

Midwest Technology Assistance Center
Groundwater Resource Assessment for Small Communities

Groundwater Availability
At
Toledo, Illinois
(Cumberland County)

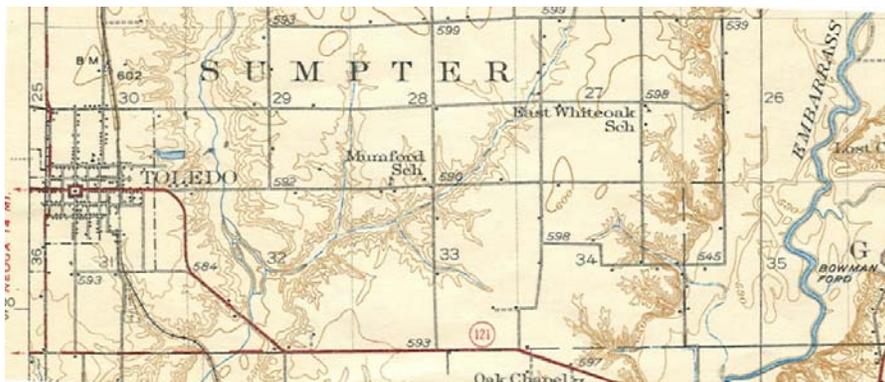
Project Overview

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 Toledo 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 within 5 and 10 miles of Toledo.

Toledo (Cumberland County)



The Village of Toledo (Facility Number 0350200) obtains its water from two active community water supply wells. Wells Nos. 101 and 102 (Illinois EPA Nos. 00284 and 00285, respectively) supply an average of 104,000 gallons per day (gpd) to 608 services or a population of 1,200.

Toledo 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

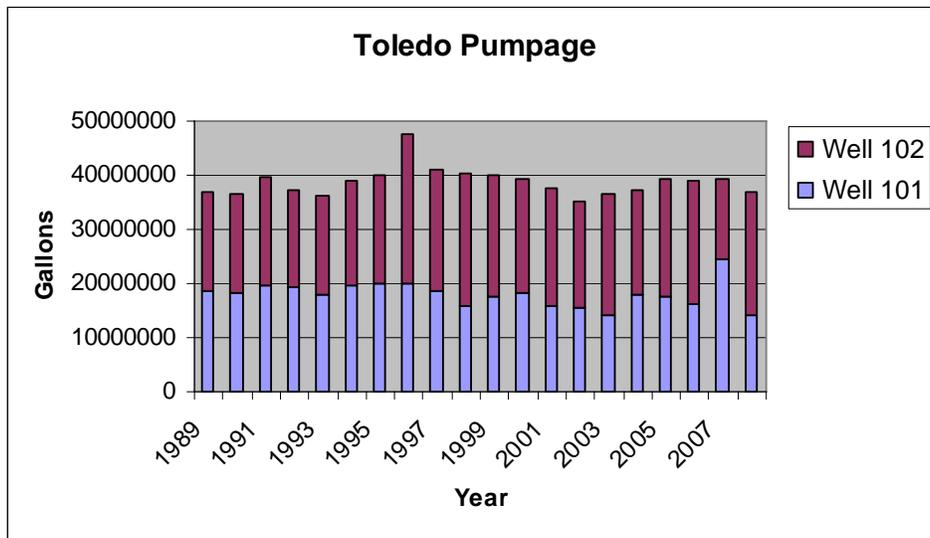
Well No. 101

Constructed in 1987 within sand and gravel deposits located in the flood plain of the Embarras River in Section 26, T.10N., R.9E., Cumberland County. The well was drilled to a depth of 44 feet and, upon completion was tested at a rate of 250 gpm for 24 hours with 10.2 feet of drawdown from a nonpumping water level of 15.09 feet. The calculated specific capacity of this well was 24.5 gpm/ft.

Well No. 102

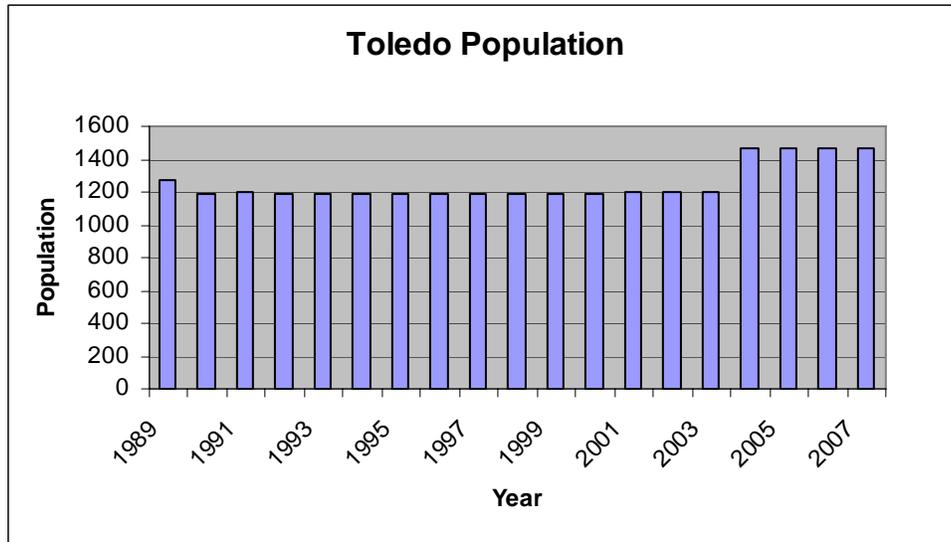
Constructed in 1987 within sand and gravel deposits located in the flood plain of the Embarras River in Section 26, T.10N., R.9E., Cumberland County. The well was drilled to a depth of 44 feet and, upon completion was tested at a rate of 250 gpm for 3 hours with 13.9 feet of drawdown from a nonpumping water level of 14.90 feet. The calculated specific capacity of this well was 18.0 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 Greenup 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 wells finished in the unconsolidated materials above bedrock. These 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.

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 are only two towns within the Toledo area that have major public water supply systems comparable to Toledo; the villages of Greenup and Jewett, both in Cumberland County.

Since 2003, the Village of Jewett began purchasing water from Village of Toledo. Prior to 2003 they used two wells finished in sand and gravel at depths of 136 and 138 feet and both were located in Section 24, T.9N., R.8E., Cumberland County. Reports indicate that the aquifer that these wells were finished within was limited which led the town to begin purchasing water from Toledo.

The Village of Greenup uses four wells all finished within the sand and gravel deposits associated with the Embarras River. These wells are located in Sections 2 and 35, T.9N., R.9E., and T.10N., R.9E., Cumberland County, respectively. The wells range in depth from 39 to 47 feet and their pumpage ranges from 175 to 376 gpm. Specific capacities from these wells range from 10.4 gpm/ft to 33.6 gpm/ft.

Figures 1 and 2 picture the ISWS Potential Yield maps for sand and gravel and bedrock aquifer in Illinois, respectively. The pertinent counties for Toledo are highlighted. Figure 1 indicates that sand and gravel deposits are variable throughout most of the Toledo area with the exception of the high-yielding deposits associated with the Embarras River. The bedrock map (Figure 2) indicates poor availability of groundwater from the bedrock throughout the Toledo 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 Toledo area as depicted in the Illinois State Geologic Survey Circular 225, *Groundwater Geology in South-Central Illinois* (Selkregg, et al., 1957). Figure 3 indicates “Fair to Good,” variable and discontinuous sand and gravel deposits regionally and “Good to Excellent” high-yielding deposits along the Embarras 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 Village of Toledo uses two wells located within the floodplain of the Embarras River in Section 26, T.10N., R.9E., Cumberland County. Both wells are finished within sand and gravel deposits at 44 feet below land surface. Upon completion, each well was tested and rated at about 250 gpm.

The available information indicates that the sand and gravel deposits the Village currently uses are capable of providing Toledo with its water needs now and into the future. Greenup’s well field to the south indicates these deposits can be used for additional wells south of the current Toledo wells, should there be the need.

References

Selkregg, L.F., W. Pryor, and J. Kempton. 1957. Groundwater Geology in South-Central Illinois, A preliminary Geologic Report. Illinois State Geological Survey Circular 225.

Estimated Potential Yields of Sand and Gravel Aquifers in Toledo Area

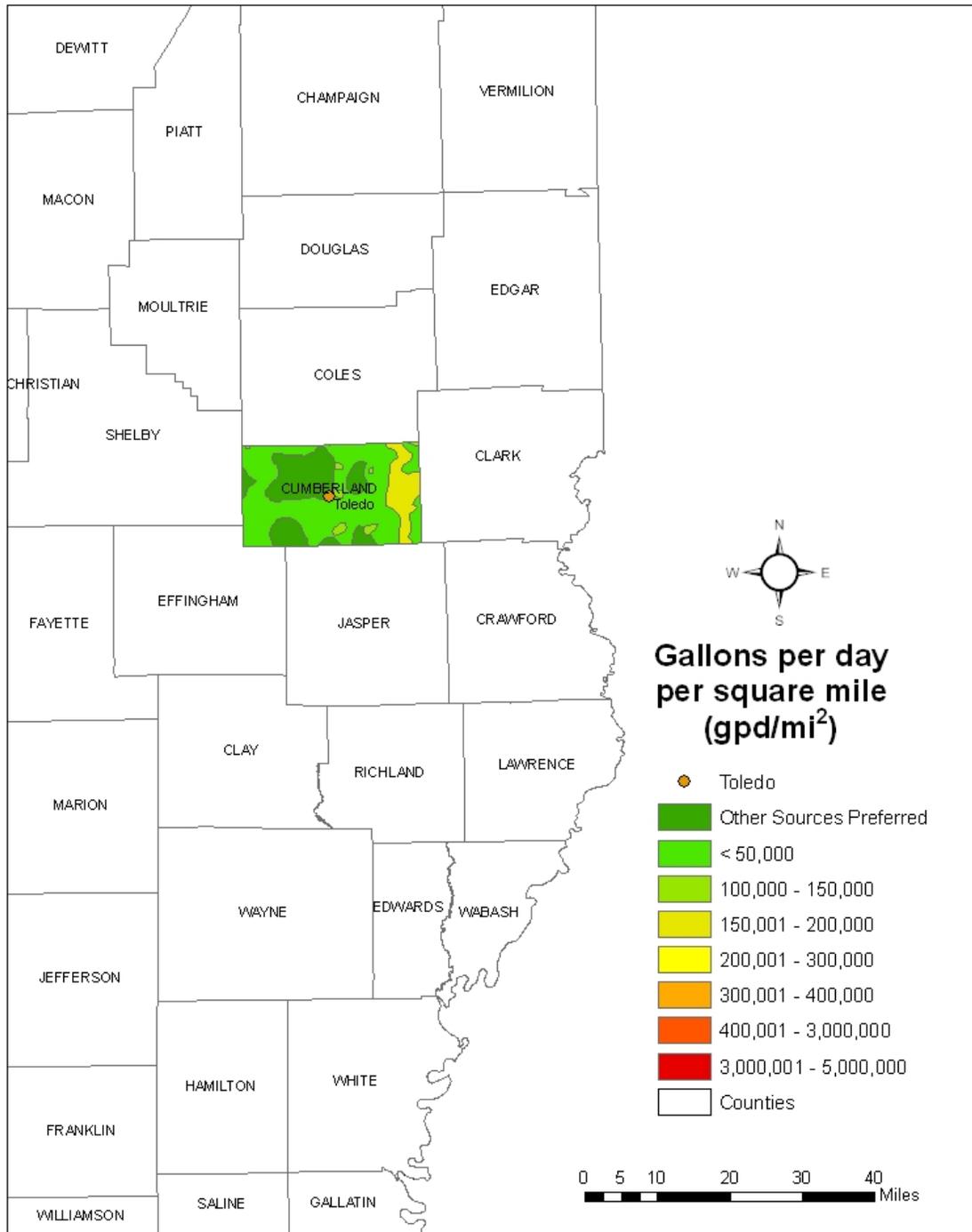


Figure 1.

Estimated Potential Yields of Shallow Bedrock Aquifers in Toledo Area

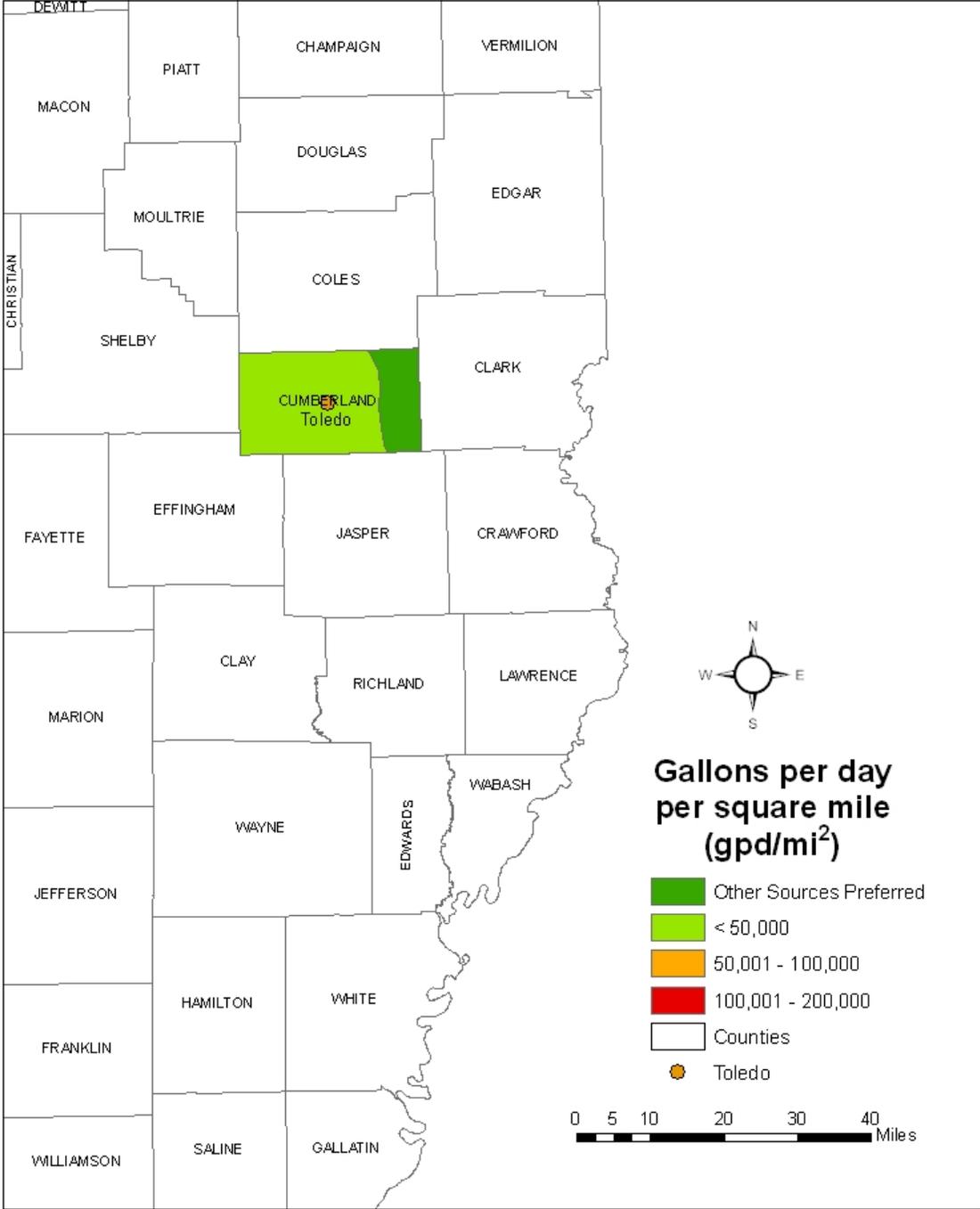
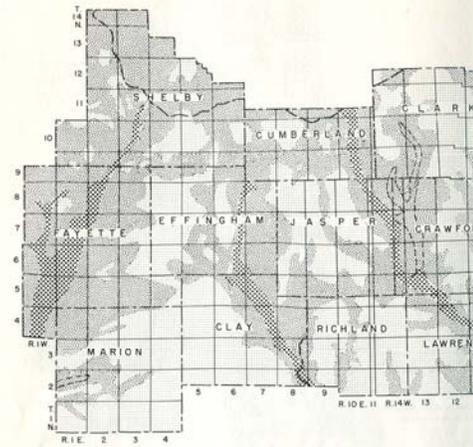
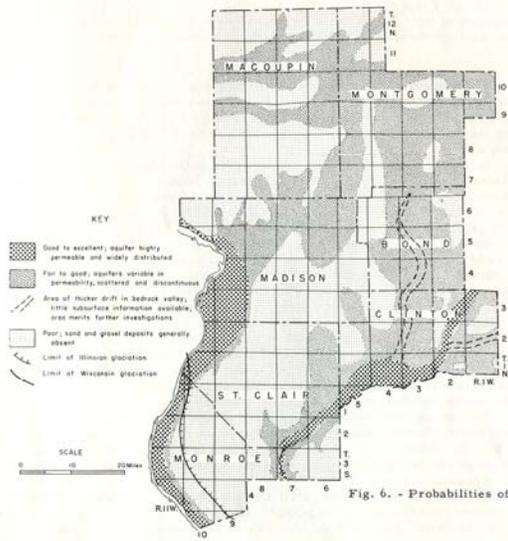
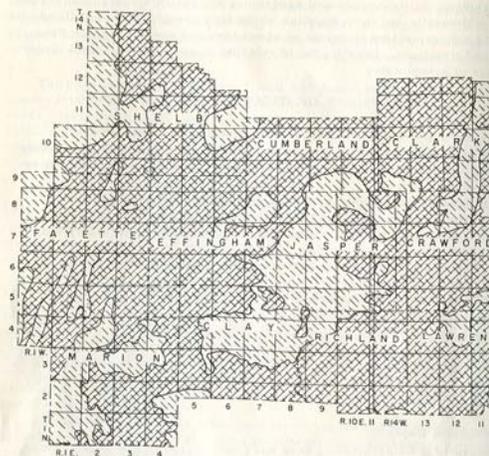
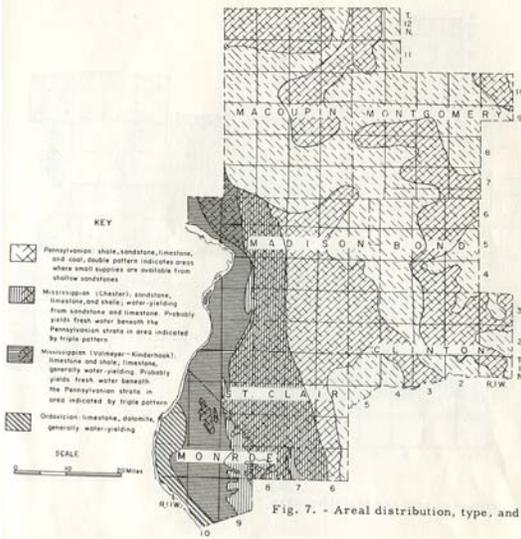


Figure 2.



occurrence of sand and gravel aquifers.

Figure 3.



water-yielding character of upper bedrock formations.

Figure 4.

ISWS publications list for Toledo and surrounding areas.

CLARK

- *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.
- *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.
- *1980 CR-237 Assessment of eighteen public groundwater supplies in Illinois. Wehrmann-Visocky-Burris-Ringler-Brower. 185p.
- 1982 COOP-8 Hydrogeologic evaluation of sand and gravel aquifers for municipal groundwater supplies in East-Central Illinois. Kempton-Morse-Visocky. 59p.
- 1989 ISSJR-2 Evaluation of underground injection of industrial waste in Illinois. Brower-Visocky-Krapac-Hensel-Peyton-Nealon-Guthrie. 182p.

COLES

- *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.
- *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.
- 1972 RI-70 Plans for meeting water requirements in the Kaskaskia River Basin, 1970-2020. Singh-Visocky-Lonnquist. 24p

- *1980 CR-237 Assessment of eighteen public groundwater supplies in Illinois. Wehrmann-Visocky-Burris-Ringler-Brower. 185p.
- 1982 COOP-8 Hydrogeologic evaluation of sand and gravel aquifers for municipal groundwater supplies in East-Central Illinois. Kempton-Morse-Visocky. 59p.

CUMBERLAND

- *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.

JASPER

- *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.
- *1966 RI-55 Yields of wells in Pennsylvanian and Mississippian rocks in Illinois. Csallany. 42p.
- *1980 CR-237 Assessment of eighteen public groundwater supplies in Illinois. Wehrmann-Visocky-Burris-Ringler-Brower. 185p.
- 1998 CR-634 Ground-Water investigation in the Embarras River Valley, Jasper County, Illinois. Sanderson. 173p.