



2019-2020 Biennial Report

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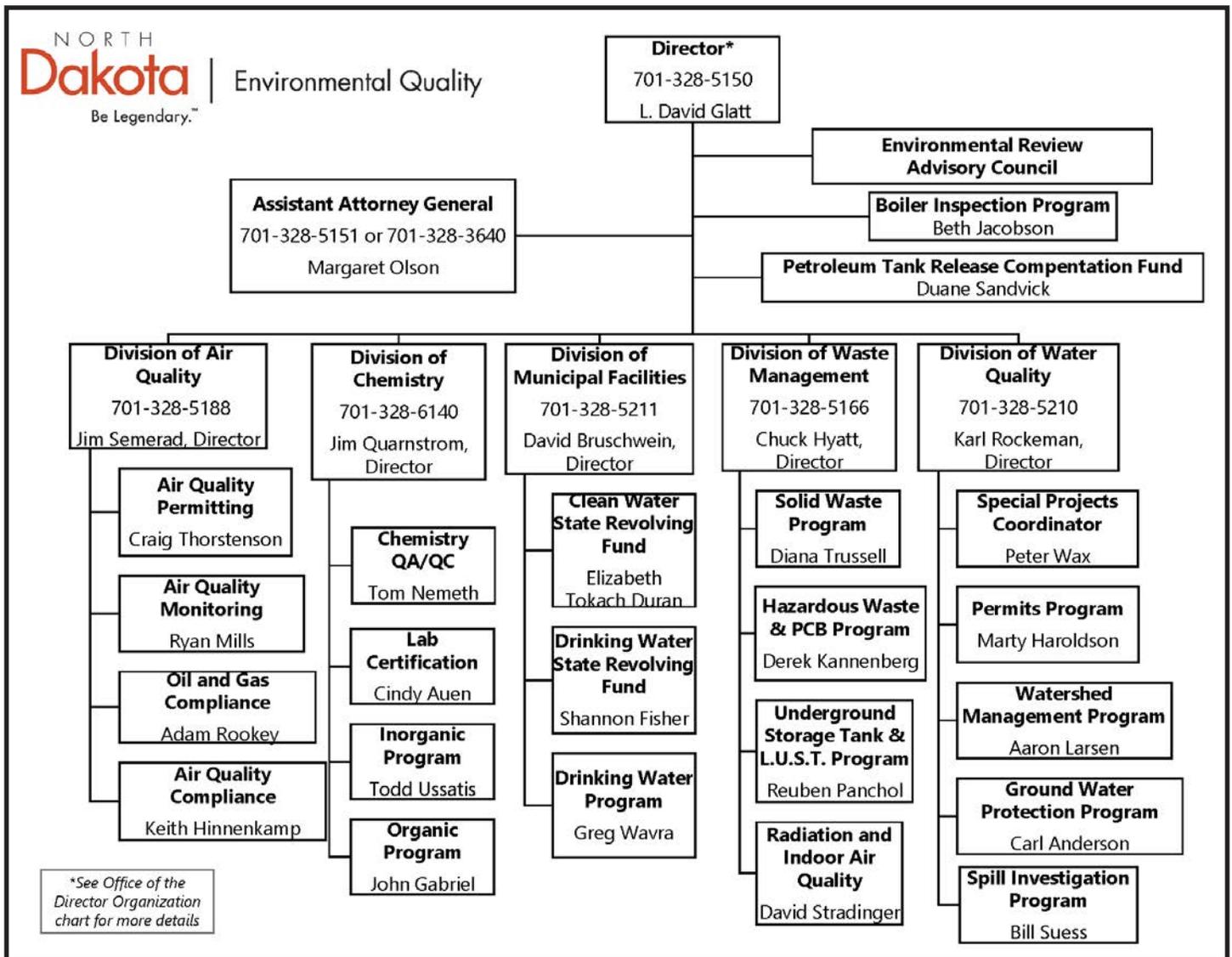
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*The Wild Prairie Rose is the state flower of North Dakota.
Credit: North Dakota Tourism*

On April 17, 2017, Governor Doug Burgum signed legislation separating the Environmental Health Section from the North Dakota Department of Health to create the standalone Department of Environmental Quality. Under Senate Bill 2327, Environmental Quality administers and enforces the same environmental protection programs as the previous Environmental Health Section under the North Dakota Department of Health. Environmental Quality became an official standalone agency effective July 1, 2019.

Environmental Quality is responsible for safeguarding North Dakota's air, land and water resources. This state agency has 166 employees, works closely with local, state and federal entities to address public and environmental health concerns and implement protection policies and programs. It consists of the Office of the Director and five divisions: Air Quality, Chemistry, Municipal Facilities, Waste Management and Water Quality.



North Dakota Department of Environmental Quality Organizational Chart

Responsibilities

The North Dakota Department of Environmental Quality has primacy for most of the environmental protection programs in North Dakota, meaning Environmental Quality has primary responsibility for ensuring implementation of many federal environmental in the state. This agency has primacy on all lands within the state borders except tribal and reservation lands where the U.S. Environmental Protection Agency (EPA) has jurisdiction for federal environmental regulations.

The Division of Air Quality

The Division of Air Quality is responsible for implementing protective programs and standards to help maintain and improve North Dakota's air quality. Scientists, engineers and technicians manage the implementation of state and federal programs to help ensure compliance with all air quality laws. The division maintains federal delegation for U.S. Environmental Protection Agency (EPA) Clean Air Act (CAA) programs and provides technical assistance on environmental matters and during emergency response efforts. Industry is regulated through the issuance of permits that include specific standards to ensure proper operations and compliance with CAA regulations. Division staff work proactively with industry to address air compliance issues as well as citizen concerns and complaints.



The division consists of 35 full-time positions. The division consists of environmental scientists environmental engineers, all of which require the minimum of a four-year degree; and electronic technicians and a data processing coordinator with two-year technical degrees. There is also an administrative support staff member.

Program staff responsibilities include:

- Implementing the Clean Air Act
- Evaluating permit applications
- Conducting computer modeling of potential impacts to air quality
- Issuing permits that outline applicable standards
- Completing compliance inspections to ensure standards are met
- Operating an ambient air quality monitoring network
- Responding to complaints and air quality concerns throughout the state
- Preparing state implementation plans for Federal Rules including the Regional Haze Rule

The Division of Chemistry

The chemistry laboratory provides analytical chemistry data to environmental protection, public health, agricultural and petroleum regulatory programs. The laboratory also maintains a certification program for laboratories submitting compliance samples to Environmental Quality.

The department's environmental protection programs use laboratory data to monitor and regulate solid and hazardous waste; municipal wastewater; agricultural runoff; surface, ground and drinking water quality; petroleum products; and other media of environmental or public health concern. The Chemistry lab also provides analysis for tribal water and wastewater systems, the North Dakota Department of Agriculture, the United States Geological Survey, and the State Water Commission. It also analyzes water samples from private citizens.



The Division of Chemistry has 16 full-time employees. Thirteen are professional chemist positions requiring the minimum of a four-year degree. Two are laboratory technician positions, and one is an administrative assistant.

The Division of Municipal Facilities

The Division of Municipal Facilities administers three programs. These are the Public Water Supply Supervision program, the Drinking Water State Revolving Loan Fund program, and the Clean Water State Revolving Loan Fund program. The division consists of 31 full-time employees. Fifteen are environmental scientists, and 13 are environmental engineers requiring the minimum of a four-year degree. There is one grants/contracts officer position, also requiring a four-year degree, and two administrative support personnel.

Public Water Supply Supervision (PWSS)

This program works with the (currently 505) public water systems (PWS) in North Dakota. The program monitors drinking water quality and provides technical assistance to ensure drinking water meets all standards established by the federal and state Safe Drinking Water Act (SDWA). Currently, 100 percent of community water systems meet all applicable health-based standards under the SDWA. North Dakota consistently has one of the highest compliance rates in the region and country. The EPA goal for 2019 was 90 percent nationwide.

The Municipal Facilities division provides training and operator certification for water treatment and distribution facilities and wastewater collection and treatment plants. There are about 1,023 certified operators in the state. A total of 68 percent of public water systems that require an operator meet operator certification requirements for water treatment (no EPA goal). Sixty-six percent of community water systems that require an operator meet operator certification requirements for water distribution (no EPA goal) in North Dakota.

Staff administer the fluoridation program and provide technical assistance to private systems. A total of 65 communities add fluoride to their drinking water. Of the population served by these communities, 98.5 percent (about 488,935) receive optimally fluoridated drinking water (no EPA goal).

Drinking Water State Revolving Loan Fund (DWSRF)

This program provides low-interest loans to help public water systems finance the infrastructure needed to comply with the SDWA. Staff members also review drinking water projects to ensure compliance with state design criteria before construction and provide technical assistance.

Since the inception in 1998 through June 30, 2021, the DWSRF has approved loans totaling about \$709 million.

Clean Water State Revolving Loan Fund (CWSRF)

This program provides low-interest loans to fund conventional wastewater and nonpoint source pollution control needs. Team members also review wastewater projects to ensure compliance with state design criteria before construction and provide technical assistance.

From 1990 through June 30, 2021, the CWSRF has approved loans totaling about \$834 million.

Field activities supporting the Municipal Facilities programs include:

- Inspecting over 570 public water and wastewater systems to ensure compliance with all public health standards.
- Reviewing State Revolving Loan Fund construction projects to ensure they meet state and federal requirements.
- Investigating complaints.



The Division of Waste Management

The programs in the Division of Waste Management work to safeguard human health and protect and improve North Dakota's natural environment for everyone. This is done by enforcing state and federal environmental laws designed to regulate where and how materials are used and stored, and their ultimate disposal. The division also works to encourage waste reduction, recycling, and beneficial reuse. There are 34 full-time positions and two part-time temporary positions; consisting of 26 environmental scientists, four environmental engineers, four program managers, the division director (all of which require the minimum of a four-year degree), and one administrative support staff member. The division is organized into four program areas.

Hazardous Waste Program

This program regulates approximately 800 facilities that generate, store, treat, dispose or transport hazardous waste. The program also coordinates assessments and cleanups at Brownfield sites (properties underdeveloped due to actual/perceived contamination). It performs inspections and compliance assistance for businesses and utilities with equipment containing polychlorinated biphenyls (PCBs).

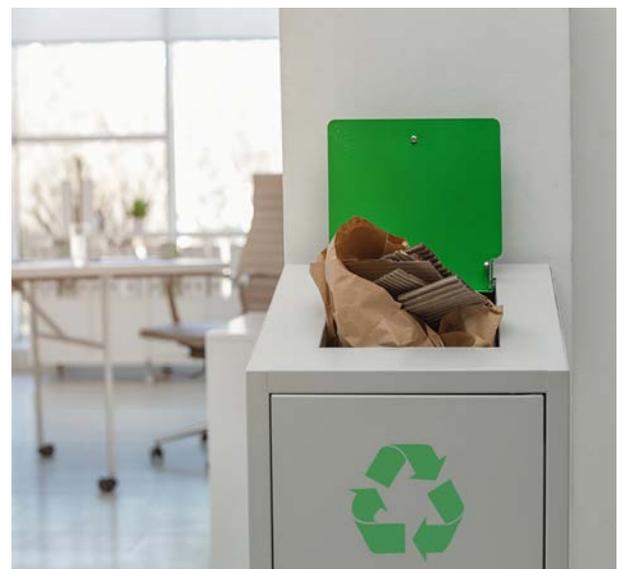
Radiation Control and Indoor Air Quality Program

This program performs two major functions:

1. Regulating the development, use and security of ionizing and radiation sources to protect North Dakotans and the environment. The program regulates 75 radioactive material licensees, 46 licenses for the transport and storage of Technologically Enhanced Naturally Occurring Radioactive Materials (TENORM), and 32 reciprocity license agreements.
2. Evaluating and mitigating asbestos, radon, lead and other indoor air quality concerns, as well as implementing a public awareness and education program concerning these health risks.

Solid Waste Program

This program regulates the collection, transportation, storage and disposal of nonhazardous solid waste. It promotes resource recovery, waste reduction and recycling. The program helps individuals, businesses, and communities provide efficient, environmentally acceptable waste management systems. The program regulates 383 solid waste facilities, including infectious waste/medical waste facilities, industrial waste landfills, land treatment facilities, municipal solid waste landfills, special waste facilities, transfer stations and inert waste landfills/compost facilities. The division also regulates 1,482 permitted waste transport companies. Program staff also administer the Abandoned Motor Vehicle Program, which assists political subdivisions in the cleanup of abandoned motor vehicles and scrap metal. A total of \$152,499.51 was spent on projects in the City of Beach, City of Dodge, Dunn County, City of Glen Ullin, McKenzie County, Slope County and Williams County during this past biennium.



Underground Storage Tank (UST) Program

This program regulates petroleum and hazardous substance storage tanks, establishes technical standards for the installation and operation of underground tanks, maintains a tank notification program, establishes financial responsibility requirements for tank owners, and provides state inspection and enforcement. The program works with retailers and manufacturers to ensure they meet specifications and standards for petroleum and antifreeze. There are 831 operating facilities and 136 temporarily non-operating facilities currently regulated under this program. The UST Program also supervises cleanup from any leaking underground storage tank facility and other petroleum product releases.

Field activities supporting the Waste Management programs include

- Compliance assistance
- Sampling
- Training
- Site inspections
- Complaint investigations

The Division of Water Quality

The Division of Water Quality maintains and improves water quality through five programs. There are 37 full-time positions, consisting of 28 environmental scientists, four environmental science managers, four environmental engineers (all of which require the minimum of a four-year degree) and one administrative assistant.

North Dakota Pollutant Discharge Elimination System (NDPDES) Permit Program

This program issues the federally required National Pollutant Discharge Elimination System (NPDES) permits for limiting the discharge of pollutants to surface waters. Discharges may include pollutants carried by stormwater, in addition to the direct release of wastewater. Many industries and municipalities are required to obtain these permits. This program also issues permits to septic tank pumpers regulating the collection and proper disposal of domestic wastewater.

The permits may be individual permits issued to one facility or general permits involving multiple facilities under one permit.

Watershed Management Program

This program monitors North Dakota watersheds' health through sampling and analysis of water quality and aquatic life in lakes, rivers, streams, and reservoirs. For those water bodies that are not usable for their designated use, the program helps develop plans to improve water quality in partnership with the local conservation districts and landowners. This program also provides cost-share assistance, information and education to help meet water quality goals.



*Turtle River State Park.
Credit: Greater Grand Forks Convention & Visitors Bureau*

Ground Water Protection Program

The Groundwater Protection Program protects and monitors groundwater quality and works towards the restoration of groundwater that has been impacted by contaminants.

This program includes:

- Source Water Protection Programs which defines the susceptibility of public water systems to contaminant sources.
- Underground Injection Control (UIC) Program which helps prevent contamination of drinking water by injection wells.
- Ground Water Monitoring Program, which assesses the quality of groundwater resources concerning agricultural and oil field-related chemical contamination.



Groundwater sampling with an audience. Credit: Andrew Peterson

Trained personnel also provide immediate response to spills and continued investigation/enforcement, to fully address environmental impacts. Program staff further fulfill open records requests typically received as part of property transactions or as Freedom of Information Act requests from the media and general public.

Spill Investigation Program

This program receives and reviews spills reported to the state and responds with other Environmental Quality divisions and additional state and federal agencies. The response may include collecting additional information, assignment to other agencies, field inspection and on-scene coordination. Program staff collect environmental samples of soil and water and work with the responsible party to ensure spills are remediated and waters of the state, both ground and surface water, are protected. Since the timely response to a critical incident is crucial, this program maintains staff in the field five days a week and one staff person on call during weekends and holidays. One staff person operates phone coverage 24 hours a day, seven days a week, in case of an incident. Staff members also work with various industries to prepare for incident response actions and educate them on proper remediation and spill assessment.

Field activities supporting water quality programs include:

- Inspection of wastewater treatment facilities and septic tank pumpers, as well as completion of compliance audits/sampling to ensure involved parties meet permit requirements
- Inspecting construction and industrial site stormwater controls
- Meetings with local/state entities to assess nonpoint source project goals
- Ambient monitoring of lakes and rivers
- Evaluating domestic water sources for potential contaminant sources
- Annual collection/analysis of samples from vulnerable aquifers
- Overseeing remediation of spills with potential to reach water sources
- Responding to complaints

Office of the Director

Agency activities are coordinated by the Office of the Director, which has 12.5 full-time employees and an attorney assigned by the Office of Attorney General.

Employees oversee quality assurance procedures; help coordinate public information efforts; assist with staff training and data management activities, emergency response efforts, enforcement of environmental regulations and funding requests.



The Office of the Director works with the department's divisions, various government agencies, industry and the public to set environmental protection policy and ensure the proper implementation of environmental protection programs.

Boiler Inspection Program

The Boiler Inspection Program provides initial and periodic inspections of boilers of all sizes, types and pressures. Originated in 1953, the Boiler Inspection Program is responsible for the inspection and safe repair of boilers installed in public and commercial locations. Technical advice and engineering assistance are provided to installers, repair firms, operators and owner/users. Nominal fees are collected to fund the inspection activity. Coordination of inspections with insurance companies allows qualified insurance company "special inspectors" to participate in making required inspections and prevent duplication of services.

As of June 30, 2021, there are 11,835 active boilers subject to regular inspection in the state, including 9,031 hot water heating boilers, 1,882 hot water supply boilers, 582 steam heating boilers, 339 power and process boilers, and 61 historical (hobby) boilers.

Petroleum Tank Release Compensation Fund Program

The North Dakota Petroleum Tank Release Compensation Fund was established by the 1989 North Dakota State Legislature to financially assist tank owners for cleanup costs and third-party liability caused by petroleum contamination.

All owners or operators of aboveground or underground petroleum storage tanks in North Dakota are required to register their tanks with the Fund and pay an annual registration fee of \$100 for each aboveground and underground tank. Violation of this law is a class B misdemeanor.

If a petroleum release occurs or petroleum contamination is discovered, an eligible tank owner is reimbursed 90 percent of necessary and reasonable costs between \$5,000 and \$155,000 for cleanup of contamination or third-party liability. The Fund reimburses 100 percent of costs between \$155,000 and \$1,000,000.

Mini Superfund (Regulated Substance Response)

In past environmental emergencies or contaminated properties where a responsible party was uncooperative or unidentified, Environmental Quality has found it challenging, if not impossible, to implement appropriate and timely corrective action. Funding deficiencies and state regulatory gaps prevented remediation, and investors avoided those sites for potential liability concerns.

The new mini Superfund passed by the 67th legislative assembly will reduce the incidences of abandoned, contaminated properties in the state by incentivizing responsible parties to initiate timely corrective action and provide the resources needed to remediate those sites when a responsible party is unavailable. It will also provide liability relief to investors that voluntarily initiate corrective actions. Non-emergency environmental contamination will also be eligible. The fund amount increased to address more significant projects. The fund will grow from environmental enforcement penalties, allowing contaminated properties to return to beneficial use.

Uniform Environmental Covenants Act

This past legislative session, North Dakota adopted practices from the Uniform Environmental Covenant Act to help remove conflicts or gaps in existing state law. This replaced North Dakota Century Code (NDCC) 23.1-04-04 with the following:

- 47-37-02: Clarified that interests before the environmental covenant remain valid (e.g., a mortgage) and that relevant parties can agree to re-order the priorities in a "subordination agreement."
- 47-37-04: Explained that certain traditional common law doctrines do not apply, ensuring an environmental covenant remains enforceable and in effect.
- 47-37-05: Stated that the Act does not authorize a use prohibited by zoning law or a prior recorded instrument
- 47-37-06: Expanded who must receive notice of the environmental covenant
- 47-37-08 & 47-37-09: Clarified the termination/amendment of an environmental covenant
- 47-37-11: Required Environmental Quality to establish a registry of environmental covenants.

Reimbursements from the Abandoned Motor Vehicle Fund

Environmental Quality supported amendments to NDCC Sections 23.1-15-05 and 07 through 09. As a result of these changes, commercial towing services (also licensed scrap iron processors) are now eligible for reimbursement through the Abandoned Motor Vehicle Fund for towing costs and up to thirty days of storage charges resulting from taking an abandoned auto into custody.

Criminal Background Checks for Certain Licenses/Permits

The sixty-seventh legislative assembly added a new section to NDCC 23-01 and 23.1-01 relating to criminal history background checks. The department can now require criminal background checks before offering employment or receiving a permit or license to operate in the state. This new language helps ensure facility operational integrity and safe handling of specific hazardous materials.

North Dakota's Regional Haze Plan

Since Environmental Quality has primacy in implementing the federal Clean Air Act (CAA) in North Dakota, we are required to develop a plan addressing visibility impairing emissions. Regional Haze State Implementation Plans (SIPs) are routinely reviewed and updated by the department and approved by the U.S. EPA. Environmental Quality strives to follow science and the law in making our Regional Haze SIP determinations, and we are grateful for legislative support enabling us to do so. This same level of collaboration allows North Dakota to meet all of the national ambient air quality standards. Our high level of air quality is accomplished through compliance outreach, technical evaluations, permitting programs, monitoring and enforcement activities.

North Dakota Environmental Laws

The majority of the North Dakota environmental laws and rules mirror the federal requirements and, by design, are no more stringent. In very few instances where no national requirements or federal regulations address a state-specific environmental or public health concern, the state has adopted new regulations. Before adoption, proposed regulations go through a rigorous public review and comment process. These rules allow us to address environmental issues at the state level avoiding federal intervention. An example would be the regulation of some air emissions in the oil patch. Environmental Quality supported the review and adoption process of new regulation as approved in NDCC 23.1-06-07.

New Appropriations & Added Responsibilities

The 67th legislative assembly awarded Environmental Quality the following new requests this past biennium:

- A package to establish a Division of Accounting
- A package to replace the Chemistry Laboratory's outdated Laboratory Information (LIMS).
The current LIMS is based on antiquated DOS technology. This new LIMS will ensure the continued operation and support of the Chemistry laboratory.
- A package to address North Dakota's Carbon Intensity Plan
- Participation in the state Litigation Funding Pool

Agency Activity

The Division of Air Quality

Increasing oil well counts and improved unconventional oil and gas extraction techniques continue to elevate the amount and complexity of work related to permitting, inspections, enforcement and citizen complaint resolution efforts. The number of oil wells registered with the division has more than tripled since 2010 (see Figure 1 in the Appendix). There has also been an increase in oil- and gas-related projects (e.g., crude oil storage tank facilities, oil terminals, gas plants, and refineries).



*The North Dakota energy industry is diverse and productive. Pictured is the Leland Olds Station in Stanton, N.D.
Credit: North Dakota National Guard*

Even with declines in **new** well production, most **existing** wells stay online and are subject to regulations and oversight. A downturn in the oil industry means North Dakota flaring rates can “catch up” to gas infrastructure needs and move toward meeting the [North Dakota Industrial Commission Gas Capture Policy goals](#).

Increased interest in renewable energy generation along with clean coal technologies such as carbon capture and sequestration has resulted in the issuance of environmental protection permitting for those activities. Federal regulations and changes in the energy generation market forces have impacted the division’s implementation plans for the Regional Haze and Affordable Clean Energy Rules.

The transition to renewable energy resources has also impacted the division. See Figure 2 in the Appendix for breakdown on electrical generation in North Dakota by industry. Electric energy produced from coal has remained relatively stable since 2000. Since about 2007, wind power has continued to add to North Dakota’s total electrical generation.

Facilities that manufacture wind turbine blades require an air quality permit from the Department. The heightened concern surrounding climate change has also peaked citizen interest in CO₂ emissions. This has resulted in a heightened concern around operations of coal-fired power plants and the long-term viability of the coal industry. It has impacted the division’s plans for the implementation of the Regional Haze Rule and the Affordable Clean Energy Rule. **Yet North Dakota remains in compliance with all national ambient air quality standards.** See Figure 3 in the Appendix for emissions trends in the state.

Most facilities that require permits under the federal Clean Air Act require routine compliance inspections by program staff. (See Figures 4 through 9 in the Appendix.) Depending on the complexity and level of public interest, an individual project or facility may require substantially more staff resources. The increased number of regulated air pollution sources and increased complexity in regulations has resulted in continuous recruitment and retention challenges and efforts for professional and experienced staff.

Additional direct and indirect impacts on the division include:

- Expansion of the Marathon Mandan Refinery and permitting work for proposed diesel refineries, including the Meridian Davis Refinery.
- Increased compliance activities (inspections, testing/report reviews) relating to the Marathon Dickinson Refinery (formally Dakota Prairie Refinery). This facility has been converted to a renewable diesel plant (one of the first of such conversions permitted in the U.S.). Many similar projects are entering the permitting phase.
- Increased permitting and compliance activities relating to gas plants, compressor stations and oil storage terminals. This includes increases in pre-construction modeling as gas plants and compressor stations expand to accommodate the increase in associated gas production from the Bakken.
- The extensive effort with the enforcement initiative to reduce and mitigate fugitive emissions from upstream oil and gas production activities.
- Bakken shale oil field surveys with the EPA utilizing Geospatial Mapping of Air Pollution (GMAP) to gather air contaminants' real-time analytical data.
- Increased oil- and gas-related complaints and questions from the public.
- Expansion/operational problems at the Tioga Gas Plant and Dakota Gasification Company.
- Adoption of significant federal regulations (40 CFR 60, Subpart OOOO and OOOOa).
- Increased workload due to administering the Volkswagen Settlement.
- State planning for extensive EPA regulations.

The Division of Chemistry

The chemistry laboratory analyzes water, soil, and other matrices to determine impacts from energy events. A single sample can have one parameter or more than 100. Figure 10 (see Appendix) demonstrates samples plotted versus analytes. Many different environmental factors can impact sample volume.

Other unique factors that impact Chemistry workload include

- Determining method limits with highly mineralized water samples. Detecting specific elements in samples can require a different dilution and reanalysis of the original sample.
- The EPA's decision to have all drinking water systems on tribal land move to Region 8 jurisdiction has increased our tribal liaison's portfolio from nine to 14 systems since April 2019.
- Implementing the new Lead and Copper Rule and other SDWA regulations.
- The lab is certified through April 2022 by EPA Region 8 for the determination of regulated parameters in drinking water. The division continues to pursue third party certification for parameters in other matrices. It is a process that involves extensive review of methods, quality assurance/quality control, and document management processes.



The Division of Municipal Facilities

Under NDCC 33.1-19, all persons operating water and wastewater systems, with some exceptions, must be certified by Environmental Quality. Figure 11 (located in the Appendix) shows decreased numbers of public water systems with certified operators since 2011, even though the number of operator certification exams has increased.

Two principal factors have been responsible for the decrease in certification.

1. Operator turnover (certified operators leaving for higher-paying jobs in the oil field).
2. New systems that do not have a certified operator.

Both factors still exist, but available oil field jobs fluctuate depending on oil markets.

Through training and site inspections, the division continues to stress the importance of having a certified operator. In oil-impacted counties, the immediate need has been for water distribution operators since most new systems obtain drinking water from other regulated treated sources. Compliance with operator certification requirements for water treatment and wastewater collection/treatment also may decrease if more systems choose to develop/treat their own drinking water sources or treat/discharge wastewater. Total approved water and wastewater plans and specifications by year are featured in Figure 12 of the Appendix.

Figures 13 and 14 (see Appendix) show the number of projects on the CWSRF and DWSRF lists increased significantly since 2010. By November 2021, the programs awarded 20 new loans. More loans result in additional SRF projects to implement, increasing workload on top of keeping pace with more technical reviews for non-SRF and oil field projects.

Additional workload impacts to those shown in Figures 13 and 14 include:

- Educating systems on SDWA requirements
- Implementing and enforcing the requirements.
- Helping systems understand compliance.
- Providing technical assistance in addressing SDWA violations.
- Responding to complaints.
- Answering calls and emails about proposals for the reactivation of housing facilities.
- Handling vendor and engineer inquiries.
- Site visits and presentations on alternative wastewater treatment systems and project proposals.



*Pictured is a wastewater stabilization lagoon located in Rutland, N.D. Facultative pond systems, such as this, use natural processes to treat wastewater.
Credit: Shawn Martin*

The Division of Waste Management

Oil Field Impacts

Despite recent volatility in the oil production and recovery sector, the workload has continued to increase. Facilities directly operated by oil field-related businesses and peripheral businesses supporting the increasing general population continue to operate. Oil field service companies and other support businesses, such as tank manufacturers, generate hazardous waste. Even with the slowdown in oil well drilling activity, the service and support companies remain active. The number of facilities that generate 220 pounds or more of hazardous waste annually have increased approximately 10 percent in the past year.

New gas stations and truck stops continue to be built or expanded. Both municipal landfills and oil field special waste landfills deal with new types and significantly increased volumes of waste. Ionizing radiation sources and materials are commonly used in oil exploration and production and require proper training and licensing for safe use. Figures 15 through 20 (see Appendix) show the increase in hazardous waste large-quantity generators (LQGs), municipal solid waste (MSW) and special waste landfills, tons of oil field special waste, number of solid waste inspections, radioactive material licensing inspections, new or expanded underground storage tank (UST) facilities, and new waste transporter permits.



The generation, proper management, and disposal of Technologically Enhanced Naturally Occurring Radioactive Material (TENORM) continues to be a priority in North Dakota. TENORM is low-activity radio active waste that is generated primarily in oil field exploration and production activities. It includes materials such as filter socks, tank bottom sludge and pipe scale. Certain types of fracking material can also be considered TENORM. Responding to illegal dumping has historically taken considerable staff time, as TENORM is a significant public concern (see Figure 21 of the Appendix).

The division oversees rejected waste loads at landfills and the cleanup of illegal dumpsites. However, the number of incidents has decreased since the implementation of required TENORM waste containers on all well sites. Environmental Quality has increasingly acted in response to TENORM management incidents, including improper processing, storage, and disposal.

The need for safe and effective TENORM disposal locations is essential. The waste management division is aware of two facilities pursuing TENORM waste permits. TENORM applications have generated significant public interest. The division has responded by working in cooperation with local governments, cities and counties, sharing information and answering questions about potential TENORM acceptance at landfills. We educate through numerous public hearings and workshops, aiming to reach as many interested parties as possible.

The department respects the relationship between the state and local governments. Permit reviews ensure landfill design protects public health and the environment, while county governments maintain jurisdiction over what land use is appropriate in their communities.

The division has three staff members on the Water Quality spill response team, which requires considerable fieldwork and office follow-up. Figure 22 (see Appendix) of this report shows spill response numbers.

In coordination with the public, stakeholders, and the regulated community, the department established a general permitting program July 1, 2020. This program will provide consistent permitting language for certain categories of facilities and streamline the permitting process, reducing review time while preserving protections for public health and the environment.

One of the first categories of facility that the division intends to address through a general permit is the land treatment of petroleum contaminated soils. Previously, the state could address the land treatment through one of three different permitting mechanisms. Developing a comprehensive general permit would ensure a clear and consistent process.

The division continues to issue contracts with cities, counties, and local public health units to provide funds from the Abandoned Auto Program Fund to remove and recycle abandoned cars, campers, trailers and mobile homes, many of which were abandoned during the oil field activity decline.

Electric Power Generation

The electric power generation landscape in North Dakota is also evolving. Renewable energy sources are becoming a more significant component of the overall electricity generation mix. New energy sources come with new waste management demands.

At the same time, companies have decided to retire some legacy coal combustion units. The decommissioning of a power plant does not mean the end of waste management responsibilities at a site. Landfills commonly require 30 years of post-closure care, including monitoring, which continue to be covered under applicable permits.



*Wind Turbines in a sunflower field near Wilton, N.D.
Credit: North Dakota Tourism*

The Water Infrastructure Improvements for the Nation Act (WIIN Act) of 2016 provides state programs approval for the control of coal combustion residuals (CCR). In response to the act, Environmental Quality adopted amendments to the Solid Waste Management rules, which became effective on July 1, 2020. The amendments included a new chapter (NDAC Chapter 33.1-20-08) entitled Disposal of Coal Combustion Residuals in Landfills and Surface Impoundments that applies to owners and operators of new and existing landfills and surface impoundments of CCR generated by the combustion of coal at electric utilities and independent power producers.

Although the department has long had applicable CCR rules, the new program requires amended permitting and additional review and inspections for CCR units within the state. Facilities have until July 1, 2022, to submit revised permit applications. The department will be working closely with affected facilities to complete appropriate permit requirements and follow-up inspections.

An emerging concern has to do with the disposal of wind turbine blades removed at the end of their usable life. These blades can be more than 100 feet long. There are currently about 1,700 turbines in North Dakota, equaling more than 5,000 blades eventually requiring replacement. The first turbines installed are going through blade swap-out now.

Blades are considered inert waste (less likely than municipal garbage to contaminate water or serve as food for pests). There are approximately two dozen landfills within the state that could potentially accept these blades. We likely have landfill capacity to handle waste blades from North Dakota for the foreseeable future; however, various groups are looking to develop other end-of-life options for these blades. There is little market for recycled blades or fiberglass blade material at this point. Still the Department is seeking to coordinate efforts to identify recycling or alternative use solutions that will work for North Dakota.

The Division of Water Quality

Spill Investigation Program

This program is primarily responsible for responding to spills with the potential to impact waters of the state and includes oversight of appropriate remediation activities. The program handles two different types of spills, oil field and non-oil field related. On Jan. 1, 2021, North Dakota combined all spill reports into the Unified Reporting System. Of the reported spills since July 1, 2019, there are currently less than ten oil field-related and non-oil field related spills awaiting initial inspection.

The Spill Investigation Program has participated in the initial inspection of most spills in the state. Between July 1, 2019, and June 30, 2021, the program reviewed 1,995 total spills and has responded to 1,097, assigning the rest to other agencies. Of the 1,097, there are 287 that need additional ongoing department oversight.

The program evaluates spills with the most significant potential to adversely impact the environment as soon as possible. July 2019 through February 2020 saw an increase in oil field related spills. March 2020 through January 2021 saw a significant drop in all spills due to the economic downturn, a decline in oil prices and the shutting in of numerous wells. Since February 2021, we have seen a slight rebound in the number of spills. As the number of oil and gas facilities increase and oil wells come back online, we expect the potential for the number of spills to continue to increase. Figure 22 (see Appendix) illustrates the change in the number of spills reported and the staff's response for each year.



NDDEQ Environmental Scientist Taylor DeVries inspects remediation at a salt water spill site. Credit: Karl Rockeman

NDPDES Program

Environmental Quality continues to issue new permit coverages with the influx of Notice of Intents and Applications. Septic pumpers (see Figure 23 in the Appendix) continue to maintain their presence as the need for services continue.

Except for septic system servicers, the following are federally required permits:

- Construction stormwater
- Dewatering and hydrostatic testing (including pipelines and tanks)
- Pretreatment
- Industrial stormwater
- Wastewater general permits (typically small domestic wastewater treatment facilities)
- Wastewater individual permits (typically major municipalities and industries)

Some of these permit types now cover permanent facilities that require more oversight to ensure permit compliance.

The overall increase in permits has resulted in additional inspections and response to complaints in all areas. This is especially true for septic pumpers, stormwater controls, well pads, and hauled wastewater treatment facilities. Construction stormwater continues to dominate the new permit coverages (see Figure 23 in the Appendix).

However, the permitting program still must address issues such as abandoned facilities (e.g., RV campgrounds with lagoon systems) that may need cleanup. As the oil and gas industry maintains its variability, companies continue to pursue petrochemical manufacturing and mining produced water. Because of their complexity, facilities engaged in these activities will require highly trained staff to issue and monitor permit compliance.

Retraining well-qualified staff is essential to the success of this program.



Fargo Wastewater Treatment facility

Groundwater Protection Program

The North Dakota Groundwater Protection Program focuses efforts on preventing groundwater contamination through programs designed to control potential sources of pollution. They also work towards the restoration of groundwater that has been impacted by a variety of contaminants. The degree to which Environmental Quality investigates or remediates contamination depends upon the pollutant, its impact on the resource's beneficial use, and the overall risk to the public or the environment.

There are approximately 380 community water systems in North Dakota. The Source Water Protection Program prepares a Source Water Assessment Report for each water system. Environmental Quality updates the reports on a five-year cycle. Each report includes:

- Delineation of the source water protection area
- Completion of a potential contaminant source inventory
- Completion of a susceptibility analysis

The reports help the Environmental Quality define the susceptibility of public water systems to potential contaminant sources found in their protected areas. Source Water Assessment Reports were prepared for 47 public water systems in 2019 and 24 systems in 2020.

Maintaining a baseline description of groundwater quality is an essential element of any statewide, comprehensive groundwater protection program. In recent years, concern for the quality of the environment and drinking water has increased as many states have experienced groundwater contamination from various point and nonpoint sources of pollution. Selected glacial drift aquifers have been monitored each year since 1992 as part of the Agricultural Groundwater Monitoring Program. The program includes approximately fifty aquifers considered to be the most vulnerable to contamination. Conducting the monitoring on five-year cycles, preferably using most of the same wells for sampling, provides a temporal assessment of agricultural chemical occurrence in specific aquifers. Two hundred and four wells were sampled in 2019, and 154 wells were sampled in 2020.

The Groundwater Protection Program initiated a Western Groundwater Monitoring Program in November of 2013. This sampling program monitors groundwater conditions in approximately 125 wells in 21 aquifers located within the oil-producing areas of North Dakota. The wells are sampled on a 1.5-year cycle. Environmental Quality sampled 78 wells in 2019 and 86 wells in 2020.

The Groundwater Protection Program conducts reviews of various sites to assess their potential to contaminate groundwater. These reviews generally fall under one of three categories:

1. Landfills
2. Concentrated animal feeding operations (CAFOs)
3. General site reviews (e.g., oil or injection well pads, construction projects, railroad line abandonment, pipelines)



NDDEQ Environmental Scientist Casey Gleich (upper left), former employee Shawna Nieraeth (lower left), and NDDEQ Environmental Scientist Jim Uhlman (lower right) collect samples for the western groundwater monitoring program. Credit: Shannon Suggs

Program staff conducted 10 CAFO and 291 general site reviews in 2019; and 14 CAFO and 230 general site reviews in 2020.

The Groundwater Protection Program reviews and provides comments on water appropriation applications received by the State Water Commission. Groundwater Protection Program staff reviewed 46 water appropriation applications in 2019 and 44 applications in 2020.

The Underground Injection Control (UIC) Program helps prevent contamination of underground sources of drinking water (USDW) by injection wells (i.e., domestic waste, industrial wastewater or motor vehicle waste disposal). The Groundwater Protection Program regulates Class I, IV, and Class V underground injection wells. Program activities have included administering the program grant, permitting, surveillance and inspections, quality assurance, enforcement, data management, public participation, training, technical assistance, and Class V assessment activities.

The inventory of UIC wells (classified as active, temporarily abandoned or inactive, or under construction) as of the end of 2020 includes eight Class I injection wells and 933 Class V injection wells. Class I injection wells are inspected annually; eight inspections were completed in both 2019 and 2020. Environmental Quality inspects Class V wells per numbers listed in annual Performance Partnership Agreements with the EPA. Forty-two Class V inspections were completed in 2019, and 49 inspections were completed in 2020.

Class I injection wells require a permit to operate. The permitting process includes an application review, preparation of a fact sheet and a draft permit, a public notice and comment period, and issuing the injection permit. The permit application review and approval process generally take between six and eight months to complete, provided the permit application package is complete and detailed, and there are no other unforeseen delays. However, this time frame can be highly variable. It could be significantly longer depending on (1) the completeness of the application and (2) the response time of the applicant to NDDEQ requests for additional information or clarification. One Class I injection well permit application was received in 2020.

Groundwater Protection Program staff respond to a significant number of information requests from the public. Topics of discussion include how to sample private wells, what types of analyses should be completed on water samples, perceived impacts to wells, where wells should be located, where to send samples, water quality in a selected area, etc. Program staff also work with responsible parties to clean up contaminated sites due to pollutant releases in the environment.

The Division of Air Quality

Air Quality will need to maintain existing resources to train and retain qualified staff, given the increase in workload and complexity of the division's rules and regulations. Training staff to be competent and have the required knowledgebase to regulate effectively takes two to three years.

Resources are also needed to achieve and maintain expertise to operate equipment to enhance air quality monitoring. Items such as Forward Looking Infrared (FLIR) cameras, flame ionization detectors, and analyzers for ambient air quality are needed to accurately identify regions with potential air quality issues.

Currently, the Air Quality division is migrating to a new comprehensive database system that will allow for greater public accessibility and reporting. The effort has required additional time, training and resources to implement.

What Oil and Gas Production Means for the Air Quality Division

Increased production and upstream development means increased regulatory, oversight and workload responsibilities to include:

- All wells post-Aug. 23, 2011, are subject to NSPS OOOO/OOOOa regulations.
 - * In 2011, North Dakota had approximately 5,500 wells.
 - * In 2019, ND had approximately 15,000 wells.
- Even with declines in **new** well production, most **existing** well and other oil and gas facilities stay online and subject to regulations.
- Taking primacy of OOOO/OOOOa from EPA resulted in a substantial increase in work and the number of staff required to ensure the industry is compliance with regulations.

A downturn in the industry means ND can "catch up" to gas infrastructure needs, helping to meet the [North Dakota Industrial Commission Gas Capture Policy goals](#) for flaring.

Infrastructure needs result in increased permitting and compliance work for Air Quality (outside of NSPS OOOO/OOOOa).

Oil and gas production relates to gas plants, compressor stations, oil storage terminals, and refining. It also includes increases in pre-construction modeling as gas plants and compressor stations expand to accommodate the increase in associated gas production and ongoing compliance and oversight once constructed.



An EPA Geospatial Measurement of Air Pollution (GMAP) program vehicle conducting an air quality survey in ND oil fields. Credit: Adam Rookey

What Wind, Coal, and Natural Gas Production Means for the Air Quality Division

Electric energy produced from coal has remained relatively stable since 2000.

Since about 2007, wind power has continued to add to North Dakota's total electrical generation. Wind and gas seem to have the most attractive economic futures.

- Wind accounted for two percent of total North Dakota power generation in 2007 and 27 percent in 2019.
- Coal accounted for 94 percent of total state power generation in 2007 and 61 percent in 2019.
- Natural gas is expected to increase as there will be better utilization of North Dakota gas resources.

Increased wind development means an increased number of manufacturing facilities to support turbine base and blade construction. If these facilities choose to locate in North Dakota, they require increased permitting and compliance work.

What Emission Trends Mean for the Air Quality Division

Nitrogen Oxide pollutants (NO_x) and Sulfur Dioxide (SO₂) from coal Electric Generating Units (EGUs) have declined significantly since 2000 while maintaining relatively stable operations (less pollution per unit of energy produced).

North Dakota remains in compliance with all national ambient air quality standards.

The Oil and Gas sector has increased North Dakota's Carbon Dioxide (CO₂) emissions. Oil and Gas CO₂ emissions are derived from calculations based on well operations and flaring (a less certain value). Coal EGU CO₂ emissions come from monitoring data (a very accurate value).

The Division of Municipal Facilities

The division continues to experience increases in workload due to oil field development activities and new or updated federal regulations.

Long-term challenges include:

- Implementing new and revised SDWA and State Revolving Loan Fund (SRF) Program requirements.
- Heightened community interest in using the SRF programs for financial assistance to address infrastructure needs.
- Stagnant or reduced federal funding, impacting how the division maintains state delegation for its programs.
- Monitoring for and remediating the class of compounds referred to as "forever chemical compounds."

The Division of Waste Management

Oil field development and established oil field activities continue to impact the work focus of the division. Solid waste management facilities are expanding their operations in response to increased population and industrial activity. Some landfills are looking to accept additional waste streams, including industrial and TENORM wastes.

Concurrently, there is a push to develop programs due to new federal regulations or requests from the regulated community for clarity and consistency. Existing facilities will continue to require oversight to ensure long-term compliance. Staffing pressures are likely to continue to increase.

Future needs will capitalize on efficiencies by applying IT solutions to current data collection management methods. Expansion of database capability is needed to accommodate the Freedom of Information Act requests. We see a need to manage permit applications and landfill waste rejection reports through electronic reporting systems.



*Mule deer reclaim territory on a closed power plant landfill.
Credit: Diana Trussell*

The Division of Water Quality

The Division of Water Quality continues to address both current and past spills to ensure appropriate cleanup. Continued oversight of ongoing remediation projects will require the retention of existing trained staff and the training of replacements due to turnover.

The division will continue to prioritize enforcement actions and field/permitting activities.

The Office of the Director

Changes in federal administration with different agendas and philosophy regarding fossil fuel development and its usage will increase the need for highly trained technical staff. The Environmental Quality will continue to follow science and the law when addressing legal challenges from both government and non-government organizations. Legal cost by biennium are charted in Figure 25 of Appendix. Enforcement actions per year are shown in Figure 26.

Fiscal and Operations

Accounting

For the 2019-2021 biennium, Environmental Quality contracted with the North Dakota Department of Health to provide fiscal services. The shared service agreement included services for fiscal operations, including providing purchasing guidance, processing expenditures and revenue, preparing the 2021-2023 budget, financial reporting, grant applications review, and administration of grants and contracts.



Accomplishments

- Developed an agency budget for the 2021-2023 biennium for the Department totaling \$60.6 million.
- Successfully established a Division of Accounting in the Department of Environmental Quality and closed out the 2019-2021 Biennium.
- Maintained fiscal services during the COVID Pandemic.

Goals

- Establish a system of electronic filing of invoices for Environmental Quality.
- Update the Department's accounting policies and procedures for the newly established division of accounting.
- Keep administrative expenses to less than 5%.

The Division of Air Quality

Appendix

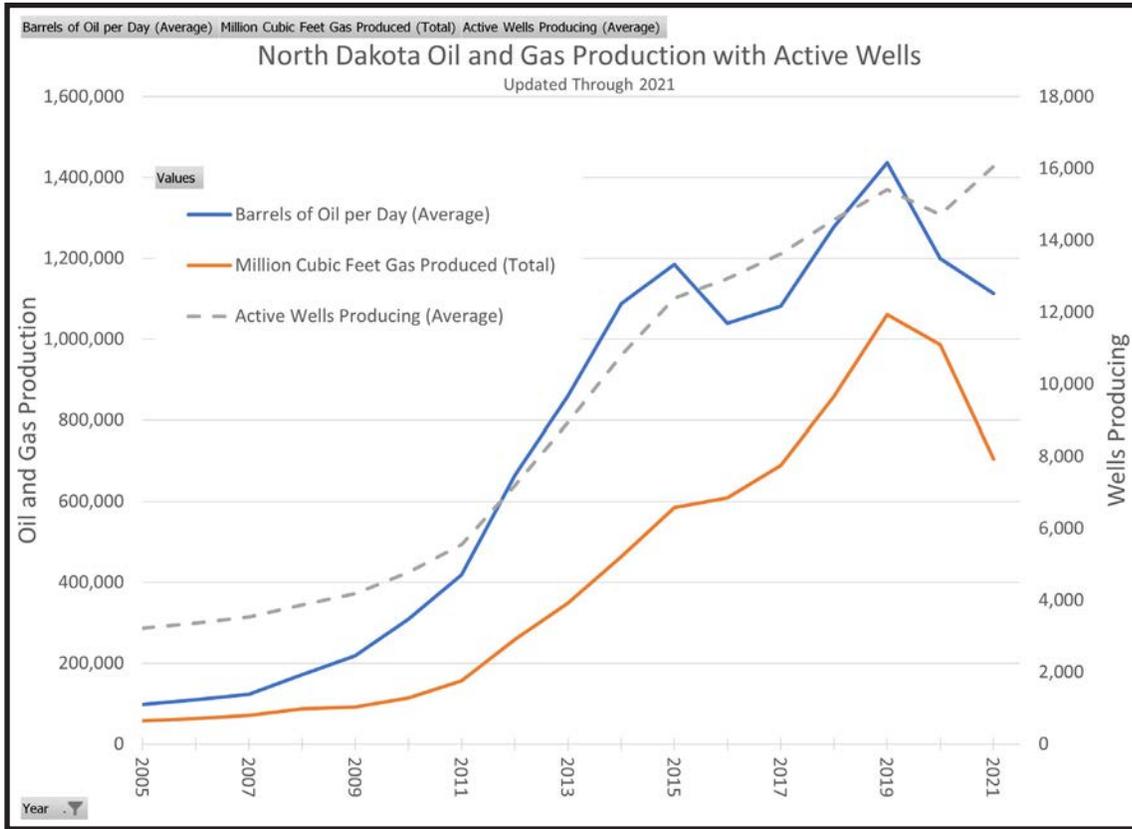


Figure 1: North Dakota Oil and Gas Production

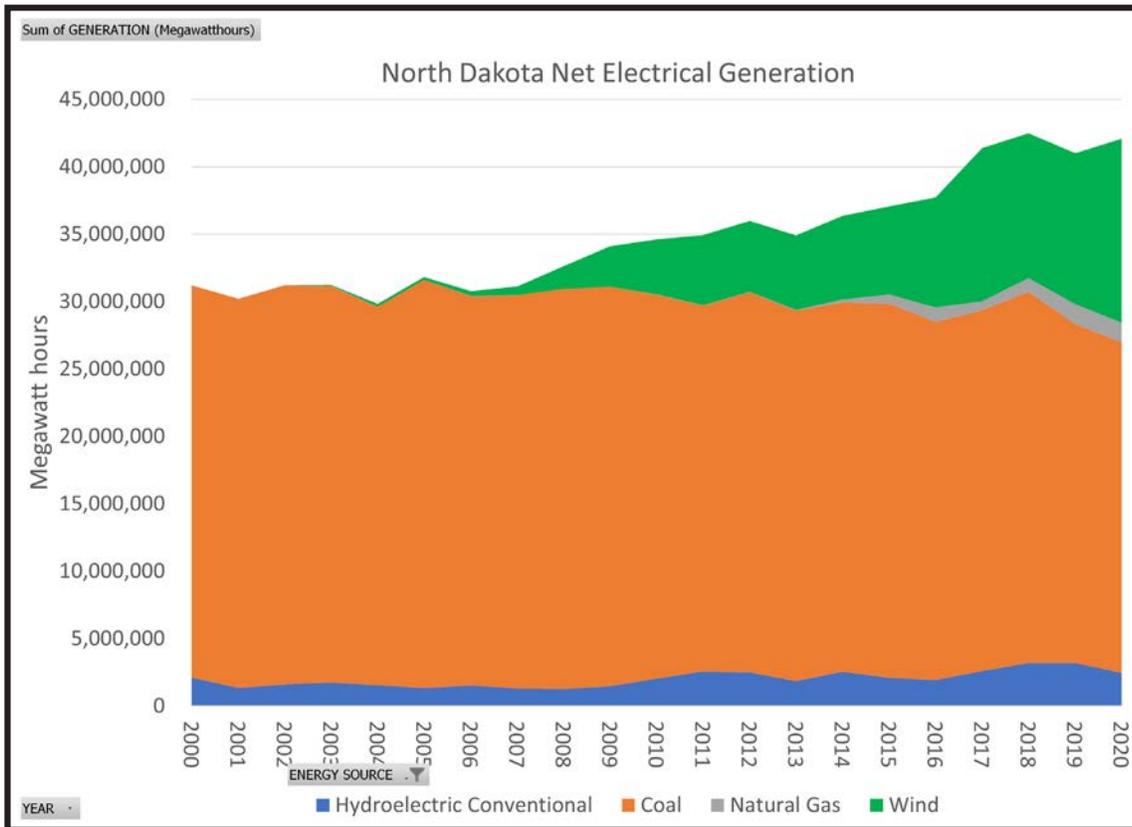


Figure 2: North Dakota Electrical Generation Breakdown by Industry

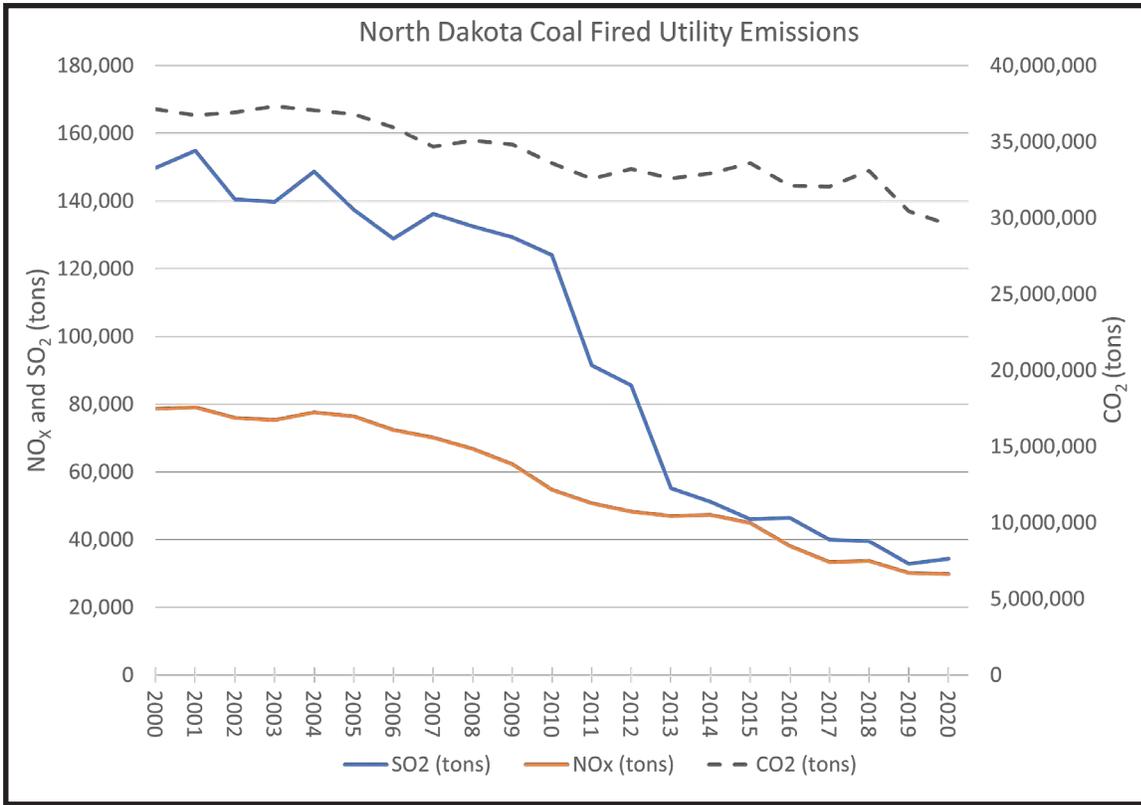


Figure 3: North Dakota CO₂ Emissions

Coal EGU (Electricity Generating Units) CO₂ emissions come from monitoring data (a very accurate value).

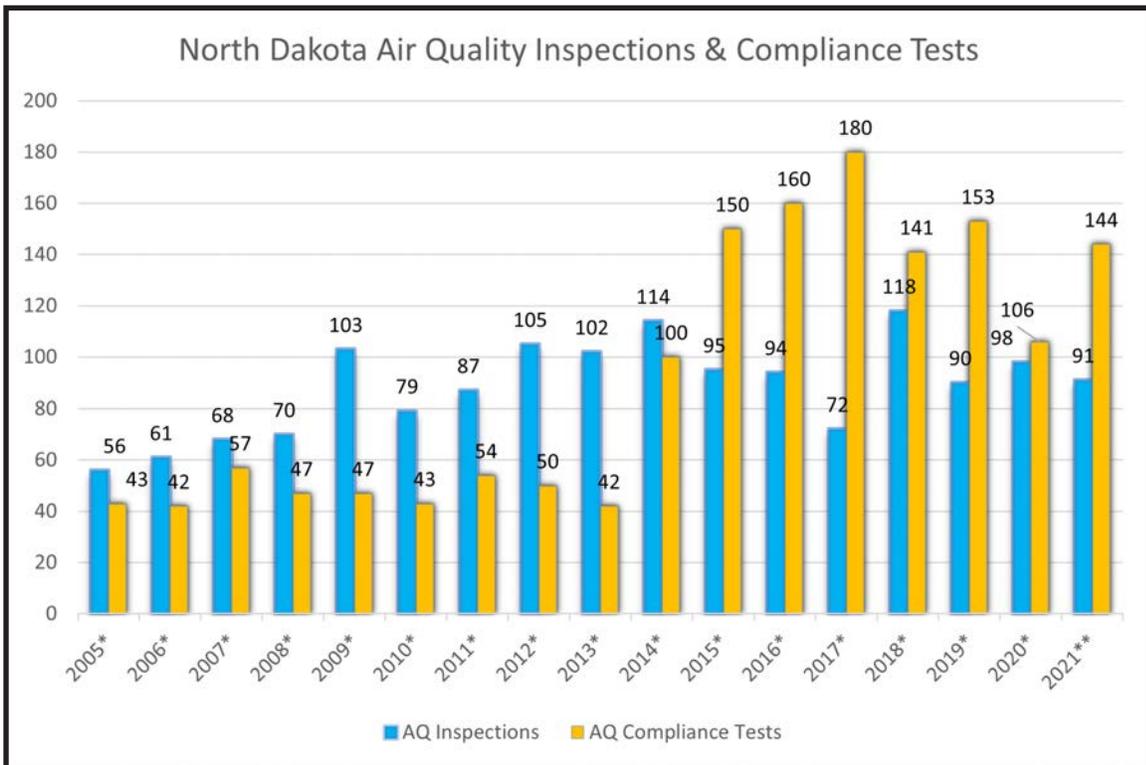


Figure 4: North Dakota Air Quality Inspections by Year*

* All numbers taken from the Air Quality Database

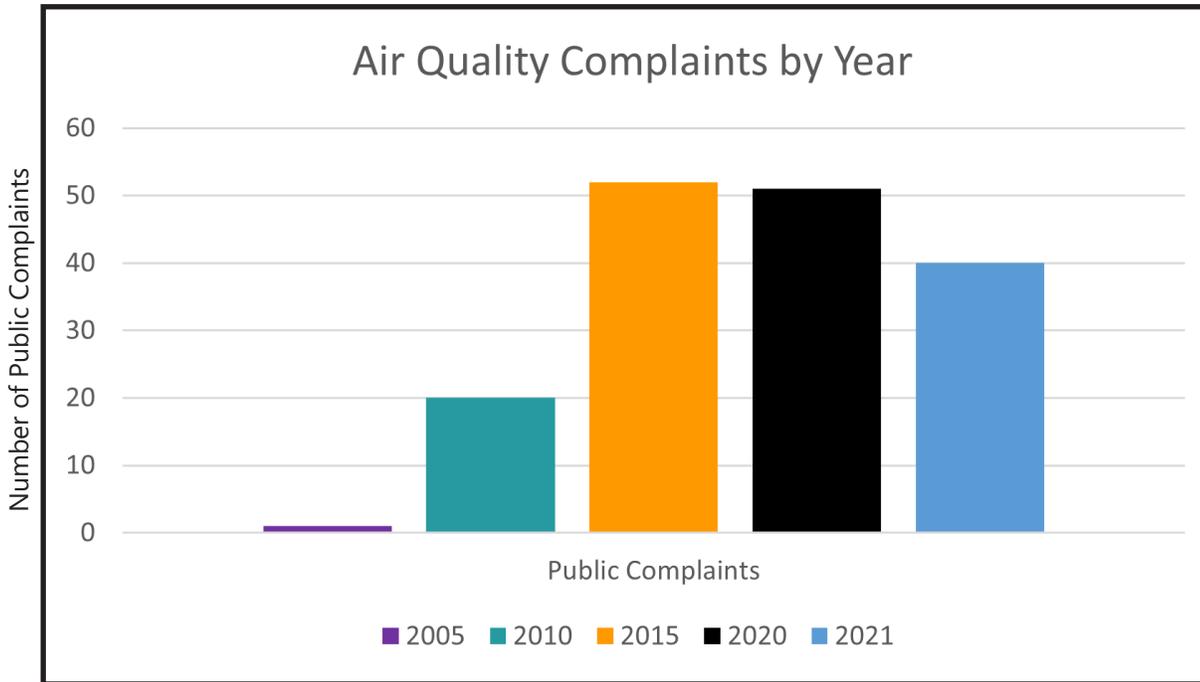


Figure 5: North Dakota Air Quality Public Complaints Addressed by Year*

* All numbers taken from the Air Quality Database

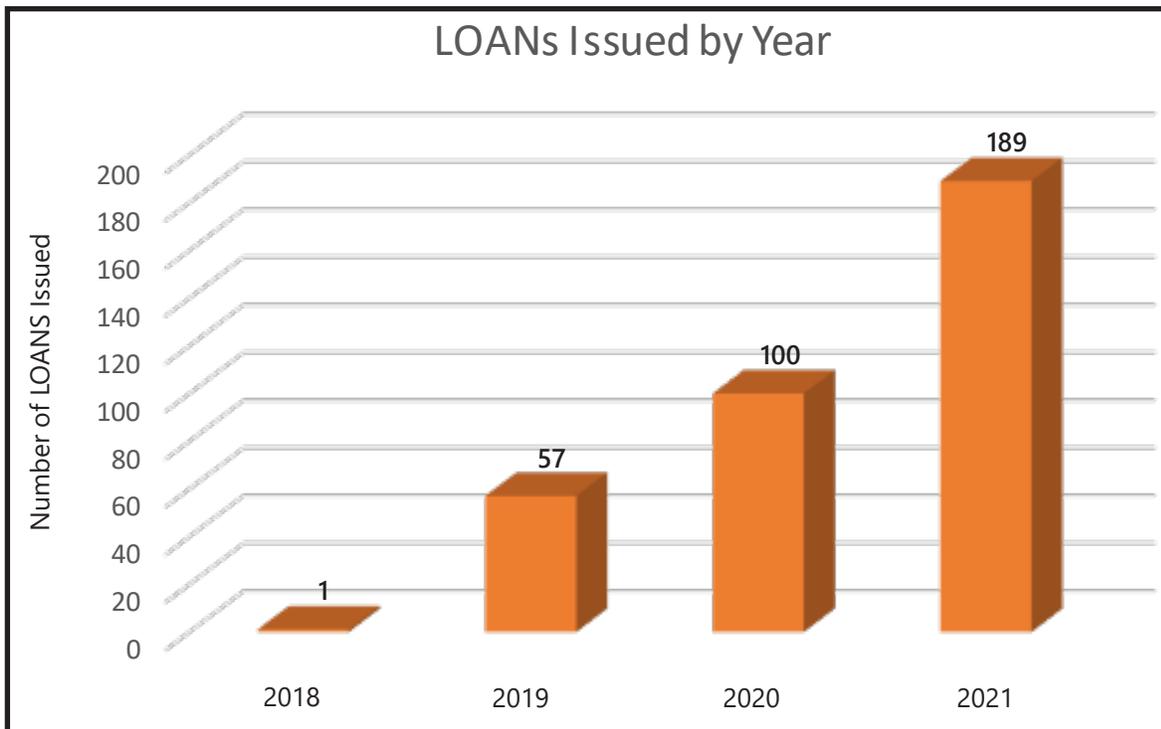


Figure 6: North Dakota Air Quality Letters of Apparent Noncompliance (LOANS) Issued Per Year*

* All numbers taken from the Air Quality Database

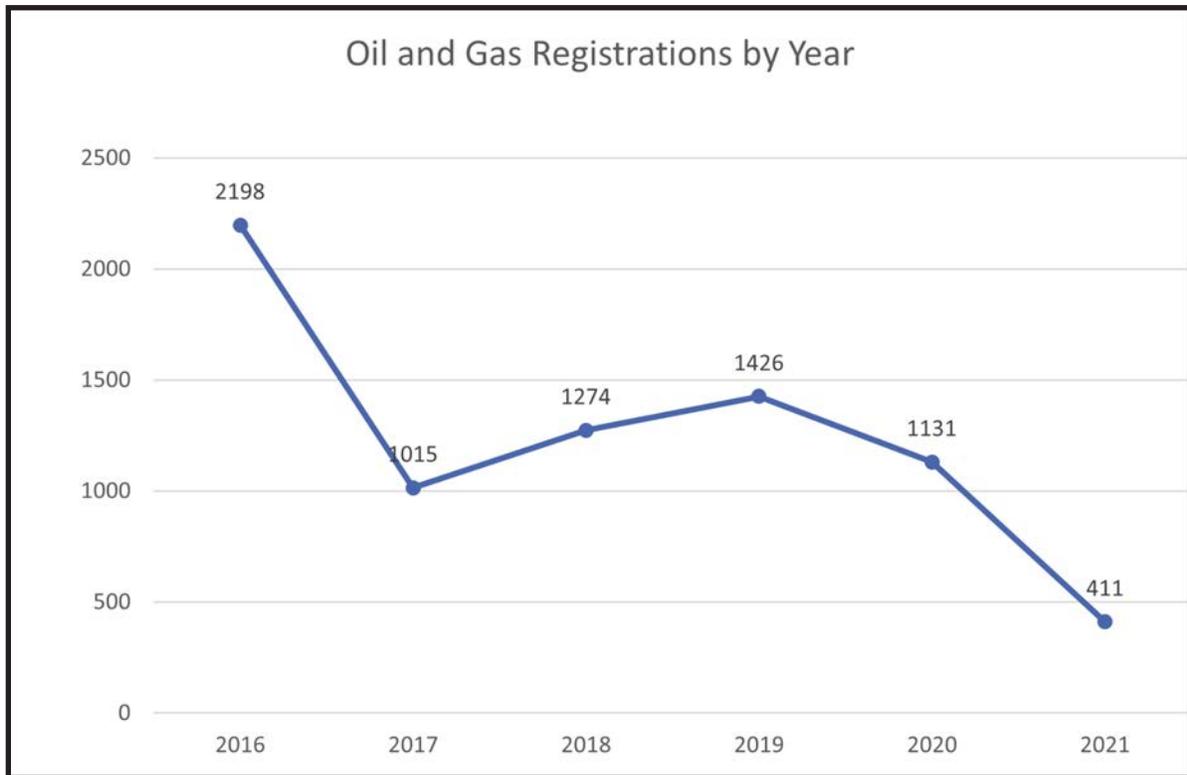


Figure 7: North Dakota Oil & Gas Registration Processed by Year

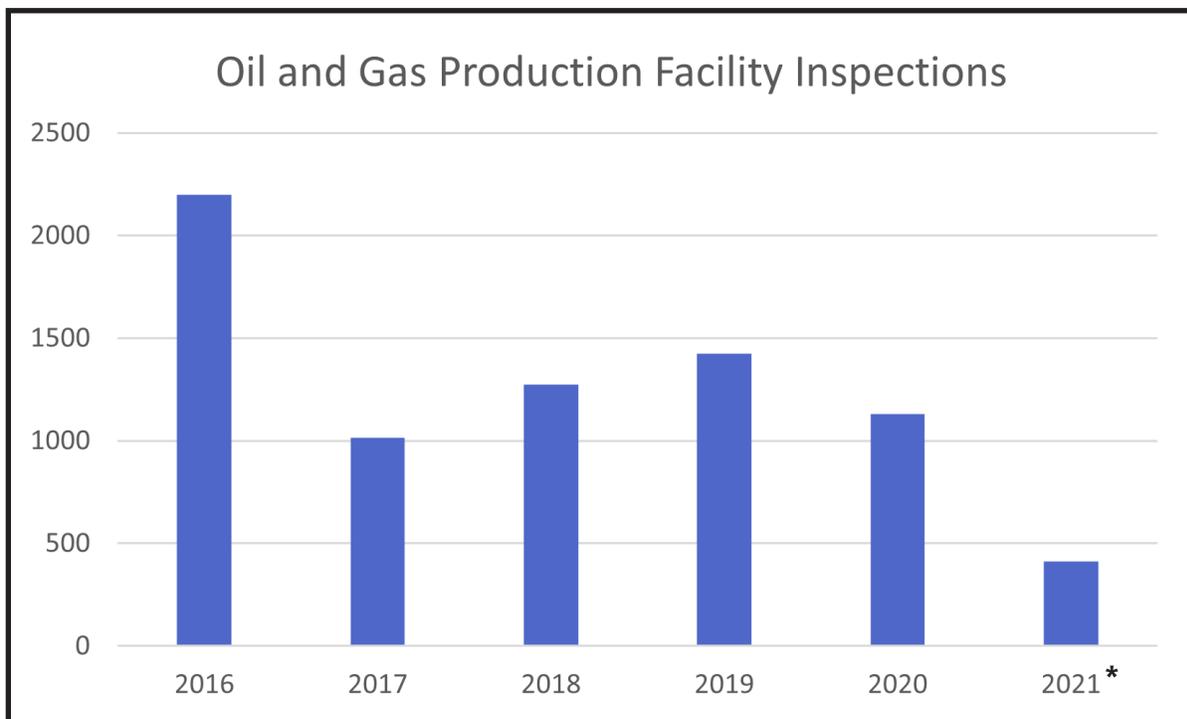


Figure 8: North Dakota Oil & Gas Production Facility Inspections by Year

**The number of 2021 inspections supplied is for "facilities" which generally include numerous wells.*

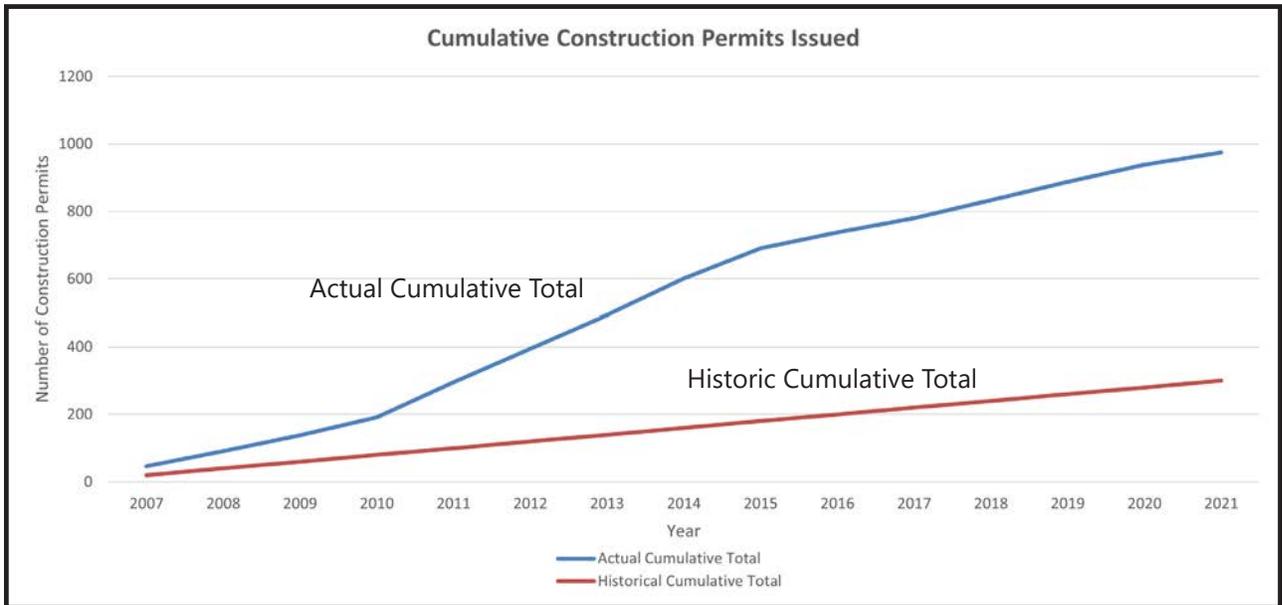


Figure 9: North Dakota Air Quality Construction Permits Issued

The Division of Chemistry

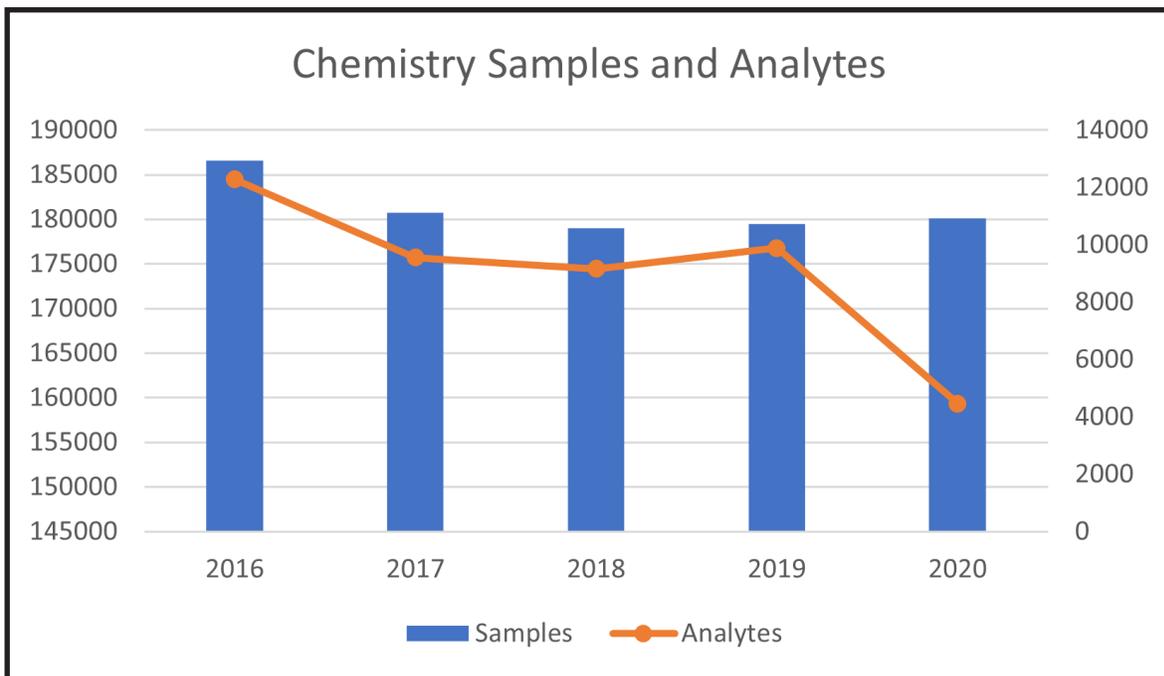


Figure 10: NDDEQ Chemistry Samples and Analytes

The Division of Municipal Facilities

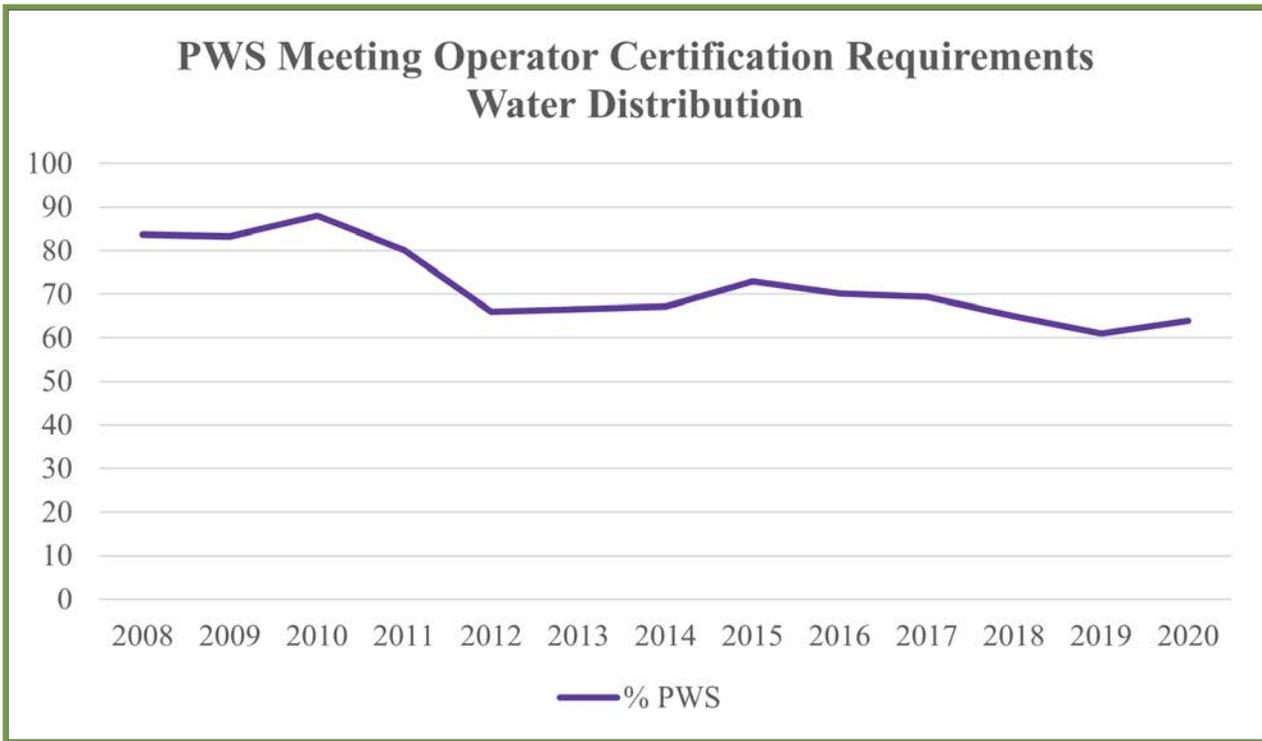


Figure 11: Percentage of Public Water Systems Meeting Operator Certification Requirements by Year

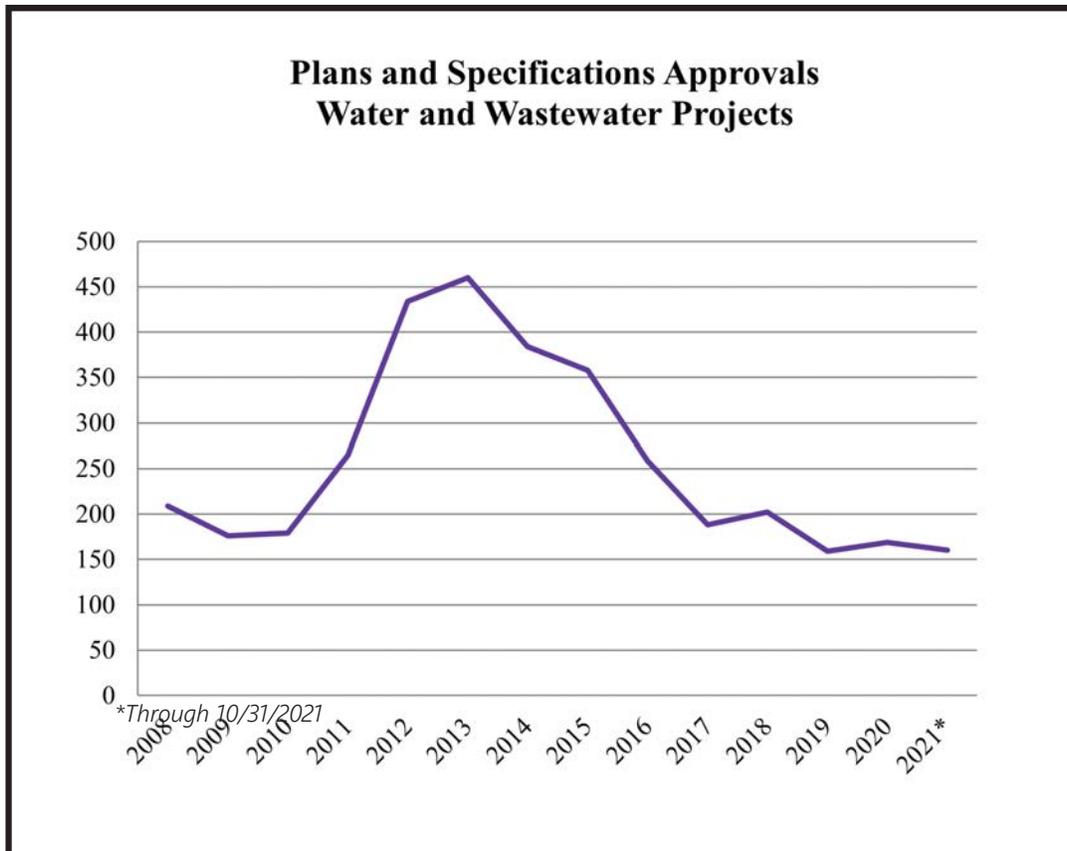


Figure 12: NDDEQ Cumulative Water and Wastewater Projects with Unmet Requirements by Year

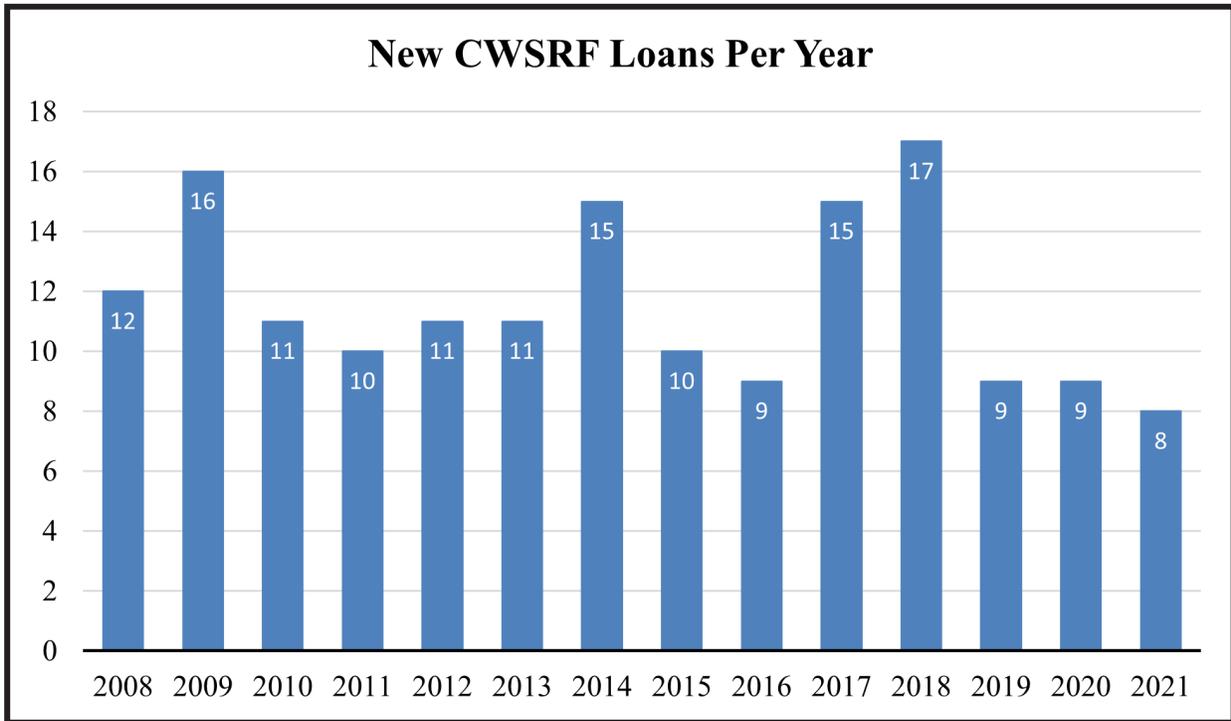


Figure 13: NDDEQ Clean Water State Revolving Fund Loans Issued by Year

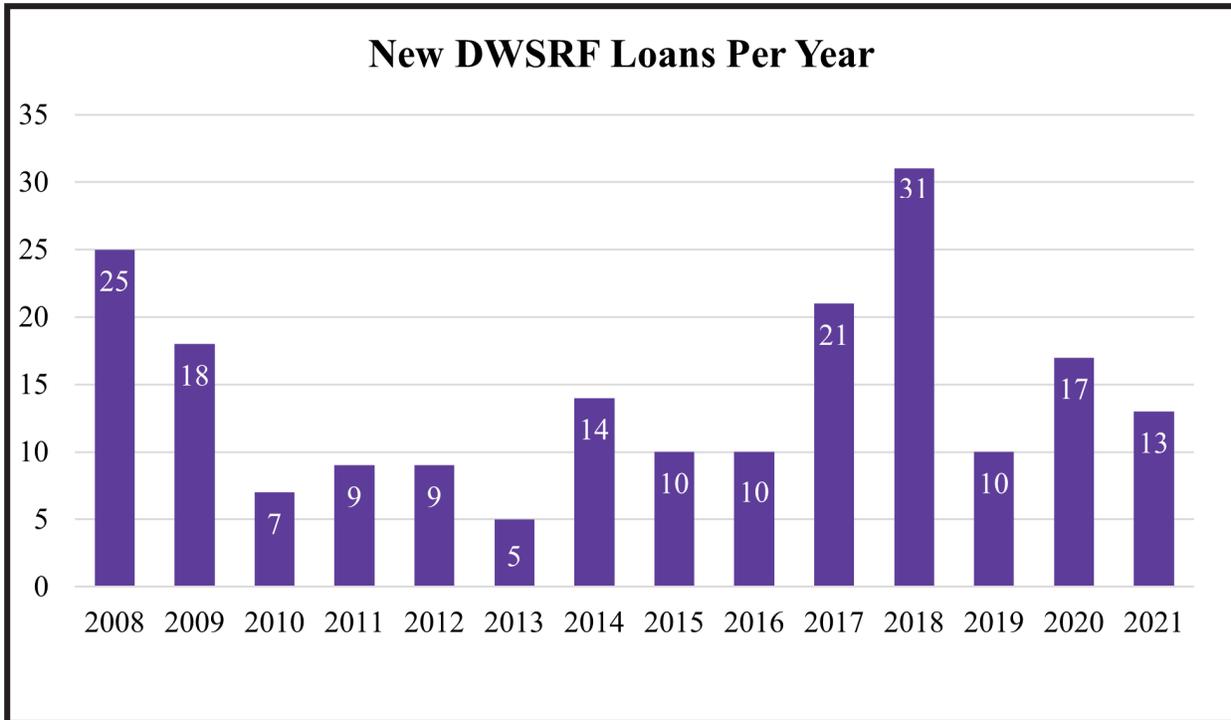


Figure 14: NDDEQ Drinking Water State Revolving Fund Loans Issued by Year

The Division of Waste Management



Figure 15: North Dakota Hazardous Waste Large Quantity Generators by Year

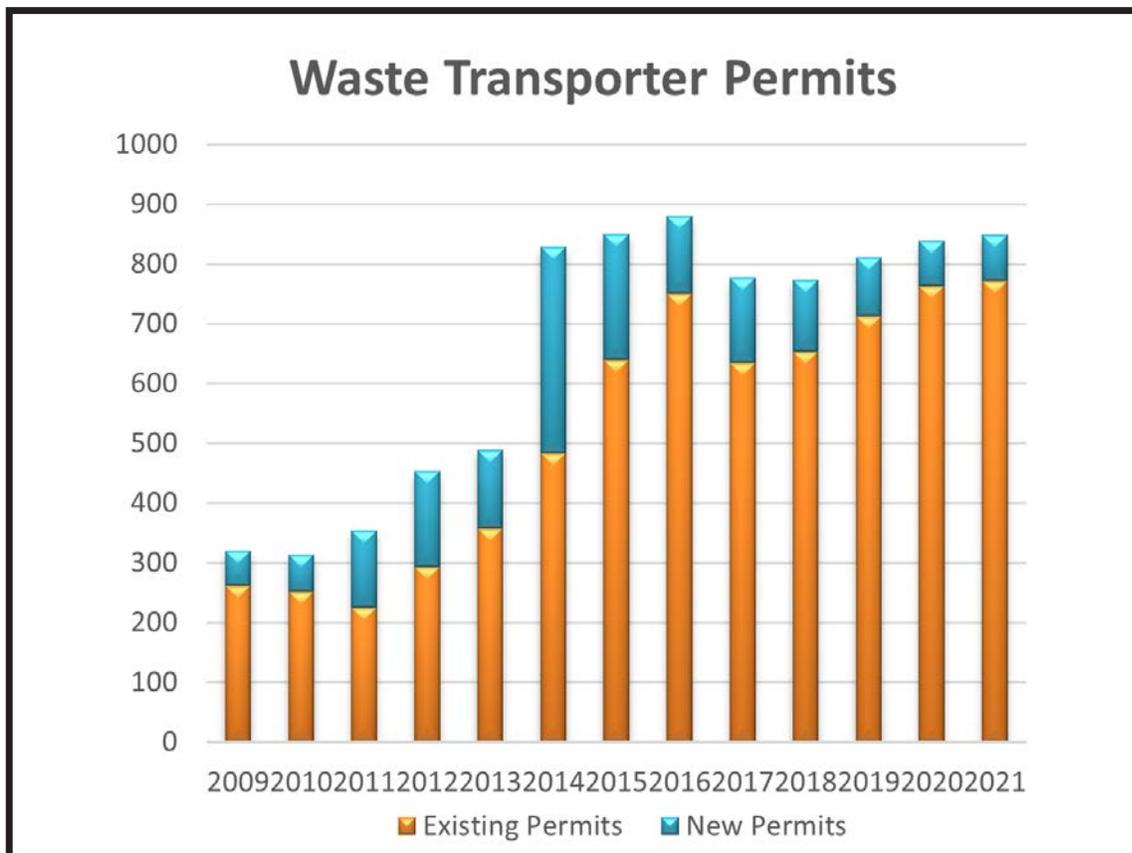


Figure 16: North Dakota Waste Transporter Permits

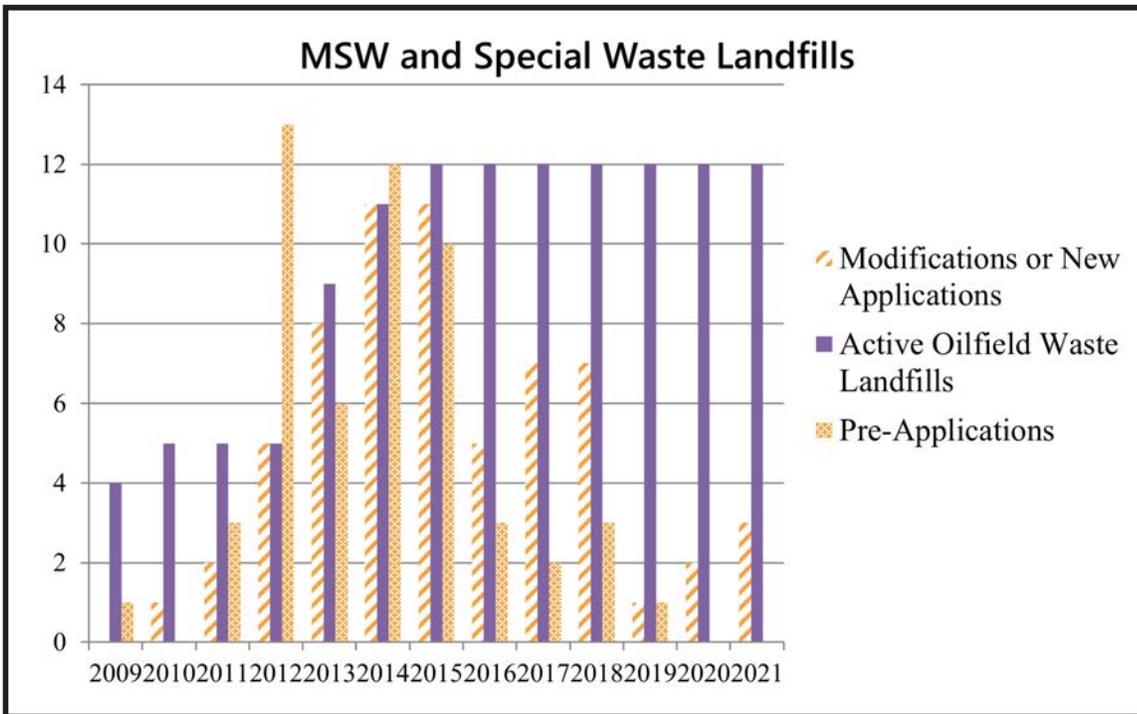


Figure 17: North Dakota Modified Special Waste and Special Waste Landfills

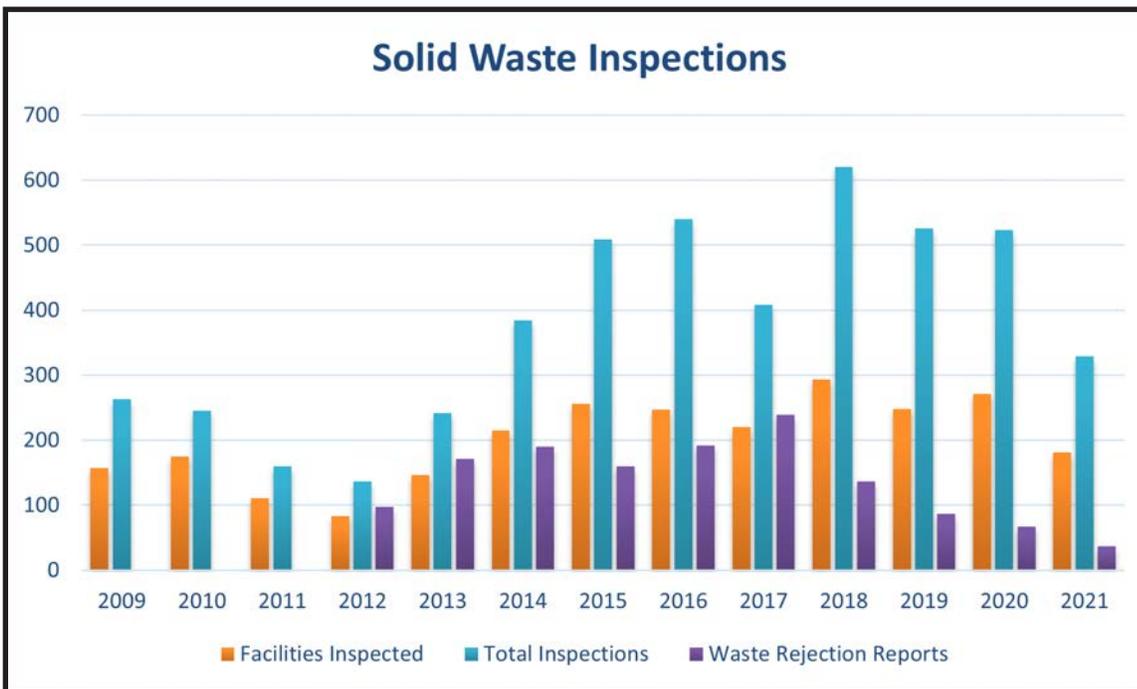


Figure 18: North Dakota Waste Transporter Permits

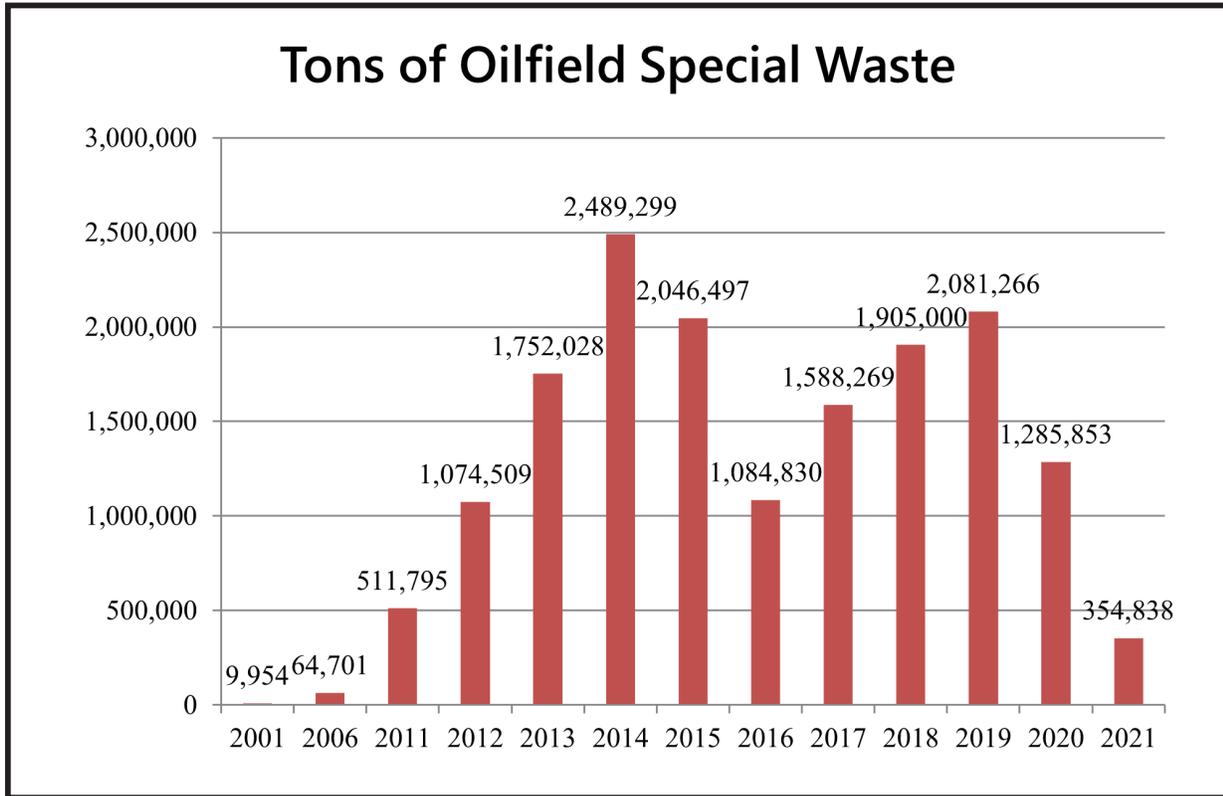


Figure 19: North Dakota Tons of Special Waste by Year

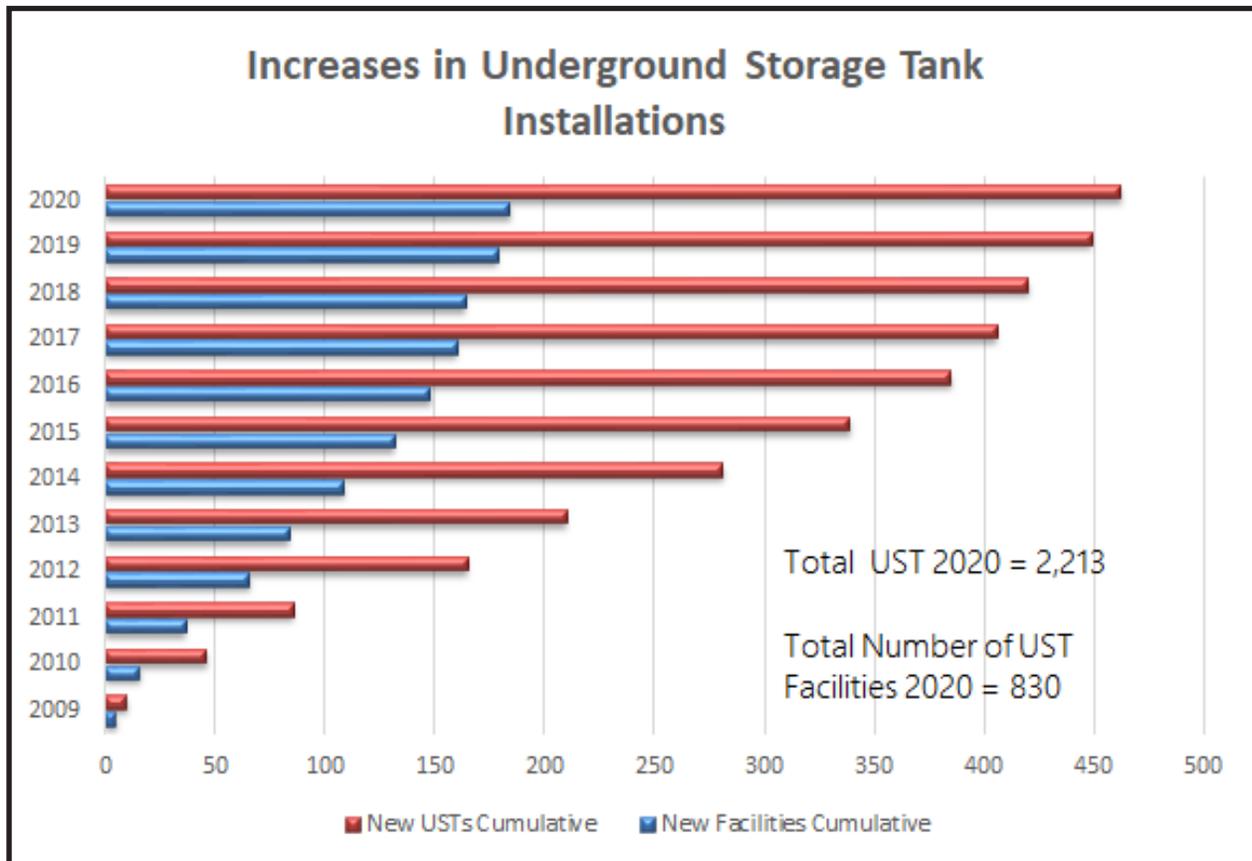


Figure 20: Increased Number of Underground Storage Tank Installations in North Dakota by Year

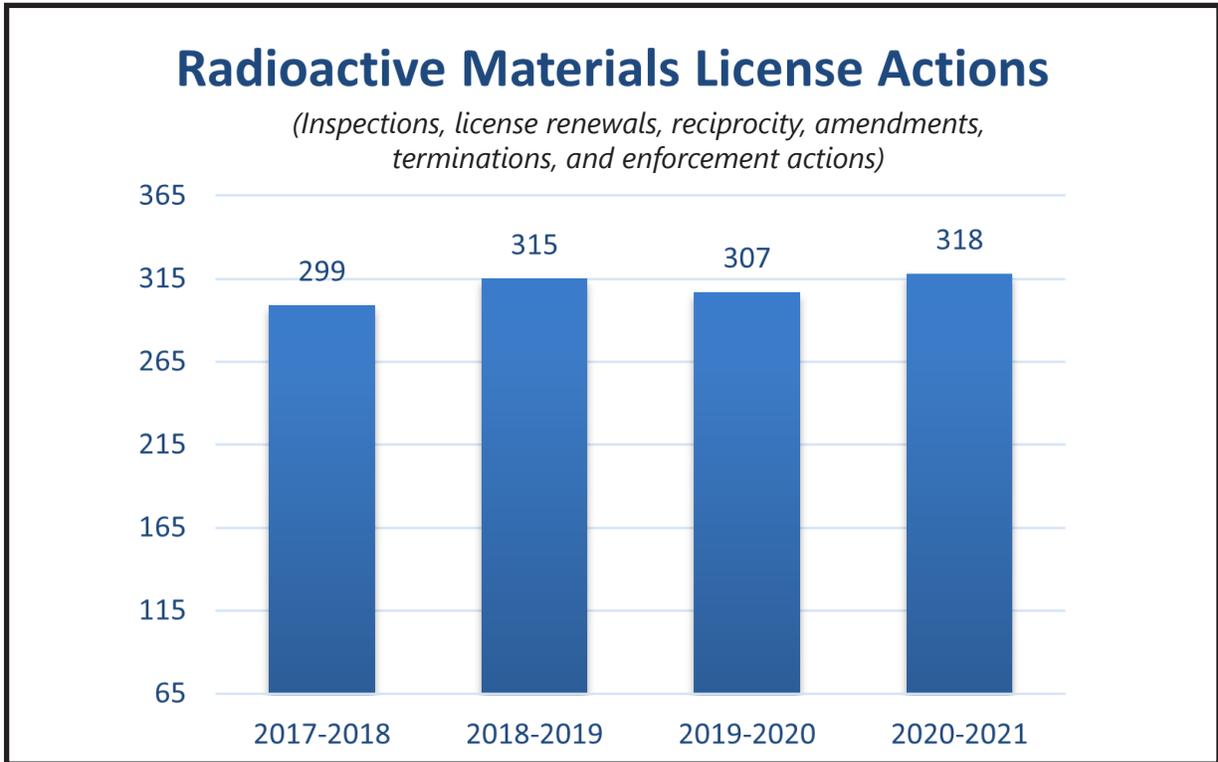


Figure 21: NDDEQ Radioactive Materials Licensing Actions

The Division of Water Quality

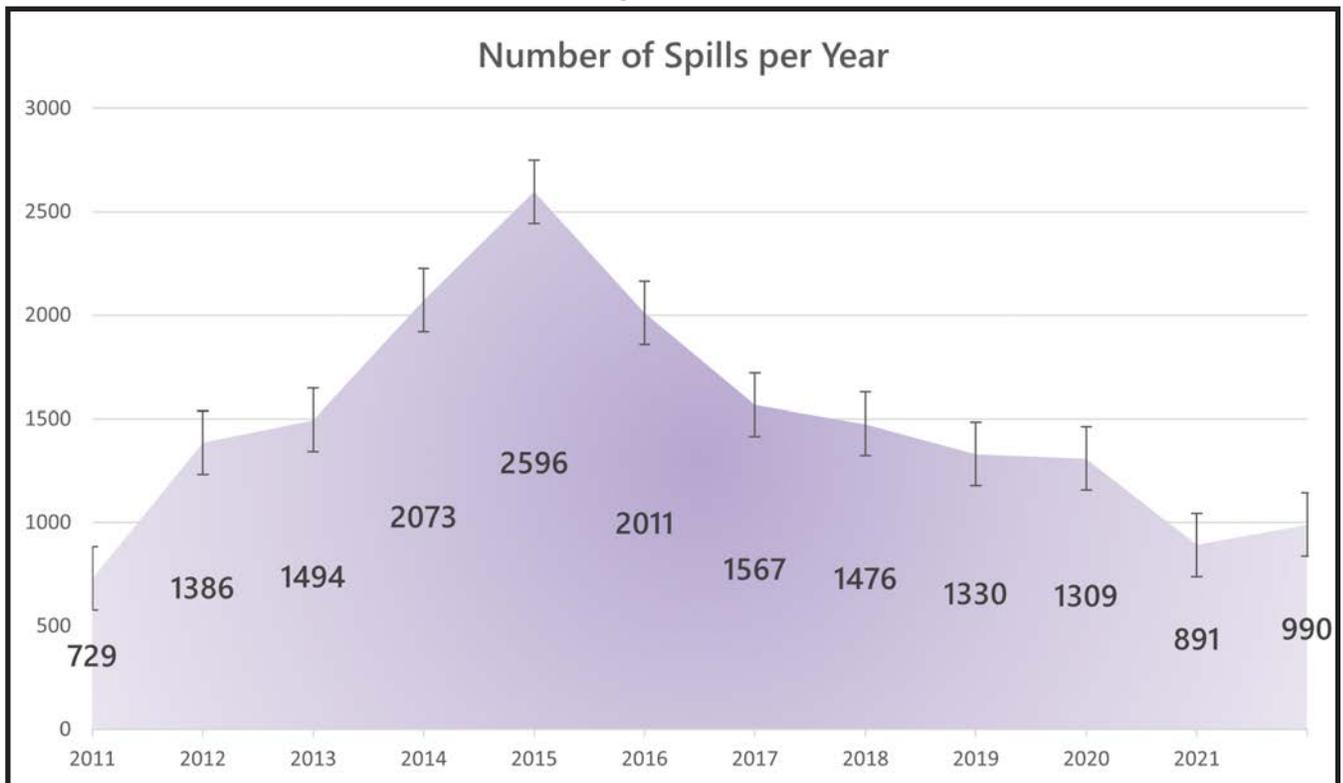


Figure 22: NDDEQ Spill Reported by Year

* 2021 is a projected number

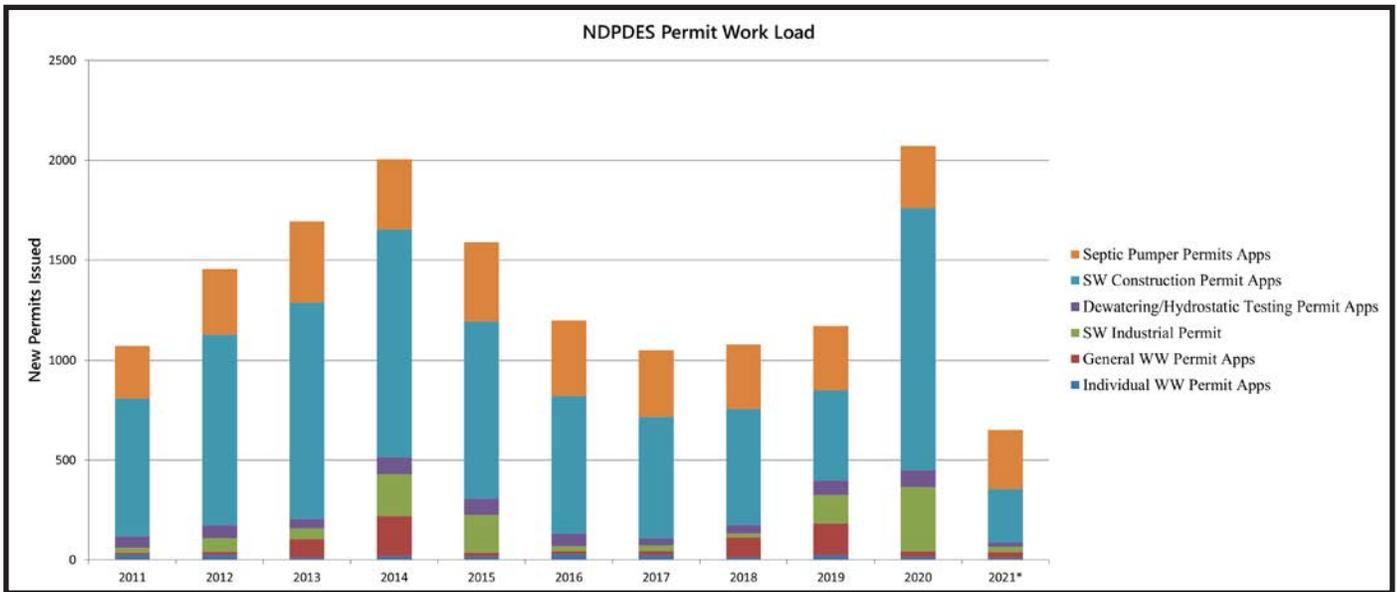


Figure 23: NDDEQ Permits Issued by Year

*The number of 2021 permits where for a partial year (1/1/2021 - 06/30/2021).

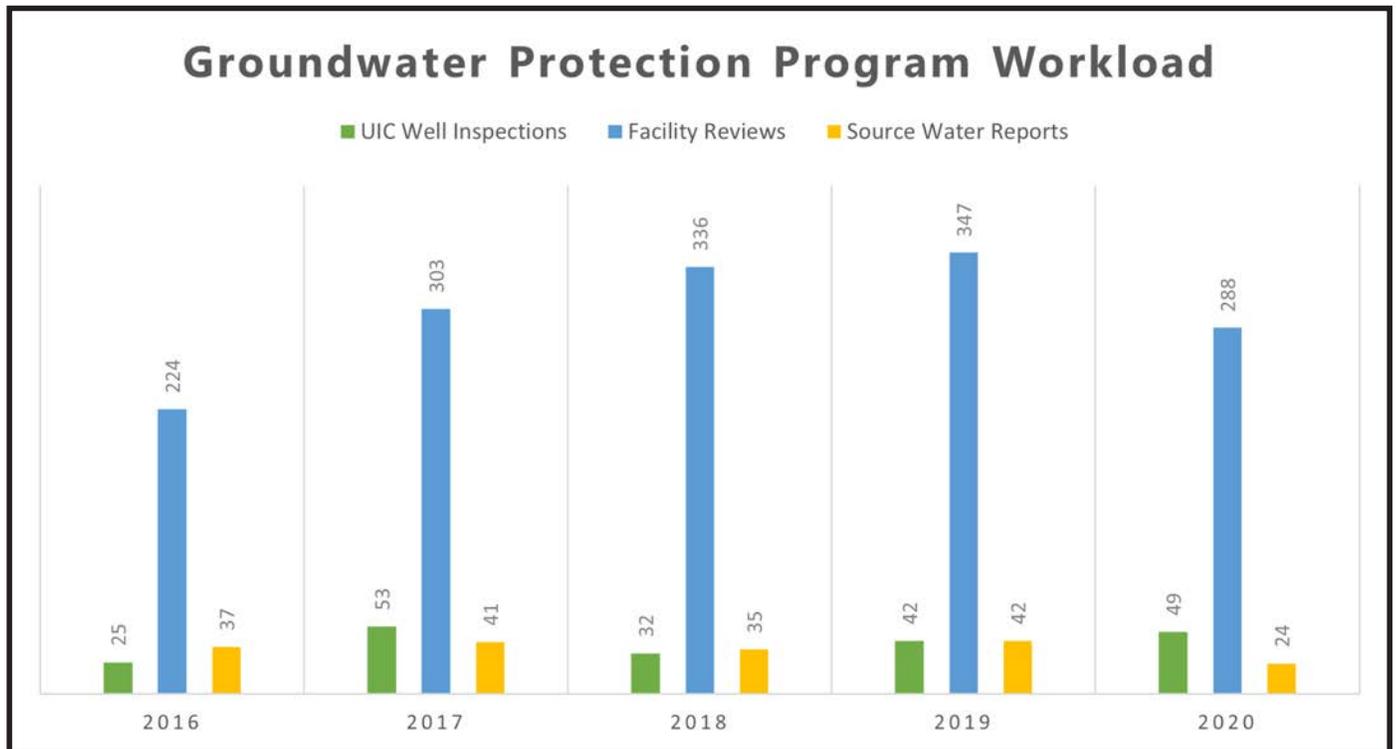


Figure 24: NDDEQ Groundwater Protection Program Workload

Office of the Director

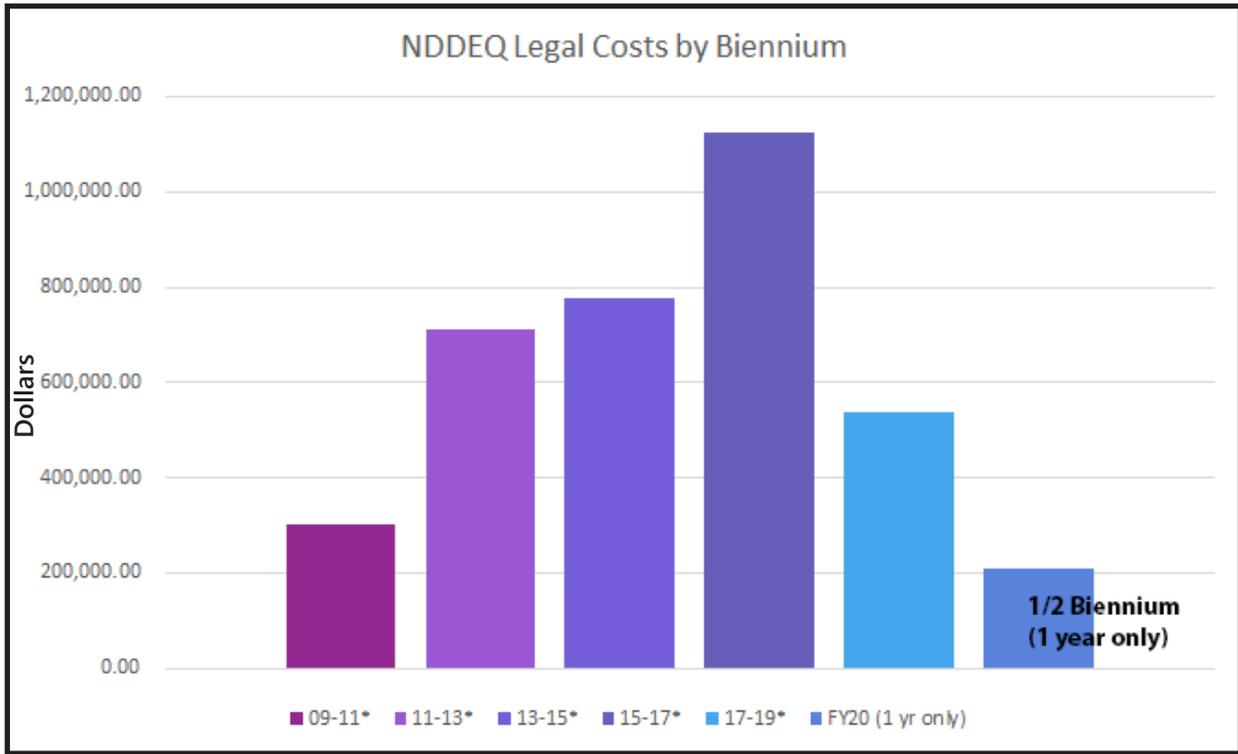


Figure 25: NDDEQ Legal Costs by Biennium

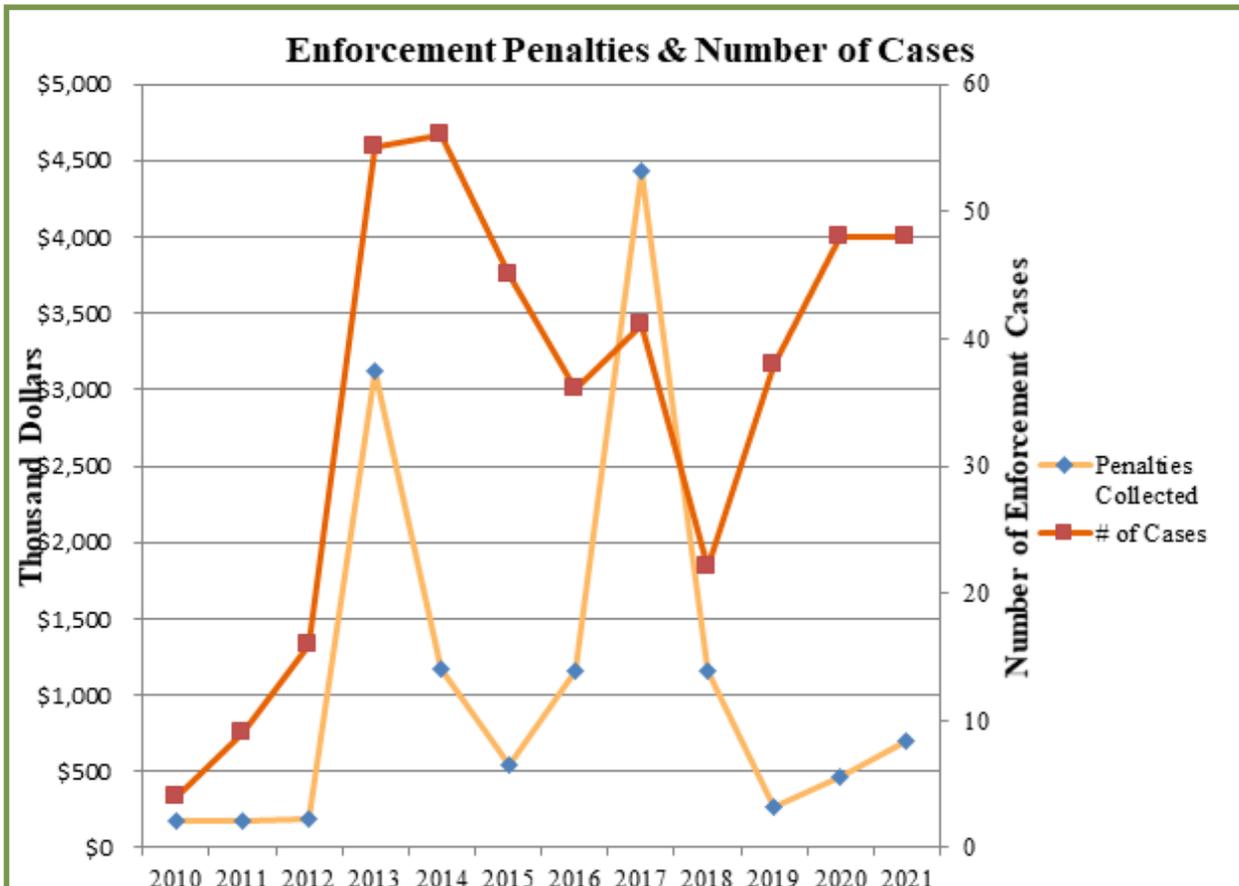


Figure 26: NDDEQ Enforcement Penalties by Year

Municipal Facilities Division

Reports

[2019 Annual Drinking Water Compliance Report](#)

[2020 Annual Drinking Water Compliance Report](#)

[2020 Annual Report for the North Dakota Clean Water State Revolving Fund](#)

[2020 Annual Report for the North Dakota Drinking Water State Revolving Fund](#)

[2020 Capacity Development Report to the Governor](#)

[2021 Intended Use Plan for the North Dakota Drinking Water State Revolving Fund](#)

[North Dakota Statewide 2020 Per- and Polyfluoroalkyl Substances \(PFAS\) Presence/Absence Survey](#)

Waste Management Division

Fact Sheet

[Abandoned Auto Fund Fact Sheet](#)

[Fuel Labeling Requirements Compliance Alert Fact Sheet](#)

Guide

[2020 North Dakota Hazardous Waste Compliance Guide](#)

Memo

[Removal of Submerged Vehicles from State Water Policy](#)

Water Quality Division

Fact Sheet

[2020 Alkali Lake Water Quality Fact Sheet](#)

[2020 Antelope Lake Water Quality Fact Sheet](#)

[2020 Balta Dam Water Quality Fact Sheet](#)

[2020 Brewer Lake Water Quality Fact Sheet](#)

[2020 Buffalo Lake Water Quality Fact Sheet](#)

[2020 Carlson-Tande Dam Water Quality Fact Sheet](#)

[2020 Clausen Springs Dam Water Quality Fact Sheet](#)

[2020 Dead Colt Creek Dam Water Quality Fact Sheet](#)

[2020 Devils Lake Water Quality Fact Sheet](#)

[2020 East Stump Lake Water Quality Fact Sheet](#)

[2020 Fordville Dam Water Quality Fact Sheet](#)

[2020 Lake Upsilon Water Quality Fact Sheet](#)

[2020 Larimore Dam Water Quality Fact Sheet](#)

[2020 Moon Lake Water Quality Fact Sheet](#)

[2020 Mooreton Pond Water Quality Fact Sheet](#)

[2020 Mount Carmel Dam Water Quality Fact Sheet](#)

[2020 North Golden Lake Water Quality Fact Sheet](#)

[2020 Red Willow Lake Water Quality Fact Sheet](#)

[2020 Silver Lake Water Quality Fact Sheet](#)

[2020 South Golden Lake Water Quality Fact Sheet](#)

[2020 Sprague Lake Water Quality Fact Sheet](#)

[2020 West Stump Lake Water Quality Fact Sheet](#)

[Apple Creek Aquifer Fact Sheet](#)

[Bismarck Aquifer Fact Sheet](#)

[Burnt Creek Aquifer Fact Sheet](#)

[Carrington Aquifer Fact Sheet](#)

[Central Dakota Aquifer Fact Sheet](#)

[Charbonneau Aquifer Fact Sheet](#)

[Cherry Creek Aquifer Fact Sheet](#)

[Crosby Aquifer Fact Sheet](#)

[Edgeley Aquifer Fact Sheet](#)

[Englevale Aquifer Fact Sheet](#)

[Esmond Aquifer Fact Sheet](#)

[Grenora Aquifer Fact Sheet](#)

[Guelph Aquifer Fact Sheet](#)

[Heimdal Aquifer Fact Sheet](#)

[Hofflund Aquifer Fact Sheet](#)

[Horse Nose Aquifer Fact Sheet](#)

[Inkster Aquifer Fact Sheet](#)

[Juanita Lake Aquifer Fact Sheet](#)

[Keene Aquifer Fact Sheet](#)

[Kilgore Aquifer Fact Sheet](#)

[Killdeer Aquifer Fact Sheet](#)

[Lake Ilo Aquifer Fact Sheet](#)

[Charbonneau Aquifer Fact Sheet](#)

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[Grenora Aquifer Fact Sheet](#)
[Guelph Aquifer Fact Sheet](#)
[Heimdal Aquifer Fact Sheet](#)
[Hofflund Aquifer Fact Sheet](#)
[Horse Nose Aquifer Fact Sheet](#)
[Inkster Aquifer Fact Sheet](#)
[Juanita Lake Aquifer Fact Sheet](#)
[Keene Aquifer Fact Sheet](#)
[Kilgore Aquifer Fact Sheet](#)
[Killdeer Aquifer Fact Sheet](#)
[Lake Ilo Aquifer Fact Sheet](#)
[Lake Nettie Aquifer Fact Sheet](#)
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[Spring Lawn Care Fact Sheet](#)
[Total Maximum Daily Loads Fact Sheet](#)
[Water Quality Data Fact Sheet](#)
[Water Quality Standards Fact Sheet](#)

Guidance

[Investigation and Cleanup of Nitrogen at Agricultural-related Sites](#)

Plans

[North Dakota Nonpoint Source Pollution Management Program Plan](#)

Reports

[2019 Harmful Algal Bloom Review Report](#)
[2020 Agricultural Chemical Detections Summary Report](#)
[2020 Harmful Algal Bloom Response Report](#)
[2021 Addendum to the 2019 North Dakota Geographic Targeting System for Groundwater Monitoring](#)

