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 Brocton 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 Brocton.

Brocton (Edgar County)

The Village of Brocton (Facility Number 0450050) utilizes two community water supply wells. Well Nos. 1 (Illinois EPA Well 40007) and 2 (Illinois EPA Well
40008) supply an average of 37,000 gallons per day to 165 services or a population of 320. It takes approximately 10.5 hours per day to produce the average amount of water consumed per day. The wells pump approximately 59 gallons per minute (gpm), and are alternated regularly, but not on a predetermined schedule.

Brocton 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
Finished in sand and gravel deposits located northeast of the village in Section 25, T.15N., R.14W., Edgar County. The well was drilled to a depth of 38 feet in 1962 and, upon completion, was pumped at a rate of 133 gpm for 70 minutes. The observed specific capacity was 7.8 gpm/ft with a long-term production rate determined to be approximately 100 gpm. Static water level was reported at approximately 5 feet below land surface when the well was completed.

Well No.2
Finished in sand and gravel deposits located northeast of the village (approximately 300 feet southwest of Well No. 1) in Section 25, T.15N., R.14W., Edgar County. The well was drilled to a depth of 46 feet in 1984 and has a pump rated at approximately 100 gpm. Static water level was reported at approximately 8 feet below land surface when the well was completed.

Background Pumpage Information

![Brocton Pumpage](chart.png)

Source: ISWS Illinois Water Inventory Program
**Regional Information**

**Resources within 5 miles of Brocton (Figure 1).**

*Domestic Groundwater Supplies*

The available regional data indicate that groundwater for domestic and farm use in this part of Illinois is obtained from large-diameter (approximately 3 feet) bored wells and small-diameter drilled wells finished in the unconsolidated materials above bedrock, and from small-diameter drilled wells tapping the underlying bedrock formations. 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 small-diameter drilled wells finished within the unconsolidated materials tap thicker sequences of sand which are very discontinuous throughout this 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 rates of 5 to 10 gallons per minute for short periods of time.

*Municipal Groundwater Supplies*

There are two towns within five miles of Brocton, the Village of Isabel and Borton, both in Edgar County. Neither of these towns report a municipal water supply and it is assumed that domestic wells are used for the resident's water needs.
Resources with 10 miles of Brocton (Figure 2).

*Municipal Groundwater Supplies*

Towns within 5 to 10 miles of Brocton include: Garland, Hume, Metcalf and Redman in Edgar County; Oakland in Coles County; and Newman and Murdock in Douglas County. The towns of Garland and Murdock do not report a municipal supply and it is assumed that domestic wells are used for the resident’s water needs.

The Village of Hume uses two wells finished in sand and gravel. Both wells are located in section 31, T.16N., R.13W., Edgar County. The wells are drilled to depths of 55 and 58 feet below land surface and report pumpage ranging from 130 to 150 gpm.

The Village of Metcalf uses one well finished in sand and gravel within the village limits. The well is located in Section 34, T.16N., R.13W., Edgar County. It was drilled to a depth of 75 feet in 1955 and is reported to be rated at 250 gpm. Static water level at the time of construction was around 13 feet below land surface.

As of 2003, the city of Oakland purchased water from the Embarras Area Water District. Up to that time, it maintained its own lake, however, this surface water supply was marginal and they contracted with the Water District as a long-term solution.

The Village of Redman uses one well finished in sand and gravel within the village limits. The well is located in Section 21, T.14N., R.13W., Edgar County. It was drilled to a depth of 66 feet in 1967 and is reported to be pumped at about 75 gpm. Static water level at the time of construction was measured at 12.83 feet below land surface.

The City of Newman uses two wells (Nos. 4 and 5) finished in sand and gravel. Both wells are located in Section 31, T.16N., R.11E., Edgar County. Well No. 4 was drilled to a depth of 58.3 feet in 1953 with a nonpumping water level of 19.66 feet. The long-term yield of this well was determined to be around 230 gpm. Well No. 5 was drilled to a depth of 52 feet in 1999. This well was capable of producing around 160 gpm. Both wells are located about one-half mile west of the town.

Figures 3 and 4 picture the ISWS Potential Yield maps for sand and gravel and bedrock aquifer in Illinois, respectively. The pertinent counties for Brocton are highlighted. Figure 3 indicates that sand and gravel deposits are variable throughout most of the Brocton area. The bedrock map (Figure 4) indicates poor availability of groundwater from the bedrock throughout the Brocton area. Figures 5 and 6 present the probability of occurrence of the sand and gravel and the water-yielding character of the shallow bedrock for the Brocton area as
depicted in the Illinois State Geologic Survey Circular 248, *Groundwater Geology in East-Central Illinois* (Selkregg, et al., 1958). Figure 5 indicates “Fair to Good,” variable and discontinuous sand and gravel deposits and Figure 6 indicates only small supplies are available from the shallow bedrock units. The domestic well construction records verify these map outlooks.

**Groundwater Availability Summary**

Available information indicates that the sand and gravel deposits that the Village uses are capable of supplying the current needs of the town. Many of the towns in this part of Illinois rely on shallow sand and gravel deposits for their supplies; however, many Electrical Earth Resistivities have been conducted to find reliable deposits throughout this area, as well. The deposits that Brocton uses have been a reliable source of groundwater for many years and there is no reason to believe they cannot be relied upon for the future. However, should a problem with this source occur, at least one Rural Water District is active in the general location, Embarras Area Water District PWS, and could be contacted to determine the feasibility of connecting to purchase water for the town, should this be needed.
Figure 2. 10-mile radius map-Brocton
Estimated Potential Yields of Sand and Gravel Aquifers in Brocton Area

Gallons per day per square mile (gpd/mi²)

- Other Sources Preferred
- < 50,000
- 100,000 - 150,000
- 150,001 - 200,000
- 200,001 - 300,000
- 300,001 - 400,000
- 400,001 - 5,000,000

Figure 3.
Estimated Potential Yields of Shallow Bedrock Aquifers in Brocton Area

Gallons per day per square mile (gpd/mi$^2$)

- Brocton
- Other Sources Preferred
- < 50,000
- 50,001 - 100,000
- 100,001 - 200,000
- > 200,000

Figure 4.
References


ISWS publications list for Brocton and surrounding area.

### COLES

<table>
<thead>
<tr>
<th>Year</th>
<th>Report Code</th>
<th>Title</th>
</tr>
</thead>
</table>

### DOUGLAS

<table>
<thead>
<tr>
<th>Year</th>
<th>Report Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961</td>
<td>RS-17</td>
<td>Evaluating wells and aquifers by analytical methods. Walton-Walker.</td>
</tr>
</tbody>
</table>


EDGAR


