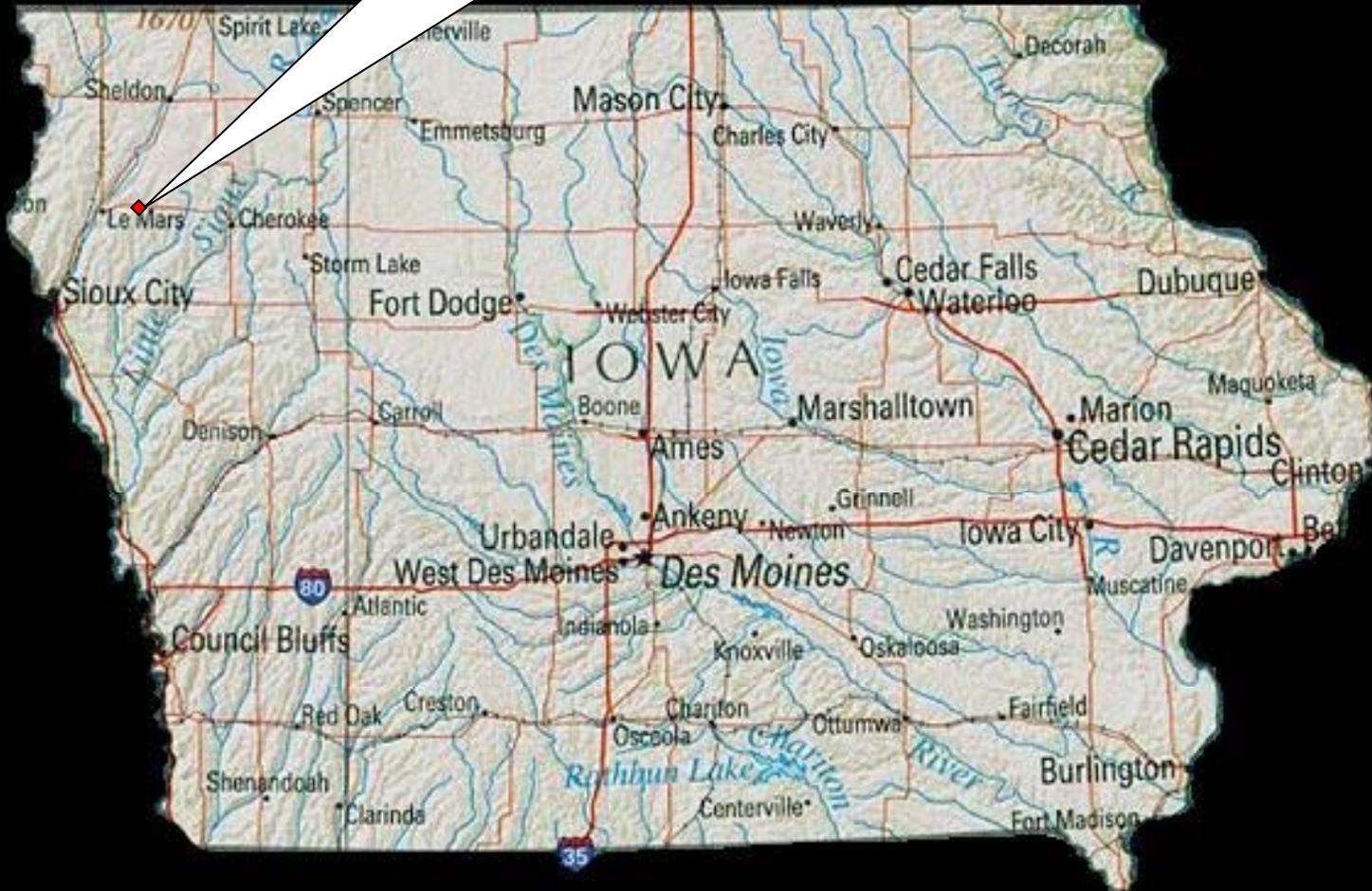


Remsen, Iowa



SOURCE WATER PROTECTION PARTNERSHIP

- Remsen SWP Community Planning Team
- Remsen Utilities Board and City Council
- Plymouth County USDA-NRCS
- Sioux Rivers RC&D
- IDNR SWP Program
- Local Landowners
- State Watershed Improvement Review Board
- Plymouth County PF Chapter

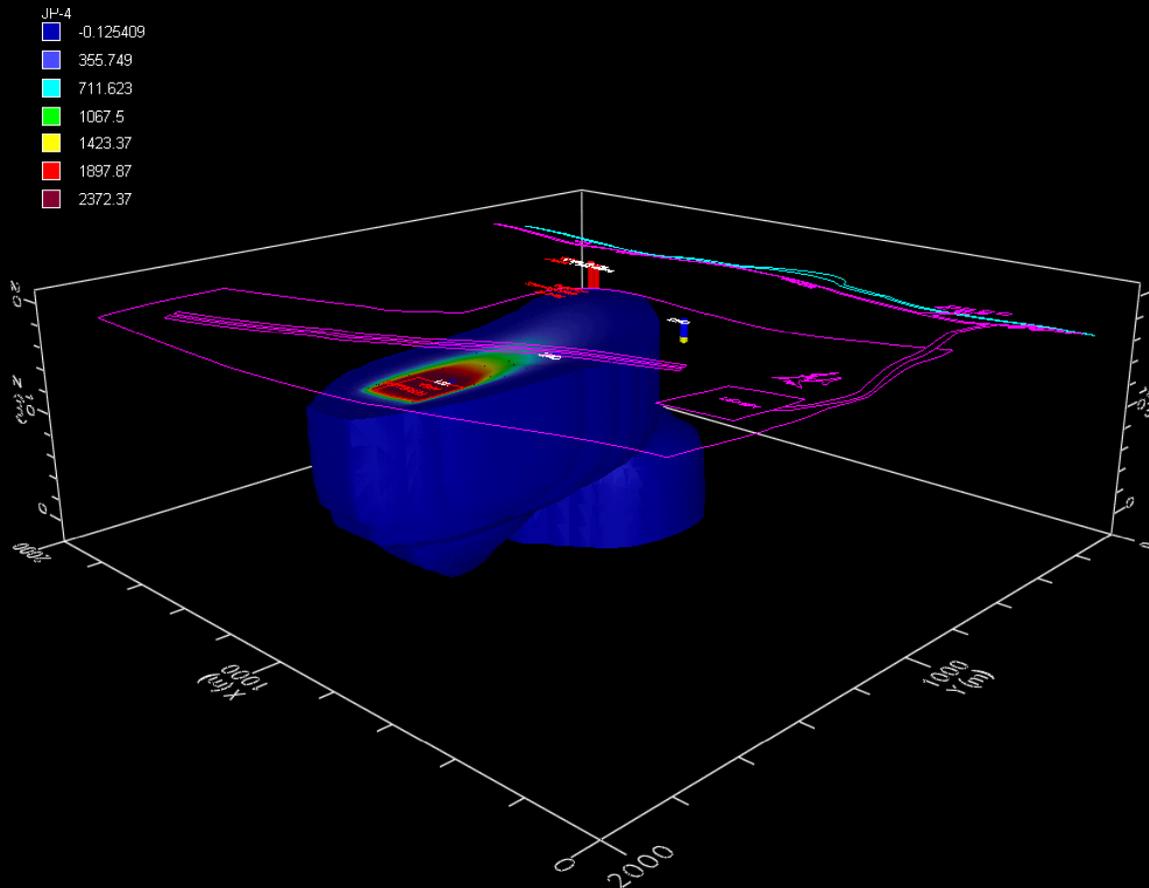
Iowa DNR Objectives For The Remsen, Iowa Site

- Identify potential source area(s) for the high nitrate levels found in Municipal Well No.8.
- Determine why Wells No. 3, 5 and 6 do not have the same nitrate levels.
- Identify groundwater flow paths for the Deep Creek alluvium system.

Remsen Shallow Well Locations



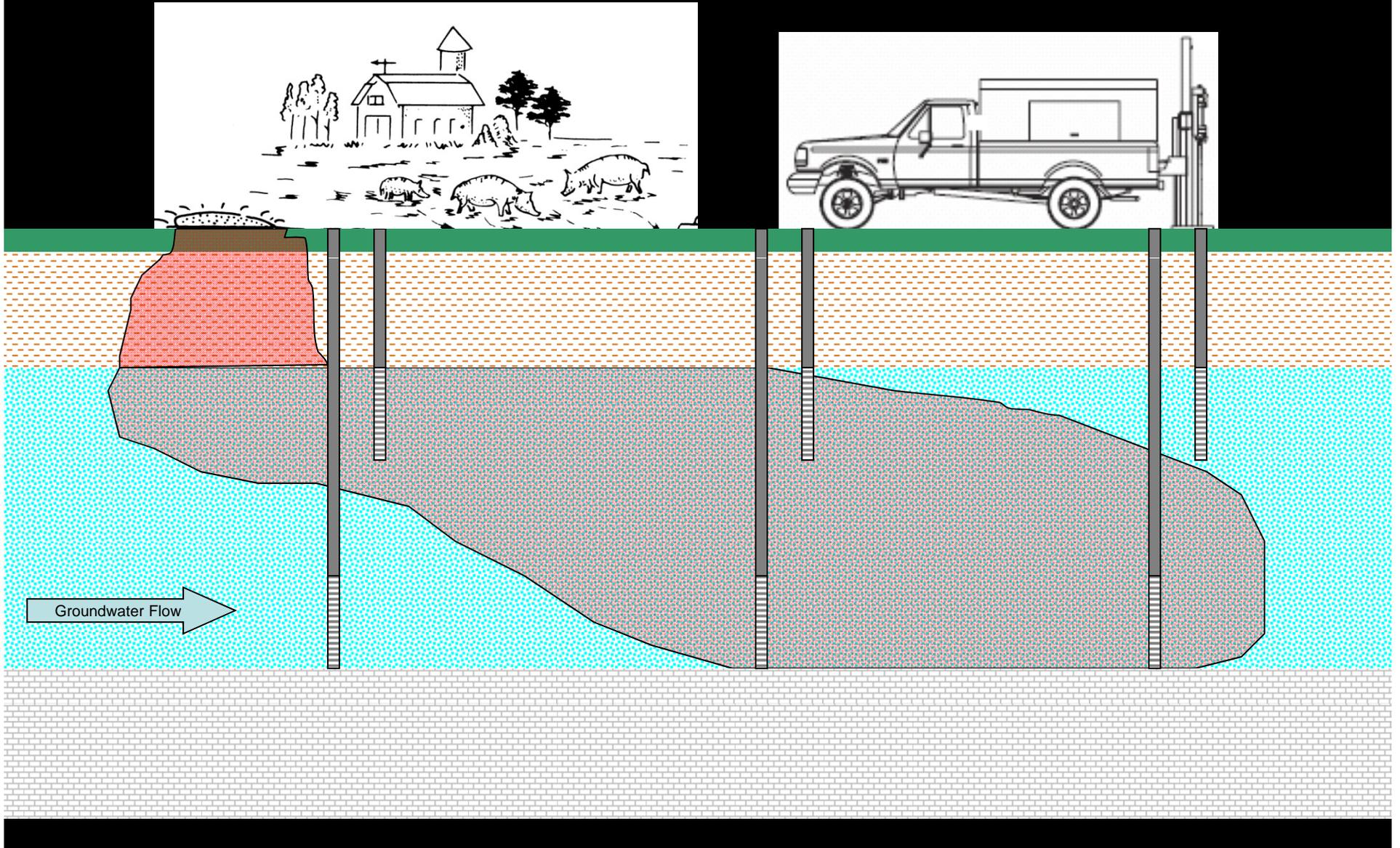
Alluvium Aquifer Modeling With Visual MODFLOW Three Dimensional Groundwater Flow and Transportation Modeling

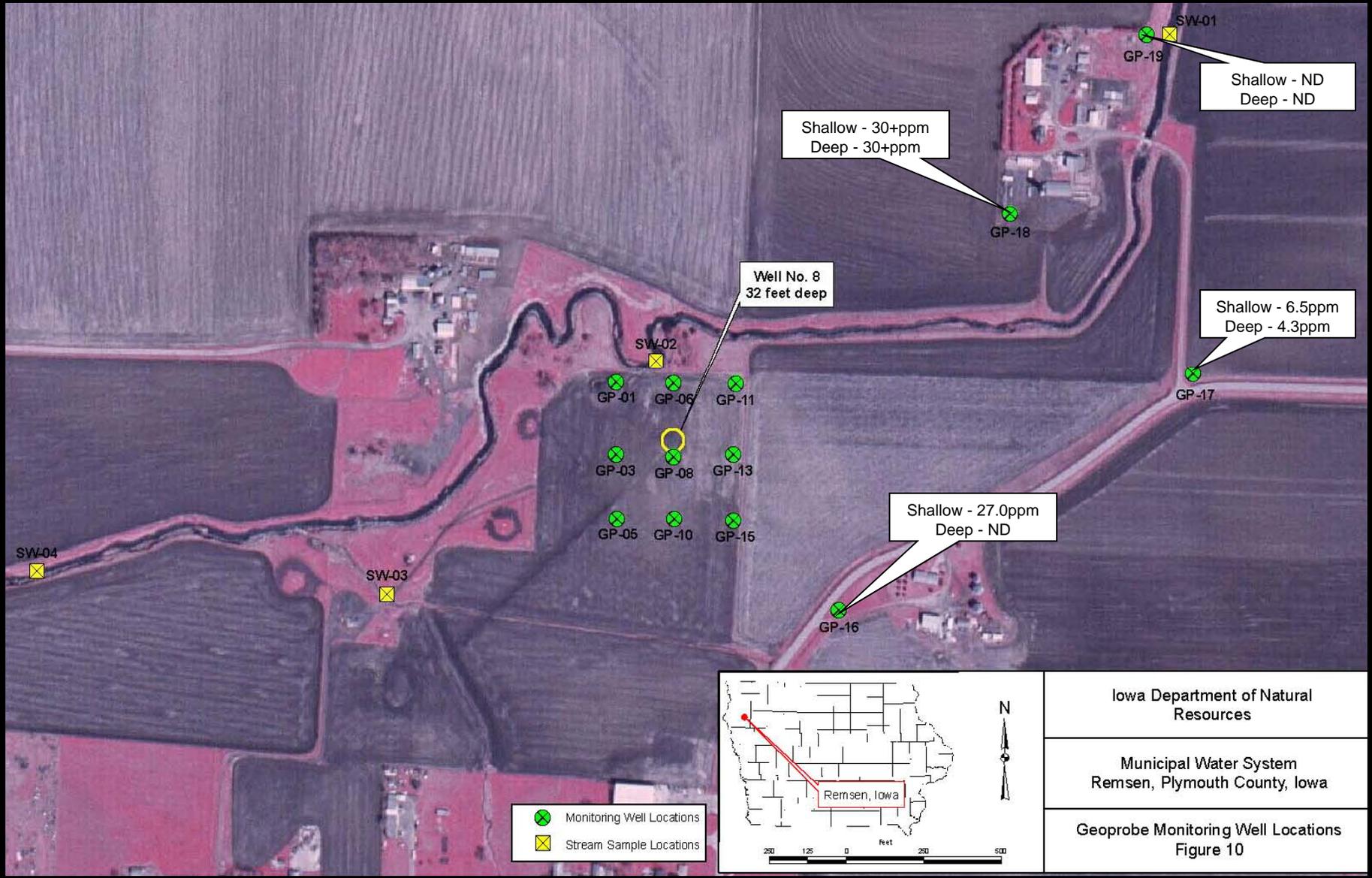


Iowa DNR Groundwater Sampling



Why we used split level sampling (nested wells).





Iowa Department of Natural Resources

Municipal Water System
Remsen, Plymouth County, Iowa

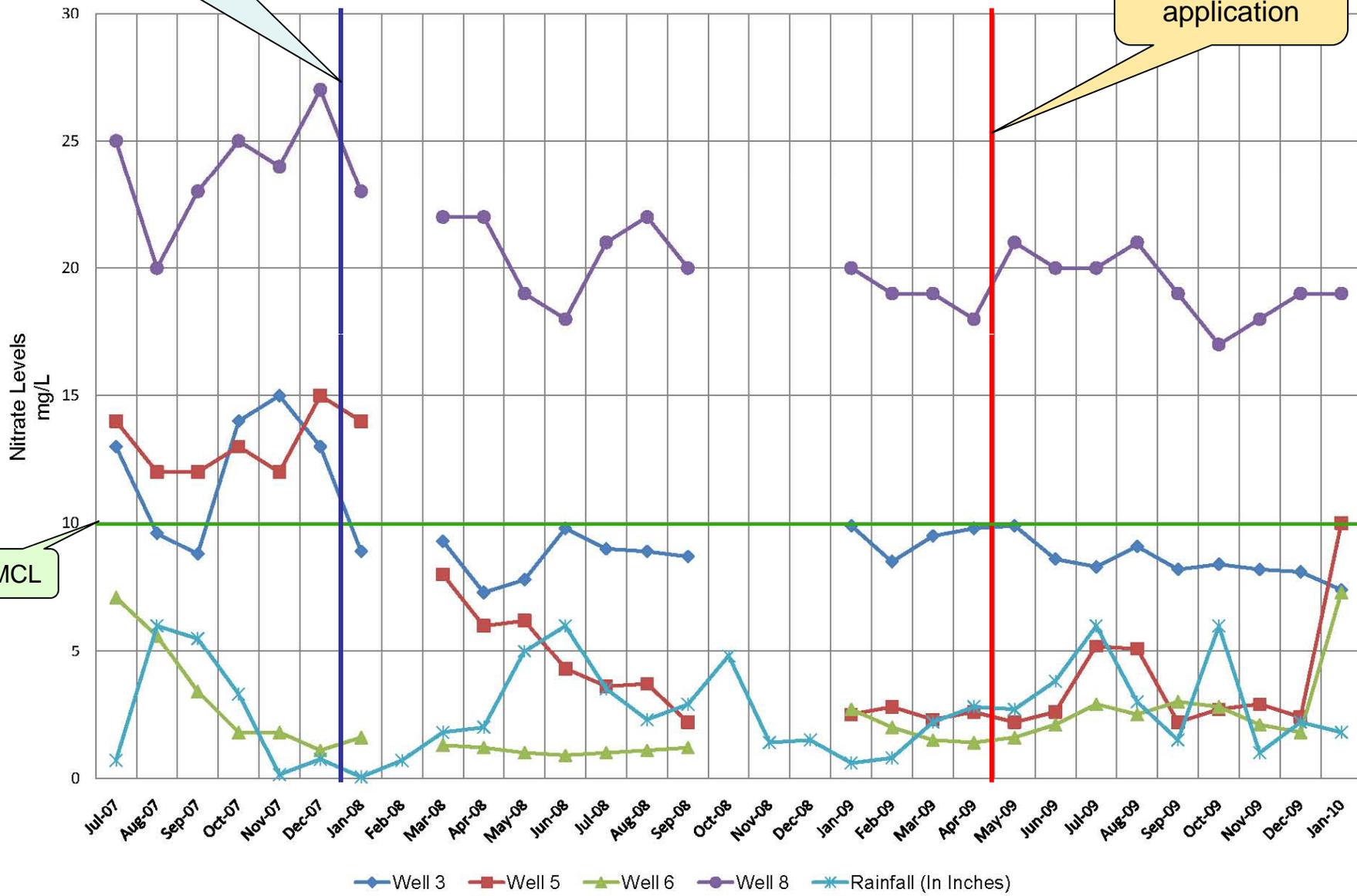
Geoprobe Monitoring Well Locations
Figure 10

Remsen Municipal Water Supply Wells No. 3, 5, 6, and 8

Last fertilizer application

SWP process started

MCL



407 lb
Nitrate-N/
Acre/Ft



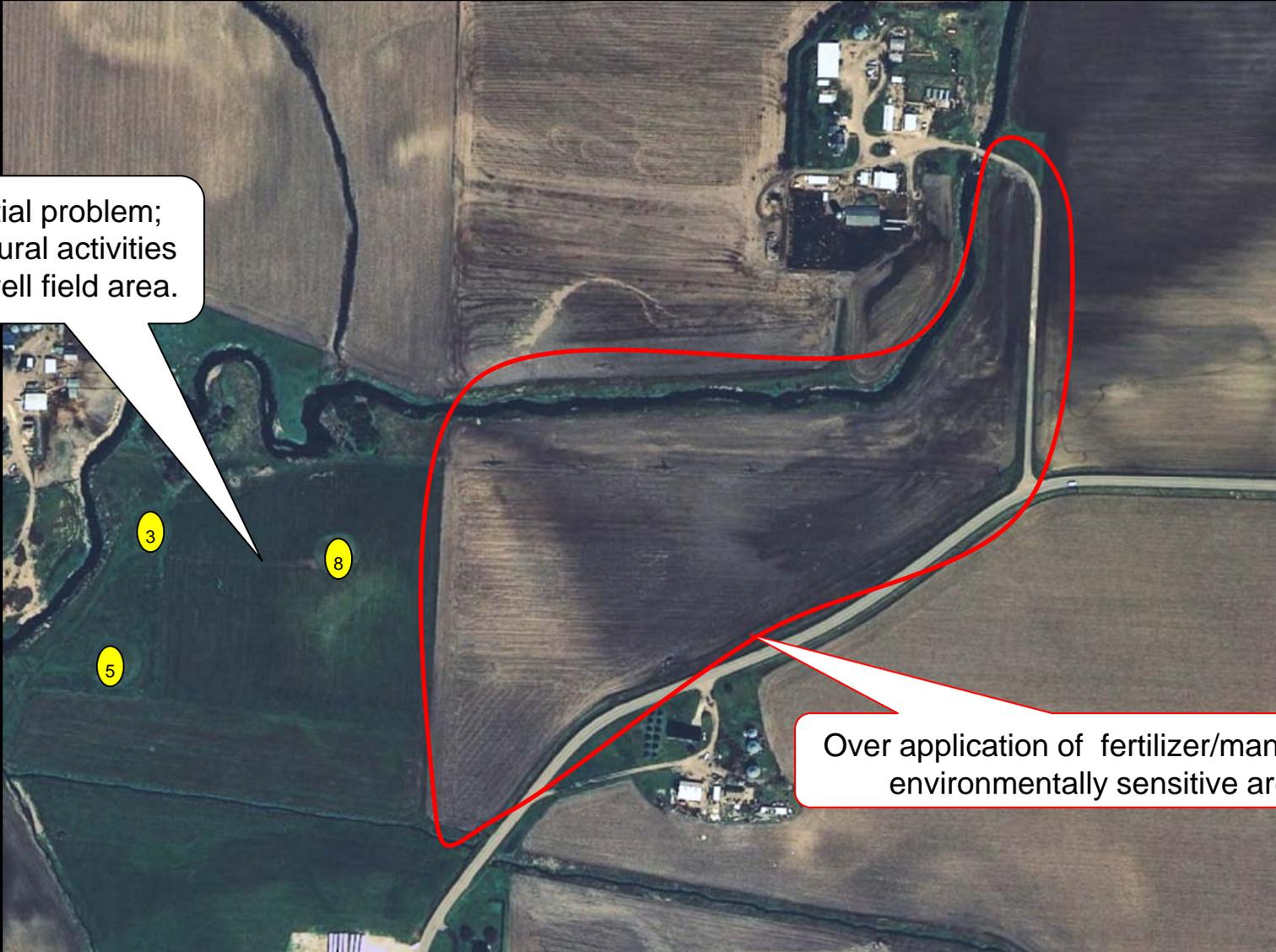
570 lb
Nitrate-N/
Acre/Ft



665 lb
Nitrate-N/
Acre/Ft



Problem Identified



Potential problem;
agricultural activities
in the well field area.

Over application of fertilizer/manure in a
environmentally sensitive area.

How to Solve the Problem

USE THE SWP PARTNERSHIP

Remsen SWP Community Planning Team

Remsen Utilities Board and City Council

Plymouth County USDA-NRCS

Sioux Rivers RC&D

IDNR SWP Program & Contaminated Sites staff

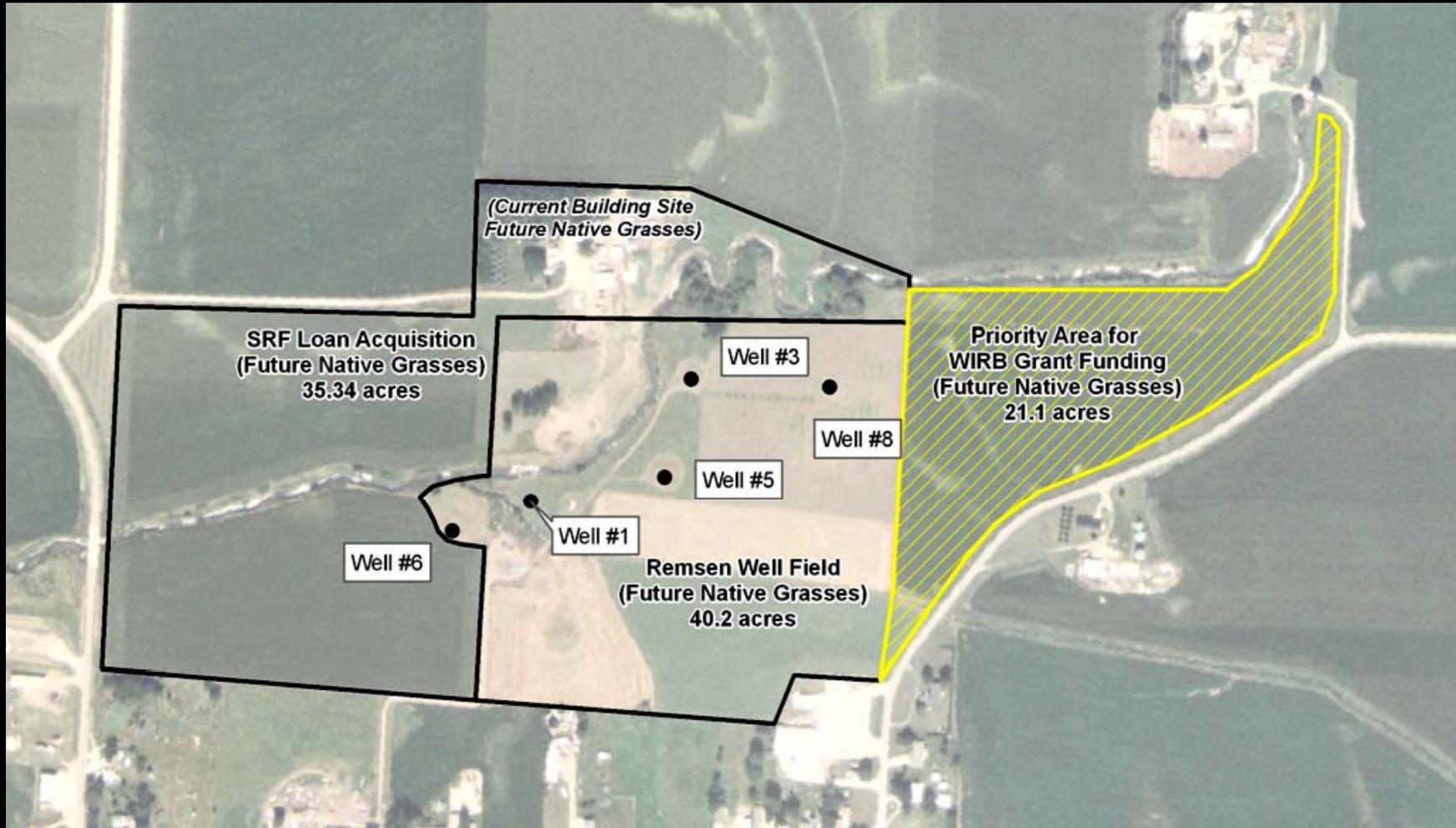
IDNR SRF Funds

State Watershed Improvement Review Board (WIRB)

USDA-ARS

Plymouth County PF Chapter

Land Acquisition

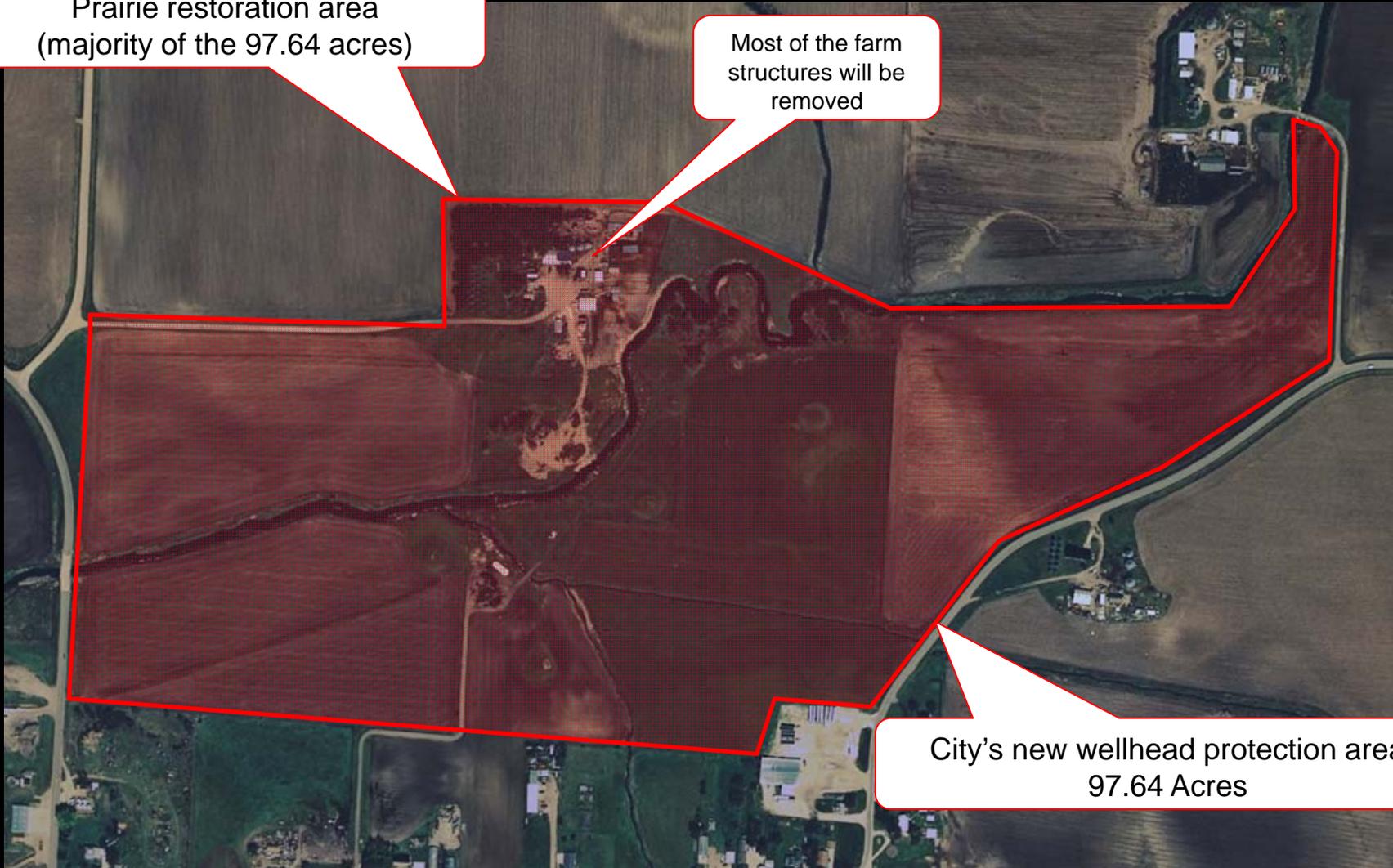


Pheasants Forever Plymouth County, Iowa Chapter

Prairie restoration area
(majority of the 97.64 acres)

Most of the farm
structures will be
removed

City's new wellhead protection area
97.64 Acres



It Takes
Time.....

