Wisconsin Department of Natural Resources

The Wisconsin Department of Natural Resources (DNR) establishes groundwater quality standards for the state, manages groundwater quantity and coordinates the implementation of the groundwater law in order to protect Wisconsin's groundwater and public health.

There are six programs within DNR that manage groundwater. Each program plays an important role in protecting Wisconsin's groundwater quality and quantity. Learn more about each program's work below.

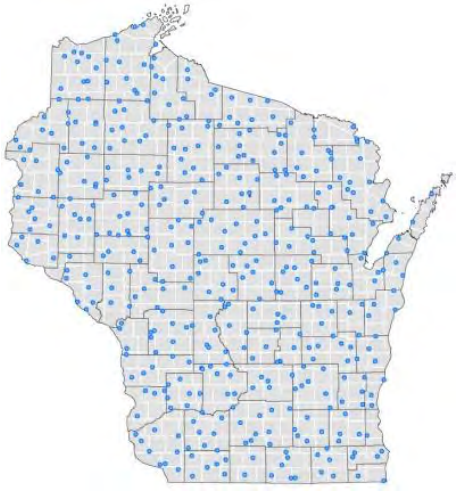
To learn more about groundwater quality and quantity, see the State of the Resource Section of this report. For actions to address groundwater quality and quantity issues, see the Recommendations Section of the report.

Sections in this document

Fiscal Year 2023 Highlights

Highlights include what was new or updated in the last year.

- In June 2022, the DNR began a project to sample for PFAS and other water quality parameters in 450 private wells, spaced apart geographically across the entire state. The main objective of the research study was to determine concentrations of PFAS present in ambient groundwater, that is, groundwater in locations that are not near a known high concentration release of PFAS. Another objective was to evaluate the usefulness of several potential source indicator chemicals, chemicals that might be used to pinpoint what source(s) of PFAS to groundwater may be present in an area. The project was a partnership between the



Wisconsin divided by 450 equal area cells – each cell includes a well tested for PFAS.

DNR, Wisconsin State Laboratory of Hygiene and the Center for Watershed Science and Education at the University of Wisconsin-Stevens Point.

- As part of a continuing commitment to protect public health, public welfare, and the environment, the DNR periodically updates groundwater quality standards in ch. NR 140, Wis. Adm. Code.
  - In March 2018, the DNR submitted a list of substances designated "Cycle 10" to DHS. DHS responded with recommendations to DNR in June 2019. Based on comments received during the rule public comment period, DHS has revised their recommendations for Cycle 10 groundwater standards. A plain language summary of each of the compounds in Cycle 10 is available at DHS's Recommended Groundwater Enforcement Standards. The DATCP website contains additional information on the Cycle 10 pesticide compounds. On Feb. 23, 2022, the Natural Resources Board (NRB) considered and did not approve this rule. The scope statement expired on March 3, 2022.
  - The DNR submitted a list of substances designated "Cycle 11" to DHS in April 2019. DHS responded with recommendations to DNR in November 2020. A plain language summary of each of the compounds in Cycle 11 is available at DHS's Groundwater Standards. After the NRB halted work on Cycle 10, DNR paused work on the Cycle 11 NR 140 Groundwater Pollutant Standards.
  - In March of 2022 the DNR proposed a rule to replace the existing total coliform bacteria standards with new state groundwater quality standards for Escherichia coli (E. coli) bacteria. The proposed rule also transitions total coliform bacteria from a public health groundwater quality standard to an indicator parameter. This rule will be published in August 2023.
  - In August 2022 the DNR proposed a to add public health groundwater standards for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS). Following the EPA's June 15, 2022 issuing of interim HAs for four PFAS the DNR drafted a Statement of Scope proposing rulemaking for these four PFAS. Based on its review of current proposed EPA draft MCLs for PFAS, the department has decided to continue rulemaking for two of the four PFAS listed in the Statement of Scope, PFOA and PFOS.
- In March 2023, DNR updated residents in the Town of Hudson and Warren in St. Croix County about changes in the status of the remediation of TCE in groundwater and provided information on water treatment technology and maintenance.
- In 2022, DNR started accepting applications for the new American Rescue Plan Act (ARPA) Well Compensation and Well Abandonment Grant Programs. The two-year programs will provide $10 million in financial assistance to well owners

to address contamination in their wells by awarding grants for the replacement, reconstruction, treatment or abandonment of their well. The eligibility criteria for both programs have been expanded beyond the previous Well Compensation Grant Program, and many previously ineligible individuals will now be eligible to apply. The expanded eligibility criteria include these changes to the contamination requirements: Any well contaminated with nitrate concentrations at or above the state's public health standard of 10 parts per million (ppm) is now eligible. Previously, only nitrate-contaminated wells with concentrations above 40 ppm that were used as a water supply for livestock were eligible. The program also allows the owners of non-community public wells to apply for grants and for well owners with bacteria that is harmful to human health to get grants to pay for new wells or treatment. In the first six months of the new programs, over $1.5 Million in grants had been awarded to replace over 100 contaminated wells and fill and seal over 40 wells.

- In 2022 over 120 municipal systems voluntarily sampled using EPA Method 537.1 for PFAS in Drinking Water, which detects 18 different PFAS compounds. A report of findings will be created following completion of the program. In addition, effluent at select Wisconsin Pollutant Discharge Elimination System (WPDES) permitted facilities was sampled and the department is also drawing on the examples and experiences of other states as it develops an interim plan to address PFAS that may be present in municipal wastewater treatment facilities' biosolids that are regularly applied to agricultural lands throughout the state. MCLs for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS) were published in NR 809 in 2022. The MCL for PFOA and PFOS is 0.000070 mg/L (70 ppt). This level is set for the combined concentration of PFOA and PFOS. Under the Safe Drinking Water Act's fifth Unregulated Contaminants Monitoring Rule (UCMR5) select water systems will be asked to sample for 29 PFAS compounds and lithium. This will begin in 2023.

- Since 2019, DNR has provided technical support to 4 counties to develop DNR and EPA-approved 9 Key Element Watershed Plans that focus, in part, on reducing nitrogen leaching to groundwater from agricultural lands to meet groundwater quality standards and protect drinking water sources. Three counties (i.e., Kewaunee, Door and Adams) have approved plans and two counties (Rock and Kewaunee) are working to develop groundwater focused plans. These watershed plans provide a framework for improving water quality in a holistic manner over a ten-year period. They assess the contributing causes and sources of nonpoint source pollution, involve key stakeholders, and prioritize restoration and protection strategies in critical areas to address water quality problems.

- Certain parts of NR 216 were updated, including specific efforts to finalize concerns raised by the EPA including issues related to legislative authority, to respond to the federal "remand rule" and propose a realignment of the fee structure for construction site erosion control permits. The updated rule was formally promulgated in April 2022.

Ongoing management activities

Ongoing management activities include what each DNR program does to manage and protect groundwater on a regular basis.

Drinking Water and Groundwater (DG) program

- Implement groundwater quality standards to minimize the concentration of polluting substances in groundwater in order to protect public health; this includes adding new and/or revised standards as required by Wisconsin's groundwater law (ch. 160, Wis. Stats).
- Set and enforce minimum standards for well construction, pump installation and well filling and sealing in order to protect groundwater and safe drinking water in private drinking water wells as set forth in ch. NR 812.
- Respond to reports of private well contamination and encourage private well owners to test their wells annually for bacteria, nitrate and other contaminants of concern.
- Develop partnerships and collaborate to reduce nitrate contamination in private wells; including using The Nitrate Initiative and Groundwater & Nitrogen Fertilizer Decision Support Tools.
- Award well compensation and abandonment grants to private well owners to address contamination in their wells.
- Sampling and testing private wells for understanding and managing arsenic contamination in Wisconsin.
- Outlined a Special Well Casing Depth Area and developed well construction guidelines to protect drinking water wells in Winnebago and Outagamie County from arsenic contamination.

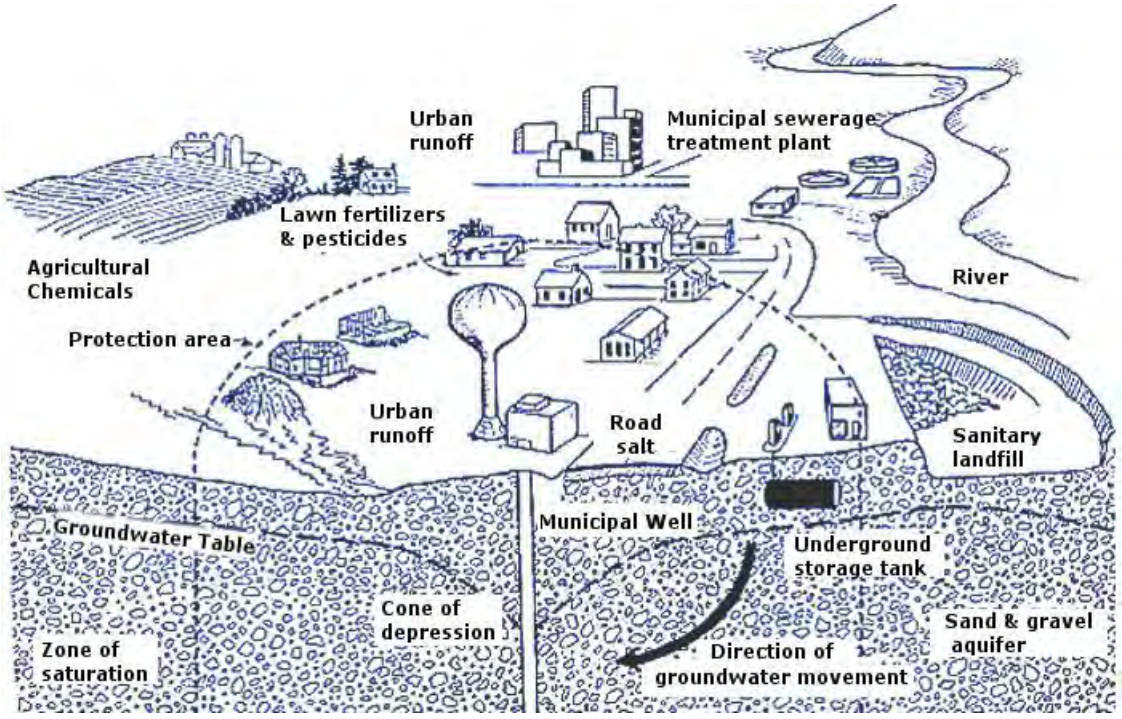
How does the DNR help protect private water supplies?

DG sets and enforces minimum standards for well construction, pump installation and well filling & sealing to help prevent contamination of groundwater. This means licensed contractors are qualified to do their work in a way that meets standards and won't contaminate groundwater, so well owners can feel more confident drinking their water.

- Work with public water system owners and operators across the state to meet groundwater quality and quantity regulations that help provide safe and reliable drinking water supplies as required by ch. NR 809 (Safe Drinking Water), Wis. Adm. Code.
- Regulate the operation of public water systems through ch. NR 810 and the general design and construction of community water systems through ch. NR 811 and NR 812 for non-community systems.
- Educate water system owners and operators to properly operate and maintain the water systems to ensure safe drinking water for Wisconsin consumers.
- Maintain drinking water and groundwater quality data in the Drinking Water System (DWS) database, an important tool used to efficiently enforce the Safe Drinking Water Act (SDWA).
- Work with public water systems on nitrate contamination issues and implementing the PFAS Action Plan.

What is source water and why should we protect it?

Source water comes from rain and snow that seeps into or flows over the ground before moving into water supply wells or intakes. Activities and facilities on the ground can contribute substances or contaminants that are carried by water flowing to the well. Identifying local priority areas to protect source water prevents contaminants from leaching into groundwater.



- Aid public water systems in implementing the revised total coliform rule (RTCR) so that when bacterial contamination potential is detected by the presence of total coliform, the DNR and water system operators investigate to find the cause, take action to fix it, and monitor to ensure public health protection.
- Coordinate the state's wellhead protection program to safeguard public water supplies at the source to reduce the risk of groundwater contamination in areas contributing groundwater recharge to public water supply wells; 43% of Wisconsin municipal public water systems are protected by a Wellhead Protection Plan (WHP); over 400 communities have a WHP plan for at least one of their wells; and approximately 57% of the groundwater sourced municipally served population is covered by source water protection plans with accompanying implementation ordinances.
- Participate in the state's source water protection program in order to identify and protect local sources of water, such as rivers, streams, lakes, reservoirs, springs and groundwater, that provide water to public drinking water supplies and private wells.
- Regulate high capacity wells under ch. 281, Wis. Stats.
- Analyze high capacity wells applications on a case-by-case basis; the analysis considers both the needs of the property and the environmental effects that the proposed high capacity well, when combined with existing environmental impacts, may have on waters of the state.
- Work with neighboring states to protect and manage the water of the Great Lakes through the Great Lakes Compact.
- Implement Compact-related programs including authorizing permits and approvals, implementing the water conservation and efficiency program, reviewing diversion applications and working in conjunction with groundwater quantity staff to collect annual water withdrawal reports.

What is the Great Lakes Compact?

The Compact is a formal agreement between the Great Lakes states which details how the states will work together to manage and protect the Great Lakes-St. Lawrence River Basin - the world's largest source of surface fresh water. This is one of North America's most important natural resources and must be protected. As part of the Compact, DNR registers water withdrawals, receives and analyzes water use reports, requires water use permits, implements a conservation program and manages Great Lakes diversions.

- Manage the Groundwater Retrieval Network (GRN), an application that consolidates and delivers well information and groundwater quality data from over 800,000 wells, including public and private water supply wells, piezometers, monitoring wells, non-potable wells and groundwater extraction wells.
- Commits $100,000 annually to help operate and maintain the Wisconsin Groundwater Level Monitoring Core Network (with USGS and WGNHS since 1946), monitoring wells that provide data about the history of water levels in an area or aquifer.
- Support groundwater monitoring studies evaluating existing design and/or management practices associated with potential sources of groundwater contamination.
- Educate teachers and students on the importance of protecting groundwater in their own communities, including working with the Groundwater Center at the Center for Watershed Science and Education (CWSE) and WGNHS to sponsor two groundwater workshops for teachers every year since 1994.
- Provide hydrogeologic advice to DNR programs, contractors and the public including: training new staff in runoff management and drinking water programs on the implementation of groundwater quality standards; training for land spreading discharge permit writing and animal waste drinking water well contamination response; consulting on groundwater quality issues that arise in agricultural and urban runoff programs. Such coordination is critical in obtaining statewide consistency on how the DNR evaluates and reduces risk of groundwater contamination associated with regulated activities.
- Staffs the Groundwater Coordinating Council.

Did you know?

Exploring best nitrogen management practices on agricultural fields is a key research priority for the GCC.

Office of Emerging Contaminants (OEC) program

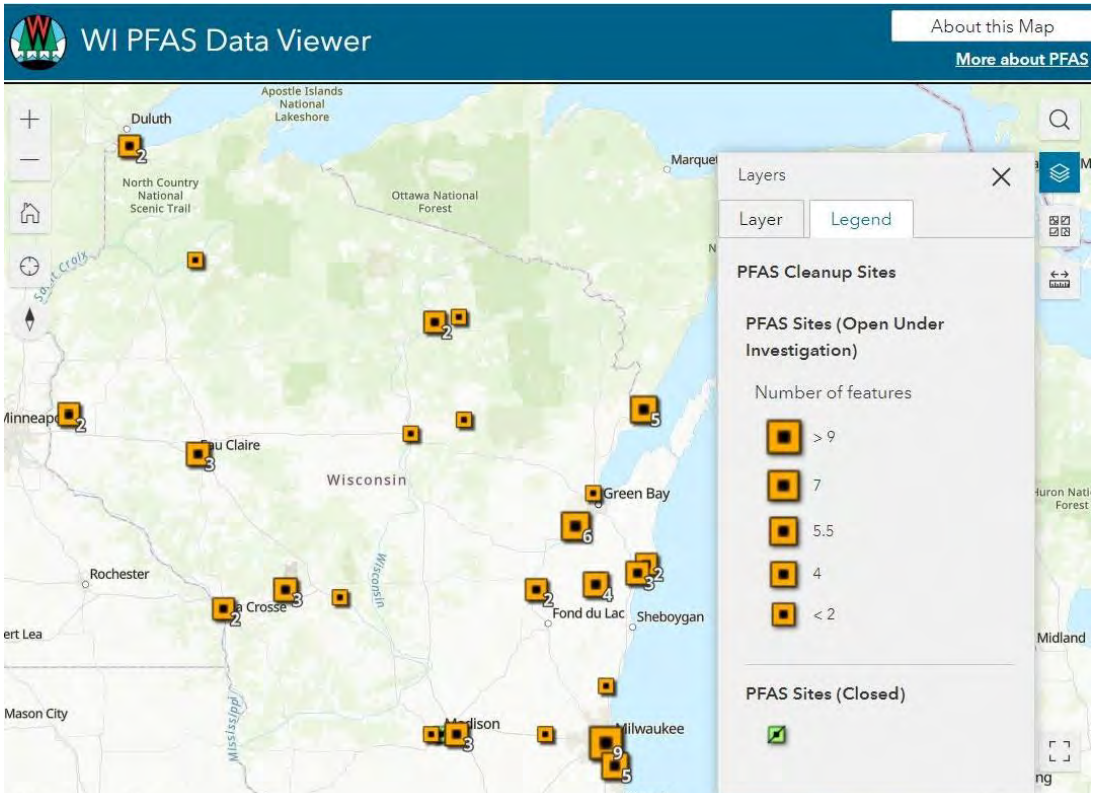
- Coordinate cross-program, division, and agency work around environmental contaminants and emerging topics, including PFAS.
- Staff the Wisconsin PFAS Action Council (WisPAC), a group of ~ 20 state agencies working to address PFAS contamination in the state; and staff

additional advisory bodies such as the PFAS External Advisory Group and the PFAS Technical Group to help foster ongoing discussion and collaboration with stakeholders.

- Monitors and advises on the implementation of the PFAS Action Plan, including sampling and ongoing monitoring, development of new methods and science-based standards and enhanced risk communication infrastructure and resources.
- Coordinates with and provides technical assistance to stakeholders across the state, including the firefighting community, through the development of best management practices, FAQs, and other resources related to Wis. Stat. 299.48 and ch. NR 159 regarding the prohibition of use to help prevent future contamination of Wisconsin's groundwater.

Where are PFAS impacting Wisconsin?

The PFAS Interactive Data Viewer allows users to see data about where PFAS impact Wisconsin.



Remediation and Redevelopment (RR) program

- Implements and aids cleanups under the Spill Law, the Environmental Repair Law, federal programs (Superfund, Hazardous Waste Corrective Action, Leaking Underground Storage Tanks (LUST)), brownfields properties, the Drycleaner

Environmental Response Program, contaminated sediments and at closed landfills.

- Provides technical assistance, financial assistance, technical project oversight of cleanup projects, and helps clarify legal liability.
- Helps with spill response and works with other agencies for conducting major spill response actions and removal of hazardous substances.
- Assists the EPA with the remediation of contaminated sediments in the Great Lakes areas of concern through execution of cooperative funding agreements. In 2022, the RR Program oversaw projects with a state cost share of $1.8 million and a total value of $42.3 million.
- Uses Environmental Fund dollars to initiate or continue environmental assessment and cleanup actions at sites with groundwater contamination across the state, including several closed landfills and manufacturing facilities.
- Provides temporary, emergency water to private well users affected by groundwater contamination. In 2022, the RR Program assisted almost 1500 affected residences at a total cost of $556,000.

Where are the Great Lakes areas of concern?

- Coordinates several efforts to encourage local governments and private businesses to cleanup and redevelop brownfield properties (properties where the release of hazardous substances threatens groundwater quality). This includes securing federal funding to assist local governments with assessment and cleanup. In 2022, the RR Program was awarded $2 million in U.S. EPA brownfields assessment funding to assist local governments with projects and to address high-risk VOC sites in environmental justice areas.
- Manages the Dry Cleaner Environmental Response Fund (DERF) Program to reimburse dry cleaner owners/operators for eligible costs associated with the cleanup of soil, groundwater and indoor air contaminated by dry-cleaning solvents.

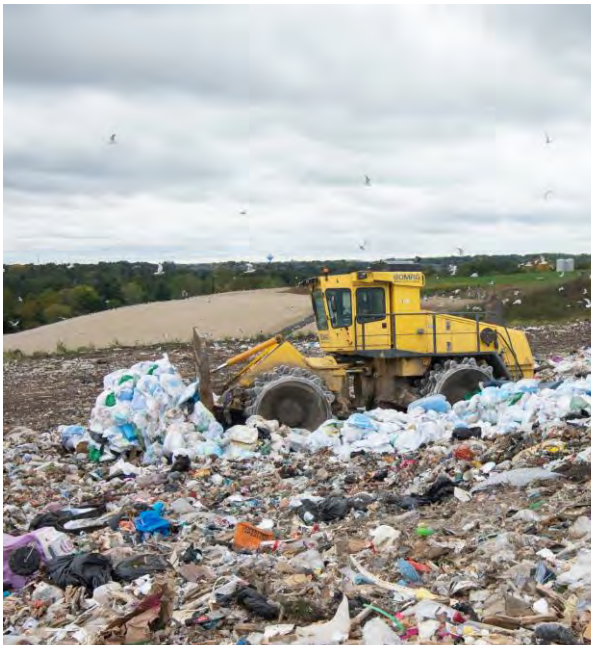
- Manages the Bureau of Remediation and Redevelopment Tracking System (BRRTS), a database that includes: information on open remediation sites; sites closed with no residual contamination; sites closed with residual groundwater contamination above the ch. NR 140 enforcement standards; sites closed with soil contamination above ch. NR 720 soil standards; sites closed with other engineering or institutional controls; legacy sediment sites; and brownfields properties.
- Maintains BRRTS on the Web (BOTW), a web-based version of BRRTS that provides information to future owners or users of the property; well drillers; community members; and other interested parties of the existence of contamination, as well as any responsibilities the property owner (or occupant in some cases) is required to comply with as a condition of closure.
- Manages RR Sites Map, a web-based mapping system that is linked to BRRTS on the Web and is useful for locating potential contaminated sites when evaluating new municipal or private well placement.

Waste and Materials Management (WA) program

- Regulates and monitors groundwater quality at proposed, active, and inactive solid waste facilities and landfills.
- Reviews baseline groundwater data submitted by landfill applicants to determine whether exemptions and alternative concentration limits (ACLs) to established ch. NR 140 groundwater standards are needed to meet public health and welfare parameters.
- Checks required landfill groundwater detection monitoring data, collected and submitted by the landfill owner at sites (both active and closed) to determine compliance with ch. NR 140 standards and site specific ACLs and PALs.
- Audits results of site investigations triggered by exceedances of groundwater standards and evaluates the effectiveness of remedial actions at active solid waste facilities and closed landfills.

Is the groundwater near landfills contaminated?

WA staff check required landfill groundwater monitoring data to determine if the water is meeting standards. Pictured: Dane Co. Landfill



- Provides public access to environmental monitoring data contained in the Groundwater and Environmental Monitoring System (GEMS) through GEMS on the Web. Places landfill locations on a GIS mapping program called the WA Sites Viewer, which includes delineating waste boundaries and locating monitoring wells where known. This information is shared with the DG Program and licensed well drillers to aid well drillers in siting a water supply well. This GIS program has been an important tool for increasing compliance with the 1,200-foot setback requirement to a landfill and for the NR 812 well variance application requirement if the setback cannot be met.

Water Quality (WQ) program

- Issues discharge permits to facilities, operations and activities that discharge treated wastewater and residuals to groundwater when groundwater standards are met.
- Administers Wisconsin Pollutant Discharge Elimination System (WPDES) permits to all communities, industrial facilities and large privately-owned wastewater systems which discharge treated domestic or industrial wastewater to groundwater through land treatment/disposal systems. These systems are primarily spray irrigation, seepage cell, subsurface absorption systems and ridge & furrow treatment systems regulated under ch. NR 206, Wis. Adm. Code (domestic wastewater) and ch. NR 214, Wis. Adm. Code (industrial wastewater).
- Evaluates WPDES permits for groundwater monitoring and data submittal requirements to ensure compliance with groundwater quality standards.
- Maintains the System for Wastewater Applications, Monitoring, and Permits (SWAMP), for holders of specific WPDES and general permits that stores facility-specific information, permit requirements, monitoring results and violations of permit requirements for private and municipal wastewater treatment facilities.
- Manages current information on groundwater, wastewater and biosolids treatment and management, as well as historical sampling data from groundwater monitoring wells through SWAMP. Sampling results and site loading information are also available for land application of municipal biosolids, septage and industrial sludge, by-product solids and wastewater.
- Assists and participates in local planning efforts for existing developed areas (served by onsite wastewater treatment systems) that are investigating the possibility of providing a public sewerage system.
- Issues WPDES general permits to a group of facilities with similar low-flow nondomestic wastewater, domestic wastewater, or mixed wastewater discharges to a subsurface soil absorption system pursuant to s. NR 205.08, Wis. Adm.

Code (except that DSPS permits subsurface soil absorption systems receiving domestic wastewater flows < 12,000 gal/day design flow).

- Review facility operating conditions (e.g. flow volume and pollutants), site restrictions and setback distance requirements of the systems to determine if the facility is applicable to be covered under the general permit; reviews and approves proposed new or modifications to these systems pursuant to s. 281.41, Wis. Stats.
- Reevaluates renewals every 5 years to determine if the facilities are still eligible for coverage under the permit and reviews land use changes that may have occurred. These review processes and permit required monitoring allow for tracking protection of groundwater quality and public health and could also identify future concerns and permit needs.
- Regulates the land application of organic industrial wastes, municipal biosolids and septage (chapters. NR 214, 204, and 113) through:
- Implementing treatment quality standards and land application site requirements and restrictions that are designed to prevent runoff to surface water or leaching of nutrients and pollutants to groundwater.
- Reviews and approves land spreading sites and requirements on locations, loading rates, nutrient levels and time of year. Uses SWAMP and LAG databases to manage recording and monitoring treatment and disposal of municipal sludge, septage and industrial land-applied wastes. This system includes an inventory and a history of all sites used for land application. The site evaluation and approval process includes providing maps to the land application entities land applying septage, sewage sludge and industrial land applied wastes that show clear boundaries for approved areas to further protect surface and groundwaters.
- NR 113: Licenses septage businesses and provide compliance inspection of these businesses relating to servicing and disposing which includes additional treatment at wastewater treatment facilities or landspreading for beneficial use of nutrients and carbon replenishment in soils.
- NR 204: Governs treatment quality, use and disposition of municipal wastewater treatment plant sludge including additional treatment at other wastewater treatment facilities or beneficial reuse to capture nutrients and other soil amendments including liming and carbon replenishment in soils.
- NR 214: Regulates the land application of industrial sludge, liquid wastes and by-product solids. Reviews the beneficial use and disposition of industrial wastewater residuals such as liquid wastes, by-product solids and sludges for

beneficial reuse to reuse nutrients and other soil amendments including lime and carbon replenishment in soils.

- Encourages land spreading entities to provide for more storage capacity to minimize winter and spring runoff to surface water. Affirmed code requirements to ensure older structures meet the standards needed to assure storage is environmentally sound and protective of both groundwater and surface water.
- Helps create better training tools and compliance training in the area of septage management. Septage operator certification code changes (ch. NR 114) now require minimum compliance training of all certified septage operators in their continuing education requirements cycles to ensure a compliance focus. New classes and training segments are offered through associations, county updates and stand-alone classes.
- Inter-division work with the Bureau of Law Enforcement continues to increase as the industry continues to explore more options for waste disposal and re-use; unfortunately, many of these options for waste disposal can cause significant harm to waters of the state so continued enforcement efforts are necessary to deter further significant environmental harm.
- Offers a zero percent Clean Water Fund loan for the planning and construction of receiving facilities and additional capacity provided for septage to provide an incentive for more wastewater treatment plants to accept and treat septage (Wisconsin Act 347).

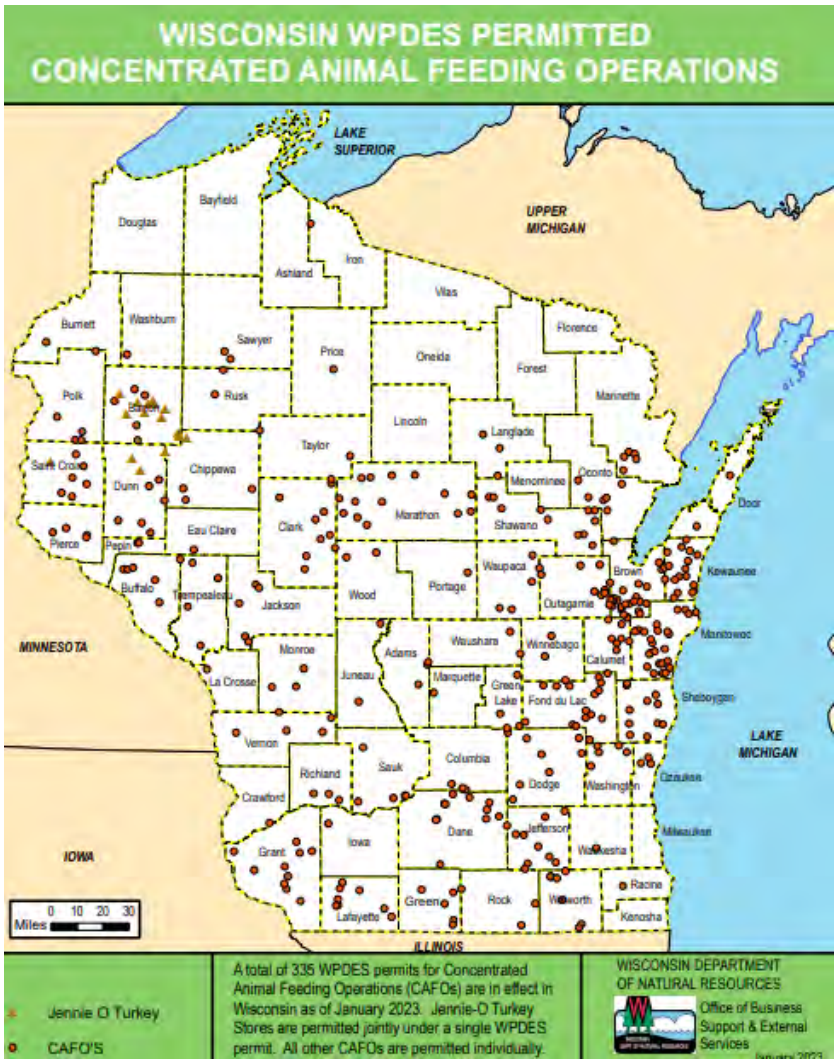
Watershed Management (WT) program

- Manages waste from large animal feeding operations (CAFOS) by issuing discharge permits (ch. NR 243). WPDES permit requirements protect surface water, groundwater and wetlands.
- Reviews nutrient management plans submitted as part of the issuance of WPDES permits for CAFOs that address how, when, where, and in what amounts CAFOs apply manure, process wastewater, and associated nutrients to cropped fields, to protect surface waters and groundwater. Groundwater protections include setback requirements from community/non-community public wells and karst features, and winter restrictions of manure applications.
- Carries out compliance and enforcement activities at CAFOs using policies, codes, and guidelines intended to meet groundwater and surface water quality standards. At the end of 2022, there were 334 permitted CAFOs; the trend of growing numbers of permit applications for large-scale livestock operations is expected to continue.

- Promotes groundwater protection through the implementation of agricultural performance standards and prohibitions in ch. NR 151; the issuance of Notices of Discharge under ch. NR 243; and response to acute manure related groundwater impacts (e.g., well contaminations).
- Implements requirements for all crop and livestock producers to create and implement nutrient management plans through NR 151.07 and ATCP 50.04(3), which requires cost sharing in many situations.

Do CAFOs have to have permits in Wisconsin?

Yes, CAFOs with 1,000 animal units or more must have a DNR-issued Wisconsin Pollutant Discharge Elimination System (WPDES) permit to operate. Below is a map of WPDES permitted CAFOs. As of January 2023, there were 334 WPDES permits for CAFOs in effect in Wisconsin.



- Supports maintenance of technical resources and expertise to implement nutrient management plans (NRCS Standard 590), including development and dissemination of the field-based Soil Nutrient Application Planner software (snapplus.wisc.edu) in cooperation with the University of Wisconsin, DATCP and Wisconsin NRCS.
- Administers Nonpoint Source grants, such as Targeted Runoff Management and Notice of Discharge grants, that provide financial assistance to agricultural and urban landowners in targeted watersheds that are critical to addressing groundwater and surface water quality issues.
- Avoid increasing pollutants in groundwater from contaminated storm water. Issues permits to dischargers of contaminated storm water.
- Regulates storm water discharges as required under the federal Clean Water Act (ch. NR 216, Wis. Adm. Code); including: permits for about 245 municipalities in Wisconsin to control polluted runoff that may enter their municipal separate storm sewer systems (MS4s); permits for owners of construction sites with one or more acre of land disturbance to control erosion during construction and to install practices to limit post-construction pollutant discharge after construction is completed; and permits for certain industrial facilities to address potential contamination of storm water from outside activities and outdoor storage of materials.
- Developed runoff performance standards for MS4s and construction sites that are implemented through the storm water permit program.
- Issued the first MS4 general permit for municipal storm water discharges in 2006. The permit was reissued in 2014. In 2020, six general storm water permits expired requiring revisions and reissuance.
- The urban runoff team worked extensively with internal staff, external stakeholders and the EPA to develop general permits that meet the standards of the Clean Water Act and Wisconsin Statues in compliance with the department's Environmental Analysis and Sustainability (EAS) program delegated Wisconsin Pollutant Discharge Elimination System (WPDES) authority.
- Regulates metallic mining activity in the state, including monitoring groundwater quality around these mines.
- Determines whether a proposed mining project receives necessary approvals; issues related to groundwater quantity and quality are critical in making this determination.
- Approves ferrous mining projects according to ch. 295, Wis. Stats. The regulatory framework for ferrous mining projects includes provisions related to

groundwater withdrawals, mining waste site design and operation and protection of groundwater quality.

- Checks for compliance with existing groundwater quality standards according to the non-ferrous mining projects statute, ch. 293, Wis. Stats. which establishes point of standards application and evaluation processes and criteria that are unique to ferrous mining projects.

Where are mining projects in Wisconsin?

Iron deposits in Wisconsin that are currently being explored for mining or were the sites of historical mines.