Nitrate and Pesticide Monitoring Results of Private Wells in the Central Sands

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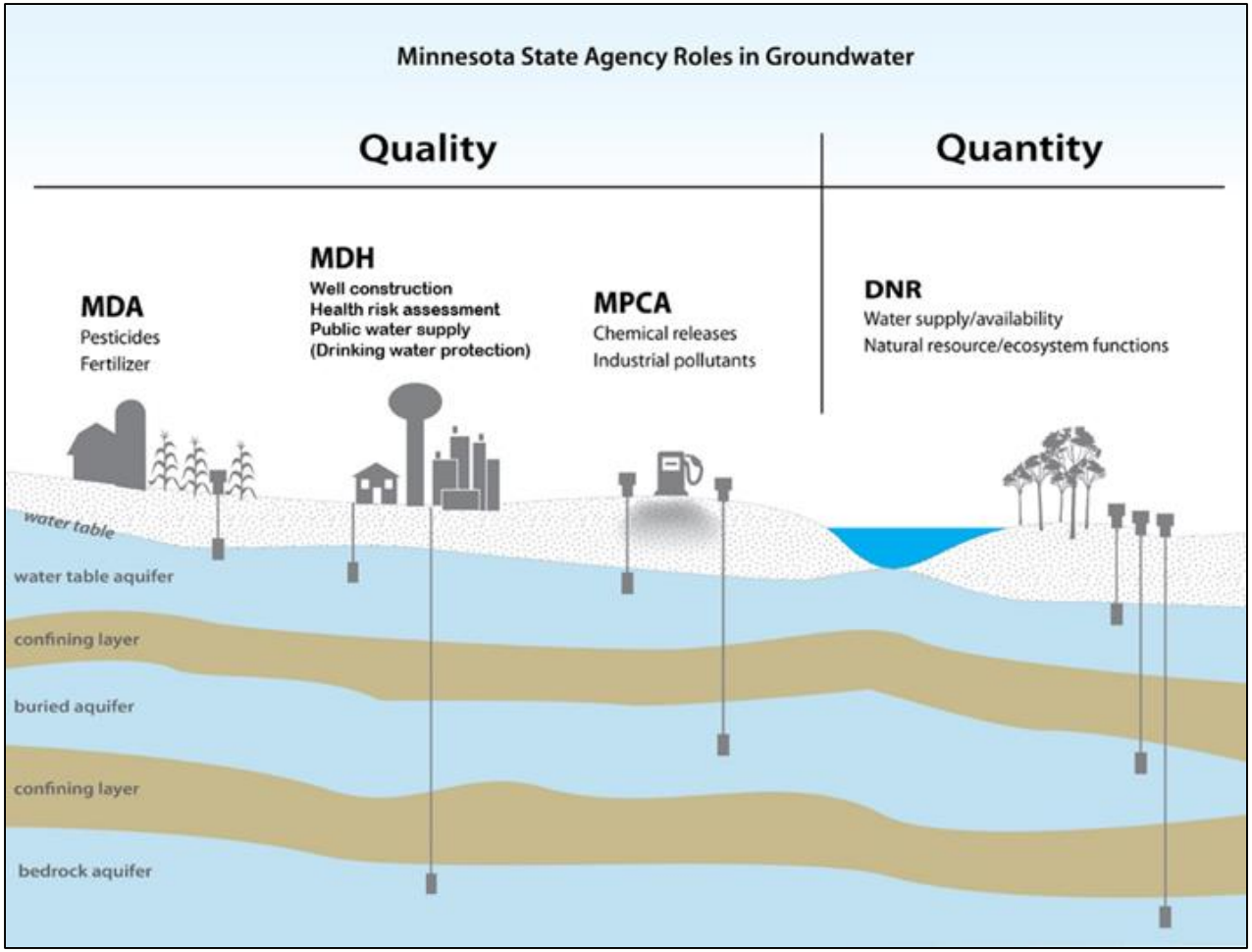
MINNESOTA DEPARTMENT OF AGRICULTURE

CLEAN WATER LAND & LEGACY AMENDMENT

Minnesota Department of Agriculture



CLEAN WATER LAND & LEGACY AMENDMENT

Two Approaches for Monitoring Nitrate in Private Wells

1. Regional
   - Central Sands Private Well Network

2. Local
   - Township Testing Program

Central Sands
Private Well Network

Phase 1

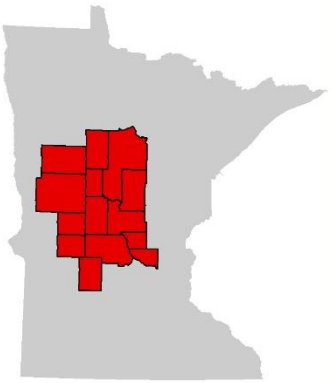
Short Term Goal (2011)

- Determine current nitrate concentrations in private wells in agricultural areas. Assess areas of concern.

Phase 2

Long Term Goal (On-going)

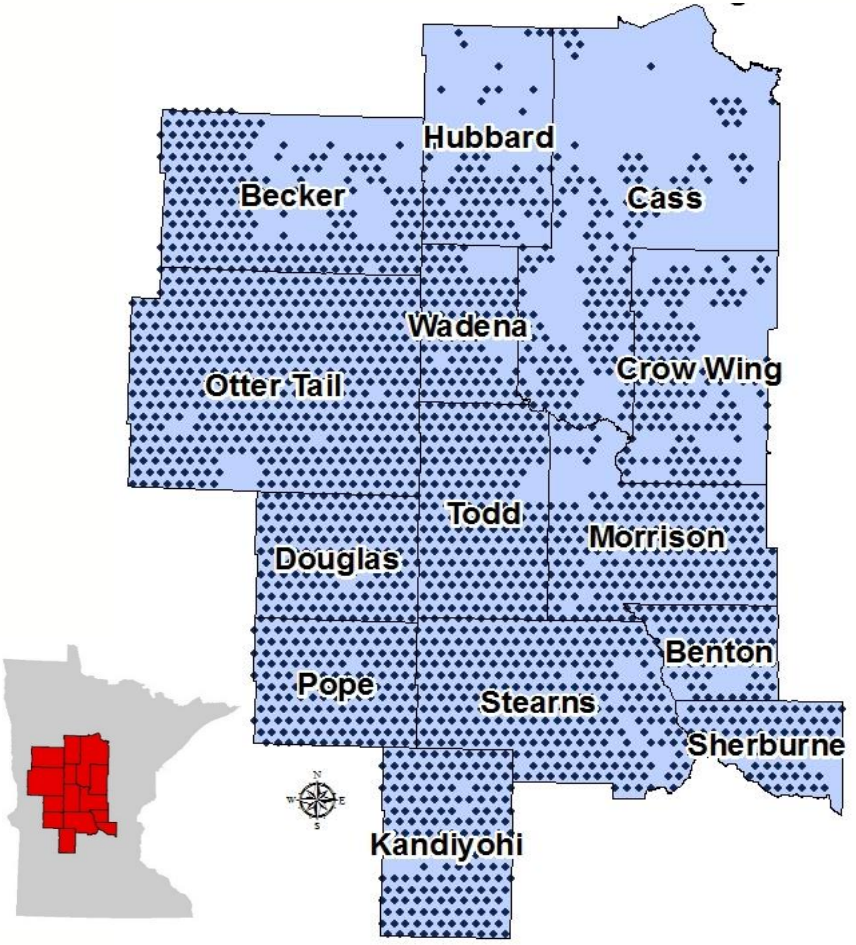
- Establish and maintain a long term network for determining trends in private well nitrate concentrations.
- Continue to assess areas of concern.



Central Sands Private Well Network Design

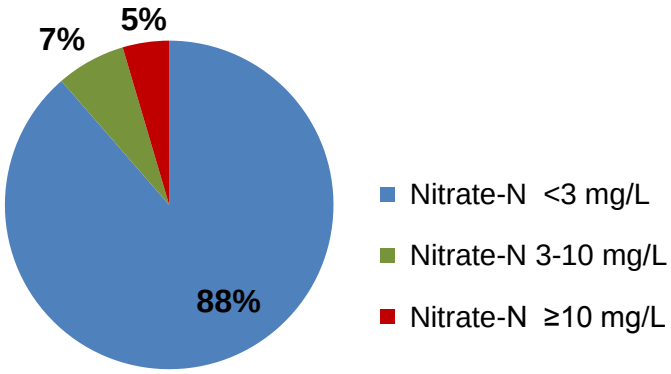
To ensure unbiased sampling and uniform distribution:

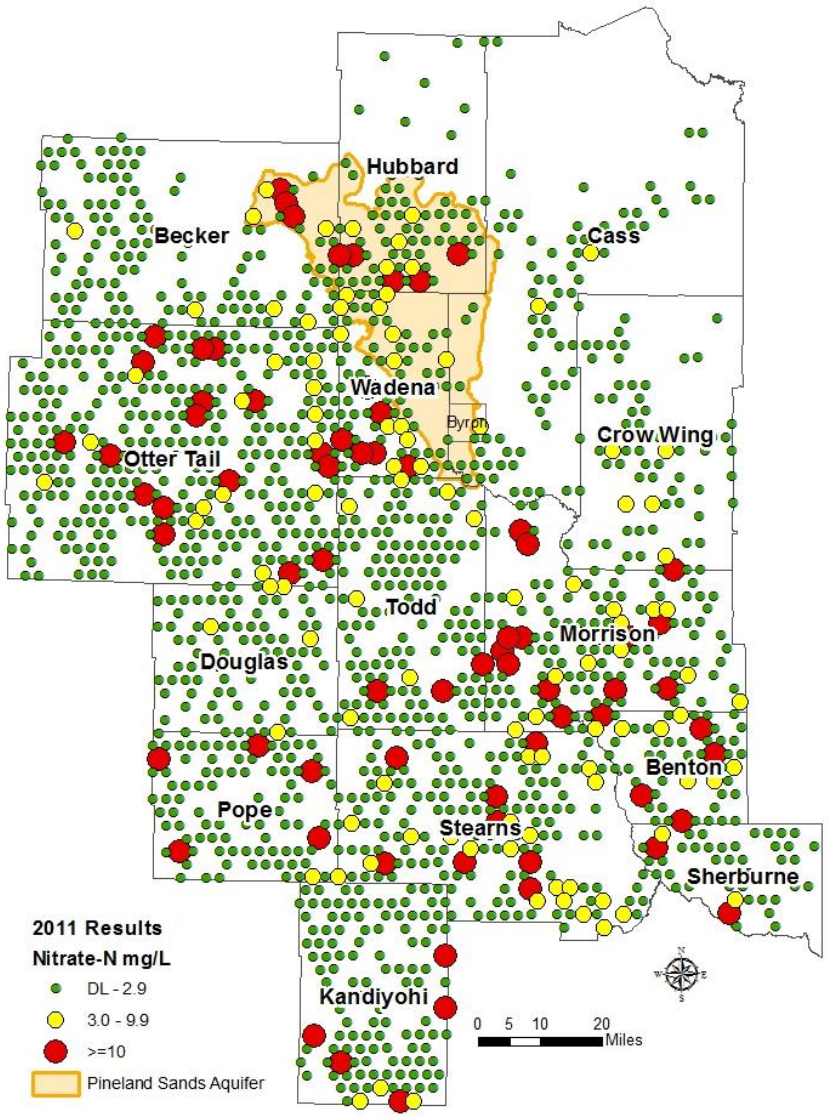
- an unaligned randomly started grid
- grid nodes were 2 miles apart
- 3 home owners from each node were asked to participate in the program, the 1st to respond was accepted into the program.



Central Sands Private Well Network Phase 1

- 1555 home owners volunteered for phase 1
- Home owners filled out a survey about their well





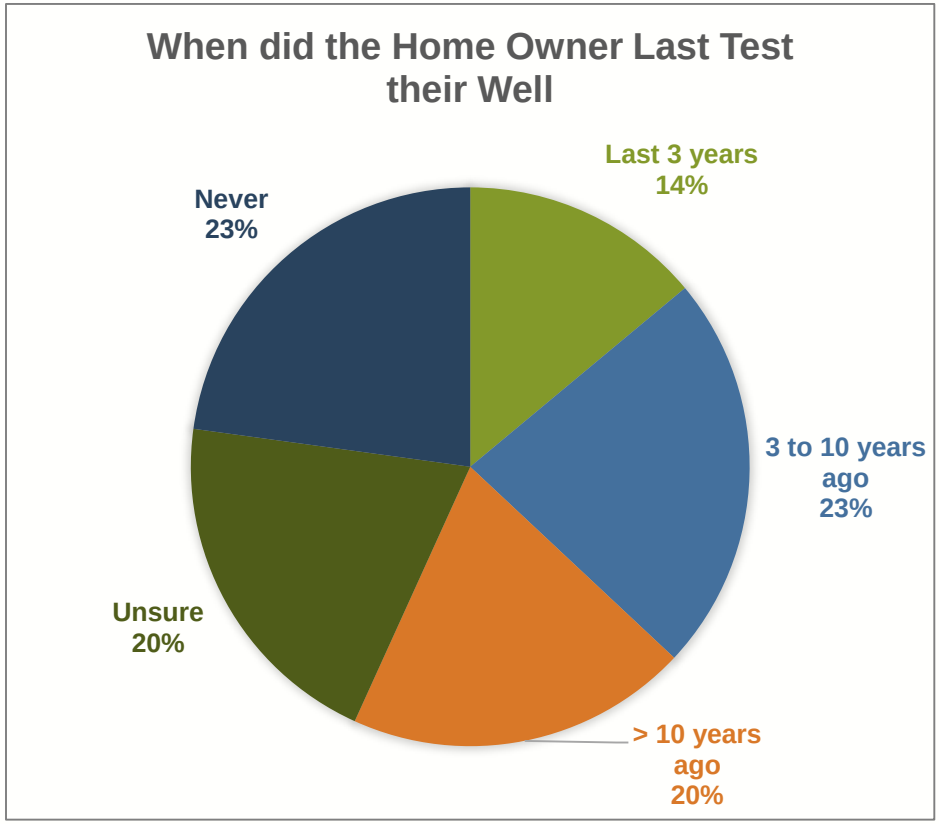
Home Owner Survey Questions:

Well information
- Age, Depth, Construction

Land use
- Farming, rural

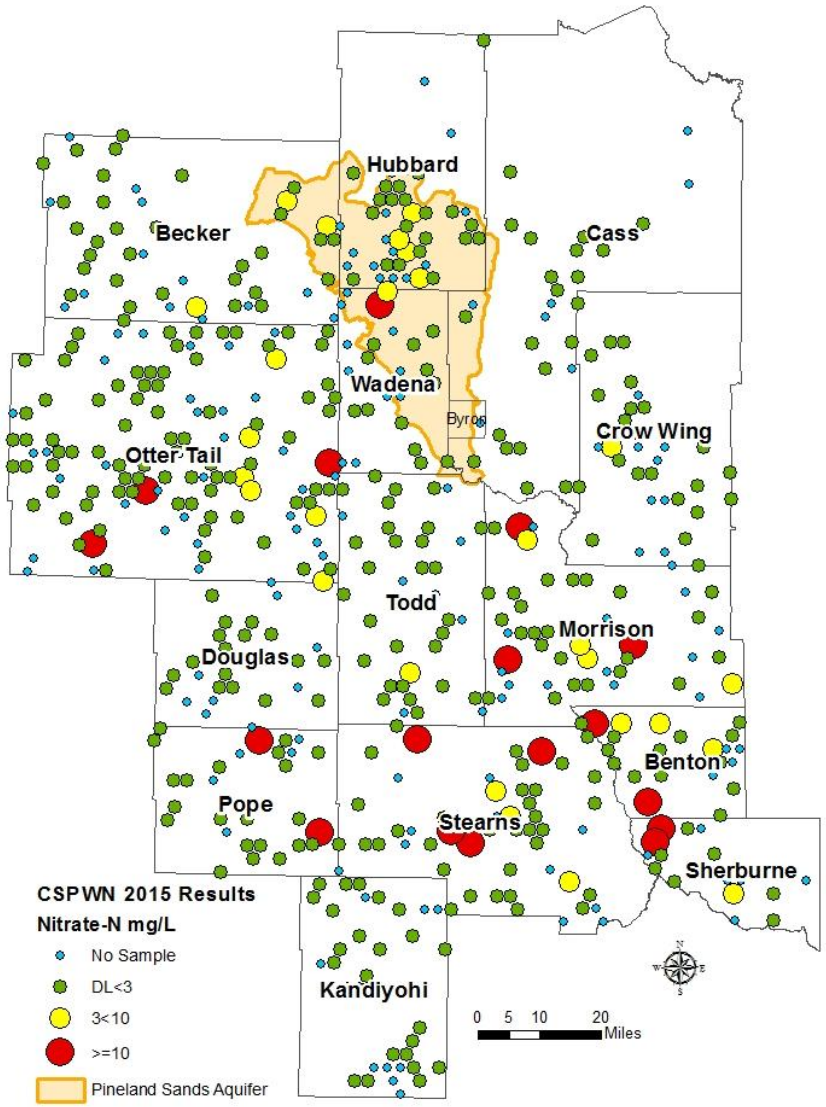
Possible nitrogen point source distances
- Septic System, Feedlots, Fertilizer Storage

How often do they test their well? Do they treat their water?



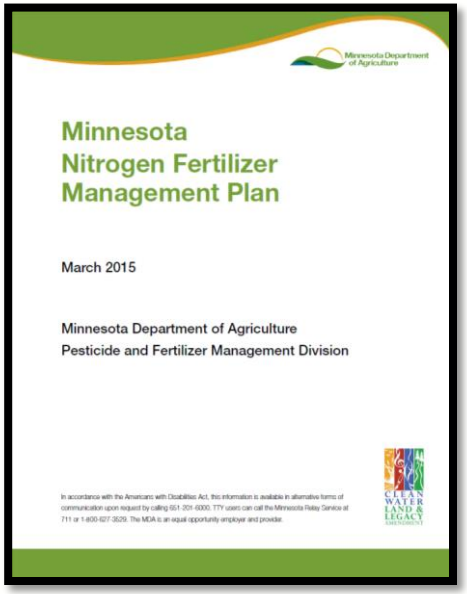
Central Sands Private Well Network Phase 2

Central Sands Private Well Network Summary					
Year	2011	2012	2013	2014	2015
Total Wells	534	510	487	434	402
Nitrate-N mg/L	Number of Wells				
< 3	478	454	433	388	357
3 < 10	35	40	41	32	27
>= 10	21	16	13	14	18
% > = 10	4%	3%	3%	3%	4%

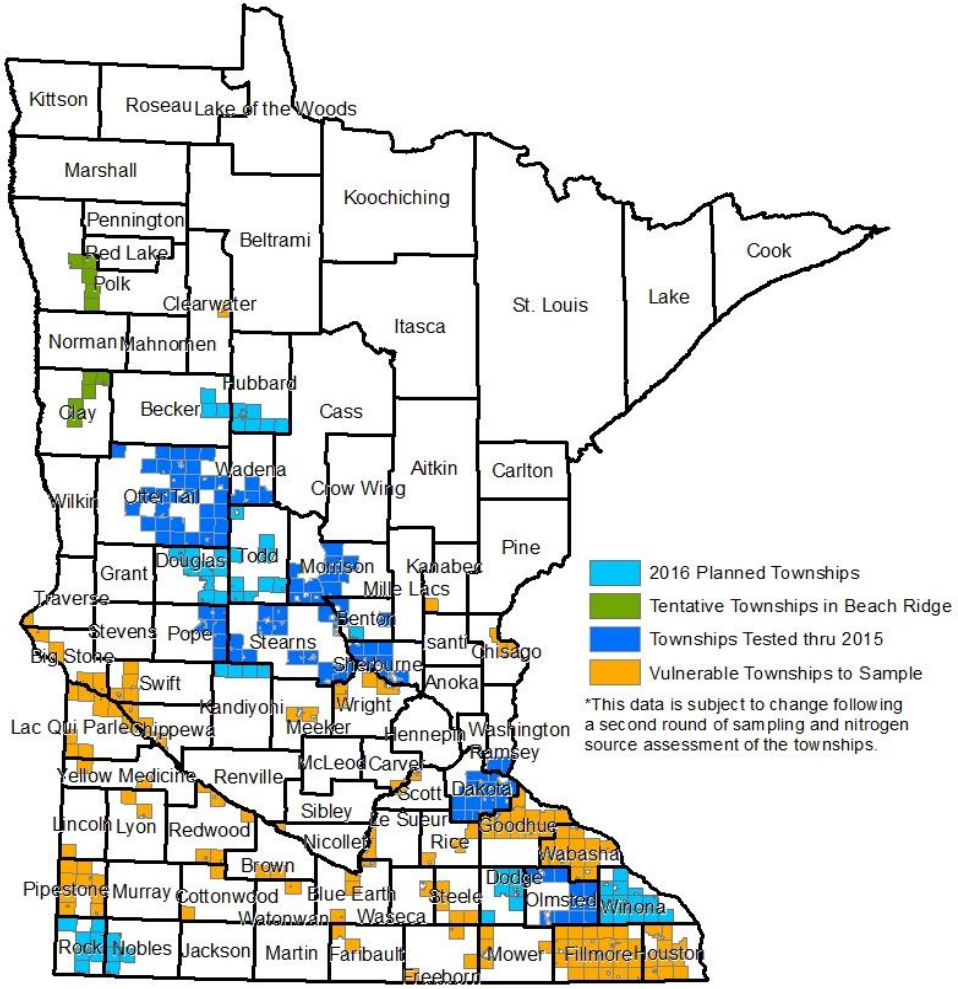


Nitrogen Fertilizer Management Plan (NFMP)

- The NFMP is the state's blueprint for minimizing groundwater impacts from the use of nitrogen fertilizer
- Has voluntary and regulatory components
- The plan calls for an assessment of current nitrate conditions in private wells in order to determine nitrate exceedances in drinking water at a township scale.



Township Testing Program



- In townships with vulnerable groundwater and significant row crops
- Partnership effort with local government
- Includes all private wells (up to 70,000 wells)
- Voluntary
- No cost to owner – funded by the Clean Water Fund

Two Step Process

Step 1 – Initial Sample:

- Work with local partner (SWCDs or County)
- All well owners are offered a free nitrate test kit
- Homeowner collects sample and mails it into lab

Step 2 – If Nitrate is Detected:

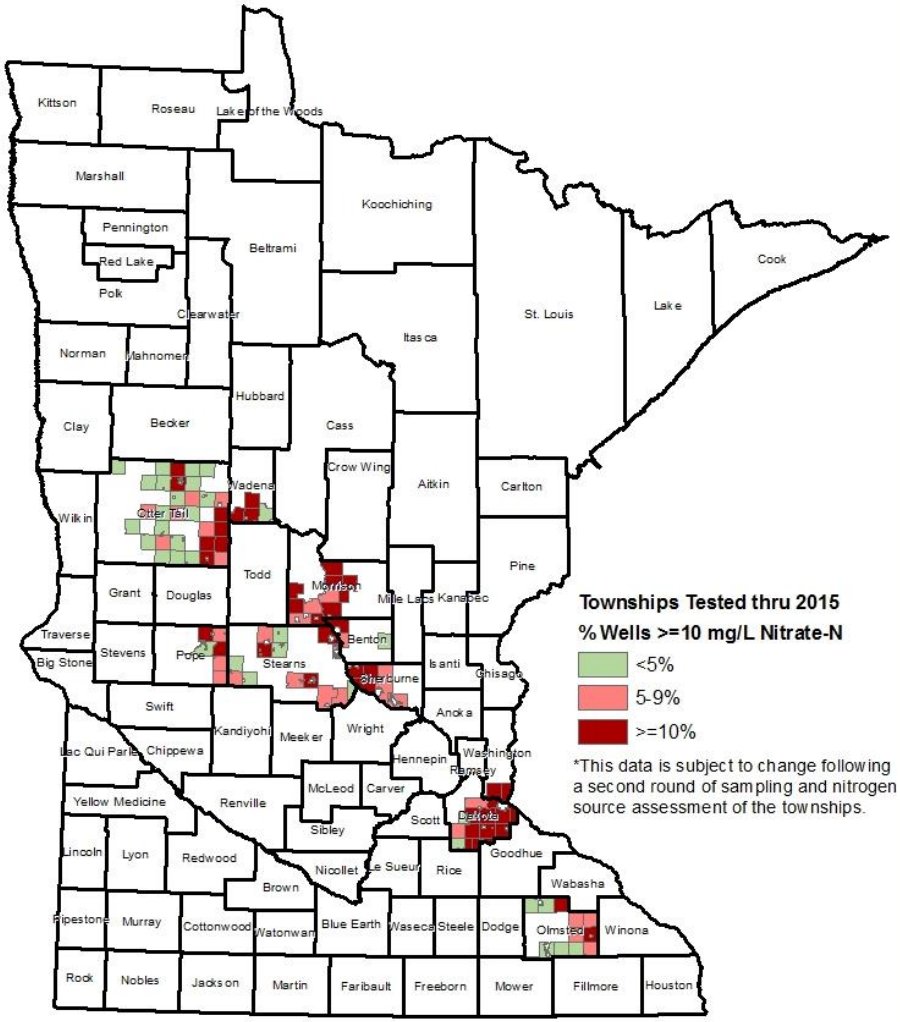
- Offer to collect follow-up nitrate and pesticide sample
- Samples collected by trained staff
- Wells assessed for possible point sources of nitrogen

Preliminary Results for 2013-2015

Percent of Wells above the Standard (10 mg/L Nitrate-N)	Number of Townships
Less than 5%	33
5%-9.9%	30
10% or more	41
Total	104

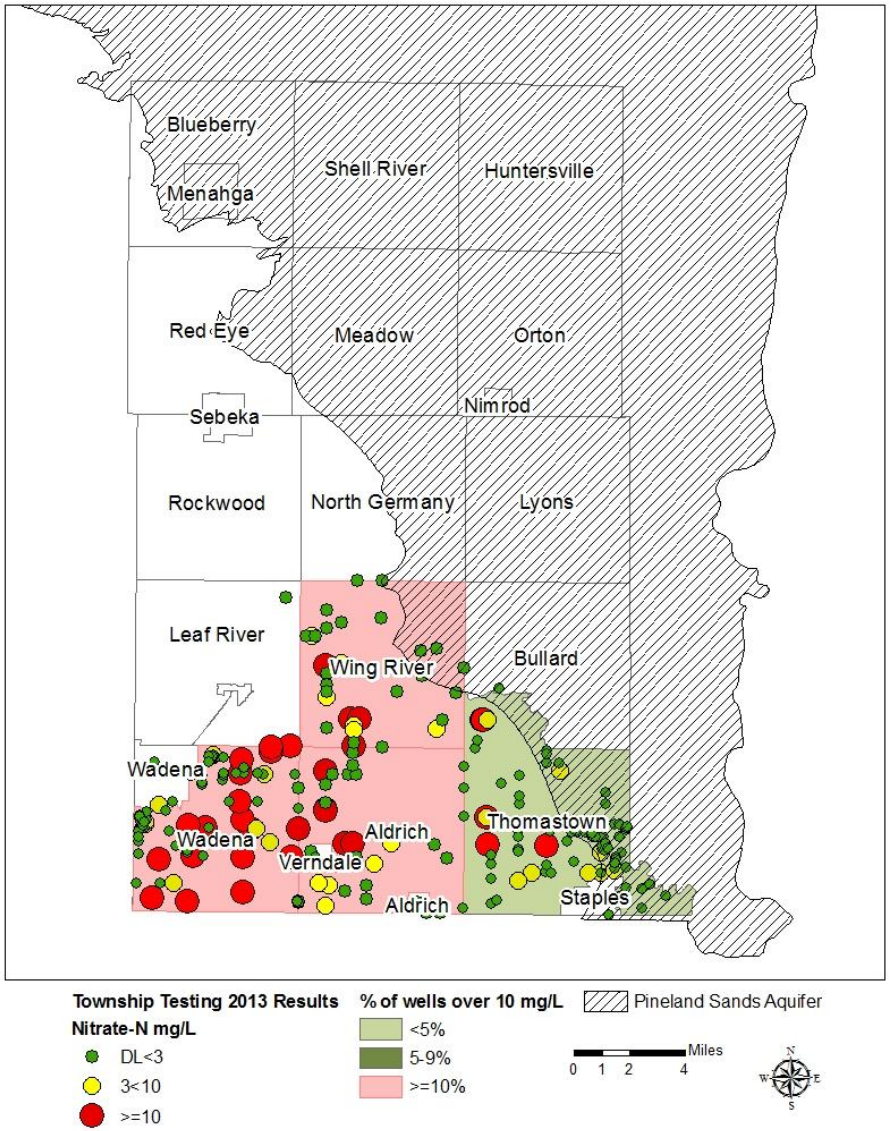
- Approximately 13,737 wells were sampled
- 10% (1325) of those wells were >= HRL

Results are preliminary and subject to change



Wadena County
2013 Township Testing Results

Township	Total Wells	Min	Max	Mean	Median	≥10 mg/L
Aldrich	33	<DL	32.4	4.9	<DL	18%
Thomastown	109	<DL	21.2	1.4	<DL	4%
Wadena	95	<DL	31.3	4.4	0.8	19%
Wing River	32	<DL	23.4	3.5	<DL	13%



Wadena County
Follow-up Testing

- In 2015, approximately 40 wells were resampled for nitrate-n and List 1 pesticides.
- No List 1 pesticide detections in these samples.
- Follow-up nitrate-n results are being compared to the initial homeowner collected samples. Well sites are being assessed for possible point sources.

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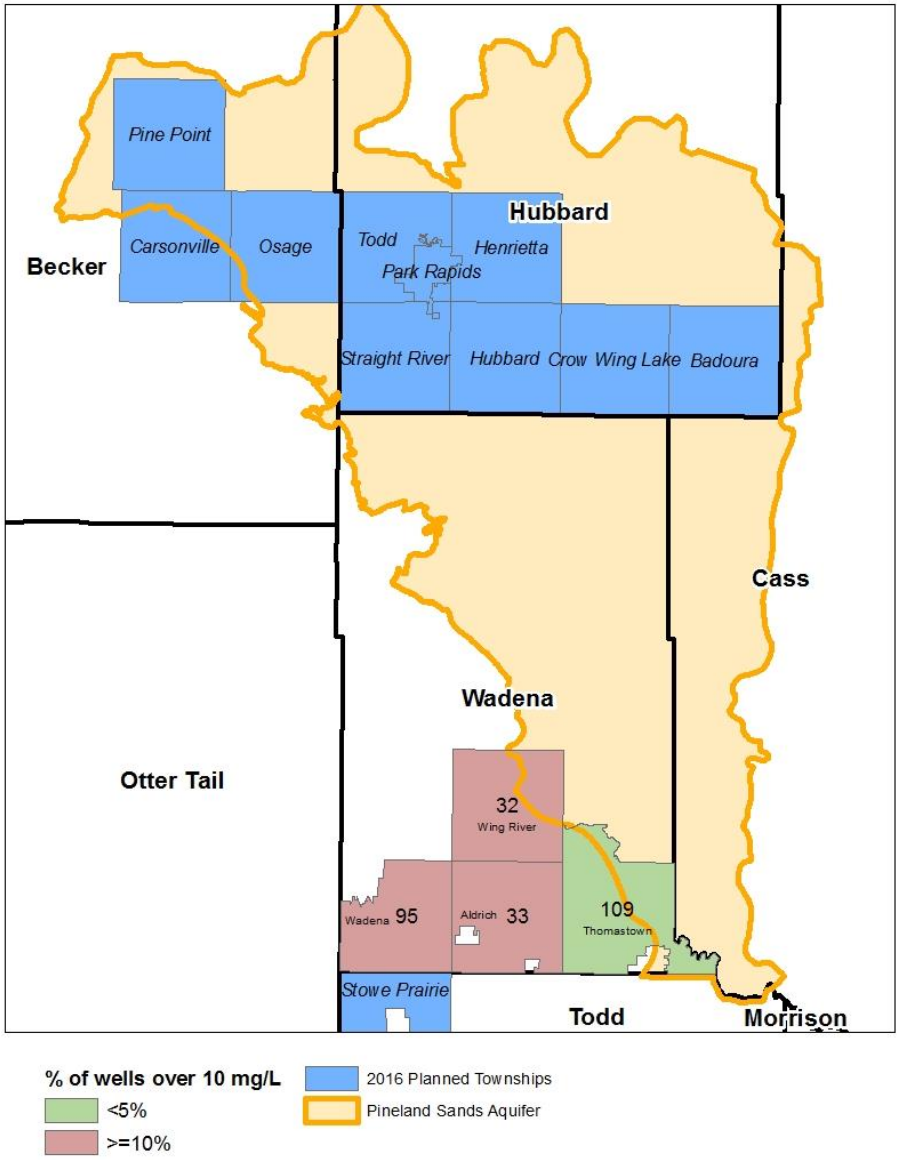
What's Next in the Township Testing Pineland Sands Area

- Initial testing in Hubbard and Becker Counties will take place in the summer of 2016
- Follow-up sampling will take place in 2017



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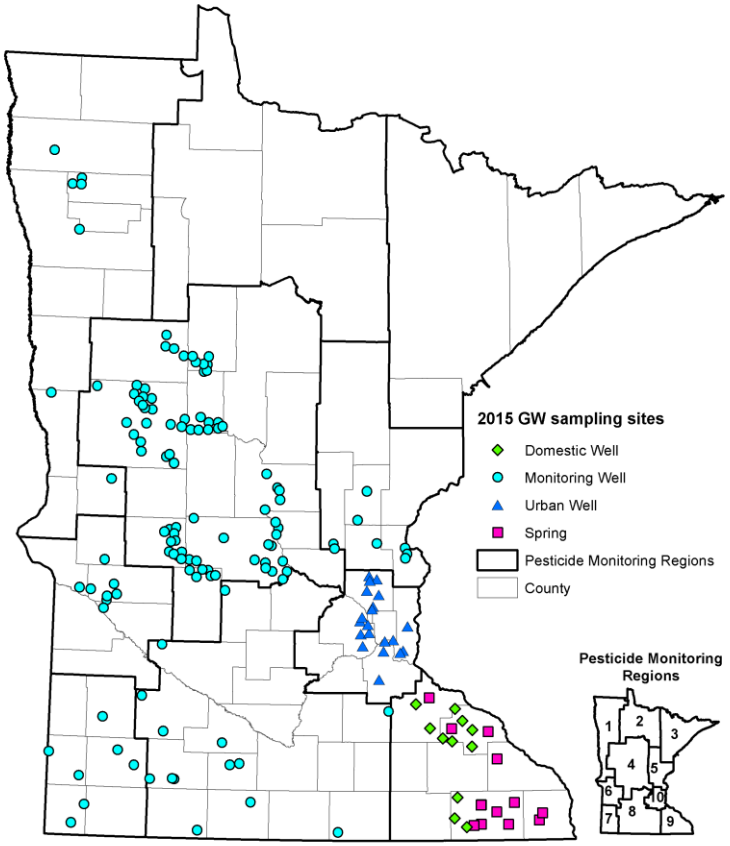
MDA Pesticide Monitoring Well Network

- Began in 1985, divides state into 10 Pesticide Monitoring Regions (PMRs)
- Wells are located at the edge of farm fields monitoring shallow groundwater
- Target most sensitive areas in each PMR
- Designed to track long-term pesticide trends by PMR
- Low-level pesticide analysis for 136 different chemicals



Summary for MDA Monitoring

1. MDA has successfully figured out how to characterize private wells for nitrate with two unique methods.

2. Huge need for both regional and localized methods.

3. MDA will be implementing private well testing in Hubbard County and Becker County this field season.

4. Regionally in the Central Sands, we see about 5% above the HRL of 10 mg/L. However, some townships in Wadena County have been found to have considerably elevated conditions.

References for MDA monitoring

For more information:

Central Sands Private Well Network
- Visit www.mda.state.mn.us/centralsandsnetwork

Township Testing Program
- Visit www.mda.state.mn.us/townshiptesting

Nitrogen Fertilizer Management Plan
- Visit www.mda.state.mn.us/nfmp

Pesticide Monitoring Network
- Visit www.mda.state.us.mn/monitoring.