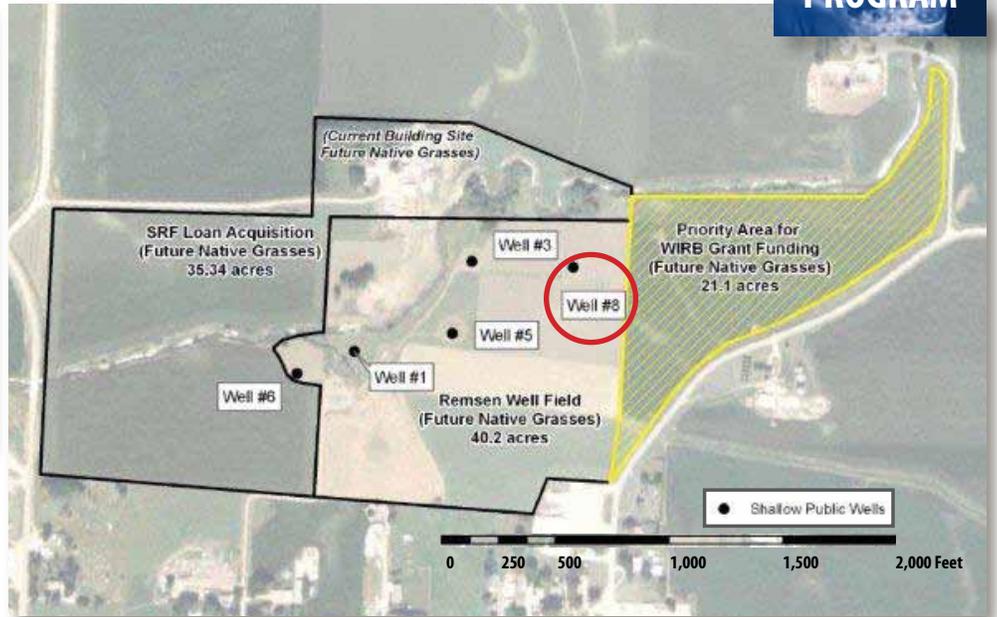




# On-Site Investigation of Source Water Area



**Remsen** was combining drinking water from its deep and shallow wells to keep nitrate levels within health standards.

Yet, nitrate levels in the shallow wells continued to rise, with Well 8 sometimes at three times the maximum amount allowed.

The cost of equipment to remove nitrate from the water was well beyond the community's budget, so the city turned to DNR's Source Water Protection (SWP) program for help.

As the local SWP planning team came together, DNR Site Investigator Dan Cook, with the aid of the DNR's Technical Assessment Team, determined how neighboring land practices, soil types and underground water flow affected the Remsen well field.

The most immediate problem to rectify was the land use practice of over application of manure and commercial fertilizer in a sensitive area that rapidly carried the fertilizer nitrates to the public wells adjacent to the 21-acre field. As active participants on the SWP Community Planning Team, the landowners developed a feasible plan to decrease the nitrate load.

The city purchased the 21 acres with a grant from the Watershed Improvement Review Board (WIRB), the first provided by the WIRB for a source water protection purpose.

An additional 35 acres adjacent to the well field was offered for sale to the city. With a zero percent interest loan from the State Revolving Fund, the city purchased it.

### Solution cleans water and provides wildlife habitat

To remove existing nitrogen, native grasses were planted by Pheasants Forever (PF) on both the acquired properties and Remsen's 40-acre well field (previously in alfalfa). Prairie plants' deep roots take up more nitrogen than crops do with their shallow roots. Each year the native grasses' roots grow in mass to further increase nitrogen

*DNR's Dan Cook (far left) found that Well 8 (circled in red) was acting as a guard well, taking most of the nitrate contamination. When Well 8 is turned off, the other wells receive more nitrate as nitrate spreads (plumes) moving through the groundwater.*

uptake. PF was willing to provide the seed and plant it to provide excellent habitat for pheasants.

"Projects on local wellheads give us the opportunity to replace some of those acres of lost habitat," says John Linquist, PF Shooting Sports Coordinator. "They're critical no matter where they are and this helps a community's drinking water source."

The Remsen Fire Department keeps weeds in check by assisting with controlled burns of the native plants.

The local farmers co-op has contributed to controlling Canadian thistle.

### Next phase

A turnover of local SWP team members has meant a fresh look at the next phase of the SWP project and properly managing the priority area to best protect the drinking

### REMSEN SOURCE WATER PROTECTION RESOURCES

- Remsen Utilities Board
- USDA-NRCS
- Local landowners
- Plymouth County Sanitation
- USDA-Natural Resources Conservation Service
- Plymouth County Pheasants Forever with Youth Council
- Iowa Department of Natural Resources
- IDAS Division of Soil Conservation
- Watershed Improvement Review Board
- Plymouth SWCD
- Sioux Rivers RC&D
- State Revolving Fund

# Solutions Target Contaminants, Not Water Treatment



*Kevin Ortmann  
SWP team chairman*

water source. The new team chairman, Kevin Ortmann, has formed three subcommittees.

One subcommittee is developing plans for an outdoor classroom with stations that offer prairie habitat and wildlife information, among other possible environmental science learning options.

A walking trail has been mowed into the grasslands for use by the community, but a subcommittee is planning a compacted gravel trail that is wheelchair accessible and comfortable for walkers and bicyclists.

A third subcommittee is developing a system for grassland maintenance.



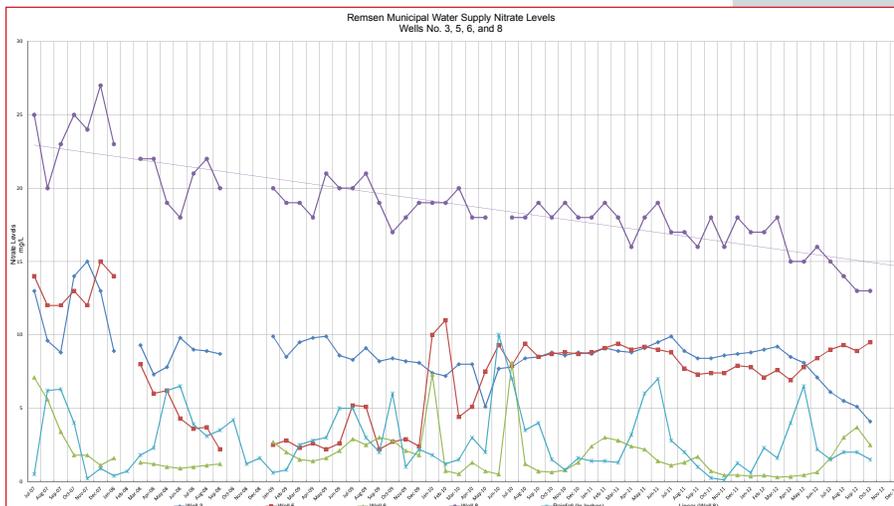
*Dick and Cara Beelner (front row), Mike Slota (L) and Doug Ruland (R), along with Gary Harpenau and Josh Berendes of Plymouth County Pheasants Forever seeded the prairie.*



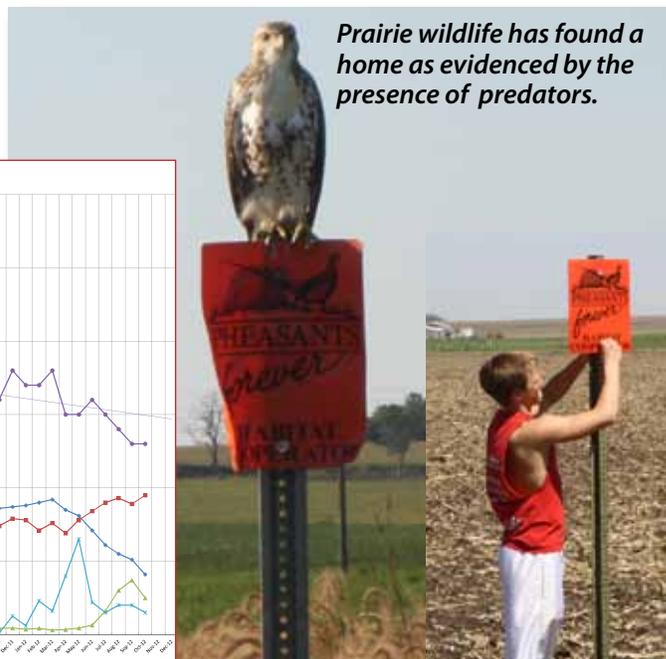
*Native grasses in the wellhead protection area in fall 2012*

Monitoring results show Remsen has reduced nitrate in Well 8 by 40 percent in three years. This example is touted throughout the country as how water quality was improved by targeting the problem and using a natural, economically feasible solution to fix it.

For more information, email SWP Coordinator Becky Ohrtman at the DNR, [Rebecca.Ohrtman@dnr.iowa.gov](mailto:Rebecca.Ohrtman@dnr.iowa.gov) or call her at 515-725-8332.



*In just three years monthly monitoring shows nitrate has been reduced 40 percent at Well 8.*



*Prairie wildlife has found a home as evidenced by the presence of predators.*

*Josh Berendes, PF Youth Council president in 2009, helped seed and sign the prairie.*