Location of Recharge Areas to the Sandstone Aquifer in Dunn County, Wisconsin

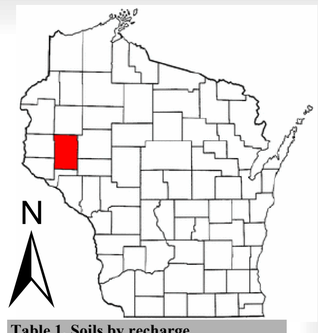

Table 1. Soils by recharge capability to the sandstone aquifer.

Excellent
- Aldo Sand
- Chelsea Fine Sand
- Farrington Loamy Sand
- Finchford Loamy Sand
- Komro Loamy Sand
- Meehan Loamy Sand
- Menahga Sand
- Plainfield Sand

Very Good
- Bilson Sandy Loam
- Burkhardt Sandy Loam
- Chetek Sandy Loam
- Dakota Silt Loam
- Drammen Loamy Sand
- Dunnbot Fine Sandy Loam
- Forkhorn Sandy Loam
- Hoopeston Sandy Loam
- Markey Muck
- Seelyville Muck
- Menomin Silt Loam
- Meridian Silt Loam
- Mert Silt Loam
- Mopet Fine Sandy Loam
- Newson Mucky Loamy Sand
- Oesterle Sandy Loam
- Palms & Houghton Mucks
- Pits
- Rassett Sandy Loam
- Rusktown Sandy Loam
- Scotah Loamy Fine Sand
- Shiffer Loam
- Tarr Sand
- Tint Sand

Good
- Boone Sand
- Boone-Elevasil Complex
- Boone-Tarr Sands
- Boplain
- Elevasil Sandy Loam
- Elkmound Loam
- Fordum Silt Loam
- Garne Loamy Sand
- Hayriver-Twinmound Complex
- Kevilar Sandy Loam
- Lows Loam
- Northbend-Ettrick Silt Loam
- Plainbo Sand
- Poskin Silt Loam
- Prissel Silt Loam
- Rib Silt Loam
- Twinmound Fine Sand

Fair
- Arenzville Silt Loam
- Beavercreek Cobbly Fine Sandy Loam
- Bearpen Silt Loam
- Boguscreek Silt Loam
- Doritty Silt Loam
- Ella Silt Loam
- Ettrick Silt Loam
- Hayriver and Elevasil Fine Sandy Loam
- Orion Silt Loam
- Plumcreek Silt Loam
- Quarder Silt Loam
- Udorthends
- Urne Fine Sandy Loam
- Vancecreek Silt Loam

Poor
- Almena Silt Loam
- Amery Sandy Loam
- Arland Fine Sandy Loam
- Chaseburg Silt Loam
- Churchtown Silt Loam
- Dobie and Hixton Silt Loam
- Dorerton-Elbaville Complex
- Fivepoints Silt Loam
- Gaphill-Rockbluff Complex
- Hersey Silt Loam
- Hiles Silt Loam
- Hixton Silt Loam
- Humbird Fine Sandy Loam
- Kert Silt Loam
- Merillan Fine Sandy Loam
- Newglarus Silt Loam
- Norden Silt Loam
- Pepin Silt Loam
- Renova Silt Loam
- Seaton Silt Loam
- Santiago Silt Loam
- Siouxcreek Silt Loam
- Spencer Silt Loam
- Vase Silt Loam
- Veedum Silt Loam
- Vlasaty Silt Loam
- Wickware Silt Loam

Table 2. Permeability rate of soil recharge groups in inches per hour.

Excellent	10 - 20
Very Good	5 - 10
Good	2 - 5
Fair	0.8 - 2
Poor	0.2 - 0.8

RECHARGE TO GROUNDWATER
- EXCELLENT
- VERY GOOD
- GOOD
- FAIR
- POOR

0 0.5 1 2 3 4 Miles

Location of Recharge Areas to the Sandstone Aquifer in Dunn County, Wisconsin - By Neil C. Koch 2005

Introduction:

The major aquifer that underlies all of Dunn County is the sandstone of Cambrian age. The sandstone aquifer receives recharge from snowmelt and rainfall in Dunn County. The snowmelt and rainfall sinks into the ground and moves down to the water table which is the top of the water surface of the aquifer. Discharge from the aquifer is to nearby creeks, rivers and lakes.

The sandstone is as much as 800 feet thick in some places in Dunn County. The sandstone in many areas is overlain by glacial drift consisting of clay, silt, sand, gravel and boulders. Dolomite of Ordovician age overlies the sandstone in 5,000 acres in western Dunn County. In some areas up to six feet of wind blown silt and clay, called loess, covers the glacial drift or sandstone. The sandstone is within 5 feet of the land surface in 43.5 percent of the County. (Sutherland, 1987). The outwash deposits of sand and gravel are part of the sandstone aquifer where they are in contact with the underlying sandstone.

As development increases, two potential problems could impact the sandstone aquifer. Reduced recharge to the aquifer may occur as more land is covered with roads and buildings causing precipitation to move quicker to streams and lakes resulting in less water available to recharge the aquifer. The danger of polluting the aquifer will increase. A water table aquifer is under great risk of becoming contaminated by surface spills, so it is necessary to manage what types of development occur, especially in areas where there is excellent to good recharge to the aquifer. To aid in planning for future development in Dunn County, the location of recharge areas to the sandstone aquifer is necessary to maintain good recharge to the aquifer and to protect the aquifer from being contaminated from surface pollutants.

Purpose and Scope:

The purpose of this map is to show where the recharge areas to the sandstone aquifer occur in Dunn County, and to rank the soils from excellent to poor as to their ability to allow precipitation to recharge the aquifer. The soil survey of Dunn County, approved in 2004, was used for the base mapping. A recharge ranking is given to 91 different types of soil types. Table 1 shows the soils that are classified under each recharge ranking. A permeability rate is given for each recharge group (table 2)

Physical Characteristics Used to Establish Soil Recharge Rankings:

The sandier the soil, the greater the recharge ranking. The more clay within the soil column or substrata the poorer the recharge ranking. Soils ranked as excellent recharge potential to the sandstone aquifer consist of outwash deposits of sand and gravel. Soils ranked as very good consist of silty, sandy alluvium overlying eolian sand or outwash. Soils ranked as good consist of sandy alluvium overlying shallow bedrock. Soils ranked as fair consist of loamy, silty, alluvium. Soils ranked as poor consist of loess and glacial till, which contains silt, clay, and pebble clay. The permeability of the soils and substrate range from 0.2 to 20 inches per hour. In Dunn County 11 percent of the area has an excellent recharge ranking, 24 percent has a very good recharge ranking, 24 percent has a good recharge ranking, 18 percent has a fair recharge ranking, and 23 percent has a poor recharge ranking.

Recharge concerns:

As demand for groundwater withdrawal increase with population and industrial growth, recharge to the aquifer should not become less than the withdrawal from the aquifer. The conversion of farm fields into urban developments results in buildings, driveways, streets, roads and parking lots, which reduces the recharge from precipitation to the aquifer. By carefully managing development in the excellent to good recharge areas, urban development will have less of an impact on reducing recharge to the aquifer.

Pollution Concerns:

Soils ranked as excellent recharge potential have the greatest risk of contaminants reaching the aquifer. Housing developments where several wells and septic fields exist would run the risk of septic waters entering the aquifer. The permeability of these soils could be 20 inches per hour. Even in the very good recharge soils, there could be septic contamination to the well where the alluvium is very sandy overlying outwash. The direction of flow in the aquifer is important to determine so wells can be placed up gradient from septic fields. Agricultural pollutants can contaminate the aquifer quickly in excellent and very good recharge areas.

Acknowledgements:

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Reference:

Sutherland, A.W. and Madison, F.W., 1987 Soils of Dunn County and their ability to attenuate contaminants,

Wisconsin Geological and Natural History Survey Map 87-4, map with text.

Wing, Gorden N., 1975 Soil Survey of Dunn County: U.S. Department of Agriculture, Soil Conservation Service, 117p.

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Cartographer's note:
The original, digital, version of this map was lost sometime after the map was published.
This map is a re-creation of the original hard copy map using the same datasets, text and graphics.
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