Minnesota Department of Natural Resources
County Atlas Program
mndnr.gov/groundwatermapping

Hydrogeologic Cross Sections

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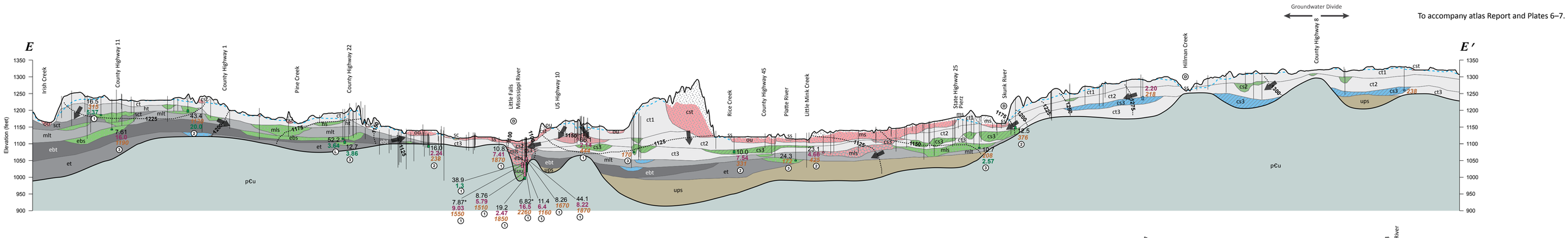
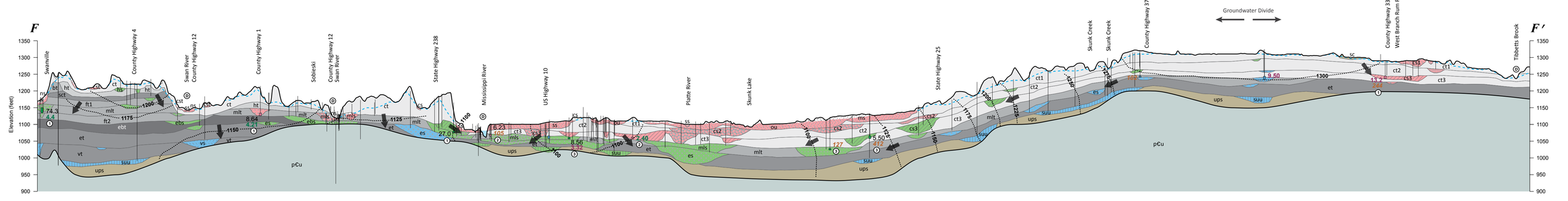
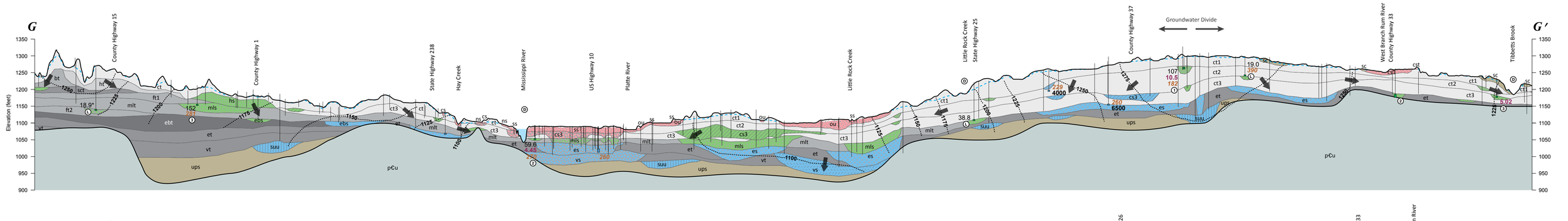
2019

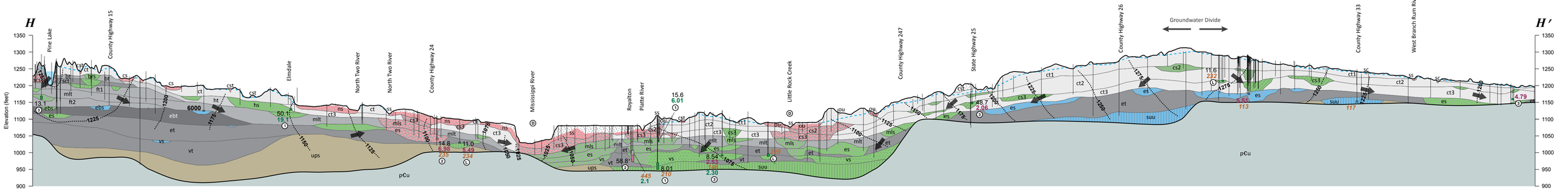
Groundwater Atlas of Morrison County
County Atlas Series C-31, Part B
Plate 8 of 8
Hydrogeologic Cross Sections
E–E′ through H–H′

To accompany atlas Report and Plates 6–7.









Cross Section Explanation

Aquifers and aquitards grouped by stratigraphy

Interpreted tritium age is indicated by background color

Quaternary unconsolidated

(see Figure 5 in the report for geologic unit correlation)

Surficial sand and gravel

- ss (one or a combination of the map units: ns, ou, ms, mst, il, is, ist, cl, cs, cst, hss, hts, cs1)

Hydraulically connected combinations of surficial aquifer and portions of buried aquifers

Buried aquifers and aquitards

sc*	scs
is2	sct*
is3	fs1
ct*	ft1*
it3*	mls
ct1*	mlt*
is4	fs2
it4*	ft2*
cs2	ebs
ct2*	ebt*
is5	es
it5*	et*
it6*	vs
cs3	vt*
ct3*	suu
hs	ups
ht*	*aquitard
brs	
bt*	

Bedrock

- pCu — Precambrian crystalline bedrock

Quaternary aquitards

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

Geologic unit code	Percent sand
ct, ct1, ct2, ct3, it3, it4, it5, it6	>60%
ht	>50% and ≤60%
bt, ft1, ft2, mlt	>40% and ≤50%
et, sct, vt	>30% and ≤40%
ebt	≤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.

- Recent: water entered the ground since about 1953 (8 to 15 tritium units [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.

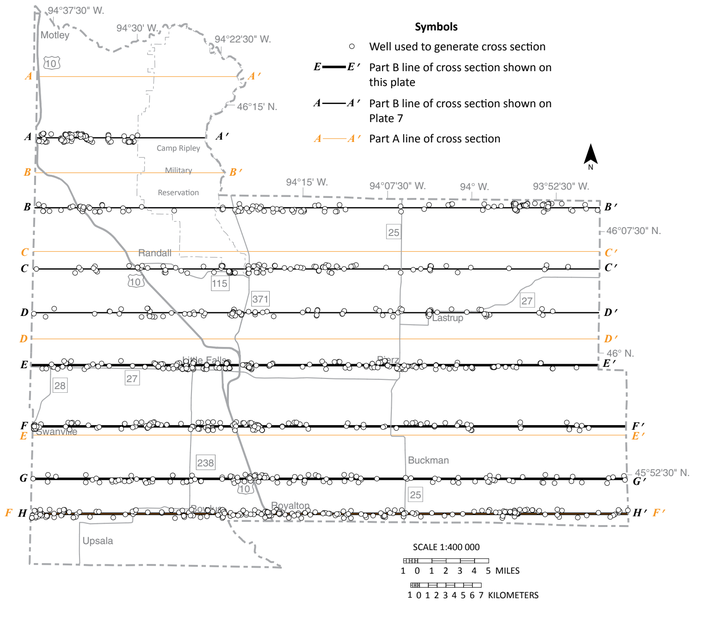
Symbols and labels

- 19.2 — Chloride: if shown, concentration is ≥5 ppm. (* naturally elevated, ˚ source unknown)
- 6.4 — Arsenic: if shown, concentration is ≥2 ppb.
- 238 — Manganese: if shown, concentration is ≥250 ppb.
- 2.40 — Nitrate: if shown, concentration is ≥1 ppm.
- 6500 — Carbon-14 (^{14}C): if shown, estimated groundwater residence time in years.
- General groundwater flow direction
- 1175 — 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.
- Ⓛ Groundwater flows laterally.
- Ⓓ Groundwater discharges to a surface-water body.

SCALE 1:100 000
VERTICAL EXAGGERATION X 50
1 0 1 2 3 4 5 MILES
1 0 1 2 3 4 5 6 7 8 9 KILOMETERS



Symbols

- Well used to generate cross section
- E — E′ — Part B line of cross section shown on this plate
- A — A′ — Part B line of cross section shown on Plate 7
- A — A′ — Part A line of cross section

This map was compiled and generated in a geographic information system. Digital data products are available from the DNR County Atlas Program at mndnr.gov/groundwatermapping.

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Base modified from Minnesota Geological Survey, Morrison County Geologic Atlas, Part A, 2014.

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

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