

2024 Field-Edge Groundwater Monitoring Program

ANNUAL REPORT



Wisconsin Department of Agriculture, Trade and Consumer Protection
Agricultural Resource Management Division
Environmental Quality Unit
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Introduction

In 2024, the Wisconsin Department of Agriculture, Trade and Consumer Protection's (DATCP) Agrichemical Management (ACM) Bureau continued the Field-Edge Groundwater Monitoring Program to document the effect continual pesticide use is having on groundwater quality. Groundwater monitoring was performed by DATCP staff across a network of 57 monitoring wells and piezometers at 22 established locations. At each location, depth to groundwater is measured and groundwater samples are collected in the spring and fall to identify pesticide concentrations and evaluate seasonal variations. Collected samples are submitted to DATCP's Bureau of Laboratory Services (BLS) for chemical analysis. This report has been prepared to document 2024 program activities and includes a summary of groundwater level measurements and analytical data results. Recommendations for the 2025 Field-Edge Groundwater Monitoring Program plan based on historic trend results are also presented in this report.

A compilation of acronyms and definitions used throughout this document is provided in [Appendix A - Acronyms and Definitions](#).

Purpose of Field-Edge Groundwater Monitoring

It is estimated that agriculture contributes \$116.3 billion annually to Wisconsin's economy (Wisconsin Department of Agriculture, Trade and Consumer Protection, 2024). Growers in Wisconsin use several million pounds of pesticides and tons of fertilizers annually to grow a wide variety of crops. DATCP's Field-Edge Groundwater Monitoring Program is one form of monitoring the agency performs to meet its statutory obligation to protect groundwater quality. Wisconsin's groundwater law, Wis. Stats., ch. §160, requires agencies to sample and monitor groundwater for substances related to facilities, activities, and practices under their jurisdiction that have a reasonable probability of entering the groundwater resources of the state; and to determine whether preventive action limits (PAL) or enforcement standards (ES) have been exceeded at points of standard application. The statute further specifies that agencies should develop monitoring plans that include provisions for conducting four types of monitoring (Wis. Stats., ch. §160.05 and §160.27):

1. Problem assessment monitoring, to detect substances in the groundwater and to assess the significance of the concentrations of the detected substances;
2. Regulatory monitoring, to determine if preventive action limits or enforcement standards are attained or exceeded and to obtain information necessary for the implementation of responses with respect to specific sites;
3. At-risk monitoring, to define and sample at-risk potable wells in areas where substances are detected in the groundwater or where preventive action limits or enforcement standards are attained or exceeded; and
4. Management practice monitoring, to assure practices are within compliance regulations.

The purpose of the Field-Edge Groundwater Monitoring Program (Program) is to evaluate agricultural practices and agrichemical uses on groundwater quality (problem assessment and regulatory monitoring). Depth to groundwater measurements and groundwater sample results are used to measure effects from agrichemical practices and use within and adjacent to agricultural fields. Effects to groundwater quality from agrichemical use are dependent on conditions at each location. Results are used to measure both localized and regional effects to aquifers over time at each field-edge sampling site. Historic and current goals of the Program include the following:

- Provide an early warning system to detect new agrichemical compounds in groundwater before widespread contamination can occur in underlying aquifers.
- Identify and measure pesticide concentrations that may have the potential to migrate to groundwater and exceed groundwater quality standards.
- Identify which environmental conditions (i.e. depth to groundwater, soil type, and geologic setting) are most vulnerable to conditions from routine agrichemical use.
- Gather and compile data regarding the occurrence and persistence of pesticide and metabolites in groundwater that may affect drinking water wells so that health-based groundwater quality standards can be established.

- Study the dissipation of restricted use pesticides (i.e. atrazine) in groundwater after prohibition areas are established or use is restricted, and the dissipation of pesticides no longer in use (i.e. aldicarb).
- Gather and compile long-term data on nitrate contamination in groundwater and its relationship to application practices.
- Evaluate effects to groundwater quality from various land uses and related pesticide use (i.e. tree nurseries, infiltration basins, golf courses).

Program Approach

DATCP and property owners typically have access agreements allowing DATCP to install and access wells for sample collection. Typically, a monitoring well nest consists of a shallow well intersecting the water table and adjacent deeper wells (piezometers) installed with well screens placed at deeper depths within the underlying aquifer. These well nests are installed at the edge of an agricultural field to measure potential effects from routine agrichemical use. Well locations were carefully selected to avoid interference from other potential sources (i.e. septic systems or spills).

Over time, monitoring well nests have been installed within a variety of geologic settings, often in areas prone to groundwater contamination, such as areas with sandy soil, shallow depths to bedrock, or shallow groundwater. Nested well locations have two to five monitoring wells/piezometers. The shallowest well intersects the water table with piezometers installed at deeper intervals. [Table B 1](#) in [Appendix B](#) provides construction specifications for each well in the Program's groundwater monitoring well network. [Figure 1](#) (Page 6) depicts the Program's monitoring locations relative to State of Wisconsin and county boundaries.

Program data collection and documentation are completed in accordance with established protocols and guidance (Wisconsin Department of Agriculture, Trade and Consumer Protection, 2024; Wisconsin Department of Natural Resources, 1996). Depth to water measurements and sample collection procedures are designed to collect reliable data consistently and in an unbiased fashion to ensure that localized conditions and regional impacts to aquifers over time can be evaluated. Field sampling observations and water level measurements are recorded in field notebooks. The compiled field information, along with laboratory results, are retained in databases maintained by DATCP.

Standard operating procedures for groundwater sampling include the following:

- After unlocking the protective casing, remove the well cap to allow the water level to equilibrate with atmospheric pressure before measuring and recording the water level at each well.
- Each well is then properly purged to remove a minimum of four well casing volumes. Purging is performed either by using dedicated bailers and rope, peristaltic pumps (low flow) with dedicated tubing, or submersible electric pumps (i.e. whale or tornado pumps) with dedicated tubing. The volume of water removed is measured and recorded in the field logbook.
- Samples are then collected and placed in laboratory-provided containers using either sampling equipment dedicated to the well, or with equipment that is decontaminated prior to use.
- Samples are placed into coolers and held on ice while in transport to the laboratory.
- Water purged from the wells and any rinse water used for cleaning is discarded on the ground surface.
- Field information is recorded in logbooks and maintained by ACM staff.

Groundwater samples are collected using the same equipment used for purging. Samples are collected in 1-liter amber glass bottles provided by BLS. Bottles and containers are then placed in a cooler and held on ice, along with a properly completed sample collection record and hand-delivered to BLS within 48 hours. During the 2024 Program, there were no issues with shipping or bottle breakage.

BLS performed all groundwater analytical testing using gas chromatography/mass spectroscopy (GC/MS/MS) and liquid chromatography/mass spectroscopy (LC/MS/MS) methods in accordance with ISO 17025 accreditation standards. All samples were tested for 115 pesticide analytes as well as nitrogen as nitrate plus nitrite. Pesticide analytes are listed in [Table B 2](#) of [Appendix B](#) along with corresponding reporting limits. A summary of the 2024 program analytical data results is listed in [Table B 3](#) of [Appendix B](#). Individual monitoring well or piezometer analytical reports are available upon request.

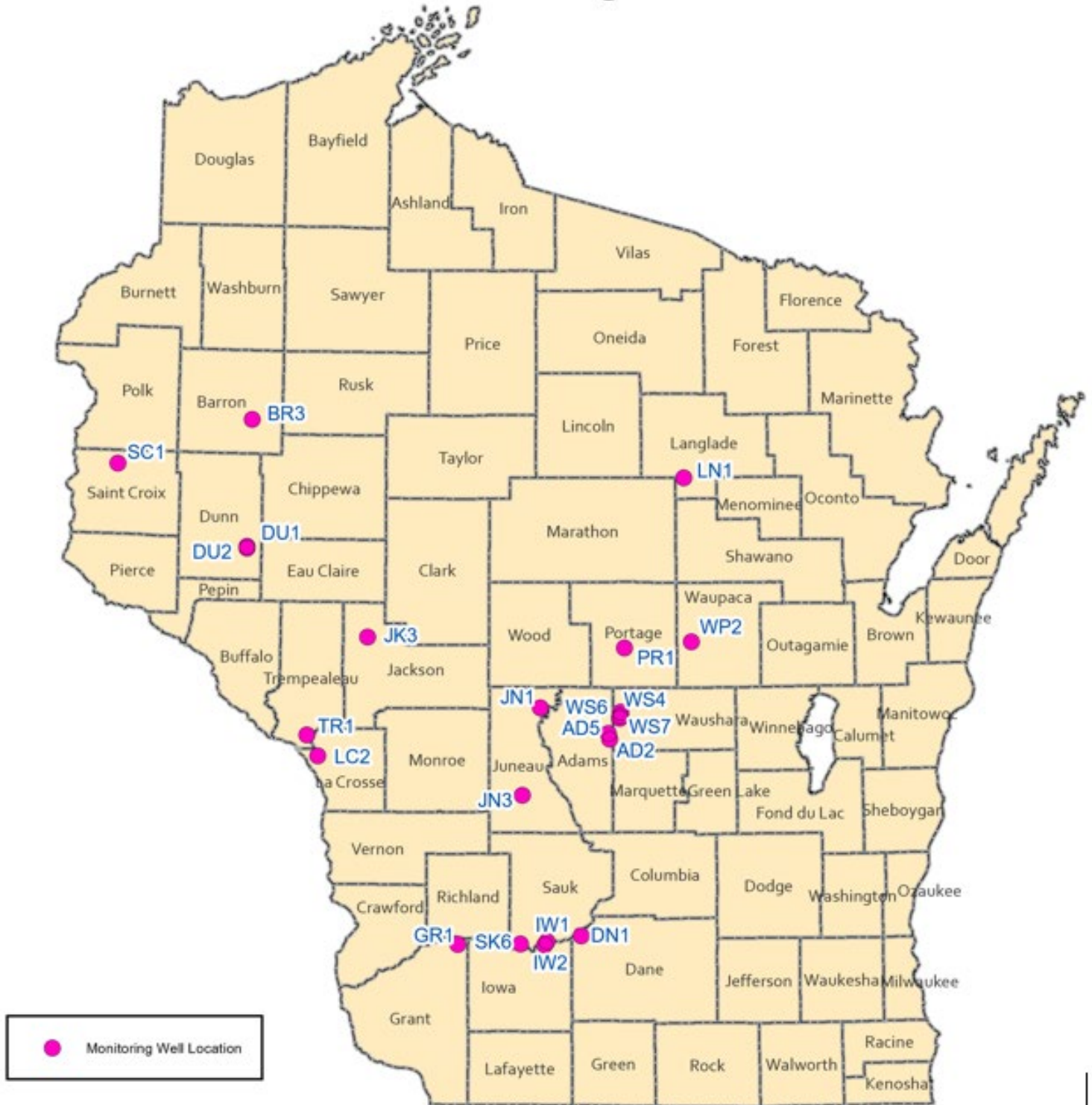
DATCP provides annual program findings documentation for each site to the respective property owner or grower. The summary letters provide the year's water level data and analytical results, and include a brief discussion of data trends over time. As part of the letter, growers are asked to reply with information regarding crops grown, pesticide use, and the amount of nitrogen applied to the fields near monitoring wells.

Program Assets and Infrastructure

The groundwater-monitoring network for the 2024 Field Edge Monitoring Program included 73 groundwater monitoring wells (31 water table observation wells and 42 piezometers) at 22 locations/stations around the state. [Table B 1](#) in [Appendix B](#) lists well construction specifications associated with these Program assets. [Figure 1](#) (Page 6) depicts the Program's monitoring sites relative to State of Wisconsin and county boundaries. Construction logs and well development forms (and abandonment forms) associated with the groundwater monitoring wells and piezometers are available upon request. The following is a summary of the Program's well installation history.

Figure 1: 2024 Monitoring Well Sites

2024 Monitoring Well Sites



1985-1989 ORIGINAL MONITORING WELLS AND PIEZOMETERS

The DATCP Field-Edge Groundwater Monitoring Program began in 1985. Initially, arrangements with growers and landowners at 50 sites were established in areas highly susceptible to groundwater contamination (i.e. coarse soil over sand, shallow depth to groundwater, and/or irrigated agricultural areas). Groundwater monitoring nests with three to four wells were installed at each site. Nested wells were constructed with well screens placed at various depths in the underlying aquifer. These wells were constructed adjacent to agricultural fields in the Central Sands region, Lower Wisconsin River Valley, and at other sandy soil areas throughout the state. The original Field-Edge Study was designed to collect groundwater samples from the uppermost shallow aquifer. Samples were tested for a limited number of agrichemicals and fertilizer to evaluate potential impacts to shallow groundwater from routine agricultural practices performed at nearby fields.

Data from the Program's initial years led to the establishment of statewide pesticide management plans for both atrazine and aldicarb. Over the years, many of the wells installed for the initial study have been abandoned due to changes in land ownership, urban encroachment, or damage. Of the original 50 sites, monitoring wells remain at 16 sites and were included in the 2024 monitoring program.

2005 MONITORING PROGRAM EXPANSION

In the fall of 2005, DATCP expanded its groundwater monitoring network with funding from a United States Environmental Protection Agency (US EPA) grant. New monitoring wells and piezometers were constructed at six sites based on local agricultural practices and susceptible to groundwater contamination (i.e. shallow groundwater with permeable subsurface soil units). Each of the six sites selected for program expansion were used for a prior DATCP groundwater monitoring study (Evaluation of Renewed Use of Atrazine in Atrazine Prohibition Areas), completed by DATCP in 2005. That study (also known as the Atrazine Reuse Study) was performed to gather information to evaluate the potential to repeal atrazine prohibition areas.

The groundwater flow direction was determined as part of the Atrazine Reuse Study. Using that information, two monitoring wells were installed hydraulically downgradient and adjacent to agricultural fields at the six new sites. All six of these sites still were included in the 2024 monitoring program.

2010 UNIVERSITY WISCONSIN-OSHKOSH WELLS

In the spring of 2010, DATCP became aware of a forthcoming study by a University of Wisconsin-Oshkosh graduate student and the Wisconsin Geological and Natural History Survey (WGNHS). The study included installation of shallow bedrock monitoring wells at the edge of agricultural fields in a karst geological setting. It used monitoring wells at sites in Brown, Calumet, Kewaunee, and Manitowoc counties. Bedrock fractures at each well were identified by the study team. Groundwater samples were collected by the study team and DATCP, and tested annually as part of this Program between 2010 and 2014. The study was completed and all monitoring wells were subsequently abandoned in 2014.

2011 MONITORING PROGRAM EXPANSION

In the summer and fall of 2011, DATCP expanded its groundwater monitoring network again with additional funding from a US EPA grant. Monitoring wells were constructed at two new stations in La Crosse and Trempealeau counties. These wells were installed along an elevated terrace adjacent to the Mississippi River. Since the groundwater flow direction was known at each site (both locations were part of the Atrazine Reuse Study), DATCP installed two groundwater monitoring wells at each site at the hydraulically down gradient edge of each agricultural field. Wells at both sites remain and were included in the 2024 monitoring program.

2017 MONITORING PROGRAM EXPANSION

In the summer and fall of 2017, DATCP further expanded the groundwater monitoring network with additional funding from a US EPA grant. Piezometers were constructed at three existing sites (two sites in Adams County [AD2 and AD5] and one in Portage County [PR1]) and at one new site, the Hancock Agricultural Research Station (HARS). At each of these sites, two piezometers were installed near the existing groundwater monitoring nest with 5-foot screens located at depths greater than 50 feet and 80 feet. The purpose was to evaluate groundwater quality relative to agrichemical uses at deeper aquifer intervals and

compare data to shallower aquifer depths. A water table observations well (well screen placed to intersect the water table) was also constructed at HARS. The HARS site and nested wells at the Adams and Portage County sites remain and were included in the 2024 Program.

2021 MONITORING PROGRAM EXPANSION/ABANDONMENT

In the summer and fall of 2021, DATCP obtained additional funding from a US EPA grant again to expand the groundwater monitoring network. Eleven monitoring wells/piezometers were installed at six existing nested monitoring well sites. New wells were installed at sites in Adams County (AD2 and AD5), Dane County (DN1), Sauk County (SK6), Waushara County (WS7), and at two sites in Iowa County (IW1 and IW2). The monitoring well installed at the Dane County site was to replace a well that was damaged beyond repair and subsequently abandoned in 2018. This shallow well was installed with a well screen intersecting the water table. Wells installed at the other five sites were constructed as piezometers with well screens placed 30 to 40 feet further in depth below the deepest existing piezometer screen already on-site in the well nest. These new piezometers were constructed with 5-foot long well screens. The purpose was to evaluate groundwater quality relative to agrichemical uses at deeper aquifer intervals and compare data across vertical aquifer horizons. All these wells were included in the 2024 fall sampling event.

Additionally, five wells at two monitoring locations were removed from the Program in 2021 in response to a change in property ownership. New owners for two Adams County sites (AD3 and AD4) did not want to continue to participate in the Program and requested removal of the wells. Two shallow water table observation monitoring wells and three piezometers at these sites were abandoned in December 2021.

2023 MONITORING PROGRAM ABANDONMENT

In fall of 2023, it was observed during the fall groundwater sampling event that three groundwater monitoring wells associated with Program had been damaged. The wells were located in St. Croix (one constructed in 2005 and the second constructed in 2011 at a common property) and Langlade counties (one constructed in 1986). It was likely that the wells were inadvertently damaged by agricultural operations conducted on the adjacent fields. In accordance with Wisconsin Administrative Code (Wisc. Admin. Code) NR141.25, the monitoring wells needed to be abandoned since they could be a conduit for groundwater contamination. In November of 2023, all three wells were properly abandoned.

2024 Results

A total of 86 groundwater samples were collected as a part of DATCP's 2024 Field-Edge Groundwater Monitoring Program. All groundwater samples were submitted to BLS for chemical analysis. [Table B 3 in Appendix B](#) summarizes 2024 Program analytical results and provides comparative risk values. The analytical data is compared to groundwater/drinking water standards to assess potential risk to human health and the environment. The risk values are sourced from the Wisc. Admin. Code ch. NR 140 for groundwater qualitative health standard limits and Wisconsin Department of Health Services (DHS) drinking water health advisories.

Key findings for 2024 include the following.

- Information regarding field use of pesticides and fertilizer was requested from growers for 22 sites, but only five growers responded. This is fewer than prior years.
- Water level measurements show an overall increase in water table elevations in 2024. This increase is likely due to more than average precipitation. In 2024, according to National Oceanic and Atmospheric Administration (NOAA), the state received on average 39.68 inches of precipitation compared to a historical average of 32.16 inches.
- Laboratory analysis includes 115 pesticide analytes for the laboratory testing methods. During 2024, 39 pesticide analytes were detected in excess of laboratory reporting limits in numerous groundwater samples, which is a slight increase compared to previous years.
- Pesticides detected in 2024 samples in excess of laboratory reporting limits include 17 herbicides, 15 herbicide metabolites, five insecticides, and two fungicides.
- Overall, analytical data collected at nested monitoring wells indicates that pesticide and nitrogen concentrations increase with depth. Greater concentrations at depth indicate that pesticides migrate vertically and laterally within the underlying aquifers. This trend is consistent with prior years' findings.

- Metolachlor ethanesulfonic acid (ESA) was detected in excess of laboratory reporting limits in 99% of all samples collected and was the most frequently detected pesticide in 2024. Additionally, metolachlor ESA was detected at each groundwater monitoring site, which is the only compound detected at each monitoring well nest location. This is consistent with prior years’ findings.
- Clothianidin was the second most frequently detected compound. It was detected in excess of laboratory reporting limits in 80% of the samples collected, and at 18 of the 22 groundwater monitoring sites. These observations are consistent with findings from prior years.
- Alachlor ESA was the third most frequently detected compound. It was detected in excess of laboratory reporting limits in 65% of the samples collected. However, the number of sites where it was detected (15 sites) has been decreasing when compared to previous years.
- Atrazine or one of its breakdown products (de-ethyl atrazine, de-isopropyl atrazine, and diamino atrazine) was detected in excess of laboratory reporting limits in 42% of the samples collected. At each site with nested wells, results were evaluated by well depth. The greatest concentrations were detected in groundwater samples collected from the deepest piezometers.
- Neonicotinoid compounds clothianidin, imidacloprid, and thiamethoxam were detected in excess of laboratory reporting limits in 80% for clothianidin and 45% for both imidacloprid and thiamethoxam. The frequency of detection is similar to observations from previous years.
- All sample results were compared to Wisc. Admin. Code, ch. NR 140 ES groundwater quality health standards¹. Two compounds exceeded an ES: atrazine total chlorinated residuals (TCR) exceeded the respective ES in one groundwater sample collected in September from a Sauk County location; and metolachlor exceeded the ES in two groundwater samples collected in May and August from one well located in Waushara County. Additionally, the Wisc. Admin. Code, ch. NR 140 PAL was exceeded for alachlor ESA, atrazine, de-ethyl atrazine, di-amino atrazine, and picloram at multiple locations and monitoring wells.
- DHS has also established drinking water quality advisories for 15 pesticides (and two additional advisories for combination of parent material and metabolites). Imidacloprid was detected at 11 out of 22 sites, with four of the 394 detections exceeding the DHS drinking water health advisory level of 0.2 micrograms per liter (µg/L) or parts per billion (ppb).

GROWER RESPONSES

DATCP obtained limited information for 2024 regarding crops grown, pesticide use, and the amount of nitrogen applied to the fields adjacent to monitoring wells. A request for this information was included with each 2024 summary letter sent to nearby property owners and growers. Responses to the information request were voluntary. DATCP received replies from only five of the 21 sites. No information was requested from HARS for site WS7. [Table B 4](#) in [Appendix B](#) summarizes information provided by the growers along with available information from the previous seven years. [Table 1](#) is a summary of crops grown adjacent to the monitoring well nests and nitrogen use data for 2024 based on property owners and growers’ responses.

Table 1: Crops Grown and Nitrogen Applied on Fields Adjacent to 2024 Field Edge Stations

Crop	Number of Sites with Crops	Percent of Sites (reported)	Range of Nitrogen Applied (lbs./acre)
Corn	2	40%	64 - 290
Potatoes	1	20%	628
Soybeans	1	20%	225
Peas	1	20%	20

¹ Only 29 of the 115 pesticides tested for have established NR 140 groundwater quality health standards.

Irrigation systems are present at 19 of the 24 monitoring sites. Of the 19 sites with irrigation systems, five sites provided water usage data for 2024. Growers reported that the range of irrigation water applied to the fields in 2024 ranged from 4 to 12 inches per acre.

Growers were also asked if they have state-approved Nutrient Management Plans for the adjacent fields. Of the five respondents, three indicated they have an approved plan.

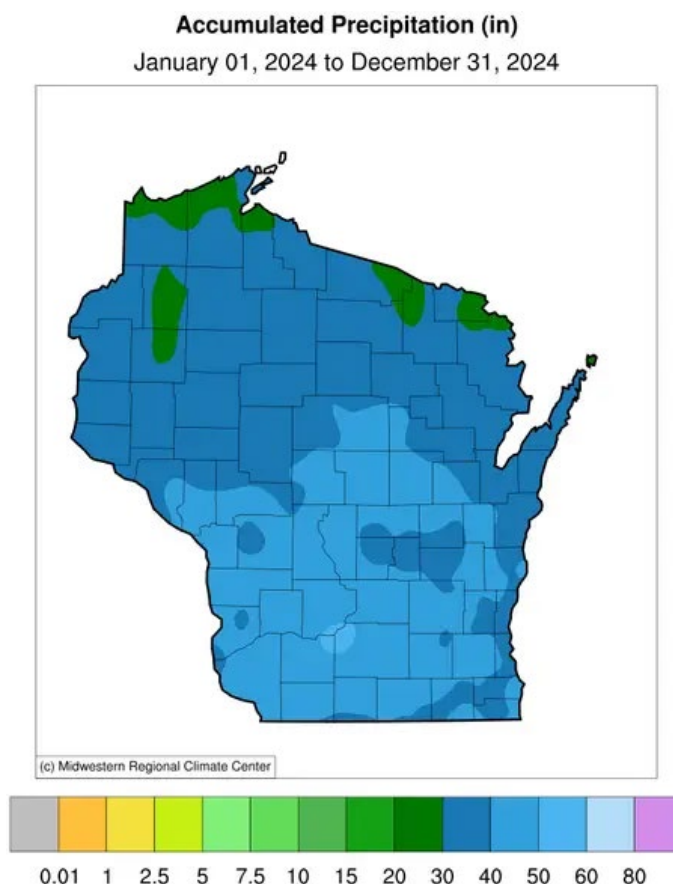
A wide variety of pesticides used on fields adjacent to field edge monitoring wells was reported by the growers. Metolachlor was the most widely used active ingredient pesticide followed by glyphosate. A total of 19 different active ingredients (pesticide compounds) were reported to be applied in 2024 to the five fields. [Table B 4 in Appendix B](#) identifies the complete list of pesticides used in 2024 as reported by the growers.

WATER LEVEL MEASUREMENTS

Depth to water level is measured at each well prior to collection of groundwater samples for laboratory testing, and measurements are compared with past DATCP records to determine any historic trends. Water level measurements are typically taken in late spring and again in late fall. In 2024, this included April, May, early June, October, and November.

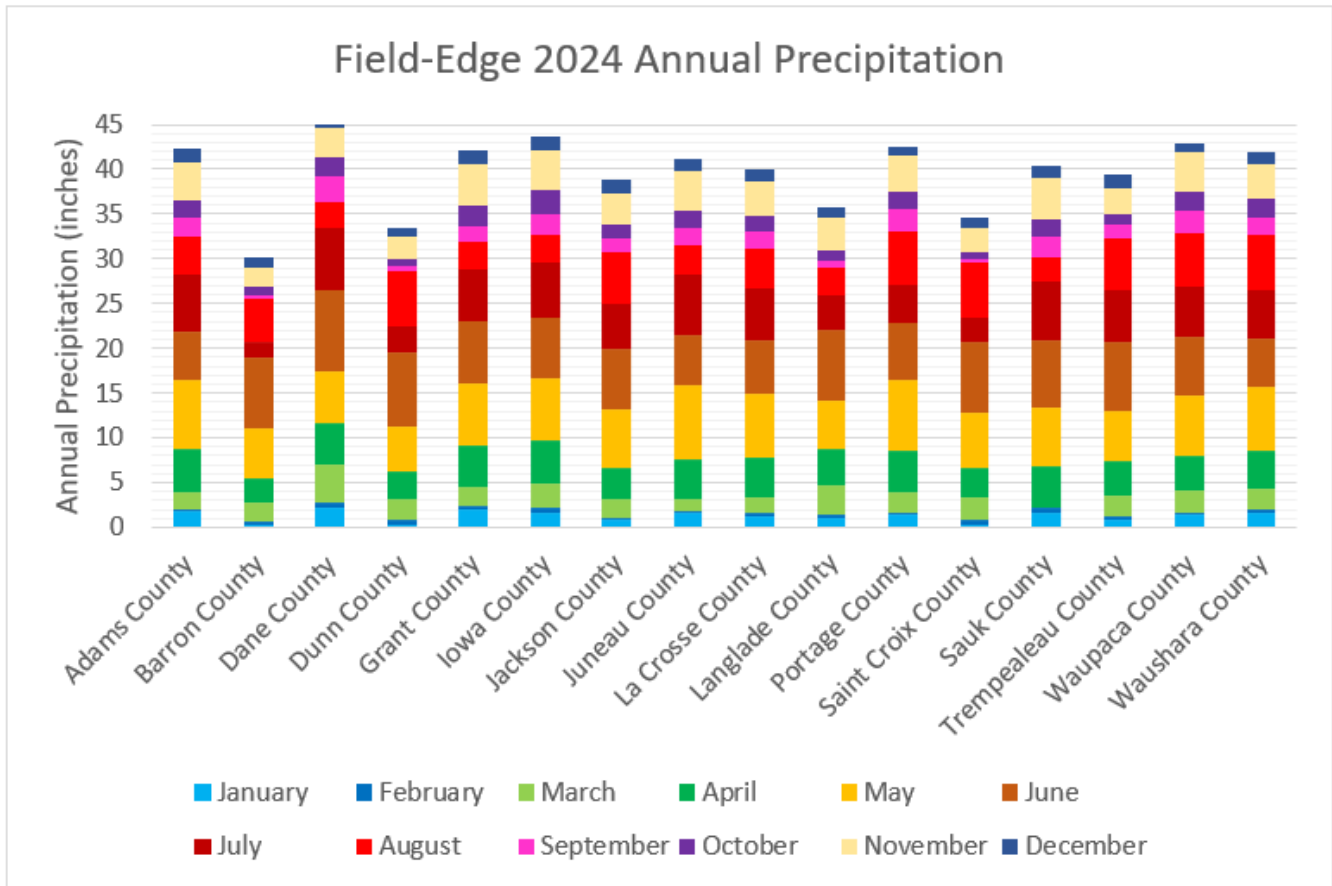
Wisconsin averages 34.06 inches of precipitation annually according to the 1991-2020 historic climate normal (Midwestern Regional Climate Center, 2024). In 2024, the state was wetter than usual, receiving 39.68 inches of total precipitation (Midwestern Regional Climate Center, 2024). [Figure 2](#) shows the total accumulated precipitation in Wisconsin over the course of 2024 (Wisconsin State Climatology Office, 2024). The map shows a relatively even distribution of total accumulated precipitation, with most of the state receiving between 30 and 40 inches. Several isolated spots received relatively less rain (20 inches), particularly in the northern region of the state; and another isolated region in the northwestern part of Dane County received around 50 inches.

Figure 2: Accumulated Precipitation from the Wisconsin Monthly Climate Watch Archive



The monthly total precipitation for each county with a Field-Edge Program monitoring well nest is shown in Figure 3 below. The figure was produced using data from the NOAA National Centers for Environmental Information (2024). Each color within a bar represents the amount of precipitation received during its corresponding month.

Figure 3: 2024 Monthly Precipitation Totals for Sampling-Site Counties from the NOAA Monthly Climate Watch Archive



Records of storm events provide specifics relating to precipitation patterns seen in sampled counties during 2024 (NOAA National Centers for Environmental Information, 2024). In January, southern Wisconsin had two major winter storms with an upwards of 18 inches that fell. In March, excessive wetness in the southeastern part of the state was experienced, and upwards of 10 to 20 inches fell in the northern part of the state. In April, a rain to snow event hit the east-central and southeast regions. The Central Sands region received more than double the normal amount of precipitation from average in May. The entire state received more rain on average than normal in the month of June. From July to August, Wisconsin had relatively normal precipitation amounts throughout the state, and then the winter months stayed relatively dry.

Figure 4 depicts the monthly statewide precipitation departures from the historic 1991-2020 average (Wisconsin State Climatology Office, 2024). Positive precipitation departure values indicate more precipitation was received than average for that month, and negative means relatively less was received. In 2024, the months of January, February, July, September, October, and December had negative departures from the historic average. September and October had the biggest negative departures and were in excess of -1 inch. The values of negative precipitation departure ranged from nearly 0 to approximately -2.18 inches. March, April, May, June, August, and November all had positive precipitation departures, with May and June having departure values in excess of 1 inch. Positive precipitation departure values ranged from about 0.19 to 2.52 inches.

Figure 4: Wisconsin Monthly Precipitation Departures (from 1991-2020 Average) for 2024

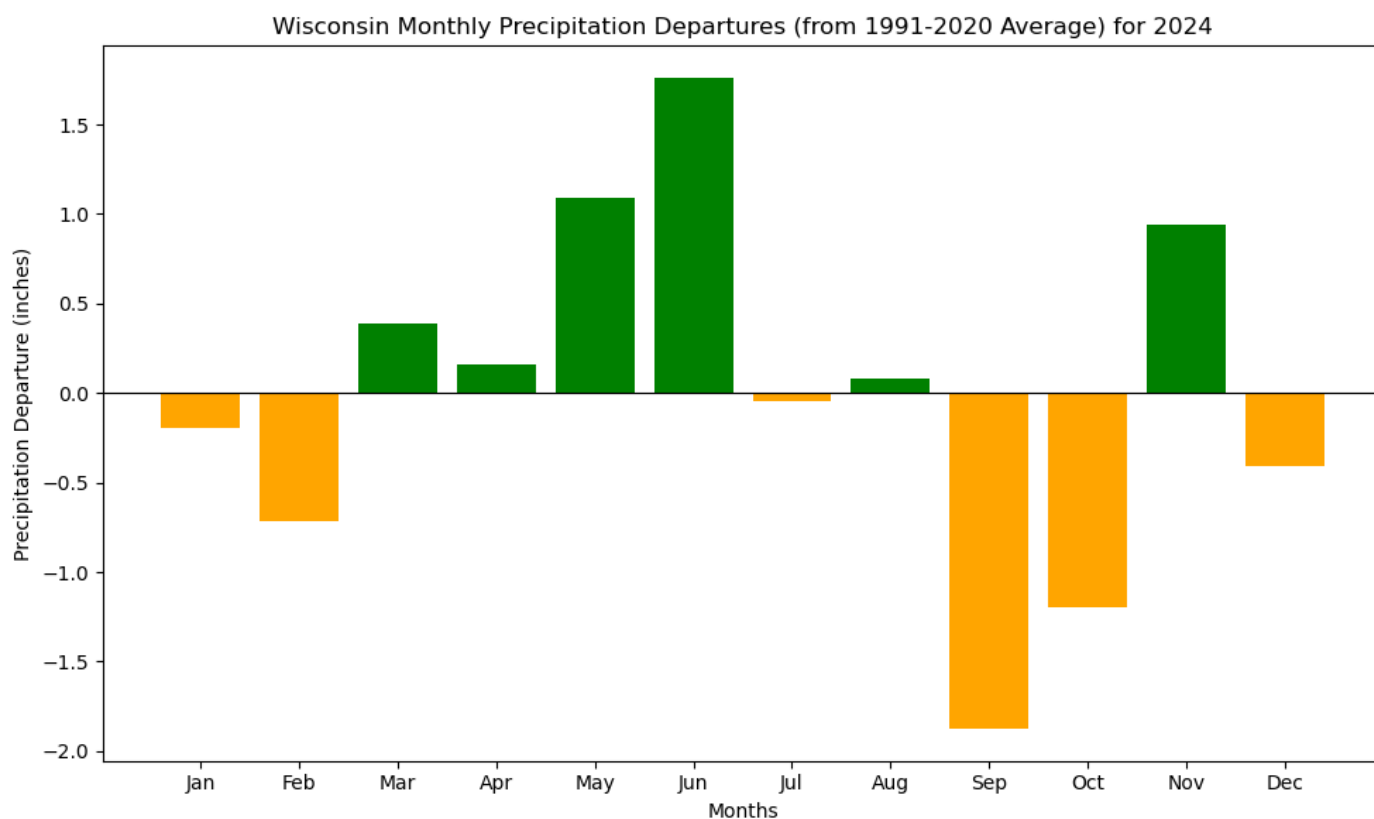
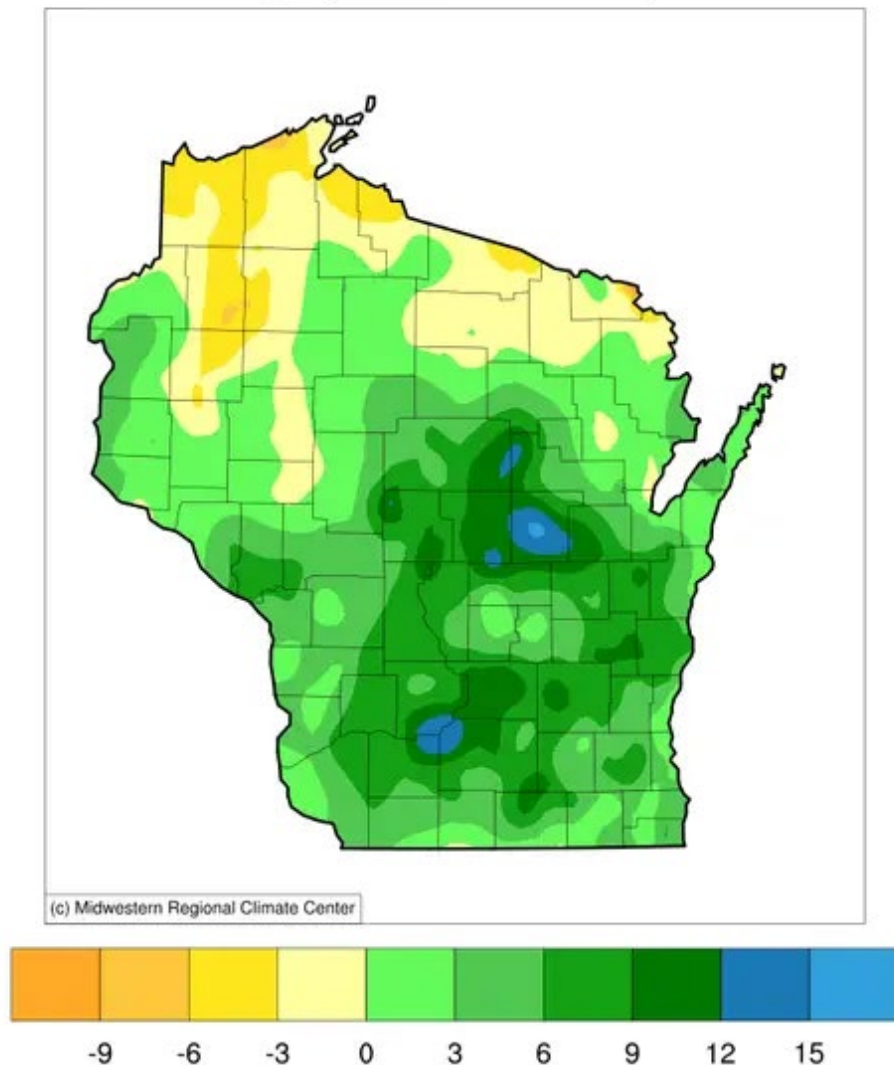


Figure 5 shows the accumulated precipitation departure in 2024 across Wisconsin as provided by the Wisconsin State Climatology Office (2024). The colors on the map show the difference between the amounts of precipitation received in 2024 compared to the 1991-2020 historic average. Green and blue indicate more precipitation accumulated than average while yellow, orange, and red indicate less. Most of Wisconsin generally received slightly more total precipitation than usual, particularly in the central region of the state where some regions received 12 to 15 inches more than normal. Several areas in the northern region received less than average precipitation, from zero to -3 inches. Overall, the total precipitation accumulated during 2024 was classified as “above average” relative to historic records (NOAA National Centers for Environmental Information, 2024).

Figure 5: Wisconsin Accumulated Precipitation (in): Departure from 1991-2020 Average

Accumulated Precipitation (in): Departure from 1991-2020 Normals

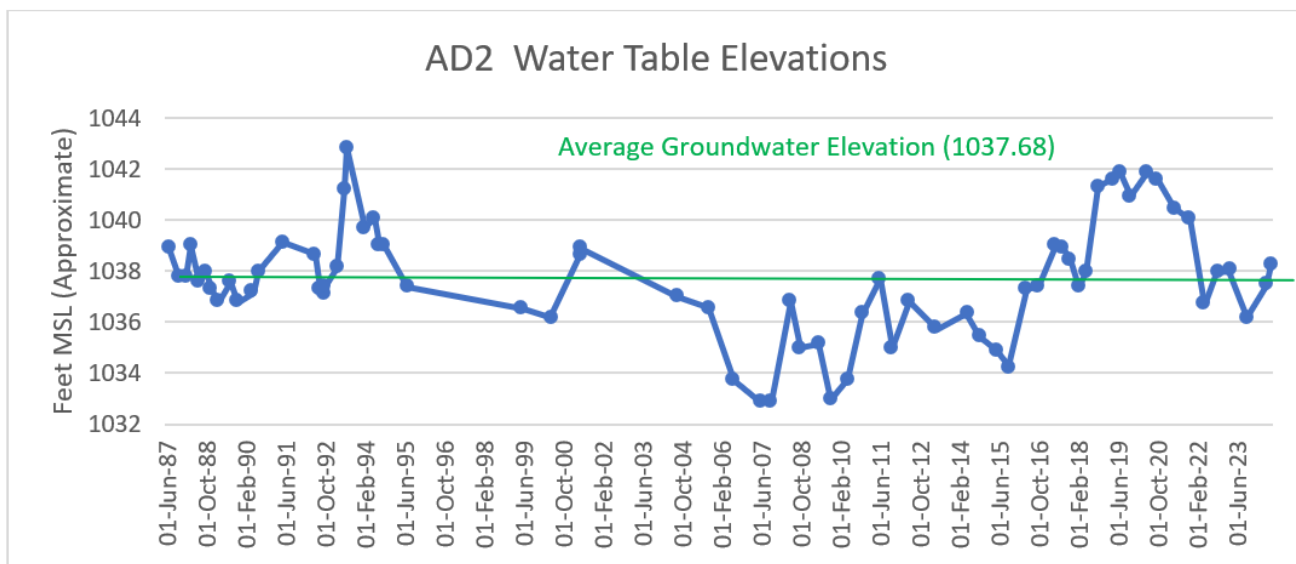
January 01, 2024 to December 31, 2024



The following figures (6 to 8) provide examples of measured water level fluctuations over time for three wells in the groundwater monitoring network. These three wells are at sites with infrastructure for irrigation. Graphs showing water level measurement trends for all other wells in the groundwater monitoring network are available upon request.

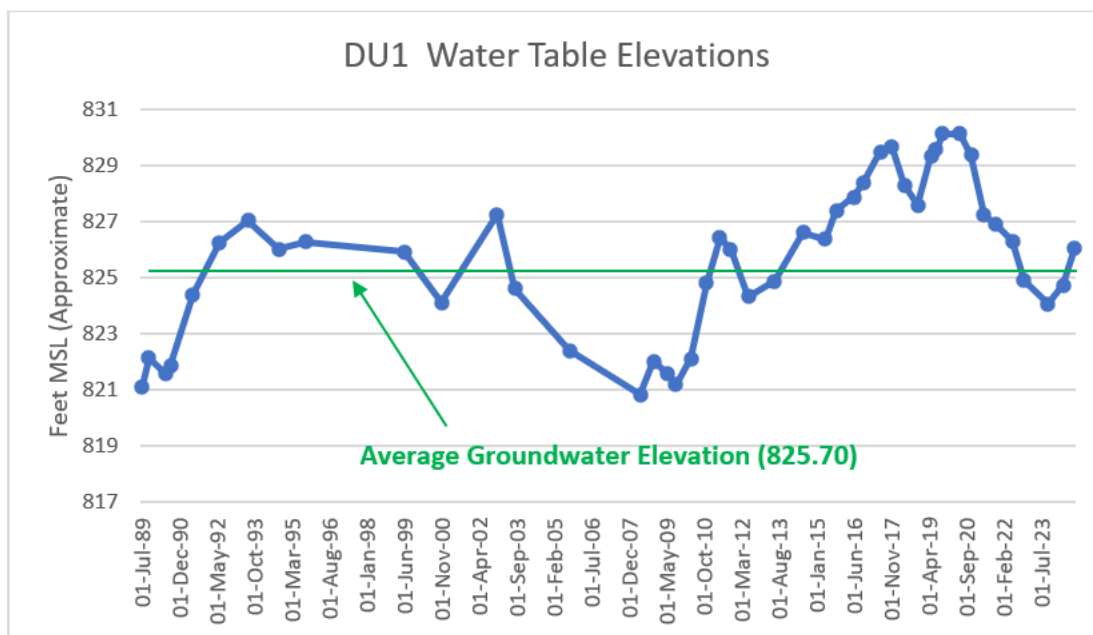
2024 water level data for Field-Edge Monitoring Program station AD2 indicate an increase in water level relative to the past several years (Figure 6). In 2024, water levels were statistically at the average for the duration of the monitoring program. According to NOAA, Adams County received 42.21 inches of precipitation in 2024, which was notably more than the past 10 years, compared to an average yearly precipitation of 34.24 inches. This precipitation increase is due to an unusually wet year compared to the previous years.

Figure 6: Historic Water Table Level Data for a Field-Edge Monitoring Station AD2 in Adams County



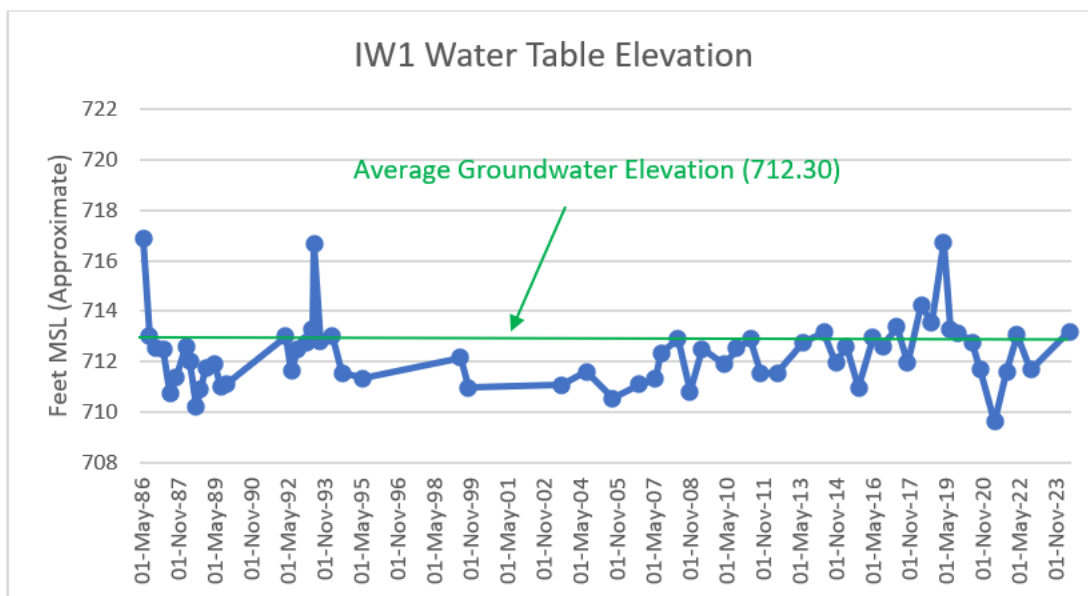
2024 water level data for Dunn County station DU1 indicated an increase compared to the previous years (Figure 7). In Dunn County, NOAA has reported that precipitation levels over the past couple of years have been around average. The water levels recorded in the DU1 location wells likely reflect that average precipitation.

Figure 7: Historic Water Table Level Data for a Field-Edge Monitoring Station DU1 in Dunn County



2024 water level data for Iowa County station IW1 indicates stable water table conditions (compared to the previous two reported locations), consistent with historical measurements (Figure 8). Because this site is near the Wisconsin River, it is likely influenced by river water levels and the dams that control water flow. High water table conditions in the spring have been observed several times at this location over the course of the monitoring program. The overall trend continues to indicate a stable trend over the past 20 years, which likely correlates to nearby river elevations. Precipitation amounts have less of an effect.

Figure 8: Historic Water Table Level Data for a Field-Edge Monitoring Station IW1 in Iowa County



PESTICIDE DETECTION FREQUENCY

Thirty-nine of the 115 analytes tested in DATCP's 2024 Field-Edge Groundwater Monitoring Program were detected in excess of laboratory reporting limits. They included 17 herbicides, 15 herbicide metabolites, five insecticides, and two fungicides. The number of compounds detected in 2024 were a slight increase compared to 2023, when 32 analytes were detected.

There were six new compounds detected in 2024, of which, five were new compounds tested this year:

- boscalid,
- hydroxyatrazine,
- pyroxasulfone,
- pyroxasulfone M-1
- sulfentrazone 3-carboxylic acid, and
- Aminopyralid.

Aminopyralid has been analyzed for several years. It is an herbicide used to kill broadleaf weeds (e.g., thistle and knapweeds) in pastures, rangelands, and rights-of-way. It was detected (0.543 ppb) once at a location in Adams County where the well nest is located adjacent to a road right-of-way.

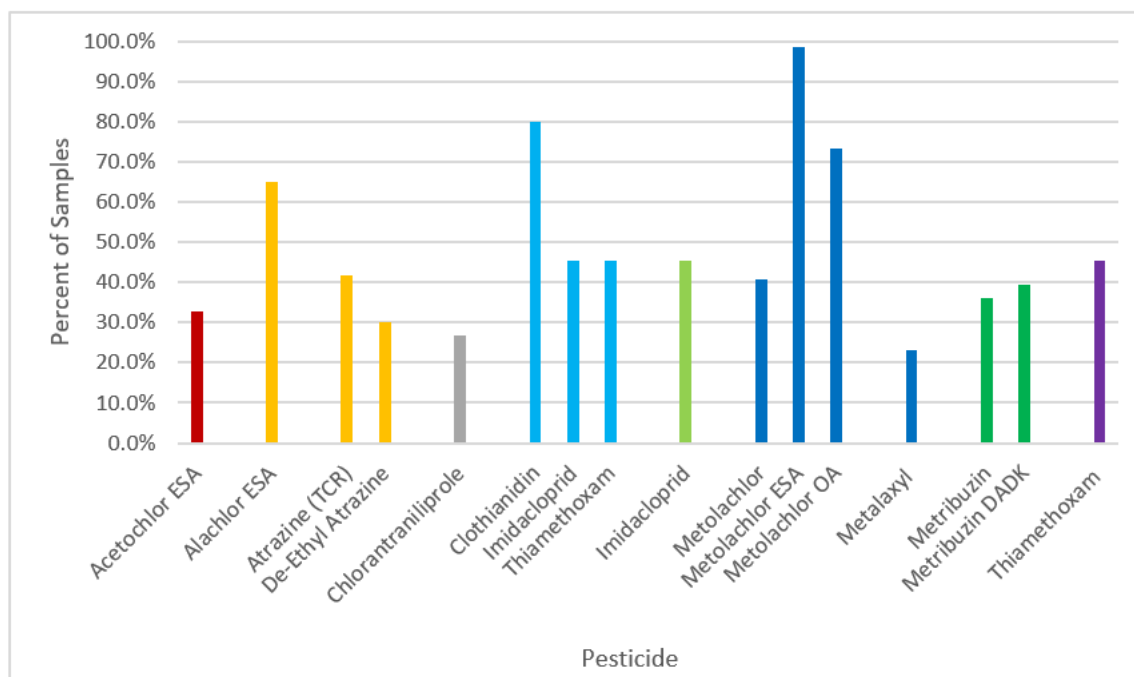
Imazethapyr was detected in 2024 in a groundwater sample collected from the well nest located in Grant County. Imazethapyr is an herbicide used to control broadleaf weeds and grasses in crops such as soybeans and alfalfa. This is the first time imazethapyr has been detected in several years in the field-edge monitoring program.

There were some reoccurring trends regarding analyte detections. There continues to be an absence of bromacil and dicamba in groundwater samples. These two compounds were consistently detected in the prior

years, but not in the last two years. Clopyralid and dimethenamid (and its metabolites) have continued to be detected in field-edge groundwater well samples, which is a recent trend.

At least two pesticide analytes were detected in every groundwater sample collected in the 2024 Field Edge Program. The most frequently detected pesticide compounds in 2024 are listed in Figure 9. This figure includes all pesticide analytes detected at a concentration greater than the laboratory reporting limit at a frequency greater than 20%.

Figure 9: Percentage of 2024 Samples with Detectable Pesticide Concentrations (Includes All Analytes Detected in 20% or More of All Samples Collected)



Notes: Atrazine TCR is total chlorinated residues of atrazine, which includes the sum of atrazine plus its metabolites de-ethyl atrazine, de-isopropyl atrazine, and di-amino atrazine.

Metolachlor ESA was once again the most frequently detected analyte in excess of laboratory reporting limits. It is a breakdown product of metolachlor, which is an active ingredient in corn herbicides. Metolachlor ESA was detected at every site and in 98.8% of all samples collected in 2024. Metolachlor ESA has been the most frequently detected analyte every year for the Field-Edge Monitoring Program.

Clothianidin was the second most frequently detected compound in 2024. Clothianidin is an insecticide that controls sucking and some chewing insects, such as aphids, thrips, and beetles. It is commonly used for seed treatment on corn. It was detected in excess of laboratory reporting limits at 19 of the 22 sites and in 80.2% of the samples collected. This rate of detection is 16.4%, greater than in 2023, continuing the trend of increasing clothianidin detections since testing for the analyte began 16 years ago. In the past, clothianidin detections were largely common at sites within the Central Sands Agricultural Region But is now detected throughout the monitoring network. Clothianidin is now commonly detected at most field-edge monitoring well sites within agricultural-intense areas.

The third most frequently detected analyte for the 2024 program was metolachlor OA, which is followed closely by alachlor ESA. Both analytes were detected in a similar percentage of samples collected in 2024, but with metolachlor OA having a slightly higher rate of detection than alachlor ESA. Metolachlor OA was detected in excess of laboratory reporting limits at 17 of 22 sites and in 74.4% of collected samples. Similarly, alachlor ESA was detected at 15 of 22 sites and in 65.1% of samples. The percentage of Metolachlor OA is slightly greater than in 2023 and decreased for alachlor ESA in 2024.

COMPARISON TO STANDARDS

The Wisconsin Department of Natural Resources (DNR) sets groundwater quality standards in Wisc. Admin. Code ch. NR 140, which includes substances of public health concern based on recommendations from DHS. These standards have two tiers: the ES and the PAL. The ES is a level that, if exceeded, requires intervention from the appropriate authority. In the case of pesticides in drinking water, DATCP is required to intervene if levels exceed the ES. The PAL is a percentage of the ES: 10% of the ES for carcinogenic, mutagenic, or teratogenic properties; and 20% of the ES for all other substances. The PAL is intended to act as a trigger for intervention by the appropriate authority before the pollutant becomes a risk to public health. Wisconsin Administrative Code (Wisc. Admin. Code) Chapter NR 140 standards have been established for 29 of the 115 analytes tested for in this program. There are three additional standards established for a combination of parent material and metabolites concentrations or just the combined metabolite concentrations. Additionally, DHS has recently established drinking water health advisories for 15 individual pesticides parent materials and metabolites, and two advisories for a combination of parent material and metabolites.

Pesticide concentrations identified during DATCP's 2024 Program were compared to these Wisc. Admin. Code ch. NR 140 Groundwater Quality Standards and DHS drinking water health advisories. [Table B 3](#) in [Appendix B](#) lists the existing standards alongside the range of concentrations for the pesticide compounds detected in 2024 groundwater samples.

In 2024, several groundwater samples contained analytes that exceeded their established ES or drinking water health advisory as follows.

- An elevated concentration of atrazine TCR (total chlorinated residues, which is the sum of atrazine and its three analyzed metabolites) was detected in excess of the 3.0 micrograms per liter ($\mu\text{g}/\text{L}$ or parts per billion [ppb]) ES. This herbicide summation was detected at 3.037 $\mu\text{g}/\text{L}$ in a groundwater sample collected in the fall from monitoring well SK6-4 located in Sauk County.
- Elevated concentrations of metolachlor were detected in excess of the 100 ppb ES at one location; the groundwater samples collected in the spring and fall from monitoring well WS6-2 located in Waushara County (246 and 418 ppb, respectively). It appears this metolachlor presence is associated with some sort of a release in the local area that is not associated with non-point source agricultural applications.
- Additionally, imidacloprid was detected in four groundwater samples at concentrations greater than the DHS drinking water health advisory of 0.2 $\mu\text{g}/\text{L}$. These groundwater samples were collected from monitoring wells located in Adams, Iowa, Sauk, and Waushara counties. All of the sites are located in the Lower Wisconsin River Valley or Central Sands Agricultural Region. Imidacloprid concentrations in these samples ranged from 0.207 to 0.301 $\mu\text{g}/\text{L}$.

No other analytes or combinations were found at concentrations greater than their respective ES or DHS drinking water health advisory.

As depicted in [Table B 3](#) of [Appendix B](#), concentrations of alachlor ESA, atrazine, de-ethyl atrazine, di-amino atrazine, and picloram were detected in excess of their respective Wisc. Admin. Code ch. NR 140 PAL standards. This list of compounds is typical for the PAL exceedances except for the picloram. The picloram exceedances were identified in the same groundwater samples that the metolachlor ES exceedances were detected and likely from the same source.

[Table B 3](#) of [Appendix B](#) also includes results for pesticides and their metabolites with no established ES, PAL, or DHS drinking water advisories. Seventy-one of 115 pesticides compounds tested have no established groundwater quality standard or advisory level. A review of 2024 data indicates that 39 different pesticides compounds were detected in excess of laboratory reporting limits, and 24 of these 39 compounds have no Wisc. Admin. Code ch. NR 140 established standard. However, nine of the 24 analytes with no Wisc. Admin. Code ch. NR 140 standards have DHS drinking water health advisories (chlorantraniliprole, clothianidin, flumetsulam, fomesafen, imidacloprid, metalaxyl, saflufenacil, sulfentrazone, and thiamethoxam).

Seven of the 15 compounds with no established standards or DHS advisories are metabolites for compounds with standards (alachlor, atrazine, dimethenamid, metribuzin, or sulfentrazone). The remaining seven detected parent material compounds with no existing standard or DHS advisory are aminopyralid, bicyclopyrone, boscalid, clopyralid, cyantraniliprole, imazethapyr, and pyroxasulfone. (Note: there was only one metabolite that had a parent material with no advisory or standard; pyroxasulfone M-1.) [Table 2](#) includes

a detection summary of these remaining seven compounds that are not metabolites and have no standard or advisory.

Table 2: Detected Parent Compounds That Have No Wisc. Admin. Code ch. NR 140 Standard or DHS Drinking Water Health Advisory Levels

Analyte	Sites with Detects (out of 22)	Number of Detects (out of 86)	% of Samples Detected	Concentration Range (in µg/L)
Aminopyralid	1	1	1.2%	0.543
Bicyclopyrone	1	4	4.7%	0.0796-1.0
Boscalid	7	11	12.8%	0.0572-0.599
Clopyralid	1	1	1.2%	0.142
Cyantraniliprole	3	3	3.5%	0.0518-0.694
Imazethapyr	1	1	1.2%	0.0816
Pyroxasulfone	1	1	1.2%	0.153

2024 is the first year pyroxasulfone has been detected in a field-edge monitoring well groundwater sample. Pyroxasulfone is a pre-emergent herbicide used to treat grasses and broadleaf weeds across various crops. It was detected in a groundwater sample collected in the fall from a well located in Iowa County.

It is important to note that comparisons of detected pesticides and their metabolite concentrations to established groundwater quality standards and drinking water advisories are based on exposure to a single compound. These comparisons do not fully evaluate the risk to human health when two or more compounds are present. Currently, there are no calculations to predict potential risk when multiple compounds are present. Since the current approach does not account for potential cumulative risk, potential toxicity may be underestimated when two or more compounds are present.

OTHER NOTABLE OBSERVATIONS

Neonicotinoids:

Interest in the neonicotinoid class of insecticides has increased greatly in recent years due to concerns over possible effects on pollinators. DATCP began testing for these compounds in 2008 with thiamethoxam. BLS now analyzes for six neonicotinoid compounds. Three of these compounds - clothianidin, imidacloprid, and thiamethoxam (CIT) - were detected in field-edge groundwater samples collected in 2024. The other three neonicotinoid compounds - acetamiprid, dinotefuran, and thiacloprid - were not detected in excess of laboratory reporting limits in any groundwater samples. The presence of the three CIT compounds in groundwater is expected as these compounds are known to readily leach when applied to crops grown in sandy soils and are used in many insecticide products. CIT compounds are labeled for use on most crops grown in the state including corn, soybeans, potatoes, many other vegetables, fruit crops, and most small grains.

Historic field-edge monitoring results indicate that CIT compounds are becoming more prevalent in groundwater over time. CIT compounds were observed at 18 of the 22 locations in 2024, which is slightly less compared to prior years. Thiamethoxam and imidacloprid have been detected in field-edge samples since testing for neonicotinoid compounds began, primarily at sites within the Central Sands Agricultural Region and Lower Wisconsin River Valley.

No Wis. Admin. Code ch. NR 140 ES or PAL groundwater quality standards have been established for the CIT compounds. However, DHS has identified drinking water health advisories for each CIT compound.

Clothianidin and thiamethoxam were detected in 80% and 45%, respectively, of all 2024 samples collected from field-edge monitoring wells. Clothianidin concentrations had an overall increase of 2% and thiamethoxam had an overall increase of 3% from last year. This increase is consistent with historical detection percentages. Clothianidin concentrations ranged from 0.0121 to 3.17 µg/L and thiamethoxam concentrations ranged from 0.0109 to 3.58 µg/L. These detections are again consistent with historical detection ranges. Additionally, these detected concentrations do not exceed any of the respective DHS drinking water health advisories for clothianidin or thiamethoxam.

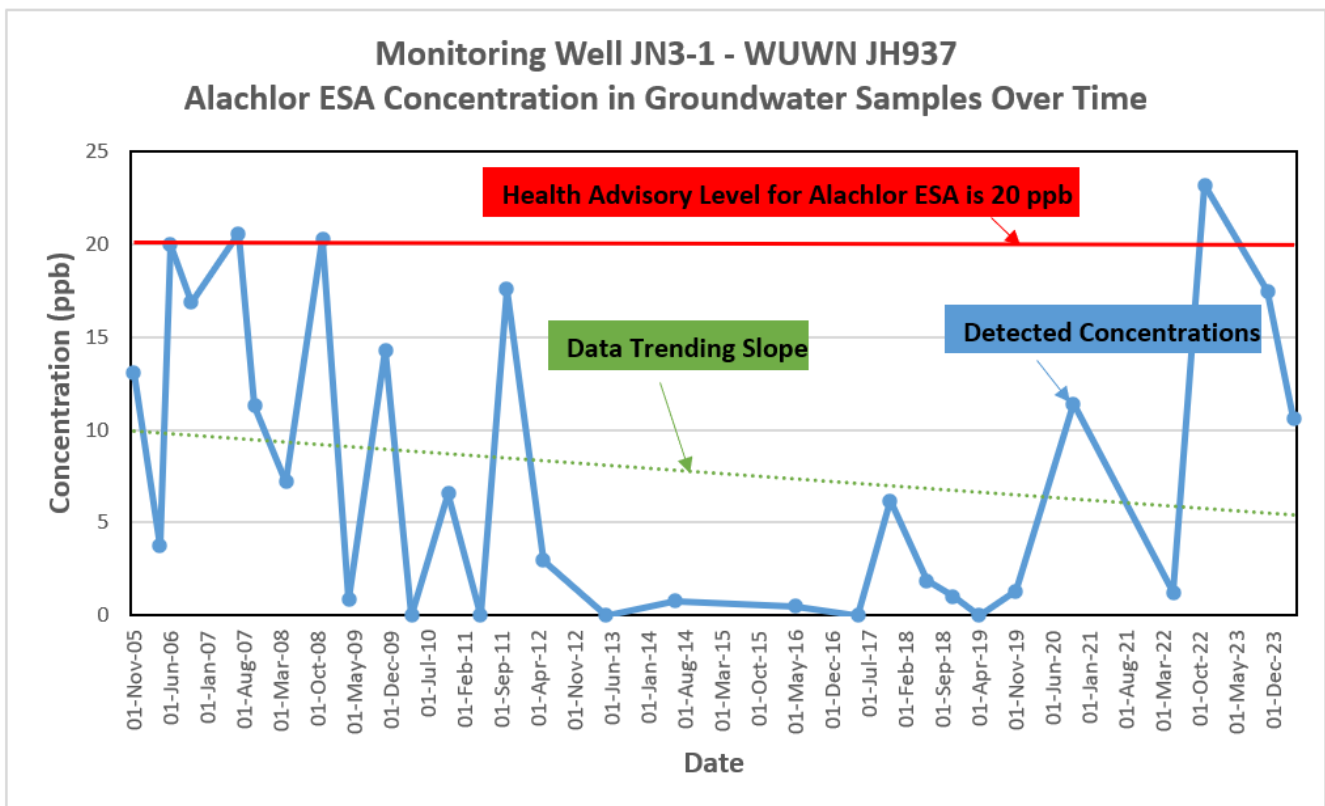
Imidacloprid concentrations exceeding laboratory reporting limits were detected in 46% of the 2024 groundwater samples collected. It was detected in samples collected from 11 of 22 sites at concentrations ranging from 0.0108 to 0.301 µg/L. This detection frequency and range are consistent with 2023 values but represent an overall increasing trend. Imidacloprid exceeded the DHS drinking water health advisory of 0.2 µg/L in four groundwater samples. These groundwater samples were collected from sites within the Central Sands Agricultural Region and Lower Wisconsin River Valley (Adams, Iowa, Sauk, and Waushara counties). The imidacloprid data relative to each monitoring location is summarized in [Table B 5](#) in [Appendix B](#).

One observation regarding the 2024 data suggests that the imidacloprid and thiamethoxam are migrating vertically and horizontally within Central Sands Agricultural Region aquifers. Concentrations appear not to fluctuate seasonally, but greater concentrations have been detected in the groundwater collected from deeper screened wells at sites AD2, AD5, and WS7 compared to adjacent shallow wells. Additionally, imidacloprid and thiamethoxam have also been detected in nearby surface water samples indicating that groundwater is discharging to surface water year-round as base flow (refer to DATCP’s *2024 Surface Water Sampling Report* - Wisconsin Department of Agriculture, Trade and Consumer Protection, 2024b).

Alachlor:

As noted previously, alachlor ESA was the third most frequently detected compound in groundwater samples collected in 2024. It was detected in excess of laboratory reporting limits in more than 65% of the samples collected and at 15 of the 22 field-edge monitoring sites. The alachlor ESA data relative to each monitoring location is summarized in [Table B 6](#) in [Appendix B](#).

Alachlor ESA concentrations ranged from 0.0509 to 10.6 µg/L in 2024 samples. The greatest concentration of alachlor ESA was 10.6 µg/L in a groundwater sample collected from monitoring well JN3-1. This



concentration exceeds the 4.0 µg/L Wis. Admin. Code ch. NR 140 PAL but not the ES of 20.0 µg/L. As indicated in the following graph, alachlor ESA concentrations at this monitoring well location has varied with an overall decreasing trend over the 20 years of groundwater collection. But it is observed that the data indicates an increasing trend over the past eight years.

In general, groundwater samples collected across an entire vertical aquifer profile, such as in the AD5 or WS7 well nests, the greatest alachlor ESA concentrations are detected at greatest depths. Although alachlor ESA remains at detectable concentrations (in some cases in excess of the PAL), it cannot be attributed to current use at nearby fields. Alachlor ESA is a breakdown product of alachlor. Alachlor production ceased in December 2014 and could not be sold in Wisconsin after August 2018. The parent alachlor was not detected in excess of laboratory reporting limits in any samples collected in 2024. These results were also observed with samples collected between 2018 and 2020.

Alachlor ESA was also widely detected in surface water and groundwater samples collected throughout the state. Because alachlor is no longer sold in Wisconsin and field use has ceased, it is expected that metabolite concentrations will decline over time. However, the increasing concentration trend as observed in JN3-1 is of concern. Additional data collection and evaluation of data from multiple years is needed to validate these observations.

Atrazine:

There are currently 101 atrazine Prohibition Areas (PAs) covering approximately 1.2 million acres within Wisconsin. It is illegal to apply any pesticide containing the active ingredient atrazine within an atrazine PA. In non-PAs, atrazine use is restricted but not prohibited. Since PAs have been in place for 10 years or more, it is anticipated that atrazine and its metabolite concentrations in groundwater would be limited or not present at all. Of the 24 field-edge sites in the Program, only 11 are located within a PA. No grower self-reported atrazine use on adjacent fields within the PAs.

In addition to testing for the parent material atrazine and three of its metabolites/breakdown products (de-ethyl atrazine, de-isopropyl atrazine, and di-amino atrazine) in 2024, another atrazine metabolite (hydroxyatrazine) was added to the testing. The chemical breakdown of atrazine, primarily through abiotic processes like hydrolysis or photolysis, leads to several key degradation products, with hydroxyatrazine being the major metabolite. There are no regulatory standards or drinking advisories for hydroxyatrazine. Biological degradation (microbial) of atrazine typically produces the other three metabolites tested by DATCP and is included in the summation for atrazine TCR.

Atrazine or one of its breakdown products were detected in excess of laboratory reporting limits in 48% of field edge groundwater samples collected in 2024. Atrazine TCR concentrations were detected in 42% of the samples, but only one groundwater sample collected in the fall from a monitoring well in in Sauk County had an atrazine TCR concentration exceeding the 3.0 µg/L Wis. Admin. Code ch. NR 140 ES. However, atrazine TCR was observed in 11 groundwater samples (12.8% of collected samples) at a concentration greater than the 0.3 µg/L Wisc. Admin. Code ch. NR 140 PAL. Concentrations for atrazine TCR ranged from 0.0577 to 3.037 µg/L. Hydroxyatrazine concentrations ranged from 0.163 to 0.0513 µg/L. Parent material atrazine, metabolite, and atrazine TCR data for each monitoring site is presented in [Table B 7](#) in [Appendix B](#).

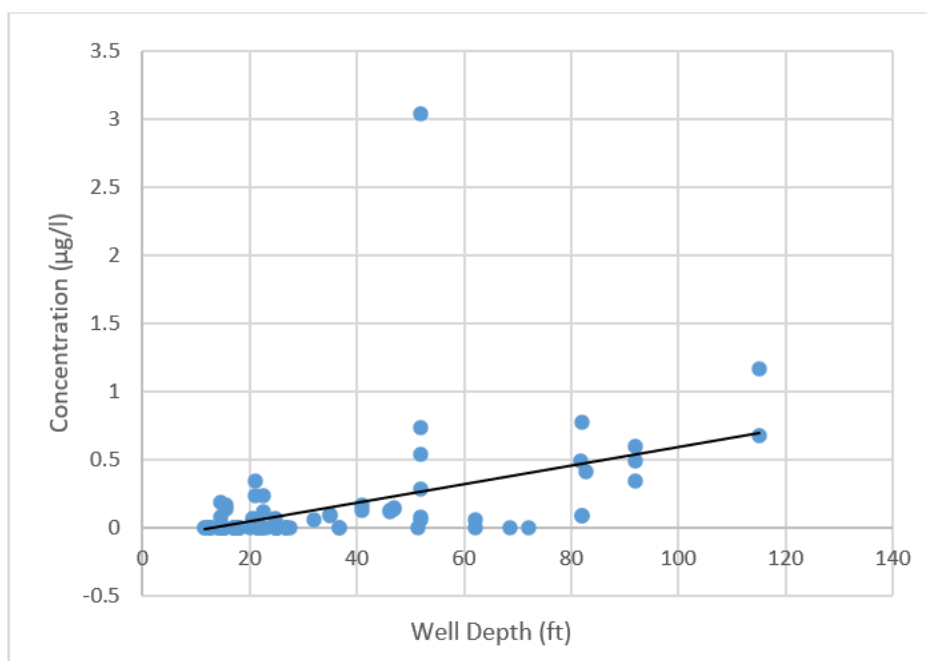
The 2024 groundwater results indicated atrazine or one of its metabolites was detected in samples collected from 16 of the 22 sites. Groundwater samples with detections in excess of the Wis. Admin. Code ch. NR 140 PAL for atrazine TCR were collected from monitoring well networks located at seven of the 22 sites as follows:

- At two locations in Adams and Iowa counties each; and
- at one location in St. Croix, Sauk, and Waushara counties.

Of those seven sites, four are located in a PA: Iowa County (IW1, IW2), St. Croix County (SC1), and Sauk County (SK6). Of the four locations within a PA, parent material atrazine was found in excess of detection limits at sites IW1, IW2, and SK6. All of these detections were identified in groundwater samples collected from piezometers constructed in 2021 at the deepest monitoring depths. This is consistent with previous year's results. Based on grower self-reporting, atrazine has not been used on the adjacent WS4 fields for over 20 years. These results indicate that the source for the parent material atrazine detections is not from adjacent fields. It is likely from a source beyond the immediate area, or it may be from historic use prior to establishment of the PA.

As observed during previous years, the greatest concentrations of atrazine TCR in 2024 samples were typically detected in samples collected from deeper screened wells. Figure 10 depicts atrazine TCR concentrations relative to groundwater sample well depth. As indicated, elevated concentrations of atrazine TCR were detected in samples collected from monitoring wells screened between 50 and 60 feet below ground surface (bgs), and at deeper wells screened between 80 and 115 feet bgs. On average, shallow wells screened between 10 and 40 feet bgs detected atrazine TCR at lesser concentrations. Based on atrazine TCR concentrations observed across the aquifer depth, it is possible that atrazine is applied at nearby agricultural fields at rates that are not affecting shallow groundwater quality. The greater atrazine concentrations observed at depth likely indicate affects from historic use rather than an on-going source from field use. Trend analyses were completed in 2025 on historical groundwater data to determine if the atrazine TCR concentrations are decreasing within PAs as intended. Results indicated that atrazine TCR concentrations, for the most part, are decreasing to levels less than regulatory enforcement levels. A report documenting the analysis is provided on DATCP's website: [Wisconsin Groundwater Quality Reports](#).

Figure 10: 2024 Atrazine TCR Concentrations Relative to Groundwater Sample Well Depth



Notes: Line through data represents trend of concentrations relative to depth.

Nitrogen:

DATCP's Field-Edge Groundwater Monitoring Program primary focus is on pesticide affects to groundwater quality. In addition to pesticides, BLS includes nitrogen as nitrate plus nitrite analyses. Nitrogen impacts in groundwater and drinking water are the responsibility of the DNR. However, BLS includes nitrogen as nitrate plus nitrite analyses as part of this program, and that data is shared with the DNR.

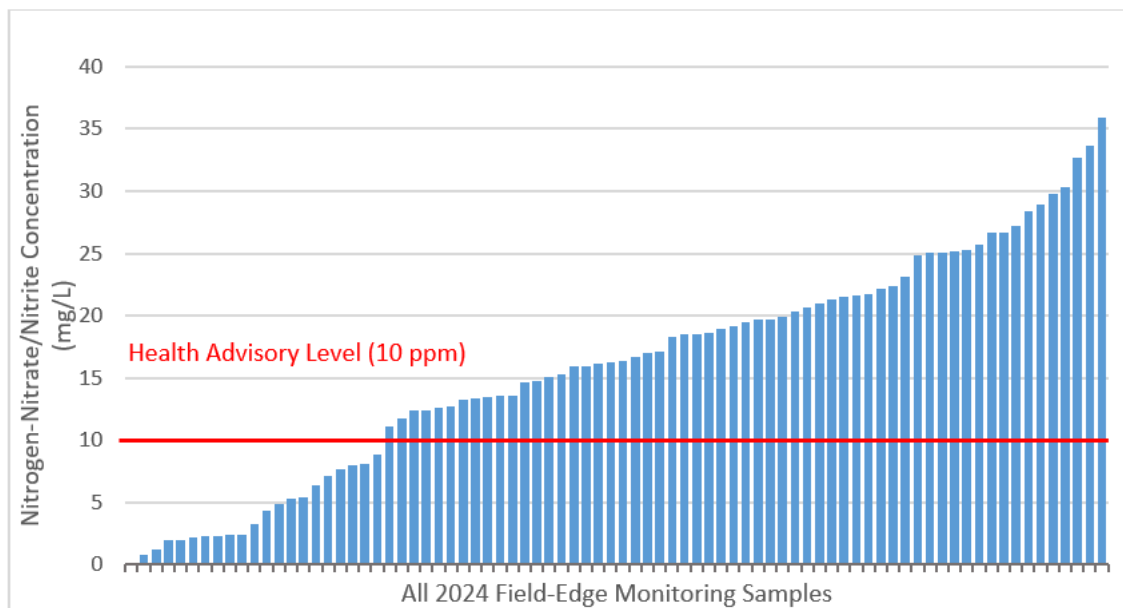
Nitrogen as nitrate plus nitrite was detected in excess of laboratory reporting limits in 85 of the 86 field-edge groundwater samples collected in 2024. The average nitrogen concentration for all 2024 samples was 16.88 milligram per liter (mg/L or parts per million [ppm]), which is slightly greater than last year's (2023) average of concentration of 16.42 ppm. This is statistically in-line with the previous three years, but continues the overall decreasing trend calculated over the past six years, which is summarized in Table 3.

Table 3: Average Nitrogen as Nitrate plus Nitrite Concentration Over Previous Years

Year	Average Nitrogen-Nitrate/Nitrite Concentration (in parts per million)
2017	17.90
2018	17.72
2019	14.61
2020	16.89
2021	16.28
2023	16.42
2024	16.88

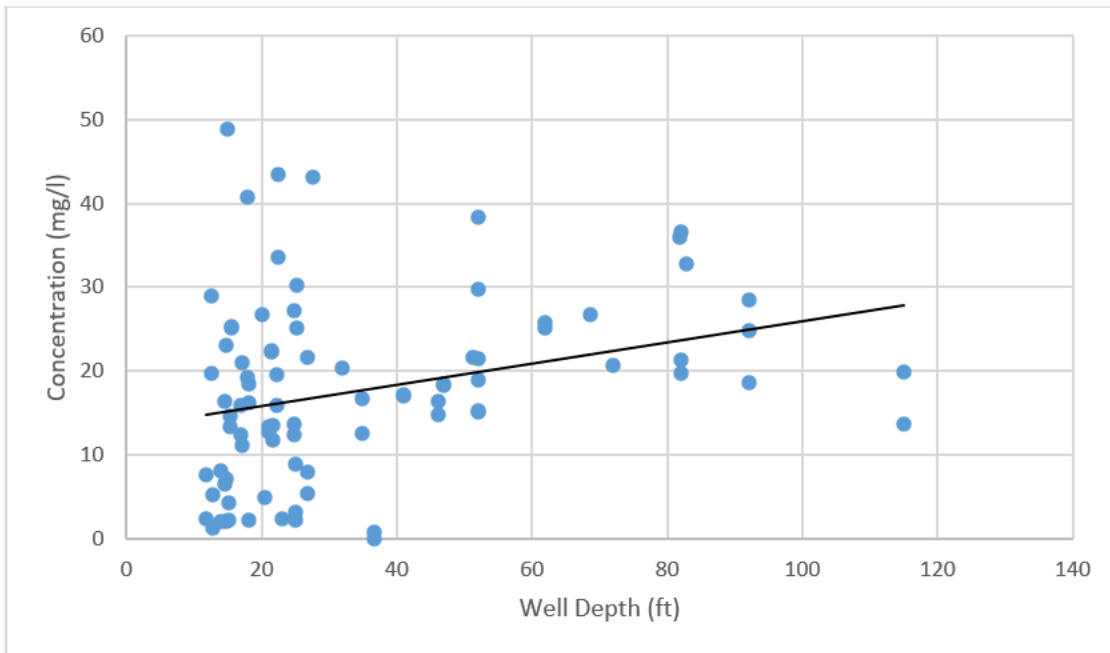
The Wis. Admin. Code ch. NR 140 ES of 10 mg/L for nitrogen as nitrate plus nitrite was exceeded in 65 of the 86 groundwater samples collected in 2024. Of the 21 that did not exceed the ES, 16 groundwater samples exceeded the 2.0 mg/L Wis. Admin. Code ch. NR 140 PAL. The greatest concentration of nitrogen (48.8 mg/L) was detected in the SK6-1 groundwater sample collected in the fall at a Sauk County station. All nitrogen as nitrate plus nitrite data relative to each monitoring location is summarized in Table B 8 of Appendix B. Figure 11 shows the 2024 nitrogen concentration distribution.

Figure 11: Nitrogen as Nitrate plus Nitrite Results Distribution in Groundwater Samples from All Wells



Nitrogen as nitrate plus nitrite concentrations were also compared to wells screened at different depths. Figure 12 depicts nitrogen concentrations for all wells by depth. As indicated, nitrogen as nitrate plus nitrite was detected over a wide range of concentrations in groundwater samples collected from wells screened at shallow depths (between 10 and 40 feet bgs) compared to deeper wells. Groundwater samples collected from deeper wells typically detected nitrogen as nitrate plus nitrite at greater concentrations compared to the shallower screened well nest. However, it does appear concentrations decrease below a depth of 80 feet. As indicated, nitrogen as nitrate plus nitrite exceeded the 10 mg/L ES in samples collected from nearly all the monitoring wells screened across the aquifer at a depth greater than 40 feet, and in more than half the wells less than 40 feet deep.

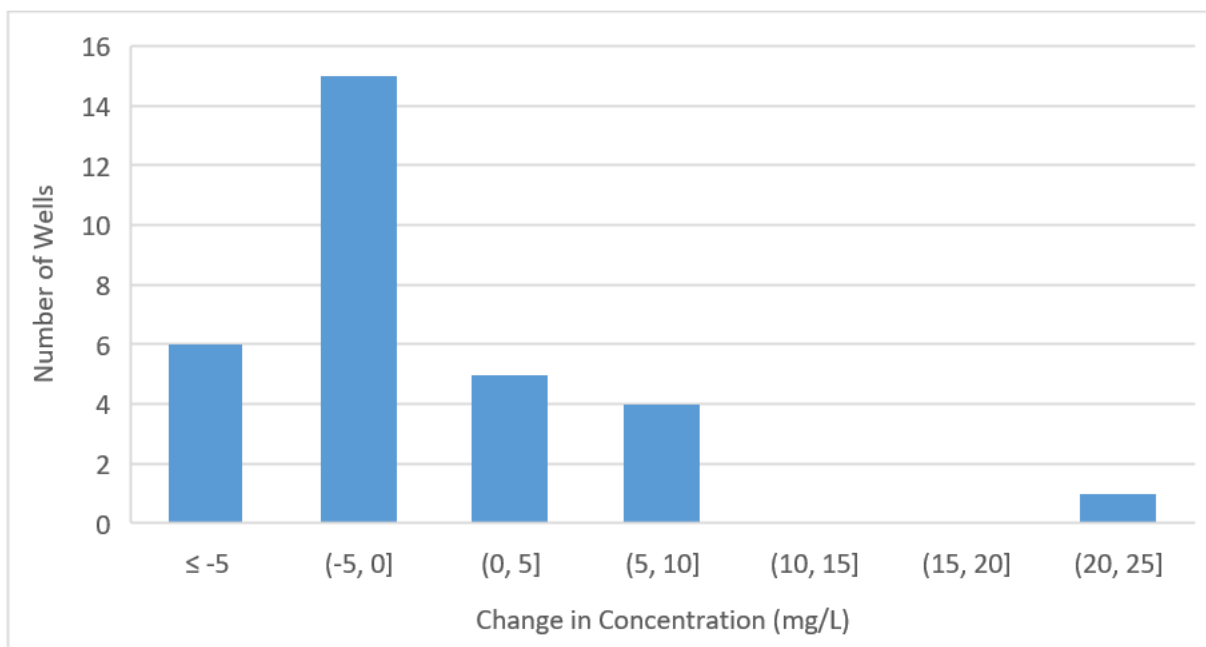
Figure 12: 2024 Nitrogen as Nitrate plus Nitrite Concentrations Relative to Groundwater Sample Well Depth



Notes: Line through data represents trend of concentrations relative to depth.

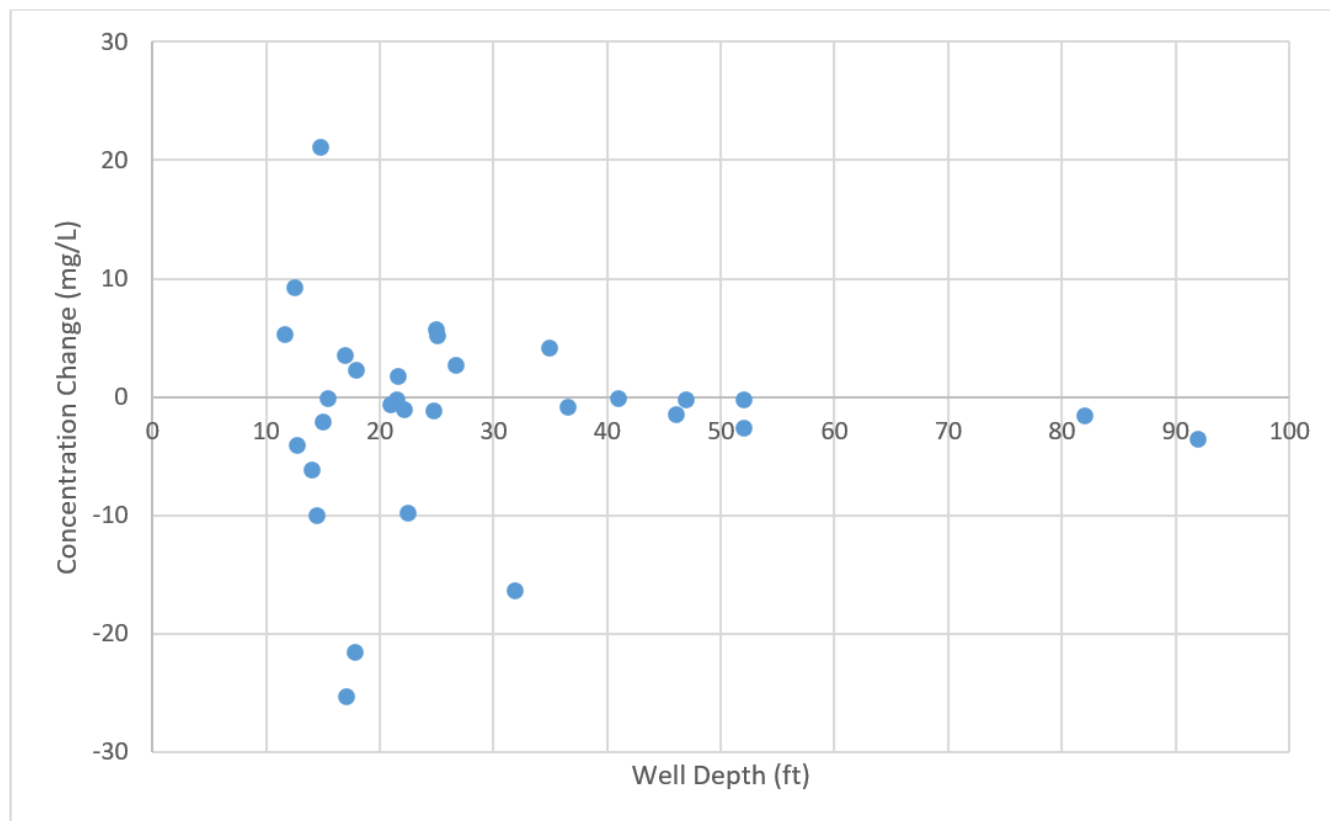
Groundwater samples collected from deeper screened wells also show less seasonal variation in nitrogen concentrations compared to shallow wells. As depicted on Figure 13 below, nitrogen as nitrate plus nitrite concentrations fluctuated between -5 mg/L to + 5 mg/L in samples collected between spring and fall 2024 at the majority of monitoring well locations. On average, nitrogen concentrations increased by 0.32 mg/L between spring and fall. Overall, this suggests that nitrogen as nitrate plus nitrite concentrations for the majority of wells indicate little seasonal variation.

Figure 13: 2024 Nitrogen as Nitrate plus Nitrite Concentrations Variability from Spring to Fall at Individual Wells



Seasonal data based on nitrogen as nitrate plus nitrite concentration variances relative to groundwater depths was evaluated. It appears that there is a limited seasonal variability with the depth. This likely indicates nitrogen applications at the surface influence groundwater quality seasonally. As depicted on [Figure 14](#) below, groundwater samples collected from shallower wells have a greater range of variability in nitrogen concentrations to deeper wells. Nitrogen as nitrate plus nitrite concentrations in samples collected from deeper screened wells are expected to show less variability and serve as a baseline, with little seasonal influence occurring. This has not been observed throughout all the years of monitoring. Additional years of monitoring are necessary to validate or refute this observation.

Figure 14: 2024 Nitrogen Concentrations Variability by Depth from Spring to Fall of Individual Wells



Vertical Distributions:

In 2024, a comprehensive analysis was performed to evaluate the vertical distribution of pesticides in groundwater. The study included an evaluation of groundwater monitoring data collected from 10 Field-Edge Program monitoring wells from various locations in Wisconsin. The study focused on evaluating the vertical distribution of imidacloprid and atrazine TCR and assessing how these chemicals persist within groundwater at varying depths. Box plots were developed which depict average and range of concentrations for each depth within an entire depth profile. The most notable findings from the analysis are presented below.

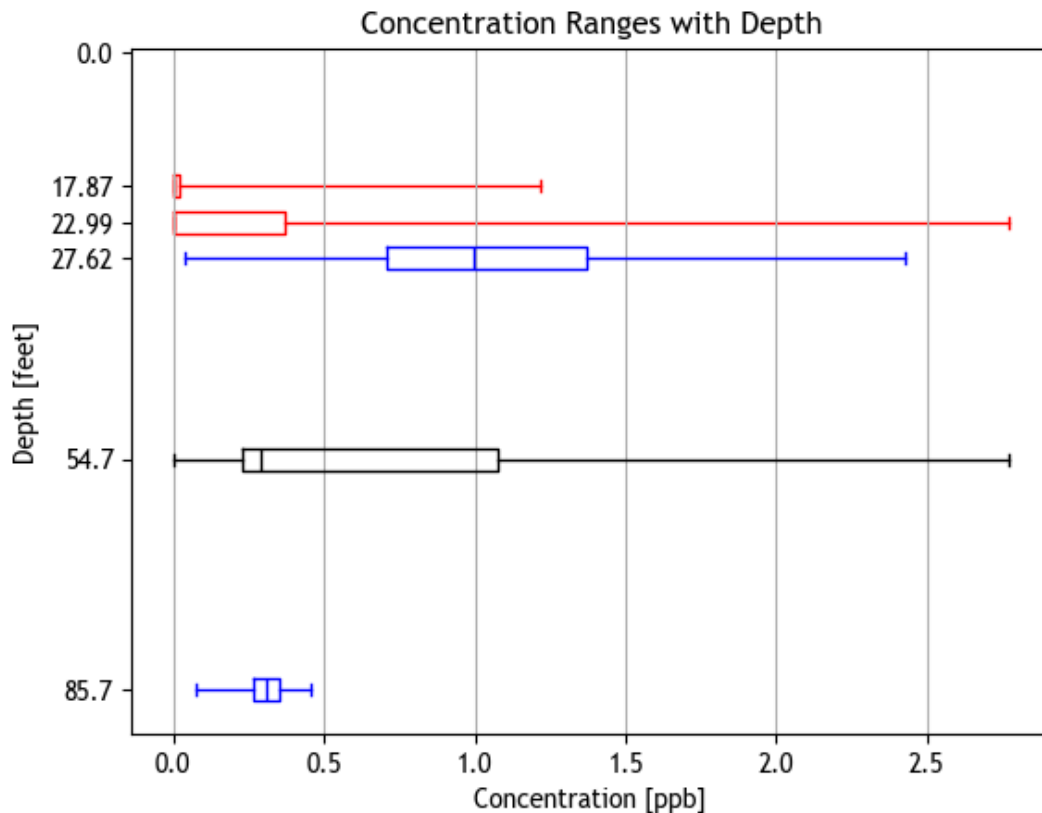
In our analysis of imidacloprid concentrations, two groups of monitoring well nests exhibited notable different vertical distribution patterns. The first analysis was with monitoring well nests at sites AD2 and AD5, both located in Adams County only two miles apart from each other. Adjacent agriculture fields at both locations have irrigation systems available. The AD2 site is comprised of five monitoring wells screened at different depths while the AD5 site consists of six monitoring wells screened at different depths. Nearly 15 years of data were used for this analysis. Unfortunately, both growers have not consistently provided annual information regarding crops and pesticide use so there is limited data on pesticide use at these sites.

As depicted on [Figure 15](#), imidacloprid concentrations were detected exceeding laboratory reporting limits at all depths within the AD2 monitoring well nest. However, greatest average concentrations were observed between 10-and-15-feet below the water table, which is 27 feet below ground surface. With increasing depth within the aquifer, average and median imidacloprid concentrations decreased. In contrast, as depicted on

Figure 16, greatest imidacloprid concentrations within the AD5 monitoring well nest is identified at a much greater depth, 85-feet below ground surface. Note that the concentration range for both well nests are similar.

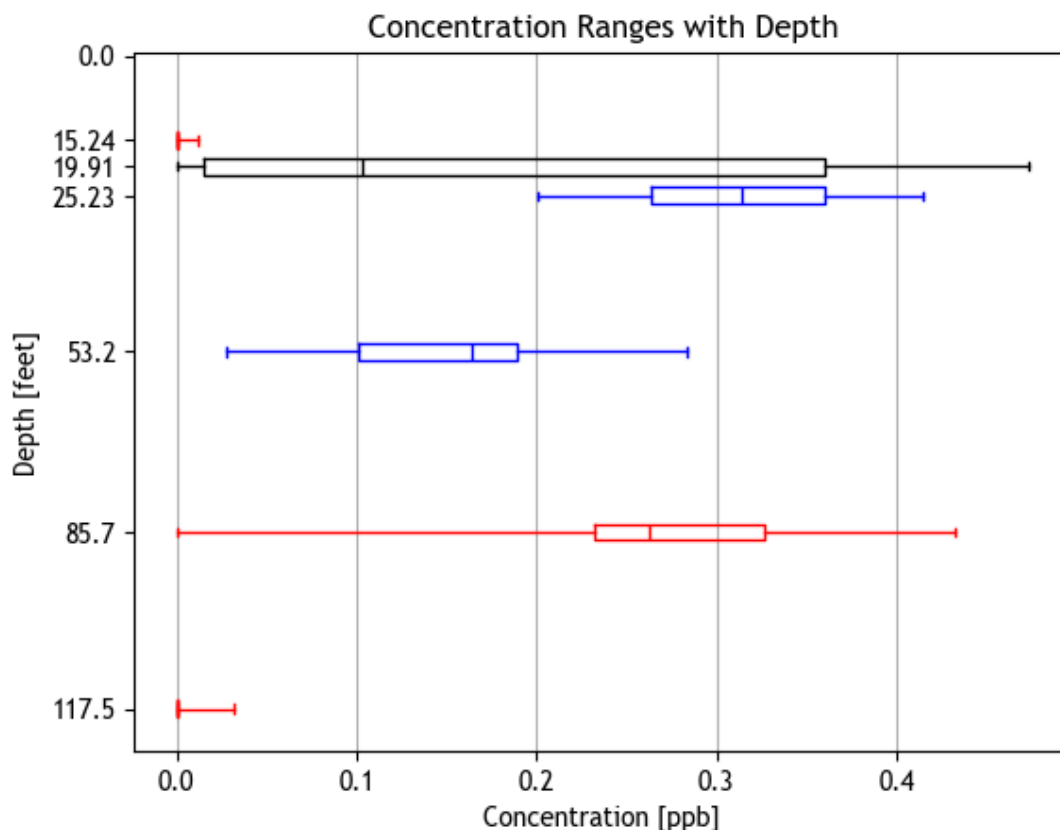
The difference between the two box plots is likely the result of the adjacent-field use of imidacloprid and the overall aquifer background concentrations of imidacloprid. It appears that imidacloprid may be used on the AD2 adjacent or nearby fields (as indicated by greater concentrations), where the imidacloprid concentrations observed in the AD5 groundwater may be associated with background conditions and not necessarily the practices of adjacent fields (lesser concentrations and consistent across the entire aquifer depth).

Figure 15: Vertical Distribution of Imidacloprid at AD2



- Notes:** Box represents the middle 50% of the data, from the 25th percentile to the 75 percentile.
- The line inside the box is the median marking the true middle of the data.
- Whisker lines extending from the box show the range of the remaining data.
- Red colored lines indicate concentration trend over the monitoring period is stastically increasing.
- Blue colored lines indicate concentration trend over the monitoring period is stastically decreasing.
- Black colored lines indicate concentration trend is stastically consistent.

Figure 16: Vertical Distribution of Imidacloprid at AD5



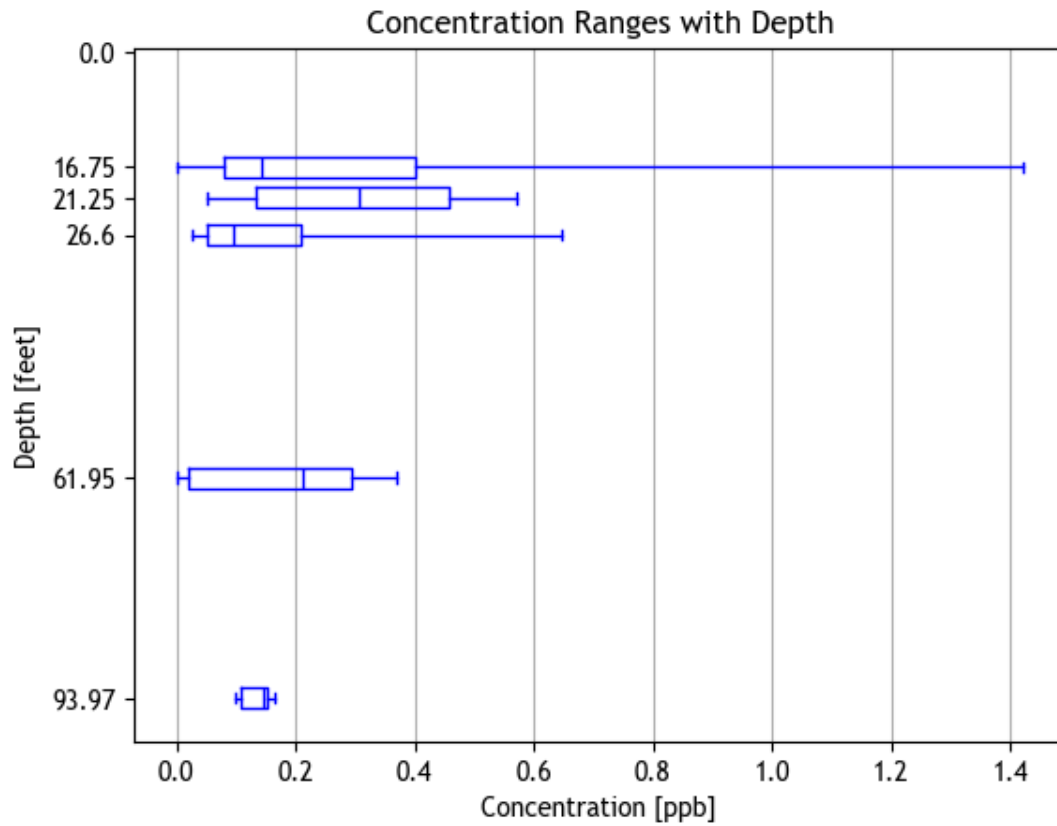
Notes Box represents the middle 50% of the data, from the 25th percentile to the 75 percentile.
 The line inside the box is the median marking the true middle of the data.
 Whisker lines extending from the box show the range of the remaining data.
 Red colored lines indicate concentration trend over the monitoring period is stastically increasing.
 Blue colored lines indicate concentration trend over the monitoring period is stastically decreasing.
 Black colored lines indicate concentration trend is stastically consistent.

The next set of monitoring well nest comparisons for imidacloprid is for two locations within the Lower Wisconsin River Valley in Iowa County. IW1 and IW2 are located about half mile apart. Both locations and adjacent fields are owned by the same organization so it is expected that similar practices would be employed in both areas. The IW2 site is located directly hydraulically upgradient to the IW1 site. Adjacent agriculture fields at both locations have irrigation systems available. Both sites have five monitoring wells screened at different depths. Nearly 15 years of data were used for this analysis. With an exception for 2024, DATCP has been provided with crops grown and use of pesticides information.

As shown on [Figure 17](#), imidacloprid concentrations were detected exceeding laboratory reporting limits at all depths at the IW1 monitoring well nest site. Overall, concentrations are consistent with aquifer depth. In contrast, as depicted on [Figure 18](#), there is a clear decrease in imidacloprid concentrations with aquifer depth. Note that the concentration range in the upgradient well nest IW2 is less than the downgradient well nest IW1.

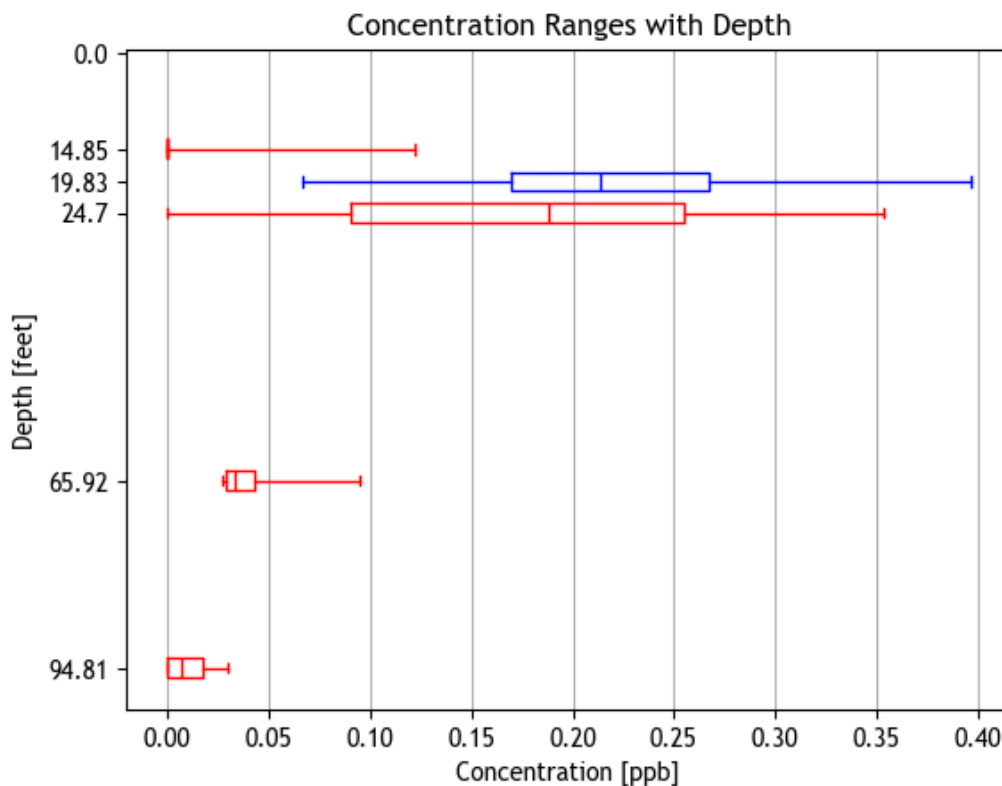
The box plots show similar trends at both sites. It appears that imidacloprid is used in the local practices based on concentrations within the shallow aquifer. But, it also appears at a consistent concentration within the deeper portions of the aquifer indicating a long-term constant use. It is also likely that the groundwater quality is heavily affected by the flow associated with the Wisconsin River. Continued monitoring and evaluating the vertical distribution will provide clearer answers.

Figure 17: Vertical Distribution of Imidacloprid at IW1



Notes: Box represents the middle 50% of the data, from the 25th percentile to the 75 percentile.
 The line inside the box is the median marking the true middle of the data.
 Whisker lines extending from the box show the range of the remaining data.
 Red colored lines indicate concentration trend over the monitoring period is stastically increasing.
 Blue colored lines indicate concentration trend over the monitoring period is stastically decreasing.
 Black colored lines indicate concentration trend is stastically consistent.

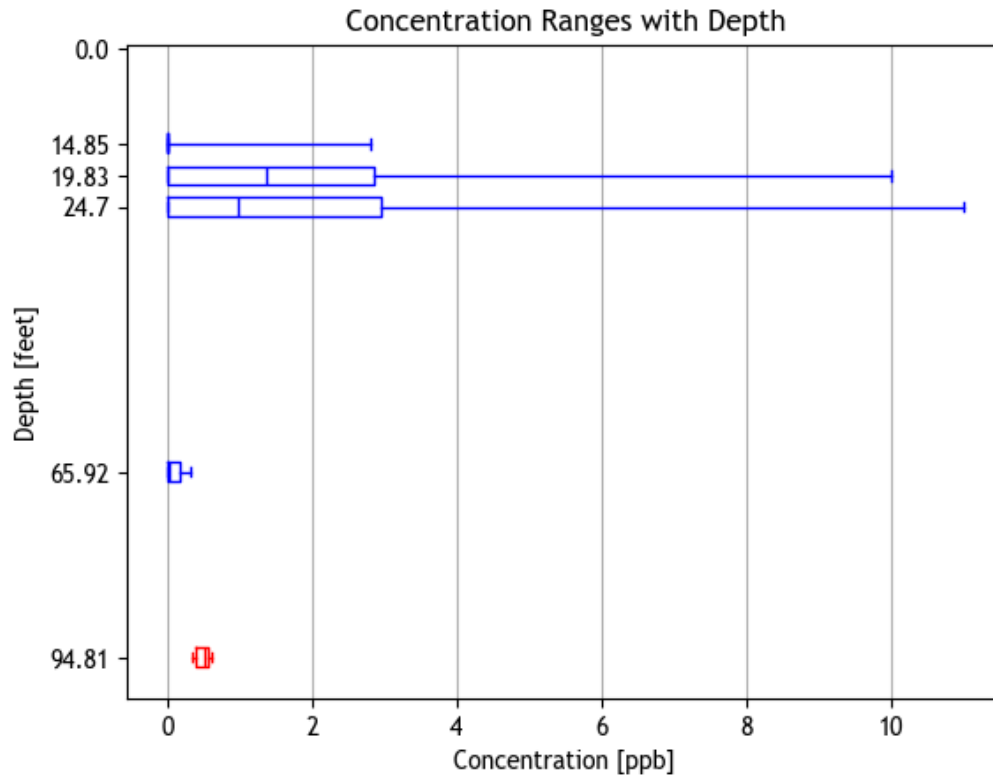
Figure 18: Vertical Distribution of Imidacloprid at IW2



Notes: Box represents the middle 50% of the data, from the 25th percentile to the 75 percentile.
 The line inside the box is the median marking the true middle of the data.
 Whisker lines extending from the box show the range of the remaining data.
 Red colored lines indicate concentration trend over the monitoring period is stastically increasing.
 Blue colored lines indicate concentration trend over the monitoring period is stastically decreasing.
 Black colored lines indicate concentration trend is stastically consistent.

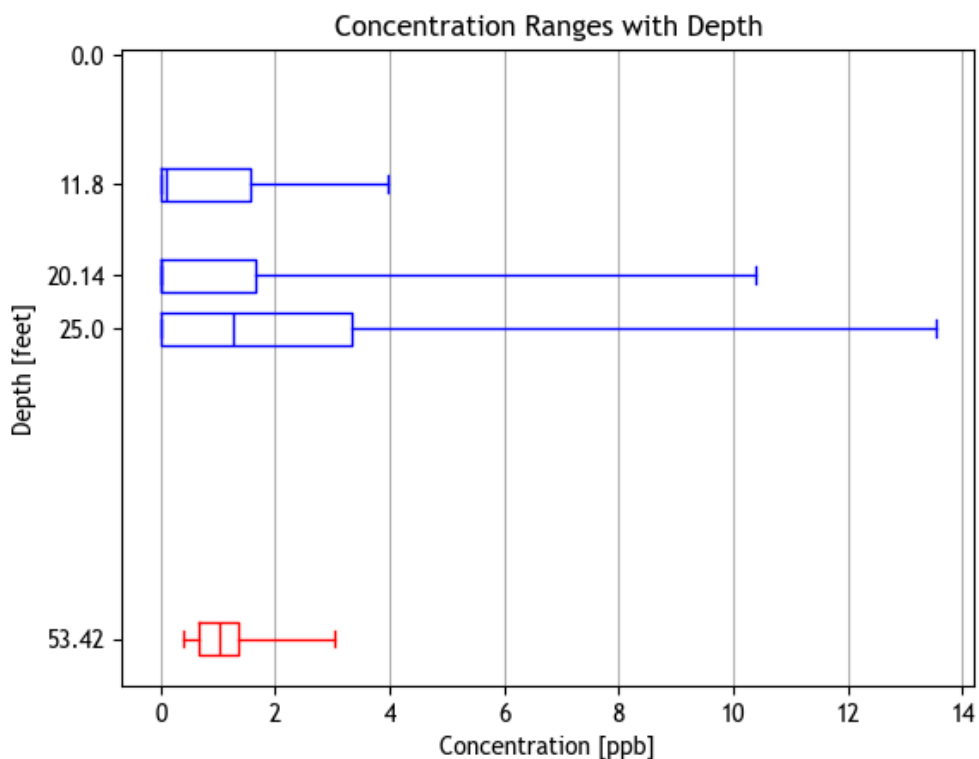
The other pesticide evaluated for vertical distribution was atrazine TCR. Observed depth-related concentration trends resemble the patterns noted for imidacloprid (prior documentation in this section) and nitrogen (as documented in Figure 12) in some cases. At many of the sites where monitoring well nest data was evaluated, increasing concentrations were observed at deeper wells while decreasing concentrations were observed at shallow wells. This trend was observed at six of the 10 evaluated locations, including AD2, AD5, DU1, IW2 (Figure 19), SK6 (Figure 20), and WS7. While this upward-with-depth pattern is consistent with certain nitrogen and imidacloprid results, it is not universal, suggesting that the processes influencing atrazine transport and persistence may differ in some areas. These differences may reflect variations in current and historical pesticide application, chemical properties, or localized hydrogeologic conditions that influence contaminant movement within the subsurface.

Figure 19: Vertical Distribution of Atrazine TCR at IW2



Notes: Box represents the middle 50% of the data, from the 25th percentile to the 75 percentile. The line inside the box is the median marking the true middle of the data. Whisker lines extending from the box show the range of the remaining data. Red colored lines indicate concentration trend over the monitoring period is stastically increasing. Blue colored lines indicate concentration trend over the monitoring period is stastically decreasing. Black colored lines indicate concentration trend is stastically consistent.

Figure 20: Vertical Distribution of Atrazine TCR at SK6



Notes: Box represents the middle 50% of the data, from the 25th percentile to the 75 percentile. The line inside the box is the median marking the true middle of the data. Whisker lines extending from the box show the range of the remaining data. Red colored lines indicate concentration trend over the monitoring period is stastically increasing. Blue colored lines indicate concentration trend over the monitoring period is stastically decreasing. Black colored lines indicate concentration trend is stastically consistent.

2025 Program Goals and Objectives

The Field-Edge Groundwater Monitoring Program is intended to monitor groundwater quality at strategic geographic locations within agricultural areas to characterize agrichemical migration to underlying aquifers, and act as an early warning signal for nearby drinking water wells. The program will continue in 2025.

Program goals for 2025 include:

- Collaborate with BLS and develop a 2025 Field-Edge Groundwater Monitoring Program Sampling Plan.
- Conduct a groundwater sampling event in the spring (limited) and fall from the Program's groundwater monitoring network.
- Document annual activities completed and summarize results for each site in a letter sent to each grower.
- Document the annual activities completed and summarize results in a 2025 Field-Edge Groundwater Monitoring Program Summary Report.
- Add a new groundwater monitoring nest location in 2025 to evaluate a change in land use following construction of a large solar farm in Portage County. The solar farm property was previously used for crop production. Three sets of monitoring well nests, two within the development and one hydraulically upgradient, are being constructed. This will provide an opportunity to evaluate groundwater quality recovery from agricultural to passive land use over time.

2025 data will be added to the existing database to ensure that long-term water level and groundwater monitoring data can be used to identify trends in groundwater quality over time. Long-term groundwater quality trends may be used to further evaluate the effectiveness of atrazine PAs. Long-term groundwater data will also be compared to surface water data from within the same watershed to identify potential relationships between surface water and groundwater quality. This evaluation may also be used to evaluate seasonal surface water flow variations and base flow groundwater discharge to surface water. DATCP intends to report findings along with an evaluation of historical results as part of DATCP's detailed comprehensive report for each field-edge site.

Acknowledgments

ACM's financial information includes the state fiscal year (FY) from July 1, 2022, through June 30, 2024. Federal grants operate October 1 through September 30. This report covers those portions of the federal grants that occurred during the state fiscal year. The primary sources of revenue for ACM are industry fees for licenses, permits, registrations, and tonnage under the feed, fertilizer, soil and plant additive, lime, and pesticide programs. In addition, a federal grant provides some funding to cover annual pesticide program expenses. ACM recognizes these important partnerships with industry and the federal government and works hard to maximize the use of this funding for the benefit of industry, consumers, and the environment.

The raw data required to reproduce the above findings is available upon request. For any questions and clarifications, please do not hesitate to reach out to us at DATCPGW@wisconsin.gov or at (608) 224-4502.

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Appendix A

The acronyms and terminology included on this list are generic definitions intended to help understand the Field-Edge Monitoring Program. Some of these terms are more specifically defined in various regulations.

ACRONYMS

µg/l _____	Micrograms per liter (a liquid equivalent of ppb)
ACM _____	DATCP Bureau of Agrichemical Management
AMPA _____	Aminomethylphosphonic acid
Bgs _____	Below ground surface
BLS _____	DATCP Bureau of Laboratory Services
CAS _____	Chemical Abstract Service
CIT _____	clothianidin, imidacloprid, and thiamethoxam
DADK _____	Desaminodiketo
DATCP _____	Wisconsin Department of Agriculture, Trade and Consumer Protection
DHS _____	Wisconsin Department of Health Services
DNR _____	Wisconsin Department of Natural Resources
ES _____	Enforcement Standard
ESA _____	Ethane Sulfonic Acid
GC _____	Gas Chromatography
GCC _____	Wisconsin Groundwater Coordinating Council
HARS _____	Hancock Agricultural Research Station
ISO _____	International Organization for Standardization
LC _____	Liquid Chromatography
mg/L _____	Milligrams per liter (a liquid equivalent of ppm)
MS _____	Mass Spectroscopy
msl _____	Mean sea level
N _____	Nitrogen
ND _____	No Detect - concentrations are less than laboratory reporting limits
NOAA _____	National Oceanic and Atmospheric Administration
OA _____	Oxanilic Acid
PA _____	Prohibition Area
PAL _____	Preventive Action Limit
PPB _____	Parts per billion
PPM _____	Parts per million
TCR _____	Total chlorinated residues of atrazine
TPVC _____	Top of well casing
TSAMP _____	Targeted Sampling Program
USDA _____	United States Department of Agriculture
US EPA _____	United States Environmental Protection Agency
WGNHS _____	Wisconsin Geological and Natural History Survey
Wis. Admin. Code _____	Wisconsin Administrative Code
WUWN _____	Wisconsin Unique Well Number

DEFINITIONS

Analyte - A chemical substance that has a defined Chemical Abstract Service (CAS) number

Atrazine Prohibition Area - An area where atrazine use is currently prohibited under Administrative Code ATCP 30

Chronic Exposure value - The highest concentration of a chemical to which the organism can be exposed without causing chronic toxicity to the organism in question

Compound - A substance formed by the chemical union of two or more ingredients

Detection - When an analyte has a concentration that can be quantified (i.e., a concentration greater than the Laboratory Reporting Limit)

Herbicide - A pesticide used to kill or inhibit the growth of plants, weeds or grasses

Insecticide - A pesticide used to kill or inhibit the growth of insects

Metabolite or Residual compound or Breakdown product - A chemical substance left behind by a parent compound that has degraded through natural chemical breakdown and/or been metabolized by bacteria

Neonicotinoids- Insecticides that target the neurological systems of insects. The neonicotinoid family includes acetamiprid, clothianidin, dinotefuran, imidacloprid, nitenpyram, nithiazine, thiacloprid, and thiamethoxam

NR140 - Wisconsin Administrative Code which establishes groundwater quality standards and required responses when the standards are exceeded

Pesticide - Substance used to kill, repel, or control certain forms of plant or animal life that are considered to be pests. The pesticide category includes herbicides, insecticides, rodenticides, fungicides, and bactericides

Piezometer - Monitoring well with screened section in saturated conditions within the aquifer beneath the groundwater surface

Reporting limit - The minimum analyte concentration that can be reliably quantified and reported by the laboratory

Total chlorinated residues (TCR) of atrazine - Sum of atrazine and atrazine metabolites (de-ethyl atrazine, de-isopropyl atrazine, and diamino atrazine)

APPENDIX B

Table B 1: Field-Edge Groundwater Monitoring Program - Monitoring Wells and Piezometers Construction Specifications

County	Site (Grower)	Well Identification	WUWN	Year Constructed	Prohibition Area	Irrigation Available	Ground Elevation (MSL)	TPVC Elevation (MSL)	Well Depth (ft)	Bottom of Well (MSL)	Screen Length (ft)	Top of Screen (ft)	Sampling Method
Adams	AD2	AD2-1	BH954	1987	No	Yes	1,051.7	1,053.96	17.87	1,036.09	5	1,053.96	Peristolic Pump
		AD2-2	BH953	1987				1,054.14	22.83	1,031.31	5	1,054.14	
		AD2-3	BH952	1987				1,054.17	27.62	1,026.55	5	1,054.17	
		AD2-4	VR844	2017				1,054.44	54.70	999.74	5	1,054.44	Whale Pump and Dedicated Tubing
		AD2-5	VR845	2017				1,054.35	85.70	968.65	5	1,054.35	
		AD2-6	PT421	2021				--	116.40	--	5	--	
	AD3	AD3-1 ⁴	BH999	1987	No	Yes	1,008.0	1,010.48	14.93	995.55	5	1,010.48	
		AD3-2 ⁴	BI000	1987				1,010.34	19.64	990.70	5	1,010.34	
		AD3-3 ⁴	BI001	1987				1,010.44	24.69	985.75	5	1,010.44	
	AD4	AD4-1 ¹	BH996	1987	No	Yes	1,013.9	1,017.38	24.71	992.67	5	1,017.38	
		AD4-2 ⁴	BH997	1987				1,017.26	29.69	987.57	5	1,017.26	
		AD4-3 ⁴	BH998	1987				1,016.56	34.57	981.99	5	1,016.56	
	AD5	AD5-1	CL461	1988	No	Yes	1,051.1	1,053.18	15.24	1,037.94	5	1,053.18	Peristolic Pump
		AD5-2	CL455	1988				1,053.31	19.91	1,033.40	5	1,053.31	
		AD5-3	CL456	1988				1,053.27	25.23	1,028.04	5	1,053.27	
		AD5-4	VR846	2017				1,053.63	53.20	1,000.43	5	1,053.63	Whale Pump and Dedicated Tubing
		AD5-5	VR847	2017				1,053.68	85.70	967.98	5	1,053.68	
		AD5-6	PT422	2021				--	117.50	--	5	--	
Barron	BR3	BR3-1	BR279	1987	No	Yes	1,052.7	1,055.79	15.03	1,040.76	5	1,055.79	Peristolic Pump
		BR3-2	BR280	1987				1,055.37	20.02	1,035.35	5	1,055.37	
		BR3-3	BR281	1987				1,054.93	25.02	1,029.91	5	1,054.93	
Dane	DN1	DN1-1 ²	BR250	1985	93-57-04	Yes	743.7	744.38	12.10	732.28	5	744.38	
		DN1-1	PT428	2021				745.32	14.90	730.42	5	745.32	
		DN1-2	BR251	1985				745.87	17.40	728.47	5	745.87	
		DN1-3	BR252	1985				746.08	22.20	723.88	5	746.08	
Dunn	DU1	DU1-1	AO384	1989	No	Yes	852.5	853.92	34.90	819.02	5	853.92	Dedicated Bailer
		DU1-2	AO385	1989				854.87	40.80	814.07	5	854.87	
		DU1-3	AO386	1989				855.12	46.10	809.02	5	855.12	
	DU2	DU2-1	AO387	1989	No	Yes	856.2	858.05	26.70	831.35	5	858.05	Peristolic Pump
		DU2-2	AO388	1989				858.17	31.30	826.87	5	858.17	
		DU2-3	AO389	1989				858.48	36.60	821.88	5	858.48	
Grant	GR1	GR1-1	BR255	1985	93-57-04	No	683.8	686.32	12.50	673.82	5	686.32	Peristolic Pump
		GR1-2	BR256	1985				686.48	17.30	669.18	5	686.48	
		GR1-3	BR257	1985				686.12	21.60	664.52	5	686.12	
Iowa	IW1	IW1-1 ³	BH955	1986	93-57-04	Yes	722.5	723.85	17.10	706.75	5	723.85	Peristolic Pump
		IW1-2 ³	BH956	1986				723.84	21.30	702.54	5	723.84	
		IW1-3 ³	BH957	1986				723.67	26.70	696.97	5	723.67	
		IW1-4	BR259	1986				723.67	61.99	661.68	5	723.67	Whale Pump and Dedicated Tubing
		IW1-5	BR260	1986				723.06	93.97	629.09	5	723.06	
		IW1-6	BR261	1986				726.76	14.80	711.96	5	726.76	Peristolic Pump
		IW1-7	BH967	1987				726.50	19.70	706.80	5	726.50	
		IW1-8	PT425	2021				726.40	24.70	701.70	5	726.40	
	IW2	IW2-1	BR036	1986	93-57-04	Yes	723.8	725.89	65.92	659.97	5	725.89	Whale Pump and Dedicated Tubing
		IW2-2	BR037	1986				726.24	94.81	631.43	5	726.24	
IW2-3		BR038	1986	726.76				14.80	711.96	5	726.76	Peristolic Pump	
IW2-4		PT426	2021	726.50				19.70	706.80	5	726.50		
IW2-5	PT427	2021	726.40	24.70	701.70	5	726.40						
Jackson	JK3	JK3-1	JH991	2005	94-27-04	No	1,025.3	1,028.06	27.33	1,000.73	10	1,028.06	Peristolic Pump
		JK3-2	JH981	2005			1,023.7	1,026.44	25.77	1,000.67	10	1,026.44	
Juneau	JN1	JN1-1	BR046	1985	No	Yes	939.7	941.26	11.70	929.56	5	941.26	Peristolic Pump
		JN1-2	BR047	1985				941.21	16.70	924.51	5	941.21	
		JN1-3	BR048	1985				941.34	21.50	919.84	5	941.34	
	JN3	JN3-1	JH937	2005	94-29-01	No	901.5	903.84	20.42	883.42	10	903.84	Peristolic Pump
JN3-2		JH936	2005	902.0				905.20	18.14	887.06	10	905.20	
La Crosse	LC2	LC2-1	VZ391	2011	No	Yes	684.1	686.40	49.22	637.18	10	686.40	Dedicated Bailer
		LC2-2	VZ392	2011				687.8	681.91	43.98	637.93	10	

Langlade	LN1	LN1-1	BH964	1986	No	No	1,471.6	1,473.85	14.80	1,459.05	5	1,473.85	Peristolic Pump
		LN1-2	BH965	1986				1,474.44	19.70	1,454.74	5	1,474.44	
		LN1-3	BH966	1986				1,473.74	24.80	1,448.94	5	1,473.74	
Portage	PR1	PR1-1	BR207	1986	No	Yes	1,079.7	1,082.01	12.70	1,069.31	5	1,082.01	Peristolic Pump
		PR1-2	BR208	1988				1,081.94	17.60	1,064.34	5	1,081.94	
		PR1-3	BR209	1988				1,081.72	22.50	1,059.22	5	1,081.72	
		PR1-4	VR848	2017				1,082.83	55.30	1,027.53	5	1,082.83	Whale Pump and Dedicated Tubing
		PR1-5	VR849	2017				1,082.77	84.70	998.07	5	1,082.77	
St. Croix	SC1	SC1-1	JH938	2005	94-56-02	Yes	1,006.8	1,010.14	24.87	985.27	10	1,010.14	Peristolic Pump
		SC1-1 (D)	VZ390	2011				1,009.16	30.10	979.06	10	1,009.16	
		SC1-2	JH939	2005				1,006.63	21.87	984.76	10	1,006.63	
		SC1-2(D)	VZ393	2011				1,006.40	30.17	976.23	10	1,006.40	
Sauk	SK6	SK6-1	BB246	1988	93-57-04	Yes	711.8	713.68	14.92	698.76	5	713.68	Peristolic Pump
		SK6-2	BB247	1988				713.37	20.04	693.33	5	713.37	
		SK6-3	BB248	1988				713.55	25.10	688.45	5	713.55	
		SK6-4	PT424	2021				710.2	711.56	53.42	658.14	5	711.56
Trempealeau	TR1	TR1-1	PX201	2005	No	Yes	730.4	733.29	75.55	657.74	10	733.29	Dedicated Bailer
		TR1-2	PX202	2005				731.1	733.83	75.20	658.63	10	
Waupaca	WP2	WP2-1	JH985	2005	94-69-01	No	908.4	911.03	20.45	890.58	10	911.03	Peristolic Pump
		WP2-2	JH984	2005				905.7	908.82	20.43	888.39	10	
Waushara	WS4	WS4-1	BB258	1988	93-70-01	Yes	1,082.4	1,084.97	17.13	1,067.84	5	1,084.97	Peristolic Pump
		WS4-2	BB259	1988				1,085.03	22.02	1,063.01	5	1,085.03	
		WS4-3	BB260	1988				1,084.98	27.16	1,057.82	5	1,084.98	
		WS4-4	BB261	1988				1,084.88	31.94	1,052.94	5	1,084.88	
	WS6	WS6-1	JH989	2005	93-70-01	Yes	1,076.8	1,080.90	18.27	1,062.63	10	1,080.90	Peristolic Pump
		WS6-2	JH990	2005				1,079.07	17.02	1,062.05	10	1,079.07	
	WS7	WS7-1	VR841	2017	No	Yes	1,075.7	1,078.65	18.40	1,060.25	10	1,078.65	Peristolic Pump
		WS7-2	VR842	2017				1,078.79	54.70	1,024.09	5	1,078.79	
WS7-3		VR843	2017	1,078.78				84.80	993.98	5	1,078.78	Whale Pump and Dedicated Tubing	
WS7-4		PT423	2021	--				104.10	--	5	--		

- Notes:
- Elevation surveying in progress.
 - 1 Monitoring well was abandoned on May 30, 2019 because integrity of protective casing was compromised during spring 2019 sampling.
 - 2 Monitoring well was abandoned on December 13, 2018 because integrity of protective casing was compromised by a vehicle prior to fall 2018 sampling.
 - 3 Monitoring wells were abandoned June 11, 1993 because they were no longer needed for the monitoring program.
 - 4 Monitoring wells were abandoned December 1, 2021 because ownership no longer wished to participate in the monitoring program.
- WUWN Wisconsin Unique Well Number
 MSL Mean sea level
 TPVC Top of well casing (PVC)
- | | |
|--|--|
| | Monitoring Well/Piezometer abandoned. |
| | Monitoring Well/Piezometer construction was financed by a 2021 U.S. EPA grant. |
| | Monitoring Well/Piezometer construction was financed by a 2017 U.S. EPA grant. |
| | Monitoring Well/Piezometer construction was financed by a 2011 U.S. EPA grant. |
| | Monitoring Well/Piezometer construction was financed by a 2005 U.S. EPA grant. |
| | Monitoring Wells/Piezometers associated with initial program activities and financed by State. |

Table B 2: 2024 Sample Analytes, Applicable Wis. Admin. Code ch. NR 140 PALs & ESs, Drinking Water Health Advisories, and Reporting Limits

Analyte Description	Preventive Action Limit*	Enforcement Standard*	Advisory**	Reporting Limit (µg/l)
2,4-D (dichlorophenoxyacetic acid)	7	70		0.050
2,4-DB				1.00
2,4-DP				0.050
2,4,5-T				0.050
2,4,5-TP (trichlorophenoxy-prop. acid)	5	50		0.050
ACETAMIPRID				0.010
ACETOCHLOR	0.7	7		0.050
ACETOCHLOR ESA	46	230		0.050
ACETOCHLOR OA	46	230		0.30
ACETOCHLOR COMBINATION (calculated)	46 ¹	230 ¹		---
ACIFLUORFEN				0.050
ALACHLOR	0.2	2		0.050
ALACHLOR ESA	4	20		0.050
ALACHLOR OA				0.25
ALDICARB SULFONE				0.050
ALDICARB SULFOXIDE				0.071
AMINOPYRALID				0.150
ATRAZINE	0.3	3		0.050
DE-ETHYL ATRAZINE	0.3	3		0.050
DEISOPROPYL ATRAZINE	0.3	3		0.050
DIAMINO ATRAZINE	0.3	3		0.150
ATRAZINE TCR (calculated)	0.3 ³	3 ³		---
AZOXYSTROBIN				0.050
BENFLURALIN				0.050
BENTAZON	60	300		0.050
BICYCLOPYRONE				0.050
BIFENTHRIN				0.005
BOSCALID				0.500
BROMACIL				0.050
CARBARYL	4	40		0.050
CARBOFURAN	8	40		0.050
CHLORAMBEN	30	150		0.32
CHLORANTRANILIPROLE			16,000	0.050
CHLOROTHALONIL				0.10
CHLORPYRIFOS	0.4	2		0.050
CHLORPYRIFOS OXYGEN ANALOG				0.050
CLOMAZONE				0.050
CLOPYRALID				0.100
CLOTHIANIDIN			1,000	0.010
CYANTRANILIPROLE				0.050
CYCLANILIPROLE				0.20
CYFLUTHRIN				0.050
CYPERMETHRIN				0.10
CYPROSULFAMIDE				0.050
DACTHAL	14	70		0.050
DACTHAL DI-ACID			70	0.050
DACTHAL MONO-ACID			70	0.050
DACTHAL COMBINATION (calculated)			70 ²	---
DIAZINON				0.050
DIAZINON OXYGEN ANALOG				0.050
DICAMBA	60	300		0.250
DICHLORBENIL				0.050
DIMETHENAMID	5	50		0.050
DIMETHENAMID ESA				0.050
DIMETHENAMID OA				0.050
DIMETHOATE	0.4	2		0.050
DINOTEFURAN				0.010
DIURON				0.050
EPTC	50	250		0.050
ESFENVALERATE				0.025

Analyte Description	Preventive Action Limit*	Enforcement Standard*	Advisory**	Reporting Limit
ETHALFLURALIN				0.050
ETHOFUMESATE				0.050
FLUMETSULAM			10,000	0.050
FLUPYRADIURONE				0.050
FLUROXYPYR				0.050
FOMESAFEN			25	0.050
GLYPHOSATE			10,000	0.50
GLYPHOSATE AMMONIUM				0.50
AMPA			10,000	0.50
HALOSULFURON METHYL				0.050
HEXAZINONE			400	0.050
HYDROXYATRAZINE				0.050
IMAZAPYR				0.050
IMAZETHAPYR				0.050
IMIDACLOPRID			0.2	0.010
ISOXAFUTOLE			3	0.050
ISOXAFUTOLE DKN			3	0.050
ISOXAFUTOLE COMBINATION (calculated)			3 ⁴	---
LAMBDA-CYHALOTHRIN				0.020
LINURON				0.050
MALATHION				0.050
MCPA				0.050
MCPB				0.10
MCPP				0.050
MESOTRIONE				0.10
METALAXYL			800	0.050
METHYL PARATHION				0.050
METOLACHLOR	10	100		0.050
METOLACHLOR ESA	260	1,300		0.050
METOLACHLOR OA	260	1,300		0.27
METOLACHLOR COMBINATION (calculated)	260 ⁵	1,300 ⁵		---
METRIBUZIN	14	70		0.050
METRIBUZIN DA				0.10
METRIBUZIN DADK				0.12
METSULFURON-METHYL				0.050
NICOSULFURON				0.050
NORFLURAZON				0.050
OXADIAZON				0.050
PENDIMETHALIN				0.050
PERMETHRIN				0.030
PICLORAM	100	500		0.050
PROMETONE	20	100		0.050
PROMETRYN				0.050
PROPICONAZOLE				0.050
PROTHIOCONAZOLE-DESTHIO				0.050
PYROXASULFONE				0.050
PYROXASULFONE M1				0.050
SAFLUFENACIL			460	0.050
SIMAZINE	0.4	4		0.050
SULFENTRAZONE			1,000	0.050
SULFENTRAZONE-3-CARBOXYLIC ACID				0.100
SULFOMETURON-METHYL				0.050
TEBUCONAZOLE				0.050
TEBUPIRIMPHOS				0.050
TEMBOTRIONE				0.10
THIACLOPRID				0.010
THIAMETHOXAM			120	0.010
THIENCARBAZONE-METHYL			800	0.050
TRICLOPYR				0.050
TRIFLURALIN	0.75	7.5		0.050
NITROGEN-NITRATE/NITRITE (mg/L)	2	10		0.5

All concentrations are presented as micrograms per liter (µg/L) or parts per billion, except for Nitrogen.

* Wisconsin Administrative Code Chapter NR 140.

** Wisconsin Department of Health Services Drinking Water Health Advisory (June 2019, November 2020, Revised February 2022).

¹ Combined sum of acetochlor metabolites ESA and OA.

² Combined sum of metabolites (di- and mono-acid) and parent material dacthal.

³ Total Chlorinated Residue for Atrazine. Combined sum of metabolites (de-ethyl, de-isopropyl and di-amino) and parent material atrazine.

⁴ Combined sum of metabolite (DKN) and parent material isoxaflutole.

⁵ Combined sum of metolachlor metabolites ESA and OA.

mg/L - milligrams per liter or parts per million.

DA - desamino

DADK - desaminodiketo

DKN - diketonitrile

ESA - ethane sulfonic acid.

OA - oxanilic acid, can also be identified as OXA.

Table B 3: Field-Edge Groundwater Monitoring Program - 2024 Groundwater Analytical Results

2024 Ground Water Project Results (all concentrations in ug/L)							Wisconsin Department of Health Services	Wisconsin Admin. Code Chapter NR 140	
Pesticide Name	Pesticide Class	Reporting Limit	Number of Sites with Detects ¹	Number of Total Detects ²	Percent of Samples with Detects	Concentration Range	Drinking Water Health Advisory ³	Enforcement Standard	Preventive Action Limit
2,4-D (dichlorophenoxyacetic acid)	Herbicide	0.05	--	--	--	--	--	70	7
2,4-DB	Herbicide	1.00	--	--	--	--	--	--	--
2,4-DP	Herbicide	0.05	--	--	--	--	--	--	--
2,4,5-T	Herbicide	0.05	--	--	--	--	--	--	--
2,4,5-TP (trichlorophenoxy-propionic acid)	Herbicide	0.05	--	--	--	--	--	50	5
Acetamiprid	Insecticide	0.010	--	--	--	--	--	--	--
Acetochlor	Herbicide	0.05	--	--	--	--	--	7	0.7
Acetochlor ESA	Metabolite	0.05	12	32	37.2%	4.61 - 0.0527	--	230	46
Acetochlor OA	Metabolite	0.3	--	--	--	--	--	230	46
Acetochlor Combination ⁴	Summation	N/A	12	32	37.2%	1.69 - 0.0517	--	230 ⁴	46 ⁴
Acifluorfen	Herbicide	0.05	--	--	--	--	--	--	--
Alachlor	Herbicide	0.05	--	--	--	--	--	2	0.2
Alachlor ESA	Metabolite	0.05	15	56	65.1%	0.0509-10.6	--	20	4
Alachlor OA	Metabolite	0.25	4	6	7.0%	0.293-0.847	--	--	--
Aldicarb Sulfone	Insecticide	0.05	--	--	--	--	--	--	--
Aldicarb Sulfoxide	Insecticide	0.071	--	--	--	--	--	--	--
Aminopyralid	Herbicide	0.15	1	1	1.2%	0.543	--	--	--
Atrazine	Herbicide	0.05	7	11	12.8%	0.0664-2.4	--	3	0.3
De-ethyl atrazine	Metabolite	0.05	10	26	30.2%	0.0533-0.772	--	3	0.3
De-isopropyl atrazine	Metabolite	0.05	9	16	18.6%	0.0577-0.202	--	3	0.3
Di-amino atrazine	Metabolite	0.15	4	7	8.1%	0.162-0.325	--	3	0.3
Atrazine (TCR)	Summation	N/A	14	29	41.9%	0.0577-3.037	--	3	0.3
Azoxystrobin	Fungicide	0.05	--	--	--	--	--	--	--
Benfluralin	Herbicide	0.05	--	--	--	--	--	--	--
Bentazon	Herbicide	0.05	6	11	12.8%	0.075 - 5.1	--	300	60
Bicyclopyrone	Herbicide	0.05	1	4	4.7%	0.0796 - 1	--	--	--
Bifentrin	Insecticide	0.0050	--	--	--	--	--	--	--
Boscalid	Fungicide	0.50	7	11	12.8%	0.0572-0.599	--	--	--
Bromacil	Herbicide	0.05	--	--	--	--	--	--	--

Carbaryl	Insecticide	0.05	--	--	--	--	--	40	4
Carbofuran	Insecticide	0.05	--	--	--	--	--	40	8
Chloramben	Herbicide	0.32	--	--	--	--	--	150	30
Chlorantraniliprole	Insecticide	0.050	8	23	26.7%	0.0525-0.838	16,000	--	--
Chlorothalonil	Fungicide	0.10	--	--	--	--	--	--	--
Chlorpyrifos	Insecticide	0.05	--	--	--	--	--	2	0.4
Chlorpyrifos Oxon	Metabolite	0.05	--	--	--	--	--	--	--
Clomazone	Herbicide	0.05	--	--	--	--	--	--	--
Clopyralid	Herbicide	0.10	1	1	1.2%	0.142	--	--	--
Clothianidin	Insecticide	0.010	18	69	80.2%	0.0121-3.17	1,000	--	--
Cyantraniliprole	Insecticide	0.050	3	3	3.5%	0.0518-0.694	--	--	--
Cyfluthrin	Insecticide	0.2	--	--	--	--	--	--	--
Cyfluthrin	Insecticide	0.050	--	--	--	--	--	--	--
lambda- Cyhalothrin	Insecticide	0.020	--	--	--	--	--	--	--
Cypermethrin	Insecticide	0.1	--	--	--	--	--	--	--
Cyprosulfamide	Safener	0.05	--	--	--	--	--	--	--
Dacthal	Herbicide	0.05	--	--	--	--	--	70	14
Dacthal Di-acid	Metabolite	0.05	--	--	--	--	70	--	--
Dacthal Mono-acid	Metabolite	0.05	--	--	--	--	70	--	--
Dacthal Combination ⁵	Summation	N/A	--	--	--	--	70 ⁵	--	--
Diazinon	Insecticide	0.05	--	--	--	--	--	--	--
Diazinon oxon	Metabolite	0.05	--	--	--	--	--	--	--
Dicamba	Herbicide	0.25	--	--	--	--	--	300	60
Dichlobenil	Herbicide	0.05	--	--	--	--	--	--	--
Dimethenamid	Herbicide	0.05	1	2	2.3%	0.152-2.62	--	50	5
Dimethenamid ESA	Metabolite	0.05	4	10	1.2%	0.0675-6.92	--	--	--
Dimethenamid OA	Metabolite	0.05	1	2	2.3%	0.665-3.27	--	--	--
Dimethoate	Insecticide	0.050	--	--	--	--	--	2	0.4
Dinotefuran	Insecticide	0.010	--	--	--	--	--	--	--
Diuron	Herbicide	0.05	--	--	--	--	--	--	--
EPTC	Herbicide	0.05	--	--	--	--	--	250	50
Esfenvalerate	Insecticide	0.025	--	--	--	--	--	--	--
Ethalfuralin	Herbicide	0.05	--	--	--	--	--	--	--
Ethofumesate	Herbicide	0.05	--	--	--	--	--	--	--
Flumetsulam	Herbicide	0.05	2	3	3.5%	0.0572-0.0996	10,000	--	--
Flupyradifurone	Insecticide	0.05	--	--	--	--	--	--	--

Fluroxypyr	Insecticide	0.050	--	--	--	--	--	--	--
Fomesafen	Herbicide	0.05	3	7	8.1%	0.061-0.231	25	--	--
Halosulfuron methyl	Herbicide	0.05	--	--	--	--	--	--	--
Hexazinone	Herbicide	0.05	--	--	--	--	400	--	--
Hydroxyatrazine	Metabolite	0.50	6	17	19.8%	0.0513-0.179	--	--	--
Imazapyr	Herbicide	0.05	--	--	--	--	--	--	--
Imazethapyr	Herbicide	0.05	1	1	1.2%	0.0816	--	--	--
Imidacloprid	Insecticide	0.010	11	39	45.3%	0.0108-0.301	0.2	--	--
Isoxaflutole	Herbicide	0.05	--	--	--	--	3	--	--
Isoxaflutole DKN	Metabolite	0.05	--	--	--	--	3	--	--
Isoxaflutole Combination ⁶	Summation	N/A	--	--	--	--	3 ⁶	--	--
Linuron	Herbicide	0.05	--	--	--	--	--	--	--
MCPA	Herbicide	0.05	--	--	--	--	--	--	--
MCPB	Herbicide	0.1	--	--	--	--	--	--	--
MCPP	Herbicide	0.05	--	--	--	--	--	--	--
Malathion	Insecticide	0.05	--	--	--	--	--	--	--
Mesotrione	Herbicide	0.1	--	--	--	--	--	--	--
Metalaxyl	Fungicide	0.05	9	20	23.3%	0.0579-0.856	800	--	--
Methyl Parathion	Insecticide	0.05	--	--	--	--	--	--	--
Metolachlor	Herbicide	0.05	10	35	40.7%	0.0526-418	--	100	10
Metolachlor ESA	Metabolite	0.05	22	85	98.8%	0.055-36.8	--	1,300	260
Metolachlor OA	Metabolite	0.27	17	63	73.3%	0.334-40.1	--	1,300	260
Metochlor Combination ⁷	Summation	N/A	22	61	70.9%	959 - 0.0579	--	1,300 ⁷	260 ⁷
Metribuzin	Herbicide	0.05	10	31	36.0%	0.0535-10.6	--	70	14
Metribuzin DA	Metabolite	0.1	10	17	19.8%	0.115-2.11	--	--	--
Metribuzin DADK	Metabolite	0.12	12	34	39.5%	0.138-10.1	--	--	--
Metsulfuron methyl	Herbicide	0.05	--	--	--	--	--	--	--
Nicosulfuron	Herbicide	0.05	--	--	--	--	--	--	--
Norflurazon	Herbicide	0.05	--	--	--	--	--	--	--
Oxadiazon	Herbicide	0.05	--	--	--	--	--	--	--
Pendimethalin	Herbicide	0.05	--	--	--	--	--	--	--
Permethrin	Insecticide	0.030	--	--	--	--	--	--	--
Picloram	Herbicide	0.05	1	2	2.3%	129-371	--	500	100
Prometone	Herbicide	0.05	1	2	2.3%	0.0562-0.078	--	100	20
Prometryn	Herbicide	0.05	--	--	--	--	--	--	--
Propiconazole	Fungicide	0.05	--	--	--	--	--	--	--
Pyroxasulfone	Herbicide	0.05	1	1	1.2%	0.153	--	--	--

Pyroxa sulfone M-1	Metabolite	0.05	2	2	2.3%	0.0757-0.342	--	--	--
Prothioconazole-desthio	Metabolite	0.050	--	--	--	--	--	--	--
Saflufenacil	Herbicide	0.05	2	4	4.7%	0.0617-0.157	460	--	--
Simazine	Herbicide	0.05	2	5	5.8%	0.0658-0.173	--	4	0.4
Sulfentrazone	Herbicide	0.05	2	3	3.5%	0.0595-0.0693	1,000	--	--
Sulfentrazone 3-Carboxylic Acid	Metabolite	0.1	3	12	14.0%	0.154-0.356	--	--	--
Sulfometuron methyl	Herbicide	0.05	--	--	--	--	--	--	--
Tebuconazole	Fungicide	0.05	--	--	--	--	--	--	--
Tebupirimphos	Insecticide	0.05	--	--	--	--	--	--	--
Tembotrione	Herbicide	0.10	--	--	--	--	--	--	--
Thiacloprid	Insecticide	0.010	--	--	--	--	--	--	--
Thiamethoxam	Insecticide	0.010	14	39	45.3%	0.0109-3.58	120	--	--
Thiencarbazone methyl	Herbicide	0.05	--	--	--	--	800	--	--
Triclopyr	Herbicide	0.05	--	--	--	--	--	--	--
Trifluralin	Herbicide	0.05	--	--	--	--	--	7.5	0.75

Notes:

- 1 Total number of sites in 2024 were 22.
- 2 Total number of samples collected in 2024 were 86.
- 3 Wisconsin Department of Health Services (WDHS) Drinking Water Health Advisory (June 2019, November 2020, revised February 2022).
- 4 Combined sum of acetochlor metabolites ESA and OA.
- 5 Combined sum of metabolites (di- and mono-acid) and parent material dacthal.
- 6 Combined sum of metabolite DKN and parent material isoxaflutole.
- 7 Combined sum of metolachlor metabolites ESA and OA.
- Indicates that Health Advisory Level value in Wisconsin not established.

DKN diketonitrile

ESA ethane sulfonic acid

OA oxanilic acid; can also be identified as OXA.

µg/L micrograms per liter or parts per billion

TCR Total Chlorinated Residue for Atrazine. Reflects an additive quantity of atrazine (parent material) and its three metabolites (de-ethyl, de-isopropyl and di-amino atrazine).

Indicates no detects in excess of laboratory reporting limits.

Indicates detects in excess of laboratory reporting limits.

Indicates detects in excess of laboratory reporting limits and a Wis. Admin. Code ch. NR 140 Preventive Action Limit.

Indicates detects in excess of laboratory reporting limits and either a Wis. Admin. Code ch. NR 140 Enforcement Standard or a WDHS Drinking Water Health Advisory.

Table B 4: Field-Edge Groundwater Monitoring Program - 2024 Land Pesticide/Nitrogen - and Irrigation-Use (as Provided by Growers)

COUNTY	SITE (Grower)	YEAR	CROP	NUTRIENT MANAGEMENT PLAN	IRRIGATION APPLIED (in inches)	NITROGEN APPLIED (in lbs/acre)	PESTICIDE PRODUCT APPLIED					
Adams	AD2	2016	corn silage	---	6.45	374.8	glyphosate atrazine dicamba					
		2017 ¹	---	---	---	---	---					
		2018 ¹	---	---	---	---	---					
		2019 ¹	---	---	---	---	---					
		2020 ¹	---	---	---	---	---					
		2021 ¹	---	---	---	---	---					
		2022 ¹	---	---	---	---	---					
		2023 ¹	---	---	---	---	---					
		2024 ¹	---	---	---	---	---					
	AD5	2016 ¹	---	---	---	---	---	---				
		2017 ¹	---	---	---	---	---	---				
		2018 ¹	---	---	---	---	---	---				
		2019 ¹	---	---	---	---	---	---				
		2020 ¹	---	---	---	---	---	---				
		2021 ¹	---	---	---	---	---	---				
		2022 ¹	---	---	---	---	---	---				
		2023 ¹	---	---	---	---	---	---				
		2024 ¹	---	---	---	---	---	---				
Barron	BR3	2016 ¹	---	---	---	---	---					
		2017 ¹	---	---	---	---	---					
		2018 ¹	---	---	---	---	---					
		2019	corn	no	2.24	300	glyphosate topramezone, dimethenamid acetochlor, flumetsulam, clopyralid					
		2020 ¹	---	---	---	---	---					
		2021 ¹	---	---	---	---	---					
		2022 ¹	---	---	---	---	---					
		2023 ¹	---	---	---	---	---					
		2024 ¹	---	---	---	---	---					
Dane	DN1	2016	seed corn	---	3	216.7	simazine metolachlor mesotrione topramezone bifenthrin pyraclastrobin, metconazole 2,4-D					
							glyphosate sodium chlorate					
							2017	soybeans	---	2	6.0	glyphosate clethodim lambda-cyhalothrin glufosinate

												glyphosate metribuzin dimethenamid glufosinate clethodim lambda-cyhalothrin
							2020	seed corn	yes	4	201.95	metolachlor glycine mesotrione simazine topramezone acetochlor simazine azoxystrobin, cyproconazole bifenthrin metaconazole, pyraclastrobin

		2022	corn	yes	5	415						simazine bifenthrin pydiflumatafen metolachlor glyphosate mesotrione acetochlor azoxystrobin
												glyphosate
												metribuzin
		2023	soybeans	yes	8	0						bifenthrin, imidacloprid glufosinate lambda-cyhalothrin 2,4-D
							glyphosate					
							simazine					
		2024	seed corn	yes	4	290	glyphosate simazine bicycloprone, mesotrione, s- metolachlor bifenthrin glufosinate topramezone azoxystrobin, propiconazole, pydiflumetofen					

Dunn	DU 1	2016	soybeans	---	3.43	100.0	dimethenamid flumioxazin clethodim benzoic acid	
		2017	horseradish	---	0.8	140.5	peroxyacetic acid, hydrogen peroxide oxyfluorfen sulfentrazone glyphosate clethodim boscolid chlorothalonil	
		2018	corn (grain)	no	3.97	193.3	glyphosate dicamba dimethenamid, safinufenacil	
		2019 ¹	---	---	---	---	---	
		2020	kidney beans	no	2.5	91.98	pendimethalin metolachlor imazamox sodium bentazon clethodim beta-cyfluthrin, imidacloprid saflufenacil	
		2021	corn	no	15.6	1076.9	dicamba dimethenamide glyphosate saflufenacil	
		2022 ¹	---	---	---	---	---	
		2023 ¹	---	---	---	---	---	
		2024 ¹	---	---	---	---	---	
		2016	corn	---	8	241.0	glyphosate dimethenamid, safinufenacil	
		2017	kidney beans	---	4	85.0	pendimethalin metolachlor bentazon fomesafen imazamox clethodim saflufenacil thiamethoxam, fludioxonil	
		2018	corn	---	5	66.2	dimethenamid, safinufenacil glyphosate atrazine pendimethalin	
		2019	kidney beans	yes	3.25	72.5	glyphosate metolachlor imazamox bentazon fomesafen clethodim imidacloprid saflufenacil	
		2020	kidney beans	no	2.5	91.98	pendimethalin metolachlor imazamox sodium bentazon clethodim beta-cyfluthrin, imidacloprid saflufenacil	
		2021	corn	no	4.2	85	clothianidin glyphosate dicamba dimethenamide pyoxasulfone saflufenacil	
	2022	soybeans	no	4	0	metolachlor metribuzin glufosinate glyphosate		
	2023	corn	no	8	255	dimethenamid, saflufenacil dicamba glyphosate		
	2024 ¹	---	---	---	---	---		
	2016 ¹	---	---	na	---	---		
	2017 ¹	---	---	na	---	---		
	2018 ¹	---	---	na	---	---		
	2019 ¹	---	---	na	---	---		
	2020 ¹	---	---	na	---	---		
	2021 ¹	---	---	na	---	---		
	2022 ¹	---	---	na	---	---		
	2023 ¹	---	---	na	---	---		
	2024 ¹	---	---	na	---	---		
	Grant	GR1						

Iowa	IW1	2016	potatoes	---	18.4	374.4	metam sodium azoxystrobin, difenoconazole metalaxyl imidacloprid azoxystrobin metribuzin novaluron spinosad beta-cyfluthrin rimsulfuron chlorothalonil pyraclostrobin boscalid abamectin pyrimethanil mancozeb diquat bromide glyphosate bifenthrin glufosinate MCPA, bromoxynil pendimethalin pyraclostrobin, metconazole propiconazole, azoxystrobin	
		2017	seed corn	---	8.9	198.5	thiamethoxam halosulfuron-methyl s-metolachlor imazamox, bentazon sethoxydim	
		2018	snap beans	no	5.7	77.0	---	
		2019 ¹	---	---	---	---	---	
		2020	potatoes	no	21	225.93	bifenthrin, pyraclostrobin metribuzin metolachlor indoxacarb acetamiprid chlorothalonil spinosad lambda-cyhalothrin mefenitroconazole abamectin zoxamide pyrimethanil mancozeb fentin hydroxide diquat dibromide	
		2021	seed corn	no	9.4	199	abamectin azoxystrobin bifenthrin bromoxynil fludioxonil tembotrione glyphosate mefenoxam pendimethalin propiconazole pydiflumetofen thiabendazole thiamethoxam	
		2022 ¹	---	---	---	---	---	
		2023	seed corn	no	15.665	321.29	azoxystrobin bifenthrin bicyclopyrone metolachlor mesotrione glyphosate glufosinate pendimethalin propiconazole pydiflumetofen pyraclostrobin metconazole	
		2024 ¹	---	---	---	---	---	
		IW2	2016	seed corn	---	12.8	195.5	glyphosate bifenthrin metolachlor pendimethalin tembotrione bromoxynil azoxystrobin glyphosate EPTC
			2017	snap beans	---	6.6	72.2	thiamethoxam bifenthrin imazamox, bentazon
			2018	seed corn	no	12.1	256.0	bifenthrin bicyclopyrone, metolachlor, mesotrione pendimethalin thiamethoxam azoxystrobin
	2019 ¹		---	---	---	---	---	
	2020		seed corn	no	10.6	223.2	bifenthrin glufosinate metolachlor nicosulfuron pyoxasulfone pendimethalin	
	2021		snap beans	no	5.2	65	azoxystrobin, propiconazole, pydiflumetofen bifenthrin captan glyphosate imazamox, bentazon halosulfuron-methyl metalaxyl sethoxydim metolachlor thiophanate-methyl thiram thiamethoxam	
	2022 ¹		---	---	---	---	---	
	2023		potatoes	yes	30.2	54.3	glyphosate polyacrylamide pendimethalin metolachlor novaluron indoxacarb toflenpyrad clethodim pyrimethanil chlorothalonil bifenthrin metalaxyl dimethylpolysiloxane	
	2024 ¹		---	---	---	---	---	

Jackson	JK3	2016 ¹	---	---	na	---	---
		2017 ¹	---	---	na	---	---
		2018 ¹	---	---	na	---	---
		2019 ¹	---	---	na	---	---
		2020 ¹	---	---	na	---	---
		2021 ¹	---	---	na	---	---
		2022 ¹	---	---	na	---	---
		2023	coen/soybeans	no	na	275	glyphosate acetochlor, clopyralid, flumetsulam dicamba 2,4-D
2024 ¹	---	---	na	---	---		
Juneau	JN1	2016	sweet corn	---	8	211.0	atrazine metolachlor
		2017	snap beans	---	2.9	122.0	metolachlor halosulfuron-methyl
		2018	sweet corn	no	8	228.6	atrazine metolachlor
		2019	potatoes	no	12.5	65.05	azoxystrobin
							chlorothalonil
							esfenvalerate
							spinosad
							thiamethoxam
	diquat dibromide						
	2020	sweet corn	no	9.5	212.37	boscalid metribuzin cyantraniliprole, abamectin metam sodium metalaxyl atrazine metolachlor	
	2021	snap beans	no	5	152.6	halosulfuron-methyl metolachlor	
	2022 ¹	---	---	---	---	---	
	2023 ¹	---	---	---	---	---	
	2024 ¹	---	---	---	---	---	
	JN3	2016 ¹	---	---	na	---	---
		2017 ¹	---	---	na	---	---
		2018 ¹	---	---	na	---	---
2019 ¹		---	---	na	---	---	
2020 ¹		---	---	na	---	---	
2021 ¹		---	---	na	---	---	
2022 ¹		---	---	na	---	---	
2023 ¹	---	---	na	---	---		
2024 ¹	---	---	na	---	---		
La Crosse	LC2	2016	corn silage	---	---	179.5	glyphosate lorsban acetochlor dicamba
		2017	soybeans	---	---	0.0	glyphosate 2,4-D imazethapyr
		2018	corn	yes	2.5	705.7	glyphosate atrazine, acetochlor
		2019	beans	---	---	0.0	mesotrione
							glyphosate
							methansulfonamide
		2020 ¹	---	---	---	---	metribuzin metolachlor glyphosate, imazethapyr
		2021 ¹	---	---	---	---	---
		2022	alfalfa	yes	5.25	0	none
		2023 ¹	---	---	---	---	---
2024 ¹	---	---	---	---	---		
Langlade	LN1	2016 ¹	---	---	---	---	---
		2017 ¹	---	---	---	---	---
		2018 ¹	---	---	---	---	---
		2019 ¹	---	---	---	---	---
		2020 ¹	---	---	---	---	---
		2021 ¹	---	---	---	---	---
		2022	sweet corn	yes	2	220	nicosulfuron
		2023 ¹	---	---	---	---	---
2024 ¹	---	---	---	---	---		
Portage	PR1	2016 ¹	---	---	---	---	---
		2017 ¹	---	---	---	---	---
		2018	sweet corn	yes	4.6	164.0	metolachlor atrazine chlorothalonil
		2019	potatoes	yes	6.7	159	azoxystrobin
							spinetram
							abamectin, cyantraniliprole
							imidacloprid
		2020 ¹	field corn	---	7.2	167.17	novaluron diqist glyphosate
2021 ¹	---	---	---	---	---		
2022 ¹	---	---	---	---	---		
2023 ¹	---	---	---	---	---		
2024	english peas	yes	---	20	imazamox bentazon		

St. Croix	SC1	2016	soybeans	---	na	---	glyphosate
		2017	corn	---	na	250.0	glyphosate
		2018	soybeans	no	na	0.0	tembotrione
		2019 ¹	---	---	na	---	acetochlor
		2020 ¹	---	---	na	---	glyphosate
		2021 ¹	---	---	na	---	---
		2022 ¹	---	---	na	---	---
		2023 ¹	---	---	na	---	---
		2024 ¹	---	---	na	---	---
		Sauk	SK6	2016 ¹	---	---	na
2017 ¹	---			---	na	---	---
2018 ¹	---			---	na	---	---
2019 ¹	---			---	---	---	---
2020 ¹	---			---	---	---	---
2021 ¹	---			---	---	---	---
2022 ¹	---			---	---	---	---
2023 ¹	---			---	---	---	---
Trempealeau	TR1	2016 ¹	---	---	---	---	---
		2017 ¹	---	---	---	---	---
		2018 ¹	---	---	---	---	---
		2019 ¹	---	---	---	---	---
		2020 ¹	---	---	---	---	---
		2021 ¹	---	---	---	---	---
		2022 ¹	---	---	---	---	---
		2023	corn	yes	12	400	glyphosate
		2024	peas/beans	yes	12	225	MCPB
		Waupaca	WP2	2016	corn	---	na
2017	soybeans			---	na	0.0	2,4-D
2018	soybeans			yes	na	0.0	glyphosate
2019	corn			yes	na	122.0	acetochlor
2020	corn			yes	na	97.9	clopyralid, flumetsulam
2021	soybeans			yes	na	0	glyphosate
2022 ¹	---			---	---	---	---
2023	corn			yes	na	225	glyphosate
2024 ¹	---			---	---	---	acetochlor, clopyralid, flumetsulam

Waushara	WS4	2016	carrots	---	9.08	176.0	glyphosate pendimethalin chlorothalonil esfenvalerate clethodim azoxystrobin
		2017	potatoes	---	13.62	115.1	glyphosate thiamethoxam, fludioxonil mancozeb azoxystrobin pentachloronitrobenzene metolachlor metribuzin rimsulfuron chlorothalonil novaluron metalaxyl spinosad boscolid cyantraniliprole, abamectin pyraclostrobin oxathiapiprolin fentin hydroxide diquat bromide metolachlor
		2018	corn	no	9.1	70.6	simazine glyphosate ammonium sulfamate
		2019	beans	no	2.42	24.96	metolachlor halosulfuron-methyl
		2020	carrots	no	12.12	241.3	pendimethalin clethodim prometryn carfentrazone-ethyl esfenvalerate chlorothalonil azoxystrobin boscalid
		2021	potatoes	no	12.71	292.3	abamectin cyantraniliprole esfenvalerate metolachlor novaluron pendimethalin phosmet spinetoram
		2022 ¹	---	---	---	---	---
		2023	beans	no	6.65	42.5	metolachlor halosulfuron-methyl chlorothalonil
		2024	potatoes	no	8.85	628.4	boscalid cyantraniliprole, abamectin pyrimethanil afidopyropen diquat dibromide esfenvalerate azoxystrobin glyphosate
		2016	corn	---	8.35	70.4	glyphosate simazine metolachlor
	2017	beans	---	6	105.6	glyphosate metolachlor halosulfuron-methyl clethodim	
	2018	carrots	no	12.76	254.1	carfentrazone-ethyl cypermethrin azoxystrobin pendimethalin	
	2019	potatoes	no	10.9	200.16	metribuzin novaluron phosmet chlorothalonil boscolid cyantraniliprole, abamectin metalaxyl fentin hydroxide diquat dibromide	
	2020	corn	no	7.93	70.78	glyphosate metolachlor simazine tembotrione metolachlor	
	2021	corn	no	14.6	133	simazine topramezone	
	2022 ¹	---	---	---	---	---	
	2023	carrots	no	14.07	183	glyphosate chllopropham clethodim metribuzin	
	2024	corn	no	6.31	64	metolachlor simazine tembotrione	
	WS7	2016					
		2017					
		2018					
		2019					
		2020					
		2021					
	2022						
	2023						
	2024						

Notes:
¹ Grower did not provide information in Annual Reporting Form.
 Site is located within an atrazine Prohibition Area.
 --- Information not provided by Grower.
 na Fields are not equipped to irrigate.
 Site is a research location with multiple crops and herbicide types and application rates. Information not available for publication.

Table B 5: Field-Edge Groundwater Monitoring Program - 2024 Imidacloprid Concentrations in Groundwater Samples

County	Site (Grower)	Well Name	WUWN	Sample Date	Imidacloprid
Adams	AD2	AD2-1	BH954	6/6/2024	0
				8/8/2024	0
		AD2-3	BH952	8/8/2024	0.0377
		AD2-4	VR844	6/6/2024	0.0441
		AD2-5	VR845	6/6/2024	0.118
		AD2-6	PT421	6/6/2024	0
	AD5	AD5-1	CL461	6/6/2024	0.0117
		AD5-4	VR846	6/6/2024	0.0991
		AD5-5	VR847	6/6/2024	0.257
		AD5-6	PT422	6/6/2024	0.0312
Barron	BR3	BR3-1	BR279	5/16/2024	0
				10/9/2024	0
		BR3-3	BR281	5/16/2024	0
				10/9/2024	0
Dane	DN1	DN1-1	PT428	4/30/2024	0
				9/26/2024	0
		DN1-3	BR252	4/30/2024	0.0411
				9/26/2024	0.0328
Dunn	DU1	DU1-1	AO384	5/16/2024	0
				10/9/2024	0
		DU1-3	AO386	5/16/2024	0
				10/9/2024	0
	DU2	DU2-1	AO387	5/16/2024	0
				10/9/2024	0
		DU2-3	AO389	5/16/2024	0
				10/9/2024	0
Grant	GR1	GR1-1	BR255	4/30/2024	0
				9/26/2024	0
		GR1-3	BR257	4/30/2024	0
				9/26/2024	0
Iowa	IW1	IW1-4	BR259	6/12/2024	0.0359
				6/12/2024	0.0579
		IW1-6	BR261	6/12/2024	0.0303
				6/12/2024	0.116
		IW1-8	PT425	5/8/2024	0.116
	6/12/2024			0.0972	
	IW2	IW2-1	BR036	6/12/2024	0
		IW2-3	BR038	6/12/2024	0.301
IW2-4		PT426	6/12/2024	0.0947	
Jackson	JK3	JK3-1	JH982	4/22/2024	0
				4/22/2024	0
		JK3-2	JH981	4/22/2024	0
				4/22/2024	0
				4/22/2024	0
Juneau	JN1	JN1-1	BR046	4/18/2024	0
				10/3/2024	0
		JN1-3	BR048	4/18/2024	0.0317
	JN3	JH937	JH936	10/3/2024	0.0271
				4/22/2024	0
La Crosse	LC2	LC2-1	VZ391	5/15/2024	0
				10/8/2024	0
		LC2-2	VZ392	5/15/2024	0
				10/8/2024	0
				10/8/2024	0
Langlade	LN1	LN1-1	BH964	5/23/2024	0
				10/17/2024	0
		LN1-3	BH966	5/23/2024	0
				10/17/2024	0

Portage	PR1	PR1-1	BR207	5/23/2024	0
				10/17/2024	0
		PR1-3	BR209	5/23/2024	0.0154
				10/17/2024	0.0151
		PR1-4	VR848	5/23/2024	0.0221
				10/17/2024	0.0226
PR1-5	VR849	5/23/2024	0.0208		
		10/17/2024	0.021		
St. Croix	SC1	SC1-1	JH938	5/15/2024	0
				10/8/2024	0
Sauk	SK6	SK6-1	BB246	9/26/2024	0.0943
				4/30/2024	0.207
		SK6-3	BB248	4/30/2024	0.0851
				9/26/2024	0.0724
		SK6-4	PT424	4/30/2024	0
				9/26/2024	0
Trempealeau	TR1	TR1-1	PX201	5/15/2024	0
				TR1-2	PX202
Waupaca	WP2	WP2-1	JH985	5/23/2024	0
				10/17/2024	0
		WP2-2	JH984	5/23/2024	0
				10/17/2024	0
Waushara	WS4	WS4-1	BB258	5/8/2024	0.222
		WS4-4	BB261	5/8/2024	0.0305
	WS6	WS6-1	JH989	5/8/2024	0.0199
				8/8/2024	0.0136
		WS6-2	JH990	5/8/2024	0.0307
				8/8/2024	0.018
	WS7	WS7-1	VR841	5/8/2024	0.0342
		WS7-2	VR842	5/8/2024	0.0108
		WS7-3	VR843	5/8/2024	0.0229

Notes:

WUWN
µg/L
0

Wisconsin Unique Well Number
Micrograms per liter or parts per billion

Concentration does not exceed laboratory reporting limit of 0.01 µg/L.

Exceeds Wisconsin Department of Health Services Drinking Water Health Advisory of 0.2 µg/L (June 2019, November 2020, revised February 2022).

Table B 6: Field-Edge Groundwater Monitoring Program - 2024 Alachlor ESA Concentrations in Groundwater Samples

County	Site (Grower)	Well Name	WUWN	Sample Date	Alachlor ESA
Adams	AD2	AD2-1	BH954	6/6/2024	0.257
				8/8/2024	0.139
		AD2-3	BH952	8/8/2024	0.313
		AD2-4	VR844	6/6/2024	0.546
		AD2-5	VR845	6/6/2024	0.471
	AD2-6	PT421	6/6/2024	1.91	
	AD5	AD5-1	CL461	6/6/2024	0.5
		AD5-4	VR846	6/6/2024	1.03
		AD5-5	VR847	6/6/2024	3.41
AD5-6		PT422	6/6/2024	8.51	
Barron	BR3	BR3-1	BR279	5/16/2024	0
				10/9/2024	0
		BR3-3	BR281	5/16/2024	0
				10/9/2024	0
Dane	DN1	DN1-1	PT428	4/30/2024	0
				9/26/2024	0
		DN1-3	BR252	4/30/2024	0
				9/26/2024	0
Dunn	DU1	DU1-1	AO384	5/16/2024	0.0775
				10/9/2024	0
		DU1-3	AO386	5/16/2024	0.0601
	DU2	DU2-1	AO387	5/16/2024	0.103
				10/9/2024	0.131
		DU2-3	AO389	5/16/2024	0.115
Grant	GR1	GR1-1	BR255	4/30/2024	0.0544
				9/26/2024	0.0697
		GR1-3	BR257	4/30/2024	0.0566
				9/26/2024	0.0509
Iowa	IW1	IW1-4	BR259	6/12/2024	0.148
		IW1-6	BR261	6/12/2024	0.818
		IW1-7	BH967	6/12/2024	1.58
		IW1-8	PT425	5/8/2024	3.36
				6/12/2024	1.47
	IW2	IW2-1	BR036	6/12/2024	0.235
		IW2-3	BR038	6/12/2024	0.3
		IW2-4	PT426	6/12/2024	0.635
Juneau	JN1	JN1-1	BR046	4/18/2024	0
				10/3/2024	0
		JN1-3	BR048	4/18/2024	0.748
				10/3/2024	0.385
JN3	JN3-1	JH937	4/22/2024	10.6	
	JN3-2	JH936	4/22/2024	0	

La Crosse	LC2	LC2-1	VZ391	5/15/2024	0
				10/8/2024	0
		LC2-2	VZ392	5/15/2024	0
				10/8/2024	0
Langlade	LN1	LN1-1	BH964	5/23/2024	0
				10/17/2024	0
		LN1-3	BH966	5/23/2024	0
				10/17/2024	0
Portage	PR1	PR1-1	BR207	5/23/2024	0
				10/17/2024	0
		PR1-3	BR209	5/23/2024	0.129
				10/17/2024	0.104
		PR1-4	VR848	5/23/2024	0.56
				10/17/2024	0.551
		PR1-5	VR849	5/23/2024	0.64
				10/17/2024	0.647
St. Croix	SC1	SC1-1	JH938	5/15/2024	0.153
				10/8/2024	0.2
Sauk	SK6	SK6-1	BB246	9/26/2024	0.302
				4/30/2024	0.794
		SK6-3	BB248	4/30/2024	0.586
				9/26/2024	0.674
		SK6-4	PT424	4/30/2024	0.292
				9/26/2024	0.23
Trempealeau	TR1	TR1-1	PX201	5/15/2024	0
		TR1-2	PX202	5/15/2024	0
Waupaca	WP2	WP2-1	JH985	5/23/2024	0
				10/17/2024	0
		WP2-2	JH984	5/23/2024	0
				10/17/2024	0
Waushara	WS4	WS4-1	BB258	5/8/2024	0.369
		WS4-4	BB261	5/8/2024	0.443
	WS6	WS6-1	JH989	5/8/2024	0.183
				8/8/2024	0.215
		WS6-2	JH990	5/8/2024	0.121
	8/8/2024			0	
	WS7	WS7-1	VR841	5/8/2024	0.225
		WS7-2	VR842	5/8/2024	0.367
		WS7-3	VR843	5/8/2024	3.22

Notes:

WUWN	Wisconsin Unique Well Number
µg/L	Micrograms per liter or parts per billion
0	Concentration does not exceed laboratory reporting limit of 0.05 µg/L.
	Detected concentration exceeds the Wisconsin Administrative Code ch. NR 140 Preventive Action Limit of 4.0 µg/L.
	Detected concentration exceeds the Wisconsin Administrative Code ch. NR 140 Enforcement Standard of 20.0 µg/L.

Table B 7: Field-Edge Groundwater Monitoring Program - 2024 Atrazine and Metabolite Concentrations in Groundwater Samples

County	Site (Grower)	Well Name	WUWN	Sample Date	Atrazine	De-ethyl Atrazine	De-isopropyl Atrazine	Di-amino Atrazine	Atrazine TCR	Hydroxyatrazine
Adams	AD2	AD2-1	BH954	6/6/2024	0	0	0	0	0	0
				8/8/2024	0	0	0	0	0	
		AD2-3	BH952	8/8/2024	0	0	0	0	0	0
		AD2-4	VR844	6/6/2024	0.107	0.176	0	0	0.283	0.0836
		AD2-5	VR845	6/6/2024	0.087	0.323	0	0	0.41	0
		AD2-6	PT421	6/6/2024	0.213	0.463	0	0	0.676	0
	AD5	AD5-1	CL461	6/6/2024	0	0	0	0	0	0.0654
		AD5-4	VR846	6/6/2024	0	0.0533	0.202	0.281	0.5363	0
		AD5-5	VR847	6/6/2024	0.173	0.431	0	0.164	0.768	0
		AD5-6	PT422	6/6/2024	0.0667	0.772	0	0.325	1.1637	0
Barron	BR3	BR3-1	BR279	5/16/2024	0	0	0	0	0	0
				10/9/2024	0	0	0	0	0	
				5/16/2024	0	0	0	0	0	
		BR3-3	BR281	10/9/2024	0	0	0	0	0	0
				5/16/2024	0	0	0	0	0	
				10/9/2024	0	0	0	0	0	
Dane	DN1	DN1-1	PT428	4/30/2024	0	0	0	0	0	
				9/26/2024	0	0	0	0	0	
		DN1-3	BR252	4/30/2024	0	0	0	0	0	0.0859
				9/26/2024	0	0	0	0	0	0.113
Dunn	DU1	DU1-1	AO384	5/16/2024	0	0	0.0888	0	0.0888	0
				10/9/2024	0	0	0.0957	0	0.0957	0
		DU1-3	AO386	5/16/2024	0	0	0.12	0	0.12	0
				10/9/2024	0	0	0.13	0	0.13	0
	DU2	DU2-1	AO387	5/16/2024	0	0	0	0	0	0
				10/9/2024	0	0	0	0	0	0
		DU2-3	AO389	5/16/2024	0	0	0	0	0	0
				10/9/2024	0	0	0	0	0	0
Grant	GR1	GR1-1	BR255	4/30/2024	0	0	0	0	0	0
				9/26/2024	0	0	0	0	0	
				4/30/2024	0	0	0	0	0	
		GR1-3	BR257	9/26/2024	0	0	0	0	0	
				5/16/2024	0	0	0	0	0	
				10/9/2024	0	0	0	0	0	
Iowa	IW1	IW1-4	BR259	6/12/2024	0	0	0	0	0	0.155
				6/12/2024	0	0	0	0	0	0.065
		IW1-7	BH967	6/12/2024	0	0.0608	0	0	0.0608	0.0771
				5/8/2024	0.101	0.493	0	0	0.594	0
	IW2	IW2-1	BR036	6/12/2024	0	0	0.1	0.162	0.337	0.0606
				6/12/2024	0	0	0	0	0	0.0513
		IW2-4	PT426	6/12/2024	0	0	0	0	0	0.0842
				6/12/2024	0	0	0	0	0	0.0842
IW2-5	PT427	6/12/2024	0.145	0	0.103	0.244	0.492	0.0683		
		6/12/2024	0.145	0	0.103	0.244	0.492	0.0683		
Jackson	JK3	JK3-1	JH982	4/22/2024	0	0	0	0	0	0
				4/22/2024	0	0	0	0	0	
		JK3-2	JH981	4/22/2024	0	0	0	0	0	0
Juneau	JN1	JN1-1	BR046	4/18/2024	0	0	0	0	0	0
				10/3/2024	0	0	0	0	0	
		JN1-3	BR048	4/18/2024	0	0	0	0	0	
				10/3/2024	0	0	0	0	0	
	JN3	JN3-1	JH937	4/22/2024	0	0.062	0	0	0.062	0
		JN3-2	JH936	4/22/2024	0	0	0	0	0	0
La Crosse	LC2	LC2-1	VZ391	5/15/2024	0	0.14	0	0	0.14	0
				10/8/2024	0	0.133	0	0	0.133	0
				5/15/2024	0	0.13	0	0	0.13	0
		LC2-2	VZ392	10/8/2024	0	0.16	0	0	0.16	0
				5/23/2024	0	0	0	0	0	
				10/17/2024	0	0	0	0	0	
Langlade	LN1	LN1-1	BH964	5/23/2024	0	0	0	0	0	
				10/17/2024	0	0	0	0	0	
				5/23/2024	0	0	0	0	0	
		LN1-3	BH966	10/17/2024	0	0.0663	0	0	0.0663	0
				5/23/2024	0	0	0	0	0	
				10/17/2024	0	0	0	0	0	
Portage	PR1	PR1-1	BR207	5/23/2024	0	0	0	0	0	
				10/17/2024	0	0	0	0		
				5/23/2024	0.0664	0.163	0	0	0.2294	0
		PR1-3	BR209	10/17/2024	0	0.118	0	0	0.118	0
				5/23/2024	0	0.0602	0	0	0.0602	0
		PR1-4	VR848	10/17/2024	0	0.0718	0	0	0.0718	0
				5/23/2024	0	0.0876	0	0	0.0876	0
		PR1-5	VR849	10/17/2024	0	0.0813	0	0	0.0813	0
5/15/2024	0			0.0543	0.0797	0.207	0.341	0		
10/8/2024	0			0.0534	0	0.182	0.2354	0		
Sauk	SK6	SK6-1	BB246	9/26/2024	0	0	0	0	0	0.122
				4/30/2024	0	0	0	0	0	0.14
		SK6-3	BB248	4/30/2024	0	0	0	0	0	0.154
				9/26/2024	0	0	0	0	0	0.179
		SK6-4	PT424	4/30/2024	0.351	0.265	0.121	0	0.737	0.109
		9/26/2024	2.4	0.442	0.195	0	3.037	0.163		
Trempealeau	TR1	TR1-1	PX201	5/15/2024	0	0	0	0	0	0
		TR1-2	PX202	5/15/2024	0	0	0	0	0	0
Waupaca	WP2	WP2-1	JH985	5/23/2024	0	0	0	0	0	0
				10/17/2024	0	0	0	0	0	
		WP2-2	JH984	5/23/2024	0	0	0	0	0	
				10/17/2024	0	0	0	0	0	

Table B 8: Field-Edge Groundwater Monitoring Program - 2024 Nitrogen-Nitrate/Nitrite Concentrations in Groundwater Samples

County	Site (Grower)	Well Name	WUWN	Sample Date	Nitrogen-Nitrate/Nitrite	
Adams	AD2	AD2-1	BH954	6/6/2024	40.8	
				8/8/2024	19.2	
		AD2-3	BH952	8/8/2024	43.2	
		AD2-4	VR844	6/6/2024	29.8	
	AD5	AD2-5	VR845	6/6/2024	32.7	
		AD2-6	PT421	6/6/2024	13.6	
		AD5-1	CL461	6/6/2024	14.6	
		AD5-4	VR846	6/6/2024	38.4	
		AD5-5	VR847	6/6/2024	36.6	
		AD5-6	PT422	6/6/2024	19.9	
		BR3	BR279	5/16/2024	4.34	
				10/9/2024	2.25	
Barron	BR3	BR281	5/16/2024	3.22		
			10/9/2024	8.88		
Dane	DN1	DN1-1	PT428	4/30/2024	8.12	
				9/26/2024	1.98	
		DN1-3	BR252	4/30/2024	15.9	
				9/26/2024	19.5	
Dunn	DU1	DU1-1	AO384	5/16/2025	12.6	
				10/9/2024	16.7	
		DU1-3	AO386	5/16/2024	16.3	
	DU2	DU2-1	AO387	10/9/2024	14.8	
				5/16/2024	5.36	
		DU2-3	AO389	10/9/2024	7.99	
Grant	GR1	GR1-1	BR255	5/16/2024	0.832	
				10/9/2024	0	
		GR1-3	BR257	4/30/2024	19.7	
				9/26/2024	28.9	
Iowa	IW1	IW1-4	BR259	4/30/2024	11.8	
				9/26/2024	13.5	
		IW1-6	BR261	6/12/2024	11.1	
				6/12/2024	21.7	
	IW1-7	BH967	6/12/2024	25.1		
			5/8/2024	28.4		
	IW2	IW2-1	BR036	6/12/2024	24.8	
				6/12/2024	7.1	
IW2-3				BR038	6/12/2024	27.2
IW2-4				PT426	6/12/2024	25.7
				6/12/2024	18.6	
Jackson	JK3	JK3-1	JH982	4/22/2024	2.21	
		JK3-2	JH981	4/22/2024	2.43	
Juneau	JN1	JN1-1	BR046	4/18/2024	2.43	
				10/3/2024	7.76	
	JN3	JN1-3	BR048	4/18/2024	22.4	
				10/3/2024	22.2	
				4/22/2024	4.91	
		JN3-2	JH936	4/22/2024	2.26	

La Crosse	LC2	LC2-1	VZ391	5/15/2024	18.5		
				10/8/2024	18.3		
		LC2-2	VZ392	5/15/2024	17.1		
				10/8/2024	17		
Langlade	LN1	LN1-1	BH964	5/23/2024	1.96		
				10/17/2024	23.1		
		LN1-3	BH966	5/23/2024	13.6		
				10/17/2024	12.4		
Portage	PR1	PR1-1	BR207	5/23/2024	5.27		
				10/17/2024	1.22		
		PR1-3	BR209	5/23/2024	43.4		
				10/17/2024	33.6		
		PR1-4	VR848	5/23/2024	21.5		
				10/17/2024	18.9		
		PR1-5	VR849	5/23/2024	21.3		
				10/17/2024	19.7		
St. Croix	SC1	SC1-1	JH938	5/15/2024	13.4		
				10/8/2024	12.7		
Sauk	SK6	SK6-1	BB246	9/26/2024	48.8		
				4/30/2024	26.7		
		SK6-3	BB248	4/30/2024	25.1		
				9/26/2024	30.3		
		SK6-4	PT424	4/30/2024	15.3		
				9/26/2024	15.1		
Trempealeau	TR1	TR1-1	PX201	5/15/2024	26.7		
				TR1-2	PX202	5/15/2024	20.7
Waupaca	WP2	WP2-1	JH985	5/23/2024	16.2		
				10/17/2024	18.5		
		WP2-2	JH984	5/23/2024	12.4		
				10/17/2024	15.9		
Waushara	WS4	WS4-1	BB258	5/8/2024	21		
				WS4-4	BB261	5/8/2024	20.3
		WS6	WS6-1	JH989	5/8/2024	25.3	
	8/8/2024				25.2		
	WS6-2		JH990	5/8/2024	16.4		
		8/8/2024		6.42			
	WS7	WS7-1	VR841	5/8/2024	13.3		
				WS7-2	VR842	5/8/2024	21.6
						WS7-3	VR843

Notes:

WUWN	Wisconsin Unique Well Number
mg/L	Milligrams per liter or parts per million
0	Concentration does not exceed laboratory reporting limit of 0.5 mg/L.
	Detected concentration exceeds the Wisconsin Administrative Code ch. NR 140 Preventive Action Limit of 2.0 mg/L
	Detected concentration exceeds the Wisconsin Administrative Code ch. NR 140 Enforcement Standard of 10.0 mg/L