

Midwest Technology Assistance Center
Groundwater Resource Assessment for Small Communities

Groundwater Availability
At
Browning, Illinois
(Schuyler 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 Browning 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 Browning.

Browning (Schuyler County)



The Village of Browning (Facility Number 1690050) utilizes two active community water supply wells. Well Nos. 2 (Illinois EPA No. 00351) and No. 3 (Illinois EPA No. 01177) supply approximately 52,200 gallons per day to an estimated population of 1,575 individuals at 489 service connections. Browning also supplies a portion of its water to the Hickory-Kerton Water Coop.

Browning 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. 3 (44 feet) included this facility for study.

Historic Information

Background Well Information

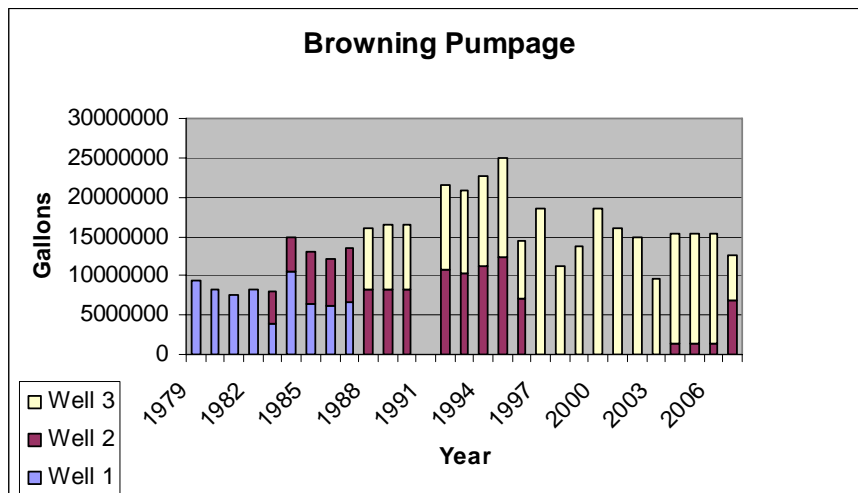
Well No. 2

Constructed in sand and gravel to a depth of 92 feet in 1983, this well is located in Section 26, T.2N., R.1E., Schuyler County. Upon construction, 52 feet of drawdown was observed while pumping 155 gallons per minute for 1 hour from a nonpumping water level of 18 feet below land surface. The calculated specific capacity of this well at the time of its construction was 2.98 gpm/ft. This well is currently pumped at about 38 gpm. This well is located within the floodplain of the Illinois River and is a backup to Well No. 3.

Well No.3

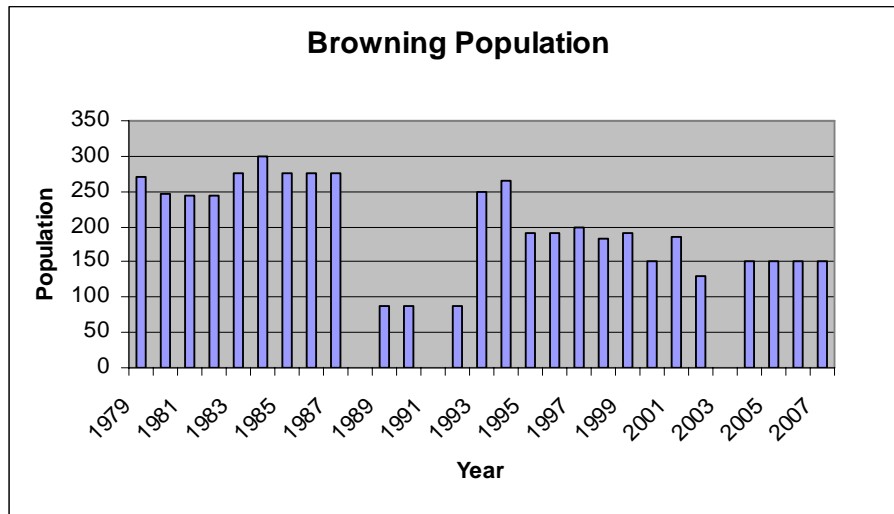
Constructed in sand and gravel to a depth of 44 feet in 1998, this well is located in Section 26, T.2N., R.1E., Schuyler County. Upon construction, 58 feet of drawdown was observed while pumping 125 gallons per minute for 8 hours from a nonpumping water level of 5 feet below land surface. The calculated specific capacity of this well at the time of its construction was 2.16 gpm/ft. This well is currently pumped at about 74 gpm. This well is located within the floodplain of the Illinois River.

Background Pumpage Information



Source: ISWS Illinois Water Inventory Program

Historic Population Information



Source: ISWS Illinois Water Inventory Program

Regional Information

Resources within the Browning 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 sandstone, limestone and shale units from the upper bedrock (less than 300 feet) in this area. These wells are mainly located above the floodplain of the Illinois River. There are also some domestic wells finished in sand and gravel located within the floodplain at depths less than 100 feet.

Municipal Groundwater Supplies

The Browning wells are located in sand and gravel deposits associated with the Illinois River. There are no other municipalities within the nearby area of Browning that use groundwater for their supplies. The closest facility is Beardstown, located in Section 14, T.18N., R.12W., Cass County. Their four wells are on the east side of the Illinois River and range in depth from 80 to 86 feet. They produce large quantities of groundwater at rates ranging from 520 to 700 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 Browning are highlighted. Figure 1 indicates that sand and gravel deposits are present and the potential exists for high yields along the Illinois River to the east of the village. The bedrock map (Figure 4) indicates poor to fair availability of groundwater from the limestone units that exist throughout this area, mainly away from the river.

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 Browning area as depicted in the Illinois State Geologic Survey Circular 232, *Groundwater Geology in Western Illinois, South Part* (Bergstrom, et al., 1957). Figure 5 indicates “Good to Excellent” potential along the Illinois River to the east for sand and gravel deposit development. Figure 6 indicates water-yielding limestone within the Browning 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 that the Village of Browning uses are capable of providing for the current water needs of the village (including the Hickory-Kerton Water Coop). However, after review of our files, it appears that there is a history of deterioration or clogging of the screens of the village wells. There could be several causes of this situation from pumping rates, well screen design to poor water quality and this problem is most likely a combination of several factors. The available information is insufficient to make any type of determination of this problem. However, the information also indicates that the potential for new well construction within this area is good to excellent. Past correspondence indicates that the construction of a new well closer to the Illinois River has the highest potential. A 1966 Electrical Earth Resistivity also indicates a higher potential to the northeast of town in Section 23 (See Figure 5). Should the village need to construct a new well, consideration of these areas is highly recommended based on available information.

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 Browning Area

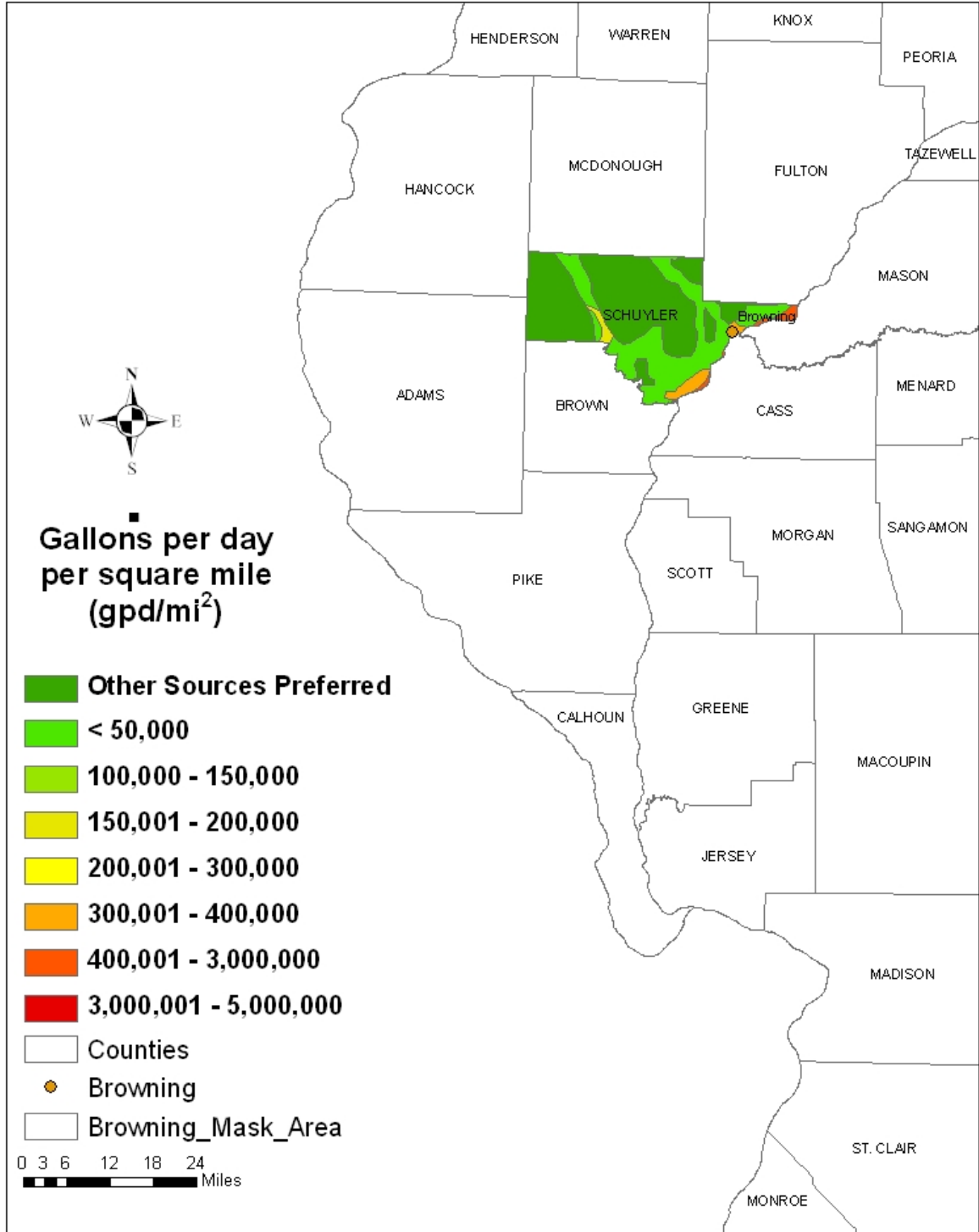


Figure 1.

Estimated Potential Yields of Shallow Bedrock Aquifers in Browning Area

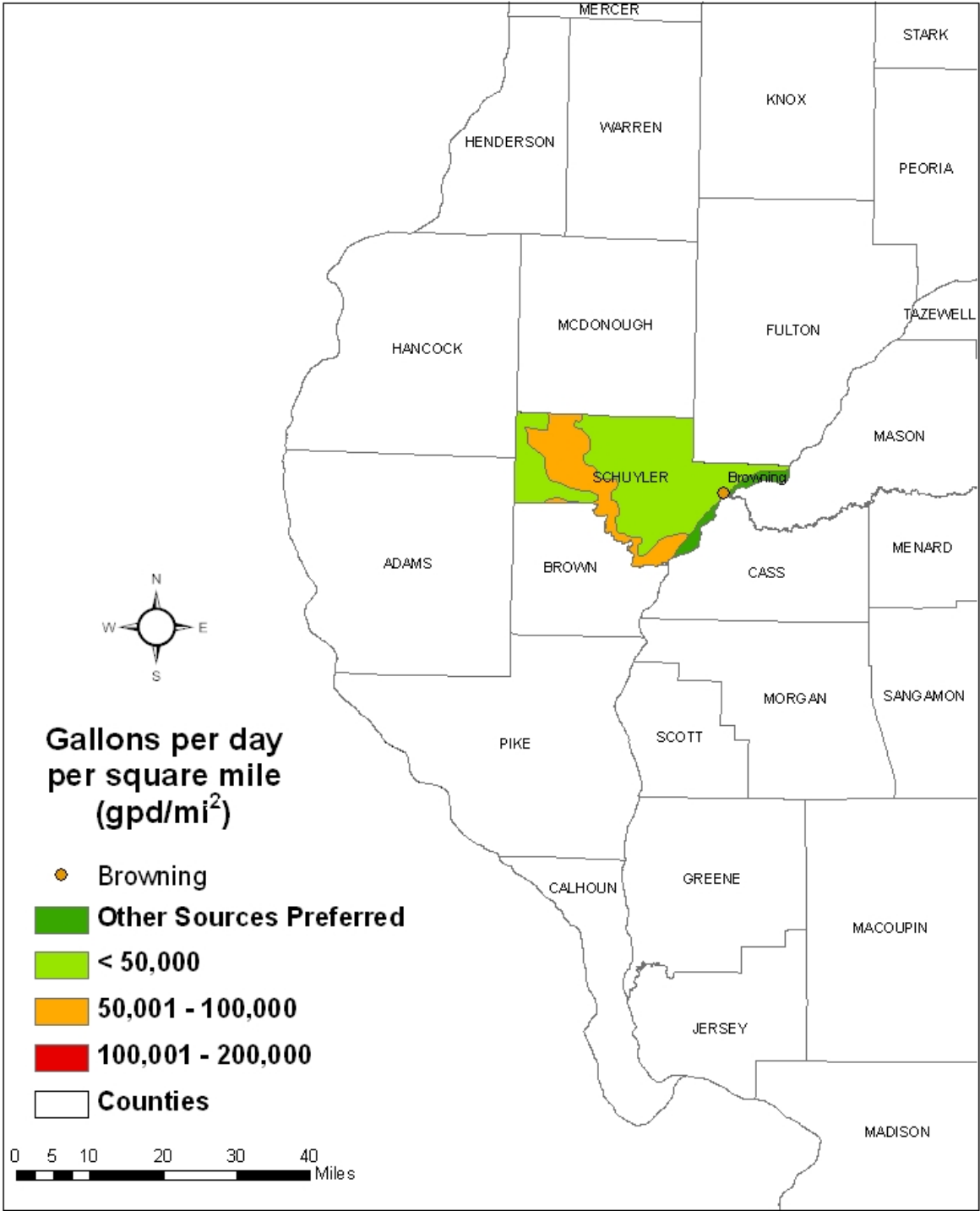
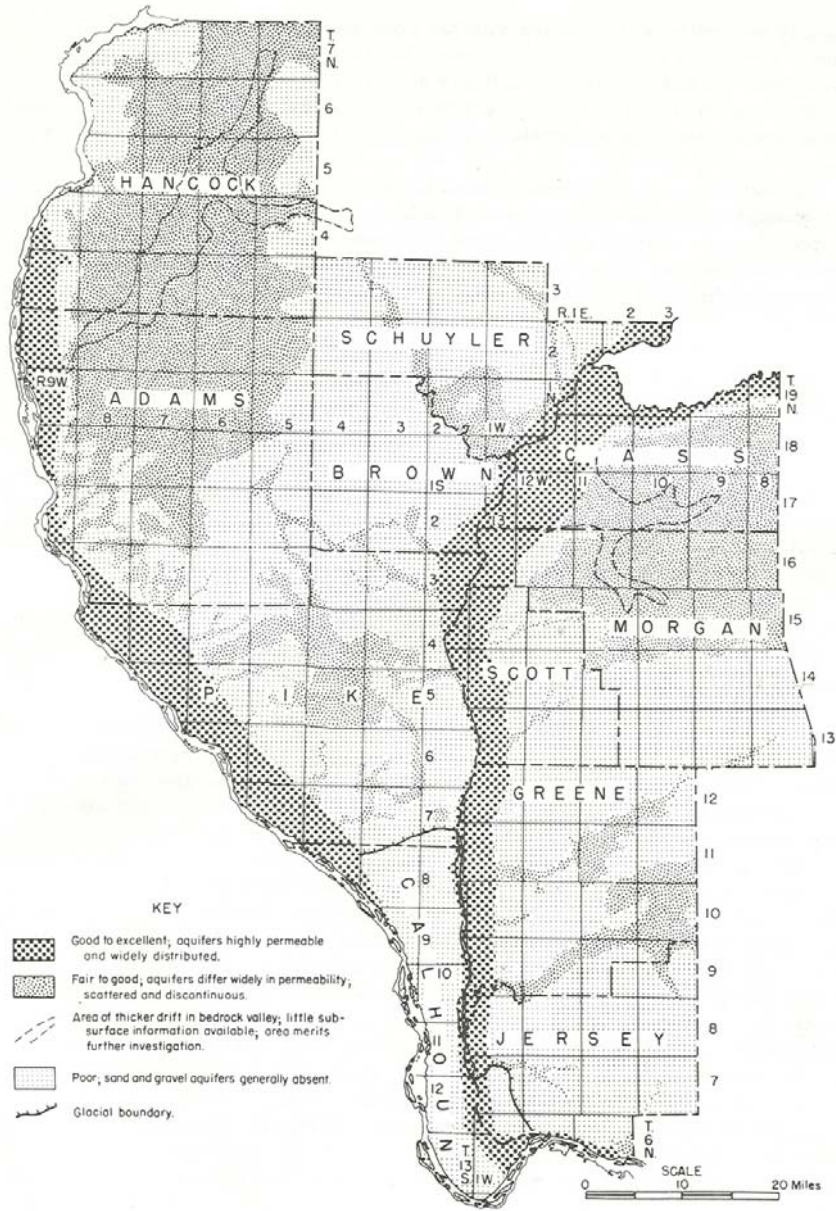


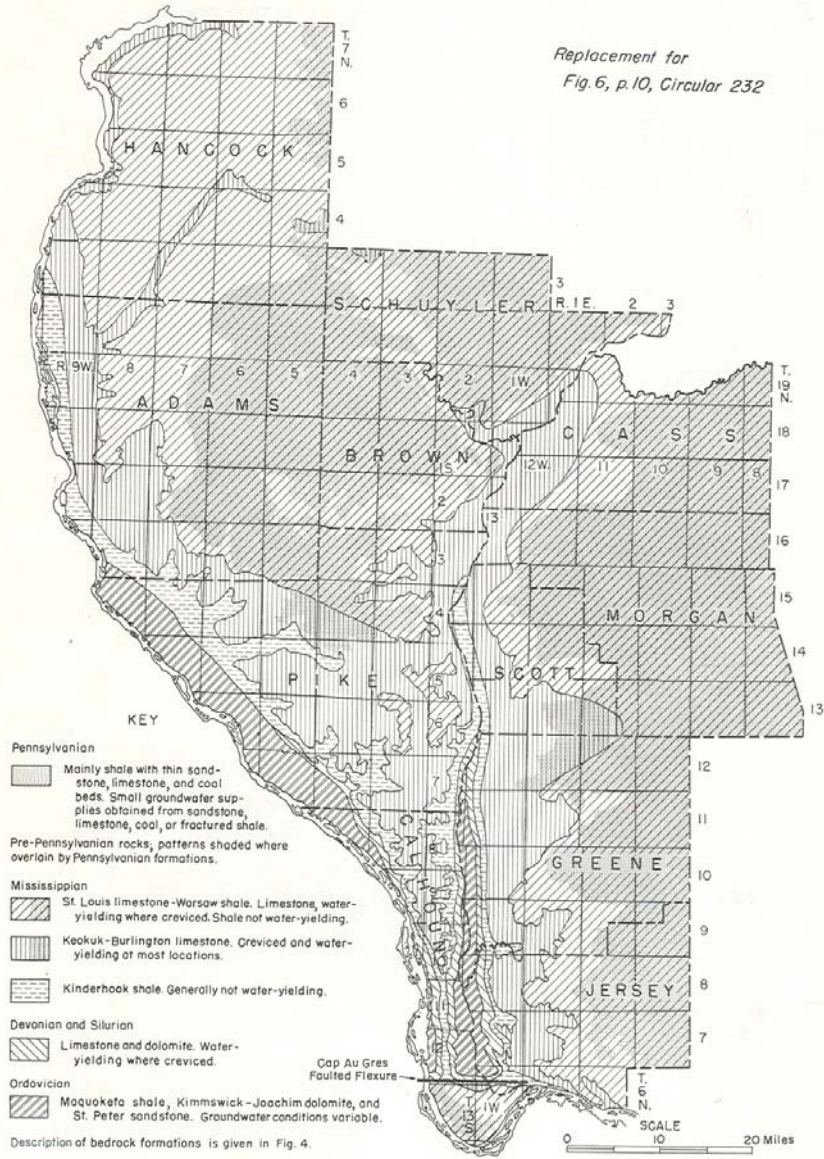
Figure 2.



- 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.

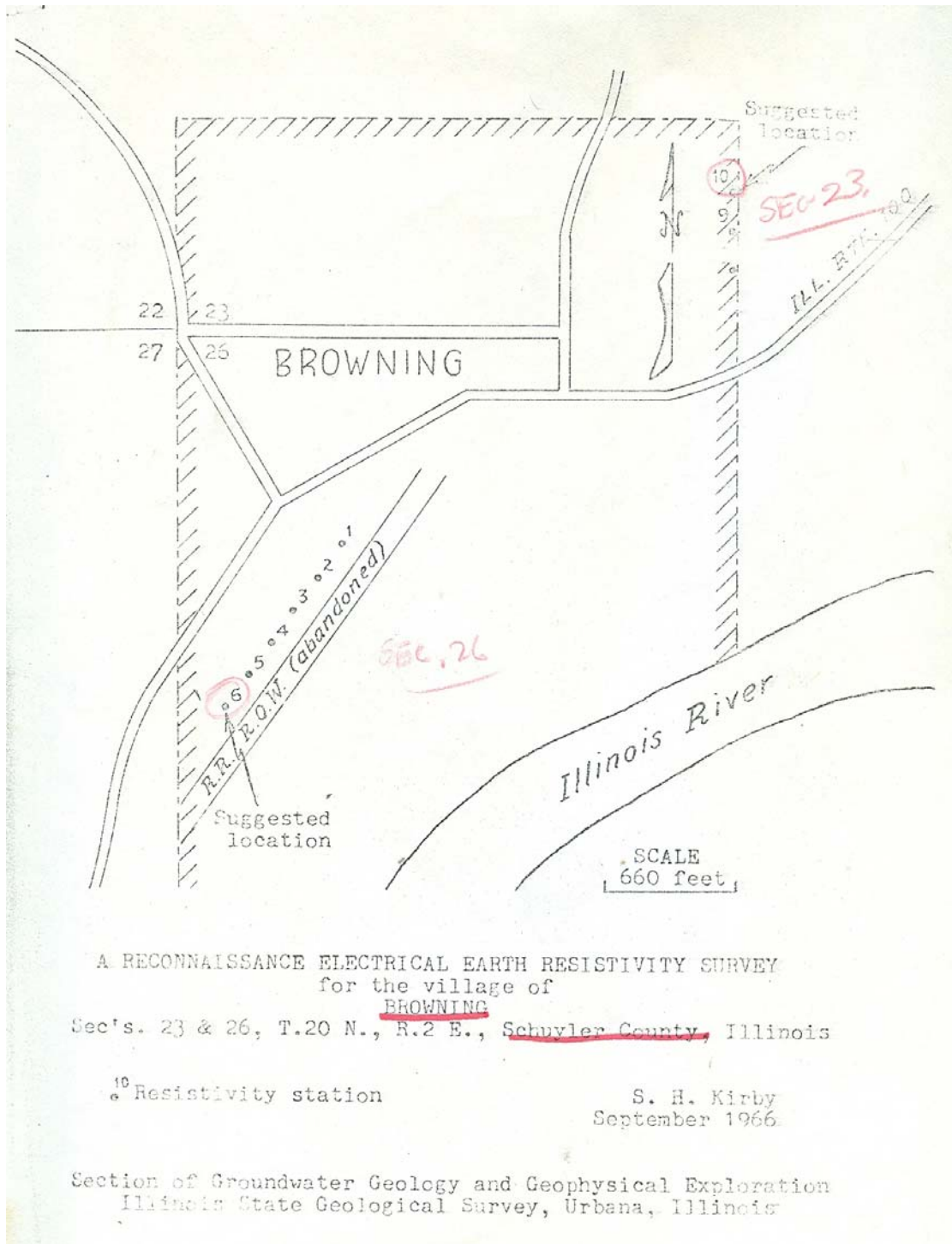


Figure 5. 1966 Browning EER.

ISWS publications list for the Browning and 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 Schuyler 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.

SCHUYLER

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