaceous		
6,980-6,984	Shale, dark greenish-gray, grayish-red mottled, calcareous		
6,984-6,988	Limestone, brownish-gray, fine-crystalline; brachiopods; bryozoans; greenish-gray clayey residue		
6,988-6,993	Limestone, pale yellowish-brown, fine-crystalline, finely to coarsely oolitic; crinoids; brachiopods; bryozoans	7,295-7,307	Limestone, pale yellowish-brown, very fine-crystalline, soft
6,993-6,995	No samples	7,307	Total depth (Drillers log)
6,995-6,997	Limestone, pale yellowish-brown, medium-oolitic	7,308	Total depth (Electrical log)
6,997-7,000	No samples		
			Rocks of Meramecian Age

LOG 8

BLAINE COUNTY, OKLAHOMA

NE¼ NE¼ NE¼ sec. 17, T. 19 N., R. 10 W.

Operator: Superior Oil Co.
 Lease: Hattie W. Norris No. 81-17
 Elevation: 1,200 feet
 Total depth: 11,008 feet
 Completion date: 1945
 Initial production: Dry and abandoned

Electrical log: 25 to 2,182 feet;
 2,364 feet to total depth

Sample intervals:
 25-foot
 0 to 2,393 feet
 10-foot
 2,413 to 6,860 feet
 6,950 to 7,000 feet
 7,060 to 7,240 feet
 7,540 to 7,970 feet
 5-foot
 6,860 to 6,950 feet
 7,000 to 7,060 feet
 7,240 to 7,540 feet
 7,970 to total depth

Cored intervals:
 11,000 to 11,005 feet

		Permian System El Reno Group Flowerpot Shale 0-70 feet			Wellington Formation 1,310-2,482 feet
0-	70	Shale and silty shale, moderate reddish-brown; light greenish-gray spots		1,310-1,315 1,315-1,317 1,317-1,326 1,326-1,328 1,328-1,330 1,330-1,340 1,340-1,343 1,343-1,350	Shale, light-gray Dolomite, light-gray, very fine-crystalline Shale, medium-gray Shale, grayish-black Shale, medium-gray Shale, moderate reddish-brown Shale, medium-gray Dolomite, medium light-gray, very fine-crystalline, slightly argillaceous
		Hennessey Shale and Garber Sandstone 70-1,310 feet			
70-	75	Shale, light greenish-gray, silty		1,350-1,360	Shale, greenish-gray
75-	150	Shale, moderate reddish-brown; white gypsum		1,360-1,370	Shale, medium-gray
150-	220	Shale, moderate reddish-brown; greenish-gray spots; white gypsum		1,370-1,380	Shale, moderate reddish-brown
220-	247	Shale, moderate reddish-brown		1,380-1,384	Shale, medium-gray
247-	260	Sandstone, moderate reddish-brown, very fine-grained, silty		1,384-1,387 1,387-1,390 1,390-1,394	Anhydrite, grayish-white, fine-crystalline Shale, medium-gray Dolomite, light olive-gray, fine-crystalline, slightly argillaceous; anhydrite crystals
260-	270	Shale, moderate reddish-brown		1,394-1,400	Shale, olive-gray
270-	274	Shale, greenish-gray, slightly calcareous		1,400-1,410	Shale, greenish-gray
274-	340	Shale, moderate reddish-brown		1,410-1,412 1,412-1,420	Dolomite, light olive-gray, very fine-crystalline Shale, medium-gray
340-	350	Shale, moderate reddish-brown; grayish-white fine-crystalline anhydrite		1,420-1,440 1,440-1,443 1,443-1,445 1,445-1,450 1,450-1,460	Shale, moderate reddish-brown Shale, medium-gray Dolomite, light olive-gray, very fine-crystalline Shale, medium-gray Shale, greenish-gray
350-	370	Shale, moderate reddish-brown		1,460-1,475	Shale, olive-gray
370-	375	Siltstone, light-gray, very finely sandy		1,475-1,480	Shale, medium-gray
375-	475	Shale, moderate reddish-brown		1,480-1,483 1,483-1,490 1,490-1,497 1,497-1,510 1,510-1,520 1,520-1,530 1,530-1,544 1,544-1,552 1,552-1,554	Shale, grayish-black Shale, medium-gray Shale, olive-gray Shale, medium-gray Shale, greenish-gray Shale, medium-gray Shale, olive-gray Shale, medium-gray Dolomite, medium-gray, very fine-crystalline, slightly argillaceous
475-	500	No samples		1,554-1,560	Shale, medium-gray
500-	600	Shale, moderate reddish-brown; white fine-crystalline anhydrite		1,560-1,570 1,570-1,578 1,578-1,580	Shale, greenish-gray Shale, medium-gray Dolomite, medium-gray, very fine-crystalline, slightly argillaceous
600-	696	Shale, moderate reddish-brown		1,580-1,600	Shale, medium-gray
696-	700	Shale, greenish-gray and medium-gray		1,600-1,610	Shale, greenish-gray
700-	750	No samples		1,610-1,630	Shale, medium-gray
750-	784	Shale, moderate reddish-brown		1,630-1,640	Shale, greenish-gray
784-	790	Shale, light olive-gray		1,640-1,645	Shale, olive-gray
790-	807	Shale, moderate reddish-brown		1,645-1,650	Shale, medium-gray
807-	810	Sandstone, pale reddish-brown, very fine-grained		1,650-1,660	Shale, olive-gray
810-	868	Shale, moderate reddish-brown		1,660-1,667	Shale, medium-gray
868-	870	Limestone, medium light-gray, very fine-crystalline		1,667-1,674 1,674-1,678	Anhydrite, very light-gray, fine-crystalline Shale, medium-gray
870-	900	Shale, moderate reddish-brown			
900-	904	Sandstone, grayish-red, very fine-grained, silty			
904-	927	Shale, moderate reddish-brown			
927-	930	Shale, greenish-gray			
930-	935	Limestone, pale-red, fine-crystalline, argillaceous			
935-	1,067	Shale, moderate reddish-brown			
1,067-	1,070	Shale, greenish-gray			
1,070-	1,094	Shale, moderate reddish-brown			
1,094-	1,105	Siltstone, pale-red			
1,105-	1,180	Shale, moderate reddish-brown			
1,180-	1,186	Shale, light-gray			
1,186-	1,260	Shale, moderate reddish-brown			
1,260-	1,271	Shale, olive-gray			
1,271-	1,310	Shale, moderate reddish-brown			

1,678-1,682	Anhydrite, very light-gray, fine-crystalline	2,737-2,747	Shale, medium-gray
1,682-1,690	Shale, medium-gray	2,747-2,759	Limestone, medium-gray, fine-crystalline, argillaceous; dark-gray specks
1,690-1,698	Anhydrite, very light-gray, fine-crystalline		
1,698-1,700	Shale, medium-gray	2,759-2,763	Shale, medium-gray
1,700-1,712	Anhydrite, very light-gray, fine-crystalline	2,763-2,766	Shale, greenish-gray
1,712-1,716	Shale, medium-gray	2,766-2,777	Limestone, medium-gray, argillaceous
1,716-1,720	Anhydrite, very light-gray, fine-crystalline	2,777-2,780	Limestone, light-gray to very pale-orange, fine-crystalline
1,720-1,723	Shale, medium-gray	2,780-2,785	Limestone, pale yellowish-brown, fine-crystalline; dark-gray spots
1,723-1,730	Anhydrite, very light-gray, fine-crystalline		Limestone, pale yellowish-brown, fine-crystalline
1,730-1,733	Shale, medium-gray	2,785-2,790	
1,733-1,742	Anhydrite, very light-gray, fine-crystalline		
1,742-1,753	Shale, olive-gray	2,790-2,796	Shale, grayish-red
1,753-1,770	Anhydrite, very light-gray, fine-crystalline	2,796-2,800	Shale, greenish-gray
1,770-1,773	Shale, medium-gray	2,800-2,807	Shale, grayish-red
1,773-1,800	Anhydrite, very light-gray, fine-crystalline		
1,800-2,350	Anhydrite, very light- to medium-gray, fine-crystalline; salt		
2,350-2,353	Dolomite, medium-gray, fine-crystalline, argillaceous		
2,353-2,360	Shale, medium-gray		
2,360-2,383	Anhydrite, very light-gray to very pale-orange	2,807-2,812	Limestone, pale-red, fine-crystalline
2,383-2,388	Shale, medium-gray	2,812-2,820	Limestone, medium-gray, fine-crystalline, slightly argillaceous
2,388-2,391	Dolomite, medium-gray, fine-crystalline, argillaceous, anhydritic	2,820-2,830	Limestone, very pale-orange to pale yellowish-brown, fine-crystalline
2,391-2,394	Shale, medium-gray	2,830-2,834	Shale, medium-gray
2,394-2,415	No samples	2,834-2,840	Limestone, pale yellowish-brown, fine-crystalline; mottled with dark gray; fusulinids
2,415-2,417	Anhydrite, grayish-white, fine-crystalline		
2,417-2,423	Shale, medium-gray	2,840-2,845	Shale, medium-gray
2,423-2,448	Anhydrite, medium-gray, fine-crystalline	2,845-2,850	Shale, grayish-red
2,448-2,450	Shale, medium-gray	2,850-2,856	Shale, medium-gray
2,450-2,460	Anhydrite, grayish-white, fine-crystalline	2,856-2,864	Limestone, very pale-orange, fine-crystalline; yellowish-brown to pale-orange granular calcareous chert and some spicular chert
2,460-2,469	Shale, medium-gray		
2,469-2,473	Dolomite, light olive-gray, fine-crystalline, argillaceous	2,864-2,867	Shale, medium-gray
2,473-2,482	Anhydrite, grayish-white, fine-crystalline	2,867-2,872	Limestone, light brownish-gray, fine-crystalline; medium light-gray spicular granular chert
	Chase Group		
	Nolans Limestone 2,482-2,540 feet	2,872-2,879	Shale, medium-gray
2,482-2,486	Dolomite, light- to medium-gray, fine-crystalline, argillaceous; grayish-white to light-gray dense chert	2,879-2,884	Limestone, brownish-gray, fine-granular, argillaceous
2,486-2,493	Limestone, medium-gray to pale yellowish-brown, very argillaceous, mottled; crinoids	2,884-2,888	Shale, medium-gray
2,493-2,498	Shale, medium-gray	2,888-2,896	Limestone, very pale-orange to pale yellowish-brown, fine-crystalline
2,498-2,503	Limestone, very pale-orange to light-gray, fine-crystalline; crinoids		
2,503-2,510	Shale, medium-gray	2,896-2,900	Shale, grayish-red
2,510-2,516	Shale, grayish-red	2,900-2,915	Shale, medium-gray
2,516-2,520	Shale, greenish-gray	2,915-2,920	Shale, grayish-red
2,520-2,526	Shale, medium-gray	2,920-2,925	Shale, greenish-gray
2,526-2,540	Dolomite, medium light-gray, fine-granular, argillaceous; brownish-gray dense chert; dark-gray spicular chert	2,925-2,934	Shale, moderate reddish-brown
		2,934-2,942	Shale, medium-gray
		2,942-2,947	Shale, grayish-red
		2,947-2,950	Shale, greenish-gray
2,540-2,546	Shale, medium-gray	2,950-2,956	Shale, medium-gray
		2,956-2,966	Shale, grayish-red
		2,966-2,970	Shale, moderate reddish-brown
		2,970-2,975	Shale, medium-gray
		2,975-2,982	Shale, olive-gray
	Winfield Limestone 2,546-2,614 feet		
2,546-2,550	Limestone, medium-gray, fine-crystalline, argillaceous; grayish-white dense chert		
2,550-2,560	Shale, medium-gray		
2,560-2,570	Limestone, medium-gray, fine-crystalline, argillaceous		
2,570-2,576	Limestone, brownish-gray, fine-crystalline, argillaceous; some reddish clay residue	2,982-2,990	Limestone, medium-gray, fine-crystalline, argillaceous
2,576-2,580	Limestone, medium light-gray, fine-crystalline, faintly oölitic and oölicastic	2,990-2,996	Shale, grayish-black
2,580-2,590	Limestone, medium-gray, very argillaceous or marly	2,996-3,002	Shale, olive-gray
2,590-2,602	Limestone, medium light-gray, fine-crystalline, argillaceous; medium- to medium dark-gray chert	3,002-3,013	Limestone, pale yellowish-brown, fine-crystalline
2,602-2,610	Limestone, medium-gray, fine-crystalline, argillaceous	3,013-3,020	Shale, greenish-gray
2,610-2,614	Limestone, medium light-gray, fine-crystalline, argillaceous; spotted with dark gray; crinoids	3,020-3,028	Shale, moderate brown
		3,028-3,030	Limestone, pale yellowish-brown, fine-crystalline
		3,030-3,040	Shale, medium-gray
		3,040-3,048	Limestone, very pale-orange, fine-crystalline
		3,048-3,053	Shale, medium-gray
		3,053-3,060	Limestone, medium light- to dark-gray, mottled, fine-crystalline, slightly argillaceous
2,614-2,617	Shale, medium-gray		
2,617-2,624	Shale, greenish-gray	3,060-3,062	Shale, medium-gray
2,624-2,632	Shale, medium-gray	3,062-3,066	Limestone, brownish-gray, fine-granular, argillaceous; fusulinids
2,632-2,634	Dolomite, pale yellowish-brown to very pale-orange, very fine-crystalline	3,066-3,070	Shale, medium-gray
2,634-2,640	Shale, medium-gray	3,070-3,074	Limestone, brownish-gray, finely oölitic, fine-crystalline
	Barneston Limestone 2,640-2,790 feet		
2,640-2,667	Shale, medium-gray, very calcareous or marly	3,074-3,080	Shale, grayish-red
2,667-2,677	Limestone, medium light- to medium-gray, fine-crystalline, very argillaceous	3,080-3,086	Shale, greenish-gray
2,677-2,685	Shale, medium-gray	3,086-3,100	Shale, medium-gray
2,685-2,688	Limestone, light- to medium light-gray, fine-crystalline; slightly yellowish-brown tint	3,100-3,103	Shale, grayish-black
2,688-2,691	Limestone, light olive-gray, fine-crystalline	3,103-3,110	Shale, greenish-gray
2,691-2,696	Siltstone, light olive-gray, calcareous	3,110-3,116	Shale, grayish-red
2,696-2,700	Shale, light greenish-gray, calcareous	3,116-3,125	Shale, medium-gray
2,700-2,704	Shale, greenish-gray	3,125-3,132	Shale, grayish-red
2,704-2,717	Shale, medium-gray	3,132-3,135	Sandstone, pale-red, fine-grained, calcareous
2,717-2,720	Siltstone, light-gray to pale yellowish-brown, very finely sandy, calcareous	3,135-3,140	Sandstone, moderate reddish-orange, fine-grained, calcareous
2,720-2,725	Limestone, medium-gray, fine-crystalline; fusulinids	3,140-3,145	Sandstone, very light-gray to very pale-orange, fine-grained, calcareous
2,725-2,730	Limestone, pale yellowish-brown, fine-crystalline; fusulinids	3,145-3,150	Shale, medium-gray
2,730-2,737	Limestone, medium light-gray, fine-crystalline, argillaceous	3,150-3,156	Shale, grayish-red
		3,156-3,166	Shale, medium-gray

4,366-4,370	Limestone, pale yellowish-brown, fine-crystalline, porous
4,370-4,374	Limestone, medium light-gray, fine-granular
4,374-4,380	Limestone, brownish-gray, fine-granular, argillaceous
4,380-4,387	Shale, medium-gray
4,387-4,390	Shale, greenish-gray
4,390-4,396	Shale, moderate-brown
4,396-4,408	Shale, medium-gray
4,408-4,411	Limestone, medium-gray, fine-crystalline, slightly argillaceous
4,411-4,417	Limestone, brownish-gray, fine-crystalline
4,417-4,425	Shale, brownish-gray, silty
4,425-4,444	Shale, medium-gray
4,444-4,450	Siltstone, light-gray to yellowish-brown, very finely sandy
4,450-4,468	Shale, medium-gray
4,468-4,474	Siltstone, brownish-gray, very finely sandy
4,474-4,480	Siltstone, medium-gray, very finely sandy
4,480-4,488	Shale, medium-gray
4,488-4,490	Siltstone, medium-gray, very finely sandy
4,490-4,496	Shale, medium-gray
4,496-4,500	Shale, moderate-brown
4,500-4,525	Shale, medium-gray
4,525-4,530	Shale, greenish-gray
4,530-4,570	Shale, medium-gray

Shawnee Group Equivalent
Topeka Limestone 4,570-4,624 feet

4,570-4,577	Limestone, brownish-gray, fine-crystalline, slightly argillaceous
4,577-4,592	Limestone, pale yellowish-brown, fine-crystalline; many fusulinids
4,592-4,600	Sandstone, pale yellowish-brown to very light-gray, very fine-grained, slightly dolomitic
4,600-4,604	Sandstone, very light-gray to very pale-orange, very fine- to fine-grained, calcareous
4,604-4,613	Limestone, light- to medium light-gray, very finely sandy, silty
4,613-4,620	Limestone, brownish-gray, very fine-crystalline
4,620-4,624	Limestone, light olive-gray, very fine-crystalline
4,624-4,630	Shale, greenish-gray
4,630-4,640	Shale, medium-gray
4,640-4,648	Sandstone, very light-gray, very fine- to fine-grained, slightly dolomitic
4,648-4,653	Sandstone, yellowish-brown, fine-grained
4,653-4,660	Siltstone, medium light-gray, very finely sandy
4,660-4,697	Shale, medium-gray
4,697-4,700	Shale, grayish-black
4,700-4,735	Shale, medium-gray
4,735-4,740	Shale, dark grayish-red
4,740-4,752	Shale, moderate-brown to brownish-gray
4,752-4,755	Limestone, pale yellowish-brown, fine-crystalline
4,755-4,764	Limestone, very pale-orange, fine-crystalline
4,764-4,770	Limestone, pale yellowish-brown, fine-crystalline, fine- to medium-oölitic; oölitic are poorly developed and black; some reddish oölitic
4,770-4,773	Limestone, pale yellowish-brown, finely oölitic and oöclastic
4,773-4,785	Limestone, pale yellowish-brown, fine-crystalline porous
4,785-4,790	Limestone, pale yellowish-brown, fine-crystalline; very light-gray to pale-orange dense chert
4,790-4,795	Limestone, brownish-gray, fine-crystalline
4,795-4,810	Limestone, pale yellowish-brown, fine-crystalline
4,810-4,817	Limestone, medium-gray, fine-crystalline, slightly argillaceous
4,817-4,823	Shale, medium-gray
4,823-4,832	Limestone, brownish-gray, fine-crystalline
4,832-4,879	Shale, medium-gray
4,879-4,882	Limestone, medium-gray, argillaceous
4,882-4,908	Shale, medium-gray
4,908-4,910	Shale, grayish-black
4,910-4,945	Shale, medium-gray
4,945-4,950	Shale, grayish-black; coal stringer
4,950-5,000	Shale, medium-gray
5,000-5,010	Shale, grayish-red; caving?
5,010-5,015	Shale, moderate reddish-brown; caving?
5,015-5,020	Shale, grayish-red
5,020-5,030	Shale, moderate-brown
5,030-5,064	Shale, medium-gray
5,064-5,070	Siltstone, moderate-brown to olive-gray
5,070-5,093	Shale, medium-gray
5,093-5,100	Sandstone, very light-gray to yellowish-brown, very fine- to fine-grained, slightly dolomitic
5,100-5,116	Shale, medium-gray
5,116-5,123	Shale, grayish-red
5,123-5,127	Sandstone, light-brown, very fine-grained, silty
5,127-5,130	Sandstone, very light-gray, very fine-grained, silty
5,130-5,138	Sandstone, light-gray, very fine- to fine-grained, dolomitic
5,138-5,170	Shale, medium-gray
5,170-5,190	Shale, grayish-red; caving?
5,190-5,199	Shale, olive-gray
5,199-5,205	Sandstone, very light-gray, fine-grained, porous
5,205-5,210	Sandstone, yellowish-brown, fine-grained, porous
5,210-5,228	Shale, medium-gray
5,228-5,237	Siltstone, very light-gray, very finely sandy

5,237-5,247	Shale, medium-gray
5,247-5,250	Siltstone, olive-gray
5,250-5,264	Shale, medium-gray

Oread Limestone Member of Vamoosa Formation 5,264-5,395 feet

5,264-5,270	Limestone, pale yellowish-brown, fine-crystalline
5,270-5,286	Limestone, medium-gray, very fine-crystalline
5,286-5,291	Limestone, brownish-gray, fine-crystalline, slightly argillaceous
5,291-5,299	Shale, medium-gray
5,299-5,310	Limestone, brownish-gray, fine-crystalline, slightly argillaceous
5,310-5,321	Limestone, pale yellowish-brown, very fine-crystalline
5,321-5,330	Shale, medium-gray
5,330-5,340	Shale, grayish-red
5,340-5,346	Shale, olive-gray
5,346-5,360	Shale, medium-gray; fusulinids 5,350-5,360 feet
5,360-5,368	Limestone, pale yellowish-brown to light-gray, fine-crystalline
5,368-5,370	Limestone, pale yellowish-brown, finely oölitic?; scattered fine sand; gastropods
5,370-5,380	Limestone, pale yellowish-brown, fine-crystalline
5,380-5,387	Limestone, medium-gray, fine-crystalline
5,387-5,395	Limestone, medium-gray, very finely sandy

Douglas Group Equivalent

5,395-5,405	Siltstone, brownish-gray to medium-gray
5,405-5,430	Shale, medium dark-gray
5,430-5,436	Shale, moderate-brown
5,436-5,440	Siltstone, greenish-gray
5,440-5,453	Siltstone, medium light- to light-gray, slightly calcareous
5,453-5,483	Shale, medium-gray
5,483-5,488	Siltstone, olive-gray
5,488-5,520	Shale, medium-gray
5,520-5,525	Shale, grayish-black
5,525-5,566	Shale, medium-gray; fusulinids 5,550-5,560 feet
5,566-5,570	Siltstone, olive-gray
5,570-5,576	Shale, moderate-brown
5,576-5,580	Shale, grayish-red
5,580-5,610	Shale, medium-gray
5,610-5,620	Shale, grayish-red

Missouri Series
Ochelata Group

Lansing Group Equivalent

5,620-5,626	Siltstone, greenish-gray
5,626-5,640	Shale, medium-gray
5,640-5,655	Siltstone, medium-gray
5,655-5,665	Sandstone, medium light- to medium-gray, very fine-grained, silty, slightly calcareous
5,665-5,672	Sandstone, light olive-gray, very fine-grained, silty, tight
5,672-5,680	Siltstone, medium light-gray to olive-gray
5,680-5,688	Shale, moderate-brown
5,688-5,698	Siltstone, moderate-brown, very finely sandy
5,698-5,707	Sandstone, pale yellowish-brown, very fine-grained
5,707-5,715	Sandstone, very light-gray, very fine-grained, slightly micaceous
5,715-5,725	Sandstone, very light-gray, fine-grained, slightly dolomitic
5,725-5,730	Sandstone, pale yellowish-brown, fine-grained, slightly dolomitic
5,730-5,733	Sandstone, very light-gray, fine-grained; reddish-brown grains
5,733-5,737	Sandstone, very light-gray, very fine- to fine-grained, slightly dolomitic

Kansas City Group Equivalent

5,737-5,760	Shale, medium-gray
5,760-5,764	Shale, grayish-black
5,764-5,780	Shale, medium-gray
5,780-5,784	Shale, grayish-black
5,784-5,790	Shale, medium-gray
5,790-5,810	Siltstone, medium-gray to olive-gray, very finely sandy
5,810-5,820	Shale, medium-gray
5,820-5,824	Shale, grayish-black
5,824-5,830	Shale, medium-gray
5,830-5,836	Shale, dark olive-gray, silty
5,836-5,900	Shale, medium-gray
5,900-5,905	Shale, grayish-black
5,905-5,955	Shale, medium-gray
5,955-5,965	Shale, grayish-black
5,965-6,020	Shale, medium-gray
6,020-6,025	Shale, grayish-black
6,025-6,040	Shale, medium-gray
6,040-6,050	Shale, olive-gray
6,050-6,070	Shale, medium-gray, silty
6,070-6,074	Shale, grayish-black
6,074-6,140	Shale, medium-gray
6,140-6,143	Siltstone, light olive-gray, slightly calcareous
6,143-6,158	Shale, medium-gray

Skiatook Group			
Drum Limestone 6,158-6,161 feet			
6,158-6,161	Limestone, medium-gray, very argillaceous and silty		
6,161-6,168	Shale, grayish-black		
6,168-6,180	Siltstone, medium-gray, slightly calcareous		
6,180-6,200	Sandstone, light-gray to light olive-gray, very fine-grained, slightly dolomitic, micaceous, tight		
6,200-6,205	Shale, medium-gray		
6,205-6,224	Sandstone, very light- to light-gray, fine-grained; scattered carbonaceous material		
6,224-6,229	Shale, medium-gray		
6,229-6,240	Sandstone, very light-gray, fine-grained, slightly dolomitic, slightly micaceous		
6,240-6,256	Sandstone, pale yellowish-brown to light olive-gray, fine-grained, slightly dolomitic		
6,256-6,267	Sandstone, very light-gray, very fine-grained, silty		
6,267-6,356	Shale, medium-gray		
6,356-6,366	Shale, moderate-brown to brownish-gray, caving?		
6,366-6,380	Shale, grayish-red; caving?		
6,380-6,392	Shale, medium-gray		
6,392-6,405	Shale, olive-gray		
6,405-6,420	Shale, medium-gray		
6,420-6,424	Siltstone, medium dark-gray		
6,424-6,430	Siltstone, medium-gray		
6,430-6,436	Siltstone, olive-gray		
6,436-6,442	Siltstone, light olive-gray		
6,442-6,484	Shale, medium-gray		
Hogshooter Limestone 6,484-6,487 feet			
6,484-6,487	Limestone, medium dark-gray, very argillaceous		
6,487-6,495	Siltstone, olive-gray		
6,495-6,500	Shale, medium-gray		
6,500-6,504	Shale, olive-gray		
6,504-6,535	Shale, medium-gray		
6,535-6,540	Shale, grayish-black		
6,540-6,575	Shale, medium-gray		
6,575-6,580	Shale, grayish-black		
6,580-6,658	Shale, medium-gray		
6,658-6,661	Limestone, dark-gray, fine-crystalline, very argillaceous		
6,661-6,677	Shale, medium-gray		
6,677-6,680	Siltstone, brownish-gray to medium dark-gray		
6,680-6,683	Limestone, medium dark-gray, fine-crystalline, argillaceous, slightly brownish		
6,683-6,690	Siltstone, medium dark-gray		
6,690-6,696	Shale, grayish-black		
6,696-6,706	Siltstone, medium-gray, slightly calcareous		
6,706-6,710	Limestone, medium-gray, fine-crystalline, argillaceous		
6,710-6,711	Shale, medium-gray		
6,711-6,713	Limestone, medium-gray, fine-crystalline		
Pleasanton Group Equivalent (Pleasanton Formation Equivalent on Chart OC-61)			
6,713-6,740	Shale, medium-gray		
6,740-6,750	Shale, brownish-gray, silty		
6,750-6,767	Shale, medium dark-gray, silty		
6,767-6,775	Shale, grayish-black		
6,775-6,786	Siltstone, medium-gray, slightly calcareous		
6,786-6,795	Shale, medium-gray		
6,795-6,810	Siltstone, medium light-gray		
6,810-6,820	Shale, medium-gray		
Des Moines Series			
Marmaton Group			
6,820-6,826	Limestone, medium-gray, fine-crystalline, argillaceous		
6,826-6,830	Limestone, brownish-gray, very fine-crystalline		
6,830-6,839	Shale, medium-gray		
6,839-6,845	Limestone, medium light-gray, very fine-crystalline		
6,845-6,850	Limestone, pale yellowish-brown, fine-crystalline		
6,850-6,855	Limestone, very pale-orange, fine-crystalline		
6,855-6,860	Limestone, very light- to light-gray, fine-crystalline		
6,860-6,867	Limestone, pale yellowish-brown, fine-crystalline		
6,867-6,888	Shale, medium-gray		
6,888-6,894	Limestone, medium dark-gray to dark-gray, fine-crystalline, argillaceous; crinoids		
6,894-6,900	Limestone, medium-gray, fine-crystalline, slightly argillaceous		
6,900-6,907	Limestone, pale yellowish-brown, fine-crystalline		
6,907-6,917	Limestone, medium dark-gray, fine-crystalline, argillaceous		
6,917-6,927	Limestone, brownish-gray to pale yellowish-brown, very fine-crystalline		
6,927-6,931	Shale, medium-gray		
6,931-6,936	Limestone, medium dark-gray, very fine-crystalline, slightly argillaceous		
6,936-6,945	Limestone, pale yellowish-brown, fine-crystalline		
6,945-6,950	Limestone, brownish-gray, very fine-crystalline		
6,950-6,962	Limestone, pale yellowish-brown, very fine-crystalline		
6,962-6,968	Shale, medium-gray		
6,968-6,974	Limestone, medium dark-gray, fine-crystalline, argillaceous		
6,974-6,988	Limestone, medium-gray, fine-crystalline		
6,988-6,996	Shale, medium-gray		
6,996-7,000	Shale, grayish-black		
7,000-7,008	Shale, medium-gray		
7,008-7,010	Limestone, brownish-gray, very fine-crystalline		
7,010-7,020	Limestone, pale yellowish-brown, fine-crystalline		
7,020-7,025	Shale, grayish-black		
7,025-7,030	Shale, medium-gray		
7,030-7,040	Siltstone, olive-gray, slightly calcareous		
7,040-7,050	Shale, medium-gray		
7,050-7,055	Shale, grayish-black		
7,055-7,060	Limestone, dark-gray, fine-crystalline, argillaceous		
7,060-7,069	Limestone, brownish-gray to dark brownish-gray, very fine-crystalline		
Cabaniss and Krebs Groups			
7,069-7,076	Shale, olive-gray, silty		
7,076-7,084	Siltstone, moderate-brown		
7,084-7,090	Shale, grayish-red; probably caving		
7,090-7,092	Shale, medium-gray		
7,092-7,094	Limestone, pale yellowish-brown, very fine-crystalline		
7,094-7,140	Shale, medium-gray		
7,140-7,145	Limestone, brownish-gray, fine-crystalline		
7,145-7,152	Limestone, pale yellowish-brown, fine-crystalline		
7,152-7,160	Shale, medium-gray		
7,160-7,165	Shale, grayish-black		
7,165-7,170	Shale, medium-gray		
7,170-7,173	Limestone, dark-gray, fine-crystalline, very argillaceous		
7,173-7,178	Limestone, brownish-gray, very fine-crystalline		
7,178-7,180	Shale, medium-gray		
7,180-7,184	Limestone, medium dark-gray, fine-crystalline, argillaceous		
7,184-7,190	Shale, medium-gray		
7,190-7,195	Shale, grayish-black		
7,195-7,210	Shale, medium-gray		
7,210-7,214	Shale, greenish-gray		
7,214-7,220	Shale, grayish-black		
7,220-7,230	Shale, medium-gray		
7,230-7,232	Limestone, medium dark-gray, fine-crystalline, argillaceous		
7,232-7,236	Shale, medium-gray		
7,236-7,244	Shale, greenish-gray		
7,244-7,248	Shale, medium-gray		
7,248-7,257	Siltstone, light olive-gray, very finely sandy		
7,257-7,260	Shale, medium-gray		
7,260-7,265	Shale, grayish-black		
7,265-7,270	Shale, medium-gray		
7,270-7,271	Limestone, medium-gray, very fine-crystalline		
7,271-7,278	Shale, medium-gray		
7,278-7,280	Limestone, dark-gray, fine-crystalline, slightly argillaceous		
7,280-7,294	Shale, medium-gray		
7,294-7,297	Limestone, medium-gray to brownish-gray, fine-crystalline, slightly argillaceous; brachiopods		
7,297-7,304	Limestone, medium dark- to dark-gray, fine-crystalline, slightly argillaceous; fusulinids		
7,304-7,310	Shale, grayish-black		
7,310-7,323	Shale, medium-gray		
7,323-7,325	Limestone, dark-gray, fine-crystalline, argillaceous		
7,325-7,330	Shale, medium-gray		
7,330-7,335	Shale, grayish-black		
7,335-7,350	Shale, medium-gray		
7,350-7,360	Shale, olive-gray		
Mississippian System			
Upper Mississippian Series			
Rocks of Chesterian Age			
7,360-7,364	Limestone, medium-gray, very fine-crystalline, slightly brownish		
7,364-7,367	Shale, medium-gray		
7,367-7,372	Limestone, medium-gray, slightly brownish, very fine-crystalline		
7,372-7,380	Shale, medium-gray		
7,380-7,384	Shale, greenish-gray		
7,384-7,388	Limestone, brownish-gray, very fine-crystalline		
7,388-7,400	Shale, medium-gray		
7,400-7,405	Limestone, pale yellowish-brown to light-gray, fine-crystalline, argillaceous		
7,405-7,415	Shale, medium-gray		
7,415-7,420	Shale, olive-gray		
7,420-7,426	Shale, medium-gray		
7,426-7,430	Limestone, pale yellowish-brown to medium light-gray, fine-crystalline		
7,430-7,436	Limestone, brownish-gray, very fine-crystalline, medium-oolitic		
7,436-7,446	Limestone, pale yellowish-brown to brownish-gray, fine-crystalline		
7,446-7,450	Limestone, medium dark-gray, fine-crystalline, medium-oolitic		
7,450-7,451	Sandstone, medium-gray, finely argillaceous		
7,451-7,454	Shale, medium-gray		
7,454-7,460	Limestone, brownish-gray, fine-crystalline, medium-oolitic		
7,460-7,505	Shale, medium-gray		
7,505-7,510	Shale, grayish-black		
7,510-7,526	Shale, medium-gray		

7,526-7,530	Limestone, medium-gray, fine-crystalline, argillaceous	8,150-8,160	Limestone, dark-gray, fine-crystalline, very argillaceous, silty
7,530-7,548	Shale, medium-gray	8,160-8,165	Limestone, dark-gray, fine-crystalline, very argillaceous, silty; crinoids
7,548-7,551	Limestone, medium-gray, fine-crystalline, argillaceous	8,165-8,170	Limestone, dark-gray, fine-crystalline, very argillaceous, silty; dark-gray calcareous chert
7,551-7,577	Shale, medium-gray	8,170-8,180	Limestone, medium dark- to dark-gray, fine-crystalline, very argillaceous, silty
7,577-7,593	Limestone, medium- to medium dark-gray, fine-crystalline, argillaceous	8,180-8,190	Limestone as above; slightly brownish; medium dark-gray chert 8,180-8,185 feet
7,593-7,628	Shale, medium-gray	8,190-8,200	Siltstone, medium dark- to dark-gray, calcareous
7,628-7,633	Limestone, medium-gray, fine-crystalline, silty; brachiopods; crinoids	8,200-8,210	Limestone, medium dark-gray to dark-gray, fine-crystalline, very argillaceous and silty
7,633-7,635	Limestone, pale yellowish-brown, finely oölitic	8,210-8,215	Limestone as above; dark-gray calcareous chert
7,635-7,640	Limestone, brownish-gray, fine-crystalline, silty	8,215-8,226	Limestone, medium dark-gray, fine-crystalline, very argillaceous; trace medium dark-gray dense chert
7,640-7,642	Shale, medium-gray	8,226-8,232	Limestone, dark-gray, fine-crystalline, very argillaceous; dark-gray dense chert
7,642-7,648	Shale, greenish-gray	8,232-8,241	Siltstone, dark-gray, calcareous; looks like limestone
7,648-7,650	Limestone, olive-gray, silty	8,241-8,250	Limestone, dark-gray, fine-crystalline, very argillaceous
7,650-7,653	Limestone, medium dark-gray, fine-crystalline, argillaceous	8,250-8,260	Limestone as above; medium dark- to dark-gray dense chert
7,653-7,680	Shale, medium-gray	8,260-8,275	Limestone, medium dark-gray, fine-crystalline, very argillaceous; medium dark- to dark-gray dense chert
7,680-7,690	Limestone, medium-gray, fine-crystalline, slightly argillaceous	8,275-8,288	Siltstone, dark-gray, calcareous; looks like limestone
7,690-7,697	Limestone, light olive-gray to pale yellowish-brown, fine-crystalline	8,288-8,295	Limestone, dark-gray, fine-crystalline, very argillaceous; crinoids
7,697-7,700	Limestone, brownish-gray, fine-crystalline, medium-oölitic	8,295-8,308	Limestone, dark-gray, fine-crystalline, very argillaceous
7,700-7,709	Limestone, medium dark- to dark-gray, fine-crystalline, argillaceous	8,308-8,323	Siltstone, dark-gray, calcareous; looks like limestone
7,709-7,720	Shale, medium-gray	8,323-8,337	Limestone, dark-gray, fine-crystalline, very argillaceous
7,720-7,726	Shale, greenish-gray	8,337-8,340	Limestone as above; dark-gray dense chert
7,726-7,730	Shale, grayish-black	8,340-8,345	Limestone, dark-gray, fine-crystalline, very argillaceous
7,730-7,738	Shale, medium-gray	8,345-8,350	Limestone, medium-gray, very fine-crystalline, argillaceous, slightly brownish
7,738-7,746	Limestone, medium dark- to dark-gray, fine-crystalline; slightly argillaceous	8,350-8,355	Limestone, brownish-gray, very fine-crystalline, slightly silty
7,746-7,758	Shale, medium-gray	8,355-8,360	Limestone as above; dark-gray dense chert
7,758-7,770	Limestone, medium- to medium dark-gray, fine-crystalline, silty, argillaceous; brachiopods	8,360-8,375	Limestone, medium dark-gray, very fine-crystalline, very argillaceous
7,770-7,780	Shale, medium-gray	8,375-8,385	Limestone, medium dark-brownish-gray, very fine-crystalline, argillaceous
7,780-7,787	Limestone, medium- to medium dark-gray, fine-crystalline, silty, argillaceous	8,385-8,395	Limestone, dark-gray, very fine-crystalline, very argillaceous
7,787-7,791	Limestone, grayish-black, very fine-crystalline, argillaceous; crinoids	8,395-8,400	Limestone, pale yellowish-brown, fine-crystalline, slightly argillaceous
7,791-7,815	Shale, medium-gray	8,400-8,416	Siltstone, dark-gray, calcareous; looks like limestone
7,815-7,820	Shale, grayish-black	8,416-8,420	Limestone, medium dark- to dark-gray, fine-crystalline, very argillaceous
7,820-7,826	Shale, medium-gray	8,420-8,425	Limestone, medium-gray, fine-crystalline, argillaceous
7,826-7,832	Siltstone, medium-gray, calcareous	8,425-8,435	Limestone, dark-gray, fine-crystalline, very argillaceous
7,832-7,840	Shale, medium-gray	8,435-8,440	Siltstone, dark-gray, calcareous; looks like limestone
7,840-7,848	Siltstone, medium light-gray, calcareous	8,440-8,460	Limestone, medium dark-gray, dense to very fine-crystalline, argillaceous
7,848-7,850	Shale, medium-gray	8,460-8,475	Limestone, medium dark- to dark-gray, fine-crystalline, very argillaceous
7,850-7,855	Shale, olive-gray	8,475-8,485	Limestone as above; medium dark-gray slightly calcareous chert
7,855-7,860	Shale, brownish-gray	8,485-8,490	Limestone, medium dark- to dark-gray, very fine-crystalline, very argillaceous; dark-gray slightly calcareous chert
7,860-7,875	Shale, medium-gray	8,490-8,496	Limestone, medium dark-gray, very fine-crystalline, slightly argillaceous
7,875-7,880	Shale, grayish-black	8,496-8,500	Siltstone, dark-gray, calcareous; looks like limestone; medium dark-gray dense chert
7,880-7,900	Shale, medium-gray	8,500-8,506	Limestone, medium dark-gray, fine-crystalline, very argillaceous, slightly brownish
7,900-7,906	Shale, grayish-red, caving?	8,506-8,510	Siltstone, dark-gray, slightly calcareous; much glauconite
7,906-7,926	Shale, medium-gray		
Upper and Lower Mississippian Series			
Rocks of Meramecian and Osagean Ages			
7,926-7,935	Limestone, light-gray, fine- to medium-crystalline	8,510-8,515	Limestone, medium dark-gray, fine-crystalline, very argillaceous
7,935-7,944	Limestone, very pale-orange, fine-crystalline, soft; medium light-gray dense chert	8,515-8,525	Limestone, medium dark- to dark-gray, dense to very fine-crystalline, argillaceous
7,944-7,950	Limestone, pale yellowish-brown, fine-granular; mottled with grayish white	8,525-8,530	Shale, medium dark- to dark-gray
7,950-7,955	Limestone, pale yellowish-brown, fine-crystalline, silty	8,530-8,533	Shale, light greenish-gray, soft
7,955-7,966	Limestone, medium-gray, fine-crystalline, silty		
7,966-7,976	Siltstone, medium dark- to dark-gray, calcareous; resembles silty limestone	Mississippian and Devonian Systems	
7,976-7,981	Limestone, light-gray, very silty	Woodford Shale 8,533-8,563? feet	
7,981-7,986	Limestone, medium light-gray, slightly yellowish-brown, medium-crystalline	8,533-8,540	Shale, black, dull, chunky
7,986-7,990	Limestone, medium dark-gray, fine-crystalline, very silty	8,540-8,580	No samples
7,990-8,010	Limestone, medium dark- to dark-gray, fine-crystalline, very argillaceous		
8,010-8,013	Limestone, pale yellowish-brown, fine- to medium-crystalline	Devonian and Silurian Systems	
8,013-8,025	Limestone, medium dark- to dark-gray, fine-crystalline, very argillaceous	Hunton Group	
8,025-8,035	Limestone, medium light- to medium-gray, fine-crystalline, argillaceous	8,580-8,585	Dolomite, pale yellowish-brown, fine-crystalline; trace grayish-white dense chert
8,035-8,040	Limestone, medium dark-gray, fine-crystalline, very argillaceous and silty	8,585-8,590	Dolomite as above
8,040-8,050	Limestone, dark-gray, fine-crystalline, very argillaceous and silty	8,590-8,595	Dolomite, light olive-gray, fine-crystalline
8,050-8,055	Siltstone, dark-gray, calcareous; resembles limestone	8,595-8,605	Dolomite, medium light- to medium-gray, fine-crystalline, slightly argillaceous
8,055-8,067	Limestone, medium dark- to dark-gray, very argillaceous, fine-crystalline	8,605-8,616	Dolomite, pale yellowish-brown, fine-crystalline
8,067-8,070	Limestone, pale yellowish-brown, fine- to medium-crystalline	8,616-8,626	Limestone, medium- to medium dark-gray, fine-crystalline, argillaceous; slightly brownish in part
8,070-8,075	Limestone, medium-gray, fine- to medium-crystalline, argillaceous		
8,075-8,090	Limestone, medium dark-gray, fine-crystalline, very argillaceous, silty		
8,090-8,110	Limestone, dark-gray, fine-crystalline, very argillaceous, silty		
8,110-8,120	Siltstone, dark-gray, calcareous; looks like limestone		
8,120-8,125	Limestone, medium dark-gray, fine-crystalline, very argillaceous, slightly brownish		
8,125-8,150	Siltstone, dark-gray; looks like limestone		

8,626-8,636	Limestone, medium dark- to dark-gray, fine-crystalline, very argillaceous	9,110-9,116	Dolomite, brownish-gray, fine-crystalline, calcareous
8,636-8,644	Limestone, medium-gray, fine-crystalline, argillaceous	9,116-9,121	Dolomite, pale yellowish-brown, fine-crystalline, slightly calcareous
8,644-8,650	Limestone, brownish-gray, fine-crystalline, slightly argillaceous	9,121-9,126	Limestone, brownish-gray, fine-crystalline
8,650-8,655	Limestone, medium dark-gray, fine-crystalline, silty	9,126-9,136	Dolomite, pale yellowish-brown to medium light-gray, fine- to medium-crystalline, slightly calcareous
8,655-8,660	Limestone, medium dark-gray, fine-crystalline, argillaceous	9,136-9,150	Limestone, medium light-gray to very pale-orange, fine-crystalline; medium light- to medium-gray dense chert
8,660-8,670	Limestone, medium-gray, fine-crystalline, slightly argillaceous	9,150-9,160	Limestone, medium light-gray to pale yellowish-brown, medium-crystalline; medium-gray to brownish-gray dense chert
8,670-8,675	Limestone, medium dark-gray, fine-crystalline, argillaceous	9,160-9,174	Limestone, medium light-gray to pale yellowish-brown, medium-crystalline
8,675-8,680	Limestone, medium dark-gray, dense, argillaceous	9,174-9,183	Limestone, medium dark-gray, fine-crystalline, argillaceous, slightly brownish
8,680-8,685	Limestone, medium dark-gray, fine-crystalline, argillaceous	9,183-9,190	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous; brachiopods; medium dark-gray dense chert
8,685-8,703	Limestone, medium-gray, fine-crystalline	9,190-9,195	Limestone, medium-gray, fine-crystalline, slightly argillaceous; pyrite; medium dark-gray dense chert
8,703-8,714	Dolomite, pale yellowish-brown, fine-crystalline	9,195-9,200	Limestone, medium-gray, fine-crystalline; chert as above
8,714-8,720	Limestone, medium-gray to brownish-gray, fine-crystalline	9,200-9,206	Limestone, light- to medium light-gray, fine-crystalline; dark-gray spots; medium- to dark-gray spicular chert
8,720-8,725	Limestone, pale yellowish-brown, fine-crystalline	9,206-9,213	Limestone, light-gray, fine-crystalline; medium light-gray granular spicular chert
8,725-8,730	Limestone, medium-gray, fine-crystalline	9,213-9,217	Limestone, medium light- to medium-gray, fine-crystalline, dolomitic
8,730-8,740	Limestone, light- to medium light-gray, fine-crystalline	9,217-9,228	Dolomite, medium-gray, fine-crystalline, slightly brownish
8,740-8,755	Limestone, medium-gray, fine-crystalline; slightly yellowish-brown tint	9,228-9,230	Limestone, pale yellowish-brown, fine- to medium-crystalline
8,755-8,760	Limestone, pale yellowish-brown, fine-crystalline	9,230-9,235	Limestone, medium-gray, fine- to medium-sandy; much subrounded sand
8,760-8,775	Limestone, pale yellowish-brown, very fine-crystalline	9,235-9,244	Limestone, light-gray, fine- to medium-sandy
8,775-8,785	Limestone, pale yellowish-brown, dense to very fine-crystalline	9,244-9,247	Sandstone, light-gray, fine- to medium-grained, calcareous
8,785-8,795	Limestone, medium-gray, dense to very fine-crystalline; moderate reddish-orange crinoid fragments	9,247-9,250	Limestone, medium dark- to dark-gray, fine-crystalline, argillaceous
8,795-8,815	Limestone, pale yellowish-brown, dense to very fine-crystalline; crinoids as above	9,250-9,255	Dolomite, light-gray to pale yellowish-brown, fine-crystalline
8,815-8,820	Limestone, pale yellowish-brown, dense to very fine-crystalline	9,255-9,257	Sandstone, white, fine-grained
8,820-8,830	Limestone as above; moderate reddish-orange crinoid fragments	9,257-9,274	No samples
8,830-8,840	Limestone, pale yellowish-brown, very fine-crystalline	9,274-9,286	Dolomite, pale yellowish-brown to brownish-gray, fine-crystalline
8,840-8,850	Limestone as above; light-gray to grayish-white dense chert	9,286-9,289	Limestone, olive-gray, dense; few fine sand grains
8,850-8,855	Limestone and chert as above; some medium-gray dense chert	9,289-9,290	Sandstone, white, fine-grained; some medium-grained sandstone
8,855-8,870	Limestone, very pale-orange, very fine-granular; very light- to medium-gray dense chert	9,290-9,300	Sandstone, white, fine- to medium-grained, calcareous, subrounded; some light greenish-gray sandstone
Ordovician System			
Sylvan Shale 8,870-8,978 feet			
8,870-8,873	Shale, greenish-gray, fissile	9,300-9,309	Sandstone, white to very pale-orange, fine-grained
8,873-8,880	Shale, dark-gray, chunky	9,309-9,311	Shale, medium-gray
8,880-8,900	Shale, medium- to medium dark-gray	9,311-9,374	Sandstone, white to very pale-orange, fine-grained; some medium sand; some oil-stained? sand
8,900-8,920	Shale, medium dark- to dark-gray, chunky, dolomitic	9,374-9,376	Shale, medium-gray
8,920-8,947	Shale, medium dark- to dark-gray	9,376-9,382	Sandstone, white, fine-grained; white to very pale-orange fine-grained sandstone
8,947-8,950	Limestone, medium dark-gray, fine-crystalline, argillaceous	9,382-9,386	Shale, medium-gray
8,950-8,955	Dolomite, grayish-black, very argillaceous; many fine black shale? pellets	9,386-9,390	Sandstone, white, very fine- to fine-grained
8,955-8,960	Dolomite, grayish-black, very argillaceous; dolomitic chunky shale	9,390-9,392	Shale, medium-gray
8,960-8,978	Shale, grayish-black, dolomitic, chunky	9,392-9,475	Sandstone, very light-gray to very pale-orange, fine-grained; some oil-stained? sandstone
Viola Limestone 8,978-9,040 feet			
8,978-8,983	Limestone, medium dark-gray, fine-crystalline, argillaceous	9,475-9,480	Sandstone, medium light- to medium dark-gray, fine-grained; color from oil stain?
8,983-8,995	Limestone, brownish-gray, fine- to medium-crystalline	9,480-9,484	Sandstone, light-gray, very fine-grained, silty, glauconitic; pyrite
8,995-9,000	Limestone, medium-gray, medium-crystalline	9,484-9,490	Siltstone, medium- to medium dark-gray, very fine- to medium-sandy, glauconitic, pyritic
9,000-9,006	Limestone, medium light-gray, fine-crystalline; little brownish-gray dense chert	9,490-9,500	Siltstone, olive-gray, moderate-brown, and medium dark-gray
9,006-9,010	Limestone, medium light-gray, fine-crystalline	9,500-9,506	Shale, greenish-gray
9,010-9,016	Limestone, brownish-gray, fine-crystalline	9,506-9,509	Shale, grayish-black
9,016-9,020	Limestone, medium- to medium dark-gray, fine-crystalline, slightly argillaceous	9,509-9,514	Shale, greenish-gray
9,020-9,030	Limestone, light-gray to very pale-orange, medium-crystalline	9,514-9,517	Shale, medium-gray
9,030-9,040	Limestone, pale yellowish-brown, fine-crystalline	9,517-9,520	Shale, greenish-gray
Simpson Group			
Bromide Formation 9,040-9,480 feet			
9,040-9,045	Limestone, pale yellowish-brown, dense to very fine-crystalline; little grayish-orange fine-crystalline limestone	9,520-9,525	Shale, medium-gray
9,045-9,055	Limestone, light-gray to pale yellowish-brown, dense to very fine-crystalline	9,525-9,535	Shale, dark greenish-gray
9,055-9,060	Limestone, pale yellowish-brown, dense to very fine-crystalline; trace grayish-white dense chert	9,535-9,558	Shale, medium dark-gray, slightly greenish
9,060-9,070	Limestone, pale yellowish-brown, dense to very fine-crystalline	9,558-9,566	Sandstone, light olive-gray, fine-grained, glauconitic, argillaceous, slightly dolomitic
9,070-9,075	Limestone, brownish-gray, dense to very fine-crystalline	9,566-9,572	Sandstone, light-gray, fine-grained, slightly dolomitic; trace glauconite
9,075-9,085	Limestone, medium-gray, fine-crystalline, slightly argillaceous	9,572-9,577	Shale, medium-gray
9,085-9,090	Limestone, medium-gray, very fine-crystalline	9,577-9,580	Shale, grayish-black
9,090-9,092	Limestone, pale yellowish-brown, very fine-crystalline	9,580-9,583	Shale, medium-gray
9,092-9,096	Dolomite, brownish-gray, fine-crystalline, calcareous, argillaceous	9,583-9,587	Shale, greenish-gray
9,096-9,100	Dolomite, medium light-gray, fine-crystalline, calcareous	9,587-9,600	Shale, medium-gray
9,100-9,105	Limestone, grayish-white, fine-crystalline soft; grayish-white dense chert	9,600-9,602	Siltstone, moderate-brown
9,105-9,110	Limestone, medium light-gray, fine-crystalline; trace light-gray mottled chert; grayish-white granular chert	9,602-9,615	Sandstone, grayish-white, very fine-grained, dolomitic; scattered fine to medium grains; little light greenish-gray fine-grained sandstone
		9,615-9,625	Shale, medium-gray
		9,625-9,630	Shale, grayish-black
		9,630-9,635	Shale, dark greenish-gray
		9,635-9,654	Shale, medium-gray
		9,654-9,675	Sandstone, medium light- to medium dark-gray, very fine- to medium-grained, very silty, dolomitic

9,675- 9,680	Sandstone as above; medium light-gray oölitic chert; oölitic have sand centers	10,130-10,145	Dolomite, medium light-gray, medium-crystalline
9,680- 9,684	Dolomite, medium-gray, very silty	10,145-10,160	Dolomite, brownish-gray, medium-crystalline; light-gray translucent medium- to coarse-oölitic chert
9,684- 9,690	Sandstone, medium-gray, very fine- to medium-grained, very silty, dolomitic	10,160-10,170	Dolomite, pale yellowish-brown to brownish-gray, fine-crystalline
9,690- 9,696	Shale, greenish-gray	10,170-10,180	Dolomite, medium dark-gray to brownish-gray, fine-crystalline
9,696- 9,700	Siltstone, medium- to medium dark-gray, fine- to medium-sandy	10,180-10,185	Dolomite, brownish-gray to medium-gray, fine-crystalline
9,700- 9,710	Siltstone as above; little greenish-gray siltstone	10,185-10,195	Dolomite, pale yellowish-brown to medium light-gray, fine- to medium-crystalline
9,710- 9,721	Shale, medium-gray	10,195-10,200	Dolomite, pale yellowish-brown, fine-crystalline; medium light-gray dense to figured chert
Ordovician and Cambrian Systems Arbuckle Group		10,200-10,205	Dolomite as above
9,721- 9,725	Dolomite, pale yellowish-brown, fine-crystalline	10,205-10,215	Dolomite, pale yellowish-brown, medium-crystalline; medium light-gray to brownish-gray chert
9,725- 9,730	Dolomite, medium dark-gray, fine-crystalline	10,215-10,221	Dolomite, pale yellowish-brown, medium-crystalline; medium light-gray mottled oölitic chert
9,730- 9,740	Dolomite, medium light- to medium-gray, fine-crystalline; scattered fine sand	10,221-10,230	Dolomite, pale yellowish-brown, medium- to coarse-crystalline
9,740- 9,745	Dolomite, pale yellowish-brown, fine-crystalline	10,230-10,235	Dolomite, medium light-gray, medium-crystalline; light- to medium light-gray dense chert
9,745- 9,755	Dolomite, pale yellowish-brown, very fine-crystalline	10,235-10,245	Dolomite, very pale-orange to pale yellowish-brown, medium-crystalline; quartz crystals
9,755- 9,765	Dolomite, medium- to medium dark-gray, fine-crystalline	10,245-10,250	Dolomite, medium-gray, fine-crystalline; light-gray dense chert
9,765- 9,770	Dolomite, pale yellowish-brown, fine-crystalline; little light-gray chert	10,250-10,265	Dolomite, pale yellowish-brown, fine-crystalline
9,770- 9,785	No samples	10,265-10,280	Dolomite, pale yellowish-brown, fine-crystalline, grayish
9,785- 9,790	Dolomite, brownish-gray, fine-crystalline	10,280-10,295	Dolomite, brownish-gray, medium-crystalline
9,790- 9,800	Dolomite, medium light-gray to pale yellowish-brown, fine-crystalline, oölitic?; light-gray chert with moderate-brown oölitic	10,295-10,307	Dolomite, medium-gray, fine-crystalline, brownish
9,800- 9,806	Dolomite, pale yellowish-brown, fine-crystalline	10,307-10,325	Dolomite, medium dark-brownish-gray, medium-crystalline
9,806- 9,813	Dolomite, very pale-orange to light-gray, fine-crystalline	10,325-10,335	Dolomite, brownish-gray, fine-crystalline
9,813- 9,830	Dolomite, pale yellowish-brown, fine-crystalline	10,335-10,340	Dolomite, medium light-gray, fine-crystalline
9,830- 9,845	Dolomite as above; some pinhole porosity	10,340-10,355	Dolomite, brownish-gray to medium-gray, medium-crystalline
9,845- 9,860	Dolomite, brownish-gray to medium-gray, fine-crystalline	10,355-10,360	Dolomite, medium dark-gray, fine-crystalline, argillaceous
9,860- 9,866	Dolomite, medium dark-gray, fine-crystalline, argillaceous	10,360-10,370	Dolomite, medium-gray, fine-crystalline
9,866- 9,870	Dolomite, medium-gray, fine-crystalline	10,370-10,380	Dolomite, medium light-gray, fine- to medium-crystalline
9,870- 9,874	Dolomite, medium light-gray, fine- to medium-crystalline	10,380-10,385	Dolomite as above; some medium light-gray dolomite; scattered fine to medium subrounded sand grains
9,874- 9,880	Dolomite, light- to medium light-gray, fine-crystalline, fine- to medium-sandy	10,385-10,390	Dolomite, medium-gray, fine-crystalline
9,880- 9,885	Dolomite, medium-gray, fine-crystalline, slightly brownish	10,390-10,400	Dolomite, medium dark-gray, medium-crystalline; some brownish dolomite
9,885- 9,890	Dolomite, light-gray, fine-crystalline, medium- to coarse-sandy	10,400-10,405	Dolomite, brownish-gray, fine-crystalline; medium light-gray chert
9,890- 9,900	Dolomite, pale yellowish-brown, fine-crystalline	10,405-10,410	Dolomite, pale yellowish-brown, medium-crystalline; grayish in part
9,900- 9,925	Dolomite, medium-gray, fine-crystalline; some brownish dolomite	10,410-10,415	Dolomite, medium- to medium dark-gray, fine- to medium-crystalline; medium-gray chert
9,925- 9,930	Dolomite, brownish-gray, fine-crystalline	10,415-10,420	Dolomite, brownish-gray, medium-crystalline; brownish-gray chert
9,930- 9,940	Dolomite, medium light-gray, fine-crystalline	10,420-10,425	Dolomite, medium light- to medium-gray, fine-crystalline; light-gray chert
9,940- 9,950	Dolomite, medium-gray, fine- to medium-crystalline, slightly brownish	10,425-10,445	Dolomite, pale yellowish-brown, fine- to medium-sandy; pale yellowish-brown to white medium- to coarse-oölitic chert; some oölitic have sand centers
9,950- 9,960	Dolomite, medium-gray, fine-crystalline	10,445-10,455	Dolomite, brownish-gray to medium-gray, medium-crystalline; pinhole porosity; some vugs
9,960- 9,970	Dolomite, pale yellowish-brown, fine-crystalline; light-gray chert (faintly figured)	10,455-10,460	Dolomite, medium-gray, fine-crystalline
9,970- 9,980	Dolomite, medium light-gray, fine-crystalline, slightly yellowish-brown	10,460-10,465	Dolomite, brownish-gray, fine- to medium-crystalline
9,980- 9,990	Dolomite, light-gray, fine-crystalline; very light-gray glassy chert	10,465-10,470	Dolomite, brownish-gray to pale yellowish-brown, medium-crystalline; brownish-gray speckled chert
9,990-10,000	Dolomite, pale yellowish-brown, fine-crystalline; light-gray dense chert	10,470-10,475	Dolomite as above
10,000-10,006	Dolomite, brownish-gray, fine-crystalline; chert as above	10,475-10,480	Dolomite, medium-gray, fine-crystalline
10,006-10,010	Dolomite, medium light- to medium-gray, medium-crystalline	10,480-10,490	Dolomite, pale yellowish-brown, medium-crystalline
10,010-10,013	Dolomite, light-gray, fine-crystalline; scattered fine sand; trace light-gray finely sandy chert	10,490-10,500	Dolomite as above; grayish-black chert
10,013-10,020	Dolomite, pale yellowish-brown, fine-crystalline; very light-gray dense chert	10,500-10,505	Dolomite as above; medium light- to medium-gray chert
10,020-10,025	Dolomite, medium-gray, fine-crystalline	10,505-10,515	Dolomite, pale yellowish-brown, medium-crystalline; medium light- to medium-gray; medium to coarse-oölitic chert
10,025-10,035	Dolomite, pale yellowish-brown to brownish-gray, fine-crystalline	10,515-10,520	Dolomite, medium light-gray, fine-crystalline
10,035-10,040	Dolomite, medium-gray, fine-crystalline	10,520-10,530	Dolomite, pale yellowish-brown, medium-crystalline; medium light-gray dense chert
10,040-10,045	Dolomite, pale yellowish-brown, fine-crystalline	10,530-10,535	Dolomite, medium light-gray, fine- to medium-crystalline
10,045-10,050	Dolomite, dark brownish-gray, fine-crystalline	10,535-10,540	Dolomite, pale yellowish-brown, fine-crystalline; medium light-gray dense chert
10,050-10,055	Dolomite, pale yellowish-brown, fine-crystalline; light-gray dense chert	10,540-10,545	Dolomite, very pale-orange, fine- to medium-crystalline; light-gray medium- to coarse-oölitic chert; some pinkish chert
10,055-10,060	Dolomite, medium light-gray to very pale-orange, medium-crystalline	10,545-10,550	Dolomite as above; many brownish-gray oölitic in chert
10,060-10,064	Dolomite, light-gray, mediumly sandy	10,550-10,555	Dolomite, pale yellowish-brown, medium-crystalline; scattered fine to medium subrounded sand
10,064-10,067	Sandstone, light-gray, fine- to medium-grained, subrounded, dolomitic	10,555-10,560	Dolomite, medium light-gray, fine- to medium-crystalline
10,067-10,070	Dolomite, pale yellowish-brown, fine-crystalline	10,560-10,570	Dolomite, pale yellowish-brown, medium-crystalline; medium light-gray dense chert
10,070-10,075	Dolomite, pale yellowish-brown, fine- to medium-crystalline	10,570-10,580	Dolomite, very pale-orange, medium-crystalline; clear dolomite rhombs
10,075-10,085	Dolomite, medium-gray, fine-crystalline	10,580-10,585	Dolomite, brownish-gray, medium-crystalline
10,085-10,090	Dolomite, brownish-gray, fine-crystalline; medium light-gray dense chert	10,585-10,600	Dolomite, pale yellowish-brown, medium-crystalline; light- to medium-gray dense chert
10,090-10,095	Dolomite as above	10,600-10,610	Dolomite, pale yellowish-brown, medium- to coarse-crystalline
10,095-10,100	Dolomite as above; medium-gray chert		
10,100-10,115	Dolomite, light- to medium light-gray, medium-crystalline		
10,115-10,125	Dolomite, brownish-gray, fine- to medium-crystalline		
10,125-10,130	Dolomite, pale yellowish-brown, medium-crystalline; light- to medium-gray dense chert		

10,610-10,620	Dolomite, pale yellowish-brown, medium-crystalline	10,815-10,825	Dolomite, very pale-orange, medium-crystalline; light-gray dense chert
10,620-10,625	Dolomite, pale yellowish-brown to very pale-orange, medium- to coarse-crystalline; light- to medium-gray dense chert; quartz crystals	10,825-10,830	Dolomite, pale yellowish-brown, medium- to coarse-crystalline; light-gray dense chert
10,625-10,635	As above; trace oölitic chert	10,830-10,840	Dolomite, light-gray, medium-crystalline
10,635-10,650	Dolomite, pale yellowish-brown to very pale-orange, medium- to coarse-crystalline; light- to medium-gray dense chert; chert decreasing downward	10,840-10,850	Dolomite as above; light-gray chert
10,650-10,675	Dolomite, pale yellowish-brown to very pale-orange, medium- to coarse-crystalline; dolomite rhombs	10,850-10,860	Dolomite, pale yellowish-brown to medium light-gray, medium-crystalline; light-gray chert
10,675-10,690	Dolomite, pale yellowish-brown, medium-crystalline; little medium light-gray chert	10,860-10,870	Dolomite as above; chert as above; figured and oölitic? chert
10,690-10,695	Dolomite, medium-gray, fine- to medium-crystalline	10,870-10,875	Dolomite, medium light-gray, fine-crystalline
10,695-10,710	Dolomite, medium light-gray, medium- to coarse-crystalline; medium light-gray chert	10,875-10,880	Dolomite, pale yellowish-brown, medium-crystalline; very light-gray to very pale-orange rough chert
10,710-10,735	Dolomite, medium light-gray to pale yellowish-brown, medium-crystalline; medium light- to medium-gray dense chert	10,880-10,885	Dolomite, medium light-gray, medium- to coarse-crystalline, slightly brownish
10,735-10,745	Dolomite, medium-gray, fine-crystalline	10,885-10,890	Dolomite, medium light-gray, fine- to medium-sandy (subrounded); caving
10,745-10,755	Dolomite, medium light-gray to very pale-orange, medium-crystalline; light-gray dense chert	10,890-10,900	Dolomite, pale yellowish-brown, fine- to medium-crystalline; pale-orange to light-gray chert
10,755-10,770	Dolomite, very pale-orange, medium- to coarse-crystalline	10,900-10,915	Dolomite as above
10,770-10,775	Dolomite, pale yellowish-brown, medium-crystalline; light- to medium light-gray chert	10,915-10,930	Dolomite as above; medium light-gray mottled chert
10,775-10,790	Dolomite, very pale-orange, medium-crystalline; light- to medium light-gray chert	10,930-10,935	Dolomite, medium light-gray, medium-crystalline
10,790-10,805	Dolomite, pale yellowish-brown, medium-crystalline	10,935-10,945	Dolomite as above; fine- to medium-sandy
10,805-10,815	Dolomite, as above; medium light- to medium-gray chert; little yellowish-brown chert	10,945-10,970	Dolomite, medium light-gray, medium-crystalline
		10,970-10,975	Dolomite, light- to medium light-gray, very fine- to fine-crystalline
		10,975-10,980	Dolomite, medium-gray, very fine- to fine-crystalline; very light-gray dense chert
		10,980-11,008	No samples (Cored at 11,000-11,005 feet reported as 3 feet of gray dense siliceous dolomite)
		11,008	Total depth

LOG 9
KINGFISHER COUNTY, OKLAHOMA
SW¼ NE¼ NW¼ sec. 22, T. 18 N., R. 9 W.

Operator: Atlantic Refining Co.
Lease: Vilhauer No. 1
Elevation: DF 1,188 feet
Total depth: Electrical log 9,638 feet
Drillers 9,639 feet
Completion date: 1947
Initial production:

Electrical log: 255 feet to total depth
Sample intervals:

10-foot
0 to 6,850 feet
6,890 to 7,500 feet
7,530 to 8,560 feet
8,570 to 8,640 feet
8,670 to 9,170 feet
9,230 to 9,360 feet
9,410 to 9,630 feet
5-foot
6,850 to 6,890 feet
7,503 to 7,530 feet
8,560 to 8,570 feet
8,640 to 8,670 feet
9,170 to 9,230 feet
9,360 to 9,410 feet
9,630 to total depth

Cored intervals:
4,250 to 4,260 feet (core chips)
7,346 to 7,361 feet (core chips)
7,493 to 7,503 feet (one core chip)
8,661 to 8,666 feet (core chips)

	Permian System	517-527	Shale, moderate reddish-brown
	El Reno Group	527-532	Sandstone, pale reddish-brown, very fine-grained, silty
	Flowerpot Shale 0-40 feet	532-560	Shale, moderate reddish-brown
0- 10	Shale, moderate reddish-brown; very light-gray to pale reddish-brown coarse anhydrite crystals	560-573	Shale, moderate reddish-brown; grayish-white fine-crystalline anhydrite
10- 12	Sandstone, very light-gray, very fine- to fine-grained	573-577	Sandstone, pale reddish-brown, very fine-grained, silty
12- 20	Shale, moderate reddish-brown; very light-gray to pale reddish-brown coarse anhydrite crystals	577-610	Shale, moderate reddish-brown
20- 40	Shale, moderate reddish-brown	610-623	Sandstone, pale reddish-brown, very fine-grained, silty, slightly calcareous
	Hennessey Shale and Garber Sandstone 40-1,405 feet	623-640	Shale, moderate reddish-brown
40- 50	Shale, moderate reddish-brown; white gypsum	640-650	Shale, moderate reddish-brown; grayish-white fine-crystalline anhydrite
50- 56	Shale, moderate reddish-brown	650-660	Shale, moderate reddish-brown
56- 64	Sandstone, light-gray, very fine-grained, gypsiferous	660-670	Sandstone, light-gray, very fine-grained, silty, slightly calcareous
64- 95	Shale, moderate reddish-brown, greenish-gray spots; white gypsum	670-680	Shale, moderate reddish-brown
95-100	Shale, medium light-gray, silty	680-690	Shale, moderate reddish-brown; greenish-gray spots
100-110	Shale, moderate reddish-brown	690-710	Shale, moderate reddish-brown
110-120	Shale, moderate reddish-brown; white gypsum	710-713	Sandstone, very light-gray, very fine-grained, silty
120-130	Shale, moderate reddish-brown	713-764	Shale, moderate reddish-brown
130-280	No samples	764-766	Sandstone, pale reddish-brown, very fine-grained, silty
280-355	Shale, moderate reddish-brown	766-820	Shale, moderate reddish-brown
355-365	Sandstone, light-gray, very fine-grained, slightly dolomitic, silty	820-824	Shale, light greenish-gray
365-398	Shale, moderate reddish-brown; grayish-white fine-crystalline anhydrite 365-370 feet	824-864	Shale, moderate reddish-brown
398-410	Siltstone, pale reddish-brown, very finely sandy	864-870	Sandstone, pale to moderate reddish-brown, very fine- to fine-grained, silty
410-440	Shale, moderate reddish-brown; very finely sandy 427-430 feet	870-872	Sandstone, pale reddish-brown, very fine- to fine-grained
440-470	Shale, moderate reddish-brown; light greenish-gray spots	872-900	Shale, moderate reddish-brown
470-490	Shale, moderate reddish-brown	900-910	Shale, moderate reddish-brown; light greenish-gray spots; calcareous pellets
490-500	Sandstone, pale reddish-brown, very fine-grained, silty	910-920	Shale, moderate reddish-brown
500-513	Shale, moderate reddish-brown; grayish-white fine-crystalline anhydrite	920-928	Sandstone, pale reddish-brown, very fine- to fine-grained
513-517	Sandstone, light-gray, very fine-grained, silty	928-942	Shale, moderate reddish-brown
		942-950	Siltstone, moderate reddish-brown, very finely sandy
		950-968	Shale, moderate reddish-brown
		968-976	Siltstone, moderate reddish-brown, very finely sandy

2,632-2,640	Shale, medium-gray	3,105-3,111	Limestone, brownish-gray, fine-crystalline
2,640-2,650	Limestone, medium light-gray, fine-crystalline, slightly argillaceous; mottled with dark-gray; fusulinids	3,111-3,120	Shale, medium-gray
2,650-2,662	Limestone, medium- to medium dark-gray, fine-crystalline, argillaceous; crinoids	3,120-3,123	Shale, grayish-black
2,662-2,670	Shale, medium-gray	3,123-3,130	Shale, olive-gray
2,670-2,675	Limestone, light-gray to very pale-orange, fine-granular, slightly silty; light-gray spicular granular chert; fusulinids	3,130-3,136	Shale, grayish-red
2,675-2,680	Limestone, medium light-gray, fine-granular, slightly argillaceous; spines	3,136-3,140	Shale, medium-gray
2,680-2,686	Limestone, medium light-gray, fine-granular, slightly argillaceous	3,140-3,148	Shale, moderate reddish-brown
2,686-2,690	Shale, medium-gray	3,148-3,155	Limestone, grayish-red, fine-crystalline; little yellowish-orange fine-crystalline limestone
2,690-2,698	Limestone, medium-gray, fine-crystalline, argillaceous; fusulinids	3,155-3,165	Shale, moderate reddish-brown
2,698-2,703	Shale, medium-gray	3,165-3,180	Shale, medium-gray
2,703-2,710	Limestone, medium-gray, fine-crystalline	3,180-3,190	Shale, olive-gray
2,710-2,724	Shale, moderate reddish-brown	3,190-3,196	Shale, grayish-red
2,724-2,730	Shale, grayish-red	3,196-3,205	Shale, medium-gray
	Wreford Limestone 2,730-2,812 feet	3,205-3,210	Shale, grayish-red
2,730-2,736	Limestone, light olive-gray, very fine-crystalline; trace of pale-red limestone	3,210-3,219	Shale, medium-gray
2,736-2,740	Limestone, medium light-gray, fine-granular, argillaceous	3,219-3,230	Sandstone, very light-gray, very fine-grained, calcareous
2,740-2,744	Shale, medium-gray	3,230-3,248	Limestone, very light-gray to very pale-orange, very finely sandy
2,744-2,751	Limestone, medium light-gray, fine-crystalline; dark-gray fusulinids?	3,248-3,278	Shale, medium-gray; fusulinids 3,250-3,255 feet; brachiopods 3,260-3,265 feet
2,751-2,754	Shale, medium-gray		Red Eagle Limestone, Johnson Shale, and Foraker Limestone, undifferentiated 3,278-3,400 feet
2,754-2,764	Shale, grayish-red	3,278-3,282	Limestone, light olive-gray, fine-crystalline
2,764-2,774	Shale, moderate reddish-brown	3,282-3,293	Shale, medium-gray
2,774-2,776	Limestone, light olive-gray, pisolitic?	3,293-3,304	Limestone, very light-gray, very finely sandy
2,776-2,781	Limestone, light-gray, fine-crystalline; light-gray chert	3,304-3,312	Sandstone, light-gray, very fine-grained, silty
2,781-2,784	Limestone, light-gray, fine-crystalline	3,312-3,313	Shale, medium-gray
2,784-2,789	Shale, medium-gray	3,313-3,317	Limestone, medium-gray, fine-crystalline, argillaceous
2,789-2,793	Limestone, pale yellowish-brown, fine-crystalline	3,317-3,320	Shale, medium-gray
2,793-2,795	Shale, medium-gray	3,320-3,330	Limestone, medium light-gray, fine-crystalline; speckled with dark gray
2,795-2,800	Limestone, light-gray, fine-crystalline	3,330-3,337	Shale, medium-gray
2,800-2,801	Shale, medium-gray	3,337-3,341	Limestone, medium dark-gray, argillaceous; fusulinids
2,801-2,812	Limestone, very pale-orange to pale yellowish-brown, fine-crystalline; light- to medium-gray spicular chert	3,341-3,349	Shale, grayish-red
	Council Grove Group	3,349-3,351	Limestone, medium dark-gray, fine-crystalline; glauconite
2,812-2,817	Shale, medium-gray	3,351-3,358	Shale, grayish-red
2,817-2,835	Shale, grayish-red to moderate reddish-brown	3,358-3,363	Limestone, pale-red, fine-crystalline, argillaceous
2,835-2,840	Shale, medium-gray	3,363-3,370	Shale, grayish-red
2,840-2,845	Shale, grayish-red	3,370-3,387	Shale, medium-gray
2,845-2,865	Shale, medium-gray	3,387-3,395	Limestone, very pale-orange to light-gray, fine-crystalline; some pale yellowish-brown limestone
2,865-2,876	Sandstone, light-gray, very fine-grained, calcareous	3,395-3,400	Limestone, medium light-gray, very fine-crystalline
2,876-2,880	Shale, medium-gray		Admire Group
2,880-2,888	Shale, grayish-red	3,400-3,408	Shale, medium-gray
2,888-2,893	Shale, medium-gray	3,408-3,410	Limestone, medium dark-gray, very fine-crystalline
	Top of Funston Limestone 2,893 feet	3,410-3,424	Shale, medium-gray
2,893-2,900	Limestone, pale yellowish-brown, fine-crystalline	3,424-3,440	Shale, grayish-red
2,900-2,913	Sandstone, pale-red to grayish-red, very fine- to fine-grained, slightly calcareous	3,440-3,450	Shale, medium-gray
2,913-2,924	Shale, medium-gray	3,450-3,460	Shale, grayish-red
2,924-2,927	Shale, grayish-black	3,460-3,474	Shale, medium-gray
2,927-2,930	Shale, medium-gray	3,474-3,480	Sandstone, pale yellowish-brown to very light-gray, very fine-grained, calcareous
2,930-2,934	Limestone, medium-gray, fine-crystalline, argillaceous	3,480-3,482	Shale, medium-gray
2,934-2,940	Siltstone, light olive-gray, very finely sandy, calcareous	3,482-3,486	Sandstone, pale yellowish-brown to very light-gray, very fine-grained, calcareous
2,940-2,946	Shale, grayish-red, olive-gray mottled	3,486-3,497	Shale, medium-gray
2,946-2,959	Shale, medium-gray	3,497-3,500	Limestone, brownish-gray, fine-crystalline; fusulinids
2,959-2,970	Shale, olive-gray	3,500-3,505	Shale, medium-gray; fusulinids
2,970-2,980	Shale, moderate reddish-brown to grayish-red	3,505-3,508	Limestone, medium dark-gray, fine-crystalline, argillaceous
2,980-2,982	Limestone, pale yellowish-brown, fine-crystalline	3,508-3,510	Shale, medium-gray
2,982-2,992	Shale, medium-gray	3,510-3,530	Shale, grayish-red
2,992-2,997	Siltstone, light olive-gray	3,530-3,538	Shale, grayish-red, very finely sandy
2,997-3,000	Shale, medium-gray	3,538-3,540	Shale, medium-gray
3,000-3,007	Limestone, pale yellowish-brown, fine-crystalline	3,540-3,548	Limestone, pale yellowish-brown, very fine-crystalline
3,007-3,009	Shale, medium-gray	3,548-3,570	Shale, medium-gray
3,009-3,017	Limestone, very pale-orange, fine-crystalline; fusulinids; abraded fusulinids?	3,570-3,574	Shale, greenish-gray
3,017-3,019	Dolomite, pale yellowish-brown, fine-crystalline, calcareous	3,574-3,588	Shale, medium-gray
	Base of Beattie Limestone 3,019 feet	3,588-3,593	Sandstone, very light-gray to very pale-orange, very fine-grained, slightly dolomitic
3,019-3,040	Shale, medium-gray	3,593-3,602	Sandstone, grayish-white, very fine-grained
3,040-3,045	Shale, greenish-gray	3,602-3,610	Shale, grayish-red, olive-gray mottled
3,045-3,050	Shale, moderate reddish-brown	3,610-3,616	Shale, olive-gray
3,050-3,055	Shale, medium-gray	3,616-3,625	Limestone, brownish-gray, fine-crystalline; fusulinids
3,055-3,057	Limestone, medium-gray, fine-crystalline, argillaceous	3,625-3,630	Siltstone, medium-gray to olive-gray
3,057-3,073	Shale, medium-gray	3,630-3,645	Shale, medium-gray
	Grenola Limestone 3,073-3,155 feet	3,645-3,650	Siltstone, very light- to light-gray, very finely sandy
3,073-3,080	Limestone, medium-gray, fine-crystalline, argillaceous	3,650-3,656	Shale, medium-gray
3,080-3,090	Shale, olive-gray	3,656-3,660	Shale, grayish-black
3,090-3,100	Shale, medium-gray	3,660-3,666	Shale, greenish-gray
3,100-3,105	Limestone, light olive-gray, very fine-crystalline	3,666-3,674	Shale, medium-gray
		3,674-3,680	Shale, grayish-red
		3,680-3,690	Shale, medium-gray
		3,690-3,694	Limestone, olive-gray to yellowish-brown, very finely sandy, silty
		3,694-3,707	Shale, medium-gray
		3,707-3,709	Limestone, pale yellowish-brown, fine-crystalline
		3,709-3,720	Shale, medium-gray
		3,720-3,723	Shale, grayish-black

3,723-3,744	Shale, medium-gray	4,315-4,327	Shale, medium-gray
3,744-3,752	Sandstone, very light- to light-gray, very fine- to fine-grained, porous	4,327-4,345	No samples From electrical log:
3,752-3,762	Shale, medium-gray	4,327-4,333	Limestone
3,762-3,781	Sandstone, grayish-white to very pale-orange, very fine- to fine-grained	4,333-4,345	Shale
3,781-3,803	Shale, medium-gray	4,345-4,372	Shale, medium-gray
3,803-3,826	Shale, grayish-red	4,372-4,383	Sandstone, light-gray to light greenish-gray, very fine-grained, silty, calcareous
3,826-3,830	Shale, medium-gray	4,383-4,392	Sandstone, very light-gray, very fine-grained, calcareous
3,830-3,835	Shale, grayish-black	4,392-4,400	Sandstone, grayish-white, fine-grained, slightly dolomitic, porous
3,835-3,838	Shale, medium-gray	4,400-4,426	Shale, medium-gray
3,838-3,842	Limestone, brownish-gray, fine-crystalline, argillaceous	4,426-4,430	Shale, greenish-gray
3,842-3,859	Shale, medium-gray	4,430-4,435	Shale, medium-gray
3,859-3,863	Limestone, brownish-gray, fine-crystalline, argillaceous	4,435-4,440	Shale, grayish-black
3,863-3,867	Limestone, very light- to medium-gray, fine-crystalline	4,440-4,456	Shale, medium-gray
3,867-3,880	Shale, medium-gray	4,456-4,460	Shale, grayish-black
3,880-3,889	Siltstone, greenish-gray	4,460-4,465	Shale, greenish-gray
3,889-3,896	Sandstone, very light-gray, very fine-grained, calcareous	4,465-4,475	Shale, medium-gray
3,896-3,901	Shale, medium-gray	4,475-4,480	Shale, grayish-black
3,901-3,907	Limestone, medium- to medium dark-gray, fine-crystalline, argillaceous	4,480-4,490	Shale, medium-gray
3,907-3,932	Shale, medium-gray		
3,932-3,934	Limestone, medium-gray, fine-crystalline, argillaceous; fossil fragments?		
3,934-3,982	Shale, medium-gray; coal fragments 3,945-3,948 feet		
3,982-3,983	Limestone, medium-gray, fine-crystalline, argillaceous		
3,983-3,990	Shale, medium-gray		
	Pennsylvanian System		
	Virgil Series		
	Wabaunsee Group Equivalent		
3,990-3,996	Limestone, brownish-gray, fine-crystalline	4,490-4,505	Limestone, pale yellowish-brown, very fine- to fine-crystalline; some very light-gray limestone
3,996-4,004	Shale, medium-gray	4,505-4,510	Limestone, brownish-gray, very fine-crystalline
4,004-4,007	Shale, grayish-black	4,510-4,515	Limestone, dark brownish-gray, fine-crystalline, argillaceous
4,007-4,012	Shale, medium-gray; bryozoans	4,515-4,537	Shale, medium-gray
4,012-4,026	Shale, medium-gray	4,537-4,540	Shale, grayish-black
4,026-4,030	Shale, greenish-gray	4,540-4,548	Shale, medium-gray
4,030-4,033	Shale, medium-gray	4,548-4,550	Limestone, brownish-gray, very fine-crystalline
4,033-4,035	Limestone, pale yellowish-brown, fine-crystalline	4,550-4,563	Shale, medium-gray
4,035-4,044	Shale, medium-gray	4,563-4,568	Sandstone, very pale-orange, very fine-grained, calcareous
4,044-4,047	Shale, grayish-black	4,568-4,570	Sandstone, very light-gray, fine-grained, dolomitic
4,047-4,057	Shale, medium-gray	4,570-4,580	Shale, medium-gray
4,057-4,065	Limestone, pale yellowish-brown, very fine-crystalline	4,580-4,586	Shale, greenish-gray
4,065-4,069	Limestone, very pale-orange, fine-crystalline	4,586-4,590	Shale, medium-gray
4,069-4,074	Shale, medium-gray	4,590-4,595	Sandstone, light-gray, very fine-grained, slightly calcareous
4,074-4,085	Limestone, pale yellowish-brown, fine-crystalline	4,595-4,605	Shale, medium-gray; fusulinids
4,085-4,090	Limestone, light-gray, fine-crystalline	4,605-4,615	Shale, medium-gray
4,090-4,110	No samples From electrical log:	4,615-4,620	Shale, grayish-black
	4,090-4,093 Limestone	4,620-4,655	Shale, medium-gray
	4,093-4,100 Shale	4,655-4,660	Shale, grayish-black
	4,100-4,105 Limestone	4,660-4,670	Shale, medium-gray; fusulinids
	4,105-4,110 Shale	4,670-4,680	Shale, grayish-black
		4,680-4,693	Shale, medium-gray
4,110-4,118	Shale, medium-gray	4,693-4,697	Limestone, brownish-gray, very fine-crystalline
4,118-4,126	Limestone, brownish-gray to medium-gray, fine-crystalline, slightly silty	4,697-4,702	Limestone, pale yellowish-brown to light-gray, fine-crystalline
4,126-4,130	Shale, medium-gray	4,702-4,707	Shale, medium-gray
4,130-4,150	No samples From electrical log:	4,707-4,715	Limestone, light-gray, very fine-crystalline, very finely sandy
	4,130-4,143 Shale	4,715-4,719	Shale, medium-gray
	4,143-4,150 Limestone	4,719-4,723	Limestone, medium light- to medium-gray, fine-crystalline, argillaceous
4,150-4,154	Shale, medium-gray	4,723-4,740	Limestone, pale yellowish-brown, fine-crystalline
4,154-4,162	Sandstone, very light-gray, very fine-grained, slightly dolomitic	4,740-4,747	Shale, medium-gray
4,162-4,170	Shale, medium-gray; fusulinids	4,747-4,759	Sandstone, light greenish-gray, very fine-grained, silty, slightly calcareous
4,170-4,176	Siltstone, medium light-gray to greenish-gray, very finely sandy	4,759-4,761	Shale, medium-gray
4,176-4,180	Shale, grayish-black	4,761-4,768	Shale, greenish-gray
4,180-4,187	Shale, medium-gray	4,768-4,770	Shale, grayish-black
4,187-4,194	Shale, medium-gray; fusulinids	4,770-4,774	Shale, medium-gray
4,194-4,200	Shale, greenish-gray	4,774-4,782	Sandstone, grayish-white, very fine-grained, slightly dolomitic
4,200-4,210	Shale, medium-gray	4,782-4,795	Shale, medium-gray
4,210-4,214	Limestone, medium dark-gray, fine-crystalline; fusulinids	4,795-4,800	Shale, grayish-black
4,214-4,220	Shale, greenish-gray, silty	4,800-4,824	Shale, medium-gray
4,220-4,238	Shale, medium-gray	4,824-4,829	Limestone, medium dark-gray, fine-crystalline, argillaceous; fusulinids
4,238-4,250	No samples From electrical log: Sandstone	4,829-4,840	Shale, medium-gray
4,250-4,258	Sandstone, pale yellowish-brown, fine-grained, dolomitic	4,840-4,849	Limestone, pale yellowish-brown, fine-crystalline
4,258-4,260	Sandstone, pale yellowish-brown to light-gray, fine-grained, calcareous	4,849-4,852	Shale, medium-gray
4,260-4,275	No samples From electrical log:	4,852-4,857	Sandstone, grayish-white, very fine-grained, calcareous
	4,260-4,268 Sandstone	4,857-4,860	Shale, medium-gray
	4,268-4,275 Limestone	4,860-4,870	Sandstone, grayish-white, fine-grained, dolomitic; porous in part
4,275-4,282	Limestone, pale yellowish-brown, fine-crystalline	4,870-4,880	Sandstone as above; pyrite
4,282-4,286	Shale, medium-gray	4,880-4,883	Shale, medium-gray
4,286-4,290	Limestone, pale yellowish-brown, fine-crystalline	4,883-4,890	Sandstone, grayish-white, fine-grained, dolomitic; porous in part
4,290-4,296	Limestone, brownish-gray, very fine-crystalline	4,890-4,895	Shale, medium-gray
4,296-4,315	No samples From electrical log:	4,895-4,902	Sandstone, grayish-white, very fine-grained
	4,296-4,300 Limestone	4,902-4,916	Shale, medium-gray
	4,300-4,315 Shale	4,916-4,920	Shale, grayish-black
		4,920-4,945	Shale, medium-gray
		4,945-4,950	Shale, greenish-gray
		4,950-4,980	Shale, medium-gray
		4,980-4,990	Shale, grayish-black
		4,990-5,010	Shale, medium-gray

5,010-5,017	Shale, medium-gray; fusulinids; caving?	5,750-5,765	Sandstone, grayish-white, fine-grained, porous;
5,017-5,027	Shale, medium-gray, silty		little mica; carbonaceous stringers
5,027-5,035	Shale, medium-gray	5,765-5,775	Sandstone as above; dolomitic
5,035-5,040	Shale, grayish-black		
5,040-5,048	Shale, medium-gray		Kansas City Group Equivalent
5,048-5,056	Limestone, medium dark-gray to dark brownish-gray, fine-crystalline, argillaceous	5,775-5,800	Shale, medium-gray
5,056-5,062	Sandstone, very light-gray, very fine-grained, silty	5,800-5,810	Shale, grayish-black
5,062-5,076	Shale, medium-gray	5,810-5,820	Shale, medium-gray
5,076-5,080	Siltstone, olive-gray, very finely sandy	5,820-5,830	Shale, olive-gray, silty
5,080-5,085	Shale, grayish-black	5,830-5,880	Shale, medium-gray
5,085-5,100	Shale, medium-gray	5,880-5,910	Shale, medium-gray, silty
5,100-5,115	Shale, grayish-red	5,910-5,920	Shale, grayish-black
5,115-5,122	Siltstone, very light-gray, very finely sandy	5,920-5,944	Shale, medium-gray
5,122-5,130	Sandstone, very light-gray, very fine-grained, brown-spotted; dolomitic in part	5,944-5,950	Shale, grayish-black
5,130-5,147	Shale, medium-gray	5,950-6,005	Shale, medium-gray
5,147-5,160	Sandstone, very light-gray, very fine- to fine-grained	6,005-6,015	Shale, grayish-black
5,160-5,172	Sandstone, grayish-white, fine-grained, slightly dolomitic	6,015-6,040	Shale, medium-gray
5,172-5,174	Shale, medium-gray	6,040-6,042	Limestone, dark brownish-gray, very fine-crystalline, argillaceous
5,174-5,193	Sandstone, grayish-white, fine- to medium-grained	6,042-6,045	Shale, medium-gray
5,193-5,210	Shale, medium-gray	6,045-6,056	Shale, grayish-black
5,210-5,218	Shale, medium-gray, silty	6,056-6,070	Shale, medium-gray
5,218-5,225	Sandstone, very light-gray, very fine- to fine-grained; slightly calcareous in part	6,070-6,090	Shale, medium- to medium dark-gray, silty
5,225-5,233	Sandstone, grayish-white, fine-grained, slightly dolomitic	6,090-6,100	Shale, grayish-black
5,233-5,250	Shale, grayish-red	6,100-6,110	Shale, medium-gray
5,250-5,260	Shale, grayish-red; dark greenish-gray shale	6,110-6,116	Shale, grayish-black
		6,116-6,150	Shale, medium-gray
		6,150-6,160	Shale, grayish-black
		6,160-6,168	Shale, medium-gray
		6,168-6,170	Coal
		6,170-6,187	Shale, medium-gray
Oread Limestone Member of Vamoosa Formation 5,260-5,397 feet			Skiatook Group
5,260-5,284	Shale, medium-gray		
5,284-5,290	Siltstone, light-gray, very finely sandy, slightly calcareous		
5,290-5,294	Siltstone, medium-gray, very finely sandy, slightly calcareous		
5,294-5,304	Shale, medium-gray	6,187-6,193	Siltstone, olive-gray
5,304-5,310	Shale, grayish-black	6,193-6,200	Shale, medium-gray
5,310-5,328	Shale, medium-gray	6,200-6,205	Siltstone, olive-gray
5,328-5,330	Sandstone, grayish-white, fine-grained, tight	6,205-6,210	Shale, medium-gray
5,330-5,347	Shale, medium-gray	6,210-6,215	Sandstone, very light-gray, very fine- to fine-grained, calcareous; some yellowish-brown sandstone; glauconitic
5,347-5,357	Limestone, pale yellowish-brown, finely oölitic, finely sandy, very sandy	6,215-6,230	Sandstone, grayish-white, fine- to medium-grained, slightly calcareous, porous
5,357-5,360	Shale, medium-gray		
5,360-5,380	Limestone, pale yellowish-brown, finely oölitic, finely sandy, very sandy	6,230-6,240	Sandstone, very light-gray, very fine-grained, slightly calcareous
5,380-5,397	Limestone, pale yellowish-brown, finely sandy	6,240-6,246	Siltstone, light-gray, very finely sandy, slightly calcareous
	Douglas Group Equivalent	6,246-6,267	Sandstone, grayish-white, fine-grained, dolomitic, porous
		6,267-6,275	Shale, medium-gray
5,397-5,406	Shale, medium-gray	6,275-6,285	Shale, grayish-black
5,406-5,410	Shale, greenish-gray	6,285-6,298	Shale, medium-gray
5,410-5,430	Shale, medium-gray	6,298-6,310	Siltstone, light- to medium-gray
5,430-5,440	Shale, grayish-red; caving?	6,310-6,320	Shale, medium-gray
5,440-5,450	Shale, grayish-black	6,320-6,330	Shale, grayish-black
5,450-5,460	Siltstone, medium-gray to greenish-gray	6,330-6,345	Shale, medium-gray
5,460-5,465	Shale, medium-gray	6,345-6,360	Shale and siltstone, medium light- to medium-gray, very silty, slightly calcareous
5,465-5,470	Shale, grayish-black	6,360-6,380	Shale, medium-gray
5,470-5,495	Shale, medium-gray	6,380-6,390	Shale, grayish-black
5,495-5,500	Shale, greenish-gray	6,390-6,410	Shale, medium-gray
5,500-5,510	Siltstone, olive-gray	6,410-6,420	Shale, medium-gray; one large fusulinid; caving?
5,510-5,530	Shale, medium-gray	6,420-6,430	Siltstone, medium-gray, very finely sandy, calcareous; fusulinid
5,530-5,536	Shale, grayish-black	6,430-6,451	Shale, medium-gray
5,536-5,555	Shale, medium-gray		
5,555-5,565	Shale, grayish-black		Hogshooter Limestone 6,451-6,453 feet
5,565-5,590	Shale, medium-gray		
5,590-5,595	Shale, grayish-black	6,451-6,453	Limestone, dark-gray, very fine-crystalline, argillaceous
5,595-5,605	Shale, medium-gray		
5,605-5,610	Shale, grayish-black	6,453-6,463	Shale, medium-gray
5,610-5,623	Shale, medium-gray	6,463-6,466	Sandstone, very light- to light-gray, very fine-grained, slightly calcareous
5,623-5,632	Siltstone, light-gray		
5,632-5,647	Shale, medium-gray	6,466-6,476	Siltstone, very light- to light-gray, very finely sandy
	Missouri Series	6,476-6,480	Shale, medium-gray
	Ochelata Group	6,480-6,500	Shale, medium-gray, silty
	Lansing Group Equivalent	6,500-6,508	Shale, gray

Pleasanton Group Equivalent (Pleasanton Formation Equivalent on Chart OC-61)			
6,750-6,756	Shale, medium-gray	7,370-7,380	Shale, medium-gray
6,756-6,770	Siltstone, light- to medium light-gray	7,380-7,390	Shale, medium-gray, silty, micaceous
6,770-6,780	Siltstone, very light-gray, very finely sandy	7,390-7,397	Limestone, brownish-gray, fine-crystalline, slightly argillaceous
6,780-6,793	Shale, medium-gray, silty	7,397-7,408	Limestone, medium dark- to dark-gray, fine-crystalline, argillaceous
6,793-6,802	Siltstone, very light-gray, very finely sandy, micaceous; carbonaceous material	7,408-7,435	Shale, medium-gray
6,802-6,819	Shale, medium-gray	7,435-7,440	Shale, grayish-black
6,819-6,835	Sandstone, very light-gray, very fine-grained, tight, slightly micaceous	7,440-7,454	Shale, medium-gray
6,835-6,840	Sandstone as above; silty; trace of glauconite		
6,840-6,851	Sandstone, very light-gray, very fine-grained, tight slightly micaceous		
6,851-6,885	Shale, medium-gray		
Des Moines Series			
Marmaton Group			
6,885-6,890	Limestone, dusky to pale yellowish-brown; dense to very fine-crystalline; medium light-gray to yellowish-brown dense chert	7,454-7,456	Limestone, medium dark-brownish-gray, fine-crystalline, argillaceous, glauconitic
6,890-6,900	Limestone, brownish-gray, very fine-crystalline	7,456-7,467	Shale, greenish-gray
6,900-6,910	Limestone, medium-gray, very fine-crystalline	7,467-7,469	Limestone, greenish-gray, very fine-crystalline, slightly argillaceous
6,910-6,915	Limestone, light-gray, fine-crystalline	7,469-7,479	Shale, medium-gray
6,915-6,920	Limestone, pale yellowish-brown, very fine-crystalline	7,479-7,482	Limestone, brownish-gray, dense
6,920-6,924	Limestone as above; dark-gray oölitoid pellets	7,482-7,488	Limestone, pale yellowish-brown, very fine-crystalline
6,924-6,934	Limestone, medium dark-gray, fine-crystalline, argillaceous; small fusulinids	7,488-7,492	Shale, medium-gray
6,934-6,940	Limestone, pale yellowish-brown, very fine-crystalline	7,492-7,499	Limestone, brownish-gray to grayish-brown, dense to very fine-crystalline
6,940-6,945	Shale, medium-gray	7,499-7,501	Shale, medium-gray
6,945-6,950	Shale, grayish-black	7,501-7,511	Limestone, pale yellowish-brown, dense to very fine-crystalline, fine to medium-oölitic
6,950-6,954	Shale, medium-gray	7,511-7,519	Limestone, brownish-gray, very fine-crystalline, faintly oölitic?
6,954-6,960	Limestone, medium- to medium dark-gray, very fine-crystalline, medium-oölitic	7,519-7,524	Limestone, brownish-gray, fine-crystalline, medium- to coarse-oölitic; dark oölitic 7,522-7,524 feet
6,960-6,968	Limestone, medium dark-gray, fine-crystalline, argillaceous	7,524-7,530	Limestone, dark-gray to grayish-black, very fine-crystalline, argillaceous
6,968-6,975	Limestone, brownish-gray, very fine-crystalline; brownish-gray dense chert	7,530-7,540	Shale, medium-gray
6,975-6,980	Shale, medium-gray	7,540-7,554	Shale, grayish-black
6,980-6,990	Limestone, pale yellowish-brown, very fine-crystalline	7,554-7,560	Limestone, medium-gray, fine-crystalline, medium-oölitic, slightly brownish
6,990-6,995	Limestone, medium-gray, very fine-crystalline	7,560-7,570	Shale, medium-gray
6,995-7,008	Limestone, brownish-gray, very fine-crystalline	7,570-7,574	Shale, greenish-gray, glauconitic
7,008-7,010	Shale, medium-gray	7,574-7,580	Limestone, brownish-gray, fine-crystalline, medium-oölitic
7,010-7,020	Limestone, pale yellowish-brown, fine-crystalline	7,580-7,587	Limestone, medium- to medium dark-gray, fine-crystalline, slightly argillaceous
7,020-7,025	Limestone, medium light-gray, fine-crystalline	7,587-7,595	Shale, medium-gray
7,025-7,035	Limestone, very pale-orange to pale yellowish-brown, fine-crystalline	7,595-7,597	Limestone, medium-gray, fine-crystalline, argillaceous
7,035-7,040	Limestone, medium-gray, very fine-crystalline	7,597-7,601	Shale, medium-gray
7,040-7,045	Limestone, brownish-gray, fine-crystalline	7,601-7,608	Limestone, medium dark-gray, fine-crystalline
7,045-7,048	Shale, medium-gray	7,608-7,620	Shale, medium-gray
7,048-7,060	Limestone, grayish-brown to dusky yellowish-brown, very fine-crystalline	7,620-7,630	Shale, grayish-black
7,060-7,066	Limestone, medium-gray, fine-crystalline; crinoids; glauconite	7,630-7,640	Shale, medium-gray
7,066-7,070	Limestone, dark-gray, fine-crystalline, argillaceous	7,640-7,672	Shale, medium-gray, silty
7,070-7,080	Shale, medium-gray	7,672-7,674	Limestone, dark-gray to grayish-black, fine-crystalline, argillaceous
7,080-7,088	Shale, grayish-black	7,674-7,687	Shale, medium-gray
7,088-7,091	Limestone, pale yellowish-brown, fine-crystalline, slightly argillaceous	7,687-7,694	Shale, grayish-black
7,091-7,100	Limestone, brownish-gray, very fine-crystalline	7,694-7,696	Limestone, dark-gray, medium-oölitic
7,100-7,107	Shale, medium-gray	7,696-7,725	Shale, medium-gray
7,107-7,114	Limestone, medium-gray, fine-crystalline, slightly brownish	7,725-7,766	Siltstone, medium- to medium dark-gray
7,114-7,127	Limestone, medium dark-gray, fine-crystalline, argillaceous, slightly brownish	7,766-7,768	Limestone, medium-gray, fine-crystalline
7,127-7,133	Limestone, dark-gray to grayish-black, fine-crystalline, very argillaceous	7,768-7,774	Shale, medium-gray
7,133-7,145	Shale, medium-gray	7,774-7,778	Shale, grayish-black
7,145-7,157	Limestone, brownish-gray, very fine-crystalline	7,778-7,785	Limestone, medium dark-gray, very fine-crystalline, pyritic; slightly brownish
7,157-7,164	Shale, medium-gray	7,785-7,790	Shale, medium-gray
7,164-7,180	Limestone, brownish-gray, very fine-crystalline	7,790-7,793	Limestone, light olive-gray, very fine-crystalline
		7,793-7,800	Limestone, pale yellowish-brown, very fine-crystalline, medium-oölitic
		7,800-7,804	Limestone, pale yellowish-brown, dense to very fine-crystalline
		7,804-7,810	Shale, medium-gray
		7,810-7,812	Siltstone, medium-gray
		7,812-7,822	Shale, medium-gray
		7,822-7,826	Siltstone, olive-gray, slightly calcareous
		7,826-7,838	Shale, medium-gray
		7,838-7,842	Limestone, dark-gray, very fine-crystalline, slightly argillaceous; crinoids
		7,842-7,850	Siltstone, medium dark-gray, slightly calcareous
		7,850-7,892	Shale, medium- to medium dark-gray
		7,892-7,902	Limestone, medium- to medium dark-gray, fine-crystalline, silty, argillaceous
		7,902-7,907	Limestone, brownish-gray, very fine-crystalline, slightly argillaceous
		7,907-7,930	Shale, medium- to medium dark-gray, silty
		7,930-7,935	Shale, grayish-black
		7,935-7,990	Shale, medium-gray
		7,990-8,000	Shale, grayish-black
		8,000-8,004	Shale, medium-gray
		8,004-8,013	Limestone, medium dark- to dark-gray, fine-crystalline, very silty
		8,013-8,016	Shale, medium-gray
		8,016-8,027	Limestone, light- to medium-gray, granular, very silty
		8,027-8,036	Shale, medium-gray
		8,036-8,040	Siltstone, medium-gray to olive-gray, calcareous
		8,040-8,043	Shale, medium-gray
		8,043-8,047	Siltstone, medium-gray to olive-gray, calcareous
		8,047-8,076	Shale, medium-gray
Cabaniss and Krebs Groups			
7,180-7,195	Siltstone, medium dark-gray, slightly olive-gray		
7,195-7,197	Limestone, medium dark-gray, fine-crystalline, argillaceous		
7,197-7,230	Shale, medium-gray		
7,230-7,240	Shale, medium-gray, silty		
7,240-7,245	Shale, grayish-black		
7,245-7,265	Shale, medium-gray		
7,265-7,274	Shale, grayish-black		
7,274-7,278	Limestone, brownish-gray, very fine-crystalline		
7,278-7,288	Shale, medium-gray		
7,288-7,300	Siltstone, very light-gray to light greenish-gray, very finely sandy; caving?		
7,300-7,308	Limestone, brownish-gray, dense to very fine-crystalline		
7,308-7,312	Shale, medium-gray		
7,312-7,320	Shale, grayish-black		
7,320-7,345	Shale, medium-gray		
7,345-7,363	Shale, medium dark-gray, chunky		
7,363-7,365	Coal		
7,365-7,370	Shale, grayish-black		

8,770-8,780

8,076-8,086	Limestone, medium-gray, fine-granular, very silty; crinoids
8,086-8,110	Limestone, medium- to medium dark-gray, granular, very silty
8,110-8,120	Limestone, dark-gray, granular, very silty
8,120-8,134	Siltstone, medium dark- to dark-gray, calcareous
8,134-8,140	Limestone, medium dark- to dark-gray, granular, very silty; trace of light-gray chert
8,140-8,150	Limestone, medium- to medium dark-gray, granular, very silty; medium dark-gray dense chert
8,150-8,160	Limestone, medium- to medium dark-gray, granular, very silty
8,160-8,200	Limestone, medium- to medium dark-gray, fine-crystalline, argillaceous
8,200-8,210	Siltstone, medium dark- to dark-gray, calcareous; resembles limestone
8,210-8,220	Siltstone as above; medium dark-gray dense chert
8,220-8,240	Limestone, medium dark-gray, fine-crystalline, argillaceous
8,240-8,270	Siltstone, dark-gray, calcareous; resembles limestone
8,270-8,280	Limestone, medium dark-gray, fine-crystalline, very argillaceous, silty
8,280-8,290	Siltstone, dark-gray, calcareous; light- to medium-gray dense chert with black spots
8,290-8,300	Siltstone as above; medium dark-gray dense chert with black spots
8,300-8,310	Siltstone as above; grayish-black dense chert
8,310-8,320	Limestone, medium dark-gray, very silty; grayish-black dense chert
8,320-8,330	Limestone, medium dark-gray to dark-gray, fine-granular, argillaceous; crinoids
8,330-8,340	Limestone as above; light- to medium-gray dense chert with black specks
8,340-8,370	Limestone as above; slightly brownish
8,370-8,380	Limestone, brownish-gray, fine-crystalline; medium light-gray to yellowish-brown dense chert
8,380-8,390	Limestone, dark-gray, very argillaceous
8,390-8,410	Limestone, medium dark-gray, fine-crystalline, very silty
8,410-8,430	Siltstone, medium dark-gray, calcareous; resembles limestone
8,430-8,440	Limestone, medium- to medium dark-gray, fine-crystalline, very argillaceous
8,440-8,450	Limestone as above; grayish-black dense chert
8,450-8,470	Siltstone, dark-gray, calcareous; resembles limestone
8,470-8,500	Limestone, medium dark-gray, fine-crystalline, very argillaceous, silty
8,500-8,520	Siltstone, dark-gray, calcareous; resembles limestone; medium dark-gray dense chert
8,520-8,525	Limestone, medium dark- to dark-gray, fine-crystalline, very argillaceous, pyritic
8,525-8,530	Limestone, brownish-gray, fine-crystalline, argillaceous
8,530-8,540	Limestone, medium dark-gray, fine-crystalline, very argillaceous
8,540-8,550	Limestone, dark-gray, fine-granular, very argillaceous; grayish-black dense chert
8,550-8,560	Limestone, medium dark-gray, very fine-crystalline, slightly argillaceous
8,560-8,570	Limestone, medium dark-gray, fine-crystalline, argillaceous; grayish-black chert, slightly granular
8,570-8,578	Limestone, brownish-gray, fine-crystalline, argillaceous
8,578-8,587	Limestone, medium dark-gray, dense to very fine-crystalline
8,587-8,594	Siltstone, dark-gray, very glauconitic, pyritic

9,225-9,230

8,594-8,598	Shale, greenish-gray
	Mississippian and Devonian Systems
	Woodford Shale 8,598-8,627 feet
8,598-8,627	Shale, black, dull, chunky; may be a trace of Misener sand

9,280-9,290

8,627-8,640	Dolomite, light-gray, fine-crystalline
8,640-8,645	Limestone, pale yellowish-brown, medium-oölitic
8,645-8,650	Limestone, pale yellowish-brown, very fine-crystalline
8,650-8,660	Limestone, medium light-gray, fine-crystalline, dolomitic
8,660-8,666	Limestone, medium light-gray, fine-crystalline, dolomitic; slightly yellowish-brown tint
8,666-8,670	Dolomite, light-gray to pale yellowish-brown, fine-crystalline
8,670-8,677	Dolomite, medium-gray, fine-crystalline, vuggy
8,677-8,690	Dolomite, brownish-gray, fine-crystalline
8,690-8,700	Limestone, medium dark-gray to brownish-gray, fine-crystalline, argillaceous
8,700-8,710	Limestone, pale yellowish-brown, fine-crystalline
8,710-8,720	Limestone, brownish-gray, fine-crystalline, argillaceous
8,720-8,730	Limestone, pale yellowish-brown, fine-crystalline, dolomitic
8,730-8,741	Limestone as above; argillaceous
8,741-8,770	Limestone, medium- to medium dark-gray, fine-crystalline, argillaceous

8,770-8,780	Limestone, medium dark-brownish-gray, fine-crystalline, slightly argillaceous
8,780-8,800	Limestone, medium dark-gray, fine-crystalline, argillaceous
8,800-8,810	Limestone, medium-gray, fine-crystalline
8,810-8,826	Limestone as above; slightly brownish
8,826-8,836	Limestone, light-gray, fine-crystalline, dolomitic
8,836-8,850	Limestone, brownish-gray to pale yellowish-brown, very fine-crystalline
8,850-8,860	Limestone, medium-gray, very fine-crystalline, slightly brownish
8,860-8,864	Limestone, medium dark-gray, fine-crystalline, argillaceous
8,864-8,870	Limestone, medium-gray, very fine-crystalline, slightly brownish
8,870-8,880	Limestone, pale yellowish-brown, very fine-crystalline
8,880-8,890	Limestone, medium-gray to brownish-gray, very fine-crystalline
8,890-8,920	Limestone, pale yellowish-brown, very fine-crystalline
8,920-8,950	Limestone, pale yellowish-brown, dense
8,950-8,970	Limestone, brownish-gray, very fine- to fine-crystalline
8,970-8,980	Limestone, pale-brown, very fine-crystalline
8,980-9,010	Limestone, brownish-gray to pale yellowish-brown, dense to very fine-crystalline
9,010-9,018	Limestone, very pale-orange to very light-gray, very fine-crystalline
9,018-9,022	Limestone, greenish-gray, fine-crystalline, argillaceous; many dark specks
9,022-9,030	Limestone, light-gray, very fine-crystalline; glauconite
9,030-9,040	Limestone, pale yellowish-brown, fine-crystalline; grayish-red crystals; crinoids?
9,040-9,050	Limestone, very pale-orange, fine-crystalline; very light-gray dense chert
9,050-9,058	Limestone, medium-gray, fine-crystalline, argillaceous

9.058-9.070

9,070-9,110	Shale, medium-gray
9,110-9,114	Shale, medium-gray, slightly greenish
9,114-9,127	Shale, medium-gray
9,127-9,140	Limestone, medium dark- to dark-gray, fine-crystalline, very argillaceous
9,140-9,160	Shale, dark-gray to grayish-black, dolomitic

9 160-9 163

9,180-9,163	Limestone, medium dark-gray, fine-crystalline, argillaceous
9,183-9,167	Limestone, medium-gray, medium-crystalline, slightly argillaceous; crinoids?
9,167-9,170	Limestone, light-gray, medium-crystalline; pyrite
9,170-9,175	Limestone, light- to medium light-gray, medium-crystalline; crinoids
9,175-9,180	Limestone, medium dark-gray, fine- to medium-crystalline
9,180-9,185	Limestone, medium dark-brownish-gray, fine-crystalline
9,185-9,195	Limestone, medium light- to medium-gray, medium-crystalline
9,195-9,200	Limestone, medium light-gray, fine-crystalline; slightly yellowish-brown tint
9,200-9,205	Limestone, pale yellowish-brown, medium-crystalline
9,205-9,210	Limestone, light-gray, medium- to coarse-crystalline; pink crystals
9,210-9,215	Limestone, grayish-white, fine-crystalline
9,215-9,225	Limestone, very light- to light-gray, medium-crystalline

9.225-9.230

9,225-9,230	Limestone, medium light-gray, dense to very fine-crystalline
9,230-9,240	Limestone, medium-gray to brownish-gray, dense to very fine-crystalline
9,240-9,250	Limestone, dark-gray, fine-crystalline, argillaceous
9,250-9,258	Limestone, brownish-gray, dense to very fine-crystalline
9,258-9,261	Dolomite, brownish-gray, fine-crystalline, calcareous
9,261-9,270	Limestone, grayish-white to very light-gray, fine- to medium-crystalline
9,270-9,280	Limestone, very light- to light-gray, fine- to medium-oölitic
9,280-9,290	Dolomite, very pale-orange, fine-crystalline, calcareous
9,290-9,295	Limestone, medium dark-gray, fine-crystalline, dolomitic, slightly argillaceous
9,295-9,300	Limestone, light- to medium-gray, fine-crystalline, dolomitic; trace of very light-gray dense chert
9,300-9,317	Limestone, medium light-gray, fine-crystalline
9,317-9,325	Limestone, pale yellowish-brown, fine-crystalline; light-gray to yellowish-brown dense chert
9,325-9,330	Limestone, brownish-gray, fine-crystalline
9,330-9,340	Limestone, medium-gray, fine-crystalline, argillaceous; medium-gray to brownish-gray dense chert
9,340-9,350	Limestone, medium dark-gray, fine-crystalline, argillaceous; medium dark-gray spicular chert and grayish-black dense chert
9,350-9,360	Dolomite, brownish-gray, fine-crystalline, slightly calcareous and argillaceous
9,360-9,366	Dolomite, brownish-gray, fine-granular, calcareous, argillaceous; light-gray spicular chert
9,366-9,377	Limestone, pale yellowish-brown, medium-crystalline
9,377-9,380	Shale, medium-gray

9,380-9,384	Shale, greenish-gray; brachiopods	9,445-9,450	Sandstone, grayish-white to light greenish-gray, very fine- to medium-grained, subrounded; slight oil stain?
9,384-9,390	Limestone, light-gray, finely sandy	9,450-9,524	Sandstone, white, fine-grained; fair porosity
9,390-9,393	Sandstone, brownish-gray, fine-grained, calcareous, subrounded; some light- to medium-gray sandstone	9,524-9,528	Shale, medium-gray
9,393-9,410	Limestone, brownish-gray, grayish-brown, and medium-gray, dense to very fine-crystalline	9,528-9,530	Sandstone, white, fine-grained; fair porosity
9,410-9,420	Dolomite, pale yellowish-brown to brownish-gray, fine-crystalline	9,530-9,539	Shale, grayish-red, chunky
9,420-9,425	Limestone, medium dark-gray, fine- to medium-sandy; subrounded sand grains	9,539-9,603	Sandstone, white, fine-grained; fair porosity
9,425-9,431	Limestone, brownish-gray, fine- to medium-sandy; subrounded sandy grains	9,603-9,610	Shale, greenish-gray to dark greenish-gray
9,431-9,436	Shale, greenish-gray	9,610-9,615	Shale, medium-gray
9,436-9,445	Sandstone, grayish-white to light greenish-gray, very fine- to medium-grained, subrounded, calcareous	9,615-9,620	Shale, grayish-black
		9,620-9,630	Shale, greenish-gray, finely sandy
		9,630-9,639	Shale, medium-gray
		9,638	Total depth (Electrical log)
		9,639	Total depth (Drillers log)

LOG 10

KINGFISHER COUNTY, OKLAHOMA

NW¼ SE¼ sec. 6, T. 16 N., R. 7 W.

Operator: The Galt-Brown Co.
 Lease: Campbell No. 1
 Elevation: DF 1,137 feet
 Total depth: 7,920 feet
 Completion date: 1930
 Initial production: Dry and abandoned

Electrical log: None

Sample intervals:

10-foot
 800 to 7,280 feet
 5-foot
 7,280 to total depth

Cored intervals:

2,960 to 2,970 feet (one core chip)
 6,015 to 6,019 feet (core chips)

Permian System			
0- 800	No samples		
Hennessey Shale and Garber Sandstone 800-1,540 feet			
800- 830	Shale, moderate reddish-brown	1,627-1,630	Dolomite, medium-gray, argillaceous
830- 836	Anhydrite, white, fine-crystalline	1,630-1,670	Shale, medium-gray
836- 850	Shale, moderate reddish-brown, greenish-gray spots	1,670-1,673	Dolomite, medium-gray, argillaceous
850- 857	Shale, greenish-gray, dolomitic	1,673-1,685	Shale, medium-gray
857- 865	Shale, medium light-gray, silty	1,685-1,695	Shale, greenish-gray
865- 920	Shale, moderate reddish-brown	1,695-1,720	Shale, medium-gray
920- 928	Siltstone, moderate reddish-brown, very finely sandy	1,720-1,722	Dolomite, medium-gray, argillaceous
928- 945	Shale, moderate reddish-brown	1,722-1,726	Shale, medium-gray
945- 950	Shale, greenish-gray	1,726-1,730	Anhydrite, very light-gray, fine-crystalline
950-1,007	Shale, moderate reddish-brown	1,730-1,790	Shale, medium-gray
1,007-1,010	Sandstone, moderate reddish-brown, very fine-grained, silty	1,790-1,794	Anhydrite, very light-gray, fine-crystalline
1,010-1,015	Shale, greenish-gray	1,794-1,800	Shale, medium-gray
1,015-1,040	Shale, moderate reddish-brown	1,800-1,810	Shale, greenish-gray
1,040-1,050	Siltstone, moderate reddish-brown, slightly dolomitic	1,810-1,815	Anhydrite, very light-gray, fine-crystalline
1,050-1,070	Shale, moderate reddish-brown	1,815-1,860	Shale, medium-gray
1,070-1,080	Sandstone, moderate reddish-brown to light-gray, very fine-grained, silty	1,860-1,865	Anhydrite, very light-gray, fine-crystalline
1,080-1,100	Shale, moderate reddish-brown	1,865-1,880	Shale, medium-gray
1,100-1,105	Sandstone, very light-gray, very fine-grained	1,880-1,885	Anhydrite, light-gray, fine-crystalline
1,105-1,160	Shale, moderate reddish-brown	1,885-1,900	Shale, medium-gray
1,160-1,170	Siltstone, moderate reddish-brown, slightly dolomitic	1,900-1,910	Shale, greenish-gray
1,170-1,180	Sandstone, moderate reddish-brown, very fine-grained, silty	1,910-1,920	Shale, medium-gray
1,180-1,200	Shale, moderate reddish-brown	1,920-1,927	Anhydrite, light-gray, fine-crystalline
1,200-1,207	Sandstone, moderate reddish-brown, very fine-grained, silty	1,927-1,935	Shale, medium-gray
1,207-1,215	Shale, greenish-gray	1,935-1,940	Anhydrite, light-gray, fine-crystalline
1,215-1,220	Shale, medium-gray	1,940-1,960	Shale, medium-gray
1,220-1,230	Shale, moderate reddish-brown	1,960-1,963	Anhydrite, light-gray, fine-crystalline
1,230-1,235	Sandstone, moderate reddish-brown, very fine-grained, silty	1,963-2,000	Shale, medium-gray
1,235-1,240	Shale, moderate reddish-brown	2,000-2,007	Anhydrite, light-gray, fine-crystalline
1,240-1,245	Sandstone, pale reddish-brown, very fine-grained	2,007-2,020	Shale, medium-gray
1,245-1,280	Shale, moderate reddish-brown	2,020-2,026	Anhydrite, light-gray, fine-crystalline
1,280-1,285	Sandstone, pale reddish-brown, very fine-grained	2,026-2,036	Shale, medium-gray
1,285-1,310	Shale, moderate reddish-brown	2,036-2,046	Anhydrite, light-gray, fine-crystalline
1,310-1,320	Sandstone, moderate reddish-brown, very fine-grained, silty	2,046-2,070	Shale, medium-gray
1,320-1,325	Sandstone, pale reddish-brown, very fine- to fine-grained	2,070-2,075	Anhydrite, light-gray, fine-crystalline
1,325-1,380	Shale, moderate reddish-brown	2,075-2,090	Shale, medium-gray
1,380-1,386	Shale, greenish-gray	2,090-2,095	Anhydrite, light-gray, fine-crystalline
1,386-1,440	Shale, moderate reddish-brown	2,095-2,100	Shale, medium-gray
1,440-1,443	Dolomite, medium light-gray, silty	2,100-2,110	Anhydrite, very light- to medium-gray, fine-crystalline
1,443-1,470	Shale, moderate reddish-brown	2,110-2,116	Shale, medium-gray
1,470-1,480	Siltstone, moderate reddish-brown, very finely sandy	2,116-2,120	Anhydrite, very light- to medium-gray, fine-crystalline
1,480-1,500	Shale, moderate reddish-brown	2,120-2,126	Shale, medium-gray
1,500-1,507	Shale, medium-gray	2,126-2,130	Anhydrite, very light- to medium-gray, fine-crystalline
1,507-1,520	Shale, moderate reddish-brown	2,130-2,140	Shale, medium-gray
1,520-1,526	Shale, medium-gray	2,140-2,145	Anhydrite, very light- to medium-gray, fine-crystalline
1,526-1,540	Shale, moderate reddish-brown	2,145-2,150	Shale, medium-gray
Wellington Formation 1,540-2,326 feet			
1,540-1,550	Shale, medium-gray	2,150-2,155	Anhydrite, very light- to medium-gray, fine-crystalline
1,550-1,552	Dolomite, medium light-gray, very fine-crystalline, argillaceous	2,155-2,160	Shale, medium-gray
1,552-1,563	Shale, medium-gray, dolomitic	2,160-2,170	Anhydrite, very light- to medium-gray, fine-crystalline
1,563-1,576	Shale, moderate reddish-brown	2,170-2,190	No samples
1,576-1,580	Shale, olive-gray	2,190-2,210	Anhydrite, very light- to medium-gray, fine-crystalline
1,580-1,586	Shale, medium-gray	2,210-2,220	No samples
1,586-1,615	Shale, moderate reddish-brown	2,220-2,230	Anhydrite, very light- to medium-gray, fine-crystalline
1,615-1,627	Shale, medium-gray	2,230-2,236	Shale, medium-gray
		2,236-2,260	Anhydrite, very light- to medium-gray, fine-crystalline
		2,260-2,266	Shale, medium-gray
		2,266-2,275	Anhydrite, very light- to medium-gray, fine-crystalline
		2,275-2,280	Shale, medium-gray
		2,280-2,290	Anhydrite, very light- to medium-gray, fine-crystalline
		2,290-2,297	Shale, medium-gray
		2,297-2,300	Anhydrite, very light- to medium-gray, fine-crystalline
		2,300-2,310	Shale, medium-gray
		2,310-2,320	Anhydrite, very light- to medium-gray, fine-crystalline
		2,320-2,326	Shale, medium-gray

Chase Group			
Nolans Limestone 2,326-2,360 feet		2,850-2,853	Limestone, medium light-gray, fine-crystalline; spotted with orange; caving from 2,660 feet?
2,326-2,335	Dolomite, light-gray, very fine-crystalline, calcareous	2,853-2,870	Shale, medium-gray
2,335-2,350	Shale, medium-gray	2,870-2,880	Shale, moderate olive-brown
2,350-2,360	Limestone, light- to medium-gray, mottled, fine-crystalline, argillaceous, fossiliferous?	2,880-2,885	Limestone, pale yellowish-brown to light-gray, fine-crystalline
2,360-2,380	Shale, medium-gray	2,885-2,896	Shale, medium-gray; bryozoans
2,380-2,390	Shale, olive-gray	2,896-2,905	Shale, grayish-red
Winfield Limestone 2,390-2,457 feet		2,905-2,910	Shale, medium-gray
2,390-2,400	Limestone, medium-gray, fine-crystalline, argillaceous	2,910-2,915	Shale, grayish-red
2,400-2,430	Shale, medium-gray	2,915-2,917	Limestone, pale-red to grayish-red, fine-granular, argillaceous
2,430-2,440	Limestone, medium light- to medium-gray, fine-crystalline, argillaceous	2,917-2,920	Limestone, pale yellowish-brown, very fine-crystalline; mottled with pale red
2,440-2,450	Shale, medium-gray	2,920-2,950	Shale, medium-gray
2,450-2,457	Limestone, medium light-gray, fine-granular, silty	2,950-2,960	Limestone, pale yellowish-brown, fine-crystalline; fusulinids
2,457-2,470	Shale, medium-gray	Base of Beattie Limestone 2,960 feet	
2,470-2,477	Limestone, medium-gray, fine-crystalline, argillaceous	2,960-2,970	Shale and siltstone, medium light-gray, grayish-red, and olive-gray mottled, silty
2,477-2,490	Shale, medium-gray; crinoids 2,485-2,490 feet	2,970-2,975	Shale, grayish-red
Barneston Limestone 2,490-2,660 feet		2,975-2,980	Shale, medium-gray
2,490-2,500	Limestone, medium light-gray, fine-crystalline, argillaceous	2,980-2,990	Shale, medium-gray; irregularly shaped limestone pellets
2,500-2,505	Shale, medium-gray	2,990-3,000	Sandstone, very light- to light-gray, very fine-grained, calcareous
2,505-2,516	Limestone, medium light-gray, fine-crystalline, argillaceous; mottled with dark gray	3,000-3,006	Shale, medium-gray
2,516-2,525	Shale, medium-gray	3,006-3,015	Shale, grayish-red
2,525-2,536	Shale, grayish-red	3,015-3,018	Shale, medium-gray
2,536-2,540	Sandstone, pale reddish-brown, very fine-grained, silty	Grenola Limestone 3,018-3,080 feet	
2,540-2,544	Sandstone, light-gray, very fine-grained, silty	3,018-3,020	Limestone, medium-gray, fine-crystalline
2,544-2,550	Shale, medium-gray	3,020-3,024	Shale, medium-gray
2,550-2,560	Shale, greenish-gray	3,024-3,030	Shale, grayish-red
2,560-2,565	Shale, medium-gray	3,030-3,040	Shale, medium-gray
2,565-2,572	Limestone, medium light-gray, fine-granular, argillaceous; mottled with dark gray; crinoids; spines	3,040-3,046	Shale, grayish-red
2,572-2,580	Limestone, medium-gray, fine-crystalline	3,046-3,060	Shale, medium-gray; fusulinids 3,050-3,060 feet
2,580-2,590	Shale, medium-gray; bryozoans	3,060-3,064	Limestone, medium-gray to pale yellowish-brown, fine-crystalline; caving?
2,590-2,600	Shale, greenish-gray	3,064-3,070	Shale, medium-gray
2,600-2,606	Limestone, medium-gray, very silty	3,070-3,080	Shale, grayish-red
2,606-2,610	Shale, grayish-red	3,080-3,087	Shale, medium-gray
2,610-2,615	Shale, medium-gray	3,087-3,090	Dolomite, medium-gray, very fine-crystalline, argillaceous
2,615-2,620	Limestone, light-gray to pale-orange, fine-granular	3,090-3,100	Shale, medium-gray
2,620-2,625	Limestone, pale yellowish-brown, fine-crystalline	3,100-3,110	Shale, grayish-red
2,625-2,636	Shale, greenish-gray	3,110-3,140	Shale, medium-gray
2,636-2,640	Limestone, medium-gray, fine-crystalline	3,140-3,146	Shale, grayish-red
2,640-2,650	Shale, medium-gray	3,146-3,150	Sandstone, grayish-red, very fine-grained, silty, calcareous
2,650-2,653	Limestone, medium light-gray, fine-crystalline, dolomitic	3,150-3,154	Sandstone, medium light-gray, very fine-grained, silty, calcareous
2,653-2,660	Limestone, medium light-gray, fine-crystalline; spotted with orange; altered fusulinids? or isolites; crystalline calcite	3,154-3,164	Sandstone, light-gray, very fine-grained, calcareous
2,660-2,667	Shale, grayish-red	3,164-3,167	Limestone, very light-gray, very finely sandy
2,667-2,670	Limestone, pale-red, very fine-crystalline, slightly argillaceous	3,167-3,170	Sandstone, light-gray, very fine-grained, calcareous
2,670-2,680	Shale, grayish-red	3,170-3,180	Shale, medium-gray
2,680-2,690	Shale, moderate reddish-brown	3,180-3,184	Limestone, medium-gray, fine-crystalline, slightly argillaceous
2,690-2,710	Shale, medium-gray	3,184-3,220	Shale, medium-gray
Wreford Limestone 2,710-2,760 feet		Red Eagle Limestone, Johnson Shale, and Foraker Limestone, undifferentiated, 3,220-3,380 feet	
2,710-2,720	Limestone, medium light-gray, silty	3,220-3,222	Limestone, medium-gray, fine-crystalline
2,720-2,728	Siltstone, brownish-gray to medium light-gray, calcareous, very finely sandy	3,222-3,230	Shale, greenish-gray
2,728-2,730	Shale, medium-gray	3,230-3,240	Limestone, medium light-gray to pale yellowish-brown, fine-crystalline
2,730-2,736	Shale, grayish-red	3,240-3,247	Sandstone, light-gray, very fine-grained, silty, calcareous
2,736-2,740	Limestone, medium-gray, very silty	3,247-3,258	Shale, medium-gray
2,740-2,745	Shale, medium-gray	3,258-3,266	Limestone, medium-gray, fine-crystalline, argillaceous
2,745-2,750	Shale, grayish-red	3,266-3,270	Siltstone, medium-gray, very calcareous
2,750-2,760	Limestone, medium-gray, fine-crystalline, argillaceous	3,270-3,280	Shale, medium-gray; fusulinids
Council Grove Group		3,280-3,285	Sandstone, very light-gray, very fine-grained, silty, calcareous
2,760-2,765	Shale, olive-gray	3,285-3,280	Shale, medium-gray
2,765-2,770	Shale, grayish-red	3,290-3,300	Shale, grayish-red
2,770-2,774	Sandstone, grayish-red, very fine-grained, calcareous, silty	3,300-3,320	Shale, medium-gray
2,774-2,806	Shale, medium-gray	3,320-3,325	Siltstone, greenish-gray
2,806-2,815	Shale, olive-gray	3,325-3,330	Shale, medium-gray
2,815-2,820	Shale, grayish-red	3,330-3,340	Siltstone, medium-gray, slightly calcareous; crinoids
2,820-2,823	Limestone, moderate reddish-orange, very fine-crystalline, argillaceous	3,340-3,350	Limestone, medium-gray, argillaceous
2,823-2,830	Shale, grayish-red	3,350-3,364	Shale, medium-gray; brachiopods 3,350-3,356 feet
2,830-2,835	Shale, medium-gray	3,364-3,370	Sandstone, very light-gray, very fine-grained, calcareous
Top of Funston Limestone 2,835 feet		3,370-3,373	Limestone, medium-gray, argillaceous
2,835-2,840	Limestone, medium-gray, fine-crystalline, argillaceous; fusulinids	3,373-3,380	Limestone, pale yellowish-brown, fine-crystalline; fusulinids
2,840-2,846	Shale, medium-gray	Admire Group	
2,846-2,850	Limestone, light-gray, very finely sandy, silty	3,380-3,390	Shale, medium-gray
		3,390-3,400	Siltstone, medium-gray
		3,400-3,410	Sandstone, very light-gray, very fine-grained, porous
		3,410-3,420	Siltstone, medium-gray, calcareous; fusulinids; abraded fusulinids

3,420-3,427	Limestone, brownish-gray, argillaceous; fusulinids	4,110-4,120	Siltstone, medium-gray, very finely sandy, calcareous
3,427-3,440	Shale, medium-gray	4,120-4,128	Limestone, pale yellowish-brown, very finely sandy, silty
3,440-3,442	Limestone, medium-gray, argillaceous	4,128-4,130	Shale, medium-gray
3,442-3,470	Shale, medium-gray	4,130-4,140	No samples
3,470-3,474	Limestone, medium- to medium dark-gray, very argillaceous	4,140-4,147	Shale, medium-gray
3,474-3,490	Shale, medium-gray	4,147-4,149	Coal
3,490-3,494	Limestone, pale yellowish-brown, very finely sandy	4,149-4,168	Shale, medium-gray; fusulinids 4,160-4,168 feet
3,494-3,500	Sandstone, very light-gray, very fine-grained, slightly dolomitic	4,168-4,170	Limestone, medium dark-brownish-gray, fine-crystalline, argillaceous
3,500-3,520	Shale, medium-gray	4,170-4,180	Shale, medium-gray
3,520-3,523	Limestone, medium-gray, argillaceous, dolomitic	4,180-4,183	Limestone, medium dark-gray, fine-crystalline, argillaceous; mottled with brownish gray; fusulinids
3,523-3,538	Shale, medium-gray	4,183-4,200	Shale, medium-gray
3,538-3,540	Limestone, moderate-brown, fine-crystalline	4,200-4,210	Sandstone, light-gray, very fine-grained, silty
3,540-3,550	Shale, medium-gray	4,210-4,220	Sandstone, very light-gray, very fine-grained, dolomitic
3,550-3,552	Sandstone, light-gray, very fine-grained, silty	4,220-4,235	Shale, medium-gray
3,552-3,558	Shale, medium-gray	4,235-4,246	Limestone, medium light-gray, fine-crystalline
3,558-3,560	Coal	4,246-4,250	Limestone, medium-gray, fine-crystalline, slightly argillaceous
3,560-3,580	Shale, medium-gray	4,250-4,260	Shale, medium-gray
3,580-3,587	Limestone, medium dark-gray, fine-crystalline, argillaceous; crinoids	4,260-4,270	Limestone, pale yellowish-brown, fine-crystalline
3,587-3,600	Shale, medium-gray, silty	4,270-4,274	Limestone, brownish-gray, fine-crystalline
3,600-3,605	Shale, greenish-gray	4,274-4,288	Shale, medium-gray
3,605-3,610	Shale, medium-gray	4,288-4,292	Limestone, medium-gray, argillaceous
3,610-3,620	Siltstone, medium light-gray, very finely sandy, calcareous	4,292-4,307	Shale, medium-gray
3,620-3,626	Sandstone, light-gray, very fine-grained, silty, calcareous	4,307-4,310	Limestone, pale yellowish-brown, very finely sandy, silty
3,626-3,634	Shale, medium-gray	4,310-4,316	Siltstone, medium light-gray, very finely sandy, calcareous
3,634-3,636	Limestone, pale yellowish-brown, fine-crystalline	4,316-4,322	Shale, grayish-black
3,636-3,655	Shale, medium-gray	4,322-4,330	Shale, medium-gray
3,655-3,662	Limestone, medium dark-gray, very argillaceous; fusulinids	4,330-4,335	Shale, greenish-gray
3,662-3,680	Shale, medium-gray	4,335-4,360	Shale, medium-gray
3,680-3,690	No samples	4,360-4,365	Sandstone, light-gray, very fine-grained, calcareous
3,690-3,700	Sandstone, very light-gray, very fine-grained, calcareous; feldspar?	4,365-4,375	Shale, medium-gray
3,700-3,710	Shale, medium-gray	4,375-4,377	Limestone, medium-gray, fine-crystalline, argillaceous
3,710-3,720	Sandstone, very light- to light-gray, very fine- to fine-grained; calcareous in part	4,377-4,380	Shale, medium-gray
3,720-3,740	Shale, medium-gray	4,380-4,390	Siltstone, medium-gray, very finely sandy
3,740-3,744	Limestone, medium-gray, argillaceous; crinoids; other fossils	4,390-4,399	Shale, medium-gray
3,744-3,750	Shale, medium-gray	4,399-4,410	Limestone, brownish-gray, fine-crystalline
3,750-3,760	Sandstone, light-gray, very fine- to fine-grained, porous; dolomitic in part	4,410-4,425	Sandstone, very light- to light-gray, very fine- to fine-grained, calcareous
3,760-3,764	Shale, medium-gray	4,425-4,460	Shale, medium-gray
3,764-3,766	Limestone, medium light- to medium-gray, fine-crystalline, argillaceous	4,460-4,470	Siltstone, medium-gray
3,766-3,770	Shale, medium-gray	4,470-4,487	Shale, medium dark-gray
3,770-3,772	Limestone, brownish-gray to pale yellowish-brown, fine-crystalline		
3,772-3,776	Shale, medium-gray	4,487-4,500	Limestone, brownish-gray, fine-crystalline
3,776-3,780	Sandstone, light-gray, very fine- to fine-grained, porous	4,500-4,510	Limestone, pale yellowish-brown, fine-crystalline
3,780-3,790	Sandstone, light-gray, very fine-grained, silty	4,510-4,515	Shale, medium-gray
3,790-3,820	Shale, medium-gray	4,515-4,520	Shale, moderate reddish-brown
3,820-3,823	Sandstone, light-gray, very fine- to fine-grained, dolomitic, porous	4,520-4,525	Shale, medium-gray
3,823-3,840	Shale, medium-gray, silty	4,525-4,530	Siltstone, medium-gray
3,840-3,850	Limestone, pale yellowish-brown, fine-crystalline; brachiopods	4,530-4,535	Sandstone, light-gray, very fine-grained, silty, calcareous
3,850-3,856	Shale, medium-gray	4,535-4,538	Shale, medium-gray
3,856-3,860	Limestone, brownish-gray, fine-crystalline	4,538-4,549	Sandstone, light-gray, fine-grained, dolomitic, porous
3,860-3,868	Shale, medium-gray	4,549-4,555	Shale, medium-gray
3,868-3,870	Limestone, medium-gray, granular, argillaceous; brachiopods	4,555-4,560	Sandstone, light-gray, fine-grained, dolomitic, porous
3,870-3,875	Shale, medium-gray	4,560-4,570	Sandstone as above; carbonaceous stringers
3,875-3,880	Siltstone, greenish-gray, very finely sandy	4,570-4,600	Shale, medium-gray
3,880-3,890	Shale, medium-gray	4,600-4,608	Shale, greenish-gray
3,890-3,893	Limestone, pale yellowish-brown, fine-crystalline; fusulinids; spines	4,608-4,620	Shale, medium-gray
3,893-3,910	Shale, medium-gray	4,620-4,624	Sandstone, light-gray, very fine-grained, silty, slightly dolomitic
3,910-3,920	No samples	4,624-4,645	Shale, medium-gray
3,920-3,930	Siltstone, medium-gray	4,645-4,650	Shale, grayish-black
3,930-3,950	Shale, medium dark-gray	4,650-4,668	Shale, medium-gray
3,950-3,960	Siltstone, greenish-gray; cave?	4,668-4,670	Limestone, pale yellowish-brown, fine-crystalline
3,960-3,970	Shale, medium-gray	4,670-4,680	Shale, medium-gray
3,970-4,000	Siltstone, medium light- to medium-gray	4,680-4,685	Limestone, pale yellowish-brown, fine-crystalline; fusulinids
		4,685-4,690	Shale, medium-gray
		4,690-4,695	Limestone, medium-gray, fine-crystalline
		4,695-4,700	Shale, medium-gray
		4,700-4,710	Limestone, pale yellowish-brown, fine-crystalline
		4,710-4,716	Shale, medium-gray
		4,716-4,720	Sandstone, medium dark-gray, very fine-grained, silty, calcareous
		4,720-4,737	Shale, medium-gray
		4,737-4,747	Sandstone, light-gray to very pale-orange, very fine-grained, silty, slightly dolomitic
4,000-4,005	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous	4,747-4,754	Shale, medium-gray
4,005-4,010	Limestone, pale yellowish-brown, fine-crystalline	4,754-4,766	Shale, medium dark-gray
4,010-4,030	Siltstone, medium-gray	4,766-4,770	Shale, grayish-black
4,030-4,034	Limestone, pale yellowish-brown, fine-crystalline	4,770-4,780	Shale, medium dark-gray
4,034-4,040	Shale, medium-gray	4,780-4,785	Sandstone, light-gray, very fine-grained, silty
4,040-4,046	Limestone, brownish-gray, fine-crystalline	4,785-4,790	Shale, medium dark-gray
4,046-4,050	Shale, medium-gray	4,790-4,800	Shale, grayish-black
4,050-4,070	Limestone, pale yellowish-brown, fine-crystalline; some very fine-crystalline limestone	4,800-4,820	Shale, medium dark-gray
4,070-4,076	Shale, medium-gray	4,820-4,830	Sandstone, very light-gray to pale-orange, very fine-grained, slightly dolomitic
4,076-4,080	Limestone, medium light-gray, fine-crystalline	4,830-4,835	Sandstone, very light-gray, very fine- to fine-grained, slightly dolomitic
4,080-4,087	Shale, medium-gray	4,835-4,850	Sandstone, very light-gray, very fine- to fine-grained, slightly calcareous
4,087-4,090	Limestone, medium-gray, fine-crystalline	4,850-4,875	Shale, medium dark-gray
4,090-4,100	Shale, medium-gray		
4,100-4,110	Sandstone, light-gray, very fine-grained, dolomitic		

Pennsylvanian System

Virgil Series

Wabunsee Group Equivalent

Shawnee Group Equivalent

4,875-4,890	Sandstone, light-gray, very fine-grained, silty	6,304-6,310	Sandstone, light-gray, fine-grained, slightly calcareous; some medium grains
4,890-5,006	Shale, medium dark- to dark-gray	6,310-6,330	Shale, medium dark- to dark-gray
5,006-5,010	Limestone, brownish-gray, fine-crystalline	6,330-6,340	Shale, grayish-black
5,010-5,020	Sandstone, light-gray, very fine-grained, silty, slightly dolomitic	6,340-6,380	Shale, medium dark- to dark-gray
5,020-5,037	Shale, medium dark- to dark-gray		
5,037-5,040	Sandstone, light-gray, very fine-grained, silty, slightly dolomitic		
5,040-5,055	Shale, medium dark- to dark-gray	6,380-6,395	Siltstone, medium dark-gray
5,055-5,066	Sandstone, light-gray, very fine- to fine-grained	6,395-6,405	Sandstone, medium-gray, very fine-grained, very silty, slightly calcareous
5,066-5,076	Shale, medium dark- to dark-gray	6,405-6,460	Shale, medium dark- to dark-gray
5,076-5,090	Sandstone, light-gray, very fine-grained; slightly dolomitic in part	6,460-6,464	Sandstone, light-gray, very fine-grained, silty, slightly calcareous
5,090-5,100	Shale, medium dark-gray	6,464-6,470	Shale, medium dark- to dark-gray
5,100-5,115	Sandstone, light-gray, very fine-grained	6,470-6,480	Sandstone, light-gray, very fine-grained, silty
5,115-5,125	Sandstone, light-gray, fine-grained, porous	6,480-6,485	Siltstone, light-gray, very finely sandy; scattered carbonaceous material and mica
5,125-5,130	Sandstone, light-gray, fine- to medium-grained, porous	6,485-6,506	Sandstone, light-gray, very fine-grained, silty
5,130-5,135	Shale, medium dark-gray	6,506-6,510	Shale, medium dark- to dark-gray
5,135-5,145	Sandstone, light-gray, very fine- to fine-grained	6,510-6,520	Sandstone, light-gray, very fine-grained, silty
5,145-5,150	Shale, medium dark-gray	6,520-6,580	Shale, medium dark- to dark-gray
5,150-5,165	Sandstone, light-gray, fine-grained; dolomitic in part	6,580-6,590	Shale, grayish-black
5,165-5,170	Shale, medium dark-gray	6,590-6,630	Shale, medium dark- to dark-gray
5,170-5,180	Sandstone, light-gray, fine-grained	6,630-6,634	Limestone, grayish-brown to dark-gray, slightly argillaceous; gastropods; many crinoids
5,180-5,200	Shale, medium dark- to dark-gray	6,634-6,670	Shale, medium dark- to dark-gray
5,200-5,205	Limestone, pale yellowish-brown, fine-crystalline, soft	6,670-6,680	Shale, medium-gray, slightly calcareous, micaceous, silty
5,205-5,220	Shale, medium dark- to dark-gray	6,680-6,700	Shale, medium dark- to dark-gray
5,220-5,223	Limestone, brownish-gray, fine-crystalline	6,700-6,704	Sandstone, light-gray, very fine-grained, silty
5,223-5,230	Shale, medium dark- to dark-gray	6,704-6,734	Shale, medium dark- to dark-gray
5,230-5,235	Limestone, pale yellowish-brown, fine-crystalline		
5,235-5,250	Shale, medium dark- to dark-gray		
5,250-5,260	Siltstone, medium light-gray, very fine-grained, sandy		
5,260-5,290	Shale, medium dark-gray		
5,290-5,300	Sandstone, light-gray, very fine-grained, dolomitic		
5,300-5,315	Siltstone, light-gray, very fine-grained, sandy slightly dolomitic	6,734-6,736	Limestone, brownish-gray, fine-crystalline
5,315-5,320	Shale, medium dark-gray	6,736-6,740	Shale, medium dark- to dark-gray
5,320-5,335	Sandstone, light-gray, fine- to medium-grained, porous	6,740-6,747	Limestone, medium dark-gray, fine-crystalline, argillaceous; crinoids
5,335-5,350	Shale, medium dark-gray	6,747-6,750	Shale, medium dark- to dark-gray
5,350-5,360	Sandstone, light-gray, fine- to medium-grained, porous	6,750-6,753	Limestone, brownish-gray, fine-crystalline; brachiopods
5,360-5,365	Shale, medium dark-gray		
5,365-5,380	Sandstone, light-gray, very fine- to fine-grained	6,753-6,810	Shale, medium dark- to dark-gray
5,380-5,406	Sandstone, light-gray, very fine-grained	6,810-6,820	Siltstone, medium-gray
5,406-5,480?	Shale, medium dark- to dark-gray	6,820-6,830	Shale, medium dark- to dark-gray
Oread Limestone Member of Vamoosa Formation 5,480? -5,615 feet			
5,480?-5,506	Shale, medium dark- to dark-gray	6,830-6,840	Siltstone, medium-gray to brownish-gray, calcareous
5,506-5,520	Sandstone, light-gray, very fine-grained, silty, slightly calcareous	6,840-6,930	Shale, medium dark- to dark-gray
5,520-5,580	Shale, medium dark- to dark-gray	6,930-6,940	Siltstone, medium-gray, calcareous
5,580-5,590	Limestone, pale yellowish-brown to brownish-gray, finely oölitic	6,940-6,980	Shale, medium dark- to dark-gray, silty
5,590-5,600	Limestone, pale yellowish-brown, finely oölitic and oölicastic	6,980-6,990	Siltstone, medium-gray, calcareous, very finely sandy
5,600-5,605	Shale, medium dark- to dark-gray	6,990-7,000	Siltstone, medium-gray
5,605-5,615	Limestone, pale yellowish-brown, grayish, finely oölitic and oölicastic	7,000-7,030	Shale, medium dark- to dark-gray
Douglas Group Equivalent			
5,615-5,630	Shale, medium dark- to dark-gray	7,030-7,050	Siltstone, medium- to medium dark-gray
5,630-5,640	Siltstone, medium light-gray, very calcareous	7,050-7,060	Shale, grayish-black
5,640-5,650	Shale, medium dark- to dark-gray	7,060-7,070	Siltstone, medium- to medium dark-gray, calcareous
5,650-5,660	Shale, medium dark- to dark-gray; trace of coal; caving?	7,070-7,080	Shale, medium dark- to dark-gray
5,660-5,810	Shale, medium dark- to dark-gray	7,080-7,084	Sandstone, medium-gray, very fine-grained, calcareous, silty
5,810-5,820	Siltstone, medium light-gray, slightly calcareous	7,084-7,100	Shale, medium dark- to dark-gray
5,820-5,840	Shale, medium dark-gray	7,100-7,105	Limestone, brownish-gray, very fine-crystalline
5,840-5,850	Siltstone, medium light-gray, slightly calcareous	7,105-7,110	Limestone, medium dark-gray, very silty, glauconitic; crinoids
5,850-5,910	Shale, medium dark-gray	7,110-7,115	Shale, medium dark- to dark-gray
Missouri Series			
Ochelata Group			
Lansing Group Equivalent			
5,910-5,915	Sandstone, light-gray, very fine-grained, silty	7,115-7,120	Limestone, brownish-gray, fine- to medium-oölicastic and oölitic; some medium dark-gray limestone
5,915-5,990	Shale, medium dark-gray		
5,990-6,000	Siltstone, medium light-gray, very finely sandy, calcareous	7,120-7,150	Shale, medium- to dark-gray, silty
6,000-6,012	Shale, medium dark- to dark-gray	7,150-7,160	Shale, grayish-black
6,012-6,050	Sandstone, light-gray, very fine-grained, silty, slightly calcareous; many gray shale stringers	7,160-7,190	Shale, medium dark-gray
6,050-6,060	Sandstone, light- to medium light-gray, very fine-grained, silty, calcareous		
Kansas City Group Equivalent			
6,060-6,170	Shale, medium dark- to dark-gray	7,190-7,194	Limestone, medium-gray, very argillaceous
6,170-6,190	Shale, grayish-black	7,194-7,196	Shale, medium dark-gray
6,190-6,210	Shale, medium dark- to dark-gray	7,196-7,200	Limestone, brownish-gray, very fine-crystalline
6,210-6,230	Shale, medium-gray, silty	7,200-7,205	Limestone, medium dark-gray, very fine-crystalline; slight brownish tint
6,230-6,250	Shale, medium dark- to dark-gray	7,205-7,220	Limestone, pale yellowish-brown to brownish-gray, fine-crystalline
6,250-6,260	Shale, grayish-black	7,220-7,225	Limestone as above; trace medium dark-gray dense chert
6,260-6,297	Shale, medium dark- to dark-gray	7,225-7,230	Limestone, medium-gray, fine-crystalline
6,297-6,304	Sandstone, medium light-gray, fine-grained, calcareous; some medium grains	7,230-7,240	Limestone, medium-gray, dense to very fine-crystalline, slightly argillaceous
		7,240-7,260	Limestone, brownish-gray to pale yellowish-brown, very fine-crystalline
		7,260-7,270	Limestone, medium- to medium dark-gray, very fine-crystalline
		7,270-7,280	Siltstone, medium light-gray, slightly micaceous
		7,280-7,290	Limestone, medium-gray, very fine- to fine-crystalline
		7,290-7,293	Siltstone, medium-gray, calcareous
		7,293-7,297	Shale, greenish-gray

7,297-7,300	Limestone, medium-gray to brownish-gray, fine-crystalline, argillaceous	7,616-7,618	Limestone, greenish-gray, very fine-crystalline
7,300-7,305	Limestone, brownish-gray, fine-crystalline	7,618-7,622	Shale, greenish-gray
7,305-7,310	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous	7,622-7,624	Limestone, brownish-gray, fine-crystalline
7,310-7,316	Siltstone, dark-gray, calcareous, hard	7,624-7,630	Shale, greenish-gray and grayish-red
7,316-7,320	Limestone, brownish-gray, fine-crystalline	7,630-7,635	Shale, medium dark-gray
7,320-7,335	Shale, medium dark- to dark-gray	7,635-7,640	Shale, greenish-gray
7,335-7,340	Limestone, medium dark-gray, fine-crystalline	7,640-7,643	Limestone, light olive-gray, fine-crystalline, argillaceous
7,340-7,354	Shale, medium dark-gray, silty	7,643-7,645	Shale, grayish-red; brachiopods
7,354-7,360	Limestone, medium-gray, very silty, argillaceous	7,645-7,649	Shale, medium dark-gray
7,360-7,380	Shale, medium dark-gray	7,649-7,652	Limestone, pale yellowish-brown to light-gray, fine-crystalline; some greenish-gray limestone
7,380-7,384	Limestone, medium dark-gray, very fine-crystalline	7,652-7,660	Shale, medium dark-gray
7,384-7,388	Limestone, medium-gray, very argillaceous	7,660-7,666	Shale, grayish-red
7,388-7,391	Shale, medium dark-gray	7,666-7,670	Shale, medium dark-gray
7,391-7,393	Coal	7,670-7,674	Limestone, pale yellowish-brown, fine-crystalline
7,393-7,396	Shale, grayish-black	7,674-7,685	Shale, medium dark-gray
7,396-7,400	Limestone, medium dark-gray, very fine-crystalline, slightly argillaceous, slightly brownish		Mississippian System
7,400-7,403	Limestone, dark-gray, very fine-crystalline, argillaceous		Upper Mississippian Series
7,403-7,410	Shale, medium dark-gray, silty		Rocks of Chesterian Age
7,410-7,417	Siltstone, medium light-gray, very calcareous, micaceous	7,685-7,687	Shale, medium light- to dark-gray, finely sandy, glauconitic
7,417-7,420	Limestone, medium dark-gray, fine-crystalline, argillaceous	7,687-7,690	Limestone, brownish-gray, finely sandy, glauconitic
7,420-7,426	Shale, medium dark-gray	7,690-7,700	Shale, medium dark-gray
7,426-7,430	Limestone, medium dark-gray, very fine-crystalline, slightly argillaceous	7,700-7,703	Limestone, medium light-gray, very fine-crystalline
7,430-7,438	Shale, medium dark-gray	7,703-7,708	Shale, medium dark-gray
7,438-7,440	Limestone, brownish-gray to medium-gray, fine-crystalline; fusulinids	7,708-7,712	Limestone, brownish-gray, fine-crystalline, argillaceous; spines
7,440-7,450	Shale, medium dark-gray, silty	7,712-7,730	Shale, medium dark-gray
7,450-7,456	Limestone, brownish-gray, fine-crystalline	7,730-7,735	Siltstone, medium light- to medium-gray, slightly calcareous
7,456-7,460	Siltstone, medium light-gray, slightly greenish; scattered brown spots	7,735-7,740	Shale, medium dark-gray
7,460-7,465	Limestone, medium dark-brownish-gray, fine-crystalline; black dull chert	7,740-7,746	Limestone, medium dark- to dark-gray, argillaceous; many crinoids; pyrite
7,465-7,470	Limestone, brownish-gray, very fine-crystalline	7,746-7,750	Shale, medium dark-gray
	Cabaniss and Krebs Groups	7,750-7,753	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous
7,470-7,480	Shale, medium dark-gray, silty	7,753-7,766	Limestone, brownish-gray, finely oölitic, very fine- to fine-sandy; little dark-gray finely sandy limestone
7,480-7,482	Limestone, medium dark-gray, fine-crystalline	7,766-7,770	Sandstone, brownish-gray, fine- to medium-grained, calcareous
7,482-7,495	Shale, medium dark-gray	7,770-7,777	Limestone, pale yellowish-brown, medium-oölitic, medium-sandy
7,495-7,500	Shale, grayish-black	7,777-7,780	Shale, medium light-gray, calcareous
7,500-7,537	Shale, medium dark- to dark-gray	7,780-7,783	Limestone, pale yellowish-brown, fine-crystalline, slightly argillaceous; crinoids; bryozoans
7,537-7,542	Limestone, brownish-gray, fine-crystalline	7,783-7,785	Limestone, medium dark-gray, very finely sandy, silty
7,542-7,547	Limestone, light greenish-gray, fine-crystalline	7,785-7,789	Limestone, medium light-gray, very finely sandy
7,547-7,550	Shale, greenish-gray	7,789-7,805	Shale, medium dark-gray
7,550-7,555	Shale, greenish-gray and grayish-red	7,805-7,810	Limestone, grayish-brown, very finely oölitic, slightly argillaceous
7,555-7,560	Shale, grayish-black	7,810-7,830	Shale, medium-gray, calcareous
7,560-7,563	Limestone, black to greenish-gray, very fine-crystalline	7,830-7,857	Shale, medium dark-gray
7,563-7,570	Shale, greenish-gray	7,857-7,863	Limestone, medium dark-gray, fine-crystalline, very argillaceous
7,570-7,577	Shale, medium dark-gray	7,863-7,870	Shale, medium dark-gray
7,577-7,590	Siltstone, medium-gray, calcareous	7,870-7,875	Siltstone, medium dark-gray, calcareous
7,590-7,600	Shale, medium dark-gray	7,875-7,880	Shale, medium dark-gray
7,600-7,604	Shale, grayish-red; caving?	7,880-7,885	Limestone, medium dark-gray, fine-crystalline, very argillaceous
7,604-7,612	Shale, medium dark-gray; trace of coal; caving?	7,885-7,890	Shale, medium dark-gray
7,612-7,616	Limestone, brownish-gray, finely sandy, glauconitic; crinoids; scattered medium to coarse grains of black shale?	7,890-7,895	Shale, dark-gray, hard, calcareous
		7,895-7,920	Shale, medium-gray, calcareous
		7,920	Total depth

LOG 11

KINGFISHER COUNTY, OKLAHOMA

NW¼ NW¼ NE¼ sec. 14, T. 15 N., R. 8 W.

Operator: Camco Oil and Trust Co.
 Lease: F. Parrington No. 1
 Elevation: DF 1,120 feet
 Total depth: 10,135 feet
 Completion date: 1953
 Initial production: Dry and abandoned
 (Logged by B. R. Haley)

Electrical log: 787 feet to total depth
 Sample intervals:

10-foot
 900 to 10,000 feet
 5-foot

10,000 feet to total depth

Cored intervals:

9,225 to 9,275 feet

Permian System			
0- 900	No samples		
Garber Sandstone 900-1,560 feet			
900- 910	Shale, moderate reddish-brown	1,616-1,624	Shale, dark-gray
910- 920	Shale, moderate reddish-brown, slightly calcareous; rounded dark-gray coarse calcareous concretions	1,624-1,628	Shale, greenish-gray
		1,628-1,648	Shale, dark-gray
920- 957	Shale, moderate reddish-brown	1,648-1,650	Dolomite, light-gray, dense
957- 960	Siltstone, moderate reddish-brown, very finely sandy	1,650-1,652	Shale, greenish-gray
960- 976	Sandstone, moderate reddish-brown, very fine-grained, gypsiferous	1,652-1,657	Dolomite, light-gray, granular, slightly silty
		1,657-1,660	Shale, greenish-gray
976- 989	Shale, moderate reddish-brown	1,660-1,670	Shale, dark yellowish-brown
989- 997	Sandstone, very light-gray, very fine-grained, gypsiferous	1,670-1,682	Shale, medium-gray
997-1,001	Shale, moderate reddish-brown	1,682-1,686	Dolomite, very light-gray, dense
1,001-1,010	Sandstone, very light-gray, very fine-grained, gypsiferous	1,686-1,718	Shale, dark-gray
1,010-1,019	Siltstone, moderate reddish-brown	1,718-1,721	Dolomite, dark yellowish-brown, very silty
1,019-1,024	Sandstone, light-gray, very fine-grained, gypsiferous	1,721-1,725	Shale, dark-gray
1,024-1,043	Shale, moderate reddish-brown	1,725-1,730	Dolomite, light-gray, dense
1,043-1,045	Limestone, light-gray, granular	1,730-1,740	Shale, light greenish-gray
1,045-1,050	Shale, moderate reddish-brown; round blackish-red lime pellets	1,740-1,743	Dolomite, yellowish-brown, granular
		1,743-1,760	Shale, dark-gray
1,040-1,060	No samples	1,760-1,770	Shale, light greenish-gray
1,060-1,092	Shale, dark reddish-brown	1,770-1,780	Shale, dark yellowish-brown
1,092-1,095	Limestone, light-gray mottled moderate-red, granular	1,780-1,800	Shale, dark-gray
1,095-1,110	Shale, moderate reddish-brown; rounded coarse calcareous pellets	1,800-1,804	Dolomite, medium-gray, granular, silty
		1,804-1,811	Shale, dark-gray
1,110-1,112	Limestone, pale-red, granular	1,811-1,830	Shale, black
1,112-1,196	Shale, moderate reddish-brown	1,830-1,837	Anhydrite, very light-greenish-gray, very fine-granular
1,186-1,200	Shale as above; very finely sandy	1,837-1,849	Shale, medium-gray
1,200-1,216	Shale, moderate reddish-brown	1,849-1,851	Anhydrite, light-gray, very fine-granular
1,216-1,220	Shale as above; very finely sandy, slightly calcareous	1,851-1,853	Shale, medium-gray
1,220-1,224	Shale, moderate reddish-brown, very finely sandy	1,853-1,860	Anhydrite, light-gray, very fine-granular
1,224-1,241	Shale, moderate reddish-brown	1,860-1,875	Shale, medium-gray
1,241-1,243	Sandstone, very light-gray, very fine-grained	1,875-1,880	Anhydrite, grayish-white, very fine-granular; salt
1,243-1,257	Shale, moderate reddish-brown	1,880-1,888	Anhydrite, grayish-white, very fine-granular
1,257-1,259	Sandstone, very light-gray, very fine-grained	1,888-1,890	Shale, medium-gray
1,259-1,318	Shale, moderate reddish-brown	1,890-1,897	Anhydrite, white, very fine-granular; salt
1,318-1,340	Sandstone, pale- to moderate reddish-brown, very fine-grained, silty	1,897-1,912	Shale, medium-gray
		1,912-1,920	Anhydrite, grayish-white, very fine-granular
1,340-1,377	Shale, moderate reddish-brown	1,920-1,925	Shale, medium-gray
1,377-1,386	Sandstone, pale- to moderate reddish-brown, very fine-grained, silty	1,925-1,930	Anhydrite, grayish-white, very fine-granular
		1,930-1,940	Shale, medium-gray
1,386-1,391	Shale, moderate reddish-brown	1,940-1,942	Anhydrite, grayish-white, very fine-granular
1,391-1,400	Sandstone, pale- to moderate reddish-brown, very fine-grained, silty	1,942-1,947	Shale, medium-gray
		1,947-1,950	Anhydrite, grayish-white, very fine-granular
1,400-1,415	Shale, moderate reddish-brown; light greenish-gray shale streak and blobs	1,950-1,968	Shale, medium-gray
		1,968-1,970	Anhydrite, grayish-white, very fine-granular
1,415-1,430	Shale, moderate reddish-brown	1,970-1,980	Shale, medium-gray
1,430-1,490	No samples	1,980-1,984	Anhydrite, grayish-white, very fine-granular
1,490-1,530	Shale, moderate reddish-brown	1,984-1,996	Shale, medium-gray
1,530-1,534	Shale, dark greenish-gray	1,996-1,999	Anhydrite, grayish-white, very fine-granular
1,534-1,547	Shale, moderate reddish-brown	1,999-2,003	Shale, medium-gray
1,547-1,552	Shale, olive-gray	2,003-2,008	Anhydrite, grayish-white, very fine-granular
1,552-1,560	Shale, moderate reddish-brown	2,008-2,010	Shale, medium-gray
		2,010-2,014	Anhydrite, grayish-white, very fine-granular
		2,014-2,086	Shale, medium-gray
		2,086-2,089	Anhydrite, grayish-white, very fine-granular
		2,089-2,091	Shale, medium-gray
		2,091-2,097	Anhydrite, grayish-white, very fine-granular; salt
		2,097-2,104	Shale, medium-gray
		2,104-2,108	Anhydrite, grayish-white, very fine-granular
		2,108-2,127	Shale, medium-gray
		2,127-2,132	Anhydrite, grayish-white, very fine-granular
		2,132-2,151	Shale, medium-gray; salt
		2,151-2,159	Anhydrite, grayish-white, very fine-granular; salt
		2,159-2,160	Salt
		2,160-2,196	Shale, medium-gray
		2,196-2,203	Anhydrite, grayish-white, very fine-granular
		2,203-2,220	Shale, medium-gray
Wellington Formation 1,560-2,497 feet			
1,560-1,570	No samples		
1,570-1,588	Shale, medium-gray		
1,588-1,591	Dolomite, light-gray, granular, slightly silty		
1,591-1,600	Shale, medium-gray		
1,600-1,610	Shale, dark-gray		
1,610-1,616	Shale, light greenish-gray, dolomitic		

2,220-2,234	Anhydrite, grayish-white, very fine-granular	3,013-3,019	Limestone, light-gray, granular, argillaceous
2,234-2,250	Shale, medium-gray	3,019-3,021	Shale, dark-gray, calcareous
2,250-2,260	Anhydrite, grayish-white, very fine-granular	3,021-3,039	Shale, grayish-red
2,260-2,268	Salt	3,039-3,040	Limestone, very light-gray, granular
2,268-2,282	Shale, medium-gray; salt	3,040-3,062	Shale, olive-gray
2,282-2,310	Anhydrite, grayish-white, very fine-granular	3,062-3,064	Limestone, very light-gray, very fine-crystalline
2,310-2,315	Anhydrite as above; salt	3,064-3,089	Shale, dark-gray
2,315-2,320	Anhydrite as above	3,089-3,104	Limestone, pale yellowish-brown; yellow blotches; very fine-crystalline; fusulinids; spines
2,320-2,324	Salt		
2,324-2,328	Shale, medium-gray		
2,328-2,332	Anhydrite, grayish-white, very fine-granular		
2,332-2,340	Shale, medium-gray	3,104-3,118	Shale, dark-gray
2,340-2,351	Anhydrite, grayish-white, very fine-granular; salt	3,118-3,128	Sandstone, grayish-white, very fine-grained, slightly calcareous
2,351-2,353	Shale, medium-gray		
2,353-2,360	Anhydrite, grayish-white, very fine-granular	3,128-3,163	Shale, dark-gray
2,360-2,364	Shale, medium-gray	3,163-3,174	Sandstone, grayish-white, very fine-grained, slightly calcareous
2,364-2,380	Anhydrite, grayish-white, very fine-granular; salt		
2,380-2,390	Anhydrite, grayish-white, very fine-granular	3,174-3,175	Shale, dark-gray
2,390-2,393	Shale, medium-gray	3,175-3,191	Shale, dark greenish-gray, slightly calcareous
2,393-2,402	Anhydrite, grayish-white, very fine-granular; salt		
2,402-2,404	Shale, medium-gray		
2,404-2,427	Anhydrite, grayish-white, very fine-granular		
2,427-2,429	Shale, medium-gray		
2,429-2,455	Anhydrite, grayish-white, very fine-granular; salt	3,191-3,198	Limestone, dark-gray, silty
2,455-2,473	Shale, medium-gray	3,198-3,224	Shale, dark-gray
2,473-2,480	Anhydrite, grayish-white, very fine-granular	3,224-3,237	Limestone, medium-gray, granular, silty
2,480-2,497	Shale, medium-gray		
Chase Group			
Nolans Limestone 2,497-2,525 feet			
2,497-2,500	Dolomite, very light-gray, granular	3,237-3,250	Shale, dark greenish-gray
2,500-2,505	Shale, medium-gray	3,250-3,285	Shale, medium-gray
2,505-2,517	Dolomite, light-gray, silty	3,285-3,291	Limestone, medium-gray, dense
2,517-2,523	Shale, medium-gray	3,291-3,297	Shale, dusky-red
2,523-2,525	Dolomite, light-gray	3,297-3,306	Shale, dark-gray
		3,306-3,340	Shale, black
		3,340-3,350	Shale, black, slightly calcareous
		3,350-3,530	No samples
			Admire Group
2,525-2,552	Shale, medium-gray	3,530-3,567	Shale, dark-gray
Winfield Limestone 2,552-2,607 feet		3,567-3,574	Sandstone, very light-gray, very fine-grained
		3,574-3,576	Shale, dark-gray
		3,576-3,590	No samples
2,552-2,558	Siltstone, dark-gray, calcareous	3,590-3,603	Shale, dark-gray
2,558-2,565	Shale, medium-gray	3,603-3,606	Limestone, very light-gray, granular
2,565-2,574	Dolomite, light-gray, dense	3,606-3,610	Shale, dark-gray
2,574-2,586	Shale, medium-gray	3,610-3,615	Siltstone, very light-gray, slightly calcareous
2,586-2,591	Limestone, dark-gray, granular	3,615-3,625	Shale, dark-gray
2,591-2,596	Dolomite, dark brownish-gray, dense	3,625-3,634	Shale, dark-gray; slightly calcareous in part
2,596-2,607	Limestone, dark-gray, fine-crystalline, silty	3,634-3,637	Coal (vitrain slivers)
		3,637-3,646	Shale, dark-gray
2,607-2,642	Shale, medium-gray	3,646-3,648	Limestone, dark-gray, argillaceous
2,642-2,645	Limestone, dark-gray, fine-crystalline, silty	3,648-3,662	Shale, dark-gray; calcareous in part
2,645-2,652	Shale, medium-gray	3,662-3,665	Limestone, medium-gray, very fine-crystalline, silty
2,652-2,654	Limestone, dark-gray, fine-crystalline, silty	3,665-3,700	Shale, dark-gray; calcareous in part
2,654-2,660	Shale, medium-gray	3,700-3,705	Sandstone, very light-gray, very fine-grained, silty
Barneston Limestone 2,660-2,780 feet		3,705-3,742	Shale, dark-gray; calcareous in part
		3,742-3,744	Limestone, pale yellowish-brown, very fine-crystalline
2,660-2,672	Limestone, light-gray, very fine-crystalline	3,744-3,775	Shale, dark-gray; calcareous in part
2,672-2,692	Shale, medium-gray	3,775-3,809	Shale, dark-gray
2,692-2,700	Limestone, light-gray, granular; medium-gray chert	3,809-3,814	Sandstone, very light-gray, very fine-grained, slightly calcareous
2,700-2,715	Shale, medium-gray		
2,715-2,730	Limestone, medium-gray, very fine-crystalline, slightly argillaceous	3,814-3,826	Shale, black
2,730-2,743	Shale, dark-gray	3,826-3,828	Coal; lignitized woody fragments
2,743-2,750	Limestone, medium-gray, very fine-crystalline, silty, argillaceous; spines	3,828-3,846	Shale, black
2,750-2,760	Limestone, medium-gray, very fine-crystalline, silty, argillaceous	3,846-3,850	Limestone, pale yellowish-brown, very fine-crystalline; fusulinids
2,760-2,770	Limestone as above; bryozoans	3,850-3,865	Shale, dark yellowish-brown, slightly calcareous
2,770-2,780	Limestone, medium-gray, very fine-crystalline, silty, argillaceous; light-gray spicular chert	3,865-3,900	Shale, dark-gray
		3,900-3,906	Limestone, very light-gray, granular
2,780-2,790	Shale, dark-gray	3,906-3,931	Shale, dark-gray
2,790-2,794	Shale, dark-gray, calcareous	3,931-3,941	Limestone, pale yellowish-brown, very fine-crystalline
2,794-2,813	Shale, dark-gray	3,941-3,950	Shale, dark-gray
		3,950-3,960	Sandstone, light-gray, very fine-grained, silty
		3,960-3,982	Shale, black; calcareous in part
		3,982-3,998	Shale, dark-gray
		3,998-4,006	Limestone, light-gray, granular to very fine-crystalline; spines
Wreford Limestone 2,813-2,902 feet		4,006-4,008	Shale, dark-gray
		4,008-4,018	Limestone, light-gray, granular- to very fine-crystalline; spines
2,813-2,822	Limestone, pale yellowish-brown, very fine-crystalline	4,018-4,047	Shale, dark-gray
2,822-2,825	Shale, dark-gray	4,047-4,050	Limestone, pale yellowish-brown, very fine-crystalline; fusulinids
2,825-2,860	Shale, medium-gray, slightly calcareous		
2,860-2,876	Limestone, medium-gray, very fine-crystalline, argillaceous, porous	4,050-4,062	Shale, dark-gray
2,876-2,890	Shale, medium-gray	4,062-4,064	Limestone, pale yellowish-brown, very fine-crystalline
2,890-2,902	Limestone, very light-gray, yellow-blotched, fine-crystalline; yellowish-brown chert	4,064-4,071	Shale, dark-gray
		4,071-4,073	Limestone, pale yellowish-brown, very fine-crystalline; fusulinids
Council Grove Group		4,073-4,119	Shale, dark-gray
		4,119-4,122	Sandstone, very light-gray, very fine-grained, silty, calcareous
2,902-2,940	Shale, dark-gray, slightly calcareous	4,122-4,130	Shale, dark-gray
2,940-2,973	Shale, dark-gray		
Top of Funston Limestone 2,973 feet			
2,973-2,980	Limestone, light-gray, granular, silty		
2,980-3,013	Shale, dark-gray		

Pennsylvanian System Virgil Series Wabaunsee Group Equivalent			
4,130-4,135	Limestone, pale yellowish-brown, granular	5,108-5,121	Shale, black
4,135-4,174	Shale, dark-gray	5,121-5,130	Sandstone, grayish-white, very fine-grained, subangular, slightly calcareous
4,174-4,178	Limestone, yellowish-brown, very fine- to fine-crystalline	5,130-5,150	Sandstone, grayish-white, very fine-grained, subangular
4,179-4,194	Shale, dark-gray	5,150-5,157	Shale, black
4,194-4,196	Limestone, light-gray, granular	5,157-5,187	Shale, dark-gray, slightly calcareous
4,196-4,213	Shale, black	5,187-5,200	Shale, black, slightly calcareous
4,213-4,215	Limestone, light-gray, granular	5,200-5,252	Shale, black
4,215-4,225	Shale, dark-gray	5,252-5,254	Limestone, yellowish-brown, very fine-crystalline
4,225-4,230	Limestone, yellowish-brown, fine-crystalline	5,254-5,261	Shale, black
4,230-4,244	Shale, black	5,261-5,263	Limestone, yellowish-brown, very fine-crystalline
4,244-4,255	Limestone, pale yellowish-brown, very fine-crystalline; fusulinids	5,263-5,272	Shale, black
4,255-4,267	Limestone, pale yellowish-brown, very fine-crystalline	5,272-5,277	Limestone, pale yellowish-brown, very fine-crystalline
4,267-4,284	Shale, dark-gray	5,277-5,293	Shale, black
4,284-4,287	Limestone, light-gray, granular	5,293-5,296	Limestone, very light-gray, granular
4,287-4,315	Shale, dark-gray	5,296-5,317	Shale, black
4,315-4,320	Sandstone, very light-gray, very fine-grained, silty	5,317-5,326	Limestone, yellowish-brown, fine-crystalline; spines; crinoids
4,320-4,330	Shale, dark-gray	5,326-5,328	Shale, black
4,330-4,333	Sandstone, yellowish-brown, very fine-grained, slightly calcareous	5,328-5,331	Limestone, brownish-black, fine-crystalline
4,333-4,353	Shale, dark-gray	5,331-5,338	Shale, black
4,353-4,390	Shale, black, slightly calcareous	5,338-5,345	Sandstone, grayish-white, very fine-grained, subangular, slightly calcareous
4,390-4,393	Coal; abundant vitrain fragments	5,345-5,357	Shale, black
4,393-4,400	Shale, black	5,357-5,373	Sandstone, grayish-white, very fine-grained, subangular
4,400-4,410	Shale, dark-gray; fusulinids; crinoids; ostracods; spines	5,373-5,400	Shale, dark-gray
4,410-4,432	Shale, dark-gray	5,400-5,421	Sandstone, grayish-white, very fine-grained, subangular
4,432-4,446	Limestone, light-gray, granular	5,421-5,437	Shale, dark-gray
4,446-4,456	Shale, black	5,437-5,441	Sandstone, light-gray, very fine-grained, slightly silty, slightly dolomitic
4,456-4,462	Limestone, pale yellowish-brown, very fine-crystalline	5,441-5,448	Sandstone, grayish-white, very fine-grained, subangular, porous
4,462-4,472	Limestone, yellowish-brown, fine-crystalline	5,448-5,451	Sandstone, grayish-white, very fine-grained, calcareous
4,472-4,474	Shale, black	5,451-5,460	Shale, dark-gray
4,474-4,500	Shale, dark-gray; slightly calcareous in part	5,460-5,474	Sandstone, grayish-white, very fine-grained, subangular
4,500-4,505	Sandstone, very light-gray, very fine-grained, calcareous, silty	5,474-5,494	Shale, dark-gray
4,505-4,518	Shale, dark-gray; calcareous in part	5,494-5,510	Limestone, very light-gray, granular
4,518-4,520	Limestone, dark yellowish-brown, fine-crystalline	5,510-5,520	Limestone, pale yellowish-brown, very fine crystalline; crinoids; spines
4,520-4,539	Shale, dark-gray; limy in part	5,520-5,533	Limestone, yellowish-brown, very fine-crystalline
4,539-4,547	Sandstone, very light-gray, very fine-grained, slightly calcareous	5,533-5,536	Sandstone, light-gray, very fine-grained, calcareous
4,547-4,549	Shale, dark-gray	5,536-5,542	Sandstone, grayish-white, very fine-grained, subangular
4,549-4,567	Sandstone, grayish-white, very fine-grained, subangular	5,542-5,560	Shale, dark-gray, slightly calcareous
4,567-4,576	Shale, dark-gray	5,560-5,568	Sandstone, grayish-white, very fine-grained, subangular
4,576-4,589	Shale, black	5,568-5,574	Sandstone, very light-gray, very fine-grained, calcareous
4,589-4,595	Limestone, very light-gray, granular	5,574-5,607	Shale, black
4,595-4,606	Limestone, yellowish-brown, fine-crystalline	5,607-5,611	Siltstone, yellowish-brown, slightly calcareous
4,606-4,620	Sandstone, very light-gray, very fine-grained, slightly calcareous, subangular	5,611-5,613	Shale, dark-gray
4,620-4,630	Sandstone, light-gray, very fine-grained, silty	5,613-5,620	Limestone, light-gray, very fine-crystalline
4,630-4,650	Sandstone, grayish-white, very fine-grained, subangular, very porous	5,620-5,624	Shale, dark-gray
4,650-4,657	Shale, black	5,624-5,636	Sandstone, grayish-white, very fine-grained
4,657-4,665	Sandstone, light-gray, very fine-grained, subangular, calcareous	5,636-5,646	Siltstone, yellowish-brown, slightly calcareous
4,665-4,675	Sandstone, light-gray, very fine-grained, subangular	5,646-5,676	Sandstone, light yellowish-brown, very fine- to fine-grained, subangular
4,675-4,687	Shale, dark-gray	5,676-5,700	Shale, black
Shawnee Group Equivalent		5,700-5,714	Shale, black, slightly calcareous
4,687-4,720	Limestone, pale yellowish-brown, granular	5,714-5,720	Sandstone, dark-gray, very fine-grained, silty
4,720-4,772	No samples	5,720-5,770	Shale, black
4,772-4,777	Sandstone, light-gray, very fine-grained, calcareous	5,770-5,790	Shale, black, carbonaceous; streaks of coal
4,777-4,796	Sandstone, grayish-white, very fine-grained, subangular, porous	5,790-5,824	Shale, black
4,796-4,814	Shale, dark-gray	Oread Limestone Member of Vamoosa Formation 5,824-5,987 feet	
4,814-4,818	Limestone, pale yellowish-brown, granular	5,824-5,830	Limestone, dark-gray, fine-crystalline, silty
4,818-4,834	Shale, black	5,830-5,846	Shale, black
4,834-4,850	Shale, black, calcareous	5,846-5,854	Sandstone, grayish-white, very fine-grained, slightly calcareous
4,850-4,852	Sandstone, grayish-white, very fine-grained, calcareous, porous	5,854-5,860	Shale, black
4,852-4,862	Sandstone, grayish-white, very fine-grained, porous	5,860-5,865	Limestone, medium-gray, very fine-crystalline, silty
4,862-4,870	Shale, dark-gray	5,865-5,867	Shale, dark-gray
4,870-4,881	Sandstone, grayish-white, very fine-grained	5,867-5,869	Limestone, medium-gray, very fine-crystalline, silty
4,881-4,924	Shale, dark-gray	5,869-5,883	Shale, black
4,924-4,969	Shale, black, slightly calcareous	5,883-5,887	Limestone, brownish-black, fine-crystalline, argillaceous; fine round brown oölites
4,969-4,977	Siltstone, light-gray, calcareous	5,887-5,904	Shale, dark-gray; slightly calcareous in part
4,977-4,984	Shale, dark-gray	5,904-5,920	Siltstone, light-gray
4,984-5,008	Sandstone, grayish-white, very fine-grained, slightly calcareous	5,920-5,944	Limestone, pale yellowish-brown, very finely oölitic, very finely sandy; very light-gray oölites
5,008-5,030	Shale, black	5,944-5,950	Shale, dark-gray
5,030-5,034	Siltstone, light-gray, calcareous	5,950-5,970	Limestone, pale yellowish-brown, very finely oölitic, very finely sandy; very light-gray oölites
5,034-5,037	Shale, black	5,970-5,987	Limestone, light-gray, very finely oölitic, very finely sandy; brownish-black oölites
5,037-5,046	Sandstone, grayish-white, very fine-grained, subangular, slightly calcareous	Douglas Group Equivalent	
5,046-5,060	Shale, black	5,987-6,000	Shale, dark-gray, slightly calcareous
5,060-5,069	Sandstone, light-gray, very fine-grained, silty	6,000-6,020	Shale, dark-gray
5,069-5,074	Shale, black	6,020-6,026	Sandstone, medium-gray, very fine-grained, very calcareous
5,074-5,090	Sandstone, grayish-white, very fine-grained, slightly calcareous	6,026-6,044	Shale, dark-gray
5,090-5,097	Sandstone, grayish-white, very fine-grained, porous	6,044-6,050	Limestone, dark-gray, very fine-crystalline, argillaceous; crinoids; spines
5,097-5,103	Shale, black	6,050-6,065	Shale, dark-gray
5,103-5,108	Limestone, dark-gray, silty	6,065-6,112	Shale, black, slightly calcareous

6,112-6,139	Siltstone, dark-gray, slightly calcareous
6,139-6,150	Sandstone, light-gray, very fine-grained, subangular
6,150-6,164	Shale, black
6,164-6,180	Sandstone, dark yellowish-brown, very fine-grained; calcareous cement
6,180-6,187	Shale, black
6,187-6,189	Coal
6,189-6,195	Shale, black
6,195-6,198	Limestone, medium-gray, fine-crystalline
6,198-6,207	Shale, black
6,207-6,216	Shale, dark-gray, slightly calcareous
6,216-6,220	Limestone, dark-gray, very fine-crystalline, argillaceous
6,220-6,240	Siltstone, dark greenish-gray; calcareous in part
6,240-6,252	Shale, black
6,252-6,282	Shale, dark-gray, slightly calcareous, silty

Missouri Series
Ochelata Group
Lansing Group Equivalent

6,282-6,290	Sandstone, very light-gray, very fine-grained, slightly calcareous
6,290-6,312	Siltstone, light-gray, slightly calcareous
6,312-6,330	Shale, dark-gray, silty, slightly calcareous
6,330-6,350	Shale, black, slightly calcareous
6,350-6,376	Shale, dark-gray, silty, slightly calcareous
6,376-6,406	Sandstone, light-gray, very fine-grained; slightly calcareous in part
Kansas City Group Equivalent	
6,406-6,460	Shale, dark-gray, silty, slightly calcareous
6,460-6,470	Siltstone, dark-gray, calcareous
6,470-6,475	Siltstone, dark-gray, calcareous, very finely sandy
6,475-6,490	Shale, dark-gray, slightly calcareous
6,490-6,538	Shale, dark brownish-gray, slightly calcareous, slightly silty
6,538-6,554	Shale, dark-gray, slightly calcareous, slightly silty
6,554-6,582	Shale, black
6,582-6,589	Siltstone, dark greenish-gray
6,589-6,598	Shale, black
6,598-6,630	Shale, dark yellowish-brown, silty, slightly calcareous
6,630-6,638	Sandstone, light-gray, very fine-grained, slightly dolomitic
6,638-6,650	Shale, black
6,650-6,700	Shale, dark-gray, silty, slightly calcareous; fusulinids (caving?) 6,690-6,700 feet
6,700-6,707	Sandstone, dark yellowish-brown, very fine-grained, subrounded, calcareous; crinoids
6,707-6,720	Shale, black
6,720-6,733	Sandstone, very light-gray, very fine-grained, silty, slightly calcareous
6,733-6,740	Shale, black
6,740-6,760	Sandstone, grayish-white, very fine-grained, subrounded; slightly calcareous in part
6,760-6,803	Shale, black, slightly calcareous
6,803-6,815	Shale, dark-gray, slightly calcareous

Skiatook Group

6,815-6,823	Limestone, yellowish-brown, granular
6,823-6,847	Shale, black, slightly calcareous
6,847-6,850	Limestone, pale yellowish-brown, fine-crystalline
6,850-6,860	Siltstone, light-gray; calcareous in part
6,860-6,867	Sandstone, very light-gray, very fine-grained, slightly calcareous
6,867-6,880	Siltstone, light-gray, sandy, micaceous
6,880-6,900	No samples
6,900-6,945	Siltstone, medium-gray, micaceous, argillaceous
6,945-6,962	Shale, black, slightly calcareous
6,962-6,980	Shale, dark-gray, slightly calcareous
6,980-6,990	Limestone, dark-gray, silty; crinoids
6,990-7,042	Shale, dark-gray
7,042-7,067	Shale, black, slightly calcareous; crinoids 7,050-7,060 feet

Hogshooter Limestone 7,067-7,118 feet

7,067-7,070	Limestone, medium-gray, fine-crystalline, slightly argillaceous
7,070-7,078	Shale, black
7,078-7,090	Limestone, yellowish-brown, very fine-crystalline; bryozoans
7,090-7,100	Shale, black
7,100-7,107	Limestone, pale yellowish-brown, very fine-crystalline; light-gray fine rounded oölites
7,107-7,114	Shale, black
7,114-7,118	Limestone, light-gray, fine-crystalline, silty
7,118-7,136	Shale, black
7,136-7,147	Sandstone, light-gray, very fine-grained, subangular, calcareous
7,147-7,184	Shale, dark-gray, silty, slightly calcareous
7,184-7,267	Shale, black, slightly calcareous
7,267-7,277	Shale, black, calcareous
7,277-7,307	Shale, black
7,307-7,314	Sandstone, medium-gray, very fine-grained, silty, calcareous
7,314-7,339	Shale, black

7,339-7,346	Sandstone, medium-gray, very fine-grained, silty calcareous; dark-brown fine rounded oölites
7,346-7,355	Shale, black
7,355-7,359	Sandstone, grayish-white, very fine-grained, calcareous
7,359-7,377	Shale, black
7,377-7,382	Sandstone, yellowish-brown, very fine-grained, calcareous
7,382-7,388	Shale, black
7,388-7,400	Limestone, medium-gray, very fine-crystalline, argillaceous
7,400-7,408	Shale, black
7,408-7,419	Limestone, dark yellowish-brown, fine-crystalline, oölitic
7,419-7,426	Siltstone, dark-gray, calcareous; dark yellowish-brown coarse rounded oölites

Pleasanton Group Equivalent
(Pleasanton Formation Equivalent on Chart OC-61)

7,426-7,440	Shale, black, slightly calcareous
7,440-7,458	Siltstone, dark-gray, slightly calcareous
7,458-7,528	Shale, black; slightly calcareous in part
Des Moines Series Marmaton Group	
7,528-7,550	Siltstone, medium-gray, calcareous
7,550-7,565	Limestone, light-gray, very fine-crystalline
7,565-7,600	Limestone, pale yellowish-brown, fine-crystalline
7,600-7,619	Limestone, light-gray, very fine-crystalline
7,619-7,626	Shale, black, slightly calcareous
7,626-7,660	Limestone, light- to medium-gray, very fine-crystalline
7,660-7,682	Limestone, yellowish-brown, very fine-crystalline, argillaceous
7,682-7,716	Shale, black; slightly calcareous in part
7,716-7,729	Limestone, brownish-black, argillaceous; black rounded oölites
7,729-7,750	Siltstone, dark-gray, slightly calcareous
7,750-7,763	Shale, black
7,763-7,796	Limestone, dark yellowish-brown, very fine-crystalline
7,796-7,815	Shale, black
7,815-7,822	Limestone, medium-gray, very fine-crystalline

Cabaniss and Krebs Groups

7,822-7,850	Shale, black
7,850-7,884	Shale, black, silty, slightly calcareous
7,884-7,891	Limestone, dark brownish-gray, fine-crystalline
7,891-7,900	Shale, black
7,900-7,911	Limestone, yellowish-brown, very fine- to fine-crystalline
7,911-7,920	Siltstone, dark-gray, micaceous
7,920-7,929	Sandstone, medium-gray, very fine-grained, silty, slightly calcareous
7,929-7,933	Shale, black
7,933-7,940	Limestone, medium-gray, very fine-crystalline, slightly argillaceous
7,940-7,961	Shale, dark-gray, silty, slightly calcareous
7,961-7,968	Limestone, light- to medium-gray, fine-crystalline
7,968-8,020	Shale, black; calcareous in part
8,020-8,028	Limestone, medium-gray, very fine-crystalline
8,028-8,030	Shale, black
8,030-8,033	Limestone, medium-gray, very fine-crystalline
8,033-8,040	Shale, black
8,040-8,045	Siltstone, medium-gray, slightly calcareous
8,045-8,080	Shale, black, silty
8,080-8,098	Shale, medium-gray
8,098-8,108	Limestone, yellowish-brown, very fine-crystalline
8,108-8,118	Shale, medium-gray
8,118-8,126	Limestone, light-gray, very fine-crystalline; yellow blobs and streaks
8,126-8,139	Shale, light greenish-gray
8,139-8,161	Shale, light-gray
8,161-8,169	Siltstone, dark-gray
8,169-8,200	Shale, black, slightly calcareous
8,200-8,237	Shale, dark-gray, slightly calcareous

Mississippian System
Upper Mississippian Series
Rocks of Chesterian Age

8,237-8,242	Limestone, brownish-black, very fine-crystalline, argillaceous; black medium oölites
8,242-8,275	Shale, black, slightly calcareous
8,275-8,285	Limestone, light-gray, very finely sandy
8,285-8,287	Shale, black
8,287-8,300	Sandstone, very light-gray, very fine-grained, calcareous
8,300-8,313	Limestone, pale yellowish-brown, very finely sandy; some rounded fine-grained sandstone
8,313-8,317	Limestone as above; black coarse rounded oölites
8,317-8,322	Shale, black
8,322-8,330	Sandstone, very light-gray, very fine-grained, calcareous
8,330-8,345	Limestone, yellowish-brown, very finely sandy
8,345-8,380	Shale, dark-gray, silty, calcareous
8,380-8,421	Shale, black; slightly calcareous in part
8,421-8,433	Shale, dark-gray; slightly silty in part
8,433-8,450	Shale, black
8,450-8,457	Shale, black, very calcareous; crinoids; spines
8,457-8,491	Shale, dark-gray

LOG 12
CANADIAN COUNTY, OKLAHOMA
Center NW¼ NE¼ sec. 16, T. 14 N., R. 9 W.

Operator: Ramsey Petroleum Co.
Lease: Mansfield No. 1
Elevation: 1,376 feet
Total depth: Electrical log 9,521 feet
Drillers 9,570 feet
Completion date: 1939
Initial production: Dry and abandoned

Electrical log: 484 to 9,521 feet
Sample intervals:
10-foot
500 to 9,540 feet
5-foot
9,540 to total depth

Permian System		1,620-1,625	Sandstone, moderate reddish-brown, very fine-grained, silty, slightly dolomitic
0- 500	No samples	1,625-1,635	Shale, moderate reddish-brown
		1,635-1,649	Sandstone, pale reddish-brown, very fine-grained, slightly dolomitic
	El Reno Group		
	Duncan Sandstone 500-523 feet	1,649-1,750	Shale, moderate reddish-brown
		1,750-1,760	Sandstone, pale-red, very fine-grained
500- 501	Dolomite, light olive-gray, fine- to medium-oölitic, oöclastic; caving?	1,760-1,789	Shale, moderate reddish-brown
		1,789-1,800	Sandstone, moderate reddish-brown, very fine-grained, silty
501- 520	Shale, moderate reddish-brown; white gypsum	1,800-1,808	Sandstone, pale-red, very fine-grained
520- 523	Sandstone, pale reddish-brown, very fine-grained, gypsiferous	1,808-1,845	Shale, moderate reddish-brown
		1,845-1,850	Shale, light greenish-gray
		1,850-1,865	Shale, moderate reddish-brown
		1,865-1,880	Sandstone, pale-red, very fine-grained
		1,880-1,901	Shale, moderate reddish-brown
		1,901-1,904	Limestone, grayish-red, very fine-crystalline, argillaceous
523- 555	Shale, moderate reddish-brown; white gypsum		
555- 561	Siltstone, light-gray	1,904-1,907	Shale, moderate reddish-brown
561- 576	Shale, moderate reddish-brown	1,907-1,914	Sandstone, pale reddish-brown, very fine-grained
576- 579	Dolomite, light olive-gray, very fine-crystalline	1,914-1,937	Shale, moderate reddish-brown
579- 590	Shale, moderate reddish-brown	1,937-1,940	Siltstone, very pale-orange
590- 650	Shale as above; light greenish-gray spots 600-630 feet; grayish-white fine-crystalline anhydrite and white gypsum	1,940-1,950	Siltstone, moderate reddish-orange
		1,950-1,960	Shale, moderate reddish-brown
		1,960-1,965	Shale, medium-gray
650- 676	Shale, moderate reddish-brown	1,965-1,975	Shale, moderate reddish-brown
676- 686	Siltstone, very light-gray, very finely sandy	1,975-1,980	Siltstone, moderate reddish-brown, very finely sandy
686- 700	Shale, moderate reddish-brown	1,980-1,994	Shale, moderate reddish-brown
700- 705	Siltstone, very light-gray, very finely sandy	1,994-2,003	Shale, medium-gray
705- 718	Shale, moderate reddish-brown	2,003-2,015	Shale, moderate reddish-brown
718- 723	Siltstone, pale reddish-brown	2,015-2,030	Shale, medium-gray
723- 759	Shale, moderate reddish-brown	2,030-2,034	Dolomite, medium-gray, argillaceous
759- 767	Siltstone, pale reddish-brown	2,034-2,050	Shale, moderate reddish-brown
767- 775	Shale, moderate reddish-brown	2,050-2,063	Shale, greenish-gray
775- 783	Siltstone, very light-gray, very finely sandy	2,063-2,072	Sandstone, grayish-red, very fine-grained, silty
783- 827	Shale, moderate reddish-brown	2,072-2,080	Shale, moderate reddish-brown
827- 832	Shale, pale reddish-brown, very finely sandy	2,080-2,090	Sandstone, pale-red to light-gray, very fine-grained
832-1,020	Shale, moderate reddish-brown	2,090-2,098	Shale, medium-gray
1,020-1,025	Siltstone, pale reddish-brown, very finely sandy	2,098-2,114	Shale, moderate reddish-brown
1,025-1,164	Shale, moderate reddish-brown	2,114-2,124	Sandstone, grayish-red, very fine-grained, silty
1,164-1,167	Gypsum, white	2,124-2,130	Shale, moderate reddish-brown
1,167-1,240	Shale, moderate reddish-brown		
1,240-1,241	Dolomite, light olive-gray, very fine-crystalline		Wellington Formation 2,130-3,045 feet
1,241-1,250	Shale, greenish-gray		
1,250-1,254	Dolomite, medium light-gray, very argillaceous		
1,254-1,290	Shale, moderate reddish-brown	2,130-2,140	Shale, medium-gray
1,290-1,295	Limestone, medium-gray, very fine-crystalline; pale yellowish-brown very fine-crystalline limestone	2,140-2,150	Shale, greenish-gray
		2,150-2,173	Shale, medium-gray
1,295-1,336	Shale, moderate reddish-brown	2,173-2,176	Dolomite, medium-gray, argillaceous
1,336-1,341	Limestone, pale-red, very fine-crystalline, slightly argillaceous	2,176-2,210	Shale, medium-gray
		2,210-2,215	Shale, dark-gray
1,341-1,369	Shale, moderate reddish-brown	2,215-2,225	Shale, greenish-gray
		2,225-2,237	Shale, medium-gray
		2,237-2,240	Shale, grayish-black
		2,240-2,248	Shale, medium-gray
		2,248-2,250	Dolomite, light-gray, very fine-crystalline
1,369-1,385	Sandstone, pale reddish-brown, very fine-grained, silty	2,250-2,260	Shale, greenish-gray
1,385-1,475	Shale, moderate reddish-brown	2,260-2,280	Shale, medium-gray
1,475-1,486	Sandstone, pale reddish-brown to very light-gray, very fine-grained, silty	2,280-2,286	Shale, greenish-gray
		2,286-2,290	Dolomite, light-gray, very fine-crystalline
1,486-1,490	Shale, moderate reddish-brown	2,290-2,310	Shale, medium-gray
1,490-1,495	Sandstone, pale reddish-brown, very fine-grained, silty	2,310-2,316	Shale, greenish-gray
1,495-1,500	Shale, moderate reddish-brown	2,316-2,320	Shale, grayish-black
1,500-1,519	No samples From electrical log: Shale	2,320-2,327	Shale, medium-gray
1,519-1,526	Sandstone, grayish-white to pale-red, very fine-grained	2,327-2,330	Dolomite, medium light-gray, very fine-crystalline
1,526-1,530	Shale, moderate reddish-brown	2,330-2,340	Shale, greenish-gray
1,530-1,550	Sandstone, grayish-white to pale-red, very fine-grained	2,340-2,350	Shale, medium- to dark-gray
1,550-1,556	Sandstone, moderate reddish-brown, very fine-grained, silty	2,350-2,353	Anhydrite, light-gray, fine-crystalline
1,556-1,567	Shale, moderate reddish-brown	2,353-2,360	Shale, medium-gray
1,567-1,587	Sandstone, pale-red, very fine-grained	2,360-2,370	Shale, greenish-gray
1,587-1,600	Shale, moderate reddish-brown	2,370-2,379	Shale, medium-gray
1,600-1,620	No samples From electrical log: Sandstone		

4,580-4,588

4,592-4,600
4,600-4,610
4,610-4,617
4,617-4,626
4,626-4,635
4,635-4,646
4,646-4,653
4,653-4,660

4,660-4,668
4,668-4,690
4,690-4,700
4,700-4,702
4,702-4,704
4,704-4,710
4,710-4,720
4,720-4,730
4,730-4,738
4,738-4,741
4,741-4,744
4,744-4,776
4,776-4,785
4,785-4,806

4,806-4,813

4,813-4,820

4,820-4,825
4,825-4,835

4,835-4,851
4,851-4,855
4,855-4,863
4,863-4,880
4,880-4,891
4,891-4,894
4,894-4,912
4,912-4,920

4,920-4,955
4,955-4,960
4,960-4,966
4,966-4,980
4,980-4,984
4,984-4,998
4,996-5,000
5,000-5,005
5,007-5,017
5,015-5,025
5,025-5,043

5,043-5,070
5,070-5,072
5,072-5,088
5,088-5,116

5,116-5,141
5,141-5,145

5,145-5,16
5,162-5,170

5,170-5,180
5,180-5,200
5,200-5,208
5,208-5,220
5,220-5,240
5,240-5,262

5,262-5,268
5,268-5,276

5,276-5,290
5,290-5,295
5,295-5,303
5,305-5,314
5,314-5,318
5,318-5,326
5,326-5,332
5,332-5,337
5,337-5,347
5,347-5,370
5,370-5,380
5,380-4,000
5,400-5,405
5,405-5,417

Pennsylvanian System
Virgil Series
Wabaunsee Group Equivalent

4,813-4,820	Limestone, very pale-orange to pale yellowish-brown, fine-crystalline
4,820-4,825	Limestone, brownish-gray to medium-gray, fine-crystalline
4,825-4,835	Limestone, pale yellowish-brown, fine-crystalline; fusulinids
4,835-4,851	Shale, medium-gray
4,851-4,855	Limestone, brownish-gray, fine-crystalline; fusulinids
4,855-4,863	Siltstone, greenish-gray
4,863-4,880	Shale, medium-gray
4,880-4,891	Shale, medium-gray, silty
4,891-4,894	Siltstone, olive-gray
4,894-4,912	Shale, medium-gray
4,912-4,920	Limestone, pale yellowish-brown to brownish-gray, fine-crystalline
4,920-4,955	Shale, medium-gray
4,955-4,960	Siltstone, medium-gray
4,960-4,966	Shale, grayish-black
4,966-4,980	Shale, greenish-gray
4,980-4,984	Shale, medium-gray
4,984-4,996	Shale, grayish-red
4,996-5,000	Shale, moderate reddish-brown
5,000-5,007	Shale, medium-gray
5,007-5,015	Sandstone, very light-gray, fine-grained, porous
5,015-5,025	Shale, medium-gray; fusulinids
5,025-5,043	Sandstone, very light-gray, very fine-grained, slightly dolomitic
5,043-5,070	Shale, medium-gray; fusulinids 5,060-5,065 feet
5,070-5,072	Limestone, medium-gray, fine-crystalline, argillaceous
5,072-5,088	Shale, medium-gray
5,088-5,116	Sandstone, very light-gray, fine-grained, slightly dolomitic, porous
5,116-5,141	Shale, medium-gray
5,141-5,145	Limestone, grayish-brown, fine-crystalline, slightly argillaceous
5,145-5,162	Shale, medium-gray
5,162-5,170	Limestone, pale yellowish-brown to brownish-gray, very fine-crystalline
5,170-5,180	Shale, greenish-gray
5,180-5,200	Shale, medium-gray
5,200-5,208	Shale, grayish-black
5,208-5,220	Shale, medium-gray
5,220-5,240	Siltstone, medium- to medium light-gray
5,240-5,262	Sandstone, very light-gray, fine-grained, slightly dolomitic, porous
5,262-5,268	Shale, medium-gray
5,268-5,276	Sandstone, very light-gray, fine-grained, slightly dolomitic, porous
5,276-5,290	Shale, medium-gray
5,290-5,295	Shale, grayish-black
5,295-5,305	Shale, medium-gray
5,305-5,314	Limestone, pale yellowish-brown, fine-crystalline
5,314-5,318	Shale, medium-gray
5,318-5,326	Siltstone, light-gray
5,326-5,332	Shale, medium-gray
5,332-5,337	Sandstone, light-gray, very fine-grained, silty
5,337-5,347	Shale, medium-gray
5,347-5,370	Sandstone, very light-gray, very fine-grained
5,370-5,380	Shale, greenish-gray
5,380-5,400	Shale, medium-gray
5,400-5,405	Shale, grayish-black
5,405-5,417	Shale, medium-gray

Shawnee Group Equivalent			
5,417-5,430	Limestone, pale yellowish-brown, fine-crystalline	6,300-6,307	Limestone, pale yellowish-brown to brownish-gray, fine-crystalline
5,430-5,439	Limestone, pale yellowish-brown to brownish-gray, very fine-crystalline	6,307-6,314	Shale, medium-gray
5,439-5,441	Limestone, medium- to medium dark-gray, fine-crystalline, slightly argillaceous	6,314-6,318	Siltstone, light-gray
5,441-5,460	Shale, medium-gray	6,318-6,330	Shale, medium-gray
5,460-5,470	Shale, grayish-black	6,330-6,334	Siltstone, light-gray
5,470-5,487	Shale, medium-gray	6,334-6,344	Shale, medium-gray
5,487-5,493	Siltstone, greenish-gray	6,344-6,353	Siltstone, light- to medium-gray, very finely sandy
5,493-5,500	Shale, medium-gray	6,353-6,365	Shale, medium-gray
5,500-5,510	Sandstone, light-gray to light olive-gray, very fine-grained, silty	6,365-6,375	Shale, grayish-black
5,510-5,514	Shale, medium-gray	6,375-6,380	Shale, medium-gray
5,514-5,520	Siltstone, medium-gray	6,380-6,392	Sandstone, very light-gray to very pale-orange, fine-grained, dolomitic
5,520-5,525	Shale, grayish-black	6,392-6,400	Shale, medium-gray
5,525-5,540	Shale, medium-gray	6,400-6,406	Shale, grayish-black
5,540-5,547	Limestone, brownish-gray, fine-crystalline	6,406-6,418	Shale, medium-gray
5,547-5,553	Siltstone, greenish-gray	6,418-6,428	Siltstone, light- to medium light-gray, very finely sandy
5,553-5,572	Shale, medium-gray; fusulinids 5,560-5,570 feet	6,428-6,430	Shale, medium-gray
5,572-5,574	Limestone, medium dark-gray, fine-crystalline, argillaceous	6,430-6,437	Siltstone, light- to medium light-gray, very finely sandy
5,574-5,580	Shale, medium-gray	6,437-6,450	Shale, medium-gray
5,580-5,587	Shale, grayish-black	6,450-6,456	Shale, grayish-black
5,587-5,589	Limestone, brownish-gray, very fine-crystalline	6,456-6,474	Shale, medium-gray
5,589-5,594	Shale, medium-gray	6,474-6,484	Limestone, dark-gray, very finely sandy, silty
5,594-5,616	Sandstone, very light- to light-gray, very fine-grained, slightly dolomitic	6,484-6,494	Shale, medium-gray
5,616-5,620	Siltstone, medium-gray, very finely sandy	6,494-6,499	Sandstone, very light- to light-gray, very fine-grained, silty
5,620-5,650	Shale, medium-gray	6,499-6,509	Shale, medium-gray
5,650-5,660	Shale, grayish-black	6,509-6,517	Sandstone, very light-gray to very pale-orange, very fine-grained
5,660-5,680	Shale, medium-gray	6,517-6,519	Shale, medium-gray
5,680-5,690	Shale, greenish-gray	6,519-6,541	Sandstone, very light-gray to very pale-orange, very fine-grained
5,690-5,700	Shale, grayish-black	6,541-6,550	Shale, medium-gray
5,700-5,715	Shale, medium-gray	6,550-6,560	Shale, grayish-black
5,715-5,720	Shale, grayish-black	6,560-6,570	Shale, medium-gray
5,720-5,740	Shale, medium-gray	6,570-6,580	Shale, grayish-black
5,740-5,744	Siltstone, light olive-gray, very finely sandy,	6,580-6,600	Shale, medium-gray
5,744-5,759	Shale, medium-gray	6,600-6,610	Shale, grayish-black
5,759-5,764	Siltstone, medium light-gray, very finely sandy	6,610-6,680	Shale, medium-gray
5,764-5,790	Shale, medium-gray	6,680-6,690	Sandstone, very light-gray, very fine-grained, silty
5,790-5,805	Sandstone, very light-gray, very fine-grained, silty	6,690-6,710	Sandstone, very light-gray, very fine-grained
5,805-5,810	Sandstone, medium-gray, very fine-grained, silty	6,710-6,730	Sandstone, very light-gray, fine-grained, slightly dolomitic
5,810-5,818	Shale, grayish-black	6,730-6,740	Shale, medium-gray
5,818-5,824	Sandstone, light-gray, very fine-grained, silty	6,740-6,745	Siltstone, medium light- to medium-gray
5,824-5,830	Shale, medium-gray; coal at base	6,745-6,769	Shale, medium-gray
5,830-5,832	Sandstone, very light-gray, very fine-grained, silty	6,769-6,784	Siltstone, light-gray to light olive-gray, very finely sandy
5,832-5,836	Shale, medium-gray; fusulinids	6,783-6,845	Shale, medium-gray; very thin coal stringers 6,800-6,805 feet
5,836-5,845	Sandstone, very light-gray, very fine-grained, silty	6,845-6,858	Sandstone, very light-gray to yellowish-brown, fine-grained, dolomitic
5,845-5,850	Shale, medium-gray	6,858-6,870	Siltstone, very light-gray, very finely sandy
5,850-5,860	Shale, grayish-black	6,870-6,885	Sandstone, very light-gray, very fine- to fine-grained
5,860-5,870	Shale, medium-gray	6,885-6,910	Sandstone, very light-gray, fine-grained
5,870-5,887	Limestone, brownish-gray, fine-crystalline	6,910-6,925	Sandstone, very light-gray, very fine-grained
5,887-5,904	Shale, medium-gray		
5,904-5,910	Sandstone, very light-gray, fine-grained, slightly dolomitic, porous	Douglas Group Equivalent	
5,910-5,922	Sandstone as above; some medium grains	6,925-6,980	Shale, medium-gray
5,922-5,925	Shale, medium-gray	6,980-6,990	Shale, grayish-black
5,925-5,930	Sandstone, very light-gray, very fine-grained	6,990-7,010	Shale, medium-gray
5,930-5,934	Shale, medium-gray	7,010-7,130	Shale, medium to dark-gray, silty
5,934-5,945	Sandstone, very light-gray, very fine- to fine-grained, slightly dolomitic	7,130-7,140	Shale, grayish-black
5,945-5,955	Shale, medium-gray	7,140-7,230	Shale, medium-gray
5,955-5,970	Shale, greenish-gray; silty in part	7,230-7,240	Shale, grayish-black
5,970-5,980	Shale, medium-gray	7,240-7,260	Shale, medium-gray
5,980-5,990	Shale, medium-gray, silty	7,260-7,270	Shale, grayish-black
5,990-6,000	Shale, medium-gray	7,270-7,312	Shale, medium-gray; coal 7,290-7,291? feet
6,000-6,010	Shale, grayish-black		
6,010-6,035	Shale, medium-gray	Missouri Series	
6,035-6,040	Siltstone, olive-gray	Ochelata Group	
6,040-6,050	Shale, medium-gray; fusulinids	Lansing Group Equivalent	
6,050-6,060	Shale, grayish-black	7,312-7,320	Sandstone, light- to medium light-gray, very fine-grained, calcareous
6,060-6,100	Shale, medium-gray	7,320-7,340	Sandstone, very light- to light-gray, very fine- to fine-grained
6,100-6,110	Siltstone, light olive-gray	7,340-7,350	Sandstone as above; slightly dolomitic
6,110-6,126	Shale, medium-gray	7,350-7,365	Sandstone, light-gray, fine-grained; yellowish-brown spots
6,126-6,130	Siltstone, medium light-gray		
6,130-6,135	Shale, medium-gray	Kansas City Group Equivalent	
6,135-6,147	Shale, grayish-black	7,365-7,370	Shale, medium-gray
6,147-6,150	Limestone, medium dark-gray, very fine-crystalline, slightly argillaceous	7,370-7,375	Shale, grayish-black
6,150-6,155	Limestone, medium dark-brownish-gray, very fine-crystalline, slightly argillaceous	7,375-7,380	Shale, medium-gray
6,155-6,160	Shale, medium-gray, silty	7,380-7,385	Shale, grayish-black
6,160-6,165	Shale, greenish-gray	7,385-7,390	Shale, medium-gray
6,165-6,175	Shale, grayish-black	7,390-7,420	Siltstone, medium-gray
6,175-6,205	Shale, medium-gray	7,420-7,425	Shale, grayish-black
6,205-6,210	Sandstone, very light-gray to very pale-orange, very fine-grained, porous	7,425-7,458	Shale, medium-gray
6,210-6,251	Sandstone, very light-gray to very pale-orange, fine-grained, porous	7,458-7,465	Siltstone, medium dark-gray, calcareous
6,251-6,275	Shale, medium-gray	7,465-7,470	Shale, medium-gray
6,275-6,280	Siltstone, greenish-gray	7,470-7,480	Shale, grayish-black
6,280-6,287	Shale, medium-gray	7,480-7,500	Shale, medium-gray
6,287-6,300	Sandstone, very light- to light-gray, very fine-grained, silty	7,500-7,513	Limestone, medium light- to dark-gray, fine- to medium-sandy; crinoids
		7,513-7,539	Shale, medium-gray
		7,539-7,542	Sandstone, medium dark-brownish-gray, fine-grained, calcareous

7,542-7,558	Shale, medium-gray
7,558-7,562	Limestone, medium dark-gray, very argillaceous; fusulinids
7,562-7,630	Shale, medium-gray
7,630-7,640	Shale, grayish-black
7,640-7,660	Shale, medium-gray
7,660-7,670	Shale, grayish-black

Skiatook Group

7,670-7,680	Siltstone, medium dark-gray
7,680-7,695	Shale, medium-gray
7,695-7,704	Siltstone, light olive-gray
7,704-7,715	Sandstone, very light-gray, very fine-grained
7,715-7,732	Siltstone, very light- to light-gray, very finely sandy, slightly micaceous
7,732-7,745	Sandstone, medium light-gray, very fine-grained, silty, slightly micaceous
7,745-7,757	Sandstone, very light- to light-gray, very fine-grained, silty
7,757-7,770	Siltstone, medium-gray
7,770-7,815	Shale, medium-gray
7,815-7,824	Shale, medium dark-gray, silty
7,824-7,830	Shale, grayish-black
7,830-7,880	Shale, medium-gray
7,880-7,890	Shale, grayish-black
7,890-7,935	Shale, medium-gray; small fusulinid 7,895-7,900 feet; caving?
7,935-7,940	Sandstone, very light- to light-gray, very fine-grained; caving?
7,940-7,995	Shale and siltstone, medium- to dark-gray, silty
7,995-8,010	Siltstone, medium-gray to light olive-gray, very finely sandy
8,010-8,030	Shale, medium-gray

Hogshooter Limestone 8,030-8,084 feet

8,030-8,035	Limestone, medium dark-gray to brownish-gray, dense to very fine-crystalline, argillaceous
8,035-8,058	Shale, medium-gray
8,058-8,060	Limestone, olive-gray, very fine-crystalline, argillaceous
8,060-8,075	Siltstone, medium dark-gray to olive-gray
8,075-8,082	Shale, medium-gray
8,082-8,084	Limestone, medium dark-gray, fine-crystalline, argillaceous
8,084-8,100	Shale, medium-gray to grayish-black
8,100-8,130	Shale, medium-gray
8,130-8,150	Shale, grayish-black
8,150-8,160	Shale, medium-gray
8,160-8,165	Shale, greenish-gray
8,165-8,170	Shale, medium-gray
8,170-8,180	Shale, grayish-black
8,180-8,200	Shale, medium-gray
8,200-8,210	Shale, grayish-black
8,210-8,233	Shale, medium-gray
8,233-8,240	Sandstone, very light- to medium light-gray, very fine-grained, silty, slightly calcareous
8,240-8,245	Limestone, medium dark-brownish-gray, fine- to medium-oolitic, finely sandy; dark-gray oolites; crinoids

Pleasanton Group Equivalent
(Pleasanton Formation Equivalent on Chart OC-61)

8,245-8,288	Shale, medium-gray
8,288-8,295	Siltstone, medium-gray, very finely sandy, calcareous
8,295-8,305	Siltstone, medium- to medium dark-gray
8,305-8,330	Shale, medium-gray
8,330-8,350	Shale, grayish-black
8,350-8,384	Shale, medium-gray

Des Moines Series
Marmaton Group

8,384-8,386	Limestone, medium dark-gray, fine-crystalline, argillaceous
8,386-8,400	Shale, medium-gray
8,400-8,410	Shale, grayish-black
8,410-8,432	Shale, medium-gray
8,432-8,439	Limestone, medium dark-gray, fine-crystalline, very argillaceous
8,439-8,470	Shale, medium-gray
8,470-8,478	Siltstone, medium dark-gray, calcareous; resembles limestone
8,478-8,484	Limestone, medium dark-gray, very fine-crystalline, argillaceous
8,484-8,494	Siltstone, medium dark-gray, calcareous; resembles limestone
8,494-8,504	Limestone, medium dark-gray, slightly brownish, very fine-crystalline, argillaceous
8,504-8,510	Limestone, brownish-gray, fine-crystalline
8,510-8,539	Limestone, medium dark-gray, fine-crystalline, argillaceous
8,539-8,550	Limestone, medium dark-gray, fine-crystalline, slightly brownish
8,550-8,588	Limestone, medium dark-gray, very fine- to fine-crystalline, argillaceous
8,588-8,600	Shale, medium-gray
8,600-8,622	Shale, grayish-black

8,622-8,630	Limestone, brownish-gray, dense to very fine-crystalline; crinoids; spines; brachiopods
8,630-8,635	Limestone, medium dark- to dark-gray, very fine-crystalline, slightly argillaceous; crinoids
8,635-8,645	Limestone, pale yellowish-brown, very fine-crystalline; fusulinids; medium light-gray to yellowish-brown dense chert
8,645-8,655	Limestone, brownish-gray, very fine-crystalline
8,655-8,665	Limestone, medium- to medium dark-gray, dense to very fine-crystalline
8,665-8,688	Limestone, brownish-gray, very fine-crystalline
8,688-8,693	Shale, medium-gray
8,693-8,700	Limestone, medium dark-gray, very fine-crystalline; fusulinids
8,700-8,708	Limestone, medium dark-gray, fine-crystalline; fusulinids
8,708-8,713	Shale, grayish-black
8,713-8,720	Limestone, brownish-gray, very fine-crystalline
8,720-8,725	Limestone, medium-gray, very fine-crystalline
8,725-8,734	Shale, medium-gray
8,734-8,741	Siltstone, medium light- to medium-gray, very finely sandy, tight, slightly micaceous
8,741-8,750	Shale, medium-gray
8,750-8,766	Limestone, medium dark-gray, fine-crystalline, argillaceous
8,766-8,770	Limestone, brownish-gray, very fine-crystalline
8,770-8,777	Limestone, medium dark-gray, fine-crystalline, argillaceous
8,777-8,784	Shale, medium-gray
8,784-8,788	Limestone, medium dark-gray, very fine-crystalline
8,788-8,803	Shale, grayish-black
8,803-8,829	Limestone, medium dark-brownish-gray, very fine-crystalline
8,829-8,835	Shale, medium-gray
8,835-8,840	Shale, grayish-black
8,840-8,850	Limestone, medium dark- to dark-gray, fine-crystalline, argillaceous; dark brownish-gray dense chert

Cabaniss and Krebs Groups

8,850-8,860	Siltstone, medium light- to medium-gray, micaceous, slightly calcareous
8,860-8,888	Siltstone, medium- to medium dark-gray
8,888-8,893	Shale, grayish-black
8,893-8,901	Siltstone, medium- to medium dark-gray
8,901-8,912	Shale, grayish-black
8,912-8,918	Siltstone, light-gray, micaceous
8,918-8,923	Shale, medium dark-gray
8,923-8,941	Siltstone, light-gray, very finely sandy
8,941-8,949	Shale, grayish-black
8,949-8,961	Limestone, medium dark-gray, very fine-crystalline, slightly argillaceous
8,961-9,000	Shale, medium dark-gray
9,000-9,010	Shale, grayish-black
9,010-9,016	Shale, medium-gray
9,016-9,019	Limestone, medium dark-brownish-gray, very fine-crystalline
9,019-9,022	Shale, medium-gray
9,022-9,024	Limestone, medium dark-brownish-gray, very fine-crystalline
9,024-9,043	Shale, medium-gray; probable coal 9,030-9,032 feet
9,043-9,049	Siltstone, very light- to light-gray, slightly calcareous; brown spots in part
9,049-9,051	Shale, medium-gray
9,051-9,062	Siltstone, medium light-gray to light brownish-gray, very finely sandy
9,062-9,079	Shale, medium dark-gray
9,079-9,082	Siltstone, medium dark-gray
9,082-9,093	Shale, grayish-black
9,093-9,115	Siltstone, medium- to medium dark-gray; trace of glauconite
9,115-9,129	Shale, medium dark- to dark-gray, silty
9,129-9,131	Limestone, medium dark-gray, very fine-crystalline, argillaceous
9,131-9,140	Shale, medium dark-gray
9,140-1,160	Shale, grayish-black
9,160-9,170	Shale, medium dark-gray
9,170-9,183	Shale, grayish-black
9,183-9,185	Limestone, medium dark-gray, very fine-crystalline
9,185-9,194	Limestone, brownish-gray, very fine-crystalline; fusulinids
9,194-9,200	Limestone, medium dark-brownish-gray, very fine- to fine-crystalline
9,200-9,203	Limestone, medium dark-gray, fine-crystalline, argillaceous
9,203-9,210	Shale, medium dark-gray
9,210-9,226	Shale, grayish-black
9,226-9,228	Limestone, medium dark-gray, fine-crystalline, argillaceous
9,228-9,230	Shale, grayish-black
9,230-9,245	Shale, medium dark-gray

Atoka Series		Mississippian System Upper Mississippian Series Rocks of Chesterian Age	
9,245-9,247	Limestone, olive-gray, dense	9,386-9,397	Shale, medium dark-gray
9,247-9,274	Shale, medium dark-gray	9,397-9,406	Limestone, medium dark-gray, very fine-crystalline, medium- to coarse-oölitic; medium dark-brownish-gray very fine-crystalline medium-oölitic limestone
9,274-9,286	Limestone, dark-gray to grayish-black, fine-crystalline, argillaceous; one fusulinid	9,406-9,410	Shale, medium dark-gray
9,286-9,290	Shale, medium dark-gray	9,410-9,426	Limestone, medium dark- to dark-gray, fine-crystalline, argillaceous
9,290-9,300	Shale, grayish-black	9,426-9,440	Shale, medium dark-gray
9,300-9,314	Shale, medium dark-gray	9,440-9,455	Limestone, medium dark- to dark-gray, fine-crystalline, argillaceous
9,314-9,322	Limestone, grayish-black, fine-crystalline, argillaceous	9,455-9,467	Shale, medium dark-gray
9,322-9,333	Shale, grayish-black	9,467-9,470	Limestone, medium dark-gray, fine- to medium-oölitic
9,333-9,336	Limestone, brownish-gray, very fine-crystalline	9,470-9,477	Limestone, medium dark-gray to brownish-gray, very fine-crystalline, medium-oölitic
9,336-9,346	Shale, medium dark-gray	9,477-9,482	Shale, medium dark-gray
9,346-9,348	Limestone, grayish-black, fine-crystalline, argillaceous	9,482-9,492	Limestone, medium dark- to dark-gray, fine-crystalline, argillaceous
9,348-9,374	Shale, medium dark-gray	9,492-9,521	Shale, medium dark-gray
9,374-9,380	Sandstone, medium- to dark-gray, fine- to medium-grained, calcareous, argillaceous	9,521	Total depth (Electrical log)
9,380-9,386	Sandstone, medium light- to medium-gray, fine- to medium-grained, calcareous		

LOG 13

CANADIAN COUNTY, OKLAHOMA

Center SW¹/₄ NE¹/₄ sec. 30, T. 13 N., R. 9 W.

Operator: Exploration Oil and Gas Co.
Lease: Ethel Hadlock No. 1
Elevation: DF 1,605 feet
KB 1,606 feet
GL 1,590 feet
Total depth: 11,708 feet
Completion date: 1950
Initial production: Dry and abandoned

Electrical log: 304 feet to total depth
Sample intervals:

10-foot
320 to 6,550 feet
6,610 to 8,360 feet
8,490 to 8,590 feet
9,280 to 9,720 feet
11,100 to 11,360 feet
11,380 to 11,420 feet
11,440 to total depth
5-foot
6,550 to 6,610 feet
8,360 to 8,490 feet
8,590 to 9,280 feet
9,720 to 11,100 feet
11,360 to 11,380 feet
11,420 to 11,440 feet

Cored intervals:
8,840 to 8,850 feet (core chips)

Permian System		690- 700	Siltstone, pale reddish-brown, very finely sandy, gypsiferous
0-320	No samples	700- 704	Shale, moderate reddish-brown
El Reno Group		704- 710	Sandstone, pale-red, very fine-grained, silty, gypsiferous
Dog Creek Shale 320-383 feet		710- 720	Sandstone, moderate reddish-brown, very fine-grained, silty, gypsiferous
320-328	Shale, moderate reddish-brown; olive-gray very fine-crystalline limestone in samples	720- 738	Shale, moderate reddish-brown
328-332	Gypsum, white	738- 758	Sandstone, pale reddish-brown, very fine-grained, silty
332-360	Shale, moderate reddish-brown	758- 781	Shale, moderate reddish-brown
360-362	Anhydrite, grayish-white, fine-crystalline	781- 792	Sandstone, pale reddish-brown, very fine-grained, silty gypsiferous
362-383	Shale, moderate reddish-brown	792- 801	Siltstone, pale reddish-brown, very fine-grained, sandy
Blaine Gypsum 383-476 feet		801- 804	Shale, pale reddish-brown, very fine-grained, silty
383-397	Anhydrite, grayish-white, fine-crystalline	804- 810	Shale, moderate reddish-brown
397-400	Shale, moderate reddish-brown	810- 814	Shale, medium light-gray, slightly dolomitic
400-403	Dolomite, light olive-gray, fine-crystalline	814- 846	Shale, moderate reddish-brown
403-410	Anhydrite, grayish-white and pale-red, fine-crystalline; some anhydritic dolomite	846- 852	Sandstone, light-gray, very fine-grained, silty
410-416	Dolomite, light olive-gray, fine-crystalline	Hennessey Shale 852-1,783 feet	
416-420	Shale, moderate reddish-brown	852- 880	Shale, moderate reddish-brown
420-438	Anhydrite, grayish-white and pale-red, fine-crystalline	880- 890	Shale as above; white gypsum and fine-crystalline anhydrite
438-440	Dolomite, light olive-gray, fine-crystalline	890- 900	Shale, moderate reddish-brown
440-458	Anhydrite, grayish-white and pale-red, fine-crystalline	900- 940	Shale, moderate reddish-brown; white gypsum and fine-crystalline anhydrite
458-473	Shale, moderate reddish-brown	940- 996	Shale, moderate reddish-brown
473-476	Dolomite, olive-gray, fine-crystalline; caving?	996- 998	Sandstone, moderate reddish-brown, very fine-grained, silty
Flowerpot Shale and Duncan Sandstone 476-852 feet		998-1,040	Shale, moderate reddish-brown
476-490	Shale, moderate reddish-brown	1,040-1,044	Sandstone, moderate reddish-brown, very fine-grained, silty
490-493	Shale, greenish-gray	1,044-1,060	Shale, moderate reddish-brown
493-515	Shale, moderate reddish-brown	1,060-1,067	Sandstone, moderate reddish-brown, very fine-grained, silty
515-520	Shale, greenish-gray	1,067-1,133	Shale, moderate reddish-brown
520-536	Shale, moderate reddish-brown	1,133-1,138	Sandstone, moderate reddish-brown, very fine-grained
536-540	Siltstone, light-gray, very finely sandy	1,138-1,147	Shale, moderate reddish-brown
540-555	Shale, moderate reddish-brown	1,147-1,158	Sandstone, light-gray, very fine-grained, silty
555-560	Sandstone, pale reddish-brown, very fine-grained, silty	1,158-1,180	Shale, moderate reddish-brown
560-563	Shale, moderate reddish-brown	1,180-1,205	Shale, moderate reddish-brown, silty
563-573	Sandstone, pale reddish-brown, very fine-grained, silty	1,205-1,243	Shale, moderate reddish-brown
573-576	Shale, moderate reddish-brown	1,243-1,248	Sandstone, moderate reddish-orange, very fine-grained, silty
576-581	Sandstone, pale reddish-brown, very fine-grained, silty	1,248-1,260	Siltstone, moderate reddish-orange, very finely sandy
581-598	Shale, moderate reddish-brown, silty	1,260-1,287	Shale, moderate reddish-brown, silty
598-607	Sandstone, pale reddish-brown, very fine-grained, silty	1,287-1,292	Siltstone, pale reddish-brown, very finely sandy, slightly dolomitic
607-610	Dolomite, light-gray to very pale-orange, fine-crystalline	1,292-1,383	Shale, moderate reddish-brown
610-620	Shale, moderate reddish-brown	1,383-1,392	Siltstone, light-gray, very fine-grained, sandy
620-622	Sandstone, pale reddish-brown, very fine-grained, silty	1,392-1,464	Shale, moderate reddish-brown, silty
622-650	Shale, moderate reddish-brown	1,464-1,476	Sandstone, light-gray to pale reddish-brown, very fine-grained, silty
650-658	Sandstone, pale to moderate reddish-brown, very fine-grained	1,476-1,515	Shale, moderate reddish-brown
658-690	Shale, moderate reddish-brown, silty	1,515-1,520	Siltstone, pale reddish-brown, very finely sandy, calcareous

1,520-1,528	Shale, pale reddish-brown, silty	2,550-2,556	Sandstone, grayish-red, very fine-grained, silty
1,528-1,535	Siltstone, pale reddish-brown, very finely sandy, calcareous		
1,535-1,550	Shale, moderate reddish-brown		Wellington Formation 2,556-3,540 feet
1,550-1,564	Shale as above; very light- to medium-gray fine-crystalline anhydrite		
1,564-1,605	Shale as above	2,556-2,598	Shale, medium-gray
1,605-1,612	Siltstone, moderate reddish-brown, very finely sandy	2,598-2,600	Dolomite, pale yellowish-brown to medium light-gray, very fine-crystalline
1,612-1,625	Shale, moderate reddish-brown		
1,625-1,628	Dolomite, grayish-red to moderate reddish-brown, very fine-crystalline, argillaceous	2,600-2,605	Shale, medium-gray
		2,605-2,610	Shale, greenish-gray
1,628-1,648	Shale, moderate reddish-brown	2,610-2,614	Sandstone, very light-gray, very fine-grained, silty
1,648-1,651	Limestone, grayish-red mottled with medium-gray, very fine-crystalline, argillaceous	2,614-2,647	Shale, medium-gray
		2,647-2,649	Dolomite, medium light-gray, fine-crystalline
1,651-1,658	Shale, moderate reddish-brown	2,649-2,655	Shale, medium-gray
1,658-1,664	Sandstone, pale reddish-brown, very fine-grained	2,655-2,665	Shale, greenish-gray
1,664-1,676	Shale, moderate reddish-brown	2,665-2,675	Shale, medium-gray
1,676-1,680	Sandstone, pale reddish-brown, very fine-grained	2,675-2,678	Dolomite, medium light-gray, fine-crystalline, argillaceous; slightly greenish
1,680-1,691	Shale, moderate reddish-brown		
1,691-1,700	Sandstone, grayish-white, very fine-grained	2,678-2,685	Shale, medium-gray
1,700-1,710	Sandstone, pale reddish-brown, very fine-grained	2,685-2,696	Shale, greenish-gray
1,710-1,723	Shale, moderate reddish-brown	2,696-2,699	Shale, grayish-black
1,723-1,725	Limestone, medium light- to medium-gray, fine-crystalline; grayish-red very fine-crystalline argillaceous limestone	2,699-2,700	Dolomite, pale yellowish-brown, very fine-crystalline
		2,700-2,730	Shale, medium-gray
1,725-1,727	Limestone, grayish-red, very fine-crystalline, argillaceous	2,730-2,739	Shale, greenish-gray
1,727-1,734	Shale, moderate reddish-brown	2,739-2,742	Dolomite, pale yellowish-brown, very fine-crystalline
1,734-1,742	Sandstone, pale-red, very fine-grained	2,742-2,770	Shale, medium-gray
1,742-1,760	Shale, moderate reddish-brown	2,770-2,780	Shale, greenish-gray
1,760-1,763	Limestone, grayish-red, very fine-crystalline, argillaceous	2,780-2,800	Shale, medium-gray
1,763-1,783	Shale, moderate reddish-brown	2,800-2,810	Shale, greenish-gray
	Garber Sandstone 1,783-2,556 feet	2,810-2,824	Shale, medium-gray
		2,824-2,827	Anhydrite, grayish-white, fine-crystalline
1,783-1,794	Sandstone, pale reddish-brown, very fine-grained	2,827-2,841	Shale, medium-gray
1,794-1,840	Shale, moderate reddish-brown	2,841-2,844	Anhydrite, grayish-white, fine-crystalline
1,840-1,850	Sandstone, very light- to light-gray, very fine-grained, silty	2,844-2,850	Shale, medium-gray
1,850-1,860	Sandstone, pale reddish-brown, very fine-grained, silty	2,850-2,853	Anhydrite, grayish-white, fine-crystalline
1,860-1,895	Shale, moderate reddish-brown	2,853-2,870	Shale, medium-gray
1,895-1,902	Siltstone, moderate reddish-brown, very finely sandy	2,870-2,880	Shale, greenish-gray
1,902-1,930	Shale, moderate reddish-brown	2,880-2,892	Shale, medium-gray
1,930-1,940	Sandstone, moderate reddish-brown, very fine-grained, silty	2,892-2,896	Anhydrite, grayish-white, fine-crystalline
1,940-1,944	Shale, moderate reddish-brown	2,896-2,900	Shale, medium-gray
1,944-1,950	Sandstone, pale reddish-brown, very fine-grained, gypsiferous; caving?	2,900-2,903	Shale, grayish-black
		2,903-2,910	Shale, greenish-gray
1,950-1,960	Siltstone, pale reddish-brown, very finely sandy	2,910-2,919	Shale, medium-gray
1,960-1,967	Sandstone, pale-red, very fine-grained	2,919-2,920	Anhydrite, grayish-white, fine-crystalline
1,967-1,977	Shale, moderate reddish-brown	2,920-2,930	Shale, medium-gray
1,977-1,980	Limestone, grayish-red to moderate reddish-brown, very fine-crystalline, argillaceous	2,930-2,932	Anhydrite, grayish-white, fine-crystalline
		2,932-2,940	Shale, medium-gray
1,980-1,992	Shale, moderate reddish-brown	2,940-2,942	Shale, grayish-black
1,992-2,000	Sandstone, grayish-red, very fine-grained	2,942-2,950	Shale, greenish-gray
2,000-2,010	Sandstone, pale-red, very fine-grained	2,950-2,983	Shale, medium-gray
2,010-2,025	Shale, moderate reddish-brown	2,983-2,985	Anhydrite, grayish-white, fine-crystalline
2,025-2,030	Sandstone, pale-red, very fine-grained	2,985-2,990	Shale, medium-gray
2,030-2,072	Shale, moderate reddish-brown	2,990-3,000	Shale, olive-gray
2,072-2,080	Siltstone, light-gray, very finely sandy	3,000-3,010	Shale, medium-gray
2,080-2,090	Siltstone, pale reddish-brown, very finely sandy	3,010-3,012	Anhydrite, grayish-white, fine-crystalline
2,090-2,108	Shale, moderate reddish-brown	3,012-3,020	Shale, greenish-gray
2,108-2,119	Sandstone, pale reddish-brown, very fine-grained	3,020-3,023	Anhydrite, grayish-white, fine-crystalline
2,119-2,128	Shale, moderate reddish-brown	3,023-3,030	Shale, olive-gray
2,128-2,136	Sandstone, very light-gray, very fine-grained	3,030-3,032	Anhydrite, grayish-white, fine-crystalline
2,136-2,177	Shale, moderate reddish-brown	3,032-3,050	Shale, medium-gray
2,177-2,185	Sandstone, very light-gray, very fine-grained	3,050-3,057	Shale, olive-gray
2,185-2,194	Sandstone, pale reddish-brown, very fine-grained	3,057-3,060	Anhydrite, grayish-white, fine-crystalline
2,194-2,226	Shale, moderate reddish-brown	3,060-3,068	Shale, olive-gray
2,226-2,240	Sandstone, pale to moderate reddish-brown, very fine-grained, silty	3,068-3,070	Anhydrite, grayish-white, fine-crystalline
		3,070-3,080	Shale, medium-gray
2,240-2,300	Shale, moderate reddish-brown	3,080-3,084	Anhydrite, grayish-white, fine-crystalline
2,300-2,320	Shale, moderate reddish-brown, silty	3,084-3,107	Shale, medium-gray
2,320-2,357	Shale, moderate reddish-brown	3,107-3,113	Anhydrite, grayish-white, fine-crystalline
2,357-2,363	Shale, medium-gray	3,113-3,115	Shale, medium-gray
2,363-2,368	Shale, greenish-gray	3,115-3,120	Anhydrite, grayish-white, fine-crystalline
2,368-2,376	Sandstone, very light- to medium light-gray and grayish-orange, very fine-grained, very porous	3,120-3,134	Shale, medium-gray
		3,134-3,137	Anhydrite, grayish-white, fine-crystalline
2,376-2,386	Shale, medium-gray	3,137-3,162	Shale, medium-gray
2,386-2,396	Sandstone, very light- to medium light-gray and grayish-orange, very fine-grained, very porous	3,162-3,164	Anhydrite, grayish-white, fine-crystalline
		3,164-3,186	Shale, medium-gray
2,396-2,410	Shale, grayish-red	3,186-3,190	Anhydrite, grayish-white, fine-crystalline
2,410-2,418	Shale, medium-gray	3,190-3,234	Shale, medium-gray
2,418-2,422	Sandstone, grayish-white, very fine-grained	3,234-3,240	Anhydrite, grayish-white, fine-crystalline
2,422-2,430	Shale, moderate reddish-brown	3,240-3,245	Shale, medium-gray
2,430-2,440	Sandstone, grayish-red, very fine-grained, silty	3,245-3,255	Shale, greenish-gray
2,440-2,445	Shale, olive-gray to medium-gray	3,255-3,265	Shale, medium-gray
2,445-2,450	Shale, medium-gray	3,265-3,280	Anhydrite, grayish-white, fine-crystalline
2,450-2,460	Shale, grayish-red	3,280-3,297	Shale, medium-gray
2,460-2,463	Shale, greenish-gray	3,297-3,300	Anhydrite, grayish-white, fine-crystalline
2,463-2,477	Shale, medium-gray	3,300-3,304	Shale, medium-gray
2,477-2,480	Sandstone, grayish-white, very fine-grained	3,304-3,314	Anhydrite, grayish-white
2,480-2,490	Shale, grayish-red	3,314-3,336	Shale, medium-gray
2,490-2,493	Sandstone, pale-red, very fine-grained, silty	3,336-3,340	Anhydrite, grayish-white, fine-crystalline
2,493-2,500	Shale, medium-gray	3,340-3,344	Shale, medium-gray
2,500-2,508	Sandstone, grayish-red, very fine-grained, silty	3,344-3,367	Anhydrite, grayish-white, fine-crystalline
2,508-2,512	Shale, grayish-red	3,367-3,373	Shale, medium-gray
2,512-2,515	Sandstone, grayish-red, very fine-grained, silty	3,373-3,392	Anhydrite, grayish-white, fine-crystalline
2,515-2,520	Shale, medium-gray	3,392-3,410	Shale, medium-gray
2,520-2,530	Sandstone, very light-gray, very fine-grained	3,410-3,416	Anhydrite, grayish-white, fine-crystalline
2,530-2,538	Sandstone, grayish-red, very fine-grained, silty	3,416-3,420	Shale, medium-gray
2,538-2,550	Shale, medium-gray	3,420-3,436	Anhydrite, grayish-white, fine-crystalline
		3,436-3,443	Shale, medium-gray

3,443-3,460	Anhydrite, grayish-white, fine-crystalline	4,078-4,085	Sandstone, light-gray to pale-red, fine-grained
3,460-3,462	Dolomite, olive-gray, fine-crystalline, argillaceous	4,085-4,088	Sandstone, light-gray, very fine-grained
3,462-3,473	Shale, medium-gray	4,088-4,096	Shale, medium-gray
3,473-3,484	Anhydrite, grayish-white, fine-crystalline	4,096-4,100	Sandstone, light-gray, very fine-grained
3,484-3,488	Shale, medium-gray	4,100-4,116	Sandstone, light-gray, fine-grained, slightly calcareous
3,488-3,500	Anhydrite, grayish-white, fine-crystalline	4,116-4,125	Shale, grayish-red
3,500-3,508	Shale, olive-gray; caving?	4,125-4,130	Sandstone, pale-red, very fine-grained, silty
3,508-3,512	Anhydrite, grayish-white, fine-crystalline	4,130-4,134	Sandstone, grayish-white, very fine-grained
3,512-3,520	Shale, greenish-gray	4,134-4,150	Shale, medium-gray
3,520-3,528	Shale, medium-gray	4,150-4,162	Shale, grayish-red
3,528-3,530	Anhydrite, grayish-white, fine-crystalline	4,162-4,167	Siltstone, light-gray, very finely sandy
3,530-3,540	Shale, medium-gray	4,167-4,170	Limestone, grayish-red, fine-crystalline, argillaceous
		4,170-4,176	Shale, grayish-red
		4,176-4,190	Shale, medium-gray
		4,190-4,210	Shale, grayish-red, silty
		4,210-4,227	Shale, medium-gray, silty
		4,227-4,230	Limestone, pale yellowish-brown, fine-crystalline
		4,230-4,240	Limestone, very pale-orange, fine-crystalline
	Chase Group		
	Nolans Limestone 3,540-3,587 feet		
3,540-3,544	Dolomite, olive-gray, fine-crystalline, argillaceous; mottled with grayish-white fine disseminated chert		
3,544-3,555	Shale, medium-gray		
3,555-3,558	Anhydrite, grayish-white, fine-crystalline		
3,558-3,567	Shale, medium-gray		
3,567-3,572	Dolomite, medium light- to medium-gray, argillaceous		
3,572-3,578	Shale, medium-gray		
3,578-3,587	Dolomite, medium light- to medium-gray, argillaceous; caving?		
3,587-3,594	Shale, medium-gray		
	Winfield Limestone 3,594-3,693 feet		
3,594-3,606	Limestone, medium-gray, argillaceous; yellowish-brown and dark-gray chert 3,594-3,600 feet		
3,606-3,608	Limestone, pale yellowish-brown, fine-crystalline		
3,608-3,628	Shale, medium-gray; crinoids 3,620-3,625 feet		
3,628-3,633	Limestone, medium light- to medium-gray, fine-crystalline		
3,633-3,640	Shale, greenish-gray		
3,640-3,646	Shale, medium-gray		
3,646-3,650	Dolomite, pale yellowish-orange to very pale-orange, fine-crystalline		
3,650-3,660	Limestone, pale yellowish-brown, fine-crystalline; crinoids		
3,660-3,668	Shale, medium-gray		
3,668-3,672	Limestone, medium-gray, fine-crystalline, argillaceous; brownish-gray dense chert		
3,672-3,676	Shale, medium-gray		
3,676-3,683	Limestone, medium-gray, very argillaceous		
3,683-3,690	Shale, medium-gray		
3,690-3,693	Limestone, medium-gray, very argillaceous		
3,693-3,700	Shale, medium-gray		
3,700-3,710	Shale, greenish-gray		
3,710-3,748	Shale, medium-gray		
	Barneston Limestone 3,748-3,870 feet		
3,748-3,753	Limestone, medium-gray, fine-crystalline, argillaceous		
3,753-3,760	Shale, medium-gray		
3,760-3,766	Limestone, medium-gray, fine-crystalline, argillaceous		
3,766-3,780	Shale, greenish-gray		
3,780-3,806	Shale, medium-gray		
3,806-3,820	Shale, grayish-red		
3,820-3,830	Shale, medium-gray		
3,830-3,836	Limestone, medium light-gray, fine-crystalline; mottled with dark gray		
3,836-3,843	Shale, medium-gray		
3,843-3,850	Limestone, medium light-gray, fine-crystalline		
3,850-3,854	Shale, medium-gray		
3,854-3,870	Sandstone, light-gray, very fine-grained, glauconitic, slightly calcareous		
3,870-3,913	Shale, medium-gray		
	Wreford Limestone 3,913-4,018 feet		
3,913-3,920	Limestone, light- to medium light-gray, fine-crystalline		
3,920-3,940	Shale, medium-gray		
3,940-3,959	Shale, grayish-red		
3,959-3,961	Limestone, medium-gray, fine-crystalline		
3,961-3,974	Shale, medium-gray		
3,974-3,976	Limestone, medium-gray, fine-crystalline		
3,976-3,982	Shale, grayish-red		
3,982-3,985	Limestone, pale yellowish-brown, fine-crystalline		
3,985-3,991	Shale, medium-gray		
3,991-3,994	Limestone, brownish-gray, fine-crystalline		
3,994-4,004	Shale, grayish-red		
4,004-4,010	Limestone, medium-gray, fine-crystalline		
4,010-4,015	Shale, medium-gray		
4,015-4,018	Limestone, medium-gray, fine-crystalline		
	Council Grove Group		
4,018-4,050	Shale, medium-gray		
4,050-4,054	Limestone, light-gray to pale yellowish-brown, fine-crystalline		
4,054-4,060	Shale, medium-gray		
4,060-4,074	Shale, grayish-red		
4,074-4,078	Shale, medium-gray		
		4,240-4,250	Shale, medium-gray
		4,250-4,260	Shale, moderate reddish-brown
		4,260-4,270	Shale, grayish-red
		4,270-4,285	Shale, medium-gray
		4,285-4,305	Sandstone, light-gray, very fine- to fine-grained
		4,305-4,308	Limestone, medium light-gray, fine-crystalline, argillaceous
		4,308-4,310	Shale, medium-gray
		4,310-4,312	Limestone, medium light-gray, fine-crystalline, argillaceous
		4,312-4,315	Shale, medium-gray
		4,315-4,322	Limestone, pale yellowish-brown, fine-crystalline
		4,322-4,345	Shale, grayish-red
		4,345-4,350	Shale, medium-gray
		4,350-4,360	Shale, moderate reddish-brown
		4,360-4,380	Shale, medium-gray
		4,380-4,385	Siltstone, light-gray; caving?
		4,385-4,407	Shale, medium-gray
		4,407-4,412	Siltstone, medium-gray, very finely sandy
		4,412-4,417	Shale, medium-gray
		4,417-4,440	Shale, grayish-red
		4,440-4,454	Shale, medium-gray
		4,454-4,460	Limestone, medium light-gray and pale yellowish-brown, fine-crystalline
		4,460-4,465	Limestone, very pale-orange, fine-crystalline
		4,465-4,467	Shale, medium-gray
		4,467-4,471	Limestone, medium light-gray, silty; crinoids
		4,471-4,480	Shale, grayish-red
		4,480-4,490	Shale, moderate reddish-brown
		4,490-4,500	Shale, grayish-red
		4,500-4,510	Sandstone, pale-red, very fine-grained, slightly calcareous
		4,510-4,525	Shale, medium-gray
		4,525-4,530	Limestone, pale yellowish-brown, fine-crystalline
			Admire Group
		4,530-4,540	Shale, medium-gray
		4,540-4,550	Siltstone, medium-gray, very finely sandy
		4,550-4,564	Sandstone, very light-gray, very fine-grained, porous
		4,564-4,580	Shale, medium-gray; trace of coal at base
		4,580-4,590	Sandstone, light- to medium light-gray, very fine-grained, silty
		4,590-4,598	Shale, grayish-red
		4,598-4,600	Limestone, grayish-red, very fine-crystalline
		4,600-4,610	Shale, medium-gray, silty
		4,610-4,620	Shale, moderate reddish-brown
		4,620-4,626	Shale, grayish-red
		4,626-4,628	Limestone, medium-gray, silty
		4,628-4,640	Shale, medium-gray
		4,640-4,655	Shale, grayish-red
		4,655-4,670	Shale, medium-gray; fusulinids 4,665-4,670 feet
		4,670-4,690	Shale, grayish-red
		4,690-4,715	Shale, medium-gray
		4,715-4,733	Sandstone, very light-gray, fine-grained, porous
		4,733-4,737	Shale, medium-gray
		4,737-4,740	Sandstone, very light-gray, very fine-grained
		4,740-4,760	Shale, medium-gray
		4,760-4,770	Siltstone, medium-gray, very finely sandy
		4,770-4,779	Shale, medium-gray
		4,779-4,781	Siltstone, medium-gray, very finely sandy
		4,781-4,810	Shale, medium-gray; black plant? impressions
			4,781-4,790 feet
		4,810-4,812	Limestone, medium light-gray, argillaceous
		4,812-4,830	Shale, medium-gray
		4,830-4,840	Shale, grayish-red
		4,840-4,885	Shale, medium-gray
		4,885-4,896	Sandstone, very light-gray, very fine-grained, calcareous
		4,896-4,907	Shale, medium-gray
		4,907-4,915	Siltstone, medium light-gray, very finely sandy
		4,915-4,924	Shale, medium-gray
		4,924-4,928	Limestone, medium-gray, fine-crystalline, argillaceous
		4,928-4,989	Shale, medium-gray; fusulinids 4,935-4,940 feet
		4,989-4,991	Limestone, medium-gray, fine-crystalline, argillaceous
		4,991-5,000	Sandstone, light-gray to yellowish-brown, very fine-grained
		5,000-5,002	Shale, medium-gray
		5,002-5,004	Limestone, pale yellowish-brown, fine-crystalline
		5,004-5,010	Shale, medium-gray

5,010-5,016	Shale, grayish-red	5,898-5,907	Sandstone, very light-gray, very fine-grained, silty
5,016-5,020	Sandstone, very light-gray, very fine-grained	5,907-5,925	Shale, medium-gray
5,020-5,023	Shale, medium-gray	5,925-5,930	Shale, grayish-black
5,023-5,025	Sandstone, very light-gray, very fine-grained	5,930-5,959	Shale, medium-gray
5,025-5,034	Shale, olive-gray	5,959-5,968	Limestone, pale yellowish-brown, fine-crystalline
5,034-5,036	Limestone, light olive-gray, silty	5,968-5,978	Shale, medium-gray
5,036-5,040	Shale, olive-gray	5,978-5,990	Sandstone, very light-gray, very fine-grained, porous
5,040-5,046	Shale, moderate-brown	5,990-6,000	Sandstone, very light-gray, fine-grained, porous
5,046-5,058	Shale, medium-gray	6,000-6,005	Sandstone, very light-gray, very fine-grained, silty
5,058-5,063	Limestone, pale-red, fine-crystalline, argillaceous	6,005-6,018	Sandstone, very light-gray, very fine-grained
5,063-5,070	Shale, olive-gray	6,018-6,030	Shale, medium-gray
5,070-5,076	Shale, greenish-gray	6,030-6,044	Shale, grayish-black
5,076-5,084	Shale, medium-gray	6,044-6,053	Siltstone, medium-gray, very finely sandy
5,084-5,096	Sandstone, very light-gray, very fine- to fine-grained, slightly dolomitic	6,053-6,096	Shale, medium-gray; fusulinids (caving?) 6,065-6,070 feet
5,096-5,099	Shale, medium-gray		Shawnee Group Equivalent
5,099-5,102	Siltstone, medium light-gray, very finely sandy	6,096-6,105	Limestone, pale yellowish-brown, fine-crystalline
5,102-5,117	Shale, medium-gray	6,105-6,108	Limestone, medium-gray, fine-crystalline
5,117-5,120	Limestone, pale yellowish-brown, fine-crystalline	6,108-6,115	Siltstone, medium-gray
5,120-5,140	Shale, medium-gray	6,115-6,130	Shale, medium-gray
5,140-5,143	Limestone, pale yellowish-brown, fine-crystalline	6,130-6,140	Siltstone, olive-gray
5,143-5,150	Shale, medium-gray	6,140-6,177	Shale, medium-gray
5,150-5,160	Shale, grayish-red	6,177-6,185	Siltstone, medium light-gray to pale yellowish-brown, very finely sandy, slightly dolomitic
5,160-5,169	Shale, medium-gray	6,185-6,192	Shale, medium-gray
5,169-5,173	Sandstone, very light-gray, very fine-grained	6,192-6,196	Limestone, brownish-gray, fine-crystalline
5,173-5,194	Shale, medium-gray	6,196-6,200	Shale, medium-gray
5,194-5,210	Siltstone, medium-gray	6,200-6,210	Shale, grayish-black
5,210-5,215	Shale, grayish-black	6,210-6,224	Shale, medium-gray
5,215-5,227	Shale, medium-gray	6,224-6,242	Limestone, pale yellowish-brown to brownish-gray, fine-crystalline
5,227-5,234	Limestone, medium dark-brownish-gray, fine-crystalline	6,242-6,244	Shale, medium-gray
5,234-5,244	Sandstone, light- to medium light-gray, very fine-grained; calcareous in part	6,244-6,250	Limestone, brownish-gray, fine-crystalline
5,244-5,250	Limestone, pale yellowish-brown, fine-crystalline	6,250-6,261	Siltstone, greenish-gray
5,250-5,310	Shale, medium-gray; trace of coal 5,300-5,303 feet	6,261-6,266	Shale, medium-gray
5,310-5,316	Siltstone, greenish-gray	6,266-6,270	Siltstone, medium-gray
5,316-5,324	Shale, medium-gray	6,270-6,275	Shale, medium-gray; fusulinids
5,324-5,339	Sandstone, very light-gray, very fine-grained	6,275-6,280	Sandstone, light-gray, very fine-grained, dolomitic
5,339-5,360	Siltstone, very light- to light-gray, very finely sandy	6,280-6,285	Sandstone, very pale-orange, fine-grained, dolomitic
5,360-5,371	Shale, medium-gray	6,285-6,295	Sandstone, very light-gray, very fine-grained, dolomitic
5,371-5,374	Limestone, pale yellowish-brown, fine-crystalline; caving?	6,295-6,305	Shale, medium-gray
5,374-5,385	Shale, medium-gray	6,305-6,325	Shale, grayish-black
5,385-5,392	Sandstone, very light-gray, very fine- to fine-grained	6,325-6,330	Shale, medium-gray
5,392-5,410	Shale, medium-gray	6,330-6,360	Shale, grayish-black
5,410-5,430	Shale, dark-gray	6,360-6,365	Shale, medium-gray
	Pennsylvanian System	6,365-6,380	Shale, grayish-black
	Virgil Series	6,380-6,386	Siltstone, medium-gray
	Wabunsee Group Equivalent	6,386-6,416	Shale, grayish-black
5,430-5,444	Limestone, pale yellowish-brown, fine-crystalline	6,416-6,421	Shale, medium-gray
5,444-5,467	Shale, medium-gray	6,421-6,428	Sandstone, light-gray, very fine-grained, silty
5,467-5,469	Limestone, pale yellowish-brown, fine-crystalline; caving?	6,428-6,430	Shale, medium-gray
5,469-5,479	Shale, medium-gray	6,430-6,435	Sandstone, light-gray, very fine-grained, silty
5,479-5,480	Limestone, pale yellowish-brown, fine-crystalline	6,435-6,448	Shale, medium-gray
5,480-5,500	Shale, medium-gray	6,448-6,450	Shale, grayish-black
5,500-5,502	Limestone, brownish-gray, fine-crystalline	6,450-6,488	Siltstone, greenish-gray, very finely sandy
5,502-5,516	Shale, medium-gray	6,488-6,498	Shale, medium-gray
5,516-5,520	Limestone, pale yellowish-brown, fine-crystalline	6,498-6,510	Sandstone, very light-gray, very fine-grained, silty
5,520-5,524	Limestone, brownish-gray, fine-crystalline	6,510-6,513	Shale, medium-gray
5,524-5,529	Shale, medium-gray		Limestone, medium-gray, fine-crystalline, argillaceous, slightly brownish
5,529-5,540	Sandstone, very light-gray, very fine-grained	6,513-6,519	Shale, medium-gray
5,540-5,548	Shale, medium-gray	6,519-6,524	Limestone, medium dark-gray, fine-crystalline, argillaceous; fusulinids
5,548-5,555	Sandstone, very light-gray, very fine-grained	6,524-6,545	Shale, medium-gray
5,555-5,590	Shale, medium-gray	6,545-6,554	Siltstone, very light-gray, very finely sandy
5,590-5,595	Shale, grayish-black	6,554-6,560	Sandstone, very light-gray, fine-grained
5,595-5,600	Shale, medium-gray	6,560-5,570	Sandstone, very light-gray, fine- to medium-grained
5,600-5,610	Shale, greenish-gray	6,570-6,575	Shale, medium-gray
5,610-5,613	Limestone, brownish-gray, fine-crystalline	6,575-6,580	Shale, grayish-black
5,613-5,620	Shale, moderate-brown	6,580-6,585	Shale, medium-gray
5,620-5,625	Shale, medium-gray	6,585-6,595	Sandstone, very light-gray, very fine- to fine-grained
5,625-5,630	Sandstone, light-gray, very fine-grained, silty	6,595-6,606	Sandstone, very light-gray, fine-grained
5,630-5,632	Shale, medium-gray	6,606-6,612	Shale, medium-gray
5,632-5,635	Sandstone, light-gray, very fine-grained, silty	6,612-6,625	Sandstone, very light-gray, fine-grained, slightly dolomitic
5,635-5,650	Shale, medium-gray	6,625-6,640	Sandstone, very light-gray, very fine-grained
5,650-5,652	Limestone, pale yellowish-brown, fine-crystalline	6,640-6,647	Sandstone, very light-gray, fine-grained
5,652-5,660	Shale, medium-gray	6,647-6,670	Shale, medium-gray
5,660-5,668	Shale, grayish-black	6,670-6,683	Shale, grayish-black
5,668-5,670	Sandstone, light-gray, very fine-grained, silty	6,683-6,696	Siltstone, medium dark-gray
5,670-5,700	Shale, medium-gray	6,696-6,710	Shale, grayish-black
5,700-5,703	Limestone, brownish-gray, fine-crystalline, argillaceous	6,710-6,714	Siltstone, dark greenish-gray, hard
5,703-5,710	Shale, medium-gray	6,714-6,725	Shale, medium-gray
5,710-5,714	Sandstone, very light-gray, very fine-grained	6,725-6,735	Shale, grayish-black
5,714-5,722	Shale, medium-gray	6,735-6,740	Shale, medium-gray
5,722-5,730	Sandstone, medium-gray, very fine-grained, silty	6,740-6,744	Siltstone, medium dark-gray, very finely sandy
5,730-5,739	Sandstone, very light-gray, very fine- to fine-grained	6,744-6,775	Shale, medium-gray
5,739-5,778	Shale, medium-gray	6,775-6,777	Siltstone, greenish-gray
5,778-5,782	Limestone, brownish-gray, fine-crystalline	6,777-6,800	Shale, medium-gray
5,782-5,795	Shale, medium-gray	6,800-6,817	Sandstone, very light-gray, very fine-grained, slightly dolomitic
5,795-5,800	Shale, grayish-black	6,817-6,838	Shale, medium-gray
5,800-5,828	Shale, medium-gray	6,838-6,853	Sandstone, very light-gray, fine-grained
5,828-5,831	Limestone, medium-gray, silty	6,853-6,870	Shale, medium-gray
5,831-5,840	Shale, medium-gray	6,870-6,890	Shale, grayish-black
5,840-5,856	Siltstone, greenish-gray, very finely sandy	6,890-6,897	Shale, medium-gray
5,856-5,864	Shale, medium-gray		
5,864-5,870	Limestone, brownish-gray, fine-crystalline		
5,870-5,898	Shale, medium-gray		

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6,897-6,905	Limestone, brownish-gray to medium dark-brownish-gray, fine-crystalline; fusulinids
6,905-6,920	Siltstone, medium-gray
6,920-6,927	Shale, grayish-black
6,927-6,938	Siltstone, light-gray, very finely sandy
6,938-6,966	Shale, medium-gray; fusulinids (caving?) 6,955-6,960 feet
6,966-6,975	Sandstone, very light-gray, fine-grained
6,975-6,990	Sandstone, very light-gray to very pale-orange, medium-grained, dolomitic
6,990-6,992	Shale, medium-gray
6,992-6,994	Sandstone, very light-gray, very fine- to fine-grained
6,994-7,025	Shale, medium-gray
7,025-7,030	Siltstone, olive-gray
7,030-7,045	Shale, medium-gray
7,045-7,050	Siltstone, olive-gray
7,050-7,056	Shale, medium-gray
7,056-7,066	Shale, grayish-black
7,066-7,076	Sandstone, very light-gray, very fine-grained, slightly dolomitic
7,076-7,078	Shale, medium-gray
7,078-7,085	Sandstone, olive-gray, very fine-grained, silty
7,085-7,112	Shale, medium-gray
7,112-7,120	Sandstone, very pale-orange, very fine- to fine-grained, calcareous
7,120-7,127	Sandstone, medium light-gray, very fine-grained, silty, calcareous
7,127-7,135	Shale, medium-gray
7,135-7,140	Shale, grayish-black
7,140-7,162	Shale, medium-gray
7,162-7,168	Siltstone, medium light-gray, hard
7,168-7,178	Sandstone, medium light-gray, very fine-grained, calcareous; many dark-gray grains
7,178-7,191	Siltstone, medium-gray and greenish-gray
7,191-7,195	Shale, grayish-black
7,195-7,208	Shale, medium-gray
7,208-7,220	Sandstone, very light-gray, very fine-grained
7,220-7,228	Shale, medium-gray
7,228-7,230	Limestone, medium light-gray, very fine-crystalline, argillaceous; crinoids?
7,230-7,232	Shale, medium-gray
7,232-7,241	Sandstone, very light-gray, very fine-grained, silty
7,241-7,254	Sandstone, very light-gray, very fine- to fine-grained
7,254-7,260	Siltstone, medium-gray
7,260-7,268	Siltstone, greenish-gray, very finely sandy
7,268-7,283	Sandstone, very light-gray, fine-grained
7,283-7,287	Sandstone, very light-gray, very fine-grained, silty
7,287-7,310	Shale, medium-gray
7,310-7,320	Shale, olive-gray, silty
7,320-7,335	Shale, medium-gray
7,335-7,340	Sandstone, very light-gray, very fine-grained
7,340-7,348	Sandstone, light-gray, very fine-grained
7,348-7,356	Siltstone, greenish-gray
7,356-7,367	Siltstone, medium dark-gray
7,367-7,375	Shale, grayish-black
7,375-7,385	Shale, medium-gray
7,385-7,390	Siltstone, medium dark-gray
7,390-7,440	Shale, medium-gray
7,440-7,450	Shale, grayish-black
7,450-7,495	Shale, medium-gray
7,495-7,505	Shale, grayish-black
7,505-7,524	Shale, medium-gray
7,524-7,530	Limestone, brownish-gray, fine-crystalline, finely sandy
7,530-7,550	Siltstone, very light- to medium light-gray
7,550-7,560	Shale, grayish-black
7,560-7,580	Shale, medium-gray
7,580-7,588	Shale, grayish-black
7,588-7,594	Sandstone, brownish-gray, very fine-grained, tight
7,594-7,600	Sandstone, very light- to light-gray, very fine-grained, silty, slightly dolomitic
7,600-7,615	Sandstone, very light-gray, very fine-grained, silty
7,615-7,620	Sandstone, very light-gray, fine-grained; medium light-gray dense chert; crinoids
7,620-7,666	Sandstone, very light-gray, fine-grained

Douglas Group Equivalent

7,666-7,675	Shale, grayish-black
7,675-7,750	Shale, medium-gray
7,750-7,760	Shale, grayish-black
7,760-7,770	Shale, medium-gray
7,770-7,780	Shale, grayish-black
7,780-7,835	Shale, medium-gray
7,835-7,845	Shale, grayish-black
7,845-7,880	Shale, medium-gray
7,880-7,890	Shale, grayish-black
7,890-7,940	Shale, medium-gray
7,940-7,950	Shale, grayish-black
7,950-8,095	Shale, medium-gray; coal at 8,064-8,066 feet

Missouri Series
Ochelata Group
Lansing Group Equivalent

8,095-8,120	Sandstone, very light- to light-gray, very fine- to fine-grained
8,120-8,154	Sandstone, very light-gray, fine-grained

Kansas City Group Equivalent

8,154-8,160	Shale, medium-gray
8,160-8,163	Limestone, pale yellowish-brown, fine- to medium-sandy
8,163-8,170	Shale, medium-gray
8,170-8,180	Siltstone, medium light- to medium-gray
8,180-8,220	Shale, medium-gray
8,220-8,225	Siltstone, medium-gray
8,225-8,248	Shale, medium-gray
8,248-8,251	Siltstone, medium light- to medium-gray
8,251-8,260	Shale, medium-gray
8,260-8,270	Shale, greenish-gray
8,270-8,278	Shale, medium-gray
8,278-8,284	Siltstone, medium light-gray, dolomitic
8,284-8,298	Shale, medium-gray
8,298-8,307	Sandstone, very light-gray, fine-grained, dolomitic, tight
8,307-8,315	Shale, medium-gray
8,315-8,325	Shale, grayish-black
8,325-8,344	Shale, medium-gray
8,344-8,350	Sandstone, brownish-gray, fine- to medium-grained, slightly calcareous, tight
8,350-8,360	Shale, medium-gray
8,360-8,370	Shale, grayish-black
8,370-8,380	Shale, medium-gray
8,380-8,385	Sandstone, very light-gray, fine-grained; trace of glauconite
8,385-8,395	Sandstone, very light-gray, fine-grained, glauconitic, slightly calcareous; some yellowish-brown sandstone
8,395-8,400	Sandstone, very light-gray, fine-grained, dolomitic, glauconitic
8,400-8,410	Sandstone, very light-gray, fine-grained; trace of glauconite
8,410-8,415	Sandstone, medium light-gray, very fine-grained, silty, slightly calcareous
8,415-8,430	Shale, medium-gray
8,430-8,440	Shale, grayish-black
8,440-8,470	Shale, medium-gray
8,470-8,476	Sandstone, medium-gray, very fine-grained, silty, tight
8,476-8,488	Shale, grayish-black
8,488-8,492	Siltstone, medium dark-gray, very finely sandy
8,492-8,520	Shale, medium-gray
8,520-8,530	Shale, grayish-black
8,530-8,566	Shale, medium-gray

Skiatook Group

8,566-8,573	Limestone, dark-gray, very fine-crystalline, argillaceous
8,573-8,580	Shale, grayish-black
8,580-8,592	Shale, medium dark-gray, silty
8,592-8,600	Sandstone, medium light- to medium-gray, very fine-grained, slightly micaceous, silty, slightly dolomitic; low porosity
8,600-8,620	Sandstone, very light- to light-gray, very fine-grained, silty, slightly dolomitic, slightly micaceous
8,620-8,625	Siltstone, olive-gray
8,625-8,650	Shale, medium-gray
8,650-8,660	Shale, grayish-black
8,660-8,700	Shale, medium-gray
8,700-8,710	Shale, grayish-black
8,710-8,730	Shale, medium-gray
8,730-8,740	Shale, grayish-black
8,740-8,770	Shale, medium-gray
8,770-8,780	Shale, grayish-black
8,780-8,830	Shale, medium-gray
8,830-8,840	Sandstone, medium-gray to olive-gray, very fine-grained, silty, argillaceous, tight
8,840-8,868	Shale and siltstone, medium- to dark-gray, silty; carbonaceous plant? impressions

Hogshooter Limestone 8,868-8,910 feet

8,868-8,873	Limestone, medium dark-gray to brownish-gray, very fine-crystalline
8,873-8,888	Shale, medium-gray
8,888-8,892	Limestone, dark-gray, finely oölitic, argillaceous
8,892-8,900	Shale, medium-gray
8,900-8,910	Limestone, medium-gray, fine-crystalline, slightly brownish
8,910-8,915	Siltstone, medium light-gray, very finely sandy, slightly greenish
8,915-8,930	Siltstone, medium- to medium dark-gray
8,930-8,940	Shale, grayish-black
8,940-8,955	Shale, medium- to medium dark-gray, silty
8,955-9,025	Shale, medium-gray
9,025-9,035	Shale, grayish-black
9,035-9,050	Shale, medium-gray
9,050-9,055	Siltstone, medium dark-gray
9,055-9,080	Shale, medium-gray
9,080-9,087	Siltstone, medium dark-gray
9,087-9,092	Shale, medium-gray
9,092-9,095	Limestone, dark-gray, finely oölitic, fine- to medium-sandy
9,095-9,104	Limestone, medium dark-brownish-gray, finely oölitic, finely sandy; some medium to coarse sand grains
9,104-9,108	Limestone, brownish-gray, medium-oölitic, glauconitic

9,108- 9,113	Limestone, brownish-gray, fine- to medium-sandy, glauconitic	10,135-10,143	Shale, grayish-black
9,113- 9,154	Shale, medium-gray	10,143-10,150	Limestone, medium dark-gray, fine-crystalline; some medium-gray limestone
9,154- 9,165	Siltstone, medium light- to medium-gray, very finely sandy, slightly calcareous	10,150-10,157	Siltstone, light greenish-gray, very finely sandy
9,165- 9,179	Shale, medium-gray	10,157-10,170	Shale, medium-gray
9,179- 9,181	Limestone, medium- to medium dark-gray, fine-crystalline, silty, very finely sandy	10,170-10,183	Siltstone, light-gray, very finely sandy
9,181- 9,190	Limestone as above; slightly brownish	10,183-10,190	Sandstone, very light-gray, fine-grained
9,190- 9,195	Limestone, medium dark-brownish-gray, fine-crystalline, slightly argillaceous	10,190-10,195	Limestone, medium dark-gray, very fine-crystalline
9,195- 9,200	Limestone, medium-gray, fine-crystalline, slightly argillaceous	10,195-10,200	Limestone, medium dark-brownish-gray, fine-crystalline
		10,200-10,210	Shale, medium-gray
		10,210-10,215	Shale, grayish-black
		10,215-10,228	Shale, medium-gray
		10,228-10,252	Siltstone, medium light-gray, very finely sandy; light-gray siltstone
	Pleasanton Group Equivalent (Pleasanton Formation Equivalent on Chart OC-61)	10,252-10,275	Siltstone, medium- to medium dark-gray; carbonaceous material
9,200- 9,290	Shale, medium-gray	10,275-10,283	Sandstone, medium light-gray, very fine-grained, silty
9,290- 9,300	Shale, grayish-black	10,283-10,290	Shale, medium-gray
9,300- 9,330	Shale, medium-gray	10,290-10,300	Shale, grayish-black
	Des Moines Series Marmaton Group	10,300-10,335	Shale, medium-gray
9,330- 9,355	Shale, medium-gray	10,335-10,345	Shale, grayish-black
9,355- 9,370	Shale, grayish-black	10,345-10,364	Shale, medium-gray
9,370- 9,510	Shale, medium-gray	10,364-10,366	Limestone, dark-gray, fine-crystalline, argillaceous
9,510- 9,520	Shale, grayish-black	10,366-10,368	Shale, medium-gray
9,520- 9,654	Shale, medium-gray; small gastropod 9,545-9,550 feet	10,368-10,375	Limestone, medium- to medium dark-gray, very fine-crystalline, slightly argillaceous; crinoids
9,654- 9,660	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous; crinoids	10,375-10,378	Limestone, dark-gray, argillaceous; crinoids
9,660- 9,700	Shale, medium-gray	10,378-10,406	Shale, medium-gray
9,700- 9,720	Shale, grayish-black	10,406-10,409	Limestone, pale yellowish-brown to medium light-gray, very fine-crystalline
9,720- 9,728	Limestone, medium dark-gray, very fine-crystalline		
9,728- 9,732	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous		Atoka Series Upper part of Dornick Hills Formation 10,409-10,789 feet
9,732- 9,738	Limestone, medium dark-brownish-gray, very fine-crystalline	10,409-10,418	Shale, medium-gray
9,738- 9,745	Limestone, dark-gray, fine-crystalline, argillaceous	10,418-10,423	Limestone, dark-gray to grayish-black, fine-crystalline, argillaceous; spines
9,745- 9,750	Limestone, medium-gray, very fine-crystalline	10,423-10,430	Shale, grayish-black
9,750- 9,760	Limestone, medium dark-brownish-gray, very fine-crystalline	10,430-10,438	Shale, medium-gray
9,760- 9,770	Limestone, medium dark- to dark-gray, fine-crystalline	10,438-10,440	Limestone, dark-gray to grayish-black, fine-crystalline, argillaceous
9,770- 9,780	Shale, medium-gray	10,440-10,450	Shale, medium-gray
9,780- 9,786	Siltstone, medium dark-gray	10,450-10,460	Shale, grayish-black
9,786- 9,792	Shale, medium-gray	10,460-10,468	Shale, medium-gray
9,792- 9,795	Limestone, medium-gray, fine-crystalline, oölitic?	10,468-10,474	Limestone, dark-gray, fine-crystalline, argillaceous; fusulinid
9,795- 9,800	Limestone, dark-gray, fine-crystalline, argillaceous	10,474-10,483	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous
9,800- 9,820	Siltstone, medium light- to medium-gray, micaceous; slightly calcareous in part	10,483-10,490	Limestone, dark-gray, fine-crystalline, argillaceous
9,820- 9,843	Siltstone, medium- to dark-gray	10,490-10,500	Shale, medium-gray
9,843- 9,860	Shale, grayish-black	10,500-10,510	Shale, grayish-black
9,860- 9,870	Shale, medium dark-gray, silty	10,510-10,520	Shale, medium-gray
9,870- 9,875	Limestone, medium-gray, very fine-crystalline, slightly brownish	10,520-10,528	Shale, grayish-black
9,875- 9,880	Limestone as above; trace of medium dark-gray spicular chert	10,528-10,530	Limestone, dark-gray, fine-crystalline, argillaceous
9,880- 9,885	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous; medium dark-gray to brownish-gray dense chert	10,530-10,560	Shale, medium-gray
9,885- 9,888	Limestone, dark-gray, fine-crystalline, very argillaceous	10,560-10,565	Limestone, brownish-gray, very fine-crystalline
9,888- 9,894	Shale, medium-gray	10,565-10,570	Siltstone, pale yellowish-brown, slightly calcareous
9,894- 9,901	Limestone, medium dark-gray, fine-crystalline, argillaceous	10,570-10,580	Shale, medium-gray
9,901- 9,908	Shale, medium-gray	10,580-10,590	Siltstone, medium-gray
9,908- 9,911	Limestone, medium dark-gray, fine-crystalline, argillaceous	10,590-10,604	Shale, medium-gray
9,911- 9,918	Shale, grayish-black; coal stringers	10,604-10,606	Limestone, grayish-black, fine-crystalline, argillaceous
9,918- 9,921	Limestone, medium dark-gray, fine-crystalline, argillaceous	10,606-10,610	Shale, medium-gray
9,921- 9,926	Shale, medium dark- to dark-gray, silty	10,610-10,620	Sandstone, medium-gray, very fine-grained, silty, calcareous
9,926- 9,935	Limestone, medium-gray, fine-crystalline	10,620-10,624	Sandstone, medium light-gray to light olive-gray, very fine-grained, silty, calcareous
	Cabaniss and Krebs Groups	10,624-10,630	Sandstone, light-gray, very fine-grained, calcareous
9,935- 9,940	Shale, medium-gray	10,630-10,633	Shale, medium-gray
9,940- 9,958	Shale, medium dark-gray, silty	10,633-10,635	Limestone, moderate-brown, finely sandy; crinoids
9,958- 9,961	Limestone, medium dark-gray, fine-crystalline, argillaceous	10,635-10,642	Sandstone, medium light-gray, fine-grained, silty, slightly calcareous
9,961- 9,973	Shale, medium-gray	10,642-10,649	Shale, medium-gray
9,973- 9,985	Shale, grayish-black; coal (caving?) 9,978-9,980 feet	10,649-10,654	Sandstone, medium light- to medium-gray, fine- to medium-grained, calcareous
9,985- 9,998	Siltstone, brownish-gray, very finely sandy, micaceous	10,654-10,672	Shale, medium-gray
9,998-10,010	Siltstone, light- to medium light-gray, very finely sandy, micaceous; carbonaceous films	10,672-10,676	Limestone, medium dark-gray, finely sandy; crinoids
10,010-10,018	Shale, medium-gray	10,676-10,682	Shale, medium-gray
10,018-10,030	Siltstone, very light- to light-gray, very finely sandy	10,682-10,687	Limestone, medium dark-gray, finely sandy; crinoids
10,030-10,033	Shale, medium-gray	10,687-10,700	Shale, grayish-black
10,033-10,040	Sandstone, very light- to light-gray, very fine-grained, calcareous	10,700-10,717	Shale, medium-gray
10,040-10,050	Shale, medium-gray	10,717-10,725	Siltstone, medium dark-gray, very finely sandy, calcareous
10,050-10,055	Shale, grayish-black	10,725-10,730	Shale, grayish-black
10,055-10,104	Shale, medium-gray	10,730-10,766	Shale, medium-gray
10,104-10,110	Limestone, brownish-gray, very fine-crystalline	10,766-10,780	Shale, grayish-black
10,110-10,117	Limestone, medium-gray, fine-crystalline, slightly brownish	10,780-10,789	Shale, medium-gray
10,117-10,135	Shale, medium-gray		Mississippian System Upper Mississippian Series Rocks of Chesterian Age
		10,789-10,815	Limestone, medium dark- to dark-gray, fine-crystalline, slightly argillaceous; weathered to light gray; brachiopods 10,800-10,805 feet
		10,815-10,830	Limestone, dark-gray, fine-granular, argillaceous

10,830-10,836	Limestone, medium dark-gray, dense to very fine-crystalline	11,180-11,190	Shale, medium-gray
10,836-10,843	Shale, medium-gray	11,190-11,200	Shale, greenish-gray
10,843-10,850	Limestone, medium- to medium dark-gray, fine-crystalline, slightly argillaceous, oölitic?	11,200-11,244	Shale, medium-gray
10,850-10,855	Limestone, medium dark-brownish-gray, fine-crystalline, oölitic?	11,244-11,246	Limestone, dark-gray, fine-crystalline, argillaceous
10,855-10,864	Limestone, dark-gray, fine-crystalline, slightly argillaceous	11,246-11,285	Shale, medium-gray
10,864-10,870	Shale, medium-gray	11,285-11,295	Shale, grayish-black
10,870-10,880	Shale, grayish-black	11,295-11,327	Shale, medium-gray
10,880-10,900	Limestone, medium dark- to dark-gray, fine-crystalline, slightly argillaceous	11,327-11,338	Limestone, medium dark- to dark-gray, fine-crystalline, silty
10,900-10,928	Limestone, dark-gray, fine-crystalline, argillaceous	11,338-11,340	Shale, medium-gray
10,928-10,936	Shale, medium-gray	11,340-11,344	Limestone, medium-gray, fine-granular, very silty, slightly brownish
10,936-10,944	Shale, grayish-black	11,344-11,350	Limestone, medium dark-gray, fine- to medium-oölitic; scattered fine sand
10,944-10,950	Shale, medium-gray	11,350-11,360	Limestone, medium- to medium dark-gray, very finely sandy, silty; some brownish limestone
10,950-10,956	Shale, greenish-gray	11,360-11,367	Shale, medium-gray
10,956-10,963	Shale, medium-gray	11,367-11,370	Limestone, medium-gray to grayish-red, fine- to medium-oölitic; scattered fine sand; crinoids
10,963-10,970	Limestone, medium dark-brownish-gray, medium-oölitic; some long oölitic	11,370-11,422	Shale, medium-gray
10,970-10,978	Limestone, medium dark- to dark-gray, fine-crystalline, slightly argillaceous	11,422-11,430	Limestone, dark-gray, fine-crystalline, argillaceous
10,978-10,980	Shale, medium-gray	11,430-11,440	Shale, medium light-gray, very finely glauconitic
10,980-10,982	Limestone, medium dark-gray, medium-oölitic	11,440-11,465	Shale, medium-gray
10,982-11,002	Limestone, medium dark- to dark-gray, fine-crystalline, argillaceous	11,465-11,475	Shale, grayish-black
11,002-11,030	Shale, medium-gray	11,475-11,485	Shale, medium dark-gray
11,030-11,045	Shale, grayish-black	11,485-11,490	Shale, grayish-black
11,045-11,085	Shale, medium-gray	11,490-11,510	Shale, medium-gray
11,085-11,090	Siltstone, medium dark-gray, very finely sandy	11,510-11,520	Shale, grayish-black
11,090-11,128	Shale, medium-gray	11,520-11,535	Shale, medium-gray
11,128-11,135	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous; spines	11,535-11,560	Shale, medium dark-gray, silty
11,135-11,140	Limestone, medium dark-brownish-gray, fine-crystalline, argillaceous; crinoids	11,560-11,570	Shale, grayish-black
11,140-11,156	Shale, medium-gray	11,570-11,572	Limestone, dark-gray, fine-crystalline, argillaceous
11,156-11,162	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous; crinoids	11,572-11,590	Shale, medium-gray
11,162-11,178	Shale, medium-gray	11,590-11,606	Siltstone, medium-gray, very finely sandy
11,178-11,180	Limestone, dark-gray, fine-crystalline, argillaceous	11,606-11,630	Shale, medium-gray
		11,630-11,632	Limestone, dark-gray, fine-crystalline, argillaceous
		11,632-11,660	Shale, medium-gray
		11,660-11,675	Sandstone, light- to medium-gray, very fine-grained silty
		11,675-11,690	Shale, medium dark-gray
		11,690-11,708	No samples
		11,708	Total depth

Log 14

CANADIAN COUNTY, OKLAHOMA

Center SE¼ SE¼ sec. 18, T. 11 N., R. 8 W.

Operator: Cities Service Oil Co.
Lease: Petree Ranch No. 1
Elevation: DF 1,324 feet
Total depth: Electrical log 11,163 feet
Drillers 11,177 feet
Completion date: 1949
Initial production: Dry and abandoned

Electrical log: 365 feet to total depth
Sample intervals:
10-foot
450 feet to total depth
Cored intervals:
10,046 to 10,051 feet (core chip)

Permian System		1,150-1,200	Shale, moderate reddish-brown
		1,200-1,300	No samples
0- 450	No samples	1,300-1,331	Shale, moderate reddish-orange, slightly dolomitic
		1,331-1,333	Dolomite, olive-gray, fine-crystalline
		1,333-1,358	Shale, moderate reddish-brown
		1,358-1,360	Dolomite, moderate reddish-brown, very fine-crystalline, argillaceous
El Reno Group			
Flowerpot Shale and Duncan Sandstone 450-670 feet			
450- 458	Shale, moderate reddish-brown; much pale-red to reddish-brown fine-grained sandstone; white gypsum	1,360-1,368	Siltstone, moderate reddish-orange, very finely sandy
458- 470	Sandstone, pale-red to reddish-brown, fine-grained, gypsiferous	1,368-1,395	Shale, moderate reddish-brown
470- 493	Shale, moderate reddish-brown, silty	1,395-1,407	Sandstone, moderate reddish-brown, very fine-grained, silty
493- 511	Sandstone, pale-red, fine-grained, gypsiferous	1,407-1,410	Shale, moderate reddish-brown
511- 519	Shale, moderate reddish-brown	1,410-1,412	Limestone, moderate reddish-brown, fine-crystalline, argillaceous
519- 525	Sandstone, moderate reddish-brown, fine-grained	1,412-1,437	Shale, moderate reddish-brown
525- 530	Shale, moderate reddish-brown	1,437-1,443	Siltstone, moderate reddish-orange, very finely sandy
530- 540	Sandstone, pale reddish-brown, fine-grained, gypsiferous	1,443-1,450	Shale, moderate reddish-brown
540- 549	Shale, moderate reddish-brown	1,450-1,453	Limestone, light olive-gray, very fine-crystalline, slightly argillaceous
549- 551	Sandstone, pale reddish-brown, fine-grained	1,453-1,476	Shale, moderate reddish-brown
551- 560	Shale, moderate reddish-brown	1,476-1,500	Sandstone, pale reddish-brown, very fine-grained; some very light-gray very fine-grained sandstone
560- 568	Sandstone, pale reddish-brown, very fine-grained, silty, gypsiferous	1,500-1,510	Shale, moderate reddish-brown
568- 574	Sandstone, pale reddish-brown, very fine- to fine-grained	1,510-1,514	Sandstone, moderate reddish-brown, very fine-grained
574- 594	Shale, moderate reddish-brown	1,514-1,530	Shale, moderate reddish-brown
594- 603	Sandstone, pale reddish-brown, very fine- to fine-grained	1,530-1,535	Limestone, moderate reddish-brown, fine-crystalline, argillaceous; gray limestone pellets
603- 610	Shale, moderate reddish-brown	1,535-1,553	Shale, moderate reddish-brown
610- 612	Dolomite, moderate reddish-brown, fine-crystalline, argillaceous	1,553-1,555	Limestone, moderate reddish-brown, fine-crystalline, argillaceous
612- 615	Shale, moderate reddish-brown		
614- 618	Sandstone, pale reddish-brown, very fine- to fine-grained		
618- 653	Shale, moderate reddish-brown		
653- 657	Sandstone, pale-red, very fine- to fine-grained, gypsiferous		
657- 668	Shale, moderate reddish-brown		
668- 670	Sandstone, pale-red, very fine- to fine-grained	1,555-1,563	Sandstone, moderate reddish-brown, very fine-grained, slightly dolomitic
Hennessey Shale 670-1,555 feet		1,563-1,585	Shale, moderate reddish-brown
		1,585-1,598	Sandstone, pale to moderate reddish-brown, very fine- to fine-grained; some very light-gray sandstone
670- 680	Shale, moderate reddish-brown	1,598-1,604	Sandstone, pale reddish-brown, very fine-grained, silty
680- 685	Siltstone, light-gray, very finely sandy	1,604-1,646	Shale, moderate reddish-brown
685- 690	Shale, moderate reddish-brown	1,646-1,650	Sandstone, pale reddish-brown, very fine-grained, silty
690- 810	No samples	1,650-1,679	Shale, moderate reddish-brown
810- 820	Shale, moderate reddish-brown	1,679-1,690	Sandstone, very light-gray, very fine-grained
820- 830	Shale, moderate reddish-orange, silty; white gypsum	1,690-1,697	Sandstone, pale reddish-brown, very fine-grained
830- 840	Shale, moderate reddish-brown; white gypsum	1,697-1,708	Shale, moderate reddish-brown
840- 860	Shale, moderate reddish-brown	1,708-1,717	Sandstone, moderate reddish-brown, fine-grained
860- 870	Shale as above; white gypsum	1,717-1,750	Shale, moderate reddish-brown
870- 880	Siltstone, moderate reddish-orange	1,750-1,773	Sandstone, pale reddish-brown, fine-grained
880- 904	Shale, moderate reddish-brown	1,773-1,786	Shale, moderate reddish-brown
904- 910	Anhydrite, white, fine-crystalline; gypsum	1,786-1,788	Sandstone, pale reddish-brown, fine-grained
910- 920	Shale, moderate reddish-brown; white gypsum	1,788-1,796	Shale, moderate reddish-brown
920- 925	Sandstone, light greenish-gray, very fine-grained, silty	1,796-1,805	Sandstone, pale reddish-brown, fine-grained
925- 930	Shale, dark-gray	1,805-1,830	Shale, moderate reddish-brown
930- 945	Shale, moderate reddish-brown	1,830-1,870	Shale, moderate reddish-brown; many grayish-red limestone pellets
945- 965	Shale as above; white fine-crystalline anhydrite and gypsum	1,870-1,874	Shale, moderate reddish-brown
965- 990	Shale, moderate reddish-brown	1,874-1,895	Sandstone, pale reddish-brown, very fine-grained
990-1,010	Shale as above; white fine-crystalline anhydrite and gypsum	1,895-1,925	Shale, moderate reddish-brown
1,010-1,020	Shale as above	1,925-1,942	Sandstone, very pale-orange to white, very fine- to fine-grained
1,020-1,030	Shale as above; white fine-crystalline anhydrite and gypsum	1,942-1,985	Shale, moderate reddish-brown
1,030-1,040	Shale as above	1,985-1,991	Sandstone, pale reddish-brown, very fine-grained
1,040-1,050	Shale, moderate reddish-brown; white fine-crystalline anhydrite and gypsum	1,991-2,000	Shale, moderate reddish-brown
1,050-1,060	Shale as above	2,000-2,110	No samples
1,060-1,063	Anhydrite, white, fine-crystalline	2,110-2,112	Sandstone, moderate reddish-brown, very fine-grained, silty
1,063-1,070	Shale, moderate reddish-brown	2,112-2,120	Shale, moderate reddish-brown
1,070-1,080	Siltstone, moderate reddish-brown	2,120-2,132	Sandstone, moderate reddish-brown, very fine-grained
1,080-1,130	Shale, moderate reddish-brown; white fine-crystalline anhydrite and gypsum	2,132-2,158	Shale, moderate reddish-brown
1,130-1,140	Shale as above		
1,140-1,150	Siltstone, moderate reddish-orange, very finely sandy, slightly dolomitic		

2,158-2,165	Sandstone, pale reddish-brown, very fine-grained, slightly dolomitic
2,165-2,168	Shale, moderate reddish-brown
2,168-2,173	Sandstone, pale reddish-brown, very fine-grained, slightly dolomitic
2,173-2,195	Shale, moderate reddish-brown
2,195-2,199	Sandstone, grayish-red, very fine-grained
2,199-2,200	Shale, moderate reddish-brown
2,200-2,210	Shale, medium-gray and greenish-gray
2,210-2,215	Siltstone, light-gray
2,215-2,220	Shale, medium-gray
2,220-2,224	Shale, grayish-black
2,224-2,235	Shale, moderate reddish-brown
2,235-2,242	Sandstone, grayish-red, very fine-grained, silty
2,242-2,255	Shale, moderate reddish-brown
2,255-2,263	Shale, medium-gray
2,263-2,270	Sandstone, grayish-red, very fine-grained, silty
2,270-2,277	Shale, moderate reddish-brown
2,277-2,283	Sandstone, grayish-red, very fine-grained, silty
2,283-2,309	Shale, moderate reddish-brown
2,309-2,312	Sandstone, very light-gray, very fine-grained
2,312-2,320	Shale, medium-gray
2,320-2,332	Shale, moderate reddish-brown
2,332-2,340	Sandstone, grayish-red, very fine-grained, silty
2,340-2,350	Shale, medium-gray
2,350-2,360	Shale, moderate reddish-brown
2,360-2,364	Shale, medium-gray
2,364-2,369	Sandstone, light-gray, very fine-grained, silty
2,369-2,372	Dolomite, very light-gray, silty
2,372-2,382	Sandstone, light-gray to pale-red, very fine-grained, silty

Wellington Formation 2,382-3,290 feet

2,382-2,386	Shale, medium-gray
2,386-2,400	Siltstone, very light- to light-gray
2,400-2,410	Shale, greenish-gray
2,410-2,432	Shale, medium-gray
2,432-2,434	Dolomite, light-gray, very fine-crystalline
2,434-2,451	Shale, medium-gray
2,451-2,453	Dolomite, light greenish-gray, dense
2,453-2,457	Shale, medium-gray
2,457-2,460	Shale, grayish-black
2,460-2,465	Shale, medium-gray
2,465-2,470	Shale, greenish-gray
2,470-2,500	Shale, medium-gray
2,500-2,510	Shale, greenish-gray
2,510-2,513	Dolomite, medium-gray, argillaceous
2,513-2,530	Shale, medium-gray
2,530-2,540	Shale, greenish-gray
2,540-2,555	Shale, medium-gray
2,555-2,557	Dolomite, light-gray, very fine-crystalline
2,557-2,579	Shale, medium-gray
2,579-2,582	Dolomite, pale yellowish-brown, very fine-crystalline
2,582-2,590	Shale, olive-gray
2,590-2,609	Shale, medium-gray
2,609-2,611	Dolomite, light olive-gray, very fine-crystalline
2,611-2,620	Shale, medium-gray
2,620-2,622	Dolomite, light olive-gray, very fine-crystalline
2,622-2,635	Shale, greenish-gray
2,635-2,660	Shale, medium-gray
2,660-2,662	Dolomite, pale yellowish-brown, fine-crystalline
2,662-2,670	Shale, medium-gray
2,670-2,680	Shale, greenish-gray
2,680-2,687	Shale, medium-gray
2,687-2,690	Anhydrite, light-gray, fine-crystalline
2,690-2,730	Shale, medium-gray
2,730-2,736	Shale, greenish-gray
2,736-2,743	Shale, medium-gray
2,743-2,746	Anhydrite, light-gray, fine-crystalline
2,746-2,785	Shale, medium-gray
2,785-2,790	Shale, greenish-gray
2,790-2,797	Shale, medium-gray
2,797-2,799	Dolomite, light olive-gray, very fine-crystalline
2,799-2,848	Shale, medium-gray
2,848-2,850	Anhydrite, very light-gray, fine-crystalline
2,850-2,870	Shale, medium-gray
2,870-2,873	Anhydrite, very light-gray, fine-crystalline
2,873-2,883	Shale, medium-gray
2,883-2,885	Anhydrite, very light-gray, fine-crystalline
2,885-2,920	Shale, medium-gray
2,920-2,923	Anhydrite, very light-gray, fine-crystalline
2,923-2,952	Shale, medium-gray
2,952-2,956	Anhydrite, very light-gray, fine-crystalline
2,956-2,990	Shale, medium-gray
2,990-2,995	Anhydrite, very light-gray, fine-crystalline
2,995-3,018	Shale, medium-gray
3,018-3,022	Anhydrite, medium light-gray, fine-crystalline
3,022-3,025	Shale, medium-gray
3,025-3,035	Anhydrite, white to light-gray, fine-crystalline
3,035-3,050	Shale, medium-gray
3,050-3,053	Anhydrite, white to light-gray, fine-crystalline
3,053-3,064	Shale, medium-gray
3,064-3,070	Anhydrite, white to light-gray, fine-crystalline
3,070-3,084	Shale, medium-gray
3,084-3,087	Anhydrite, white to light-gray, fine-crystalline
3,087-3,102	Shale, medium-gray

3,102-3,117	Anhydrite, white to light-gray, fine-crystalline
3,117-3,130	Shale, medium-gray
3,130-3,144	Anhydrite, white to light-gray, fine-crystalline
3,144-3,156	Shale, medium-gray
3,156-3,163	Anhydrite, white to light-gray, fine-crystalline
3,163-3,173	Shale, medium-gray
3,173-3,207	Anhydrite, white to light-gray, fine-crystalline
3,207-3,225	Shale, medium-gray
3,225-3,238	Anhydrite, white to light-gray, fine-crystalline
3,238-3,246	Shale, medium-gray
3,246-3,252	Anhydrite, white to light-gray, fine-crystalline
3,252-3,257	Shale, medium-gray
3,257-3,260	Dolomite, brownish-gray, fine-crystalline
3,260-3,265	Shale, medium-gray
3,265-3,267	Anhydrite, white to light-gray, fine-crystalline
3,267-3,272	Shale, medium-gray
3,272-3,280	Anhydrite, white to light-gray, fine-crystalline
3,280-3,290	Shale, medium-gray

Chase Group

3,290-3,296	Limestone, medium dark-gray, fine-crystalline, argillaceous; fossils?
3,296-3,300	Shale, medium-gray
3,300-3,306	Limestone, medium light- to medium-gray, fine-crystalline, argillaceous
3,306-3,320	Shale, medium-gray
3,320-3,420	No samples
3,420-3,440	Shale, medium-gray
3,440-3,450	Shale, grayish-red
3,450-3,478	Shale, medium-gray

Barneston Limestone 3,478-3,614 feet

3,478-3,481	Limestone, medium-gray, fine-crystalline, argillaceous
3,481-3,490	Shale, greenish-gray
3,490-3,494	Limestone, pale yellowish-brown, fine-crystalline
3,494-3,497	Shale, medium-gray
3,497-3,502	Siltstone, medium light-gray, very finely sandy, calcareous
3,502-3,505	Shale, medium-gray
3,505-3,520	Shale, grayish-red
3,520-3,525	Siltstone, medium light-gray, calcareous
3,525-3,532	Shale, medium-gray
3,532-3,533	Limestone, medium-gray, fine-crystalline, argillaceous
3,533-3,543	Shale, medium-gray
3,543-3,550	Limestone, medium light- to medium-gray, fine-crystalline, slightly argillaceous; spotted with dark gray
3,550-3,557	Shale, medium-gray
3,557-3,570	Siltstone, medium light-gray, calcareous
3,570-3,573	Shale, medium-gray
3,573-3,580	Limestone, medium light-gray to yellowish-brown, fine-crystalline, argillaceous
3,580-3,586	Shale, medium-gray
3,586-3,594	Shale, greenish-gray
3,594-3,600	Limestone, brownish-gray, fine-crystalline
3,600-3,602	Shale, medium-gray
3,602-3,614	Limestone, brownish-gray, very silty
3,614-3,630	Shale, medium-gray
3,630-3,645	Shale, olive-gray
3,645-3,649	Shale, moderate-brown

Wreford Limestone 3,649-3,733 feet

3,649-3,652	Limestone, medium light- to medium-gray, fine-crystalline
3,652-3,656	Shale, medium-gray
3,656-3,660	Limestone, medium light- to medium-gray, fine-crystalline
3,660-3,664	Shale, greenish-gray, fissile
3,664-3,675	Shale, grayish-red to moderate reddish-brown
3,675-3,680	Shale, medium-gray
3,680-3,690	Shale, olive-gray
3,690-3,695	Shale, moderate reddish-brown
3,695-3,700	Shale, greenish-gray
3,700-3,706	Shale, moderate reddish-brown
3,706-3,709	Shale, medium-gray
3,709-3,717	Sandstone, very light-gray, very fine- to fine-grained, calcareous
3,717-3,730	Sandstone, very light-gray, fine-grained
3,730-3,733	Limestone, pale yellowish-brown, fine-crystalline

Council Grove Group

3,733-3,740	Shale, medium-gray
3,740-3,760	Shale, grayish-red
3,760-3,770	Shale, medium-gray
3,770-3,783	Shale, grayish-red
3,783-3,796	Sandstone, pale-red to grayish-red, very fine- to fine-grained, slightly calcareous
3,796-3,802	Shale, grayish-red
3,802-3,804	Sandstone, pale-red to grayish-red, very fine- to fine-grained, slightly calcareous
3,804-3,815	Shale, grayish-red
3,815-3,825	Shale, medium-gray
3,825-3,845	Shale, grayish-red
3,845-3,863	Shale, medium-gray
3,863-3,868	Limestone, medium-gray, very fine-crystalline, argillaceous

3,868-3,877	Shale, medium-gray	4,680-4,686	Shale, medium-gray
3,877-3,883	Limestone, very pale-orange, fine-crystalline, slightly silty	4,686-4,695	Sandstone, very light- to light-gray, very fine-grained;
3,883-3,888	Limestone, pale-red to grayish-red, fine-crystalline, argillaceous		scattered orange grains (feldspar?)
3,888-3,895	Shale, grayish-red	4,695-4,721	Sandstone, very light- to light-gray, fine-grained
3,895-3,905	Shale, medium-gray	4,721-4,723	Limestone, brownish-gray, fine-crystalline
3,905-3,919	Shale, grayish-red	4,723-4,750	Shale, medium-gray
3,919-3,922	Limestone, pale-red, fine-crystalline	4,750-4,752	Limestone, pale yellowish-brown, fine-crystalline
3,922-3,930	Shale, medium-gray	4,752-4,760	Shale, medium-gray
3,930-3,933	Limestone, medium light-gray, fine-crystalline	4,760-4,780	Shale, grayish-red
3,933-3,940	Shale, medium-gray	4,780-4,786	Shale, medium-gray
3,940-3,955	Sandstone, very light-gray to pinkish-gray, fine-grained, subangular to angular	4,786-4,800	Sandstone, very light- to light-gray, fine-grained, porous, feldspathic?
3,955-3,959	Limestone, medium light-gray, fine-crystalline; mottled with dark gray	4,800-4,810	Sandstone, very light-gray, fine-grained, slightly dolomitic
3,959-3,963	Shale, medium-gray	4,810-4,817	Sandstone, very light-gray, very fine-grained
3,963-3,965	Limestone, light olive-gray, fine-crystalline	4,817-4,832	Shale, medium-gray
3,965-3,977	Shale, moderate reddish-brown	4,832-4,855	Sandstone, very light-gray, very fine-grained
3,977-3,980	Sandstone, yellowish-brown, very fine-grained, silty	4,855-4,865	Shale, medium-gray
3,980-3,988	Shale, moderate reddish-brown	4,865-4,875	Shale, grayish-red
3,988-3,990	Limestone, pale-red, very fine-crystalline	4,875-4,880	Shale, medium-gray
3,990-3,996	Shale, moderate reddish-brown	4,880-4,884	Limestone, pale yellowish-brown, very fine-crystalline
3,996-4,005	Shale, grayish-red	4,884-4,886	Shale, medium-gray
4,005-4,015	Shale, medium-gray	4,886-4,890	Limestone, medium-gray to brownish-gray, fine-crystalline
4,015-4,030	Shale, olive-gray	4,890-4,900	Shale, medium-gray
4,030-4,035	Shale, medium-gray	4,900-4,920	Shale, grayish-red
4,035-4,053	Sandstone, very light-gray, very fine-grained	4,920-4,930	Shale, medium-gray
4,053-4,058	Shale, medium-gray	4,930-4,932	Limestone, pale yellowish-brown, fine-crystalline
4,058-4,060	Limestone, brownish-gray, fine-crystalline	4,932-4,938	Shale, medium-gray
4,060-4,064	Shale, medium-gray	4,938-4,946	Limestone, pale yellowish-brown, fine-crystalline
4,064-4,070	Shale, grayish-red	4,946-4,953	Shale, medium-gray
4,070-4,077	Shale, medium-gray	4,953-4,958	Siltstone, light- to medium light-gray, very finely sandy
4,077-4,080	Limestone, pale yellowish-brown, fine-crystalline	4,958-4,973	Shale, medium-gray
4,080-4,084	Shale, medium-gray	4,973-4,988	Siltstone, light olive-gray to greenish-gray, very finely sandy
4,084-4,087	Sandstone, very light-gray, fine-grained, subangular; caving?	4,988-5,014	Shale, medium-gray
4,087-4,090	Shale, medium-gray	5,014-5,016	Limestone, medium-gray, silty
4,090-4,100	Shale, grayish-red	5,016-5,027	Shale, medium-gray
4,100-4,110	Shale, medium-gray	5,027-5,036	Limestone, pale yellowish-brown, fine-crystalline; crinoids; fusulinids
4,110-4,127	Sandstone, very light-gray, fine-grained, subangular; caving?	5,036-5,040	Sandstone, very light-gray, very fine-grained, calcareous
4,127-4,133	Limestone, pale yellowish-brown, fine-crystalline; medium-gray limestone; trace of glauconite	5,040-5,047	Shale, medium-gray
4,133-4,140	Shale, medium-gray	5,047-5,051	Limestone, pale yellowish-brown to brownish-gray, fine-crystalline
4,140-4,148	Shale, grayish-red	5,051-5,060	Shale, medium-gray
4,148-4,150	Sandstone, very light-gray, fine-grained	5,060-5,076	Sandstone, very light-gray, very fine-grained
4,150-4,155	Shale, medium-gray	5,076-5,090	Shale, medium-gray
4,155-4,166	Sandstone, very light-gray, very fine-grained	5,090-5,100	Sandstone, very light-gray, very fine- to fine-grained, slightly dolomitic; feldspar?
4,166-4,170	Shale, medium-gray	5,100-5,107	Sandstone, very light-gray, fine- to medium-grained, slightly dolomitic; feldspar?
4,170-4,178	Shale, grayish-red	5,107-5,117	Shale, medium-gray
4,178-4,183	Shale, medium-gray	5,117-5,143	Sandstone, very light-gray to light olive-gray, very fine-grained, feldspathic?
4,183-4,207	Sandstone, very light-gray, very fine-grained	5,143-5,146	Shale, medium-gray
4,207-4,233	Shale, medium-gray	5,146-5,150	Sandstone, very light-gray to light olive-gray, very fine-grained, feldspathic?
4,233-4,240	Limestone, pale yellowish-brown, fine-crystalline	5,150-5,173	Shale, grayish-red
	Admire Group	5,173-5,175	Limestone, grayish-red, fine-crystalline
		5,175-5,180	Shale, grayish-red
		5,180-5,190	Shale, medium-gray
4,240-4,246	Shale, medium-gray		Pennsylvanian System
4,246-4,266	Shale, grayish-red		Virgil Series
4,266-4,280	Shale, medium-gray		Wabunsee Group Equivalent
4,280-4,290	Sandstone, very light-gray, fine-grained		
4,290-4,303	Shale, medium-gray		
4,303-4,310	Shale, grayish-red		
4,310-4,319	Shale, medium-gray	5,190-5,197	Limestone, pale yellowish-brown, fine-crystalline
4,319-4,330	Sandstone, very light-gray, fine-grained	5,197-5,201	Shale, medium-gray
4,330-4,332	Shale, medium-gray	5,201-5,218	Limestone, pale yellowish-brown, fine-crystalline
4,332-4,342	Sandstone, very light-gray, fine-grained	5,218-5,240	Shale, medium-gray
4,342-4,360	Shale, medium-gray	5,240-5,252	Limestone, very pale-orange to pale yellowish-brown, fine-crystalline
4,360-4,375	Shale, grayish-red		Shale, medium-gray
4,375-4,390	Sandstone, pale-red to grayish-red, very fine-grained, silty	5,252-5,270	Limestone, medium-gray, fine-crystalline, argillaceous
4,390-4,400	Sandstone, very light-gray, very fine-grained; slightly calcareous in part	5,270-5,272	Shale, medium-gray
4,400-4,408	Sandstone, pale-red, fine-grained	5,272-5,298	Limestone, medium-gray, fine-crystalline, argillaceous
4,408-4,415	Shale, grayish-red	5,298-5,299	Shale, medium-gray
4,415-4,420	Shale, medium-gray	5,299-5,313	Limestone, medium-gray, fine-crystalline, argillaceous
4,420-4,430	Shale, olive-gray	5,313-5,315	Shale, medium-gray
4,430-4,440	Shale, moderate reddish-brown	5,315-5,337	Limestone, pale yellowish-brown, fine-crystalline
4,440-4,456	Shale, medium-gray	5,337-5,339	Shale, medium-gray
4,456-4,460	Shale, moderate reddish-brown	5,339-5,344	Sandstone, very light-gray, very fine-grained
4,460-4,466	Shale, medium-gray	5,344-5,354	Shale, medium-gray
4,466-4,480	Shale, grayish-red	5,354-5,360	No samples
4,480-4,490	Shale, medium-gray	5,360-5,380	Shale, medium-gray
4,490-4,495	Sandstone, light-gray, very fine-grained, silty	5,380-5,395	Shale and siltstone, greenish-gray, silty
4,495-4,504	Shale, medium-gray	5,395-5,406	Limestone, olive-gray to yellowish-brown, fine-crystalline, silty
4,504-4,510	Shale, grayish-red	5,406-5,410	Shale, medium-gray
4,510-4,515	Shale, medium-gray		
4,515-4,520	Sandstone, pale-red, very fine-grained	5,410-5,426	Siltstone, light-gray to light olive-gray, slightly dolomitic
4,520-4,530	Sandstone, light-gray, very fine-grained, very silty	5,426-5,436	Shale, medium-gray
4,530-4,539	Shale, medium-gray	5,436-5,440	Shale, grayish-brown
4,539-4,550	Sandstone, light-gray, very fine-grained	5,440-5,446	Siltstone, olive-gray
4,550-4,650	No samples	5,446-5,454	Shale, medium-gray
4,650-4,666	Shale, grayish-red	5,454-5,458	Sandstone, light-gray, very fine-grained
4,666-4,668	Limestone, pale-red, very fine-crystalline	5,458-5,470	Shale, medium-gray
4,668-4,673	Shale, medium-gray	5,470-5,476	Sandstone, olive-gray, very fine-grained, silty
4,673-4,679	Shale, grayish-red	5,476-5,480	Shale, medium-gray
4,679-4,680	Limestone, pale-red, very fine-crystalline	5,480-5,488	Coal
		5,488-5,490	

5,490-5,498	Shale, medium-gray	6,185-6,190	Sandstone, very light-gray, very fine- to fine-grained, slightly dolomitic; scattered medium grains
5,498-5,502	Siltstone, medium-gray	6,190-6,204	Sandstone, very light-gray, fine- to medium-grained, subangular; scattered coarse grains; few dark-gray grains of chert? and pink feldspar?
5,502-5,520	Shale, grayish-red	6,204-6,212	Shale, medium-gray
5,520-5,528	Shale, medium-gray	6,212-6,220	Sandstone, very light-gray, fine-grained
5,528-5,534	Siltstone, light-gray, very finely sandy	6,220-6,222	Shale, medium-gray
5,534-5,540	Shale, grayish-black	6,222-6,233	Sandstone, very light-gray, fine-grained
5,540-5,548	Shale, medium-gray	6,233-6,240	Shale, medium-gray
5,548-5,552	Siltstone, medium-gray, very finely sandy, calcareous	6,240-6,248	Shale, greenish-gray
5,552-5,555	Shale, medium-gray	6,248-6,257	Sandstone, very light-gray, fine-grained
5,555-5,565	Shale, greenish-gray	6,257-6,259	Shale, medium-gray
5,565-5,595	Shale, medium-gray	6,259-6,274	Sandstone, very light-gray, very fine- to fine-grained, dolomitic
5,595-5,599	Limestone, medium-gray to grayish-brown, fine-crystalline, slightly argillaceous; fusulinids	6,274-6,276	Shale, medium-gray
5,599-5,605	Shale, medium-gray	6,276-6,288	Sandstone, very light-gray, very fine-grained
5,605-5,610	Sandstone, light-gray, very fine-grained, silty, calcareous	6,288-6,302	Shale, medium-gray
5,610-5,617	Shale, medium-gray	6,302-6,306	Limestone, brownish-gray, very fine-crystalline; fusulinids
5,617-5,637	Sandstone, very light-gray, very fine-grained	6,306-6,314	Shale, medium-gray
5,637-5,648	Shale, medium-gray	6,314-6,317	Siltstone, light-gray to light olive-gray, slightly dolomitic
5,648-5,650	Sandstone, very light-gray, very fine-grained	6,317-6,320	Shale, medium-gray
5,650-5,656	Shale, medium-gray	6,320-6,325	Siltstone, light-gray to light olive-gray, slightly dolomitic
5,656-5,665	Shale, grayish-black; very thin coal stringers	6,325-6,330	Shale, medium- and dark-gray
5,665-5,670	Shale, medium-gray	6,330-6,335	Shale, grayish-black
5,670-5,680	Shale, grayish-black	6,335-6,340	Shale, medium-gray
5,680-5,683	Limestone, medium dark-gray, fine-crystalline, argillaceous; crinoids?	6,340-6,347	Sandstone, very light-gray, very fine-grained, dolomitic
5,683-5,700	Shale, medium-gray	6,347-6,358	Shale, greenish-gray
5,700-5,708	Siltstone, light olive-gray	6,358-6,360	Limestone, medium dark-gray, argillaceous
5,708-5,714	Shale, medium-gray	6,360-6,365	Shale, medium-gray
5,714-5,720	Limestone, medium dark-gray, fine-crystalline, argillaceous	6,365-6,370	Shale, grayish-black
5,720-5,727	Shale, medium-gray	6,370-6,376	Siltstone, olive-gray
5,727-5,735	Sandstone, very light-gray, very fine-grained, silty, calcareous in part	6,376-6,387	Siltstone, light-gray, very finely sandy, slightly dolomitic
5,735-5,744	Siltstone, medium-gray, very finely sandy	6,387-6,400	Shale, medium-gray
5,744-5,750	Shale, medium-gray	6,400-6,405	Siltstone, light-gray, very finely sandy
5,750-5,760	Shale, greenish-gray	6,405-6,411	Shale, medium-gray
5,760-5,780	Shale, medium-gray	6,411-6,416	Siltstone, olive-gray, tight
5,780-5,790	Shale, grayish-black	6,416-6,423	Shale, medium-gray; fusulinids
5,790-5,810	Shale, medium-gray	6,423-6,428	Siltstone, light-gray
5,810-5,820	Limestone, pale yellowish-brown and brownish-gray, fine-crystalline	6,428-6,430	Shale, medium-gray
5,820-5,825	Limestone, grayish-brown to dark-gray, fine-crystalline, dolomitic	6,430-6,436	Siltstone, light-gray
5,825-5,840	Shale, medium-gray	6,436-6,440	Shale, medium-gray
5,840-5,850	Siltstone, very light- to light-gray, very finely sandy, slightly calcareous	6,440-6,457	Sandstone, very light-gray, very fine- to fine-grained, slightly dolomitic
5,850-5,852	Shale, medium-gray	6,457-6,460	Shale, medium-gray
5,852-5,858	Sandstone, light-gray, very fine-grained, silty, slightly dolomitic	6,460-6,480	Sandstone, very light-gray, fine-grained; little feldspar?
5,858-5,880	Shale, medium-gray	6,480-6,490	Shale, medium-gray
5,880-5,885	Sandstone, medium light-gray, very fine-grained	6,490-6,494	Siltstone, medium-gray, calcareous
5,885-5,922	Sandstone, very light- to light-gray, fine-grained	6,494-6,501	Shale, medium-gray
5,922-5,940	Shale, medium-gray	6,501-6,512	Limestone, brownish-gray to medium-gray, fine-crystalline, argillaceous; spotted with dark gray; crinoids
5,940-5,950	Shale, grayish-black	6,512-6,520	Shale, medium-gray
5,950-5,967	Shale, medium-gray	6,520-6,539	Sandstone, very light-gray, very fine- to fine-grained; little black oil stain? or carbonaceous material
Shawnee Group Equivalent		6,539-6,570	Shale, medium-gray
5,967-5,972	Limestone, pale yellowish-brown, fine-crystalline	6,570-6,590	Sandstone, medium light-gray, very fine-grained, silty, calcareous
5,972-6,000	Shale, medium-gray	6,590-6,600	Shale, medium-gray
6,000-6,010	Siltstone, light greenish-gray, very finely sandy	6,600-6,610	Shale, grayish-black
6,010-6,020	Shale, medium-gray	6,610-6,630	Shale, medium-gray
6,020-6,030	Shale, grayish-black	6,630-6,640	Shale, grayish-black
6,030-6,040	Shale, greenish-gray to olive-gray, silty	6,640-6,680	Shale, medium-gray
6,040-6,044	Sandstone, light-gray, very fine-grained, silty, slightly dolomitic	6,680-6,690	Shale, grayish-black
6,044-6,050	Shale, medium-gray	6,690-6,705	Siltstone, olive-gray; olive-gray silty shale
6,050-6,055	Sandstone, very light-gray, very fine-grained	6,705-6,710	Shale, brownish-gray, silty; siltstone
6,055-6,060	Sandstone, very light-gray, fine-grained	6,710-6,720	Shale, grayish-black; trace of coal
6,060-6,065	Limestone, pale yellowish-brown, fine-crystalline; fusulinids	6,720-6,725	Shale, medium-gray
6,065-6,070	Limestone, brownish-gray, very fine-crystalline	6,725-6,743	Sandstone, very light- to light-gray, fine-grained
6,070-6,080	Shale, medium-gray	6,743-6,750	Shale, medium-gray
6,080-6,083	Limestone, medium dark-gray, fine-crystalline, argillaceous	6,750-6,760	Shale and siltstone, olive-gray
6,083-6,093	Limestone, brownish-gray to grayish-brown, very fine-crystalline	6,760-6,766	Shale, dark greenish-gray
6,093-6,110	No samples	6,766-6,775	Shale, medium- and dark-gray
6,110-6,112	Shale, medium-gray	6,775-6,780	Shale, medium-gray
6,112-6,119	Limestone, medium dark-gray, fine-crystalline, argillaceous; fusulinids	6,780-6,787	Siltstone, light greenish-gray to light-gray, tight
6,119-6,126	Shale, medium-gray	6,787-6,790	Limestone, medium dark- to dark-gray, very fine-crystalline; fusulinids
6,126-6,137	Siltstone, light-gray, very finely sandy, slightly calcareous	6,790-6,805	Shale, medium-gray
6,137-6,140	Shale, medium-gray	6,805-6,815	Siltstone, light greenish-gray
6,140-6,145	Shale, grayish-black	6,815-6,820	Shale, grayish-red
6,145-6,153	Shale, medium-gray	6,820-6,828	Shale, grayish-black
6,153-6,160	Sandstone, very light-gray, very fine-grained, dolomitic; trace of glauconite	6,828-6,837	Siltstone, medium light-gray
6,160-6,165	Shale, medium-gray	6,837-6,850	Shale, medium-gray
6,165-6,170	Shale, grayish-black	6,850-6,866	Siltstone, light-gray to light greenish-gray, very finely sandy
6,170-6,175	Shale, medium-gray	6,866-6,870	Shale, medium-gray
6,175-6,179	Limestone, pale yellowish-brown, fine-crystalline	6,870-6,875	Shale, grayish-red
6,179-6,183	Sandstone, very light-gray, very fine- to fine-grained, slightly dolomitic; scattered medium grains	6,875-6,880	Shale, medium-gray
6,183-6,185	Shale, medium-gray	6,880-6,889	Sandstone, very light-gray, fine-grained
		6,889-6,891	Shale, medium-gray
		6,891-6,910	Sandstone, very light-gray, very fine-grained, slightly dolomitic
		6,910-6,922	Shale, grayish-black
		6,922-6,932	Siltstone, light-gray, very finely sandy, slightly dolomitic
		6,932-6,940	Siltstone, olive-gray to greenish-gray, tight

6,940-6,947	Shale, medium-gray	7,810-7,830	Shale, grayish-black
6,947-6,953	Siltstone, olive-gray to brownish-gray, very finely sandy; slightly calcareous in part	7,830-7,844	Shale, medium-gray
6,953-6,956	Shale, medium-gray		Missouri Series
6,956-6,964	Siltstone, olive-gray to brownish-gray, very finely sandy; slightly calcareous in part		Ochelata Group
6,964-6,970	Shale, grayish-black		Lansing Group Equivalent
6,970-6,974	Limestone, medium dark-brownish-gray, fine-crystalline, argillaceous	7,844-7,865	Sandstone, very light-gray, fine-grained; trace of glauconite
6,974-6,987	Shale, medium-gray	7,865-7,970	Sandstone, very light-gray, fine-grained
6,987-6,995	Limestone, medium dark-brownish-gray, fine-crystalline, argillaceous; crinoids; other fossils?	7,970-8,040	Sandstone, very light- to light-gray, fine-grained; glauconite 7,970-7,990 feet
6,995-7,000	Shale, medium-gray	8,040-8,050	Sandstone, light-gray, fine-grained; scattered carbonaceous? material
7,000-7,010	Shale, grayish-black	8,050-8,063	Sandstone, medium light-gray, very fine-grained
7,010-7,020	Shale, medium-gray		Kansas City Group Equivalent
7,020-7,030	Limestone, pale yellowish-brown to brownish-gray, very fine-crystalline		
7,030-7,048	Shale, medium-gray	8,063-8,078	Shale, medium-gray
7,048-7,055	Sandstone, very light-gray, very fine-grained	8,078-8,090	Siltstone, medium-gray; calcareous in part
7,055-7,056	Shale, medium-gray	8,090-8,110	Shale, medium-gray
7,056-7,058	Limestone, pale yellowish-brown, fine-crystalline	8,110-8,114	Limestone, dark-gray to dark brownish-gray, fine-crystalline, argillaceous
7,058-7,070	Shale, medium-gray		Shale, medium-gray
7,070-7,078	Siltstone, light olive-gray, slightly calcareous	8,114-8,119	Limestone, grayish-black, very fine-crystalline, argillaceous
7,078-7,085	Sandstone, very light-gray, very fine-grained	8,119-8,120	Shale, medium-gray
7,085-7,097	Sandstone, very light-gray, fine-grained		Limestone, grayish-black, very fine-crystalline, argillaceous
7,097-7,102	Shale, grayish-black	8,120-8,140	Shale, medium-gray
7,102-7,121	Sandstone, very light-gray, fine-grained	8,140-8,160	Shale, grayish-black
7,121-7,125	Shale, medium-gray	8,160-8,197	Shale, medium-gray
7,125-7,143	Sandstone, very light-gray, very fine-grained	8,197-8,200	Limestone, brownish-gray, fine-crystalline
7,143-7,150	Shale, medium-gray	8,200-8,240	Shale, medium-gray
7,150-7,160	Shale, grayish-black	8,240-8,250	Shale, grayish-black
7,160-7,202	Shale, medium-gray	8,250-8,280	Shale, medium-gray
7,202-7,211	Sandstone, light-gray, very fine-grained, silty	8,280-8,290	Sandstone, very light- to light-gray, fine- to medium-grained, glauconitic, tight; black shale stringers
7,211-7,220	Siltstone, medium light-gray to olive-gray, very finely sandy	8,290-8,295	Sandstone, yellowish-brown, medium-grained, calcareous
7,220-7,230	Sandstone, very light-gray, very fine-grained, silty	8,295-8,310	Sandstone, light-gray, fine- to medium-grained, glauconitic, tight; black shale stringers
7,230-7,235	Shale, medium-gray	8,310-8,327	Sandstone, medium light-gray, fine-grained, tight; black shale stringers and pellets
7,235-7,250	Shale, grayish-black	8,327-8,350	Sandstone, medium-gray, very fine- to fine-grained, silty
7,250-7,260	Shale, medium-gray	8,350-8,380	Sandstone, medium light-gray, very fine- to fine-grained, tight
7,260-7,265	Shale, grayish-black	8,380-8,398	Sandstone, very light-gray, fine-grained; glauconite
7,265-7,270	Siltstone, medium- to medium dark-gray	8,398-8,405	Shale, medium-gray
7,270-7,280	Sandstone, very light-gray, very fine-grained	8,405-8,415	Shale, grayish-black
7,280-7,290	Sandstone, very light-gray, fine-grained	8,415-8,440	Shale, medium dark- to dark-gray, silty
7,290-7,310	Sandstone, very light-gray, fine- to medium-grained	8,440-8,450	Shale, grayish-black
7,310-7,315	Shale, medium-gray	8,450-8,480	Shale, medium dark-gray
7,315-7,325	Siltstone, light olive-gray to medium light-gray	8,480-8,507	Shale, grayish-black
7,325-7,330	Siltstone, medium light-gray, very finely sandy		Skiatook Group
7,330-7,340	Siltstone, olive-gray	8,507-8,524	Limestone, dark-gray to grayish-black, very fine-crystalline, argillaceous; crinoids
7,340-7,350	Shale, grayish-black	8,524-8,534	Siltstone, medium dark-gray, very finely sandy, slightly calcareous
7,350-7,370	Shale, medium-gray	8,534-8,541	Sandstone, light- to medium light-gray, very fine- to fine-grained
7,370-7,380	Shale, grayish-black	8,541-8,550	Sandstone, medium-gray, very fine-grained, silty, calcareous
7,380-7,390	Shale, medium-gray	8,550-8,560	Sandstone, medium dark-gray, very fine-grained, silty, slightly calcareous
7,390-7,396	Siltstone, olive-gray to greenish-gray	8,560-8,580	Shale, medium dark- to dark-gray, silty
7,396-7,407	Sandstone, very light-gray, very fine-grained, dolomitic	8,580-8,590	Shale, grayish-black
7,407-7,420	Siltstone, very light- to medium light-gray, slightly micaceous	8,590-8,620	Shale, medium dark-gray
7,420-7,424	Shale, medium-gray	8,620-8,644	Sandstone, light- to medium-gray, very fine-grained, silty
7,424-7,430	Siltstone, olive-gray	8,644-8,646	Limestone, dark-gray, very fine-crystalline, argillaceous
7,430-7,440	Shale, medium-gray	8,646-8,670	Siltstone, medium-gray, very finely sandy
7,440-7,445	Limestone, brownish-gray, finely sandy, slightly argillaceous; many crinoids	8,670-8,690	Shale, medium dark-gray, silty
7,445-7,450	Limestone, pale yellowish-brown to light-gray, fine- to medium-sandy, very sandy; crinoids	8,690-8,700	Shale, medium dark-gray
7,450-7,465	Sandstone, very pale-orange, fine- to medium-grained, very calcareous; crinoids; trace of glauconite	8,700-8,725	Shale, grayish-black
7,465-7,475	Sandstone, light-gray, very fine- to fine-grained, calcareous; dark-gray coating on some quartz grains	8,725-8,733	Limestone, medium dark-gray, very fine-crystalline, argillaceous
7,475-7,480	Sandstone, light- to medium-gray, fine- to medium-grained, calcareous; dark-gray coating on many quartz grains; very fine pyrite	8,733-8,770	Shale, medium dark-gray, silty
7,480-7,498	Sandstone, very light- to light-gray, fine-grained; slightly calcareous in part	8,770-8,790	Shale, grayish-black
	Douglas Group Equivalent	8,790-8,808	Shale, medium dark-gray
7,498-7,510	Shale, medium-gray	8,808-8,816	Limestone, medium dark-gray, fine- to medium-sandy, fine- to medium-oölitic; crinoids
7,510-7,520	Shale, grayish-black	8,816-8,826	Shale, medium dark-gray
7,520-7,540	Shale, medium-gray		Hogshooter? Limestone 8,826-8,872 feet
7,540-7,555	Siltstone, light- to medium-gray; caving?	8,826-8,831	Limestone, medium dark-gray, very fine-crystalline, argillaceous
7,555-7,568	Shale, medium-gray	8,831-8,840	Shale, medium dark-gray
7,568-7,570	Shale, light- to medium-gray	8,840-8,842	Limestone, medium dark-gray, very fine-crystalline, argillaceous
7,570-7,590	Shale, medium-gray	8,842-8,850	Shale, medium dark-gray
7,590-7,605	Shale, grayish-black	8,850-8,860	Shale, grayish-black
7,605-7,635	Shale, medium-gray	8,860-8,866	Shale, medium dark-gray
7,635-7,645	Siltstone, light-gray, very finely sandy, slightly dolomitic	8,866-8,872	Limestone, medium-gray to brownish-gray, very fine-crystalline, argillaceous; crinoids; brachiopods
7,645-7,675	Sandstone, very light- to light-gray, very fine-grained, silty; caving?		
7,675-7,690	Shale, medium-gray		
7,690-7,700	Shale, grayish-black		
7,700-7,714	Shale, medium-gray		
7,714-7,725	Sandstone, medium light- to medium-gray, very fine-grained, silty		
7,725-7,744	Shale, medium dark-gray to dark olive-gray, silty		
7,744-7,760	Shale, grayish-black		
7,760-7,790	Shale, medium-gray		
7,790-7,800	Shale, grayish-black		
7,800-7,810	Shale, medium-gray		

8,872-8,880	Sandstone, brownish-gray to light olive-gray, very fine-grained, silty, calcareous	9,925- 9,946	Siltstone, light- to medium light-gray, micaceous, slightly calcareous
8,880-8,890	Sandstone, olive-gray, very fine-grained, silty, calcareous	9,946- 9,970	Shale, medium dark-gray, silty
8,890-8,900	Sandstone, medium- to medium dark-gray, very fine-grained, silty, calcareous; black rounded calcareous pellets	9,970-10,000	Shale, medium dark-gray
8,900-8,910	Siltstone, medium dark- to dark-gray, very finely sandy, calcareous	10,000-10,013	Limestone, brownish-gray to dark brownish-gray, fine-crystalline; trace of light-gray dense chert
8,910-8,925	Shale, grayish-black	10,013-10,021	Shale, medium dark-gray
8,925-8,930	Shale, greenish-gray	10,021-10,026	Siltstone, light-gray, tight, slightly calcareous
8,930-8,940	Siltstone, medium dark-gray, calcareous	10,026-10,035	Shale, medium dark-gray
8,940-8,950	Shale, grayish-black	10,035-10,040	Siltstone, medium-gray, micaceous
8,950-8,985	Shale, medium dark-gray	10,040-10,049	Siltstone, medium-gray, calcareous, slightly yellowish-brown
8,985-9,000	Shale, medium dark-gray, slightly reddish and brownish, silty	10,049-10,055	Limestone, medium dark-gray, fine-crystalline, silty; brachiopods
9,000-9,008	Shale, medium dark-gray	10,055-10,076	Limestone, dark-gray, fine-granular, very silty; scattered mica
9,008-9,017	Limestone, medium dark- to dark-gray, fine- to medium-oölitic, fine- to medium-sandy		Cabaniss and Krebs Groups
9,017-9,020	Shale, medium-gray	10,076-10,090	Siltstone, dark-gray, calcareous, slightly micaceous
9,020-9,025	Limestone, brownish-gray to pale yellowish-brown, fine- to medium-oölitic, finely sandy; glauconite	10,090-10,135	Shale, medium dark- to dark-gray, silty
9,025-9,030	Limestone, medium dark-gray, fine- to medium-oölitic, finely sandy	10,135-10,150	Shale, grayish-black
9,030-9,068	Shale, medium dark-gray	10,150-10,152	Limestone, dark-gray, fine-crystalline, very silty
9,068-9,075	Limestone, brownish-gray to medium dark-gray, dense to very fine-crystalline	10,152-10,180	Shale, medium dark- to dark-gray, very silty
9,075-9,080	Limestone, brownish-gray, fine-crystalline; many crinoids	10,180-10,185	Shale, grayish-black
9,080-9,085	Limestone, medium dark-gray, very fine-crystalline, slightly argillaceous; crinoids	10,185-10,188	Coal
9,085-9,097	Limestone, medium-gray, very fine-crystalline, slightly argillaceous	10,188-10,196	Shale, medium dark-gray
9,097-9,100	Limestone, medium dark-gray, fine-crystalline, medium to coarse-oölitic	10,196-10,200	Sandstone, medium light-gray, very fine-grained, silty; coal fragments
9,100-9,120	Shale, medium dark-gray	10,200-10,208	Sandstone, light-gray, very fine-grained, slightly dolomitic
9,120-9,130	Shale, grayish-black	10,208-10,211	Limestone, medium dark-gray, fine-crystalline; caving?
9,130-9,177	Shale, medium dark-gray	10,211-10,217	Sandstone, light-gray, very fine-grained
9,177-9,183	Siltstone, light greenish-gray, very finely sandy, calcareous	10,217-10,235	Siltstone and silty shale, dark-gray
9,183-9,190	Limestone, pale yellowish-brown, fine- to medium-oölitic, finely sandy	10,235-10,250	Shale, medium dark-gray
9,190-9,195	Limestone, pale yellowish-brown, fine- to medium-oölitic	10,250-10,270	Shale, grayish-black
9,195-9,200	Limestone, dark-gray, finely sandy, fine- to medium-oölitic; light-gray matrix; many oölitic have sand grains	10,270-10,280	Shale, medium dark-gray
9,200-9,210	Limestone as above; very sandy	10,280-10,286	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous; brachiopods; spines
9,210-9,220	Sandstone, medium light- to medium-gray, fine-grained, calcareous; scattered very dark grains (coated?)	10,286-10,288	Shale, medium-gray
9,220-9,240	Sandstone, light- to medium light-gray, very fine-grained, silty	10,288-10,293	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous
	Pleasanton Group Equivalent (Pleasanton Formation Equivalent on Chart OC-61)	10,293-10,308	Shale, medium dark-gray
9,240-9,300	Shale, medium dark-gray	10,308-10,310	Limestone, dark-gray, very fine-crystalline, argillaceous
9,300-9,320	Shale, grayish-black	10,310-10,332	Shale, medium dark-gray
9,320-9,340	Shale, medium dark-gray	10,332-10,339	Limestone, medium dark- to dark-gray, fine-crystalline, slightly argillaceous
9,340-9,360	Shale, grayish-black	10,339-10,348	Shale, medium dark-gray
9,360-9,370	Shale, medium dark-gray	10,348-10,351	Limestone, brownish-gray, fine-crystalline
	Des Moines Series Marmaton Group	10,351-10,360	Shale, grayish-black
9,370-9,410	Shale, medium dark-gray	10,360-10,370	Shale, medium dark-gray
9,410-9,420	Shale, grayish-black	10,370-10,390	Siltstone, medium- to medium dark-gray
9,420-9,440	Shale, medium dark-gray	10,390-10,400	Sandstone, light olive-gray, very fine-grained, slightly calcareous, silty
9,440-9,450	Shale, grayish-black	10,400-10,406	Sandstone, light-gray, very fine-grained, silty; carbonaceous streaks
9,450-9,590	Shale, medium dark-gray	10,406-10,413	Sandstone, light-gray to brownish-gray, very fine-grained; slight oil stain?
9,590-9,610	Shale, grayish-black	10,413-10,420	Sandstone, light-gray, very fine- to fine-grained, calcareous; trace of glauconite and feldspar?
9,610-9,670	Shale, medium dark-gray; coal stringers 9,645-9,650 feet	10,420-10,460	Shale, medium dark- to dark-gray, silty
9,670-9,680	Shale, grayish-black	10,460-10,470	Shale, grayish-black
9,680-9,710	Shale, medium dark-gray	10,470-10,480	Shale, medium- to dark-gray
9,710-9,720	Shale, grayish-black	10,480-10,495	Shale, grayish-black
9,720-9,740	Shale, medium dark-gray	10,495-10,497	Limestone, medium dark-gray, fine-crystalline, argillaceous; caving?
9,740-9,750	Shale, grayish-black	10,497-10,514	Shale, medium dark-gray
9,750-9,770	Shale, medium dark-gray	10,514-10,524	Limestone, dark-gray to grayish-black, dense to very fine-crystalline, slightly argillaceous
9,770-9,800	Shale, grayish-black	10,524-10,540	Shale, medium dark-gray
9,800-9,810	Siltstone, medium light- to medium-gray, very finely sandy	10,540-10,550	Shale, grayish-black
9,810-9,812	Shale, medium-gray	10,550-10,560	Shale, medium dark-gray
9,812-9,820	Siltstone, medium light- to medium-gray, very finely sandy	10,560-10,562	Limestone, light olive-gray to brownish-gray, very fine-crystalline
9,820-9,830	Limestone, medium dark- to dark-gray, argillaceous; crinoids; pyrite		Atoka Series
9,830-9,839	Shale, medium dark-gray	10,562-10,566	Shale, medium dark-gray
9,839-9,845	Limestone, dark-gray, very fine-crystalline, slightly argillaceous	10,566-10,570	Shale, grayish-black
9,845-9,847	Shale, medium-gray	10,570-10,580	Shale, medium dark-gray
9,847-9,858	Limestone, medium dark-gray, dense to very fine-crystalline	10,580-10,583	Limestone, dark-gray, fine-crystalline, argillaceous
9,858-9,860	Shale, medium-gray	10,583-10,586	Shale, medium-gray
9,860-9,875	Limestone, dark-gray, fine-crystalline, argillaceous	10,586-10,590	Limestone, medium-gray, fine-crystalline, slightly argillaceous
9,875-9,880	Shale, grayish-black	10,590-10,594	Limestone, pale yellowish-brown, fine-crystalline
9,880-9,890	Limestone, medium dark-gray, very fine-crystalline, slightly argillaceous	10,594-10,606	Shale, medium dark-gray
9,890-9,897	Shale, medium-gray	10,606-10,609	Limestone, medium dark-gray, fine-crystalline
9,897-9,900	Limestone, medium dark-gray, fine-crystalline, argillaceous	10,609-10,615	Shale, medium dark-gray
9,900-9,913	Shale, medium dark-gray	10,615-10,620	Shale, grayish-black
9,913-9,916	Coal	10,620-10,627	Shale, medium dark-gray
9,916-9,925	Siltstone, medium-gray, slightly micaceous	10,627-10,633	Limestone, dark-gray, fine-crystalline, argillaceous
		10,633-10,640	Limestone, dark brownish-gray, very fine-crystalline
		10,640-10,644	Limestone, dark-gray, very fine-crystalline, slightly argillaceous
		10,644-10,650	Limestone, brownish-gray, very fine-crystalline; spines
			Upper part of Dornick Hills Formation 10,562-10,775 feet

10,650-10,660	Shale, grayish-black	10,838-10,859	Shale, medium dark-gray
10,660-10,667	Shale, medium dark-gray	10,859-10,865	Limestone, medium dark- to dark-gray, fine-crystalline, argillaceous; pyrite
10,667-10,669	Limestone, dark-gray, fine-crystalline, argillaceous	10,865-10,890	Shale, medium dark-gray
10,669-10,675	Shale, medium dark-gray	10,890-10,916	Limestone, medium dark- to dark-gray, fine-crystalline, argillaceous
10,675-10,688	Shale, grayish-black	10,916-10,940	Shale, medium dark-gray
10,688-10,690	Limestone, dark-gray, fine-crystalline, argillaceous	10,940-10,960	Shale, grayish-black
10,690-10,707	Shale, medium dark-gray	10,960-11,006	Shale, medium dark-gray
10,707-10,710	Limestone, medium dark-gray, fine-crystalline, slightly brownish	11,006-11,042	Limestone, medium dark- to dark-gray, fine-granular, very silty
10,710-10,719	Siltstone, light olive-gray to greenish-gray	11,042-11,060	Shale, medium dark-gray
10,719-10,721	Limestone, pale yellowish-brown, dense	11,060-11,062	Limestone, medium dark- to dark-gray, fine-crystalline, argillaceous; caving?
10,721-10,732	Shale, medium dark-gray	11,062-11,070	Shale, medium dark-gray
10,732-10,737	Limestone, medium dark- to dark-gray, fine-crystalline, argillaceous	11,070-11,078	Shale, medium dark-gray, very calcareous
10,737-10,740	Limestone, brownish-gray, very fine-crystalline	11,078-11,093	Shale, medium dark-gray
10,740-10,745	Shale, medium dark-gray	11,093-11,107	Shale, medium dark-gray, very calcareous; fusulinids
10,745-10,765	Shale, grayish-black	11,107-11,116	Shale, medium dark-gray
10,765-10,775	Shale, medium dark-gray	11,116-11,126	Limestone, medium dark- to dark-gray, fine-granular, silty, argillaceous; brachiopods; pyrite
	Mississippian System	11,126-11,140	Limestone, dark-gray to grayish-black, very fine-crystalline, slightly argillaceous; few grayish-red crinoid? fragments
	Upper Mississippian Series	11,140-11,145	Limestone, dark-gray to black, argillaceous; crinoids
	Rocks of Chesterian Age	11,145-11,150	Shale, grayish-black
10,775-10,808	Limestone, dark-gray to grayish-black, very fine-crystalline, slightly argillaceous; little pyrite	11,150-11,170	Limestone, dark-gray to grayish-black, very fine- to fine-crystalline, slightly argillaceous to argillaceous
10,808-10,815	Shale, medium dark-gray	11,170-11,177	Shale, grayish-black; gastropods, pelecypods
10,815-10,825	Shale, grayish-black	11,177	Total depth (Drillers log)
10,825-10,833	Shale, medium dark-gray	11,163	Total depth (Electrical log)
10,833-10,838	Limestone, dark-gray, medium-oölitic, slightly argillaceous		

LOG 15

CADDO COUNTY, OKLAHOMA

Center SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 16, T. 10 N., R. 9 W.

Operator: Denver Producing and Refining Co.
 Lease: School Land No. 1
 Elevation: GL 1,535 feet
 Total depth: 17,094 feet
 Completion date: 1948
 Initial production: 5 million CFGPD from 12,600 to 12,660 feet

Electrical log: 534 to 15,338 feet

Sample intervals:

10-foot
 8,200 to 8,300 feet
 8,400 to 8,600 feet
 8,820 to 8,860 feet
 5-foot
 600 to 8,200 feet
 8,300 to 8,400 feet
 8,600 to 8,820 feet
 8,860 to 15,884 feet

Cored intervals:

16,080 feet to total depth (core chips)

Note: Below 16,200 feet most of the samples were tied in bundles of 4 sacks with the same drilled interval marked on each sack in a bundle; the sacks were numbered 1 through 4. For logging the intervals were divided into 4 parts.

Permian System

Hennessey Shale 922-2,119 feet

0- 600	No samples	922- 935	Shale, moderate reddish-brown
		935- 943	Siltstone, pale reddish-brown
		943- 970	Shale, moderate reddish-brown
		970- 976	Siltstone, pale reddish-brown
		976- 984	Shale, moderate reddish-brown
		984- 990	Siltstone, pale reddish-brown
		990-1,014	Shale, moderate reddish-brown
		1,014-1,047	Shale, moderate reddish-brown; white fine-crystalline anhydrite and gypsum at 1,015-1,018 and 1,034-1,038 feet
	El Reno Group	1,047-1,050	Siltstone, moderate reddish-brown, very finely sandy
	Flowerpot Shale and Duncan Sandstone 600-922 feet	1,050-1,110	Shale, moderate reddish-brown; white fine-crystalline anhydrite and gypsum at 1,056-1,059, 1,070-1,072, 1,079-1,080, 1,084-1,086, 1,098-1,100, and 1,104-1,107 feet
600- 617	Shale, moderate reddish-brown; scattered white gypsum; caving?		Shale, moderate reddish-brown
617- 619	Anhydrite, white, fine-crystalline	1,110-1,123	Anhydrite, white, fine-crystalline; moderate reddish-brown shale
619- 630	Shale, moderate reddish-brown	1,123-1,126	Shale, moderate reddish-brown
630- 633	Anhydrite, white, fine-crystalline	1,126-1,130	Siltstone, light-gray
633- 650	Shale, moderate reddish-brown	1,130-1,137	Shale, moderate reddish-brown; white fine-crystalline anhydrite
650- 657	Siltstone, moderate reddish-brown, very finely sandy	1,137-1,140	Shale, moderate reddish-brown
657- 678	Shale, moderate reddish-brown		Siltstone, pale reddish-brown
678- 680	Siltstone, moderate reddish-brown, very finely sandy	1,140-1,151	Shale, moderate reddish-brown
680- 688	Shale, moderate reddish-brown	1,151-1,160	Siltstone, pale reddish-brown; white fine-crystalline anhydrite
688- 708	Siltstone, moderate reddish-brown, very finely sandy	1,160-1,174	Shale, moderate reddish-brown; white fine-crystalline anhydrite
708- 728	Shale, moderate reddish-brown	1,174-1,180	Siltstone, pale reddish-brown
728- 730	Siltstone, moderate reddish-brown, very finely sandy	1,180-1,183	Anhydrite, white, fine-crystalline
730- 740	Shale, moderate reddish-brown	1,183-1,190	Siltstone, pale reddish-brown
740- 750	Shale as above, greenish-gray spots	1,190-1,193	Anhydrite, white, fine-crystalline
750- 760	Shale, moderate reddish-brown	1,193-1,208	Shale, moderate reddish-brown
760- 764	Sandstone, pale reddish-brown, very fine-grained, very silty	1,208-1,210	Anhydrite, white, fine-crystalline
764- 773	Shale, moderate reddish-brown	1,210-1,242	Shale, moderate reddish-brown; white fine-crystalline anhydrite 1,216-1,219 and 1,238-1,240 feet
773- 790	Sandstone, pale reddish-brown, very fine-grained, very silty	1,242-1,248	Anhydrite, white, fine-crystalline
790- 807	Shale, moderate reddish-brown	1,248-1,257	Siltstone, pale reddish-brown
807- 810	Sandstone, pale to moderate reddish-brown, very fine-grained, silty	1,257-1,290	Shale, moderate reddish-brown
810- 813	Shale, moderate reddish-brown	1,290-1,293	Anhydrite, white, fine-crystalline
813- 821	Sandstone, pale to moderate reddish-brown, very fine-grained, silty	1,293-1,301	Shale, moderate reddish-brown
821- 830	Shale, moderate reddish-brown	1,301-1,312	Anhydrite, white, fine-crystalline; moderate reddish-brown shale
830- 833	Dolomite, moderate reddish-brown, very fine-crystalline, argillaceous	1,312-1,330	Shale, moderate reddish-brown
833- 840	Shale, moderate reddish-brown	1,330-1,335	Anhydrite, white, fine-crystalline
840- 851	Sandstone, moderate reddish-brown, very fine-grained, very silty	1,335-1,356	Siltstone and silty shale, pale to moderate reddish-brown
851- 860	Shale, moderate reddish-brown	1,356-1,360	Anhydrite, white, fine-crystalline
860- 870	Siltstone, pale reddish-brown, very finely sandy	1,360-1,370	Shale, moderate reddish-brown
870- 877	Shale, moderate reddish-brown	1,370-1,375	Anhydrite, white, fine-crystalline
877- 883	Siltstone, pale reddish-brown	1,375-1,385	Shale, moderate reddish-brown
883- 888	Shale, moderate reddish-brown	1,385-1,390	Shale as above, anhydritic
888- 893	Siltstone, pale reddish-brown		
893- 897	Shale, moderate reddish-brown		
897- 903	Siltstone, pale reddish-brown		
903- 916	Shale, moderate reddish-brown		
916- 922	Sandstone, light-gray, very fine-grained, silty		

1,390-1,400	Shale, moderate reddish-brown	2,209-2,211	Sandstone, pale-red to grayish-red, very fine-grained
1,400-1,410	Shale as above, anhydritic	2,211-2,229	Shale, moderate reddish-brown
1,410-1,416	Shale, moderate reddish-brown; gray limestone pellets	2,229-2,231	Sandstone, very light-gray, very fine-grained
1,416-1,420	Shale, greenish-gray	2,231-2,250	Shale, moderate reddish-brown
1,420-1,426	Shale, moderate reddish-brown	2,250-2,253	Sandstone, moderate reddish-brown, very fine-grained, silty
1,426-1,430	Dolomite, moderate reddish-brown, fine-crystalline, argillaceous	2,253-2,287	Shale, moderate reddish-brown
1,430-1,445	Shale, moderate reddish-brown, anhydritic	2,287-2,303	Sandstone, pale reddish-brown, very fine-grained, silty
1,445-1,465	Shale, moderate reddish-brown	2,303-2,324	Shale, moderate reddish-brown
1,465-1,470	Siltstone, pale reddish-brown	2,324-2,328	Sandstone, light-gray, very fine-grained
1,470-1,474	Shale, moderate reddish-brown	2,328-2,330	Shale, light-gray
1,474-1,482	Siltstone, pale reddish-brown	2,330-2,337	Sandstone, pale-red, very fine-grained
1,482-1,490	Shale, moderate reddish-brown	2,337-2,342	Sandstone, grayish-red, very fine-grained
1,490-1,500	Shale as above; gray limestone pellets	2,342-2,347	Sandstone, light-gray, very fine- to fine-grained
1,500-1,508	Shale, moderate reddish-brown	2,347-2,380	Shale, moderate reddish-brown
1,508-1,516	Siltstone, pale reddish-brown	2,380-2,384	Limestone, moderate reddish-brown, fine-crystalline, argillaceous
1,516-1,521	Shale, moderate reddish-brown	2,384-2,393	Shale, moderate reddish-brown
1,521-1,523	Dolomite, light olive-gray, fine-crystalline	2,393-2,403	Sandstone, pale reddish-brown, very fine-grained
1,523-1,550	Shale, moderate reddish-brown	2,403-2,450	Shale, moderate reddish-brown
1,550-1,553	Dolomite, moderate reddish-brown, fine-crystalline, argillaceous	2,450-2,457	Sandstone, very light-gray, very fine-grained
1,553-1,560	Shale, moderate reddish-brown	2,457-2,460	Shale, greenish-gray
1,560-1,567	Siltstone, pale reddish-brown	2,460-2,469	Shale, moderate reddish-brown
1,567-1,574	Shale, moderate reddish-brown	2,469-2,480	Sandstone, grayish-red, very fine- to fine-grained
1,574-1,583	Siltstone, pale reddish-brown	2,480-2,534	Shale, moderate reddish-brown
1,583-1,594	Shale, moderate reddish-brown	2,534-2,546	Sandstone, grayish-red, very fine-grained, silty
1,594-1,598	Siltstone, pale reddish-brown, very finely sandy	2,546-2,550	Shale, moderate reddish-brown
1,598-1,604	Shale, moderate reddish-brown	2,550-2,566	Sandstone, pale-red to grayish-red, very fine-grained
1,604-1,610	Siltstone, pale reddish-brown	2,566-2,590	Shale, moderate reddish-brown
1,610-1,616	Sandstone, light-gray, very fine-grained, silty	2,590-2,600	Sandstone, grayish-red, very fine-grained
1,616-1,624	Shale, moderate reddish-brown	2,600-2,658	Shale, moderate reddish-brown
1,624-1,635	Siltstone, pale reddish-brown	2,658-2,666	Sandstone, light-gray, very fine-grained
1,635-1,644	Siltstone, pale reddish-brown, very finely sandy	2,666-2,678	Shale, moderate reddish-brown
1,644-1,698	Shale, moderate reddish-brown; silty in part	2,678-2,690	Sandstone, pale-red, very fine-grained
1,698-1,700	Dolomite, light olive-gray, very fine-crystalline	2,690-2,695	Shale, moderate reddish-brown
1,700-1,706	Shale, moderate reddish-brown	2,695-2,700	Shale, medium-gray
1,706-1,708	Dolomite, moderate reddish-brown, very fine-crystalline, argillaceous	2,700-2,704	Sandstone, yellowish-brown to light-gray, very fine-grained
1,708-1,718	Siltstone, pale reddish-brown	2,704-2,709	Shale, medium-gray
1,718-1,728	Shale, moderate reddish-brown	2,709-2,710	Sandstone, yellowish-brown to light-gray, very fine-grained
1,728-1,730	Dolomite, moderate reddish-brown, very fine-crystalline, argillaceous	2,710-2,713	Shale, medium-gray
1,730-1,746	Shale, moderate reddish-brown	2,713-2,740	Shale, moderate reddish-brown
1,746-1,748	Limestone, light- to medium-gray, very fine-crystalline	2,740-2,746	Siltstone, grayish-red, very finely sandy
1,748-1,775	Shale, moderate reddish-brown	2,746-2,749	Shale, medium-gray
1,775-1,780	Siltstone, pale reddish-brown, very finely sandy	2,749-2,752	Siltstone, light-gray
1,780-1,786	Shale, moderate reddish-brown	2,752-2,764	Shale, medium-gray
1,786-1,790	Siltstone, pale reddish-brown, very finely sandy	2,764-2,770	Sandstone, light-gray, very fine-grained, silty
1,790-1,815	Shale, moderate reddish-brown	2,770-2,774	Shale, moderate reddish-brown
1,815-1,832	Siltstone, pale reddish-brown	2,774-2,784	Siltstone, grayish-red, very finely sandy
1,832-1,842	Shale, moderate reddish-brown	2,784-2,800	Shale, moderate reddish-brown
1,842-1,844	Limestone, pale-red, very fine-crystalline	2,800-2,810	Shale, medium-gray
1,844-1,854	Shale, moderate reddish-brown	2,810-2,816	Siltstone, light-gray, very finely sandy
1,854-1,861	Sandstone, light-gray, very fine-grained, silty	2,816-2,822	Sandstone, grayish-red, very fine-grained, silty
1,861-1,869	Shale, moderate reddish-brown	2,822-2,829	Shale, moderate reddish-brown
1,869-1,871	Siltstone, pale reddish-brown, very finely sandy	2,829-2,836	Sandstone, light-gray, very fine-grained, silty
1,871-1,877	Shale, moderate reddish-brown	2,836-2,840	Shale, olive-gray
1,877-1,887	Siltstone, pale reddish-brown, very finely sandy	2,840-2,850	Shale, medium-gray
1,887-1,912	Shale, moderate reddish-brown	2,850-2,860	Siltstone, grayish-red, very finely sandy
1,912-1,924	Siltstone, pale reddish-brown		
1,924-1,945	Shale, moderate reddish-brown	2,860-2,862	Dolomite, olive-gray, oölitic?
1,945-1,950	Siltstone, pale reddish-brown, very finely sandy	2,862-2,880	Shale, medium-gray
1,950-1,970	Shale, moderate reddish-brown	2,880-2,893	Shale, greenish-gray
1,970-1,977	Siltstone, pale reddish-brown	2,893-2,896	Shale, grayish-black
1,977-1,980	Limestone, moderate reddish-brown, very fine-crystalline	2,896-2,928	Shale, medium-gray
1,980-2,030	Shale, moderate reddish-brown	2,928-2,930	Siltstone, medium-gray, very finely sandy
2,030-2,034	Limestone, moderate reddish-brown, fine-crystalline, slightly argillaceous	2,930-2,945	Shale, medium-gray
2,034-2,042	Sandstone, moderate reddish-brown, very fine-grained, silty	2,945-2,956	Shale, greenish-gray
2,042-2,054	Shale, moderate reddish-brown	2,956-2,976	Shale, medium-gray
2,054-2,060	Sandstone, moderate reddish brown, very fine-grained, silty, slightly calcareous	2,976-2,986	Shale, greenish-gray
2,060-2,077	Shale, moderate reddish-brown	2,986-3,002	Shale, medium-gray
2,077-2,080	Limestone, moderate reddish-brown, fine-crystalline, argillaceous	3,002-3,004	Dolomite, medium light-gray, very fine-crystalline
2,080-2,090	Shale, moderate reddish-brown	3,004-3,010	Shale, dark-gray
2,090-2,093	Limestone, light olive-gray, fine-granular; dark-gray to brownish-gray pellets? included in limestone?	3,010-3,017	Shale, grayish-black
2,093-2,100	Sandstone, pale reddish-brown, very fine-grained, silty	3,017-3,034	Shale, medium-gray
2,100-2,103	Shale, moderate reddish-brown	3,034-3,035	Dolomite, medium light-gray, very fine-crystalline
2,103-2,105	Limestone, moderate reddish-brown, argillaceous; contains limestone pellets?	3,035-3,047	Shale, medium-gray
2,105-2,119	Shale, moderate reddish-brown	3,047-3,049	Dolomite, medium-gray, very fine-crystalline
	Garber Sandstone 2,119-2,860 feet	3,049-3,065	Shale, medium-gray
2,119-2,123	Sandstone, pale reddish-brown, very fine-grained, silty	3,065-3,075	Shale, greenish-gray
2,123-2,140	Shale, moderate reddish-brown	3,075-3,092	Shale, medium-gray
2,140-2,142	Sandstone, pale reddish-brown, very fine-grained	3,092-3,094	Dolomite, medium light-gray, very fine-crystalline; caving?
2,142-2,170	Shale, moderate reddish-brown	3,094-3,118	Shale, medium-gray
2,170-2,182	Sandstone, pale to moderate reddish-brown, very fine-grained, silty	3,118-3,123	Anhydrite, white, fine-crystalline
2,182-2,188	Shale, moderate reddish-brown	3,123-3,130	Shale, medium-gray
2,188-2,197	Sandstone, pale to moderate reddish-brown, very fine-grained, silty	3,130-3,140	Shale, greenish-gray
2,197-2,209	Shale, moderate reddish-brown	3,140-3,180	Shale, medium-gray
		3,180-3,182	Anhydrite, white, fine-crystalline
		3,182-3,230	Shale, medium-gray
		3,230-3,232	Anhydrite, white, fine-crystalline
		3,232-3,240	Shale, medium-gray
		3,240-3,250	Shale, olive-gray
		3,250-3,317	Shale, medium-gray
		3,317-3,319	Anhydrite, white, fine-crystalline
		3,319-3,324	Shale, medium-gray
		3,324-3,330	Shale, greenish-gray
		3,330-3,333	Anhydrite, white, fine-crystalline

Wellington Formation 2,860-3,759 feet

3,333-3,379	Shale, medium-gray	4,006-4,010	Sandstone, medium light-gray, very fine-grained, calcareous, silty
3,379-3,380	Anhydrite, white, fine-crystalline	4,010-4,017	Shale, brownish-gray
3,380-3,398	Shale, medium-gray	4,017-4,021	Shale, medium-gray
3,398-3,400	Anhydrite, white, fine-crystalline	4,021-4,023	Limestone, medium-gray, argillaceous
3,400-3,410	Shale, medium-gray	4,023-4,030	Shale, medium-gray
3,410-3,411	Anhydrite, white, fine-crystalline	4,030-4,045	Shale, grayish-red
3,411-3,419	Shale, medium-gray	4,045-4,056	Shale, medium-gray
3,419-3,420	Anhydrite, white, fine-crystalline	4,056-4,060	Limestone, medium-gray, fine-granular, argillaceous
3,420-3,457	Shale, medium-gray	4,060-4,065	Limestone, medium light-gray, fine-crystalline; some yellowish-brown limestone; some dark-gray spots
3,457-3,461	Anhydrite, white to light-gray, fine-crystalline	4,065-4,075	Shale, medium-gray
3,461-3,476	Shale, medium-gray	4,075-4,080	Limestone, medium light-gray, very finely sandy, silty, finely oölitic and oölicastic; dark-gray spots
3,476-3,478	Anhydrite, white to light-gray, fine-crystalline	4,080-4,081	Shale, medium-gray
3,478-3,497	Shale, medium-gray	4,081-4,086	Sandstone, medium light-gray, very fine-grained, silty, calcareous
3,497-3,503	Anhydrite, white to light-gray, fine-crystalline	4,086-4,090	Limestone, medium light-gray, very finely sandy, silty
3,503-3,519	Shale, medium-gray	4,090-4,104	Shale, medium-gray
3,519-3,522	Anhydrite, white to light-gray, fine-crystalline	4,104-4,109	Limestone, medium dark-gray, fine-crystalline, argillaceous; dark-gray spots
3,522-3,530	Shale, medium-gray	4,109-4,114	Shale, medium-gray
3,530-3,542	Anhydrite, white to light-gray, fine-crystalline	4,114-4,120	Limestone, medium-gray, fine-crystalline, argillaceous; fusulinids
3,542-3,560	Shale, medium-gray	4,120-4,125	Limestone, medium light-gray, fine-crystalline
3,560-3,566	Anhydrite, white to light-gray, fine-crystalline	4,125-4,130	Limestone, pale yellowish-brown, fine-crystalline
3,566-3,577	Shale, medium-gray	4,130-4,134	Limestone, medium dark-gray, fine-crystalline, argillaceous
3,577-3,580	Anhydrite, white to light-gray, fine-crystalline	Base of Barneston Limestone 4,134 feet	
3,580-3,583	Shale, medium-gray	4,134-4,140	Shale, medium-gray
3,583-3,591	Anhydrite, white to light-gray, fine-crystalline	4,140-4,142	Limestone, medium-gray, fine-crystalline
3,591-3,596	Shale, medium-gray	4,142-4,153	Shale, medium-gray
3,596-3,598	Anhydrite, white to light-gray, fine-crystalline	4,153-4,160	Shale, grayish-red, calcareous
3,598-3,603	Shale, medium-gray	Wreford Limestone 4,160-4,224 feet	
3,603-3,606	Anhydrite, white to light-gray, fine-crystalline	4,160-4,165	Limestone, pale-red, fine-crystalline, slightly argillaceous
3,606-3,612	Shale, medium-gray	4,165-4,170	Limestone, pale yellowish-brown, very fine-crystalline to dense
3,612-3,620	Anhydrite, white to light-gray, fine-crystalline	4,170-4,174	Limestone, very pale-orange, fine-crystalline, dolomitic
3,620-3,630	Shale, greenish-gray	4,174-4,180	Shale, medium-gray
3,630-3,640	Anhydrite, white to light-gray, fine-crystalline	4,180-4,183	Limestone, olive-gray, fine-crystalline, finely oölitic?; grayish-red spots
3,640-3,646	Shale, medium-gray	4,183-4,190	Shale, medium-gray; fusulinids
3,646-3,648	Anhydrite, white to light-gray, fine-crystalline	4,190-4,196	Shale, greenish-gray
3,648-3,652	Shale, medium-gray	4,196-4,200	Shale, grayish-red
3,652-3,654	Dolomite, medium-gray, fine-crystalline, argillaceous	4,200-4,205	Sandstone, moderate reddish-brown, fine- to medium-grained, calcareous
3,654-3,660	Shale, medium-gray	4,205-4,210	Sandstone, pale to moderate reddish-brown, very fine-grained; light-gray very fine-grained sandstone; calcareous
3,660-3,672	Anhydrite, light-gray to white, fine-crystalline	4,210-4,215	Sandstone, pale reddish-brown, very fine-grained, silty, calcareous
3,672-3,678	Shale, medium-gray	4,215-4,222	Sandstone, light-gray, very fine-grained, calcareous; feldspar?
3,678-3,685	Anhydrite, light-gray to white, fine-crystalline	4,222-4,224	Limestone, light olive-gray, fine-crystalline, silty
3,685-3,690	Shale, medium-gray	Council Grove Group	
3,690-3,692	Dolomite, olive-gray, argillaceous, anhydritic	4,224-4,236	Shale, medium-gray
3,692-3,696	Shale, medium-gray	4,236-4,246	Siltstone, medium light-gray, very finely sandy, calcareous
3,696-3,700	Anhydrite, light-gray to white, fine-crystalline	4,246-4,250	Shale, medium-gray
3,700-3,705	Shale, medium-gray	4,250-4,260	Shale, grayish-red
3,705-3,717	Anhydrite, light-gray to white, fine-crystalline	4,260-4,264	Shale, medium-gray
3,717-3,726	Shale, medium-gray	4,264-4,267	Sandstone, pale to moderate reddish-brown, very fine-grained, silty, calcareous
3,726-3,736	Anhydrite, light-gray to white, fine-crystalline	4,267-4,272	Shale, grayish-red
3,736-3,747	Shale, medium-gray	4,272-4,280	Sandstone, pale to moderate reddish-brown, very fine-grained, silty, calcareous
3,747-3,752	Anhydrite, light-gray to white, fine-crystalline	4,280-4,292	Limestone, pale to moderate reddish-brown, fine- to medium-granular, calcareous
3,752-3,759	Shale, medium-gray	4,292-4,306	Shale, grayish-red
Chase Group		4,306-4,315	Sandstone, pale to moderate reddish-brown, very fine-grained, silty, calcareous
Nolans Limestone 3,759-3,810		4,315-4,322	Sandstone, light-gray, fine- to medium-grained, calcareous; feldspar?
3,759-3,761	Dolomite, medium-gray, argillaceous	4,322-4,330	Shale, grayish-red
3,761-3,767	Shale, medium-gray	4,330-4,340	Shale, medium-gray
3,767-3,769	Limestone, medium dark-gray, argillaceous, dolomitic	4,340-4,348	Shale, grayish-red
3,769-3,779	Shale, medium-gray	4,348-4,357	Sandstone, light-gray, very fine- to fine-grained, calcareous
3,779-3,781	Limestone, medium dark-gray, argillaceous, dolomitic	4,357-4,380	Shale, medium-gray
3,781-3,791	Shale, medium-gray	4,380-4,396	Shale, grayish-red
3,791-3,800	Dolomite, medium light-gray to pale yellowish-brown, fine-crystalline	4,396-4,405	Shale, medium-gray
3,800-3,802	Shale, medium-gray	4,405-4,409	Limestone, medium light-gray, fine-crystalline; reddish-orange oölitoid pellets
3,802-3,810	Limestone, medium dark-gray, fine-crystalline, argillaceous	4,409-4,414	Siltstone, medium light-gray, very finely sandy, calcareous
Winfield Limestone 3,820-3,891		4,414-4,440	Shale, medium-gray
3,820-3,829	Limestone, medium-gray, fine-crystalline; light- to medium-gray dense chert; some medium dark-gray dense chert	4,440-4,457	Shale, grayish-red
3,829-3,830	Shale, medium-gray	4,457-4,462	Limestone, pale-red, fine-crystalline
3,830-3,836	Limestone, medium light-gray to pale yellowish-brown, fine-crystalline	4,462-4,468	Shale, medium-gray; carbonaceous imprints; trace of coal at top
3,836-3,862	Shale, medium-gray	4,468-4,475	Shale, greenish-gray
3,862-3,870	Limestone, medium-gray, fine-granular, argillaceous; brachiopods?	4,475-4,490	Shale, grayish-red
3,870-3,871	Shale, medium-gray	4,490-4,501	Sandstone, light-gray, very fine-grained, silty, calcareous
3,871-3,878	Limestone, pale yellowish-brown, fine-crystalline	4,501-4,506	Shale, medium-gray
3,878-3,880	Shale, medium-gray; bryozoans		
3,880-3,886	Limestone, medium light-gray, argillaceous		
3,886-3,888	Shale, medium-gray		
3,888-3,891	Dolomite, very pale-orange to pale yellowish-brown, very fine-crystalline, calcareous		
3,891-3,900	Shale, medium-gray		
3,900-3,910	Shale, greenish-gray		
3,910-3,925	Shale, medium-gray		
3,925-3,935	Shale, grayish-red		
3,935-3,950	Shale, medium-gray		
3,950-3,960	Shale, greenish-gray		
3,960-3,980	Shale, grayish-red		
3,980-4,006	Shale, medium-gray		

4,506-4,509	Limestone, medium dark-gray, fine-crystalline, argillaceous	5,160-5,176	Shale, grayish-red
4,509-4,521	Shale, medium-gray	5,176-5,183	Shale, medium-gray
4,521-4,528	Limestone, medium light- to medium-gray, fine-crystalline; fusulinids; slight brownish tint	5,183-5,184	Limestone, medium-gray, fine-granular, argillaceous
4,528-4,535	Shale, medium-gray	5,184-5,193	Shale, medium-gray
4,535-4,550	Shale, grayish-red	5,193-5,200	Sandstone, light-gray, very fine- to fine-grained; feldspar?; porous
4,550-4,560	Shale, greenish-gray	5,200-5,217	Sandstone, light-gray, fine-grained, porous
4,560-4,569	Shale, medium-gray	5,217-5,222	Shale, black; coal
4,569-4,576	Sandstone, very light-gray to pale-red, fine- to medium-grained, feldspathic?, very porous	5,222-5,236	Shale, medium-gray
4,576-4,582	Sandstone, pale-red, fine- to medium-grained, dolomitic; glauconite?	5,236-5,244	Sandstone, medium light-gray to light greenish-gray, very fine-grained, silty; feldspar?
4,582-4,589	Sandstone, light-gray, fine-grained, porous	5,244-5,249	Shale, medium-gray
4,589-4,591	Sandstone, greenish-gray, fine-grained, argillaceous	5,249-5,256	Sandstone, medium light-gray to light greenish-gray, very fine-grained, silty
4,591-4,600	Sandstone, pale reddish-orange to light-gray, very fine- to fine-grained, calcareous; feldspar; glauconite?	5,256-5,262	Sandstone, light-gray, very fine- to fine-grained; feldspar?
4,600-4,609	Sandstone, medium light-gray, very fine-grained, silty, calcareous; feldspar?; few coarse sand grains	5,262-5,272	Sandstone, very light-gray, fine-grained, porous; feldspar?
4,609-4,616	Shale, medium-gray	5,272-5,280	Shale, medium-gray
4,616-4,626	Shale, grayish-red	5,280-5,305	Shale, grayish-red
4,626-4,631	Shale, medium-gray; fusulinids	5,305-5,313	Siltstone, medium light-gray to light olive-gray, very finely sandy
4,631-4,636	Limestone, medium- to medium dark-gray, fine-crystalline, argillaceous; fusulinids	5,313-5,320	Sandstone, light-gray, very fine- to fine-grained, calcareous; medium light-gray fine-grained calcareous sandstone
4,636-4,647	Shale, medium-gray	5,320-5,327	Sandstone, light-gray, very fine- to fine-grained, slightly calcareous
4,647-4,653	Sandstone, pale reddish-brown, very fine-grained, silty	5,327-5,350	Shale, medium-gray
4,653-4,659	Shale, grayish-red	5,350-5,354	Limestone, medium dark-gray to brownish-gray, fine-crystalline; fusulinids
4,659-4,661	Sandstone, pale reddish-brown, very fine-grained, silty	5,354-5,366	Shale, medium-gray
4,661-4,669	Shale, grayish-red	5,366-5,370	Shale, grayish-black
4,669-4,678	Sandstone, pinkish-gray to pale-red, very fine- to fine-grained, slightly calcareous; trace of glauconite	5,370-5,374	Shale, medium-gray
4,678-4,690	Shale, grayish-red	5,374-5,380	Siltstone, greenish-gray, very finely sandy
4,690-4,705	Shale, medium-gray	5,380-5,386	Sandstone, medium light-gray, very fine-grained, silty
4,705-4,715	Shale, grayish-red	5,386-5,390	Sandstone, light-gray, very fine- to fine-grained; feldspar?
4,715-4,722	Shale, medium-gray	5,390-5,400	Shale, medium-gray
4,722-4,727	Sandstone, light-gray, very fine-grained, silty	5,400-5,405	Shale, greenish-gray
4,727-4,737	Sandstone, very light-gray, fine-grained, dolomitic; feldspar?; porous; scattered medium grains	5,405-5,409	Shale, medium-gray
4,737-4,740	Sandstone, light-gray, fine- to medium-grained, dolomitic; feldspar; scattered subangular coarse grains	5,409-5,415	Sandstone, very light-gray, fine- to medium-grained, porous
4,740-4,745	Sandstone, light-gray, fine-grained, dolomitic	5,415-5,420	Sandstone, very light-gray, fine-grained, porous
4,745-4,750	Sandstone, very light-gray, medium- to coarse-grained, calcareous; some very coarse grains; feldspar	5,420-5,424	Sandstone, light-gray, fine-grained, calcareous; limestone fragments? or fossil fragments
4,750-4,755	Shale, medium-gray	5,424-5,430	Sandstone, light-gray, fine-grained; feldspar?
4,755-4,762	Sandstone, light-gray to light olive-gray, fine-grained, slightly dolomitic	5,430-5,443	Sandstone, light-gray, fine-grained
4,762-4,777	Shale, medium-gray	5,443-5,449	Sandstone, light-gray, very fine-grained, silty
4,777-4,779	Limestone, medium dark-gray, argillaceous	5,449-5,460	Shale, medium-gray
4,779-4,808	Shale, medium-gray	5,460-5,467	Limestone, medium dark-gray, very silty; crinoids
4,808-4,815	Limestone, brownish-gray to medium dark-gray, very fine- to fine-crystalline; fusulinids	5,467-5,478	Shale, medium-gray
4,815-4,830	Shale, medium-gray; light-gray sandstone Admire Group	5,478-5,490	Siltstone, light olive-gray, very finely sandy
4,830-4,832	Shale, medium-gray	5,490-5,510	Sandstone, very light- to light-gray, fine-grained, porous; some medium grains; feldspar?
4,832-4,859	Sandstone, light-gray, fine-grained, porous; feldspar?	5,510-5,521	Shale, medium-gray
4,859-4,861	Shale, medium-gray	5,521-5,523	Limestone, medium dark-gray, silty
4,861-4,884	Sandstone, light-gray, very fine-grained, silty	5,523-5,529	Shale, medium-gray
4,884-4,890	Shale, medium-gray	5,529-5,535	Siltstone, medium-gray to olive-gray, very finely sandy
4,890-4,906	Shale, grayish-red	5,535-5,545	Shale and siltstone, grayish-red
4,906-4,917	Shale, medium-gray	5,545-5,550	Shale, medium-gray
4,917-4,930	Sandstone, light-gray, very fine-grained, silty	5,550-5,560	Siltstone, medium light-gray, very finely sandy
4,930-4,949	Shale, medium-gray	5,560-5,575	Shale, medium-gray
4,949-4,954	Siltstone, light-gray, very finely sandy	5,575-5,578	Limestone, pale yellowish-brown, fine-crystalline
4,954-4,960	Shale, medium-gray	5,578-5,585	Shale, medium-gray
4,960-4,964	Sandstone, pale-red to pinkish-gray, very fine-grained	5,585-5,596	Limestone, pale yellowish-brown, fine-crystalline; pinhole porosity
4,964-4,972	Sandstone, light-gray, very fine-grained, slightly dolomitic	5,596-5,605	Shale, medium-gray
4,972-4,976	Shale, medium-gray	5,605-5,610	Siltstone, medium light-gray, very finely sandy
4,976-4,980	Sandstone, light-gray, very fine-grained, slightly dolomitic	5,610-5,616	Shale, medium-gray
4,980-4,985	Siltstone, medium light-gray, calcareous	5,616-5,625	Sandstone, very light-gray, fine-grained, porous
4,985-4,990	Shale, medium-gray; coal stringer	5,625-5,628	Sandstone, light-gray, very fine- to fine-grained; scattered carbonaceous material
4,990-4,995	Shale, medium-gray	5,628-5,633	Shale, medium-gray
4,995-5,000	Shale, grayish-red	5,633-5,646	Sandstone, very light-gray, fine-grained, porous
5,000-5,006	Shale, medium-gray	5,646-5,650	Shale, medium-gray
5,006-5,007	Limestone, medium dark-gray, fine-crystalline, argillaceous	5,650-5,654	Sandstone, medium light-gray, very fine-grained, silty
5,007-5,015	Shale, medium-gray	5,654-5,673	Shale, medium-gray
5,015-5,020	Shale, grayish-black	5,673-5,678	Sandstone, very light- to light-gray, very fine-grained
5,020-5,030	Shale, medium-gray	5,678-5,680	Shale, medium-gray
5,030-5,040	Shale, grayish-red	5,680-5,690	Sandstone, very light- to light-gray, fine-grained, porous; some medium-grained sandstone
5,040-5,050	Shale, medium dark-olive-gray	5,690-5,716	Sandstone, very light-gray, medium-grained, porous
5,050-5,068	Shale, grayish-red	5,716-5,720	Limestone, medium dark-gray, very silty
5,068-5,072	Sandstone, moderate reddish-brown, very fine-grained, silty, calcareous	5,720-5,724	Limestone, brownish-gray to medium dark-gray, fine-crystalline; fusulinids
5,072-5,083	Sandstone, pale-red to light-gray, very fine- to fine-grained, porous; feldspar?	5,724-5,734	Siltstone, greenish-gray, very finely sandy
5,083-5,090	Shale, grayish-red	5,734-5,739	Shale, grayish-red
5,090-5,103	Sandstone, pale to moderate reddish-brown, very fine- to fine-grained, porous	5,739-5,742	Shale, medium-gray
5,103-5,120	Shale, grayish-red; mottled with gray	5,742-5,755	Shale, grayish-red
5,120-5,136	Shale, medium-gray	5,755-5,762	Shale, medium-gray
5,136-5,146	Shale, grayish-red	5,762-5,770	Sandstone, light- to medium light-gray, very fine-grained, silty; calcareous in part
5,146-5,150	Shale, medium-gray	5,770-5,772	Shale, medium-gray
5,150-5,152	Limestone, pale yellowish-brown, very finely sandy	5,772-5,777	Siltstone, medium-gray, very finely sandy, calcareous
5,152-5,160	Shale, medium-gray	5,777-5,790	Shale, medium-gray
		5,790-5,792	Limestone, medium dark-gray, very silty
		5,792-5,796	Shale, medium-gray
		5,796-5,810	Sandstone, very light- to light-gray, very fine- to fine-grained, slightly calcareous; feldspar?

5,810-5,900	No samples	From electrical log:	6,390-6,400	Shale, grayish-black
		5,810-5,812 Sandstone	6,400-6,417	Shale, medium-gray
		5,812-5,815 Shale	6,417-6,421	Limestone, medium dark-gray, fine-crystalline, argillaceous; fusulinids
		5,815-5,818 Sandstone		
		5,818-5,825 Shale	6,421-6,435	Shale, medium-gray
		5,825-5,832 Sandstone	6,435-6,436	Limestone, medium dark- to dark-gray, very argillaceous
		5,832-5,836 Shale	6,436-6,440	Shale, medium-gray
		5,836-5,856 Sandstone	6,440-6,450	Shale, grayish-red
		5,856-5,870 Shale	6,450-6,454	Limestone, medium dark-gray, fine-crystalline, very silty; fusulinids
	Pennsylvanian System		6,454-6,466	Siltstone, light-gray
	Virgil Series		6,466-6,470	Siltstone, light-gray, very finely sandy
	Waubensee Group Equivalent		6,470-6,490	Sandstone, very light-gray, fine-grained, porous; carbonaceous material at base
		5,870-5,875 Limestone	6,490-6,493	Shale, medium-gray
		5,875-5,900 Shale	6,493-6,500	Sandstone, very light-gray, very fine- to fine-grained, slightly dolomitic
5,900-5,902	Shale, medium-gray		6,500-6,510	Sandstone, very light-gray, fine-grained, porous
5,902-5,908	Limestone, medium dark-brownish-gray to medium dark-gray, dense to very fine-crystalline		6,510-6,514	Sandstone, light-gray, very fine-grained, silty; carbonaceous material
5,908-5,910	Limestone, medium dark-gray, argillaceous		6,514-6,530	Sandstone, light-gray, very fine- to fine-grained
5,910-5,917	Limestone, dark-gray, very silty		6,530-6,545	Sandstone, very light-gray, fine-grained, porous
5,917-5,920	Shale, medium-gray		6,545-6,550	Sandstone, light-gray, very fine-grained, dolomitic
5,920-5,926	Shale, grayish-black		6,550-6,556	Shale, greenish-gray
5,926-5,936	Shale, medium-gray		6,556-6,566	Shale, medium-gray
5,936-5,940	Limestone, medium light-gray to very pale-orange, fine-crystalline, slightly argillaceous; some medium dark-gray limestone		6,556-6,575	Shale, grayish-black
			6,575-6,589	Shale, medium-gray
5,940-5,946	Limestone, medium dark-brownish-gray, fine-crystalline		6,589-6,591	Limestone, medium dark-gray, dense to very fine-crystalline
5,946-5,960	Shale, medium-gray		6,591-6,595	Limestone, brownish-gray, dense to very fine-crystalline
5,960-5,970	Siltstone, medium light-gray, very finely sandy		6,595-6,609	Limestone, pale yellowish-brown to brownish-gray, fine-crystalline; slightly argillaceous in part
5,970-5,977	Shale, medium-gray; fusulinids			
5,977-5,984	Siltstone, medium light-gray, very finely sandy, slightly calcareous		6,609-6,610	Sandstone, medium dark- to dark-gray, fine-grained, calcareous; dark coating on grains
5,984-6,000	Shale, medium-gray		6,610-6,621	Sandstone, very light-gray, fine-grained, slightly dolomitic
6,000-6,004	Shale, grayish-black		6,621-6,630	Shale, medium-gray
6,004-6,007	Limestone, medium-gray, very finely sandy, very sandy		6,630-6,634	Limestone, medium dark-gray to brownish-gray, finely sandy
6,007-6,018	Shale, medium-gray		6,634-6,639	Sandstone, very light-gray, very fine-grained, slightly dolomitic
6,018-6,021	Siltstone, greenish-gray, very finely sandy			
6,021-6,025	Shale, medium-gray		6,639-6,649	Shale, medium-gray
6,025-6,033	Sandstone, medium light-gray, very fine-grained, silty		6,649-6,700	No samples
6,033-6,037	Shale, medium-gray			From electrical log:
6,037-6,043	Sandstone, medium light-gray, very fine-grained, silty		6,649-6,653	Sandstone
6,043-6,050	Shale, medium-gray		6,653-6,670	Shale
6,050-6,060	Shale, grayish-red		6,670-6,677	Sandstone
6,060-6,063	Shale, medium-gray		6,677-6,680	Shale
6,063-6,065	Limestone, brownish-gray, very fine-crystalline		6,680-6,693	Sandstone
6,065-6,069	Limestone, medium dark-brownish-gray to medium dark-gray, fine-crystalline, slightly argillaceous		6,693-6,700	Shale
6,069-6,080	Shale, medium-gray			
6,080-6,083	Siltstone, medium light-gray, very finely sandy		6,700-6,710	Shale, medium-gray
6,083-6,100	Shale, medium-gray		6,710-6,714	Sandstone, light-gray, very fine-grained, calcareous
6,100-6,106	Siltstone, medium light- to medium-gray; carbonaceous stringers		6,71-6,730	Shale, grayish-black
6,106-6,116	Shale, medium-gray		6,730-6,733	Shale, medium-gray
6,116-6,120	Shale, grayish-black		6,733-6,735	Limestone, dark-gray, very silty
6,120-6,127	Shale, medium-gray		6,735-6,750	Shale, medium-gray
6,127-6,130	Sandstone, light-gray, very fine-grained, silty		6,750-6,762	Shale, grayish-black
6,130-6,135	Sandstone, light-gray, very fine-grained, slightly dolomitic		6,762-6,764	Limestone, dark-gray, very fine-crystalline, argillaceous
6,135-6,147	Sandstone, very light- to light-gray, fine- to medium-grained, dolomitic, porous		6,764-6,770	Shale, medium-gray
6,147-6,156	Shale, medium-gray			
6,156-6,158	Siltstone, medium light-gray, calcareous		6,770-6,775	Limestone, medium dark-brownish-gray, fine-crystalline, slightly argillaceous
6,158-6,168	Shale, medium-gray		6,775-6,778	Limestone, medium-gray, dense; pale yellowish-brown medium-crystalline limestone
6,168-6,173	Siltstone, greenish-gray		6,778-6,780	Shale, medium-gray
6,173-6,180	Shale, medium-gray		6,780-6,790	Sandstone, very light-gray, very fine- to fine-grained, porous
6,180-6,184	Limestone, medium dark-gray, very silty; many fusulinids		6,790-6,800	Sandstone, very light-gray, fine-grained, slightly dolomitic, porous
6,184-6,190	Shale, dark greenish-gray, silty			
6,190-6,196	Shale, medium-gray		6,800-6,806	Shale, medium-gray
6,196-6,200	Shale, grayish-red		6,806-6,816	Shale, grayish-black
6,200-6,205	Shale, medium-gray		6,816-6,826	Shale, greenish-gray, silty
6,205-6,212	Sandstone, very light- to light-gray, fine-grained, dolomitic		6,826-6,834	Siltstone, olive-gray, very finely sandy
6,212-6,225	Shale, medium-gray		6,834-6,840	Sandstone, light-gray, fine-grained, porous; feldspar?
6,225-6,235	Shale, grayish-black		6,840-6,850	Sandstone, very light-gray, fine-grained, dolomitic
6,235-6,240	Shale, medium-gray		6,850-6,854	Shale, very dusky red
6,240-6,246	Siltstone, medium light-gray, very finely sandy		6,854-6,859	Siltstone, light-gray, very finely sandy
6,246-6,254	Shale, dark-gray		6,859-6,866	Shale, medium-gray
6,254-6,258	Sandstone, light-gray, very fine-grained		6,866-6,870	Siltstone, greenish-gray
6,258-6,269	Sandstone, light-gray to yellowish-brown, very fine-grained; carbonaceous fragments		6,870-6,875	Shale, medium-gray
6,269-6,270	Shale, medium-gray		6,875-6,877	Coal
6,270-6,279	Sandstone, light-gray to yellowish-brown, very fine-grained		6,877-6,880	Shale, medium-gray
6,279-6,290	Siltstone, medium-gray, very finely sandy		6,880-6,886	Siltstone, medium light-gray, very finely sandy, calcareous
6,290-6,313	Shale, medium-gray		6,886-6,890	Sandstone, very light- to light-gray, very fine-grained, silty, dolomitic
6,313-6,320	Limestone, medium dark-gray to brownish-gray, fine-crystalline			
6,320-6,330	Shale, medium-gray		6,890-6,900	Shale, medium-gray
6,330-6,336	Sandstone, light-gray, fine-grained, slightly dolomitic		6,900-6,910	Shale, grayish-black
6,336-6,340	Shale, grayish-black		6,910-6,920	Shale, greenish-gray
6,340-6,350	Shale, grayish-red		6,920-6,930	Shale, medium-gray; coal stringers 6,922-6,924 feet
6,350-6,354	Sandstone, light-gray, very fine-grained		6,930-6,940	Shale, greenish-gray
6,354-6,360	Shale, medium-gray		6,940-6,956	Shale, medium-gray
6,360-6,370	Shale; olive-gray		6,956-6,974	Shale, grayish-black
6,370-6,375	Shale, medium-gray		6,974-6,983	Shale, medium-gray
6,375-6,385	Shale, grayish-black		6,983-6,988	Limestone, medium dark-brownish-gray, very fine-crystalline
6,385-6,390	Shale, medium-gray			

6,988-6,992	Limestone, medium dark- to dark-gray, fine-crystalline, argillaceous; fusulinids	7,687-7,690	Siltstone, greenish-gray
6,992-7,011	Siltstone, greenish-gray to medium-gray, calcareous	7,690-7,694	Shale, medium-gray
7,011-7,016	Sandstone, olive-gray, very fine-grained, calcareous	7,694-7,700	Siltstone, greenish-gray
7,016-7,018	Limestone, yellowish-brown, very finely sandy	7,700-7,710	Shale, medium-gray
7,018-7,026	Sandstone, light-gray, very fine-grained, calcareous	7,710-7,716	Siltstone, greenish-gray to light-gray, very finely sandy
7,026-7,035	Shale, medium-gray	7,716-7,730	Sandstone, very light- to light-gray, very fine- to fine-grained
7,035-7,045	Shale, grayish-black	7,730-7,744	Sandstone, very light-gray, fine-grained, porous
7,045-7,055	Shale, medium-gray	7,744-7,750	Shale, medium-gray
7,055-7,070	Shale, grayish-black; gastropods 7,065-7,070 feet	7,750-7,758	Siltstone, light-gray, very finely sandy
7,070-7,080	Shale, medium-gray	7,758-7,761	Shale, medium-gray
7,080-7,085	Shale, grayish-black	7,761-7,770	Siltstone, medium-gray
7,085-7,094	Shale, medium-gray	7,770-7,773	Shale, grayish-black
7,094-7,100	Limestone, medium dark-brownish-gray, very fine-crystalline; fusulinids	7,773-7,786	Sandstone, medium light-gray, very fine-grained, very silty
7,100-7,106	Siltstone, medium light-gray, calcareous	7,786-7,790	Shale, grayish-black
7,106-7,110	Siltstone, light-gray, very finely sandy, calcareous	7,790-7,799	Shale, medium-gray
7,110-7,115	Sandstone, very light-gray, very fine-grained, porous	7,799-7,802	Siltstone, greenish-gray
7,115-7,130	Sandstone, very light-gray, fine-grained, porous	7,802-7,810	Sandstone, light-gray, very fine-grained, silty, slightly calcareous
7,130-7,142	Sandstone, very light-gray, fine-grained	7,810-7,822	Sandstone, very light-gray, very fine-grained, slightly calcareous
7,142-7,145	Shale, medium-gray	7,822-7,847	Shale, grayish-black
7,145-7,152	Shale, grayish-black	7,847-7,857	Limestone, medium dark- to dark-gray, finely sandy, very sandy
7,152-7,159	Limestone, medium dark-gray to grayish-black, very silty	7,857-7,897	Sandstone, light- to medium light-gray, very fine-grained, silty, hard, tight
7,159-7,167	Shale, medium-gray	7,897-7,906	Shale, medium-gray
7,167-7,170	Limestone, medium dark-gray to grayish-black, very silty	7,906-7,920	Shale, grayish-black
7,170-7,172	Shale, medium-gray	7,920-7,926	Sandstone, medium light-gray, fine-grained, calcareous, argillaceous
7,172-7,176	Limestone, medium dark-gray to grayish-black, very silty	7,926-7,934	Sandstone, very light-gray, very fine-grained, dolomitic
7,176-7,183	Shale, medium-gray	7,934-7,945	Sandstone, very light-gray, fine-grained
7,183-7,190	Shale, grayish-black	7,945-7,949	Shale, medium-gray
7,190-7,207	Shale, medium-gray	7,949-7,969	Sandstone, very light- to light-gray, very fine-grained
7,207-7,210	Siltstone, dark-gray, calcareous	7,969-7,975	Shale, medium-gray
7,210-7,218	Shale, medium-gray	7,975-7,980	Shale, grayish-black
7,218-7,220	Coal	7,980-8,000	Shale, medium-gray
7,220-7,230	Shale, dark olive-gray; nonbedded?	8,000-8,010	Shale, grayish-black
7,230-7,235	Shale, dark greenish-gray; nonbedded	8,010-8,017	Shale, medium-gray
7,235-7,240	Sandstone, light olive-gray, very fine-grained, silty	8,017-8,020	Limestone, medium dark-brownish-gray, fine- to medium-sandy, very sandy
7,240-7,245	Sandstone, light-gray, very fine- to fine-grained	8,020-8,030	Sandstone, very light-gray, very fine-grained
7,245-7,270	Sandstone, very light-gray, fine-grained, porous	8,030-8,053	Sandstone, light-gray, fine-grained; scattered carbonaceous material
7,270-7,276	Siltstone, medium light- to medium-gray, very finely sandy, slightly calcareous	8,053-8,072	Sandstone, medium light-gray, very fine-grained, silty, hard, tight
7,276-7,290	Shale, medium-gray	8,072-8,077	Sandstone, very light-gray, very fine- to fine-grained dolomitic
7,290-7,295	Limestone, medium dark-gray, very finely sandy	8,077-8,082	Sandstone, very light-gray, fine-grained
7,295-7,300	Siltstone, medium-gray, calcareous	8,082-8,089	Sandstone, medium light-gray, very fine- to fine-grained
7,300-7,319	Shale, medium-gray	8,089-8,098	Siltstone, medium-gray, very finely sandy
7,319-7,323	Limestone, medium dark- to dark-gray, fine-granular, very silty; fusulinids	8,098-8,110	Shale, medium-gray
7,323-7,330	Shale, grayish-black	8,110-8,120	Sandstone, medium light-gray to yellowish-brown, fine- to medium-grained, tight; slightly calcareous in part
7,330-7,332	Limestone, medium dark-gray, very finely sandy, silty	8,120-8,140	Sandstone, light-gray, fine-grained, slightly dolomitic, tight
7,332-7,338	Sandstone, light- to medium light-gray, very fine-grained, slightly dolomitic	8,140-8,149	Sandstone, medium light-gray, very fine-grained, silty
7,338-7,347	Shale, medium-gray	8,149-8,154	Shale, medium-gray
7,347-7,349	Limestone, dark-gray, very silty	8,154-8,170	Siltstone, medium light- to medium-gray, very finely sandy
7,349-7,359	Shale, medium-gray	8,170-8,180	Sandstone, light-gray, very fine-grained, silty, dolomitic
7,359-7,366	Siltstone, medium dark-gray, calcareous	8,180-8,188	Siltstone, medium light-gray, very finely sandy
7,366-7,376	Sandstone, very light- to light-gray, fine-grained, dolomitic, porous	8,188-8,210	Siltstone, medium light- to medium-gray
7,376-7,379	Sandstone, very light- to light-gray, fine-grained, dolomitic, angular, porous	8,210-8,225	Siltstone, medium-gray
7,379-7,381	Shale, medium-gray	8,225-8,250	Shale, medium- to dark-gray, silty
7,381-7,389	Sandstone, light-gray, very fine-grained, silty; carbonaceous material	8,250-8,270	Shale, grayish-black
7,389-7,390	Shale, medium-gray	8,270-8,279	Shale, medium-gray
7,390-7,400	Sandstone, light-gray, very fine- to fine-grained; scattered carbonaceous material	8,279-8,286	Limestone, medium dark-gray, fine- to medium-sandy, argillaceous; pyrite; crinoids; sand is subangular to round and dark-gray coated
7,400-7,415	Sandstone, light-gray, fine-grained, porous	8,286-8,294	Siltstone, medium light-gray, hard; little mica
7,415-7,435	Sandstone, light-gray, very fine- to fine-grained	8,294-8,310	Sandstone, very light- to light-gray, very fine-grained, silty; carbonaceous material
7,435-7,440	Shale, medium-gray	8,310-8,330	Siltstone, medium-gray
7,440-7,460	Shale, grayish-black	8,330-8,340	Shale, grayish-black
7,460-7,470	Shale, medium-gray	8,340-8,370	Shale, dark-gray
7,470-7,471	Limestone, medium-gray, argillaceous	8,370-8,378	Siltstone, medium- to medium dark-gray, slightly calcareous, hard
7,471-7,490	Siltstone, medium- to medium dark-gray	8,378-8,400	Shale, medium-gray
7,490-7,506	Shale, grayish-black	8,400-8,410	Limestone, pale yellowish-brown, fine- to medium-sandy; crinoids
7,506-7,514	Shale, medium-gray	8,410-8,414	Limestone as above; light- to medium-gray and greenish-gray dense chert
7,514-7,516	Siltstone, medium dark-gray, calcareous, hard	8,414-8,418	Sandstone, very light-gray, fine-grained; calcareous in part
7,516-7,524	Shale, medium-gray	8,418-8,426	Limestone, pale yellowish-brown, fine- to medium-sandy; scattered coarse to very coarse chert grains; medium light- to dark-gray dense chert
7,524-7,528	Siltstone, medium dark-gray, calcareous, hard	8,426-8,436	Sandstone, white to very light-gray, fine-grained
7,528-7,530	Shale, medium-gray	8,436-8,455	Sandstone, white to very light-gray, fine- to medium-grained
7,530-7,534	Shale, grayish-black	8,455-8,465	Sandstone, light-gray, fine- to medium-grained; brown spots; feldspar?
7,534-7,540	Shale, medium-gray; calcareous lower half	8,465-8,480	Sandstone, very light-gray, fine-grained
7,540-7,546	Siltstone, medium dark-gray, calcareous, hard	8,480-8,490	Sandstone, light- to medium-gray, very fine-grained
7,546-7,553	Shale, grayish-black	8,490-8,500	Sandstone, light- to medium-gray, very fine-grained, silty
7,553-7,559	Sandstone, light-gray, very fine-grained, silty; carbonaceous material		
7,559-7,580	Shale, grayish-black		
7,580-7,600	Shale, medium-gray		
7,600-7,610	Shale, grayish-black		
7,610-7,634	Shale, medium-gray		
7,634-7,640	Limestone, medium dark- to dark-gray, very fine-crystalline, slightly argillaceous; crinoids		
7,640-7,646	Shale, greenish-gray		
7,646-7,650	Shale, medium-gray		
7,650-7,660	Siltstone, light- to medium light-gray		
7,660-7,666	Siltstone, greenish-gray		
7,666-7,674	Shale, grayish-red		
7,674-7,680	Siltstone, greenish-gray		
7,680-7,687	Shale, grayish-red		

Douglas Group Equivalent			
8,500-8,518	Siltstone, medium- to medium dark-gray, very finely sandy	9,480- 9,483	Limestone, dark-gray, very fine-crystalline, argillaceous
8,518-8,540	Siltstone, medium dark- to dark-gray	9,483- 9,504	Siltstone, medium dark-gray; pyrite
8,540-8,580	Shale, medium- to dark-gray	9,504- 9,506	Sandstone, light- to medium-gray, very fine- to fine-grained
8,580-8,590	Shale, grayish-black	9,506- 9,520	Siltstone, medium dark-gray, very finely sandy, hard, tight
8,590-8,610	Shale, medium- to dark-gray	9,520- 9,540	Shale, medium dark- to dark-gray, silty
8,610-8,620	Shale, grayish-black	9,540- 9,550	Siltstone, medium dark-gray, very finely sandy, hard, tight
8,620-8,640	Shale, medium- to dark-gray	9,550- 9,560	Sandstone, medium- to medium dark-gray, very fine-grained, silty, hard, tight
8,640-8,660	Shale, grayish-black	9,560- 9,566	Sandstone, medium light-gray, very fine-grained, silty, hard, tight
8,660-8,680	Shale, medium- to dark-gray	9,566- 9,570	Limestone, dark-gray, very finely sandy; crinoids
Missouri Series		9,570- 9,580	Shale, grayish-black
Ochelata Group		9,580- 9,610	Shale, dark-gray
Lansing Group Equivalent		9,610- 9,617	Siltstone, medium dark- to dark-gray, slightly calcareous
8,680-8,695	Sandstone, very light- to light-gray, fine- to medium-grained, glauconitic, slightly dolomitic	9,617- 9,620	Limestone, dark-gray, fine-crystalline, argillaceous; pyrite
8,695-8,710	Sandstone, white, fine-grained; trace of glauconite	9,620- 9,626	Shale, medium dark-gray
8,710-8,725	Sandstone, white to very light-gray, fine-grained	9,626- 9,634	Shale, grayish-black
8,725-8,740	Sandstone, light-gray, fine-grained	9,634- 9,644	Sandstone, medium dark- to dark-gray, very fine-grained, silty, hard, tight
8,740-8,790	Sandstone, light-gray, very fine-grained	9,644- 9,650	Shale, medium dark-gray
8,790-8,810	Sandstone, very light- to light-gray, very fine- to fine-grained	9,650- 9,660	Shale, grayish-black
8,810-8,820	Sandstone, very light-gray, very fine-grained, dolomitic; light-green glauconite	9,660- 9,670	Shale, medium dark-gray
8,820-8,860	Sandstone, very light-gray, very fine- to fine-grained	9,670- 9,695	Shale, medium dark-gray, very silty
8,860-8,890	Sandstone, light-gray, very fine-grained	9,695- 9,730	Shale, medium dark-gray
8,890-8,900	Sandstone, light- to medium light-gray, very fine-grained;	9,730- 9,790	Shale, medium dark- to dark-gray, silty
	dark-gray shaly stringers	9,790- 9,808	Shale, medium dark-gray, very silty
8,900-8,985	Sandstone, light-gray, very fine-grained, tight	9,808- 9,815	Shale, grayish-black
		9,815- 9,820	Shale, medium dark- to dark-gray, very silty
		9,820- 9,844	Siltstone, medium dark-gray
		9,844- 9,850	Siltstone, medium dark-gray, very finely sandy
Kansas City Group Equivalent			
8,985-9,005	Siltstone, medium light-gray, very finely sandy, tight		Hogshooter? Limestone 9,850-9,900 feet
9,005-9,068	Siltstone, medium- to medium dark-gray, very finely sandy	9,850- 9,854	Limestone, medium dark-gray, very silty, very finely sandy
9,068-9,072	Limestone, grayish-black, very fine-crystalline, very argillaceous	9,854- 9,861	Limestone, medium dark-gray, dense to very fine-crystalline, slightly argillaceous
9,072-9,080	Shale, medium dark-gray	9,861- 9,865	Shale, medium dark-gray
9,080-9,086	Shale, grayish-black	9,865- 9,870	Shale, grayish-black
9,086-9,098	Shale, dark-gray, silty	9,870- 9,876	Shale, medium dark-gray
9,098-9,109	Shale, grayish-black	9,876- 9,882	Sandstone, medium-gray, very fine-grained, calcareous, slightly yellowish-brown
9,109-9,114	Limestone, dark-gray, very fine-crystalline, argillaceous	9,882- 9,894	Shale, medium dark-gray
9,114-9,128	Shale, medium dark-gray	9,894- 9,900	Limestone, medium-gray, dense to very fine-crystalline, slightly argillaceous
9,128-9,130	Siltstone, medium- to medium dark-gray, calcareous, hard		
9,130-9,136	Siltstone, medium- to medium dark-gray, slightly calcareous, micaceous	9,900- 9,905	Limestone, medium dark-brownish-gray, very fine-crystalline, fine- to medium-oölitic, glauconitic, finely sandy
9,136-9,143	Shale, medium dark-gray	9,905- 9,910	Sandstone, light olive-gray, very fine-grained, glauconitic, slightly calcareous
9,143-9,147	Siltstone, medium dark-gray, calcareous, hard	9,910- 9,915	Sandstone, medium-gray, fine-grained, calcareous, slightly brownish; glauconite?
9,147-9,153	Shale, medium dark-gray	9,915- 9,925	Sandstone, medium-gray, very fine-grained, silty, slightly brownish
9,153-9,176	Siltstone, medium- to medium dark-gray, hard; micaceous in part	9,925- 9,930	Sandstone, medium light-gray, very fine- to fine-grained
9,176-9,200	Shale, medium dark-gray	9,930- 9,935	Sandstone, medium light-gray, fine-grained, calcareous
9,200-9,242	Shale, medium- to dark-gray, silty	9,935- 9,940	Sandstone, medium dark-gray, very fine-grained, silty, slightly calcareous
9,242-9,256	Sandstone, light-gray, fine-grained; calcareous in part; trace of glauconite at center	9,940- 9,945	Shale, grayish-black
9,256-9,260	Sandstone, very light- to light-gray, fine-grained, glauconitic, dolomitic	9,945- 9,950	Shale, greenish-gray
9,260-9,270	Sandstone, very light- to light-gray, fine-grained, glauconitic	9,950- 9,963	Shale, medium dark-gray
9,270-9,274	Sandstone, light-gray, very fine- to fine-grained, calcareous, glauconitic	9,963- 9,966	Siltstone, medium-gray, very finely sandy
9,274-9,280	Sandstone, light-gray, very fine- to fine-grained, dolomitic, glauconitic	9,966- 9,975	Sandstone, light- to medium-gray, very fine-grained, silty, calcareous
9,280-9,290	Sandstone, very light-gray, fine-grained	9,975- 9,990	Siltstone, dark-gray
9,290-9,325	No samples From electrical log: 9,290-9,297 Shale 9,297-9,312 Sandstone 9,312-9,325 Shale	9,990- 9,995	Shale, grayish-black
9,325-9,340	Sandstone, very light- to light-gray, fine- to medium-grained, dolomitic, glauconitic	9,995- 10,010	Shale, medium dark-gray
9,340-9,351	Sandstone, medium light-gray, fine- to medium-grained, calcareous, glauconitic	10,010-10,020	Shale, greenish-gray
9,351-9,358	Shale, grayish-black	10,020-10,035	Shale, grayish-black
9,358-9,365	Siltstone, medium dark-gray, very finely sandy, slightly calcareous	10,035-10,045	Shale, medium dark-gray; trace of coal at center
9,365-9,375	Siltstone, medium-gray, very finely sandy, slightly calcareous	10,045-10,050	Shale, greenish-gray
9,375-9,395	Siltstone, medium- to medium dark-gray	10,050-10,060	Shale, grayish-black
9,395-9,410	Shale, medium dark-gray, silty	10,060-10,064	Siltstone, medium light- to medium-gray, slightly calcareous, very finely sandy
9,410-9,420	Shale, grayish-black	10,064-10,070	Limestone, medium dark-brownish-gray, fine-crystalline, medium-oölitic; little fine sand
9,420-9,436	Shale, medium dark-gray, silty	10,070-10,075	Limestone as above; some grayish-black limestone
9,436-9,446	Shale, grayish-black	10,075-10,080	Limestone, medium dark-gray, fine-crystalline, fine- to medium-oölitic, slightly brownish; little very fine sand
		10,080-10,087	Limestone, medium dark-gray, fine-granular, silty
		10,087-10,107	Limestone, pale yellowish-brown, fine- to medium-oölitic, fine- to medium-sandy, glauconitic
		10,107-10,117	Siltstone, medium- to medium dark-gray, very finely sandy
		10,117-10,126	Sandstone, medium dark-gray, very fine-grained, silty
		10,126-10,130	Shale, medium dark-gray
		10,130-10,135	Shale, grayish-black
		10,135-10,145	Shale, medium dark-gray
		10,145-10,153	Limestone, brownish-gray to medium dark-brownish-gray, dense to very fine-crystalline
		10,153-10,160	Limestone, brownish-gray, very silty
Skiatook Group			
9,446-9,450	Limestone, grayish-black, very fine-crystalline, argillaceous		
9,450-9,456	Shale, grayish-black		
9,456-9,460	Shale, medium dark-gray; little light-gray fine-grained sandstone; probably caving		
9,460-9,462	Limestone, grayish-black, very fine-crystalline, argillaceous		
9,462-9,473	Shale, grayish-black		
9,473-9,480	Siltstone, medium dark- to dark-gray, slightly calcareous, micaceous		

10,160-10,167	Limestone, dark-gray, very fine-crystalline, argillaceous; some medium oolites	10,883-10,890	Sandstone, medium light-gray, very fine-grained, silty
10,167-10,173	Shale, medium dark-gray	10,890-10,895	Siltstone, medium- to medium dark-gray, very finely sandy
10,173-10,176	Limestone, medium-gray, very fine-crystalline, argillaceous, slightly brownish	10,895-10,910	Shale, medium dark-gray
10,176-10,186	Limestone, medium- to dark-gray, fine- to medium-sandy, very sandy, many crinoids	10,910-10,920	Shale, grayish-black
10,186-10,193	Sandstone, medium light- to medium-gray, very fine-grained, silty, slightly calcareous, tight, hard	10,920-10,940	Shale, medium dark-gray
10,193-10,200	Shale, medium dark-gray	10,940-10,950	Siltstone, medium- to medium dark-gray, very finely sandy
10,200-10,210	Shale, grayish-black	10,950-10,970	Siltstone, medium-gray
10,210-10,224	Siltstone, medium dark-gray	10,970-10,985	Siltstone, dark-gray
10,224-10,236	Shale, medium dark-gray	10,985-10,996	Siltstone, medium-gray
10,236-10,247	Shale, grayish-black	10,996-11,000	Shale, grayish-black
10,247-10,253	Limestone, brownish-gray, very fine-crystalline, dolomitic; fine-crystalline dolomitic silty limestone	11,000-11,010	Shale, medium dark-gray
10,253-10,256	Limestone, medium dark- to dark-gray, fine- to medium-oolitic, finely sandy	11,010-11,020	Shale, grayish-black
Pleasanton Group Equivalent (Pleasanton Formation Equivalent on Chart OC-61)		11,020-11,031	Shale, medium dark-gray
10,256-10,263	Sandstone, light- to medium light-gray, very fine-grained, silty	11,031-11,037	Siltstone, medium-gray, very finely sandy, hard, tight
10,263-10,280	Siltstone, medium light- to medium-gray	11,037-11,062	Shale, dark-gray, silty
10,280-10,295	Shale, grayish-black	11,062-11,075	Shale, grayish-black
10,295-10,300	Shale, medium dark-gray	11,075-11,081	Shale, medium dark-gray
10,300-10,310	Shale, grayish-black	11,081-11,090	Siltstone, dark-gray, very finely sandy, slightly calcareous
10,310-10,335	Shale, medium dark-gray	11,090-11,096	Siltstone, medium light-gray, very finely sandy
10,335-10,345	Shale, grayish-black	11,096-11,103	Limestone, dark-gray, very argillaceous
10,345-10,356	Shale, medium dark-gray	11,103-11,110	Shale, medium dark-gray
Des Moines Series Deese Formation		11,110-11,120	Shale, grayish-black
10,356-10,362	Limestone, medium dark-gray, argillaceous; fusulinids; many crinoids	11,120-11,130	Limestone, grayish-black, very fine-crystalline, argillaceous
10,362-10,372	Sandstone, medium light- to medium-gray, very fine-grained, slightly calcareous	11,130-11,137	Siltstone, dark-gray, calcareous, micaceous
10,372-10,380	Sandstone, medium-gray, very fine-grained, silty	11,137-11,140	Limestone, dark-gray, very fine-crystalline, argillaceous
10,380-10,386	Sandstone as above; sample shows medium dark-gray argillaceous limestone, fusulinids, crinoids; sample out of place?	11,140-11,150	Shale, medium dark-gray
10,386-10,398	Siltstone, medium-gray, very finely sandy	11,150-11,155	Siltstone, dark-gray
10,398-10,410	Siltstone, medium-gray	11,155-11,174	Siltstone, medium dark- to dark-gray, very finely sandy, micaceous; carbonaceous material
10,410-10,415	Shale, grayish-black	11,174-11,190	Siltstone, medium dark-gray
10,415-10,440	Shale, medium dark-gray, silty	11,190-11,200	Siltstone, medium dark- to dark-gray, micaceous; carbonaceous material
10,440-10,450	Shale, grayish-black	11,200-11,205	Shale, grayish-black
10,450-10,475	Shale, dark-gray, silty	11,205-11,220	Siltstone, dark-gray, slightly micaceous
10,475-10,485	Shale, grayish-black	11,220-11,235	Shale, dark-gray, silty
10,485-10,510	Shale, dark-gray, silty	11,235-11,250	Shale, grayish-black
10,510-10,520	Shale, grayish-black	11,250-11,262	Shale, dark-gray; black ironstones?
10,520-10,545	Shale, dark-gray	11,262-11,270	Shale, dark-gray, calcareous, hard; resembles limestone
10,545-10,560	Shale, grayish-black	11,270-11,280	Shale, grayish-black
10,560-10,570	Shale, medium dark-gray	11,280-11,320	Siltstone, medium dark- to dark-gray, slightly micaceous; trace of coal 11,310-11,315 feet
10,570-10,590	Shale, grayish-black	11,320-11,330	Limestone, medium dark- to dark-gray, fine-crystalline, silty, argillaceous
10,590-10,600	Siltstone, medium-gray	11,330-11,335	Siltstone, dark-gray, slightly calcareous, micaceous
10,600-10,607	Sandstone, light- to medium light-gray, very fine-grained, silty, slightly calcareous	11,335-11,340	Limestone, dark-gray, very silty
10,607-10,610	Siltstone, greenish-gray, very finely sandy, tight, hard	11,340-11,365	Limestone, grayish-black, very silty
10,610-10,633	Shale, medium dark-gray; trace of coal at center	11,365-11,382	Shale, grayish-black, calcareous, silty, micaceous
10,633-10,638	Siltstone, medium-gray	11,382-11,395	Limestone, grayish-black, very silty
10,638-10,646	Sandstone, medium dark-gray to brownish-gray, fine-grained, calcareous; some medium grains	11,395-11,400	Shale, grayish-black, calcareous, silty
10,646-10,656	Siltstone, medium light-gray to yellowish-brown, very finely sandy	11,400-11,410	Shale, medium dark-gray
10,656-10,660	Sandstone, medium-gray, very fine- to fine-grained, calcareous	11,410-11,425	Shale, grayish-black
10,660-10,670	Shale, medium dark-gray	11,425-11,427	Coal
10,670-10,680	Sandstone, medium light-gray, very fine-grained, silty, slightly calcareous	11,427-11,434	Siltstone, medium dark-gray, very finely micaceous
10,680-10,684	Shale, medium-gray	11,434-11,444	Siltstone, medium- to medium dark-gray, very finely sandy
10,684-10,690	Siltstone, medium-gray, very finely sandy, hard, tight	11,444-11,460	Siltstone, medium dark-gray
10,690-10,698	Sandstone, light-gray, very fine-grained	11,460-11,466	Shale, grayish-black
10,698-10,700	Shale, medium-gray	11,466-11,470	Siltstone, medium light- to medium-gray, very finely sandy
10,700-10,708	Siltstone, medium-gray	11,470-11,475	Siltstone, medium dark-gray, very finely sandy, micaceous
10,708-10,715	Sandstone, very light-gray, very fine-grained	11,475-11,480	Siltstone, dark-gray
10,715-10,720	Sandstone, light-gray, very fine-grained	11,480-11,488	Sandstone, medium light-gray, very fine-grained, silty, tight
10,720-10,730	Siltstone, medium light-gray, very finely sandy, tight, hard	11,488-11,494	Siltstone, dark-gray, slightly calcareous
10,730-10,735	Shale, medium dark-gray	11,494-11,500	Sandstone, medium light-gray, very fine-grained, silty
10,735-10,740	Shale, grayish-black	11,500-11,510	Siltstone, medium dark-gray, very finely sandy
10,740-10,745	Shale, medium dark-gray	11,510-11,530	Siltstone, medium dark-gray
10,745-10,750	Siltstone, medium-gray	11,530-11,535	Shale, grayish-black
10,750-10,770	Siltstone, medium-gray, very finely sandy	11,535-11,540	Shale, medium dark-gray
10,770-10,775	Shale, medium-gray	11,540-11,550	Shale, grayish-black
10,775-10,789	Siltstone, medium dark-gray	11,550-11,585	Shale, medium dark-gray; trace of coal 11,565-11,570 feet
10,789-10,791	Siltstone, medium-gray, very finely sandy	11,585-11,600	Shale, grayish-black
10,791-10,798	Siltstone, medium-gray	11,600-11,604	Limestone, medium dark- to dark-gray, very fine-crystalline, argillaceous
10,798-10,801	Siltstone, medium-gray, very finely sandy	11,604-11,606	Shale, medium-gray
10,801-10,814	Shale, dark-gray, silty	11,606-11,610	Limestone, medium dark- to dark-gray, very fine-crystalline, argillaceous, slightly brownish
10,814-10,816	Siltstone, dark-gray	11,610-11,614	Shale, medium-gray
10,816-10,825	Shale, medium dark-gray	11,614-11,622	Limestone, dark-gray to grayish-black, fine-crystalline, argillaceous; crinoids
10,825-10,840	Shale, grayish-black	11,622-11,630	Shale, grayish-black
10,840-10,883	Shale, medium dark-gray	11,630-11,635	Shale, medium dark-gray
		11,635-11,646	Siltstone, medium light-gray, slightly calcareous
		11,646-11,650	Siltstone, greenish-gray to medium-gray
		11,650-11,660	Shale, medium dark-gray, silty
		11,660-11,680	Shale, medium dark-gray
		11,680-11,710	No samples From electrical log: Shale
		11,710-11,718	Shale, medium dark-gray
		11,718-11,722	Limestone, dark-gray, very argillaceous
		11,722-11,724	Shale, medium dark-gray

11,724-11,727	Limestone, medium-gray, argillaceous	12,240-12,242	Limestone, grayish-black, fine-crystalline, very argillaceous
11,727-11,730	Shale, medium dark-gray	12,242-12,245	Limestone, dark-gray, very fine-crystalline
11,730-11,733	Siltstone, medium light-gray, very finely sandy	12,245-12,260	Shale, grayish-black
11,733-11,745	Shale, medium dark-gray	12,260-12,270	Shale, medium-gray; gastropod in lower half
11,745-11,755	Siltstone, medium- to medium dark-gray, very finely sandy	12,270-12,280	Shale, grayish-black
11,755-11,760	Sandstone, medium light-gray, very fine-grained, silty, calcareous	12,280-12,287	Shale, medium dark-gray
11,760-11,768	Siltstone, medium light- to medium-gray, very finely sandy	12,287-12,290	Limestone, dark-gray, very argillaceous
11,768-11,772	Shale, medium dark-gray	12,290-12,318	Shale, medium dark-gray; brachiopods 12,300-12,305 feet
11,772-11,774	Limestone, medium dark- to dark-gray, fine-crystalline, very argillaceous	12,318-12,320	Limestone, light olive-gray, silty; crinoids; spines
11,774-11,785	Shale, medium dark-gray	12,320-12,338	Shale, medium dark-gray
11,785-11,789	Siltstone, medium light-gray	12,338-12,340	Sandstone, medium-gray to brownish-gray, fine-grained, slightly calcareous; caving?
11,789-11,792	Shale, medium dark-gray	12,340-12,360	Shale, medium dark-gray
11,792-11,796	Siltstone, medium light-gray	12,360-12,365	Limestone, dark-gray, fine-crystalline, argillaceous; fusulinids; spines
11,796-11,800	Siltstone, medium-gray	12,365-12,370	Shale, medium dark-gray
11,800-11,810	Sandstone, medium light-gray, very fine-grained, silty; little carbonaceous material and mica	12,370-12,375	Sandstone, white to light-gray, fine-grained, clean; slight oil stain?
11,810-11,820	Sandstone, light-gray, very fine- to fine-grained; some light-gray fine- to medium-grained sandstone	12,375-12,380	Sandstone, light-gray, very fine-grained, slightly calcareous
11,820-11,823	Sandstone, brownish-gray to medium dark-gray, very fine-grained, silty, slightly calcareous	12,380-12,383	Shale, medium dark-gray
11,823-11,830	Sandstone, medium light-gray, very fine-grained; little carbonaceous material	12,383-12,388	Sandstone, very light-gray, very fine-grained, silty
11,830-11,840	Sandstone, medium light-gray, very fine- to fine-grained	12,388-12,394	Sandstone, light olive-gray, very fine-grained, silty
11,840-11,847	Sandstone as above; much carbonaceous material	12,394-12,400	Shale, medium dark-gray
11,847-11,860	Sandstone, medium-gray, very fine-grained, silty, micaceous; carbonaceous material	12,400-12,405	Siltstone, olive-gray to greenish-gray, hard, tight
11,860-11,870	Siltstone, medium- to medium dark-gray, very finely sandy, carbonaceous material	12,405-12,410	Shale, grayish-black
11,870-11,882	Siltstone, medium dark-gray, very finely sandy	12,410-12,416	Shale, medium dark-gray
	Atoka Series	12,416-12,422	Sandstone, light- to medium-gray, fine-grained, very argillaceous; scattered medium grains
	Upper part of Dornick Hills Formation 11,882-12,649 feet	12,422-12,428	Shale, medium dark-gray
11,882-11,898	Siltstone, medium dark-gray	12,428-12,432	Sandstone, light- to medium light-gray, very fine-grained; black shale streaks
11,898-11,900	Shale, grayish-black	12,432-12,441	Sandstone, very light- to light-gray, fine-grained, slightly calcareous
11,900-11,905	Shale, medium dark-gray	12,441-12,447	Shale, medium dark-gray
11,905-11,910	Shale, grayish-black	12,447-12,450	Siltstone, greenish-gray
11,910-11,925	Shale, medium dark-gray	12,450-12,460	Shale, medium dark-gray
11,925-11,935	Shale, grayish-black	12,460-12,480	Shale, grayish-black
11,935-11,945	Shale, medium dark-gray	12,480-12,495	Shale, medium dark-gray
11,945-11,955	Shale, grayish-black; trace of coal 11,950-11,955 feet	12,495-12,500	Limestone, grayish-black, finely sandy; crinoids; pyrite
11,955-12,000	Shale, medium dark-gray	12,500-12,504	Siltstone, medium dark-gray, very finely sandy, calcareous; crinoids
12,000-12,017	Shale, grayish-black	12,504-12,512	Siltstone, medium- to medium dark-gray, calcareous
12,017-12,020	Limestone, dark-gray to grayish-black, very fine-crystalline, argillaceous	12,512-12,518	Siltstone, medium- to dark-gray, very finely sandy, calcareous
12,020-12,022	Limestone, medium dark-gray, very fine-crystalline, slightly brownish	12,518-12,520	Shale, medium dark-gray
12,022-12,030	Shale, medium dark-gray	12,520-12,522	Siltstone, greenish-gray
12,030-12,045	Shale, grayish-black	12,522-12,528	Shale, medium dark-gray
12,045-12,056	Shale, medium dark-gray	12,528-12,533	Siltstone, medium light-gray, light olive-gray, and greenish-gray, calcareous, very finely sandy
12,056-12,058	Shale, grayish-red; out of place?	12,533-12,546	Shale, medium dark-gray
12,058-12,070	Shale, medium-gray, silty; fusulinids at top; caving?	12,546-12,550	Sandstone, light- to medium light-gray, very fine-grained, calcareous, silty
12,070-12,075	Shale, grayish-black	12,550-12,553	Sandstone, light-gray to yellowish-brown, fine- to medium-grained, slightly calcareous
12,075-12,080	Shale, medium dark-gray	12,553-12,556	Siltstone, medium-gray, very finely sandy, slightly calcareous
12,080-12,083	Limestone, medium light-gray, fine-crystalline	12,556-12,570	Shale, medium dark-gray
12,083-12,090	Limestone, dark-gray to grayish-black, very fine-granular, very argillaceous	12,570-12,572	Limestone, dark-gray, silty
12,090-12,094	Limestone, medium dark-gray, fine-crystalline, argillaceous	12,572-12,603	Shale, medium dark-gray
12,094-12,100	Limestone, medium-gray, very fine- to fine-crystalline; fine- to medium-oolitic in part	12,603-12,606	Sandstone, light- to medium light-gray, fine-grained
12,100-12,106	Siltstone, dark greenish-gray, calcareous	12,606-12,610	Sandstone, light- to medium light-gray, very fine-grained; few coarse grains
12,106-12,110	Limestone, medium dark-gray, fine-crystalline, silty	12,610-12,620	Sandstone, very light- to light-gray, fine-grained
12,110-12,114	Shale, medium dark-gray	12,620-12,630	Sandstone, very light-gray, fine- to coarse-grained, subangular; some very coarse grains
12,114-12,120	Shale, black, calcareous	12,630-12,640	Sandstone, very light- to light-gray, fine-grained
12,120-12,127	Limestone, grayish-black, fine-crystalline, argillaceous	12,640-12,649	Sandstone as above; few medium grains
12,127-12,140	Shale, grayish-black		Morrow Series
12,140-12,143	Limestone, dark-gray to grayish-black, dense to very fine-crystalline, slightly argillaceous		Springer Formation 12,649-12,907 feet
12,143-12,148	Shale, medium-gray	12,649-12,660	Shale, medium dark-gray
12,148-12,150	Limestone, medium dark-gray, fine-crystalline, very silty	12,660-12,670	Shale, grayish-black
12,150-12,160	Limestone, medium dark-gray, very fine-crystalline	12,670-12,710	Shale, medium dark-gray
12,160-12,165	Limestone, grayish-black, fine-crystalline, slightly argillaceous	12,710-12,715	Shale, grayish-black
12,165-12,170	Shale, grayish-black	12,715-12,720	Shale, medium dark-gray; brownish-black ironstone
12,170-12,179	Shale, medium dark-gray	12,720-12,730	Shale, medium dark-gray
12,179-12,181	Limestone, black, fine-crystalline, silty	12,730-12,732	Siltstone, medium dark-gray, calcareous
12,181-12,187	Shale, grayish-black	12,732-12,743	Shale, medium dark-gray
12,187-12,190	Limestone, grayish-black, fine-crystalline, argillaceous; spines	12,743-12,746	Siltstone, medium dark-gray, calcareous
12,190-12,195	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous	12,746-12,865	Shale, medium dark-gray; one coal fragment (probably caved) 12,785-12,790 feet
12,195-12,200	Limestone, medium dark-gray, very fine-crystalline, slightly brownish	12,865-12,870	Shale, grayish-black
12,200-12,206	Limestone, dark-gray, very fine-crystalline, slightly argillaceous; fusulinids	12,870-12,907	Shale, medium dark-gray
12,206-12,225	Shale, medium dark-gray; fusulinid? at top; probably caving		Mississippian System
12,225-12,235	Shale, grayish-black; pelecypods	12,907-12,925	Upper and Lower Mississippian Series
12,235-12,240	Shale, medium dark-gray	12,925-12,938	Limestone, dark-gray, fine-crystalline, argillaceous
		12,938-12,940	Shale, dark-gray, calcareous, silty
		12,940-12,950	Limestone, dark-gray, fine-crystalline, argillaceous
		12,950-12,960	Shale, medium dark-gray
			Shale, grayish-black

12,960-12,970	Shale, medium dark-gray	13,996-14,000	Shale, grayish-black
12,970-12,980	Limestone, dark-gray to grayish-black, fine-crystalline, argillaceous	14,000-14,010	Limestone, dark-gray, very silty
12,980-13,006	Shale, medium dark-gray	14,010-14,026	Shale, black, calcareous
13,006-13,024	Limestone, grayish-black, fine-crystalline, argillaceous	14,026-14,036	Shale, medium dark-gray
13,024-13,034	Shale, dark-gray, calcareous	14,036-14,044	Siltstone, grayish-black, calcareous to slightly calcareous, slightly micaceous
13,034-13,040	Limestone, dark-gray, very argillaceous	14,044-14,080	Limestone, medium dark- to dark-gray, granular, very silty; little white calcite
13,040-13,085	Shale, medium dark-gray	14,080-12,090	Shale, dark-gray, silty
13,085-13,090	Shale, grayish-black	14,090-14,095	Limestone, grayish-black, fine-crystalline, argillaceous
13,090-13,112	Shale, medium dark-gray	14,095-14,108	Limestone, grayish-black, granular, very silty
13,112-13,114	Limestone, dark-gray, very argillaceous	14,108-14,118	Shale, medium dark-gray
13,114-13,122	Shale, medium dark-gray	14,118-14,128	Limestone, dark-gray to grayish-black, very silty
12,122-13,135	Limestone, dark-gray, very argillaceous	14,128-14,147	Siltstone, grayish-black, calcareous
13,135-13,150	Limestone, dark-gray, fine-crystalline, very argillaceous	14,147-14,154	Shale, grayish-black, calcareous
13,150-13,167	Limestone, dark-gray, very argillaceous	14,154-14,160	Limestone, grayish-black, very silty
13,167-13,185	Shale, medium dark-gray	14,160-14,170	Siltstone, grayish-black, calcareous
13,185-13,194	Limestone, dark-gray, fine-crystalline, very argillaceous	14,170-14,198	Limestone, medium dark- to dark-gray, very silty
13,194-13,204	Shale, medium dark-gray	14,198-14,215	Siltstone, grayish-black, calcareous
13,204-13,212	Limestone, dark-gray, fine-crystalline, very argillaceous	14,215-14,228	Limestone, dark-gray, very silty
13,212-13,220	Shale, medium dark-gray	14,220-14,247	Siltstone, grayish-black, calcareous
13,220-13,240	Limestone, dark-gray to grayish-black, fine-crystalline to granular, argillaceous; little pyrite	14,247-14,263	Limestone, grayish-black, very silty
13,240-13,260	Limestone, grayish-black, fine-crystalline slightly argillaceous; pyrite	14,263-14,275	Shale, grayish-black, calcareous, silty
13,260-13,275	Limestone, dark-gray, fine-crystalline, argillaceous	14,275-14,290	Siltstone, dark-gray to grayish-black, calcareous
13,275-13,300	Limestone, dark-gray to grayish-black, very fine- to fine-crystalline, argillaceous	14,290-14,297	Shale, grayish-black, silty, glauconitic
13,300-13,307	Limestone, medium dark-gray, fine-granular, silty	14,297-14,300	Limestone, medium-gray, fine-crystalline, dolomitic, argillaceous; very fine pyrite
13,307-13,316	Shale, medium dark-gray		Mississippian and Devonian Systems
13,316-13,323	Limestone, medium dark-gray, fine-granular, silty		Woodford Shale 14,300-14,415 feet
13,323-13,330	Shale, medium dark-gray	14,300-14,310	Shale, grayish-black, hard, siliceous?; black dense pyritic chert
13,300-13,348	Siltstone, medium dark-gray, very calcareous; resembles limestone	14,310-14,325	Shale, grayish-black, hard, siliceous?; black dense chert
13,348-13,360	Shale, medium-gray, fissile	14,325-14,335	Shale as above; much black dull chert or very siliceous black shale
13,360-13,370	Shale, medium-gray, silty	14,335-14,370	Shale, dark-gray to grayish-black
13,370-13,385	Shale, medium dark-gray; brachiopods 13,375-13,380 feet	14,370-14,375	Shale as above; much black dull chert or very siliceous black shale
13,385-13,410	Limestone, dark-gray to grayish-black, very fine- to fine-crystalline, argillaceous	14,375-14,415	Shale, dark-gray to grayish-black
13,410-13,448	Shale, medium dark-gray		Devonian and Silurian Systems
13,448-13,459	Siltstone, medium dark-gray, calcareous		Hunton Group
13,459-13,463	Limestone, dark-gray, very silty	14,415-14,420	Dolomite, medium light-gray, granular, very finely sandy, glauconitic; very light-gray dense chert
13,463-13,470	Siltstone, medium dark-gray, calcareous	14,420-14,425	Dolomite, medium light- to medium-gray, very finely sandy, very glauconitic; chert as above with quartz crystals
13,470-13,476	Limestone, dark-gray, very silty	14,425-14,430	Dolomite, very pale-orange, fine-crystalline; chert as above
13,476-13,510	Shale, medium dark-gray	14,430-14,434	Dolomite, medium light-gray, fine-granular, very finely sandy, glauconitic; very light-gray dense chert with dolomite rhombs
13,510-13,535	Shale, medium dark-gray, calcareous	14,434-14,440	Dolomite, light-gray, fine-granular, silty, calcareous; little glauconite
13,535-13,599	Shale, medium dark-gray	14,440-14,455	Limestone, medium light-gray, very finely sandy, dolomitic; very light- to light-gray spicular chert; glauconite
13,599-13,609	Limestone, dark-gray to grayish-black, silty; little pyrite	14,455-14,460	Limestone, medium light- to medium-gray, silty, dolomitic; light-gray chert
13,609-13,644	Shale, medium dark-gray; gastropods 13,625-13,635 feet	14,460-14,470	Limestone, very pale-orange to light-gray, medium-crystalline; medium light- to medium-gray dense chert
13,644-13,652	Shale, dark-gray, calcareous, silty	14,470-14,480	Limestone, light- to medium light-gray, medium- to coarse-crystalline
13,652-13,658	Limestone, dark-gray to grayish-black, fine-granular, very argillaceous; pyrite	14,480-14,490	Limestone, very pale-orange, fine-crystalline, soft
13,658-13,660	Shale, medium dark-gray	14,490-14,495	Limestone, light- to medium light-gray, medium-crystalline
13,660-13,665	Limestone, dark-gray to grayish-black, fine-granular, very argillaceous	14,495-14,510	Limestone, light-gray to very pale-orange, coarse-crystalline
13,665-13,670	Shale, medium dark-gray	14,510-14,520	Limestone, light-gray, fine- to medium-crystalline
13,670-13,680	Shale, medium dark- to dark-gray, calcareous, silty	14,520-14,565	Limestone, light-gray, fine-crystalline; some medium-crystalline limestone
13,680-13,698	Shale, medium dark-gray; gastropods 13,685-13,690 feet	14,565-14,585	Limestone, light-gray, fine- to medium-crystalline
13,698-13,704	Limestone, dark-gray, very argillaceous	14,585-14,595	Limestone, very pale-orange, fine-crystalline
13,704-13,719	Shale, medium dark-gray	14,595-14,600	Limestone, light-gray, fine-crystalline
13,719-13,720	Limestone, dark-gray, very argillaceous	14,600-14,615	Limestone, light-gray, medium-crystalline
13,720-13,733	Shale, medium dark-gray	14,615-14,620	Limestone, light-gray, medium- to coarse-crystalline; scattered pink crystals
13,733-13,735	Limestone, dark-gray, very argillaceous	14,620-14,635	Limestone, medium light-gray, medium-crystalline
13,735-13,746	Shale, medium dark-gray	14,635-14,640	Limestone, light-gray, fine- to medium-crystalline
13,746-13,749	Limestone, dark-gray, very argillaceous	14,640-14,650	Limestone, light- to medium light-gray, medium-crystalline
13,749-13,750	Shale, medium dark-gray	14,650-14,655	Limestone, light- to medium light-gray, medium- to coarse-crystalline; brachiopods
13,750-13,753	Limestone, dark-gray, very argillaceous	14,655-14,660	Limestone, medium-gray, fine-crystalline; pyrite; greenish-gray to medium dark-gray medium-crystalline limestone; pyrite
13,753-13,768	Shale, medium dark-gray	14,660-14,665	Limestone, medium- to medium dark-gray, fine- to medium-crystalline; little pyrite; argillaceous in part
13,768-13,770	Limestone, dark-gray, very argillaceous	14,665-14,680	Limestone, medium dark- to dark-gray, fine- to medium-crystalline, slightly argillaceous
13,770-13,798	Shale, dark-gray, very calcareous		
13,798-13,800	Limestone, grayish-black, very argillaceous		
13,800-13,802	Shale, medium dark-gray		
13,802-13,810	Limestone, grayish-black, very argillaceous		
13,810-13,817	Shale, dark-gray, very calcareous		
13,817-13,819	Limestone, grayish-black, very argillaceous; pyrite		
13,819-13,834	Shale, medium dark-gray		
13,834-13,844	Limestone, grayish-black, very argillaceous		
13,844-13,852	Shale, dark-gray, calcareous		
13,852-13,856	Limestone, dark-gray, fine-granular, very silty, very finely pyritic		
13,856-13,870	Shale, dark-gray, calcareous		
13,870-13,883	Shale, medium dark-gray		
13,883-13,893	Limestone, dark-gray, fine-granular, very silty, very finely pyritic		
13,893-13,901	Shale, black, calcareous		
13,901-13,908	Shale, dark-gray, calcareous		
13,908-13,916	Shale, black, very calcareous		
13,916-13,924	Dolomite, dark-gray, calcareous, silty		
13,924-13,946	Shale, medium-gray		
13,946-13,948	Siltstone, grayish-black, calcareous, hard		
13,948-13,956	Shale, medium-gray		
13,956-13,960	Dolomite, dark-gray, very fine-crystalline, calcareous, argillaceous		
13,960-13,980	Siltstone, dark-gray, calcareous		
13,980-13,993	Shale, medium dark-gray		
13,993-13,996	Siltstone, grayish-black, calcareous, pyritic		

14,680-14,695	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous; brachiopods 14,685-14,690 feet		Viola Limestone 15,348-15,770 feet
14,695-14,710	Limestone, medium dark- to dark-gray, medium-crystalline, slightly argillaceous; brachiopods 14,705-14,710 feet	15,348-15,355	Limestone, dark-gray to grayish-black, very argillaceous; some medium- to coarse-crystalline limestone
14,710-14,715	Limestone, medium dark-gray, medium-crystalline, argillaceous	15,355-15,366	Limestone, dark-gray, very argillaceous
14,715-14,720	Limestone, medium dark-gray, fine-crystalline, argillaceous	15,366-15,370	Limestone, medium dark- to dark-gray, medium- to coarse-crystalline
14,720-14,733	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous	15,370-15,375	Limestone, medium light- to medium-gray, medium- to coarse-crystalline
14,733-14,750	Limestone, medium dark- to dark-gray, fine-crystalline, argillaceous; light-gray coarse-crystalline limestone; caving?	15,375-15,380	Limestone, light- to medium-gray, medium-crystalline; few pink crystals
14,750-14,760	Limestone, medium dark-gray, very fine- to fine-crystalline, slightly argillaceous	15,380-15,385	Limestone, light- to medium light-gray, medium-crystalline; slightly yellowish-brown tint
14,760-14,780	Limestone, medium dark-gray, very fine- to fine-crystalline	15,385-15,390	Limestone, medium- to dark-gray, fine- to medium-crystalline, argillaceous
14,780-14,790	Limestone, medium dark- to dark-gray, very fine- to fine-crystalline, slightly argillaceous	15,390-15,396	Limestone, dark-gray to grayish-black, fine- to medium-crystalline, argillaceous; crinoids
14,790-14,840	Limestone, medium dark-gray, fine-crystalline, argillaceous; brachiopods and crinoids 14,825-14,830 feet	15,396-15,400	Limestone as above; dark-gray to black dense chert
14,840-14,846	Limestone, medium dark-gray, very fine- to fine-crystalline, argillaceous	15,400-15,405	Limestone, medium-gray to brownish-gray, medium-crystalline
14,846-14,855	Limestone, medium dark-gray, very fine-crystalline, slightly argillaceous	15,405-15,413	Limestone, medium light-gray, medium-crystalline, slightly brownish
14,855-14,905	Limestone, medium dark-gray, fine-crystalline, argillaceous	15,413-15,450	No samples
14,905-14,915	Limestone, medium dark-gray, very fine-crystalline, slightly argillaceous	15,450-15,460	Limestone, dark-gray to grayish-black, fine- to medium-crystalline, slightly argillaceous
14,915-14,930	Limestone, medium-gray, very fine-crystalline	15,460-15,464	Limestone, medium- to dark-gray, medium-crystalline, slightly argillaceous; some pale yellowish-brown medium-crystalline limestone
14,930-14,945	Limestone, medium dark-gray, fine-crystalline, argillaceous	15,464-15,485	Limestone, medium light-gray to pale yellowish-brown, medium-crystalline
14,945-14,950	Limestone, medium dark-gray to brownish-gray, fine-crystalline, argillaceous, dolomitic	15,485-15,495	Limestone, dark-gray, fine-crystalline, slightly brownish; little dark-gray dense chert
14,950-14,965	Limestone, medium dark-gray, very fine- to fine-crystalline, argillaceous	15,495-15,500	Limestone, medium dark-brownish-gray, fine-crystalline
14,965-15,000	Limestone, medium dark-gray, very fine-crystalline, slightly argillaceous	15,500-15,505	Limestone, medium dark-brownish-gray, medium-crystalline; medium dark-gray dense chert
15,000-15,017	Limestone, medium dark-gray, dense to very fine-crystalline	15,505-15,510	Limestone, medium dark- to dark-gray, fine-crystalline; dark-gray dense chert
15,017-15,035	Limestone, medium dark- to dark-gray, fine-crystalline, argillaceous	15,510-15,515	Limestone as above; slightly brownish
15,035-15,044	Siltstone, medium dark- to dark-gray, calcareous; resembles limestone	15,515-15,525	Limestone as above; dark-gray to black dense chert
15,044-15,050	Limestone, medium dark-gray, fine-crystalline, argillaceous	15,525-15,540	Limestone, medium dark-brownish-gray, fine-crystalline
15,050-15,055	Limestone, grayish-red, fine-crystalline to granular, argillaceous	15,540-15,560	No samples
15,055-15,077	Limestone, medium dark-gray, fine-crystalline, very argillaceous	15,560-15,565	Limestone, medium light- to medium-gray, fine- to medium-crystalline
15,077-15,080	Limestone, grayish-red, fine-granular, very argillaceous	15,565-15,570	Limestone, pale yellowish-brown to medium-gray, medium-crystalline
15,080-15,100	Limestone, medium dark-gray, fine-crystalline, very argillaceous	15,570-15,575	Limestone, brownish-gray to medium-gray, fine-crystalline
15,100-15,110	Limestone, medium-gray, dense	15,575-15,580	Limestone, dark-gray, fine-crystalline, dolomitic, slightly argillaceous
15,110-15,116	Limestone, grayish-brown to brownish-gray, very fine- to fine-crystalline; argillaceous in part	15,580-15,585	Limestone, brownish-gray, very fine-crystalline
15,116-15,127	Limestone, medium-gray, dense	15,585-15,590	Limestone, dark-gray, fine-crystalline, dolomitic, slightly argillaceous
15,127-15,150	Limestone, medium-gray, dense; few pink crinoid? fragments	15,590-15,595	Limestone, brownish-gray, fine-crystalline
15,150-15,153	Limestone, medium dark-gray, fine-crystalline, argillaceous	15,595-15,605	Limestone, dark-gray, fine-crystalline, argillaceous, probably dolomitic
15,153-15,160	Siltstone, medium dark-gray, calcareous, slightly greenish	15,605-15,616	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous
15,160-15,162	Shale, greenish-gray, calcareous, chunky	15,616-15,620	Limestone, dark-gray, fine-crystalline, argillaceous, dolomitic
15,162-15,168	Limestone, light-gray, very fine- to fine-crystalline; very light-gray translucent dense chert	15,620-15,625	Limestone, medium dark-brownish-gray, very fine- to fine-crystalline; little black chert
15,168-15,175	Limestone, medium light-gray, very fine- to fine-crystalline; chert as above; trace of glauconite	15,625-15,630	Limestone, medium dark-brownish-gray, very fine- to fine-crystalline
15,175-15,190	Limestone as above; medium light-gray dense chert	15,630-15,640	Limestone, pale yellowish-brown to medium light-gray, medium-crystalline
15,190-15,195	Limestone, medium light- to medium-gray, fine-crystalline; light- to medium dark-gray dense chert	15,640-15,645	Limestone, brownish-gray, medium-crystalline
15,195-15,200	Limestone, medium light-gray, fine-crystalline; medium light-gray dense chert	15,645-15,660	Limestone, pale yellowish-brown to medium light-gray, medium- to coarse-crystalline
15,200-15,206	Limestone, medium light-gray, medium- to coarse-olitic; some limestone with yellowish-brown tint	15,660-15,665	Limestone, pale yellowish-brown, fine-crystalline
	Ordovician System	15,665-15,670	Limestone, medium-gray to brownish-gray, medium-crystalline
	Sylvan Shale 15,206-15,348 feet	15,670-15,680	Limestone, pale yellowish-brown to brownish-gray, medium-crystalline
15,206-15,228	Shale, medium dark- to dark-gray, slightly dolomitic	15,680-15,690	Limestone, medium-gray, fine- to medium-crystalline, slightly brownish; some medium dark-gray limestone
15,228-15,230	Siltstone, dark-gray	15,690-15,705	Limestone, medium light-gray to pale yellowish-brown, medium- to coarse-crystalline; some light-gray limestone
15,230-15,247	Shale, dark-gray, slightly dolomitic	15,705-15,715	Limestone, light-gray to pale yellowish-brown, medium- to coarse-crystalline
15,247-15,260	Shale, dark-gray, dolomitic; some shale with abundant black silt-size grains; pyrite 15,250-15,255 feet	15,715-15,765	Limestone, light-gray, medium- to coarse-crystalline
15,260-15,270	Shale, dark-gray, slightly dolomitic	15,765-15,770	Limestone, pale yellowish-brown to brownish-gray, medium-crystalline; dark-gray shale
15,270-15,290	Shale, dark-gray		Simpson Group
15,290-15,320	Shale, dark-gray, slightly dolomitic	15,770-15,772	Shale, dark-gray
15,320-15,340	Dolomite, grayish-black, fine-crystalline very argillaceous	15,772-15,780	Limestone, dark-gray, fine-crystalline, argillaceous; dark-gray dense slightly argillaceous limestone
15,340-15,348	Dolomite, grayish-black, calcareous, very argillaceous	15,780-15,790	Limestone, dark-gray, dense, slightly argillaceous; slightly brownish in part
		15,790-15,795	Limestone, brownish-gray, dense

15,795-15,800	Limestone, dark-gray, dense, slightly argillaceous	16,484-16,487	Shale, dark-gray, calcareous
15,800-15,808	Limestone, medium-gray, dense	16,487-16,518	Limestone, medium dark- to dark-gray, fine-crystalline, very argillaceous; medium dark-gray very calcareous shale; resembles limestone; brachiopods 16,510-16,515 feet
15,808-15,810	Dolomite, medium-gray, fine-crystalline		
15,810-15,826	Limestone, medium dark- to dark-gray, dense, slightly argillaceous; grayish-black fine-crystalline argillaceous limestone	16,518-16,522	Shale, dark-gray, very calcareous
15,826-15,836	Dolomite, dark-gray, fine-crystalline, argillaceous, calcareous	16,522-16,524	Limestone, medium dark-gray, medium-crystalline, silty
15,836-15,846	Limestone, medium dark- to dark-gray, dense, slightly argillaceous	16,524-16,527	Limestone, medium dark-gray, fine-crystalline, argillaceous
15,846-15,860	Dolomite, dark-gray to grayish-black, fine-crystalline, argillaceous, calcareous	16,527-16,530	Sandstone, medium dark-gray, fine- to medium-grained, calcareous, very argillaceous; brachiopods
15,860-15,867	Limestone, medium- to medium dark-gray, fine-crystalline, dolomitic, slightly argillaceous	16,530-16,536	Sandstone, medium dark-gray, fine- to medium-grained, dolomitic; gray shale laminae and stringers
15,867-15,869	Limestone, medium- to dark-gray, fine- to medium-sandy	16,536-16,540	Limestone, medium dark-gray, very fine- to fine-crystalline, very argillaceous; many brachiopods; scattered fine to medium sand
15,869-15,870	Sandstone, medium-gray, fine- to medium-grained, subrounded; calcareous in part	16,540-16,545	Sandstone, medium dark-gray to olive-gray, very fine-grained, slightly dolomitic; dark-gray shale stringers
15,870-15,875	Sandstone, light- to medium-gray, fine- to medium-grained, subrounded, calcareous	16,545-16,550	Shale, medium dark-gray, calcareous; scattered fine to medium sand; some medium dark-gray calcareous siltstone
15,875-16,080	No samples	16,550-16,556	Shale, medium dark-gray to grayish-black, finely sandy; brachiopods
16,080-16,100	Sandstone, grayish-white, fine-grained, porous; pyrite 16,088-16,092 feet	16,556-16,560	Limestone, medium dark-gray, medium-crystalline, slightly silty
16,100-16,140	Sandstone, very light-gray, fine-grained; pyrite 16,135-16,140 feet	16,560-16,566	Limestone, medium dark-gray, very fine- to fine-sandy, silty
16,140-16,150	Sandstone, very light-gray, fine-grained, tight	16,566-16,573	Shale, medium dark-gray
16,150-16,156	Shale, medium-gray, smooth	16,573-16,581	Limestone, medium dark-gray, medium-crystalline, slightly silty
16,156-16,160	Sandstone, very light-gray, fine-grained	16,581-16,596	Shale, medium dark- to dark-gray, calcareous
16,160-16,167	Sandstone, very light-gray to greenish-gray, fine-grained; medium-gray shale streaks	16,596-16,602	Limestone, medium dark-gray, medium-crystalline, argillaceous
16,167-16,185	Shale, medium dark-gray; few silt laminae	16,602-16,606	Shale, dark-gray, calcareous
16,185-16,187	Siltstone, dark-gray, dolomitic, hard	16,606-16,608	Limestone, medium dark-gray, fine-crystalline, argillaceous
16,187-16,191	Shale, medium dark-gray	16,608-16,613	Shale, dark-gray, calcareous
16,191-16,199	Siltstone, medium dark-gray	16,613-16,616	Limestone, medium dark-gray, fine- to medium-sandy; many medium well-rounded reddish-brown pellets of ironstone?
16,199-16,258	Shale, medium dark-gray	16,616-16,621	Limestone, medium- to medium dark-gray, medium- to coarse-crystalline, slightly dolomitic?
16,258-16,265	Shale as above; calcareous streaks	16,621-16,638	Shale, medium dark- to dark-gray
16,265-16,296	No samples	16,638-16,641	Limestone, medium dark-gray, fine- to medium-crystalline, argillaceous
16,296-16,299	Sandstone, medium dark-gray, very fine- to fine-grained, dolomitic, argillaceous	16,641-16,649	Shale, medium dark- to dark-gray
16,299-16,300	Shale, medium dark-gray	16,649-16,652	Limestone, medium dark-gray, fine- to medium-crystalline, argillaceous
16,300-16,302	Limestone, medium dark-gray, dense, slightly argillaceous	16,652-16,656	Shale, medium dark- to dark-gray
16,302-16,305	Shale, medium dark- to dark-gray; scattered very fine- to fine sand grains	16,656-16,671	Limestone, medium dark-gray, medium-crystalline, slightly argillaceous
16,305-16,312	Shale, medium dark- to dark-gray	16,671-16,676	Shale, dark-gray, fine- to medium-sandy, calcareous
16,312-16,320	Shale, medium dark-gray; very fine-sandstone stringers	16,676-16,678	Limestone, medium dark-gray, fine- to medium-sandy, medium-crystalline; few coarse grains
16,320-16,330	Shale, medium dark-gray	16,678-16,682	Sandstone, medium dark-gray, fine- to medium-grained, very argillaceous, calcareous; gray shale stringers
16,330-16,340	Sandstone, very light- to light-gray, very fine- to fine-grained	16,682-16,688	Shale, medium dark- to dark-gray; fine- to medium-grained sandstone lenses
16,340-16,346	Sandstone, grayish-white, fine-grained; scattered very small fish scales?	16,688-16,690	Limestone, medium dark-gray, medium- to coarse-crystalline, fine- to medium-sandy
16,346-16,352	Sandstone as above; gray shale fragments; scattered medium to coarse grains	16,690-16,694	Shale, dark-gray, fine- to medium-sandy; much sand
16,352-16,359	Sandstone, light-gray to greenish-gray, very fine-grained, gray shale stringers	16,694-16,700	Shale, dark-gray
16,359-16,361	Shale, medium dark gray	16,700-16,705	Shale, dark-gray, fine- to medium-sandy; very sandy
16,361-16,364	Sandstone, light-gray, very fine-grained; gray shale stringers and pebbles?	16,705-16,710	Limestone, medium dark-gray, fine-crystalline; very finely sandy, silty
16,364-16,368	Siltstone, medium-gray	16,710-16,720	Limestone, medium dark-gray, medium-crystalline, fine- to medium-sandy
16,368-16,372	Sandstone, light-gray, very fine-grained; gray shale fragments and fish scales?	16,720-16,725	Limestone as above; dark-gray shale stringers
16,372-16,376	Sandstone, medium-gray, fine- to medium-grained, dolomitic; scattered coarse subrounded grains	16,725-16,728	Shale, dark-gray; scattered fine to medium sand
16,376-16,381	Dolomite, medium- to medium dark-gray, fine- to medium-crystalline; scattered fine sand grains, argillaceous	16,728-16,731	Sandstone, medium-gray, medium-grained, calcareous; pyrite
16,381-16,384	Sandstone, light-gray, fine-grained; scattered medium to coarse subrounded grains; gray shale streaks	16,731-16,739	Shale, medium dark- to dark-gray, fine- to medium-sandy
16,384-16,392	Sandstone, light-gray, very fine-grained	16,739-16,742	Shale, grayish-black
16,392-16,394	Dolomite, medium-gray, finely sandy	16,742-16,744	Limestone, medium dark-gray, fine-crystalline, argillaceous
16,394-16,398	Sandstone, medium light-gray, very fine-grained, silty	16,744-16,750	Sandstone, medium- to medium dark-gray, fine- to medium-grained, subrounded, very argillaceous, slightly calcareous; few coarse grains
16,398-16,406	Siltstone, medium light-gray, very finely sandy, tight	16,750-16,755	Sandstone, medium dark-gray, very fine- to fine-grained, silty, calcareous
16,406-16,412	Sandstone, medium light-gray, very fine-grained, silty, tight	16,755-16,765	Sandstone, medium-gray, fine- to medium-grained, subrounded, dolomitic
16,412-16,420	Shale, medium dark-gray	16,765-16,768	Limestone, medium dark-gray, fine- to medium-sandy, argillaceous
16,420-16,425	Siltstone, medium dark-gray	16,768-16,773	Limestone, medium dark-gray, fine-crystalline, very finely sandy, silty; dark-gray shale stringers
16,425-16,429	Dolomite, medium-gray to brownish-gray, medium-crystalline, silty, calcareous	16,773-16,778	Shale, dark-gray, fine- to medium-sandy, calcareous
16,429-16,434	Limestone, medium dark-gray, medium-crystalline, dolomitic; scattered fine to medium sand	16,778-16,782	Limestone, medium dark-gray, medium-crystalline, fine- to medium-sandy
16,434-16,438	Sandstone, medium light-gray, fine- to medium-grained, dolomitic	16,782-16,786	Sandstone, medium dark-gray, fine- to medium-grained, subrounded, calcareous, very argillaceous
16,438-16,442	Limestone, medium dark-gray, fine- to medium-crystalline, silty, dolomitic	16,786-16,791	Limestone, medium dark-gray, medium-crystalline, fine- to medium-sandy
16,442-16,447	Sandstone, light-gray, very fine- to fine-grained, dolomitic; medium light-gray very fine-grained, dolomitic sandstone		
16,447-16,452	Sandstone, light-gray, very fine-grained		
16,452-16,461	Sandstone, medium light-gray, very fine-grained, dolomitic; scattered medium sand		
16,461-16,463	Shale, dark-gray		
16,463-16,471	Siltstone, medium dark-gray, calcareous		
16,471-16,476	Limestone, medium dark-gray, very fine-crystalline, slightly argillaceous; dark-gray shale stringers		
16,476-16,484	Limestone, medium dark-gray, fine-crystalline, argillaceous		

16,791-16,800	Limestone, medium dark-gray, fine- to medium-crystalline, argillaceous, silty	16,905-16,910	Dolomite, medium dark-gray, medium- to coarse-crystalline, slightly silty
16,800-16,805	Limestone, medium dark-gray, fine- to medium-crystalline; brachiopods	16,910-16,916	Dolomite, medium dark-gray, fine-crystalline, slightly silty; dark-gray shale laminae and thin bedded
16,805-16,810	Shale, dark-gray; calcareous fine-grained sandstone stringers	16,916-16,925	Dolomite, medium dark-gray, fine-crystalline, slightly silty
16,810-16,816	Limestone, medium dark-gray, medium-crystalline, slightly argillaceous	16,925-16,944	Dolomite, medium dark-gray, fine-crystalline, argillaceous
16,816-16,820	Shale, dark-gray, very calcareous; resembles limestone	16,944-16,950	Dolomite, medium dark-gray, very fine-crystalline
Ordovician and Cambrian Systems		16,950-16,960	Dolomite, medium dark-gray, fine-crystalline, argillaceous
Arbuckle Group		16,960-16,980	Dolomite, dark-gray, fine-crystalline, slightly argillaceous
16,820-16,825	Dolomite, medium light-gray, medium-crystalline, fine- to medium-sandy	16,980-16,987	Dolomite, dark-gray, fine-crystalline, very argillaceous
16,825-16,830	Dolomite, medium-gray, fine-crystalline	16,987-16,990	Dolomite, medium dark-gray, fine-crystalline, argillaceous; dark-gray shale laminae and thin bedded
16,830-16,835	Dolomite, medium-gray, fine-crystalline; fine-grained sandstone stringer	16,990-16,997	Dolomite, medium dark-gray, fine-crystalline, argillaceous
16,835-16,844	Dolomite, medium-gray, fine-crystalline	16,997-17,000	Dolomite, medium-gray, fine-crystalline
16,844-16,846	Sandstone, medium dark-gray, medium- to coarse-grained, subrounded, dolomitic	17,000-17,012	Dolomite, medium dark-gray, fine-crystalline, slightly argillaceous; pyrite at base
16,846-16,848	Dolomite, medium dark-gray, fine-crystalline, hard	17,012-17,015	Dolomite, dark-gray, fine-crystalline, argillaceous
16,848-16,850	Limestone, medium dark-gray, finely sandy	17,015-17,025	Dolomite, medium-gray, fine-crystalline
16,850-16,857	Dolomite, medium light- to medium-gray, fine-crystalline	17,025-17,030	Dolomite, dark-gray, fine-crystalline, argillaceous
16,857-16,870	Dolomite, medium dark-gray, fine-crystalline, silty	17,030-17,040	Dolomite, medium- to medium dark-gray, fine-crystalline
16,870-16,876	Dolomite, medium-gray, fine-crystalline	17,040-17,048	Dolomite, medium dark-gray, fine-crystalline, argillaceous
16,876-16,880	Dolomite, medium- to dark-gray, fine-crystalline, silty	17,048-17,065	No samples
16,880-16,886	Dolomite, medium-gray, fine-crystalline	17,065-17,070	Dolomite, medium-gray, fine-crystalline; slightly yellowish-brown tint
16,886-16,890	Dolomite, medium dark-gray, fine-crystalline, silty	17,070-17,072	Dolomite, medium dark-gray, fine-crystalline, argillaceous
16,890-16,900	No samples	17,072-17,075	Dolomite, medium- to medium dark-gray, fine-crystalline; medium- to dark-gray dense mottled chert
16,900-16,905	Dolomite, medium dark-gray, fine-crystalline, slightly silty; pyrite	17,075-17,080	Dolomite, medium dark-gray, fine-crystalline, argillaceous
		17,080-17,086	Dolomite, medium-gray, fine-crystalline; dark-gray streaks; slightly yellowish-brown
		17,086-17,094	Dolomite, medium dark-gray, fine-crystalline, argillaceous
		17,094	Total depth

LOG 16

CADDO COUNTY, OKLAHOMA

Center SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 33, T. 10 N., R. 10 W.

Operator: Denver Producing and Refining Co.
Lease: Sah-Cam No. 1
Elevation: 1,420 feet
Total depth: 13,840 feet
Completion date: 1943 (deepened)
Initial production: Dry and abandoned

Electrical log: 3,000 to 7,556 feet
7,595 to 7,995 feet
8,032 to 8,094 feet
8,132 to 13,737 feet

Sample intervals:
20-foot
410 to 560 feet
630 to 900 feet
1,650 to 2,220 feet
10-foot
200 to 410 feet
560 to 630 feet
900 to 1,650 feet
2,220 to 7,625 feet
7,690 to 10,090 feet
5-foot
7,625 to 7,690 feet
10,090 to 13,840 feet

Cored intervals:
4,305 to 4,321 feet

Permian System Whitehorse Group		Duncan Sandstone 580-920 feet	
0-200	No samples	580- 600	Sandstone, pale to moderate reddish-brown, very fine-grained, silty
	Marlow Formation 200-230 feet	600- 610	Sandstone, pale reddish-brown, very fine-grained, gypsiferous
200-210	Shale, moderate reddish-brown; white gypsum	610- 620	Shale, moderate reddish-brown
210-220	Shale as above; greenish-gray spots	620- 640	Sandstone, moderate reddish-brown, very fine- to fine-grained, gypsiferous
220-230	Sandstone, pale reddish-brown, very fine-grained, silty, gypsiferous; some medium light-gray sandstone	640- 655	Sandstone, moderate reddish-brown, very fine- to fine-grained
	El Reno Group	655- 660	Shale, moderate reddish-brown
	Dog Creek Shale and Blaine Gypsum 230-392 feet	660- 680	Sandstone, moderate reddish-brown, very fine- to fine-grained, silty
230-250	Shale, moderate reddish-brown; gypsum	680- 690	Sandstone, moderate reddish-brown, very fine- to fine-grained
250-270	Shale, moderate reddish-brown, silty	690- 700	Shale, moderate reddish-brown
270-280	Shale, moderate reddish-brown; gypsum	700- 730	Sandstone, moderate reddish-brown, very fine- to fine-grained
280-290	Siltstone, pale to moderate reddish-brown, very finely sandy	730- 740	Shale, moderate reddish-brown
290-305	Shale, moderate reddish-brown	740- 750	Sandstone, moderate reddish-brown, very fine-grained, silty, dolomitic
305-320	Siltstone, pale reddish-brown to medium light-gray, very finely sandy	750- 785	Sandstone, pale to moderate reddish-brown, very fine- to fine-grained, slightly gypsiferous
320-370	Shale, moderate reddish-brown	785- 825	Shale, moderate reddish-brown
370-380	Shale as above; greenish-gray spots	825- 830	Siltstone, greenish-gray, very finely sandy
380-382	Anhydrite, white, fine-crystalline; white gypsum	830- 880	No samples
382-390	Shale, moderate reddish-brown	880- 890	Shale, moderate reddish-brown
390-392	Anhydrite, white, fine-crystalline	890- 910	Sandstone, moderate reddish-brown, very fine-grained, silty, slightly gypsiferous
	Flowerpot Shale 392-580 feet	910- 920	Siltstone, medium light-gray; very fine-grained silty gypsiferous sandstone
392-400	Shale, moderate reddish-brown		
400-420	Siltstone, moderate reddish-brown, very finely sandy		
420-423	Siltstone, medium light-gray		
423-425	Shale, dark-gray, hard; out of place?		
425-490	Shale, moderate reddish-brown		
490-510	Siltstone, medium light-gray, very finely sandy	920- 940	Shale, moderate reddish-brown
510-540	Shale, moderate reddish-brown	940- 960	Shale as above; white gypsum
540-560	Siltstone, moderate reddish-brown, very finely sandy	960-1,020	Shale, moderate reddish-brown
560-575	Shale, moderate reddish-brown	1,020-1,024	Anhydrite, white, fine-crystalline; gypsum
575-580	Shale, greenish-gray	1,024-1,030	Shale, moderate reddish-brown
		1,030-1,040	Shale as above; gypsum

1,040-1,050	Siltstone, pale reddish-brown, very finely sandy		
1,050-1,060	Siltstone, pale reddish-brown		
1,060-1,070	Shale, moderate reddish-brown	2,160-2,170	Garber Sandstone 2,160-2,815 feet
1,070-1,100	Shale as above; white gypsum	2,170-2,200	Sandstone, pale reddish-brown, very fine-grained, silty
1,100-1,110	Shale as above	2,200-2,220	Shale, moderate reddish-brown
1,110-1,120	Shale as above; white gypsum	2,220-2,230	Siltstone, pale reddish-brown, very finely sandy
1,120-1,130	Shale as above	2,230-2,250	Sandstone, pale reddish-brown, very fine-grained, silty
1,130-1,140	Siltstone, moderate to pale reddish-brown; greenish-gray spots	2,250-2,265	Shale, moderate reddish-brown
1,140-1,150	Shale, moderate reddish-brown	2,265-2,280	Sandstone, pale reddish-brown, very fine-grained, silty
1,150-1,160	Siltstone, pale reddish-brown	2,280-2,290	Shale, moderate reddish-brown
1,160-1,197	Shale, moderate reddish-brown	2,290-2,300	Sandstone, pale reddish-brown, very fine-grained, silty
1,197-1,200	Shale, greenish-gray	2,300-2,340	Siltstone, moderate reddish-brown, very finely sandy
1,200-1,210	Siltstone, pale reddish-brown	2,340-2,350	Shale, moderate reddish-brown
1,210-1,234	Shale, moderate reddish-brown	2,350-2,410	Siltstone, moderate reddish-brown, very finely sandy
1,234-1,235	Dolomite, light olive-gray, granular	2,410-2,425	Shale, moderate reddish-brown
1,236-1,240	Shale, moderate reddish-brown	2,425-2,440	Sandstone, pale red, very fine-grained
1,240-1,244	Sandstone, pale reddish-brown, very fine-grained, silty, slightly dolomitic	2,440-2,444	Shale, moderate reddish-brown
1,244-1,260	Shale, moderate reddish-brown	2,444-2,450	Limestone, moderate reddish-brown, argillaceous
1,260-1,290	Shale as above; white to light-gray fine-crystalline anhydrite and gypsum	2,450-2,530	Sandstone, pale reddish-brown, very fine-grained
1,290-1,300	Shale, moderate reddish-brown	2,530-2,535	Shale, moderate reddish-brown
1,300-1,305	Siltstone, medium light-gray, very finely sandy	2,535-2,566	Sandstone, grayish-red, very fine-grained, silty
1,305-1,320	Shale, moderate reddish-brown	2,566-2,570	Shale, moderate reddish-brown
1,320-1,340	Siltstone, pale reddish-brown	2,570-2,574	Shale, medium-gray
1,340-1,350	Shale, moderate reddish-brown	2,574-2,595	Sandstone, light-gray, very fine-grained, silty
1,350-1,360	Shale as above; white to light-gray fine-crystalline anhydrite and gypsum	2,595-2,600	Shale, moderate reddish-brown
1,360-1,370	Shale, moderate reddish-brown	2,600-2,610	Shale, olive-gray
1,370-1,386	Siltstone, moderate reddish-brown, very finely sandy	2,610-2,620	Shale, moderate reddish-brown
1,386-1,390	Siltstone, medium light-gray, very finely sandy	2,620-2,624	Shale, medium-gray
1,390-1,410	Siltstone, moderate reddish-brown	2,624-2,655	Sandstone, light-gray, very fine-grained, silty
1,410-1,416	Siltstone, medium light-gray, very finely sandy	2,655-2,660	Siltstone, medium light-gray
1,416-1,425	Shale, moderate reddish-brown	2,660-2,684	Shale, moderate reddish-brown
1,425-1,446	Siltstone, pale to moderate reddish-brown, very finely sandy	2,684-2,695	Shale, medium-gray
1,446-1,454	Sandstone, light-gray, very fine-grained, silty	2,695-2,715	Shale, moderate reddish-brown
1,454-1,460	Siltstone, moderate reddish-brown, very finely sandy	2,715-2,720	Shale, medium-gray
1,460-1,480	Shale, moderate reddish-brown	2,720-2,744	Shale, moderate reddish-brown
1,480-1,490	Shale, moderate reddish-brown; white fine-crystalline anhydrite	2,744-2,750	Shale, medium-gray
1,490-1,500	Siltstone, moderate reddish-brown	2,750-2,760	Shale, moderate reddish-brown
1,500-1,510	Shale, moderate reddish-brown; white gypsum	2,760-2,770	Shale, medium-gray
1,510-1,519	Shale, moderate reddish-brown	2,770-2,780	Shale, olive-gray
1,519-1,520	Dolomite, pale-red, very fine-crystalline	2,780-2,790	Shale, moderate reddish-brown
1,520-1,528	Shale, moderate reddish-brown	2,790-2,795	Siltstone, light-gray, very finely sandy
1,528-1,530	Dolomite, light olive-gray, very fine-crystalline	2,795-2,800	Shale, medium-gray
1,530-1,558	Shale, moderate reddish-brown	2,800-2,815	Shale, moderate reddish-brown
1,558-1,560	Dolomite, light olive-gray, very fine-crystalline; mottled with pale-red; caving?		
1,560-1,590	Shale, moderate reddish-brown	2,815-2,830	Wellington Formation 2,815-3,756 feet
1,590-1,596	Shale, medium-gray; gray limestone pellets	2,830-2,834	Shale, medium-gray
1,596-1,650	Shale, moderate reddish-brown	2,834-2,845	Siltstone, moderate reddish-brown, very finely sandy
1,650-1,670	Shale as above; white gypsum	2,845-2,850	Shale, medium-gray
1,670-1,688	Shale, moderate reddish-brown	2,850-2,860	Shale, moderate reddish-brown
1,688-1,690	Dolomite, grayish-red, silty; mottled with olive gray	2,860-2,870	Shale, medium-gray
1,690-1,708	Shale, moderate reddish-brown	2,870-2,925	Shale, olive-gray
1,708-1,710	Dolomite, grayish-red, silty; mottled with olive gray	2,925-2,930	Shale, medium- to medium dark-gray
1,710-1,726	Shale, moderate reddish-brown	2,930-2,940	Shale, dark greenish-gray
1,726-1,730	Limestone, moderate reddish-brown, very fine-crystalline, argillaceous, dolomitic; some light olive-gray limestone	2,940-2,945	Shale, medium- to medium dark-gray
1,730-1,740	Shale, moderate reddish-brown	2,945-3,002	Siltstone, light-gray, very finely sandy
1,740-1,760	Shale, moderate reddish-brown; grayish-red limestone pellets	3,002-3,004	Shale, medium- to medium dark-gray
1,760-1,785	Shale, moderate reddish-brown	3,004-3,027	Dolomite, medium-gray, argillaceous
1,785-1,790	Shale, greenish-gray	3,027-3,029	Shale, medium- to medium dark-gray
1,790-1,820	Shale, moderate reddish-brown	3,029-3,090	Dolomite, light-gray, fine-crystalline
1,820-1,824	Siltstone, moderate reddish-brown, very finely sandy	3,090-3,100	Shale, medium- to medium dark-gray
1,824-1,847	Shale, moderate reddish-brown	3,100-3,109	Shale, olive-gray
1,847-1,850	Limestone, pale-red, very fine-crystalline	3,109-3,114	Shale, medium- to medium dark-gray
1,850-1,860	Shale, moderate reddish-brown	3,114-3,307	Anhydrite, light-gray, fine-crystalline
1,860-1,870	Siltstone, moderate reddish-brown, very finely sandy	3,307-3,310	Shale, medium- to medium dark-gray
1,870-1,880	Shale, moderate reddish-brown	3,310-3,316	Shale as above; white fine-crystalline anhydrite
1,880-1,890	Siltstone, moderate reddish-brown, very finely sandy	3,316-3,320	Shale as above
1,890-1,960	Shale, moderate reddish-brown	3,320-3,330	Anhydrite, white, fine-crystalline
1,960-1,970	Siltstone, moderate reddish-brown, very finely sandy	3,330-3,336	Shale, medium- to medium dark-gray
1,970-1,980	Shale, moderate reddish-brown	3,336-3,414	Anhydrite, white, fine-crystalline
1,980-2,000	Siltstone, moderate reddish-brown, very finely sandy	3,414-3,417	Shale, medium- to medium dark-gray
2,000-2,020	Sandstone, pale reddish-brown, very fine-grained, silty	3,417-3,455	Anhydrite, white, fine-crystalline
2,020-2,030	Shale, moderate reddish-brown	3,455-3,464	Shale, medium- to medium dark-gray
2,030-2,032	Limestone, moderate reddish-brown, very fine-crystalline; caving?	3,464-3,487	Shale as above; white fine-crystalline anhydrite
2,032-2,040	Shale, moderate reddish-brown	3,487-3,496	Anhydrite, white, fine-crystalline
2,040-2,050	Sandstone, pale reddish-brown, very fine-grained, silty	3,496-3,506	Shale, medium- to medium dark-gray
2,050-2,070	Shale, moderate reddish-brown	3,506-3,520	Dolomite, olive-gray, argillaceous
2,070-2,072	Limestone, moderate reddish-brown, very fine-crystalline	3,520-3,522	Shale, medium- to medium dark-gray
2,072-2,100	Shale, moderate reddish-brown	3,522-3,524	Anhydrite, white, fine-crystalline
2,100-2,103	Limestone, moderate reddish-brown, very fine-crystalline; caving?	3,524-3,526	Shale, medium- to medium dark-gray
2,130-2,120	Shale, moderate reddish-brown	3,526-3,530	Anhydrite, white, fine-crystalline
2,120-2,125	Limestone, moderate reddish-brown, very fine-crystalline; caving?	3,530-3,540	Shale, medium- to medium dark-gray
2,125-2,160	Shale, moderate reddish-brown	3,540-3,556	Anhydrite, white, fine-crystalline
		3,556-3,560	Shale, medium- to medium dark-gray
		3,560-3,569	Anhydrite, white, fine-crystalline
		3,569-3,590	Shale, medium- to medium dark-gray
		3,590-3,610	Anhydrite, white to light-gray, fine-crystalline
		3,610-3,620	Shale, medium- to medium dark-gray
		3,620-3,630	Anhydrite, white to light-gray, fine-crystalline
		3,630-3,640	Shale, medium- to medium dark-gray
		3,640-3,648	Anhydrite, white to light-gray, fine-crystalline
		3,648-3,650	

3,650-3,659	Shale, medium- to medium dark-gray	4,140-4,152	Limestone, medium-gray to brownish-gray, fine-crystalline, slightly argillaceous
3,659-3,666	Anhydrite, white to light-gray, fine-crystalline		
3,666-3,670	Shale, medium- to medium dark-gray		
3,670-3,673	Anhydrite, white to light-gray, fine-crystalline		
3,673-3,680	Shale, medium- to medium dark-gray		
3,680-3,684	Anhydrite, white to light-gray, fine-crystalline	4,152-4,156	Shale, medium-gray
3,684-3,695	Shale, medium- to medium dark-gray	4,156-4,165	Shale, grayish-red
3,695-3,704	Anhydrite, white to light-gray, fine-crystalline	4,165-4,170	Shale, greenish-gray
3,704-3,709	Shale, medium- to medium dark-gray		
3,709-3,716	Anhydrite, white to light-gray, fine-crystalline		
3,716-3,732	Shale, medium- to medium dark-gray		
3,732-3,740	Anhydrite, white to light-gray, fine-crystalline		
3,740-3,750	Shale, medium- to medium dark-gray		
3,750-3,756	Anhydrite, white to light-gray, fine-crystalline		
Chase Group			
Nolans Limestone 3,756-3,811 feet			
3,756-3,758	Dolomite, olive-gray, very fine-crystalline		
3,758-3,765	Shale, medium- to medium dark-gray		
3,765-3,767	Dolomite, olive-gray, very fine-crystalline		
3,767-3,776	Shale, medium- to medium dark-gray		
3,776-3,777	Dolomite, olive-gray, very fine-crystalline		
3,777-3,786	Shale, medium- to medium dark-gray		
3,786-3,791	Limestone, medium-gray, granular, silty, argillaceous, fossiliferous?; little medium light-gray dense chert		
3,791-3,800	Shale, medium- to medium dark-gray		
3,800-3,802	Limestone, medium-gray, granular, silty, argillaceous		
3,802-3,806	Shale, medium- to medium dark-gray		
3,806-3,811	Dolomite, light olive-gray, fine-crystalline, slightly argillaceous		
3,811-3,820	Shale, medium- to medium dark-gray		
3,820-3,826	Shale, greenish-gray		
3,826-3,829	Shale, medium- to medium dark-gray		
Winfield Limestone 3,820-3,908 feet			
3,829-3,840	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous; some brownish limestone		
3,840-3,847	Limestone, brownish-gray to olive-gray, fine-crystalline; light-gray dense chert; medium light-gray dense translucent chert		
3,847-3,860	Shale, medium- to medium dark-gray		
3,860-3,866	Siltstone, medium light-gray		
3,866-3,870	Shale, medium- to medium dark-gray		
3,870-3,877	Limestone, medium-gray, silty		
3,877-3,880	Shale, medium- to medium dark-gray		
3,880-3,884	Limestone, medium-gray, fine-crystalline		
3,884-3,891	Limestone, medium-gray, very argillaceous		
3,891-3,896	Shale, medium- to medium dark-gray		
3,896-3,898	Limestone, brownish-gray, fine-crystalline		
3,898-3,900	Shale, medium- to medium dark-gray		
3,900-3,902	Limestone, brownish-gray, fine-crystalline		
3,902-3,906	Shale, medium- to medium dark-gray		
3,906-3,908	Limestone, medium light-gray, fine-crystalline, dolomitic		
3,908-3,923	Shale, medium-gray		
3,923-3,927	Siltstone, light olive-gray, dolomitic		
3,927-3,945	Shale, medium- to medium dark-gray		
3,945-3,955	Shale, grayish-red		
3,955-3,960	Shale, medium-gray		
3,960-3,964	Limestone, moderate reddish-brown, argillaceous		
3,964-3,967	Shale, grayish-red		
3,967-3,976	Shale, medium-gray		
3,976-3,982	Shale, grayish-red		
3,982-3,986	Shale, medium- to medium dark-gray		
3,986-3,990	Shale, grayish-red		
3,990-4,000	Shale, medium-gray		
4,000-4,007	Shale, grayish-red		
4,007-4,018	Shale, medium-gray		
4,018-4,024	Siltstone, medium light-gray		
4,024-4,036	Shale, medium-gray		
4,036-4,040	Shale, grayish-red		
4,040-4,043	Limestone, pale yellowish-brown, fine-crystalline, dolomitic		
4,043-4,057	Shale, medium-gray		
4,057-4,059	Limestone, pale yellowish-brown, fine-crystalline, dolomitic; caving?		
4,059-4,073	Shale, medium-gray		
4,073-4,075	Limestone, pale yellowish-brown, fine-crystalline		
4,075-4,083	Siltstone, light-gray, very finely sandy		
4,083-4,085	Limestone, medium-gray, fine-crystalline, argillaceous		
4,085-4,097	Shale, medium-gray		
4,097-4,106	Sandstone, light-gray, very fine-grained, silty, calcareous; little feldspar?		
4,106-4,110	Limestone, medium-gray, silty, very finely sandy, fossiliferous		
4,110-4,114	Shale, medium-gray		
4,114-4,116	Limestone, medium light-gray, silty; spotted with dark gray		
4,116-4,120	Shale, medium-gray		
4,120-4,125	Limestone, medium-gray, silty		
4,125-4,130	Shale, medium-gray		
4,130-4,140	Limestone, medium light- to medium-gray, fine-crystalline, argillaceous, silty		
		4,170-4,178	Limestone, pale yellowish-brown, fine-crystalline; fusulinids
		4,178-4,182	Shale, medium-gray
		4,182-4,185	Sandstone, light-gray, very fine-grained, silty
		4,185-4,190	Limestone, pale yellowish-brown, fine-crystalline
		4,190-4,194	Shale, medium-gray
		4,194-4,197	Dolomite, very pale-orange, silty, calcareous
		4,197-4,215	Shale, medium-gray
		4,215-4,230	Shale, grayish-red
		4,230-4,240	Shale, medium-gray
		4,240-4,245	Shale, grayish-red
		4,245-4,268	Shale, medium-gray
		4,268-4,270	Limestone, medium-gray, silty
		Council Grove Group	
		4,270-4,277	Shale, medium-gray
		4,277-4,283	Siltstone, light-gray, very finely sandy
		4,283-4,300	Sandstone, pale to moderate reddish-brown, very fine- to fine-grained
		4,300-4,310	Sandstone, grayish-red, very fine- to fine-grained, silty, calcareous; some medium grains
		4,310-4,320	Siltstone, moderate reddish-brown, very finely sandy, calcareous
		4,320-4,324	Limestone, medium light-gray, silty
		4,324-4,330	Shale, medium-gray
		4,330-4,336	Shale, grayish-red
		4,336-4,350	Shale, medium-gray
		4,350-4,354	Siltstone, medium light-gray
		4,354-4,357	Shale, medium-gray
		4,357-4,360	Siltstone, medium light-gray
		4,360-4,379	Shale, medium-gray
		4,379-4,385	Siltstone, grayish-red, very finely sandy
		4,385-4,390	Shale, grayish-red
		4,390-4,415	Shale, medium-gray
		4,415-4,418	Limestone, medium dark-gray, very argillaceous
		4,418-4,440	Shale, medium-gray
		4,440-4,455	Siltstone, light- to medium light-gray
		4,455-4,471	Shale, medium-gray
		4,471-4,473	Limestone, brownish-gray, fine-crystalline
		4,473-4,477	Shale, medium-gray
		4,477-4,480	Limestone, pale yellowish-brown, fine-crystalline
		4,480-4,490	Shale, grayish-red
		4,490-4,500	Shale, medium-gray
		4,500-4,510	Sandstone, light-gray, very fine- to fine-grained
		4,510-4,517	Sandstone, grayish-red, very fine- to fine-grained
		4,517-4,520	Shale, grayish-red
		4,520-4,525	Sandstone, light-gray, fine-grained
		4,525-4,530	Shale, medium-gray
		4,530-4,540	Shale, grayish-red
		4,540-4,544	Shale, medium-gray
		4,544-4,552	Limestone, pale yellowish-brown, fine-crystalline; fusulinids
		4,552-4,566	Shale, medium-gray
		4,566-4,580	Shale, grayish-red
		4,580-4,590	Shale, moderate reddish-brown
		4,590-4,600	Sandstone, very light-gray, very fine- to fine-grained, slightly dolomitic; trace of feldspar
		4,600-4,610	Sandstone, pale-red, fine- to medium-grained; some coarse grains; feldspar
		4,610-4,620	Shale, moderate reddish-brown
		4,620-4,625	Limestone, medium-gray, very argillaceous
		4,625-4,634	Shale, medium-gray
		4,634-4,640	Sandstone, light-gray, very fine-grained
		4,640-4,656	Shale, medium-gray
		4,656-4,658	Limestone, pale yellowish-brown, fine-crystalline
		4,658-4,660	Shale, medium-gray
		4,660-4,669	Siltstone, medium light-gray
		4,669-4,680	Sandstone, light-gray, very fine- to fine-grained; scattered black grains
		4,680-4,690	Sandstone as above; slightly calcareous
		4,690-4,700	Sandstone, light-gray, very fine-grained, silty
		4,700-4,710	Shale, medium-gray
		4,710-4,720	Shale, grayish-red
		4,720-4,730	Shale, medium-gray
		4,730-4,745	Shale, grayish-red
		4,745-4,755	Shale, medium-gray
		4,755-4,760	Sandstone, light-gray, very fine-grained, silty
		4,760-4,767	Sandstone, grayish-red, very fine-grained, silty
		4,767-4,780	Shale, grayish-red
		4,780-4,787	Siltstone, light-gray, very finely sandy
		4,787-4,800	Sandstone, light-gray, very fine- to fine-grained; trace of feldspar
		4,800-4,810	Sandstone, light-gray, fine-grained

4,810-4,820	Sandstone, light-gray, fine- to medium-grained; some coarse grains; little feldspar	5,757-5,765	Sandstone, light-gray, very fine- to fine-grained
4,820-4,835	Shale, grayish-red	5,765-5,775	Shale, grayish-red
4,835-4,846	Shale, medium-gray	5,775-5,780	Shale, medium- to medium dark-gray
4,846-4,850	Limestone, medium-gray, argillaceous	5,780-5,785	Limestone, medium dark-gray to brownish-gray, fine-crystalline; spines
4,850-4,863	Shale, medium-gray	5,785-5,789	Limestone, medium-gray, silty
4,863-4,866	Limestone, brownish-gray, fine-crystalline; fusulinids	5,789-5,800	Shale, medium- to medium dark-gray
Admire Group			
4,866-4,875	Shale, medium-gray	5,800-5,804	Limestone, medium-gray, silty
4,875-4,883	Shale, grayish-red	5,804-5,810	Shale, medium- to medium dark-gray
4,883-4,900	Sandstone, pale-red, very fine-grained, silty, slightly calcareous	5,810-5,820	Shale, grayish-red
4,900-4,908	Sandstone, light-gray, fine-grained; trace of feldspar	5,820-5,830	Shale, medium- to medium dark-gray
4,908-4,925	Shale, medium-gray	5,830-5,840	Shale, grayish-red
4,925-4,945	Shale, grayish-red	5,840-5,860	Shale, medium- to medium dark-gray
4,945-4,950	Shale, medium-gray	5,860-5,870	Sandstone, light-gray, very fine-grained
4,950-4,960	Sandstone, light-gray, very fine-grained	5,870-5,900	Shale, medium- to medium dark-gray
4,960-4,970	Shale, medium-gray	5,900-5,918	Sandstone, light-gray, very fine-grained, silty
4,970-4,980	Shale, grayish-red	5,918-5,930	Shale, grayish-red
4,980-4,990	Shale, medium-gray	5,930-5,940	Sandstone, light-gray, very fine- to fine-grained
4,990-5,000	Shale, grayish-red	5,940-5,946	Shale, medium- to medium dark-gray
5,000-5,002	Sandstone, light-gray, very fine-grained	5,946-5,950	Shale, grayish-red
5,002-5,009	Shale, medium dark-gray	5,950-5,954	Shale, medium- to medium dark-gray
5,009-5,022	Sandstone, light-gray, very fine-grained, silty	5,954-5,970	Sandstone, light-gray, fine-grained; some fine- to medium-grained
5,022-5,058	Sandstone, light-gray, very fine- to fine-grained; slightly dolomitic in part	5,970-5,980	Sandstone, light-gray, very fine- to fine-grained
5,058-5,090	Shale, medium dark-gray; trace of coal 5,080-5,082 feet	Pennsylvanian System	
5,090-5,100	Shale, grayish-red	Virgil Series	
5,100-5,113	Shale, medium dark-gray	Wabaunsee Group Equivalent	
5,113-5,125	Sandstone, light-gray, very fine-grained; trace of feldspar	5,980-5,986	Limestone, pale yellowish-brown, fine-crystalline
5,125-5,128	Shale, medium dark-gray	5,986-5,989	Shale, medium- to medium dark-gray
5,128-5,134	Sandstone, light-gray, very fine-grained, silty; trace of feldspar	5,989-5,995	Limestone, pale yellowish-brown, fine-crystalline
5,134-5,142	Shale, medium-gray	5,995-6,020	Shale, medium- to medium dark-gray
5,142-5,145	Sandstone, light-gray, very fine-grained, silty; trace of feldspar	6,020-6,030	Limestone, pale yellowish-brown, fine-crystalline
5,145-5,157	Shale, grayish-red	6,030-6,040	Shale, medium- to medium dark-gray
5,157-5,167	Shale, medium-gray	6,040-6,055	Sandstone, light-gray, very fine-grained, silty
5,167-5,175	Sandstone, light-gray, very fine- to fine-grained	6,055-6,065	Shale, grayish-red
5,175-5,180	Siltstone, medium-gray, very finely sandy	6,065-6,076	Shale, medium- to medium dark-gray
5,180-5,186	Shale, medium-gray	6,076-6,082	Siltstone, olive-gray
5,186-5,189	Sandstone, light-gray, very fine-grained, silty	6,082-6,090	Siltstone, olive-gray, very finely sandy
5,189-5,190	Shale, medium-gray	6,090-6,095	Shale, medium- to medium dark-gray
5,190-5,192	Sandstone, light-gray, very fine-grained, silty	6,095-6,105	Siltstone, medium light-gray, very finely sandy
5,192-5,195	Shale, medium-gray	6,105-6,113	Sandstone, light-gray, very fine-grained, silty
5,195-5,210	Sandstone, light-gray, fine-grained, slightly dolomitic	6,113-6,135	Sandstone, light-gray, fine-grained, slightly dolomitic; some fine- to medium-grained sandstone
5,210-5,232	Sandstone, light-gray, very fine- to fine-grained; trace of feldspar?	6,135-6,140	Sandstone, light-gray, very fine-grained, silty
5,232-5,250	Shale, grayish-red	6,140-6,144	Limestone, brownish-gray, fine-crystalline, slightly silty
5,250-5,278	Shale, medium- to medium dark-gray	6,144-6,150	Shale, medium- to medium dark-gray
5,278-5,291	Siltstone, medium light-gray, very finely sandy	6,150-6,169	Siltstone, light- to medium light-gray, very finely sandy
5,291-5,304	Shale, medium- to medium dark-gray	6,169-6,174	Sandstone, light-gray, very fine-grained, silty
5,304-5,344	Sandstone, light-gray, very fine- to fine-grained	6,174-6,190	Sandstone, light-gray, very fine-grained
5,344-5,354	Shale, grayish-red	6,190-6,193	Shale, medium- to medium dark-gray
5,354-5,383	Shale, medium- to medium dark-gray	6,193-6,196	Sandstone, light-gray, very fine-grained, silty
5,383-5,387	Sandstone, light-gray, very fine-grained	6,196-6,200	Siltstone, light-gray, very finely sandy
5,387-5,393	Siltstone, medium light-gray	6,200-6,206	Sandstone, light-gray, very fine- to fine-grained
5,393-5,410	Sandstone, light-gray, fine-grained	6,206-6,245	Shale, medium- to medium dark-gray
5,410-5,426	Shale, medium- to medium dark-gray	6,245-6,260	Siltstone, medium light-gray, very finely sandy
5,426-5,428	Limestone, pale yellowish-brown, fine-crystalline	6,260-6,290	Shale, medium- to medium dark-gray
5,428-5,435	Siltstone, medium light-gray, very finely sandy	6,290-6,313	Sandstone, light-gray, very fine- to fine-grained, slightly dolomitic
5,435-5,444	Shale, medium- to medium dark-gray	6,313-6,325	Shale, medium- to medium dark-gray; trace of coal at base; caving?
5,444-5,447	Limestone, brownish-gray, fine-crystalline	6,325-6,336	Siltstone, medium light-gray
5,447-5,480	Shale, medium- to medium dark-gray	6,336-6,366	Sandstone, light-gray, fine- to medium-grained
5,480-5,490	Shale, greenish-gray	6,366-6,415	Shale, medium- to medium dark-gray
5,490-5,499	Shale, medium- to medium dark-gray	6,415-6,422	Limestone, pale yellowish-brown, fine-crystalline
5,499-5,515	Sandstone, light-gray, fine-grained; some fine- to medium-grained; trace of feldspar	6,422-6,427	Shale, medium- to medium dark-gray
5,515-5,520	Shale, medium- to medium dark-gray	6,427-6,430	Limestone, medium-gray, fine-crystalline
5,520-5,540	Sandstone, light-gray, very fine- to fine-grained; trace of feldspar	6,430-6,446	Siltstone, medium-gray, very finely sandy
5,540-5,549	Shale, medium- to medium dark-gray	6,446-6,456	Shale, medium- to medium dark-gray
5,549-5,550	Limestone, medium-gray, fine-crystalline	6,456-6,460	Siltstone, medium light-gray, very finely sandy, slightly calcareous
5,550-5,570	Shale, medium- to medium dark-gray	6,460-6,490	Shale, medium- to medium dark-gray
5,570-5,590	Shale, grayish-red	6,490-6,500	Shale, grayish-black
5,590-5,600	Shale, medium- to medium dark-gray	6,500-6,538	Shale, medium- to medium dark-gray
5,600-5,613	Sandstone, light-gray, fine-grained	6,538-6,541	Limestone, brownish-gray, fine-crystalline
5,613-5,616	Limestone, medium light-gray, fine-crystalline, slightly argillaceous	6,541-6,548	Limestone, medium-gray, fine-crystalline, argillaceous
5,616-5,630	Shale, medium- to medium dark-gray	6,548-6,556	Shale, medium- to medium dark-gray
5,630-5,640	Shale, grayish-red	6,556-6,572	Sandstone, light-gray, very fine-grained, silty
5,640-5,658	Shale, medium- to medium dark-gray	6,572-6,580	Shale, medium- to medium dark-gray
5,658-5,660	Limestone, medium-gray, fine-crystalline	6,580-6,585	Limestone, dark-gray, fine-crystalline, slightly argillaceous
5,660-5,665	Shale, medium- to medium dark-gray	6,585-6,612	Shale, medium- to medium dark-gray
5,665-5,674	Limestone, pale yellowish-brown, fine-crystalline	6,612-6,625	Sandstone, light-gray, very fine-grained
5,674-5,677	Shale, medium- to medium dark-gray	6,625-6,640	Shale, medium- to medium dark-gray
5,677-5,680	Limestone, pale yellowish-brown, fine-crystalline	6,640-6,660	Shale, grayish-black
5,680-5,685	Shale, medium- to medium dark-gray	6,660-6,670	Shale, medium-gray
5,685-5,695	Shale, grayish-red	6,670-6,680	Shale, grayish-red
5,695-5,705	Shale, medium- to medium dark-gray	6,680-6,710	Shale, medium- to medium dark-gray
5,705-5,709	Sandstone, light-gray, very fine- to fine-grained	6,710-6,720	Shale, grayish-black
5,709-5,712	Shale, medium- to medium dark-gray	6,720-6,740	Shale, medium- to medium dark-gray
5,712-5,743	Sandstone, light-gray, very fine- to fine-grained	6,740-6,750	Shale, grayish-black
5,743-5,757	Shale, medium- to medium dark-gray	6,750-6,780	Shale, medium- to medium dark-gray
		6,780-6,790	Shale, olive-gray
		6,790-6,800	Shale, medium- to medium dark-gray
		6,800-6,810	Shale, grayish-black

6,810-6,866	Shale, medium- to medium dark-gray	7,927-7,935	Sandstone, light-gray, very fine-grained, silty
6,866-6,876	Siltstone, light- to medium light-gray, very finely sandy	7,935-7,940	Shale, medium-gray
6,876-6,900	Shale, medium- to medium dark-gray	7,940-7,946	Siltstone, medium light-gray
6,900-6,910	Limestone, brownish-gray to pale yellowish-brown, fine-crystalline; slightly argillaceous in part	7,946-7,969	Shale, medium dark-gray
6,910-6,913	Shale, medium- to medium dark-gray	7,969-7,976	Sandstone, light-gray, very fine-grained, silty
6,913-6,916	Limestone, brownish-gray to pale yellowish-brown, fine-crystalline; slightly argillaceous in part	7,976-7,985	Siltstone, medium light-gray
6,916-6,935	Shale, medium- to medium dark-gray	7,985-7,993	Shale, medium-gray
6,935-6,940	Siltstone, medium light-gray, slightly calcareous	7,993-7,998	Siltstone, medium light-gray
6,940-6,957	Shale, medium- to medium dark-gray	7,998-8,005	Shale, medium-gray
6,957-6,960	Sandstone, light-gray, very fine- to fine-grained	8,005-8,016	Sandstone, very light-gray, very fine-grained
6,960-6,961	Shale, medium- to medium dark-gray	8,016-8,025	Shale, medium-gray
6,961-6,976	Sandstone, light-gray, very fine- to fine-grained	8,025-8,030	Sandstone, light olive-gray, very fine-grained, silty
6,976-6,997	Shale, medium- to medium dark-gray	8,030-8,050	Sandstone, light-gray to light olive-gray, very fine-grained, very silty, slightly calcareous and micaceous
6,997-7,001	Siltstone, medium-gray	8,050-8,060	Shale, medium-gray
7,001-7,004	Limestone, brownish-gray, fine-crystalline	8,060-8,076	Siltstone, medium light-gray
7,004-7,010	Shale, medium- to medium dark-gray	8,076-8,080	Sandstone, light-gray, very fine- to fine-grained
7,010-7,038	Sandstone, light-gray, fine-grained	8,080-8,090	Sandstone as above; trace of glauconite
7,038-7,042	Shale, medium- to medium dark-gray	8,090-8,100	Shale, medium-gray
7,042-7,105	Sandstone, light-gray, very fine- to fine-grained; trace of glauconite	8,100-8,110	Sandstone, very light-gray, very fine- to fine-grained
7,105-7,120	Sandstone, light-gray, very fine-grained, silty	8,110-8,130	Siltstone, medium light-gray, very finely sandy
7,120-7,140	Shale, medium- to medium dark-gray	8,130-8,144	Sandstone, very light-gray, very fine- to fine-grained
7,140-7,150	Limestone, brownish-gray to medium-gray, fine-crystalline, slightly argillaceous	8,144-8,152	Siltstone, medium-gray
7,150-7,155	Limestone, brownish-gray to medium-gray, fine-crystalline	8,152-8,164	Limestone, grayish-brwn to dark-gray, dense, argillaceous
7,155-7,168	Shale, medium- to medium dark-gray	8,164-8,175	Shale, medium dark-gray
7,168-7,170	Limestone, medium dark-gray, argillaceous	8,175-8,176	Coal; caving?
7,170-7,178	Shale, medium- to medium dark-gray	8,176-8,190	Shale, medium dark-gray
7,178-7,180	Limestone, medium dark-gray, argillaceous	8,190-8,200	Siltstone, medium-gray
7,180-7,187	Shale, medium- to medium dark-gray	8,200-8,225	Shale, medium dark- to dark-gray
7,187-7,193	Siltstone, medium light-gray	8,225-8,270	Shale as above; silty
7,193-7,199	Shale, medium- to medium dark-gray	8,270-8,285	Sandstone, light- to medium light-gray, very fine- to fine-grained, calcareous
7,199-7,202	Siltstone, medium light-gray	8,285-8,305	Siltstone, medium-gray
7,202-7,210	Shale, medium- to medium dark-gray	8,305-8,310	Sandstone, light-gray to very pale-orange, fine-grained, very calcareous
7,210-7,213	Limestone, brownish-gray, fine-crystalline	8,310-8,318	Sandstone, pale yellowish-brown, fine- to medium-grained, very calcareous
7,213-7,270	Shale, medium- to medium dark-gray	8,318-8,320	Limestone, medium dark-gray, medium-oolitic; oolites have sand centers
Shawnee Group Equivalent		8,320-8,375	No samples
7,270-7,275	Limestone, brownish-gray to pale yellowish-brown, fine-crystalline	8,375-8,380	Sandstone, light-gray, very fine-grained, silty, slightly micaceous
7,275-7,280	Siltstone, medium light-gray	8,380-8,515	No samples From electrical log: 8,495-8,515 Sandstone
7,280-7,300	Shale, medium- to medium dark-gray	8,515-8,520	Sandstone, medium light-gray, very fine-grained, silty, calcareous, tight
7,300-7,310	Siltstone, medium light-gray, very finely sandy	8,520-8,540	No samples From electrical log: 8,520-8,535 Sandstone 8,535-8,540 Shale
7,310-7,328	Sandstone, light-gray, very fine-grained	8,540-8,545	Siltstone, medium-gray, very tight
7,328-7,350	Shale, medium- to medium dark-gray	8,545-8,555	No samples From electrical log: Shale
7,350-7,356	Siltstone, dark-gray, calcareous	8,555-8,565	Shale, dark-gray
7,356-7,385	Shale, medium- to medium dark-gray	8,565-8,580	Siltstone, medium-gray, very tight
7,385-7,402	Siltstone, medium dark-gray	8,580-8,603	Siltstone, medium light- to medium-gray, very finely sandy
7,402-7,408	Shale, medium- to medium dark-gray	8,603-8,660	Shale, medium dark- to dark-gray, silty
7,408-7,414	Limestone, brownish-gray, very fine-crystalline	8,660-8,720	Shale, dark-gray, slightly silty
7,414-7,434	Shale, medium- to medium dark-gray	8,720-8,810	Shale, dark-gray
7,434-7,465	Siltstone, medium light-gray, slightly calcareous	8,810-8,830	Shale, grayish-black
7,465-7,480	Shale, medium- to medium dark-gray	8,830-8,840	Shale, dark-gray
7,480-7,502	Sandstone, light-gray, very fine- to fine-grained, slightly calcareous	8,840-8,860	Shale, grayish-black
7,502-7,521	Shale, medium- to medium dark-gray	8,860-8,910	Shale, dark-gray
7,521-7,536	Limestone, brownish-gray, fine-crystalline	8,910-8,953	Shale, dark-gray, silty
7,536-7,555	Siltstone, medium light- to medium-gray	8,953-8,970	Sandstone, medium light-gray, very fine- to fine-grained, slightly calcareous, tight
7,555-7,565	Shale, medium- to medium dark-gray	8,970-9,017	Sandstone, medium light-gray, fine- to medium-grained, slightly calcareous
7,565-7,575	Sandstone, light-gray, very fine-grained		
7,575-7,590	Shale, medium- to medium dark-gray		
7,590-7,598	Sandstone, light-gray, very fine-grained		
7,598-7,606	Shale, medium-gray		
7,606-7,620	Sandstone, medium light-gray, very fine-grained, silty		
7,620-7,630	Siltstone, medium light- to medium-gray, very finely sandy		
7,630-7,640	Shale, medium- to medium dark-gray		
7,640-7,656	Siltstone, medium light-gray, very finely sandy		
7,656-7,667	Shale, medium- to medium dark-gray		
7,667-7,674	Sandstone, medium light-gray, very fine-grained, silty, tight		
7,674-7,677	Shale, medium- to medium dark-gray		
7,677-7,687	Sandstone, medium light-gray, very fine-grained, silty, tight		
7,687-7,700	Shale, dark-gray, silty		
7,700-7,795	Shale, medium dark- to dark-gray		
7,795-7,800	Siltstone, medium-gray		
7,800-7,825	Sandstone, light-gray, very fine-grained, silty, slightly dolomitic		
7,825-7,840	Shale, medium dark-gray		
7,840-7,846	Sandstone, light- to medium light-gray, very fine-grained, silty		
7,846-7,855	Shale, medium dark-gray		
7,855-7,860	Sandstone, light- to medium light-gray, very fine-grained, silty		
7,860-7,868	Limestone, medium dark- to dark-gray, fine-crystalline, argillaceous; fusulinids; some brownish limestone		
7,868-7,878	Shale, medium dark-gray		
7,878-7,880	Coal		
7,880-7,910	Shale, medium-gray		
7,910-7,920	Siltstone, medium-gray to greenish-gray		
7,920-7,923	Limestone, brownish-gray to greenish-gray, argillaceous		
7,923-7,927	Shale, medium dark-gray		
		9,017-9,050	Shale, medium dark- to dark-gray, micaceous
		9,050-9,068	Shale, medium dark-gray, silty, micaceous
		9,068-9,100	Shale, medium dark-gray, silty
		9,100-9,190	Shale, medium dark-gray
		9,190-9,230	Shale, medium dark-gray, silty, micaceous
			Missouri Series
			Ochelata Group
			Lansing Group Equivalent
		9,230-9,250	Sandstone, medium light-gray, very fine- to fine-grained, slightly calcareous; few medium grains
		9,250-9,260	Sandstone as above; trace of black coarse chert fragments
		9,260-9,268	Sandstone, medium light-gray, very fine-grained
		9,268-9,280	Siltstone, medium light-gray, very finely sandy
		9,280-9,298	Sandstone, light-gray, fine- to medium-grained
		9,298-9,302	Siltstone, medium light-gray, very finely sandy
		9,302-9,310	Sandstone, light-gray, very fine-grained, silty; trace of glauconite
		9,310-9,318	Siltstone, light-gray, very finely sandy
		9,318-9,320	Sandstone, light-gray, very fine-grained, silty
		9,320-9,335	Siltstone, light-gray, very finely sandy
		9,335-9,360	Sandstone, light-gray, very fine-grained, very silty slightly dolomitic

9,360- 9,365 Siltstone, light-gray, very finely sandy
 9,365- 9,373 Sandstone, light-gray, very fine-grained, silty, slightly dolomitic
 9,373- 9,380 Shale, medium dark-gray
 9,380- 9,410 Sandstone, medium light-gray, very fine-grained, tight
 9,410- 9,420 Shale, medium dark-gray
 9,420- 9,427 Siltstone, medium-gray
 9,427- 9,433 Shale, medium dark-gray
 9,433- 9,445 Sandstone, medium light-gray, very fine-grained, tight
 9,445- 9,450 Shale, medium dark-gray
 9,450- 9,463 Sandstone, medium-gray, very fine-grained, silty, tight

Kansas City Group Equivalent

9,463- 9,470 Shale, medium dark-gray
 9,470- 9,480 Shale, grayish-black
 9,480- 9,484 Shale, medium dark-gray
 9,484- 9,495 Shale, medium dark-gray, silty
 9,495- 9,517 Siltstone, medium-gray
 9,517- 9,530 Shale, medium dark-gray
 9,530- 9,545 Sandstone, medium light-gray, very fine- to fine-grained, calcareous
 9,545- 9,555 Siltstone, medium light-gray, very finely sandy, calcareous
 9,555- 9,563 Siltstone, medium dark-gray
 9,563- 9,568 Siltstone, medium light-gray, very finely sandy, calcareous
 9,568- 9,595 Shale, dark-gray, silty
 9,595- 9,632 Shale, medium dark-gray, silty, calcareous
 9,632- 9,645 Sandstone, medium light-gray, medium- to coarse-grained, calcareous; medium dark-gray to black coarse to very coarse detrital chert; trace of glauconite?
 9,645- 9,740 Shale, medium dark-gray, silty
 9,740- 9,800 Siltstone, medium dark-gray
 9,800- 9,850 Shale, medium dark-gray, silty, slightly micaceous
 9,850- 9,863 Shale, medium dark-gray
 9,863- 9,874 Shale, grayish-black

Skiatook Group

9,874- 9,890 Siltstone, medium light- to medium-gray, very finely sandy, slightly calcareous
 9,890- 9,898 Sandstone, medium light-gray, very fine-grained, silty, slightly calcareous, tight
 9,898- 9,904 Siltstone, medium-gray
 9,904- 9,916 Sandstone, medium-gray, very fine-grained, silty, slightly calcareous, tight
 9,916- 9,925 Shale, grayish-black
 9,925- 9,935 Shale, medium dark-gray
 9,935- 9,940 Shale, grayish-black
 9,940- 9,946 Shale, medium dark-gray
 9,946- 9,960 Sandstone, medium light-gray, very fine- to fine-grained, calcareous
 9,960- 9,970 Shale, medium dark-gray
 9,970- 10,000 Shale, grayish-black
 10,000- 10,040 Shale, medium dark-gray
 10,040- 10,056 Sandstone, medium light- to medium-gray, very fine-grained, silty, calcareous
 10,056- 10,086 Siltstone, medium dark-gray
 10,086- 10,090 Shale, grayish-black
 10,090- 10,105 Shale, medium dark-gray
 10,105- 10,110 Siltstone, medium- to medium dark-gray, slightly calcareous, very finely sandy
 10,110- 10,125 Siltstone, medium- to medium dark-gray, slightly calcareous
 10,125- 10,130 Siltstone as above; very finely sandy
 10,130- 10,200 Siltstone, medium dark- to dark-gray, slightly calcareous; some dark-gray shale
 10,200- 10,212 Siltstone, medium light- to medium-gray, very finely sandy, slightly calcareous
 10,212- 10,216 Sandstone, medium light-gray, very fine-grained, silty, slightly calcareous
 10,216- 10,222 Limestone, medium dark-gray, fine- to medium-sandy; crinoids; spines; trace of glauconite
 10,222- 10,250 Siltstone, medium light-gray, slightly calcareous
 10,250- 10,278 Shale, medium dark-gray
 10,278- 10,285 Shale, grayish-black
 10,285- 10,290 Siltstone, medium light-gray, very finely sandy, slightly calcareous
 10,290- 10,294 Siltstone, medium light-gray
 10,294- 10,321 Shale, medium dark-gray

Hogshooter? Limestone 10,321-10,395 feet

10,321- 10,330 Limestone, medium dark-gray, argillaceous; crinoids; other fossils
 10,330- 10,340 Shale, medium dark-gray
 10,340- 10,356 Shale, grayish-black
 10,356- 10,388 Shale, medium dark-gray
 10,388- 10,392 Limestone, medium-gray, very fine-crystalline, argillaceous
 10,392- 10,395 Limestone, medium-gray, very fine-crystalline
 10,395- 10,402 Sandstone, dark-gray, very fine- to fine-grained, argillaceous, calcareous

10,402- 10,408 Shale, grayish-black
 10,408- 10,425 Shale, medium dark-gray
 10,425- 10,430 Siltstone, medium-gray, very finely sandy, slightly calcareous
 10,430- 10,435 Sandstone, light-gray, very fine-grained, silty, slightly calcareous
 10,435- 10,440 Siltstone, medium-gray, very finely sandy, slightly calcareous
 10,440- 10,456 Siltstone, medium dark-gray
 10,456- 10,473 Siltstone, medium-gray, very finely sandy, slightly calcareous
 10,473- 10,520 Shale, medium dark-gray, silty
 10,520- 10,534 Shale, grayish-black
 10,534- 10,558 Shale, medium dark-gray
 10,558- 10,563 Sandstone, medium dark-gray, fine-grained, very calcareous; some medium grains
 10,563- 10,569 Sandstone, medium light-gray, fine-grained, calcareous
 10,569- 10,576 Siltstone, medium light-gray, very finely sandy, slightly calcareous, tight
 10,576- 10,590 Sandstone, very light-gray, very fine-grained, silty; calcareous in part
 10,590- 10,597 Sandstone, very light-gray, fine-grained, calcareous; some medium grains
 10,597- 10,600 Shale, medium dark-gray
 10,600- 10,607 Shale, grayish-black
 10,607- 10,618 Siltstone, medium-gray, very finely sandy; slightly greenish in part
 10,618- 10,626 Limestone, medium dark-gray, very finely sandy, silty; slightly brownish
 10,626- 10,630 Sandstone, light-gray, very fine-grained, silty
 10,630- 10,638 Sandstone, medium light-gray to brownish-gray, fine-grained, calcareous; crinoids; trace of glauconite?
 10,638- 10,643 Sandstone as above; few fine to medium oolites
 10,643- 10,659 Shale, medium dark-gray
 10,659- 10,662 Siltstone, medium dark-gray, very finely sandy, slightly calcareous; glauconite
 10,662- 10,667 Limestone, medium dark-gray, silty, very finely sandy; few medium oolites
 10,667- 10,670 Limestone, medium dark-gray, fine-crystalline, medium oolitic
 10,670- 10,677 Limestone, medium-gray to brownish-gray, fine-crystalline
 10,677- 10,680 Shale, medium dark-gray
 10,680- 10,687 Limestone, medium dark-gray, fine-crystalline, slightly argillaceous
 10,687- 10,693 Limestone, medium dark-gray, granular, silty
 10,693- 10,700 Limestone, medium dark-gray, fine-crystalline, slightly argillaceous
 10,700- 10,712 Limestone, medium dark- to dark-gray, fine-crystalline, fine- to medium-sandy; oolites? crinoids
 10,712- 10,730 Shale, medium dark-gray
 10,730- 10,740 Shale, grayish-black
 10,740- 10,746 Shale, medium dark-gray
 10,746- 10,756 Shale, grayish-black
 10,756- 10,760 Sandstone, dark-gray, fine-grained, calcareous, very tight
 10,760- 10,766 Shale, grayish-black
 10,766- 10,780 Sandstone, light-gray to very pale-orange, very fine-grained, silty, calcareous
 10,780- 10,792 Sandstone, light-gray, very fine-grained, silty, slightly calcareous

Pleasanton Group Equivalent
(Pleasanton Formation Equivalent on Chart OC-61)

10,792- 10,805 Siltstone, medium-gray
 10,805- 10,889 Shale, dark-gray

Des Moines Series
Deese Formation 10,889-12,720 feet

10,889- 10,896 Limestone, medium dark-gray, fine-crystalline, argillaceous; fossils
 10,896- 10,905 Limestone, medium dark-gray to brownish-gray, fine- to medium-sandy; glauconite; crinoids; few coarse angular grains
 10,905- 10,918 Sandstone, medium light-gray, very fine- to fine-grained, calcareous; trace of glauconite
 10,918- 10,930 Siltstone, medium light-gray, very finely sandy, slightly calcareous
 10,930- 10,960 Shale, medium- to medium dark-gray, silty
 10,960- 10,980 Shale, dark-gray
 10,980- 10,990 Shale, grayish-black
 10,990- 11,000 Shale, dark-gray
 11,000- 11,010 Shale, grayish-black
 11,010- 11,050 Shale, dark-gray
 11,050- 11,055 Shale, greenish-gray
 11,055- 11,060 Shale, dark-gray
 11,060- 11,070 Shale, grayish-black
 11,070- 11,100 Shale, dark-gray
 11,100- 11,110 Shale, grayish-black
 11,110- 11,143 Shale, dark-gray
 11,143- 11,147 Siltstone, greenish-gray
 11,147- 11,152 Shale, medium dark-gray

11,152-11,156	Sandstone, light-gray, very fine-grained, silty	12,140-12,150	Shale, grayish-black
11,156-11,180	Siltstone, medium light- to medium-gray	12,150-12,160	Shale, dark-gray
11,180-11,185	Shale, medium dark-gray	12,160-12,183	Shale, black, chunky; nonbedded?
11,185-11,194	Siltstone, medium light-gray	12,183-12,191	Siltstone, medium-gray, slightly calcareous
11,194-11,204	Sandstone, medium light-gray to brownish-gray, fine-grained, calcareous		slightly micaceous
11,204-11,210	Siltstone, light-gray, very finely sandy	12,191-12,194	Shale, medium dark-gray
11,210-11,215	Siltstone, medium-gray, very finely sandy	12,194-12,212	Siltstone, medium light-gray, very finely sandy; calcareous in part
11,215-11,217	Shale, medium dark-gray		
11,217-11,227	Sandstone, light-gray, very fine-grained	12,212-12,218	Shale, medium dark-gray
11,227-11,243	Shale, medium dark-gray	12,218-12,226	Siltstone, medium-gray, very finely sandy
11,243-11,250	Siltstone, medium light-gray, very finely sandy, tight	12,226-12,228	Shale, medium dark-gray
11,250-11,258	Siltstone, medium dark-gray	12,228-12,233	Siltstone, medium light-gray, very finely sandy
11,258-11,270	Shale, medium dark-gray	12,233-12,242	Shale, medium dark-gray, silty
11,270-11,275	Sandstone, medium light-gray, very fine-grained, silty, slightly calcareous	12,242-12,253	Siltstone, medium-gray
11,275-11,287	Sandstone, light-gray, very fine-grained, silty	12,253-12,262	Siltstone, medium light-gray, very finely sandy
11,287-11,293	Siltstone, medium-gray, very finely sandy	12,262-12,273	Siltstone, medium- to medium dark-gray
11,293-11,315	Shale, grayish-black	12,273-12,300	Shale, medium dark-gray, silty
11,315-11,340	Shale, medium dark- to dark-gray, silty	12,300-12,360	Shale, dark-gray
11,340-11,348	Siltstone, medium-gray, very finely sandy	12,360-12,370	Shale, grayish-black
11,348-11,363	Shale, dark-gray, silty	12,370-12,395	Shale, dark-gray
11,363-11,438	Shale, medium dark- to dark-gray	12,395-12,403	Shale, grayish-black
11,438-11,454	Sandstone, medium light-gray, very fine- to fine-grained, calcareous; trace of glauconite	12,403-12,407	Shale, medium dark- to dark-gray, calcareous, fossiliferous; resembles argillaceous limestone
11,454-11,466	Shale, medium dark-gray	12,407-12,414	Shale, grayish-black
11,466-11,476	Sandstone, medium light-gray, very fine-grained, silty, slightly calcareous	12,414-12,418	Shale, medium dark- to dark-gray, calcareous, fossiliferous; resembles argillaceous
11,476-11,490	Shale, medium dark-gray	12,418-12,420	Shale, grayish-black
11,490-11,500	Shale, grayish-black	12,420-12,427	Shale, medium dark- to dark-gray, calcareous, fossiliferous; resembles argillaceous limestone
11,500-11,516	Shale, medium dark-gray	12,427-12,436	Shale, medium dark-gray
11,516-11,528	Siltstone, medium light- to medium-gray, very finely sandy, slightly calcareous	12,436-12,442	Limestone, dark-gray, very fine-crystalline, argillaceous
11,528-11,545	Sandstone, light- to medium light-gray, very fine-grained, silty	12,442-12,450	Shale, grayish-black
11,545-11,553	Shale, medium dark-gray	12,450-12,459	Shale, medium dark-gray
11,553-11,563	Siltstone, medium-gray, slightly calcareous	12,459-12,461	Limestone, medium dark-gray, fine-crystalline
11,563-11,573	Shale, medium dark-gray	12,461-12,464	Shale, medium dark-gray
11,573-11,580	Siltstone, medium-gray, very finely sandy, tight	12,464-12,470	Siltstone, light- to medium light-gray, slightly calcareous
11,580-11,585	Shale, medium dark-gray	12,470-12,481	Siltstone, medium dark-gray
11,585-11,595	Shale, grayish-black	12,481-12,530	Shale, dark-gray
11,595-11,600	Shale, medium dark-gray	12,530-12,547	Shale, grayish-black
11,600-11,605	Siltstone, medium-gray	12,547-12,553	Siltstone, medium dark-gray, very finely sandy
11,605-11,610	Siltstone, medium light-gray, slightly greenish, tight	12,553-12,583	Shale, medium dark-gray
11,610-11,620	Sandstone, light-gray, very fine-grained, silty	12,583-12,587	Limestone, olive-gray, very fine- to fine-crystalline, silty
11,620-11,622	Shale, medium dark-gray	12,587-12,593	Siltstone, olive-gray, calcareous
11,622-11,627	Sandstone, light-gray, very fine-grained, silty	12,593-12,607	Shale, medium dark-gray
11,627-11,630	Shale, medium dark-gray	12,607-12,613	Siltstone, medium dark-gray, calcareous, very finely sandy
11,630-11,638	Shale, grayish-black	12,613-12,620	Shale, medium dark-gray
11,638-11,647	Sandstone, light-gray, very fine-grained, silty	12,620-12,630	Shale, grayish-black
11,647-11,650	Shale, medium dark-gray	12,630-12,633	Shale, medium dark-gray
11,650-11,680	Sandstone, light- to medium light-gray, very fine-grained	12,633-12,638	Siltstone, medium-gray, very finely sandy, slightly calcareous
11,680-11,686	Shale, grayish-black	12,638-12,640	Shale, medium dark-gray
11,686-11,690	Siltstone, medium-gray	12,640-12,645	Sandstone, medium light-gray, very fine-grained, silty, calcareous
11,690-11,700	Shale, medium dark-gray	12,645-12,650	Siltstone, medium-gray, very finely sandy, slightly calcareous
11,700-11,705	Siltstone, medium-gray	12,650-12,658	Shale, medium dark-gray, silty
11,705-11,715	Sandstone, light-gray, very fine-grained, silty	12,658-12,672	Shale, grayish-black; trace of coal 12,662-12,664 feet
11,715-11,722	Siltstone, medium-gray	12,672-12,690	Siltstone, medium-gray, very finely sandy, slightly calcareous; medium-gray siltstone
11,722-11,730	Shale, medium dark-gray	12,690-12,720	Sandstone, medium light-gray, very fine-grained, silty
11,730-11,748	Shale, grayish-black		
11,748-11,757	Limestone, grayish-black, dense to very fine-crystalline, dolomitic, argillaceous		
11,757-11,762	Limestone, grayish-black, fine-crystalline		
11,762-11,768	Limestone, medium dark-gray, fine-crystalline, silty, dolomitic		
11,768-11,776	Shale, medium dark-gray		
11,776-11,793	Shale, grayish-black		
11,793-11,800	Siltstone, medium dark-gray		
11,800-11,816	Sandstone, light-gray, very fine-grained, silty	12,720-12,750	Siltstone, medium dark-gray
11,816-11,822	Shale, grayish-black	12,750-12,775	Shale, medium dark-gray, silty
11,822-11,830	Siltstone, medium dark-gray, calcareous, micaceous	12,775-12,783	Shale, grayish-black
11,830-11,832	Shale, medium dark-gray; coal stringers	12,783-12,793	Siltstone, medium dark-gray
11,832-11,840	Siltstone, medium-gray	12,793-12,820	Shale, medium dark- to dark-gray
11,840-11,866	Siltstone, medium light- to medium-gray, very finely sandy, slightly micaceous	12,820-12,835	Shale, grayish-black
11,866-11,870	Shale, medium dark-gray	12,835-12,890	Shale, medium dark- to dark-gray
11,870-11,890	Siltstone, medium light- to medium-gray, very finely sandy, slightly calcareous, slightly micaceous	12,890-12,900	Shale, grayish-black
11,890-11,900	Siltstone, black, very carbonaceous, micaceous	12,900-12,960	Shale, medium dark- to dark-gray
11,900-11,910	Siltstone, medium dark-gray, micaceous	12,960-12,980	Shale, grayish-black
11,910-11,937	Shale, medium dark-gray, silty	12,980-12,995	Shale, medium dark- to dark-gray
11,937-11,940	Siltstone, medium light-gray, slightly calcareous	12,995-13,005	Shale, grayish-black
11,940-11,988	Shale, dark-gray	13,005-13,010	Shale, medium dark- to dark-gray
11,988-11,990	Limestone, dark-gray, argillaceous	13,010-13,013	Limestone, medium dark-gray, very fine-crystalline, very argillaceous
11,990-12,010	Shale, dark-gray; trace of coal in lower half; caving?	13,013-13,020	Shale, medium dark-gray
12,010-12,023	Limestone, dark-gray, very silty; calcareous siltstone	13,020-13,030	Shale, grayish-black
12,023-12,038	Siltstone, medium dark- to dark-gray	13,030-13,050	Shale, dark-gray
12,038-12,040	Coal; caving?	13,050-13,056	Shale, grayish-black
12,040-12,058	Siltstone, medium dark-gray	13,056-13,085	Shale, dark-gray; pelecypods? 13,070-13,080 feet
12,058-12,060	Coal	13,085-13,090	Shale, grayish-black
12,060-12,067	Siltstone, medium light- to medium-gray, calcareous	13,090-13,120	Shale, medium dark-gray
12,067-12,070	Shale, grayish-black	13,120-13,121	Limestone, medium dark-gray, fine-crystalline
12,070-12,095	Siltstone, dark-gray, very calcareous	13,121-13,124	Shale, medium dark-gray
12,095-12,125	Shale, dark-gray	13,124-13,127	Limestone, dark-gray to grayish-black, fine-crystalline, very argillaceous
12,125-12,135	Shale, dark-gray, calcareous, silty	13,127-13,136	Limestone, medium dark-gray, fine-crystalline
12,135-12,140	Shale, dark-gray	13,136-13,139	Shale, medium dark-gray

13,139-13,141	Limestone, medium dark-gray, fine-crystalline, silty	13,573-13,580	Sandstone, medium-gray, very fine-grained, calcareous; brown spots and streaks
13,141-13,148	Shale, medium dark-gray	13,580-13,587	Sandstone, medium-gray, very fine- to fine-grained, calcareous; much light-green glauconite
13,148-13,150	Limestone, medium dark-gray, fine-crystalline, silty	13,587-13,590	Sandstone as above; very calcareous
13,150-13,156	Shale, grayish-black	13,590-13,596	Limestone, medium-gray, very finely sandy, glauconitic
13,156-13,164	Limestone, grayish-black, fine-crystalline, argillaceous, silty	13,596-13,601	Sandstone, medium dark-gray, very fine-grained, calcareous, very glauconitic
13,164-13,174	Shale, grayish-black	13,601-13,605	Limestone, medium dark-gray, very fine-crystalline; trace of glauconite
13,174-13,177	Limestone, medium dark-gray, fine-crystalline	13,605-13,609	Shale, medium dark-gray, calcareous, glauconitic
13,177-13,180	Shale, medium dark-gray	13,609-13,614	Shale, medium dark-gray
13,180-13,183	Limestone, grayish-black, fine-crystalline, argillaceous	13,614-13,620	Siltstone, medium dark- to dark-gray, very finely sandy, slightly calcareous, very glauconitic
13,183-13,196	Limestone, medium dark-gray, fine-crystalline; fusulinids; spines	13,620-13,625	Sandstone, medium-gray, very fine-grained, silty, calcareous, slightly glauconitic
13,196-13,200	Shale, grayish-black	13,625-13,630	Sandstone, medium light-gray, very fine-grained, silty, slightly calcareous
13,200-13,207	Shale, medium dark-gray	13,630-13,640	Sandstone, light- to medium light-gray, very fine-grained, calcareous, very glauconitic
13,207-13,210	Limestone, dark-gray to grayish-black, fine-crystalline, argillaceous	13,640-13,643	Sandstone as above but less glauconitic
13,210-13,213	Limestone, medium dark-gray, fine-crystalline; fusulinids	13,643-13,647	Siltstone, grayish-black, very finely sandy, very glauconitic
13,213-13,218	Shale, medium dark-gray	13,647-13,660	Sandstone, medium-gray, fine-grained, calcareous, very glauconitic; some fine- to medium-grained sandstone
13,218-13,222	Limestone, dark-gray, fine-crystalline	13,660-13,670	Sandstone as above; crinoids
13,222-13,227	Shale, medium dark-gray	13,670-13,675	Sandstone, light- to medium light-gray, very fine- to fine-grained, calcareous, glauconitic, clean
13,227-13,228	Shale, grayish-black	13,675-13,680	Sandstone as above; trace of glauconite
13,228-13,238	Limestone, medium dark- to dark-gray, fine-crystalline	13,680-13,692	Sandstone, very light-gray, very fine-grained, calcareous
13,238-13,255	Shale, dark-gray	13,692-13,700	Sandstone, medium light-gray, very fine-grained, silty, glauconitic, tight
13,255-13,265	Shale, grayish-black	13,700-13,707	Siltstone, medium dark-gray
13,265-13,290	Shale, dark-gray	13,707-13,712	Siltstone, medium dark-gray, very finely sandy
13,290-13,300	Shale, grayish-black	13,712-13,718	Shale, medium dark-gray
13,300-13,344	Shale, dark-gray	13,718-13,729	Sandstone, medium- to medium dark-gray, very fine- to fine-grained, calcareous, glauconitic
13,344-13,348	Siltstone, grayish-black, calcareous	13,729-13,738	Sandstone, dark-gray, very fine- to fine-grained, silty, calcareous, glauconitic
13,348-13,350	Limestone, grayish-black, very fine-crystalline, argillaceous	13,738-13,743	Sandstone, light- to medium light-gray, very fine- to fine-grained, calcareous; little glauconite
13,350-13,356	Shale, medium-gray, smooth, chunky	13,743-13,757	Shale, medium dark-gray
13,356-13,368	Shale, dark-gray; brachiopods	13,757-13,760	Sandstone, light-gray, very fine-grained, silty
13,368-13,371	Limestone, dark-gray, very fine- to fine-crystalline, argillaceous; crinoids; slightly brownish in part	13,760-13,775	Shale, medium dark-gray
1,371-13,380	Shale, dark-gray	13,775-13,780	Sandstone, very light- to light-gray, very fine-grained, slightly calcareous
13,380-13,382	Siltstone, medium dark-gray, slightly greenish	13,780-13,786	Sandstone, medium light-gray, very fine- to fine-grained, calcareous; crinoids; some fine- to medium-grained sandstone
13,382-13,415	Shale, dark-gray		
13,415-13,430	Shale, grayish-black		
13,430-13,440	Shale, dark-gray		
13,440-13,443	Limestone, grayish-black, fine-crystalline, very silty		
13,443-13,450	Siltstone, medium dark-gray		
13,450-13,455	Limestone, medium dark- to dark-gray, very fine- to fine-crystalline, slightly argillaceous		
13,455-13,458	Limestone, grayish-black, very fine-crystalline, argillaceous		
13,458-13,465	Shale, dark-gray		
13,465-13,475	Shale, grayish-black		
13,475-13,487	Shale, dark-gray		
13,487-13,495	Siltstone, medium dark- to dark-gray, calcareous		
13,495-13,498	Shale, grayish-black		
13,498-13,500	Limestone, grayish-black, fine-crystalline, argillaceous		
13,500-13,508	Shale, dark-gray		
13,508-13,512	Siltstone, dark-gray, calcareous		
13,512-13,516	Limestone, grayish-black, fine-crystalline, silty		
13,516-13,521	Shale, dark-gray		
13,521-13,526	Sandstone, olive-gray to medium light-gray, very fine- to fine-grained, calcareous		
13,526-13,535	Shale, dark-gray		
13,535-13,539	Limestone, medium-gray, very fine-crystalline; slight yellowish-brown tint		
13,539-13,546	Shale, dark-gray to grayish-black		
13,546-13,548	Limestone, grayish-black, fine-crystalline, argillaceous		
13,548-13,563	Shale, dark-gray		
13,563-13,567	Siltstone, medium-gray, very finely sandy		
Morrow Series			
Lower part of Dornick Hills Formation		13,840	
13,567-13,570	Shale, greenish-gray, smooth, glauconitic		
13,570-13,573	Siltstone, medium- to medium dark-gray, very finely sandy, tight; much glauconite		
			Springer Formation
		13,786-13,790	Shale, medium dark-gray
		13,790-13,795	Sandstone, very light- to light-gray, fine-grained, slightly calcareous
		13,795-13,805	Sandstone, very light- to light-gray, fine-grained, clean
			Estimated 35 feet lag in samples
			No circulation samples at total depth
			Total depth

Log 17
CADDO COUNTY, OKLAHOMA
NW¼ NW¼ NE¼ sec. 11, T. 8 N., R. 12 W.

Operator: Superior Oil Co.
Lease: Weller No. 51-11
Elevation: KB 1,440 feet
GL 1,426 feet
Total depth: 17,823 feet
Completion date: 1947
Initial production: Dry and abandoned

Electrical log: 1,539 to 17,738 feet
Sample intervals:
10-foot
140 to 8,353 feet
9,310 to 9,340 feet
17,680 to 17,750 feet
5-foot
8,353 to 9,310 feet
9,340 to 17,680 feet
17,750 to 17,823 feet

Permian System		570-575	Shale, moderate reddish-brown
0-140	No samples	575-580	Shale, moderate reddish-brown; white gypsum
		580-590	Shale, moderate reddish-brown
		590-595	Shale, moderate reddish-brown; white gypsum
		595-613	Shale, moderate reddish-brown
		613-617	Gypsum, white
Whitehorse Group			
Rush Springs Sandstone 140-250 feet			
140-150	Sandstone, pale reddish-brown, very fine- to fine-grained, porous, gypsiferous? or anhydritic?; few medium grains		Flowerpot Shale and Duncan Sandstone 617-1,076 feet
150-190	Sandstone, pale reddish-brown, very fine- to fine-grained, calcareous to very calcareous; some calcite crystals; some noncalcareous sandstone	617-620	Shale, moderate reddish-brown
190-210	Sandstone, pale to moderate reddish-brown, very fine- to fine-grained	620-635	Shale, moderate reddish-brown; greenish-gray spots
210-240	Sandstone, pale reddish-brown, very fine- to fine-grained, calcareous	635-650	Shale, moderate reddish-brown
240-250	Sandstone, pale to moderate reddish-brown, very fine-grained, silty, calcareous	650-658	Sandstone, pale reddish-brown, fine-grained, gypsiferous; scattered medium round grains
Marlow Formation 250-390 feet			
250-260	Sandstone, moderate reddish-brown, very fine- to fine-grained, gypsiferous	658-680	Shale, moderate reddish-brown
260-280	Siltstone, moderate reddish-brown; salt?	680-686	Shale, light greenish-gray
280-300	Sandstone, pale reddish-brown, very fine- to fine-grained, gypsiferous	686-690	Shale, moderate reddish-brown
300-310	Siltstone, moderate reddish-brown; salt?	690-697	Shale, medium light-gray to greenish-gray, very finely sandy
310-320	Sandstone, pale reddish-brown, very fine- to fine-grained, gypsiferous	697-710	Shale, moderate reddish-brown
320-325	Shale, medium light-gray, silty	710-720	Shale, moderate reddish-brown; white gypsum
325-340	Shale, pale reddish-brown, silty	720-726	Sandstone, pale reddish-brown, very fine-grained, gypsiferous
340-345	Sandstone, light-gray, very fine- to fine-grained, very gypsiferous; scattered medium grains	726-740	Shale, moderate reddish-brown
345-350	Sandstone, pale reddish-brown, very fine-grained, silty, gypsiferous	740-746	Sandstone, pale reddish-brown, fine-grained
350-360	Siltstone, pale reddish-brown, very fine-grained, sandy, gypsiferous	746-780	Shale, moderate reddish-brown
360-370	Sandstone, pale reddish-brown, very fine-grained, silty, gypsiferous	780-790	Sandstone, pale reddish-brown, very fine-grained, gypsiferous
370-380	Siltstone, moderate reddish-brown	790-800	Shale, moderate reddish-brown
380-390	Sandstone, light-gray, very fine-grained, very gypsiferous	800-805	Sandstone, pale reddish-brown, very fine-grained, gypsiferous
El Reno Group		805-810	Shale, moderate reddish-brown
Dog Creek Shale and Blaine Gypsum 390-617 feet		810-820	Siltstone, medium light-gray
390-400	Shale, moderate reddish-brown	820-830	Sandstone, pale reddish-brown, very fine-grained, gypsiferous
400-420	Shale, moderate reddish-brown; white gypsum	830-840	Shale, moderate reddish-brown
420-440	Shale, moderate reddish-brown	840-845	Siltstone, medium light-gray
440-460	Shale, moderate reddish-brown; salt	845-850	Sandstone, pale reddish-brown, very fine-grained, silty, gypsiferous
460-467	Shale, moderate reddish-brown; white gypsum	850-860	Siltstone, pale to moderate reddish-brown
467-470	Shale, greenish-gray, silty	860-875	Sandstone, pale reddish-brown, very fine-grained, silty, gypsiferous
470-508	Shale, moderate reddish-brown; white gypsum	875-890	Shale, moderate reddish-brown
508-510	Sandstone, pale reddish-brown, very fine-grained, gypsiferous	890-900	Sandstone, pale reddish-brown, very fine- to fine-grained, gypsiferous
510-540	Shale, moderate reddish-brown	900-940	Shale, moderate reddish-brown, soft
540-550	Shale, moderate reddish-brown; salt	940-950	Siltstone, medium light-gray
550-560	Shale, moderate reddish-brown	950-965	Sandstone, pale to moderate reddish-brown, very fine- to fine-grained; silty in part
560-570	Shale, moderate reddish-brown, salt	965-970	Sandstone, medium light-gray, very fine-grained, silty
		970-980	Sandstone, moderate reddish-brown, very fine-grained, silty
		980-986	Shale, moderate reddish-brown
		986-990	Sandstone, moderate reddish-brown, fine-grained

990-1,000	Shale, moderate reddish-brown	2,003-2,023	Siltstone, pale reddish-brown, very finely sandy
1,000-1,003	Dolomite, pale reddish-brown, very fine-crystalline, argillaceous	2,023-2,030	Shale, moderate reddish-brown
1,003-1,015	Shale, moderate reddish-brown	2,030-2,033	Siltstone, pale reddish-brown, very finely sandy
1,015-1,020	Sandstone, moderate reddish-brown, very fine-grained, silty	2,033-2,038	Shale, moderate reddish-brown
1,020-1,040	Shale, moderate reddish-brown	2,038-2,041	Siltstone, pale reddish-brown, very finely sandy
1,040-1,050	Siltstone, pale reddish-brown, very finely sandy	2,041-2,053	Shale, moderate reddish-brown
1,050-1,065	Shale, moderate reddish-brown	2,053-2,063	Siltstone, moderate reddish-brown, very finely sandy
1,065-1,076	Sandstone, moderate reddish-brown, very fine-grained, silty	2,063-2,071	Shale, moderate reddish-brown
	Hennessey Shale 1,076-2,225 feet	2,071-2,081	Siltstone, pale reddish-brown, very finely sandy
1,076-1,100	Shale, moderate reddish-brown	2,081-2,110	Shale, moderate reddish-brown
1,100-1,105	Siltstone, medium light-gray, very finely sandy	2,110-2,122	Sandstone, pale reddish-brown, very fine-grained, silty
1,105-1,130	Shale, moderate reddish-brown	2,122-2,130	Shale, moderate reddish-brown
1,130-1,135	Siltstone, medium light-gray, very finely sandy	2,130-2,146	Sandstone, pale reddish-brown, very fine-grained, silty
1,135-1,140	Shale, greenish-gray	2,146-2,148	Limestone, grayish-red, fine-granular, argillaceous; mottled with olive gray
1,140-1,196	Shale, moderate reddish-brown	2,148-2,163	Shale, moderate reddish-brown
1,196-1,205	Sandstone, moderate reddish-brown, very fine-grained, silty	2,163-2,166	Sandstone, pale reddish-brown, very fine-grained, silty
1,205-1,215	Shale, moderate reddish-brown, gypsiferous	2,166-2,176	Shale, moderate reddish-brown
1,215-1,225	Shale, moderate reddish-brown	2,176-2,186	Siltstone, moderate reddish-brown, very finely sandy
1,225-1,230	Shale, moderate reddish-brown, gypsiferous	2,186-2,188	Limestone, medium light-gray, very fine-crystalline; grayish-red fine-crystalline argillaceous limestone
1,230-1,234	Shale, moderate reddish-brown	2,188-2,190	Siltstone, moderate reddish-brown, very finely sandy
1,234-1,240	Sandstone, pale reddish-brown, very fine-grained, silty	2,190-2,215	Shale, moderate reddish-brown
1,240-1,245	Sandstone, light-gray, very fine-grained, silty	2,215-2,217	Limestone, grayish-red, very fine-crystalline, argillaceous
1,245-1,250	Shale, moderate reddish-brown	2,217-2,225	Shale, moderate reddish-brown
1,250-1,270	Shale, moderate reddish-brown, gypsiferous		Garber Sandstone 2,225-2,850 feet
1,270-1,280	Shale, moderate reddish-brown	2,225-2,230	Siltstone, moderate reddish-brown, very finely sandy
1,280-1,290	Shale, moderate reddish-brown, gypsiferous	2,230-2,240	Sandstone, pale reddish-brown, very fine-grained, silty
1,290-1,300	Shale, moderate reddish-brown	2,240-2,290	Shale, moderate reddish-brown
1,300-1,320	Shale, moderate reddish-brown, gypsiferous	2,290-2,310	Sandstone, pale reddish-brown, very fine-grained, silty
1,320-1,350	Shale, moderate reddish-brown	2,310-2,397	Shale, moderate reddish-brown
1,350-1,360	Shale, moderate reddish-brown, gypsiferous	2,397-2,400	Siltstone, moderate reddish-brown, very finely sandy
1,360-1,366	Shale, moderate reddish-brown; light-gray fine-crystalline anhydrite; white gypsum	2,400-2,406	Shale, moderate reddish-brown
1,366-1,374	Shale, moderate reddish-brown	2,406-2,412	Siltstone, moderate reddish-brown, very finely sandy
1,374-1,378	Anhydrite, white, fine-crystalline	2,412-2,438	Shale, moderate reddish-brown
1,378-1,420	Shale, moderate reddish-brown	2,438-2,440	Siltstone, light olive-gray, slightly dolomitic
1,420-1,426	Siltstone, pale reddish-brown	2,440-2,445	Shale, moderate reddish-brown
1,426-1,430	Siltstone, medium light-gray, slightly dolomitic	2,445-2,456	Siltstone, moderate reddish-brown
1,430-1,440	Shale, moderate reddish-brown; light-gray fine-crystalline anhydrite; white gypsum	2,456-2,480	Shale, moderate reddish-brown
1,440-1,480	Shale, moderate reddish-brown	2,480-2,486	Siltstone, moderate reddish-brown, very finely sandy
1,480-1,500	Shale, moderate reddish-brown; light-gray fine-crystalline anhydrite; white gypsum	2,486-2,530	Shale, moderate reddish-brown
1,500-1,510	Shale, moderate reddish-brown	2,530-2,540	Siltstone, moderate reddish-brown, very finely sandy
1,510-1,514	Shale, greenish-gray	2,540-2,556	Shale, moderate reddish-brown
1,514-1,520	Shale, moderate reddish-brown	2,556-2,558	Limestone, pale-red, very fine-crystalline, argillaceous
1,520-1,525	Siltstone, medium-gray	2,558-2,560	Shale, moderate reddish-brown
1,525-1,530	Shale, moderate reddish-brown	2,560-2,570	Shale, moderate reddish-brown, silty
1,530-1,540	No samples	2,570-2,620	Shale, moderate reddish-brown
1,540-1,546	Shale, moderate reddish-brown; white fine-crystalline anhydrite and gypsum	2,620-2,630	Siltstone, pale reddish-brown
1,546-1,586	Shale, moderate reddish-brown	2,630-2,646	Shale, moderate reddish-brown
1,586-1,590	Siltstone, medium light-gray	2,646-2,648	Dolomite, light olive-gray, very fine-crystalline
1,590-1,616	Shale, moderate reddish-brown	2,648-2,656	Shale, moderate reddish-brown
1,616-1,625	Siltstone, medium light-gray	2,656-2,670	Siltstone, pale reddish-brown, very finely sandy
1,625-1,640	Shale, pale reddish-brown, silty	2,670-2,678	Shale, moderate reddish-brown
1,640-1,653	Shale, moderate reddish-brown	2,678-2,680	Siltstone, pale reddish-brown, very finely sandy
1,653-1,660	Siltstone, medium light-gray, very finely sandy	2,680-2,687	Shale, moderate reddish-brown
1,660-1,666	Shale, moderate reddish-brown	2,687-2,693	Shale, medium-gray
1,666-1,668	Dolomite, grayish-red, very fine-crystalline, argillaceous	2,693-2,700	Shale, medium light-gray; salt?
1,668-1,677	Shale, moderate reddish-brown	2,700-2,710	Shale, light olive-gray
1,677-1,680	Shale, moderate reddish-brown; grayish-red fine-crystalline anhydrite	2,710-2,740	Shale, moderate reddish-brown
1,680-1,690	Shale, moderate reddish-brown	2,740-2,750	Shale, medium- to dark-gray
1,690-1,705	Siltstone, light-gray	2,750-2,760	Shale, greenish-gray to medium-gray
1,705-1,746	Shale, moderate reddish-brown	2,760-2,770	Shale, moderate reddish-brown
1,746-1,750	Shale, moderate reddish-brown; white fine-crystalline anhydrite	2,770-2,780	Shale, medium-gray
1,750-1,755	Shale, moderate reddish-brown	2,780-2,786	Shale, light-gray, silty
1,755-1,760	Shale, moderate reddish-brown; white fine-crystalline anhydrite	2,786-2,800	Shale, moderate reddish-brown
1,760-1,780	Shale, moderate reddish-brown	2,800-2,810	Shale, greenish-gray to medium-gray
1,780-1,785	Siltstone, medium light-gray	2,810-2,822	Siltstone, medium light-gray, very finely sandy
1,785-1,808	Shale, moderate reddish-brown	2,822-2,830	Shale, medium-gray
1,808-1,810	Dolomite, olive-gray, very fine-crystalline, argillaceous	2,830-2,850	Shale, moderate reddish-brown
1,810-1,830	Shale, moderate reddish-brown		Wellington Formation 2,850-3,894 feet
1,830-1,850	Shale, moderate reddish-brown, silty; mottled with light gray	2,850-2,860	Shale, medium-gray
1,850-1,870	Shale, moderate reddish-brown	2,860-2,870	Shale, moderate reddish-brown
1,870-1,877	Siltstone, pale reddish-brown	2,870-2,880	Shale, medium-gray
1,877-1,888	Shale, moderate reddish-brown	2,880-2,890	Shale, greenish-gray to medium-gray
1,888-1,890	Limestone, pale-red, very fine-crystalline, argillaceous	2,890-2,900	Shale, light olive-gray to medium light-gray, silty
1,890-1,920	Shale, moderate reddish-brown	2,900-2,905	Shale, brownish-gray
1,920-1,930	Shale, moderate reddish-brown; medium-gray limestone pellets	2,905-2,915	Shale, medium-gray
1,930-1,938	Shale, moderate reddish-brown	2,915-2,925	Shale, moderate reddish-brown
1,938-1,940	Dolomite, light olive-gray, very fine-crystalline	2,925-2,930	Shale, brownish-gray
1,940-1,943	Shale, moderate reddish-brown	2,930-2,945	Shale, medium-gray
1,943-1,946	Siltstone, pale reddish-brown	2,945-2,950	Shale, greenish-gray
1,946-1,980	Shale, moderate reddish-brown	2,950-2,955	Shale, medium light-gray, silty
1,980-1,986	Siltstone, moderate reddish-brown, very finely sandy	2,955-2,970	Shale, medium-gray
1,986-2,003	Shale, moderate reddish-brown	2,970-2,976	Shale, olive-gray
		2,976-2,980	Shale, light-gray, silty
		2,980-2,990	Shale, medium-gray
		2,990-2,996	Siltstone, medium light-gray
		2,996-3,000	Shale, medium-gray
		3,000-3,005	Siltstone, medium light-gray
		3,005-3,010	Shale, medium-gray
		3,010-3,020	Shale, moderate reddish-brown

Wreford Limestone 4,254-4,350 feet			4,680-4,683	Shale, medium-gray
4,254-4,260	Limestone, pale yellowish-brown to light olive-gray, very fine-crystalline	4,683-4,690	4,683-4,690	Limestone, pale yellowish-brown, fine-crystalline; dolomitic in part
4,260-4,264	Shale, greenish-gray	4,690-4,695	4,690-4,695	Sandstone, medium light-gray, fine- to coarse-grained, calcareous, arkosic; green grains
4,264-4,270	Limestone, grayish-red, fine- to medium-sandy; scattered coarse to very coarse subangular chert grains	4,695-4,701	4,695-4,701	Sandstone, medium light- to medium-gray, very fine- to fine-grained, silty, calcareous; feldspar
4,270-4,281	Shale, medium-gray	4,701-4,710	4,701-4,710	Shale, medium-gray
4,281-4,290	Limestone, light-gray to very pale-orange, earthy, dolomitic	4,710-4,714	4,710-4,714	Limestone, dark-gray, fine-crystalline, pseudoölitic?; medium-gray fine-crystalline limestone with dark-gray flattened pseudoölitites?
4,290-4,296	Shale, medium-gray	4,714-4,726	4,714-4,726	Shale, medium-gray
4,296-4,305	Shale, grayish-red	4,726-4,740	4,726-4,740	Shale, grayish-red
4,305-4,314	Shale, medium-gray	4,740-4,748	4,740-4,748	Shale, olive-gray
4,314-4,321	Siltstone, medium-gray, very finely sandy; little carbonaceous material	4,748-4,750	4,748-4,750	Limestone, pale-red, fine-crystalline
4,321-4,330	Sandstone, light-gray, fine- to medium-grained, calcareous, arkosic; some coarse to very coarse arkosic sandstone; much glauconite in part	4,750-4,754	4,750-4,754	Limestone, pale yellowish-brown to medium-gray, fine-crystalline
4,330-4,334	Limestone, light olive-gray, very fine-crystalline, finely sandy; trace of feldspar	4,754-4,765	4,754-4,765	Shale, medium-gray
4,334-4,337	Limestone, medium-gray, fine-crystalline; olive-gray to grayish-red coarse öolitoid pellets	4,765-4,770	4,765-4,770	Shale, greenish-gray
4,337-4,340	Shale, medium-gray	4,770-4,780	4,770-4,780	Shale, grayish-red
4,340-4,350	Limestone, brownish-gray, fine-crystalline; olive-gray coarse öolitoid pellets	4,780-4,786	4,780-4,786	Shale, olive-gray
Council Grove Group			4,786-4,790	Shale, grayish-red
4,350-4,353	Shale, medium-gray	4,790-4,804	4,790-4,804	Siltstone, light-gray to yellowish-brown, very finely sandy, calcareous
4,353-4,356	Siltstone, greenish-gray	4,804-4,820	4,804-4,820	Sandstone, light-gray, very fine-grained, porous
4,356-4,365	Shale, medium-gray	4,820-4,826	4,820-4,826	Shale, medium-gray
4,365-4,386	Shale, grayish-red	4,826-4,830	4,826-4,830	Limestone, medium-gray, very finely sandy, very silty
4,386-4,396	Shale, medium-gray	4,830-4,848	4,830-4,848	Shale, medium-gray
4,396-4,405	Shale, grayish-red	4,848-4,853	4,848-4,853	Limestone, pale yellowish-brown to brownish-gray, fine-crystalline; abundant fusulinids
4,405-4,412	Shale, medium-gray	Admire Group		
4,412-4,431	Sandstone, medium light-gray, fine-grained, calcareous; some medium grains	4,853-4,866	4,853-4,866	Shale, medium-gray
4,431-4,438	Limestone, brownish-gray, very fine-crystalline	4,866-4,880	4,866-4,880	Shale, grayish-red
4,438-4,440	Shale, medium-gray	4,880-4,903	4,880-4,903	Shale, medium-gray
4,440-4,445	Limestone, medium-gray to brownish-gray, fine-crystalline, slightly argillaceous, pseudoölitic	4,903-4,922	4,903-4,922	Sandstone, light-gray, very fine- to fine-grained, slightly calcareous, porous; some yellowish-brown sandstone
4,445-4,450	Limestone, medium light-gray, fine- to medium-sandy; many dark-gray spots	4,922-4,930	4,922-4,930	Shale, medium-gray
4,450-4,454	Siltstone, medium light-gray, very finely sandy, calcareous	4,930-4,940	4,930-4,940	Shale, greenish-gray
4,454-4,463	Shale, grayish-red	4,940-4,950	4,940-4,950	Shale, medium-gray
4,463-4,465	Sandstone, light-gray, very fine-grained, silty, calcareous	4,950-4,955	4,950-4,955	Siltstone, medium-gray
4,465-4,468	Shale, medium-gray	4,955-4,960	4,955-4,960	Siltstone, grayish-red, very finely sandy
4,468-4,473	Limestone, pale yellowish-brown, fine-crystalline	4,960-4,968	4,960-4,968	Shale, medium-gray
4,473-4,478	Shale, grayish-red	4,968-4,978	4,968-4,978	Sandstone, light greenish-gray, very fine-grained, silty, calcareous
4,478-4,482	Limestone, grayish-red, fine-granular, argillaceous	4,978-4,985	4,978-4,985	Shale, medium-gray
4,482-4,486	Shale, grayish-red	4,985-4,990	4,985-4,990	Shale, olive-gray
4,486-4,490	Limestone, medium dark-gray, fine-crystalline, argillaceous	4,990-5,000	4,990-5,000	Shale, grayish-red
4,490-4,496	Limestone, medium, medium-gray, fine-crystalline	5,000-5,006	5,000-5,006	Shale, medium-gray
4,496-4,500	Shale, grayish-red	5,006-5,012	5,006-5,012	Sandstone, medium light-gray, very fine-grained, silty
4,500-4,507	Limestone, grayish-red, fine-crystalline; mottled with light-gray; slightly argillaceous in part	5,012-5,017	5,012-5,017	Shale, medium-gray
4,507-4,512	Shale, grayish-red	5,017-5,023	5,017-5,023	Sandstone, medium light-gray, very fine-grained, silty
4,512-4,523	Limestone, grayish-red, fine-crystalline	5,023-5,032	5,023-5,032	Shale, medium-gray
4,523-4,528	Shale, moderate reddish-brown	5,032-5,038	5,032-5,038	Sandstone, very light-gray, fine-grained, calcareous, porous
4,528-4,534	Shale, grayish-red	5,038-5,050	5,038-5,050	Shale, medium-gray
4,534-4,538	Shale, medium-gray	5,050-5,060	5,050-5,060	Shale, greenish-gray
4,538-4,540	Limestone, light-gray to pale-red, very fine-crystalline	5,060-5,068	5,060-5,068	Shale, grayish-red
4,540-4,544	Limestone, grayish-red, very silty	5,068-5,070	5,068-5,070	Limestone, pale yellowish-brown, fine-crystalline
4,544-4,550	Shale, grayish-red	5,070-5,078	5,070-5,078	Sandstone, light-gray to yellowish-brown, very fine-grained, silty, slightly calcareous; feldspar
4,550-4,555	Limestone, brownish-gray to light olive-gray, very fine-crystalline	5,078-5,090	5,078-5,090	Shale, medium-gray
4,555-4,562	Limestone, medium-gray, fine-crystalline	5,090-5,100	5,090-5,100	Shale, grayish-red
4,562-4,568	Shale, grayish-red	5,100-5,101	5,100-5,101	Limestone, pale-red, very fine-crystalline
4,568-4,570	Shale, medium-gray	5,101-5,104	5,101-5,104	Shale, medium-gray
4,570-4,583	Limestone, medium dark- to dark-gray, very finely sandy, silty; scattered coarse to very coarse sand grains and feldspar	5,104-5,108	5,104-5,108	Siltstone, medium light-gray, very finely sandy
4,583-4,587	Shale, grayish-red	5,108-5,118	5,108-5,118	Shale, medium-gray
4,587-4,597	Limestone, grayish-red, fine-crystalline; argillaceous in part	5,118-5,127	5,118-5,127	Sandstone, light-gray, very fine-grained, calcareous
4,597-4,603	Shale, grayish-red	5,127-5,131	5,127-5,131	Limestone, pale yellowish-brown, very finely sandy, fine-crystalline
4,603-4,610	Limestone, pale-red, grayish-red, fine-crystalline; mottled with medium light gray	5,131-5,140	5,131-5,140	Sandstone, pale-red, fine- to medium-grained, arkosic, slightly micaceous; calcareous in part; green grains
4,610-4,616	Dolomite, pale yellowish-brown, very fine-crystalline	5,140-5,146	5,140-5,146	Shale, grayish-red
4,616-4,625	Shale, medium-gray	5,146-5,150	5,146-5,150	Shale, medium-gray
4,625-4,630	Sandstone, yellowish-brown, very fine-grained, silty, dolomitic	5,150-5,153	5,150-5,153	Limestone, pale yellowish-brown, very finely sandy
4,630-4,635	Siltstone, light greenish-gray, very finely sandy	5,153-5,159	5,153-5,159	Sandstone, light-gray, very fine-grained, silty
4,635-4,640	Shale, grayish-red, very finely sandy	5,159-5,168	5,159-5,168	Shale, medium-gray
4,640-4,650	Shale, grayish-red	5,168-5,170	5,168-5,170	Sandstone, light-gray, very fine-grained, silty, very calcareous
4,650-4,656	Shale, medium-gray	5,170-5,180	5,170-5,180	Sandstone, light-gray, very fine- to fine-grained, slightly calcareous; feldspar
4,656-4,660	Limestone, medium-gray, fine-crystalline; slightly yellowish-brown in part; very sparse fusulinids	5,180-5,182	5,180-5,182	Limestone, medium-gray, fine-crystalline, argillaceous
4,660-4,666	Shale, medium-gray	5,182-5,190	5,182-5,190	Shale, medium-gray
4,666-4,680	Sandstone, pale-red, medium light-gray and greenish-gray, fine- to medium-grained, very calcareous; feldspar; many black and green grains	5,190-5,206	5,190-5,206	Shale, grayish-red
		5,206-5,210	5,206-5,210	Sandstone, light-gray, very fine-grained, silty; feldspar
		5,210-5,218	5,210-5,218	Shale, olive-gray
		5,218-5,222	5,218-5,222	Sandstone, light-gray, very fine-grained, silty
		5,222-5,238	5,222-5,238	Shale, medium-gray
		5,238-5,242	5,238-5,242	Sandstone, light-gray, very fine-grained, silty, calcareous; trace of feldspar
		5,242-5,260	5,242-5,260	Shale, grayish-red
		5,260-5,268	5,260-5,268	Shale, medium-gray
		5,268-5,280	5,268-5,280	Sandstone, very light-gray, very fine-grained, calcareous, porous; trace of feldspar

5,280-5,296	Shale, grayish-red	6,000-6,016	Sandstone, very light-gray, fine-grained, porous
5,296-5,308	Sandstone, very light-gray, very fine-grained, calcareous	6,016-6,048	Shale, medium-gray
5,308-5,316	Shale, medium-gray	6,048-6,058	Sandstone, very light-gray, fine- to medium-grained, dolomitic, porous; trace of feldspar
5,316-5,324	Shale, grayish-red		
5,324-5,329	Shale, medium-gray	6,058-6,067	Shale, medium-gray
5,329-5,333	Limestone, brownish-gray to medium dark-brownish-gray, fine-crystalline, slightly argillaceous; fusulinids	6,067-6,069	Limestone, brownish-gray, fine-crystalline
		6,069-6,075	Shale, medium-gray
5,333-5,335	Shale, medium-gray	6,075-6,083	Shale, olive-gray; coal stringer
5,335-5,340	Sandstone, light-gray, very fine-grained, calcareous	6,083-6,100	Shale, medium-gray
5,340-5,351	Shale, medium-gray	6,100-6,110	Shale, brownish-gray
5,351-5,354	Siltstone, medium-gray, very finely sandy, calcareous	6,110-6,121	Shale, medium-gray
5,354-5,360	Shale, medium-gray	6,121-6,122	Coal
5,360-5,370	Shale, grayish-red	6,122-6,128	Shale, greenish-gray, silty
5,370-5,380	Shale, olive-gray	6,128-6,140	Sandstone, very light-gray, very fine- to fine-grained, porous
5,380-5,390	Shale, medium-gray		
5,390-5,396	Siltstone, greenish-gray	6,140-6,154	Sandstone, yellowish-brown, very fine-grained, porous
5,396-5,415	Shale, medium-gray	6,154-6,160	Shale, brownish-gray
5,415-5,422	Shale, greenish-gray	6,160-6,170	Sandstone, very light-gray, very fine- to fine-grained, slightly dolomitic, porous
5,422-5,450	Sandstone, very light-gray, very fine- to fine-grained, feldspathic?, very porous; slightly calcareous in part	6,170-6,180	Sandstone, light-gray, light olive-gray, and yellowish-brown, very fine-grained
5,450-5,458	Shale, greenish-gray	6,180-6,184	Sandstone, olive-gray, very fine-grained, silty
5,458-5,475	Shale, medium-gray	6,184-6,208	Shale, medium-gray
5,475-5,484	Sandstone, light-gray, very fine-grained, silty	6,208-6,216	Limestone, brownish-gray, fine-crystalline; some dark brownish-gray and pale yellowish-brown limestone
5,484-5,488	Limestone, pale yellowish-brown, fine-crystalline; fusulinids		
		6,216-6,233	Shale, medium-gray
5,488-5,490	Shale, medium-gray	6,233-6,240	Siltstone, medium dark- to dark-gray, calcareous
5,490-5,496	Sandstone, light greenish-gray, very fine-grained, silty	6,240-6,250	Shale, medium-gray
5,496-5,500	Shale, medium-gray	6,250-6,260	Shale, greenish-gray
5,500-5,513	Shale, olive-gray	6,260-6,300	Shale, medium-gray
5,513-5,517	Siltstone, greenish-gray, very finely sandy	6,300-6,304	Shale, black
5,517-5,537	Shale, medium-gray	6,304-6,312	Shale, medium-gray
5,537-5,540	Limestone, brownish-gray, fine-crystalline	6,312-6,313	Coal
5,540-5,548	Limestone, pale yellowish-brown, fine-crystalline; pinhole porosity	6,313-6,322	Shale, medium-gray
5,548-5,561	Siltstone, medium-gray, very finely sandy	6,322-6,330	Siltstone, medium-gray, very finely sandy
5,561-5,574	Shale, medium-gray	6,330-6,340	Shale, medium-gray
5,574-5,577	Limestone, medium-gray, very silty	6,340-6,345	Limestone, brownish-gray, fine-crystalline; fusulinids
5,577-5,590	Shale, medium-gray	6,345-6,366	Shale, medium-gray
5,590-5,605	Sandstone, very light-gray, very fine-grained, slightly calcareous; little feldspar	6,366-6,372	Limestone, medium dark-gray, very finely sandy
		6,372-6,377	Sandstone, light-gray, very fine-grained
5,605-5,620	Shale, medium-gray	6,377-6,388	Sandstone, very light-gray, fine- to medium-grained, dolomitic, porous; traces of pyrite and feldspar at top
5,620-5,638	Sandstone, very light-gray, very fine-grained, slightly calcareous; little feldspar		
		6,388-6,400	Shale, medium-gray
5,638-5,640	Limestone, pale yellowish-brown, fine-crystalline	6,400-6,405	Shale, black
5,640-5,658	Shale, medium-gray	6,405-6,416	Shale, medium-gray
5,658-5,661	Limestone, brownish-gray, fine-crystalline; fusulinids (abraded?)	6,416-6,420	Limestone, brownish-gray to grayish-brown, fine-crystalline
5,661-5,676	Shale, medium-gray	6,420-6,450	Shale, medium-gray
5,676-5,686	Shale, olive-gray	6,450-6,460	Shale, black
5,686-5,697	Shale, medium-gray	6,460-6,485	Shale, medium-gray
5,697-5,700	Siltstone, light greenish-gray, very finely sandy, slightly calcareous	6,485-6,495	Shale, black
		6,495-6,505	Shale, dusky-brown
5,700-5,709	Shale, medium-gray	6,505-6,510	Shale, olive-gray
5,709-5,712	Siltstone, light- to medium light-gray	6,510-6,520	Shale, grayish-brown
5,712-5,715	Shale, medium-gray	6,520-6,563	Shale, medium-gray
5,715-5,728	Siltstone, light- to medium light-gray	6,563-6,564	Coal
5,728-5,736	Shale, medium-gray	6,564-6,573	Shale, medium-gray
5,736-5,740	Shale, grayish-brown	6,573-6,580	Siltstone, medium-gray
5,740-5,750	Shale, grayish-red	6,580-6,598	Shale, medium-gray
5,750-5,762	Shale, grayish-brown	6,598-6,600	Limestone, brownish-gray, fine-crystalline; caving?
5,762-5,770	Siltstone, light-gray	6,600-6,632	Shale, medium-gray
5,770-5,794	Shale, grayish-red	6,632-6,636	Limestone, medium dark-gray, fine-crystalline, argillaceous
5,794-5,798	Sandstone, very light-gray, very fine-grained, silty, slightly calcareous		
5,798-5,805	Shale, medium-gray	6,636-6,641	Limestone, brownish-gray, fine-crystalline
		6,641-6,664	Shale, medium-gray
		6,664-6,673	Siltstone, medium-gray
		6,673-6,687	Siltstone, greenish-gray
		6,687-6,702	Sandstone, very light-gray, fine-grained, slightly dolomitic, porous
5,805-5,810	Limestone, pale yellowish-brown, fine-crystalline; fusulinids; pinpoint porosity in part	6,702-6,717	Shale, medium-gray
5,810-5,819	Limestone, medium-gray, fine-crystalline	6,717-6,718	Limestone, pale yellowish-brown, fine-crystalline
5,819-5,833	Shale, medium-gray	6,718-6,728	Shale, medium-gray
5,833-5,843	Sandstone, light-gray, very fine-grained, silty	6,728-6,730	Limestone, medium-gray, fine-crystalline
5,843-5,850	Limestone, pale yellowish-brown, fine-crystalline	6,730-6,734	Shale, medium-gray
5,850-5,854	Siltstone, light greenish-gray, very finely sandy	6,734-6,747	Siltstone, medium-gray
5,854-5,876	Shale, medium-gray	6,747-6,765	Shale, medium-gray
5,876-5,882	Siltstone, medium light-gray, very finely sandy, calcareous; fusulinids	6,765-6,770	Shale, black
		6,770-6,778	Shale, medium-gray
5,882-5,890	Sandstone, medium light-gray, very fine-grained, calcareous, silty	6,778-6,785	Siltstone, medium-gray
		6,785-6,835	Shale, medium-gray
5,890-5,896	Shale, medium-gray	6,835-6,840	Siltstone, medium-gray
5,896-5,908	Sandstone, light-gray, very fine-grained, silty, calcareous	6,840-6,845	Shale, medium-gray
5,908-5,940	Shale, medium-gray	6,845-6,850	Siltstone, medium-gray
5,940-5,950	Shale, olive-gray to grayish-brown	6,850-6,880	Shale, medium-gray
5,950-5,955	Sandstone, olive-gray, very fine-grained, silty, calcareous, porous; some yellowish-brown sandstone		
5,955-5,960	Sandstone, very light-gray, very fine-grained, calcareous	6,880-6,884	Limestone, medium dark-brownish-gray, fine-crystalline; fusulinids?
5,960-5,970	Shale, medium-gray		
5,970-5,977	Limestone, brownish-gray to pale yellowish-brown, fine-crystalline	6,884-6,892	Shale, medium-gray
		6,892-6,893	Limestone, medium dark-brownish-gray, fine-crystalline
5,977-5,980	Sandstone, very light-gray, very fine-grained	6,893-6,906	Shale, medium-gray
5,980-5,987	Shale, medium-gray	6,906-6,915	Limestone, brownish-gray, fine-crystalline
5,987-5,991	Siltstone, light-gray, very finely sandy	6,915-6,923	Limestone, pale yellowish-brown, very fine- to fine-crystalline
5,991-6,000	Sandstone, very light-gray, very fine- to fine-grained, feldspathic?, porous		

Pennsylvanian System
Virgil Series
Wabaunsee Group Equivalent

Shawnee Group Equivalent

6,923-6,929	Shale, medium-gray	7,694-7,700	Sandstone, medium-gray, very fine-grained, silty
6,929-6,932	Limestone, brownish-gray, fine-crystalline	7,700-7,710	Sandstone, light-gray, very fine-grained, silty, slightly calcareous
6,932-6,937	Shale, medium-gray		
6,937-6,943	Sandstone, light greenish-gray, very fine-grained, silty	7,710-7,725	Limestone, light- to medium-gray, finely sandy, very sandy
6,943-6,950	Sandstone, light-gray, very fine-grained	7,725-7,760	Shale, medium-gray
6,950-6,960	Shale, medium-gray	7,760-7,767	Siltstone, medium-gray, very finely sandy
6,960-6,970	Siltstone, medium light-gray, very finely sandy	7,767-7,770	Shale, medium-gray
6,970-6,978	Siltstone, brownish-gray, very finely sandy	7,770-7,776	Limestone, brownish-gray, finely sandy, crinoids
6,978-6,984	Siltstone, medium-gray, calcareous	7,776-7,790	Shale, medium-gray
6,984-6,988	Limestone, medium dark-gray, fine-crystalline, argillaceous	7,790-7,800	Sandstone, brownish-gray, very fine-grained, silty, calcareous
6,988-6,993	Limestone, pale yellowish-brown, fine-crystalline	7,800-7,807	Shale, medium-gray
6,993-6,999	Siltstone, medium light-gray, calcareous	7,807-7,820	Sandstone, light-gray to light olive-gray, fine-grained, slightly calcareous; trace of feldspar?
6,999-7,011	Siltstone, medium-gray		
7,011-7,016	Sandstone, light-gray, very fine-grained, silty, calcareous	7,820-7,830	Sandstone, medium light-gray, very fine-grained, silty
7,016-7,026	Shale, medium-gray	7,830-7,840	Sandstone, very light-gray to light olive-gray, very fine- to fine-grained
7,026-7,030	Sandstone, very light-gray, very fine-grained, porous		
7,030-7,035	Sandstone, very light-gray, fine-grained, porous; green grains	7,840-7,850	Sandstone, medium light-gray, very fine- to fine-grained
7,035-7,039	Sandstone, very light-gray, fine-grained, calcareous	7,850-7,882	Shale, medium-gray
7,039-7,047	Shale, medium-gray	7,882-7,900	Sandstone, light- to medium light-gray, very fine- to fine-grained
7,047-7,050	Sandstone, light-gray, very fine-grained, calcareous, silty		
7,050-7,060	Shale, medium-gray	7,900-7,920	Siltstone, medium-gray
7,060-7,064	Siltstone, medium light-gray	7,920-7,940	Shale, medium-gray
7,064-7,070	Sandstone, light-gray, very fine-grained, silty	7,940-7,950	Shale, greenish-gray
7,070-7,085	Shale, medium-gray	7,950-8,085	Shale, medium-gray
7,085-7,087	Coal	8,085-8,087	Limestone, light olive-gray, fine-crystalline, argillaceous; caving?
7,087-7,090	Shale, medium-gray	8,087-8,090	Shale, medium-gray
7,090-7,098	Shale, dark greenish-gray	8,090-8,108	Siltstone, medium light- to medium-gray
7,098-7,100	Shale, dark grayish-red	8,108-8,112	Limestone, medium dark- to dark-gray, finely sandy
7,100-7,119	Sandstone, very light- to light-gray, very fine- to fine-grained; slight oil stain?	8,112-8,117	Siltstone, medium light- to medium-gray
7,119-7,125	Shale, medium-gray	8,117-8,132	Shale, medium-gray
7,125-7,130	Siltstone, light- to medium light-gray, very finely sandy	8,132-8,134	Limestone, light olive-gray, fine-crystalline
7,130-7,142	Shale, medium-gray	8,134-8,137	Shale, medium-gray
7,142-7,150	Limestone, medium dark- to dark-gray, argillaceous, silty	8,137-8,148	Siltstone, olive-gray, slightly calcareous
7,150-7,157	Siltstone, medium light-gray, very finely sandy	8,148-8,207	Shale, medium-gray
7,157-7,163	Shale, medium-gray	8,207-8,220	Sandstone, very light-gray, medium-grained, calcareous, porous; yellowish-brown fine- to medium-grained calcareous sandstone
7,163-7,170	Siltstone, medium-gray, very finely sandy, calcareous	8,220-8,245	Sandstone, very light-gray, fine- to medium-grained, porous; oil stain? 8,240-8,245 feet
7,170-7,180	Shale, medium-gray	8,245-8,280	Sandstone, very light- to light-gray, medium-grained, porous
7,180-7,200	Sandstone, very light-gray, fine- to medium-grained, slightly dolomitic, very porous	8,280-8,350	Sandstone, light-gray, fine-grained
7,200-7,220	Shale, medium-gray; coal in 7,210-2,220 sample (probably caved)	8,350-8,360	Sandstone, light-gray, very fine-grained, silty; dark-gray shale laminae; carbonaceous material on bedding surfaces
7,220-7,230	Shale, black	8,360-8,390	Sandstone, light-gray, very fine-grained, silty
7,230-7,242	Shale, medium-gray		
7,242-7,248	Limestone, medium dark-gray to medium dark-brownish-gray, fine-crystalline, slightly argillaceous		Douglas Group Equivalent
7,248-7,270	Shale, medium-gray	8,390-8,410	Siltstone, light- to medium-gray, very finely sandy
7,270-7,280	Shale, black	8,410-8,465	Siltstone, medium- to medium dark-gray
7,280-7,288	Shale, medium-gray	8,465-8,480	Shale, medium dark- to dark-gray
7,288-7,308	Sandstone, medium light-gray, very fine-grained, silty, slightly calcareous; scattered carbonaceous material	8,480-8,490	Shale, black
7,308-7,320	Shale, medium-gray	8,490-8,524	Shale, medium-gray
7,320-7,330	Shale, black		
7,330-7,340	Shale, medium-gray		Missouri Series
7,340-7,350	Shale, greenish-gray		Ochelata Group
7,350-7,365	Shale, medium-gray		Lansing Group Equivalent
7,365-7,375	Siltstone, medium-gray	8,524-8,531	Limestone, dark brownish-gray, fine- to coarse-sandy, glauconitic; crinoids; fusulinids; feldspar; light- to dark-gray coarse to very coarse dense very angular chert grains
7,375-7,382	Sandstone, very light- to light-gray, very fine- to fine-grained, slightly dolomitic	8,531-8,543	Sandstone, medium light-gray to brownish-gray, medium- to coarse-grained, calcareous; glauconite; probably some chert grains
7,382-7,414	Siltstone, medium light- to medium-gray, very finely sandy	8,543-8,550	Sandstone, light- to medium light-gray, medium- to coarse-grained, calcareous; probably some chert grains
7,414-7,436	Sandstone, light-gray, very fine-grained, silty	8,550-8,553	Sandstone, light- to medium light-gray, medium-grained, calcareous; glauconite
7,436-7,450	Shale, medium-gray	8,553-8,560	Sandstone, light- to medium light-gray, medium-grained, calcareous
7,450-7,460	Shale, black	8,560-8,566	Sandstone, light- to medium light-gray, fine- to medium-grained, calcareous
7,460-7,470	Shale, medium-gray	8,566-8,588	Sandstone, light- to medium light-gray, fine- to medium-grained, calcareous
7,470-7,480	Siltstone, medium light-gray, very finely sandy	8,588-8,592	Sandstone, medium light-gray, fine-grained, slightly calcareous
7,480-7,490	Shale, medium-gray	8,592-8,610	Sandstone, light- to medium light-gray, very fine- to fine-grained
7,490-7,502	Siltstone, medium light-gray, very finely sandy	8,610-8,620	Sandstone, medium light-gray, fine- to medium-grained, calcareous; glauconite
7,502-7,519	Sandstone, light-gray, very fine-grained, silty	8,620-8,637	Sandstone, medium light-gray, very fine- to fine-grained, slightly calcareous; glauconite
7,519-7,526	Siltstone, medium light-gray	8,637-8,646	Siltstone, medium light- to medium-gray
7,526-7,558	Shale, medium-gray	8,646-8,655	Sandstone, very light- to light-gray, fine-grained, calcareous; glauconite
7,558-7,560	Limestone, brownish-gray, fine-crystalline	8,655-8,670	Sandstone, medium light-gray, fine-grained, slightly calcareous; glauconite
7,560-7,567	Limestone, medium-gray, fine-crystalline, slightly argillaceous; slightly brownish in part	8,670-8,680	Sandstone, light- to medium light-gray, fine-grained, slightly calcareous
7,567-7,575	Shale, medium-gray	8,680-8,684	Siltstone, medium-gray
7,575-7,580	Coal	8,684-8,710	Sandstone, medium light-gray to light olive-gray, fine-grained, slightly calcareous
7,580-7,600	Shale, medium-gray		
7,600-7,608	Sandstone, light-gray, very fine-grained, dolomitic		
7,608-7,615	Shale, medium-gray		
7,615-7,620	Siltstone, light greenish-gray		
7,620-7,623	Shale, medium-gray		
7,623-7,630	Sandstone, light-gray, very fine-grained, silty		
7,630-7,638	Shale, medium-gray		
7,638-7,648	Siltstone, light-gray, very finely sandy		
7,648-7,651	Shale, medium-gray		
7,651-7,660	Limestone, brownish-gray, very fine-crystalline		
7,660-7,666	Limestone, pale yellowish-brown to light olive-gray, very fine-crystalline		
7,666-7,670	Limestone, brownish-gray, finely oolitic, finely sandy		
7,670-7,680	Limestone, brownish-gray, very fine-crystalline		
7,680-7,694	Siltstone, light-gray, calcareous		

8,710-8,718	Sandstone, light-gray, fine-grained, calcareous	9,750- 9,753	Sandstone, medium-gray, very fine-grained, silty, calcareous; medium dark-gray very fine- to fine-grained slightly calcareous sandstone; oil stain
8,718-8,720	Sandstone, light-gray, fine-grained		
8,720-8,725	Sandstone, medium light-gray, fine-grained	9,753- 9,770	Sandstone, medium light- to medium-gray, very fine-grained, calcareous
8,725-8,735	Sandstone, medium light-gray, very fine-grained		
8,735-8,750	Sandstone, light-gray, very fine- to fine-grained	9,770- 9,776	Sandstone, very light- to light-gray, very fine- to fine-grained, calcareous to slightly calcareous
8,750-8,756	Sandstone as above; some yellowish-brown sandstone	9,776- 9,783	Sandstone as above; some slightly yellowish-brown sandstone
8,756-8,773	Siltstone, medium- to medium dark-gray	9,783- 9,797	Sandstone, very light- to light-gray, very fine-grained; trace of glauconite
8,773-8,794	Sandstone, light- to medium light-gray, very fine-grained, silty	9,797- 9,808	Sandstone as above; calcareous
	Kansas City Group Equivalent	9,808- 9,815	Sandstone, medium light-gray, very fine-grained, slightly calcareous
8,794-8,806	Siltstone, medium dark-gray	9,815- 9,827	Sandstone, very light- to light-gray, very fine- to fine-grained, calcareous
8,806-8,815	Shale, black, silty	9,827- 9,850	Siltstone, medium light- to medium-gray, very finely sandy, calcareous
8,815-8,826	Shale, medium-gray	9,850- 9,870	Shale, medium dark- to dark-gray, silty
8,826-8,840	Siltstone, medium-gray, calcareous	9,870- 9,890	Shale, black
8,840-8,859	Sandstone, medium light-gray, very fine-grained, silty, calcareous	9,890- 9,906	Shale, dark-gray
8,859-8,880	Siltstone, medium light- to medium-gray, calcareous	9,906- 9,915	Shale, black
8,880-8,890	Siltstone, medium dark-gray, calcareous	9,915- 9,920	Shale, medium-gray
8,890-8,910	Shale, medium- to dark-gray		
8,910-8,916	Shale, greenish-gray		
8,916-8,922	Siltstone, medium dark-gray, calcareous		
8,922-8,930	Shale, black		
8,930-8,940	Shale, medium-gray		
8,940-8,950	Shale, black		
8,950-8,960	Shale, medium-gray	9,920- 9,922	Limestone, dark-gray, fine-crystalline, very argillaceous
8,960-8,978	Sandstone, light- to medium light-gray, very fine-grained, silty, calcareous	9,922- 9,940	Shale, medium-gray
		9,940- 9,946	Sandstone, medium light- to medium-gray, very fine-grained, silty, calcareous, tight
8,978-8,987	Shale, black	9,946- 9,958	Siltstone, light-gray, very finely sandy, slightly calcareous
8,987-8,994	Siltstone, medium-gray, calcareous	9,958- 9,976	Siltstone, medium dark-gray, calcareous
8,994-9,010	Shale, medium-gray	9,976- 9,987	Shale, medium-gray
9,010-9,030	Siltstone, medium-gray, calcareous; resembles silty limestone	9,987- 9,990	Limestone, medium dark- to dark-gray, very fine-crystalline, argillaceous
9,030-9,060	Siltstone, medium light-gray to yellowish-brown, very finely sandy, calcareous, slightly micaceous	9,990- 9,994	Limestone, medium dark-gray, very fine-crystalline, slightly argillaceous; spines
9,060-9,070	Shale, medium-gray		
9,070-9,080	Shale, black		
9,080-9,093	Shale, medium-gray		
9,093-9,110	Sandstone, light- to medium-gray, very fine-grained, silty, very calcareous, very sandy; crinoids; trace of glauconite	9,994- 9,999	Siltstone, greenish-gray, calcareous, hard
		9,999-10,002	Siltstone, medium-gray, very finely sandy, calcareous
		10,002-10,011	Shale, medium-gray
9,110-9,120	Siltstone, medium-gray, very finely sandy, calcareous; trace of glauconite	10,011-10,017	Sandstone, light- to medium light-gray, very fine-grained, silty, slightly calcareous; trace of glauconite
9,120-9,130	Shale, dark-gray	10,017-10,040	Sandstone, light-gray, very fine- to fine-grained, slightly calcareous; some yellowish-brown sandstone
9,130-9,140	Shale, black		
9,140-9,155	Shale, dark-gray, silty	10,040-10,050	Shale, black
9,155-9,165	Shale, black	10,050-10,065	Shale, medium-gray
9,165-9,190	Shale, medium dark-gray, silty	10,065-10,070	Shale, black
9,190-9,200	Shale, black	10,070-10,078	Shale, medium-gray
9,200-9,260	Shale, medium dark-gray, calcareous, silty	10,078-10,080	Limestone, medium dark-gray, very fine-crystalline, argillaceous
9,260-9,270	Shale, black		
9,270-9,320	Shale, medium-gray	10,080-10,102	Shale, medium-gray
9,320-9,330	Shale, black	10,102-10,111	Siltstone, medium light-gray, hard
9,330-9,360	Shale, medium-gray	10,111-10,115	Shale, medium-gray
	Skiatook Group	10,115-10,125	Sandstone, medium-gray to olive-gray, fine- to coarse-grained, calcareous, subangular; trace of glauconite; light- to dark-gray very coarse detrital chert; trace of feldspar?; dark-gray to black grains
9,360-9,370	Limestone, medium dark- to dark-gray, very fine- to fine-crystalline, very argillaceous	10,125-10,140	Shale, medium-gray
9,370-9,390	Shale, dark-gray, calcareous	10,140-10,142	Coal; with sulfur bloom
9,390-9,400	Siltstone, medium dark- to dark-gray, calcareous	10,142-10,146	Shale, medium-gray
9,400-9,406	Limestone, medium dark-gray to brownish-gray, very silty, glauconitic	10,146-10,148	Coal
9,406-9,412	Sandstone, medium-gray, fine-grained, calcareous, silty	10,148-10,154	Shale, medium-gray, smooth
9,412-9,475	Shale, medium-gray	10,154-10,165	Siltstone, light- to medium light-gray, very finely sandy, slightly calcareous
9,475-9,480	Sandstone, medium-gray, very fine-grained, silty, slightly calcareous, tight; some dark-gray sandstone		
9,480-9,485	Sandstone, medium- to dark-gray, very fine-grained, silty, tight	10,165-10,214	No samples
9,485-9,494	Sandstone, dark-gray to brownish-gray, very fine- to fine-grained, tight	10,214-10,224	Sandstone, light-gray, very fine-grained, silty; trace of glauconite
9,494-9,568	Shale, medium-gray	10,224-10,227	Sandstone, medium light-gray, very fine-grained, silty, calcareous
9,568-9,570	Sandstone, medium light- to medium-gray, fine-grained, calcareous, slightly brownish	10,227-10,232	Limestone, medium-gray, medium-oölitic, argillaceous; some oölitic with sand centers
9,570-9,576	Limestone, medium-gray, fine- to coarse-sandy, very sandy, coarsely oölitic; light- to dark-gray coarse detrital chert; crinoids; glauconite; trace of feldspar	10,232-10,236	Limestone, pale yellowish-brown, oölitic; many oölitic with sand centers; trace of glauconite
9,576-9,581	Sandstone, medium-gray, fine- to medium-grained, very calcareous; trace of glauconite and feldspar; coarse chert fragments; crinoids	10,236-10,246	Limestone, medium-gray, fine-crystalline, medium- to coarse-oölitic; some oölitic have medium-grained sand in center
9,581-9,595	Sandstone, medium light-gray, fine- to medium-grained, calcareous; trace of glauconite	10,246-10,280	Sandstone, pale yellowish-brown, medium-grained, calcareous
9,595-9,600	Sandstone, medium-gray, very fine- to fine-grained, silty, slightly calcareous	10,280-10,290	Shale, medium-gray
9,600-9,610	Sandstone, medium light-gray, very fine- to fine-grained, calcareous	10,290-10,309	Shale, black
9,610-9,630	Shale, medium-gray	10,309-10,311	Sandstone, light-gray, very fine-grained
9,630-9,636	Siltstone, medium dark- to dark-gray, calcareous	10,311-10,314	Sandstone, medium light-gray, very fine-grained, calcareous
9,636-9,650	Shale, black	10,314-10,320	Limestone, medium dark-brownish-gray, fine- to coarse-oölitic, fine- to medium-sandy
9,650-9,663	Sandstone, medium light- to medium-gray, very fine- to fine-grained, silty, calcareous	10,320-10,332	Limestone, brownish-gray, medium-oölitic; little fine to medium sand; brachiopods?
9,663-9,670	Siltstone, medium dark-gray, very finely sandy, calcareous	10,332-10,340	Limestone, brownish-gray, very fine- to fine-sandy
9,670-9,750	Shale, medium-gray	10,340-10,360	Limestone, pale yellowish-brown, fine-crystalline, finely sandy
		10,360-10,373	No samples From electrical log: Shale

10,373-10,380	Sandstone, light-gray, very fine-grained, silty, slightly calcareous, tight	11,158-11,165	Shale, medium-gray
10,380-10,388	Sandstone, medium light-gray, very fine-grained, calcareous	11,165-11,170	Sandstone, medium-gray, very fine-grained, silty, calcareous
10,388-10,390	Sandstone, medium light-gray, very fine-grained, silty, calcareous; oil stain?	11,170-11,176	Shale, medium-gray
10,390-10,395	Sandstone, medium light-gray, very fine- to fine-grained, slightly calcareous; oil stain?	11,176-11,180	Sandstone, light- to medium-gray, very fine-grained, calcareous; dark grains
10,395-10,420	Sandstone, pale yellowish-brown, brownish-gray, and medium-gray, fine- to medium-grained, calcareous; trace of glauconite 10,405-10,415 feet	11,180-11,189	Sandstone, medium-gray, very fine-grained, silty, calcareous; trace of glauconite
10,420-10,429	Shale, medium-gray to black	11,189-11,204	Shale, medium-gray
10,429-10,432	Limestone, medium dark-gray, fine-crystalline, argillaceous	11,204-11,210	Sandstone, brownish-gray to medium light-gray, very fine- to fine-grained, calcareous; much light- to medium light-gray coarse to very coarse dense chert fragments (detrital?); trace of glauconite
10,432-10,440	Shale, black	11,210-11,216	Sandstone, medium light-gray to yellowish-brown, very fine-grained, silty, slightly calcareous
10,440-10,459	Shale, medium-gray	11,216-11,226	Siltstone, light- to medium light-gray, very finely sandy, slightly calcareous
10,459-10,464	Sandstone, medium-gray, very fine-grained, silty, very tight	11,226-11,230	Siltstone, brownish-gray, very finely sandy, slightly calcareous
10,464-10,468	Limestone, medium dark-gray, very fine-crystalline, argillaceous	11,230-11,275	Siltstone, light-gray, very finely sandy, slightly calcareous
10,468-10,470	Limestone, medium dark-gray, very fine-crystalline	11,275-11,287	Siltstone, medium light-gray, very finely sandy, slightly calcareous
10,470-10,475	Limestone, brownish-gray, very fine-crystalline	11,287-11,293	Siltstone, brownish-gray, very finely sandy, slightly calcareous
10,475-10,481	Limestone, medium- to medium dark-gray, very fine-crystalline	11,293-11,310	Siltstone, medium light- to medium-gray
10,481-10,494	Shale, medium-gray	11,310-11,337	Shale, medium dark- to dark-gray
10,494-10,500	Limestone, medium dark- to dark-gray, medium-sandy; fine to medium oolites with sand centers; many crinoids and spines; few coarse chert fragments	11,337-11,340	Siltstone, medium-gray, very finely sandy
10,500-10,510	Limestone, brownish-gray, medium-oolitic, fine- to medium-sandy; sand centers in some oolites	11,340-11,400	Shale, medium dark- to dark-gray
10,510-10,522	Limestone, medium dark-gray, very fine-crystalline	11,400-11,410	Shale, black
10,522-10,549	Shale, medium-gray	11,410-11,440	Shale, medium dark- to dark-gray
10,549-10,555	Sandstone, medium-gray, very fine-grained, silty, calcareous, tight; trace of glauconite	11,440-11,450	Shale, black
10,555-10,563	Sandstone, light- to medium light-gray, very fine-grained, silty, calcareous	11,450-11,526	Shale, medium dark- to dark-gray; gastropods 11,480-11,485 feet
10,563-10,600	Shale, medium-gray	11,526-11,534	Siltstone, light-gray, very finely sandy, calcareous
10,600-10,605	Limestone, dark-gray, very argillaceous	11,534-11,540	Sandstone, medium light- to medium-gray, very fine-grained, silty, calcareous
10,605-10,610	Limestone, dark-gray, very fine- to fine-crystalline, argillaceous	11,540-11,566	Shale, medium-gray
10,610-10,636	Shale, medium-gray	11,566-11,570	Siltstone, medium-gray to brownish-gray, very finely sandy, slightly calcareous
10,636-10,640	Sandstone, light olive-gray, brownish-gray, and medium-gray, fine-grained, calcareous; some medium-grains; trace of feldspar and glauconite	11,570-11,635	Shale, medium dark- to dark-gray
Pleasanton Group Equivalent (Pleasanton Formation Equivalent on Chart OC-61)		11,635-11,643	Siltstone, medium-gray
10,640-10,700	Shale, medium-gray	11,643-11,650	Shale, medium dark- to dark-gray
10,700-10,710	Shale, medium-gray, slightly greenish	11,650-11,660	Shale, black
10,710-10,765	Shale, medium-gray	11,660-11,668	Shale, medium dark- to dark-gray
Des Moines Series Deese Formation 10,765-13,087 feet		11,668-11,680	Siltstone, medium-gray, very finely sandy
10,765-10,769	Limestone, medium dark- to dark-gray, fine-granular, argillaceous; fusulinids; crinoids	11,680-11,695	Shale, medium dark- to dark-gray
10,769-10,788	Shale, medium-gray	11,695-11,715	Shale, dark-gray to black
10,788-10,801	Sandstone, medium light- to medium-gray, very fine-grained, silty, calcareous; trace of glauconite at top	11,715-11,790	Shale, medium dark- to dark-gray
10,801-10,820	Siltstone, medium light- to medium-gray, very finely sandy, slightly calcareous	11,790-11,800	Shale, black
10,820-10,835	Shale, medium-gray	11,800-11,842	Shale, medium dark- to dark-gray
10,835-10,840	Shale, moderate-brown; siltstone	11,842-11,846	Siltstone, medium light-gray, very finely sandy, slightly calcareous
10,840-10,850	Shale, medium-gray	11,846-11,854	Siltstone, medium-gray, slightly greenish
10,850-10,860	Shale, black	11,854-11,880	Shale, medium dark- to dark-gray
10,860-10,874	Shale, medium-gray	11,880-11,890	Shale, black
10,874-10,880	Siltstone, medium-gray, very finely sandy	11,890-11,900	Shale, medium dark- to dark-gray
10,880-10,935	Shale, medium-gray	11,900-11,913	Siltstone, medium-gray, very finely sandy, slightly calcareous, hard
10,935-10,950	Shale, black	11,913-11,950	Shale, medium dark- to dark-gray
10,950-10,985	Shale, medium-gray	11,950-11,960	Shale, black
10,985-10,995	Shale, black	11,960-12,000	Shale, medium dark- to dark-gray
10,995-11,075	Shale, medium-gray	12,000-12,002	Dolomite, dark-gray, very fine-crystalline, very argillaceous
11,075-11,080	Sandstone, medium light-gray, very fine-grained, silty, slightly calcareous, tight	12,002-12,020	Shale, medium dark- to dark-gray
11,080-11,086	Siltstone, medium light-gray, very finely sandy	12,020-12,030	Siltstone, dark-gray, calcareous, hard; pyrite
11,086-11,090	Sandstone, very light- to light-gray, very fine-grained, silty	12,030-12,055	Shale, medium dark- to dark-gray
11,090-11,098	Sandstone as above; slightly calcareous	12,055-12,060	Siltstone, brownish-gray, very finely sandy, calcareous
11,098-11,111	Shale, medium dark-gray, smooth	12,060-12,070	Siltstone, medium-gray, very finely sandy, calcareous
11,111-11,117	Sandstone, very light-gray, very fine-grained, slightly calcareous	12,070-12,080	Siltstone, medium light-gray, micaceous
11,117-11,121	Shale, medium-gray	12,080-12,090	Siltstone, medium-gray, micaceous
11,121-11,125	Sandstone, moderate-brown, very fine-grained, silty, slightly calcareous	12,090-12,097	Siltstone, medium light- to medium-gray, very finely sandy, slightly micaceous
11,125-11,128	Sandstone, brownish-gray to medium-gray, very fine-grained, silty, slightly calcareous	12,097-12,107	Siltstone as above; calcareous
11,128-11,136	Shale, medium-gray	12,107-12,110	Shale, medium-gray
11,136-11,140	Siltstone, light-gray, very finely sandy, slightly calcareous	12,110-12,114	Siltstone, medium light-gray, very finely sandy, slightly calcareous
11,140-11,150	Sandstone, greenish-gray to light olive-gray, very fine-grained, silty, slightly calcareous, tight	12,114-12,130	Siltstone, medium light- to medium-gray
11,150-11,158	Sandstone, medium light-gray, very fine-grained, silty, calcareous	12,130-12,140	Shale, medium-gray
		12,140-12,150	Shale, black
		12,150-12,160	Shale, medium-gray
		12,160-12,167	Shale, moderate-brown to grayish-red; caving?
		12,167-12,175	Shale, medium-gray
		12,175-12,190	Shale, black
		12,190-12,225	Shale, medium dark- to dark-gray
		12,225-12,240	Shale, black
		12,240-12,260	Shale, medium dark- to dark-gray
		12,260-12,270	Shale, black
		12,270-12,288	Shale, medium dark- to dark-gray
		12,288-12,296	Siltstone, medium-gray, very finely sandy, calcareous, slightly micaceous
		12,296-12,328	Siltstone, medium light- to medium-gray, slightly micaceous
		12,328-12,338	Siltstone, medium light- to medium-gray, very finely sandy, slightly micaceous

12,338-12,342	Shale, medium-gray	13,340-13,347	Shale, black
12,342-12,350	Siltstone, medium-gray, very finely sandy, slightly calcareous	13,347-13,357	Siltstone, medium-gray
12,350-12,358	Shale, medium-gray	13,357-13,361	Siltstone, medium light-gray, very finely sandy
12,358-12,362	Siltstone, medium-gray, slightly calcareous, hard	13,361-13,370	Shale, medium-gray
12,362-12,385	Shale, medium dark- to dark-gray	13,370-13,375	Shale, black
12,385-12,395	Shale, black	13,375-13,381	Shale, medium dark-gray
12,395-12,410	Shale, medium dark- to dark-gray	13,381-13,385	Limestone, medium dark-gray, very argillaceous
12,410-12,420	Shale, black	13,385-13,390	Sandstone, medium light-gray, very fine-grained, silty, slightly calcareous
12,420-12,431	Shale, medium dark- to dark-gray	13,390-13,395	Siltstone, medium light-gray, very finely sandy
12,431-12,438	Siltstone, light- to medium light-gray, very finely sandy	13,395-13,400	Siltstone, medium light-gray
12,438-12,440	Shale, medium-gray	13,400-13,405	Shale, black
12,440-12,448	Siltstone, light- to medium light-gray, very finely sandy	13,405-13,414	Shale, medium dark-gray
12,448-12,452	Shale, medium-gray	13,414-13,434	Sandstone, medium light- to medium-gray, very fine-grained, silty; some oil stain?
12,452-12,458	Shale, olive-gray	13,434-13,449	Siltstone, medium-gray
12,458-12,468	Siltstone, light olive-gray, very finely sandy, slightly calcareous	13,449-13,456	Sandstone, medium light- to medium-gray, very fine-grained, silty
12,468-12,525	Shale, medium dark-gray	13,456-13,462	Siltstone, medium-gray
12,525-12,530	Shale, grayish-brown	13,462-13,468	Sandstone, medium light-gray, very fine-grained, silty, slightly calcareous
12,530-12,545	Shale, medium dark-gray	13,468-13,520	Shale, medium dark- to dark-gray, silty; little mica in part
12,545-12,550	Shale, black	13,520-13,565	Shale, medium dark- to dark-gray
12,550-12,606	Shale, medium dark-gray	13,565-13,590	Shale, black
12,606-12,610	Siltstone, light-gray, calcareous	13,590-13,620	Shale, medium dark- to dark-gray
12,610-12,620	Limestone, medium dark- to dark-gray, fine-crystalline, argillaceous	13,620-13,640	Shale, black
12,620-12,625	Siltstone, medium light- to medium-gray, very finely sandy, micaceous, carbonaceous	13,640-13,745	Shale, medium dark- to dark-gray
12,625-12,633	Siltstone, medium light-gray, very finely sandy	13,745-13,755	Siltstone, dark-gray
12,633-12,640	Siltstone, medium-gray, micaceous	13,755-13,760	Shale, black
12,640-12,655	Shale, medium dark-gray	13,760-13,705	Shale, medium dark- to dark gray
12,655-12,660	Shale, black	13,795-13,805	Shale, black
12,660-12,687	Shale, medium dark-gray	13,805-13,825	Shale, medium dark- to dark-gray
12,687-12,690	Siltstone, medium-gray to brownish-gray, very finely sandy, micaceous	13,825-13,835	Shale, black
12,690-12,700	Siltstone, medium light-gray, very finely sandy, slightly calcareous	13,835-13,960	Shale, medium dark- to dark-gray
12,700-12,710	Siltstone, medium light-gray	13,960-13,965	Shale, black
12,710-12,730	Siltstone, medium light-gray, very finely sandy	13,965-13,980	Shale, medium dark- to dark-gray
12,730-12,750	Siltstone, medium-gray, slightly micaceous	13,980-13,995	Shale, black
12,750-12,760	Shale, medium dark-gray	13,995-14,007	Shale, medium dark- to dark-gray
12,760-12,780	Siltstone, medium light- to dark-gray	14,007-14,009	Limestone, medium dark-gray, fine-crystalline to granular, argillaceous, slightly brownish
12,780-12,786	Shale, medium dark-gray	14,009-14,040	Shale, medium dark- to dark-gray
12,786-12,792	Siltstone, medium-gray, very finely sandy	14,040-14,060	Shale, dark-gray to black
12,792-12,820	Shale, medium dark-gray	14,060-14,125	Shale, medium dark- to dark-gray
12,820-12,835	Siltstone, medium dark-gray, micaceous	14,125-14,135	Shale, black
12,835-12,840	Siltstone, olive-gray	14,135-14,190	Shale, medium dark- to dark-gray
12,840-12,860	Shale, medium dark-gray	14,190-14,195	Shale, medium dark- to dark-gray, ostracods
12,860-12,864	Siltstone, medium-gray	14,195-14,220	Shale, medium dark- to dark-gray
12,864-12,870	Shale, medium dark-gray	14,220-14,225	Limestone, dark-gray, very fine-crystalline, dolomitic, argillaceous
12,870-12,874	Siltstone, medium-gray	14,225-14,240	Limestone, medium dark-gray to brownish-gray, very fine-crystalline, very dolomitic, slightly argillaceous
12,874-12,884	Shale, medium dark-gray	14,240-14,247	Shale, medium dark- to dark-gray
12,884-12,887	Siltstone, medium dark-gray, micaceous	14,247-14,250	Limestone, medium-gray, argillaceous
12,887-12,915	Shale, medium dark- to dark-gray	14,250-14,260	Shale, medium-gray, calcareous
12,915-12,925	Shale, black	14,260-14,263	Limestone, medium dark-gray, fine-crystalline, argillaceous
12,925-12,940	Shale, medium dark-gray	14,263-14,290	Shale, medium dark- to dark-gray
12,940-12,950	Shale, black	14,290-14,298	Shale as above; many small gastropods
12,950-12,956	Shale, moderate-brown to dark olive-gray	14,298-14,303	Limestone, dark-gray, very fine-crystalline, dolomitic, argillaceous
12,956-12,960	Shale, black	14,303-14,315	Shale, medium dark- to dark-gray
12,960-12,975	Shale, medium dark- to dark-gray	14,315-14,325	Shale, black
12,975-12,985	Shale, black	14,325-14,350	Shale, medium dark-gray
12,985-13,005	Shale, medium dark- to dark-gray	14,350-14,358	Limestone, medium dark-gray, very fine-crystalline; crinoids?
13,005-13,020	Shale, black	14,358-14,360	Shale, medium dark- to dark-gray
13,020-13,045	Shale, black, nonbedded?, slickensided?	14,360-14,364	Limestone, medium-gray, dense
13,045-13,047	Limestone, medium dark-gray, very argillaceous	14,364-14,370	Shale, medium dark- to dark-gray
13,047-13,053	Siltstone, brownish-gray to medium-gray	14,370-14,384	Siltstone, medium light- to medium-gray, very finely sandy, calcareous
13,053-13,066	Shale, black	14,384-14,389	Shale, medium dark- to dark-gray
13,066-13,076	Sandstone, light-gray, very fine-grained, silty, slightly calcareous; some light olive-gray sandstone	14,389-14,390	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous
13,076-13,085	Sandstone, light-gray, very fine-grained	14,390-14,394	Shale, medium dark- to dark-gray
13,085-13,087	Sandstone, light-gray, very fine-grained, silty	14,394-14,400	Limestone, medium dark-gray, fine-crystalline, argillaceous
Atoka Series			
Upper part of Dornick Hills Formation 13,087-15,510 feet			
13,087-13,100	Siltstone, medium-gray, nonbedded?	14,400-14,403	Limestone, medium dark-gray, fine-crystalline
13,100-13,125	Shale, medium dark- to dark-gray	14,403-14,410	Siltstone, medium-gray
13,125-13,135	Shale, black	14,410-14,415	Shale, olive-gray; caving?
13,135-13,180	Shale, medium dark- to dark-gray	14,415-14,420	Shale, medium dark- to dark-gray
13,180-13,190	Shale, black	14,420-14,430	Shale, black
13,190-13,204	Shale, medium dark- to dark-gray	14,430-14,500	Shale, medium dark- to dark-gray
13,204-13,212	Siltstone, medium-gray	14,500-14,520	Shale, black
13,212-13,225	Shale, medium dark- to dark-gray	14,520-14,565	Shale, medium dark- to dark-gray
13,225-13,234	Siltstone, medium light-gray, very finely sandy, calcareous	14,565-14,575	Shale, black
13,234-13,240	Shale, medium dark- to dark-gray	14,575-14,594	Shale, medium dark- to dark-gray
13,240-13,248	Siltstone, medium-gray, very finely sandy, calcareous	14,594-14,596	Limestone, medium dark-gray, fine-crystalline, argillaceous
13,248-13,265	Shale, medium dark- to dark-gray	14,596-14,606	Shale, medium dark- to dark-gray
13,265-13,285	Shale, black	14,606-14,616	Shale, black
13,285-13,310	Shale, medium dark- to dark-gray	14,616-14,628	Shale, medium dark- to dark-gray
13,310-13,314	Siltstone, brownish-gray to medium-gray, very calcareous; resembles silty limestone	14,628-14,633	Limestone, dark-gray, fine-crystalline, argillaceous; some medium black oolites?; brachiopods
13,314-13,321	Shale, medium dark-gray	14,633-14,636	Siltstone, medium dark-gray, calcareous
13,321-13,329	Siltstone, pale yellowish-brown to medium light-gray, very calcareous; resembles silty limestone		
13,329-13,336	Shale, moderate-brown		
13,336-13,340	Shale, medium dark-gray		

Morrow Series

Lower part of Dornick Hills Formation 15,510-16,257 feet

14,636-14,655	Shale, medium dark- to dark-gray		
14,655-14,670	Shale, black		
14,670-14,672	Coal		
14,672-14,720	Shale, medium dark- to dark-gray	15,510-15,520	Siltstone, medium dark- to dark-gray, calcareous; light-green glauconite?
14,720-14,735	Siltstone, medium-gray, slightly micaceous		
14,735-14,800	Shale, medium dark- to dark-gray	15,520-15,528	Siltstone as above; much glauconite?
14,800-14,803	Shale as above; ironstone	15,528-15,560	Shale, medium dark-gray
14,803-14,825	Shale, medium dark- to dark-gray	15,560-15,570	Siltstone, medium dark- to dark-gray, calcareous; much glauconite?
14,825-14,830	Shale, black		
14,830-14,850	Shale, medium dark- to dark-gray	15,570-15,575	Shale, medium- to dark-gray
14,850-14,860	Shale, black	15,575-15,585	Shale, black
14,860-14,880	Shale, medium dark-gray	15,585-15,647	Shale, medium dark- to dark-gray, very finely micaceous
14,880-14,885	Shale, medium dark- to dark-gray; gastropods; pelecypods	15,647-15,652	Limestone, medium dark- to dark-gray, fine-crystalline to granular, silty, argillaceous
14,885-14,890	Shale, medium dark- to dark-gray	15,652-15,661	Siltstone, dark-gray, calcareous; light-green glauconite?
14,890-14,900	Shale, black	15,661-15,675	Shale, medium dark- to dark-gray
14,900-14,920	Shale, medium dark- to dark-gray	15,675-15,685	Shale, black
14,920-14,922	Limestone, medium dark-gray, fine-crystalline, argillaceous	15,685-15,695	Shale, medium dark- to dark-gray
14,922-14,930	Shale, medium dark- to dark-gray	15,695-15,705	Shale, black
14,930-14,940	Shale, black	15,705-15,717	Shale, medium dark- to dark-gray
14,940-14,948	Shale, medium dark- to dark-gray	15,717-15,720	Siltstone, dark-gray, calcareous, very finely sandy; much light-green glauconite?
14,948-14,955	Siltstone, medium dark-gray, calcareous; resembles limestone	15,720-15,728	Shale, medium dark- to dark-gray
14,955-14,974	Shale, medium dark- to dark-gray	15,728-15,732	Limestone, medium dark-gray, fine-crystalline; crinoids; trace of glauconite
14,974-14,977	Siltstone, medium dark-gray, calcareous; resembles limestone	15,732-15,759	Shale, medium dark- to dark-gray, very finely micaceous
14,977-14,990	Shale, medium dark- to dark-gray	15,759-15,770	Limestone, medium dark- to dark-gray, fine-crystalline, very finely sandy, silty; crinoids; bryozoans; pyrite; many dark-gray sand grains
14,990-14,995	Shale, black		
14,995-15,001	Shale, medium dark- to dark-gray	15,770-15,776	Limestone, medium dark- to dark-gray, fine-crystalline, silty, argillaceous
15,001-15,004	Siltstone, light-gray to pale yellowish-brown, slightly calcareous, very tight		
15,004-15,008	Siltstone, medium dark-gray, calcareous; resembles limestone	15,776-15,789	Shale, medium dark- to dark-gray
15,008-15,059	Shale, medium dark- to dark-gray	15,789-15,790	Siltstone, dark-gray, very calcareous
15,059-15,060	Siltstone, medium dark-gray, calcareous; resembles limestone	15,790-15,799	Shale, medium dark- to dark-gray
15,060-15,075	Shale, medium dark- to dark-gray	15,799-15,800	Siltstone, dark-gray, very calcareous
15,075-15,078	Shale, medium-gray, nonbedded	15,800-15,807	Shale, medium dark- to dark-gray
15,078-15,085	Shale, medium dark-gray, calcareous; brachiopods; indistinct bed	15,807-15,810	Siltstone, dark-gray, very calcareous
15,085-15,088	Shale, medium dark-gray	15,810-15,815	Siltstone, dark-gray, calcareous; much light-green glauconite?
15,088-15,090	Limestone, dark-gray, fine-crystalline, argillaceous	15,815-15,828	Siltstone, dark-gray, very calcareous; little light-green glauconite?
15,090-15,095	Shale, medium dark-gray	15,828-15,875	Shale, medium dark- to dark-gray; gastropods 15,855-15,869 feet
15,095-15,100	Sandstone, greenish-gray to dark greenish-gray, very fine- to fine-grained, tight; some dark-gray sandstone	15,875-15,894	Siltstone, medium dark- to dark-gray, very finely sandy, calcareous, slightly to very glauconitic
15,100-15,107	Shale, medium dark-gray	15,894-15,900	Siltstone, dark-gray, calcareous; much light-green glauconite?
15,107-15,115	Limestone, dark-gray, fine-crystalline, slightly argillaceous	15,900-15,904	Shale, dark-gray
15,115-15,120	Shale, medium dark-gray	15,904-15,938	Siltstone, dark-gray, calcareous; much light-green glauconite?
15,120-15,124	Shale, medium light-gray, very finely sandy; trace of light-green glauconite?	15,938-15,950	Siltstone as above; very little glauconite
15,124-15,129	Siltstone, greenish-gray to dark greenish-gray, very fine- to fine-sandy, very tight	15,950-15,953	Siltstone, medium dark-gray, calcareous
15,129-15,135	Shale, medium dark-gray	15,953-15,958	Shale, dark-gray
15,135-15,144	Limestone, medium dark-gray, fine-crystalline	15,958-15,963	Siltstone, medium dark- to dark-gray, very finely sandy, calcareous; glauconite
15,144-15,147	Shale, medium dark-gray	15,963-15,968	Shale, dark-gray
15,147-15,150	Sandstone, greenish-gray to medium light-gray, very fine-grained, silty, slightly calcareous	15,968-15,974	Siltstone, dark-gray, calcareous; much glauconite
15,150-15,155	Shale, medium dark-gray	15,974-15,985	Siltstone, medium- to medium dark-gray, calcareous to slightly calcareous, very finely sandy, very glauconitic
15,155-15,160	Shale, medium light-gray; few black specks	15,985-15,990	Siltstone, dark-gray, calcareous, very glauconitic
15,160-15,176	Shale, medium dark-gray	15,990-16,000	Siltstone, black, slightly calcareous, very glauconitic
15,176-15,180	Sandstone, greenish-gray to dark-gray, very fine- to fine-grained, silty; some with many grayish-red grains; oil stain?	16,000-16,013	Siltstone, dark-gray, slightly calcareous, very glauconitic
15,180-15,188	Shale, medium dark-gray	16,013-16,020	Siltstone, medium light- to medium-gray, slightly calcareous, very finely sandy; light-green glauconite
15,188-15,190	Limestone, dark-gray, fine-crystalline, argillaceous, very finely pyritic	16,020-16,030	Sandstone, medium light-gray, very fine-grained, silty, calcareous; little light-green glauconite
15,190-15,219	Shale, medium dark-gray	16,030-16,040	Siltstone, medium- to dark-gray, very finely sandy, slightly calcareous; much glauconite
15,219-15,221	Shale as above; ironstone	16,040-16,056	Siltstone, medium dark-gray, slightly calcareous to calcareous, very glauconitic
15,221-15,230	Shale, black	16,056-16,060	Sandstone, light- to medium light-gray, very fine-grained, silty, calcareous
15,230-15,240	Shale, medium dark-gray	16,060-16,065	Sandstone, medium light-gray, very fine-grained, silty, slightly calcareous; light-green glauconite
15,240-15,250	Shale, medium-gray; coal at top	16,065-16,073	Sandstone as above; tight
15,250-15,259	Shale, medium dark-gray	16,073-16,075	Shale, dark-gray
15,259-15,260	Limestone, dark-gray, fine-crystalline, argillaceous	16,075-16,082	Sandstone, medium-gray, very fine-grained, silty, glauconitic; some dark-gray sandstone
15,260-15,265	Shale, medium dark-gray	16,082-16,100	Shale, medium dark-gray
15,265-15,271	Limestone, dark-gray, fine-crystalline, argillaceous; crinoids; other fossils; pyrite	16,100-16,110	Siltstone, dark-gray, very finely sandy, tight; little glauconite
15,271-15,300	Shale, medium dark-gray	16,110-16,113	Siltstone, dark-gray, very finely sandy, glauconitic
15,300-15,310	Shale, black	16,113-16,150	Shale, medium dark-gray
15,310-15,325	Shale, medium dark-gray	16,150-16,154	Siltstone, light-gray, very finely sandy
15,325-15,326	Limestone, dark-gray, fine-granular, argillaceous	16,154-16,170	Sandstone, light-gray, very fine-grained, silty, tight; some yellowish-brown sandstone
15,326-15,340	Shale, medium dark-gray	16,170-16,176	Sandstone, light-gray, very fine-grained, silty, slightly calcareous; trace of light-green glauconite
15,340-15,343	Limestone, dark-gray, fine-granular, argillaceous	16,176-16,214	Shale, medium dark-gray
15,343-15,354	Shale, medium dark-gray	16,214-16,218	Sandstone, medium light- to light-gray, very fine- to fine-grained, calcareous
15,354-15,356	Limestone, dark-gray, fine-granular, argillaceous	16,218-16,220	Shale, medium dark-gray
15,356-15,360	Shale, medium light- to medium-gray, very slightly dolomitic		
15,360-15,385	Shale, medium dark-gray		
15,385-15,400	Shale, black		
15,400-15,426	Shale, medium dark-gray		
15,426-15,429	Limestone, dark-gray, very argillaceous		
15,429-15,480	Shale, medium dark-gray		
15,480-15,482	Limestone, dark-gray, very argillaceous		
15,482-15,510	Shale, medium dark-gray		

16,220-16,230	Sandstone, medium light-gray to light olive-gray, fine-grained; scattered medium angular grains; calcareous in part; little glauconite	17,030-17,065	Sandstone, very light- to light-gray, very fine-grained
16,230-16,240	Sandstone, light-gray, fine-grained, calcareous; little medium-grained sandstone	17,065-17,080	Shale, black
16,240-16,249	Sandstone, light-gray, very fine-grained	17,080-17,095	Shale, dark-gray
16,249-16,257	Siltstone, light olive-gray to olive-gray, very finely sandy, very tight and hard; little light-green glauconite	17,095-17,110	Shale, black
	Springer Formation 16,265-17,805 feet	17,110-17,130	Shale, dark-gray
16,257-16,265	Shale, medium dark-gray	17,130-17,140	Shale, black
16,265-16,280	Shale, black	17,140-17,150	Shale, dark-gray
16,280-16,288	Siltstone, olive-gray, very finely sandy, hard, tight	17,150-17,160	Shale, black
16,288-16,296	Shale, medium dark-gray	17,160-17,280	Shale, dark-gray
16,296-16,306	Sandstone, light-gray, very fine-grained, slightly calcareous	17,280-17,367	Shale, medium dark- to dark-gray
16,306-16,314	Sandstone, medium light-gray, very fine-grained, silty	17,367-17,370	Claystone, dark-gray, slightly dolomitic, pyritic; resembles limestone
16,314-16,320	Siltstone, light-gray, very finely sandy	17,370-17,406	Shale, medium dark- to dark-gray
16,320-16,330	Sandstone, light-gray, very fine-grained	17,406-17,407	Sandstone, medium- to dark-gray, very fine-grained, silty, argillaceous, very tight, dolomitic; crinoid fragments?; pyrite
16,330-16,335	Shale, medium dark-gray	17,407-17,410	Shale, medium dark- to dark-gray
16,335-16,340	Sandstone, medium-gray to olive-gray, very fine-grained, silty, very tight and hard	17,410-17,414	Limestone, medium- to dark-gray, finely sandy; some medium oolites with sand centers
16,340-16,356	Sandstone, light- to medium light-gray, very fine-grained, silty	17,414-17,446	Shale, medium dark- to dark-gray
16,356-16,360	Shale, black, silty	17,446-17,448	Siltstone, dark-gray, very finely sandy, dolomitic; pyrite; crinoids?
16,360-16,366	Sandstone, medium-gray, very fine-grained, silty	17,448-17,467	Shale, medium dark- to dark-gray
16,366-16,376	Shale, black	17,467-17,470	Sandstone, dark-gray to black, very fine-grained, silty, slightly dolomitic, very tight
16,376-16,383	Sandstone, very light- to light-gray, very fine-grained, oil-stained	17,470-17,474	Sandstone, olive-gray, very fine-grained, silty
16,383-16,412	Sandstone, very light- to light-gray, very fine-grained	17,474-17,495	Shale, medium dark- to dark-gray
16,412-16,430	Shale, black	17,495-17,505	Siltstone, medium dark- to dark-gray, very finely sandy, slightly dolomitic
16,430-16,440	Shale, dark-gray	17,505-17,546	Shale, medium dark- to dark-gray
16,440-16,460	Shale, black	17,546-17,550	Siltstone, medium dark-gray, very finely sandy, slightly calcareous
16,460-16,470	Shale, dark-gray	17,550-17,566	Shale, medium dark- to dark-gray
16,470-16,480	Shale, black	17,566-17,576	Sandstone, medium-gray, very fine- to fine-grained, calcareous; some slightly brownish sandstone
16,480-16,493	Shale, dark-gray	17,576-17,583	Sandstone, light- to medium light-gray, very fine-grained, slightly calcareous
16,493-16,496	Siltstone, medium dark-gray to black, slightly dolomitic	17,583-17,588	Shale, medium dark- to dark-gray
16,496-16,505	Shale, dark-gray	17,588-17,590	Siltstone, medium dark-gray, very finely sandy, very tight
16,505-16,510	Shale, black	17,590-17,598	Siltstone, medium- to medium dark-gray, tight
16,510-16,525	Shale, dark-gray	17,598-17,605	Shale, medium dark- to dark-gray
16,525-16,535	Shale, black	17,605-17,608	Limestone, medium dark-gray, very argillaceous; crinoids; spines
16,535-16,555	Shale, dark-gray	17,608-17,610	Shale, medium dark- to dark-gray
16,555-16,565	Shale, black	17,610-17,615	Shale, black
16,565-16,606	Shale, dark-gray	17,615-16,625	Shale, medium dark- to dark-gray
16,606-16,630	Sandstone, very light- to light-gray, very fine-grained	17,625-17,630	Sandstone, medium dark- to dark-gray, very fine-grained, silty, calcareous
16,630-16,656	Sandstone, medium- to medium dark-gray, very fine-grained, silty; some brownish-gray sandstone	17,630-17,635	Sandstone, dark-gray, very fine-grained, silty, slightly calcareous
16,656-16,670	Siltstone, medium-gray to light olive-gray, very finely sandy, very tight and hard	17,635-17,640	Shale, medium dark- to dark-gray
16,670-16,680	Sandstone, medium dark-gray, very fine-grained, silty, argillaceous	17,640-17,650	Sandstone, medium dark-gray, very fine-grained, silty
16,680-16,690	Siltstone, medium dark-gray	17,650-17,654	Shale, medium dark- to dark-gray
16,690-16,695	Siltstone, medium dark-gray, dolomitic	17,654-17,658	Sandstone, medium dark-gray, very fine-grained, silty
16,695-16,700	Siltstone, dark olive-gray, slightly dolomitic	17,658-17,660	Shale, medium dark- to dark-gray
16,700-16,708	Shale, dark-gray	17,660-17,667	Sandstone, medium dark-gray, very fine-grained, silty
16,708-16,710	Sandstone, medium- to dark-gray, very fine-grained, very tight and hard	17,667-16,672	Shale, medium dark- to dark-gray
16,710-16,722	Sandstone, light- to medium light-gray, very fine-grained	17,672-17,700	Sandstone, light- to medium-gray, very fine-grained, silty
16,722-16,730	Shale, dark-gray	17,700-17,730	Shale, medium dark- to dark-gray
16,730-16,735	Shale, black	17,730-17,750	Shale, black
16,735-16,745	Shale, dark-gray	17,750-17,758	Sandstone, dark-gray, very fine-grained, silty, very tight; caving?
16,745-16,750	Shale, dark-gray; ironstone	17,758-17,765	Shale, black
16,750-16,780	Shale, dark-gray	17,765-17,770	Siltstone, dark-gray, very finely sandy; caving?
16,780-16,790	Shale, black	17,770-17,775	Shale, medium dark- to dark-gray
16,790-16,815	Shale, dark-gray	17,775-17,780	Sandstone, dark-gray, very fine-grained, silty, very tight
16,815-16,825	Shale, black	17,780-17,795	Shale, medium dark- to dark-gray
16,825-16,840	Shale, dark-gray	17,795-17,805	Shale, black
16,840-16,855	Shale, black		Estimated 18 feet lag in samples
16,855-16,875	Shale, dark-gray		No circulation samples at total depth
16,875-16,885	Shale, black		
16,885-16,925	Shale, dark-gray		
16,925-16,945	Sandstone, light- to medium light-gray, very fine- to fine-grained; good porosity	17,823	
16,945-16,959	Sandstone as above; fair porosity		
16,959-16,963	Shale, dark-gray		
16,963-16,983	Sandstone, very light- to light-gray, very fine-grained; slight oil stain?		
16,983-16,985	Shale, dark-gray		
16,985-16,990	Sandstone, medium light-gray, very fine-grained, silty, slightly brownish		
16,990-16,994	Shale, dark-gray		
16,994-17,000	Sandstone, very light-gray, very fine-grained, silty, tight		
17,000-17,006	Shale, dark-gray		
17,006-17,008	Sandstone, very light-gray, very fine-grained, silty, tight		
17,008-17,024	Shale, dark-gray; trace of coal		
17,024-17,030	Sandstone, medium-gray to light olive-gray, very fine-grained, very tight		

LOG 18
CADDO COUNTY, OKLAHOMA
SW¼ NW¼ NW¼ sec. 1, T. 6 N., R. 13 W.

Operator: Sinclair Prairie Oil Co.
Lease: German No. 1
Elevation: DF 1,382 feet
Total depth: Electrical log 11,026 feet
Completion date: 1940
Initial production: Dry

Electrical log: 589 to 11,026 feet

Sample intervals:

10-foot

620 to 6,590 feet

6,615 to 9,500 feet

(Some 2-foot and 3-foot samples and
some 1-foot to 5-foot samples 9,200 to
9,230 feet)

5-foot

6,590 to 6,615 feet

9,500 to 9,548 feet

9,715 to 9,905 feet

9,915 to 10,090 feet

10,130 to 10,718 feet

10,730 to 11,026 feet

2-foot

9,548 to 9,715 feet

9,905 to 9,915 feet

10,090 to 10,130 feet

10,718 to 10,730 feet

Cored intervals:

3,392 to 3,418 feet (core chips)

7,957 to 7,962 feet (no core chips;
2-foot rotary samples)

8,290 to 8,306 feet (no core chips;
2-foot rotary samples)

9,149 to 9,166 feet (core chips)

9,180 to 9,195 feet (core chips)

	Permian System	777-779	Limestone, moderate reddish-brown to olive-gray, very fine-crystalline, argillaceous
0-620	No samples	779-784	Shale, moderate reddish-brown
	Hennessey Shale 620-736 feet	784-790	Sandstone, pale reddish-brown, very fine-grained, silty, gypsiferous; some medium light-gray sandstone
620-626	Anhydrite, white, fine-crystalline; soft gypsum	790-808	Sandstone, pale reddish-brown, very fine-grained, gypsiferous, silty
626-640	Shale, moderate reddish-brown; white gypsum	808-818	Shale, moderate reddish-brown
640-656	Siltstone, light- to medium light-gray, very finely sandy, slightly dolomitic	818-820	Limestone, light olive-gray, very fine-crystalline
656-660	Dolomite, light olive-gray, very fine-crystalline, argillaceous; moderate reddish-brown very fine-crystalline argillaceous dolomite	820-827	Sandstone, light-gray, very fine-grained, silty, gypsiferous, porous
660-683	Shale, moderate reddish-brown, slightly dolomitic	827-830	Shale, moderate reddish-brown
683-686	Gypsum, white	830-843	Sandstone, pale reddish-brown, very fine-grained, silty, gypsiferous, porous
686-700	Shale, moderate reddish-brown; white gypsum	843-850	Shale, moderate reddish-brown
700-706	Shale, greenish-gray	850-858	Sandstone, light-gray, very fine-grained, silty, gypsiferous
706-736	Gypsum and anhydrite, white	858-870	Shale, moderate reddish-brown
	Pennsylvanian? and Permian Systems	870-880	Shale, moderate reddish-brown; with dark reddish-brown calcareous pellets
	Upper part of Wichita Formation 736-1,130 feet	880-890	Shale, moderate reddish-brown
736-748	Siltstone, medium light-gray, slightly dolomitic	890-902	Shale, moderate reddish-brown; with dark reddish-brown calcareous pellets
748-753	Siltstone, medium light-gray, very finely sandy, slightly dolomitic	902-906	Limestone, pale to moderate reddish-brown, fine-crystalline, argillaceous
753-777	Shale, moderate reddish-brown	906-913	Sandstone, moderate reddish-brown, very fine-grained, silty; probably contains very coarse grains of dark reddish-brown limestone (subrounded)

913- 923	Shale, moderate reddish-brown	1,708-1,720	Dolomite, light olive-gray to medium light-gray, very fine-granular, slightly calcareous and argillaceous
923- 937	Siltstone, pale to moderate reddish-brown, very finely sandy		
937- 952	Shale, moderate reddish-brown		
952- 966	Sandstone, pale reddish-brown, very fine-grained, silty	1,720-1,724	Shale, moderate reddish-brown
966- 987	Shale, moderate reddish-brown	1,724-1,730	Dolomite, light olive-gray to medium light-gray, very fine-granular, slightly calcareous and argillaceous
987-1,007	Sandstone, light-gray to pale-red, very fine-grained, gypsiferous		
1,007-1,014	Shale, moderate reddish-brown	1,730-1,735	Shale, moderate reddish-brown
1,014-1,037	Sandstone, light-gray to pale-red, very fine-grained, gypsiferous; very coarse limestone grains as at 906-913 feet	1,735-1,750	Shale, moderate reddish-brown, calcareous
		1,750-1,770	Limestone conglomerate, pale to moderate reddish-brown, fine-crystalline, slightly argillaceous; some of red limestone contains very fine to fine sand grains
1,037-1,042	Sandstone, pale to moderate reddish-brown, very fine-grained, silty	1,770-1,780	Shale, moderate reddish-brown, calcareous
1,042-1,071	Shale, moderate reddish-brown	1,780-1,783	Limestone, pale-red, very fine-crystalline
1,071-1,074	Limestone, moderate reddish-brown, fine-crystalline, argillaceous	1,783-1,790	Shale, moderate reddish-brown, calcareous
		1,790-1,792	Limestone, pale-red, very fine-crystalline
1,074-1,079	Shale, moderate reddish-brown	1,792-1,810	Shale, moderate reddish-brown, calcareous
1,079-1,088	Siltstone, medium light-gray, very finely sandy, calcareous	1,810-1,818	Shale, moderate reddish-brown
1,088-1,130	Shale, moderate reddish-brown	1,818-1,820	Shale, moderate reddish-brown, calcareous
		1,820-1,835	Limestone conglomerate, pale-red to moderate reddish-brown, very fine- to fine-crystalline, slightly argillaceous
	Pontotoc Group		
1,130-1,135	Limestone, very pale-orange and light olive-gray, very fine-crystalline; ostracods?	1,835-1,839	Shale, moderate reddish-brown
1,135-1,138	Limestone, pale-red, fine-crystalline, slightly argillaceous	1,839-1,841	Limestone conglomerate, medium dark-gray, very fine-crystalline; trace of gray chert
		1,841-1,849	Shale, moderate reddish-brown
1,138-1,150	Shale, moderate reddish-brown	1,849-1,852	Limestone, pale reddish-brown, fine-granular, slightly argillaceous
1,150-1,186	Limestone conglomerate, pale-red to pale yellowish-orange, fine-crystalline; samples had some very fine- to fine-grained sandstone fragments	1,852-1,868	Shale, moderate reddish-brown
		1,868-1,872	Limestone, light-gray, very fine-crystalline
1,186-1,208	Shale, moderate reddish-brown	1,872-1,888	Shale, moderate reddish-brown
1,208-1,210	Limestone, pale-red, fine-crystalline, argillaceous	1,888-1,892	Limestone, pale to moderate reddish-brown, silty to finely sandy; trace of glauconite?
1,210-1,227	Shale, moderate reddish-brown		
1,227-1,230	Siltstone, moderate reddish-brown	1,892-1,900	Shale, moderate reddish-brown
1,230-1,260	Shale, moderate reddish-brown	1,900-1,910	Shale, moderate reddish-brown, calcareous
1,260-1,287	Limestone conglomerate, light-gray, very pale-orange, and pale yellowish-brown, dense to fine-crystalline, dolomitic; few small vugs, some coated with dead oil?	1,910-1,960	Shale, moderate reddish-brown
		1,960-1,964	Shale, moderate reddish-brown; trace of pale-red dense chert
1,287-1,295	Shale, moderate reddish-brown	1,964-1,970	Shale, moderate reddish-brown; one very small gastropod
1,295-1,303	Siltstone, light-gray, very finely sandy	1,970-1,980	Limestone conglomerate, medium-gray to pale yellowish-brown, fine-crystalline; bryozoans?; trace of gray chert; trace of light-gray to pink medium-grained calcareous sandstone
1,303-1,308	Shale, moderate reddish-brown		
1,308-1,310	Sandstone, pale reddish-brown, very fine-grained, silty	1,980-1,988	Limestone conglomerate, medium-gray to pale yellowish-brown, fine-crystalline; trace of light-gray dense chert; trace of oolitic chert
1,310-1,350	Shale, moderate reddish-brown		
1,350-1,360	Siltstone, moderate reddish-brown, very finely sandy		
1,360-1,368	Shale, moderate reddish-brown	1,988-1,999	Shale, moderate reddish-brown
1,368-1,382	Limestone, pale-red to very pale-orange, very fine-crystalline	1,999-2,001	Limestone conglomerate, brownish-gray to medium-gray, fine-crystalline
		2,001-2,009	Shale, moderate reddish-brown
1,382-1,388	Shale, moderate reddish-brown	2,009-2,018	Limestone conglomerate, brownish-gray to medium-gray, fine-crystalline
1,388-1,400	Siltstone, light-gray, very finely sandy, calcareous		
1,400-1,410	Sandstone, pale to moderate reddish-brown, very fine-grained, silty, calcareous	2,018-2,028	Shale, moderate reddish-brown
		2,028-2,033	Limestone conglomerate, light- to medium light-gray, fine- to medium-sandy, granules of light-gray chert; trace of granite?; little asphaltite?
1,410-1,436	Shale, moderate reddish-brown		
1,436-1,450	Shale, moderate reddish-brown, calcareous	2,033-2,040	Limestone conglomerate, medium-gray to brownish-gray, fine-crystalline
1,450-1,465	Shale, moderate reddish-brown	2,040-2,043	Limestone conglomerate, medium light-gray, fine-granular, argillaceous; medium light-gray dense chert; caving?; fine- to coarse-sandy and calcareous matrix; some light-gray fine- to medium-grained glauconitic sandstone fragments
1,465-1,469	Limestone, pale to moderate reddish-brown, very finely sandy, silty		
1,469-1,486	Shale, moderate reddish-brown	2,043-2,054	Shale, moderate reddish-brown
1,486-1,490	Limestone, moderate reddish-brown, fine- to medium-sandy, silty	2,054-2,060	Limestone conglomerate, pale yellowish-brown, very fine-crystalline, grayish
1,490-1,494	Limestone, medium light-gray, very fine- to medium-sandy; trace feldspar? and glauconite?		
1,494-1,520	Shale, moderate reddish-brown	2,060-2,069	Shale, moderate reddish-brown
1,520-1,525	Limestone, pale reddish-brown, fine-crystalline, dolomitic, slightly argillaceous	2,069-2,073	Limestone, medium-gray, fine- to medium-sandy; caving?
1,525-1,530	Dolomite, pale reddish-brown, fine-crystalline, calcareous, slightly argillaceous		
1,530-1,535	Limestone, pale-red, fine-crystalline, dolomitic, slightly argillaceous	2,073-2,080	Shale, moderate reddish-brown
1,535-1,550	Limestone, pale-red, very fine-crystalline; mottled with light gray	2,080-2,087	Limestone conglomerate, medium-gray, fine-crystalline; reddish-brown calcareous matrix
1,550-1,570	Shale, moderate reddish-brown	2,087-2,093	Limestone conglomerate, pale yellowish-brown, fine-crystalline
1,570-1,590	Limestone, pale to moderate reddish-brown, very fine- to fine-crystalline, slightly argillaceous		
1,590-1,594	Limestone, medium light-gray to light olive-gray, fine-crystalline	2,093-2,095	Shale, moderate reddish-brown
1,594-1,600	Shale, moderate reddish-brown	2,095-2,107	Limestone conglomerate, medium-gray, fine-crystalline; some medium oolites; some fine to medium sand
1,600-1,607	Dolomite, light olive-gray to light-gray, fine-crystalline, calcareous	2,107-2,113	Sandstone, light-gray, medium-grained, calcareous, subrounded; coarse to very coarse loose quartz grains
1,607-1,610	Shale, moderate reddish-brown		
1,610-1,620	Limestone, pale-red, very fine-crystalline, slightly argillaceous	2,113-2,133	Shale, moderate reddish-brown
1,620-1,630	Limestone, moderate reddish-brown, fine-crystalline, slightly argillaceous	2,133-2,146	Limestone conglomerate, medium-gray to brownish-gray, fine-crystalline; little light-gray to yellowish-brown chert; trace of light-gray fine- to medium-grained very glauconitic sandstone
1,630-1,633	Limestone, pale-red, very fine-crystalline		
1,633-1,641	Shale, moderate reddish-brown	2,146-2,152	Shale, moderate reddish-brown
1,641-1,654	Limestone, pale-red, very fine-crystalline	2,152-2,164	Limestone conglomerate, medium-gray, fine-crystalline
1,654-1,659	Dolomite, light olive-gray, fine-granular to crystalline, calcareous	2,164-2,170	Shale, moderate reddish-brown
		2,170-2,180	Limestone conglomerate, pale yellowish-brown, very fine-crystalline; calcareous and sandy matrix
1,659-1,670	Shale, moderate reddish-brown		
1,670-1,676	Sandstone, moderate reddish-brown, very fine-grained, silty, calcareous	2,180-2,193	Limestone conglomerate, brownish-gray to medium-gray, very fine-crystalline; scattered fine to coarse sand; little light-gray fine- to medium-grained very glauconitic sandstone
1,676-1,683	Shale, moderate reddish-brown		
1,683-1,688	Shale, moderate reddish-brown, very calcareous	2,193-2,200	Shale, moderate reddish-brown, calcareous
1,688-1,690	Sandstone, medium light-gray, very fine-grained, silty	2,200-2,206	Limestone, pale reddish-brown, fine-crystalline, slightly argillaceous
1,690-1,708	Shale, moderate reddish-brown		

2,206-2,225	Shale, moderate reddish-brown	3,870-3,946	Shale, medium-gray, calcareous, very splintery
2,225-2,238	Limestone conglomerate, pale yellowish-brown to pale-red, very fine-crystalline; light-gray to pale-red chert; trace of oolitic chert; scattered fine to medium sand	3,946-3,960	Limestone, medium-gray, fine-crystalline, argillaceous
		3,960-4,000	Shale, medium-gray, very calcareous, marly, splintery to chunky
2,238-2,250	Shale, moderate reddish-brown	4,000-4,010	Limestone, medium-gray, very argillaceous
2,250-2,256	Limestone, moderate reddish-brown, fine- to medium-sandy	4,010-4,030	Shale, medium-gray, very calcareous, marly, splintery to chunky
2,256-2,263	Shale, moderate reddish-brown	4,030-4,037	Limestone, medium-gray, very argillaceous
2,263-2,270	Limestone conglomerate, pale yellowish-brown, very fine-crystalline; yellowish-brown to pale-red dense chert; some dolomitic limestone fragments	4,037-4,066	Shale, medium-gray, very calcareous, marly, splintery to chunky
2,270-2,280	Shale, moderate reddish-brown	4,066-4,074	Limestone, medium-gray, very argillaceous
2,280-2,298	Limestone conglomerate, light- to medium light-gray, fine-crystalline to granular; stringers? of fine- to medium-grained sandstone; gray chert; much light- to medium-gray chert 2,290-2,298 feet	4,074-4,088	Shale, medium-gray, very calcareous, marly, splintery to chunky
2,298-2,318	Shale, moderate reddish-brown	4,088-4,107	Limestone, medium-gray, very argillaceous
2,318-2,323	Limestone, pale-red, very finely sandy, silty, soft	4,107-4,127	Shale, medium-gray, very calcareous, marly, splintery to chunky
2,323-2,336	Limestone conglomerate, pale-red to medium-gray, fine-crystalline; light- to medium-gray chert	4,127-4,136	Limestone, medium-gray, very argillaceous
2,336-2,350	Shale, moderate reddish-brown	4,136-4,228	Shale, medium-gray, very calcareous, marly, splintery to chunky
2,350-2,363	Sandstone, medium light-gray, very fine-grained, silty, calcareous	4,228-4,232	Limestone, medium-gray, very argillaceous
2,363-2,380	Siltstone, medium-gray, very finely sandy, calcareous; much carbonaceous material	4,232-4,264	Shale, medium-gray, very calcareous, marly, splintery to chunky
2,380-2,394	Siltstone, pale reddish-brown, very finely sandy, calcareous	4,264-4,274	Limestone, medium-gray, very argillaceous
2,394-2,400	Sandstone, pale-red to grayish-red, fine-grained, very calcareous; scattered medium to coarse grains; many dark-red grains	4,274-4,300	Shale, medium-gray, very calcareous, marly, splintery to chunky
2,400-2,414	Sandstone, medium light-gray, medium- to coarse-grained, calcareous; feldspar?; scattered coarse to very coarse quartz grains (loose)	4,300-4,340	Shale, medium-gray, calcareous
2,414-2,420	Sandstone, medium light-gray to medium-gray, very fine-grained, silty, calcareous	4,340-4,360	Shale, medium-gray, very calcareous
2,420-2,430	Sandstone, grayish-red, medium-grained, calcareous; feldspar?; scattered coarse to very coarse grains and granules of quartz; granite?	4,360-4,366	Limestone, medium-gray, very argillaceous; white calcite
2,430-2,440	Sandstone, light- to medium light-gray, medium-grained, calcareous; feldspar?; many black grains; coarse to very coarse grains and granules of quartz; limestone	4,366-4,394	Shale, medium-gray, very calcareous; some with slight brownish tint
2,440-2,445	Sandstone, medium light-gray, very fine- to fine-grained, silty, very calcareous; trace of feldspar	4,394-4,421	Limestone, medium-gray, very argillaceous
	Pennsylvanian System	4,421-4,440	Shale, medium-gray, very calcareous, splintery
2,445-2,478	Shale, medium dark-gray, very calcareous	4,440-4,470	Shale, medium-gray, calcareous
2,478-2,481	Sandstone, dark-gray, very fine- to fine-grained, argillaceous, calcareous; pyrite	4,470-4,475	Limestone, medium-gray, very argillaceous
2,481-2,489	Shale, medium dark-gray, very calcareous	4,475-4,486	Shale, medium-gray, calcareous
2,489-2,491	Sandstone, dark-gray, very fine- to fine-grained, argillaceous, calcareous	4,486-4,490	Limestone, medium-gray, very argillaceous
	Morrow Series	4,490-4,553	Shale, medium-gray, calcareous
2,491-2,700	Shale, medium dark-gray; platy to fissile; not calcareous; ironstone at 2,610-2,615 feet	4,553-4,562	Limestone, medium-gray, very argillaceous
2,700-2,730	Shale, dark-gray	4,562-4,580	Shale, medium-gray, calcareous
2,730-2,800	Shale, medium dark-gray	4,580-4,625	Shale, medium-gray, very calcareous
2,800-2,840	Shale, medium dark-gray, fissile	4,625-4,646	Limestone, medium-gray, very argillaceous
2,840-2,900	Shale, medium dark-gray, platy to fissile	4,646-4,670	Shale, medium-gray, calcareous
2,900-2,910	Shale, moderate-brown, fissile	4,670-4,677	Limestone, medium-gray, very argillaceous
2,910-3,020	Shale, medium dark- to dark-gray	4,677-4,725	Shale, medium-gray, very calcareous, marly
3,020-3,038	Shale, grayish-black; bedding obscure	4,725-4,740	Limestone, medium-gray, very argillaceous
3,038-3,125	Shale, dark-gray	4,740-4,780	Shale, medium-gray, very calcareous, marly
	Mississippian System	4,780-4,788	Limestone, medium-gray, very argillaceous
	Lower and Upper Mississippian Series	4,788-4,800	Shale, medium-gray, very calcareous, marly
3,125-3,138	Shale, medium dark-gray, calcareous	4,800-4,812	Shale, medium-gray
3,138-3,150	Shale, dark-gray	4,812-4,860	Shale, medium-gray, calcareous
3,150-3,230	Shale, medium-gray, calcareous	4,860-4,870	Shale, medium-gray
3,230-3,265	Shale, medium-gray, very calcareous; calcareous fillings (marly)	4,870-4,924	Shale, medium-gray, calcareous
3,265-3,300	Shale, medium-gray, calcareous	4,924-4,931	Limestone, medium-gray, very silty
3,300-3,380	Shale, medium-gray, very calcareous, marly	4,931-4,940	Shale, medium-gray, calcareous
3,380-3,389	Shale, dark-gray	4,940-4,970	Shale, medium- to medium dark-gray
3,389-3,392	Limestone, medium light-gray, very silty	4,970-5,000	Shale, medium-gray, calcareous
3,392-3,400	Limestone, medium-gray to olive-gray, argillaceous; crinoids; bryozoans?; some medium oolites?; oil stain	5,000-5,007	Limestone, medium dark-gray, very argillaceous
3,400-3,418	Limestone, medium-gray to medium dark-olive-gray, argillaceous, silty; crinoids; brachiopods; bryozoans	5,007-5,040	Shale, medium-gray, very calcareous
3,418-3,475	Shale, medium-gray, very calcareous, marly; bedding obscure	5,040-5,046	Limestone, medium dark-gray, very argillaceous
3,475-3,530	Shale, medium-gray to medium dark-gray; calcareous in part	5,046-5,079	Shale, medium-gray, very calcareous
3,530-3,600	Shale, medium- to medium dark-gray	5,079-5,086	Limestone, medium-gray, very argillaceous
3,600-3,614	Shale, medium-gray, calcareous	5,086-5,120	Shale, medium-gray, very calcareous
3,614-3,630	Limestone, medium-gray, very argillaceous	5,120-5,140	Shale, medium- to medium dark-gray, calcareous
3,630-3,640	Shale, medium-gray, calcareous	5,140-5,160	Shale, dark-gray, calcareous
3,640-3,658	Limestone, medium-gray, very argillaceous	5,160-5,264	Shale, medium- to medium dark-gray, calcareous
3,658-3,680	Shale, medium-gray	5,264-5,268	Dolomite, medium dark-brownish-gray, fine-crystalline, argillaceous, calcareous
3,680-3,870	Shale, medium-gray, calcareous; splintery in part	5,268-5,274	Shale, medium- to medium dark-gray, calcareous
		5,274-5,296	Shale, medium dark- to dark-gray
		5,296-5,314	Shale, medium dark-gray, calcareous
		5,314-5,318	Dolomite, medium dark-gray, fine-crystalline, argillaceous, calcareous
		5,318-5,360	Shale, medium dark-gray, calcareous
		5,360-5,373	Shale, medium- to medium dark-gray, very calcareous
		5,373-5,380	Limestone, dark-gray, argillaceous
		5,380-5,399	Shale, medium- to medium dark-gray, very calcareous
		5,399-5,412	Limestone, medium-gray, very argillaceous
		5,412-5,422	Shale, medium- to medium dark-gray, very calcareous
		5,422-5,440	Shale, medium dark-gray and dark-gray
		5,440-5,448	Dolomite, medium dark-gray, fine-crystalline, argillaceous
		5,448-5,460	Limestone, dark-gray, very argillaceous
		5,460-5,470	Shale, dark-gray, slightly calcareous
		5,470-5,480	Limestone, dark-gray, very argillaceous
		5,480-5,486	Shale, dark-gray, slightly calcareous
		5,486-5,530	Limestone, dark-gray, very argillaceous; probably calcareous shale in part
		5,530-5,540	Dolomite, medium dark-gray, fine-crystalline, very argillaceous
		5,540-5,556	Limestone, dark-gray, very argillaceous; probably calcareous shale in part
		5,556-5,577	Shale, medium dark- to dark-gray, slightly calcareous in part
		5,577-5,595	Shale, medium dark- to dark-gray, calcareous
		5,595-5,610	Shale, medium dark- to dark-gray

5,610-5,618	Shale, dark-gray, silty, slightly calcareous	6,541-6,545	Siltstone, medium dark- to dark-gray, very glauconitic; little pyrite
5,618-5,660	Siltstone, medium- to medium dark-gray, very calcareous		
5,660-5,666	Limestone, medium-gray, very fine-crystalline, argillaceous		Devonian and Mississippian Systems
5,666-5,710	Siltstone, medium- to medium dark-gray, very calcareous		Woodford Shale 6,545-7,150
5,710-5,725	Shale, medium dark- to dark-gray, silty, micaceous	6,545-6,550	Shale, medium-gray, slightly greenish, very hard, siliceous
5,725-5,745	Siltstone, medium dark-gray, slightly calcareous; oil stain?	6,550-6,568	Chert, greenish-gray, dense, pyritic; probably shale as above
5,745-5,758	Siltstone, medium- to medium dark-gray, calcareous	6,568-6,578	Shale, greenish-gray
5,758-5,762	Limestone, medium-gray, very fine-crystalline, argillaceous	6,578-6,581	Shale, greenish-gray, hard, siliceous; pyrite
5,762-5,778	Shale, medium dark-gray	6,581-6,600	Shale, dark-gray to black, siliceous; dark-gray to black dense pyritic chert; asphalt on some fragments
5,778-5,782	Siltstone, medium dark- to dark-gray, calcareous	6,600-6,690	Shale, dark-gray to black, siliceous; dark-gray to black dense chert
5,782-5,790	Siltstone, medium-gray, calcareous	6,690-6,730	Shale and chert as above; much medium dark-gray shale, probably caving
5,790-5,813	Limestone, medium-gray, very silty	6,730-6,735	Shale, dark-gray
5,813-5,819	Shale, medium dark-gray	6,735-6,740	Shale, black
5,819-5,831	Siltstone, medium-gray, very calcareous	6,740-6,750	Shale, dark-gray to black; with yellowish sulfur? bloom
5,831-5,860	Limestone, medium-gray, very silty	6,750-6,770	Shale, dark-gray to black
5,860-5,870	Shale, dark-gray, silty, calcareous	6,770-6,780	Shale, dark-gray
5,870-5,880	Siltstone, medium dark-gray, very calcareous	6,780-6,810	Shale, black
5,880-5,893	Siltstone, medium-gray, very calcareous	6,810-6,830	Shale, dark-gray
5,893-5,898	Shale, dark-gray, silty	6,830-6,840	Shale, dark-gray to black, siliceous; dark-gray to black rough chert; pyrite
5,898-5,911	Limestone, medium-gray, very silty	6,840-6,870	Shale, dark-gray to black, siliceous; dark-gray to black rough chert
5,911-5,915	Shale, dark-gray, silty	6,870-6,880	Shale, dark-gray
5,915-5,931	Siltstone, medium-gray, very calcareous	6,880-6,895	Shale, medium-gray; caving?
5,931-5,947	Limestone, medium-gray, very silty	6,895-6,956	Shale, dark-gray to black, siliceous; dark-gray to black rough chert
5,947-5,970	Siltstone, medium dark-gray, calcareous	6,956-6,962	Shale, medium dark-gray, slightly greenish
5,970-5,980	Siltstone, dark-gray, calcareous	6,962-6,980	Shale, dark-gray
5,980-5,990	Shale, dark-gray	6,980-6,996	Shale, dark greenish-gray; little pyrite
5,990-6,000	Siltstone, dark-gray, calcareous	6,996-7,000	Shale, dark-gray to black, siliceous
6,000-6,020	Siltstone, medium-gray, very calcareous	7,000-7,010	Shale as above; with much medium-gray, brownish-gray, and dark brownish-gray dense chert
6,020-6,030	Limestone, medium-gray, very silty; crinoids	7,010-7,014	Shale, dark-gray to black, siliceous
6,030-6,041	Limestone, medium-gray, very silty	7,014-7,020	Shale, dark-gray, siliceous
6,041-6,047	Shale, dark-gray	7,020-7,040	Siltstone, dark-gray, slightly dolomitic, glauconitic, siliceous?; some siltstone with brownish tint
6,047-6,075	Limestone, medium-gray, very silty; some medium dark-gray limestone	7,040-7,050	Shale, dark-gray to black, very slightly dolomitic, silty; little glauconite; black dense to granular chert
6,075-6,090	Limestone, medium light- to medium-gray, very silty	7,050-7,060	Shale, dark-gray to black, very slightly dolomitic, silty; black dense to granular chert
6,090-6,108	Siltstone, medium dark-gray, calcareous	7,060-7,086	Shale, dark-gray to black, siliceous; black dense chert
6,108-6,112	Shale, dark-gray	7,086-7,090	Shale, medium-gray, silty, siliceous, very glauconitic, very hard
6,112-6,130	Limestone, medium-gray, very silty	7,090-7,095	Shale, medium light-gray, very siliceous, glauconitic
6,130-6,145	Siltstone, medium- to medium dark-gray, calcareous, hard, very tight	7,095-7,100	Shale, dark-gray, siliceous; medium-gray dense chert
6,145-6,170	Limestone, medium-gray, very silty	7,100-7,110	Shale as above; with brownish-gray dense chert
6,170-6,180	Siltstone, medium dark-gray, very calcareous	7,110-7,130	Shale, dark brownish-gray, siliceous; dark brownish-gray dense chert
6,180-6,190	Siltstone, medium-gray, calcareous	7,130-7,140	Shale, medium- to medium dark-gray; caving?
6,190-6,200	Limestone, medium-gray, very silty; slight yellowish-brown tint	7,140-7,145	Shale as above; dark greenish-gray shale; caving?
6,200-6,209	Limestone, medium-gray, very fine-crystalline, argillaceous; little pyritic medium-gray dense chert; pyrite	7,145-7,150	Shale, medium dark-gray
6,209-6,215	Shale, dark-gray		Silurian and Devonian Systems
6,215-6,226	Siltstone, medium-gray, calcareous		Hunt Group
6,226-6,238	Siltstone, medium dark- to dark-gray, calcareous	7,150-7,157	Shale, pale yellowish-brown, very calcareous, hard; resembles fine-crystalline limestone
6,238-6,246	Shale, dark-gray, very silty	7,157-7,167	Limestone, pale yellowish-brown to medium-gray, fine-crystalline, very argillaceous, dolomitic; medium light-gray dense chert
6,246-6,250	Siltstone, dark-gray, calcareous	7,167-7,180	Limestone, medium light-gray, fine-crystalline; slight yellowish-brown tint; light- to medium-gray dense chert
6,250-6,260	Limestone, medium dark-gray, very silty; some with brownish tint	7,180-7,190	Limestone, light-gray to pale yellowish-brown, fine-crystalline; medium light-gray dense chert
6,260-6,278	Siltstone, medium dark- to dark-gray, calcareous	7,190-7,210	Limestone, light-gray, fine- to medium-crystalline; spots of medium dark gray; oil stain?
6,278-6,283	Shale, dark-gray	7,210-7,230	Limestone, light- to medium light-gray, fine- to medium-crystalline
6,283-6,290	Limestone, medium-gray, fine-crystalline, silty; slightly brownish	7,230-7,250	Limestone, medium light-gray, fine-crystalline
6,290-6,300	Limestone, medium-gray to brownish-gray, very fine-crystalline, very argillaceous	7,250-7,260	Limestone, light-gray, fine- to medium-crystalline
6,300-6,312	Siltstone, medium dark-gray, calcareous	7,260-7,270	Limestone, medium light-gray to olive-gray, fine-crystalline; medium light-gray to bluish-gray dense chert
6,312-6,324	Shale, dark-gray	7,270-7,287	Limestone, medium dark-gray to brownish-gray, fine-crystalline, argillaceous; some olive-gray very argillaceous limestone
6,324-6,330	Limestone, medium dark-gray to brownish-gray, dense to very fine-crystalline; argillaceous in part	7,287-7,290	Limestone, brownish-gray, fine-crystalline; brachiopods
6,330-6,340	Limestone, medium dark-brownish-gray, dense to very fine-crystalline; argillaceous in part	7,290-7,300	Limestone, medium dark-brownish-gray, fine-crystalline, slightly argillaceous
6,340-6,370	Limestone, medium dark-gray, dense to very fine-crystalline, argillaceous	7,300-7,310	Limestone, brownish-gray, fine-crystalline; medium-gray dense chert
6,370-6,372	Shale, dark-gray	7,310-7,320	Limestone, grayish-brown, fine-crystalline, argillaceous
6,372-6,390	Limestone, medium dark-gray, dense to very fine-crystalline, very argillaceous	7,320-7,340	Limestone as above; medium-gray dense chert
6,390-6,400	Siltstone, medium dark-gray, calcareous	7,340-7,355	Limestone, medium-gray to brownish-gray, fine-crystalline; medium-gray to brownish-gray dense chert
6,400-6,410	Siltstone, dark-gray		
6,410-6,440	Limestone, medium dark-gray, very fine-crystalline, very argillaceous		
6,440-6,450	Siltstone, dark-gray, slightly calcareous		
6,450-6,455	Limestone, medium dark-gray, fine-granular, argillaceous; oil stain?; medium light- to medium-gray calcareous chert		
6,455-6,470	Limestone, medium dark-gray, very fine-crystalline, very argillaceous; slightly brownish in part		
6,470-6,483	Limestone, medium dark-gray, fine-crystalline, very argillaceous		
6,483-6,490	Siltstone, dark-gray, calcareous; medium-gray dense chert		
6,490-6,500	Siltstone, medium-gray, calcareous		
6,500-6,504	Siltstone, medium-gray, tight, slightly greenish; medium-gray slightly greenish dense chert		
6,504-6,510	Limestone, medium-gray, fine-granular, silty; slight yellowish-brown tint		
6,510-6,517	Siltstone, dark-gray, calcareous		
6,517-6,541	Limestone, medium dark-gray, very fine-crystalline, argillaceous		

7,355-7,370	Limestone, pale yellowish-brown to brownish-gray, fine- to medium-crystalline		Ordovician System Sylvan Shale 8,030-8,250 feet
7,370-7,380	Limestone, brownish-gray, fine-crystalline		
7,380-7,390	Limestone, medium-gray, fine-crystalline, argillaceous	8,030-8,070	Shale, medium dark- to dark-gray, slightly dolomitic; very slightly greenish in part
7,390-7,400	Limestone, brownish-gray, fine-crystalline, slightly argillaceous, dolomitic	8,070-8,077	Shale, dark-gray, dolomitic
7,400-7,410	Limestone, brownish-gray, fine-crystalline; medium-gray dense chert	8,077-8,108	Shale, medium dark- to dark-gray, slightly dolomitic
7,410-7,425	Limestone, medium-gray, fine-crystalline, argillaceous	8,108-8,120	Shale, medium dark-gray
7,425-7,430	Limestone, medium dark-gray to brownish-gray, fine-granular, argillaceous	8,120-8,137	Shale, medium dark- to dark-gray, slightly dolomitic
7,430-7,435	Siltstone, brownish-gray, very slightly calcareous	8,137-8,141	Dolomite, medium dark-gray, fine-crystalline, argillaceous
7,435-7,440	Limestone, medium-gray, fine-granular, argillaceous; brownish tint; brownish-gray chert	8,141-8,160	Shale, dark-gray, dolomitic
7,440-7,450	Limestone, medium-gray, fine-crystalline, slightly brownish; medium light-gray dense chert	8,160-8,190	Dolomite, dark-gray, very argillaceous; dolomitic shale
7,450-7,460	Limestone, brownish-gray, fine-crystalline; medium-gray dense chert	8,190-8,210	Shale, dark-gray, dolomitic
7,460-7,465	Limestone, medium-gray, fine-crystalline, argillaceous; medium-gray chert	8,210-8,250	Shale, dark-gray, calcareous
7,465-7,485	Limestone, medium-gray, fine-crystalline, argillaceous; some limestone with brownish tint		Viola Limestone 8,250-9,010 feet
7,485-7,520	Limestone as above; very argillaceous	8,250-8,260	Limestone, dark-gray, very argillaceous; black medium oolitic pellets
7,520-7,540	Limestone as above; little medium-gray dense chert 7,520-7,525 feet; caving?	8,260-8,275	Limestone, medium dark-gray, fine- to medium-crystalline, very argillaceous; some brown limestone
7,540-7,580	Limestone, medium-gray, fine-crystalline, argillaceous	8,275-8,285	Limestone, brownish-gray to medium-gray, medium-crystalline
7,580-7,625	Limestone, medium-gray to pale yellowish-brown, fine-crystalline, slightly argillaceous	8,285-8,290	Limestone, light-gray to pale yellowish-brown, medium-crystalline; pyrite; crinoids?; some coarse-crystalline limestone
7,625-7,635	Limestone, medium-gray, fine-crystalline, very argillaceous	8,290-8,295	Limestone, brownish-gray, medium- to coarse-crystalline; mottled with dark gray
7,635-7,648	Limestone, pale yellowish-brown, fine-crystalline	8,295-8,300	Limestone, medium dark-gray to brownish-gray, fine- to medium-crystalline; slightly argillaceous in part; crinoids; brachiopods
7,648-7,660	Limestone, medium-gray, fine-crystalline, very argillaceous	8,300-8,310	Limestone, brownish-gray to medium dark-brownish-gray, fine-crystalline; medium dark-brownish-gray dense chert 8,305-8,310 feet
7,660-7,680	Limestone, medium-gray, fine-crystalline, argillaceous	8,310-8,320	Limestone, medium dark-gray, fine-crystalline, argillaceous
7,680-7,690	Limestone, medium dark-gray, fine-crystalline, argillaceous	8,320-8,330	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous; medium dark-brownish-gray dense chert
7,690-7,693	Limestone, grayish-red, fine-crystalline, argillaceous	8,330-8,340	Limestone, medium dark-gray, fine-crystalline, argillaceous; dark-gray dense chert
7,693-7,720	Limestone, medium-gray, fine-crystalline, argillaceous	8,340-8,370	Limestone, medium dark-gray, fine-crystalline, argillaceous
7,720-7,730	Limestone, grayish-red, fine-crystalline, argillaceous	8,370-8,390	Limestone, dark-gray, fine-crystalline, argillaceous; dark-gray dense chert
7,730-7,760	Limestone, pale yellowish-brown to brownish-gray, fine-crystalline, slightly argillaceous	8,390-8,410	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous
7,760-7,765	Limestone, pale yellowish-brown to medium-gray, very fine-crystalline	8,410-8,430	Limestone as above; slightly brownish
7,765-7,776	Limestone, medium-gray to brownish-gray, fine-crystalline, argillaceous	8,430-8,440	Limestone, grayish-brown, fine-crystalline
7,776-7,800	Limestone, grayish-red, fine-crystalline, very argillaceous	8,440-8,450	Limestone, medium dark-gray, fine-crystalline, argillaceous
7,800-7,807	Limestone, medium-gray, fine-crystalline, argillaceous	8,450-8,470	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous
7,807-7,816	Limestone, pale yellowish-brown, dense to very fine-crystalline	8,470-8,490	Limestone, grayish-brown, medium-crystalline, slightly argillaceous; mottled with dark gray
7,816-7,820	Limestone, light-gray, fine-crystalline; light-gray dense chert	8,490-8,510	Limestone, brownish-gray to pale yellowish-brown, medium- to coarse-crystalline
7,820-7,830	Limestone, pale yellowish-brown, very fine-crystalline	8,510-8,520	Limestone, grayish-brown to brownish-gray, fine- to medium-crystalline
7,830-7,850	Limestone, light-gray to very pale-orange, fine-crystalline; very light-gray to bluish-gray dense chert	8,520-8,540	Limestone, medium dark-gray to grayish-brown, fine- to medium-crystalline, slightly argillaceous
7,850-7,860	Limestone, brownish-gray, fine-crystalline	8,540-8,550	Limestone, brownish-gray, medium-crystalline
7,860-7,870	Limestone, medium light-gray, fine-crystalline	8,550-8,560	Limestone, medium dark-gray, fine-crystalline
7,870-7,880	Limestone, light-gray, fine-crystalline; medium light-gray dense chert	8,560-8,570	Limestone, medium dark-gray, fine- to medium-crystalline, slightly brownish
7,880-7,890	Limestone, very light- to light-gray, fine-crystalline; light-gray to bluish-gray dense chert	8,570-8,580	Limestone, medium dark-gray, medium-crystalline, slightly argillaceous
7,890-7,895	Limestone as above; much chert; some greenish-gray limestone and chert	8,580-8,590	Limestone, medium dark-gray, medium-crystalline
7,895-7,900	Limestone, light-gray to pale yellowish-brown, fine-crystalline; trace of glauconite; chert as above	8,590-8,620	Limestone as above; slightly brownish
7,900-7,910	Limestone, light-gray, fine-crystalline; light- to medium light-gray dense chert	8,620-8,630	Limestone, medium dark-gray to grayish-brown, fine-crystalline, slightly argillaceous
7,910-7,915	Limestone, light-gray, medium-crystalline; chert as above	8,630-8,650	Limestone, medium dark-gray, fine-crystalline, slightly brownish
7,915-7,925	Limestone, very pale-orange to light-gray, fine-crystalline; chert as above	8,650-8,660	Limestone, medium dark-brownish-gray, fine-crystalline; little medium dark- to dark-gray dense chert
7,925-7,930	Limestone, light-gray, fine-crystalline; trace of glauconite	8,660-8,675	Limestone, medium dark-brownish-gray, fine-crystalline; medium dark-gray dense chert
7,930-7,940	Limestone, pale yellowish-brown to light-gray, fine-crystalline; dark-gray shaly inclusions	8,675-8,700	Limestone, medium dark-brownish-gray, very fine-crystalline, argillaceous
7,940-7,950	Limestone, light-gray to very pale-orange, fine-crystalline	8,700-8,720	Limestone, medium dark-gray, very fine-crystalline, argillaceous; medium dark-gray dense chert
7,950-7,955	Limestone as above; little light-gray dense chert	8,720-8,740	Limestone, medium dark-brownish-gray, very fine-crystalline, argillaceous; medium dark-brownish-gray dense chert
7,955-7,968	Limestone, pale yellowish-brown to very pale-orange, fine-crystalline; few pink crystals and crinoids	8,740-8,760	Limestone, medium dark-brownish-gray, very fine-crystalline, argillaceous
7,968-7,978	Limestone, light- to medium light-gray, fine-crystalline, glauconitic	8,760-8,780	Limestone, medium dark-brownish-gray, fine-crystalline, slightly argillaceous
7,978-7,980	Limestone, pale yellowish-brown, fine- to medium-crystalline; pink crystals; crinoids	8,780-8,790	Limestone, medium dark-gray, very fine-crystalline slightly brownish, slightly argillaceous; medium dark-gray dense chert
7,980-7,990	Limestone, light-gray to very pale-orange, medium- to coarse-crystalline		
7,990-8,000	Limestone, pale yellowish-brown, fine-crystalline; medium light-gray to pale yellowish-brown dense chert		
8,000-8,017	Limestone, pale yellowish-brown to very pale-orange, fine-crystalline; light-gray dense chert		
8,017-8,030	Limestone, pale yellowish-brown to brownish-gray, fine-crystalline; medium- to coarse-oolitic in part		

8,790-8,800	Limestone, medium dark-gray, very fine- to fine-crystalline, argillaceous	9,380-9,390	Sandstone, medium-gray, fine-grained
8,800-8,810	Limestone, medium dark-gray, dense to very-fine crystalline, argillaceous, slightly brownish; medium dark- to dark-gray dense chert	9,390-9,395	Sandstone, medium-gray, medium-grained; medium-gray very fine-grained silty sandstone
8,810-8,826	Limestone, medium dark-gray, very fine-crystalline; slightly argillaceous in part	9,395-9,400	Sandstone, light- to medium light-gray, medium-grained
8,826-8,830	Limestone, medium dark-gray, dense to very fine-crystalline, argillaceous; dark-gray dense chert	9,400-9,406	Sandstone, medium-gray, very fine-grained, silty
8,830-8,840	Limestone, medium dark-gray, very fine-crystalline, argillaceous	9,406-9,418	Siltstone, medium-gray, very finely sandy
8,840-8,860	Limestone, medium dark-brownish-gray, very fine- to fine-crystalline, slightly argillaceous	9,418-9,430	Siltstone, medium-gray
8,860-8,870	Limestone, medium dark-gray, very fine- to fine-crystalline, argillaceous	9,430-9,460	Shale, dark greenish-gray to medium dark-gray, smooth
8,870-8,880	Limestone, dark-gray, fine-crystalline, very argillaceous	9,460-9,472	Shale, dark greenish-gray, smooth
8,880-8,900	Limestone, medium dark-gray, very fine-crystalline, argillaceous	9,472-9,474	Sandstone, medium- to dark-gray, very fine- to fine-grained; many black grains; trace of glauconite
8,900-8,910	Limestone, medium dark-gray, fine-crystalline, argillaceous; black dense chert	9,474-9,480	Sandstone, light- to medium-gray, very fine-grained, silty, dolomitic; many dense grains
8,910-8,936	Siltstone, medium dark- to dark-gray, calcareous, hard; resembles limestone	9,480-9,488	Shale, dark greenish-gray and dusky yellowish-brown, smooth
8,936-8,950	Limestone, medium dark-gray, very fine- to fine-crystalline, argillaceous	9,488-9,500	Siltstone, medium-gray, very finely sandy
8,950-8,980	Limestone, dark-gray to brownish-gray, fine-crystalline, slightly argillaceous	9,500-9,511	Shale, dark greenish-gray to dark-gray
8,980-8,990	Limestone, medium dark- to dark-gray, very fine-crystalline, argillaceous	9,511-9,528	Shale, dark greenish-gray, smooth
8,990-9,010	Limestone, black, fine-crystalline, very argillaceous	9,528-9,535	Siltstone, greenish-gray, very finely sandy
	Simpson Group	9,535-9,550	Shale, medium dark-gray, smooth
	Bromide Formation 9,010-9,406 feet	9,550-9,556	Limestone, medium- to medium dark-gray, granular, silty
9,010-9,022	Limestone, medium-gray to brownish-gray, dense to fine-crystalline	9,556-9,560	Siltstone, medium-gray, dolomitic
9,022-9,028	Dolomite, medium dark-gray to brownish-gray, fine- to medium-crystalline, calcareous	9,560-9,565	Shale, medium dark-gray
9,028-9,040	Limestone, medium-gray to brownish-gray, dense to fine-crystalline	9,565-9,577	Shale, dark greenish-gray
9,040-9,060	Limestone, brownish-gray to medium dark-gray, dense to very fine-crystalline, slightly argillaceous; brachiopods 9,050-9,060 feet	9,577-9,590	Shale, medium dark-gray
9,060-9,070	Limestone, brownish-gray, fine-crystalline, very finely sandy, silty	9,590-9,598	Shale, dark greenish-gray
9,070-9,077	Limestone, medium-gray, fine-crystalline	9,598-9,600	Limestone, medium-gray, fine-crystalline; crinoids?
9,077-9,098	Limestone, medium dark-gray, fine-crystalline, very argillaceous	9,600-9,602	Shale, medium dark-gray
9,098-9,108	Limestone, medium-gray, fine-crystalline, slightly brownish	9,602-9,606	Dolomite, medium light-gray, finely sandy, silty
9,108-9,135	Shale, dark greenish-gray, smooth	9,606-9,610	Sandstone, light- to medium light-gray, medium-grained; many black grains
9,135-9,147	Limestone, medium- to medium dark-gray, fine-crystalline, slightly argillaceous	9,610-9,613	Sandstone, light- to dark-gray, very fine- to fine-grained
9,147-9,153	Dolomite, medium-gray, fine-crystalline; many thin beds of dark greenish-gray shale	9,613-9,620	Shale, dark greenish-gray
9,153-9,159	Shale, greenish-gray	9,620-9,626	Shale, dusky yellowish-brown
9,159-9,161	Dolomite, medium-gray, fine-crystalline; many thin beds of dark greenish-gray shale	9,626-9,638	Shale, medium-gray; conodont
9,161-9,167	Shale, greenish-gray	9,638-9,640	Limestone, medium-gray, very silty; mottled with light gray; ostracods?
9,167-9,170	Shale, dark greenish-gray, finely sandy, smooth	9,640-9,649	Shale, medium dark-gray to dark greenish-gray
9,170-9,180	Sandstone, medium light-gray, medium-grained; little light-gray fine- to medium-grained dolomitic sandstone	9,649-9,653	Limestone, medium-gray, very silty; mottled with light gray
9,180-9,188	Sandstone, medium light- to medium-gray, fine- to medium-grained; oil stain?	9,653-9,655	Sandstone, light- to medium-gray, very fine-grained, calcareous, glauconitic
9,188-9,190	Sandstone as above; few black shale fragments	9,655-9,666	Shale, medium dark-gray
9,190-9,198	Sandstone, medium light-gray, medium-grained; oil stain?	9,666-9,670	Limestone, light- to medium-gray, mottled, fine-crystalline, fossiliferous
9,198-9,205	Sandstone as above; pyrite	9,670-9,675	Siltstone, medium- to medium dark-gray, slightly calcareous
9,205-9,210	Sandstone, greenish-gray, fine- to medium-grained, shaly	9,675-9,680	Siltstone, light- to medium light-gray, calcareous
9,210-9,215	Sandstone, medium light-gray, fine- to medium-grained	9,680-9,690	Siltstone, medium light- to medium-gray, very finely sandy, slightly calcareous
9,215-9,222	Sandstone, very light- to light-gray, fine- to medium-grained	9,690-9,695	Siltstone, medium light-gray, slightly calcareous
9,222-9,230	Sandstone, medium light-gray, fine-grained	9,695-9,703	Shale, medium dark-gray
9,230-9,233	Limestone, pale yellowish-brown, fine-crystalline	9,703-9,707	Siltstone, medium light-gray, slightly dolomitic
9,233-9,255	Sandstone, light- to medium light-gray, medium-grained, subrounded; some coarse grains; oil stain at 9,235-9,245 feet	9,707-9,712	Siltstone, light- to medium-gray, calcareous
9,255-9,263	Sandstone, very light- to light-gray, medium-grained	9,712-9,714	Shale, medium dark-gray
9,263-9,270	Siltstone, greenish-gray, tight	9,714-9,717	Shale, light-gray, calcareous
9,270-9,280	Sandstone, light- to medium light-gray, fine- to medium-grained	9,717-9,723	Shale, medium dark-gray
9,280-9,287	Sandstone, light greenish-gray, medium-grained	9,723-9,725	Limestone, medium light-gray, fine-crystalline, silty, fossiliferous; brachiopods
9,287-9,290	Siltstone, greenish-gray, tight	9,725-9,733	Shale, dark greenish-gray, smooth
9,290-9,300	Sandstone, medium-gray, fine- to medium-grained; oil stain?	9,733-9,740	Shale, medium dark-gray
9,300-9,305	Sandstone, very light- to light-gray, fine- to medium-grained	9,740-9,743	Sandstone, medium-gray, very fine-grained, very calcareous; glauconite; many dark grains
9,305-9,310	Sandstone, medium light-gray, medium-grained; oil stain	9,743-9,746	Siltstone, medium dark-gray, calcareous, very glauconitic
9,310-9,315	Sandstone, very light-gray, very fine-grained, slightly glauconitic	9,746-9,753	Shale, dark greenish-gray
9,315-9,340	Sandstone, medium light- to medium-gray, fine- to medium-grained; oil stain?	9,753-9,756	Sandstone, medium-gray, very fine-grained, silty, calcareous, very glauconitic
9,340-9,355	Sandstone, light- to medium light-gray, medium-grained	9,756-9,763	Shale, medium dark-gray
9,355-9,360	Sandstone, very light-gray, very fine- to fine-grained	9,763-9,766	Siltstone, medium dark-gray, calcareous
9,360-9,370	Sandstone, medium-gray, very fine- to fine-grained	9,766-9,770	Shale, dark greenish-gray
9,370-9,380	Sandstone, medium-gray, medium-grained	9,770-9,780	Limestone, light- to medium-gray, fine-crystalline, silty; brachiopods
		9,780-9,784	Siltstone, light- to medium light-gray, calcareous
		9,784-9,790	Shale, medium-gray
		9,790-9,797	Shale, medium-gray, silty
		9,797-9,800	Limestone, medium light-gray, fine-crystalline; brachiopods
		9,800-9,806	Shale, medium-gray
		9,806-9,815	Shale, dark greenish-gray
		9,815-9,817	Limestone, medium light-gray, fine-crystalline
		9,817-9,823	Shale, medium-gray
		9,823-9,827	Sandstone, medium dark-gray, very fine-grained, silty
		9,827-9,832	Shale, medium-gray
		9,832-9,840	Limestone, medium-gray to brownish-gray, fine-crystalline, slightly argillaceous
		9,840-9,843	Shale, grayish-brown, smooth; brachiopods
		9,843-9,850	Limestone, medium dark-gray, fine-granular, argillaceous
		9,850-9,858	Siltstone, medium light-gray, very calcareous
		9,858-9,866	Siltstone as above; ostracods?
		9,866-9,877	Siltstone, greenish-gray, slightly calcareous
		9,877-9,887	Shale, dark greenish-gray

9,887- 9,890	Limestone, pale yellowish-brown, medium-crystalline; dark-gray spots	10,292-10,296	Limestone, light-gray, fine-crystalline; scattered fine sand grains; many reddish-brown to dark greenish-gray flattened pellets of calcareous ironstone?, some altered? to yellowish-brown
9,890- 9,897	Shale, dark greenish-gray		
9,897- 9,901	Limestone, medium light-gray, fine-crystalline, silty	10,296-10,300	Shale, medium-gray
9,901- 9,910	Shale, dark greenish-gray	10,300-10,306	Limestone, medium- to medium dark-gray, very finely sandy; caving?
9,910- 9,918	Shale, medium-gray		
9,918- 9,926	Limestone, medium light-gray, very finely sandy	10,306-10,316	Shale, medium-gray
9,926- 9,928	Sandstone, medium-gray, very fine-grained, calcareous	10,316-10,320	Limestone, medium dark-gray, fine-crystalline, argillaceous
9,928- 9,935	Limestone, medium light-gray to pale yellowish-brown, medium-crystalline; brachiopods		
9,935- 9,941	Sandstone, light-gray, very fine- to fine-grained, very calcareous, glauconitic	10,320-10,322	Shale, medium-gray
		10,322-10,325	Limestone, medium dark-gray, fine-crystalline, argillaceous
9,941- 9,950	Limestone, medium light-gray to pale yellowish-brown, medium-crystalline; some finely sandy limestone; trace of glauconite; brachiopods	10,325-10,330	Shale, medium-gray
9,950- 9,958	Limestone as above; trace of glauconite at top	10,330-10,334	Sandstone, medium-gray, very fine-grained, argillaceous, calcareous
9,958- 9,964	Shale, dark greenish-gray	10,334-10,337	Shale, medium-gray
9,964- 9,972	Limestone, medium-gray to pale yellowish-brown, fine-crystalline, slightly argillaceous	10,337-10,340	Limestone, medium light- to medium dark-gray, mottled, medium-crystalline, finely sandy
9,972- 9,975	Shale, medium-gray	10,340-10,348	Shale, medium-gray
9,975- 9,978	Limestone, medium-gray to pale yellowish-brown, fine-crystalline, slightly argillaceous	10,348-10,349	Limestone, light-gray, medium-crystalline; mottled with dark gray
9,978- 9,980	Shale, medium-gray	10,349-10,350	Shale, medium-gray
9,980- 9,987	Limestone, pale yellowish-brown, medium-crystalline	10,350-10,354	Limestone, light-gray, medium-crystalline; mottled with dark gray
9,987- 9,990	Limestone, medium-gray, fine-crystalline, argillaceous		
9,990- 9,996	Shale, medium-gray	10,354-10,360	Shale, medium-gray
9,996 10,010	Limestone, medium light- to medium-gray, very finely sandy, silty	10,360-10,362	Limestone, light- to medium dark-gray, fine- to medium-crystalline
10,010-10,020	Limestone, medium dark-gray, very finely sandy, silty	10,362-10,366	Shale, medium-gray
10,020-10,029	Shale, medium-gray	10,366-10,376	Limestone, light- to medium dark-gray, fine- to medium-crystalline; brachiopods
10,029-10,038	Limestone, medium-gray, silty		
10,038-10,040	Shale, medium-gray	10,376-10,380	Shale, medium-gray
10,040-10,049	Limestone, medium-gray, silty	10,380-10,387	Limestone, medium- to dark-gray, mottled, fine- to medium-crystalline, argillaceous
10,049-10,058	Shale, medium-gray		
10,058-10,068	Limestone, medium dark-gray, very silty	10,387-10,389	Shale, medium-gray
10,068-10,074	Shale, medium-gray	10,389-10,395	Limestone, medium- to dark-gray, mottled, fine- to medium-crystalline, argillaceous
10,074-10,080	Sandstone, very light- to light-gray, medium-grained, calcareous; pyrite	10,395-10,400	Shale, medium-gray
10,080-10,085	Sandstone, light-gray, very fine- to fine-grained, slightly calcareous	10,400-10,402	Limestone, medium-gray, very fine-crystalline, argillaceous
10,085-10,090	Sandstone, very light-gray, fine- to medium-grained, calcareous; scattered coarse grains	10,402-10,407	Shale, medium-gray
10,090-10,098	Sandstone, light-gray, fine-grained; many black grains	10,407-10,409	Limestone, medium-gray, very fine-crystalline, argillaceous
10,098-10,112	Sandstone, light-gray, fine-grained; many black grains; calcareous	10,409-10,417	Shale, medium-gray
		10,417-10,418	Limestone, medium-gray, very fine-crystalline, argillaceous
10,112-10,120	Shale, dark greenish-gray		
10,120-10,130	Shale, medium dark-gray	10,418-10,444	Shale, medium-gray
10,130-10,132	Limestone, medium-gray, mottled dark gray, fine-crystalline, fossiliferous	10,444-10,446	Limestone, medium dark-gray, fine-granular, very argillaceous
10,132-10,134	Shale, medium-gray	10,446-10,456	Shale, medium-gray
10,134-10,138	Limestone, medium-gray, fine-crystalline, fossiliferous; mottled with dark gray	10,456-10,457	Limestone, medium dark-gray, fine-granular, very argillaceous
10,138-10,140	Shale, medium-gray	10,457-10,460	Shale, medium-gray
10,140-10,146	Limestone, medium light-gray, fine- to medium-crystalline, finely sandy; spotted with dark gray	10,460-10,462	Limestone, medium dark-gray, fine-granular, very argillaceous
10,146-10,159	Limestone, medium-gray, fine-crystalline, very argillaceous	10,462-10,484	Shale, medium-gray
10,159-10,167	Shale, medium dark-gray	10,484-10,485	Limestone, medium dark-gray, fine-granular, very argillaceous
10,167-10,170	Limestone, medium dark-gray, medium-crystalline	10,485-10,489	Shale, medium-gray
10,170-10,172	Shale, medium-gray	10,489-10,493	Limestone, light- to medium-gray, medium-crystalline, finely sandy
10,172-10,190	Limestone, light- to medium-gray, spotted and mottled, fine- to medium-crystalline, slightly argillaceous	10,493-10,499	Limestone, medium light-gray, fine-crystalline; mottled with dark-gray; scattered fine sand grains
10,190-10,196	Shale, dark greenish-gray	10,499-10,507	Shale, medium-gray
10,196-10,202	Shale, medium dark-gray	10,507-10,511	Sandstone, medium-gray, fine-grained, shaly, calcareous
10,202-10,206	Limestone, light-gray, medium-crystalline, slightly argillaceous; spotted with dark gray	10,511-10,522	Shale, medium-gray, finely sandy
10,206-10,208	Shale, medium-gray	10,522-10,527	Sandstone, medium-gray, fine-grained, shaly, calcareous
10,208-10,218	Limestone, light-gray, medium-crystalline, slightly argillaceous; spotted with dark gray	10,527-10,537	Shale, medium-gray
10,218-10,220	Shale, medium-gray	10,537-10,540	Siltstone, medium light-gray, very finely sandy, calcareous
10,220-10,225	Limestone, medium dark-gray, medium-crystalline, argillaceous; mottled with light gray	10,540-10,547	Limestone, medium- to medium dark-gray, argillaceous; ostracods
10,225-10,230	Limestone, medium-gray, fine- to medium-crystalline, slightly argillaceous; scattered fine to medium sand grains	10,547-10,550	Shale, medium-gray
10,230-10,239	Shale, medium-gray	10,550-10,560	Sandstone, light- to medium light-gray, medium-grained, calcareous; scattered coarse grains; some fine-grained calcareous sandstone
10,239-10,241	Limestone, light olive-gray, very fine-crystalline, argillaceous	10,560-10,563	Sandstone as above; very calcareous
10,241-10,246	Limestone, medium dark-gray, fine- to medium-crystalline, finely sandy	10,563-10,570	Limestone, light- to medium light-gray, fine-crystalline, fossiliferous; mottled and spotted with dark gray
10,246-10,250	Shale, medium-gray		
10,250-10,258	Limestone, medium-gray, very fine-crystalline, argillaceous	10,570-10,580	Sandstone, medium-gray, fine-grained, calcareous, very argillaceous
10,258-10,264	Limestone, medium dark-gray, fine-crystalline, argillaceous; scattered fine sand grains	10,580-10,583	Sandstone, light-gray, fine- to medium-grained, calcareous
10,264-10,266	Shale, medium-gray	10,583-10,586	Limestone, medium-gray, fine-crystalline, argillaceous
10,266-10,270	Shale, medium dark-gray, calcareous; scattered very fine to fine sand grains	10,586-10,593	Limestone, medium- to medium dark-gray, medium-crystalline, finely sandy
10,270-10,276	Shale, medium-gray	10,593-10,597	Sandstone, light-gray, medium-grained, rounded, very calcareous; some coarse rounded grains
10,276-10,278	Limestone, light- to medium-gray, fine- to medium-crystalline	10,597-10,610	Limestone, medium light-gray, fine-crystalline, very fine- to fine-granular, sandy; brachiopods
10,278-10,286	Shale, medium-gray		
10,286-10,290	Limestone, light- to medium-gray, fine- to medium-crystalline, slightly argillaceous	10,610-10,616	Limestone, medium dark-gray, finely sandy; fine to medium rounded grains of pyrite
10,290-10,292	Shale, medium-gray		

10,616-10,620	Limestone, medium dark-gray, argillaceous	10,870-10,876	Limestone as above; some medium sand grains
10,620-10,630	Limestone, medium light-gray, fine-crystalline, argillaceous; mottled with dark gray; fossiliferous; scattered very fine sand grains	10,876-10,880	Sandstone, brownish-gray to medium light-gray, fine- to medium-grained, calcareous
10,630-10,640	Limestone, medium dark-gray, fine-crystalline, silty	10,880-10,890	Limestone, medium-gray, very fine-crystalline, slightly argillaceous
10,640-10,655	Limestone, medium-gray, fine-crystalline, argillaceous	10,890-10,904	Limestone, medium dark-gray, silty
10,655-10,660	Limestone, medium- to medium dark-gray, fine- to medium-crystalline, very finely sandy; ostracods	10,904-10,915	Limestone, medium dark-gray, very fine- to fine-crystalline
10,660-10,675	Limestone, medium dark-gray, fine-crystalline, slightly argillaceous; mottled with dark gray and brownish gray	Cambrian and Ordovician Systems Arbuckle Group	
10,675-10,683	Limestone, medium-gray, very fine-crystalline, slightly argillaceous; slight yellowish-brown tint	10,915-10,920	Dolomite, pale yellowish-brown, fine-crystalline, argillaceous
10,683-10,686	Limestone, medium dark-gray, finely sandy, silty	10,920-10,923	Limestone, medium-gray, fine-crystalline, slightly argillaceous, dolomitic
10,686-10,700	Limestone, medium dark-gray, fine-crystalline, argillaceous; ostracods?	10,923-10,927	Limestone, medium dark-gray, fine- to medium-crystalline, slightly silty
10,700-10,715	Limestone, medium dark-gray, fine-crystalline, argillaceous; scattered very fine sand grains	10,927-10,930	Dolomite, brownish-gray, fine-granular, finely sandy
10,715-10,725	Limestone, medium-gray, medium-crystalline, finely sandy	10,930-10,934	Dolomite, brownish-gray, fine-granular, earthy
10,725-10,730	Limestone as above; argillaceous	10,934-10,939	Limestone, dark-gray, fine-crystalline; scattered very fine to fine sand grains
10,730-10,744	Limestone, medium dark-gray, fine-crystalline, argillaceous; scattered very fine sand grains; pelecypods? 10,735-10,740 feet	10,939-10,942	Limestone, medium dark-gray, medium- to coarse-sandy; few medium to coarse oolites
10,744-10,757	Limestone, medium dark-gray, fine-crystalline, very finely to finely sandy, argillaceous	10,942-10,948	Dolomite, brownish-gray, fine- to medium-sandy
10,757-10,775	Limestone, medium dark-gray, fine-crystalline; scattered silt and very fine sand grains	10,948-10,956	Dolomite, medium dark-gray, fine-crystalline, silty
10,775-10,785	Limestone, medium dark-gray, fine-crystalline, argillaceous	10,956-10,960	Dolomite, pale yellowish-brown, fine- to medium-sandy
10,785-10,795	Limestone, medium-gray, fine-crystalline, argillaceous; slight yellowish-brown tint	10,960-10,968	Dolomite, medium-gray, fine-crystalline
10,795-10,806	Limestone, medium dark-gray, fine-crystalline, argillaceous	10,968-10,970	Dolomite, medium light- to medium-gray, fine- to medium-sandy
10,806-10,827	Limestone, medium dark-gray, very fine-crystalline, slightly argillaceous	10,970-10,977	Dolomite, brownish-gray, very fine- to fine-crystalline
10,827-10,835	Limestone as above; slightly brownish	10,977-10,980	Dolomite, medium-gray, very fine-crystalline
10,835-10,840	Limestone, medium dark-gray, medium-crystalline, finely to medium sandy	10,980-10,985	Dolomite, medium light-gray, very fine-crystalline, finely sandy
10,840-10,850	Limestone, medium- to medium dark-gray, fine- to medium-sandy, very sandy	10,985-10,990	Dolomite, medium light-gray, very fine-crystalline
10,850-10,855	Sandstone, light- to medium-gray, fine- to medium-grained, subrounded, calcareous; few coarse grains	10,990-10,995	Dolomite, medium light-gray, very fine-crystalline, finely sandy
10,855-10,860	Sandstone, brownish-gray, fine- to medium-grained, calcareous	10,995-11,005	Dolomite, pale yellowish-brown to medium light-gray, fine-crystalline
10,860-10,870	Limestone, brownish-gray, finely sandy	11,005-11,014	Dolomite, brownish-gray, fine-crystalline
		11,014-11,026	Dolomite, medium-gray to pale yellowish-brown, very fine- to fine-crystalline, slightly argillaceous
		11,026	Total depth (Electrical log)

LOG 19
CADDO COUNTY, OKLAHOMA
SW¼ SW¼ SE¼ sec. 24, T. 6 N., R. 13 W.

Operator: Amerada Petroleum Co.
Lease: Mack Silverhorn No. 1
Elevation: 1,398 feet
Total depth: Electrical log 4,229 feet
Drillers 4,235 feet
Completion date: Sept. 7, 1951
Initial production: Dry

Electrical log: 312 to 4,229 feet
Sample intervals: Not recorded
Cored intervals:
1,787 to 1,795 feet
1,991 to 2,004 feet
2,281 to 2,291 feet
2,747 to 2,757 feet
3,157 to 3,167 feet
3,522 to 3,537 feet
3,692 to 3,707 feet
3,889 to 3,904 feet
4,009 to 4,019 feet
4,155 to 4,170 feet

Pennsylvanian? and Permian Systems		Upper part of Wichita Formation 0-558? feet	
0-320	No samples		
320-325	Siltstone, light-gray, very finely sandy	735- 740	Limestone conglomerate, very light-gray, very fine-crystalline; black veinlets and cavity fillings of asphaltite?; some pale yellowish-brown limestone fragments
325-330	Siltstone, moderate reddish-brown	740- 788	Shale, moderate reddish-brown; fine- to medium-grained calcareous sandstone with much asphaltite? 750-770 feet
330-335	Siltstone, light-gray	788- 800	Limestone, moderate reddish-brown, argillaceous to very finely sandy, dolomitic
335-340	Siltstone, moderate reddish-brown	800- 806	Limestone, moderate reddish-brown, fine- to medium-sandy, argillaceous; trace of glauconite
340-350	Siltstone, light-gray and moderate reddish-brown, very finely sandy	806- 830	Shale, moderate reddish-brown
350-358	Siltstone, moderate reddish-brown	830- 834	Limestone, medium-gray, very fine-crystalline
358-365	Siltstone, light-gray, very finely sandy	834- 843	Shale, moderate reddish-brown
365-372	Sandstone, light-gray, very fine-grained, silty	843- 847	Limestone, light-gray, very fine-crystalline
372-410	Shale, medium dark- to dark-gray	847- 860	Shale, moderate reddish-brown
410-420	Sandstone, light-gray to pale-red, fine- to medium-grained	860- 863	Limestone, light-gray, very fine-crystalline
420-428	Siltstone, light-gray	863- 888	Shale, moderate reddish-brown
428-435	Shale, dark-gray	888- 890	Limestone, light-gray, very fine-crystalline
435-440	Sandstone, moderate reddish-brown, fine-grained	890- 918	Shale, moderate reddish-brown
440-450	Shale, moderate reddish-brown	918- 930	Sandstone, light-gray to reddish-brown, medium- to very coarse-grained, very calcareous, glauconitic; contains many medium to coarse limestone grains; much limestone (may be limestone conglomerate)
450-470	Shale, dark-gray	930- 940	Limestone, medium light-gray, fine- to medium-sandy; trace of glauconite and feldspar?
470-480	Sandstone, very light- to light-gray, fine- to medium-grained, porous; some coarse grains	940- 950	Shale, moderate reddish-brown
480-492	Shale, moderate reddish-brown	950- 960	Shale, grayish-red
492-508	Sandstone, very light- to light-gray, fine-grained, slightly dolomitic; some pink sandstone	960- 990	Shale, moderate reddish-brown
508-512	Dolomite, light olive-gray to pale reddish-brown, very fine-crystalline	990- 995	Sandstone, light-gray, fine-grained, silty; medium to coarse chert fragments; granite? fragments
512-518	Limestone, grayish-red, fine-crystalline, argillaceous	995-1,000	Sandstone, light-gray, very fine-grained, calcareous; feldspar; glauconite; some green mottling
518-524	Shale, moderate reddish-brown	1,000-1,020	Shale, moderate reddish-brown
524-532	Sandstone, very light-gray, very fine- to fine-grained, calcareous; pyrite	1,020-1,030	Limestone conglomerate, brownish-gray to pale yellowish-brown, very fine-crystalline; glauconite; light-gray dense chert; medium to coarse sand grains; trace pink chert; some oölites and spicular chert
532-558	Shale, moderate reddish-brown	1,030-1,040	Shale, moderate reddish-brown
Pontotoc Group		1,040-1,044	Limestone conglomerate, brownish-gray to pale yellowish-brown, very fine-crystalline; glauconite; light-gray dense chert; medium to coarse sand grains; trace of pink chert; some oölites and spicular chert
558-563	Limestone, pale-red to light-gray, very fine-crystalline	1,044-1,050	Shale, moderate reddish-brown
563-570	Shale, moderate reddish-brown	1,050-1,055	Sandstone, moderate reddish-brown, fine- to medium-grained, silty, calcareous; few very coarse grains; feldspar?; granite wash?
570-574	Limestone, grayish-red, fine-crystalline, argillaceous; caving?	1,055-1,062	Limestone conglomerate, pale yellowish-brown, very fine-crystalline
574-587	Shale, moderate reddish-brown	1,062-1,077	Shale, moderate reddish-brown
587-599	Limestone, pale-red, fine-crystalline, argillaceous	1,077-1,085	Siltstone, very pale-orange to light-gray; mottled with greenish gray; glauconite?
599-607	Shale, moderate reddish-brown	1,085-1,090	Limestone, medium light-gray, finely sandy; medium grains of subrounded brown limestone; glauconite
607-610	Limestone, light-gray to very pale-orange, very fine-crystalline	1,090-1,120	Limestone conglomerate, brownish-gray to medium-gray, very fine-crystalline
610-635	Shale, moderate reddish-brown		
635-650	Limestone, pale-red, fine-crystalline, argillaceous		
650-655	Limestone, pale-red, very fine-crystalline		
655-662	Limestone, pale yellowish-brown, very fine-crystalline		
662-667	Limestone, medium-gray, fine-crystalline		
667-673	Limestone, pale yellowish-brown, very fine-crystalline		
673-688	Shale, moderate reddish-brown		
688-694	Limestone, medium light-gray, fine-crystalline, argillaceous		
694-699	Shale, moderate reddish-brown		
699-710	Limestone, grayish-red, earthy, argillaceous		
710-714	Shale, moderate reddish-brown		
714-735	Limestone conglomerate, pale-red to grayish-red, very fine-crystalline; argillaceous in part		

1,120-1,123	Limestone conglomerate, grayish-red, fine-crystalline, argillaceous	1,890-1,900	Limestone, medium light-gray, fine-crystalline, slightly argillaceous
1,123-1,130	Limestone conglomerate, pale yellowish-brown, very fine-crystalline, fine- to medium-oölitic	1,900-1,914	Limestone, medium-gray, fine-crystalline, argillaceous dolomitic
1,130-1,150	Limestone conglomerate, pale yellowish-brown to brownish-gray, very fine-crystalline	1,914-1,932	Siltstone, medium- to medium dark-gray, dolomitic, glauconitic; resembles dolomite
1,150-1,155	Limestone conglomerate, pale-red to light-gray, very fine-crystalline		
1,155-1,170	Limestone conglomerate, pale yellowish-brown to brownish-gray, very fine-crystalline		Devonian and Mississippian Systems Base of Woodford Shale 1,932 feet
1,170-1,177	Shale, moderate reddish-brown	1,932-1,950	Shale, black, hard; black dense chert
1,177-1,180	Limestone conglomerate, medium-gray, fine-crystalline	1,950-1,955	Shale, black, hard
1,180-1,188	Shale, moderate reddish-brown	1,955-1,960	Shale, dark-gray, slightly dolomitic
1,188-1,192	Limestone conglomerate, pale-red, fine-crystalline	1,960-1,968	Shale, black, hard
1,192-1,200	Shale, moderate reddish-brown	1,968-1,972	Siltstone, medium-gray, very glauconitic, very slightly dolomitic
1,200-1,210	Limestone conglomerate, medium-gray, slightly brownish, very fine- to fine-crystalline	1,972-2,004	Shale, black, hard, probably siliceous; black dense chert
1,210-1,214	Shale, moderate reddish-brown	2,004-2,010	Shale, medium dark-gray
1,214-1,218	Limestone conglomerate, moderate reddish-brown, fine-crystalline, slightly argillaceous	2,010-2,040	Shale, dark-gray to black; black chert
1,218-1,232	Shale, moderate reddish-brown	2,040-2,065	Shale, black
1,232-1,238	Limestone conglomerate, moderate reddish-brown, fine-crystalline, slightly argillaceous	2,065-2,100	Shale, black; black chert
1,238-1,249	Limestone conglomerate, pale-red, fine-crystalline; grayish-red chert	2,100-2,144	Shale as above; with brownish-black dense chert
1,249-1,258	Shale, moderate reddish-brown	2,144-2,156	Siltstone, medium- to dark-gray, slightly dolomitic; glauconitic in part
1,258-1,266	Limestone conglomerate, pale-red, fine-crystalline; grayish-red chert	2,156-2,164	Shale, medium-gray to brownish-gray, hard, chunky, smooth; medium-gray to brownish-gray dense chert
1,266-1,278	Shale, moderate reddish-brown	2,164-2,185	Shale, greenish-gray to dark greenish-gray
1,278-1,280	Limestone conglomerate, pale-red, fine-crystalline	2,185-2,210	Shale, medium dark- to dark-gray
1,280-1,284	Shale, moderate reddish-brown; section below 1,284 feet is overturned	2,210-2,216	Shale, black
		2,216-2,225	Shale, medium dark- to dark-gray
		2,225-2,230	Shale, black
		2,230-2,240	Shale, medium dark- to dark-gray
		2,240-2,280	Shale, dark-gray to black
		2,280-2,300	Shale, black, hard, siliceous; dark-gray to black chert
		2,300-2,320	Shale and chert as above; many reddish-brown spore cases?
		2,320-2,410	Shale, dark-gray to black
		2,410-2,420	Shale, medium dark- to dark-gray
		2,420-2,450	Shale, dark-gray to black
1,284-1,290	Limestone, pale yellowish-brown, fine-crystalline, argillaceous; light- to medium-gray dense chert	2,450-2,485	Shale, black, hard, siliceous?; little black chert
1,290-1,300	Limestone, medium-gray, fine-crystalline, argillaceous; chert as above	2,485-2,510	Shale, black, hard, siliceous?
1,300-1,310	Limestone, medium light-gray to pale yellowish-brown, fine-crystalline, argillaceous	2,510-2,540	Shale as above; little black chert
1,310-1,320	Limestone as above; light-gray dense chert	2,540-2,630	Shale, black, hard, siliceous; black rough chert
1,320-1,330	Limestone, medium light-gray to pale yellowish-brown, fine-crystalline, argillaceous	2,630-2,762	Shale as above; black dense chert
1,330-1,345	Limestone, light-gray, fine-granular, argillaceous; very light-gray dense chert	2,762-2,770	Shale, medium-gray
1,345-1,380	Limestone, light-gray, fine-crystalline	2,770-2,780	Shale, medium-gray, hard, siliceous; pyrite; medium-gray dense chert
1,380-1,400	Limestone, medium light- to medium-gray, fine-crystalline, argillaceous	2,814-2,830	Shale, medium-gray, hard, siliceous; pyrite; medium-gray dense chert
1,400-1,431	Limestone as above; medium light-gray dense chert	2,830-2,840	Shale, greenish-gray
1,431-1,455	Limestone, medium light-gray to very pale-orange, fine-crystalline	2,840-2,850	Shale, light olive-gray, hard
1,455-1,463	Limestone, medium-gray, fine-crystalline, argillaceous	2,850-2,870	Shale, greenish-gray, hard, chunky
1,463-1,470	Limestone, medium light-gray, fine-granular, slightly argillaceous; crinoids?	2,870-2,880	Shale as above; probably siliceous; greenish-gray to pale yellowish-brown dense chert
1,470-1,490	Limestone, medium light-gray to pale yellowish-brown, fine-granular	2,880-2,900	Shale, greenish-gray
1,490-1,510	Limestone, medium light-gray, fine-crystalline; medium light-gray dense chert	2,900-2,925	Shale, dark-gray to black
1,510-1,550	Limestone, light- to medium light-gray, fine-crystalline	2,925-2,948	Shale, dark-gray
1,550-1,590	Limestone as above; light- to medium light-gray dense chert	2,948-2,956	Shale, medium-gray, hard, chunky
1,590-1,600	Limestone and chert as above; spicular chert	2,956-2,965	Shale, light olive-gray, hard, chunky, siliceous
1,600-1,620	Limestone, medium light-gray to pale yellowish-brown, fine-crystalline, slightly argillaceous; light- to medium-gray dense and spicular chert	2,965-2,975	Shale, medium-gray, chunky
1,620-1,630	Limestone as above; light- to medium-gray dense chert		
1,630-1,660	Limestone, pale yellowish-brown, fine-crystalline	2,975-2,980	Shale, medium-gray; very glauconitic in part
1,660-1,680	Limestone, pale yellowish-brown to medium-gray, fine-crystalline, slightly argillaceous	2,980-2,990	Shale, greenish-gray
1,680-1,696	Limestone, pale yellowish-brown, fine-crystalline	2,990-3,008	Shale, medium-gray
1,696-1,710	Limestone, medium-gray, fine-crystalline, slightly argillaceous	3,008-3,024	Shale, medium- to medium dark-gray, slightly brownish, calcareous, chunky; resembles limestone
1,710-1,740	Limestone, light-gray to very pale-orange, fine-crystalline; very light- to light-gray dense chert; less chert downward; crinoids?	3,024-3,032	Limestone, medium-gray to brownish-gray, very fine-crystalline, argillaceous
1,740-1,750	Limestone, light-gray to very pale-orange, fine-crystalline; little very light- to light-gray dense chert	3,032-3,060	Shale, medium- to medium dark-gray, calcareous, chunky; resembles limestone
1,750-1,760	Limestone, light-gray to very pale-orange, fine-crystalline	3,060-3,066	Shale, medium- to medium dark-gray, calcareous, chunky; resembles limestone
1,760-1,770	Limestone, light-gray to very pale-orange, fine-crystalline; very light- to light-gray dense chert	3,066-3,079	Shale, medium- to medium dark-gray, calcareous, chunky; resembles limestone
1,770-1,788	Limestone, light-gray to very pale-orange, fine-crystalline; crinoids?	3,079-3,122	Shale, medium-gray, chunky
1,788-1,863	Limestone, light-gray, fine-crystalline; crinoid fragments? (1,810-1,820 had much medium-gray fine-crystalline very argillaceous dolomitic limestone; probably out of place)	3,122-3,148	Limestone, medium-gray to pale yellowish-brown, fine-crystalline, argillaceous
1,863-1,870	Limestone, light-gray, fine-crystalline; scattered very fine pyrite; light-gray to bluish-gray dense chert; some spicular very finely pyritic chert	3,148-3,153	Shale, medium-gray, calcareous, chunky
1,870-1,890	Limestone, pale yellowish-brown, fine-crystalline; medium light-gray dense chert	3,153-3,160	Limestone, pale yellowish-brown, fine-crystalline, argillaceous
		3,160-3,200	Limestone, medium-gray, very fine- to fine-crystalline, argillaceous; slightly brownish
		3,200-3,220	Limestone as above; little medium-gray dense chert
		3,220-3,230	Limestone as above
		3,230-3,246	Shale, medium- to medium dark-gray, slightly calcareous, chunky
		3,246-3,290	Shale, medium- to medium dark-gray, calcareous, chunky; resembles argillaceous limestone
		3,290-3,310	No samples
		3,310-3,330	Limestone, medium light-gray to pale yellowish-brown, fine-crystalline; medium light-gray calcareous chert
		3,330-3,360	No samples
		3,360-3,410	Shale, medium dark-gray, calcareous, chunky; resembles argillaceous limestone

3,410-3,430	Siltstone, pale yellowish-brown to brownish-gray, calcareous, hard; probably siliceous	3,740-3,750	Siltstone, medium-gray, calcareous; resembles silty limestone
3,430-3,445	Shale, medium dark-gray, calcareous, chunky	3,750-3,757	Limestone, medium light-gray, silty
3,445-3,472	Limestone, medium light- to medium-gray, slightly to very silty	3,757-3,770	Siltstone, medium-gray, calcareous; resembles silty limestone
3,472-3,490	Siltstone, medium-gray, very calcareous	3,770-3,788	Limestone, medium light-gray, silty
3,490-3,500	Siltstone, medium-gray, calcareous; brownish-gray granular chert (siliceous siltstone?)	3,788-3,800	Siltstone, medium-gray, calcareous; resembles silty limestone
3,500-3,522	Shale, medium dark- to dark-gray, calcareous, silty	3,800-3,818	Siltstone, medium dark- to dark-gray, calcareous
3,522-3,540	Siltstone, medium-gray, calcareous; resembles silty limestone	3,818-3,830	Siltstone, medium- to medium dark-gray, calcareous, hard
3,540-3,550	Limestone, medium-gray, very silty	3,830-3,904	Siltstone, medium-gray, very calcareous; resembles silty limestone
3,550-3,558	Siltstone, medium-gray, calcareous; resembles silty limestone	3,904-4,004	No samples
3,558-3,565	Limestone, medium-gray, very silty	4,004-4,022	Shale, medium dark-gray, very slightly calcareous, chunky
3,565-3,580	Siltstone, medium-gray, calcareous; resembles silty limestone	4,022-4,030	Siltstone, medium dark-gray, very calcareous
3,580-3,590	Limestone, medium-gray, very silty	4,030-4,045	Limestone, medium-gray, silty
3,590-3,600	Siltstone, medium-gray, calcareous; resembles silty limestone	4,045-4,090	Siltstone, medium-gray, calcareous
3,600-3,624	Limestone, medium-gray, very silty	4,090-4,100	Siltstone, medium-gray, very calcareous; resembles limestone
3,624-3,645	Siltstone, medium-gray, calcareous; resembles silty limestone	4,100-4,120	No samples
3,645-3,666	Limestone, medium light-gray, very silty	4,120-4,145	Siltstone, medium-gray, very calcareous; resembles limestone
3,666-3,670	Siltstone, medium-gray, calcareous; resembles silty limestone	4,145-4,175	Siltstone, medium-gray, calcareous; little black oil stain
3,670-3,675	Limestone, medium light-gray, very silty	4,175-4,196	Siltstone, medium-gray, very calcareous
3,675-3,685	Siltstone, medium-gray, calcareous; resembles silty limestone	4,196-4,216	Limestone, medium light-gray, very silty
3,685-3,720	Limestone, medium light-gray, silty	4,216-4,235	No samples
3,720-3,730	Siltstone, medium-gray, calcareous; resembles silty limestone	4,235	Total depth (Drillers)
3,730-3,740	Limestone, medium light-gray, silty	4,229	Total depth (Electrical log)