

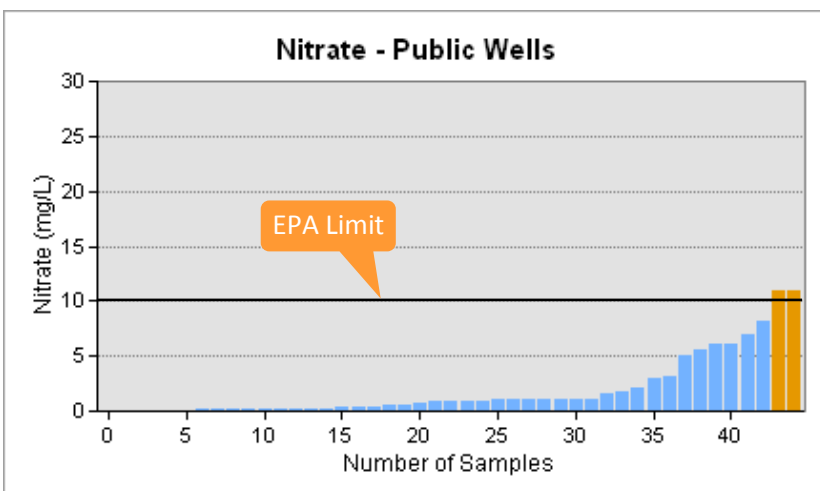
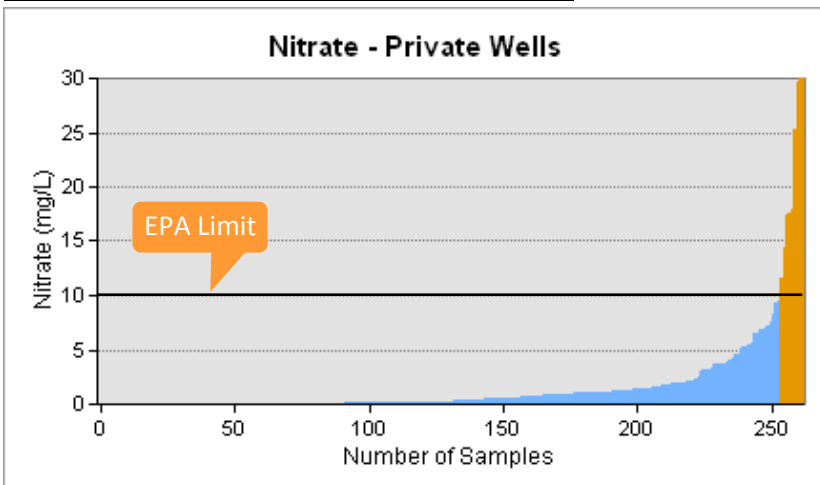
WDWDD-SDSMT Report Card for Nitrate

Private Well Tests	
Number of wells	262
Number of tests	272
Earliest test date	5/5/2013
Latest test date	11/03/2015
Lowest value detected	**
Highest value detected (mg/L)	31.5
Number of wells above EPA limit	8
Percent wells above limit	3%
Public Well Records	
Number of wells	45
Number of recorded tests	382
Earliest test date	6/12/1963
Latest test date	9/21/2009
Lowest value detected	**
Highest value detected (mg/L)	20
Number of wells above EPA limit	2
Percent wells above limit EPA limit	4%
** Below detection limit of 0.04 mg/L	

Dissolved nitrate can occur in well water because of human activities, including runoff from fertilizer or improperly maintained septic tanks, or, more rarely, from weathering of certain rock types. The maximum contaminant level for nitrate in public water supplies is 10 mg/L. Nitrate is regulated in public water supplies because it can cause illness and death in infants due to blue-baby syndrome.

We sampled 262 private wells between 2013 and 2015, and compiled published data from 45 public wells to evaluate the presence of nitrate in well water in western Pennington County, SD. In some cases the wells were tested multiple times; we took the highest test in each case. We found that 3% of private wells and 4% of public wells had tests that exceeded the EPA standard. The maximum value detected was 31.5 mg/L, about three times the EPA standard.

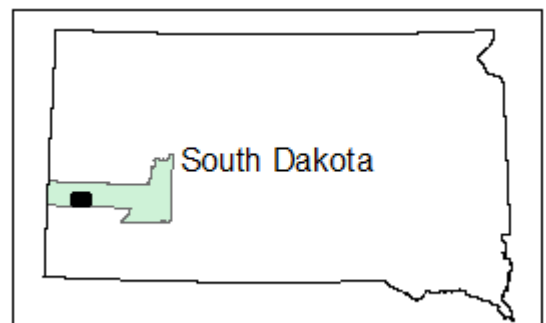
In the graphs, the blue bars represent nitrate values below the EPA



standard; the orange bars represent values above the standard, and the standard is indicated by a black horizontal line at 10 mg/L. The graphs show only a few values above the EPA standard.

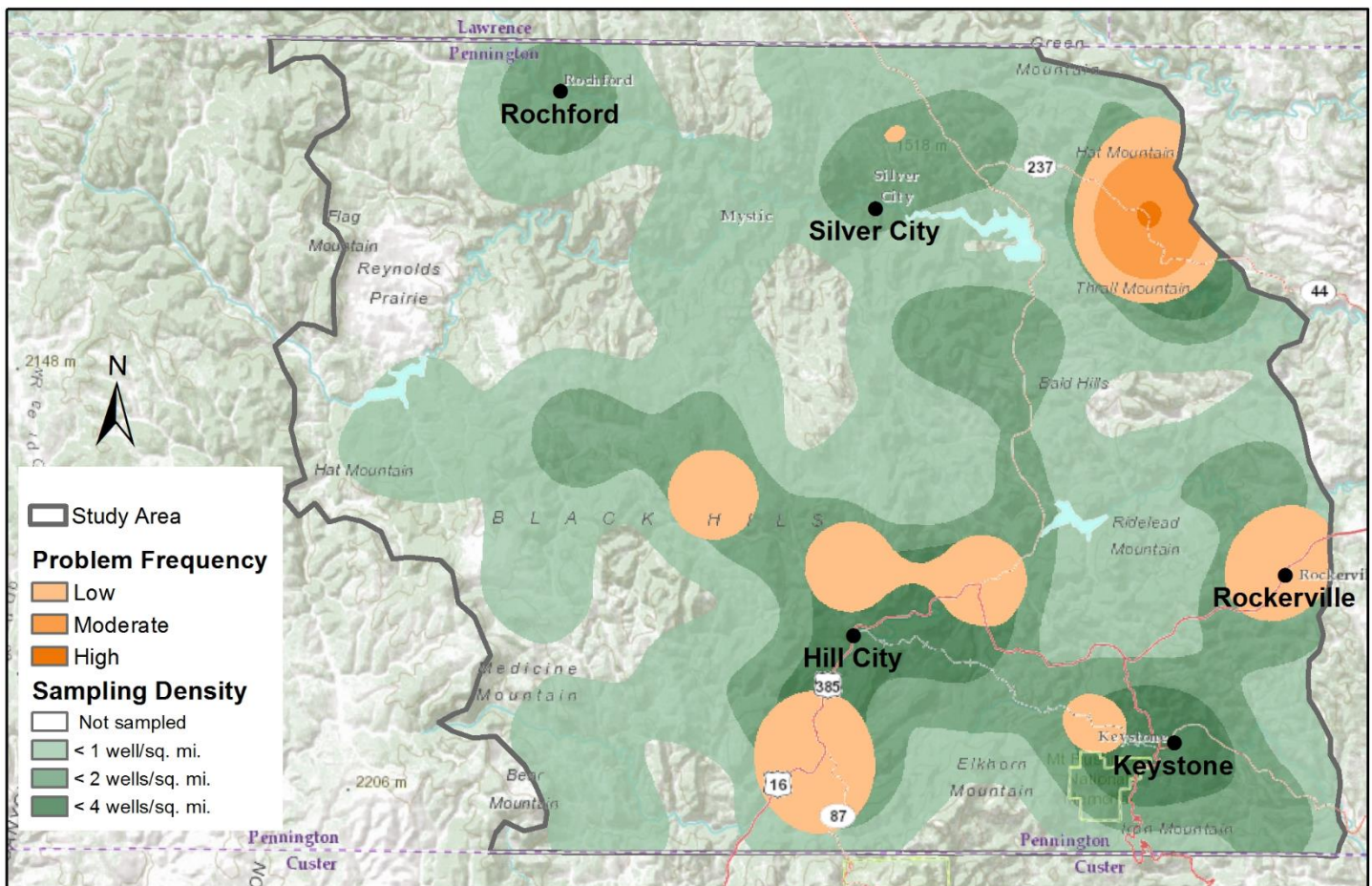
Nitrate problems can be treated so that the water is safe to drink. Public water supplies are regulated by law. Although the tests are performed prior to treatment, water from public wells should be safe.

Private wells are not regulated by law and homeowners are not required to meet drinking water standards set by the EPA. However, homeowners are encouraged to test their water to ensure that it is safe to drink and to protect their families.



To protect the privacy of homeowners who participated in the study, we do not plot individual well test locations on maps shown to the public. Instead, we selected the private and public wells with nitrate values greater than or equal to 50% of the EPA standard and created a density map showing areas with more frequent nitrate problems. These regions are considered to represent a higher *risk* of nitrate issues. **It is important to understand that subsurface conditions can change rapidly from place to place, and not all wells in the shaded areas will have nitrate problems.** The only way to know whether a particular well has elevated nitrate levels is to test it. Homeowners in the shaded areas are especially encouraged to test their well water to ensure that it is safe.

Nitrate does not appear to be a widespread problem in the study area. However, the higher values are associated with areas where fecal coliform bacteria have also been detected in wells, which is consistent with the impact of human activities. For interactive maps showing these associations, click [here](#).



Areas of Concern for Nitrate

This map shows areas where nitrate problems have been found to occur in drinking water from wells in western Pennington County, South Dakota. Unshaded areas have few to no wells and have not been sampled. Green areas have been sampled and are largely free of problems. Orange areas have been sampled and show where problems are likely to occur. Not all wells in the orange areas will have a problem; the only way to know if a particular well is safe is to test it. The study area is defined as the metamorphic rocks in Pennington County.

