STATE OF MINNESOTA
DEPARTMENT OF NATURAL RESOURCES
ECOLOGICAL AND WATER RESOURCES DIVISION

Prepared and published with the support of the
MINNESOTA ENVIRONMENT AND NATURAL RESOURCES TRUST FUND and the CLEAN WATER, LAND AND LEGACY AMENDMENT

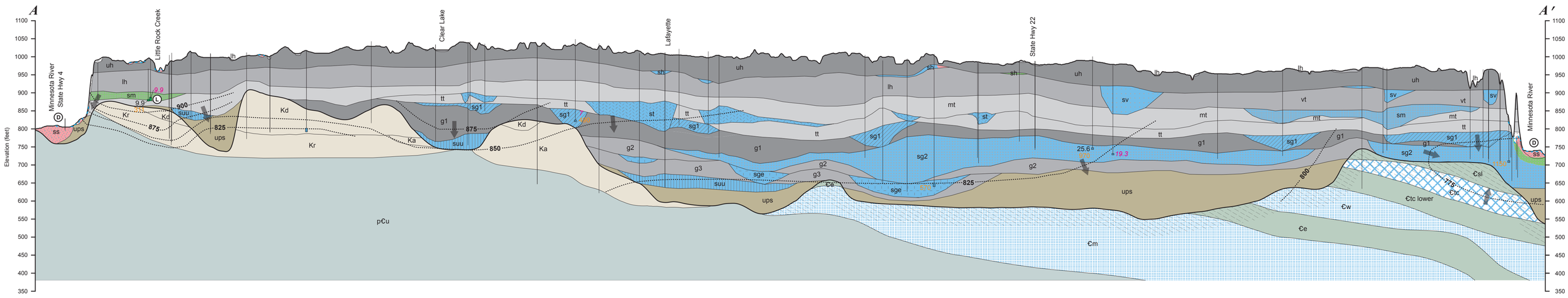
COUNTY ATLAS SERIES
NICOLLET COUNTY
Atlas C-25, Plate 8 of 8
Hydrogeologic Cross Sections

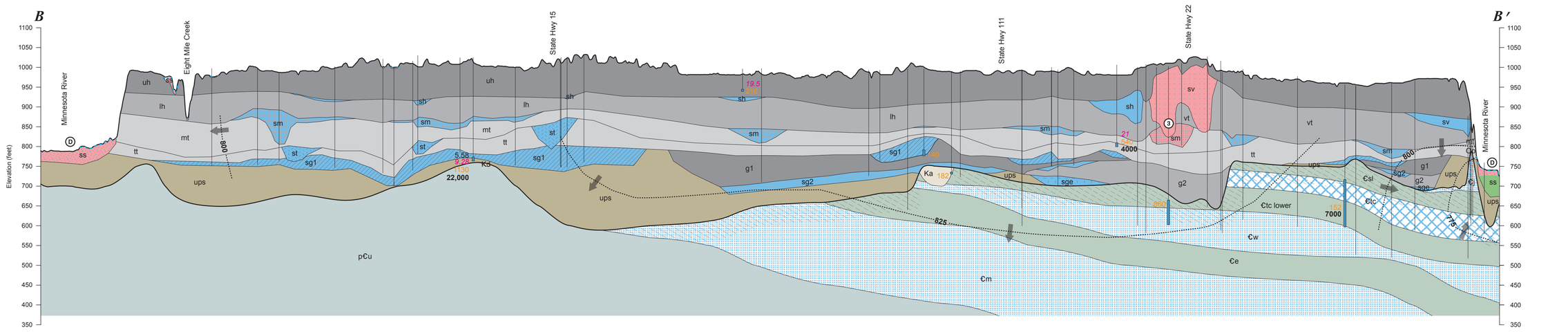
To accompany atlas Report and Plate 7.

Hydrogeologic Cross Sections

By Vanessa M. Baratta and Todd A. Petersen

2016





CROSS SECTION EXPLANATION

Aquifers and aquitards grouped by stratigraphy

Interpreted tritium age is indicated by background color

Interpreted tritium age is indicated by pattern color

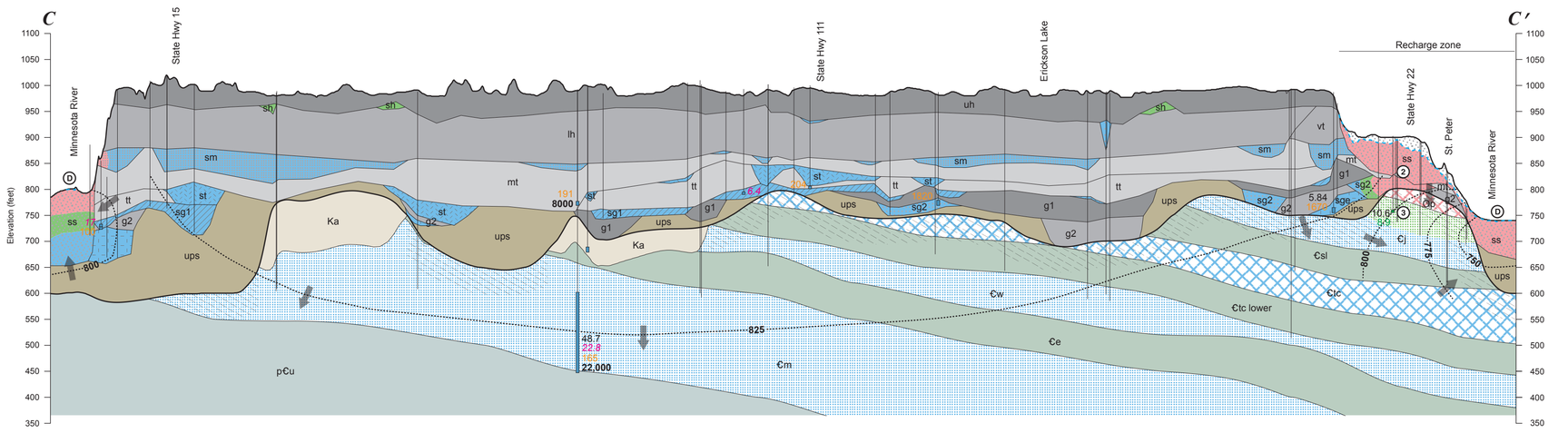
Quaternary unconsolidated sediment
(see figure 4 for geologic unit correlation)

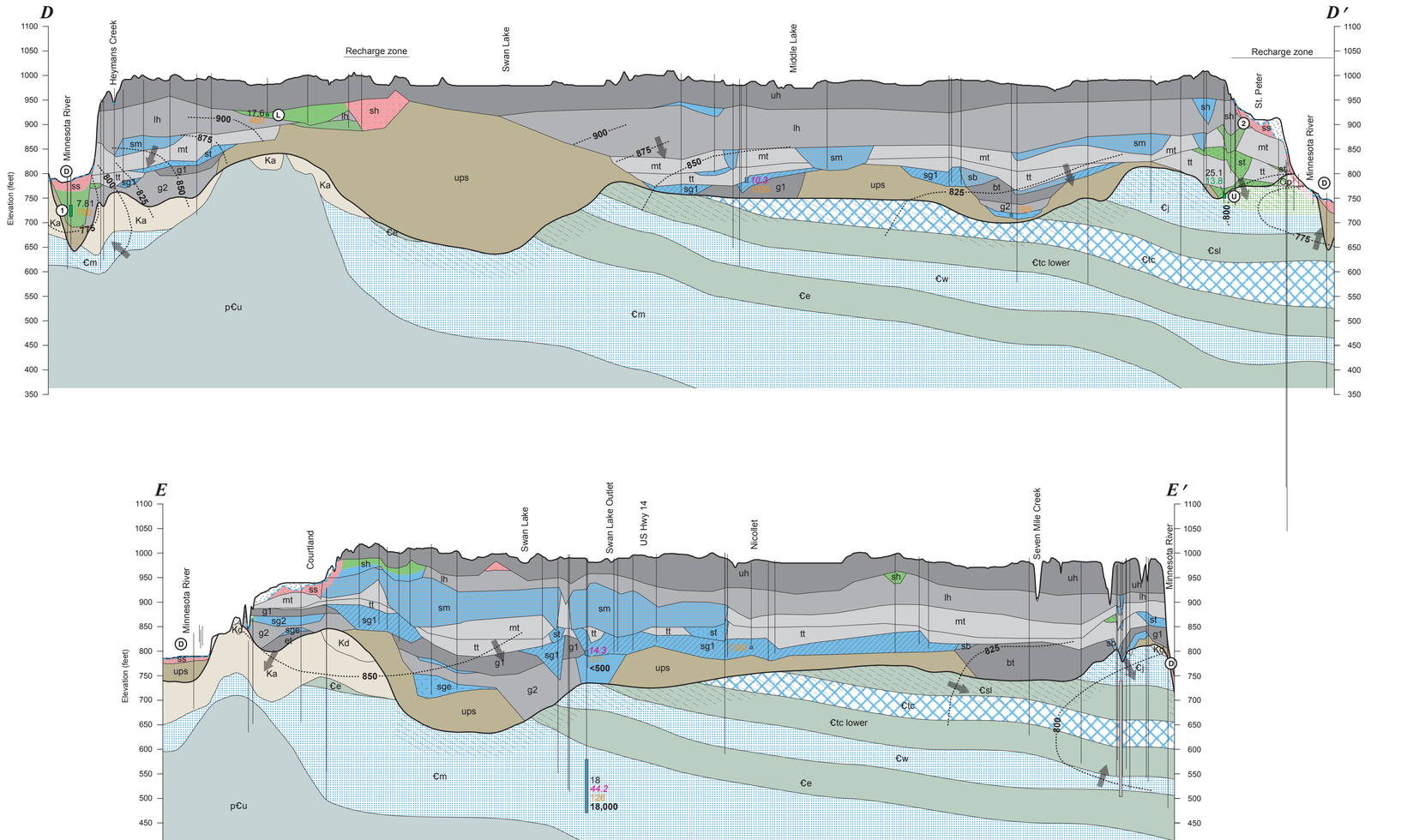
Surficial sand and gravel
- ss

Buried aquifers and aquitards
- uh
- sh/sv
- lh,vt
- sm
- mt
- st
- tt
- sb
- bt
- sg1
- g1
- sg2
- sge
- et
- suu
- Undifferentiated sediment (ups)

Bedrock
- Kd Dakota
- Ka Unnamed
- Kr Saprolith
- Op Prairie du Chien
- Cj Jordan
- Csl St. Lawrence Formation
- Ctc Upper Tunnel City
- Ctc lower Lower Tunnel City Group
- Cw Wonewoc
- Ce Eau Claire Formation
- Cm Mt. Simon
- pCu Precambrian crystalline bedrock

- Enhanced-permeability zone





Quaternary aquitards

Grouped by texture ranging from highest to lowest sand content, indicating relative hydraulic conductivity. Lighter shades of gray represent units with higher hydraulic conductivity and darker shades of gray have lower hydraulic conductivity.

Hydrogeologic unit code	Percent sand
mt, tt	>50% and ≤60%
g2, lh, vt	>40% and ≤50%
bt, g1, uh, et	>30% and ≤40%

Tritium age

Darker color in small vertical rectangle (well screen symbol) indicates tritium age of water sampled in well. Lighter color indicates interpreted age of water in aquifer.

- Recent: water entered the ground since about 1953 (8 to 15 tritium units [TU]).
- Mixed: water is a mixture of recent and vintage (greater than 1 TU to less than 8 TU).
- Vintage: water entered the ground before 1953 (less than or equal to 1 TU).
- Well not sampled for tritium.

Symbols and labels

- 9.9 If shown, chloride concentration equals or exceeds 5 parts per million.
- 5.4 If shown, arsenic concentration equals or exceeds 5 parts per billion.
- 273 If shown, manganese concentration equals or exceeds 100 parts per billion.
- 8.9 If shown, nitrate-nitrogen concentration equals or exceeds 1 part per million.
- 4000 If shown, groundwater residence time in years, estimated by carbon-14 (^{14}C) isotope analysis
- General groundwater flow direction
- 900 Approximate equipotential contour; contour interval 25 feet
- Geologic contact
- Land or bedrock surface
- Water table

Groundwater conditions

1. Water from the surface moves through a thin layer of overlying fine-grained material to an underlying aquifer.
2. Groundwater moves from an overlying surficial aquifer to a buried aquifer.
3. Groundwater moves from an overlying buried aquifer to an underlying buried aquifer.
- D Groundwater discharge to a surface-water body.
- L Groundwater flows laterally.
- U Groundwater flowpath is unknown (deep groundwater, recent or mixed tritium age).
- Groundwater movement is out of cross section.

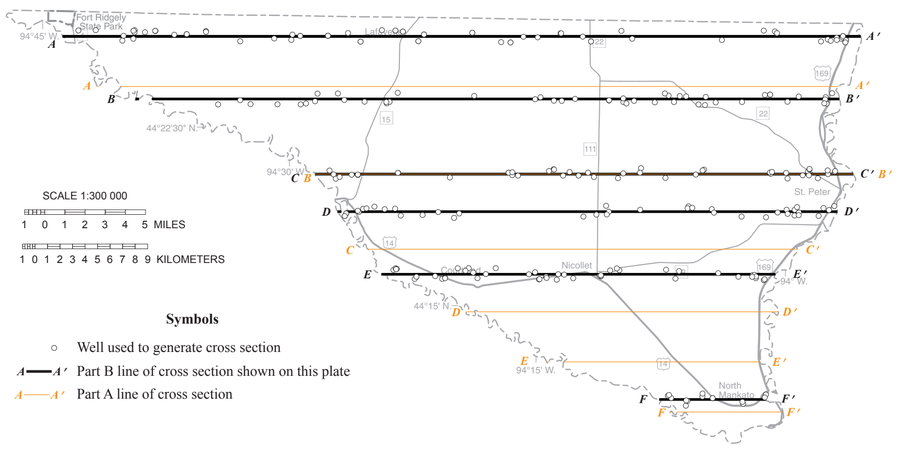
Maps were compiled and generated in a geographic information system (GIS). Digital data products, including chemistry data, are available from the Minnesota Department of Natural Resources (DNR), Ecological and Water Resources Division on the Groundwater Atlas Program page (mndnr.gov/groundwatermapping).

This map was prepared from publicly available information. Every reasonable effort has been made to ensure the accuracy of the factual data on which this map interpretation is based. However, the DNR does not warrant the accuracy, completeness, or any implied uses of these data. Users may wish to verify critical information; sources include both the references in the report and information on file in the offices of the Minnesota Geological Survey and the DNR. Every effort has been made to ensure the interpretation shown conforms to sound geologic and cartographic principles. This map should not be used to establish legal title, boundaries, or locations of improvements.

Base modified from Minnesota Geological Survey, Nicollet County Geologic Atlas, Part A, 2012.

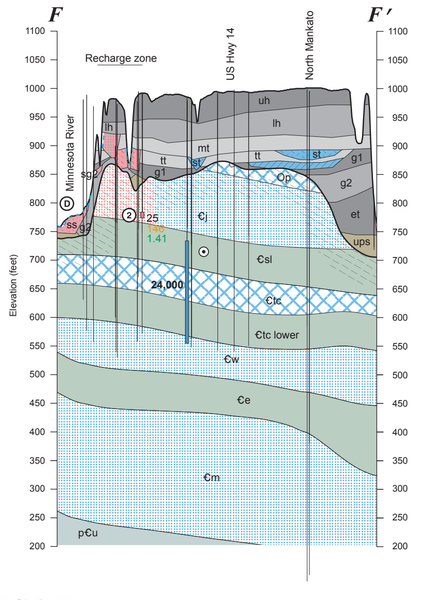
Universal Transverse Mercator projection, zone 15N, North American Datum of 1983. North American Vertical Datum of 1988.

GIS and cartography by Vanessa M. Baratta and Holly Johnson. Edited by Ruth MacDonald.



Symbols

- Well used to generate cross section
- A—A′ Part B line of cross section shown on this plate
- A—A′ Part A line of cross section



GEOLOGIC ATLAS OF NICOLLET COUNTY, MINNESOTA

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This information is available in alternative format on request.