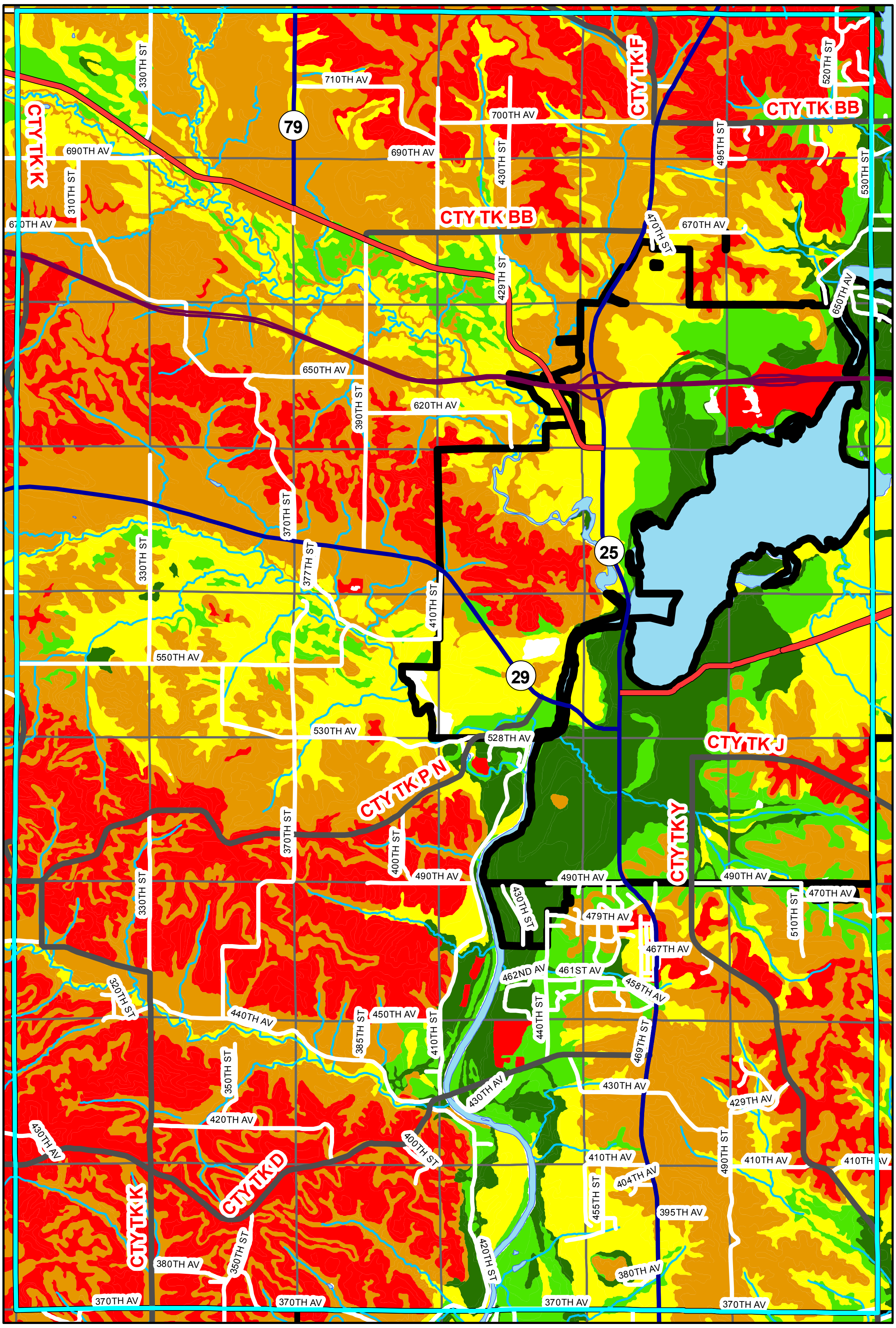
Location of Recharge Areas to the Sandstone Aquifer in the Town of Menomonie, Dunn Co., WI



Recharge to Groundwater

Permeabilty in Inches Per Hour

Excellent 10 - 20

Very Good 5 - 10

Good 2 - 5

Fair 0.8 - 2

Poor 0.2 - 0.8

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
Game 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
Ulme 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 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

Location of Recharge Areas to the Sandstone Aquifer in Dunn County, Wisconsin - By Neil C. Koch 2005/2015

INTRODUCTION

The major aquifer that underlies all of Dunn County is the sandstone of Cambrian age. The sandstone aquifer receiving 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 a 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 soil types. Table 1 shows the soils that are classified under each recharge ranking. A permeability rate is given for each recharge group.

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. The 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 pebbly clay. The permeability of the soils and substrata range from 0.2 to 20 inches per hour (table 2). In Dunn County 11 percent of the area has an excellent 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 increases with population and industrial growth, recharge to the aquifer should not become less than 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 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 the septic waters entering the aquifer. The permeability of these soils could be 20 inches per hour (table 2). 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 upgradient from septic fields. Agricultural pollutants can contaminate the aquifer quickly in excellent and very good recharge areas

ACKNOWLEDGMANTS

A special thanks to Rick Mechelke, Conservation Planner Dunn County Land Conservation Division who computer generated the recharge map of the soils in Dunn County and helped with modifying the ranking of the soils and to Larry L. Natzke, Resource Soil Scientist, U.S. Department of Agriculture who helped with modifying the ranking of the soils. Thanks also to Larry L. Natzke for reviewing the map and providing suggestions. This map is the result of an activity by the Dunn County Groundwater Guardian Community, which is part of a program of The Groundwater Foundation, a private non-profit educational organization that informs and motivates people to care about and for groundwater.

REFERENCES

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, 117 p