

**Water and Environment Program  
Engineering Success Story**

**State:** Minnesota

**Borrower Name:** Upper Sioux Community

**Engineering Firm:** North American Wetland Engineering

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**Congressional Information:** Congressman David Minge

**Counties:** Yellow Medicine

**Keywords:** Constructed Wetlands, Tribal, Native American

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**Upper Sioux Community Wastewater System Requires Fast  
Track Solution**

**Description:**

The Upper Sioux Community in Granite Falls Minnesota was waiting 20 years for a wastewater treatment system. Inadequate treatment, residential housing on holding tanks and delays in expansion of tribal projects was no longer acceptable. A new engineering approach was needed.

**Solution:**

From facility planning to substantial completion in nine months on a Rural Development Project is like breaking the sound barrier. But, that is what was needed to get the wastewater treatment system built for the Upper Sioux Community. In 1997, with the assistance of the Indian Health Service, a wastewater treatment system design began for the Upper Sioux Community. The receiving stream, the Minnesota River, is designated an Outstanding Resource Value Water subject to non-degradation provisions of the Clean Water Act. This all but eliminated the surface water discharge option. Several conventional options, including spray irrigation and rapid infiltration, were explored. However, detailed soil and site investigations provided data that indicated the need for an innovative solution.

On March 16, 2000, the Upper Sioux Tribal Council engaged the services of North American Wetland Engineering, an ecological based engineering firm specializing in innovative wastewater options for small communities. A new Preliminary Engineering Report was prepared, environmental compliance was completed, final design of the

treatment system was completed, financing was approved, and bidding was completed so that construction could begin in October 2000—all in less than eight months. Even with Minnesota's inclement winters that seem to end and begin within months, the treatment system was substantially complete by mid December the same year. This represents a first for Rural Development and North American Wetland Engineering.

The solution for the Upper Sioux Community was a 45,000-gallon per day wastewater treatment system consisting of four vertical flow wetland cells of a modular design. The vertical flow wetland design uses recirculating gravel filter technology. Six zones with a total of 30,000 feet of chambered trenches were used for disposal of the treated effluent. The trenches were carefully located to avoid significant cultural resources near the Minnesota River.

In the end, all of the infrastructure was constructed in such a way as to protect the valuable natural and cultural resources in the planning area while providing a robust system which will meet the needs of the Tribe for the next 20-plus years.

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