Pennington County ditch fixes stabilize banks, stanch erosion

Top: *Pennington SWCD staff talk to contractor Ryan Anderson, who was installing side-water inlets on the Pennington County Ditch 96 system near Thief River Falls.*

CLEAN WATER LAND & LEGACY AMENDMENT

An additional $516,000 Clean Water Fund grant Pennington SWCD received in December 2020 will add County Ditch 96 outlet stabilizations, improving water quality, fish habitat and recreational opportunities on the Red Lake River, a source of drinking water.

Landowners work with county engineer, SWCD on sediment reduction in Red Lake River watershed

THIEF RIVER FALLS — A Pennington Soil & Water Conservation District project within three county ditch systems that outlet into the Red Lake River cut landowners' immediate out-of-pocket ditch repair costs by about 75% while keeping topsoil in the fields and out of the river.

The Red Lake River flows to the Red River, which feeds Lake Winnipeg. All three are impaired for sediment, which causes turbidity, degrades fish and wildlife habitat, and carries pollutants.

The $248,820 project wrapped up in 2020 when contractors installed the last of 43 side-water inlets in the county ditch 96, 21 and 16 systems. Together with two grant-funded buffers, those grade-stabilization structures will keep

Pennington SWCD Manager Bryan Malone, right, visits the site on Nov. 6, 2019, with SWCD water plan coordinator Peter Nelson, left, and resource technician Matthew Sorvig. It's part of gully control and buffer implementation on three county ditch systems funded by a Clean Water Fund grant from the Minnesota Board of Water and Soil Resources. Malone is now the Becker SWCD manager; Nelson is the Pennington SWCD manager. **Photo Credits:** Ann Wessel, BWSR

an estimated 220 tons of sediment out of the Red Lake River annually. That's the equivalent of nearly 17 dump truck loads.

A $196,500 Clean Water Fund grant from the Minnesota Board of Water and Soil Resources covered 75% of the $158,160 in side-water inlet project costs. Without the grant, benefiting landowners would have borne the full cost through ditch authority assessments. Instead, assessments will cover the balance.

"Clean Water Funds will be used to offset the cost to the ditch authority for fixing these erosion problems, a cost that would have been prohibitive for those ditch systems to pay themselves," SWCD Manager Bryan Malone said.

Malone, who has since taken a job as the Becker SWCD manager, spoke en route to a field outlet under construction in November 2019 near Thief River Falls. This would be the last day of fall field work, marking the second consecutive year when rain-delayed harvests shortened the construction season — one of the challenges in accomplishing the work.

> **"By having the side-inlets, it prevents erosion. In the long run, it saves maintenance costs for the legal ditch system."**
> — Mike Flaagan, Pennington County engineer

In the field, Ryan Anderson of Anderson Services in Newfolden was scraping dirt over a newly installed culvert connecting the field ditch to the County Ditch 96 system.

The inlets eliminate gully erosion by armoring water's path from fields to the county ditch systems, which sit at a lower elevation. Without the side-water inlets, water gains velocity, carrying sediment as it evens the grade — sometimes cutting hundreds of feet into fields.

"By having the side-inlets, it prevents erosion," said Pennington County Engineer Mike Flaagan, who administers the county highway department and the legal ditch system. Flaagan evaluates landowners' ditch maintenance petitions, and then makes a recommendation to Pennington County Commissioners, who serve as the ditch authority. "In the long run, it saves maintenance costs for the legal ditch system."

Washouts caused by heavy rains shortly after a ditch clean-out in 2014 deposited more sediment, reducing the effectiveness of that maintenance and precipitating the work on County Ditches 96, 21 and 16.

On average, clean-outs occur every 25 years. The current cost is about $6,000 a mile.

The County Ditch 96 system includes 53 miles of ditch; County Ditches 21 and 16 each contain 8 miles. About 400 total miles of public ditch systems exist in Pennington County.

"Since the ditches were initially installed 100 years ago, over time farming practices have changed. They've improved their drainage, so we see a lot more field ditches being built that exit into the legal ditch systems," Flaagan said. "As the water drains off the fields through those field ditches, there's a little bit of erosion that occurs. There's sediment that builds up at the end of the field ditches located in the legal ditch system."

A Pennington SWCD drainage ditch inventory and inspection — funded by a $91,300 Clean Water Fund grant awarded in 2014 — identified locations where side-water inlets would be most effective.

When implementation got underway, SWCD staff handled survey and design work. Pennington County staff hired contractors and managed construction in 2019. When highway projects required more county staff time in 2020, the SWCD handled the remaining construction contracts.

Malone described how farmers benefit:

"The side-water inlet provides a stable outlet to their field ditch, so the gully wouldn't be forming back into their cropland. They won't lose as much cropland through erosion."

That's been Jeremiah Hasnedl's experience.

With his wife and father, Hasnedl runs about 2,700

Left: *Side-water inlets installed on three Pennington County ditch systems are designed to stop field erosion where drainage outlets into the county system.* **Middle:** *Contractor Ryan Anderson of Anderson Services in Newfolden took a moment to talk to Pennington SWCD staff.* **Right:** *A bit of open water remained in the Pennington County Ditch 96 system, which empties into the Red Lake River. By the time it reaches the confluence of the Clearwater River in Red Lake Falls, the Red Lake River is impaired for sediment.*

Malone, top, and Sorvig lent scale to a gully cutting into a Pennington County field as Nelson prepared to cross the ditch. All three county ditch systems included in the Clean Water Fund grant work flow to the Red Lake River.

acres of conventionally tilled wheat, soybeans, canola and perennial rye. Where six side-water inlets were installed about 10 years ago, he hasn't seen the erosion that sometimes came with high water.

"They're definitely functioning in that respect," Hasnedl said.

While the structure took some land out of production, it provided a field crossing.

"The overall benefit is positive because it wouldn't be a really productive area in the first place," Hasnedl said. "If the ditch is wet enough where we couldn't drive across it, we can drive across the structure. It enables us to get across the field if we need to when it's still wet."

Within the County Ditch 96, 21 and 16 systems, the SWCD had proposed 81 side-water inlets with buffer strips averaging 50 feet wide. Staff had planned to work with individual landowners, and to offer incentive payments for installing ditch bank-stabilizing buffers — leveraging an Enbridge Ecofootprint grant and assistance from the USDA's Natural Resources Conservation Service.

But the timing coincided with the Buffer Law rollout in 2015, and landowners viewed buffer incentives as a mandate rather than voluntary conservation. They were not interested. Instead, Pennington County staff worked directly with landowners to acquire maintenance easements. The culverts will be part of the county ditch system, which will be responsible for maintenance. Landowners will maintain the 16.5-foot buffers.

The $60,000 Enbridge Ecofootprint grant awarded in 2016 was approved for another use. It allowed the SWCD to work with nine more Pennington County landowners to install 34 side-water inlets on different ditch systems within the Red Lake River watershed.

That $125,225 project tapped matching funds from Pennington County, and local capacity dollars from the SWCD. The ditches were among the priorities identified in the One Watershed, One Plan process.

"The goal is you don't have to clean those systems as often, and you prevent future maintenance costs," Flaagan said of the side-water inlet and buffer work as a whole. "(As) part of the One Watershed, One Plan for the Red Lake River watershed, you're always looking for ways to reduce the sediment load in our rivers."

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