# Ground Water Resources of MADISON COUNTY

by
**Michael Hallfrisch**
**(Modified from Norris, S.E. 1959)**

1 0 1 2 Miles

1 0 1 2 Kilometers

CONTOUR INTERVAL 5 FEET

County Line

Township Line

Incorporated City Limit

Location of Ancestral Buried Bedrock Channel

## Well Yields

AREAS IN WHICH YIELDS OF 100 TO 500 GALLONS PER MINUTE MAY BE DEVELOPED

Industrial and municipal ground water supplies are available from the carbonate bedrock aquifer at depths typically less than 350 feet. Test wells in northern Darby and Pike Townships yielded in excess of 1000 gallons per minute. Yields sufficient for domestic use and livestock watering are often obtained at depths of 150 feet or less.

A large proportion of the domestic and farm wells in this area are developed in sand and gravel lenses and layers interbedded in the glacial till which overlies the bedrock aquifer. These wells are typically 35 to 140 feet deep. Yields in excess of 100 gallons per minute have been reported from some thick and laterally extensive sand and gravel layers in the northern portion of the county.

Potentially large supplies of ground water may be available from the outwash sand and gravel deposits underlying the floodplains of many larger streams in the county. Extensive test drilling may be required to locate the coarsest saturated deposits.

Buried valley deposits below which the carbonate bedrock aquifer has been eroded away. This area may contain several zones of productive sand and gravel deposits. Extensive test drilling may be required to locate the best aquifers.

This area may contain highly productive sand and gravel aquifers in the deposits overlying the carbonate bedrock aquifer. These sand and gravel deposits may not exist under every location in this area. Test drilling will be required to locate the best deposits. The carbonate bedrock aquifer is described above.

AREAS IN WHICH YIELDS UP TO 100 GALLONS PER MINUTE MAY BE DEVELOPED

Yields of as much as 100 gallons per minute from large diameter wells are available from the carbonate bedrock. As with the other carbonate bedrock aquifer areas in the county, many domestic wells are developed in sand and gravel lenses interbedded in the till which overlies the bedrock.

AREAS IN WHICH YIELDS OF 5 TO 25 GALLONS PER MINUTE MAY BE DEVELOPED

Lenses of sand and gravel interbedded in glacial till yield sufficient quantities of ground water for farm and domestic use. Bedrock is Ordivician shales and shaley limestones capable of yielding only meager quantities of ground water.

## Well Site Symbols

WELL INFORMATION
(SEE NOTE)

DEPTH (ft.) Total depth of well in feet.
AQUIFER TYPE Water–bearing formation
YIELD (gpm) Amount of water a well produces in gallons per minute.
WELL SITE Approximate well location
*75-SS-20* / *26*
DEPTH TO BEDROCK (ft.) Depth to bedrock in feet.

WELL TYPES
- Well Site
- Municipal-Industrial Well
- Observation Well Site**
- Test Well*
- A Chemical Analyses

AQUIFER TYPES
- S – Sand
- G – Gravel
- SG – Sand & Gravel
- LS – Limestone

## Chemical Analysis Table

| Well Site | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 1.1 | .78 | .5 | 1.1 | – | 1.6 | – | .93 | 9.0 |
| Manganese (Mn) | .05 | .035 | – | .11 | .03 | .12 | – | .03 | 0.1 |
| Sulfate ($SO^4$) | 91 | 84 | 245 | 170 | 111 | 91 | 180 | 257 | 80 |
| Chloride (Cl) | 4.0 | 1.5 | 14.3 | 6.0 | 36 | 3.0 | 9.5 | 8.0 | 4.0 |
| Fluoride (F) | 1.7 | 1.7 | – | 1.4 | 0.9 | 1.5 | 69 | 0.6 | 1.6 |
| Sodium (Na) | 18 | 8.5 | 20.7 | 28 | 58 | 3.6 | 35 | 63 | 15 |
| Hardness as CaCO3 | 390 | 450 | 571 | 460 | 377 | 389 | 480 | 512 | 432 |
| Total Dissolved Solids | 480 | 544 | 743 | 580 | 558 | 461 | 660 | 745 | 506 |

Chemical constituents as milligrams per liter (mg/l)

**Observation well sites indicate the location of wells used to collect ground water level information. These wells are part of the state observation well network. Hydrographs of the water levels recorded in these and other State observation wells can be obtained through ODNR–Division of Water.

*Test well sites indicate the location of a test well that was part of a regional ground water study. Detailed lithologic logs, water quality analysis and pumping test information for these wells may be available from ODNR–Division of Water.

NOTE

The ground water characteristics have been mapped regionally, based upon interpertations of water well records and the area's geology and hydrology. Mapped well sites were selected as typical for the areas shown.

Information regarding specific sites may be obtained from ODNR–Division of Water.

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