Midwest Technology Assistance Center
Groundwater Resource Assessment for Small Communities

Groundwater Availability
At
Mechanicsburg-Buffalo Water Commission, Illinois
(Sangamon County)

Project Overview

This project is an outgrowth of the Public Service Program of the Center for Groundwater Science (CGS) at the Illinois State Water Survey. For over 50 years, the CGS has provided groundwater information to any requesting individual, commercial facility or public water facility. Groundwater resource assessments have been an integral part of this public service and have been undertaken for thousands of individuals and facilities throughout its history. Community groundwater supplies that have been identified as potentially "deficient" are the targets for this project. The criterion used for determining community deficiency were; 1) Water Supply and Demand (operating time), 2) Aquifer Limitation, 3) Well Specific Capacity, and 4) Facility History. The Mechanicsburg-Buffalo Water Commission has been identified as a target community for groundwater assessment through this project.

Project Goal

To provide a resource tool of pertinent groundwater information to each target facility. This document describes a summary of historic information, current conditions and the potential for expansion of the water supply of the Mechanicsburg-Buffalo Water Commission.

Mechanicsburg-Buffalo Water Commission (Sangamon County)

The Mechanicsburg-Buffalo Water Commission (Facility Number 1675150) utilizes two community water supply wells. Well Nos. 1 and 2 (Illinois EPA Nos. 50110 and 50111, respectively) supply an average of 157,500 gallons per day to 402 services or a population of 1,030. Our records indicate that the Commission also has constructed a new well (No. 3) in 2006 within the same general area of Nos. 1 and 2. We have incomplete information whether this well is currently being used.

Mechanicsburg-Buffalo Water Commission was determined to be “Adequate” by the project criteria and this report serves as a summary of information should they need to increase their current supply.

Historic Information

Background Well Information

Well No. 1

Constructed within sand and gravel deposits located in the flood plain of the Sangamon River in Section 11, T.15N., R.3W., Sangamon County. The well was drilled to a depth of 45 feet and has a current rating of about 150 gpm.

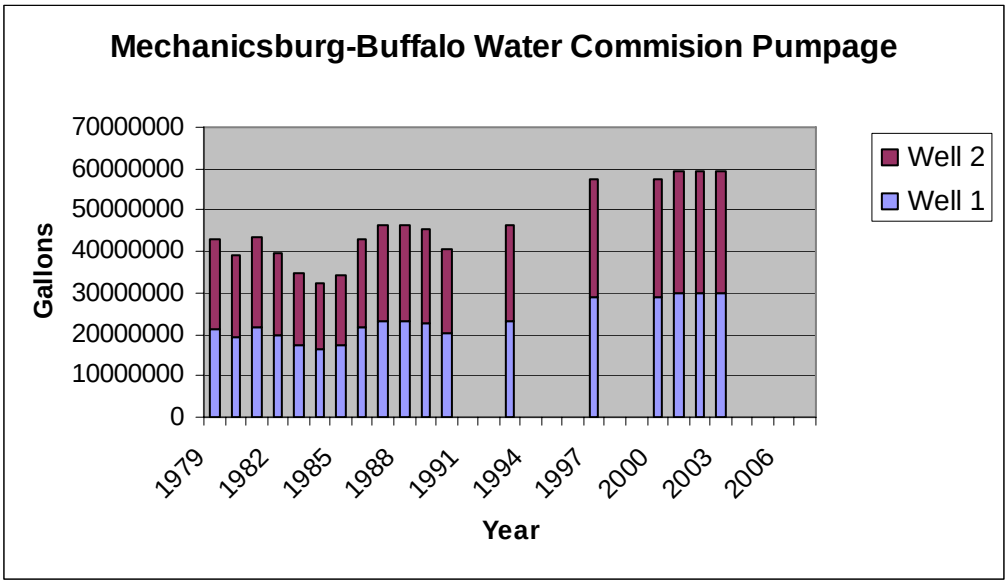
Well No. 2

Constructed in 1971 within sand and gravel deposits located in the flood plain of the Sangamon River in Section 11, T.15N., R.3W., Sangamon County. The well was drilled to a depth of 48 feet and has a current rating of about 150 gpm.

Well No. 3

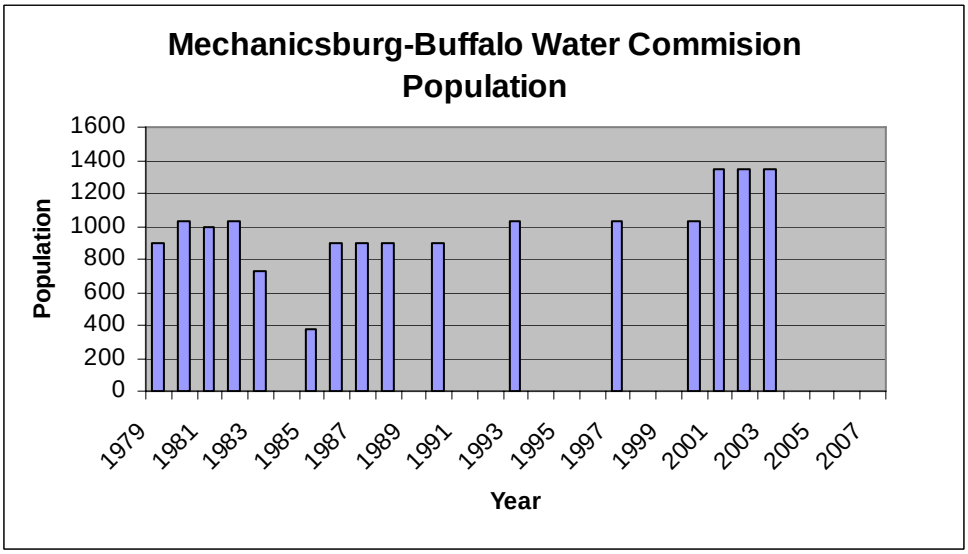
Constructed in 2006 within sand and gravel deposits located in the flood plain of the Sangamon River in Section 11, T.15N., R.3W., Sangamon County. The well was drilled to a depth of 51 feet and was pumped at rates ranging from 153 to 399 gpm for 3 hours, upon its completion. The maximum drawdown during this test was 14.60 feet from a static water level of 2.88 feet. The calculated specific capacity of this well is 27.3 gpm/ft.

Background Pumpage Information



Source: ISWS Illinois Water Inventory Program

Historic Population Information



Source: ISWS Illinois Water Inventory Program

Regional Information

Resources within the Mechanicsburg-Buffalo Water Commission area

Domestic Groundwater Supplies
The available regional data indicate that groundwater for domestic and farm use in this part of Illinois is obtained from mainly large-diameter (approximately 3 feet) bored and small-diameter drilled wells finished in the unconsolidated materials above bedrock. The bored wells tap stringers or lenses of silt, sand, or gravel only a few inches thick contained in the unconsolidated materials above bedrock. The yield of this type of well is limited to a few hundred gallons per day and may be only barely adequate for normal household uses. The drilled wells tap variable, thin sand and gravel deposits throughout the area.

A few reported wells in the area have been drilled into the underlying Pennsylvanian bedrock formations. These wells are finished in thin sandstone and creviced limestone beds in the shallow bedrock. Upon completion, these wells were pumped at very low rates for short periods of time.

Municipal Groundwater Supplies
There is only one town within the Mechanicsburg-Buffalo Water Commission area that has a major public water supply system comparable to Mechanicsburg-Buffalo Water Commission; the village of Dawson located to the northwest in Sangamon County.

The Village of Dawson uses four wells finished within the sand and gravel deposits associated with the Sangamon River located in Section 25, T.16N., R.4W., Sangamon County. These wells range in depth from 41 to 54 feet with wells 4 and 5, each capable of producing about 200 gpm.

Figures 1 and 2 picture the ISWS Potential Yield maps for sand and gravel and bedrock aquifer in Illinois, respectively. The pertinent counties for Mechanicsburg-Buffalo Water Commission are highlighted. Figure 1 indicates that sand and gravel deposits are variable throughout most of the Mechanicsburg-Buffalo Water Commission area with the exception of the high-yielding deposits associated with the Sangamon River. The bedrock map (Figure 2) indicates poor availability of groundwater from the bedrock throughout the Mechanicsburg-Buffalo Water Commission area. Figures 3 and 4 present the probability of occurrence of the sand and gravel and the water-yielding character of the shallow bedrock for the Mechanicsburg-Buffalo Water Commission area as depicted in the Illinois State Geologic Survey Circular 248, *Groundwater Geology in East-Central Illinois* (Selkregg, et al., 1958). Figure 3 indicates “Fair to Good,” variable and discontinuous sand and gravel deposits regionally and “Good to Excellent” high-yielding deposits along the Sangamon River. Figure 4 indicates only small supplies are available from the shallow bedrock units. The domestic well construction records verify these map outlooks.

Groundwater Availability Summary

The available information indicates that the sand and gravel deposits the Water Commission currently uses are capable of providing for their water needs now and into the future. Anliker's (1998) report indicates the sand and gravel deposits associated with the River are capable of producing good quality and quantity groundwater for the Commission. Figure 5 pictures the major users of this aquifer. Should the Commission need to expand, these deposits appear capable for additional use, however, care should be taken in properly spacing new wells away from the current wells to ensure drawdown interference is minimal.

References

Anliker, M. A. and D. M. Woller, 1998. Potential Ground-Water Resources for Springfield, Illinois. Illinois State Water Survey Contract Report 627.

Selkregg, L.F. and J. Kempton. 1958. Groundwater Geology in East-Central Illinois, A preliminary Geologic Report. Illinois State Geological Survey Circular 248.

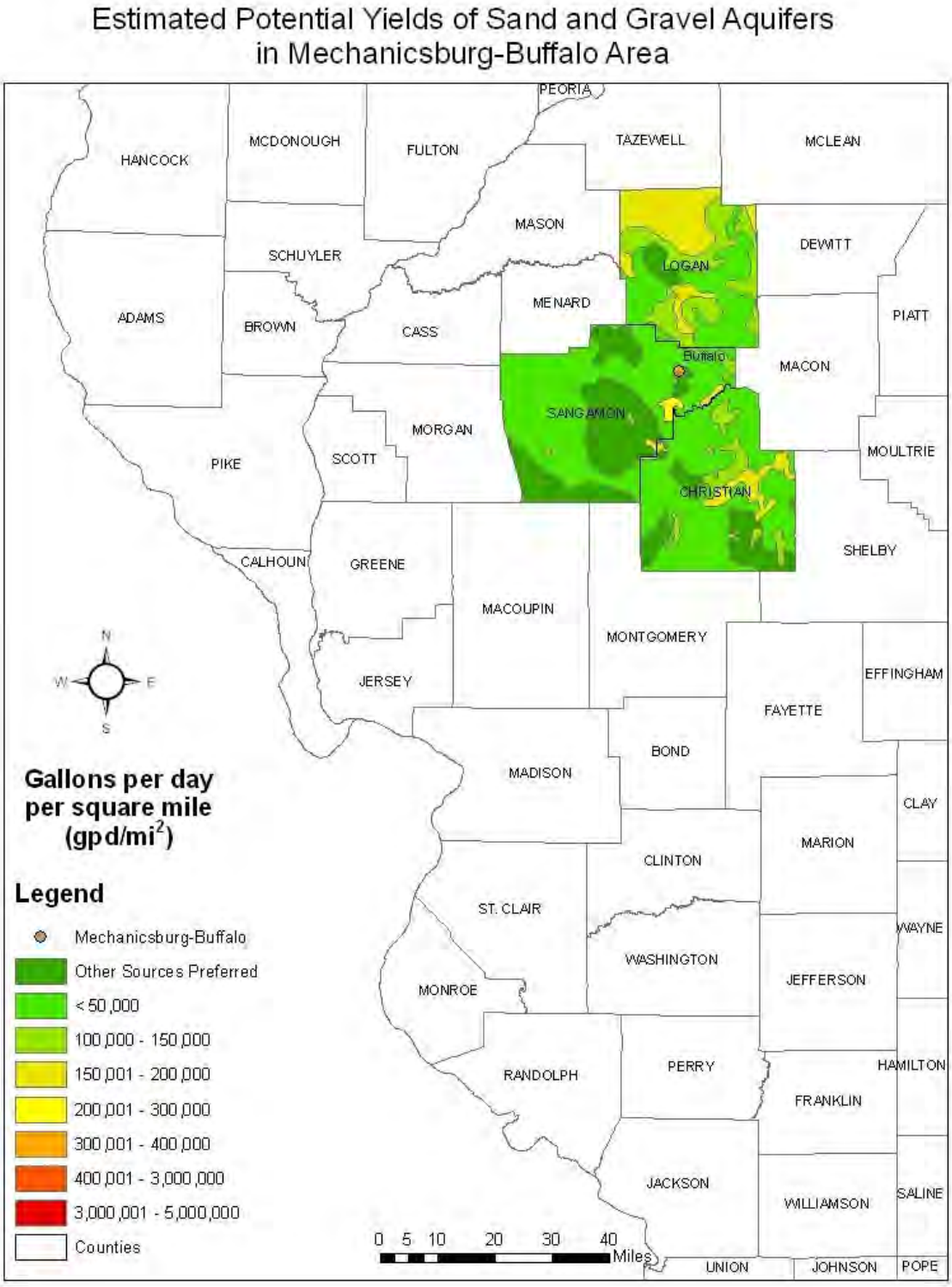

Estimated Potential Yields of Sand and Gravel Aquifers
in Mechanicsburg-Buffalo Area
PEORIA
HANCOCK
MCDONOUGH
FULTON
TAZEWELL
MCLEAN
MASON
DEWITT
SCHUYLER
LOGAN
ADAMS
BROWN
CASS
MENARD
PIATT
Buffalo
MACON
SANGAMON
MORGAN
MOULTRIE
PIKE
SCOTT
CHRISTIAN
SHELBY
CALHOUN
GREENE
MACOUPIN
MONTGOMERY
JERSEY
EFFINGHAM
FAYETTE
BOND
MADISON
CLAY
MARION
CLINTON
ST. CLAIR
WAYNE
WASHINGTON
JEFFERSON
MONROE
RANDOLPH
PERRY
HAMILTON
FRANKLIN
JACKSON
WILLIAMSON
SALINE
UNION
JOHNSON
POPE
N
W
E
S
Gallons per day
per square mile
(gpd/mi2)
Legend
Mechanicsburg-Buffalo
Other Sources Preferred
< 50,000
100,000 - 150,000
150,001 - 200,000
200,001 - 300,000
300,001 - 400,000
400,001 - 3,000,000
3,000,001 - 5,000,000
Counties
0 5 10 20 30 40
Miles

Figure 1.

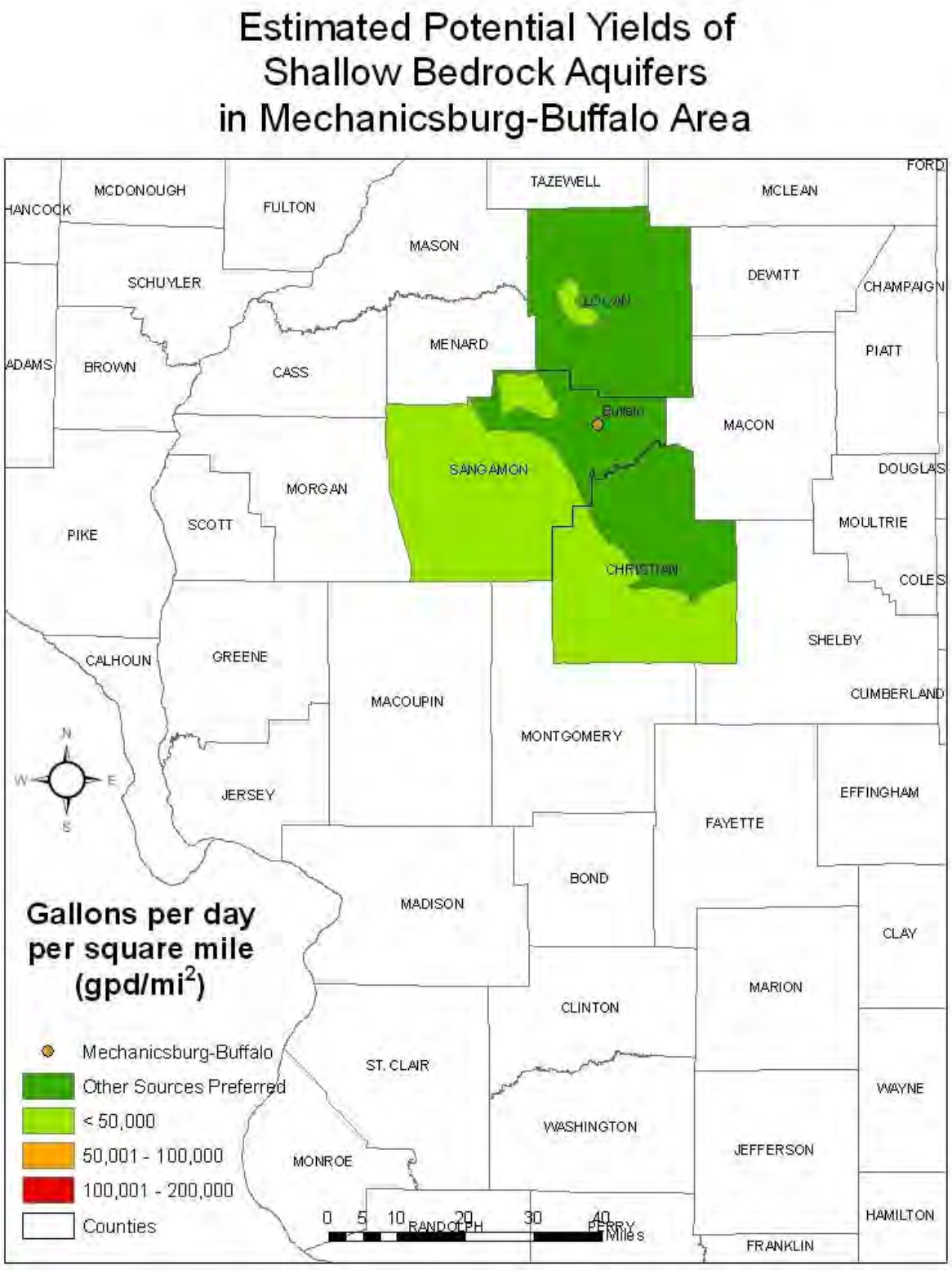

Estimated Potential Yields of
Shallow Bedrock Aquifers
in Mechanicsburg-Buffalo Area
MCDONOUGH
HANCOCK
FULTON
TAZEWELL
MCLEAN
FORD
MASON
SCHUYLER
DEWITT
CHAMPAIGN
LOGAN
MENARD
ADAMS
BROWN
CASS
PIATT
Buffalo
MACON
SANGAMON
DOUGLAS
MORGAN
PIKE
SCOTT
MOULTRIE
CHRISTIAN
COLES
SHELBY
CALHOUN
GREENE
MACOUPIN
CUMBERLAND
MONTGOMERY
JERSEY
EFFINGHAM
FAYETTE
BOND
MADISON
CLAY
MARION
CLINTON
ST. CLAIR
WAYNE
WASHINGTON
JEFFERSON
MONROE
HAMILTON
RANDOLPH
PERRY
FRANKLIN
N
W
E
S
Gallons per day
per square mile
(gpd/mi2)
Mechanicsburg-Buffalo
Other Sources Preferred
< 50,000
50,001 - 100,000
100,001 - 200,000
Counties
0 5 10 20 30 40
Miles

Figure 2.

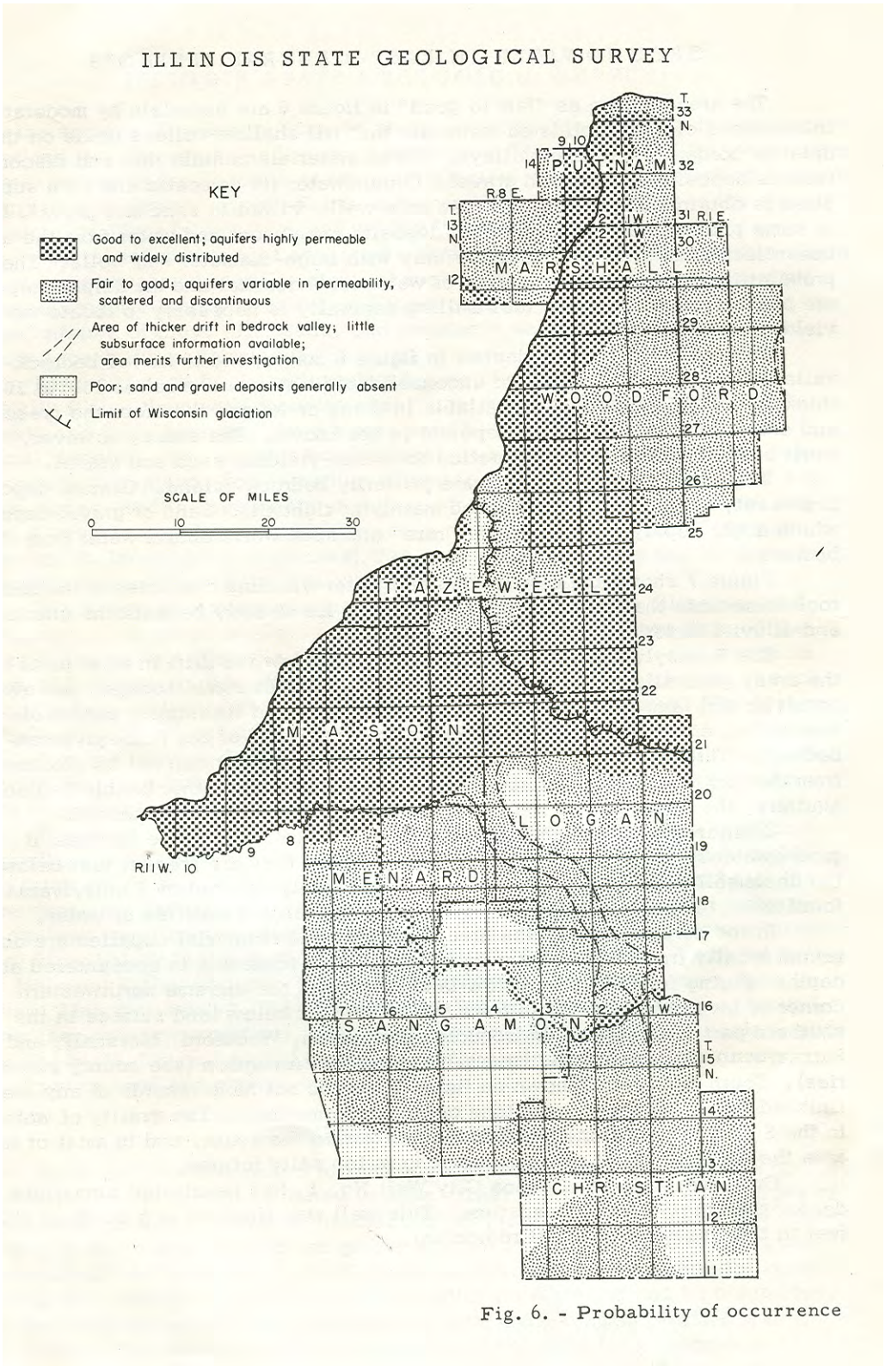


Fig. 6. - Probability of occurrence

Figure 3.

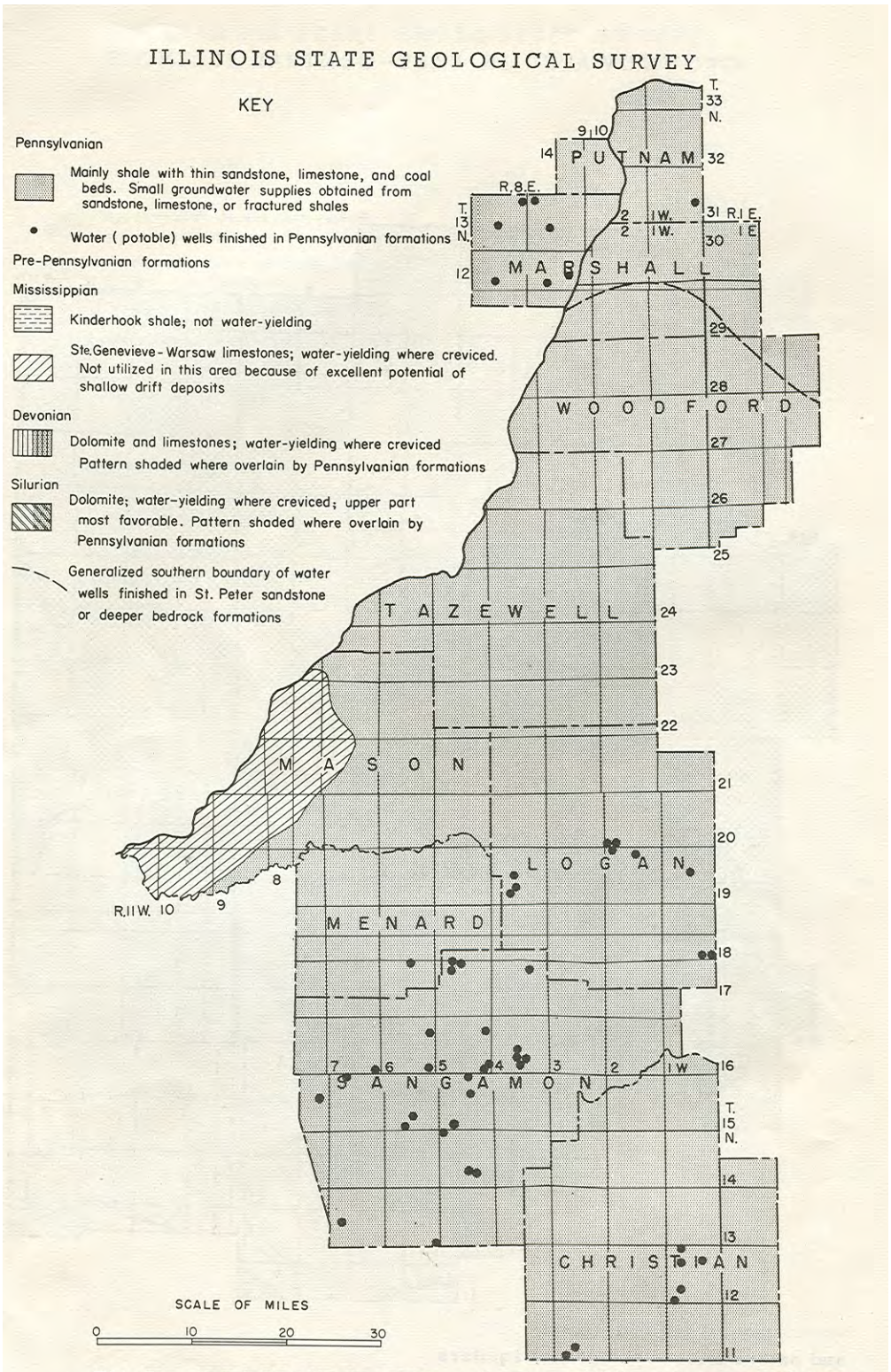


Fig. 7. - Areal distribution, type, and water-yielding character of upper

Figure 4.

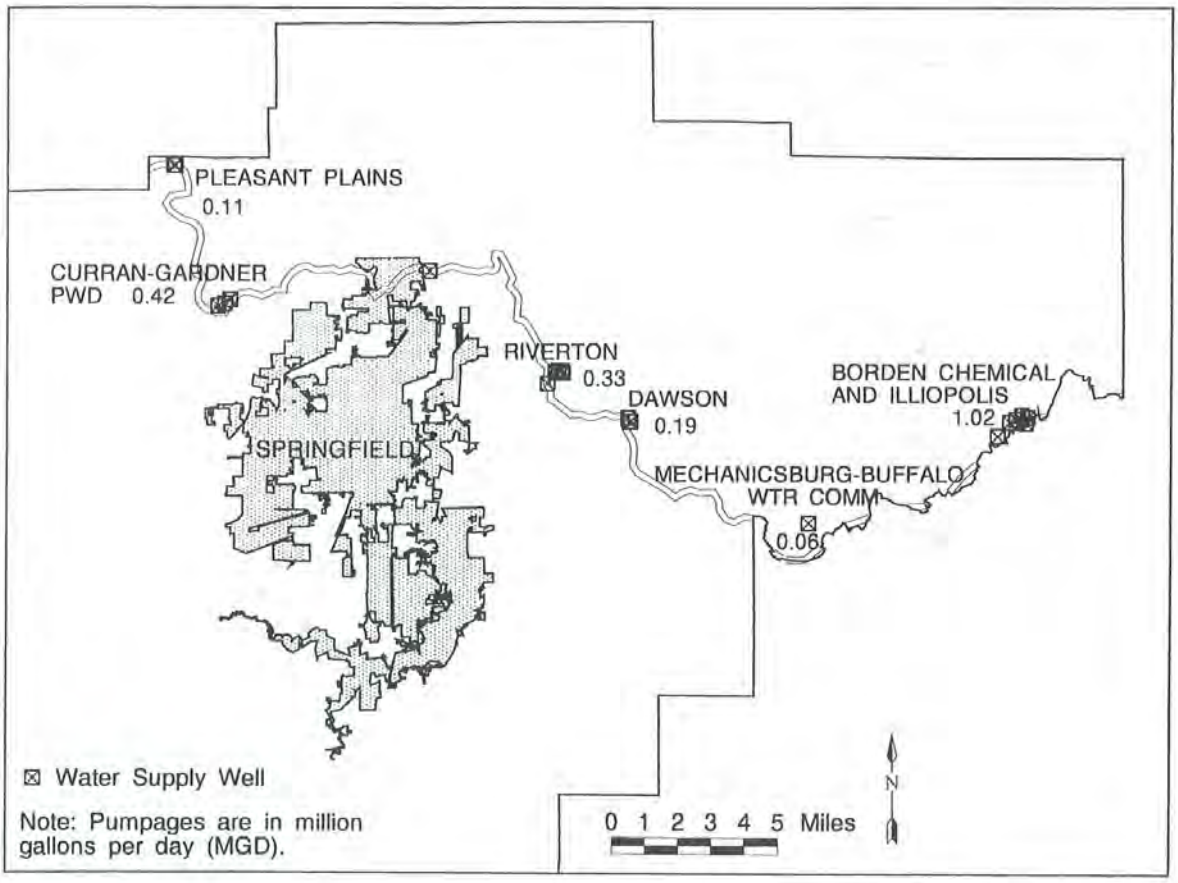


Figure 5. Major groundwater users along the Sangamon River near Springfield (Anliker, 1998)

ISWS publications list for the Mechanicsburg-Buffalo Water Commission and surrounding areas.

* = Publication is out of print.
$ = Payment required.

CHRISTIAN

*1961 RI-41 Ground-water development in three areas of central Illinois. Walker-Walton. 43p.

*1961 RS-17 Evaluating wells and aquifers by analytical methods. Walton-Walker.

*1969 RI-62 Groundwater resources of the buried Mahomet Bedrock Valley. Visocky- Schicht. 52p.

*1978 CR-209 Assessment of public groundwater supplies in Illinois. Visocky-Wehrmann- Kim-Ringler. 193p.

1981 COOP-6 Assessment of a regional aquifer in central Illinois. Burris-Morse-Naymik. 77p.

*1981 COOP-7 Procedures for the collection of representative water quality data from monitoring wells. Gibb-Schuller-Griffin. 66p.

*1982 CR-299 A summary of information related to the comprehensive management of groundwater and surface water resources in the Sangamon River Basin, Illinois. O'Hearn-Williams. 145p.

LOGAN

1965 COOP-3 Preliminary report on the ground-water resources of the Havana region in west-central Illinois. Walker-Bergstrom-Walton. 61p.

*1966 RI-55 Yields of wells in Pennsylvanian and Mississippian rocks in Illinois. Csallany. 42p.

*1969 RI-62 Groundwater resources of the buried Mahomet Bedrock Valley. Visocky-Schicht. 52p.

*1982 CR-299 A summary of information related to the comprehensive management of groundwater and surface water resources in the Sangamon River Basin, Illinois. O'Hearn- Williams. 145p.

1992 COOP-13 Regional groundwater resources in Western McLean and Eastern Tazewell Counties with emphasis on the Mahomet Bedrock Valley. Kempton-Visocky. 46p.

1994 COOP-16 The Sankoty-Mahomet aquifer in the confluence area of the Mackinaw and Mahomet bedrock valleys, central Illinois . Wilson-Kempton-Lott. 64p.

SANGAMON

*1965 RI-53 Potential yield of aquifers in Embarras River Basin, Illinois. Walton-Csallany. Open File Report.

1965 RS-48 Relationship between water use and population in the Embarras River Basin, Illinois. Csallany.

*1978 CR-209 Assessment of public groundwater supplies in Illinois. Visocky-Wehrmann-Kim- Ringler. 193p.

1998 CR-627 Potential Ground-Water Resources for Springfield, Illinois. Anliker-Woller. 197p.