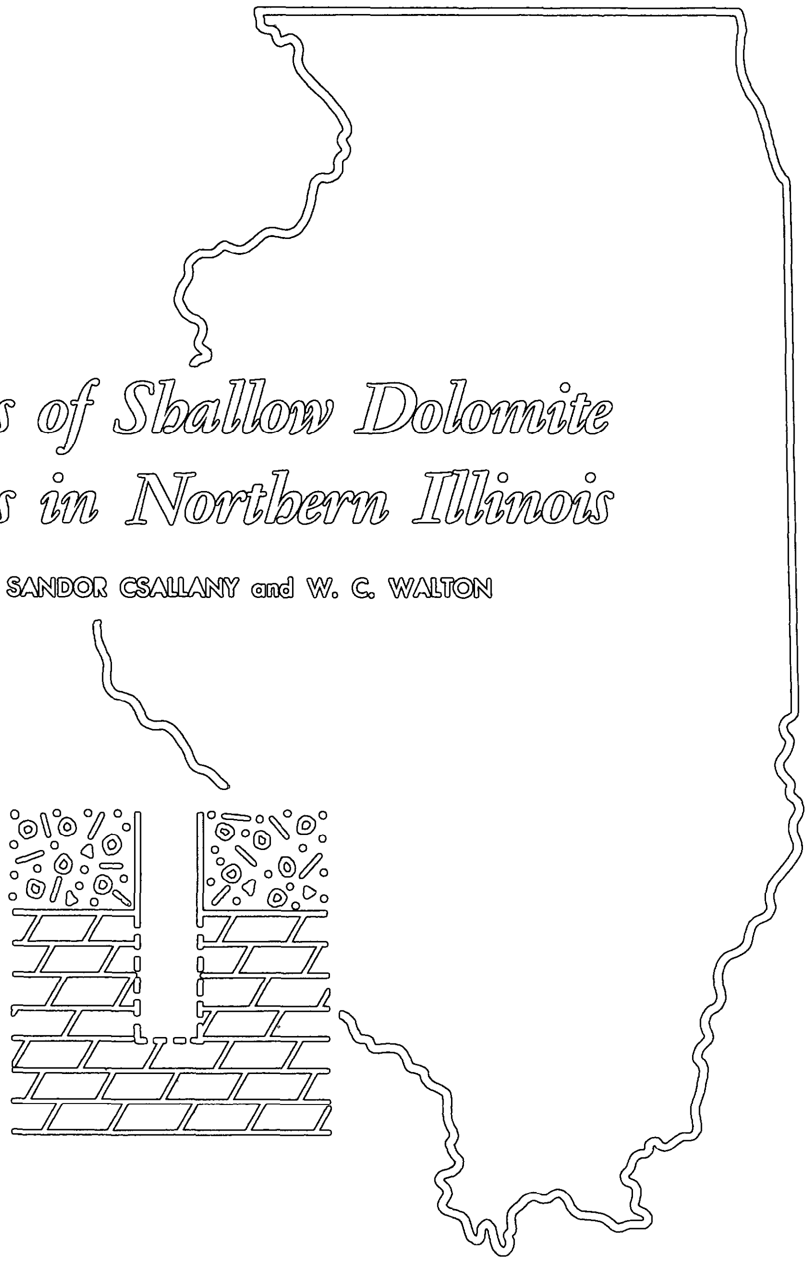
REPORT OF INVESTIGATION 46

STATE OF ILLINOIS

DEPARTMENT OF REGISTRATION AND EDUCATION

Yields of Shallow Dolomite Wells in Northern Illinois

by SANDOR CSALLANY and W. C. WALTON



ILLINOIS STATE WATER SURVEY

URBANA

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by SANDOR CSALLANY and W. C. WALTON

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STATE OF ILLINOIS

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DEPARTMENT OF REGISTRATION AND EDUCATION

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ABSTRACT

In northern Illinois large quantities of ground water are withdrawn from wells in shallow dolomite aquifers of Silurian and Ordovician age. The Niagaran and Alexandrian Series of Silurian age and the Galena-Platteville Dolomite of Ordovician age yield moderate to large quantities of ground water. Dolomite beds of the Maquoketa Formation of Ordovician age yield small quantities of water to wells. Silurian rocks are usually encountered at depths of between 10 and 300 feet in northeastern Illinois and between 30 and 880 feet in northwestern Illinois. These rocks exceed 450 feet in thickness at places and are often overlain by glacial drift. The average depth of shallow doIomite weIIs is about 140 feet, and most wells of recent design are finished 12 to 16 inches in diameter.

About 1000 well-production tests were made, 1921-1961, on more than 800 shallow dolomite wells. Statistical analysis of specific-capacity data provided a basis for determining 1) the role of individual shallow dolomite aquifers or formations, uncased in wells, as contributors of water; 2) whether or not significant relationships exist between the yields of wells and geohydrologic controls; and 3) the effects of acid treatment on the productivities of wells.

It is concluded that the Niagaran Series, Alexandrian Series, and Galena-Platteville Dolomite all have similar moderate to high yields and inconsistency of yields in areas throughout northern Illinois where these rocks directly underlie glacial drift. These Silurian and Ordovician rocks have similar low yields and inconsistency of yields in areas where these rocks are overlain by bedrock. On the other hand, the Maquoketa Formation and rocks of Devonian age yield very little water to wells. Most water-yielding openings occur in the upper one-third of the shallow dolomite aquifers. There is a good connection between glacial drift and the upper part of the shallow dolomite aquifers. Highest yielding wells are found in bedrock upland areas, in areas where the glacial drift immediately overlying the shallow dolomite aquifers is composed of sand and gravel, and in areas where reefs and associated strata are present.

Most dolomite wells treated with acid show significant improvement in yield; largest improvements are recorded for rehabilitated wells. Yields are increased because water-yielding openings are enlarged and fine drill cuttings or incrustations are removed from openings.

Probable ranges in yields of shallow dolomite wells in undeveloped areas are estimated from specific-capacity frequency graphs, aquifer thickness and area1 geology maps, and water-level data.

INTRODUCTION

In northern Illinois (see figure 1) north of the forty-first parallel of latitude, several hundred municipal and industrial wells obtain large quantities of ground water from bedrock of Silurian and Ordovician age. Silurian and Ordovician rocks are encountered at depths ranging from a few to several hundred feet, and the parts of these rocks above the Glenwood-St. Peter Sandstone functioning as aquifers consist largely of dolomite (a limestone-like rock rich in magnesium). Silurian rocks range in thickness from a few to more than 450 feet; the maximum known thickness of the Galena-Platteville Dolomite exceeds 350 feet. The Silurian rocks are major aquifers in northeastern and northwestern Illinois, and the Galena-Platteville Dolomite of Ordovician age is a major aquifer in the central portion of northern Illinois. Despite the fact that these shallow dolomite aquifers are very inconsistent in productivity and the yields of wells vary greatly from place to place, shallow dolomite wells have been prolific sources of water for nearly 75 years. Small quantities of water also are obtained from dolomite beds of the Maquoketa Formation and limestone beds of rocks of Devonian age.

Pumpage from Silurian and Ordovician rocks is largely concentrated in DuPage, Cook, and Lake Counties in northeastern Illinois. Withdrawals from dolomite wells in northeastern Illinois averaged about 55 million gallons per day (mgd) in 1960. Shallow dolomite wells at places have yields exceeding 1000 gallons per minute (gpm) . Large quantities of water are pumped from wells owned by Chicago Heights, Clarendon Hills, Downers Grove, Flossmoor, Glen Ellyn, Hinsdale, Homewood, La Grange, Libertyville,

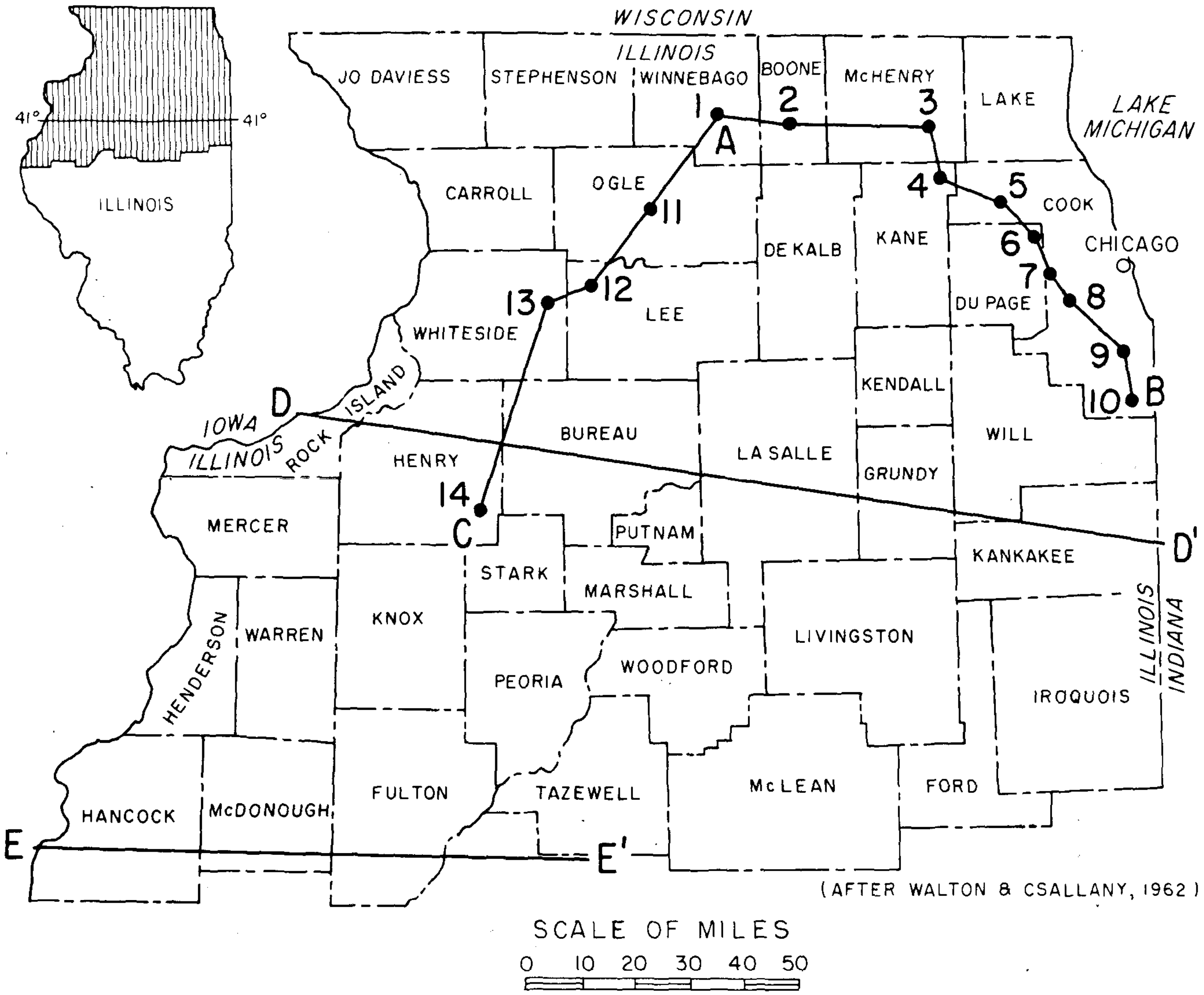

Figure 1 Northern Illinois areo and locations of geologic cross sections shown in figure 3

Lisle, Lombard, Orland Park, Park Forest, Thornton, Villa Park, West Chicago, Westmont, Wheaton, and other municipalities.

The State Water Survey has collected many data on the performance of shallow dolomite wells. The results of well-production tests made on several hundred wells provide important information concerning the influence of location, depth, construction features, and age of a well on its yield. The effects of acid treatment of shallow dolomite wells are apparent from data for tests made before and after acid treatment. The performance of a shallow dolomite well depends in large part upon the water-yielding properties of the rocks uncased in the well, Thus, well-production data for wells drilled to various depths and uncased in one or more bedrock units can be used to evaluate the water-yielding properties of the individual units.

The geology and hydrology of the ground-water resources of the Chicago region were discussed in detail in a cooperative report (Suter et al., 1959) issued by the State Water Survey and State Geological Survey. Emphasis was placed on deeply buried sandstone aquifers of Ordovician and Cambrian age which have been widely used for large ground-water supplies. Very littIe information on shallow dolomite aquifers was presented; however, from available data their potential yield was judged to be larger than withdrawals. Additional quantitative studies of the potential yield of shallow dolomite aquifers were recommended. The Water Survey program of collecting and analyzing well-production data for shallow dolomite wells in northern Illinois was accelerated in 1960.

This report summarizies the results of studies made to date on the yields of shallow dolomite wells in northern Illinois; emphasis is placed on wells in the Chicago region. A summary of published information concerning the geology and hydrology of the bedrock units uncased in shallow dolomite wells is presented to serve as a background for interpretation of the records.

Acknowledgments

This report was prepared under the general supervision of William C. Ackermann, Chief of the State Water Survey,

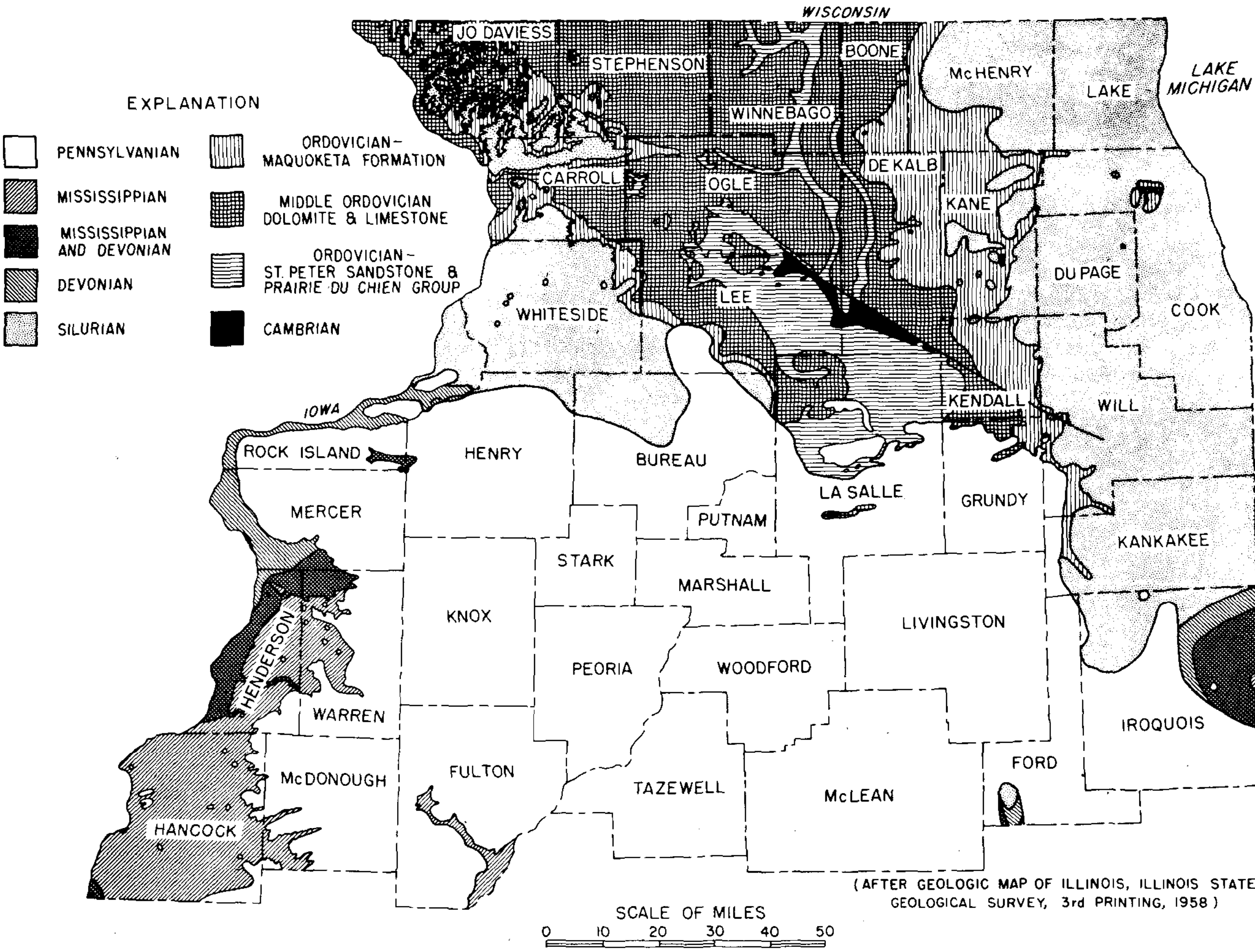

Figure 2. Areal geology of bedrock surface in northern Illinois

and H. F. Smith, Head of the Engineering Section. Many former and present members of the State Water Survey and State Geological Survey participated in well-production tests, wrote earlier special reports which have been used as reference material, or aided the authors indirectly in preparing this report. Grateful acknowledgment is made, therefore, to the following: R. T. Sasman, W. H. Baker, T. A. Prickett, Max Suter, Jack Bruin, J. B. Millis, J. S. Randall, R. A. Hanson, A. J. Zeizel, J. E. Hackett, G. B. Maxey, and R. E. Bergstrom.

Consulting engineers, well drillers, and municipal officials were most cooperative and helpful in making data available on well-production tests. J. W. Brother prepared the illustrations.

GEOLOGY AND HYDROLOGY

Shallow dolomite wells in northern Illinois may penetrate bedrock of Pennsylvanian, Mississippian, Devonian, Silurian, and Ordovician age (figure 2). This report is mainly concerned with rocks of Devonian and Silurian age and upper formations of rocks of Ordovician age (Maquoketa Formation and Galena-Platteville Dolomite); other formations are considered. only with respect to their relation to the geohydrologic conditions of these rocks.

The geologic nomenclature and characteristics, drilling and casing conditions, and water-yielding properties of the glacial drift and the bedrock in northern Illinois are summarized in the chart presented on the next page. The sequence, structure, and general characteristics of the rocks are shown in figure 3. For further details of the geology of the rocks the reader is referred to Suter et al. (1959), Horberg (1950), Hackett (1960), Hackett and Bergstrom (1956) Bergstrom et al. (1955) and Zeizel et al. (1962). The following sections on geology and hydrology were abstracted from these reports.

Ordovician Rocks

Three formations, the Platteville Dolomite, the Decorah Formation, and the Galena Dolomite, are considered as one geohydrologic unit and are collectively called the Galena-Platteville Dolomite. The Galena-Platteville Dolomite is dense to porous, partially argillaceous and cherty, and has shale partings and sandy dolomite beds. Interbedded dolomitic limestone and calcareous dolomite grade

Generalized Stratigraphy and Water-Yielding Properties of Rocks in Northern Illinois

SYSTEM	SERIES	GROUP OR FORMATION	GEOHYDROLOGIC UNITS	AQUIFERS	LOG	APPROXIMATE RANGE IN THICKNESS (ft)	DESCRIPTION	DRILLING AND CASING CONDITIONS	WATER-YIELDING PROPERTIES
Quaternary	Pleistocene		Glacial drift aquifers			0-500	Unconsolidated clay, silt, sand, gravel, and boulders deposited as till, outwash, pond water deposits, and loess	Boulders, heaving sand locally; sand and gravel wells usually require screens and development; casing required in wells into bedrock	Probabilities for ground-water development range from poor to excellent; outwash sand and gravel yield more than 1000 gpm to wells at places; large supplies generally obtained from permeable outwash in major valleys; glacial aquifers used for many small water supplies because they are shallow
Pennsylvanian		McLeansboro Carbondale Tradewater Caseyville		Bedrock aquifers		0-600	Mainly shale with thin limestone, sandstone, and coal beds	May require casing because of shale caving and poor-quality water	Generally unfavorable as an aquifer; locally domestic and farm supplies obtained from thin limestone and sandstone beds
Mississippian	Valmeyer	St. Louis-Salem				0-100	Limestone		Water yielding where creviced; too thin to be important source of water in most of area
		Warsaw				0-100	Shale	Casing required	Not water yielding at most places
		Keokuk-Burlington				0-200	Cherty limestone		Generally creviced and water yielding; dependable aquifer for small supplies in western Illinois
	Kinderhook					0-300	Shale with limestone and dolomite	Casing required	Not water yielding at most places; locally limestones within shale are source of small farm supplies
Devonian						0-200	Thin limestone, shale, & sandstone beds		Not normally a source of water because of a lack of cracks or solution openings
Silurian	Niagaran	Port Byron Racine Waukesha Joliet	Silurian	Shallow dolomite aquifers		0-500	Dolomite; silty at base, locally cherty	Upper part usually weathered and broken; extent of creviceing varies widely	Some wells yield more than 1000 gpm; not consistent; crevices and solution channels more abundant near surface
	Alexandrian	Kankakee Edgewood							
Ordovician	Cincinnatian	Maquoketa	Maquoketa			0-250	Shale, gray or brown; locally dolomite and/or limestone, argillaceous	Shale requires casing	Shales, generally not water yielding, act as confining beds between shallow and deep aquifers; crevices in dolomite yield small amounts of water
	Mohawkian	Galena Decorah Platteville	Galena-Platteville			220-350	Dolomite and/or limestone, cherty, sandy at base, shale partings	Creviceing common only where formations underlie drift; top of Galena usually selected for hole reduction and seating of casing	Where formation lies below shales, development and yields of crevices are small; where not capped by shales, dolomites are fairly permeable
		Glenwood	Glenwood-St. Peter	Cambrian-Ordovician aquifer		50-650	Sandstone, fine- and coarse-grained; little dolomite; shale at top Sandstone, fine- to medium-grained; locally cherty red shale at base	Lower cherty shales cave and are usually cased; friable sand may slough	Small to moderate quantities of water; coefficient of transmissibility probably averages about 15 percent of that of Cambrian-Ordovician aquifer
	Chazyan	St. Peter							
	Prairie du Chien	Shakopee New Richmond Oneota	Prairie du Chien			0-400	Dolomite, sandy, cherty; sandstone. Sandstone interbedded with dolomite, white to pink, coarse-grained, cherty, sandy	Crevices encountered locally in the dolomite, especially in Trempealeau; casing generally not required	Crevices in dolomite and sandstone generally yield small to moderate quantities of water; Trempealeau locally well creviced and partly responsible for exceptionally high yields of several deep wells; coefficient of transmissibility probably averages about 35 percent of that of Cambrian-Ordovician aquifer
Cambrian	St. Croixian	Trempealeau	Trempealeau			0-225	Dolomite, white, fine-grained, geodic quartz, sandy at base		
		Franconia	Franconia			45-175	Dolomite, sandstone, and shale glauconitic, green to red, micaceous		
		Ironton Galesville	Ironton-Galesville			105-270	Sandstone, fine- to medium-grained, well sorted, upper part dolomitic	Amount of cementation variable; lower part more friable; sometimes sloughs	Most productive unit of Cambrian-Ordovician aquifer; coefficient of transmissibility probably averages about 50 percent of that of Cambrian-Ordovician aquifer
		Eau Claire	Eau Claire (upper and middle beds) lower beds	Mt. Simon aquifer		235-450	Shale and siltstone, dolomitic, glauconitic; sandstone, dolomitic, glauconitic	Casing not usually necessary; locally weak shales may require casing	Shales generally not water yielding; act as confining bed between Ironton-Galesville and Mt. Simon
		Mt. Simon	Mt. Simon			1000-2000±	Sandstone, coarse-grained, white, red in lower half; lenses of shale and siltstone, red, micaceous	Casing not required	Moderate amounts of water; permeability intermediate between that of Glenwood-St. Peter and Ironton-Galesville
Precambrian crystalline rocks									

(After suter et al., 1959; and selkregg and Kempton, l958)

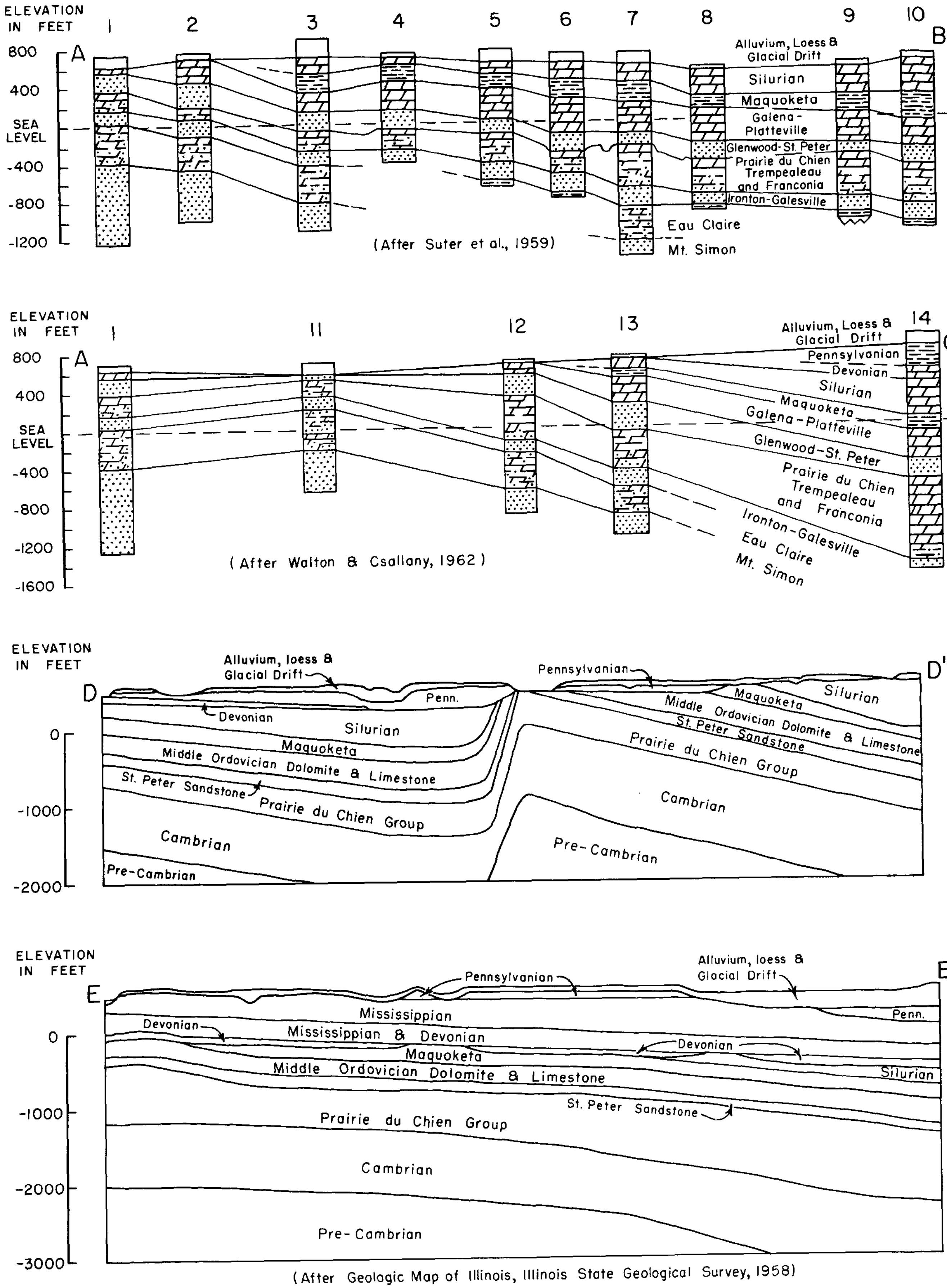

Figure 3. Cross sections of structure and stratigraphy of bedrock in northern Illinois (locations shown on figure 1)

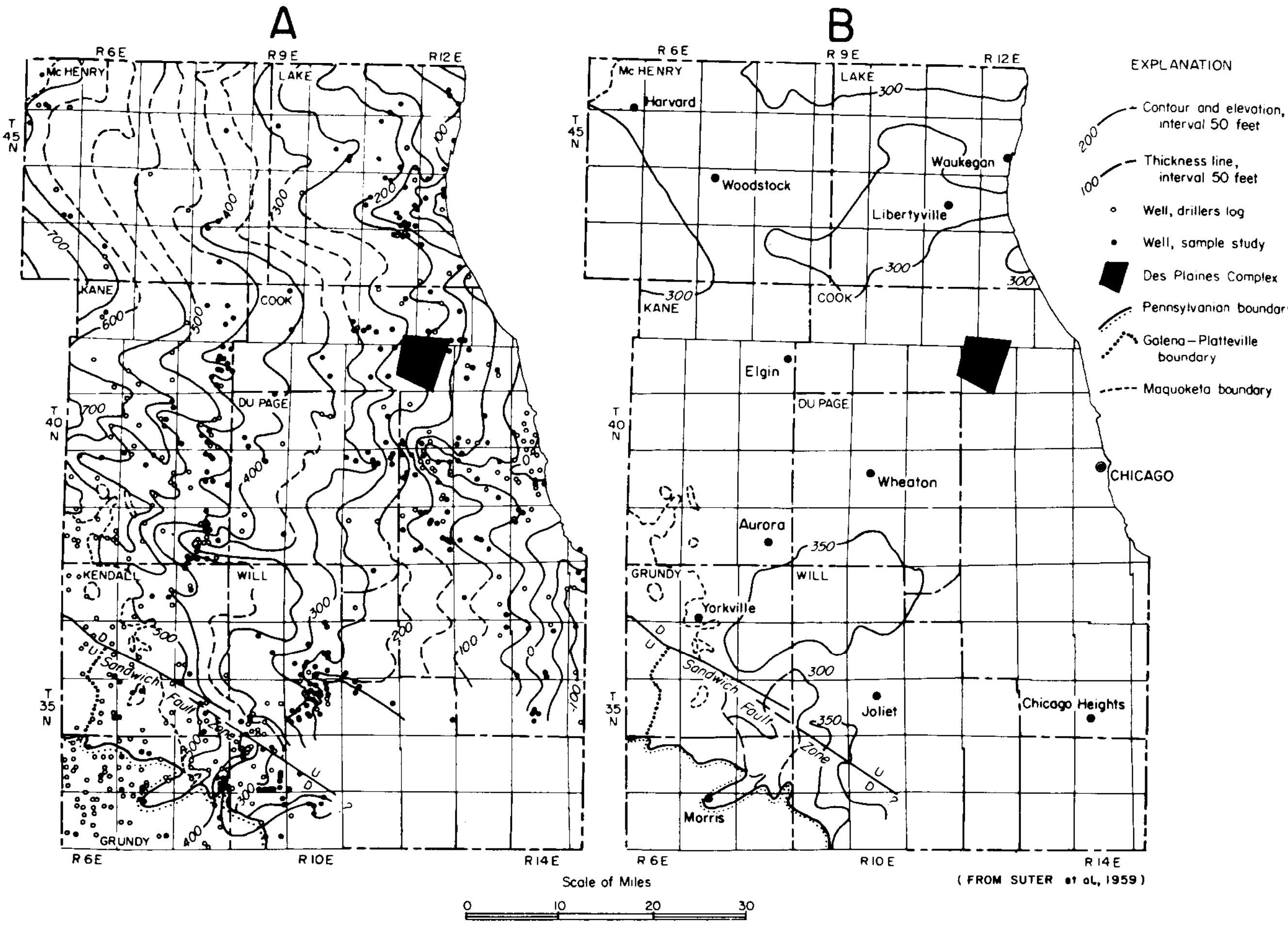

Figure 4. Elevation of top (A) and thickness (B) of Galena-Platteville Dolomite in northeastern Illinois

into one another at places. The unit is the uppermost bedrock formation in many counties in central and northwestern parts of northern Illinois. In these areas the thickness of the unit varies because the bedrock surface has been eroded. In areas where the Galena-Platteville Dolomite is overlain by other rocks, it has a uniform thickness averaging about 300 feet. As described by Bergstrom and Emrich (see Suter et al., 1959) the lowest formation of the Galena-Platteville Dolomite is the Platteville Dolomite, "which is commonly argillaceous, cherty in the upper half, buff to gray, very fine- to fine-grained, and commonly mottled. Near the base it is sandy. The Decorah Formation lies above the Platteville and consists of fine- to medium-grained, speckled (red and black) dolomite with thin gray to red shale partings. The overlying Galena Dolomite is cherty in the lower half, fine- to medium-grained, buff to brown, and includes scattered thin shale beds." The thickness and elevation of the top of the Galena-Platteville Dolomite in northeastern Illinois are given in figure 4.

Figure 5 shows elevations of the base of the Galena-Platteville Dolomite. In western LaSalle and Lee Counties rocks are folded into an asymmetrical anticline (LaSalle anticline). Beds on the western side dip steeply while beds on the eastern side dip gently. A long fault zone (the Sandwich Fault Zone) extends southeastward through Ogle, northeastern Lee, DeKalb, Kendall, and Will Counties. Rocks have been displaced as much as 900 feet vertically along the fault. Other gentle folds and warps are common. In northeastern Illinois the Galena-Platteville Dolomite has a regional dip to the east and south of about 10 feet per mile. The Galena-Platteville Dolomite is missing in large areas in the central part of northern Illinois, as shown in figure 5.

Rocks of the Galena-Platteville Dolomite underlie the glacial drift or other unconsolidated deposits in parts of McHenry, Kane, Kendall, Grundy, DeKalb, Boone, Winnebago, Stephenson, JoDaviess, Carroll, Ogle, Lee, and LaSalle Counties. In areas where the Galena-Platteville Dolomite underlies glacial drift or other unconsolidated deposits, solution activity has enlarged openings, and the unit yields moderate quantities of water to wells. Where the unit is overlain by the Maquoketa Formation, the Galena-Platteville Dolomite is a less favorable source of ground water and yields very little water from joints, fissures and solution cavities.

In large parts of northern Illinois the Galena-Platteville Dolomite is overlain by the Maquoketa Formation which is the uppermost unit of the Ordovician rocks. The unit consists mostly of shale, dolomitic shale, and argillaceous

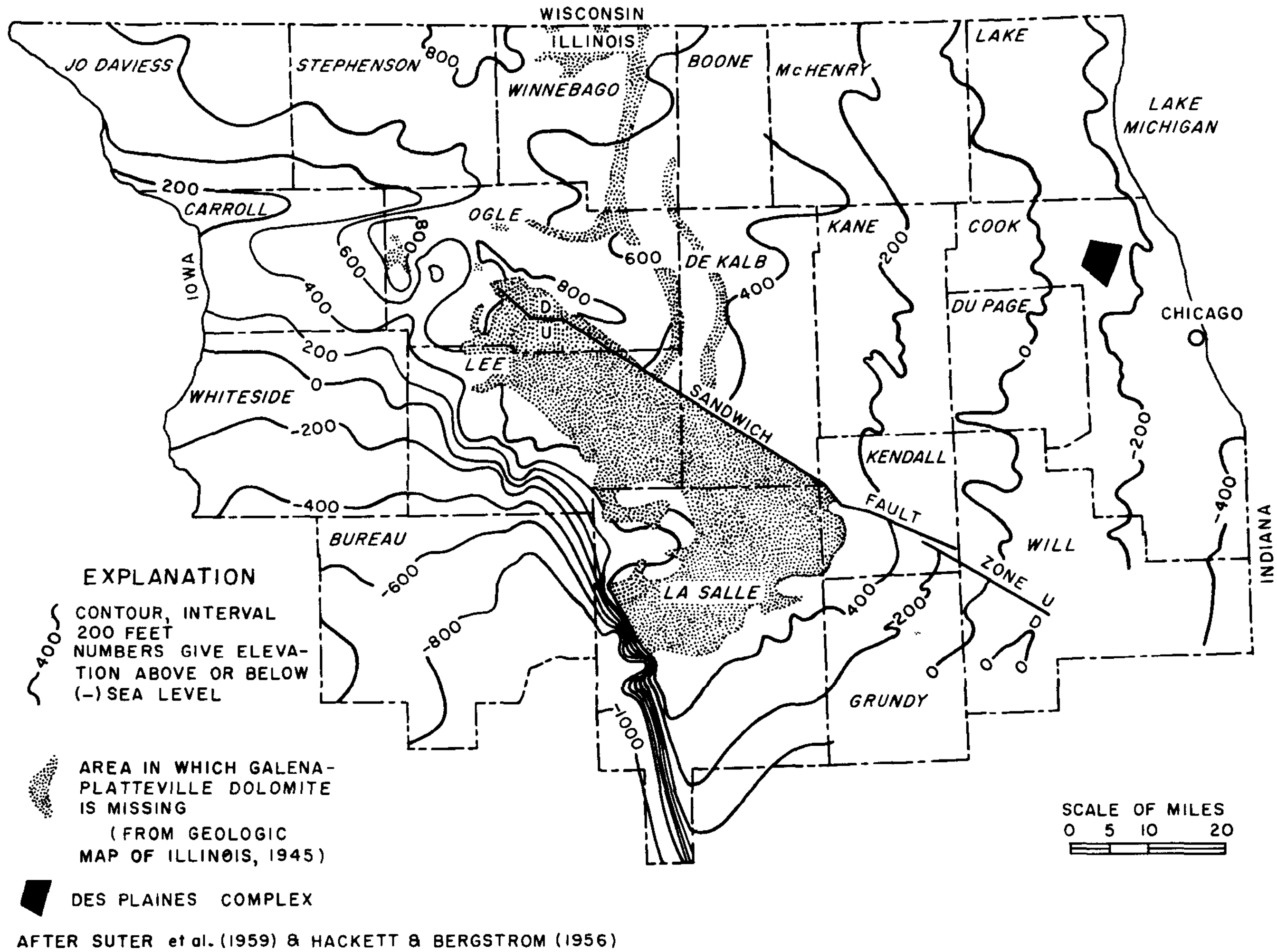

Figure 5. Elevation of base of Galena-Platteville Dolomite in part of northern Illinois

dolomite and has a maximum thickness of about 250 feet in northeastern Illinois (see figure 6). In areas where the Maquoketa Formation is the uppermost bedrock, the thickness of the unit varies because the bedrock surface has been eroded. The formation dips regionally to the east in northeastern Illinois at a uniform rate of about 10 feet per mile.

Bergstrom and Emrich (see Suter et al., 1959) divided the Maquoketa Formation in northeastern Illinois into three units: lower, middle, and upper. As described by Bergstrom and Emrich, "The lower unit is normally a brittle, dark brown, occasionally gray or grayish brown, dolomitic shale grading locally to dark brown, argillaceous dolomite . . . The middle unit is dominantly brown to gray, fine- to coarse-grained, fossiliferous, argillaceous, speckled dolomite and limestone. It is commonly interbedded with a fossiliferous brownish gray to gray, dolomitic shale . . . The upper unit is a greenish gray, weak, silty, dolomitic shale that grades into very argillaceous, greenish gray to gray dolomite." The lower unit is thicker in Cook and Will Counties where it exceeds 100 feet. It thins to the north and west to less than 50 feet. The middle unit is thicker to the west where it is more than 100 feet locally and thins to the east. The upper unit ranges in thickness from less than 50 feet in the west to more than 100 feet in parts of Cook and Will Counties. The lower dense shale unit is the most impermeable unit. Dolomite beds in the middle unit yield small quantities of water. The middle unit water-yielding potential is greatest in Kane County.

The Maquoketa Formation underlies the glacial drift or other unconsolidated deposits in large areas in McHenry, DeKalb, Boone, Kane, and Kendall Counties and in smaller areas in Kankakee, Grundy, Will, Cook, DuPage, Bureau, Lee, Whiteside, Carroll, Ogle, Stephenson, and JoDaviess, as shown in figure 2. The unit overlies the Galena-Platteville Dolomite in northeastern Illinois where it confines the water in the Cambrian-Ordovician Aquifer under artesian conditions. According to Walton (1960) the average vertical permeability of the Maquoketa Formation in northeastern Illinois is 0.00005 gallons per day per square foot (gpd/sq ft) . Even though the vertical permeability is very low, leakage through the unit is appreciable under the influence of existing large vertical hydraulic gradients. The Maquoketa Formation is missing in large areas in the central part of northern Illinois.

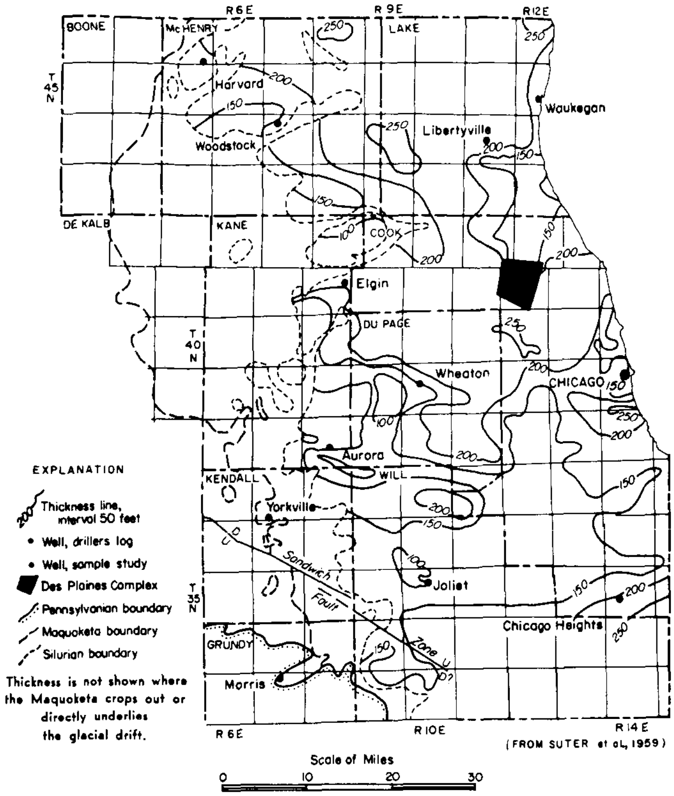

Figure 6. Thickness of Maquoketo Formation in northeastern Illinois

Silurian Rocks

The bedrock surface in the eastern one-third and the western one-fourth of northern Illinois is formed by Silurian rocks. In northeastern Illinois Silurian rocks dip to the southeast at an average rate of about 10 feet per mile. The thickness of the rocks increases from less than 50 feet in McHenry, Kane, and Kendall Counties to more than 450 feet in southeastern Will County as shown in figure 7. Where valleys occur in the bedrock (see figure 8), the Silurian rocks have been deeply eroded and are thinned. Silurian rocks attain thicknesses exceeding 300 feet in parts of northwestern Illinois. In the southern part of northern Illinois the rocks are overlain by rocks of Devonian, Mississippian, and Pennsylvanian age.

The Silurian rocks are mainly dolomites and are silty at the base. They are divided into the Alexandrian Series below and the Niagaran Series above. Areas where the Alexandrian Series forms the bedrock surface are small compared with the areas where the Niagaran Series is the uppermost bedrock. The Alexandrian Series consists of two formations: Edgewood below and Kankakee above. According to Bergstrom and Emrich (see Suter et al., 1959)) in northeastern Illinois "the Edgewood Formation is an argillaceous to finely sandy, light gray to gray brown, finely crystalline dolomite. At some places it is similar to the dolomite of the Maquoketa Formation. The Kankakee Formation is a light gray to buff, cherty, finely crystalline dolomite." The rocks of the Niagaran Series have been subdivided into Joliet, Waukesha, and Racine formations.

The Niagaran Series is white to light gray, finely to medium crystalline, compact dolomite with varying amounts of silt. White to light gray chert generally occurs in the upper part. At the base the dolomite is commonly green, pink, or red and is slightly silty. At places shaly dolomite beds occur at the base, and reefs and associated strata are present in upper formations. Reefs and associated strata are most characteristic of the Racine Formation but may occur stratigraphically as low as the Joliet Formation (Zeizel et al., 1962).

Ground water in the Silurian and Ordovician rocks above the Glenwood-St. Peter Sandstone occurs in joints, fissures, solution cavities, and other openings. The water-yielding openings are irregularly distributed both vertically and horizontally. Available geohydrologic data indicate that the rocks contain numerous openings which extend for considerable distances and are interconnected on an area1 basis. The upper parts of the rocks are much more permeable than lower parts. The Niagaran and Alexandrian Series have about the same average productivity in areas where the units are the uppermost bedrock. Recharge to these Silurian and Ordovician rocks is derived locally mostly from vertical leakage through the glacial drift or other unconsolidated deposits, and surficial materials are in turn recharged from precipitation. Water occurs in these rocks mainly under leaky artesian conditions.

Devonian, Mississippian, and Pennsylvanian Rocks

Rocks of Devonian, Mississippian, and Pennsylvanian ages occur at places on top of Silurian or Ordovician rocks. They underlie the glacial drift in areas of the southern part of northern Illinois. The Devonian and Mississippian rocks are composed mostly of dolomitic and calcareous shale, and the Pennsylvanian rocks are mainly shales with thin sandstone, limestone, clay, and coal beds. The rocks mentioned above yield small quantities of water from creviced dolomite and sandstone beds. The Devonian rocks have a maximum thickness of about 100 feet in the area of study.

CONSTRUCTION FEATURES OF WELLS

The shallow dolomite wells in northern Illinois are drilled mainly by the cable tool method. They range in depth from 15 to 450 feet in northeastern Illinois and from 20 to 650 feet in northwestern Illinois. The average depth of wells is about 140 feet.

Many shallow dolomite wells penetrate more than one bedrock aquifer, and often several formations of an aquifer contribute to the yield of the well. Wells may be grouped into the following categories according to the rocks uncased in wells: 1) Silurian rocks (*Sil*) ; 2) Silurian rocks and Maquoketa Formation (*Sil-Maq*) ; 3) Maquoketa Formation (*Maq*) ; 4) Devonian and Silurian rocks (*Dev-Sil*) ;

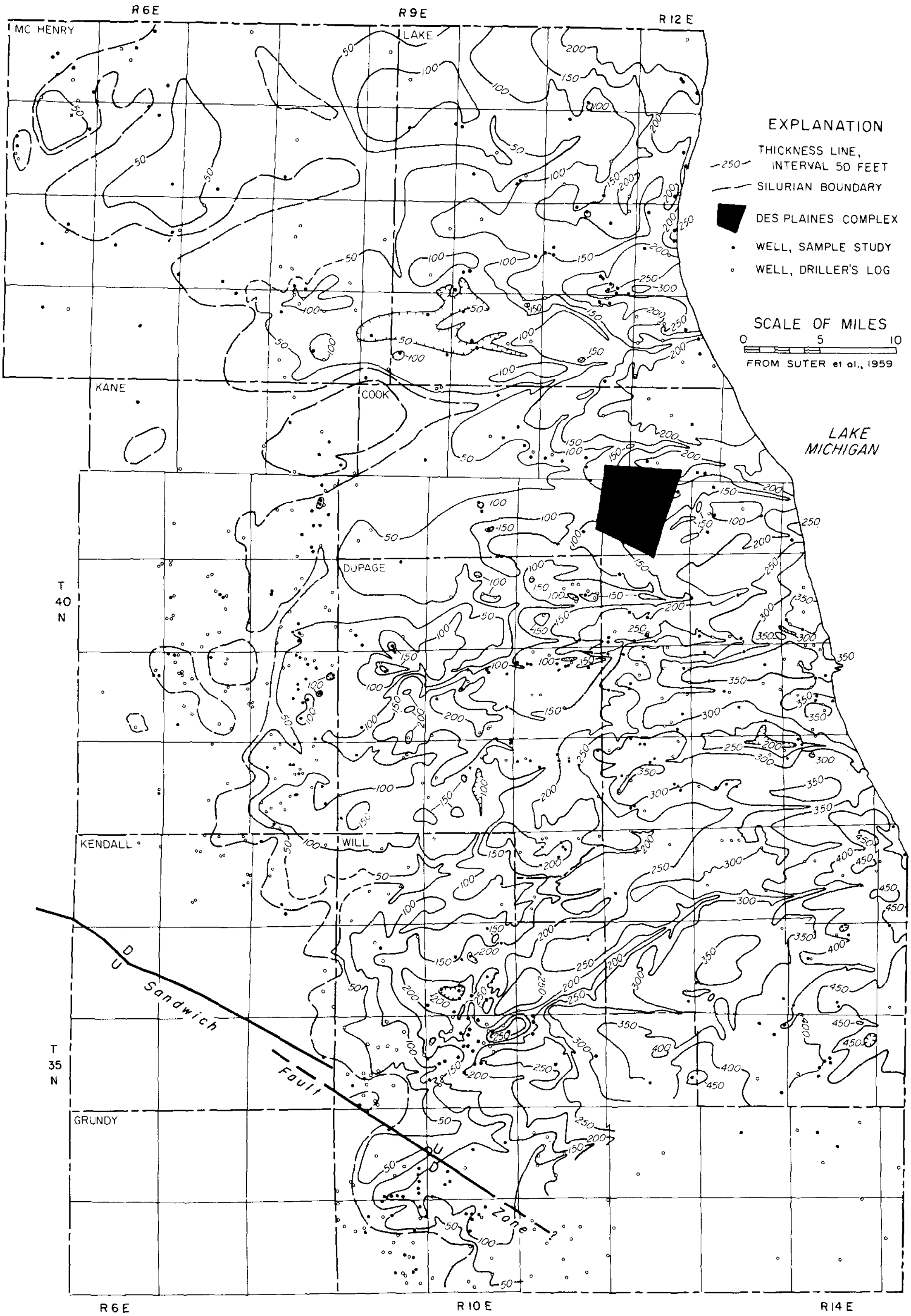

Figure 7. Thickness of Silurian rocks in northeastern Illinois

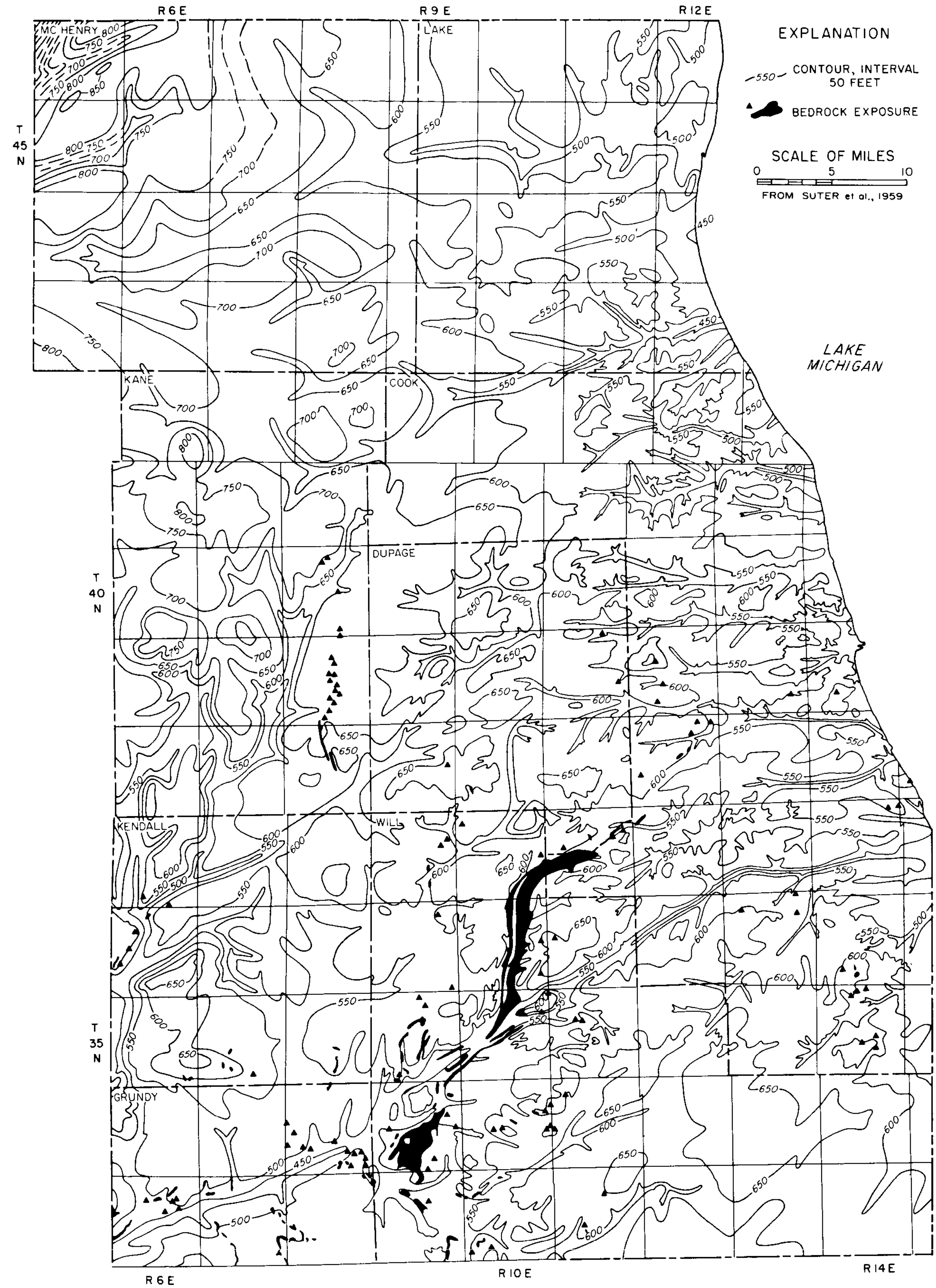

Figure 8. Bedrock topography of northeastern Illinois

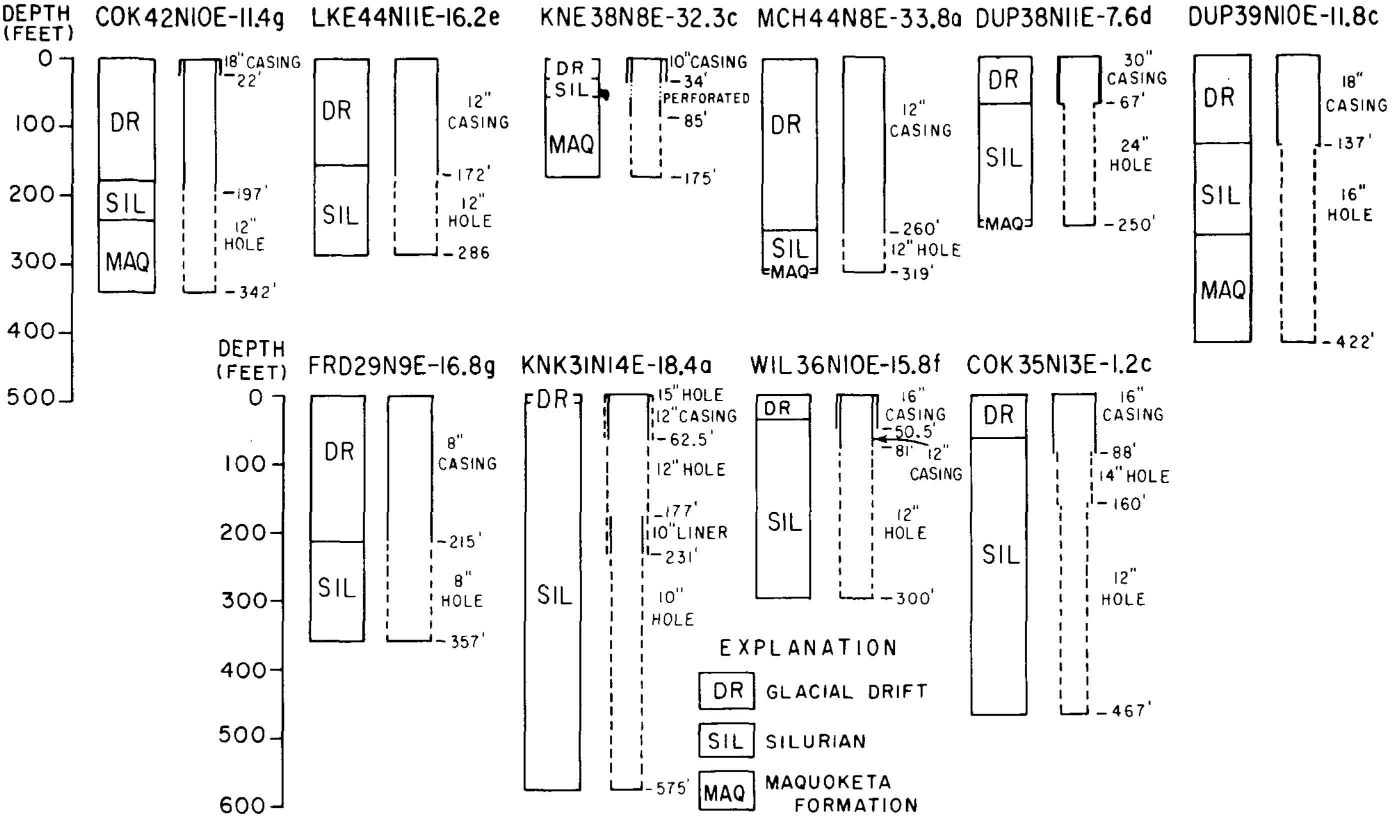

Figure 9. Construction features of selected wells in northeastern Illinois

and 5) Galena-Platteville Dolomite (*G-P*). The distribution of wells in these five categories is as follows:

	Percentage of wells uncased in aquifers				
Area	*Sil*	*Sil-Maq*	*Maq*	*Dev-Sil*	*G-P*
Northeastern Illinois	67	29	1	—	3
Northwestern Illinois	36	—	—	36	28
Northern Illinois	65	27	1	3	4

Many deep sandstone wells are either uncased or faultily cased in Silurian rocks and obtain large quantities of water from that aquifer. In northeastern Illinois most shallow dolomite wells are uncased in the entire thickness of the Silurian rocks and often terminate in dolomite beds in the upper part of the Maquoketa Formation. In the central part of northern Illinois shallow dolomite wells are open to the Galena-Platteville Dolomite. Most of the shallow dolomite wells in northwestern Illinois are uncased in Silurian rocks. In the southern part of northern Illinois usually both Devonian and Silurian rocks are open to wells.

Shallow dolomite wells usually are uncased through the formations penetrated because most of the bedrock encountered does not cave or swell. A drive pipe extends through the unconsolidated deposits to bedrock. The diameters of some wells are smaller at the bottom than at the top. Well-bore diameters ranging from 6 to 16 inches at the top and reduced to between 6 and 12 inches at the bottom are common. Generalized graphic logs of typical shallow dolomite wells are given in figures 9 and 10.

SPECIFIC-CAPACITY DATA

The water-yielding properties of shallow dolomite aquifers influence the productivity of wells; as the size and/or number of openings in shallow dolomite aquifers increase, the yields of wells increase. The hydraulic properties of aquifers are commonly expressed mathematically by the coefficients of transmissibility, *T*, or permeability, *P*, and storage, *S*. The hydraulic property of a confining bed (deposits overlying aquifers and retarding vertical movement of water into aquifers) influencing the productivity of a well is the coefficient of vertical permeability, *P'*.

The coefficient of transmissibility is defined as the rate of flow of water in gallons per day through a vertical strip of the aquifer one foot wide and extending the full saturated thickness of the aquifer under a hydraulic gradient of 100 percent (one foot per foot) and at the prevailing temperature of the ground water. The coefficient of permeability is defined as the rate of flow of water in gallons per day, through a cross-sectional area of one square foot of the aquifer under a hydraulic gradient of one foot per foot at the prevailing temperature of the ground water. The relation of the coefficients of transmissibility and permeability is shown by the formula $P = T/m$, *or*

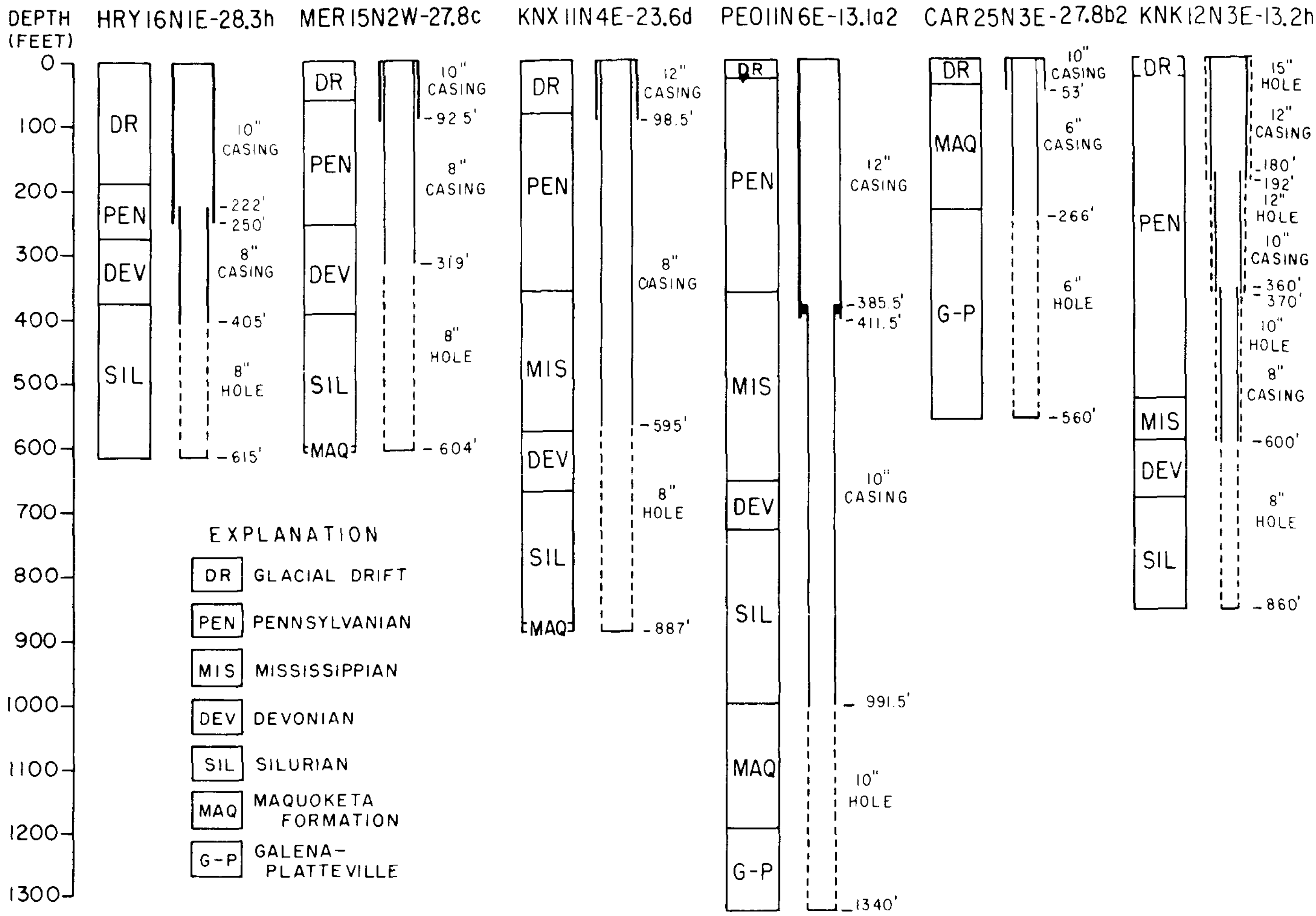

Figure 10. Construction features of selected wells in northwestern Illinois

$T = Pm$, where m is the saturated thickness of the aquifer. The storage properties of an aquifer are expressed by the coefficient of storage, which is defined as the volume of water in cubic feet released from or taken into storage per square foot of surface area of the aquifer per foot change in the component of head normal to that surface. The coefficient of vertical permeability of a confining bed is defined as the rate of flow of water in gallons per day through a horizontal cross-sectional area of one square foot of the confining bed under a hydraulic gradient of one foot per foot at the prevailing temperature of the ground water. The leakage coefficient is (P'/m') where m' is the saturated thickness, in feet, of the confining bed through which leakage occurs.

The hydraulic properties of leaky artesian aquifers and their confining beds are often determined by means of aquifer tests, wherein the effect of pumping a well at a known constant rate is measured in the pumped well and in observation wells penetrating the aquifer. The data collected during aquifer tests can often be analyzed by means of the leaky artesian formula (Hantush and Jacob, 1955). However, the difference between the ideal porous media assumed in the derivation of that formula and the character of water-yielding openings of shallow dolomite aquifers suggests that the leaky artesian formula will not completely describe the response of shallow dolomite aquifers to pumping.

Walton (see Zeizel et al., 1962) made the following remarks : "The high average yields of shallow dolomite wells and the conformable piezometric surface of the Silurian rocks in DuPage County suggest that the dolomite contains numerous fractures and crevices which extend for considerable distances and are interconnected on an area1 basis. Such a network of openings can give a resultant regional effect equivalent to a radially homogeneous aquifer (also see Walton, 1953) ." The dolomite feeds its water into a complex system of interconnected fractures; some of the fractures are intersected by wells. The flow of ground water through dolomite assumes at least some of the characteristics of the flow of water in a linear channel in the immediate vicinity of a pumped well. Turbulent head losses are appreciable in the pumped well. Thus, the leaky artesian formula (based on laminar flow conditions) may describe drawdown on an area1 basis with reasonable accuracy but does not completely describe the drawdown in a pumped well.

Two controlled aquifer tests were made using shallow dolomite wells in DuPage County, and results of the tests were described in Zeizel et al. (1962). Hydraulic properties computed with aquifer-test data are as follows:

1. *Test at City of Wheaton, central DuPage County*— coefficient of transmissibility, 61,000 gpd/ft; coefficient of storage, fraction, 3.5 x 10^{-4}; leakage coefficient, 6.5 x 10^{-3} gpd/cu ft.

2. *Test at Argonne National Laboratory, southeast DuPage County* — coefficient of transmissibility, 44,000 gpd/ft; coefficient of storage, fraction, 9.0 x 10^{-5}; leakage coefficient, 1.0 x 10^{-3} gpd/cu ft.

During the aquifer tests interference between wells spaced more than one-half mile apart was measured indicating that water-yielding openings in Silurian rocks extend for considerable distances.

The yield of a well may be expressed in terms of its specific capacity, which is commonly defined as the yield of the well in gallons per minute per foot of drawdown (gpm/ft) for a stated pumping period and rate. The specific capacity is influenced by the hydraulic properties of the aquifer and confining bed, thickness of the confm-ing bed, radius of the well, and pumping period.

The theoretical specific capacity, *Q/s,* of a well in a leaky artesian aquifer can be written as:

$$Q/s = T/[114.6\ W(u, r_w/B)] \qquad (1)$$

where:

$$u = 1.87\ r_w^2 S/Tt \qquad (2)$$

$$r_w/B = r_w/\sqrt{T/(P'/m')} \qquad (3)$$

Q = discharge of pumped well, in gpm
s = drawdown, in ft
T = coefficient of transmissibility, in gpd/ft
r_w = nominal radius of the well, in ft
S = coefficient of storage, fraction
t = pumping period, in days
p' = coefficient of vertical permeability, in gpd/ sq ft
m' = saturated thickness of confining bed, in ft

Equation 1 was derived by assuming that 1) the well completely penetrates the aquifer, 2) well loss is negligible, and 3) the effective radius of the well has not been affected by the drilling and development of the well and is equal to the nominal radius of the well.

From equations 1-3 the theoretical specific capacity of a well depends in part upon the radius of the well and the pumping period. The relationships between theoretical specific capacity and the radius of a well and the pumping period are shown in figure 11. Diagram A indicates that a 20-inch diameter well has a specific capacity about 22 percent larger than that of a 4-inch diameter well. It is evident that large increases in the radius of a well are accompanied by comparatively small increases in specific capacity. Diagram B shows that the specific capacity de-creases with the length of the pumping period as the cone of depression deepens and expands until vertical leakage through the confining bed into the aquifer balances dis-charge. It is evident that the yields of wells cannot be compared unless specific-capacity data are adjusted to a common radius and pumping period base. The theoreti-cal specific capacity does not change with the pumping rate.

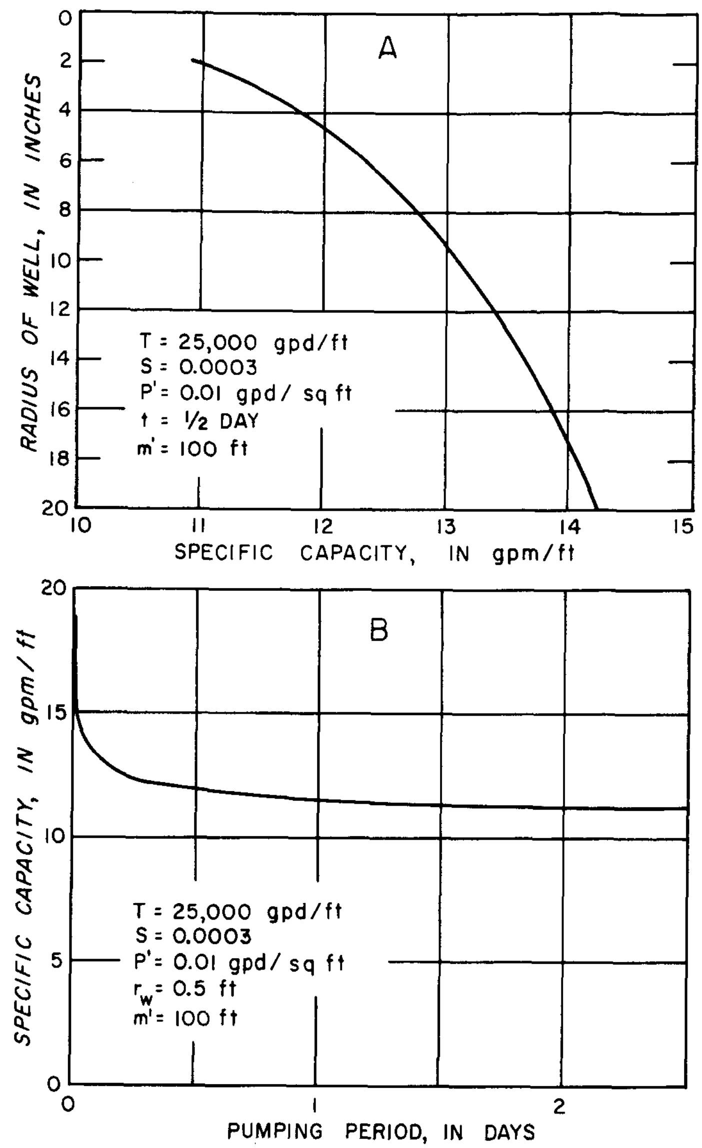

Figure 11. Theoretical relation between specific capacity and radius of well (A) and pumping period (B)

In addition to the drawdown in equation 1 there is generally a head loss or drawdown (well loss) in the dis-charging well due to the turbulent flow of water as it enters the well itself and flows upward through the well bore. The specific capacity of a well taking into account well loss is defined by the following equation:

$$Q/s_a = Q/(s + s_w) \qquad (4)$$

where:

Q/s_a = specific capacity, in gpm/ft
s = the laminar flow head loss due to the movement of water through the aquifer towards the well, in ft
s_w = the turbulent flow head loss due to the move-ment of water through the aquifer in the im-mediate vicinity of the well bore and the well face, in ft

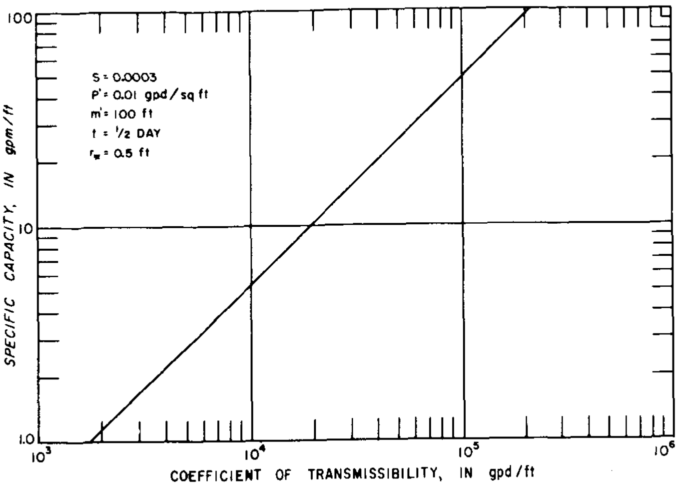

Figure 12. Theoretical relation between specific capacity and coefficient of transmissibility

Well loss may be calculated from the following relationship (Jacob, 1946) :

$$s_w = CQ^2 \tag{5}$$

where :

s_w = well loss, in ft
C = empirical well-loss constant, sec^2/ft^5
Q = rate of pumping, in cubic feet per second (cfs)

In wells having appreciable well loss, the specific capacity decreases with an increase in the pumping rate. Thus, the yields of wells cannot be compared unless well losses are subtracted from observed drawdowns and the specific capacities are computed on the basis of radial flow and as described by equation 1. The value of C in equation 5 may be estimated from "step-drawdown" test data by using the equations given below. During a step-drawdown test the well is operated during three successive periods of one hour at constant fractions of full capacity.

For steps 1 and 2

$$C = \frac{(\Delta s_2/\Delta Q_2) - (\Delta s_1/\Delta Q_1)}{\Delta Q_1 + \Delta Q_2}$$

For steps 2 and 3

$$C = \frac{(\Delta s_3/\Delta Q_3) - (\Delta s_2/\Delta Q_2)}{\Delta Q_2 + \Delta Q_3} \tag{6}$$

where:

the Δs terms represent increments of drawdown produced by each increase (ΔQ) in the rate of pumping. The commonly used dimensions of Δs and ΔQ are feet and cubic feet per second, respectively.

When the well-loss constant is known, well loss can be computed for any particular pumping rate from equation 5.

The coefficient of transmissibility of an aquifer is related to the specific capacity of a production well and can be estimated from specific-capacity data. The relationship between the theoretical specific capacity in equation 1 and the coefficient of transmissibility of a leaky artesian aquifer is given in figure 12.

Description and Analysis of Specific-Capacity Data

Step-drawdown tests have been made on about 45 shallow dolomite wells in northern Illinois. Analysis of available data indicates that the well-loss constant is a function of 1) specific capacity and therefore the hydraulic properties of shallow dolomite aquifers and 2) the position of the pumping level in relation to the top of shallow dolomite aquifers. High values of C are computed for wells having low specific capacities, and low values of C are computed for wells having high specific capacities. Apparently turbulence and therefore well loss increases as the specific capacity (and therefore the coefficient of transmissibility) of the dolomite aquifers decreases. It is probable that as the coefficient of transmissibility decreases the size and/or number of water-yielding openings in the dolomite decrease.

The well-loss constant increases greatly when water levels are lowered below the top of the shallow dolomite aquifer. As the pumping level declines below the most productive water-yielding openings in the upper part of the dolomite maximum contribution from these openings is attained. Additional withdrawals place a greater burden on lower and less permeable water-yielding openings and well loss is greatly increased. The relations described above are shown graphically in figure 13.

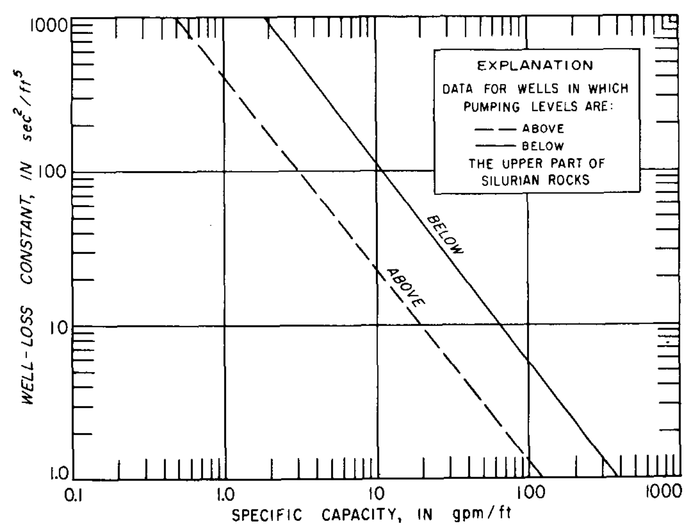

Figure 13. Relation between well-loss constant and specitlc capacity and pumping level

Experience has shown that the constant-rate method of testing production wells, when applied to shallow dolomite wells, has often resulted in erroneously optimistic predicted yields of wells under higher rates of discharge. The value of C increases with higher pumping rates as water levels decline below major producing zones. The step-drawdown test provides data that can be analyzed to obtain more accurate predictions of yields under various pumping-rate. conditions.

Drawdown at the end of each pumping period is plotted against the corresponding pumping rate, and a curve is drawn through the points. The drawdown in the well

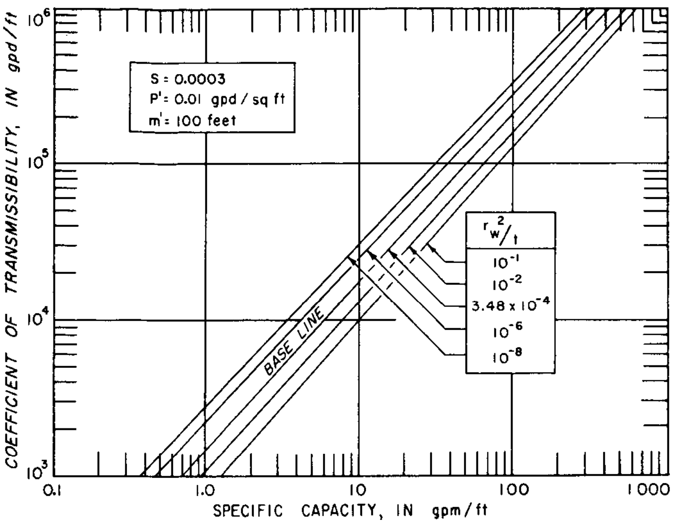

Figure 14. Coefficient of transmissibility versus specific capacity for several values of r_w^2/t

caused by a planned rate of discharge may be read directly from the curve or approximated for higher pumping rates by projecting the curve.

During the period 1921 to 1961, well-production tests were made by the State Water Survey on about 800 shallow dolomite wells in northern Illinois. The well-production tests consisted of pumping a well at a constant rate and frequently measuring the drawdown in the pumped well. Drawdowns were commonly measured with an airline, steel tape, or electric dropline; rates of pumping were largely measured by means of a circular orifice at the end of the pump discharge pipe.

The results of the tests are summarized in appendix tables A-D. Values of well loss were estimated for all wells from the results of step-drawdown tests, well-construction data, pumping-rate data in the appendix, and equation 5. Well losses were subtracted from observed drawdowns, and specific capacities adjusted for well losses were computed.

An artesian coefficient of storage and leakage coefficient, based on the results of aquifer tests in DuPage County and available geohydrologic data, and several values of t and r_w were substituted into equation 1 to construct figure 14 showing the relationship between specific capacity and coefficient of transmissibility for several values of r_w^2/t. This graph, specific capacities adjusted for well losses, and data concerning the lengths of tests and radii of wells were used to estimate theoretical coefficients of transmissibility of shallow dolomite aquifers contributing to the yields of wells. Specific capacities adjusted for well losses were then further adjusted to a common radius and pumping period based on estimated coefficients of transmissibility and the graphs in figure 14. The average radius, 0.5 foot, and pumping period, 12 hours, calculated from well-production and well-construction data in the appendix, were used as bases. Observed specific capacities, adjusted for well losses and to common radius and pumping period, also are given in the appendix. Actual and adjusted specific capacities were divided by the total depths of penetration below the top of the shallow dolomite aquifer to determine actual and adjusted specific capacities per foot of drawdown per foot of penetration.

No great accuracy is inferred for the adjusted specific capacities because they are based on estimated well-loss constants and on an average coefficient of storage and leakage coefficient. However, they come much closer to describing the relative productivity of shallow dolomite aquifers than do the observed specific capacities based on pumping rates, pumping periods, and radii which vary from well to well.

The yields of shallow dolomite wells are affected by many man-made factors such as partial clogging of the well bore, partial penetration of formations, poor well construction, and acid treatment, in addition to natural conditions. All of these factors and more must be taken into consideration in appraising the relative, local, and regional productivity of the formations and aquifers.

YIELDS OF INDIVIDUAL SHALLOW DOLOMITE AQUIFERS

Many shallow dolomite wells in northern Illinois tap more than one bedrock unit or shallow dolomite aquifer and are multiaquifer wells. The specific capacity of a multiaquifer well is the numeric sum of the specific capacities of the individual units or aquifers. The yields of individual units or aquifers can be ascertained by studying the specific capacities of multiaquifer wells.

Silurian Rocks

Many wells penetrate only rocks of the Niagaran (N) Series; some wells penetrate rocks of both the Niagaran and Alexandrian (A) Series; other wells penetrate rocks of both the Niagaran and Alexandrian Series and dolomite beds in the upper part of the Maquoketa (M) Formation.

Wells in DuPage County were segregated (Walton and Neill, 1963) into three categories, N, N + A, and N + A + M, depending upon the units penetrated by the wells. Specific capacities per foot of penetration for wells in each of the three categories were tabulated in order of magnitude, and frequencies were computed by the Kimball (1946) method. Values of specific capacity per foot of penetration were then plotted against percent of wells on logarithmic probability paper as shown in figure 15. Specific capacities per foot of penetration decrease as the number of units penetrated increase, indicating that the Niagaran and Alexandrian Series are more productive than the Maquoketa Formation, and the Niagaran Series is more productive than the Alexandrian Series.

The unit specific-capacity frequency graphs in figure 16 were constructed from the graphs in figure 15 by the process of subtraction taking into consideration uneven distribution of wells in the three well categories. The slope of a unit specific-capacity frequency graph varies with the inconsistency of production, a steeper line indicating a larger range in productivity. The slopes of the unit frequency graphs indicate that the Maquoketa Formation is much less consistent in productivity than both the Niagaran and Alexandrian Series, and the productivity of the Alexandrian Series is more consistent than the productivity of the other units.

Statistical analysis (Walton and Neill, 1963) of specific-capacity data for DuPage County indicates that significant correlations exist between specific capacities and the thickness of Silurian age dolomite at the well site, stratigraphic thickness of Niagaran unit penetrated by the well, and thickness of reef and associated strata at the well site.

Shallow dolomite wells penetrating Silurian rocks in northern Illinois were segregated into two categories, N and A, depending upon the uppermost unit beneath the glacial drift at well sites. Specific-capacity frequency graphs were constructed as shown in figure 17. The graphs indicate that the Niagaran and Alexandrian Series have about the same productivity in areas where the rocks immediately underlie the glacial drift.

Wells in Silurian rocks were segregated into two other categories, those wells penetrating only the upper 33 percent of Silurian rocks and those wells penetrating the entire thickness of Silurian rocks. Specific-capacity frequency graphs were constructed as shown in figure 18. The graphs indicate that the productivity of the upper 33 percent of Silurian rocks is much greater than that of the lower 67 percent of Silurian rocks.

The specific-capacity frequency graphs in figures 19-21 were prepared to determine the relations between well yields and the following geologic controls: 1) the glacial deposits penetrated by the well immediately above bedrock are predominately till (clayey materials) ; 2) the glacial deposits penetrated by the well immediately above bedrock are predominately sand and gravel; 3) sand and gravel deposits immediately above bedrock are less than 10 feet thick; 4) sand and gravel deposits immediately above bedrock exceed 10 feet in thickness; 5) the well is in a bedrock valley; and 6) the well is in a bedrock upland. Figure 19 indicates that the productivity of the Silurian rocks is greater in areas where sand and gravel directly overlie and are in hydraulic connection with the dolomite than it is in areas where relatively impermeable till directly overlies the dolomite. Figure 20 indicates that the productivity of the Silurian rocks increases as the thickness of sand and gravel directly overlying the dolomite increases. Graphs in figure 21 indicate that the productivity of the Silurian rocks is greater in bedrock uplands than it is in bedrock valleys.

Specific-capacity frequency graphs also were prepared to determine the relation between the yields of wells and

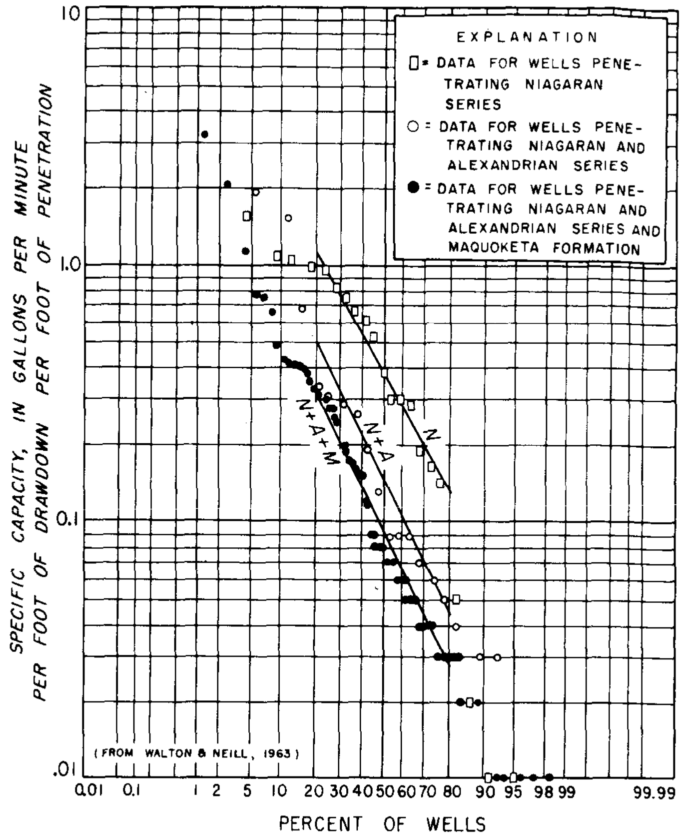

Figure 15. Relation between specific capacity and units penetrated by wells in DuPage County

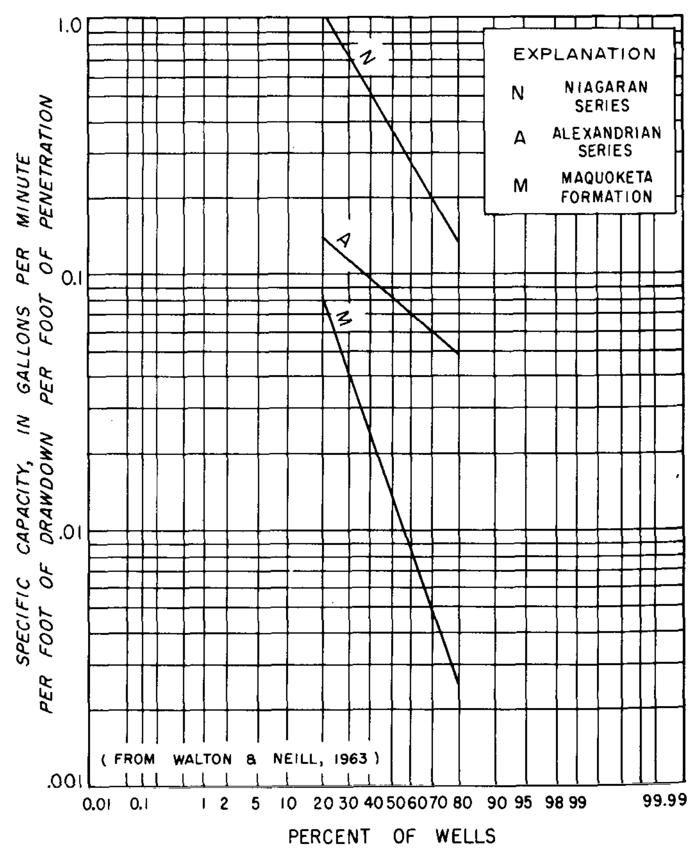

Figure 16. Speciftc-copocity frequency graphs for units penetrated by wells in DuPage County

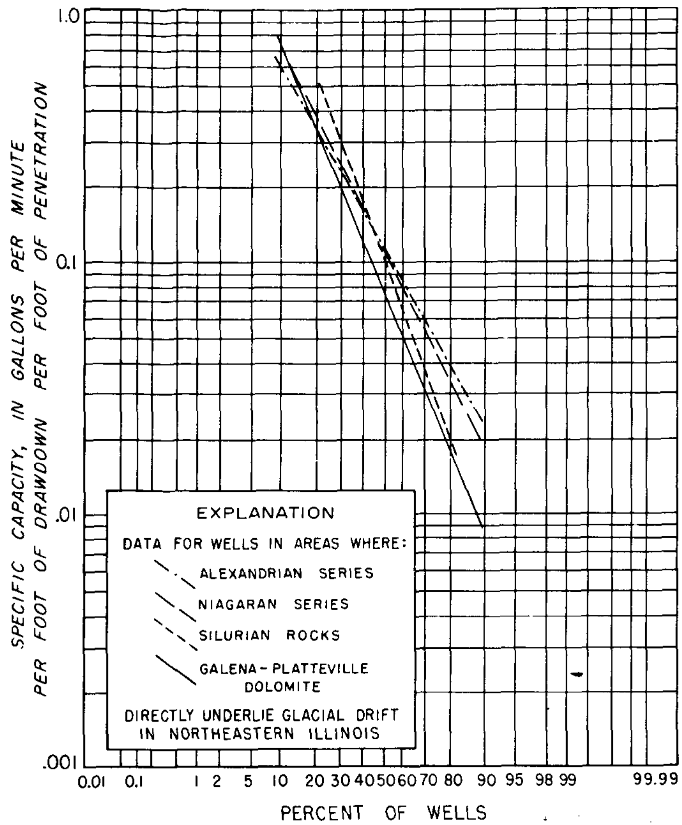

Figure 17. Relation between specific capacities of wells in Silurian and Ordovician rocks overlain by glacial drift

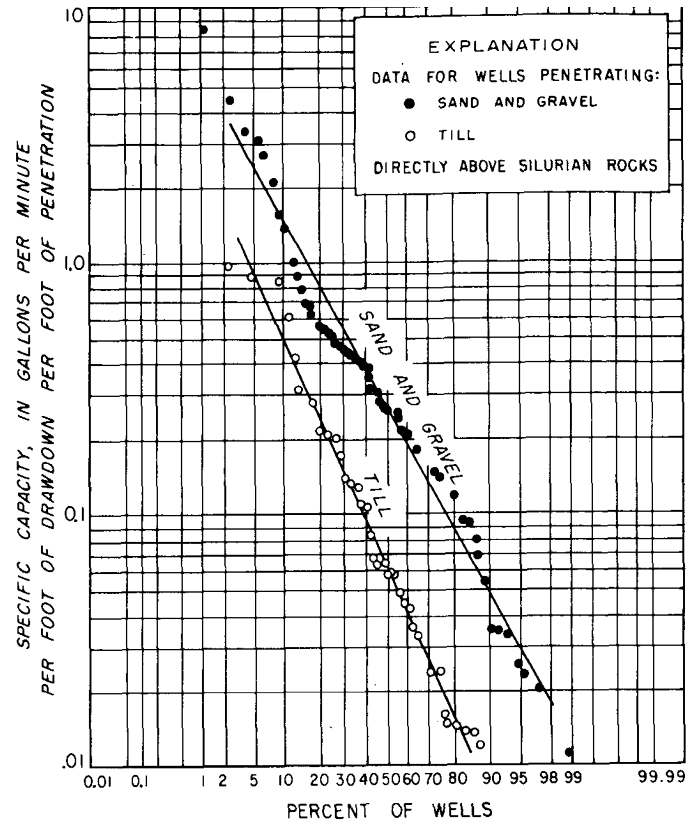

Figure 19. Relation between specific capacity and character of glacial drift

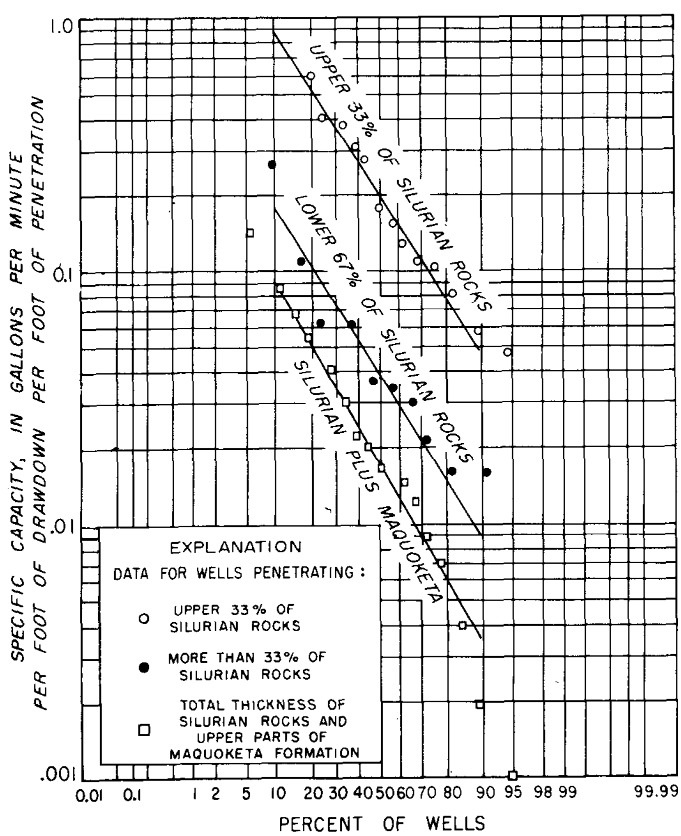

Figure 18. Relation between speciftc capacity and depth of penetration of wells in McHenry County

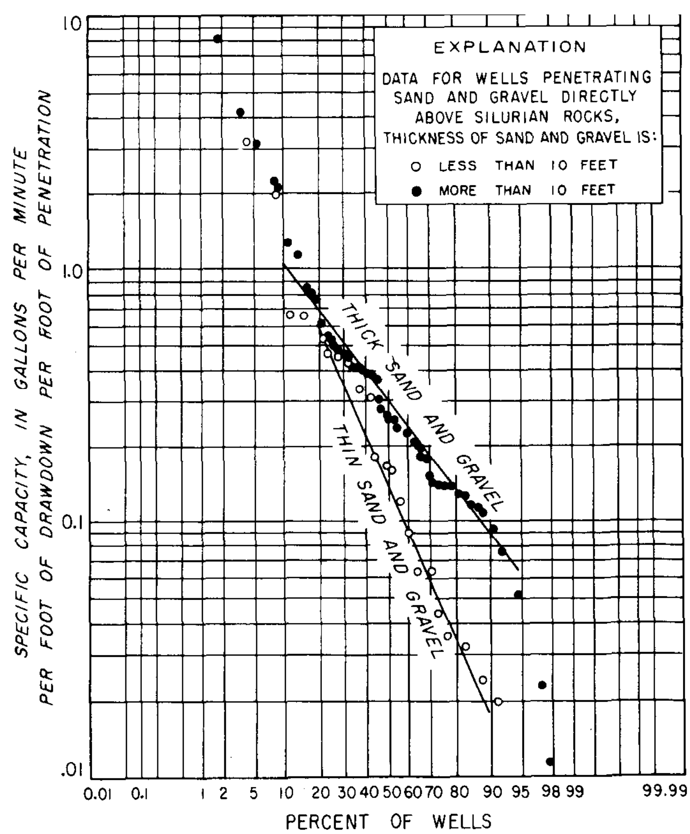

Figure 20. Relation between specific capacity and thickness of sand and gravel directly above Silurian rocks

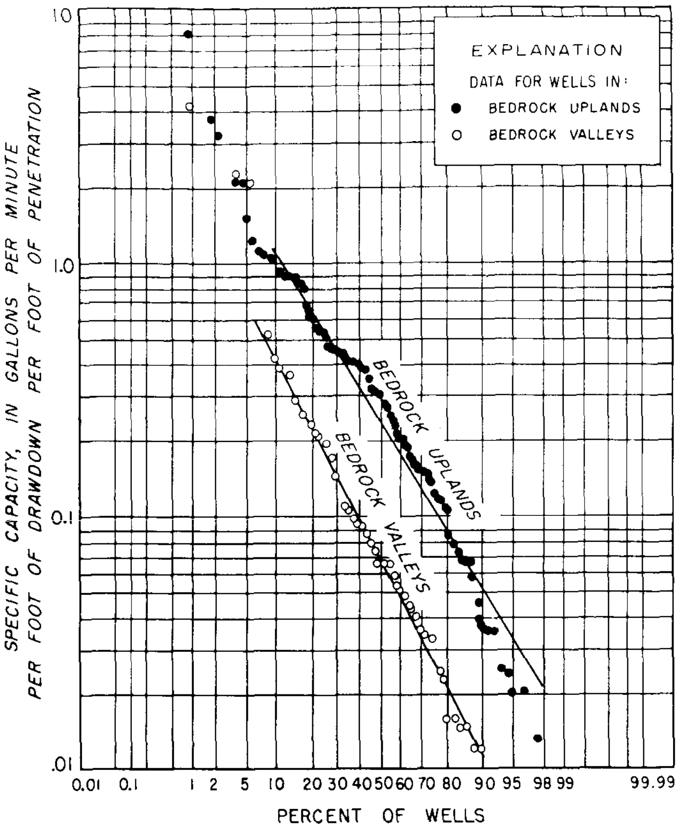

Figure 21. Relation between specific capacity and bearock topography

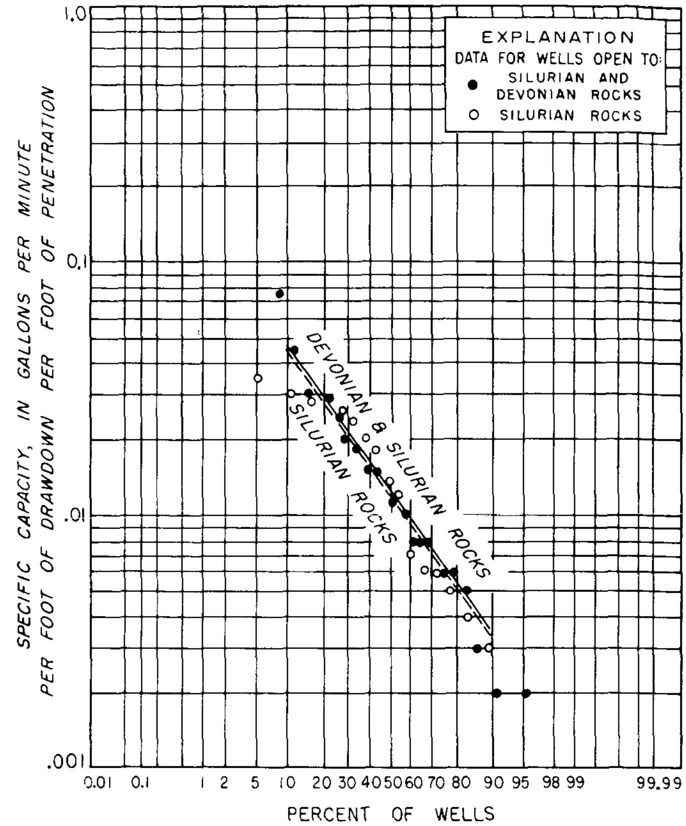

Figure 22. Relation between specific capacities of wells in Silurian and Devonian rocks

the following geologic controls : 1) the well is in a bedrock anticline; 2) the well is in a bedrock syncline; 3) glacial drift overlying the dolomite is thin; and 4) glacial drift overlying the dolomite is thick. No significant relation exists between yields of wells and these geologic controls.

Graphs in figures 19 and 20 suggest that there is a good hydraulic connection between Silurian rocks and overlying glacial drift and that the productivity of Silurian rocks is primarily controlled by solution openings in the upper part of the aquifer.

In northwestern Illinois Silurian rocks are at places overlain by Devonian rocks, and some shallow dolomite wells are open to both Silurian and Devonian rocks. On the other hand, some wells in northwestern Illinois penetrate only Silurian rocks. Wells were segregated into two categories, Silurian *(Sil)* and Silurian and Devonian *(Sil + Dev)* depending upon the rocks penetrated by wells. Specific-capacity frequency graphs for these two categories, based on appendix tables B and C and shown in figure 22, indicate that Devonian rocks contribute very little water to wells. Graphs in figures 23 and 24 indicate that in areas where Silurian rocks are overlain by Pennsylvanian, Mississippian, or Devonian rocks the productivity of the Silurian rocks is low and about the same magnitude as the productivity of the Maquoketa Formation in northeastern Illinois.

Specific capacities for wells penetrating Silurian rocks in northeastern Illinois were divided by the total depths

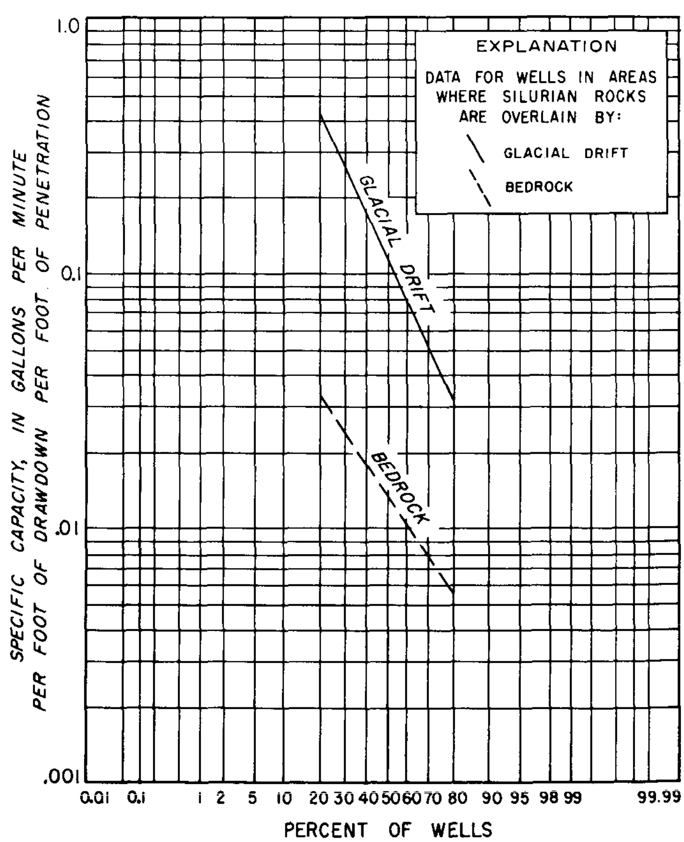

Figure 23. Relation between specific capacity and character of deposits overlying Silurian rocks in northern Illinois

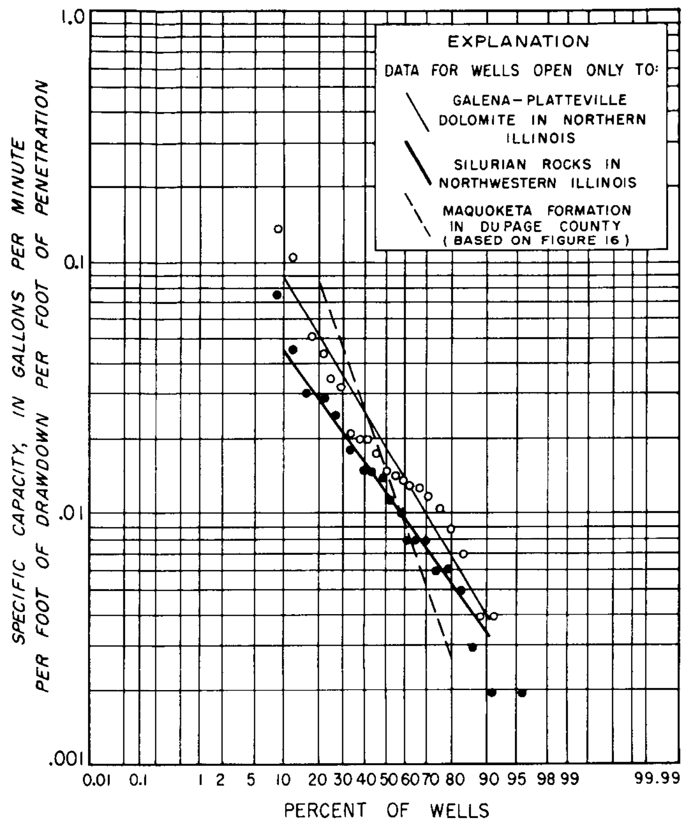

Figure 24. Relation between specific capacities of wells in Silurian and Ordovician rocks overlain by bedrock

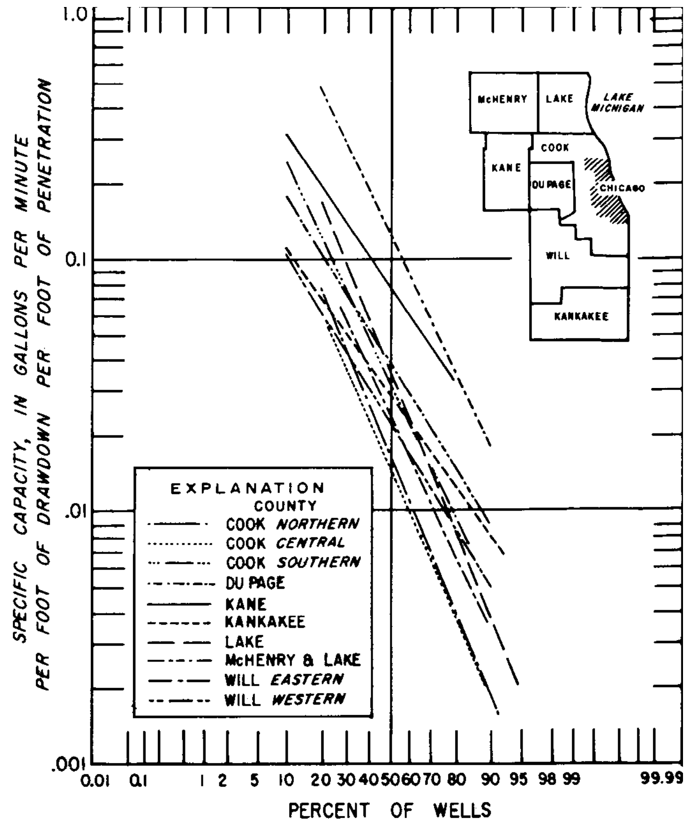

Figure 25. Specific-capacity frequency graphs for wells in northeastern Illinois

of penetration to obtain specific capacities per foot of penetration. Wells were segregated into 10 areas (Lake County, McHenry-Lake Counties, northern, central, and southern Cook County, DuPage County, Kane County, eastern and western Will County, and Kankakee County). Specific-capacity frequency graphs for the 10 categories are shown in figure 25. The productivity of the Silurian rocks is highest in DuPage County and lowest in central Cook County.

Specific-capacity data for wells penetrating Silurian rocks in northwestern Illinois are given in the appendix, table B. The specific-capacity frequency graph for the case where Silurian rocks are overlain by glacial drift is given in figure 17. The, productivity of wells in Silurian rocks is about the same in northwestern Illinois as it is in northeastern Illinois, as is indicated by comparison of the figure-l7 graph with the average specific-capacity frequency graphs in figure 23 pertaining to similar geologic conditions in northern Illinois.

Average specific-capacity frequency graphs for the two cases 1) where Silurian rocks immediately underlie the glacial drift and 2) where Silurian rocks are overlain by bedrock are shown in figure 23. The graphs indicate that in northern Illinois, the Silurian rocks yield much more water to wells in areas where the Silurian rocks are the uppermost bedrock than they do in areas where Silurian rocks underlie bedrock.

Ordovician Rocks

Available specific-capacity data for wells in the Galena-Platteville Dolomite in northern Illinois are summarized in the appendix, table D. Wells were segregated into two categories: 1) wells in areas where the Galena-Platteville Dolomite is the uppermost bedrock and 2) wells in areas where the Galena-Platteville Dolomite is overlain by the Maquoketa Formation. A specific-capacity frequency graph for the case where the Galena-Platteville Dolomite is the uppermost bedrock is given in figure 17. A comparison of this specific-capacity frequency graph with corresponding graphs for Silurian rocks and the Maquoketa Formation shows that in areas where the Galena-Platteville Dolomite directly underlies the glacial drift the productivity of the aquifer is about the same as the productivities of Silurian rocks in areas where the Niagaran or Alexandrian Series immediately underlie the glacial drift. The productivity of the Galena-Platteville Dolomite is much greater in these areas than the productivity of the Maquoketa Formation.

A specific-capacity frequency graph for the case where the Galena-Platteville Dolomite is overlain by the Maquoketa Formation is given in figure 24. A comparison of the specific-capacity frequency graphs in figure 24 shows that in areas where the Galena-Platteville Dolomite is overlain by bedrock the productivity of the aquifer is low and about the same as the productivities of the Maquoketa Formation and Silurian rocks in areas where the Niagaran and Alexandrian Series are overlain by bedrock. A comparison of figures 17 and 24 indicates that the productivity of the Galena-Platteville Dolomite is much lower in areas where the aquifer is overlain by bedrock than it is in areas where the aquifer directly underlies the glacial drift.

Very little is known about the yield of the Maquoketa Formation; few wells are open only to the Maquoketa Formation. As indicated from the specific-capacity unit frequency graphs for DuPage County in figure 16, the productivity of the Maquoketa Formation is in most areas low and very inconsistent.

ACID TREATMENT OF WELLS TO INCREASE YIELD

Acid treatment has been used successfully to rehabilitate old shallow dolomite wells and to develop newly constructed wells in northern Illinois. Many wells have been treated with inhibited 15 percent hydrochloric acid in quantities ranging from 100 to 4000 gallons. The pump and discharge column are usually removed from the well during the treatment period. Acid is introduced through a temporary line extending to a position near the bottom of the well. The solution is allowed to stand under pressure in the well for periods ranging from one-half hour to four days and averaging about one day. The pump is then reinstalled, and the spent acid is removed from the well during pumping periods ranging from one to eight hours.

Well-production tests were made on a few wells before and after acid treatment. The results of the tests are summarized in the appendix, table E. There is an extremely large range (0-1190 percent) in improvement. Most improvements over 100 percent were recorded for rehabilitated wells; improvements generally less than 100 percent were reported for newly constructed wells. In several cases where little or no improvement was observed the acid was allowed to stand in the well for short periods (one hour or less). The results of acid treatment of two wells are shown graphically in figure 26.

When wells are operated at high rates of pumping the pressure of the water in the shallow dolomite aquifer is greatly reduced in the immediate vicinity of the well bore and in fractures extending some distance from the well bore. Because of the decline in pressure carbon dioxide is liberated, and the water is unable to hold in solution its load of mineral salts. Consequently calcium carbonate is precipitated in the openings of the well face and well wall, and the permeability of the well face and well wall is greatly reduced. This clogging is especially noticeable in those wells with pumping levels below the top of the dolomite. The yields of clogged wells can often be restored to their original values by acid treatment.

During the construction of many shallow dolomite wells some very fine drill cuttings invariably infiltrate a short

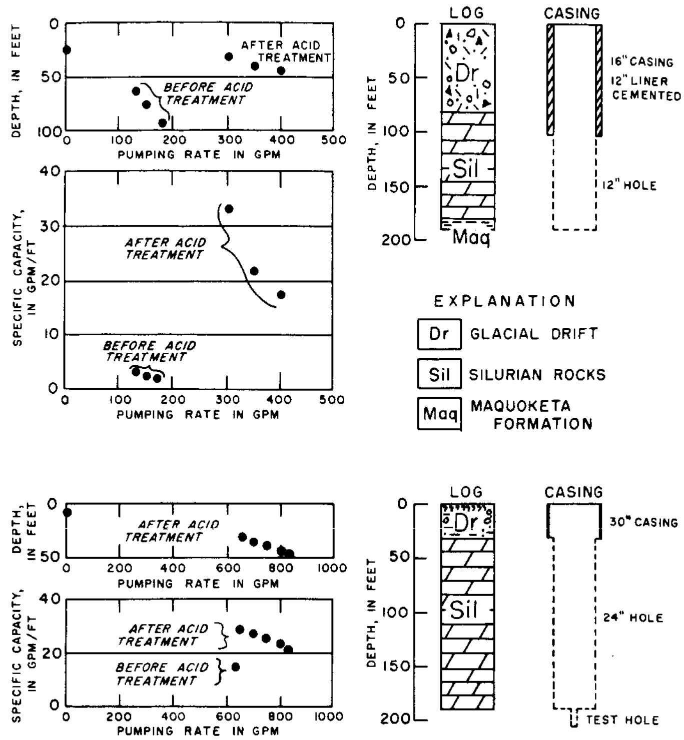

Figure 26. Effects of acid treatment on yields of selected wells

distance into the water-yielding openings of the aquifer and reduce the permeability of the well wall. A newly completed well is often less than 100 percent efficient because of the partial clogging of openings. With acid treatment the yield of a newly completed well can often be increased by removing the fine materials which have migrated into the openings of the dolomite.

Acid introduced into a well tends to flow into, and widen, fractures leading into the well bore. Also the acid reacts with drill cuttings in openings and the dolomite of the well wall. The effect of the reaction with the massive dolomite of the well wall is to increase the radius of the well bore. Large increases in the well bore result in comparatively small increases in specific capacity because the specific capacity varies with the logarithm of $1/r_w^2$. Several thousand gallons of acid cannot dissolve in a day enough massive dolomite to substantially increase the radius of the well bore. Thus, large increases in the yield of a shallow dolomite well can not be attributed to well bore enlargement. However, the acid will penetrate considerable distances along the fractures and will widen openings and increase their permeability. In addition, the acid will dissolve drill cuttings in openings and increase the permeability of the well wall.

The effect of treatment will vary according to the permeability of the well wall before treatment. A tight dolomite with narrow openings will respond differently than one with openings of appreciable width. Furthermore, a formation which has been partially clogged during drilling will respond differently than one which has not been clogged. Acid should be removed from the well before it is entirely spent; if acid remains in the well after it has been spent, clogging due to iron falling out of solution may occur.

According to Muskat (1946), acid treatment will be relatively ineffective unless the shallow dolomite aquifer has extended fractures or the openings are partially clogged. Increases up to about 50 percent for wells of initially moderate or high capacity may be explained on the assumption that the width of water-yielding openings of a small radial zone about the well bore have been increased and/or that drilling cuttings partially clogging the well wall have been removed. Moderate increases, 50 to 500 percent, may be explained on the assumption that there are extended fractures in the dolomite which are penetrated and widened by the action of the acid or that mild clogging is the principal factor in determining the initial yield of the well. Increases larger than 500 percent can only be explained on the assumption that there are extended fractures in the dolomite which are penetrated and widened by the acid or that there was initially a condition of almost complete clogging of the fractures.

Specific capacities per foot of penetration of newly completed wells before and after acid treatment were tabulated in order of magnitude, and frequencies were computed. Values of specific capacity per foot of penetration before and after acid treatment were then plotted against percent of wells on logarithmic probability paper as shown in figure 27. There was some improvement in the yields of 80 percent of the wells indicating that in most cases acid treatment will increase the initial yields of newly completed wells. Improvement increases as the specific capacity increases. In 50 percent of the wells tested, improvement averaged over 100 percent.

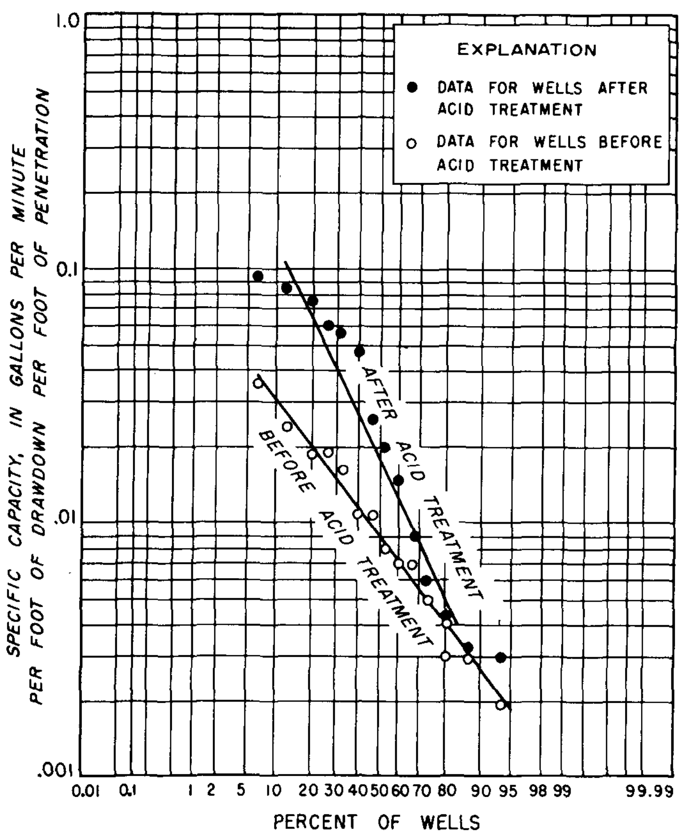

Figure 27. Effects of acid treatment on specific capacities of newly constructed wells

Frequency graphs for rehabilitated wells are shown in figure 28. There was some improvement in all wells indicating that in most cases the specific capacity of a well whose yield has deteriorated because of partial clogging of water-yielding openings by incrustation can be greatly increased with acid treatment. In 50 percent of the wells tested, improvement averaged over 150 percent.

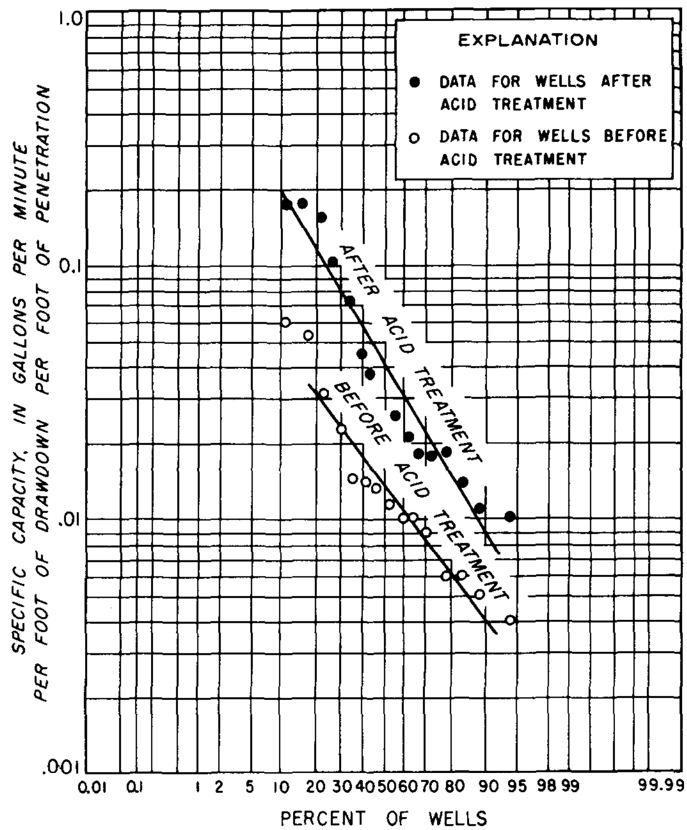

Figure 28. Effects of acid treatment on specific capacitier of old wells

PREDICTING THE YIELDS OF WELLS

The productivity of the shallow dolomite aquifers is very inconsistent, and it is impossible to predict with a high degree of accuracy the yield of a well before drilling at any location in undeveloped areas. However, the probable yields of wells can be estimated based on specific-capacity frequency graphs, aquifer thickness and area1 geology maps, and water-level data. Probable ranges of specific capacities of shallow dolomite wells in northern Illinois were estimated as the products of the specific capacities per foot of penetration measured in 50 percent of the wells (see figures 15-25) and aquifer thicknesses. It was assumed that wells completely penetrate the Silurian rocks or the Galena-Platteville Dolomite. Aquifer thicknesses were estimated from figures 4-7 and from well-log and water-level data.

Probable yields of shallow dolomite wells were estimated from computed specific capacities and water-level data. Computed specific capacities were multiplied by available drawdowns to determine yields of wells. Pumping levels were limited to depths below the top of the dolomite equal to about one-third of the thickness of the aquifer. Under such conditions the most productive water-yielding openings in the dolomite will be discharging freely into the well, and maximum use of upper openings is attained. Additional discharge with pumping levels much below the upper one-third of the aquifer will be accompanied by rapidly declining specific capacities and yields of wells.

The probable range of yields of shallow dolomite wells in northern Illinois is shown in figure 29. It is possible to drill what is essentially a dry hole at any location; however, from data for 50 percent of existing wells, the chances of obtaining a well with a production of 250 gpm or more are good in all areas except areas where the Silurian rocks and Galena-Platteville Dolomite are thin or where the Maquoketa Formation is the uppermost bedrock. The chances of obtaining a well with a production of 500 gpm or more are good in large portions of northeastern and northwestern Illinois. In the southern part of northwestern Illinois and south of a line extending through Iroquois, Ford, McLean, Woodford, and Peoria Counties (see figure 29), the quality of water in the shallow dolomite aquifers is unsuitable for most public use (exceeds 1500 parts per million total solids). The yields of shallow dolomite wells in areas where the quality of water is poor are not considered in this report. From figure 29 it is probable that the yield of the dolomite aquifer is high enough to support heavy industrial or municipal well development in !arge parts of northern Illinois.

The specific capacities used to compute probable yields were adjusted to a well radius of 0.5 foot and a pumping period of 12 hours; therefore, the probable yields of wells

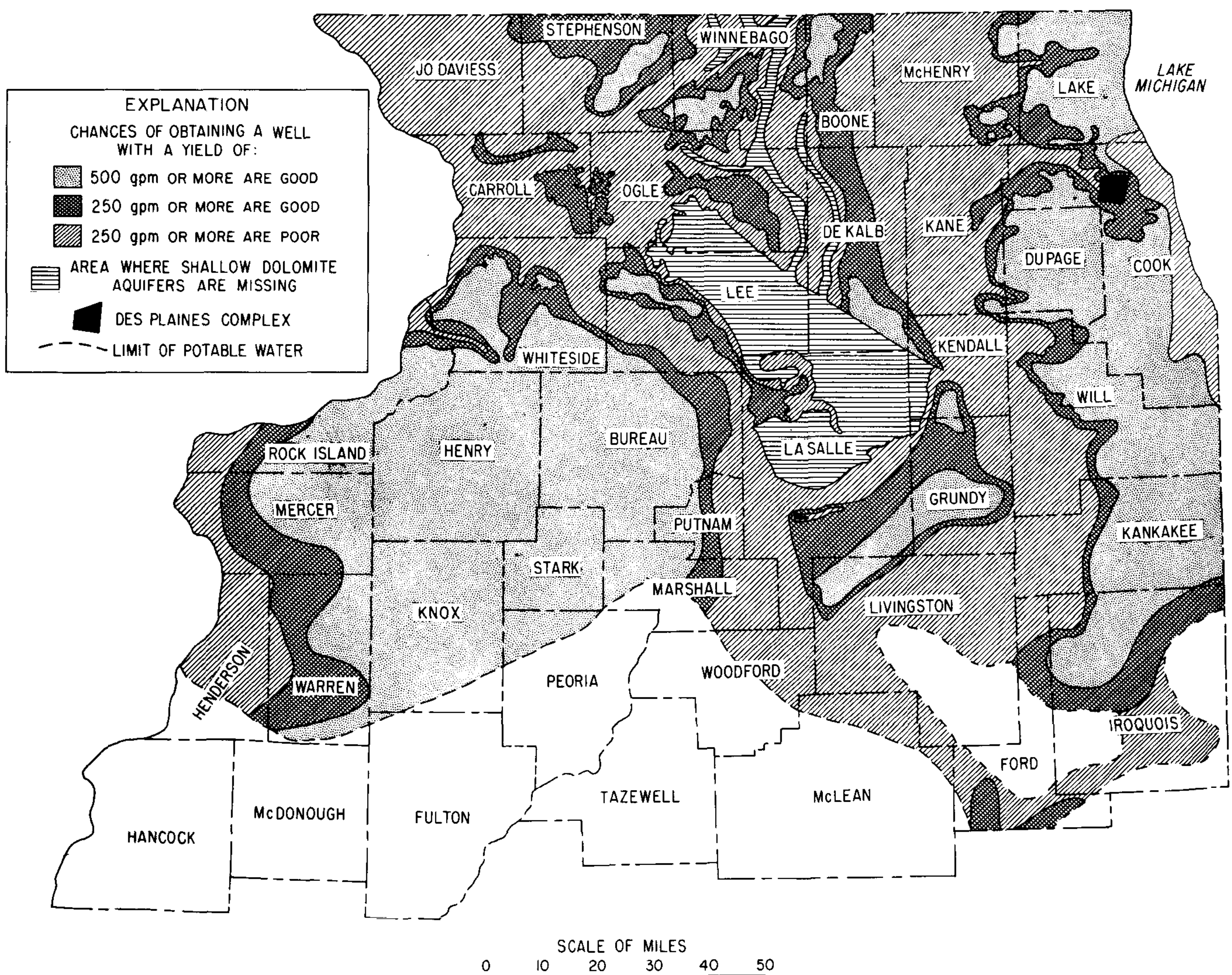

Figure 29. Estimated yields of shallow dolomite wells in northern Illinois

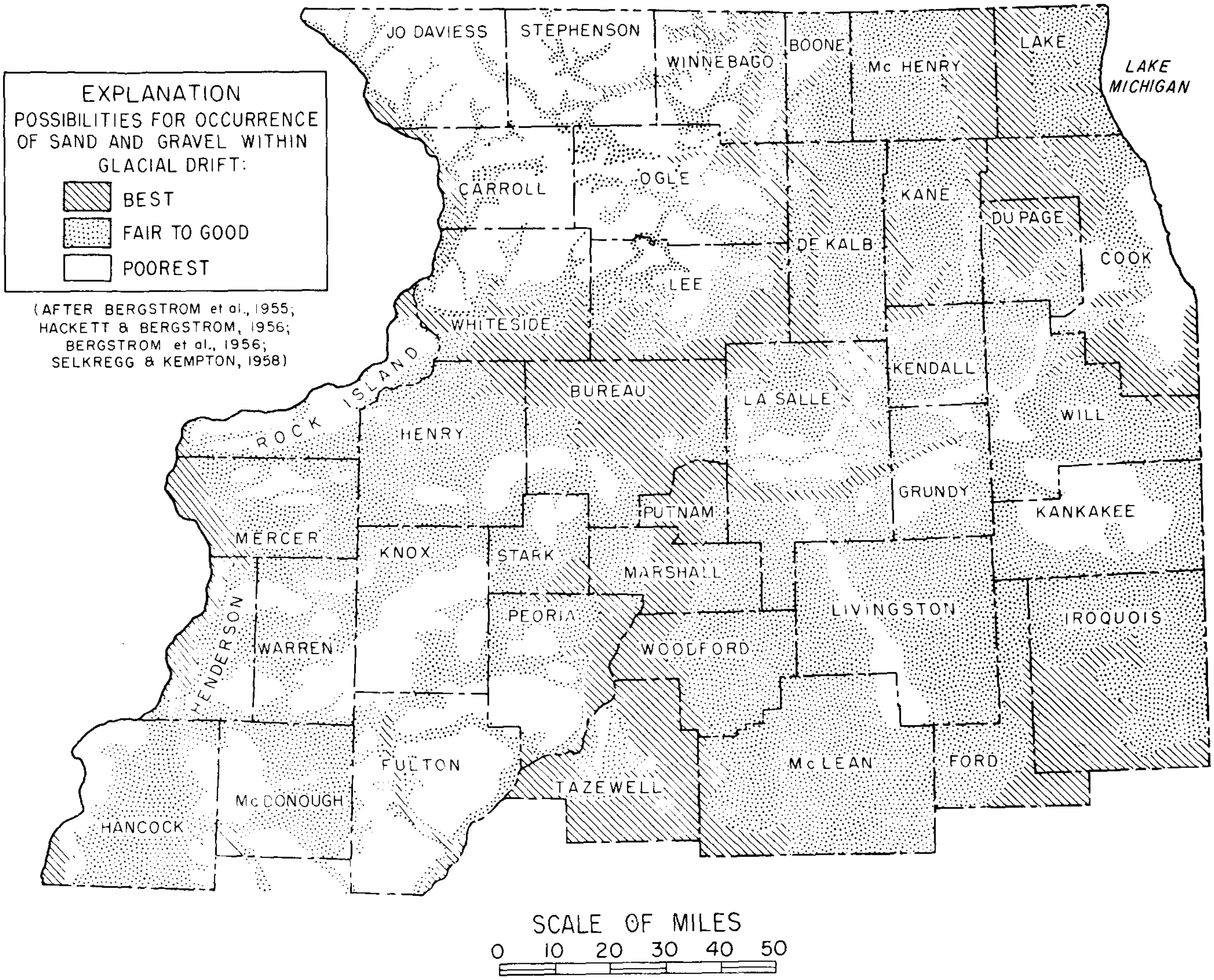

Figure 30. Possibilities for occurrence of sand and gravel above bedrock in northern Illinois

given in figure 29 are valid only for these conditions. Probable yields for other conditions can be estimated with figure 11.

For design purposes, the hydrologist may wish to base the computation of the probable yield of a well on a specific capacity with a particular frequency other than 50 percent. In this event, the probable yield indicated in figure 29 is multiplied by the ratio of the specific capacity with the selected frequency (see figures 15-25) and the specific capacity with a 50 percent frequency to obtain the probable yield of the well based on the selected frequency.

Highest yielding wells will probably be located in areas where possibilities for occurrence of sand and gravel is best as indicated in figure 30 and in bedrock upland areas as indicated in figure 31.

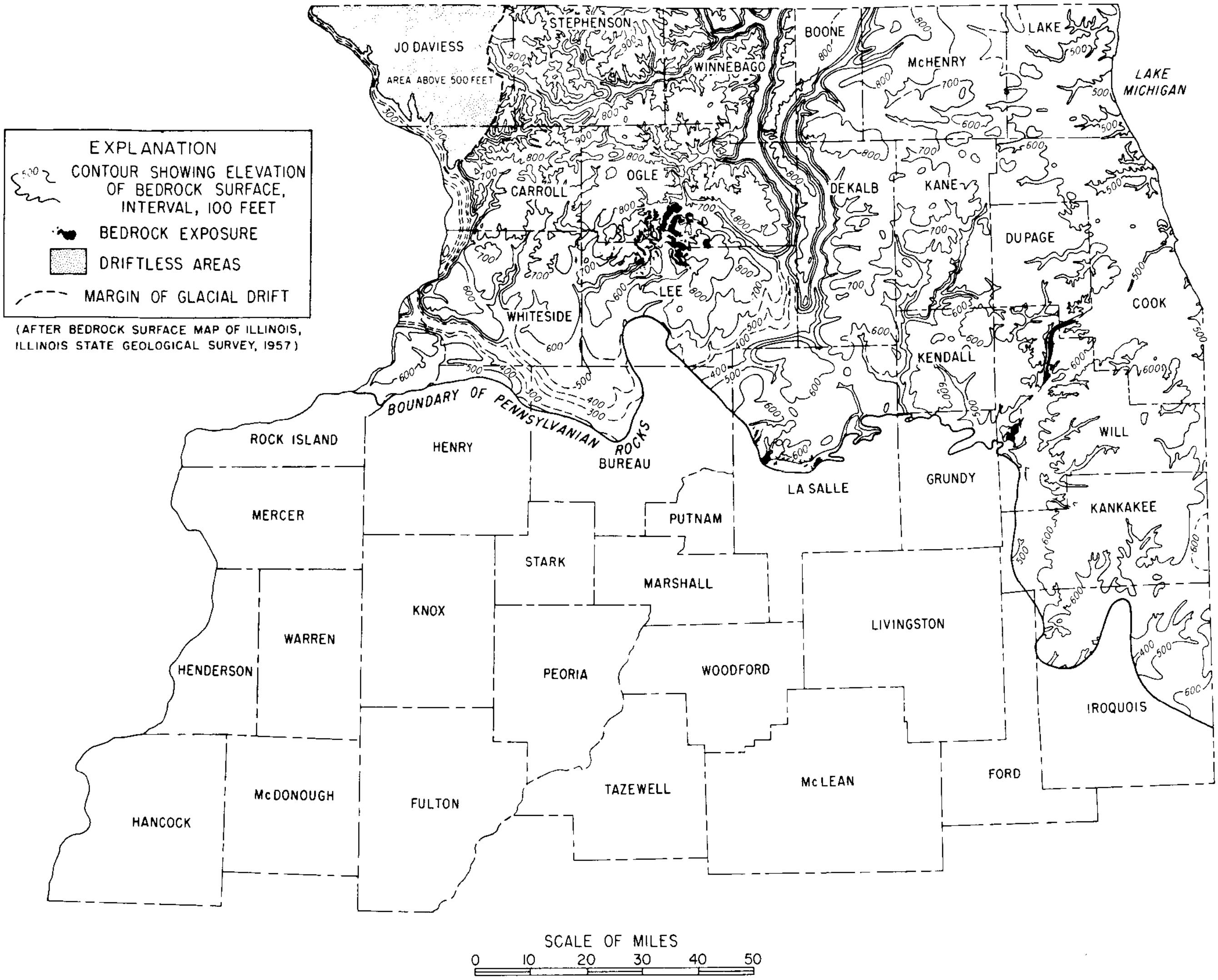

Figure 31. Bedrock topography of northern Illinois

CONCLUSIONS

Statistical analysis of specific-capacity data provides a basis for judging whether or not significant relationships exist between the yields of shallow dolomite wells and geohydrologic controls. Specific-capacity frequency graphs shed much light on the role of individual units uncased in shallow dolomite wells as contributors of water.

It is recognized that precise evaluations of yields of shallow dolomite wells in undeveloped areas is impossible. However, statistical analysis combined with a knowledge of geohydrologic conditions does take much of the guesswork out of estimating probable yields.

To refine estimates of probable yields of shallow dolomite wells the following investigations are recommended:

1) geophysical logging and well testing to determine the nature and occurrence of water-yielding openings

2) geohydrologic studies to determine the hydraulic connection between water-yielding openings in the upper and lower parts of shallow dolomite aquifers

3) geohydrologic studies to delineate areas where reefs are present

4) geohydrologic studies to delineate more accurately favorable and unfavorable areas for development of high capacity wells

5) collection of more complete data on the specific capacities of wells open only in the Maquoketa Formation

6) geohydrologic studies to determine why yields of shallow dolomite wells are greater in bedrock uplands than in bedrock valleys

7) continuing studies of actual ground-water development so that predicted and actual well behavior can be compared.

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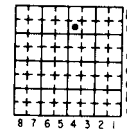
APPENDEX

Well-Numbering System

The well-numbering system used in this report is based on the location of the well, and uses the township, range, and section for identification. The well number consists of five parts: county abbreviation, township, range, section, and coordinate within the section. Sections are divided into rows of one-eighth-mile squares. Each one-eighth-mile square contains 10 acres and corresponds to a quarter of a quarter of a quarter section. A normal section of one square mile contains eight rows of eighth-mile squares; an odd-sized section contains more or fewer rows. Rows are numbered from east to west and lettered from south to north as shown in the diagram; the number of the well shown is COK 41N11E-25.4g. Where there is more than one well in a 10-acre square they are identified by arabic numbers after the lower case letter in the well number.

Any number assigned to the well by the owner is shown in parentheses after the location well number. For example, the first well listed in table A below is owned by the Village of Flossmoor and is known as Village Well No. 1, which is indicated by (1) in the well number COK 35N13E-1.2a (1). Directional titles used by the owner are indicated by (N) for North Well, etc.; Test Wells are indicated by (T).



Cook County
T41N, R11E,
sec 25

The abbreviations used for counties are:

BNE Boone	JDV JoDaviess	MRS Marshall
BUR Bureau	KEN Kendall	OGL Ogle
CAR Carroll	KNE Kane	PEO Peoria
COK Cook	KNK Kankakee	PUT Putnam
DEK DeKalb	KNX Knox	RIS Rock Island
DUP DuPage	LAS LaSalle	STE Stephenson
FRD Ford	LEE Lee	STK Stark
FUL Fulton	LIV Livingston	WAR Warren
GRY Grundy	LKE Lake	WIL Will
HAN Hancock	MCD McDonough	WIN Winnebago
HND Henderson	MCH McHenry	WTS Whiteside
HRY Henry	MER Mercer	WDF Woodford

Other abbreviations used in the tables are:

(V) Village owned	Sbd. Subdivision
(C) City owned	CCb. Country Club
(T) Town owned	Pres. Preserve

Table A. Specific-Capacity Data for Wells in Silurian Rocks and Maquoketa Formation in Northeastern Illinois

Well number	Owner	Depth (ft)	Diameter (in)	Penetration (ft)	Year drilled	Year of test	Length of test (hr)	Non-Pumping level (ft)	Pumping Rate (gpm)	Drawdown (ft)	Unadjusted		Adjusted	
											Specific capacity (gpm/ft)	Specific capacity Per foot of penetration (gpm/f^2)	Specific capacity (gpm/ft)	Specific capacity per foot of penetration (gpm/ft^2)
COK—														
35N13E-														
1.2a (1)	Flossmoor (V)	275	10	190	1939	1940	......	47	300	38	7.90	0.042	11.50	0.061
1.2a (1)	Floossmor (V)	275	10	190	1939	1945	0.3	90	300	20	15.00	0.079	18.80	0.100
1.2c (3)	Flossmor (V)	467	16	379	1941	1941	8	64	250	38	6.60	0.017	8.30	0.022
3.4b (4)	Country Club Hills	382	12	289	....	....	......	60	500	32	15.63	0.054	45.50	0.157
12.3b	Flossmoor (V)	250	12	207	1952	1952	......	7	544	52	10.45	0.051	36.30	0.175
12.4d	A. Hritsh	470	....	......	1923	....	......	30	75	195	0.38	....	1.00	....
12.8f(5)	Flossmoor (V)	500	11	408	1956	1956	7	40	450	47	9.57	0.023	18.00	0.044
13 (1)	Olympia Fields CCb.	370	10	......	....	....	......	18	500	3	167.00	....	207.00	....
13.7c (2)	Olympia Fields CCb.	187	15	......	1925	1925	......	1.5	650	7	93.00		116.00	....
14.6a (2)	Olympia Fields (V)	270	12	177	1958	1958	8	42	560	31	18.15	0.102	62.30	0.352
14.6f (2)	Rich Township H.S.	303	....	......	1960	1960	6	46	748	71	10.55	....	13.20	....
23.1h (1)	Olympia Fields (V)	169	10	......	1956	1956	4	17	380	4	95.00	....	210.00	....
23.2c (T)	Lionville	463	12	370	1950	1950	2.5	31	480	16	30.00	0.081	160.00	0.433
23.2c	Park Forest (V)	463	12	370	....	1950	......	33	500	15	33.30	0.090	166.00	0.450
25.1e (5)	Park Forest (V)	345	17	244	1953	1953	23	50	575	5	115.00	0.472	144.00	0.592
25.1g (6)	Park Forest (V)	361	16	......	1958	1958	7	46	1050	95	11.08	......	13.80	....
25.5f (3)	Park Forest (V)	350	16	133	1948	1948	15	41	645	19	33.90	0.146	42.00	0.316
25.5f	Park Forest (V)	300	12	237	1952	1952	24	39	595	46	12.95	0.055	74.50	0.315
26.5h (1)	Matteson (V)	282	10	......	1914	1914	14	8	200	8	25.00	....	33.30	
26.8f (2)	Matteson (V)	305	12	213	1956	1956	10	20	650	25	26.00	0.122	162.00	0.762
26.8f (2)	Matteson (V)	305	12	213	1956	1958	......	33	580	16	36.20	0.170	45.30	0.213
29.3d	Public Service Co. of N. I11.	158	8	78	1948	1948	3/4	27	71	2	35.50	0.456	38.50	0.494
29.3d	Public Service Co. of N. I11.	156	8	71	1948	1948	4	26	313	8.4	37.30	0.525	51.30	0.723
30.7f (2)	Park Forest (V)	300	15	203	1947	1947	3	57.5	1052	10	102.50	0.505	128.00	0.630
36.1a	Indian Wood CCb.	300	12	227	1929	1929	10	10	250	20	12.50	0.055	18.50	0.082
36.3h (4)	Park Forest (V)	350	12	237	1952	1952	24	39	595	46	12.95	0.055	54.00	0.227
35N14E-														
3	Glenwood (V)	150	6	103	1946	1946	3	18	35	5	7.00	0.068	8.75	0.085
3.1g	Camp Thorton, CCC	153	6	63	....	1939	......	14	25	11	2.28	0.036	2.85	0.045
6.5b (2)	Flossmoor (V)	351	12	246	1928	1945	0.3	40	420	20	21.00	0.085	38.50	0.156
6.7h (2)	Homewood (V)	436	21	256	1945	1945	0.3	35	350	242	1.45	0.006	1.80	0.007
7.5c	Flossmoor CCb.	280	12	230	1952	1952	......	12	280	6	46.70	0.203	90.50	0.393
7.5c	Flossmoor CCb..	280	12	230	1952	1952	3	12	517	20	25.80	0.112	101.00	0.440
9.6g	N. Ill. Gas Co.	220	12	182	1959	1959	1	10	160	11	14.55	0.080	18.20	0.100
9.6g	N. Ill. Gas Co.	220	12	182	1959	1959	1	10	350	34	10.30	0.057	19.50	0.107
15.8a1 (3)	Gold Seal Asphalt Co.	240	8	205	1946	1946	......	32	130	60	2.17	0.011	2.37	0.012
15.8a1 (3)	Gold Seal Asphalt Co.	240	8	205	1946	1946	......	32	30	....	....	....	....	....
15.8a1 (3)	Gold Seal Asphalt Co.	240	8	205	1946	1946	2	32	155	8	19.40	0.095	24.30	0.118
15.8a2 (1)	Gold Seal Asphalt Co.	309	8	246	1937	1946	......	63	130	56.5	2.30	0.009	2.88	0.011
15.8a2 (1)	Gold Seal Asphalt Co.	309	8	246	1937	1946	2	63	155	35	4.44	0.018	5.55	0.023
15.8a2 (1)	Gold Seal Asphalt Co.	309	8	241	1937	1947	2	68	73	13	5.61	0.023	9.12	0.038
15.8a2 (1)	Gold Seal Asphalt Co.	309	8	254	1937	1940	......	55	135	20	6.75	0.027	19.30	0.076

Table A (Continued)

Well number	Owner	Depth (ft)	Diameter (in)	Penetration (ft)	Year drilled	Year of test	Length of test (hr)	Nonpumping level (ft)	Pumping rate (gpm)	Drawdown (ft)	Unadjusted: Specific capacity (gpm/ft)	Unadjusted: Specific capacity per foot of penetration (gpm/ft²)	Adjusted: Specific capacity (gpm/ft)	Adjusted: Specific capacity per foot of penetration (gpm/ft²)
COK—														
35N14E-(Cont'd)														
15.8a2 (1)	Gold Seal Asphalt Co.	309	8	254	1937	1940	......	55	170	25	6.82	0.027	8.50	0.034
15.8a2 (1)	Gold Seal Asphalt Co.	309	8	254	1937	1937	......	....	185	47	3.94	0.016	4.93	0.020
15.8a2 (1)	Gold Seal Asphalt Co.	309	8	269	1937	1955	......	40	82	56	1.46	0.005	2.16	0.008
15.8a2 (1)	Gold Seal Asphalt Co.	309	8	......	1937	1953	......	.....	25	....	....	....	....	....
15.8a2 (1)	Gold Seal Asphalt Co.	309	8	243	1937	1953	......	66	120	24	5.00	0.021	20.00	0.084
15.8a3 (4)	Gold Seal Asphalt Co.	425	12	....	1953	1953	......	38	118	75	1.57	....	1.96	....
15.8a3 (4)	Gold Seal Asphalt Co.	425	12	.....	1953	1955	......	40	375	160	2.34	....	2.93	....
15.8h (2)	Gold Seal Asphalt Co.	205	8	170	1941	1946	2.5	25	92	87	1.06	0.006	12.25	0.722
15.8h (2)	Gold Seal Asphalt Co.	205	8	165	1941	1946	13	40	222	75	2.96	0.018	3.70	0.023
15.8h (2)	Gold Seal Asphalt Co.	205	8	133	1941	1953	......	72	120	16	7.50	0.056	24.00	0.117
16.2a (3)	Victor Chemical Co.	275	15	238	1941	1941	2.3	36.5	147	111	1.32	0.006	1.65	0.008
16.2a (3)	Victor Chemical Co.	433	15	395	1941	1941	0.8	37	145	275	0.53	0.001	0.66	0.002
16.2a (3)	Victor Chemical Co.	433	15	395	1941	1947	24	37	130	178	0.73	0.002	0.73	0.003
16.2f (1)	Dawes Laboratory	250	15	212	1957	1957	24	9	544	30	18.10	0.085	22.50	0.116
16.2f (1)	Alcoa Products, Inc.	250	15	212	1957	1957	24	9	544	30	18.15	0.086	22.50	0.116
17(19)	Chicago Heights (C)	330	.....	228	....	1946	......	20	400	17	23.50	0.103	28.50	0.125
17.6a1 (18)	Chicago Heights (C)	251	24	196	1941	1941	......	.....	1650	39	42.40	0.216	53.10	0.270
17.6a1 (18)	Chicago Heights (C)	251	24	196	1941	1945	12	.....	900	28	32.20	0.164	173.10	0.885
17.6a2 (21)	Chicago Heights (C)	203	23	145	1945	1945	12	22	870	24	36.30	0.250	158.50	1.090
17.6a2 (21)	Chicago Heights (C)	203	23	145	1945	1945	14	22	1680	45.5	37.00	0.255	46.40	0.320
17.6a2 (21)	Chicago Heights (C)	203	23	145	1945	1948	0.3	26	1440	40	36.00	0.248	45.00	0.310
19.2e (23)	Chicago Heights (C)	260	23	202	1946	1956	......	33.5	1800	55	32.80	0.163	41.00	0.199
19.2e (23)	Chicago Heights (C)	260	23	202	1946	1946	23	33.5	1270	28	45.50	0.225	57.00	0.282
19.4c (22)	Chicago Heights (C)	270	23	190	1946	1946	1	26	1500	46	32.60	0.175	40.80	0.215
19.7a (25)	Chicago Heights (C)	450	24	168	1958	1958	18	52	1800	26	69.30	0.412	84.30	0.502
19.7a (25)	Chicago Heights (C)	450	24	168	1958	1959	1.5	50	1900	35	54.30	0.324	67.80	0.405
20	Lincoln-Dixie Theatre	210	....	182	1938	1938	......	84	100	80	1.25	0.009	1.55	0.011
20	Lincoln-Dixie Theatre	330	....	(302)	1938	1938	......	84	150	80	1.87	0.008	2.52	0.010
20	Lincoln-Dixie Theatre	330	....	(302)	1938	1938	......	84	198	196	1.87	0.004	1.69	0.007
21	Diamond Braiding Mills	200	12	......	1936	1936	......	110	440	14	31.40	....	....	....
21 (15)	Chicago Heights (C)	193	24	105	1917	1947	5	88	1000	27	37.10	0.353	46.30	0.453
21.1h3 (4)	Victor Chemical Co.	252	10	115	1945	1947	5	52	350	59	5.94	0.052	11.50	0.100
21.1h1 (6)	Victor Chemical Co.	250	10	213	1955	1955	......	102	70	78	0.90	0.006	5.38	0.036
21.1h1 (6)	Victor Chemical Co.	250	10	213	1955	1955	......	108	60	62	0.97	0.007	3.92	0.028
21.1h2 (7)	Victor Chemical Co.	......	....	.....	1955	1955	......	110	130	60	2.17	....	....	....
21.2h(1)	Victor Chemical Co.	400	10	40	1909	1921	......	35	340	100	3.40	0.085	5.90	0.147
21.2h(1)	Victor Chemical Co.	400	10	40	1909	1923	......	70	300	135	2.22	0.056	4.50	0.111
21.2h(1)	Victor Chemical Co.	400	10	40	1909	1929	......	79	300	105	2.86	0.069	5.50	0.137
21.2h(1)	Victor Chemical Co.	400	10	40	1909	1930	......	79	105	260	0.40	0.010	0.56	0.014
21.2h (1)	Victor Chemical Co.	400	10	40	1909	1945	......	70	120	240	0.50	0.012	0.69	0.017
21.2h (1)	Victor Chemical Co.	400	10	40	1909	1945	......	40	100	....	....	....	....	....
21.2h (1)	Victor Chemical Co.	400	10	40	1909	1945	......	35	58	.....	....	....	....	....
21.2h (1)	Victor Chemical Co.	400	10	40	1909	1945	.....	35	123	....	....	....	....	....
21.2h (1)	Victor Chemical Co.	400	10	40	1909	1946	......	36	350	224	1.56	0.039	4.50	
21.4a(3)	Flintkote Co.	300	18	274	1946	1946	4	106	325	100	3.25	0.017	4.07	0.015
21.4a (3)	Flintkote Co.	300	18	274	1946	1951	2	111	210	47	4.47	0.024	5.60	0.020
21.7e (1)	Flintkote, Tile-Tex.	416	17.3	306	1951	1951	2.8	58	510	19	26.80	0.088	35.60	0.116
22	Penn. Salt Mfg. Co.	215	6	193	1954	1954	3.5	6	88	26	3.39	0.018	3.46	0.018
22.8h1 (5)	Victor Chemical Co.	250	15	201	1956	1956	12	49	520	111	4.68	0.023	17.35	0.087
22.8h2 (10)	Victor Chemical Co.	250	15	155	1956	1956	......	95	500	65	7.70	0.050	20.50	0.132
22.8h3 (8)	Victor Chemical Co.	......	....	......	1955	1955	......	97	250	15	16.65	....	20.80	....
23.4b	E. Chicago Hts. (V)	499	16	419	1958	1958	6	5	135	82	1.65	0.004	2.05	0.005
23.4b	E. Chicago Hts. (V)	499	16	419	1958	1958	96	5	130	78	1.67	0.004	2.06	0.005
23.5a	E. Chicago Hts. (V)	510	12	452	1953	1953	2	13	110	67	1.65	0.004	2.00	0.004
23.5b	E. Chicago Hts. (V)	499	16	419	1958	1958	24	5	126	78	1.62	0.004	1.90	0.005
23.6e	E. Chicago Hts. (V)	510	12	453	1953	1953	......	13	200	187	1.07	0.002	1.34	0.003
25.3c (2)	Sauk Village (V)	474	12	396	1959	1959	11	27	1016	11	92.40	0.233	116.00	0.294
28 (2)	Inland Steel Co.	425	15	302	1953	1953	.....	120	400	80	5.00	0.017	11.22	0.037
28.1g (24)	Chicago Heights (C)	450	19	383	1958	1960	3	15	500	181	2.76	0.007	33.00	0.009
28.1g (24)	Chicago Heights (C)	450	19	168	1958	1958	20	13	435	148	2.94	0.018	35.00	0.021
28.5h (W)	Inland Steel Co.	332	8	132	1900	1900	......	....	450	48	9.38	0.071	20.00	0.151
28.5h (W)	Inland Steel Co.	332	8	132	1900	1945	......	....	125	....	....	....	....	....
28.5h (W)	Inland Steel Co.	332	8	132	1900	1945	......	....	183	....	....	....	....	....
28.5h (W)	Inland Steel Co.	332	8	132	1900	1945	......	....	220	....	....	....	....	....
29 (26)	Chicago Heights (C)	450	23	161	1960	1960	1.3	59	1500	21	71.50	0.445	89.50	0.556
29 (26)	Chicago Heights (C)	450	23	161	1960	1960	6	59	2000	33	60.60	0.376	76.00	0.473
29 (26)	Chicago Heights (C)	450	23	161	1960	1960	2.5	59	2000	31	64.60	0.400	81.00	0:503
29.1c	S. Chicago Hghts. (V)	250	12	168	1956	1956	3	82	500	66	7.58	0.045	9.50	0.057
29.5e (1)	Amer. Locomotive Co.	222	10	160	1910	1945	......	....	300	....	....	....	....	....
29.5e (1)	Amer. Locomotive Co.	222	10	160	1910	1945	......	63	600	....	....	....	....	....
29.6e (3)	Amer. Locomotive Co.	222	12.3	174	1942	1942	3	56	690	0.2	3450.00	20.700	3470.00	20.900
29.6e (3)	Amer. Locomotive Co.	222	12.3	174	1942	1942	16.5	56	900	1	900.000	5.420	3210.08	19.350
29.6e (3)	Amer. Locomotive Co.	222	12.3	174	1942	1942	24	56	1150	2.1	549.00	3.300	3200.00	19.300
29.7f (3)	Alco Products Inc.	248	12	175	1959	1959	24	74	1000	....	1000.00	5.750	1250.00	7.150
32.1a	Ex-Service Men's Club	205	8	116	1953	1953	......	45	75	45	1.67	0.014	1.80	0.015
35N15E-														
20.6d	J. DeChico	304	8	211	1955	1955	4	9.5	220	26	8.45	0.040	10.00	0.047
36N12E-														
4.1a (2)	Orland Park (V)	397	12	237	1956	1956	7.5	35	458	103.5	4.52	0.019	7.77	0.033
4.1a (2)	Orland Park (V)	397	12	237	1956	1958	......	38	550	78	7.05	0.030	19.20	0.081
5	Cook Co. Forest Pres.	218	6	80	....	....	....	27	25	1	25.00	0.313	26.10	0.326
9.3g (1)	Orland Park (V)	329	6	119	1897	1936	8	40	238	8	29.80	0.250	39.60	0.333
9.3g (1)	Orland Park (V)	329	6	119	1897	1943	8	40	235	8	29.40	0.247	39.20	0.330
9.8a (3)	Orland Park (V)	453	12	310	1960	1960	12	52	572	36	15.90	0.051	31.80	0.102
16	U. S. Government	253	12	93	....	1956	24	40	132	20	6.60	0.071	7.78	0.084
17.1g	Andrews Corp.	249	6	105	1953	1953	5	40	240	1	240.00	2.285	320.00	3.050
17.4b	J. Kolenski	212	5	26	1949	1949	1	40	10	25	0.40	0.015	0.41	0.016
22.2d	Fernway Utility Co.	125	10	7	1959	1959	5	38	400	7	57.30	8.200	92.00	13.150

Table A (Continued)

Well number	Owner	Depth (*ft*)	Diameter (*in*)	Penetration (*ft*)	Year drilled	Year of test	Length of test (*hr*)	Non-pumping level (*ft*)	Pumping rate (*gpm*)	Drawdown (*ft*)	Unadjusted: Specific capacity (*gpm/ft*)	Unadjusted: Specific capacity per foot of penetration (gpm/ft^2)	Adjusted: Specific capacity (*gpm/ft*)	Adjusted: Specific capacity per foot of penetration (gpm/ft^2)
COK—														
36N12E-(Cont'd)														
25.5c	Southlands Sbd.	459	10	362	1954	1954	4	28	255	66	3.86	0.011	5.21	0.014
30.2b	N. Amer. Mushroom Co.	200	10	103	1954	1955	4	13	500	11	45.50	0.442	84.25	0.817
36.1g1 (2)	Tinley Park St. Hosp.	489	20	365	1951	1951	0.8	12	510	10	51.00	0.140	101.50	0.278
36.1g2 (3)	Tinley Park St. Hosp.	515	19	386	1951	1951	6	14	680	80	8.50	0.022	17.75	0.046
36.3f (1)	Tinley Park St. Hosp.	491	19	370	1950	1950	12	22	260	170	1.53	0.004	2.06	0.006
36.3f (1)	Tinley Park St. Hosp.	491	19	370	1950	1951	10	26	835	166	5.03	0.014	13.30	0.036
36N13E-														
1.1g	Libby, McNeil, & Libby	300	6	243	1941	1947	15	25	35	5	7.00	0.029	7.38	0.030
16	Oak Forest (V)	297	12	231	1952	1952	3	15	346	31	11.15	0.048	16.95	0.074
22	Sherry Builders	455	16	371	1959	1959	1.5	27	350	118	2.97	0.008	5.85	0.016
22.6b	Willowick Estates	455	15	371	1959	1959	5	22	350	125	2.81	0.008	5.25	0.014
34.5e (1)	Country Club Hills	387	12	304	1957	1957	10	14	700	40	17.50	0.058	21.90	0.072
34.7b	Country Club Hills	373	12	263	1956	1956	4	45	270	95	2.84	0.011	3.98	0.015
36N14E-														
6	Cook Co. Forest Pres.	144	6	98	....	....	....	13	24	67	0.36	0.004	0.45	0.005
13.7b	Brown Packing Co.	386	....	......	....	1952	......	40	55	14	3.93	....	....	....
19.5e	Coca-Cola Bottling Co.	280	15	216	1960	1960	7	50	140	110	1.27	0.006	1.55	0.007
23.2a	Illinois Hwy. Div.	250	6	152	1957	1957	24	36	14	36	0.39	0.003	0.50	0.003
31.5d (1)	Homewood (V)	252	10	182	1911	1946	72	77	285	39	7.32	0.040	9.17	0.050
31.5d (1)	Homewood (V)	252	10	182	1911	1923	1	26	170	22	7.74	0.042	9.00	0.050
31.5d (1)	Homewood (V)	252	10	182	1911	1945	......	34	245	134	1.83		2.45	0.013
31.5d (1)	Homewood (V)	252	10	182	1911	1943	....	34	345	120	2.88	0.017	3.00	0.017
31.6h (T)	Homewood (V)	210	10	146	1922	1922	20	16	240	73	3.29	0.022	4.14	0.028
31.6h (T)	Homewood (V)	226	10	160	1946	1946	1.5	23	195	103	1.89	0.012	2.20	0.014
31.8d (3)	Ravisloe Golf Club	420	12	357	1953	1953	7	41	530	38	1.40	0.004	1.75	0.005
31.8d (3)	Ravisloe CCb.	420	12	357	1953	1953	2	41	520	33	15.75	0.042	47.20	0.132
32	Wash. Pk. Race Track	400	12	375	1946	1946	1	25	230	300	0.77	0.002	0.97	0.003
33.5f	Oak Lawn Cemetery	302	8	260	1946	1946	4	42	180	16	11.25	0.043	14.10	0.054
34.5d (1)	Thornton (V)	477	12	385	1923	1923	......	30	7 5	195	0.38	0.001	0.48	0.001
34.5d (1)	Thornton (V)	477	12	385	1923	1941	0.3	92	100	61	1.64	0.004	2.07	0.005
34.5h1 (2)	Thornton (V)	408	12	332	1928	1928	......	76	160	130	1.23	0.004	1.54	0.005
34.5h2 (3)	Thornton (V)	250	8	97	1943	1946	4	53	100	43	2.33	0.024	2.50	0.026
34.5h2 (3)	Thornton (V)	250	8	153	1943	1944	4	97	100	10	10.00	0.065	22.20	0.145
36.2h (T)	Homewood (V)	460	6	381	1940	1946	1	29	103	18	5.72	0.015	8.06	0.016
36N15E-23	Hwy. Div. Storage	250	....	......	1957	1957	24	36	14	38	0.37	......	0.38	......
37N11E-														
14.8b	Alexander Chemical	191	10	164	1951	1951	1	7	120	57	2.11	0.013	2.45	0.015
22(2)	Coghill Golf & CCb.	172	6	72	1927	1941	2.5	72	127	5	25.40	0.352	29.90	0.415
28.2a	Fournier Institute	370	10	242	1930	1945	5	120	173	6	28.90	0.119	35.80	0.148
28.2a	Fournier Institute	370	10	242	1930	1947	2.8	105	390	12.5	31.20	0.129	50.90	0.210
32	Lemont Packing Co.	244	10	129	1947	1947	......	132	200	4	50.00	0.387	63.50	0.490
37N12E-														
7	Cook Co. Forest Pres.	147	6	62	....	....	......	70	30	1	30.00	0.484	31.40	0.506
8	Camp Kwanis Scouts	......	....	......	1945	1949	......	100	36	60	0.60	....	....	....
9	CCC Camp, Palos Hills	302	6	153	....	....	......	103	30	6	5.00	0.033	5.25	0.035
18.8h	U. of Chicago Expt. Sta.	308	8	137	1944	1944	8	158	65	14	4.65	0.034	5.66	0.041
26	Ill. Bell Telephone	352	6	......	1960	1960	1	52	50	3	16.65	....	20.02	....
30.2f	St. Coletta School	350	10	172	1950	1950	4	86	250	24	10.41	0.061	14.10	0.082
32	Palos Park El. Sch. Dist.	250	6	130	1957	1957	8	47	200	9	22.20	0.171	28.20	0.217
35.4b	Palos—Highlands Sbd.	234	10	100	1953	1953	6	57	500	25	20.00	0.200	36.30	0.363
37N13E-														
4	Linder Sch.—Chi. Dist.	215	8	121	1945	1945	......	50	80	38	2.10	0.017	2.27	0.019
8.8b	Ill. Bell Telephone	200	6	135	1959	1959	......	6	50	174	0.29	0.002	....	....
32.5g1 (1)	Ridgeland Sbd.	369	10	270	1957	1957		8	80	82	0.98	0.004	1.09	
32.5g2 (T)	Ridgeland Sbd.	92	8	9	1958	1958	4	7	120	12	10.00	1.111	12.40	1.378
33(1)	Playfield Sbd.	395	12	313	1959	1959	3.5	6	302	95	3.18	0.010	4.55	0.145
37N14E-13	Cal—Auto Wreckers	292	5	200	1959	1959	......	18	15	62	0.24	0.001	0.25	0.001
38N12E-														
2.6d	Werner Mfg. Co.	385	8	274	1957	1957	4.5	111	125	74	1.69	0.006	2.20	0.008
5.3e (6)	LaGrange (V)	352	24	277	1949	1949	6.8	75	1000	50	20.00	0.072	26.00	0.094
5.4d (5)	LaGrange (V)	358	20	299	1947	1947	12	48	900	143	6.30	0.021	8.20	0.027
5.4d (5)	LaGrange (V)	358	20	280	1947	1950	0.5	78	118	7	16.85	0.060	21.90	0.078
5.8c (1)	Western Springs (V)	385	15	285	1924	1937	12	60	500	22	22.70	0.080	45.00	0.158
5.8c (1)	Western Springs (V)	385	15	285	1924	1942	3	60	650	20	32.50	0.085	42.30	0.118
5.8c (1)	Western Springs (V)	385	15	285	1924	1954	3.8	98	500	20	25.00	0.088	32.50	0.115
5.8c (1)	Western Springs (V)	385	15	285	1924	1924	......	40	500	11	45.50	0.160	78.00	0.273
5.8d (2)	Western Springs (V)	313	17	248	1930	1937	12	62	500	22	22.70	0.092	29.50	0.120
5.8d (2)	Western Springs (V)	313	15	248	1930	1946	3.3	67	500	24	20.80	0.084	27.10	0.109
5.8d (2)	Western springs (V)	313	17	248	1930	1951	2.5	65	500	25	20.00	0.081	26.00	0.105
5.8d (2)	Western Springs (V)	313	17	248	1930	1954	3.8	98	500	22	22.70	0.092	29.50	0.120
5.8d (2)	Western Springs (V)	313	17	252	1930	1931	......	61	500	22	22.70	0.090	29.50	0.117
8.1a	Country Club Hts.	370	6	260	1955	1955	......	110	70	10	7.00	0.027	12.70	0.049
8.3h	LaGrange Field Club	330	6	140	1955	1955	2	95	210	15	14.00	0.100	18.20	0.130
9.5a	Mark Magisano	327	8	260	1950	1950	24	67	40	18	2.22	0.009	3.50	0.013
9.8d	Mark Magirano	327	8	260	1950	1950	2	67	33	4	8.25	0.032	10.30	0.040
16.4c	Sch. Dist. 105, Lyons Twp.	377	6	193	1951	1951	1.3	54	55	33	1.67	0.009	3.67	0.019
16.8e	Finn Construction Co.	325	6	82	1954	1954	10	75	100	51	1.96	0.024	2.55	0.031
17.1a	Midwest Water Co.	375	8	313	1952	1952	2	74	110	82	1.34	0.004	1.74	0.005
17.2c	Coronet Construction	420	10	341	1953	1953	1.3	81	290	48	6.05	0.018		0.023

Table A (Continued)

Well number	Owner	Depth (*ft*)	Diameter (*in*)	Penetration (*ft*)	Year drilled	Year of test	Length of test (*hr*)	Non-pumping level (*ft*)	Pumping rate (*gpm*)	Drawdown (*ft*)	Unadjusted: Specific capacity (*gpm/ft*)	Unadjusted: Specific capacity per foot of penetration (*gpm/ft²*)	Adjusted: Specific capacity (*gpm/ft*)	Adjusted: Specific capacity per foot of penetration (*gpm/ft²*)
COK—														
38N12E-(Cont'd)														
18.1h	E. G. Boone	190	6	120	1959	1959	3	43	50	40	1.25	0.010	2.78	0.013
18.2g	Ridgewood Sbd.	349	10	299	1957	1957	7	25	450	45	10.00	0.033	13.00	0.043
18.8f1 (1)	Cook Co. TB Sanitar.	357	12	232	1952	1952	1	35	158	91	1.74	0.007	2.26	0.009
18.8f1 (1)	Cook Co. TB Sanitar.	357	12	232	1952	1952	4	39	288	111	2.60	0.011	3.28	0.014
18.8f2 (2)	Cook Co. TB Sanitar.	342	15	289	1952	1952	1	39	299	16	18.70	0.065	27.20	0.078
19	Hinsdale San. Dist.	220	8	177	1957	1957	22	22	150	26	5.77	0.032	7.15	0.041
19.2f	Indian Head Park	295	8	253	1947	1947	......	35	130	86	1.51	0.006	1.96	0.008
19.2f	Indian Head Park	295	8	253	1947	1958	.....	48	135	75	1.80	0.007	2.34	0.009
19.2f	Indian Head Park	295	8	253	1947	1960	0.3	48	130	72	1.81	0.007	2.35	0.009
20	Cook Co. Forest Pres.	93	6	30	....	....	.....	38	25	18	1.39	0.046	1.50	0.050
20.8e	Acacia CCb.	409	8	354	1948	1948	4	55	330	9	36.70	0.104	38.00	0.107
28.8c	Buick-Gen. Motor Co.	180	6	91	1951	1951		68	260	32	8.14	0.090	10.58	0.117
30.8b	Made Crest Golf Cb.	401	10	361	1957	1957	3	35	600	6	100.00	0.277	104.00	0.289
32.7h	Edgewood Acres Sbd.	150	10	102	1953	1953	3	15	210	34	6.19	0.061	12.40	0.122
32.7h	Edgewood Acres Sbd.	150	10	102	1953	1958	......	25	207	9	23.70	0.228	24.00	0.235
35	Midwest Justice Wtr. Co.	145	10	58	1954	1954	8	15	235	19	12.35	0.213	12.50	0.215
36.5a	Ajax Box Co.	322	10	249	1959	1959	8	45	100	90	1.12	0.005	1.82	0.007
38N13E-														
20.1e (1)	Nat. Aluminate Corp.	393	.....	314	....	1936	8	79	85	150	0.57	0.002	....	....
20.7d (2)	Nat. Aluminate Corp.	233	.....	142	1936	1937	85	50	63	85	0.74	0.005	0.81	0.006
29.5c	School Dist. 220	298		212	1942	1942	49	12	50	34	1.47	0.007	1.58	0.007
29.5d	School Dist. 220	300		211	1948	1948	2	60	20	36	0.56	0.003	0.57	0.003
29.6c	Stickney Comm. Dist. 220	375	8	286	1948	1948	7.5	64	60	30	2.00	0.007	2.18	0.008
30.7d	Stickney Sch. 111	286	8	221	1948	1948	1.5	40	32	76	0.42	0.002	0.44	0.002
31.5h	Reedy Developm't Corp.		8	295	1956	1946	67	10	70	72	0.97	0.003	1.07	0.004
32	Stickney Sch. 111	300	6	229	1938	1938	12	21	20	9	2.22	0.010	2.30	0.010
33.7e	Stickney Sch. 111	215	8	121	1945	1945	54	9	88	34	2.56	0.021	2.90	0.024
38N14E.														
3.7h	Goldenrod Ice Cream	374	12	322	1938	1939	......	47	90	150	0.60	0.002	0.66	0.002
39N12E-														
2 (1)	Raytheon Mfg. Co.	306	12	243	1955	1955	8	57	305	18	16.95	0.070	22.00	0.091
4	Sacrad Heart Seminary	250	6	77	....	1940	1.8	173	55	7	7.85	0.105	11.90	0.155
4.2b (1)	Richardson Co.	315	....	......	1936	1952	1.3	170	165	3	55.00	......	119.00	....
4.2b (1)	Richardson Co.	315	....	......	1936	1952	......	173	170	2	85.00	......	97.00	....
4.2h	Hiway Restaurant	250	10	......	1935	1935	4	25	135	80	1.69	......	6.18	....
4.8e(2)	Stone Park (V)	291	12	119	1942	1942	5.5	172	57	8	7.12	0.060	8.45	0.071
11	Cook Co. Forest Pres.	202	6	128	......	....	......	75	15	30	0.50	0.004	0.63	0.005
17	Hillside Shop. Center	242	12	206	1955	1955	2	36	200	110	1.81	0.009	2.35	0.011
17	Hillside (V)	178	6	113	1937	1937	8	35	40	25	1.60	0.014	1.75	0.016
17.1c	Vulcan Tin Can Co.	305	10	252	1948	1958	......	20	16	132	0.12	0.001	0.13	0.001
18	Leona Finger	130	5	49	1957	1957	1	60	30	50	0.60	0.012	1.00	0.020
18.7h (2)	Berkeley (V)	151	10	47	1930	1930	1	44	150	8	18.75	0.400	24.40	0.520
19	Catholic Cemeteries Inc.	252	10	200	1959	1959	2	37	185	163	1.13	0.006	1.47	0.008
21.2h	Hub Planting Works	178	6	93	1952	1953	......	18	50	4	12.50	0.135	13.20	0.142
21.2h	Amphenol Corp.	345	19	292	1958	1958	6	9	400	111	3.60	0.012	4.68	0.016
31.2c	Salt Creek Camp	118	6	49	1936	1936	10	27	25	2	12.50	0.256	16.30	0.333
32	Cook Co. Forest Pres.	112	6	77	....	....	......	9	60	2	30.00	0.390	39.00	0.507
33.2g	La Grange Park (V)	370	15	298	1954	1954	6	21	900	79	11.40	0.038	14.80	0.049
39N13E-														
9	Meyercord Co.	250	.....	....	1910	1934	4	68	30	10	3.00	....	314	
9	Peterson Ice Cream	260	.....	....	1905	1934	7	36	65	74	0.88	....	0.96	....
24.2b	Aermotor Co.	350	5	....	1895	1958	0.3	40	20	20	1.00	....	1.03	....
29.5c	Stickney Comm. Dist. 220	300	8	211	1948	1948	5	60	27	84	0.32	0.002	0.34	0.002
39N14E-28	A. P. Callahan Co.	386	5	325	1906	1935	......	44	11	80	0.14	0.001	0.14	0.001
40N12E-														
2	Elgin	93	12	41	1941	1941	....	33	350	4	87.60	2.140	109.50	2.680
3	Cook Co. Forest Pres.	192	6	123	....	....	......	28	34	32	1.06	0.009	1.12	0.009
3	Cook Co. Forest Pres.	102	6	26	....	....	....	13	25	2	12.50	0.482	13.75	0.530
3.4h (6)	Park Ridge Camp	102	5	26	1936	1936	10	13	25	2	12.50	0.482	13.75	0.530
10 (5)	Park Ridge Camp	123	5	42	1936	1936	10	10.5	25	4	6.25	0.149	6.52	0.155
10	Cook Co. Forest Pres.	96	6	4	-------	....	......	13	25	3	8.35	2.090	8.70	2.170
10.2e (2)	Park Ridge Camp	97	5	5	1935	1935	10	13	25	16	1.56	0.314	1.62	0:325
11 (4)	Park Ridge Camp	221	5	147	1936	1936	10	75	15	30	0.50	0.003	0.75	0.005
17	Bert Bush	150	5	85	1941	1941	5	22	15	3	5.00	0.059	5.14	0.060
20.3f1	Dakota Chief Sales Co.	270	16	177	1950	1958	......	38	290	50	5.81	0.033	8.19	0.046
20.3f2	Dakota Chief Sales Co.	260	16	176	1950	1958	......	30	170	128	1.33	0.008	1.62	0.009
20.4f1 (E)	C.M.St.P. & P. RR	270	16	180	1950	1950	......	36	290	59	4.92	0.027	6.94	0.039
31.3h (2)	North Lake (C)	316	12	288	1946	1947	8	19	133	119	1.12	0.004	2.72	0.009
33.3e	Public Water Co.	330	6	250	1943	1943	......	40	16	220	0.07	0.001	0.08	0.001
35	Cook Co. Forest Pres.	136	6	68	....	....	......	44	15	40	0.38	0.006	0.39	0.006
35	Cook Co. Forest Pres.	83	6	11	....	....	......	44	30	30	1.00	0.091	1.09	0.099
35.1c (1)	Park Ridge Camp	136	5	68	1935	1935	10	44	15	40	0.37	0.005	0.38	0.006
35.5h (3)	Park Ridge Camp	83	5	3	1935	1935	3	44	30	3	10.00	3.333	10.03	3.380
40N13E-10	Cook Co. Forest Pres.	212	6	127	....	....	....	22	15	70	0.21	0.002	0.22	0.002
41N9E-														
21	Water Service Co.	165	4	49	1931	1931	....	20	10	108	0.09	0.002	0.10	0.002
21	Ramblevale	165	4	29	1931	1931	......	20	10	88	0.11	0.004	0.12	0.004
29.6b	C.M.St.P. & P. RR	156	10	64	1943	1943	......	20	12	80	0.15	0.002	0.15	0.002
34.1b (1)	Bartlett (V)	200	8	54	1923	1924	8	33	265	4	66.30	1.230	90.90	1.684
34.1b (1)	Bartlett (V)	200	8	54	1923	1925	....	46	300	6	50.00	0.925	71.50	1.325

Table A (Continued)

Well number	Owner	Depth (ft)	Diameter (in)	Penetration (ft)	Year drilled	Year of test	Length of test (hr)	Non-pumping level (ft)	Pumping rate (gpm)	Drawdown (ft)	Unadjusted: Specific capacity (gpm/ft)	Unadjusted: Specific capacity per foot of penetration (gpm/ft^2)	Adjusted: Specific capacity (gpm/ft)	Adjusted: Specific capacity per foot of penetration ($gpml/ft^2$)
COK—														
41NSE— (Cont'd)														
34.1b(1)	Bartlett (V)	200	8	54	1923	1936	3.5	37	263	4	65.80	1.220	90.01	1.670
34.1b(1)	Bartlett (V)	200	8	54	1923	1945	2	37	200	4	50.00	0.925	63.40	1.720
34.1b(1)	Bartlett (V)	200	8	54	1945	1959	1.5	60	349	7	50.00	0.925	75.60	1.400
41NI0E-														
12.5d (1)	Pure oil co.	200	8	53	1956	1956	8	5	250	90	2.78	0.052	3.76	0.071
15.lf (1)	Citizens Utilities Co.	225	12	88	1955	1958	0.3	20	300	28	10.71	0.122	15.30	0.174
15.4f (3)	Citizens Utilities Co.	236	12	80	1956	1958	......	28	305	30	10.71	0.127	14.50	0.182
20 (1)	Weathersfield Sbd.	263	6	94	1958	1958	6.5	67	85	16	5.31	0.057	5.92	0.063
20 (2)	Weathenfield Sbd.	250	12	78	1960	1960	10	71	250	143	1.75	0.022	2.35	0.030
22	Schaumburg Sch. Dia. 54	205	6	168	1953	1953	3	32	34	5	6.80	0.041	7.20	0.043
4lNllE-														
7	Altendrof Construction	121	....	11	1933	1933	5	6	18	29	0.62	0.056	0.87	0.079
8	R. F. Johnson	125	5	35	1945	1945	8	15	600	3	200.00	5.730	426.00	2.150
10.3f	Hatlen Heights Sbd.	195	13	85	1955	1955	0.8	24	96	100	0.96	0.011	1.09	0.013
12.3f (1)	Mt. Prospect (V)	200	12	108	1922	1922	3	35	150	15	10.00	0.093	12.00	0.111
12.3f (1)	Mt. Prospect (V)	210	12	100	1927	1927	......	40	100	30	3.33	0.033	3.80	0.038
12.8h (2)	Mt. Prospect (V)	204	12	94	1927	1958	......	37	100	100	1.00	0.011	1.14	0.012
23	Texas Co.	231	8	133	1954	1958	8	30	200	20	10.00	0.072	13.00	0.098
23	Badger Pipe Line Co.	228	8		1954	1954	......	20	200	13	15.40	....	18.75	....
24.1g(1)	Waycinden Park	487	10	117	1958	1958	6	37	144	120	1.20	0.010	1.44	0.012
25.00	Standard Oil Co.	218	8	135	1958	1958	......	25	60	62	0.97	0.007	1.01	0.007
41N12E-														
17	Public Service Co. of N. Ill.	274	-----	48	1954	1954	......	122	20	30	0.67	0.014	0.69	0.014
17 (1)	Public Service Co. of N. III.	274	6	48	1953	1953	......	122	20	18	1.11	0.023	1.16	0.024
28.7c	Higgins Water Co.	208	12	....	....	1952	4	25	260	41	6.35	....	8.68	....
33.5e	Orchard Place	208	12	141	1952	1952	3	25	258	16	16.10	0.114	22.15	0.157
34.1a	G. C. Ehrhard	216	8	169	1946	1946	1	28	50	112	0.45	0.003	0.50	0.003
41N13E-														
7.ld	Golf (V)	260	8	164	1923	1923	......	60	17	64	0.26	0.002	0.28	0.002
10.8h	Sally's Restaurant	308	6	199	1940	1941	24	87	70	31	2.26	0.011	2.48	0.012
32	Cook Co. Forest Pres.	130	6	46	....	....	......	13	25	15	1.67	0.036	1.74	0.038
42N9E-														
1.7hl (1)	Barrington (V)	305	12	105	1898	1922	9	56	270	5	54.00	0.515	71.40	0.680
1.7hl (1)	Barrington (V)	305	12	105	1898	1923	......	60	400	16	25.00	0.238	40.00	0.381
1.7hl (1)	Barrinrton (V)	305	12	105	1898	1928	......	61	380	16	23.75	0.226	36.05	0.344
1.7hl (1)	Barrington (V)	305	12	105	1898	1933	4.5	61	350	4	87.50	0.832	138.50	1.310
1.7h2 (2)	Barrington (V)	210	16	18	1929	1929	4	53	540	14	38.60	2.140	77.20	4.280
1.7h2 (2)	Barrington (V)	210	16	18	1929	1933	2	52	700	12	58.40	3.240	146.00	8.110
3.7g	Arthur Teremes	236	4	23	1932	1944	......	80	16	2	8.00	0.347	8.25	0.358
5	Wm. P. Siblev	188	6	30	....	1944	......	20	32	22	1.45	0.048	1.53	0.051
27.4h	F. McCormac k	276	6	30	1933	1933	8	110	40	30	1.33	0.044	1.42	0.046
42Nl0E-														
2.5f	Rand Rd. Drive-In Theatre	171	8	37	1959	1959	12	15	127	21	6.05	0.164	7.14	0.193
3.8f	Barrington Woods Sbd.	250	8	57	1953	1953	......	38	16	102	0.16	0.003	0.16	0.003
3.8f (1)	Barrington Woods Sbd.	250	8	57	1953	1953	6	44	16	152	0.11	0.002	0.11	0.002
11.4a (1)	Northemaire Estates	342	12	149	1958	1958	3.5	32	30	128	0.23	0.002	0.25	0.002
16.7h	C. L. Wertz	225	5	10	1952	1952	......	65	10	5	2.00	0.200	2.04	0.204
17.3d	A. T. McIntosh	230	4	4	1941	1941	6	85	10	5	2.00	0.500	2.04	0.510
25	Rolling Meadows Sbd.	218	19	81	1953	1953	......	38	230	84	2.74	0.034	3.03	0.037
25. If	Kimball-Hill & Assoc.	218	18	86	....	1953	......	38	223	77	2.90	0.034	3.77	0.044
35.8a	Cook Co. Highway Gar.	172	6	15	1951	1951	6	25	38	16	2.38	0.158	2.54	0.169
42NllE-														
1	Cook Co. Forest Pres.	127	......	12	....	....	......	11	38	7	3.44	0.452	5.79	0.483
10. le	Wheeling (V)	245	15	141	1955	1955	12	20	135	130	1.04	0.007	1.10	0.008
10.le (2)	Wheeling (V)	245	15	141	1955	1955	2.3	40	100	45	2.22	0.015	2.54	0.018
10.1e (2)	Wheeling (V)	245	15	141	1953	1958	7.5	40	180	90	2.00	0.014	2.50	0.018
11	Ekco Foil Container	275	8	175	1955	1955	2	32	320	32	10.00	0.057	14.70	0.084
12.8h (1)	Wheeling (V)	200	12	100	1926	1927	......	15	150	20	7.50	0.075	9.05	0.091
22	C. A. Smith	128	5	5	1938	1944	3	20	20	5	4.00	0.800	4.15	0.832
27.7c (2)	Prospect Meadows Sbd.	206	12	7	1951	1951	2.5	42	187	29	6.45	0.921	8.06	1.150
27.8c1	Nat. mortgage & Invest.	201	10	92	1949	1949	0.8	33	29	9	3.23	0.035	3.38	0.037
27.8c2(1)														
28	Prospect Meadows Sbd.	201	2	10	1948	1949	0.8	33	105	55	1.91	0.191	2.18	0.218
29 (1)	Rollingg Green CCb.	201	8	4	1959	1959	2	36	150	42	3.58	0.895	4.23	1.080
29.6b	Arlington Heights (V)	140	10	23	1909	1946	1.5	25	240	51	4.71	0.205	6.28	0.273
34.1d	Arlington Hts. Theatre	170	12	48	1941	1941	0.3	83	65	57	1.14	0.024	1.25	0.026
34. 11h	Citizens Bluett Co.	218	12	133	1953	1958	10	26	157	121	1.30	0.010	1.57	0.012
34.1h	Brickman Manor Sbd.	213	12	108	1958	1958	24	38	200	72	2.78	0.026	3.52	0.033
34.7g	R. T. Bluett & Sons	218	12	131	1953	1953	......	26	152	63	2.42	0.018	2.93	0.022
35 (2)	Bluett—Central Ford	265	12	164	1958	1958	......	25	30	195	0.15	0.001	0.30	0.002
42N12E-														
13.5d	W. S. Davis	144	4	22	1940	1941	2	82	10	3	3.33	0.151	3.41	0.155
17.3e	W.K.Blue	143	4	3	1940	1941	2	50	15	5	3.00	1.000	3.10	1.033
17.8f	Northbrook West Sbd.	286	12	136	1955	1955	....	50	64	142	0.45	0.003	0.50	0.004
17.8f	Northbrook West Sbd.	286	12	136	1955	1955	....	50	99	122	0.81	0.006	1.03	0.008
17.8g	M. Rothschild	139	4	16	1939	1941	10	50	30	10	3.00	0.187	3.16	0.197
27.1e	Lutter Brick Co.	215	6	105	1905	1941	2	50	80	25	3.20	0.030	3.55	0.034
30.2d (1)	Northfield Woods Sbd.	300	12	220	1954	1954	4.5	55	60	179	0.33	0.002	0.49	0.002
42N13E-														
6.3f2	Cohen	186	6	65	....	....	....	60	17	68	0.25	0.004	0.27	0.004
30.1	T. E. Wecker	185	6	87	1940	1940	10	70	10	55	0.18	0.002	0.19	0.002

Table A (Continued)

											Unadjusted		Adjusted	
Well number	Owner	Depth (*ft*)	Diameter (*in*)	Penetration (*ft*)	Year drilled	Year of test	Length of test (*hr*)	Nonpumping level (*ft*)	Pumping rate (*gpm*)	Drawdown (*ft*)	Specific capacity (*gpm/ft*)	Specific capacity per foot of penetration (gpm/ft^2)	Specific capacity (*gpm/ft*)	Specific capacity per foot of penetration (gpm/ft^2)
DUP—														
37N11E-														
4.3c (4)	Argonne Nat'l Lab.	341	14	226	1959	1959	....	82	550	32	17.20	0.076	26.10	0.115
8.2h (5)	Argonne Nat'l Lab.	345	12	235	1948	1948	....	105	200	3	66.70	0.285	80.00	0.341
9.8a	Argonne Nat'l Lab.	155	6	40	1949	1949	....	107	43	2	21.50	0.538	22.60	0.566
10.5f (1)	Argonne Nat'l Lab.	284	12	219	1948	1948	....	24	200	17	11.75	0.054	13.60	0.062
10.6g (2)	Argonne Nat'l Lab.	300	12	239	1948	1948	....	21	750	86	8.73	0.037	16.90	0.071
38N9E-														
2.1h (1)	Elmhurst-Chicago Stone Co.	266	16	198	1957	1957	8	10	1270	86	14.79	0.075	110.00	0.556
13.2h (4)	Naperville (C)	178	30	134	1928	1943	8	11	620	11.5	53.80	0.403	105.00	0.784
17.5d	Reber Preserving Co.	200	.....	.....	......	.....	3	48	100	14	7.15	....	6.90	....
23.3g (1)	Lawn Meadow Sbd.	210	10	188	1956	1956	4	11	200	63	3.18	0.017	3.50	0.019
38N10E-														
5.4e	Ill Toll Hwy. Comm.	420	12	318	1958	1958	....	58	100	1	100.00	0.315	111.00	0.348
3.8a (2)	Lisle (V)	233	12	148	1959	1959	2.5	68	726	10	72.60	0.491	180.00	1.215
11.6d (1)	Schieser School	170	6	55	1955	1955	....	123	200		33.33	0.606	286.00	5.190
11.7c	Oakview Sbd.	200	8	85	1957	1957	6.5	96	305	12	25.40	0.298	35.00	0.412
12.5e	Schaffer Bearing Div.	250	12	196	1955	1955	22	50	620	2	310.00	1.581	887.00	4.520
12.6b	Downers Gr. San. Dist.	150	6	75	....	....	24	33	75	1	75.00	1.000	97.00	1.295
12.2b (2)	Belmont (V)	295	10	205	1954	1954	3	84	340	4	85.00	0.415	118.00	0.576
13.8h (2)	Maple Hill Improv.	158	6	64	1954	1958	0.5	94	150	8	18.75	0.294	19.00	0.298
15.8h1	Benedict Sisters Sacred Heart	300	6	200	....	....	8.8	65	35	19	1.84	0.092	2.10	0.011
15.8h2	Benedict Sisters Sacred Heart	237	12	142	....	1939	......	57	140	65	2.16	0.015	2.30	0.016
16.4d	St. Procopius College	245	....	155	....	1935	......	62	200	8.5	23.60	0.152	27.40	0.177
18.3d1 (5)	Naperville (C)	190	30	159	1930	1947	......	12	560	41	13.65	0.086	23.70	0.149
18.3d2 (6)	Naperville (C)	202	27	172	1937	1948	......	10	400	25	16.00	0.093	22.20	0.129
26.1b (1)	Woodridge Sbd.	334	16	237	1959	1959	......	89	530	1	530.00	2.220	589.00	2.485
26.2b	Surety Builders	......	....	......	....	1958	8	77	60	2.5	24.00	....	29.40	....
38N11E-														
1.3al (2)	Hinsdale (V)	271	20	226	1924	1947	3.5	58	970	76	12.75	0.056	33.30	0.147
1.3a2 (3)	Hinsdale (V)	210	20	165	1928	1947	5	61	700	80	8.75	0.053	16.10	0.098
1.4a (1)	Hinsdale (V)	209	12	179	....	1924	......	17	520	3	173.20	0.970	347.00	1.940
3.1b	Hinsdale Golf Club	165	12	20	1944	1944	4.5	90	525	23	22.82	1.142	36.00	1.800
6.4c (9)	Downers Grove (V)	300	30	210	1956	1958	5	109	850	76	11.20	0.053	22.30	0.106
7.6d	Downers Grove (V)	250	30	183	1928	1947	1	46	860	12	71.60	0.392	218.00	1.191
8.4b	Downers Grove (V)	295	30	195	1930	1945	10	96	980	15	65.40	0.335	340.00	1.742
8.7c (8)	Downers Grove (V)	262	30	197	1950	1953	......	64	412	5	82.40	0.419	129.00	0.656
9.1h (2)	Westmont (V)	313	16	190	1926	1938	11	101	600	1.2	500.00	2.630	2000.00	10.520
10.2c (2)	Clarendon Hills (V)	250	12	210	1932	1932	....	95	150	11.5	13.05	0.062	14.60	0.070
10.2c (2)	Clarendon Hills (V)	250	12	210	1932	1947	2	113	300	4	75.00	....	93.80	....
10.6e (1)	Blackhawk Sbd.	295	12	205	1953	1953	8	102	210	24	8.75	0. 043	10.40	0.051
10.7a (3)	Westmont (V)	302	17	167	1935	1947	24	123	250	20	12.50	0.075	15.80	0.095
10.8e (4)	Westmont (V)	313	12	208	1958	1958	12	128	259	27	9.60	0.046	12.10	0.058
11.5a (3)	Clarendon Hills (V)	354	12	239	1945	1945	......	91	385	12	32.10	0.134	45.90	0.192
11.5d (4)	Clarendon Hills (V)	370	12	255	1956	1956	3	90	838	8	105.00	0.412	440.00	1.725
12.8a (5)	Hinsdale (V)	319	15	230	1954	1954	......	69	708	10	70.80	0.308	173.00	0.755
(T)	Hinsdale (V)	212	....	119	1954	1954	......	73	360	12	30.00	0.252	41.00	0.344
1.8c (T)	Hinsdale (V)	291	....	198	1954	1954	......	73	388	7	55.50	0.280	80.80	0.408
(T)	Hinsdale San. Dist.	200	8	182	1957	1957	......	22	150	126	1.19	0.007	1.30	0.007
(1)	Ill. Toll Highway	238	8	138	1957	1957	.....	25	157	55	2.86	0.021	3.10	0.022
24.3b (1)	Internat'l Harvester	294	16	239	1956	1956	4	78	400	20	20.00	0.084	25.20	0.105
24.4b1 (2)	Internat'l Harvester	398	16	296	1957	1957	....	70	500	10	50.00	0.167	84.80	0.287
24.4b2 (3)	Internat'l Harvester	294	16	199	1957	1957	8	73	580	10	58.00	0.291	108.00	0.544
28.1c (2)	Brookhaven Manor	317	16	218	1960	1960	3	115	100	90	1.11	0.051	1.10	0.051
30.5d	Maple Crest Lake CCb.	395	10	250	1958	1958	8	134	320	22	14.55	0.058	19.50	0.078
33.2b (1)	Cass School Dist. 63	250	6	155	1958	1958	8	90	147	10	14.70	0.095	17.30	0.112
39N9E-														
3 (1)	Campbell Soup Co.	250	6	155	....	1946	......	64	282	5	56.40	0.364	70.70	0.456
3.1h1 (2)	Campbell Soup Co.	255	8	160	....	1947	.....	45	180	15.0	12.00	0.075	13.60	0.085
3.1h2 (4)	Campbell Soup Co.	248	8	154	1958	1958	4	68	75	78	0.96	0.006	1.00	0.007
4.2b (3)	West Chicago (C)	310	24	228	1950	1950	......	73	510	41	12.41	0.055	18.90	0.083
4.4a (2)	West Chicago, (C)	322	12	233	1908	1947	......	82	500	18	27.80	0.119	44.60	0.192
5.5g1 (3)	Western Electric Co.	265	8	200	1958	1958	......	87	215	3.5	61.50	0.308	154.00	0.770
5.5g2 (2)	Western Electric Co.	257	8	193	1958	1958	2.5	77	196	19	10.30	0.053	11.60	0.060
7.6h (1)	Western Electric Co.	268	8	204	1958	1958	10	78	542	40	13.52	0.066	22.90	0.112
9.3d (2)	Lindsay Chemical Co.	332	16	243	1953	1953	......	72	800	38	21.10	0.087	50.60	0.208
9.3h (1)	Northwest'n Chemical	320	12	245	1957	1957	.....	95	150	11	13.64	0.056	15.10	0.062
9.6e (1)	Molded Products Corp.	330	12	237	1953	1953	.....	86	465	32	14.51	0.061	21.30	0.090
9.7d	George Ball Inc.	350	....	267	....	....	4	78.5	336	36.5	9.23	0.035	11.60	0.044
12.4b	Winfield Sanitarium	200	....	75	....	1939	3	46	60	9	6.66	0.089	6.90	0.092
13.6c1 (2)	Winfield (V)	335	12	205	1957	1958	8	85	400	5	80.00	0.390	122.00	0.596
13.6c1 (2)	Winfield (V)	254	12	124	1957	1957	......	75	234	63	3.72	0.030	4.30	0.035
35.1a (2)	Elmhunt-Chicago Stone Co.	273	6	218	1957	1957	.....	17	570	16	35.60	0.163	64.80	0.297
39N10E-														
2.3e (1)	Ray Spaulding School	160	6	77	1958	1958	.....	22	100	1	100.00	1.300	111.00	1.445
9.2f (4)	Wheaton (C)	341	20	246	1954	195	.....	45	863	79	10.92	0.045	26.20	0.106
10.3b	Jefferson Ice Co.	134	8	19	....	1944	......	65	80	5	16.00	0.842	17.0	0.895
10.4c	Rathkum Farm Prod.	138	6	18	....	1944	5	40	70	5	14.00	0.778	15.30	0.851
11.7c1	Glen Ellyn (V)	310	8	195	....	1916	......	42	500	93	5.38	0.028	7.70	0.040
11.7c2 (2)	Glen Ellyn (V)	352	12	236	1922	1947	6.5	76	750	68	11.02	0.047	21.70	0.092
11.8c (3)	Glen Ellyn (V)	422	18	290	1941	1947	6	98	750	72	10.40	0.036	19.00	0.066
12.4a (2)	Glen Oak CCb	202	16	152	....		......	2	150	11	13.64	0.090	15.20	0.100
12.4c (3)	Glen Oak CCb.	212	16	132	1958	1958	6	24	450	50	9.00	0.068	13.30	0.101
15.1b (4)	Glen Ellyn (V)	422	20	262	1954	1954	......	85	765	19	40.25	0.154	99.30	0.379
16 (1)	Hitchcock Pub. Co.	200	5	87	....	1957	......	60	32	1	32.00	0.368	32.00	0.368

Table A (Continued)

Well number	Owner	Depth (ft)	Diameter (in)	Penetration (ft)	Year drilled	Year of test	Length of test (hr)	Non-pumping level (ft)	Pumping rate (gpm)	Drawdown (ft)	Unadjusted		Adjusted	
											Specific capacity (gpm/ft)	Specific capacity per foot of penetration (gpm/ft²)	Specific capacity (gpm/ft)	Specific Capacity Per foot of penetration (gpm/ft²)
DUP-														
39N10E-(Cont'd)														
16.6c (4)	Wheaton (C)	330	18	64	1946	1946	1	45	320	4	80.00	1.250	93.00	1.455
18.6e (1)	DuPage Co. Hwy. Dept.	265	8	180	1958	1958	8	25	156	5	31.21	0.174	37.00	0.205
19.4h	St.Francis Academy	252	8	170	1957	1957	5	38	260	2	130.00	0.765	180.00	1.060
30.1h(1)	Arrowhead Sbd.	335	12	250	1959	1959	8	40	759	13	58.30	0.234	159.00	0.637
34.3d(3)	Morton Arboretum	250	12	177	1945	1956	4	75	690	2	345.00	1.942	1115.00	6.300
34.4d(4)	Morton Arboretum	250	12	175	....	1956	24	85	720	6	120.00	0.687	403.00	2.310
35.5g(2)	Valley View Sbd.	250	12	200	1957	1957	12	32	560	7.5	74.60	0.373	150.00	0.750
35.6g(1)	Valley View Sbd.	290	12	179	1957	1957	5	80	536	11	48.70	0.272	86.00	0.481
39N11E-														
1	J. F. Kyle	237	6	183	1955	1955	5.5	61	190	27	7.05	0.039	8.50	0.047
3.2e	Black Top Road Co.	195	10	159	1956	1956	6	37	240	8	30.00	0.189	37.50	0.036
3.3a (1)	Robert Hall Clothes	114	5	26	1958	1958	2	38	200	2	1.00.00	3.850	131.00	5.040
4.1e (5)	Villa Park (V)	235	12	170	1930	1944	......	33	220	3	73.40	0.432	91.80	0.540
5.3g (1)	Lombard Heights	209	15	124	1954	1954	10	43	335	17	19.72	0.159	25.70	0.207
7.1h1 (3)	Lombard (V)	175	20	115	1948	1948	....	9	365	27	13.51	0.117	21.30	0.185
7.1h2 (T)	Lombard (V)	175	6	103	1948	1948	....	9	80	1	80.00	0.776	114.00	1.105
8.7h (1)	Lombard (V)	84	8	14	....	1939	....	10	465	21	22.15	1.580	33.70	2.405
10(3)	Wander Co.	220	....	....	....	1922	....	19	350	40	8.75		11.30	....
10(4)	Wander Co.	187	....	....	....	1924	....	26	500	55	9.10	....	13.50	....
10.8e (3)	Villa Park (V)	285	8	227	1919	1955	....	57	500	70	7.15	0.032	10.50	0.046
10.8d (4)	Villa Park (V)	251	12	193	1923	1955	....	57	500	4	125.00	0.648	238.00	1.231
10.8d (4)	Villa Park (V)	187	....	129	1923	1924	4.5	26	500	55	9.10	0.071	13.20	0.104
13.3g (7)	Elmhurst (C)	290	8	210	1959	1959	8	74	335	86	3.90	0.019	5.10	0.024
16	Elmhurst (C)	175	10	......	1960	1960	......	38	830	31	26.80	....	71.60	....
20.1g	York Center Sbd.	235	....	140	1947	1947	....	66	195	55	3.55	0.025	6.90	0.049
20.6g (1)	Highland Hills Sbd.	241	10	135	1954	1954	....	29	483	114	4.23	0.031	5.90	0.043
23.1a	Ill. Toll Hwy. Comm.	290	6	227	1958	1958	....	26	60	1	60.00	0.264	66.60	0.294
24.2g	J. Harris Jones	350	10	290	1959	1959	......	45	350	65	5.40	0.019	6.90	0.024
34	Liberty Park Home Owners' Assn.	279	8	179	1956	1956	....	103	136	53	2.56	0.014	2.80	0.016
34.2g	St. Francis Retreat	298	8	161	1950	1950	8	55	180	134	1.34	0.008	1.60	0.010
34.5e (2)	St. Joseph College	250	8	135	1958	1958	....	84	60	15	4.00	0.030	8.60	0.064
36	Camp Fullersburg	120	....	30	....	1933	......	14.5	30	0.5	60.00	2.000	60.00	2.000
40N9E-														
28.4bl (1)	Christ the King Seminary	340	12	228	1954	1954	24	82	254	85	2.99	0.013	3.70	0.016
28.4b2 (2)	Christ the King Seminary	160	8	55	1957	1957	8	54	100	30	3.33	0.059	3.60	0.066
32.5gl (1)	Kawneer Corp.	271	10	203	1955	1955	......	50	421	60	7.02	0.035	9.50	0.047
34.3g (1)	De Vito Co.	140	5	43	1958	1958	2	29	24	3	8.00	0.186	8.60	0.200
35.3g (1)	Sidwell Studios	192	8	82	1958	1958	......	28	81	63	1.29	0.016	1.40	0.017
40Nl0E-														
3.4e1(1)	Roselle (V)	182	10	43	1925	1926	6.5	37	110	14	7.86	0.183	9.80	0.205
3.4e2(2)	Roselle (V)	183	10	43	1954	1954	3	47	142	10	14.20	0.331	15.20	0.354
12.7b	Medinah CCb.	145	....	85	1925	1945	....	11	250	17	14.70	0.173	17.70	0.208
20.5d(2)	Allied Cement Co.	320	10	200	1958	1958	5	60	85	16	5.31	0.027	5.60	0.028
26.5d	N. Glen Ellyn Utilities	353	16	232	1959	1959	10	50	300	129	2.32	0.010	2.80	0.012
31.2g	Carol Stream Sbd.	335	10	225	1958	1958	1.5	40	408	9	45.30	0.201	122.00	0.541
40NllE-														
8.4f (T)	Itasca (V)	200	12	129	1959	1959	8	7	115	40	2.88	0.022	3.40	0.026
8.6c (5)	Itasca (V)	190	12	108	1958	1958	5.5	28	70	122	0.57	0.005	0.57	0.005
8.6f (3)	Itasca (V)	200	12	120	1939	1947	1	2	350	20	17.50	0.146	20.50	0.171
8.8f (2)	Itasca (V)	185	8	102	1936	1947	2	62	50	108	0.46	0.005	0.46	0.005
24.4b	River Forest Golf Cb.	219	10	164	1959	1959	1	28	200	44	4.55	0.028	4.55	0.028
28.3a (3)	Addison (V)	221	10	150	1956	1957	....	14	600	109	5.50	0.037	8.70	0.058
28.3f (2)	Addison (V)	91	6	21	1908	1950	2		98	7	13.85	0.660	15.20	0.725
28.4f (1)	Addison (V)	155	10	65	1924	1925	10	18	150	2	75.00	1.152	90.50	0.139
28.7b	Addison (V)	152	10	66	....	1934	6	20	200	10	20.00	0.304	24.00	0.364
33.7f (4)	Addison (V)	250	10	176	1954	1959	......	30	453	85	5.34	0.030	7.30	0.042
IRO—														
26NllE-19	Gibson's Transfer	173	6	38	....	1959	2	14	159	50	3.18	0.084	4.22	0.112
27NllW-														
ll.lh	C. Clifton	130	4	......	1947	1947	—	38	10	7	1.43	....	1.50	....
27N14W-														
18.3g (T)	Danforth (V)	160	8	16	....	1956	5.8	24	12	88.5	0.14	0.009	0.14	0.090
28Nl0E-														
36.8a	W. G. Cole	108	4	10	1945	1946	1	7.5	20	7.5	2.67	0.267	2.76	0.276
28N12W-														
16.6g	Martinton (V)	265	10	117	....	1959	8	9	530	13	40.80	0.0350	74.80	0.640
28N14W-														
3.4d (1)	Clifton (V)	137	6	41	....	1941	6	24.5	46	3.7	12.42	0.304	13.20	0.322
28.5e (1)	Ashkum (V)	196	8	42	1947	1947	12	28	75	40	1.88	0.045	2.15	0.051
29Nl0E-														
31.2d	A. Goodman	172	4	......	1949	1949	....	50	20	10	2.00	....	2.10	....
29N14W-														
14.2f	George Berns	89	4	17	1929	1933	10	28	150	58	2.60	0.153	4.92	0.289
14.4h1 (1)	Chebanse (V)	152	8	66	1949	1949	1	39	371	20.3	18.30	0.278	19.00	0.288
14.4h2 (2)	Chebanse (V)	150	10	66	1957	1957	2.5	45	324	20	16.20	0.246	16.80	0.255
21.1e	H. Fleming	150	4	70	1927	1934	24	4	10	3	3.33	0.048	3.40	0.049
26.5a	Sch. Dist. 4, Clifton	196	6	98	....	1952	4.5	7.7	48	5.2	9.22	0.094	9.80	0.100

Table A (Continued)

Well number	Owner	Depth (ft)	Diameter (in)	Penetration (ft)	Year drilled	Year of test	Length of test (hr)	Nonpumping level (ft)	Pumping rate (gpm)	Drawdown (ft)	Unadjusted Specific capacity (gpm/ft)	Unadjusted Specific capacity per foot of penetration (gpm/ft^2)	Adjusted Specific capacity (gpm/ft)	Adjusted Specific capacity per foot of penetration (gpm/ft^2)
KNE—														
38N7E-														
3.6g	E. Tanner	158	5	97	1950	1950	......	21	30	11	2.73	0.028	2.86	0.029
22.1c	Batavia Farm Service	111	5	38	1946	1946	......	21	20	4	5.00	0.131	5.15	0.135
22.8b	G. H. Alexander	290	6	196	1950	1950	......	51	70	28	2.51	0.013	2.82	0.014
38N8E-														
3 (W)	North Aurora (V)	190	....	50	....	1953	......	....	20	2	10.00	0.200	10.25	0.205
4.6g	O. S. Skeen	110	5	46	1955	1955	......	45	20	5	4.00	0.087	4.13	0.090
17	Matteson	70	5	16	1940	1940	......	19	20	3	6.66	0.417	6.85	0.428
21	Burgess-Norton Co.	220	20	160	1950	1950	4	50	200	120	1.67	0.010	2.58	0.016
29.5g	V. Tiazzo	140	19	19	1947	1947	......	26	20	2	10.00	0.526	10.25	0.540
31.7d	Blackberry Hts. Sbd.	160	11	101	1959	1959	5.5	36	200	9	22.20	0.210	27.60	0.273
32.3c (1)	Montgomery (V)	175	8	141	1928	1947	5	24	100	10	10.00	0.071	11.30	0.080
32.5d	N. L. Pitz	88	5	30	1947	1947	......	18	19	1	19.00	0.635	19.40	0.646
32.7d	Nick Larenz	142	5	84	1950	1950	......	42	30	1	30.00	0.375	30.90	0.368
35.8d	Marviray Manor	300	10	242	1946	1946	5	27	50	5	10.00	0.041	10.60	0.044
39N6E-														
22.5d	D. Perry	212	5	142	1949	1949	......	19	30	11	2.73	0.019	2.87	0.020
39N7E-														
1.5a	D. Scott	132	5	48	1950	1950	......	24	30	6	5.00	0.104	5.21	0.108
2.7c1	Potter	128	5	63	....	....	......	45	10	15	0.67	0.011	0.68	0.001
2.7c2	R. Johnson	139	5	76	1946	1946	......	38	20	5	4.00	0.053	4.12	0.054
6.1c	A. H. Bennet	306	5	170	1948	1948	......	77	10	5	2.00	0.012	2.04	0.012
8.8e	H. W. Dahlstrom	185	5	60	1947	1947	......	77	20	24	0.83	0.014	0.88	0.015
9.8b	D. T. Hugbs	285	6	75	1958	1958	12	68	50	2	25.00	0.333	27.60	0.368
20.6c	M. Tiemey	190	5	71	1956	1956	......	30	25	30	0.83	0.012	0.88	0.012
20.6h	M. T. Voss	121	5	45	1951	1951	......	23	20	12	0.48	0.011	0.50	0.011
39N8E-														
4.4a	I. Johnson	152	5	82	....	....	......	45	20	4	5.00	0.061	5.15	0.063
11.7c (3)	St. Trng. Sch., Girls	265	10	192	1953	1953	4	66	200	6	12.48	0.065	33.40	0.173
11.7c (3)	St. Trng. Sch., Girls	265	10	192	1953	1957	......	61	175	22	8.00	0.042	22.20	0.116
15.3e (2)	Fox R. Sanitarium	300	6	220	1952	1957	8	30	550	38	14.49	0.066	21.20	0.096
15.6f (1)	Campana Sales Co.	281	10	240	1936	1945	0.5	37	206	42	4.92	0.020	5.48	0.023
15.6g3 (1)	Campana Sales Co.	250	10	209	1936	1946	......	41	125	95	1.32	0.006	4.82	0.023
15.6g1	B. Oman	86	4	16	....	....	......	30	15	5	3.00	0.187	3.07	0.192
15.6g2	B. Oman	85	4	32	1955	1955	......	33	25	2	12.50	0.391	12.90	0.403
15.7d	Ernest Oswalt	265	10	200	1939	1939	36	65	150	30	5.00	0.025	6.28	0.031
21.1c	L. Montgomery	86	5	48	1955	1955	......	13	15	5	3.00	0.063	3.07	0.064
21.2f (1)	Furnas Elevator Co.	193	8	133	1946	1953	......	23	30	20	1.50	0.011	2.14	0.016
21.2f (1)	Furnas Elevator Co.	193	8	133	1946	1953	......	23	120	97	1.24	0.009	4.80	0.035
22	Excel. Bldg. & Maint.	105	4	71	1949	1949	......	22	20	23	0.87	0.012	0.91	0.013
22.6d	Excel. Bldg. & Maint.	105	5	71	1949	1949	......	22	20	23	0.87	0.012	1.00	0.014
40N7E-														
25	A. Meeks	196	5	54	1956	1956	......	112	15	3	5.00	0.093	5.10	0.094
27	W. C. Wicker	192	5	43	1949	1949	......	70	20	5	4.00	0.093	4.12	0.096
33.5a	Larson	183	5	61	1946	1946	......	2	25	23	1.08	0.018	1.14	0.019
40N8E-														
10.4g	Jacobson	157	5	85	1946	1946	......	68	10	11	0.91	0.011	1.03	0.012
13.8h	A. Weeker	292	6	194	1940	1940	1	60	18	40	0.45	0.002	1.14	0.006
19.1g	A. Cibis	280	4	127	1951	1951	......	55	10	41	0.24	0.002	0.25	0.002
21.6f	A. W. McNeille	383	5	261	1947	1947	......	78	10	30	0.33	0.001	0.44	0.002
26.7b	U.S. Print. & Lithog.	319	10	271	1939	1946	2	48	139	9	15.45	0.057	49.00	0.181
28.8f	C. Sandberg	226	5	81	1950	1950	......	80	15	15	1.00	0.012	1.03	0.013
28.8h	W. Jonson	235	....	75	1958	1958	......	92	15	28	0.54	0.007	0.55	0.001
30.6g	T. Engelhart	140	5	55	1951	1951	......	47	25	8	3.14	0.057	3.25	0.039
32	Kane Co. Farm Bur.	242	5	46	1957	1957	0.5	80	34	5	6.80	0.148	7.02	0.152
41N7E-														
22.7g	Plato Milk Co.	350	6	200	1912	1934	24	60	65	20	3.25	0.016	3.61	0.018
22.7h	Plato Milk Co.	350	6	182	....	1938	24	60	65	20	3.25	0.018	3.60	0.020
41N8E-														
21	Rialto Theatre	300	......	255	1941	1958	......	9	530	51	10.40	0.040	4.50	0.214
27.5d	Elgin State Hosp.	260	4	140	....	1935	......	86	25	63	10.40	0.003	0.50	0.004
28.1e	Rollins Builders Inc.	300	12	213	1960	1960	12	17	310	15	20.62	0.097	30.60	0.102
35.7g	Max Gates	20	6	11	1924	1934	......	10	15	2	7.50	0.682	19.50	0.102
42N8E-														
23.7a	Haeger Potteries	343	6	290	1939	1939	5	19	33	69	0.48	0.002	0.65	0.002
23.7d	Eat Dundee (V)	130	6	30	1933	1939	0.5	51	30	30	4.34	0.145	5.35	0.178
26.2g	Fin & Feather Club	173	6	10	....	1957	......	115	32	10	3.20	0.320	3.36	0.340
KNK—														
29N12E-														
4.4a1 (1)	St. Anne (V)	257	10	157	1918	1918	......	....	200	15	13.35	0.085	17.10	0.109
4.4a2 (1)	St. Anne (V)	265	10	161	1928	1937	......	57	300	16	18.75	0.116	26.80	0.166
29N12W-														
4.4a1 (1)	St. Anne (V)	257	10	158	1918	1947	......	57	285	16	17.88	0.114	25.20	0.160
30N9E-														
27.2d (3)	Buckingham (V)	155	8	57	1949	1949	6	33.9	31	36	0.86	0.015	0.87	0.020
27.2d (3)	Buckingham (V)	240	8	148	1949	1949	3	40	55	38.2	1.44	0.010	1.51	0.010

Table A (Continued)

Well number	Owner	Depth (ft)	Diameter (in)	Penetration (ft)	Year drilled	Year of test	Length of test (hr)	Nonpumping level (ft)	Pumping rate (gpm)	Drawdown (ft)	Unadjusted: Specific capacity (gpm/ft)	Unadjusted: Specific capacity per foot of penetration (gpm/ft^2)	Adjusted: Specific capacity (gpm/ft)	Adjusted: Specific capacity per foot of penetration (gpm/ft^2)
KNK—(Cont'd)														
30N10E-														
23.8h	Ernst Denault	114	4	55	1947	1947	3	21.5	17	11.5	1.48	0.027	1.52	0.030
33	Texas—Ill. Herscher	115	....	55	1952	1952	22	53	60	33	1.82	0.033	3.30	0.060
30N11E-6	Jacob Zeilenga	100	....	96	1949	1949	......	6	450	16	28.10	0.300	47.90	0.510
30N11W-28	Hopkins Park School	150	8	66	1959	1959	4.5	20	75	70	1.07	0.016	1.34	0.020
30N12E-2	Jacob Salm	243	....	218	1949	1949	......	5	200	39	5.13	0.023	25.00	0.120
30N12W-														
25.6b	Vigil De Groot	234	6	182	1959	1959	3	8	180	10	18.00	0.099	22.00	0.120
27	Richard Voss	109	6	81	1940	1940	......	6	70	8	8.75	0.108	9.57	0.120
30N13W-														
14	Lowe Seed House	177	6	114	1943	1943	......	12	28	4	7.00	0.061	7.18	0.060
14.4e	Aroma Park (V)	299	8	249	1959	1959	5	10	200	80	2.50	0.010	....	......
14.6b (1)	Aroma Park (V)	182	8	131	1950	1950	2	20	100	18.3	5.46	0.042	6.33	0.040
19.4b	Kankakee Co. Fair	156	6	126	1948	1948	1	7	300	19.5	15.40	0.122	22.60	0.180
23	Trevlyn Riggs	52	....	129	1946	1946	1	6	20	7	2.86	0.022	2.95	0.020
27	James Wilson	68	4	49	1946	1946	3	11	20	12	1.67	0.034	2.06	0.040
31N11E-														
5.3g (1)	Kankakee River St. Pk.	96	6	70	1953	1953	4	12	10	22	0.45	0.006	0.48	0.007
31N12E-														
19.1f	Bourbonnais (V)	230	10	198	1923	1947	24	....	65	6	10.80	0.055	11.80	0.060
20.8b	E. Benoit	86	6	30	1928	1934	1	20	20	10	2.00	0.067	2.07	0.070
23.5a	S. Stone	175	6	71	....	1958	......	51	25	45	0.56	0.008	0.61	0.010
33.4g(1)	Borden Co.	300	8	266	1946	1946	20	8	265	69.5	3.82	0.014	4.40	0.020
33.4h(2)	Borden Co.	325	8	295	1947	1947	24	15.5	209		3.52	0.012	4.00	0.010
33.5g(2)	General Food Corp.	325	10	274	1961	1961	2	12	225	11	20.40	0.075	26.20	0.100
34.3a	G. Dandurand	100	4	57	1939	1940	.....	28	25	12	2.08	0.036	2.47	0.038
31N13E-														
13.3d (N)	Momence (C)	175	12	125	1957	1957	2	16	360	6	60.00	0.480	84.00	0.670
24.1g	Eldorado Terrace	282	8	252	1959	1959	5	....	100	39	2.56	0.010	5.46	0.022
33 (2)	Momence (C)	125	12	105	1936	1947	5	2	450	46	9.80	0.093	20.42	0.195
31N14E-														
18.4.a (5)	Momence (C)	575	12	513	1936	1947	......	20	95	90	1.06	0.002	2.92	0.006
19.7d (S)	Momence (C)	176	12	120	1957	1957	2	15	393	8.5	46.30	0.386	67.70	0.171
32N12E-														
22.8e1 (S)	Manteno (V)	100	12	80	1936	1936	......	17	450	25	18.00	0.250	32.70	0.725
22.8e1 (S)	Manteno (V)	100	12	80	1936	1939	......	24	210	25	8.40	0.113	11.30	0.153
22.8e1 (S)	Manteno (V)	120	12	97	1941	1941	......	28.3	285	18	15.83	0.172	22.90	0.250
26.4c (5)	Manteno St. Hosp.	225	15	206	1940	1940	......	19	390	121	3.22	0.015	8.00	0.039
26.5f (3)	Manteno St. Hosp.	227	12	107	1935	1935	5	10	268	88	3.05	0.028	5.22	0.049
26.5g (4)	Manteno St. Hosp.	226	.....	206	1938	1938	6	19.7	615	3.6	171.00	0.830	275.00	1.333
32N13E-35	Frank Gamble	101	.....	71	1959	1959	2	23.5	21	4.5	4.67	0.066	4.80	0.068
32N14E-														
19.1b (3)	Grant Park (V)	330	8	265	1949	1949	3	41	125	14	8.94	0.034	10.47	0.040
20.8c2 (1)	Grant Park (V)	252	8	192	1899	1949	1	34	49	27	1.81	0.009	2.02	0.011
29	Am. Tel. & Telegraph	150	8	67	1956	1956	5	36	30	3	10.00	0.150	10.00	0.150
LKE—														
43N9E-														
13	E. Sayewski	247	....	100	1934	1934	5	75	16	20	0.81	0.008	0.83	0.008
13.6b	G. Greswell	252	6	40	1933	1933	24	50	30	80	0.38	0.009	0.41	0.010
22	I. Bates	207	6	39	....	....	......	38	50	7	7.15	0.183	7.60	0.195
25.5d	Valenti	310	10	71	1958	1958	7	112	740	3	247.00	3.480	426.00	6.000
25.7a	Elm Construction Co.	310	10	71	1958	1958	3	119	716	2	358.00	5.180	568.00	8.000
26.1e	M. McDoo	247	6	15	1937	1937	4	82	40	3	13.35	0.890	13.95	0.931
36.1h	Pure Oil, Barrington	305	10	85	1945	1945	12	84	665	9.5	70.00	0.825	137.00	1.620
43N10E-														
6.6a	Albani Real Estate	330	6	43	1956	1958	8	135	240	35	6.85	0.159	9.95	0.232
7	Wm. Rueffer	274	....	10	1941	1941	8	90	16	13	1.23	0.125	1.27	0.127
7.3h	Mt. St. Joseph (V)	400	10	112	1949	1949	8	106	113	67	1.69	0.015	2.12	0.019
18.5c	C. E. Johnson	278	6	11	1941	1941	24	101	40	9	4.45	0.404	4.72	0.428
20.2e (3)	Lake Zurich (V)	443	6	143	1949	1949	1	40	135	3	13.31	0.093	13.92	0.098
20.6h (2)	Lake Zurich (V)	421	10	149	1951	1951	1.5	108	396	7	56.60	0.380	82.00	0.550
24.5e	G. Reed	197	6	30	1939	1939	2	45	10	20	0.50	0.017	0.51	0.017
25	C. H. Parson	192	6	17	1940	1941	14	33	40	15	2.67	0.057	2.86	0.170
25	L. Schaufler	211	6	17	1937	1937	4	46	40	14	2.86	0.163	3.06	0.180
26	R. L. Huszaah	202	6	9	1934	1944	......	8	35	14	2.50	0.278	2.65	0.295
28	Kopp Farm	350	6	81	1958	1958	5	110	100	2	50.00	0.617	55.50	0.685
43N11E—														
6.7g	Towner Sbd.	280	6	39	1957	1957	.....	85	50	75	0.67	0.017	0.75	0.019
8.2f	Vernon Hills Inc.	190	6	17	1961	1961	24	74	50	38	1.32	0.078	1.46	0.086
15.5f	J. D. Allen	162	6	44	1941	1941	16	38	15	7	2.14	0.049	2.20	0.050
35.3d	Wm. Johnson	350	....	230	1938	1957	24	53	236	44	5.36	0.023	7.94	0.035
35.6c	Chevy Chase CCb.	280	....	160	1938	1958	24	53	236	48	5.37	0.034	8.33	0.052
43N12E-														
19.1c	W. Wecker	228	6	18	1935	1935	8	68	25	32	0.78	0.043	0.82	0.045
19.1h	H. E. LeRoy	275	6	81	1940	1940	10	30	75	10	7.50	0.093	8.27	0.012
31.6f	Ill. Tollway Comm.	330	6	115	1958	1958	21	63	30	3	10.00	0.087	10.23	0.090

Table A (Continued)

Well number	Owner	Depth (ft)	Diameter (in)	Penetration (ft)	Year drilled	Year of test	Length of test (hr)	Non-pumping level (ft)	Pumping rate (gpm)	Drawdown (ft)	Unadjusted: Specific capacity (gpm/ft)	Unadjusted: Specific capacity per foot of penetration (gpm/ft²)	Adjusted: specific capacity (gpm/ft)	Adjusted: specific capacity per foot of penetration (gpm/ft²)
LKE—(Cont'd)														
44N9E-														
20.2f	Island Lake (V)	190	....	20	1941	1941	8	70	10	40	0.25	0.012	0.26	0.013
21.6b	Island Lake (V)	182	....	20	1940	1940	8	50	20	50	0.40	0.020	0.42	0.021
26.1c1 (1)	Wauconda (V)	231	8	13	1939	1939	8	39	210	20	10.50	0.807	13.85	1.065
26.1c2 (2)	Wauconda (V)	257	12	31	1939	1939	8		318	44	7.23	0.233	11.20	0.362
26.3b (3)	Wauconda (V)	325	12	32	1957	1957	8	25	287	155	1.85	0.058	4.00	0.125
44N10E-														
24.3d2	Mundelein (V)	270	6	37	1954	1954	......	64	183	13	14.05	0.380	17.45	0.474
24.3d1	A. T. McIntosh & Co.	264	12	31	....	....	......	80	350	143	2.45	0.079	5.80	0.187
24.3e1	Loch Lomond Sbd.	358	8	91	1953	1953	......	71	71	10	7.10	0.078	7.80	0.085
24.3e2	A. T. McIntosh & Co.	264	12	33	1954	1954	......	82	64	93	0.69	0.021	0.80	0.024
24.3e3	A. T. McIntosh & Co.	270	6	39	1954	1954	......	64	182	12	15.15	0.390	15.50	0.398
30.3c	M. J. Boyle	358	12	60	1954	1944	8	82	330	20	16.50	0.276	25.50	0.425
32.6c	Wm. M. Paris	351	6	5	1942	1942	8	135	25	2	12.50	2.500	12.90	2.580
44N11E-														
8 (1)	Leesley Nursery	252	8	81	....	1929	9	20	60	19	3.16	0.039	3.48	0.043
8	Leesley Nursery	255	8	90	1956	1959	......	40	100	70	1.43	0.016	1.75	0.019
9.2d	E. J. Burns (Sbd.)	168	12	46	1954	1954	......	14	115	75	1.53	0.033	1.80	0.039
10.3b	B. Cooper	242	6	79	1959	1959	24	47	125	93	1.35	0.017	1.75	0.039
11.4b	E. P. Doerr	260	6	50	1959	1959	8	77	226	36	6.27	0.125	8.89	0.177
14.7c	Casey	342	6	104	1941	1941	4	60	35	80	0.44	0.004	0.49	0.005
14.8d	Farm	301	6	74	1940	1940	4	67	30	28	1.07	0.014	1.14	0.015
16 (T)	Libertyville (V)	225	16	56	1955	1955	24	52	188	55	3.42	0.061	4.75	0.085
16.la	Libertyville (V)	250		75	1950	1950	1	9	70	59	1.19	0.016	1.38	0.018
16.1b1 (6)	Libertyville (V)	297	6	97	1955	1958	8	53	200	24	8.34	0.086	11.00	0.131
16.1b1 (6)	Libertyville (V)	297	16	102	1955	1955	......	20	350	180	1.94	0.019	5.00	0.049
16.1b1 (6)	Libertyville (V)	297	16	102	1955	1955	......	20	376	180	2.09	0.020	5.30	0.052
16.1b1 (6)	Libertyville (V)	297	16	102	1955	1955	......	20	728	150	4.85	0.048	19.15	0.188
16.1b1 (6)	Libertyville (V)	297	16	102	1955	1955	8	13	681	143	6.17	0.060	15.00	0.147
16.1b2 (7)	Libertyville (V)	300	6	102	1955	1955	6	33	630	152	4.15	0.041	52.50	0.515
16.1b2 (7)	Libertyville (V)	300	6	102	1955	1958	......	53	700	24	29.20	0.286	82.00	0.820
16.2c (1)	Libertyvillc (V)	251	16	63	1929	1935	5	....	442	130	3.40	0.054	10:50	0.167
16.2c (1)	Libertyville (V)	251	....	64	1929	1958	......	96	300	57	5.26	0.082	8.92	0.140
16.2c (1)	Libertyville (V)	251	16	63	1929	1930	......	....	450	196	2.30	0.036	17.30	0.275
16.3c 4	Libertyville (V)	240	8	40	1921	....	5	....	70	35	2.00	0.050	2.28	0.057
16.3c1 (3)	Libertyville (V)	287	12	115	1947	1947	3	15	330	37	8.90	0.078	14.90	0.130
16.3e1 (3)	Libertyville (V)	287	12	115	1947	1958	8	52	325	14	23.20	0.202	50.00	0.435
16.3e2 (4)	Libertyville (V)	286	6	129	1946	1946	......	20	200	11	18.20	0.141	22.70	0.175
16.3e2 (4)	Libertyville (V)	286	6	129	1947	1958	8	52	150	14	10.70	0.083	12.85	0.100
16.4d1 (5)	Libertyville (V)	227	6	42	1950	1950	1.5	35	130	6	21.70	0.517	24.80	0.590
16.4d1 (5)	Libertyville (V)	227	12	71	1951	1951	1.8	39	305	13	23.60	0.332	33.30	0.470
16.4dl (5)	Libertyville (V)	227	12	71	1951	1958		79	500	26	19.25	0.272	38.70	0.545
16.4d2 (T)	Libertyville (V)	251	6	78	1950	1950	5.5	35	215	13	16.51	0.212	21.40	0.275
19.8a	Mundelein (V)	285	12	46	1930	1930		64	120	57	2.11	0.046	2.64	0.057
19.2a	Mundelein (V)	213	10	1	1946	1946	6	90	125	60	2.08	2.080	2.63	2.630
28.2f	I. Florsheim	178	10	9	1935	1961	24	37	100	27	3.71	0.412	4.35	0.483
31.5e	E. J. & E. RR	215	5	25	1959	1961	3	73	55	34	1.62	0.065	1.80	0.072
32.3a	Cuneo Press Inc.	231	6	51	1954	1954	......	50	50	140	0.36	0.007	0.46	0.009
32.2a	Cuneo Press Inc.	231	6	51	1954	1954	......	50	130	128	1.02	0.020	1.38	0.027
36.3d	A. A. Gilchrist	222		17	1941	1941	4	50	10	4	2.50	0.147	2.54	0.150
44N12E-														
6	Abbott Lab.	270	8	113	1952	1952	......	44	30	88	0.34	0.003	0.37	0.003
9 (1)	Great Lakes Hosp.	200	....	20	....	....	9	25	110	35	3.15	0.158	3.78	0.189
16	T. H. Donnelly	201	8	12	1936	1936	10	40	55	55	1.00	0.083	1.12	0.093
21	C. Olmstead	295	8	125	1937	1937	3	55	25	120	0.21	....	0.23	0.002
45N9E-														
1.la	Fox Lane Hills Sbd.	383	....	111	1954	1954	......	60	30	140	0.21	0.002	0.24	0.002
23 (2)	Wooster Lake Co.	200	....	8	....	1932	1	30	70	2	35.00	4.370	37.20	4.650
23.3c	E. Ross	265	6	65	1947	1947	....	40	40	10	4.00	0.062	4.20	0.065
45N10E-														
12	A. Hallman	235	4.5	9	1939	1939	6	45	10	10	1.00	0.112	1.02	0.114
12.2e (1)	L. Hennier.	265	4	15	1951	1951	......	60	10	5	2.00	0.199	7.20	0.248
16	Shorew'd-Ridge Wtr. Co.	314	6	81	1952	1952	......	45	200	81	2.47	0.031	3.66	0.045
16.4a	L. B. Harris	278	6	40	1952	1952	......	45	128	20	6.40	0.160	7.70	0.193
16.5a (1)	Shorew'd-Ridge Wtr. Co.	342	12	54	1947	1948	23	41	100	158	0.63	0.012	0.79	0.015
19. 1a	Public Service Co. of N. Ill.	267	....	57	1953	1953	......	35	25	27	0.93	0.016	1.11	0.020
27.5c	Grays Lake (V)	337	12	87	1958	1958	8	80	442	145	3.05	0.035	9.82	0.113
27.5c	Grays Lake (V)	337	12	87	1958	1959	5	87	710	106	6.70	0.077	89.00	1.020
28.6h1 (3)	Round Lake Park	313	10	53	1944	1944	8	46	100	74	1.35	0:025	1.67	0.032
28.6h2 (1)	Round Lake Park	279	6	29	1939	1939	6	26	150	46	3.28	0.113	4.20	0.145
28.6h1 (1)	Boysen Water Co.	279	6	29	1939	1939	6	46	150	26	5.78	0.199	7.20	
28.6h2 (3)	Boysen Water Co.	313	10	53	1944	1944	8	46	100	54	1.85	0.035	2.25	0.043
29.4f (1)	Round Lake (V)	350	6	120	1914	1945	1.5	40	175	10	17.50	0.146	21.00	0.175
29.5h (2)	Round Lake (V)	359	10	133	1945	1945	7.5	51	288	107	2.66	0:020	5.10	0.038
45N11E-														
2.1b (2)	Waukegan C'tryside Sbd.	285	6	75	1957	1957	......	25	22	175	0.13	0.002	0.14	0.002
46N9E-														
9.4e	N. Keller	260	4	10	1947	1947	......	30	30	5	6.00	0.600	6.17	0.617
13.1c	Ferris	250	4	18	1954	1954	......	15	10	15	0.67	0.037	0.68	0.038
28.2h (1)	Chain-O-Lakes St. Pk.	234	8	22	1940	1940	8	44	53	94	0.56	0.025	0.65	0.030
28.2h (1)	Chain-O-Lakes St. Pk.	270	8	52	1940	1940	8	54	40	97	0.41	0.008	0.46	0.009
46N10E-														
12.1f	J. A. Cuthrie	257	4	10	1941	1941	......	38	15	10	1.50	0.150	1.56	0.156
28.2h	Antioch Sch. Dist 31	290	6	30	1958	1958	8	65	45	185	0.24	0.008	0.32	0.011

Table A (Continued)

Well-number	Owner	Depth (ft)	Diam-eter (in)	Pene-tration (ft)	Year drilled	Year of test	Length of test (hr)	Non pump-ing level (ft)	Pump-ing rate (gpm)	Draw down (ft)	Unadjusted: Specific capacity (gpm/ft)	Unadjusted: Specific capacity per foot of pene tration (gpm/ft^2)	Adjusted: Specific capacity (gpm/ft)	Adjusted: Specific capacity per foot of pene-tration (gpm/ft^2)
LKE—(Cont'd)														
46NllE-														
16.4g	R. Laursen	210	4	20	1943	1943	......	35	5	25	0.20	0.010	0.20	0.010
46N12E-														
10.5d (1)	Winthrop Harbor	138	8	42	1953	1959	......	10	250	50	5.00	0.119	7.65	0.182
10.8g (4)	Winthrop Harbor (V)	159	6	69	1912	1922	2	....	37	16	0.23	0.003	16.80	0.244
21 (2)	Zion (C)	220	8	32	....	1932	......	12	50	105	0.50	0.016	0.54	0.017
28	J. Sicks	262	8	121	1946	1946	......	26	75	110	0.68	0.006	0.82	0.004
35	Ill. Beach St. Pk.	160	8	36	1947	1947	2	17	11	124	0.09	0.003	0.10	0.003
MCH–														
43N6E-														
4.5f (1)	Union (V)	192	...	42	1935	1958	0.3	50	150	86	1.74	0.041	2.18	0.052
43N8E-														
1.8g	Ladd Enterprises	250	6	67	1960	1960	8	10	130	120	1.08	0.016	1.45	0.022
4	Harnischfeger Co.	400	....	130	1956	1956	.....	111	263	30	8.80	0.068	12.80	0.099
5.1b1 (1)	Pure Oil Co.	423	8	165	1948	1948	6	74	51	43	1.18	0.007	1.31	0.008
5.1b1(1)	Pure Oil Co.	423	8	165	1948	1957	......	113	160	11	14.55	0.085	14.78	0.090
5.1b2(2)	Pure Oil Co.	414	10	159	1953	1957	.....	90	200	40	5.00	0.031	6.90	0.043
13.lg (2)	Cary (V)	300	10	146	1913	1940	6	30	113	70	1.62	0.011	2.02	0.014
13.lg (2)	Cary (V)	300	10	146	1913	1922	3	22	118	52	2.27	0.016	2.80	0.019
24.1g	A. Filip	125	....	23	1940	1940	5	14	10	20	0.50	0.022	0.66	0.029
26.1e	F. Chranowski	213	....	8	1931	1934	2	85	20	18	1.11	0.138	1.16	0.145
27.2el	Algonquin-McHenry CO.	167	6	32	1954	1954	......	30	165	30	5.50	0.172	7.06	0.221
27.2e2	Algonquin (V)	165	6	30	1955	1957	4	45	165	45	3.67	0.122	4.69	0.157
29.4a (1)	Lake-in-the-Hills	257	10	97	1947	1954	24	60	100	35	2.86	0.029	3.38	0.034
33.7.a	B. Standerman	207	4	17	1952	1952	.....	110	10	5	2.08	0.118	2.04	0.120
43N9E-														
6.2bl	Northwood Fur Farm	330	12	100	1954	1954	......	105	118	125	0.94	0.009	1.26	0.013
6.2b2 (3)	Northwood Fur Farm	385	12	135	1954	1954	2	105	55	10	5.50	0.041	5.92	0.044
18.3al(1)	Fox River Grove (V)	145	12	43	1928	1928	2.5	6	220	19	11.60	0.270	14.35	0.334
18.3al(1)	Fox River Grove (V)	145	12	43	1928	1947	0 5	9	250	23	10.70	0.250	15.35	0.356
18.3a2(2)	Fox River Grove (V)	120	10	19	1956	1956	2	17	250	32	7.82	0.412	11.05	0.583
18.3a2(2)	Fox River Grpve (V)	120	10	19	1956	1958	9	17	320	35	9.15	0.482	14.85	0.780
30	V. C. P. Dreiske	243	4	23	1941	1941	......	100	32	38	0.84	0.036	0.88	0.038
32	T. Suchy	182	4	10	1941	1941	......	60	14	5	2.80	0.280	2:86	0.286
44N7E-														
13.6e	St. Joseph Noviciate	268	6	5	1959	1959	6	30	100	16	6.25	1.250	7.17	1.432
16.7h1 (1)	Hwy. Garage Woodstock	330	6	65	1956	1957	1.5	110	4	120	0.03	0.001	0.03	0.005
25	M. Schieck	350	6	60	1936	1936	......	25	30	8	3.75	0.062	3.92	0.065
44N8E-														
25	N. Johnson	257	5	10	1934	1944	......	112	10	21	0.48	0.048	0.49	0.049
33.8a	Nat. Grain Yeast Co.	319	12	62	1940	1940	5	105.5	140	62	2.28	0.037	2.90	0.047
33.8b	Crystal Lake (C)	280	10	20	1940	1940	3	98	350	46	7.62	0.380	13.35	0.669
33.8b	Clystal Lake (C)	280	10	20	1905	1947	1	107	415	46	9.04	0.452	17.90	0.896
45N8E-														
10.8c	Morton Chemical Co.	222	6	15	1948	1959	28	46	110	134	0.90	0.050	1.07	0.071
17.8a	C. Todd	330	6	150	1939	1939	10	22	10	58	0.17	0.001	0.18	0.001
22	Nathanson	208	...	14	1943	1948	4	42	10	12	0.83	0.059	0.85	0.061
22.5e	F. C. Howard	300	8	153	1939	1939	10	3	150	18	8:35	0.055	10.12	0.066
25.2a (1)	Eastwood Manor Wtr. Co.	180	8	12	1955	1958	10	42	100	40	2.50	0.208	3.13	0.261
25.2a (1)	Eastwood Manor Wtr. Co.	180	8	12	1955	1956	......	32	125	57	2.20	0.183	2.76	0.230
26.6f	McHenry Sand & Gravel	193	12	11	1956	1956	12	60	600	61	9.85	0.896	33.00	3.000
29.2h	McHenry Comm. Sch. 15	298	6	48	1961	1961	7	98	40	20	1.82	0.038	1.95	0.041
34.1h	McHenry (C)	224	....	100	1924	......	......	39	100	85	1.18	0.012	1.48	0.015
45N9E-														
7 (1)	Sunnyside Estates Sbd.	250	6	60	1942	1955	24	6	32	19	1.68	0.028	1.78	0.030
7.2g	Ladd Enterprises	303	12	56	1959	1959	36	70	220	76	2.90	0.052	3.11	0.055
7.8d	Sunnyside Estates Sbd.	297	12	47	1955	1955	......	80	25	9	2.78	0.059	2.90	0.062
7.8d	Sunnyside Estates Sbd.	297	12	47	1955	1956	12	84	40	66	0.61	0.013	0.67	0.014
46N5E-														
27.6g	L. H. Van Hoozen	150	....	27	1944	1944	10	25	12	25	0.48	0.018	0.50	0.019
46N8E-														
9.4b	Richmond (V)	170	10	8	1927	1927	17	....	100	75	1.33	0.166	1.64	0.206
46N9E-														
5	D. B. Maher	184	6	4	1937	1937	8	50	25	75	0.33	0.082	0.36	0.090
8.2b	Jim Carey	325	6	20	1944	1944	......	28	50	8	6.25	0.312	6.68	0.334
WIL-														
33N9E-														
7.4b	J.O'Brein	130	5	40	1948	1948	1	24	15	12	1.25	0.035	1.28	0.032
13.4c	Dan Collins	139	6	104	1934	1834	10	10	18	60	0.30	0.003	0.36	0.004
17.1h	E.Mavin	125	6	83	1946	1946	1	24	15	12	1.25	0.015	1.25	0.015
35	Mellinaer	115	6	63	1946	1946	1	25	10	10	1.00	0.016	1:02	0.016
36.4e	M. Carterfield	75	4	43	1943	1943	1	16	10	2	5.00	0.116	5.16	0.120

Table A (Continued)

Well number	Owner	Depth (ft)	Diameter (ft)	Penetration (in)	Year drilled	Year of test	Length of test (hr)	Non-pumping level (ft)	Pumping rate (gpm)	Drawdown (ft)	Unadjusted Specific capacity (gpm/ft)	Unadjusted Specific capacity per foot of penetration (gpm/ft^2)	Adjusted Specific capacity (gpm/ft)	Adjusted Specific capacity per foot of penetration (gpm/ft^2)
WIL—(Cont'd)														
33N10E-														
22.1d	J. Whalen	117	4	58	1942	1942	1	20	10	3	3.33	0.057	3.46	0.060
23.6a	B. Baskerville	160	4	92	1942	1942	0.5	38	10	7	1.43	0.015	1.49	0.016
33N14E-														
16.8a	Beecher (V)	165	10	75	1931	1944	......	26	300	3	100.00	1.335	126.00	1.680
34N10E-														
28.3h	E. F. Coldwater	240	4	196	1946	1946	0.5	24	10	7	1.45	0.007	1.46	0.007
29.6f	Elwood (V)	230	6	130	1956	1958	......	23	80	28	2.86	0.022	3.26	0.025
32	Elwood Ordnance	388	....	155	......	1941	......	21	246	92.5	2.66	0.017	4.54	0.029
32.5h (1)	Elwood Ordnance	203	8	162	1940	1941	8	30	40	65	0.62	0.004	1.08	0.007
32.6h (3)	Elwood Ordnance	187	10	126	1941	1941	4.5	18	80	26	3.00	0.024	3.51	0.028
34N11E-														
5	F. Kistel	134	5	30	1951	1951	2	16	20	4	5.00	0.168	5.15	0.172
12.1e	J. Fietterer	135	5	76	1952	1952	......	31	15	3	5.00	0.066	5.10	0.067
15.8h	A. Helt	136	5	97	1950	1950	......	27	15	4	3.76	0.039	3.84	0.040
17	S. Chellios	115	10	77	1946	1946	4	15	290	12	24.20	0.314	33.50	0.435
17.5d	A. Helt	102	5	70	1949	1949	1	21	20	3	6.66	0.095	6.86	0.098
20 (3)	Wabash RR Co.	176	6	156	1942	1942	10	18	240	36	6.68	0.043	9.25	0.059
20.2g1 (E)	Manhattan (V)	156	4	123	......	1934	......	15	20	13	1.54	0.012	1.59	0.013
20.2g2 (W)	Manhattan (V)	98	10	61	......	1934	......	15	40	59	0.68	0.011	1.02	0.017
26.8c	T. Gallagher	101	5	19	1950	1950	2	42	15	2	7.50	0.395	7.62	0.402
34N13E-														
(2)	Cardex Corp.	408	17	277	1945	1945	......	59	195	43	4.53	0.016	6.25	0.022
14.3f	Mall Airport	412	6	265	1957	1957	......	70	70	11	6.36	0.024	7.05	0.027
17	A. DeMuth	250	10	121	1958	1958	1	50	200	8	25.00	0.205	25.50	0.210
21.5d (1)	Monee (V)	157	10	67	1913	1946	1	75	140	10	14.00	0.209	16.40	0.245
21.7c (3)	Monee (V)	490	20	356	1960	1960	8	80	600	15	40.00	0.112	80.60	0.220
30	J. Koenig	200	8	120	1960	1960	......	28	80	22	3.64	0.030	4.12	0.034
34N14E-														
21.6b (2)	Lincoln Flds. Racing Inc.	379	16	....	1953	1953	1	32	508	10	50.80	....	86.20	....
5.3h1 (1)	Steger (V)	318	12	171	1910	1946	2	43	350	4	87.66	0.513	118.00	0.691
5.3h2 (2)	Steger (V)	325	12	215	1935	1946	2	45	400	4	100.00	0.463	138.00	0.642
5.3h2 (2)	Steger (V)	325	12	215	1935	1942	1	31	300	2.5	120.00	0.560	150.00	0.698
7.6a	Meadowood Sch.	200	6	100	1960	1960	3.5	33	50	11	4.54	0.045	4.88	0.048
8.1a (1)	Crete (V)	195	10	45	1903	1945	1	18	123	5	24.60	0.547	27.80	0.620
8.5h (2)	Crete (V)	263	12	162	1955	1955	......	40	300	16	18.80	0.115	26.90	0.166
20.1d (1)	Balmoral Hts. Sbd.	246	6	140	1956	1956	8	50	60	40	1.50	0.011	1.68	0.012
24.8d	Sun Valley Sports Cb.	203	6	91	1960	1960	......	21	60	3	20.00	0.250	21.30	0.234
35N9E-														
15	Troy Elm. School	175	6	125	1961	1960	24	15	30	4	7.50	0.060	7.80	0.062
24	Joan Sibley	55	4	17	1946	1946	......	7	16	11	1.45	0.085	1.50	0.088
31.1b (2)	Joyce 7-Up Mfg. Co.	240	14	196	1951	1951	5	44	245	18	13.60	0.070	1.445	0.074
33.1f	State of Illinios	303	6	144	1960	1960	24	159	20	42	0.48	0.003	0.66	0.005
35N10E-														
1.3h	Maloney	135	4	125	1933	1933	20	8	12	2	6.00	0.048	6.10	0.049
2.5e	J. Lasinas	123	6	54	1946	1946	0.5	30	20	24	0.83	0.015	0.90	0.017
6.4h	Ch. W. Goody	70	4	42	1950	1950	1	18	20	1	20.00	0.477	20.42	0.040
10	Zero Ice co.	228	8	178	1922	1940	2	....	160	125	0.28	0.007	1.81	0.010
13.6g	Wm. Mellish	150	5	63	1946	1946	5	40	16	11	1.45	0:023	1.50	0.024
15.6a	H. Dotson	79	4	28	1950	1950	6	51	12	1	12.00	0.430	12.77	0.456
18.8c	R. Caddarette, Jr.	231	6	154	1957	1957	12	70	47	50	0.94	0.006	1.93	0.013
18.2e	E, Moris	124	5	39	1950	1950	3	85	10	15	0.67	0.017	0.76	0.019
25.3h	J. Sibley	55	4	17	1946	1946	5	7	16	18	0.89	0.052	0.92	0.054
27.8h (2)	Preston Heights	248	15	......	1960	1960	......	10		61	3.28	0.021	13.30	0.084
28.4h	Deavours Trailer Camp	265	8	152	1952	1952	3	35	45	115	0.39	0.003	0.59	0.004
35N11E-														
2.7c	Warwick	125	5	48	1948	1948	5	62	350	8	43.80	0.915	62.10	0.496
7.8g	N. Ill. Gas Co.	180	10	130	1957	1957	1	11	90	23	3.91	0.030	4.56	0.035
7.8g	N. Ill. Gas Co.	180	10	130	1957	1957	4	11	160	92	1.74	0.013	2.39	0.018
9. 1a	W. P. Henning	185	5	103	1949	1949	1	39	12	9	1.33	0.013	1.35	0.013
9.1b	H. Henning	144	5	18	1951	1951	3	50	12	15	0.80	0.045	0.82	0.046
9.5a	Krapp	200	4	109	1948	1948	5	8	12	7	1.72	0.016	1.75	0.016
10.7c	Triebie	150	4	61	1948	1948	1	43	300	20	15.00	0.246	21.90	0.360
14.1a (1)	Lincolnway School	356	12	253	1953	1953	1.3	26	83	103		0.003	1.29	0.005
14.1a (1)	Lincolnway School	356	12	253	1953	1953	1	24	82	97	0.85	0.003	1.23	0.005
14.3b	Lincolnway School	153	6	86	1949	1949	1	14	20	2	10.00	0.264	10.25	0.428
16.2d	Devoor	130	5	65	1948	1948	5	25	300	25	12.00	0.185	18.10	0.278
21 (1)	New Lenox (V)	378	.....	155	....	1948	....	53	65	103	0.63	0.004	0.74	0.005
21.2b (2)	New Lenox (V)	334	12	232	1951	1951	5	35	205	48	4.27	0.018	6.00	0.026
28.3a	E. J. McLanghlin	79	5	4	1950	1950	2	4	25	2	12.50	3.140	12.90	3.230
29.6d	Geo. Barnes	273	14	243	1947	1947	5	17	380	5	76.00	0.313	105.00	0.432
33.1b	P. Kistel	92	5	24	1950	1950	2	12	20	2	10.00	0.418	10.25	0.428
34.8d	W. B. Mooney	129	5	38	1949	1949	1	14		2	10.00	0.264	10.25	0.428
35N12E-														
3	WLS	315	8	185	1938	1938	6	30	25	21	1.19	0.006	1.25	0.007
7.4e	A. J. Schickling	130	5	42	1951	1951	2	49	12	8	1.50	0.036	1.53	0.036
10.7f	Arbury Hills Sbd.	457	19	336	1960	1960	2	56	300	174	1.72	0.005	7.70	0.023
8.6c	Mokena (V)	225	8	135	1920	1922	3	67	57	1.2	45.50	0.352	49.50	0.367
8.6c	Mokena (V)	225	8	135	1920	1952	1.5	65	475	30	15.82	0.117	54.50	0.402
36N9E-	Spring Bank Resort	100	6	78	1939	1939	......	6	50	18	2.78	0.036	3.14	0.040
3.6h	Materials Paving Co.	159	8	109	1960	1960	......	8	77	98	0.79	0.007	1.90	0.017
3.8e	W. Anderson	147	6	71	1947	1947	5	70	20	45	0.44	0.006	0.60	0.008
9.1g (1)	Plainfield (V)	200	15	159	1929	1929	......	12	112	29	3.87	0.024	4.60	0.029
9.2g (2)	Plainfield (V)	201	15	153	1929	1929	5	10	200	61	3.28	0.021	13.30	0.084

Table A (Continued)

Well number	Owner	Depth (ft)	Diameter (in)	Penetration (ft)	Year drilled	Year of test	Length of test (hr)	Nonpumping level (ft)	Pumping rate (gpm)	Drawdown (ft)	Unadjusted: Specific capacity (gpm/ft)	Unadjusted: Specific capacity per foot of penetration (gpm/ft²)	Adjusted: Specific capacity (gpm/ft)	Adjusted: Specific capacity per foot of penetration (gpm/ft²)
WIL—(Cont'd)														
36N10E-														
3.6h	Materials Paving co.	159	8	109	1960	1960	.....	8	77	98	0.79	0.007	1.90	0.017
13.3a	Bonnie Brae Sbd.	310	18	249	1957	1957	10.5	59	850	3.1	27.40	0.111	131.00	0.526
15.1a	Material service Corp.	206	8	161	1957	1957	.....	18	228	23	9.92	0.062	13.40	0.083
15.2a	Material service Corp.	206	8	162	1957	1957	8	6	100	15	6.66	0.041	7.65	0.047
16.4d1(2)	Globe Aircraft Corp.	285	10	230	1951	1951	2	45	80	19	4.21	0.018	6.35	0.027
16.4d2 (3)	Globe Aircraft Corp.	301	10	246	1952	1952	5	46	24	77	0.31	0.001	0.48	0.002
23	Lewis Coll., Lockport	300	12	219	1956	1956	8	45	151	29	5.21	0.024	7.10	0.033
24	N. Ill. Gas Co.	221	6	146	1959	1959	2	11	50	10	5.00	0.034	5.35	0.037
26.7g	E. C. Blagg	64	5	34	1946	1946	3	30	30	2.5	12.00	0.353	14.30	0.421
31		190	6	110	1952	1952	.....	35	15	3	5.00	0.045	5.10	0.046
31.4b	Hillcrest Shop. Center	282	10	239	1959	1959	5	5	200	62	3.23	0.013	11.75	0.049
31.7a1 (3)	Richland Improv. Assoc.	290	6	130	1949	1950	2.3	24	44	12	3.67	0.028	3.93	0.030
31.7a2 (3)	Richland Improv. Assoc.	300	8	128	1951	1951	1.3	30	210	15	4.00	0.109	18.10	0.141
35.7c	New Fairmount Sch.	312	10	245	1959	1959	......	81	50	27	1.85	0.008	3.45	0.014
36N11E-														
11.1g (1)	Commonwealth Edison	485	12	332	1957	1957	5.3	82	400	7	57.20	0.172	83.00	0.250
27.3c (T)	State Geol. Survey	175	10	19	1943	1943	3	....	172	71	2.42	0.127	3.05	0.160
37N10E-														
25.5d	Lemont Mfg. co.	152	8	81	1958	1958	......	3	67	88	0.76	0.009	0.76	0.013
25.7h	Badger Pipe Line Co.	180	6	134	1954	1958	8	39	135	46	2.94	0.022	45.00	0.335
33.1h	Hampton Park	165	12	123	1958	1958	24	20	400	140	2.86	0.023	20.00	0.063

Table B. Specific-Capacity Data for Wells in Silurian Rocks in Areas Outside of Northeastern Illinois

Well number	Owner	Depth (ft)	Diameter (in)	Penetration (ft)	Year drilled	Year of test	Length of test (hr)	Nonpumping level (ft)	Pumping rate (gpm)	Drawdown (ft)	Unadjusted: Specific capacity (gpm/ft)	Unadjusted: Specific capacity per foot of penetration (gpm/ft^2)	Adjusted: Specific capacity (gpm/ft)	Adjusted: Specific capacity per foot of penetration (gpm/ft^2)
BNE—														
43N4E-														
6.6f	Ill. Toll Road Plaza	200	6	80	1958	1958	3	31	20	2	10.00	0.125	10.30	0.129
BUR—														
15N6E-														
10.5b (1)	Neponsett (V)	830	6	222	1948	1948	24	276	193	11.9	1.72	0.008	1.84	0.008
16N6E-														
8.8b (1)	Mineral (V)	375	8	146	1954	1954	3	65	42	30	1.40	0.010	1.49	0.010
FRD—														
23N7E-														
11.7d (3)	Central Soya co.	402	10	237	1947	1947	30	75	130	45	2.90	0.012	3.40	0.014
29N9E-														
16.8g (3)	Cabery (V)	357	8	143	1956	1956	4	48	125	34.5	3.63	0.025	4.22	0.030
16.8h (2)	Cabery (V)	233	6	33	1920	1920	0.1	33	70	47	1.49	0.045	1.84	0.056
HRY—														
16N1E-														
28.3h (1)	Orion (V)	615	8	210	1927	1944	3	213	115	27	4.26	0.020	4.95	0.024
16N2E-														
29.1h (1)	Osco (Uninc.)	400	5	67	1947	1947	....	225	10	10	1.00	0.015	1.02	0.015
16N5E-														
3.5c	Creamery Well	185	4	27	1890	1945	5	32.6	27	35.1	0.77	0.029	0.80	0.030
3.6c (1)	Annawan (T)	250	10	92	1947	1947	5	38	60	84	0.72	0.008	0.77	0.008
17N1E-														
11.8g (1)	Colona (V)	492	8	333	1956	1956	8	23.5	76	38.5	1.98	0.006	2.20	0.007
KNX—														
13N1E-														
17.1a (1)	Rio (V)	675	8	253	1958	1958	2	257	62	9	6.90	0.027	7.50	0.030
13N3E-														
16.5g	Altona High School	564	6	20	1940	1940	......	345	15	10	1.50	0.075	1.55	0.077
16.8h (1)	Altona (V)	808	8	280	1951	1951	6	221	135	27.5	4.91	0.018	5.64	0.021
16N1W-														
3.2e (1)	Oak Glen Home	555	12	330	1954	1954	22	186	318	83	3.83	0.013	5.62	0.017
3.2e	Rock Is. Co. Home		6	134	1940	1940	3	168	50	21	2.38	0.018	2.56	0.019
17N1E-														
7.1g (1)	Glendale Addition	595	8	277	1955	1959	5.8	162.5	121	219	0.55	0.002	0.64	0.002
17N1W-														
11.7h (1)	Weavers 3rd Addition	500	5	218	1954	1955	3.5	151	48	82	0.58	0.003	0.63	0.003
15.1h	Moline Sch. Dist. 140	260	6	54	1954	1954	11	25	35	43	0.82	0.015	0.86	0.016
21.5f (2)	Quad City Airport	410	8	252	1953	1953	16	25	213	176	1.22	0.005	1.73	0.007
18N1E-														
2.4c	Rapids City (V)	532	8	360	1952	1955	......	115	80	7	11.40	0.032	12.70	0.036
19(1)	Moline St. Hosp.	325	8	127	1931	1931	......	20.5	120	31.5	3.81	0.030	4.45	0.035
19.4d1 (2)	Moline St. Hosp.	335	10	180	1912	1931	8	9.5	202	202	1.44	0.008	2.06	0.011
29.7b (3)	C.R.I. & P. RR	405	10	267	1940	1940	......	47	135	84	1.61	0.006	1.90	0.007
31.4a (1)	Silvis Heights	555	6	233	1952	1953	3	151.5	120	6.5	18.50	0.080	21.60	0.093
31.4a (2)	Silvis Heights	556	8	171	1957	1958	2.5	168.5	225	7.5	30.00	0.175	39.50	0.231
19N1E-														
25.3f (2)	Port Byron (V)	462	8	222	1952	1952	6	127.5	36	9	4.00	0.018	4.26	0.019
WTS—														
19N4E-														
6.3a (1)	Erie (V)	567	8	392	1920	1952	......	6	92	6	15.35	0.039	17.30	0.044
19N5E-														
5.1h (2)	Eclipse Lawn Mower	193	8	45	1942	1942	......	24	470	35	13.42	0.298	25.40	0.565
20N5E-														
33.5a	Prophetstown (C)	235	10	40	1944	1944	......	41	304	26.5	11.48	0.287	16.40	0.410
21N7E-														
33.3c (2)	Dillon School	135	16	25	1960	1960	2	10	2150	8	269.00	10.700	404.00	16.150
WDF—														
27N3E-														
29.3.3	Caterpillar Trail W.D.	358	10	20	1956	1958	6.5	294	111	4	27.80	1.390	32.00	1.600

Table C. Specific-Capacity Data for Wells in Silurian and Devonian Rocks and Maquoketa Formation in Areas Outside of Northeastern Illinois

Well number	Owner	Depth (*ft*)	Diameter (*in*)	Penetration (*ft*)	Year drilled	Year of test	Length of test (*hr*)	Nonpumping level (*ft*)	Pumping rate (*gpm*)	Drawdown (*ft*)	Unadjusted: Specific capacity (*gpm/ft*)	Unadjusted: Specific capacity per foot of penetration (*gpm/ft*)	Adjusted: Specific capacity (*gpm/ft*)	Adjusted: Specific capacity per foot of penetration (*gpm/ft*)
FUL—														
4N3E-														
1.5a (2)	Dickson Mounds St. Pk.	840	6	28	1951	1951	13	95	60	115	0.52	0.019	0.57	0.020
GRY—														
32N8E-														
2.8e1 (1)	Coal City (V)	265	8	75	1925	1927	......	50	300	2	150.00	2.000	214.00	2.860
2.8e2 (3)	Coal City (V)	360	12	147	1937	1938	......	69	700	42	16.65	0.113	41.80	0.284
HRY—														
14N1E-														
21.1f (2)	Alpha (V)	1209	8	658	1950	1950	4.5	256	112	49	2.29	0.004	2.64	0.004
15N1E-														
28.4a	Ophiem (C)	370	6	143	1946	1946	3	180	50	108	0.46	0.003	0.50	0.004
15N2E-														
17.5h (1)	Andover (V)	677	8	334	1954	1954	2.5	248.5	109	53.6	2.04	0.006	2.34	0.007
KNX—														
11N4E-														
23.6d (2)	Williamsfield (V)	887	8	292	1946	1946	5.5	186.5	230	40	5.76	0.020	7.48	0.026
12N2E-														
16.5d (1)	Wataga (V)	840	8	260	1954	1954	1.5	324	108	33	3.27	0.013	3.82	0.015
12N3E-														
13.2h (1)	Victoria (V)	860	8	260	1950	1950	5	315	110	14	7.86	0.030	9.04	0.035
13N2E-														
36.6f (1)	Oneida (C)	840	8	314	1945	1945	3	277	49	5.5	8.92	0.028	9.60	0.031
LEE—														
20N8E-														
14.1d	Harmon (V)	532	5	362	1909	1916	......	7	30	62	0.48	0.001	0.51	0.001
LIV—														
28N7E-														
15.3c (N)	Saunemin (V)	584	8	184	1926	1926	......	118	20	49	0.41	0.002	0.42	0.002
MER—														
13N1W-														
26.8g (1)	North Henderson (V)	710	8	297	1957	1957	2	256.8	52	9.6	5.28	0.018	5.85	0.020
14N1W-														
13.2g (1)	New Windsor (C)	546	8	144	1924	1924	1	228	100	30	3.33	0.023	3.80	0.026
15N1W-														
4.6d (1)	Sherrard (V)	660	6	274	1950	1950	......	250	26	16	1.63	0.006	1.71	0.006
24.5g (1)	Swedona (V)	533	6	252	1957	1957	5.3	184	25	72.6	0.34	0.001	0.36	0.001
15N2W-														
27.8c (1)	Matherville (V)	604	6	285	1951	1951	8	207.5	58	7.5	7.61	0.027	8.40	0.029
PEO—														
11N6E-														
13.1a (2)	Princeville (V)	1340	10	248	1938	1938	3	194.5	320	95	3.38	0.014	4.90	0.020
RIS—														
16N3W-														
36.3b (1)	Reynolds (V)	589	12	256	1952	1952	24	240	161	44.5	3.62	0.014	4.44	0.017
17N1W-														
1.1e (1)	Urbandale Sbd.	430	8	288	1938	1938	10	163	200	27	7.43	0.026	9.40	0.033
STK—														
13N4E-														
18.4c (1)	Lafayette (V)	758	8	268	1959	1959	6	289.6	55	29	1.90	0.007	2.07	0.008
13N6E-														
19.7b (2)	Toulon (C)	780	16	338	1942	1942	2.5	203.2	205	18	11.04	0.034	14.60	0.043
WAR—														
12N3W-														
21.8a (S)	Little York (V)	326	6	100	1915	1915	10	45	33	60	0.55	0.005	0.58	0.006

Table D. Specific-Capacity Data for Wells in Galena-Platteville Dolomite in Northern Illinois

Well number	Owner	Depth (ft)	Diameter (in)	Penetration (ft)	Year drilled	Year of test	Length of test (hr)	Nonpumping level (ft)	Pumping rate (gpm)	Drawdown (ft)	Unadjusted: Specific capacity (gpm/ft)	Unadjusted: Specific capacity per foot of penetration (gpm/ft²)	Adjusted: Specific capacity (gpm/ft)	Adjusted: Specific capacity per foot of penetration (gpm/ft²)
CAR—														
25N3E-														
27.8b1	Miss. Palisades St. Pk.	446	6	57	1940	1940	......	10	61	85	0.72	0.013	0.74	0.013
27.8b2 (3)	Miss. Palisades St. Pk.	560		294	1951	1951	24	50	40	24	1.67	0.006	1.97	0.007
27.8b2 (3)	Miss. Palisades St. Pk.	560	6	294	1951	1951	24	52	61	30	2.04	0.007	2.26	0.008
COK—														
40N12E-														
32.5a	North Lake (C)	855	....	287	1940	1941	30	75	100	192	0.52	0.002	0.54	0.002
42N12E-														
33.4b (1)	Glenview Countryside	572	6	191	1939	1939	8	212	100	12	8.35	0.044	9.52	0.050
33.7b (2)	Glenview Countryside	606	10	332	1941	1941	8	188	200	26	7.70	0.023	9.70	0.029
33.1b	Glenview Countryside	650	14	160	1954	1954	24	279	230	128	1.80	0.011	2.43	0.015
DEK—														
38N3E-														
10.4g	United Precision Co.	337	6	25	1943	1943	72	130	10	5	2.00	0.080	2.04	0.082
38N4E-														
16.2d	Waterman (V)	400	10	276	1946	1947	5	30.5	165	84.5	1.96	0.007	2.39	0.009
38N5E-														
15	Hinckley (V)	157	5	33	1945	1945	5	5	15	12	1.25	0.038	1.29	0.039
39N4E-														
32.7f	NW Mutual Life Ins.	400	6	88	1940	1940	1	120	20	20	1.00	0.011	1.04	0.012
40N4E-														
13.6c	C.M.St.P. & P. RR	230	10	13	....	1934	......	61	100	59	1.70	0.131	1.93	0.149
42N4E-														
22.7a (1)	Kingston (V)	202	10	77	1911	1928	1.5	36.5	30	20	1.50	0.020	1.58	0.021
DUP—														
40N11E-														
23.1d	White Pine CCb.	628	....	225	....	1950	4	366	310	41	7.55	0.034	10.95	0.049
35.5e	Elmhurst (C)	734	....	300	....	1953	....	470	100	76	1.32	0.004	1.50	0.005
FUL—														
6N3E-														
20.6f (4)	Cuba (C)	1380	8	215	1951	1951	8	156	153	62	2.47	0.012	2.98	0.014
20.6f (4)	Cuba (C)	1380	8	215	1951	1952	3.5	168.4	86	19.8	4.35	0.020	4.90	0.023
GRY—														
34N8E-														
29.7e	Aux Sable Lock	185	6	102	1942	1942	......	14	30	77	0.39	0.004	0.41	0.004
HAN—														
7N9W-35	Mauvoo Milk Products	812	8	747	1943	1945	......	44	75	18	4.16	0.006	4.63	0.006
HND—														
10N5W-34	McChesney	675	6	35	1950	1950	......	165	130	65	2.00	0.057	2.36	0.068
HRY—														
15N5E-														
32.2f (2)	Kewanee Boiler Co.	1084	10	89	1918	1921	0.5	284	199	146	1.36	0.015	1.73	0.019
32.2f (2)	Kewanee Boiler Co.	1110	10	115	1918	1945	......	308	200	83	2.41	0.021		0.027
33 (4)	Walworth Co., Kewanee	1152	8	150	....	1938	......	263	175	20	8.75	0.058	10.80	0.072
33 (4)	Walworth Co., Kewanee	1152	8	150	....	1948	......	243	187	149	1.26	0.008	1.51	0.010
JDV—														
27N2E-														
24.2c (2)	Elizabeth (V)	317	12	282	1900	1937	4.5	130	100	10	10.00	0.036	1.14	0.041
LEE—														
2N9E-5	Better Brothers	110	6	98	1934	1934	1	30	10	2.5	4.00	0.041	4.08	0.042
21N10E-														
1.8b	L. Taylor	95	6	5	1958	1958	5	43		10	4.00	0.800	4.25	0.850
35.3b	A. Biesecker	32	48	22	1860	1934	......	9	100	23	4.35	0.198	4.95	0.225
MCD—														
7N1W-														
1.3e (1)	Prairie City (V)	1090	8	243	1954	1954	1	171.5	50	23.8	2.10	0.009	2.25	0.009
MCH—														
43N8E-														
10.6h	Hickory Manor Motel	447	10	247	1960	1960	3	113	64	25	4016	0.017	4.84	0.020
20.4b (2)	Lake-in-the-Hills	321	10	166	1947	1954		64	100	116	0.86	0.004	1.41	0.007
20.4b (2)	Lake-in-the-Hills	321	10	166	1947	1954	......	64	130	30	4.34	0.022	5.25	0.027
44N7E-														
16.7h1	Hwy. Garage, Woodstock	435	6	170	1957	1957	23.5	96	17	5	3.40	0.020	3.49	0.020

Table D (Continued)

Well number	Owner	Depth (ft)	Diameter (in)	Penetration (ft)	Year drilled	Year of test	Length of test (hr)	Non-pumping level (ft)	Pumping rate (gpm)	Drawdown (ft)	Unadjusted		Adjusted	
											Specific capacity (gpm/ft)	Specific capacity per foot of penetration (gpm/ft²)	Specific capacity (gpm/ft)	specific capacity per foot of penetration (gpm/ft²)
PEO—														
10N5E-24.8h	Brimfield Sch. Dist	1257	8	327	1949	1949	30	208	60	8	7.50	0.023	8.17	0.025
11N6E-13.1a2 (2)	Princeville (V)	1342	10	251	1938	1938	3	194.5	320	94.5	3.39	0.014	4.82	0.020
13.1a2 (2)	Princeville (V)	1342	10	251	1938	1943	1.5	195	148	50	2.96	0.012	3.57	0.014
STE—														
26N5E-36	E. Devires	183	6	173	1950	1950	3	105	28	38	0.74	0.004	0.78	0.005
27N8E-30.7b (4)	Freeport (C)	100	16	16	1928	1934	18	37	1000	13	77.00	4.810	154.00	9.620
28N8E-25	Dakota Cemetery	98	6	74	1940	1940	3	24	27	3	9.00	0.122	9.75	0.132
WAR—														
10N3W-8 (4)	Kirkwood (V)	1069	5	124	1948	1946	......	193	50	157	0.32	0.003	0.34	0.003
WTS—														
21N7E-14.4d (2)	Sterling St. Police Hq.	476	6	175	1952	1952	......	94	130	12	10.80	0.062	12.70	0.073
WIL—														
34N9E-34.3a (3)	Kankakee Ordnance	260	21	244	1940	1940	5.5	7.5	173	69	2.51	0.010	3.48	0.014
35.5a (1)	Kankakee Ordnance	275	21	263	1940	1940	4	7	100	68	1.47	0.006	18.20	0.069
35.8a1 (2)	Kankakee Ordnance	280	21	274	1940	1940	1.5	10.5	245	26	9.43	0.034	13.25	0.048
35.8a2 (2a)	Kankakee Ordnance	100	25	84	1941	1941	2.5	8.5	195	43	4.55	0.054	6.25	0.075

Table E. Specific-Capacity Data for Wells in Northeastern Illinois Showing Effects of Acid Treatment

Well number	Owner	Depth (ft)	Diameter of well (in)	Year drilled	Year of treatment	Quantity of acid used (gal)	Period acid left in well (hr)	Before acid treatment: Pumping rate (gpm)	Before acid treatment: Specific capacity (gpm/ft)	Before acid treatment: Specific capacity per foot of penetration (gpd/ft)	After acid treatment: Pumping rate (gpm)	After acid treatment: Specific capacity (gpm/ft)	After acid treatment: Specific capacity per foot of penetration (gpm/ft)	Increase in specific capacity (gpm/ft)	Percent improvement in specific capacity
COK—															
35N14E-															
15.8a1 (3)	Gold Seal Asphalt Co.	240	8	1946	1946	2000	....	130	2.17	0.011	155	19.40	0.095	17.23	798
15.8a2 (1)	Gold Seal Asphalt Co.	309	8	1937	1946	3000	....	136	2.30	0.009	155	4.44	0.018	1.14	93
15.8a2 (1)	Gold Seal Asphalt Co.	309	8	1937	1953	2000	....	82	1.46	0.006	120	5.00	0.021	3.54	242
15.8h (2)	Cold Seal Asphalt Co.	205	8	1941	1946	2000	....	92	1.06	0.006	222	2.96	0.018	1.90	180
21.2h (1)	Victor Chemical Co.	400	10	1909	1945	2500	....	120	0.50	0.012	100	0.62	0.015	0.12	24
21.2h (1)	Victor Chemical Co.	400	10	1909	1945	2000	....	158	0.60	0.014	90	1.56	0.038	0.96	154
28.5h (W)	Inland Steel Co.	332	8	1900	1945	500	....	125	......	....	183	....	....	....	......
28.5h (W)	Inland Steel Co.	332	8	1900	1945	1000	....	183	......	....	220	....	....	....	......
29.5e (1)	Amer. Locomotive Co.	222	12	1910	1945	4400	....	300	......	....	600	....	....	....	......
36N12E-															
36.3f (1)	Tinley Park St. Hosp.	491	19	1950	1951	5000	......	170	1.53	0.004	166	5.03	0.014	3.50	278
36N14E-															
31.5d (1)	Homewood (V)	252	10	1911	1945	2000	....	245	1.82	0.100	345	2.88	0.158	1.06	58
39N12E-															
4.2b (1)	Richardson Co.	315	....	1936	1952	......	....	165	55.00	....	170	85.00	....	30.00	55
42N10E-															
3.8f (1)	Barrington Woods Sbd.	250	8	1953	1953	....	....	16	0.11	0.002	16	0.16	0.003	0.05	45
42N11E-															
10.1e (2)	Wheeling (V)	245	15	1955	1955	4000	....	135	1.04	0.007	100	2.22	0.015	1.18	113
42N12E-															
17.8f	Northbrook West Sbd.	286	12	1955	1955	2000	....	64	0.45	0.003	99	0.81	0.006	0.36	88
DUP—															
38N9E-															
13.2h (4)	Naperville (C)	178	24	1928	1943	....	336	250	4.20	0.031	620	54.00	0.403	49.80	1190
38N10E-															
18.3d1 (5)	Naperville (C)	190	24	1930	1942	3000	24	390	3.70	0.023	700	26.90	0.171	23.20	627
18.3d2 (6)	Naperville (C)	202	24	1937	1947	2000	0.5	390	3.70	0.023	700	1.70	0.010	0.00	none
18.3d2 (6)	Naperville (C)	202	24	1937	1948	3000	96	285	1.70	0.010	570	12.50	0.073	10.80	635
39N9E-															
4.2b (3)	West Chicago (C)	310	24	1950	1953	3000	....	375	3.30	0.015	800	10.00	0.045	6.70	203
39N10E-															
12.4c (2)	Glen Oak CCb.	212	16	1957	1957	600	....	311	2.20	0.017	450	6.30	0.048	4.10	187
39N11E-															
10.8e2 (3)	Villa Park (V)	285	8	1919	1946	1500	....	200	3.40	0.014	369	4.50	0.018	1.10	33
13.3g (7)	Elmhurst (C)	290	8	1959	1959	3000	....	335	3.90	0.019	300	5.40	0.026	1.50	39
40N10E-															
3.4f (1)	Roselle (V)	182	10	1925	1955	1000	24	140	2.30	0.054	170	7.70	0.178	5.40	235
40N11E-															
8.5f1 (6)	Itasca (V)	181	20	1959	1959	1000	....	75	0.70	0.008	50	0.40	0.004	0.30	none
8.6b(5)	Itasca (V)	190		1958	1959	1000	20	156	1.20	0.011	250	3.80	0.035	2.60	216
8.6b (5)	Itasca (V)	190	12	1958	1960	2000	72	250	3.80	0.035	400	6.30	0.058	2.50	66
KNE—															
39N8E-															
21.2f (1)	Furnas Elevator Co.	193	8	1946	1953	1000	....	30	2.14	0.016	120	4.80	0.035	2.64	124
KNK—															
31N12E-															
33.4h (2)	Borden Co.	325	8	1947	1947	500	....	....	......	....	209	3.52	0.012	....	....
LKE—															
44N10E-															
24.3d	A. T. McIntosh & Co.	264	12	1954	1954	500	....	......	......	....	350	2.45	0.079	....	....
24.3e	Loch Lomond Sbd.	358	8	1953	1953	....	....	60	0.46	0.005	125	0.81	0.009	0.36	78
44N11E-															
16.1b1 (9)	Libertyville (V)	297	6	1955	1955	4000	....	376	2.35	0.024	200	8.34	0.086	5.99	254
16.1b2 (10)	Libertyville (V)	300	16	1955	1955	100	....	350	1.94	0.019	376	2.09	0.020	0.15	8
16.1b2 (10)	Libertyville (V)	300	16	1955	1955	4000	....	376	2.09	0.020	728	4.85	0.048	2.76	132
16.1b2 (10)	Libertyville (V)	300	16	1955	1955	. . .	......	728	4.85	0.048	681	6.17	0.060	1.32	37
16.1b2 (10)	Libertyville (V)	300	16	1955	1958	3300	....	681	6.17	0.060	700	9.45	0.103	3.28	53
35.3d	Cuneo Press Inc.	231	6	1954	1954	....	....	50	0.36	0.007	130		0.020	0.66	184
45N10E-															
16.5a	Shorewood-Ridge Wtr. Co.	342	12	1947	1948	....	....	....	......	....	100	0.63	0.012	....	......
27.5c (3)	Grays Lake (V)	337	12	1958	1959	....	....	442	3.05	0.035	710	6.70	0.077	3.65	120
MCH—															
43N8E-															
20.4b (2)	Lake-in-the-Hills	321	10	1947	1954	....	....	100	0.86	0.005	130	4.34	0.026	3.48	405
WILL—															
35N11E-															
14.1a (1)	Lincolnway School	356	12	1953	1953	2000	24	83	0.80	0.003	91	0.89	0.003	0.09	13