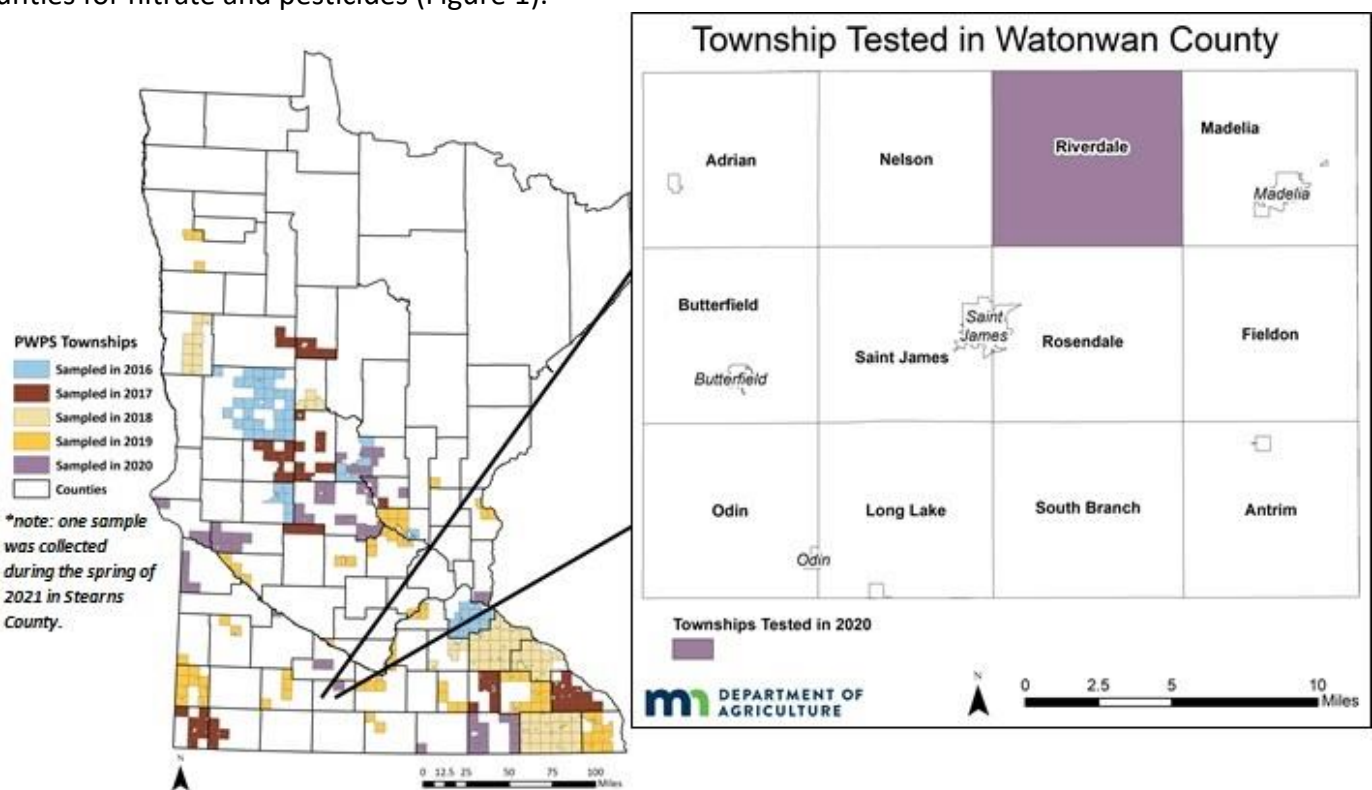


## Watonwan County Private Well Pesticide Sampling Project Results Summary

Four private drinking water wells in Watonwan County, Minnesota were sampled by the Minnesota Department of Agriculture (MDA) as part of the [Private Well Pesticide Sampling \(PWPS\) Project](#) in 2020. The PWPS Project is a follow-up program to the MDA Township Testing Program. Homeowners with nitrate-nitrogen (nitrate) detections in the Township Testing Program are offered follow-up nitrate and pesticide testing, performed by MDA staff. The primary goal of the PWPS Project is to provide information to homeowners and the general public about the presence of pesticides and pesticide break-down products (degradates) in private drinking water wells. Testing is targeted to areas of the state with vulnerable groundwater and row crop agriculture. From 2014-2021, the MDA sampled approximately 6,350 wells in 50 counties for nitrate and pesticides (Figure 1).



**Figure 1.** Areas offered private well pesticide sampling.

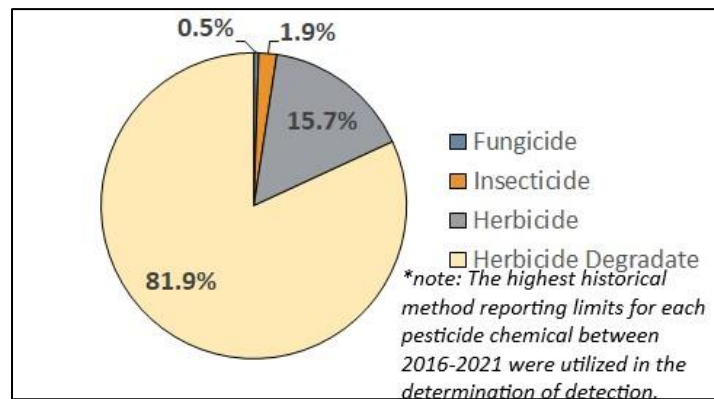
### Program Background

The PWPS Project began with a Pilot Project in Dakota County in 2014 and was expanded to additional counties in 2015. Samples collected in 2014-2015 were analyzed for nitrate and a list of 22 pesticides and pesticide degradates. No samples exceeded pesticide drinking water health reference values in 2014-2015.

Beginning in 2016, the MDA contracted with a laboratory capable of detecting many more pesticides at lower concentrations. Homeowners who had their well sampled in 2014-2015 were given the opportunity to have their wells re-sampled using the new laboratory methods. Sampling with the new laboratory continued into the spring of 2021.

## 2016-2021 PWPS Program Overall Results

All of the wells sampled in 2016-2018 were analyzed for approximately 125 pesticide and pesticide degradates. For 2019-2021, six additional pesticide chemicals were added to the analytical list, including the degradates of the herbicide cyanazine. Results indicate that pesticides or pesticide degradates were detected in 76% of the wells tested. Metolachlor ESA (a corn herbicide degradate) was the most frequently detected compound. Herbicide-related compounds were also the most frequently detected type of pesticide in the 2016-2021 sampling (Figure 2).



**Figure 2.** Frequency of pesticide detections by type in 2016-2021.

A pesticide drinking water reference value was exceeded in 62 of the 1,842 (3.4%) wells tested in the PWPS program in 2019-2021. This rate was higher than was observed previously during 2016-2018, where only three of the 3,858 (0.08%) samples exceeded a reference value. Sixty-one of the 62 exceedances that occurred in 2019-2021 were related to the presence of cyanazine degradates, while one was related to metribuzin and its degradates.

## Watonwan County Background

Riverdale Township in Watonwan County is predominantly agricultural, with 78% of its landcover dedicated to row crop agriculture. Surface geology in the tested townships often consists of sandy floodplain alluvium and glacial outwash, both of which provide little protection to aquifers. The sandy surficial geology and the high amount of agricultural land use makes wells in Riverdale Township, especially shallow wells, potentially vulnerable to contamination from agricultural chemicals, including pesticides.

## Watonwan County PWPS Results

In 2020, four private wells in Riverdale Township in Watonwan County were tested for 131 pesticides and pesticide degradates (parts per trillion reporting level). Two different pesticide chemicals were detected: 2,4-D (which is a herbicide) and metololachlor ESA (a herbicide degradate). 2,4-D was detected in two of the four tested wells and metolachlor ESA was detected in all four wells that were tested. No cyanazine degradates were detected in Watonwan County and no reference values of any pesticides were exceeded.

**Table 1.** 2016-2021 Private Well Pesticide Sampling Project pesticide detection frequency.

Counties	# of wells sampled	# of wells sampled with at least one pesticide detection <sup>^</sup>	pesticide sample detection frequency (%)	# of pesticides analyzed	# of detected pesticides	# of wells w/reference value exceedances
All 50 counties sampled 2016-2021	5,700	4,314	76	125-133*	75	62
Watonwan	4	4	100	131	2	0

<sup>^</sup>The highest historical method reporting limits for each pesticide chemical between 2016-2021 were utilized in the determination of detection.

\*The number of pesticides analyzed varied slightly from year to year. From 2016-2018, it was about 125, then was raised to 133 in 2019.

**Table 2.** Private Well Pesticide Sampling project concentration statistics and reference values for pesticide chemicals detected in Watonwan County during the 2020 sampling. All concentrations are reported in ng/L, which is equivalent to parts per trillion (ppt).

Pesticide	Detection Frequency (%)	Median (ng/L)	90 <sup>th</sup> percentile (ng/L)	Maximum (ng/L)	Drinking Water Reference Value (ng/L)	Reference Value Type
Metolachlor ESA	100	161	441	510	800,000	HRL*
2,4-D	50	39	170	210	30,000	HRL

HRL\* – Health Risk Limit, a promulgated drinking water standard established by the MN Department of Health.

### Relationship between Pesticide and Nitrate Results in Watonwan County

Based upon the data collected from other counties in 2020, it was generally found that as the concentration of nitrate increased, the likelihood of detecting at least one pesticide also increased. The relationship between pesticide detections and nitrate concentration in Watonwan County, however, was not assessed due to the limited number of samples collected in 2020.