

Vermillion River Monitoring Network 2007 Report: Executive Summary

Prepared for:
Vermillion River Watershed Joint Powers Organization

The Vermillion River Monitoring Network (Figure 1) was created to collect water quality and quantity data throughout the Vermillion River Watershed. Samples are analyzed for a variety of parameters including nutrients, bacteria, and sediment. These results are used to establish long-term water quality and quantity data, provide trend analysis and pollutant loading values.

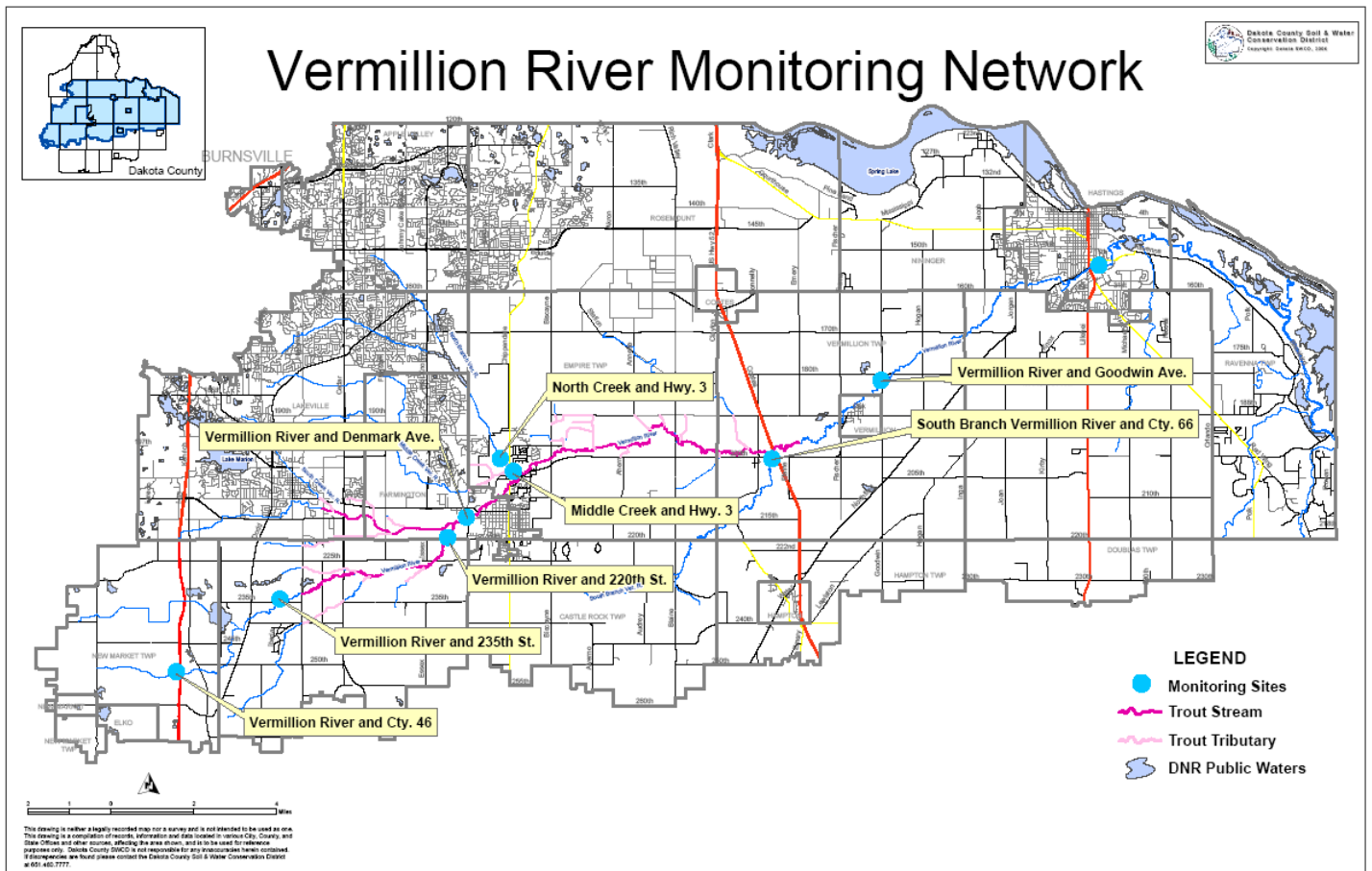


Figure 1. Vermillion River Monitoring Network and WOMP Station Locations

Results for the 2007 monitoring season are listed below and are compared against state water quality standards or minimally impacted stream eco-region means, developed by the Minnesota Pollution Control Agency. Results in red text are exceeding state water quality standards or eco-region means.

Wastewater treatment plant discharge can contribute to elevated conductivity levels which may explain the conductivity results for those sites downstream from nearby wastewater treatment plants (Elko/New Market and Empire/Vermillion). Since the Vermillion River has been listed as impaired for bacteria, it is not surprising that 2007 *E. coli* results exceeded the state standard at all locations. A region-wide effort is currently underway to address elevated bacteria concentrations. Nitrate results were unusually high at the South Branch site, and may warrant further investigation in view of nitrate groundwater contamination in the eastern portion of the watershed. The turbidity (cloudiness) results at sites located in the center of the watershed confirm concerns that turbidity in these locations frequently exceeds the state standard. The Minnesota Pollution Control Agency has proposed listing this reach as impaired for turbidity in 2008.

Monitoring Sites										
Parameters	Vermillion River and Cty. 46 (Scott Co.)	Vermillion River and 235 th St.	Vermillion River and 220 th St.	Vermillion River and Denmark Ave.	Middle Creek and Hwy. 3	North Creek and Hwy. 3	South Branch Vermillion River and Cty. 66	Vermillion River and Goodwin Ave.	2007 Notes	
	Alkalinity	271 mg/L	222 mg/L	211 mg/L	207 mg/L	195 mg/L	188 mg/L	173 mg/L	207 mg/L	Typical for freshwater
	Chloride	199 mg/L	79 mg/L	34 mg/L	41 mg/L	51 mg/L	52 mg/L	18 mg/L	90 mg/L	In compliance with state standard
	Conductivity (field)	1051 mMHOS	727 mMHOS	563 mMHOS	589 mMHOS	648 mMHOS	669 mMHOS	524 mMHOS	816 mMHOS	Above eco-region mean downstream from wastewater treatment plants
	Dissolved Oxygen	8.72 mg/L	8.38 mg/L	9.03 mg/L	8.33 mg/L	7.62 mg/L	8.16 mg/L	8.77 mg/L	9.15 mg/L	Adequate for trout fishery
	<i>E. coli</i>	na	156 CFU/100mL	190 CFU/100mL	242 CFU/100mL	231 CFU/100mL	237 CFU/100mL	337 CFU/100mL	335 CFU/100mL	Exceeding state standard at all sites
	Nitrate (NO ₃)	1.70 mg/L	0.75 mg/L	1.45 mg/L	1.71 mg/L	0.86 mg/L	0.83 mg/L	5.65 mg/L	4.57 mg/L	Exceeding eco-region mean at S. Branch and Cty. 66
	Nitrogen Ammonia	0.09 ug/L	0.27 ug/L	0.08 ug/L	0.08 ug/L	0.22 ug/L	0.18 ug/L	0.15 ug/L	0.10 ug/L	Below eco-region mean
	Total Phosphorus	0.27 mg/L	0.20 mg/L	0.16 mg/L	0.12 mg/L	0.12 mg/L	0.10 mg/L	0.13 mg/L	0.18 mg/L	Below eco-region mean
	pH (field)	8.11	7.86	7.94	7.90	7.77	7.72	7.95	8.08	In compliance with state standard
	Suspended Solids	17.3 mg/L	10.2 mg/L	33.6 mg/L	23.0 mg/L	13.2 mg/L	15.1 mg/L	13.6 mg/L	25.9 mg/L	Below eco-region mean
	Average Summer Temperature	67.4 °F	68.2 °F	65.9 °F	64.7 °F	60.4 °F	60.1 °F	64.6 °F	69.1 °F	Slightly elevated for trout fishery at 220 th St.
Turbidity	9.0 NTU	7.6 NTU	40.7 NTU	16.2 NTU	10.3 NTU	7.2 NTU	9.1 NTU	11.2 NTU	Exceeding state standard near center of watershed	
mg/L = milligrams per liter or parts per million (ppm) CFU = colony forming units ug/L = micrograms per liter or parts per billion (ppb) NTU = nephelometric turbidity units mMHO = micromhos or microseimens °F = degrees Fahrenheit										

Recommendations for 2008 monitoring:

- Continue water quality/quantity monitoring utilizing the Vermillion River Monitoring Network
- Continue collaborating with MNDNR to further refine flow measurements and subsequent data analysis
- Further investigate turbidity issues in the center of the watershed