

## Menomonee River Watershed Restoration Plan Fact Sheet MN-4, Reach 820, Willow Creek

Data resulting from model runs:

Figure	Overall Project Team Assessment	Analysis
Flashiness index	Good	The Flashiness Index quantifies the frequency and rapidity of short-term changes in stream flow. The index ranges from 0 to 2, with 0 being constant flow. The flashiness is reasonable at this location.
Dissolved oxygen v. days per year	Moderate	Typically, aquatic communities need 5 mg/l or more of dissolved oxygen to survive. Concentrations at this site fall below this level about 20% of the time.
Fecal coliform v. days per year	Good	For recreational uses, lower fecal coliform counts (a measure of bacteria) are better (preferably under 400 counts / 100ml). The counts on majority of the days are 'below 400'. Unlike many of the downstream sites, this site does not exhibit frequent spikes of >5,000 counts.
Phosphorus v. days per year	Good	Phosphorus is a nutrient that can lead to increased growth of algae. The concentrations on most of the days are at or below the 0.1 mg/l planning guideline. Throughout the year, the phosphorus concentrations do not exceed 0.3 mg/l on any day.
Suspended solids v. days per year	Very Good	Suspended solids cause water to become cloudy, which is aesthetically unpleasant. They can also clog the gills of fish and invertebrates, make feeding difficult, and lead to sediment deposition (poor habitat). The concentrations are less than 25 mg/l on most of the days and the concentrations of suspended solids do not exceed 125 mg/l on any day
Monthly dissolved oxygen	Moderate	The decline in dissolved oxygen concentrations during the summer is normal due to the decreased solubility of oxygen in warmer water. However, the summer concentrations decline more than would be expected. This may indicate a lack of riffles and aeration.
Monthly fecal coliform	Good to Moderate	While the ranges of values are fairly consistent throughout the year, notice that the median and 75 <sup>th</sup> percentile values decline during the summer swimming season. This may be related to the die-off of bacteria due to solar radiation. Also note that the conditions are poorest in March and are likely related to snow melt.
Monthly phosphorus	Very Good	Phosphorus concentrations exceed the planning guideline less than 25% of the time. The median concentration increases slightly in March and is likely related to snow melt. Note that the increases in the lowest values during the late spring and early summer could be related to fertilizer application.
Monthly suspended solids	Very Good	The concentrations of suspended solids are reasonable year-round and lower during the winter months. The lower concentrations during the winter are probably related to a number of factors including frozen conditions and low-impact storms (snow doesn't pound the soil like rain).

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Dissolved oxygen by flow	Good to Moderate	Note that the largest decreases in dissolved oxygen concentrations occur at low flows. This is partly due to a combination of decreased water agitation and higher temperatures (low flow conditions are often naturally associated with the warm summer months). Decreases during low flow conditions may be exacerbated by excess organic material and biochemical oxygen demand.
Fecal coliform by flow	Moderate to Poor	Generally, a pollutant that is present at high concentrations during high flows and low concentrations during low flows (fecal coliform, in this case) is attributed primarily to non-point sources. Note that during any period with the high flows, fecal coliform counts exceed the regulatory standard roughly 75% of the time. During low flows and dry conditions, the standard is met well over 75% of the time. This would be the safest time for any recreational uses (boating, swimming, wading, etc.), although the amount of water in the stream may limit recreational use to wading.
Phosphorus by flow	Good	Concentrations of phosphorus only exceed the planning guideline at moist conditions and high flows. This suggests that the excess phosphorus is primarily from non-point sources. The similarities between the phosphorus and suspended solids data suggest that the phosphorus may be associated with suspended sediment.
Suspended solids by flow	Very Good to Good	The concentrations of suspended solids increase with increased flows, suggesting contributions from non-point sources. The suspended solids may come from runoff that carries a sediment load, from stream bank erosion, or re-suspended stream sediments.