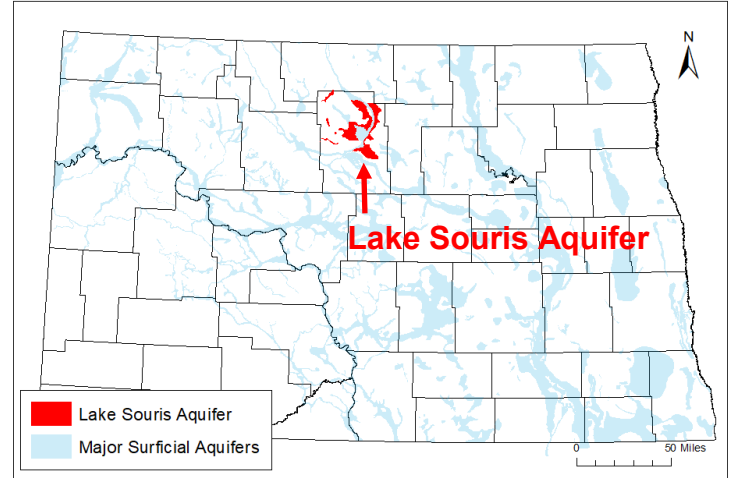


Lake Souris Aquifer

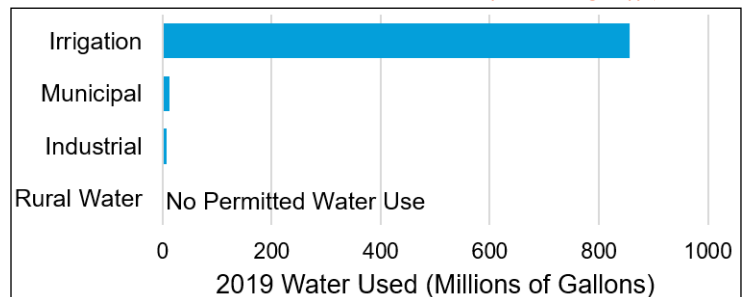
McHenry County

Aquifer At-a-Glance	
Area	247.4 square miles
Aquifer Type	Unconfined Surficial
Major Land Uses over Aquifer (percentage of aquifer area covered in 2017) ¹	Grassland/Pasture (63%) Crops (19%)
Depth to Water (2018)*	1-25 feet
Total Unique Wells Sampled	63
Wells Sampled in 2018	37
Samples Collected in 2018	47
Years Sampled	1993, 1998, 2003, 2008, 2013, 2018

*Depths to water may vary seasonally, year to year, and across the aquifer



2019 Lake Souris aquifer permitted water use (from North Dakota State Water Commission (swc.nd.gov))↓



- Aquifer materials consist of scattered patches of surficial sands that were left behind by Glacial Lake Souris. This lake formed during the latter years of the last ice age as meltwater pooled behind retreating glaciers. Some aquifer deposits consist of wind-blown sands.²
- The aquifer ranges from 5-57 feet thick and averages about 22 feet thick.²
- Domestic, irrigation, and stock wells are common in the aquifer. Irrigation is concentrated in the southern and eastern parts of the aquifer.
- The city of Towner draws water from the Lake Souris aquifer.
- In North Dakota, permits are required to withdraw large quantities of groundwater. In 2019, 875 million gallons of permitted water were drawn from the aquifer; irrigation use consumed the largest quantity of water. For more information on water use and permits, contact the North Dakota State Water Commission (swc.nd.gov).

About the Agricultural Groundwater Monitoring Program

- The North Dakota Department of Environmental Quality monitors a network of wells in approximately 50 surficial aquifers that are at elevated risk of agricultural contamination.
- Aquifers are sampled on a 5-year rotation.
- Monitoring began in 1992.
- The vast majority of these aquifers are located in central and eastern North Dakota.
- Water is tested for 21 general chemistry parameters, eight trace metals, and 64 pesticides.

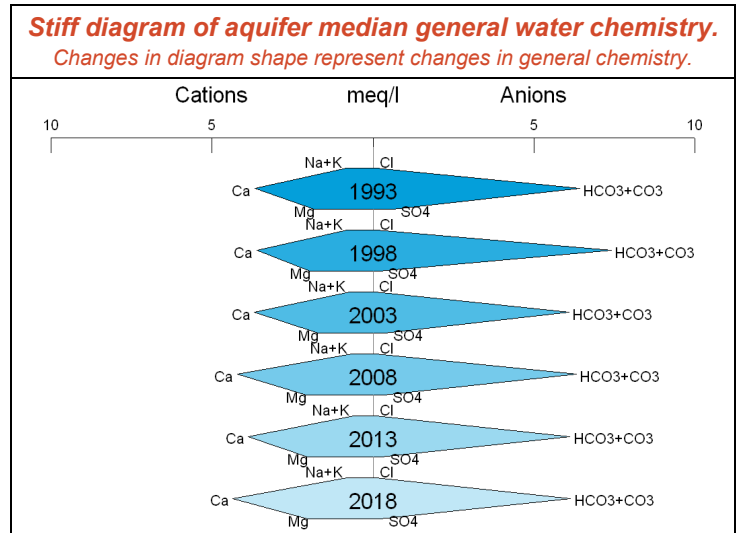
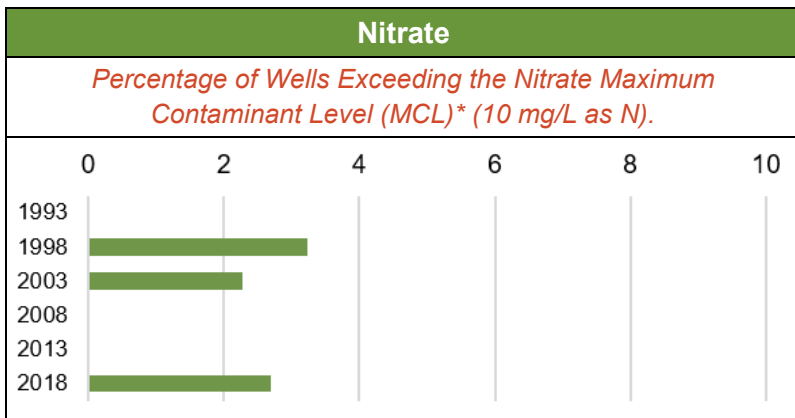
References

- (1) US Department of Agriculture, 2017, National Agricultural Statistics Service Cropland Data Layer.
- (2) Randich, P.G., 1981, Ground-Water Resources of McHenry County, North Dakota, North Dakota State Water Commission County Ground-Water Studies 33-Part 3, North Dakota Geological Survey Bulletin 74.

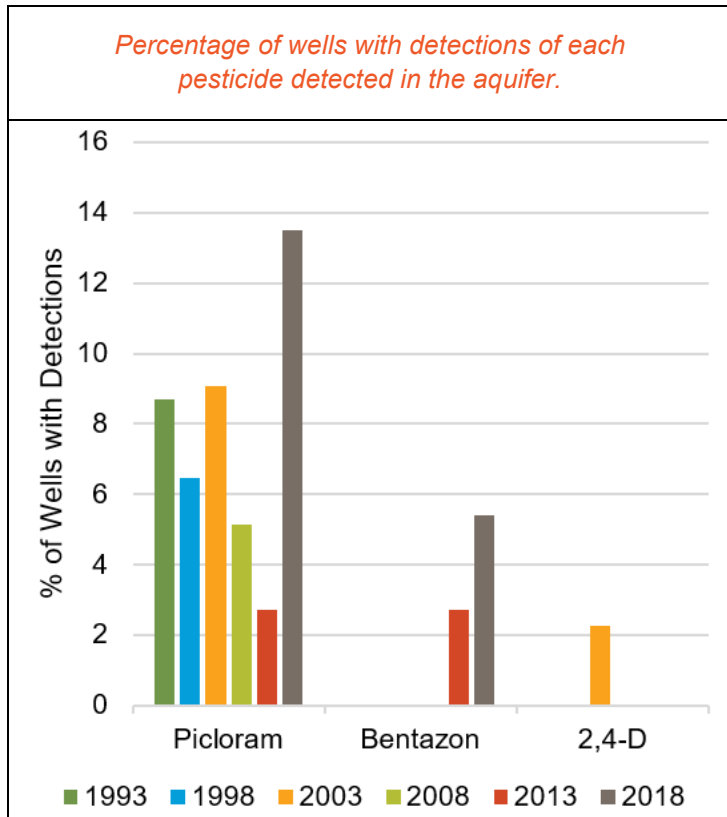
Water Chemistry

Is Aquifer Water High in...?	Analyte	Result	2018 Median Concentration	Potential Effects
	Arsenic	Locally	< 0.005 mg/L	Skin or circulatory system damage, increased cancer risk
	Iron	YES	4.56 mg/L	Metallic taste/odor, discoloration of surfaces
	Manganese	YES	0.41 mg/L	
	Sodium	NO	17.1 mg/L	Taste, people with certain health conditions may need to limit intake
	Sulfate	NO	10.4 mg/L	Taste/odor, laxative effect for people not used to the water
For more information about Maximum Contaminant Levels (MCLs), health effects, and treatment options for these contaminants and more, see the NDDEQ's fact sheets (deq.nd.gov/wq/1_Groundwater) or visit the US EPA website (epa.gov/ground-water-and-drinking-water).				

Dominant Water Type	Water Hardness
Calcium-Bicarbonate	Very Hard



Pesticides



State Pesticide Management Plan	
Agricultural Groundwater Monitoring Program aquifers are monitored as a part of the State Pesticide Management Plan. A Prevention Action Level (PAL) threshold of 25% of the pesticide's Maximum Contaminant Level (MCL)* or Health Advisory Level (HAL) is used to identify whether action is needed to prevent further contamination.	
Prevention Action Level Exceedances	None
MCL or HAL Exceedances	None

Number of Unique Wells with Pesticide Detections since 1993	12 of 63 Total Wells
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2018 Pesticide Detections		
Picloram	5 Wells	Herbicide applied to crops and roads/rights-of-way
Bentazon	2 Wells	Herbicide applied to crops

*Note that MCLs are for public drinking water systems; private wells are not regulated in North Dakota. MCLs still provide guidelines for drinking groundwater.

Feel free to use this information, but please credit the North Dakota Department of Environmental Quality.