

Midwest Technology Assistance Center
Groundwater Resource Assessment for Small Communities

Groundwater Availability
At
Versailles, Illinois
(Brown County)

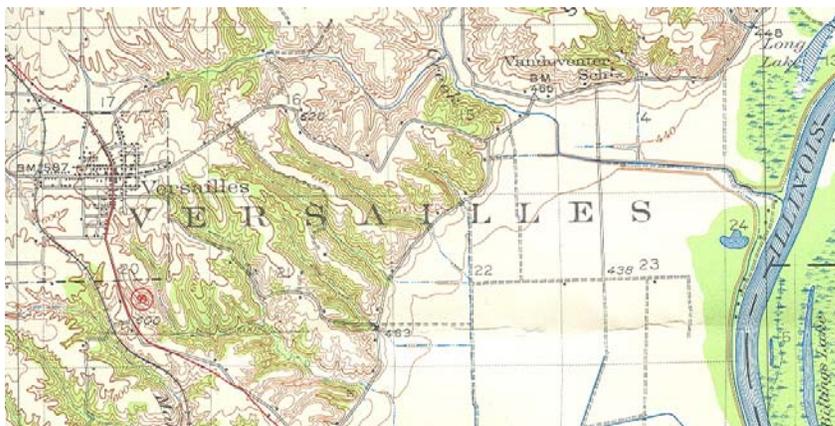
Project Overview

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 Village of Versailles 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 Versailles.

Versailles (Brown County)



The Village of Versailles (Facility Number 0090200) utilizes two active community water supply wells. Well Nos. 5 and 6 (Illinois EPA Nos. 00977 and 00978, respectively) supply an average of 72,479 gallons per day (gpd) to 320 services or a population of 500.

Versailles 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. The shallow depth of Well No. 6 (50 feet) included this facility for study.

Historic Information

Background Well Information

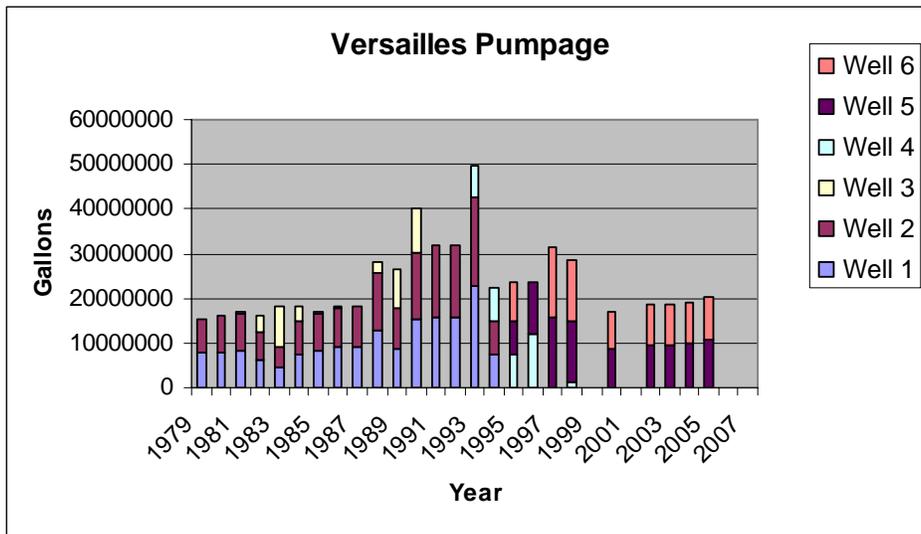
Well No. 5

Constructed in sand and gravel to a depth of 56 feet in 1995, this well is located in Section 17, T.2S., R.2W., Brown County. Upon construction, 22 feet of drawdown was observed while pumping 150 gallons per minute for 3 hours from a nonpumping water level of 8 feet below land surface. The calculated specific capacity of this well at the time of its construction was 6.8 gpm/ft. This well is currently pumped at about 90 gpm.

Well No. 6

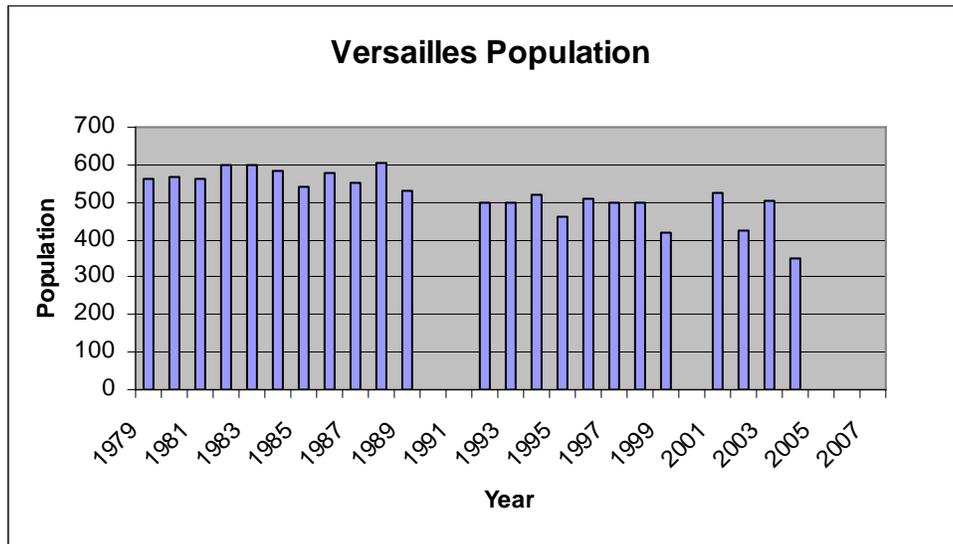
Constructed in sand and gravel to a depth of 50 feet in 1995, this well is located in Section 17, T.2S., R.2W., Brown County. Upon construction, 19 feet of drawdown was observed while pumping 150 gallons per minute for 3 hours from a nonpumping water level of 10 feet below land surface. The calculated specific capacity of this well at the time of its construction was 7.9 gpm/ft. This well is currently pumped at about 90 gpm.

Background Pumpage Information



Source: ISWS Illinois Water Inventory Program

Historic Population Information



Source: ISWS Illinois Water Inventory Program

Regional Information

Resources within the Versailles area

Domestic Groundwater Supplies

The available regional data indicate that groundwater for domestic and farm use in this part of Illinois is obtained mainly from small-diameter drilled wells finished in the shallow bedrock. These wells tap limestone units at depths ranging from 136 to 360 feet in this area. Nonpumping water levels range from about 48 to 180 feet with pumping water levels ranging from 130 to 300 feet below land surface. Upon completion, these wells reportedly produce groundwater at rates ranging from 3 to 7 gpm for short periods of time.

Municipal Groundwater Supplies

The Versailles wells are located in sand and gravel deposits associated with the South Fork Camp Creek. There are two municipalities within the nearby area of Versailles; the Villages of Perry (Pike County), and Meredosia (Morgan County). Each has wells that produce groundwater for their supplies.

The Village of Perry uses three wells finished within local sand and gravel deposits at depths ranging from 49 to 72 feet. The wells are all located in Section 21, T.3S., R.3W., Pike County and produce groundwater at rates ranging from 30 to 62 gpm.

The Village of Meredosia uses two wells for their main supply. Both are finished in sand and gravel at depths of 90 and 92 feet which is associated with the Illinois River. They are both located in Section 22, T.16N., R. 13W., Morgan County, and each has the capacity of about 300 gpm.

Figures 1 and 2 picture the ISWS Potential Yield maps for sand and gravel and bedrock aquifers in Illinois, respectively. The pertinent counties for Versailles are highlighted. Figure 1 indicates that sand and gravel deposits are variable throughout the Versailles area. It also indicates that the potential exists for high yields along the Illinois River to the east of the village. The bedrock map (Figure 4) indicates fair availability of groundwater from the limestone units that exist throughout this 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 Versailles area as depicted in the Illinois State Geologic Survey Circular 232, *Groundwater Geology in Western Illinois, South Part* (Bergstrom, et al., 1957). Figure 3 indicates "Good to Excellent" potential along the Illinois River to the east for sand and gravel deposit development. Figure 4 indicates water-yielding limestone within the Versailles area from the upper bedrock is capable of supplying small to moderate needs.

Groundwater Availability Summary

The available information indicates that the sand and gravel deposits associated with the South Fork Camp Creek within the Versailles area are capable of providing for the water needs of the village now and into the future. The sands that are being used, based on past testing, are capable of producing groundwater at a rate much higher than the village's current needs. Although exploration by towns within the Versailles area has been successful in finding groundwater supplies, the only area where the potential is very high for future development would be along the Illinois River system. The Meredosia wells indicated the potential exists and could be explored, if needed.

References

Bergstrom, R. E., and A.J. Zeizel. 1957. Groundwater Geology In Western Illinois, South Part. A preliminary Geologic Report. Illinois State Geological Survey Circular 232.

Estimated Potential Yields of Sand and Gravel Aquifers in Versailles Area

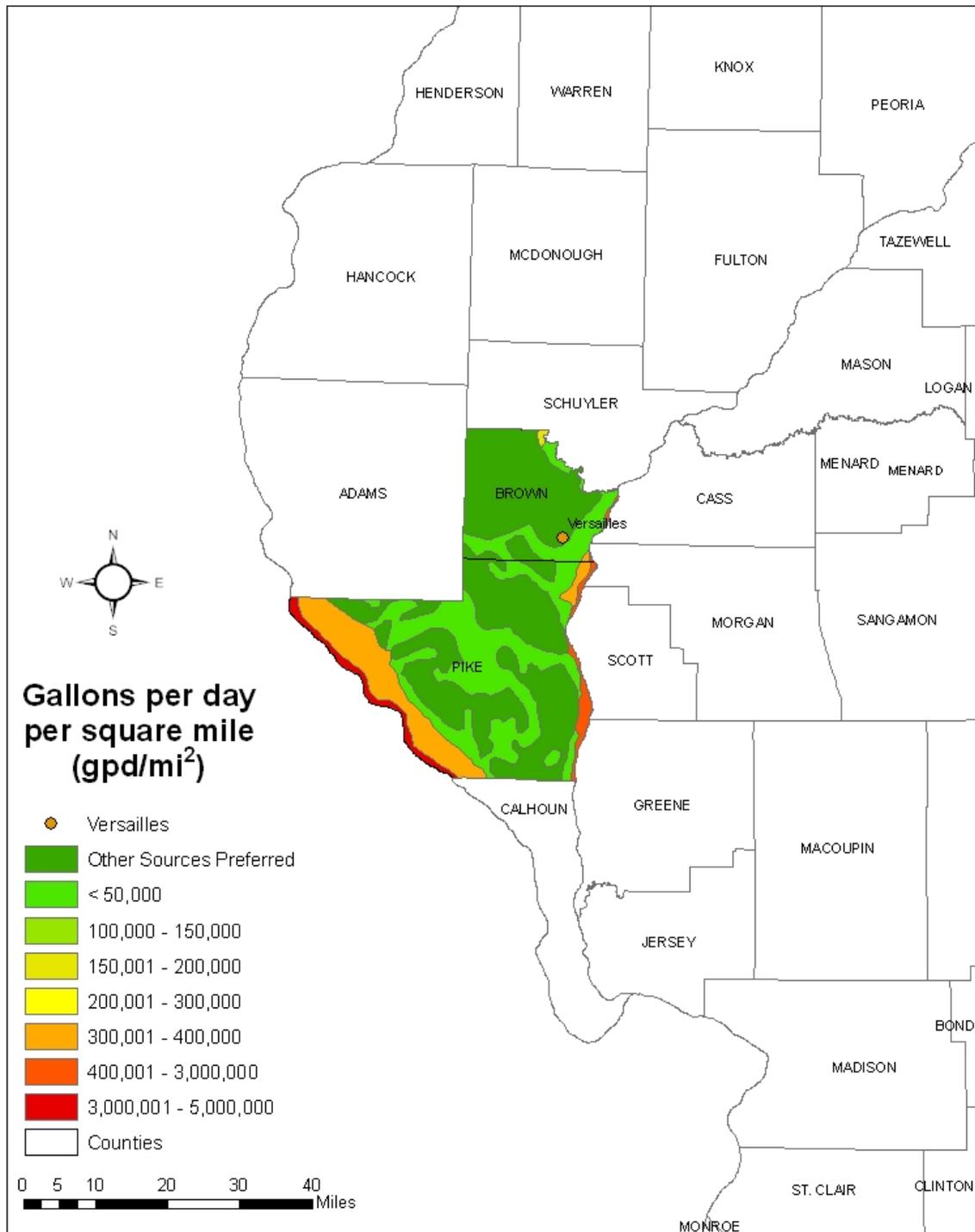


Figure 1.

Estimated Potential Yields of Shallow Bedrock Aquifers in Versailles Area

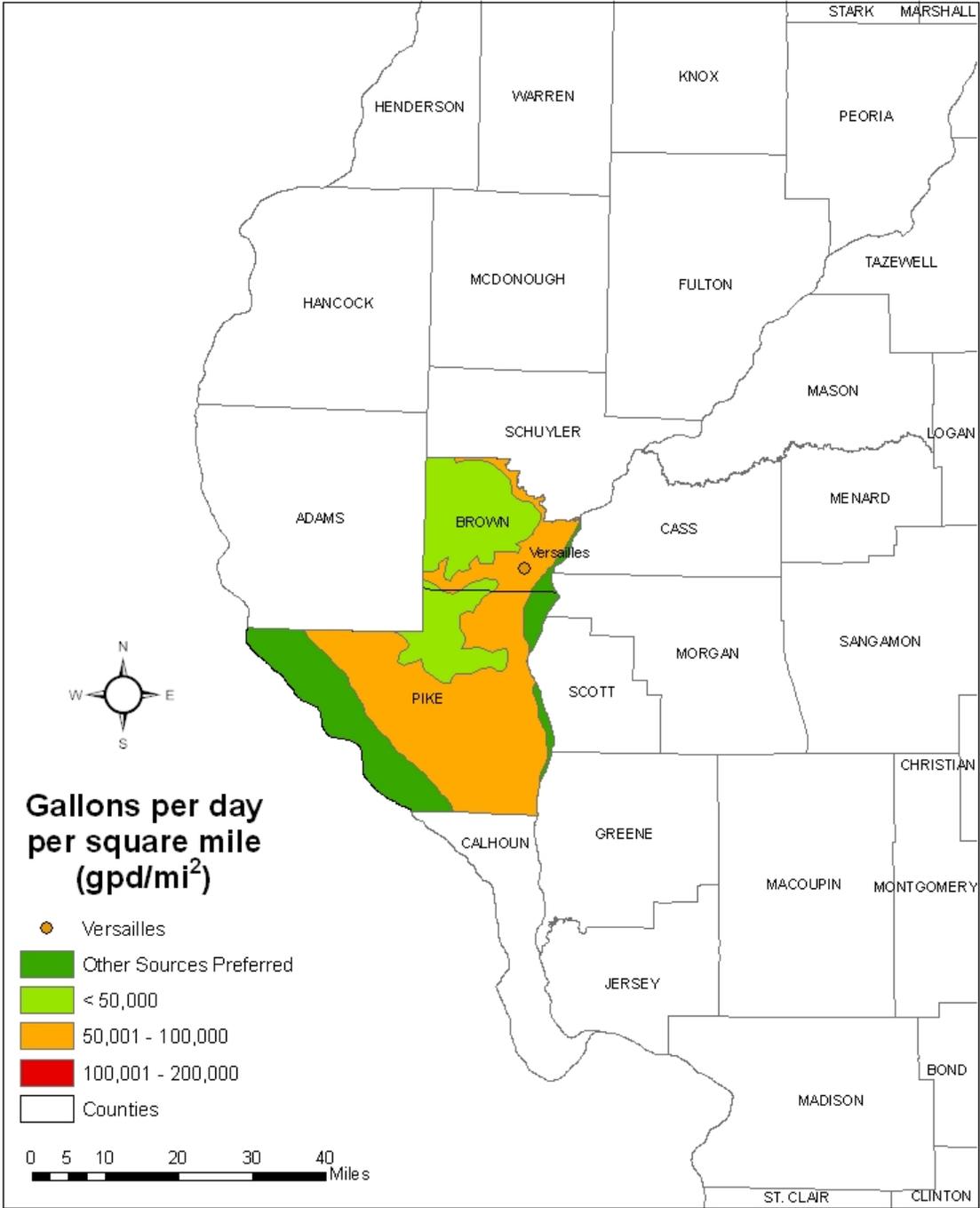
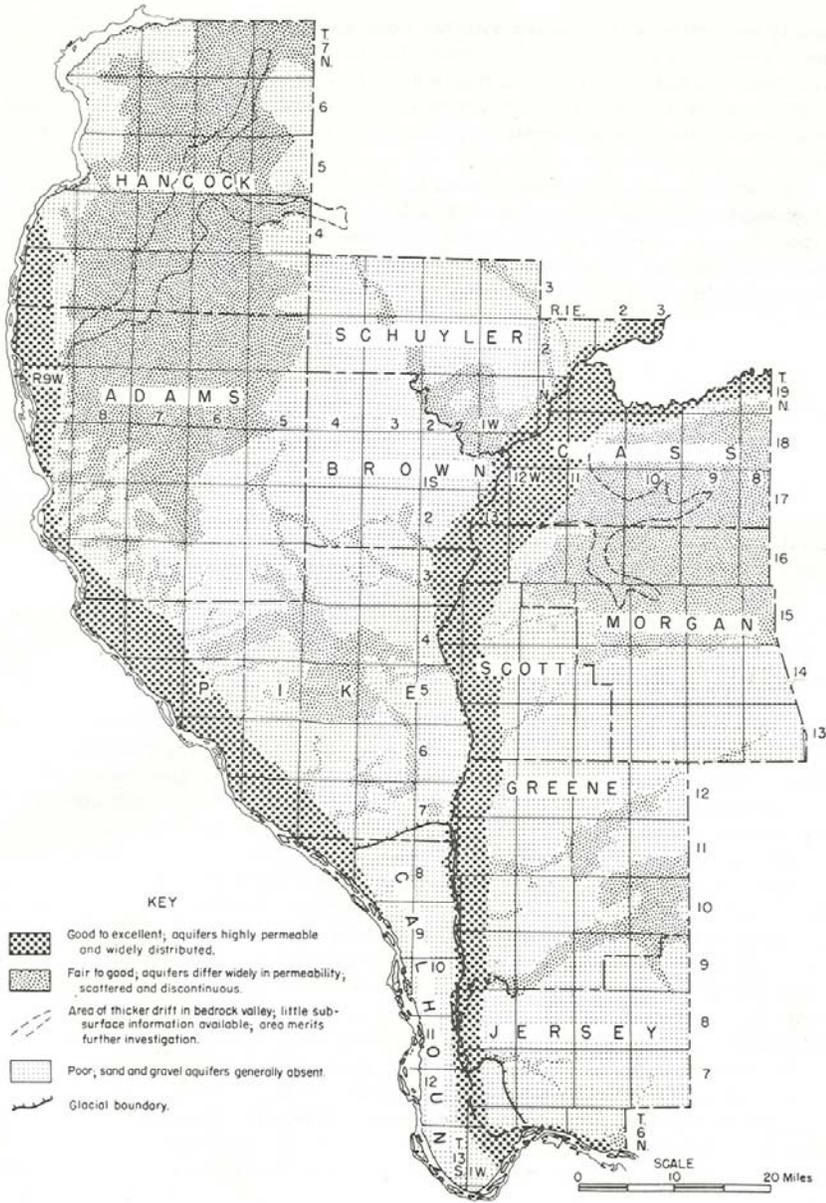


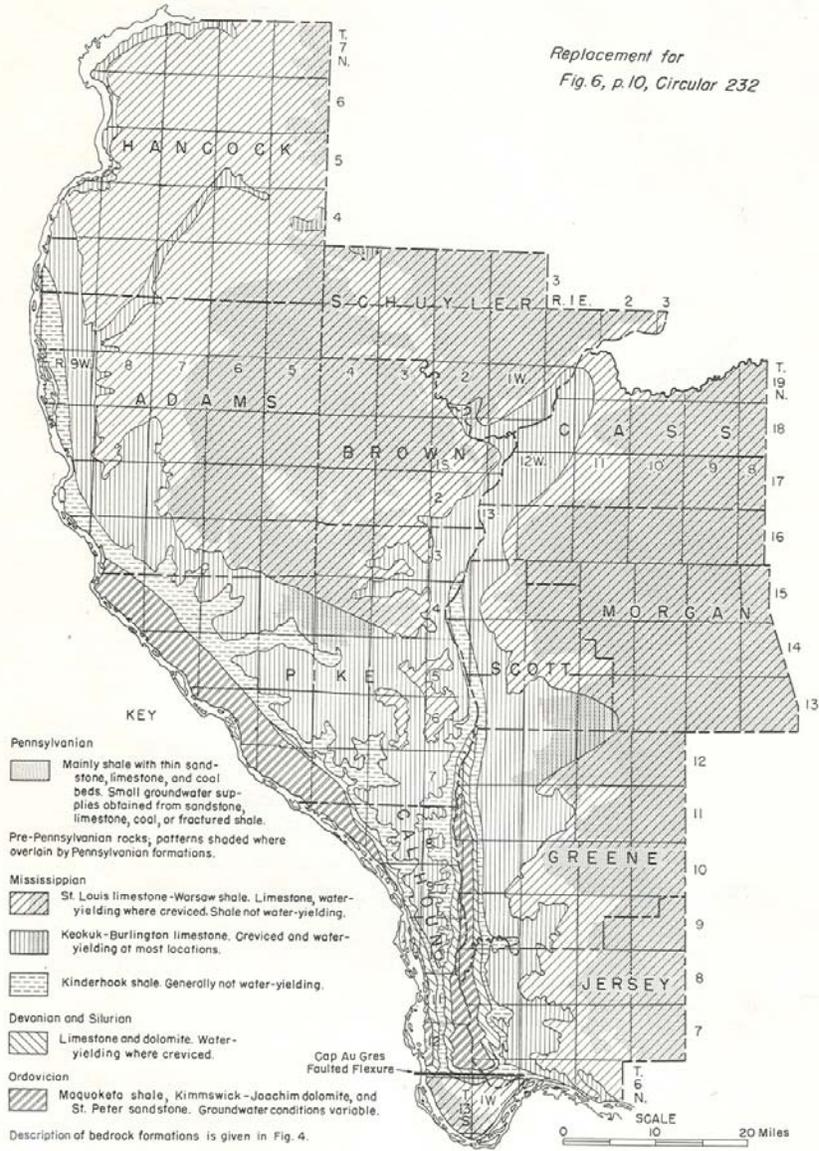
Figure 2.



- Probability of occurrence and nature of sand and gravel aquifers.

Figure 3.

Replacement for
Fig. 6, p. 10, Circular 232



- Areal distribution, type, and water-yielding character of upper bedrock formations (modified from Geologic Map of Illinois, 1945).

Figure 4.

ISWS publications list for Versailles and the surrounding areas.

* = Publication is out of print.

\$ = Payment required.

BROWN

- *1966 RI-55 Yields of wells in Pennsylvanian and Mississippian rocks in Illinois. Csallany. 42p. 1974 B-60-5. Public groundwater supplies in Brown County. Woller. 4p.
- *1978 CR-199 Reconnaissance study of final cut impoundments. Gibb-Evans. 101p.
- *1979 CR-208 Groundwater conditions and river-aquifer relationships along the Illinois Waterway. Gibb-Noel-Bogner-Schicht. 87p.
- *1980 CR-237 Assessment of eighteen public groundwater supplies in Illinois. Wehrmann-Visocky-Burris-Ringler-Brower. 185p.
- \$1982 C-154 Water level trends, pumpage, and chemical quality in the Cambrian-Ordovician aquifer in Illinois, 1971-1980. Sasman-Benson-Ludwigs-Williams. 64p. \$6.00.
- 1985 COOP-10 Geology, hydrology, and water quality of the Cambrian and Ordovician Systems in Northern Illinois. Visocky-Sherrill-Cartwright. 136p.

PIKE

- *1961 RI-40 Hydrologic budgets for three small watersheds in Illinois. Schicht-Walton. 40p.
- *1966 RI-55 Yields of wells in Pennsylvanian and Mississippian rocks in Illinois. Csallany. 42p.
- *1978 CR-199 Reconnaissance study of final cut impoundments. Gibb-Evans. 101p.
- *1979 CR-208 Groundwater conditions and river-aquifer relationships along the Illinois Waterway. Gibb-Noel-Bogner-Schicht. 87p.
- 1979 B-60-26 Public groundwater supplies in Pike County. Woller-Kunz-Sanderson. 20p.

- *1980 CR-237 Assessment of eighteen public groundwater supplies in Illinois. Wehrmann-Visocky-Burris-Ringler-Brower. 185p.
- \$1982 C-154 Water level trends, pumpage, and chemical quality in the Cambrian-Ordovician aquifer in Illinois, 1971-1980. Sasman-Benson-Ludwigs-Williams. 64p. \$6.00.
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