

**Title: Powder Mill Creek Septic System Replacement Project**

Michigan AUID Number: 040201010205-02

GRTS Number: This project was funded with Clean Michigan Initiative – Clean Water Fund monies and was not used as match for another project, so it is not in the GRTS system.

Opening Paragraph: Powder Mill Creek is a tributary to the Black River in Gogebic County, in Michigan's Upper Peninsula. The creek is a popular trout stream, but a 1 mile reach was not meeting designated uses due to *Escherichia coli* (*E. coli*) bacteria concentrations. Poorly maintained and failing septic systems associated with the Powderhorn Ski Resort were believed to be the source of the bacteria.

Problem: A 1 mile reach of Powder Mill Creek was not attaining designated uses due to discharges from poorly maintained and failing septic systems.

Project Highlights: Sewers were installed at the Powderhorn Ski Resort.

- Replace 278 Septic Systems
- Install 43,000 feet of gravity sewer line (8" and 15"), 17,000 feet of force main lines (2" to 8"), 5 submersible pump stations, and 12 residential grinder stations

The project was completed in September, 2007.

Results:

This water body did not meet designated uses. This determination was based on qualitative evidence of pollutant sources and gross degradation, prior to the development of quantitative listing and delisting requirements. Consequently, pre-BMP data were not collected. Post-BMP monitoring found:

- Very low *E. coli* concentrations downstream of the sewered area, below both MDEQ's partial-body and total-body recreation criteria (130 CFUs/100 mL and 1,000 CFUs/100 mL, respectively).
- Low total phosphorus concentrations downstream of the sewered area, comparable to concentrations upstream of the BMPs.
- A diverse macroinvertebrate community with a high number of sensitive taxa downstream of the sewered area, comparable to an upstream reach.

This reach of Powder Mill Creek is now attaining water quality standards, and MDEQ staff are recommending that it be re-classified in 2010.

Also, pollution reduction calculations indicate that this project reduced pollutant loadings by 29 tons of sediment per year, 1,709 pounds of phosphorus per year, and 5,260 pounds of nitrogen per year.

Partners and Funding: The Powderhorn Ski Resort replaced septic systems with sewers. MDEQ provided \$1,000,000 in Clean Michigan Initiative funds to Ironwood Charter Township, which was combined with \$6,600,000 in U.S. Department of Agriculture Rural Development funds and \$381,250 from the ski resort.

Photographs: None.

Data:

Pre-BMP data were not collected. Post-BMP data are below.

**Table 1. Post-BMP Monitoring Results.**

<b>Metric</b>	<b>Upstream of Sewered Area</b>	<b>Downstream of Sewered Area</b>
<i>E. coli</i>	Not sampled	Geometric mean = 16 CFUs/100 mL (n = 3)
Total phosphorus	0.022 mg/L	0.019 mg/L
Total macroinvertebrate taxa	33	25
Number of sensitive macroinvertebrate taxa*	12	11
Overall macroinvertebrate score** and category	+ 4 "Acceptable"	+ 5 "Excellent"

\*Sensitive taxa = mayflies, caddisflies and stoneflies

\*\*On a scale of – 9 to + 9

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