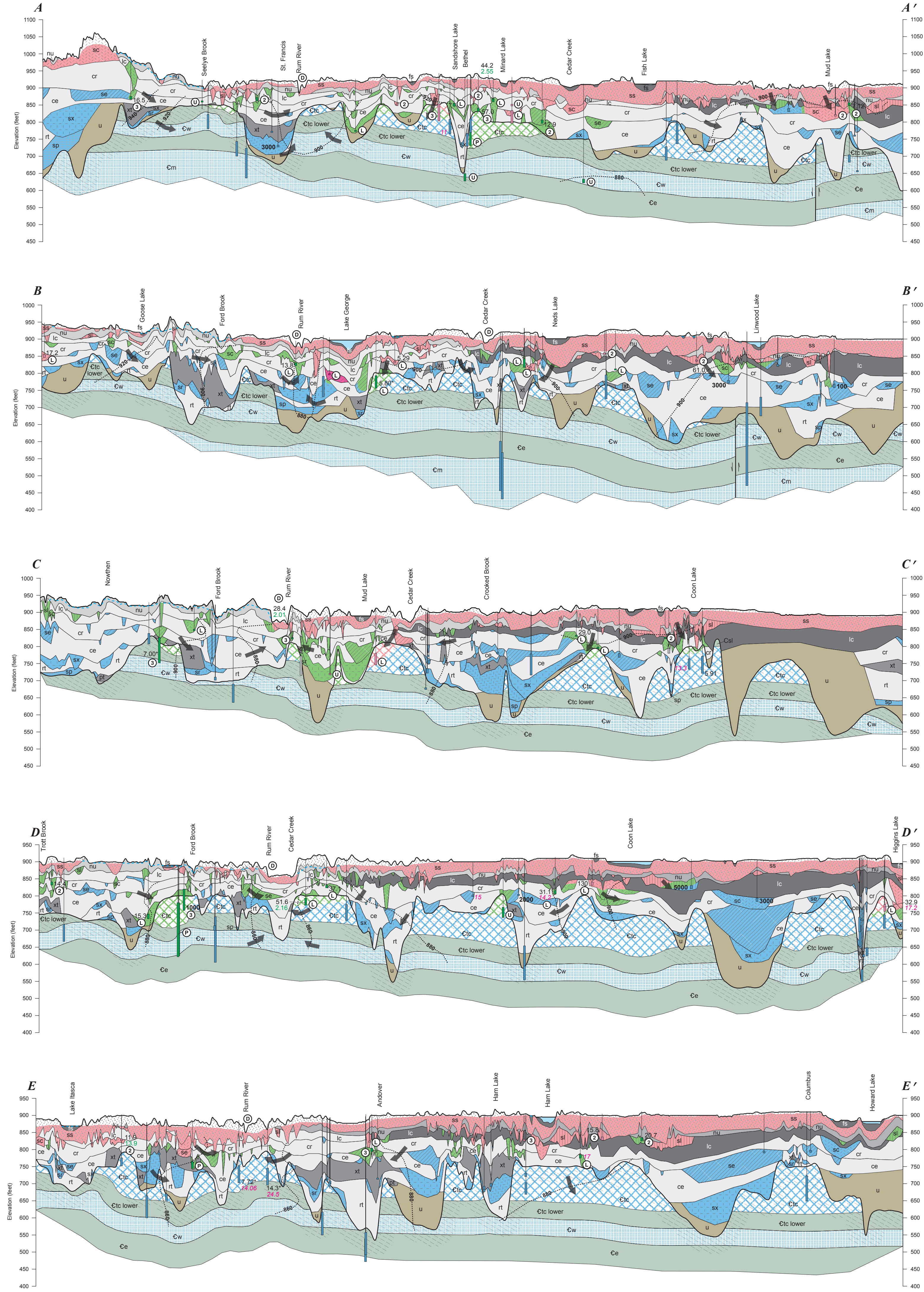


To accompany atlas [Report](#) and [Plate 7](#) and [Plate 9](#).

Hydrogeologic Cross Sections
By James A. Berg
2016



CROSS SECTION EXPLANATION

Aquifers and aquitards grouped by stratigraphy
Interpreted tritium age is indicated by background color

Surficial sand
ss

Buried sand and gravel and Quaternary sediment
sl, sc, se, sx, sr, sp, Undifferentiated sediment (u)

Bedrock
St. Peter, Shakopee, Onondaga Dolomite*, Jordan, St. Lawrence Formation*, Upper Tunnel City, Lower Tunnel City*, Wonegan, Eau Claire Formation*, Mt. Simon (not shown in areas where data were not available), Enhanced-permeability zone near the bedrock surface, *aquitard

Quaternary aquitards
Grouped by texture ranging from highest to lowest sand content indicating relative hydraulic conductivity.

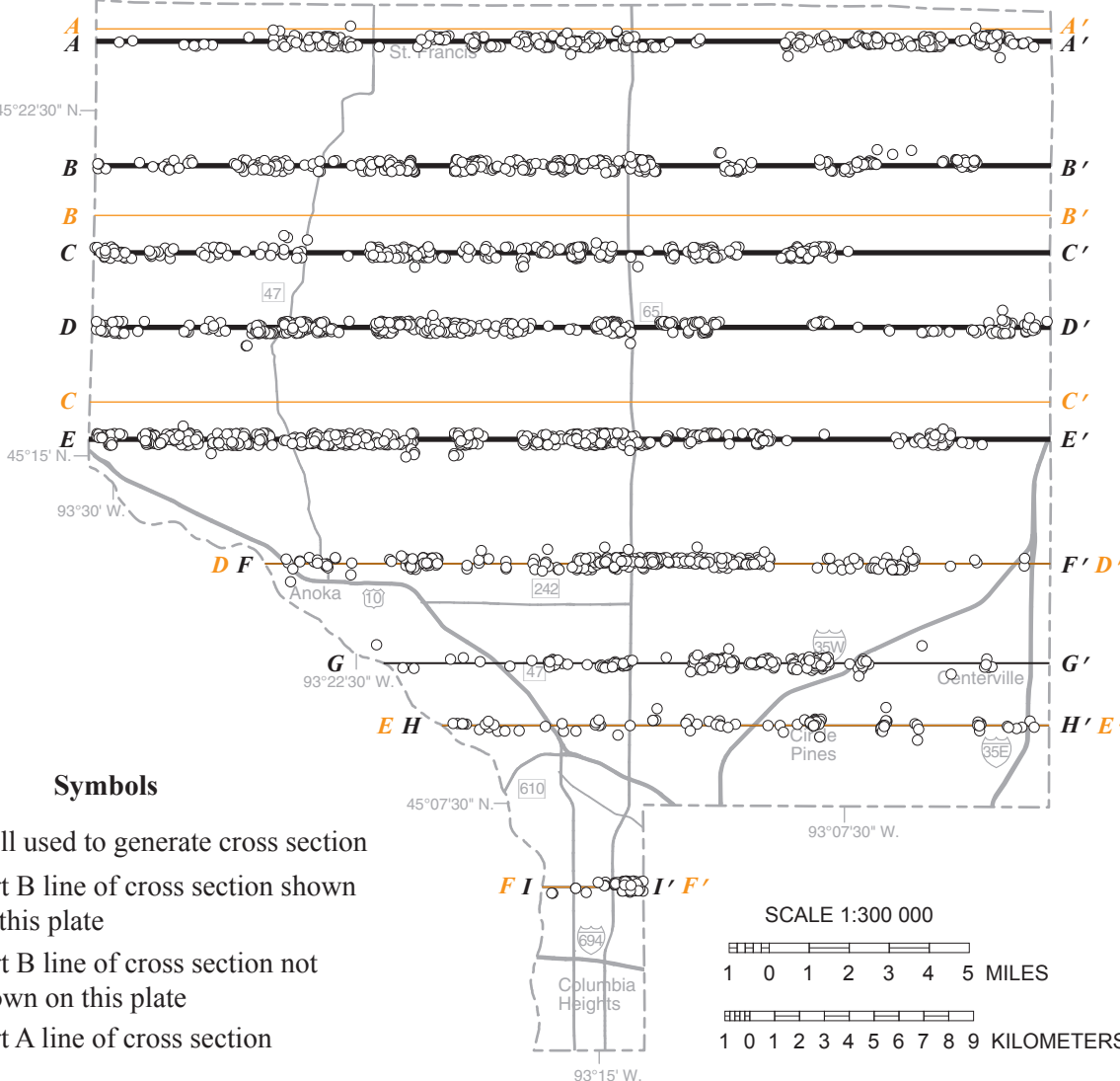
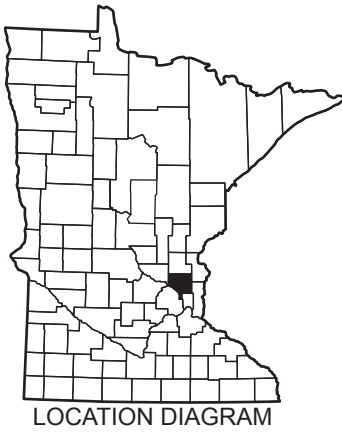
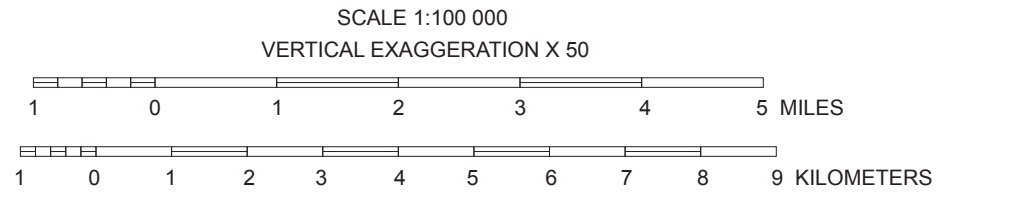
Hydrogeologic unit code
cr, ce, rt, lc (sandy), nu (sandy), nu, xt, pt, lc

Percent sand
> 60%, > 50% and ≤ 60%, > 40% and ≤ 50%, > 30% and ≤ 40%, ≤ 30%

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.
Cold War era: water entered the ground during the peak period of atmospheric tritium concentration during nuclear bomb testing, 1958–1959 and 1961–1972 (greater than 15 tritium units [TU]).
Recent: water entered the ground since about 1953 (8 to 15 TU).
Mixed: water is a mixture of recent and vintage waters (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
16.5 If shown, chloride concentration equals or exceeds 5 parts per million. (* indicates naturally elevated values)
17 If shown, arsenic concentration equals or exceeds 10 parts per billion.
2.01 If shown, nitrate-nitrogen concentration equals or exceeds 1 part per million.
3000 If shown, groundwater residence time in years as estimated by carbon-14 (¹⁴C) isotope analysis.
General groundwater flow direction
Approximate equipotential contour; contour interval 20 feet
Geologic contact
Land or bedrock surface
Water table
Lake
Direction of fault movement, arrows indicate relative movement

Groundwater conditions
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.
④ Groundwater discharges to a surface-water body.
Ⓛ Groundwater flows laterally.
Ⓟ Tritium concentrations may be artificially elevated by high capacity pumping.
Ⓢ Groundwater flowpath is unknown.



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 ([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, Anoka County Geologic Atlas, Part A, 2013.

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

North American Vertical Datum of 1988.

GIS and cartography by James A. Berg and Holly Johnson. Edited by Ruth MacDonald.

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[mndnr.gov/groundwatermapping](#)

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This information is available in alternative format on request.

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