



NORTH
Dakota | Mineral Resources
Be Legendary.™

Lynn D. Helms, Ph.D. Director
Bruce E. Hicks, Assistant Director
Edward C. Murphy, Asst. Director of Geological Survey, State Geologist

NORTH DAKOTA DEPARTMENT OF MINERAL RESOURCES

The Legislature created the **Industrial Commission of North Dakota in 1919** to conduct and manage, on behalf of the State, certain utilities, industries, enterprises, and business projects established by state law. The Industrial Commission has jurisdiction **over oil and gas resources, the investigation and publication of geological information and the regulation of coal exploration, geophysical exploration, geothermal energy, paleontology resources, subsurface minerals, geophysical exploration, and oil, gas, and carbon dioxide underground storage** in North Dakota through the Department of Mineral Resources Geological Survey and Oil and Gas Division.

The Industrial Commission appoints the **Director of the Department of Mineral Resources**, who serves as Director of the Oil and Gas Division and appoints the State Geologist and Assistant Director of the Oil and Gas Division.



NORTH DAKOTA OIL AND GAS DIVISION

The Oil and Gas Division, headed by the Director, was formed in 1981 to provide the technical expertise needed for enforcement of Industrial Commission jurisdiction over statutes, rules, regulations, and orders pertaining to geophysical exploration, drilling, production of oil and gas, restoration of drilling and production sites, and proper disposal of oil field brine and other oil field wastes in North Dakota.

The Division facilitates the electronic storage of and provides access to oil and gas production, reservoir, well, and geophysical exploration data for use by industry, royalty owners, and other governmental agencies and citizens.

In 1997, regulation of geophysical exploration (seismic) was placed under the Oil and Gas Division's jurisdiction. In 2009, regulation of carbon dioxide storage was added to the Oil and Gas Division responsibilities. In 2013, regulation of underground gathering pipeline infrastructure was added to the Oil and Gas Division's responsibilities. In 2015, this authority was broadened to include bonding requirements on underground gathering pipelines. Also, the Oil and Gas Division has obtained primacy from the United States Environmental Protection Agency over Class II (disposal/injection) and Class VI (carbon dioxide storage) wells.



DMR ORGANIZATIONAL STRUCTURE



Department of Mineral Resources Director
Lynn Helms



Oil & Gas Division
Assistant Director (1)
Bruce Hicks



DMR Support
EGIS Staff Officer (1)
Michael Ziesch



Geological Survey
Assistant Director State Geologist (1)
Ed Murphy

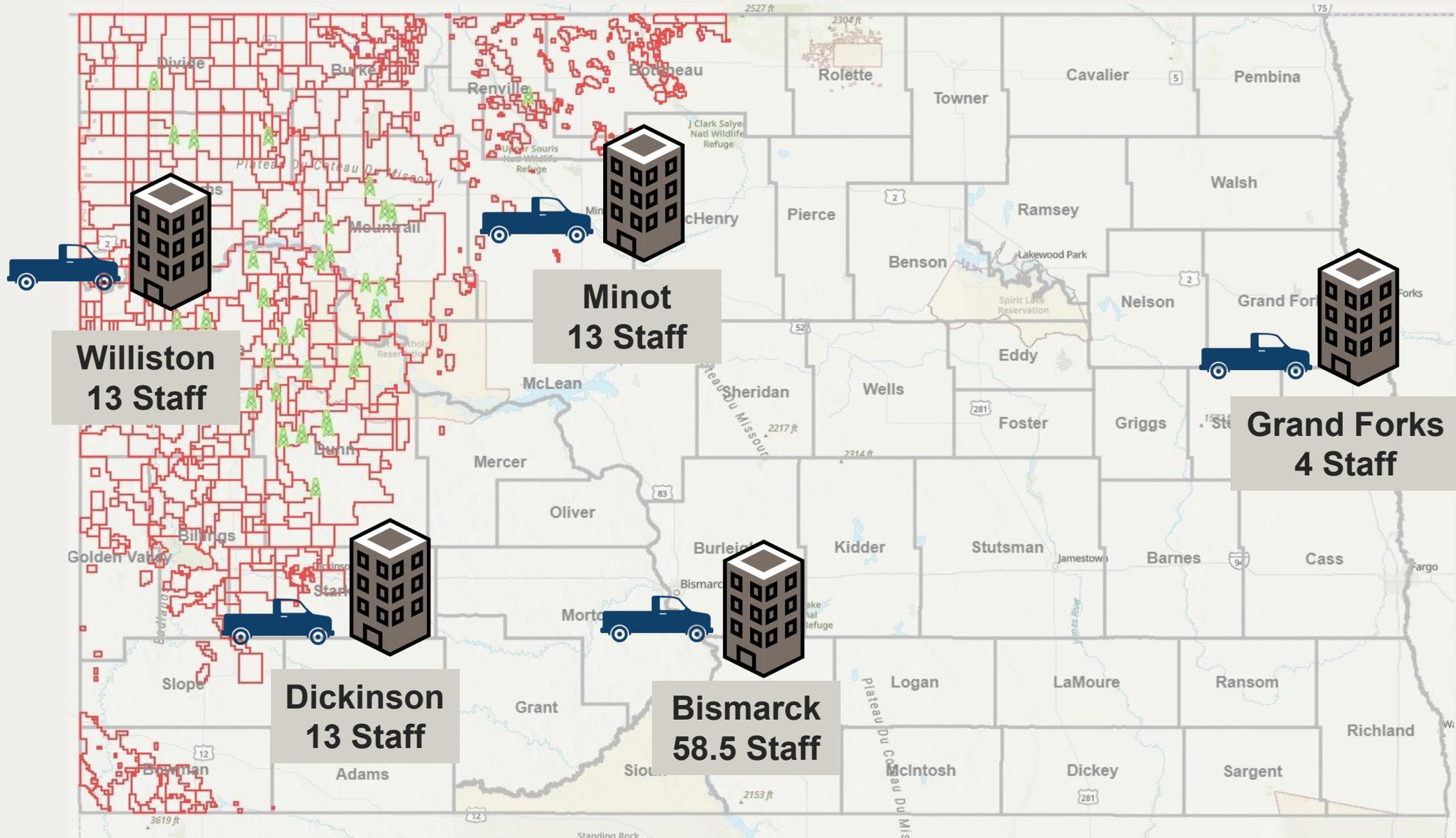
Field Staff (33)
Pipeline Program (10)
Reclamation Program (2)
Permitting (5)
Geological Analyst | CCUS (3)
Logs (3)
Petroleum Engineering (2)
Production | Measurement (5)
UIC | Treating Plants (2)
Bonding (1)

IT | Data Management (4)
Administrative Assistants (2)
Finance | Accounting (3)
Legal | Hearing Dockets | Orders (2)
Public Information Officer (1)
Safety Officer (1)
Human Resources (1)
Warehouse Technician (.5)

Paleontology (3)
Geo Reviews | GIS | Publications (4)
Surface Geology (4)
Subsurface Geology (2)
Core Library (3)
Minerals Geology (1)

Total Oil and Gas = 68
Total DMR Support = 15.5
Total Geological Survey = 18
Total DMR FTEs = 101.5

OFFICE LOCATIONS AND TOTAL STAFF



DMR RETENTION & PROFESSIONAL DEVELOPMENT ISSUES

Current Personnel as of 12/31/2022

Years of Service	0-3	4-6	7-10	11-15	16-20	21-25	26-30	30+
FTE	37	5	23.5	18	6	5	2	5
%	36%	5%	23%	18%	6%	5%	2%	5%

Turnover rates do not include inter-agency transfers

Turnover	Total FTE	Total Turnover	Turnover Percent	Classified Turnover	Classified Reason	Unclassified Turnover	Unclassified Reason
2017-19 Biennium	103.6	16	15%	3	1R, 2PS	13	1R, 10PS, 2D
2019-21 Biennium	105.5	17	16%	1	1R	16	7R, 9PS
2021-23 Biennium	101.5	18	18%	3	1R, 1PS, 1D	15	3R, 12PS

Key:
R=Retirement
PS=Private Sector
D=Death



NORTH
Dakota

Be Legendary.™

| Mineral Resources

Oil & Gas Agency Overview

OIL AND GAS REGULATORY PROGRAMS

Oil and Gas Exploration and Production (NDCC 38-08)

It is hereby declared to be in the public interest to foster, to encourage, and to promote the development, production, and utilization of natural resources of oil and gas in the state in such a manner as will prevent waste; to authorize and to provide for the operation and development of oil and gas properties in such a manner that a greater ultimate recovery of oil and gas be had and that the correlative rights of all owners be fully protected; and to encourage and to authorize cycling, recycling, pressure maintenance, and secondary recovery operations in order that the greatest possible economic recovery of oil and gas be obtained within the state to the end that the landowners, the royalty owners, the producers, and the general public realize and enjoy the greatest possible good from these vital natural resources.

Geophysical Exploration (NDCC 38-08.1)

Notwithstanding any other provision of this chapter, the commission is the primary enforcement agency governing geophysical exploration in this state. Any person in this state engaged in geophysical exploration or engaged as a subcontractor of a person engaged in geophysical exploration shall comply with this chapter; provided, however, that compliance with this chapter by a crew or its employer constitutes compliance herewith by that person who has engaged the service of the crew, or its employer, as an independent contractor.

Pipeline (NDCC 38-08-27)

The application of this section is limited to an underground gathering pipeline that is designed or intended to transfer crude oil or produced water from a production facility for disposal, storage, or sale purposes and which was placed into service after August 1, 2015. Upon request, the operator shall provide the commission the underground gathering pipeline engineering construction design drawings and specifications, list of independent inspectors, and a plan for leak protection and monitoring for the underground gathering pipeline. Within sixty days of an underground gathering pipeline being placed into service, the operator of that pipeline shall file with the commission an independent inspector's certificate of hydrostatic or pneumatic testing of the underground gathering pipeline.

OIL AND GAS REGULATORY PROGRAMS

Carbon Dioxide Geological Storage (NDCC 38-22-01)

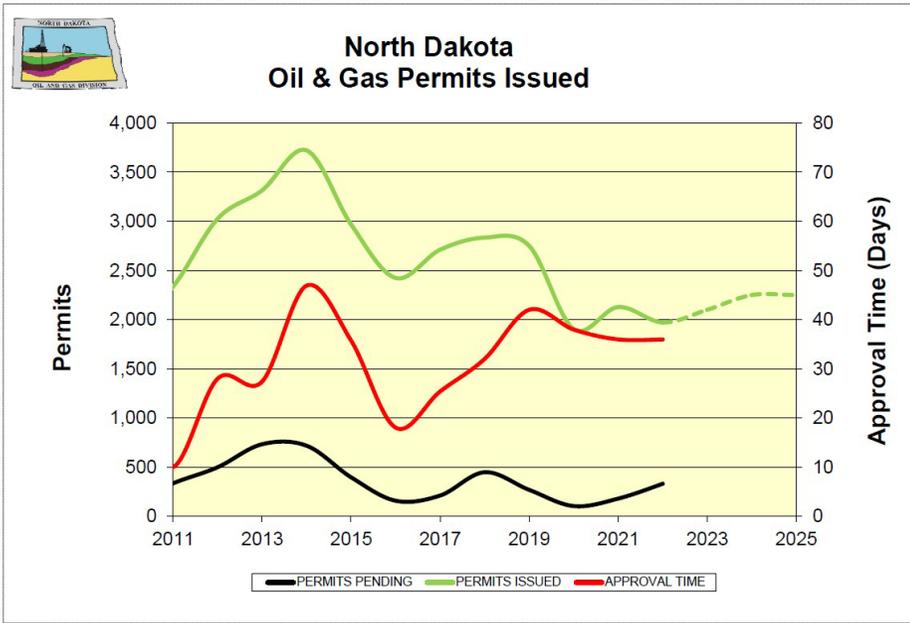
It is in the public interest to promote the geologic storage of carbon dioxide. Doing so will benefit the state and the global environment by reducing greenhouse gas emissions. Doing so will help ensure the viability of the state's coal and power industries, to the economic benefit of North Dakota and its citizens. Further, geologic storage of carbon dioxide, a potentially valuable commodity, may allow for its ready availability if needed for commercial, industrial, or other uses, including enhanced recovery of oil, gas, and other minerals. Geologic storage, however, to be practical and effective requires cooperative use of surface and subsurface property interests and the collaboration of property owners. Obtaining consent from all owners may not be feasible, requiring procedures that promote, in a manner fair to all interests, cooperative management, thereby ensuring the maximum use of natural resources.

Underground Storage of Oil and Gas (NDCC 38-25-08)

If a storage operator does not obtain the consent of all persons owning a pore space and of mineral interest owners when required by this chapter, the commission may require the interest owned by the nonconsenting owners be included in an approved storage facility and subject to geologic storage if the minimum percentage of consent is obtained as specified in this chapter. Any pore space owner who does not have responsibility over the construction, management, supervision, or control of the storage facility operations is not liable for money damages for personal or other property damages proximately caused by the operations.

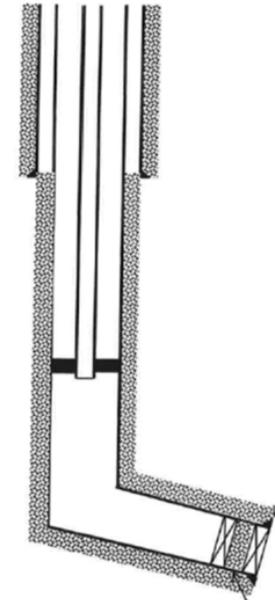
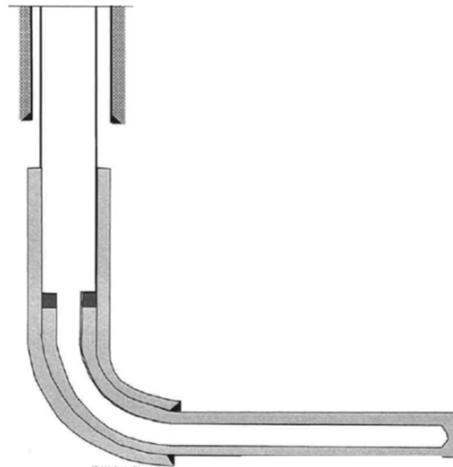
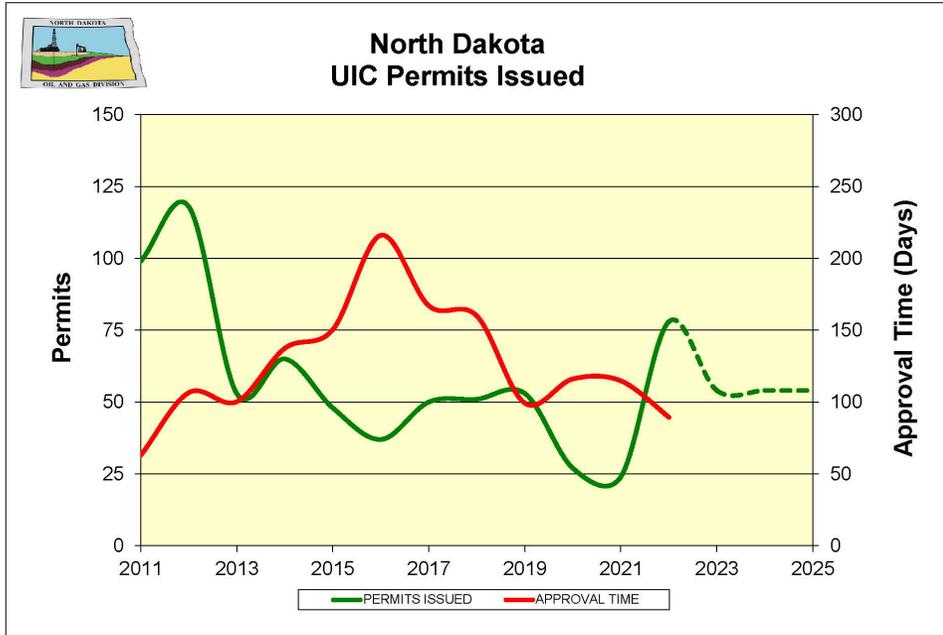
Underground Storage of Oil and Gas (NDCC 38-25-11)

This chapter does not apply to applications filed with the commission which propose to use produced gas for an enhanced oil or gas recovery project. Those applications must be processed under chapter 38-08.



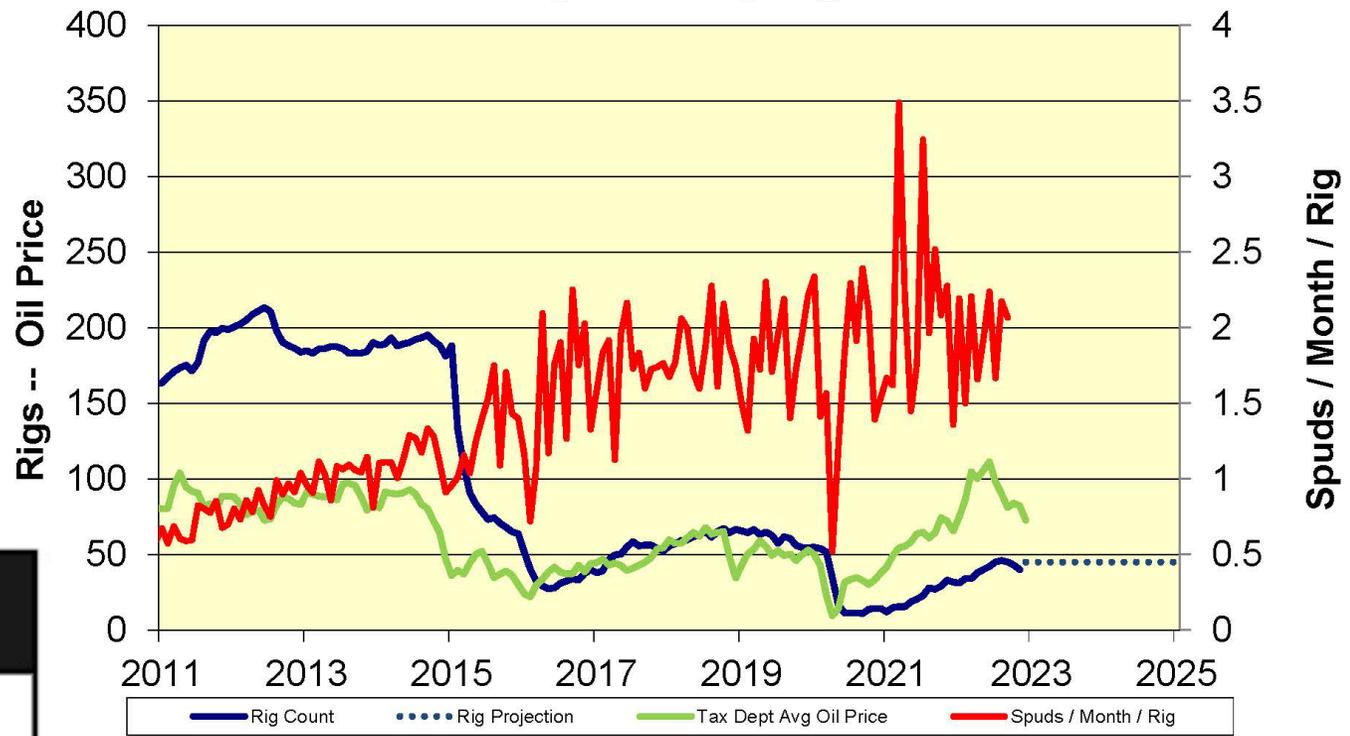
NORTH
Dakota |
 Be Legendary.™

Mineral Resources





North Dakota Average Monthly Rig Count



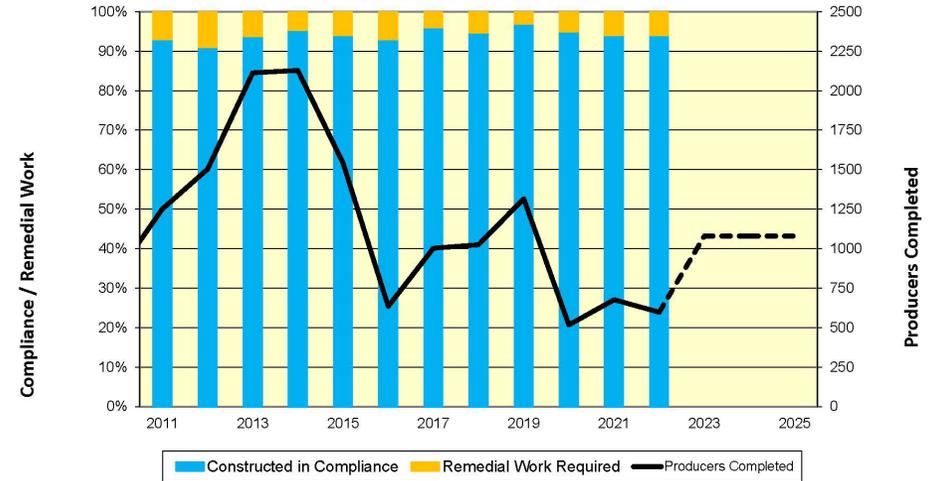
Statistics	2021	2022
Wells Waiting On Completion	475	489
Inactive Wells	1,975	1,886
Wells Completed	677	597
Producing Wells	17,953	18,197



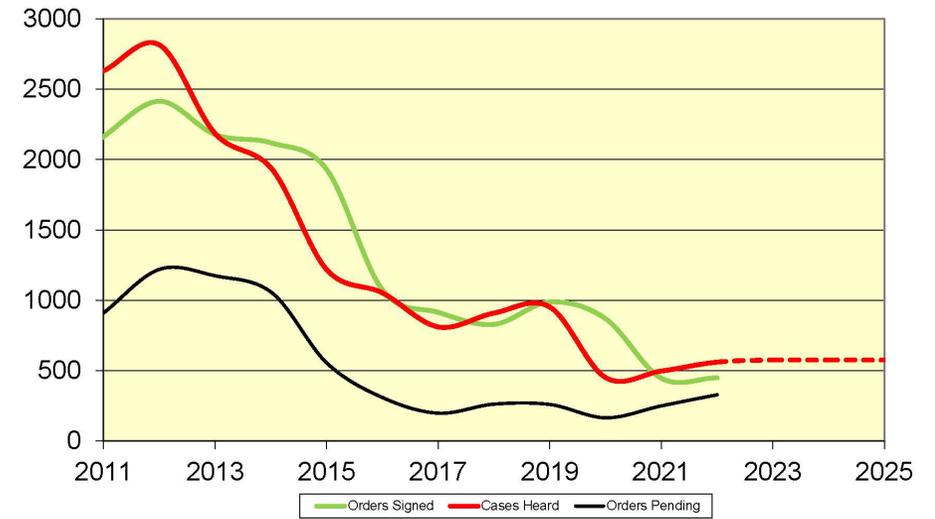


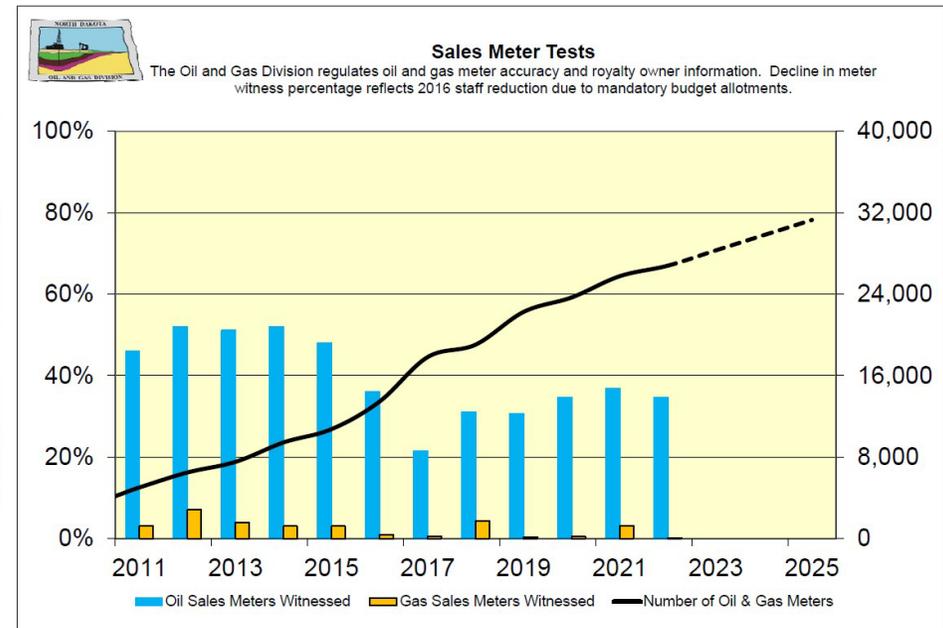
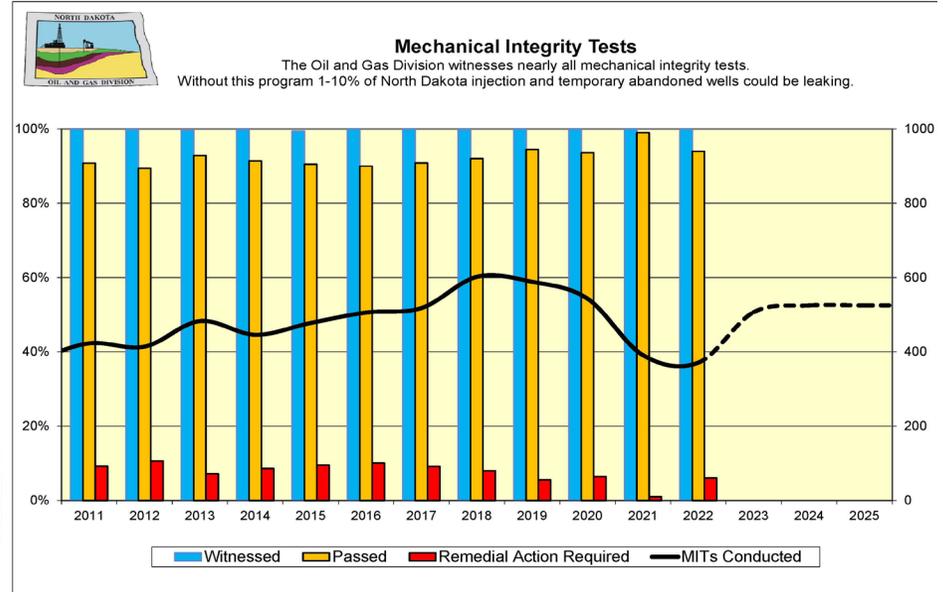
Well Construction

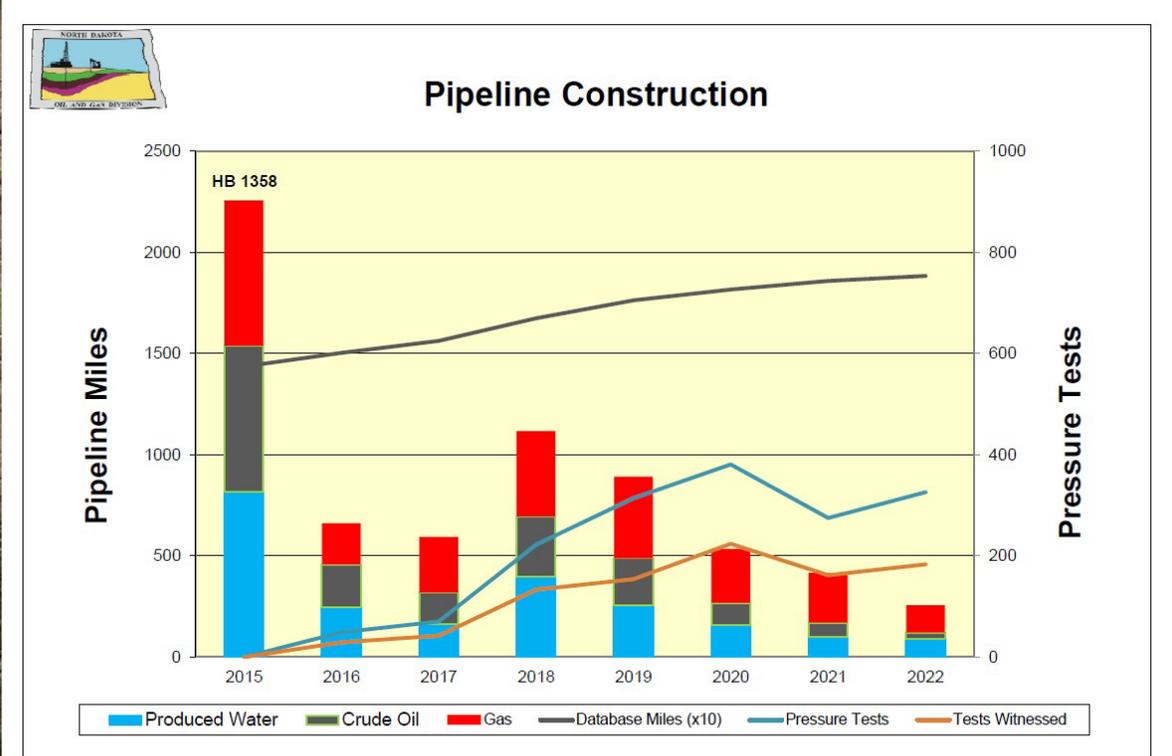
Well construction rules protect underground drinking water. Without this program 5-10% of new wells could be leaking.



Orders Signed--Cases Heard







The background of the slide is a landscape of rolling hills with dry, golden-brown grass. A dirt road winds through the hills. In the distance, a silver windmill stands on a hill. A faint rainbow is visible in the sky, arching over the landscape. The text 'NORTH Dakota' is overlaid on the left side, with 'NORTH' in a small, black, sans-serif font and 'Dakota' in a large, bold, orange font. Below 'Dakota' is the slogan 'Be Legendary.™' in a smaller, black, sans-serif font.

NORTH
Dakota
Be Legendary.™

Mineral Resources

Geological Survey Overview

GEOLOGICAL SURVEY

The North Dakota Geological Survey was created by an act of the North Dakota Legislature in 1895. After 128 years, the Survey still serves as the primary source of geological information in the state. Its mission over the years has grown and is now three-fold: to investigate the geology of North Dakota; to administer regulatory programs and act in an advisory capacity to other state agencies; and to provide public service to the people of North Dakota.

The Geological Survey publishes maps and reports on the mineralogical, paleontological, and geochemical resources of North Dakota, including oil and gas, coal, uranium, critical minerals (including the rare earth elements), clay, sand and gravel, volcanic ash, potash and other salts, etc. In addition to the mapping of subsurface resources such as the Inyan Kara Formation for produced water disposal, the Survey is actively mapping landslides throughout the state. Survey publications support the regulatory programs of the Industrial Commission, as well as other state and federal agencies, and assist mineral companies, geotechnical consulting firms, city and county governments, landowners, and citizens of the state.

The Geological Survey and the Oil and Gas Division are in the Department of Mineral Resources and under the North Dakota Industrial Commission. The main office of the Department of Mineral Resources is located at 1016 East Calgary Avenue in Bismarck. The paleontology program of the Geological Survey is housed in the Clarence Johnsrud Paleontology Laboratory in the North Dakota Heritage Center (state museum) on the State Capitol grounds in Bismarck. The North Dakota State Fossil Collection, as well as the State Rock and Mineral Collection, are also housed in the Heritage Center. The North Dakota Geological Survey's Wilson M. Laird Core and Sample Library is located on the University of North Dakota campus in Grand Forks. The facility currently houses 486,000 feet of core (170,000 core boxes) and 59,000 boxes of drill cuttings obtained from oil and gas wells.

GEOLOGICAL SURVEY REGULATORY PROGRAMS

Regulation, Development, and Production of Subsurface Minerals (NDCC 38-12)

The exploration, development and production of subsurface minerals requires a permit, basic data to be provided to the state geologist. These regulations cover minerals not included in the oil & gas and coal regulatory programs.

Subsurface Mineral Exploration and Development (NDAC 43-02-02)

Underground Injection Control Program (NDAC 43-02-02.1)

In Situ Leach Mineral Mining Rules (NDAC 43-02-02.2)

Surface Mining–(Non-Coal) (NDAC 43-02-02.3)

Solution Mining (NDAC 43-02-02.4)

Coal Exploration (NDCC 38-12.1)

Drilling for coal exploration or evaluation requires a permit and a report of findings must be filed with the state geologist. Collectively, these reports comprise a database useful to private and government coal researchers and provide information necessary for geologic correlations and economic forecasting.

Coal Exploration (NDAC 43-02-01)

Geothermal Resource Development Regulation (NDCC 38-19)

Geothermal (ground source) heating and cooling systems require a permit. The permit review process helps to ensure that geothermal systems are properly designed and constructed, in order to minimize the risk of groundwater contamination or other environmental problems.

Geothermal Energy Production (NDAC 43-02-07)

Geothermal Deep Energy Production (NDAC 43-02-07.1)

GEOLOGICAL SURVEY REGULATORY PROGRAMS

Paleontological Resource Protection (NDCC 54-17.3)

Paleontological resources, on land owned by the State of North Dakota and its political subdivisions, are protected. A permit is required from the state geologist to investigate, excavate, collect, or otherwise record paleontological resources on these lands.

Paleontological Resource Protection (NDAC 43-04-02)

High-Level Radioactive Waste Disposal (NDCC 38-23)

The exploration, testing, placement, storage, or disposal of high-level radioactive waste is prohibited in North Dakota. If this prohibition is struck from the law, a permit is required before any testing, exploring, excavating, drilling, boring or operating of a high-level radioactive waste facility can commence.

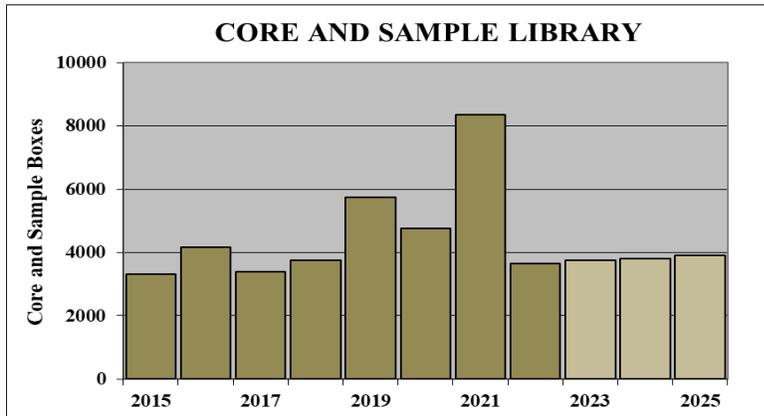
High-Level Radioactive Waste (NDAC 43-02-13)

Underground Storage and Retrieval of Nonhydrocarbons (NDCC 38-24)

A permit is required for the testing, storage, or retrieval of nonhydrocarbons and other gases not regulated by title 38.

WILSON M. LAIRD CORE AND SAMPLE LIBRARY

Geological Survey – Subsurface Section



Upper Left: Expansion of the Wilson M. Laird Core and Sample Library was completed in 2016. The core library contains 59,000 sample boxes and 170,000 core boxes. Lower left: Roughly 900, three-foot sample boxes (11 bins) and 9,000 core boxes (289 bins) were received into the core library this biennium (equal to all of the boxes within the yellow rectangle in the photograph on the right). Inset photo: left to right – whole core, large slab or butts, and thin slab or curator (rocker) set.

CORE AND THIN SECTION PHOTOGRAPHY PROGRAM

Wilson M. Laird Core and Sample Library

Geological Survey – Subsurface Section



Core of the Three Forks Formation at a depth of 10,865 feet in Dunn County.

Total core (one set) in the core library =	486,000 feet (92 mi.)
Total photographed =	217,520 feet (45%)
Core photographs =	336,066
Total thin sections in the core library =	19,486
Thin section photographs =	143,252
Total photographs on website =	479,318



Coarser grains and cross-bedding indicative of higher energy deposition in the upper half of a thin section from the Three Forks Formation at a depth of 9,785 feet in Williams County.



UND students (Survey temps) photographing core (left) and thin sections (below).

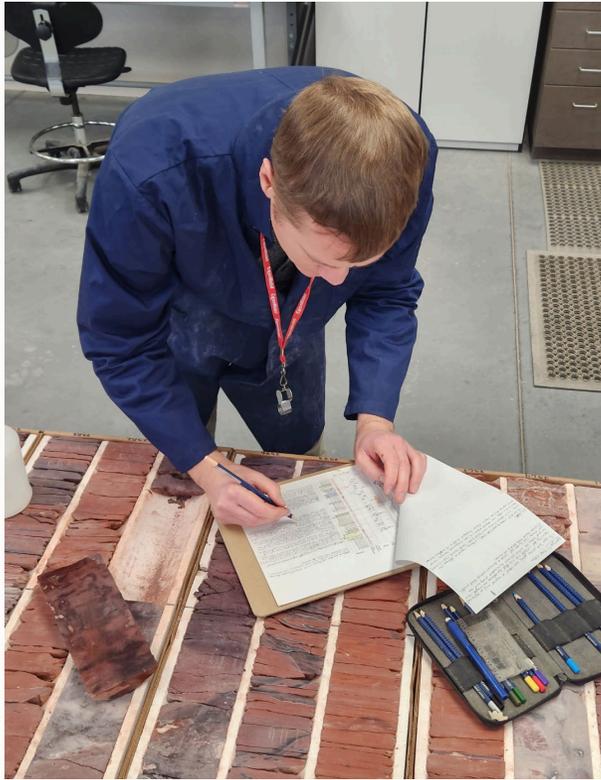


Historically the agency has used resources available from the Reservoir Data Fund to pay temporary salaries for student workers at the Core Library to photograph core and thin sections. In the next biennium those resources are needed by the agency for maintenance and operations activities of its data management platform, the NorthSTAR system. As a result, a onetime funding request was made for an additional \$90,000 in temporary salaries for the next biennium. This request was not included in the Executive Recommended Budget.

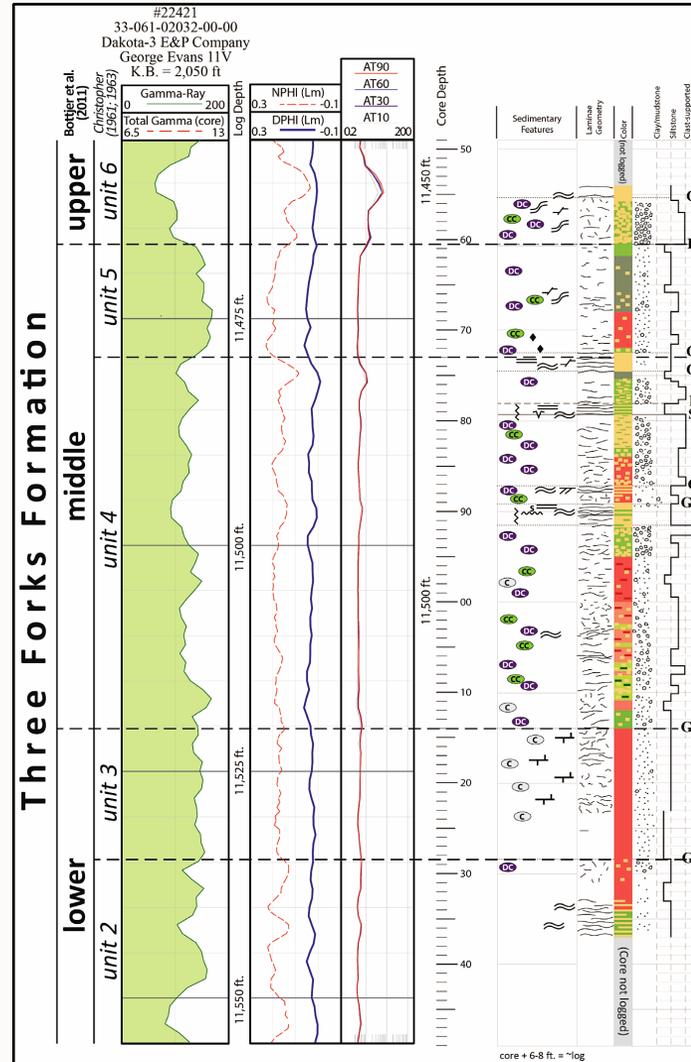
CORE STUDIES AND CORE WORKSHOPS

Wilson M. Laird Core and Sample Library

Geological Survey – Subsurface Section



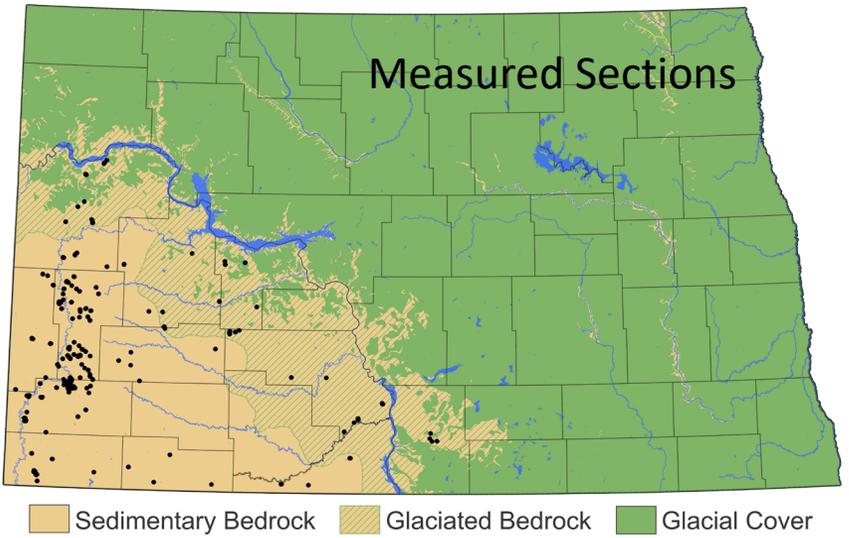
Above: Subsurface geologist Tim Nesheim describes core for a Geological Survey report on the Middle Three Forks Formation. Right: A figure from the Three Forks Formation report.



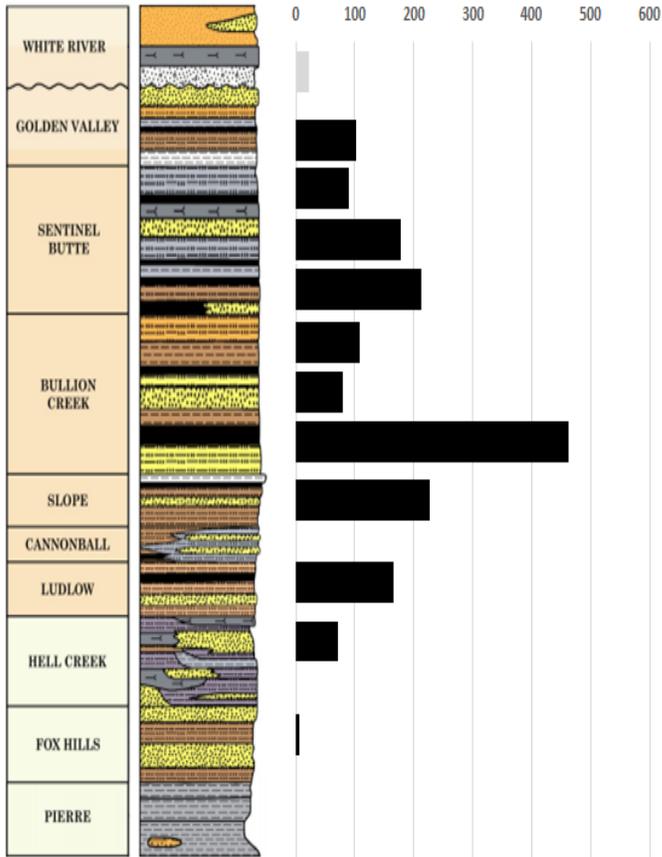
We have held two core workshops this biennium (Aug. 9-13, 2021 and Sept. 10 & 11, 2022) with a third core workshop scheduled for next year (RMS AAPG June 3 & 4, 2023 in Bismarck).

CRITICAL MINERALS PROJECT (2015 to Present)

Geological Survey – Surface Section & Minerals Section



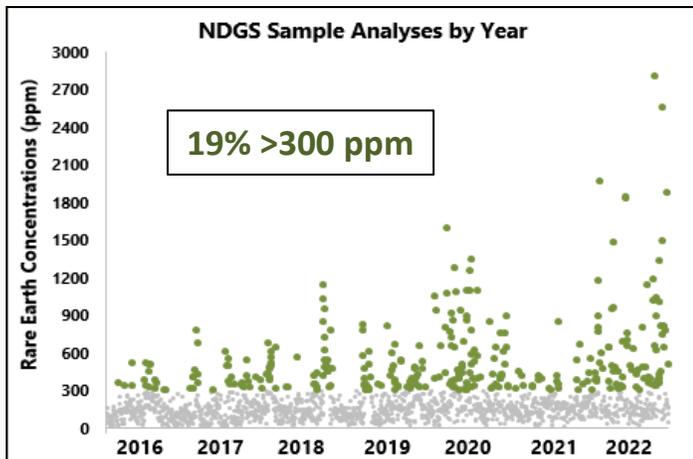
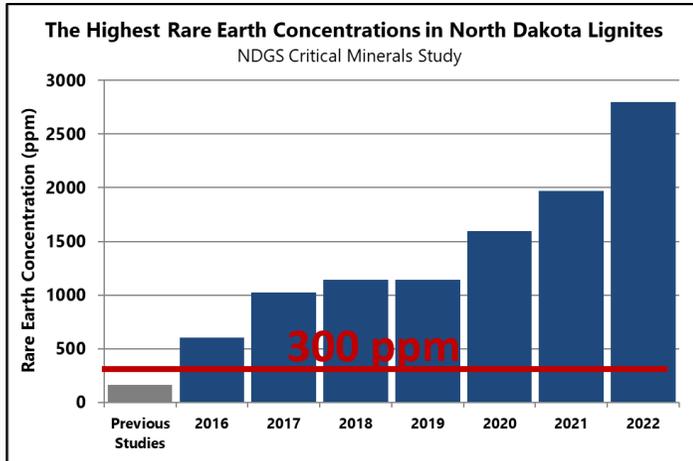
Number of Samples Analyzed by Stratigraphic Unit



Upper left: The location of the 306 measured sections and sample localities (black dots) in western and south-central ND (74 geologic sections measured, 407 samples collected and 372 analyzed so far this biennium). Right: Stratigraphic column of rocks exposed at the surface in western North Dakota and the number of rock samples obtained by formation. Photos: Collecting rock samples using a modified hand drill and with a pick and shovel.

CRITICAL MINERALS PROJECT

Geological Survey – Surface Section & Minerals Section



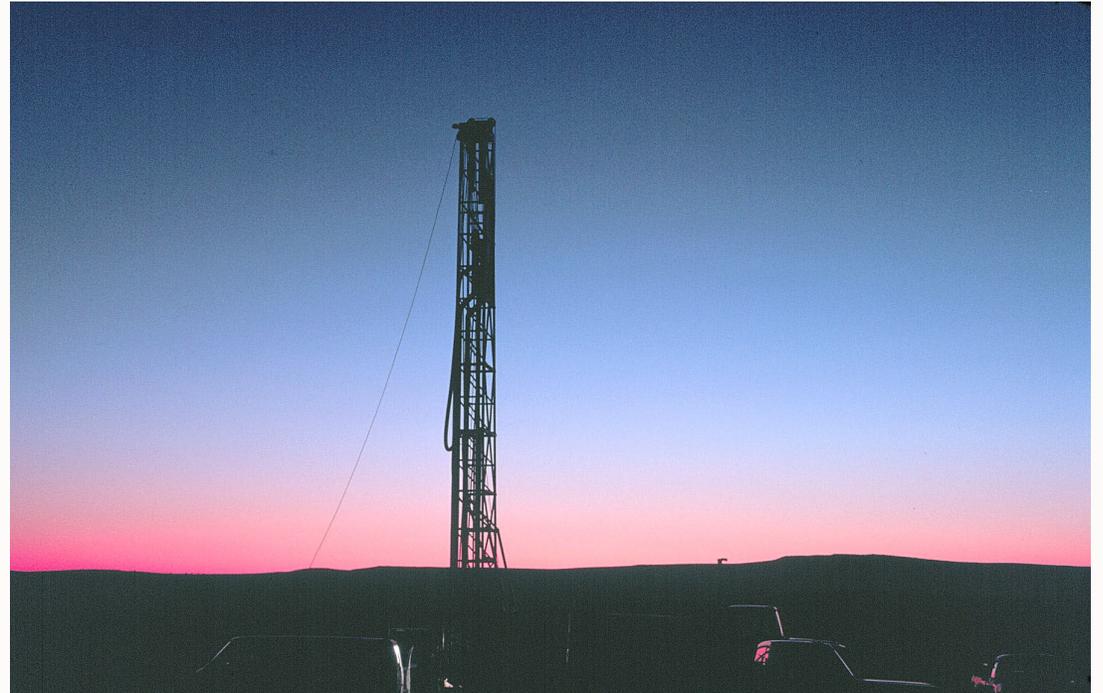
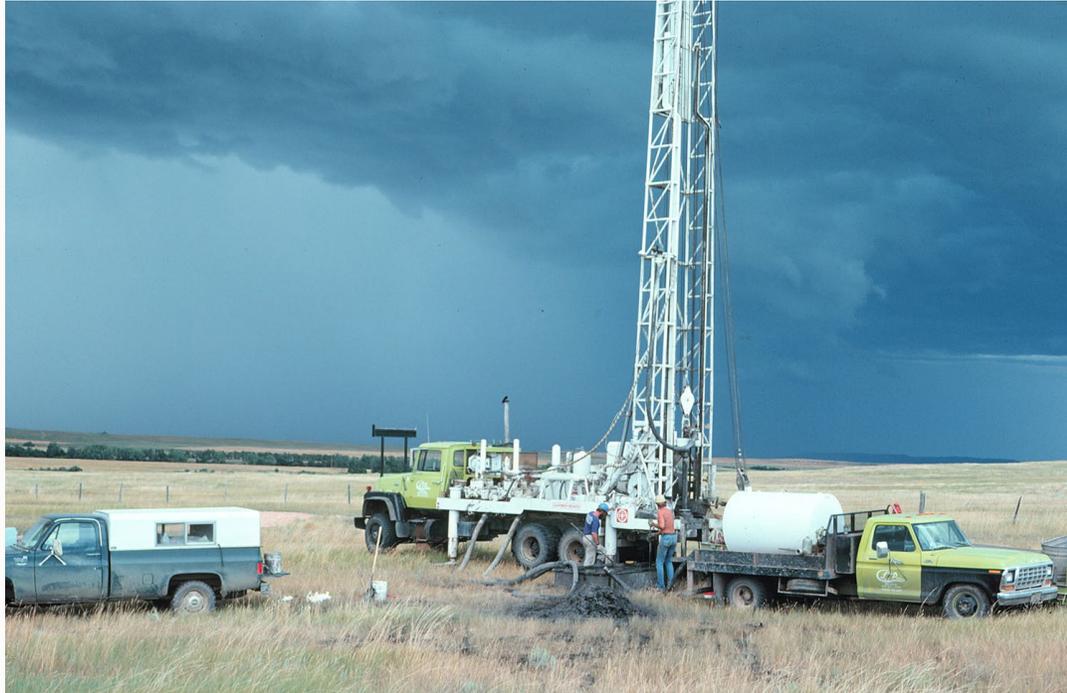
Upper left: When the Geological Survey study began, 169 ppm was the highest recorded concentration of rare earth elements in a ND lignite, we have increased that to 2,800 ppm. Lower left: 19% of our samples have exceeded 300 ppm (the US Department of Energy’s estimated economic threshold for rare earth elements in coal). Middle: Collecting lignite samples from the Slope Formation along the Little Missouri River in Golden Valley County in 2022. Right: Collecting lignite samples at Sentinel Butte in Golden Valley County in 2021.

CRITICAL MINERALS PROJECT

Proposed Drilling Project

Geological Survey – Surface Section & Minerals Section

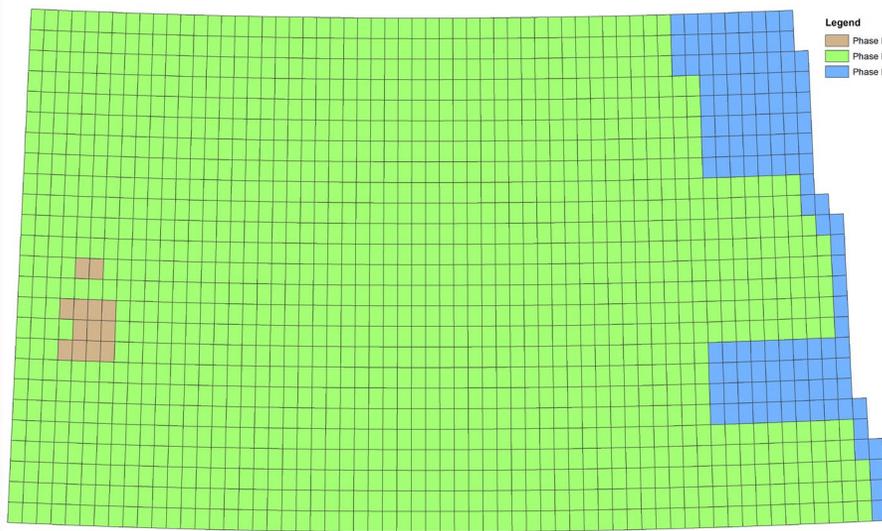
Critical Minerals 50 Hole Drilling Program
\$400,000 Project Total Cost (\$140,000 for sample analysis)
Amendment to be Proposed



We requested two critical mineral geologists; one critical mineral geologist was included In the Executive Recommended Budget.

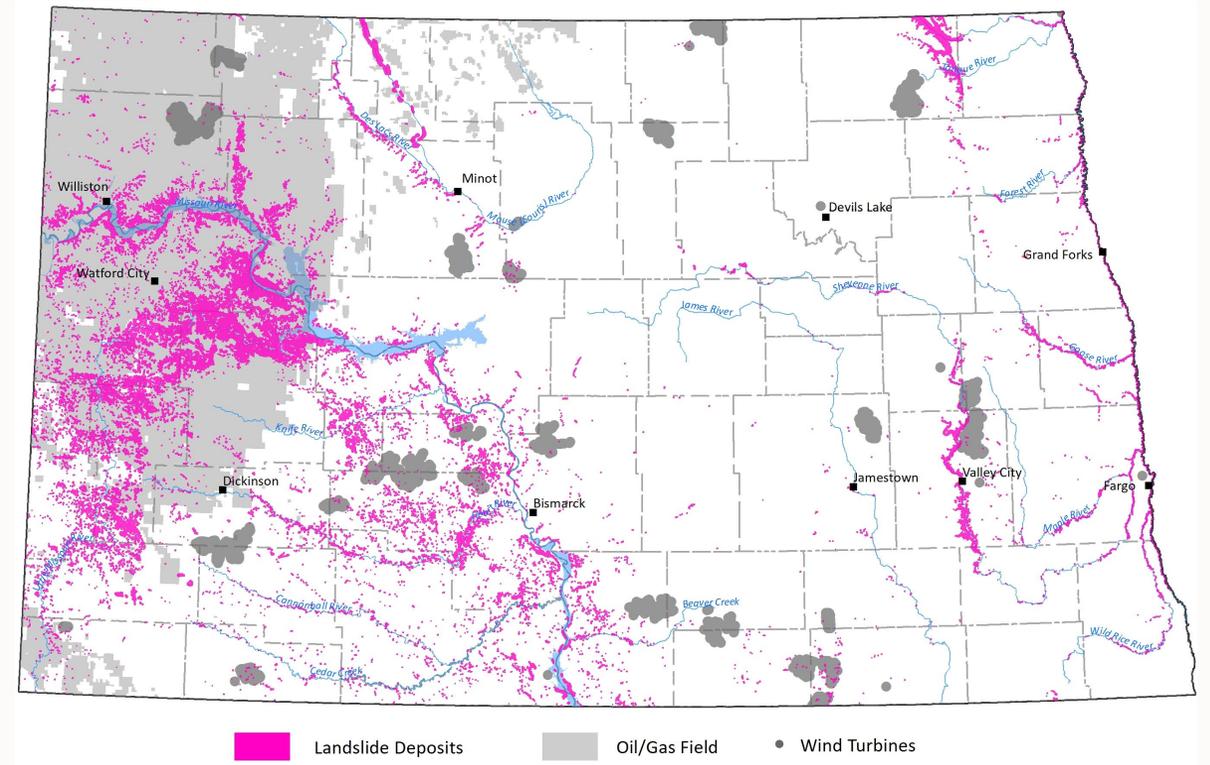
LANDSLIDE PROGRAM

Geological Survey – Surface Section



Phase I landslide maps (tan): interpreted from stereopair aerial photographs.
Phase II landslide maps (green): interpreted from stereopair aerial photographs, LiDAR, Google Earth imagery.
Phase III landslide maps (blue): LiDAR coverages from 2008 compared and contrasted to 2018, etc.

> 50,000 landslides mapped in ND

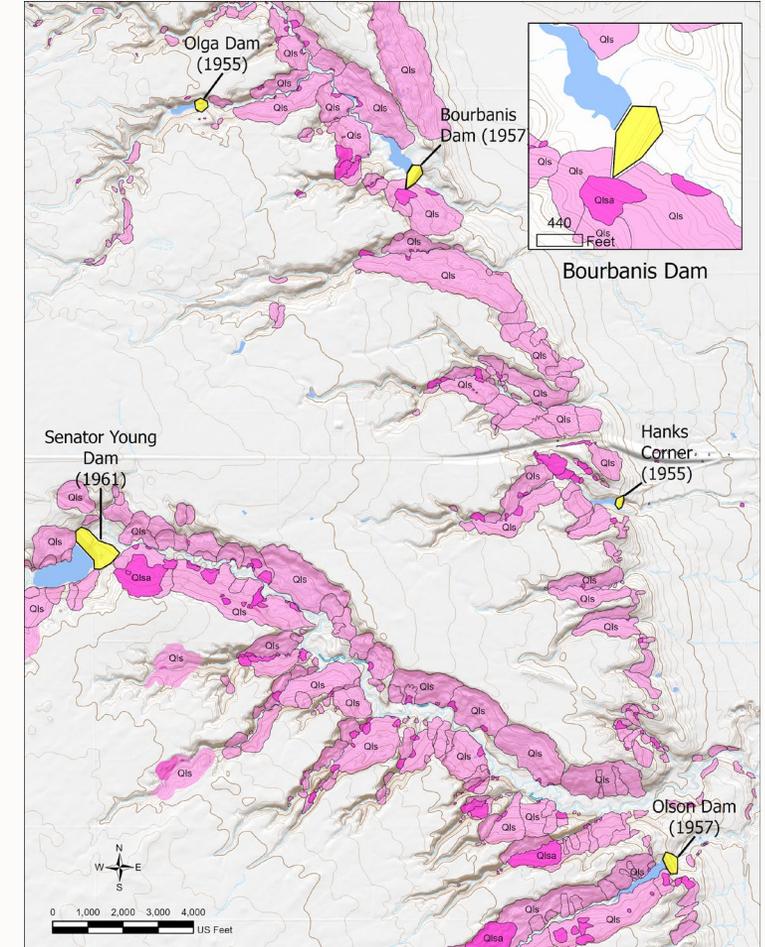
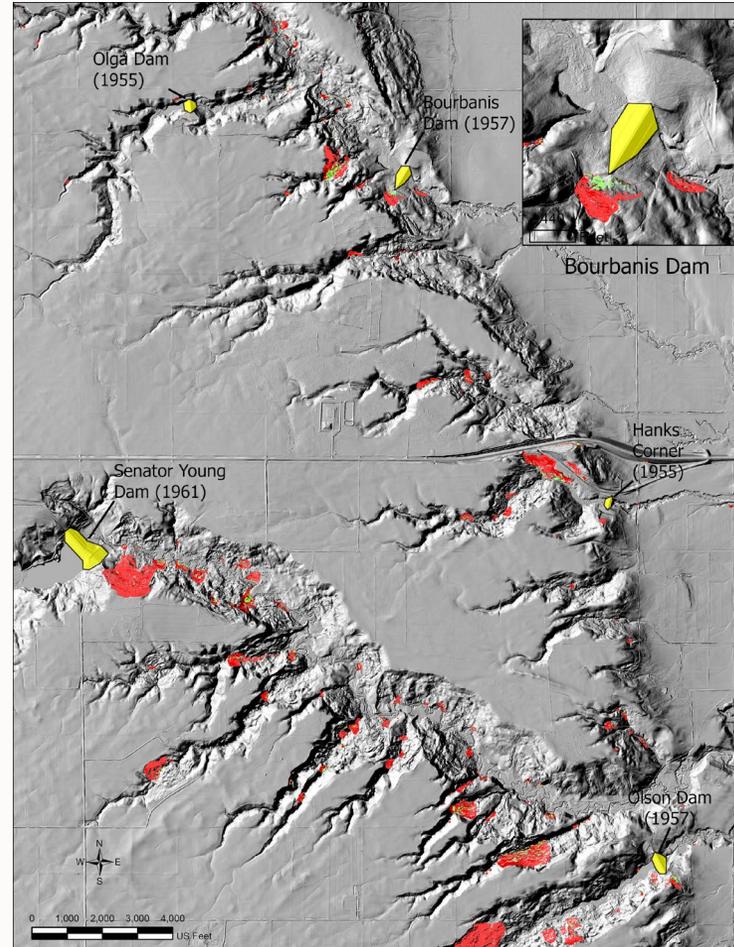
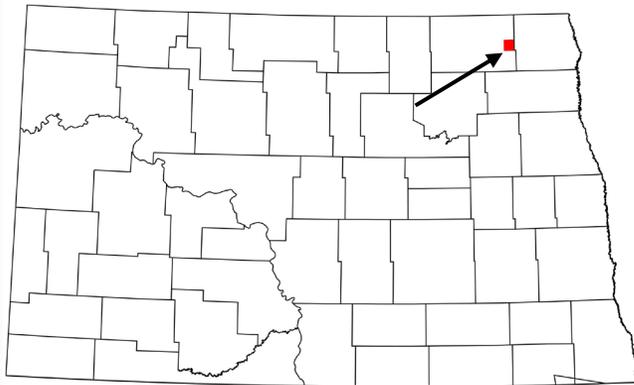


Upper left: A total of 316 landslide quadrangles have been mapped so far this biennium (245 Phase I to Phase II maps and 71 Phase II to Phase III maps). The remaining Phase I landslide maps will be converted to Phase II by the end of this biennium. Half of the Phase II maps should be converted to Phase III by the end of the 2023 – 2025 biennium. Right: To date, the Geological Survey has mapped over 50,000 landslides at a scale of 1:24,000 -- making North Dakota one of the first states in the nation to map all of its landslides at that scale.

PHASE III LANDSLIDE MAPS

Landslides in the Vicinity of Earthen Dams in Northeastern North Dakota

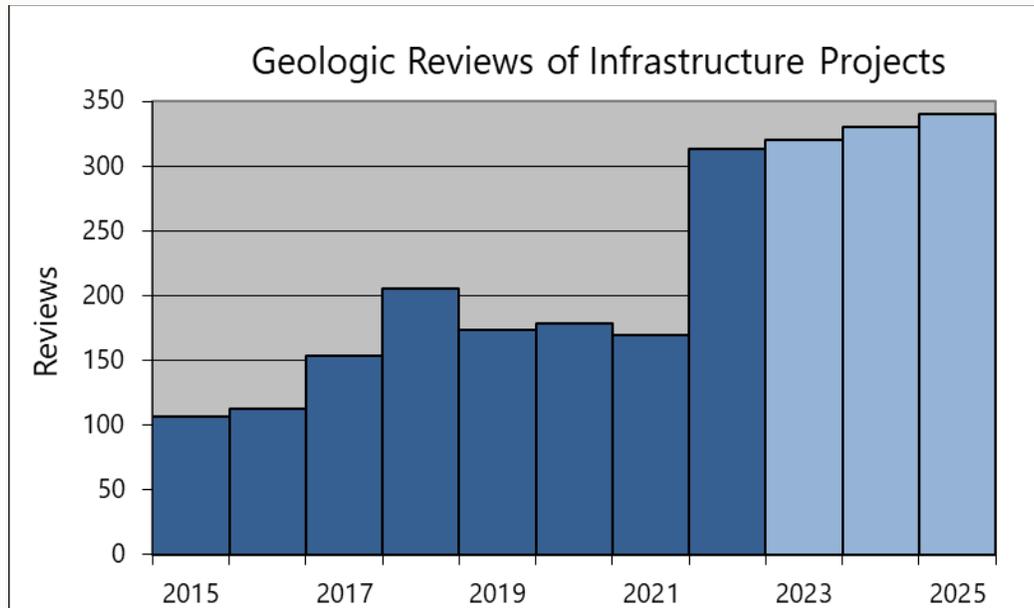
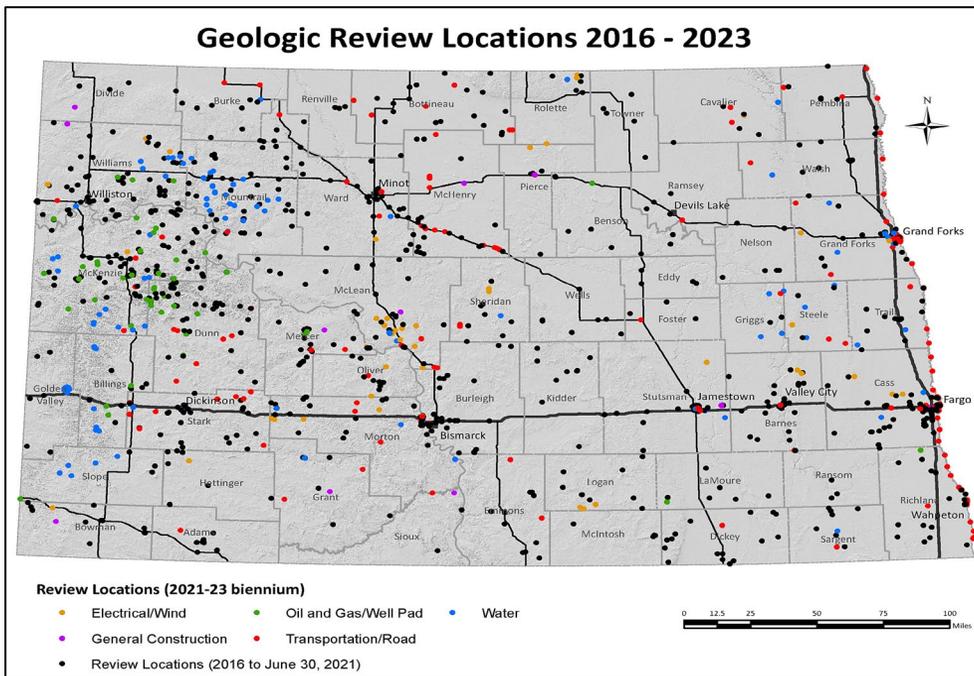
Geological Survey – Surface Section



Left: Phase III landslide mapping in northeastern North Dakota during the spring of 2022 demonstrated there had been recent (between 2008 and 2018) slope failure in proximity to five earthen dams in that area -- noted on this hillshade map constructed from LiDAR in either red (for a negative topographic change) or in green (for a positive topographic change). Right: The finished map depicts landslides in pink with slope movement since 2008 in dark pink.

GEOLOGIC REVIEWS OF INFRASTRUCTURE PROJECTS

Geological Survey – Surface Section



Upper left: Since 2016, we have reviewed the geologic suitability of 1,305 infrastructure projects. The majority of these have been road projects. Upper right: So far, we have reviewed the geologic suitability of 403 infrastructure projects during the 21-23 biennium. Photos left to right: highway overpass on 1-29 south of Fargo, sewer installation at Larimore, a wind turbine near Valley City, transmission line replacement near Fargo.

DRONE PROJECTS

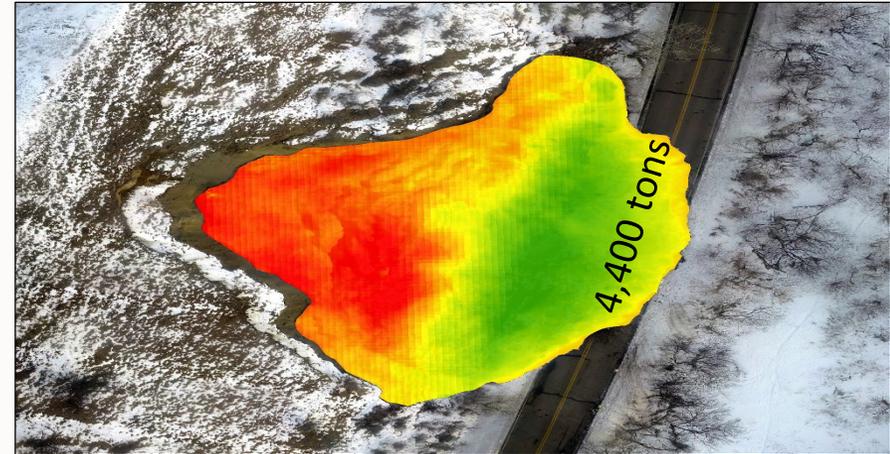
Geological Survey – Surface and Mineral Sections



For the past five and a half years, the Geological Survey's two geologists/drone pilots have taken 21,919 drone photographs and 78 videos from 150 sites across the state and generated 68 (orthomosaic and surface elevation) maps with the DJI Phantom 4 Pro platform. The Executive Recommended Budget contains funding (\$4,765) to replace this Phantom 4 drone with a DJI Mavic 3 Enterprise drone that can be folded up and placed in a backpack for easy carrying into remote areas.

DRONE PHOTOGRAPHY AND DIGITAL SURFACE MAPS

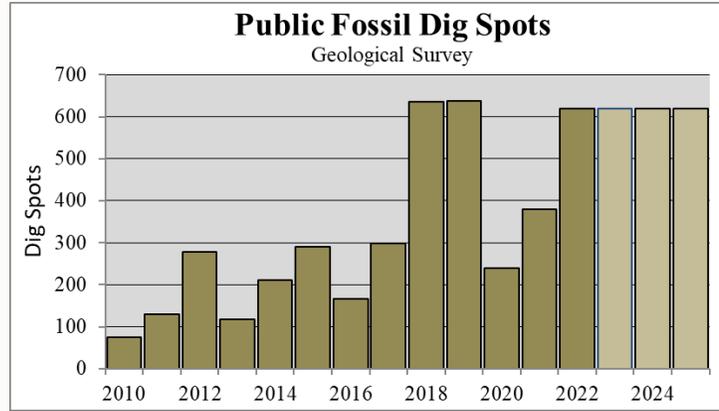
Geological Survey – Surface Section



Upper left: Reconnaissance flight across Sunset Butte in Bowman County to determine sampling route to the top (8/21). Upper right: Tracing a channel sandstone in the Ludlow Fm. where it cuts down through the Cretaceous-Tertiary boundary (8/21). Lower left: A reactivated landslide along River Road north of Bismarck (6/22). Lower right: Drone surface elevation map compared to existing LiDAR to determine surface elevation changes due to the 2019 landslide, green for elevation increases and red for decreases.

PUBLIC FOSSIL DIGS

Geological Survey – Paleontology Section



Upper left: The Public Fossil Dig Program has grown dramatically in recent years and yet we still turn away hundreds of people every year who want to participate in these digs. Lower left: A fossil dig participant in Morton County makes a field jacket for a hadrosaur jaw they discovered. Middle: Participants at the Pembina public fossil dig excavate a horizon rich in marine reptiles and fish. Upper right: Participants at the Medora public dig excavate a horizon rich in turtles and crocodiles. Lower right: Participants at the fossil dig in Morton County find dinosaur and crocodile bones at many different horizons.

FOSSIL FIELD JACKET BACKLOG

Geological Survey – Paleontology Section



One of two field jackets (one a ton and the other a half ton) are ready for transport from the public fossil dig site in Morton County. The field jackets contain the partial skeleton of a triceratops.

FOSSIL FIELD JACKET BACKLOG

Geological Survey – Paleontology Section



765 Fossil Field Jackets

100 fossil jackets collected per year.

50 fossil jackets prepared per year.

50 fossil jackets added to backlog per year.

The Addition of one Paleontology Technician

80% fossil preparation in lab, 20% in field.

100 fossil jackets collected per year.

150 fossil jackets prepared per year.

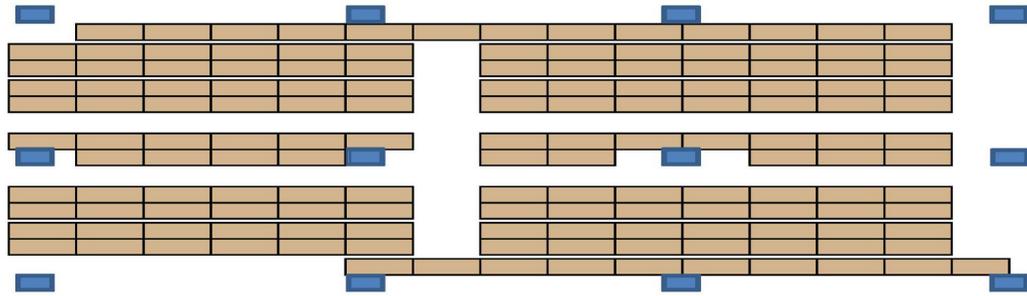
50 fossil jackets removed from backlog per year.

Backlog eliminated in 13 years.

Senior Paleontologist Clint Boyd stands next to a series of shelving units holding some of the 765 fossil field jackets that have primarily been the result of the very successful public fossil dig program. That backlog of field jackets would fill a semi-trailer. We requested two paleontology technicians; one paleontology technician was included in the Executive Recommended Budget.

STATE FOSSIL COLLECTION

Geological Survey – Paleontology Section



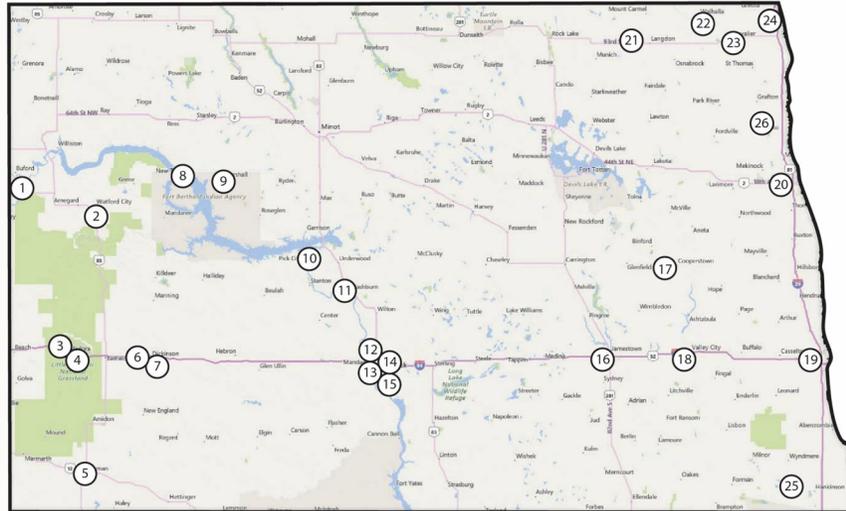
Upper left: Map view of the 150 fossil cabinets in the State Fossil Collection. Lower left: Turtle shells and bones from the Sentinel Butte Fm. (Paleocene, 60 mya). Lower middle: Fossil plant leaves from the Hell Creek Fm. (Cretaceous, 67 mya). Right: Hadrosaur (duck-billed dinosaur) bones from the Hell Creek Fm. (Cretaceous, 67 mya).

\$250,000 REQUEST FOR ONE-TIME FUNDING

(included in the Executive Recommended Budget)

\$100,000 of this to go towards fossil exhibits across the state

Geological Survey – Paleontology Section



\$ 250,000
 \$ 955,600
\$1,205,600
 \$ 6,545

1997 - 2022

1997 Appropriated funds.
 Donations (78% of the total).
 Deposited into the fund.
Ending balance as of 11/30/2022



Upper left: The locations of the 26 fossil exhibits that we designed and maintain across the state. Lower photographs (left to right): a pteranodon and triceratops display at the Bismarck Airport; an eight-foot-high fossil tree stump and associated fossils in a display cabinet at the Watford City Visitor Center, a mounted triceratops skeleton at the Barnes County Museum in Valley City, a marine Cretaceous display at Icelandic State Park, and bare shelves at the Walsh County Historical Museum in Minto because we are in the process of renovating that rock and fossil display. Any appropriated funds would go into the Fossil Excavation & Restoration Continuing Appropriation Fund (NDCC 54-17.4-9.1).

\$250,000 REQUEST FOR ONE-TIME FUNDING

(included in the Executive Recommended Budget)

\$100,000 of this to go towards fossil exhibits across the state

Geological Survey – Paleontology Section



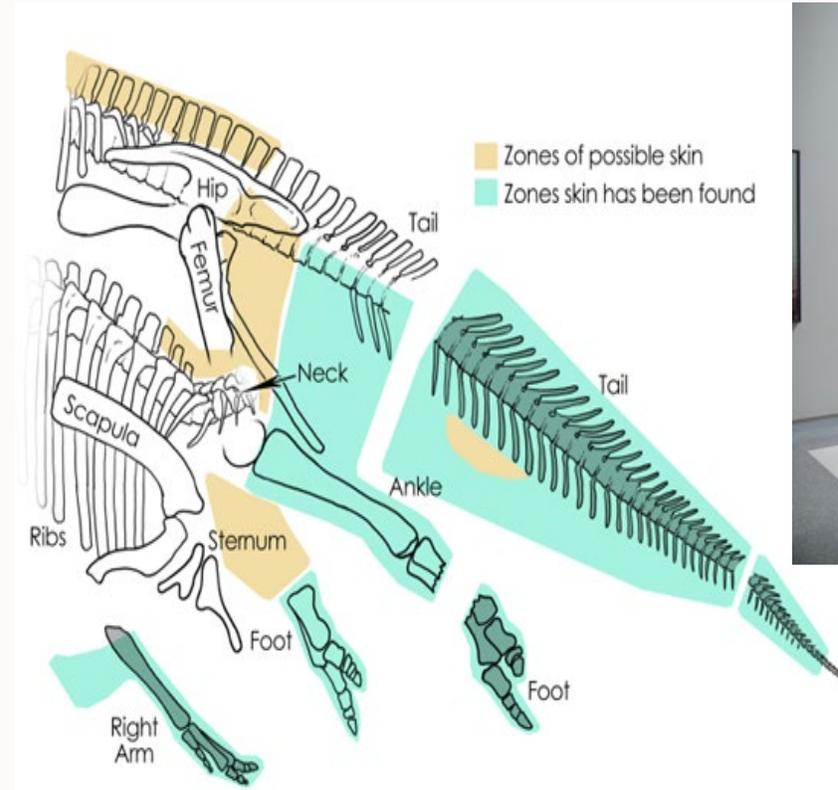
A paleontology tech removing sediment from a field jacket containing a partial skeleton of a juvenile *Bison antiquus* unearthed adjacent to an oil well pad in Williams County. This bison is scheduled to go on exhibit in Williston during the 23-25 biennium.

\$250,000 REQUEST FOR ONE-TIME FUNDING

(included in the Executive Recommended Budget)

\$150,000 to finish preparation work on Dakota – the mummified hadrosaur (duck-billed dinosaur)

Geological Survey – Paleontology Section



Left: A Survey temp employee removes rock on the body block of Dakota. Middle: a drawing of the position of identified bones in the Dakota field jacket. The bones in gray were covered with skin and are currently on display in the Heritage Center. Upper right: The revised Dakota exhibit had a grand opening on October 16, 2021 and will be modified in 2023.

\$250,000 REQUEST FOR ONE-TIME FUNDING

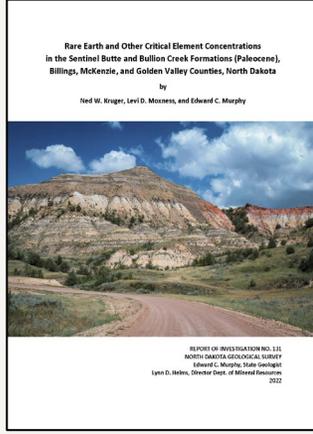
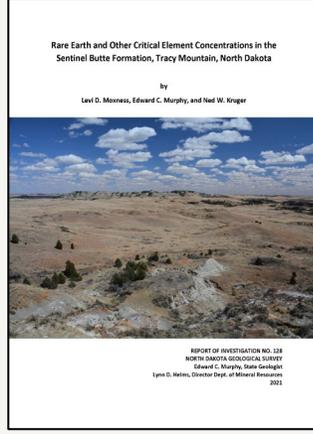
(included in the Executive Recommended Budget)

\$150,000 to finish preparation work on Dakota – the mummified hadrosaur (duck-billed dinosaur)

Geological Survey – Paleontology Section



Left: One of three hoof like toes on the rear foot of Dakota. Upper middle: A closeup of the air scribe used to chip off small pieces of rock lying above the preserved skin layer. Upper right: a paleotech removes rock from Dakota's hand with an air scribe. Lower right: Puncture marks in the skin of one of the hands of Dakota (white arrows) have been determined to be crocodile teeth marks.

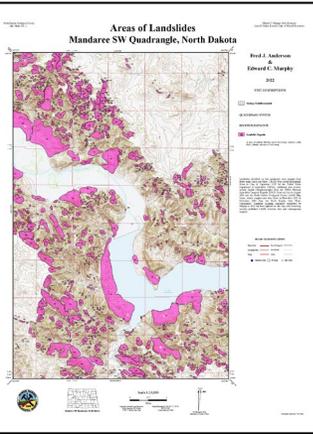
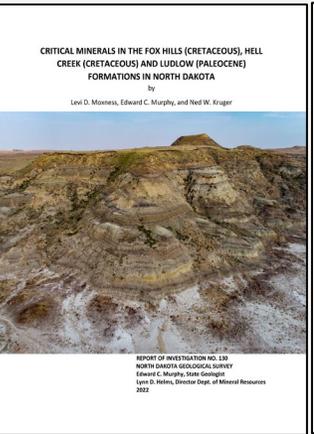


Critical Elements in North Dakota Lignite
Lignite Research Council White Paper

North Dakota Department of Mineral Resources
Geological Survey

Levi D. Moness
Neal W. Kruger
Edward C. Murphy

February 3, 2022

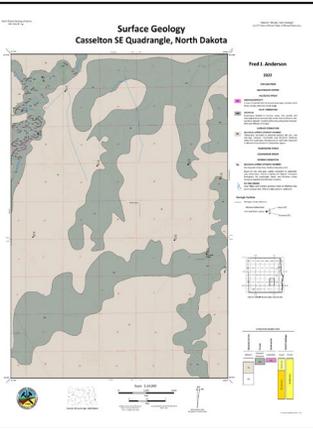
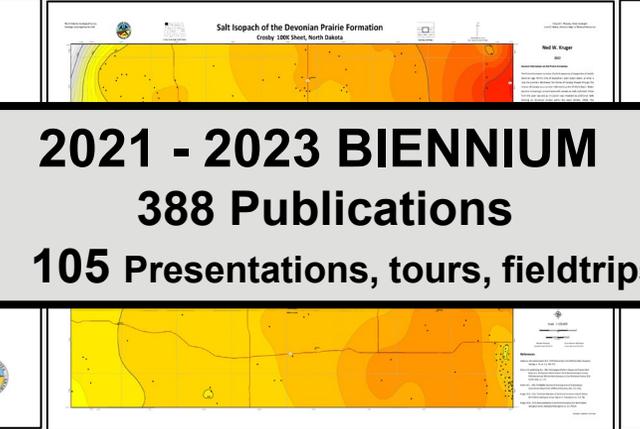
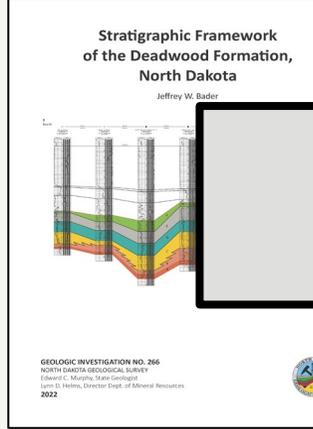


PLOS ONE

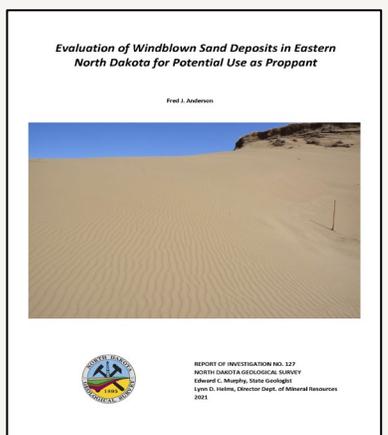
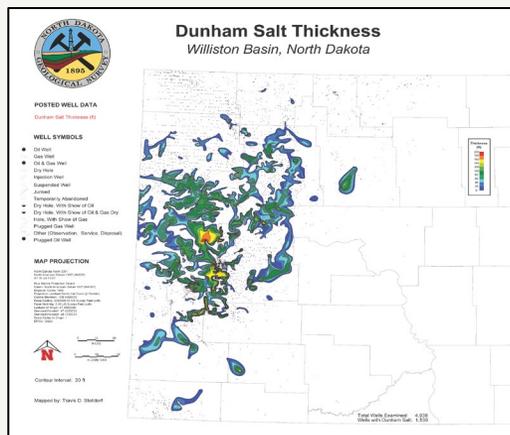
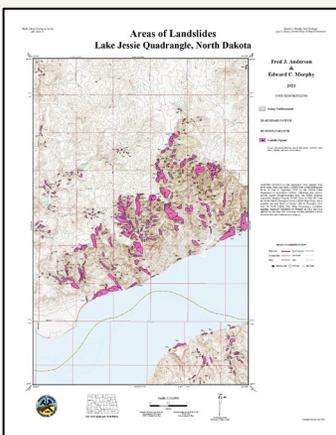
RESEARCH ARTICLE

Biostratigraphic alterations of an *Edmontosaurus* "mummy" reveal a pathway for soft tissue preservation without invoking "exceptional conditions"

Stephanie K. Drumheller^{1*}, Clint A. Boyd², Becky M. S. Barnes³, Mindy L. Householder⁴



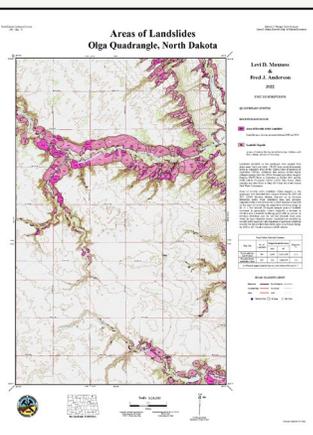
2021 - 2023 BIENNIUM
388 Publications
105 Presentations, tours, fieldtrips



GEO NEWS

Dakota | Mineral Resources

VOLUME 30 | NO. 1
JANUARY 2023





Audit | Budget Overview

RECENT AUDIT FINDINGS

A biennial audit of the Industrial Commission was conducted by the State Auditor's Office in accordance with generally accepted government auditing standards for the two-year period ending June 30, 2020.

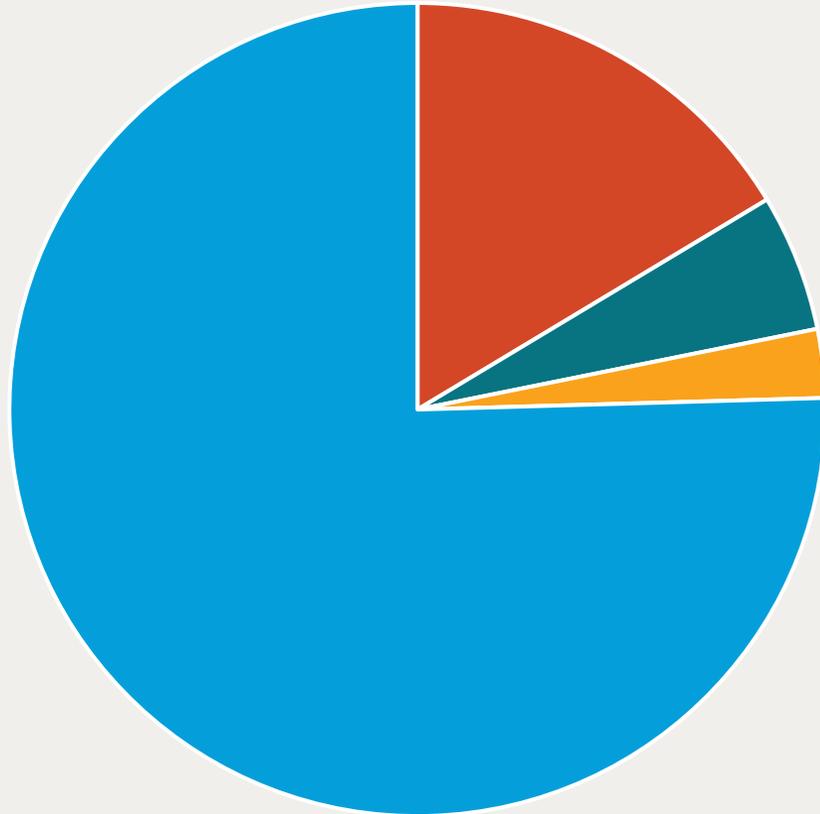
The audit included the following entities and programs under the direction and control of the Commission:

- Department of Mineral Resources (Geological Survey and Oil and Gas Division)
- Lignite Research, Development, and Marketing Program
- Oil and Gas Research Program
- Outdoor Heritage Fund
- Pipeline Authority
- Renewable Energy Program
- Transmission Authority

The audit did not have any findings.

2023-2025 DMR BUDGET

DMR Budget



■ Travel ■ Facilities ■ IT ■ Salary\Benefits

The Department of Mineral Resources (DMR) budget is **99% general funds and <1% federal funds**.

Budget costs are primarily salary and benefits (83%).

Federal funds for the **protection of freshwater supplies** are increasing (14%), while program costs continue to significantly rise due to inflation and federal environmental mandates.

The **Operating Budget** consists of travel (36%), primarily state fleet vehicle mileage for fieldwork. Other operating items of significant costs include Lease, Rent, Facilities costs (30%) for the Bismarck office, warehouse, and three field offices; and IT costs (16%), more than half of which are ITD data processing, Telephone, and Contractual Services.

2023-2025 DMR EXECUTIVE RECOMMENDED BUDGET

	2023-25 Base Level	Executive Recommended Budget
40510 Salaries & Benefits	\$22,095,326	\$23,464,046
Salary Increases		\$2,168,675*
40530 Operating Expense	\$4,632,291	\$6,048,092
40550 Capital Assets	\$0	\$98,000
40570 Transfers	<u>\$0</u>	<u>\$250,000</u>
Total Expenditures	\$26,727,617	\$32,028,813
Less Federal Income	<u>\$238,004</u>	<u>\$268,000</u>
Total General Fund	\$26,489,613	\$32,368,164
FTE	101.5	107.0

*Note: based on Executive Budget recommended increases to salary, benefit, health, and retirement.

EXECUTIVE RECOMMENDED BUDGET CHANGES

40510 Salaries & Benefits - The Executive budget recommendation includes \$1,368,720 for 5.5 new FTEs: 3 CCUS positions, 1 paleo laboratory technician, 1 critical mineral geologist, and 0.5 records management position. It also includes an additional \$2,168,675 for pay plan increases and \$204,122 in base pay changes which including cost to continue changes.

40530 Operating -The Executive budget includes \$821,456 one-time inflationary costs, \$230,000 in server transition costs, \$100,000 one-time core and mineral analysis costs, and \$498,109 for 5.5 new FTE operating costs.

40550 Capital Assets -The Executive budget allowed \$80,000 one-time funding for the server transition and \$18,000 one-time funding for two scanner/copier/printers.

40570 Transfers - The Executive budget allowed \$250,000 one-time funding for a general fund transfer to the Fossil Excavation and Restoration Fund (Paleo Fund).

FTE – The Executive budget increased the FTE count by 5.5 bringing the total count to 107 FTE.

2021-2023 STATE FISCAL RECOVERY FUNDING

(67TH LEGISLATIVE ASSEMBLY SB 2345)

Abandoned Oil Well Conversion to Water Supply

Appropriated: \$3,200,000

Expended: \$162 (advertising costs)

DMR identified approximately 32 oil and gas wells confiscated by the Commission to plug back and convert to freshwater wells for use by private ranchers or the two western ND grazing associations. Most of the wells are on lands managed by the USFS, are federal wells co-regulated by DMR and BLM, or both. **There has been a lack of cooperation from both the BLM and USFS in approving the plugging procedures and granting surface use approval.** DMR has not given up on receiving their cooperation and has so far identified at least six additional non-federal wells on private surface to convert to freshwater wells.

Funds can continue to be obligated through 12/31/2024 and expended through 12/31/2026. For this reason, a carryover of unexpended funds to the 2023-25 biennium is being requested.

AVAILABLE FEDERAL FUNDING FOR 2023-25 BIENNIUM

<u>Federal Funding Program</u>	<u>2021-2023 Anticipated Award</u>	<u>2021-2023 Anticipated Change</u>	<u>2023-2025 Anticipated Award</u>
UIC Oil & Gas (EPA)	\$210,000	\$39,000	\$240,000
PSC Coal (OSM-DOI)	\$15,000	\$0	\$15,000
Statemap (USGS-DOI)	\$13,000	\$20,267	\$13,000
IIJA Initial Grant (ECRP-DOI)	\$0	\$2,500,000	\$0
Resources of Nat'l Park System (DOA)	\$0	\$10,000	\$0
Data Preservation (DOI)	\$0	\$5,280	\$0

Infrastructure Investment and Jobs Act:

Appropriated: \$2,500,000

Expended: \$9,775

Funds can continue to be obligated through 10/01/2023 and the performance period ends 04/01/2024. For this reason, a carryover of unexpended funds to the 2023-25 biennium is being requested.

2023-2025 DMR BUDGET

	2023-25 Base Level	Executive Recommended Budget	DMR Essential Budget
40510 Salaries & Benefits	\$22,095,326	\$23,464,046	\$23,793,436
Salary Increases		\$2,168,675*	\$2,168,675*
40530 Operating Expense	\$4,632,291	\$6,048,092	\$6,326,053
40550 Capital Assets	\$0	\$98,000	\$98,000
40570 Transfers	<u>\$0</u>	<u>\$250,000</u>	<u>\$250,000</u>
Total Expenditures	\$26,727,617	\$32,028,813	\$32,636,164
Less Federal Income	<u>\$238,004</u>	<u>\$268,000</u>	<u>\$268,000</u>
Total General Fund	\$26,489,613	\$31,760,813	\$32,368,164
FTE	101.5	107.0	108.0

*Note: based on Executive Budget recommended increases to salary, benefit, health, and retirement.

DMR ESSENTIAL BUDGET CHANGES

40510 Salaries & Benefits - The difference between the Executive budget and the DMR essential budget is \$329,390. This includes \$239,390 for one subsurface geologist position and an increase of \$90,000 for temporary employees used at the Core Library. The Executive budget did not include these two items.

40530 Operating - The difference between the Executive budget and the DMR essential budget is \$277,961. This includes on-going inflationary costs of \$65,412 for the change to the Fleet Rate guidelines **after** budgets were already submitted. It also includes \$45,199 for the subsurface geologist position operating costs, and \$167,350 for professional development. The IOGCC dues of \$105,000 is part of the professional development costs. The Executive budget did not include these items.

FTE – The DMR essential budget increases the Executive budget by one FTE bringing the total count to 108 FTE.

OTHER DMR ESSENTIAL BUDGET CHANGES

Carryover Requests:

- The Abandoned Oil Well Conversion to Water Supply program funds can continue to be obligated through 12/31/2024 and expended through 12/31/2026. For this reason, a carryover of unexpended funds to the 2023-25 biennium is being requested items.
- The \$2.5 million Initial Grant funds appropriated can continue to be obligated through 10/01/2023 and the performance period ends 04/01/2024. For this reason, a carryover of unexpended funds to the 2023-25 biennium is being requested.
- The 65th Legislative Session SB 2134 Ordinary High Water Mark cases are still ongoing and continue to require expert witness testimony. For this reason, a carryover of unexpended funds to the 2023-25 biennium is being requested.

Ongoing Costs:

The Executive recommended budget provided \$821,456 one-time inflationary costs and \$100,000 one-time core and mineral analysis costs. DMR is requesting that all inflationary costs be on-going as well as the core and mineral analysis costs.

Emergency Clause:

The Executive recommended budget provided \$230,000 in on-going and \$80,000 of one-time costs to transitioning agency data storage and website services from on premise servers to an NDITD hosted solution. An emergency clause is requested for a speedier transition.

ONE TIME FUNDING 21-23 BIENNIUM

Other Equipment <\$5,000	Cost	Status
Custom Air Chamber (Paleontology Lab)	\$2,500	Seeking Bids
Wifi (PL)	<u>\$3,100</u>	Purchased
	\$5,600	
Other Equipment >\$5,000		
Drone & Mobile Station (Geological Survey)	\$10,200	Ordered
Trimble Mobile Receiver & Software (GS)	\$14,385	Purchased
Microscope (GS)	\$6,400	Purchased
Scope & Camera (PL)	\$21,565	Purchased
Dust Collector (PL)	\$10,650	Purchased
Pallet Rack Shelving (PL)	<u>\$5,122</u>	Seeking Bids
	\$68,322	
IT Equipment & Software > \$5,000		
Scanner/Printer (Oil & Gas)	\$10,000	Purchased
Scanner/Printer (GS)	\$10,000	Seeking Bids
Wide-Bed Plotter (GS)	\$7,338	Purchased
Wide-Bed Plotter (CL)	<u>\$5,000</u>	Ordered
	\$32,338	

ONE TIME FUNDING 23-25 REQUESTS

EQUIPMENT AND CAPITAL ASSETS:

IT Equipment <\$5,000

Desktop computers (Geological Survey)	\$48,383
---------------------------------------	----------

Other Equipment <\$5,000

Drone replacement (Geological Survey)	\$4,765
---------------------------------------	---------

Drone replacements (Oil & Gas Division)	<u>\$12,500</u>
---	-----------------

	\$17,265
--	----------

Other Equipment >\$5,000

Server Transition	\$80,000
-------------------	----------

IT Equip/Software over \$5,000

Scanner/printer (Oil & Gas Permitting)	\$10,000
--	----------

Scanner/printer (Oil & Gas Production)	<u>\$8,000</u>
--	----------------

	\$18,000
--	----------

GENERAL FUND TRANSFERS:

Fossil Excavation and Restoration Fund

Dakota the Mummified Hadrosaur	\$150,000
--------------------------------	-----------

Establishing Fossil Exhibits across ND	<u>\$100,000</u>
--	------------------

	\$250,000
--	-----------

The Executive Recommended Budget included these one-time funding needs.

BILLS WITH BUDGETARY IMPACT

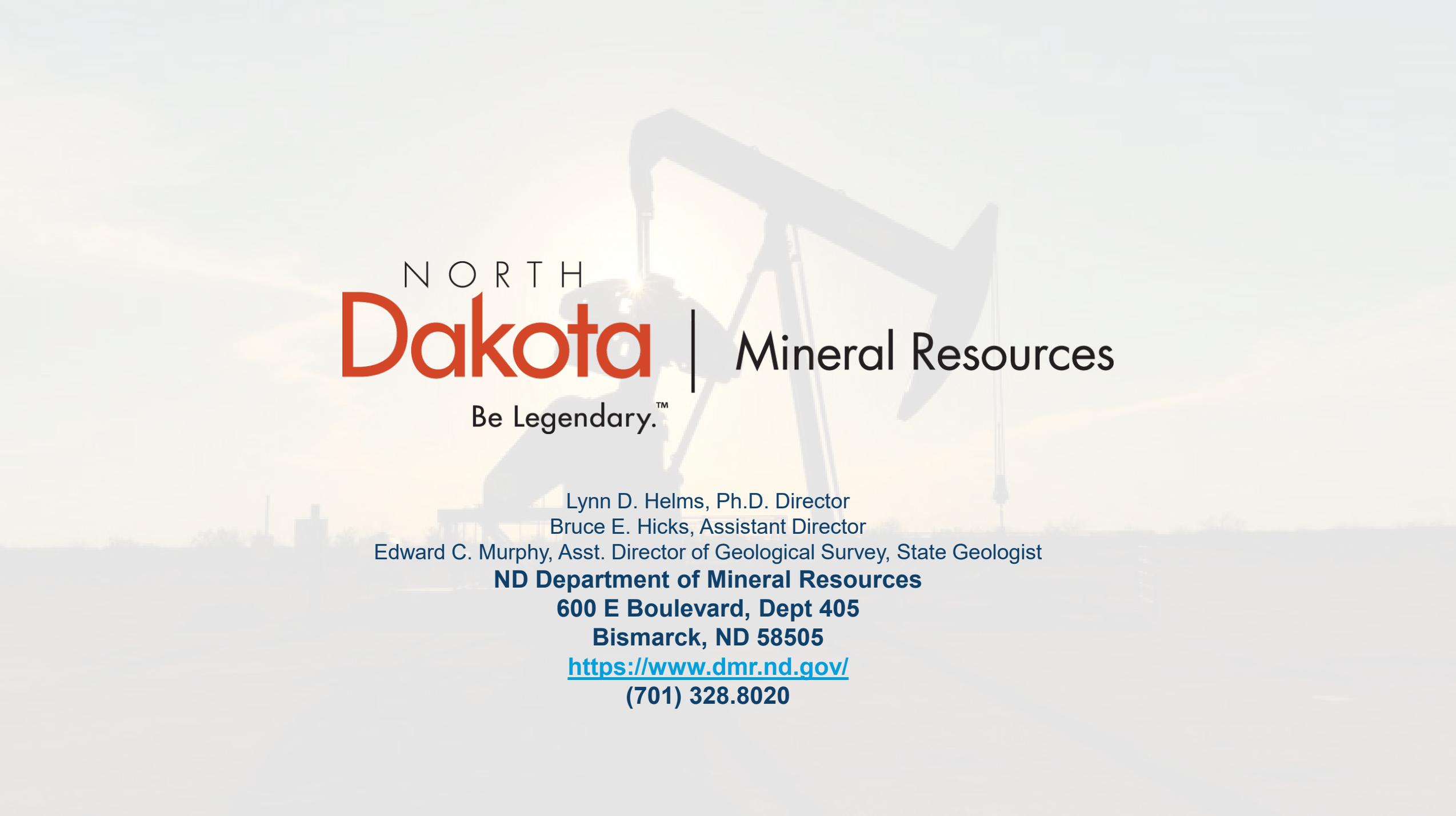
Operating Fees/Services

Litigation:

The 67th Legislative Assembly established a litigation pool in the Attorney General's budget in the amount of \$4,650,000. The Industrial Commission was provided access to the pool for the purpose of defraying expenses associated with possible litigation and other administrative proceedings such as:

- SB 2134 – 2017 65th Assembly – 1 case South Central District Court & 1 case appealed to SCOTUS
- DAPL – US Court of Appeals District of Columbia Circuit
- BLM 11/18/16 Waste Prevention, Production Subject to Royalties, and Resource Conservation Final Rule - US Court of Appeals Tenth Circuit
- BLM 3/26/15 Hydraulic Fracturing on Federal and Indian Lands Final Rule - US Court of Appeals Tenth Circuit

The Governor's recommended budget included \$5,000,000 for a statewide litigation pool. The Industrial Commission currently estimates ongoing litigation costs at \$3,500,000.



NORTH
Dakota | Mineral Resources
Be Legendary.™

Lynn D. Helms, Ph.D. Director
Bruce E. Hicks, Assistant Director
Edward C. Murphy, Asst. Director of Geological Survey, State Geologist

ND Department of Mineral Resources

600 E Boulevard, Dept 405

Bismarck, ND 58505

<https://www.dmr.nd.gov/>

(701) 328.8020