



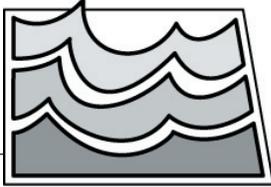
NORTH DAKOTA
State Water Commission
AND
Office of the State Engineer



BIENNIAL REPORT
for the period July 1, 2003 to June 30, 2005

Governor John Hoeven
Chairman

Dale L. Frink, P.E.
Secretary and State Engineer



North Dakota State Water Commission

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December 1, 2005

The Honorable John Hoeven
Governor of North Dakota
State Capitol
Bismarck, ND 58505

RE: 2003-2005 Biennial Report

Dear Governor Hoeven:

It is with great pride in the State Water Commission and the Office of the State Engineer that we present our Biennial Report for July 1, 2003, through June 30, 2005. This report highlights the events and activities of the State Water Commission and the State Engineer for your information and consideration.

Respectfully submitted,

Dale L. Frink
Secretary and State Engineer

DLF:pf
Enclosure

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NORTH DAKOTA STATE WATER COMMISSION



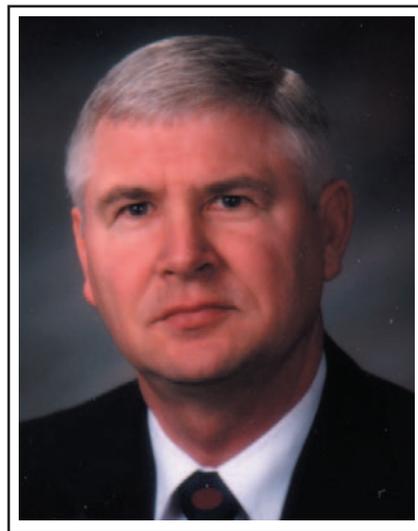
GOVERNOR JOHN HOEVEN
Chairman

Mission

To improve the quality of life and strengthen the economy of North Dakota by managing the water resources of the state for the benefit of its people.

Philosophy and Values

In the delivery of services to the citizens of North Dakota, we the employees of the State Water Commission and the Office of the State Engineer value fairness, objectivity, accountability, responsiveness, and credibility. We pledge to use professional and scientific methods to maintain only the highest of standards in our delivery of services to our constituents.



DALE L. FRINK, P.E.
Secretary & State Engineer

Agency Goals

- To regulate the use of water resources for the future welfare and prosperity of the people of North Dakota.
- To develop water resources for the future welfare and prosperity of the people of North Dakota.
- To manage water resources for the future welfare and prosperity of the people of North Dakota.
- To educate the public regarding the nature and occurrence of North Dakota's water resources.
- To collect, manage, and distribute information to facilitate improved management of North Dakota's water resources.
- To conduct research into the processes affecting the hydrologic cycle to improve the management of North Dakota's water resources.

Organization

The State Water Commission consists of the Governor as chairman, the Commissioner of Agriculture as an ex-officio member, and seven members who are appointed by the Governor to serve terms of six years each. The terms of office for appointees are arranged such that two terms and not more than three terms shall expire on the first day of July of each odd numbered year. The Commission appoints a Secretary (the State Engineer) as its executive officer, who employs

a staff as needed to carry out the work of the Commission.

The State Water Commission is located primarily in the State Office Building near the State Capitol in Bismarck, North Dakota. In addition, the Commission has a field office in West Fargo.

History and Mandates

The Office of State Engineer was created in 1905 to regulate and administer matters concerning allocation of the state's water and

related land resources in compliance with article XI, § 3 of the North Dakota Constitution, which declares all waters to be property of the state for public use. In 1937, additional duties were added to this office when the State Engineer was designated Chief Engineer and Secretary to the Commission.

The State Water Commission was created by legislative action in 1937, as a result of the drought of the 1930s, for the specific purpose of fostering and promoting water resources development throughout the state.

Agency Policies

The State Water Commission and the State Engineer have developed procedures and policies based upon the comprehensive legislation contained in Title 61 of North Dakota's Century Code to:

- Administer the water laws of the state.
- Prepare and maintain a comprehensive plan for future growth and development, and to direct project development in accordance with that plan.
- Conduct studies to determine availability and occurrence of the ground and surface waters of the

state for the purposes of allocation and management.

- Assist local entities of government in the development and construction of water resource projects.
- Assist local entities of government in management and maintenance of water resource projects.
- Assist in the organization of various legal entities through which water resource projects can be sponsored and operated.
- Administer water information/education programs to enhance understanding of the state's water resources.

- Coordinate with federal, state, and local entities in water resources management and development.

- Represent the interests of the state in water resources matters in national, state, regional, and international forums.

Many of the policies in effect have evolved as a result of the agency's financial participation in project development along with local government sponsors. The amount of financial participation varies with the project's purpose.

Principal Agency Activities

- Develop Missouri River water in ways that will secure North Dakota's share of Missouri River flows for our current and future needs, as reflected in comprehensive water management planning documents and the Pick-Sloan Plan.

- Implement plans for the distribution of Missouri River water

through regional water supply systems such as the Southwest Pipeline project, the Northwest Area Water Supply project, and the Red River Valley Water Supply Project.

- Manage and develop North Dakota's water resources to facilitate economic development and improve quality of life for current and future generations.

- Promote and provide water supplies needed for the expansion and diversification of North Dakota's agricultural industry.

- Work to implement all aspects of the Dakota Water Resources Act of 2000 to provide a reliable source of good-quality water throughout North Dakota in return for the sacrifices made under the Pick-Sloan Plan.

- Complete detailed studies and research that more precisely define the nature and occurrence of water to optimize its conservation and development throughout the state.

- Maintain a water project inventory and water management plan to promote efficiency in meeting North Dakota's future water development and funding needs.

- Refine legislation and policies for administering the Water Development Trust Fund and the Resources Trust Fund through which critical water facilities can be constructed.

- Continue to implement the



The Missouri River

state's three-pronged approach (including an outlet to the Sheyenne River, infrastructure protection, and upper-basin management) to solving the Devils Lake area flooding problems.

- Develop policies and initiatives that will stimulate progress toward developing flood control measures along the Sheyenne, Pembina, and Red Rivers, and Devils Lake.

- Pursue cooperative efforts with neighboring states and provinces to plan for beneficial water management of shared water resources.

- Cooperate with agencies that have regulatory authority over North Dakota's waters to protect and enhance the quality of North Dakota's water resources and related ecosystems.

- Enforce weather modification standards, conduct research, and supervise operational cloud seeding programs for hail suppression and rainfall enhancement.

- Provide water education for North Dakota's teachers, youth, and general public.

- Promote expanded development of North Dakota's water-based recreation resources, especially the Missouri River, Lake Oahe, Lake Sakakawea, and Devils Lake.

- Collect water resource data for the purpose of identifying the location, condition, and temporal changes of the water resources of the state.

- Disseminate water resource information to the general public, businesses, and government agencies.

- Manage the water resource database so that it is available and accessible to interested parties.

- Manage state water resources and sovereign lands within the framework of North Dakota's Century and Administrative Codes.

2003 Water Resources Legislation

House Bill 1021 was the Commission's appropriation bill. It provided the agency's funding within two special line items, the Administrative and Support Services line item and the Water and Atmospheric Resources line item, and totaled almost \$126 million. New items in the Commission's bill this year include language appropriating any excesses in the Resources Trust Fund and the Water Development Trust Fund, funding for the operation of the Devils Lake outlet, and additional bonding authority of \$7 million.

House Bill 1153 enabled the Commission to issue \$60 million in bonds that were identified in the agency's 2003-2005 appropriation bill. When the agency began the process of issuing \$60 million in bonds, the agency's bond counsel identified several sections of the bill that contained conflicting language. House Bill 1153 was introduced with an emergency clause to clean up the earlier language and allow the Commission to issue the bonds. This bill passed and the bonds were issued.

House Bill 1274 amended N.D.C.C. § 61-24.3-07, removing a requirement that industrial users pay at least their proportionate costs of the Southwest Pipeline Project.

House Bill 1399 amended N.D.C.C. § 61-16.1-09.1, relating to special assessments for snagging, clearing, and maintaining watercourses.

House Concurrent Resolution 3019 urged the Corps of Engineers to retain sufficient water in the upper portion of Lake Oahe to ensure a stable water supply for the residents of the Standing Rock Indian Reservation and surrounding communities.

House Concurrent Resolution 3026 urged the Corps of Engineers to maintain the level of Lake Saka-

kawea at a minimum elevation of 1,825 feet msl.

House Concurrent Resolution 3027 urged the Corps of Engineers to retain sufficient water in Lake Sakakawea to ensure a stable water supply for all water users.

House Concurrent Resolution 3029 expressed the Legislative Assembly's support for continued construction of the Northwest Area Water Supply Project.

Senate Bill 2115 provided for a Legislative Council study of the process to negotiate and quantify reserved water rights.

Senate Bill 2126 amended N.D.C.C. § 61-36-01, adding one member from the Upper Sheyenne River Joint Water Resource Board to the Devils Lake Outlet Management Advisory Committee.

Senate Bill 2155 created N.D.C.C. § 61-01-01.2, relating to findings and declaration of policy concerning the use of ground water for irrigation.

Senate Bill 2293 created N.D.C.C. § 61-35-02.1, relating to conversion of water resource district water supply systems to water districts.

Senate Bill 2295 amended N.D.C.C. chapters 61-35 and 61-39, relating to Lake Agassiz Water Authority - issuance of bonds, water supply contracts, and membership and powers.

Senate Concurrent Resolution 4023 expressed commendation and support for the efforts of the Lake Agassiz Water Authority to deliver water to eastern North Dakota.

Senate Concurrent Resolution 4026 urged Congress to enact legislation to address the adverse economic impact on businesses and the economic health of North Dakota caused by the low water levels of the federally managed reservoirs on the Missouri River.

Legal Actions

In 1999, approximately 95 landowners in the Devils Lake area sued the State of North Dakota, the North Dakota State Water Commission, the State Engineer, and nine water resource districts, alleging that all government constructed, sponsored, operated, and maintained water management projects in the Devils Lake basin have caused the lake to flood their property. The landowners are also alleging that government is responsible for all of the private drainage that has occurred in the Devils Lake basin. The landowners are seeking money damages, restoration of all wetlands in the Devils Lake basin, and an order enjoining the counties from continued maintenance of all watercourses and water management projects. The case is currently scheduled for trial in the summer of 2006.

In *Manitoba v. Norton*, Manitoba asserts that the U.S. Bureau of Reclamation violated NEPA by failing to prepare an Environmental Impact Statement for the Northwest Area Water Supply (NAWS) project. Manitoba is concerned that the project will bring Missouri River basin biota to and harm the environment of the Hudson Bay basin. North Dakota intervened in the lawsuit to protect the state's interests. North Dakota, as well as the Bureau, filed motions to dismiss the case on the ground that because the dispute concerns the relations of the United States with another county, and relations governed by a treaty, the judiciary is without jurisdiction over the dispute. The District Court for the District of Columbia rejected the motions. All parties then filed summary judgment motions. The court denied the state's motion and the Bureau's

motion but granted in part Manitoba's ruling that NEPA requires the Bureau to complete additional environmental analysis. The Bureau and state have appealed this decision to the Court of Appeals for the District of Columbia.

In a suit filed in 2002, the state challenged the manner in which the Corps of Engineers manages the Missouri River. It also sought an order requiring that the Corps issue a revised Master Manual, (the document governing its management of the river that had been under review for over 14 years). The District Court granted the state's request for an order preventing the Corps from reducing Lake Sakakawea's level during the 2002 spring fish spawn. The Corps appealed the District Court's decision to the Eighth Circuit Court of Appeals. The Eighth Circuit agreed with the state that the Corps' river management decisions are reviewable. It disagreed with the state about the propriety of the District Court's injunction, overturning the injunction primarily on the grounds that the state did not prove the likelihood of success on the merits because it found that the 1944 Flood Control Act gives navigation a preference. The state has filed a petition for rehearing with the Eighth Circuit asking it to reconsider its decision and clarify certain issues. The petition was denied. The state then asked the U.S. Supreme Court to review the Eighth Circuit's decision, but it has declined to do so.

Other lawsuits were filed against the Corps in 2002 as well as an additional suit by North Dakota in 2003. The state's 2003 suit asked the court to rule that the Clean Water Act required the Corps to comply with the state's water quality requirements. The suit resulted in a temporary injunction that prevented the Corps from reducing Lake Sakakawea's level during

the spring 2003 fish spawn. Also, in 2003, all of the Missouri River litigation was consolidated before the District Court for the District of Minnesota. That court ordered the Corps to issue a new Master Manual, which it did in 2004.

The revised Master Manual gives upstream interests greater consideration. Downstream interests challenged the new Master Manual but the Minnesota District Court upheld the Manual. Downstream interests, as well as environmental organizations, have appealed to the Eighth Circuit Court of Appeal.

In 2002, the North Dakota State Water Commission began construction of the NAWS project. During the first phase of construction, the Commission was forced to condemn five parcels of property for the project. All five landowners decided to challenge the compensation awarded by the Commission and appeal the condemnations to the District Court. One of the condemnation appeals was tried in front of a jury after efforts to negotiate a compromise failed. The remaining four cases were settled out of court.

Also in 2002, the State Water Commission began construction of the Devils Lake Outlet. During the first phase of construction, the Commission was forced to condemn five parcels of property. All of the landowners challenged the compensation awarded by the Commission and appealed the condemnations to the District Court. The cases are pending.

On April 1, 2003, the State Water Commission applied to the State Engineer for a drain permit to help alleviate the flooding conditions around Devils Lake. The State Engineer determined that the proposed project was of statewide and interdistrict significance and

the application was referred to the Ramsey County and Towner County Water Resource Districts. The districts subsequently approved the project and forwarded the permit to the State Engineer. The State Engineer approved the permit on July

2, 2003, and two groups of individuals, People to Save the Sheyenne and Peterson Coulee Outlet Association, subsequently requested a hearing before the State Engineer. After a public hearing, the State Engineer affirmed the issuance

of Drain Permit No. 2986 to the Commission. On October 31, 2003, the People to Save the Sheyenne appealed the State Engineer's decision, but the appeal was ultimately dismissed.

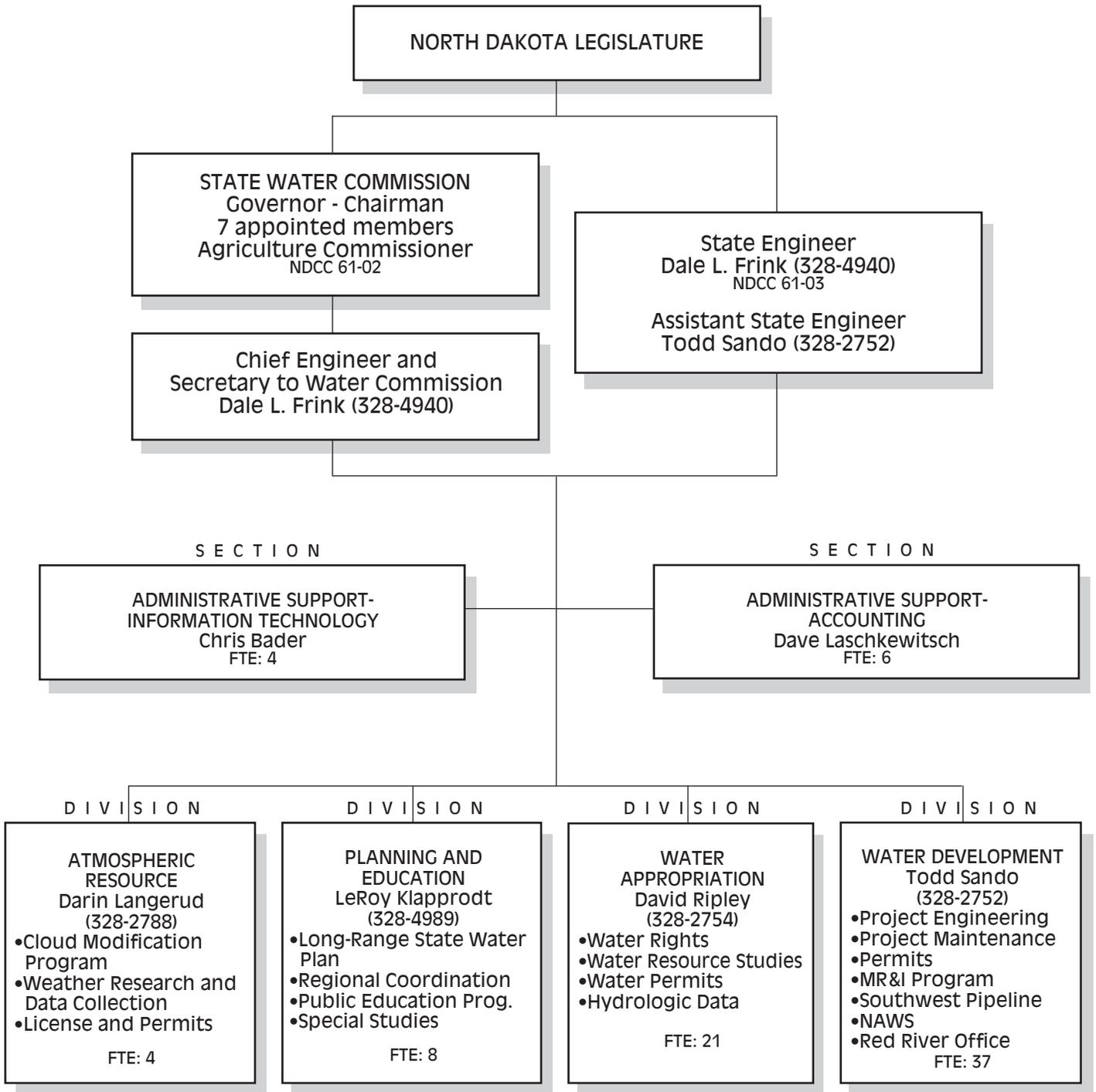
State Water Commission Members as of June 30, 2005

NAME	POSITION	APPOINTED	TERM ENDS
John Hoeven	Governor-Chairman		
Roger Johnson.....	Department of Agriculture		
Charles "Mac" Halcrow	Member from Drayton	May 1, 2001	June 30, 2005
Larry Hanson.....	Member from Williston.....	July 1, 2001	June 30, 2005
Curtis Hofstad	Member from Devils Lake.....	July 1, 2001	June 30, 2005
Elmer Hillesland	Member from Grand Forks	July 1, 2001	June 30, 2007
Robert Thompson.....	Member from Page	July 1, 2001	June 30, 2007
Jack Olin	Member from Dickinson.....	July 1, 2001	June 30, 2009
Harley Swenson	Member from Bismarck	July 1, 2001	June 30, 2009

State Water Commission Meetings July 1, 2003 through June 30, 2005

DATE	LOCATION	DATE	LOCATION
August 6, 2003	Grand Forks	August 16, 2004	Bismarck
November 3, 2003.....	Bismarck	November 17, 2004... (conference call)	Bismarck
December 5, 2003.....	Bismarck	December 10, 2004.....	Bismarck
February 11, 2004..... (conference call)	Bismarck	January 28, 2005..... (conference call)	Bismarck
March 11, 2004	Bismarck	March 10, 2005	Bismarck
April 16, 2004	Bismarck	May 11, 2005..... (conference call)	Bismarck
May 28, 2004	(conference call)	June 22, 2005.....	Bismarck
June 28, 2004..... (conference call)	Bismarck		

North Dakota State Water Commission Organizational Chart



TOTAL FULL TIME EQUIVALENTS OF 82 PERSONNEL

June 30, 2005

State Water Commission Employees as of June 30, 2005

ADMINISTRATIVE SERVICES DIVISION

State Engineer: Dale L. Frink
Administrative Assistant: Sharon Locken
Accounting Manager: David Laschkewitsch
Accounting Budget Specialists: Kay Koch, Lorna Wohnoutka
Legal Assistant: Rosemary Pedersen
Records Center Technician: Karen Heinert
IT Manager: Christopher Bader
IT Coordinators: Paul Moen, Jeffrey Ofstedal
GIS Specialist: Rodney Bassler
Human Resources: LeNor Dollinger

ATMOSPHERIC RESOURCE BOARD

Division Director: Darin Langerud
Business Manager: LeNor Dollinger
Environmental Scientist: Aaron Gilstad
Administrative Assistant: Dawn Moen

WATER APPROPRIATION DIVISION

Division Director: David Ripley
Administrative Secretary: Marlene Backman
Hydrologist Managers: Royce Cline, Jon Patch, William Schuh, Robert Shaver
Hydrologists: Rex Honeyman, Kevin Krogstad, Scott Parkin, Steve Pusc, Alan Wanek
Water Resource Engineer: Daniel Farrell, Robert White
Water Resource Program Manager: Michael Hove, James MacArthur
Engineering Technicians: Jeffrey Berger, Kelvin Kunz, Albert Lachenmeier, Merlyn Skaley
Rotary Drill Operator: Gary Calheim
Equipment Operator: James Leuwer

PLANNING AND EDUCATION DIVISION

Division Director: LeRoy Klapprodt
Information Processing Specialist: Dawn Schock
Water Resource Education Program Manager: Bill Sharff
Water Resource Planners: Michael Noone, Linda Weispfenning
Natural Resources Economist: Patrick Fridgen
Research Analyst: Larry Knudtson
Graphic Artist: Brenda Hove

WATER DEVELOPMENT DIVISION

Division Director/Asst. State Engineer: Todd Sando
Administrative Secretary: Cindy Graff
Water Resource Engineer Managers: Jason Boyle, Bruce Engelhardt, J. Tim Fay, Timothy Freije, Randy Gjestvang, Karen Goff, Jeffrey Mattern, John Paczkowski, Ronald Swanson, Shandi Teltschik
Water Resource Engineers: Dwight Comfort, Timothy Larson, James Lindseth, Julie Prescott, Sindhuja Subramania Pillai
Engineering Technicians: Daniel Bahm, Robert Buchholz, Theodore DeWall, John Edwards, Tom Engberg, Edward Gall, Leland Krein
Water Resource Project Managers: Darron Nichols, Daniel Sauter
Water Resource Program Administrator: Jeffrey Klein
Planner: Bruce Lange
Account Technician: Winston Enyart
Grants/Contract Officer: Carolyn Merbach
Southwest Pipeline & Northwest Area Water Supply
Water Resource Engineer Manager: James Lennington
Realty Officer: Roger Kolling
Engineering Technician: Allen Balliet, Perry Weiner

Administrative Services Division

The Administrative Services Division provides the overall direction of agency powers and duties as described in the state's water laws. The activities include both the State Engineer and Water Commission's operations, as well as accounting, information technology, records, and support services for all agency programs.

Budget and fiscal control work is accomplished within the provi-

sions of statutory law and principles or rules of that law. Agency accounting consists of keeping adequate financial records, preparation of financial statements and reports, project or program cost accounting, preparation of budgets, and proper control of various funds appropriated by the state legislature.

A considerable portion of time is spent in coordination of water resource programs with federal

agencies and other state and local entities. The division works with contracts and agreements necessary to carry out investigations, planning, and cooperation with various other agencies in water resources development. A close liaison is maintained with irrigation districts, water resource districts, and the Garrison Diversion Conservancy District.

The State Engineer serves as North Dakota's representative on various boards and associations. Presently the State Engineer is the United States Co-chairman of the International Souris River Board, board of directors member of the Missouri River Basin Association, executive council member of the Western States Water Council, member of the National Water Resource Association, board of directors ex-officio member of the North Dakota Water Users Association, board of directors member of the North Dakota Water Education Foundation, member of the Association of Western States Engineers, and state representative to the Red River Basin Commission.

Information Technology (IT) Section

The State Water Commission utilizes information technology in almost all aspects of water resource management. The primary responsibility of the IT section is to provide the technology support required to fulfill the array of agency functions.

Over the past decade, the agency has developed considerable technology infrastructure for data storage and analysis required to meet the agency's water resource management responsibilities. However, the increasing demands associated with water management has resulted in changes in both the type of data collection efforts and the types of tools required to perform the necessary analysis. The agency has made significant changes to its IT infrastructure, including enhancements to data storage, desktop computing, production equipment, and training for agency staff, as a result of the changing data and analysis requirements.

The agency's IT infrastructure was redesigned during the 2001-2003 biennium to build a framework to meet the challenges that

are anticipated over the next decade and beyond. With increasing emphasis on spatial relationships, geographic information systems (GIS) and related technologies will continue to play an expanding role in managing North Dakota's water resources.

Components of the agency's GIS infrastructure were completed in January 2003. Initial efforts focused on ground water and atmospheric data management programs. Preliminary tools that provide very basic integration of the data with the GIS infrastructure have been completed. Internal integration, web based mapping services are now completed for these areas and are available via the agency website (<http://www.swc.state.nd.us/mapservices.html>). With the integration of much of the agency data within base GIS systems, development efforts are now focused on the "tool-base" required to per-

form many of the basic hydrologic requirements for managing the state's water resources.

Related to the GIS infrastructure, information, including paper maps and aerial photographs are being assimilated into the system. These include approximately 2,800 Government Land Office (GLO) plat maps representing the original statewide government survey of North Dakota and more than 20,000 color infrared aerial photographs owned by the agency. Scanning of the GLO plat maps has been completed, and these maps are now available through the state GIS hub. In addition, more than half of the color photographs have been scanned and work has now been started on processing these images to mosaic them for general presentation within a GIS framework. The composite mosaic scenes generated from these photographs will also be made available on the state GIS hub as they are completed.

Atmospheric Resource Board

The Atmospheric Resource Board (ARB) is a quasi-judicial, quasi-legislative advisory and rule-making board under the supervision of the State Water Commission. ARB staff are co-located with the SWC, and function as a division of the Commission.

The Atmospheric Resource Board is comprised of ten members. Seven are appointed by the Governor, and ex-officio members include the State Engineer, the Director of the State Aeronautics Commission, and a representative of the Environmental Section of the Department of Health.

The primary functions of the ARB are to:

- Carry out administrative procedures required for the licensing of weather modification contractors

and the permitting of cloud seeding operations and research activities;

- Develop and maintain a system for the collection of data and records of all operational weather modification activities;
- Conduct research into atmospheric precipitation processes to assess and improve the effectiveness of cloud seeding technology;
- Promulgate rules and regulations governing cloud seeding activities to ensure environmental and public safety;
- Monitor and evaluate cloud seeding activities and report such to sponsoring entities;
- Monitor, collect, and disseminate accurate climate and precipitation data; and
- Provide human resources support for the agency.

North Dakota Cloud Modification Program

The North Dakota Cloud Modification Project (NDCMP) served six western counties during the 2003-2005 biennium. These were Bowman, McKenzie, Mountrail, Ward, Williams, and part of Slope. At the conclusion of the biennium, the project target area covered 6.7 million acres of western North Dakota.

The NDCMP has two goals: the suppression of damaging hail, and the enhancement of rainfall. Hail suppression, however, continues to be the primary motivation of the sponsoring counties.

Suitable clouds over two multi-county operational districts were treated during June, July, and August of each summer of the biennium. Eight twin-engine aircraft operated by Weather Modification, Inc., of Fargo, were deployed under contract to the ARB and participating counties. Operations were directed by project meteorologists from radar operations centers based in Bowman and Stanley, North Dakota.

The most recent evaluations of the program indicate a 45 percent reduction in crop-hail losses, a six percent increase in wheat yields, and up to a 10 percent increase in rainfall. The latest economic analysis suggests a total benefit to cost ratio of 40 to 1 in the target counties.

Student Intern Programs Continue

Eighteen intern copilots from the University of North Dakota's John D. Odegaard School of Aerospace Sciences participated in the NDCMP during the last biennium. All were trained at UND for a full academic year prior to their participation. Since the board's inception in 1975, approximately 300 intern pilots have logged more

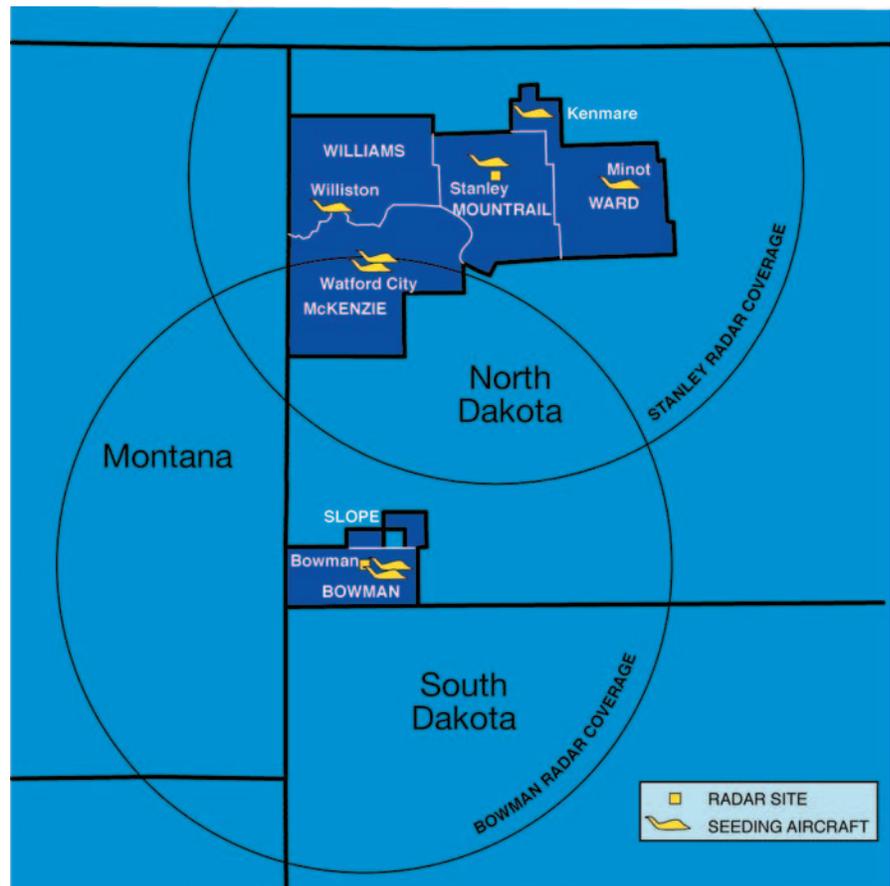
than 20,000 hours of flight time in the conduct of cloud seeding operations in North Dakota's skies. In addition to recording the time, location, duration, and meteorological conditions during all seeding and reconnaissance missions; the pilots are fully qualified to fly the aircraft, providing an additional safety margin. Because of the experience they gain, many intern copilots have returned to the NDCMP as Pilots in Command (PICs) in subsequent years.

The weather modification pilot training program is the only one of its kind in the United States and provides a significant number of qualified cloud seeding pilots for projects elsewhere in the U.S. and around the world.

Because of budgeting considerations, funding for the pilot intern program was cut in the 2003-2005 biennium. Due to the cuts, intern

pilots participated during the biennium as volunteers, creating financial hardship for some students. Funding was requested in budgeting for the 2005-2007 biennium leading to support from the Governor's Office and approval by the Legislature. Interns will now be paid an hourly wage and considered temporary employees of ARB during the summers.

ARB also retained undergraduate students majoring in atmospheric science as intern meteorologists during the 2003-2005 biennium. The four student interns assisted NDCMP field meteorologists at radar-equipped operations centers. Like the intern pilots, intern meteorologists continue to demonstrate their enthusiasm and dedication to the NDCMP and provide a pool of better qualified persons to serve future projects as radar meteorologists.



North Dakota Cloud Modification Project (NDCMP) target areas.

Digital Aircraft Recordkeeping System Fully Deployed

As required by law, detailed records are kept for every flight conducted by NDCMP seeding aircraft. One of the recommendations in the March 2003 final report of a panel of experts that reviewed NDCMP operations was to transition from paper records to a system utilizing a digital format. While a system for meteorological operations in the two NDCMP radar facilities was developed and deployed at the end of the 2001-2003 biennium, the complications of aircraft operations required significantly more effort to develop an airborne system. The aircraft system was field tested by two NDCMP seeding aircraft during the 2003 project and was fully deployed for the 2004 program. The system collects location information from the GPS at a prescribed time interval during flight, in addition to storing data input by the pilot crew. Flight data are then uploaded to the ARB database in Bismarck via standard telephone line.

Both systems provide better data organization and accessibility for real-time operational use by NDCMP pilots and meteorologists. Additionally, project information will be more readily accessible for post-analysis, project evaluations, and requests from the public.

Progress in Weather Modification Research

Cloud seeding research continued during the biennium under the umbrella of the Bureau of Reclamation's (BoR) Weather Damage Modification Program. ARB staff set research priorities, administered grants, participated in research objectives, and reported results quarterly to the BoR. The federally funded program requires a 50 percent in-kind match for research activities. ARB used expenditures

from cloud seeding operations toward the matching requirement.

Dr. Paul Kucera, Associate Professor at the University of North Dakota, directed an evaluation of the nearly 800-member ARB Cooperative Observer Network precipitation data from 1977-2002. Study results indicated precipitation increases of 4 to 9 percent in and slightly downwind of the seeded areas in North Dakota when compared to upwind control areas. A second study of National Weather Service long-term climate stations found no significant impact on rainfall in the target area. Dr. Paul Smith, Professor Emeritus at the South Dakota School of Mines and Technology, concluded however, that since there were so few reporting stations, a relatively small (less than 10 percent) increase would be difficult to find in the data as the 90 percent confidence intervals in the results were on the order of plus or minus 0.1.

Progress was also made on the two remaining federally funded initiatives: numerical cloud modeling of the effects of cloud seeding, and data collection and analysis of cloud condensation nuclei over western North Dakota. Final reports on these activities will be submitted by our research partners early in the 2005-2007 biennium.

One final research project to mention began in June 2005, and involves collection and analysis of radar data with the UND polarimetric C-band Doppler radar in Grand Forks. The polarimetric upgrade allows the radar to discriminate between liquid and ice-phase hydrometeors in clouds and should prove to be a tremendous research tool for weather modification. This initial baseline study may open the door to additional, more elaborate research where questions regarding raindrop coalescence and ice-phase change processes may be more fully explored and understood

than ever before, providing for the improvement of cloud seeding operations and evaluations.

Weather Radars Continue Operations, Savings

ARB continued to operate two WSR-74C weather radars during the last biennium. Radars were located in facilities at the Bowman and Stanley airports and continued to operate at approximately one-quarter the cost of previously leased systems.

Preventative maintenance and system calibrations were conducted every seven to twelve days, keeping unscheduled maintenance to a minimum. Including down time for scheduled and unscheduled maintenance, radars operated better than 98 percent of the time.

The Stanley radar is sited roughly midway between the National Weather Service (NWS) radar at Williston and the Minot Air Force Base radar near Deering, which makes it a good backup if either of the NWS sets should fail. The Bowman radar is sited at the coverage limits of the NWS radars located at Bismarck, Billings, Glasgow, Rapid City, and Williston, and thus provides low atmosphere coverage of southwestern North Dakota, southeastern Montana, and northwestern South Dakota, not available from NWS radars. Images from both radars are available and updated every five minutes on the ARB website during the operational season.

Statewide Growing Season Precipitation Observations

Again during the last biennium, the ARB operated a statewide growing season (April through September) cooperative observer network (ARBCON) numbering about 775 volunteer observers, building on a database back to

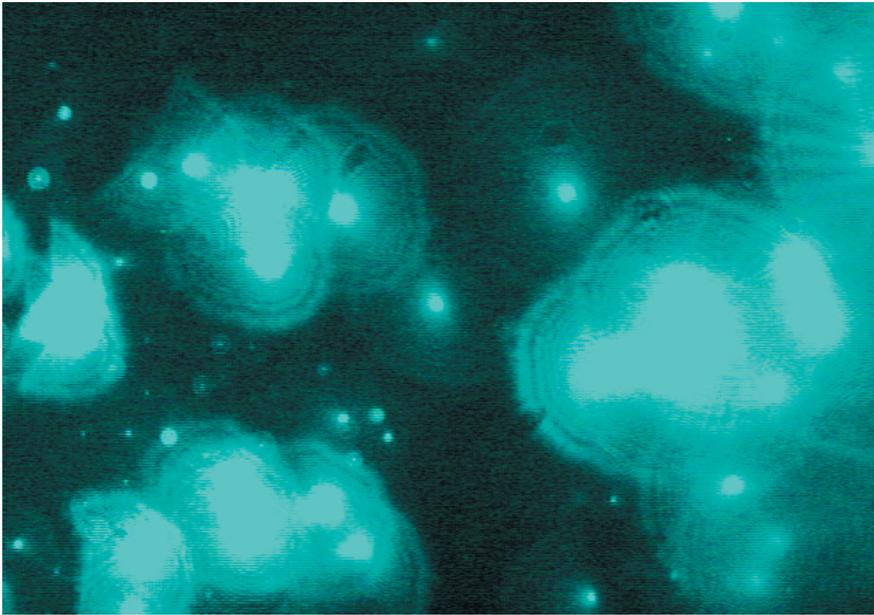


Image of activated cloud condensation nuclei collected at the NDCMP Bowman field site during the Weather Damage Modification Program.

1977. Rain and hail reports were recorded daily and sent in by our volunteer observers at the end of each month. In the event more than one inch of rain was received in any 24-hour period, observers also called in their rainfall report directly to the National Weather Service offices, where the data were used by hydrologists for short-term forecasting, and if necessary, in the issuance of flood watches and warnings. Since the gage type employed by the network is not suitable for measuring snow, snowfall measurements are not attempted.

Rain and hail data, as well as monthly and growing season precipitation maps can be publicly accessed and downloaded directly, through the ARB website. Additional improvements in data accessibility and utility were made during the biennium. The data have proven to be very helpful in the assessment of excess rainfall and attendant flooding as well as in the monitoring and delineation of drought.

Interaction with State and National Organizations

The ARB is an active member of many state, national, and

international organizations with mutual interests. During the last biennium, ARB staff worked with these groups to forward the goals and objectives of the board.

In North Dakota, ARB has worked toward water supply and weather damage mitigation goals with the North Dakota Water Coalition, North Dakota Weather Modification Association, and the North Dakota Water Education Foundation. Nationally, the ARB has been active in the Weather Modification Association and the North American Interstate Weather Modification Council, with ARB staff holding elected officer positions in both organizations during the biennium. Both national organizations are supporting Congressional legislation that would create a federal weather modification advisory board and provide up to \$10 million per year for weather modification research.



Student interns participated in all facets of NDCMP operations during the biennium.

Planning and Education Division

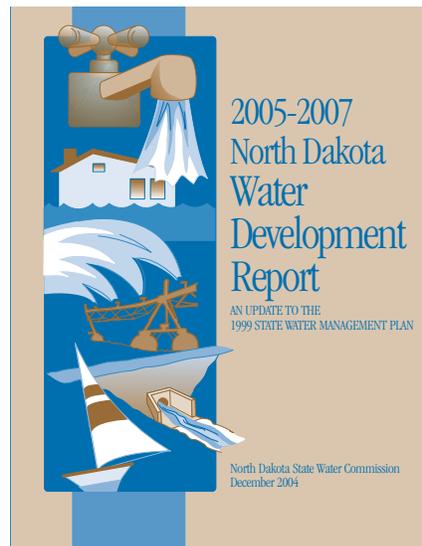
The primary responsibility of the Planning and Education Division is to maintain and update the State Water Management Plan for the State of North Dakota. Division staff also participate in numerous regional, state, local, and inter-office planning activities; manage the agency's water education programs; manage the Drought Disaster Livestock Water Supply Project Assistance Program; and coordinate the Environmental Protection Agency's Wetlands Protection Project Grant for the State of North Dakota. Specific staff responsibilities include:

- Maintaining a water project inventory and water management plan to promote efficiency in meeting North Dakota's future water development and funding needs;
- Leading or participating in special studies that result in water resource and related land management plans;
- Monitoring water resource issues and determining possible impacts to North Dakota's water management objectives;
- Representing the State Engineer and State Water Commission on regional, national, and international natural resource planning bodies such as the Red River Water Resources Council, the Pembina River Basin Advisory Board, the Red River Basin Institute, Red River Basin Commission, and the Lewis and Clark Advisory Committee, to name a few;
- Providing opportunities for adults and students to increase their understanding about North Dakota's water resources and how these resources are managed;
- Reviewing applications and meeting with applicants to determine eligibility for cost-share under the Drought Disaster Livestock Water Supply Project Assistance Program;

- Coordinating statewide efforts by various agencies, organizations, or special interests to conserve and enhance North Dakota's wetland resources through the Environmental Protection Agency's wetlands protection grant program; and
- Coordinating and managing internal planning and policy development efforts.

2005-2007 Water Development Report

In December 2004, the Planning and Education Division completed the 2005-2007 Water Development Report (WDR). The purpose of the 2005-2007 WDR is: to serve as a supplement to the 1999 State Water Management Plan (SWMP); to provide up-to-date information regarding North Dakota's current and future water development project needs; to provide current information regarding North Dakota's ability to fund those water development needs; and to serve as a formal request for funding from the Resources Trust Fund during the 2005 Legislative Session.



2005-2007 Water Development Report.

By virtue of North Dakota Century Code, Section 61-02-14, Powers and Duties of the Commission; and Section 61-02-26, Duties of State Agencies Concerned with Intrastate Use of Disposition of Waters, the Commission is required to develop and maintain a comprehensive water plan for the sound management of North Dakota's water resources.

Agency Strategic Planning

The Planning and Education Division coordinated the development of a new agency Strategic Plan, completed in late 2004. The purpose of the 2004-2007 Strategic Plan was to clearly document agency direction and expectations through the planning timeframe (2004-2007). As part of the planning process, Water Commission and State Engineer staff reevaluated the agency's goals to ensure that both were achieving the standards expected by their constituents. In addition, staff members were asked to develop objectives for several key projects and programs, to more effectively meet goals. More specifically, staff defined tasks and actions that divisions and management need to take to achieve desired outcomes.

Strategic Land Management Planning

In the spring of 2005, the Planning and Education Division began coordinating the development of a statewide sovereign land management plan. The idea of developing a new sovereign land management plan evolved from a January 2005, Attorney General Opinion (2005-L-01) that focused on the ability of land developers to construct wildlife habitat on sovereign lands for mitigation requirements.

In response to that opinion,

and following several discussions with the Attorney General's Office; the Office of State Engineer determined it to be in the best interest of the state to pursue the development of a comprehensive statewide sovereign lands management plan – since no such plan existed.

The overall purpose of the plan is to: 1) satisfy the requirements outlined in the opinion; 2) provide greater consistency in the management of sovereign lands and administration of regulations; 3) serve as a supplement to the state's Administrative Rules concerning sovereign land management; and 4) generally improve management of the state's sovereign lands for present and future generations.

Devils Lake Basin Planning Efforts

Planning and Education Division staff played an integral role in assisting the Devils Lake Basin Joint Water Resource Board in their efforts to review and update the Devils Lake Basin Water Management Plan (DLBWMP) – initially completed in 1995. This plan is a critical component of the state's multi-pronged approach to solving flooding problems in the Devils Lake basin.

The 2005 update of the DLBWMP has two main objectives:

1) To involve local citizenry for their experience and expertise. Through that process, four subject committees (agriculture, economic development, recreation, and wildlife and fisheries) were created to represent the four broad areas of interest in the basin.

2) To develop a list of specific goals that reflect the more general objectives developed in the DLBWMP, to be accomplished prior to the next update of the plan in 2008. These goals indicate those areas that are of the highest priority identified by each of the subject committees.

As part of this process, the Planning and Education Division provided technical planning assistance, as well as staff resources for re-writing and publishing the document and associated website.

Upper Sheyenne River Basin Planning Efforts

Planning and Education Division staff have guided the development of a joint water board in the watershed above Lake Ashtabula – similar to the Devils Lake board. Accomplishments have included the inclusion of ten counties in the joint board (Barnes, Benson, Eddy, Foster, Griggs, Nelson, Pierce, Steele, Stutsman, and Wells), and the development of a conceptual water management plan that identifies water resource development needs, and focuses resources towards achieving specific objectives.

Pembina River Basin Planning Efforts

Division staff participated on the Pembina River Basin Advisory Board as technical advisors, during the 2003-2005 biennium. With the "Framework for a Pembina River Basin Management Plan" completed, division staff members have continued to provide support to assist in the execution of the Board's planning goals and objectives.

Extended Storage Acreage Program (ESAP)

During the 2003-2005 biennium, the ESAP continued to be administered. Under ESAP, contacts for floodwater retention are arranged for ten-year periods. There are currently nine landowners participating in the ESAP program in the Devils Lake basin. Just over 400 acres are under contract, with available storage of 835 acre-feet annually.

Wetlands Protection Program Grant Administration

The U.S. Environmental Protection Agency (EPA) funded Wetlands Protection Program Grant continues to be administered by Planning and Education Division staff for all state and local governmental recipients in North Dakota. The wetlands grant program funds a broad spectrum of projects related to developing, protecting, managing, and enhancing North Dakota's wetland resources.

Under the Fiscal Year (FY) 2002 Wetlands Protection Program Grant cycle, the Planning and Education Division monitored the progress of two projects:

1. The North Dakota Department of Health's project entitled "Development of a Region 8 Assessment of Wetlands Workgroup in Support of State Wetland Monitoring and Assessment Programs;" involves their sponsorship of two workshops that bring personnel from state and tribal water quality monitoring and natural resource agencies together with federal agencies, academia, and private wetland conservation groups to improve wetland monitoring and assessments in EPA's Region 8. The first workshop, held in February 2004, was designed to develop the framework for a workgroup and to develop specific shared goals relating to wetland assessment methodologies and program development. The subsequent workshop (held in October 2005) built upon relationships and experience gained in the first workshop. A framework will then be developed during the 2005-2007 biennium to continue the workgroup into the future. This project is scheduled for completion in December 2005.

2. The University of North Dakota, Earth System Science Institute project, entitled "Assessment of Wetland Health Using Remote

Sensing in the Upper-Missouri Coteau Region of North Dakota;" relates to the assessment of wetland quality using satellite and remote sensing. That project was completed in June 2004.

Under the FY 2003 Wetlands Protection Program Grant cycle, the Planning and Education Division monitored the progress of three projects:

1. Of the three projects sponsored by the Health Department, the first is entitled "Evaluating and Validating the Index of Plant Community Integrity for the Assessment of Temporary, Seasonal, and Semi-Permanent Wetlands in the Prairie Pothole Region." The goal of this project is to evaluate and validate the Index of Plant Community Integrity for temporary, seasonal, and semi-permanent wetlands located in the Prairie Pothole Region of the United States. Vascular plant sampling techniques and metrics developed under previous grants for temporary and seasonal wetlands in the Northwestern Glaciated Plains Ecoregion for semi-permanent wetlands will be used to accomplish this goal.

2. The second project sponsored by the Health Department is entitled "Assessment of Methyl-Mercury Contamination in Depressional Wetlands of the Lostwood National Wildlife Refuge (LNWR) and Wilderness Area." The overall goal of this assessment project is to determine the level of mercury contamination and the potential for methyl-mercury production and biological exposure in the pothole wetlands located of the LNWR.

3. The third and final project sponsored by the Health Department under the FY 2003 wetland grant is entitled "Development of a Regional Scale Method to Predict Wetland Condition for the Prairie Pothole Region." The goal of this

project is to develop an assessment method applicable at a regional scale that is capable of characterizing wetland condition using GIS and remote sensing models and tools.

Red River Basin Planning Efforts

In 2002, the Red River Basin Board, the International Coalition, and the Red River Water Resources Council combined into one organization, now known as the Red River Basin Commission (RRBC). Throughout that process, Planning and Education Division staff provided insight and technical support toward the merger process.

Throughout the 2003-2005 biennium, Planning and Education Division staff members continued to actively contribute to the RRBC's planning and education advancements through involvement on several committees. In recent years, planning staff members have served on the RRBC's Plan Management and Communications Committees, as well as other RRBC sub-committees.

The RRBC is regarded as the primary facilitator in advocating and resolving water and land management issues from a basin-wide perspective. The Commission supports efforts that promote basin-wide goals and objectives that result in cooperation and coordination among varied water management organizations and interests.

Red River Valley Water Supply Studies

As directed by the Dakota Water Resources Act, the State Water Commission is assisting in a technical capacity with the completion of a Red River Valley water supply study, which includes the development of a Needs and Options Report and an Environmental Impact Statement. The Red River Valley

Needs and Options Study and Environmental Impact Statement will include a comprehensive analysis of all reasonable alternatives to meet the municipal, rural, and industrial water supply needs of the Red River Valley. All proposed alternatives will be examined equally. As part of this effort, Planning and Education Division and other agency staff provide technical assistance as members of the study technical team. The technical team is responsible for day-to-day operations of the studies or tasks and for the evaluation, analysis, and detailed review of technical material and data developed during the course of the various tasks.

Missouri River Management

The Planning Division also provided support toward the U.S. Army Corps' development of spring rise scenarios that are being designed to recover the endangered Pallid Sturgeon, and toward the Corps' revision of the Lake Sakakawea Resource Management Plan. In another important Missouri River management effort, Planning staff provided technical assistance toward the organization of a new Missouri River Joint Water Board.

Interagency Project Reviews

Planning and Education Division staff continue to conduct and coordinate interagency environmental reviews involving projects associated with Community Development Block Grants and Loans, highway improvements, airport improvements, dike/levee projects, water storage impoundments, municipal water supply projects, and various federal and state water, land, and wildlife management plans. On average, 19 inter-agency environmental reviews were conducted monthly during the 2003-2005 biennium.



Participants at the 2004 Missouri River Institute learn about how water users share water resources in a watershed.

Environmental review comments address compliance requirements involving State Engineer and State Water Commission regulatory responsibilities in issuing permits pertaining to water appropriation, floodplain management, sovereign lands, and the construction of dikes, levees, dams, drains, and water holding ponds. Staff members also provide information concerning the location of wells and benchmarks.

Project WET

The North Dakota Project WET (Water Education for Teachers) program began in 1984 and became the pattern for an international WET program that now involves 49 states and many foreign countries. Growth of the national program has provided new education tools that have enhanced students' learning experiences. Division staff have been active in building the international program, and in addition, have expanded North Dakota's program with the innovative *Explore Your Watershed* extension of WET.

International WET program materials and new materials developed by division staff for North Dakota are aimed toward preschool, daycare, grades K-12 students, and formal educators, pre-service teachers, youth group leaders (i.e. Boy Scouts and 4H), natural resources education specialists, and other non-formal K-12 educators.

The *Explore Your Watershed* program promotes an interdisciplinary approach, requiring significant staff coordination with specialists from several facets of public school education and natural resource management. *Explore Your Watershed* has expanded the traditional teacher workshop offerings with water festivals, intensive teacher institutes, and special youth and community programs.

Graduate credit and non-credit offerings were made available throughout the biennium. Training during the biennium reached 328 K-12 teachers, 13,620 K-12 students, 34 pre-service teachers, 3,740 community members, and 62 non-formal teachers and natural resource managers.

North Dakota Water Magazine

Since 1993, various water interests in North Dakota have pooled resources through the North Dakota Water Education Foundation to publish a magazine titled *North Dakota Water*. This magazine provides a broad spectrum of high quality information about the state's water resources to the widest possible audience. Over the course of the 2003-2005 biennium, average monthly distribution of the magazine was approximately 11,000. Readers include the general public, local, state, and federal agencies, and elected officials.

The Planning and Education Division develops the State Water Commission's contribution—a two-page section called *The Oxbow* and a feature page titled *The Water Primer*. The former is designed to inform readers about the State Water Commission's projects and programs as well as local, state, and national water management issues. The latter highlights interesting or little known facts about water and related land resources.

Drought Disaster Livestock Water Supply Project Assistance Program

In an effort to support North Dakota's agricultural producers during recent years of drought, the State Water Commission reinstated the Drought Disaster Livestock Water Supply Assistance Program in August 2002. The livestock watering program provides cost-share assistance to producers living in, and adjacent to, those counties identified by the Governor as "drought emergency areas."

During the 2003-2005 biennium, the Planning and Education Division, which manages the program, recommended 125 applicants

for cost-share assistance to construct emergency livestock water supplies. Of the 245 approvals that occurred in both the 2003-2005 and previous biennium, 151 producers completed projects and were reimbursed \$220,987, for an average assistance amount of \$1,463 per producer. Under this program, 50 percent of eligible costs can be reimbursed, with a maximum amount of \$3,500 per producer.

Other Governmental and Non-governmental Organization Involvement

The Planning and Education Division also participated, to varying degrees, on several other governmental and non-governmental organizations, providing input from the State Engineer and State Water Commission's perspectives. During the previous biennium, staff were involved with the Army Corps-sponsored Fargo-Moorhead and Upstream Feasibility Study and Missouri River Spring Rise committees, the Grand Forks/East Grand Forks Greenway Alliance, Little Missouri State Recreation River Committee, Devils Lake Outlet Advisory Committee, the Governor's Lewis and Clark Advisory Committee, Friends of Lake Sakakawea, and the State Stewardship Coordinating Committee.

Water Appropriation Division

The Water Appropriation Division is responsible for the appropriation and management of the state's water resources in accordance with Article XI of the North Dakota Constitution and Chapter 61 of the North Dakota Century Code. The laws are based on the Doctrine of Prior Appropriation. The following principal activities fulfill these responsibilities:

- Identify the availability and chemical quality of the state's water resources;
- Assist municipalities and other public entities in developing solutions to particular water supply problems;
- Assess the impacts of existing water use on ground water levels, streamflow, and chemical quality of water for purposes of future allocation and management;
- Collect, store, and disseminate data on stream flow, spring flow, ground water and lake levels, water quality, and water use;
- Carry out the administrative procedures required for water permit applications, water permits, and water rights;
- Conduct analyses and provide recommended decisions to the State Engineer on water permit applications;

- Develop and maintain a system for the storage and retrieval of water permit records;
- Monitor the utilization of each conditional and perfected water permit through annual water use reports, and maintain a permanent record; and
- Participate in committees and task forces pertaining to water quantity and/or quality issues as required.

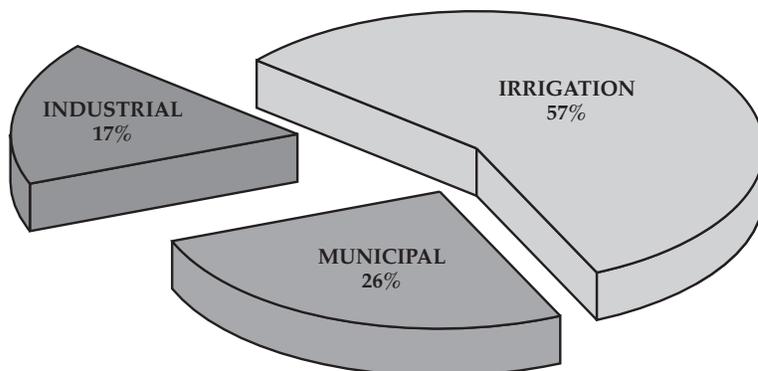
Major Activities (2003-2005)

Ongoing exploration for ground water resources as well as monitoring and regulation of known aquifer systems require test-drilling and monitoring well installation. During the biennium, 45,869 feet of test drilling was completed, 213 new observation wells were installed, and an additional 67 test holes were drilled where no well was installed. As part of our ongoing well maintenance program, 88 existing monitoring wells were rehabilitated, and 168 older wells were properly plugged and abandoned.

The program for collecting water resource data involves several aspects. The major components of the program are the collection of samples for water quality analyses from surface and ground waters, the collection of water level data from surface and ground waters, the acquisition of water use data from surface and ground waters, and the monitoring of surface water flows.

During the biennium, 4,578 water samples were analyzed for chemical constituents. These samples were collected from streams at gage stations, selected observation wells and production wells, and selected surface water bodies. These data are used to determine the suitability of the

NORTH DAKOTA WATER USE BY TYPE
YEAR 2004



chemical quality for beneficial use, to interpret areal hydrology, and to assess changes in the quality resulting from the stresses of both man-induced processes like pumping, and natural processes caused by climatic variations.

Over 3,500 wells and surface water bodies are measured for water levels. These are predominantly observation wells, but some lakes, sloughs and production wells are measured. These data reflect the changes in the surface and ground waters resulting from natural climatic variations and from pumping for beneficial use. These data are essential for making decisions on water permit applications and overall water management, present and future.

The agency supports the operation of 40 streamflow gages as a part of the cooperative program with the U.S. Geological Survey (USGS). The cost of these gages is, for the most part, shared equally by the State Water Commission and the USGS. Additionally, at about ten sites distributed around the state, stream or spring flows are measured for specific studies.

Water use information is submitted annually from more than 2,900 water permit holders. Approximately 600 additional permits have the associated water use estimated, based upon evaporative losses from reservoirs. This information is essential for evaluating the impacts of withdrawals authorized by water permits on ground water levels and stream flow, and making decisions on water permit applications. The pie chart on page 16 shows the relative volume of use by the major categories in 2004.

The bar graphs on page 17 show the trend for the last 11 years for each of the three major categories of use (irrigation, municipal, and industrial).

Water permit applications for the 2003-2005 biennium and a sum-

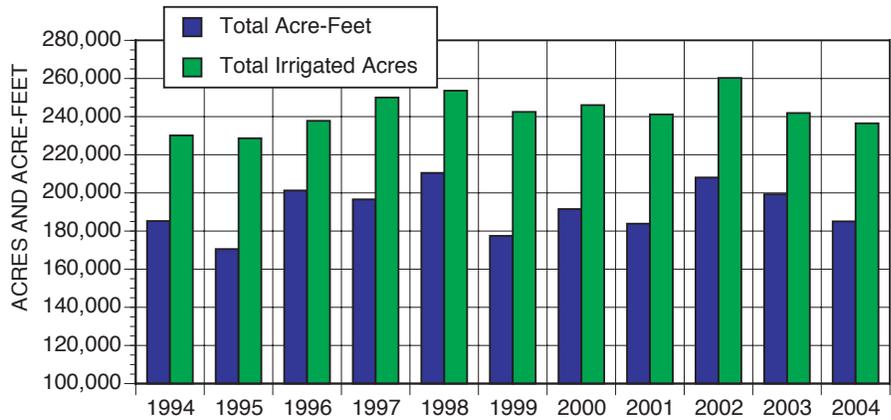
mary of the actions taken on them are listed in the table on page 18.

There were 415 temporary water permits issued by the State Engineer during the 2003-2005 biennium. The total volume of water allocated was 15,837 acre-feet. Thirty-seven temporary permits were

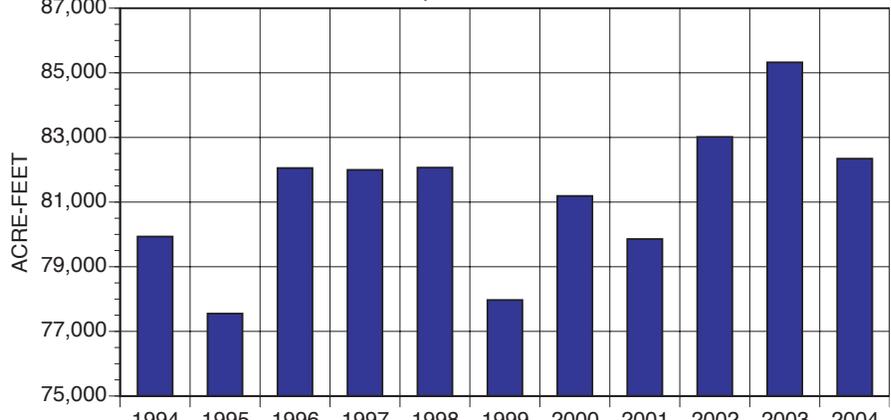
from ground water sources, with a total volume of 2,294 acre-feet, and 378 temporary permits were from surface water sources, with a total volume of 13,544 acre-feet.

There were 97 conditional water permits perfected during the biennium. These water permits

IRRIGATED ACREAGE and ASSOCIATED WATER USE (1994-2004)

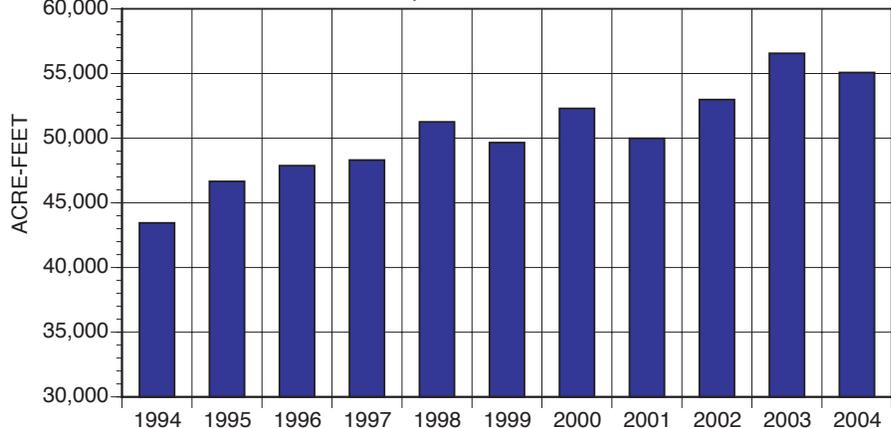


REPORTED WATER USE* for MUNICIPAL PERMITS (1994-2004)



*Includes water use from Minnesota points of diversion, which supply water to Grand Forks.

REPORTED WATER USE for INDUSTRIAL PERMITS (1994-2004)



Water Permit Summary July 1, 2003 - June 30, 2005

WATER USE	ACRE-FEET
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Irrigation

Applications filed:	63
Acres requested:	11,869
Acres granted*:	8,696
Water granted*	12,419
Ground water	8,814
(6,179 acres)	
Surface water	3,605
(2,517 acres)	

Flood Control

Applications filed: 0

Industrial

Applications filed: 45
Water granted* 1,041

Livestock

Applications filed: 6
Water granted* 49
Storage granted* 181

Municipal

Applications filed: 6
Water granted** 1,051

Recreation, Fish, and Wildlife

Applications filed: 16
Storage granted* 501
Annual use granted* 187

TOTAL Applications Filed: 136

TOTAL Water Granted 14,747

**Includes backlog—permits applied for in previous bienniums.*

***Includes Re-Perfection of West Fargo Water Permit No. 1117.*

had been approved earlier, and had been fully developed. After being inspected, reports on these inspections were written and the permits were perfected.

All County Ground Water Studies, North Dakota Ground Water Studies, and Water resource Investigations were imaged and portable document format (PDF) type files were created. These PDF format reports will be available through the Internet on the Water Commission's website.

The management of surficial unconfined aquifers often requires the development of ground water flow models. Recharge, evapotranspiration, and irrigation water use are required inputs for both model calibration and simulating aquifer responses and are a function of climate. Software has been developed to read and combine various climate data sets (NOAA, NDAWN, and ARBCON data) for input to a Versatile Soil Moisture Budget model (VB2000). The aquifer model is calibrated against one or more climatic data sets that are considered representative of the climate overlying the aquifer by adjusting soil parameters. Initial testing of the model has been very encouraging with its ability to reproduce water level trends.

The Water Appropriation Division was also asked to assist and advise the public on the availability of water for all purposes of use.

During the 2003-2005 biennium, the division was involved in several studies that are in progress. Descriptions of those efforts follow.

- A site-specific ground water investigation of the proposed new well-field location for the City of Devils Lake was initiated. The investigation involved a cooperative agreement with the city to install wells in strategic locations to gain a better understanding of water

quality constraints and to provide monitoring wells for an aquifer test. Low hardness, low TDS (total dissolved solids) water occurs in the portion of the aquifer the city intends to use as their permanent supply. It is hypothesized that low TDS, higher-hardness water moves downward from the overlying Warwick aquifer and is "softened" by cation-exchange as it passes through a clayey aquitard. A better understanding of the origin of the water chemistry is necessary to evaluate the potential for water quality change in the future after the city begins pumping.

- The Water Commission entered into an agreement with the Traill Rural Water District to further define the hydrogeology of the Page/Galesburg aquifer and assess its capability to support future water supply needs for the District. Phase I of the study has been completed (see reports prepared during the 2003-2005 biennium). The remainder of the ground water study is divided into two phases. Phase II involves the installation and monitoring of test holes and observation wells to further define the movement of ground water, the geometry, the hydraulic properties and the water quality of the aquifer. Phase III involves the construction and analysis of a test well to determine aquifer hydraulic properties and sustained well yields, and to provide a basis for well design.

- A surface and ground water sampling plan was designed for Camp Grafton South, and was submitted to the North Dakota National Guard in May 2005. This plan calls for a major sampling of surface water bodies and the Cherry Lake aquifer in 2006.

- A ground water study of nitrate contamination in the Karlsruhe aquifer in McHenry County, initiated in December 2000, was completed in February 2005. The study was a cooperative effort with the Department of Health. This was

a 5-year investigation with extensive instrumentation involving more than 70 well nests and multi-port samplers. It also incorporated a UND student majoring in geology. Results of the study included recommendations for an "extraction well" to remove nitrate-laden water from the aquifer for use on crops. The wells were constructed and began operation in June 2005. A modified and less extensive "monitoring" phase is currently in planning and will be submitted for adoption by both agencies.

- Two Masters Degree projects were contracted jointly by the Water Commission and the Department of Health to study and quantify denitrification in the Karlsruhe aquifer. They were completed and submitted to the Department prior to June 30, 2005.

- A multi-year cooperative study measuring aquifer recharge in the Carrington aquifer was completed and wells were decommissioned in the fall of 2004. Two papers on the results were published in the refereed journal, "Natural Resources Research" in 2004. Before decommissioning, water samples were taken for nitrogen and oxygen isotope analyses to enable evaluation of denitrification activity and dating of recharge water. Results will be analyzed in 2006.

- The State Water Commission, the University of Leeds (United Kingdom), and the Energy and Environmental Research Center of the University of North Dakota have completed the field phase of a study identifying sources and processes controlling sulfate and chloride in the Elk Valley Aquifer. A first draft of the report was completed in 2004. Modifications are required and a second draft is in progress.

- A cooperative project to assess denitrification capability of aquifers in Minnesota and North Dakota was undertaken by the Wa-

ter Commission, the Department of Health, and the Minnesota Department of Agriculture. The project was conducted by Dr. Scott Korom of the University of North Dakota. It was funded using EPA Section 319 money, with matching funds provided by the three departments. The project was substantively completed in 2004-2005, and a final report is scheduled to be submitted to the agencies by August 31, 2006. The Water Commission is providing sampling assistance for some additional measurements on North Dakota aquifers.

- The SWC allocated a one-year matching fund of up to \$20,000 in 2004-5 for North Dakota university research that is federally funded through the North Dakota Water Resource Research Institute. Matching funds were for research focused on water resource issues. They were to be used for funding graduate student stipends and for research supplies and equipment.

- A ground water study of the southern half of Richland County is in progress. The study is in a preliminary phase involving the acquisition of basic hydrogeologic data for the area.

- The International Souris River Board (ISRB) assigned the Natural Flow Methods Committee (NFMC) to examine methods to determine the diversion of natural flow at the Sherwood Crossing by Rafferty and Alameda Reservoirs, and to recommend a preferred method to the ISRB. The Water Appropriation Division is representing the State Engineer on the NFMC. This project is ongoing.

- On February 4, 1999, the International Joint Commission (IJC) requested that the ISRB review options for broadening its mandate to include water quality, flood forecasting, and flood operations. A paper was prepared discussing the enhanced mandate. The discussion paper also explores the amalgamation of the ISRB and the

Souris River Bilateral Water Quality Monitoring Group. The Water Appropriation Division's personnel have been directly involved in the preparation of the paper.

- A digital ground water modeling study of the Streeter aquifer has been completed. The Streeter aquifer is located in Logan and Kidder Counties. The ground water model analysis of the Streeter aquifer is providing a basis for actions taken on pending water permit applications in the study area. The results of the study will be published as a North Dakota Water Resource Investigation later in 2005 or early 2006.

- A focused sampling regime of the major public water supplies from ground water in Grand Forks County was continued during the 2003-2005 biennium. The four major public water supplies (Grand Forks-Traill Rural Water, Tri-county Rural Water, Agassiz Rural Water, and the City of Larimore) obtain their water from the Inkster and Elk Valley aquifers. Twenty-five wells were sampled three times per year for an in-depth monitoring program, which began several years ago. This was done to detect any seasonal or long-term trends with respect to water quality changes - specifically nitrate.

- Monitoring the Forest River Colony Artificial Recharge Project was continued during the 2003-2005 biennium. The project involves pumping water from the Forest River during high flow times in the spring into a basin overlying the Inkster aquifer. Water is withdrawn later in the season for irrigation purposes. Without artificial recharge the aquifer would not be able to support the number of acres being irrigated. Mandatory sampling and water level monitoring protocols are given to the permit holder each year before artificial recharge begins.

The following reports were published during the 2003-2005 biennium:

- Two North Dakota ground water studies were completed for the City of Bottineau in 2003 and 2004 to identify and develop additional sources of ground water. North Dakota Ground Water Study No. 112 is entitled, "An Evaluation of the Potential to Increase the Pumping Capacity of the Ground Water Supply for the City of Bottineau Using Additional Wells, Phase I, Results of Test Drilling and Water Chemistry Sampling." North Dakota Ground water Study No. 114 is entitled, "An Evaluation of the Potential to Increase the Pumping Capacity of the Ground Water Supply for the City of Bottineau, Phase II – Results of Pumping Tests, Water Chemistry Sampling and Recommendations." As a result of these two studies, the City of Bottineau installed an additional well to augment their existing ground water supply.

- A report entitled "Water Supply Investigation for the City of Devils Lake, Spiritwood Aquifer Near Warwick and the Sheyenne River, Ramsey, Benson, Eddy, and Nelson Counties, North Dakota," (North Dakota Ground Water Study No. 113) was published in 2005. The purpose of the study was to determine if the Spiritwood aquifer near Warwick could provide the municipal water supply for the City of Devils Lake. The comprehensive water supply investigation involved the construction of a geographical information system (GIS) base, test drilling and monitoring well construction, construction of a digital ground water flow model, aquifer testing, and water quality analysis including general chemical, trace and isotopic analysis. The study was a cooperative investigation with the City of Devils Lake and Ramsey County Water Resource District.

- An investigation to evaluate the expansion of Traill Rural Water District's ground water supply was

completed in 2005, and compiled in North Dakota Ground Water Study No. 115, "Evaluation of the Potential for Expansion of the Traill Rural Water District's Ground Water Supply in the Northern Part of the Page/Galesburg Aquifer, Phase I - Compilation and Evaluation of Existing Data." Utilizing existing data, the objectives of the Phase I investigation were to 1) determine the occurrence and movement of ground water, 2) determine the geometry of the aquifer system, 3) estimate aquifer hydraulic properties and potential well yields, and 4) evaluate the water quality of the aquifer system. The Phase I investigation determined there is potential for the expansion of the ground water supply in the northern part of the Page/Galesburg aquifer.

- From 1984 through 1988, infiltration data were measured, in cooperation with North Dakota State University, on several soils and at several sites in the Oakes area. A basic-data report with infiltration transfer functions for modeling applications was completed as Water Commission Water Resources Investigation No. 18-A in February 2005.

- A Water Commission open file report published in 2004 details the operation and interpretation of a large-scale aquifer test in Kidder County, North Dakota. An irrigation well completed in the Kidder County Aquifer Complex was pumped at a controlled rate for 100 hours, and approximately 50 observation wells in the area were monitored during pumping and recovery. The data collected provide excellent aquifer parameter values required for future evaluation of this aquifer system, and the test itself was a useful demonstration of several innovative telemetry techniques for real-time data collection. The results of this test are being used to evaluate several deferred permit applications in the area.

- The Water Appropriation Division cooperates with the Depart-

ment of Health in reviewing ground water aspects of landfill applications and with the State Public Service Commission in reviewing ground water aspects of coal mining permits and revisions. Written responses are provided to the Department of Health regarding the suitability of locations for the proposed landfill uses and to the Public Service Commission regarding the accuracy and completeness of supporting information and ground water monitoring plans.

- Water Appropriation Division staff was involved in reviewing and providing comments on the U.S. Bureau of Reclamation publication entitled, "Draft Report on Red River Valley Water Needs and Options." The draft report is a comprehensive study of the water quality and quantity needs of the Red River Valley through the year 2050.

With the large volume of water resource data collected by the agency, management of that data is essential for its efficient use. These management efforts involve processes related to the collection, storage, analysis, and dissemination of a wide range of data which include well inventory information, water levels, water chemistry analyses, water permits, water use, dams, drains, and precipitation. Because of the unique nature of much of the data, the Water Commission has developed the necessary data management tools internally.

The architecture of the Water Commission's data management structure has evolved into a distributed client-server model that can easily be extended to incorporate new functionality to meet the changing business requirements of the agency. More than eight years ago, the agency extended the functionality of this system to include seamless integration with the Internet to provide external access to the data managed by the agency. During the last biennium, the data management infrastructure was expanded to provide integration

with the state GIS hub and other web-based mapping applications. All of the data resources currently maintained by the Water Commission can now be accessed either through the traditional text based interface at www.swc.state.nd.us/dataresources.html or through the new map services located at www.swc.state.nd.us/mapservices.html.

The Water Appropriation Division represents the State Engineer and the State Water Commission on state, regional and national natural resource organizations. Members of the division have provided soils, ground, or surface water assistance in meetings or reviews pertaining to: Section 319 Task Force; Working Committee of the State Pesticide in Ground Water Protection Plan; Technical Committee of the State Pesticide in Ground Water Protection Plan; Energy & Environmental Research Center Red River Water Management Consortium; Energy and Environmental Research Center WAFFLE project task force; North Dakota Board of Water Well Contractors; Midwest Ground water Conference; North Dakota State University Remote Sensing Project for Quantifying Crop and Other Vegetative Cover; North Dakota Water Resources Research Institute; North Dakota Department of Health Water Quality Rules Changes; North Dakota Public Service Commission Mining Plans; and North Dakota State University Extension Irrigation Workshops.

Economic development is a major state initiative. In most instances water is needed to serve new enterprises. Information is provided to the Department of Commerce and local economic development organizations regarding the availability and chemical quality of the water to serve a proposed enterprise. The agency also provided information to Department of Commerce clients on immediate and long-term regulatory issues, which helps in defining capital requirements.

Water Development Division

The Water Development Division provides technical review and guidance in water management project design and in regulating project construction. The division staff has several responsibilities:

- Preparing engineering and feasibility reports and designs for the construction, maintenance, and major repair of water resource projects;
- Reviewing and making recommendations on permit applications for drains, dikes, dams, and sovereign lands;
- Providing technical assistance to water resource district boards;
- Inspecting and reporting on the safety of dams;
- Assisting communities in practicing floodplain management through the National Flood Insurance Program;
- Administering FEMA's Map Modernization Project;
- Providing joint coordination of the Municipal, Rural, and Industrial Water Supply program;
- Management and operation of the Devils Lake Outlet project;
- Managing the design, construction, and operation of the Southwest Pipeline Project (SWPP); and
- Managing the design and construction of the Northwest Water Supply Project (NAWS).

The Water Development Division is divided into six sections: 1) Regulatory; 2) Investigations; 3) Design and Construction; 4) Municipal, Rural, and Industrial Water Supply; 5) Red River Office (located in West Fargo); and 6) Southwest Pipeline Project and NAWS. The following is a summary of the biennial activities of each of these sections.

Regulatory

The Regulatory Section processed 43 applications for permits to construct or modify dams, dikes, diversion ditches, or other water control facilities. The section also processed 70 permits to drain, 36 sovereign land permits, 153 wetland creations, and 143 wetland restorations. Additionally, the engineering staff provided assistance with the environmental reviews coordinated by the Planning Division, addressed several appeals of water resource district decisions and various complaints from around the state. Staff members also represented the agency on various interagency committees, including the U.S. Army Corps of Engineers Interagency Coordinating Meetings, the NRCS State Technical Committee, the NRCS Interagency Watershed Committee, Association of Soil Conservation Districts, North Dakota Soil Conservation Committee, and the Natural Resources Trust.

During the 2003-2005 biennium, one additional full-time employee was added to the section to administer FEMA's new Map Modernization Program. This program is an effort by FEMA to update and convert the existing Flood Insurance Rate Maps (FIRM's) to a digital, county-wide format (DFIRM) for the entire United States within a five-year timeframe. In the first year of the program, a total of more than \$1.4 million was secured from Fiscal Year 2005 funding to do Map Modernization work in Barnes, Grand Forks, Walsh, Mercer, and Richland Counties.

The Regulatory Section is also responsible for coordination of the National Flood Insurance Program. Two positions are funded partially through the Federal Emergency Management Agency's (FEMA)

Community Assistance Program (CAP) and the Flood Mitigation Assistance Program (FMAP). Through CAP, the floodplain management staff assists 290 communities with the administration of their floodplain management responsibilities. Each community designates an individual as an administrator to oversee floodplain development. State Water Commission staff works closely with those individuals to provide technical assistance. The State Water Commission staff also visits the communities directly, and conducts periodic training workshops. The FMAP provides federal and state cost-share for community flood mitigation planning, technical assistance, and subsequent acquisition projects. The floodplain management staff within the Regulatory Section also completed 1,174 floodplain determinations for home mortgages under a cooperative agreement with the Bank of North Dakota.

During the 2001 biennium, the Regulatory Section developed a mapping plan that prioritizes future flood insurance study and flood hazard mapping needs for the state. This plan was developed in cooperation with FEMA as an initial step in their map modernization initiative. During the 2003 legislative session, legislation was adopted, making changes to Chapter 61-16.2 of the North Dakota Century Code, which addresses floodplain management. Changes included more stringent requirements for elevating structures in the floodplain and other general housekeeping changes. The Regulatory Section was directly involved in drafting this legislation.

Investigations

The Investigations Section primarily concentrated on the flooding problems at Devils Lake and Missouri River issues during the 2003-2005 biennium.

State Water Commission staff spent a large amount of time providing technical assistance to local officials, developing a state emergency outlet, and working with the Devils Lake Joint Water Resource Board on in-basin water management.

Significant flooding has occurred throughout the Devils Lake Basin since 1993. The level of Devils Lake rose over 25 feet from an elevation of 1423.24 feet above mean sea level (amsl) on July 1, 1993 to 1449.18 feet amsl on June 17, 2004. At the end of biennium (June 30, 2005) the elevation of Devils Lake was 1448.90 feet amsl. While the elevation of Devils Lake increased only 1.57 feet over the 2003-2005 biennium, Stump Lake rose 15.36 feet to an elevation of 1430.1 amsl by June 30, 2005.

The majority of the construction of the outlet from Devils Lake to the Sheyenne River occurred during the 2003-2005 biennium. Inspecting and managing the construction of ten miles of open channel with two drop structures and three siphons under wetlands, three miles of pipeline, and two pumping plants each with a standpipe, kept several Water Commission staff members busy throughout the biennium. The outlet was nearly complete by the end of the biennium and was operational on August 5, 2005.

With regard to Missouri River management, the Investigations Section provided technical review for the Corps of Engineers' Missouri River Master Manual revision. The new Master Manual was completed in March 2004. The section also reviewed and developed comments on the Corps' Annual Operating Plans (AOP) for the Missouri River. The AOPs were critical to the state during the past biennium as the Missouri River basin has been in a drought since 2000. The Investigation Section also provided technical support to the Attorney

General's Office on the many lawsuits that occurred concerning the operation of the Missouri River.

Design and Construction

During the 2003-2005 biennium, the State Water Commission's construction crew conducted repairs and modifications to water resource structures throughout the state. The majority of the work was associated with repairs or modifications to dams and maintenance to United States Geological Survey (USGS) gaging sites throughout North Dakota. This summary also includes a list of dams inspected under the Dam Safety program.

McVile Dam (SWC Project #616) – McVile Dam is located in the east central portion of the state near the City of McVile in Nelson County. The Water Commission, North Dakota Game and Fish Department, and the City of McVile entered into an agreement to share the costs associated with construction of a new low-level drawdown at the dam. The Nelson County Water Resource District also assisted by securing funds from the Red River Joint Board to help pay for the project.

In addition to the construction of a new low-level drawdown, the project also included taking the existing low-level drawdown out of service. The new low-level is a self-regulating system, which benefits the Game and Fish Department by reducing the need to manually operate the system. The work was completed during July 2003, at a cost of approximately \$22,000.

Walsh County Drain No. 27 (SWC Project #1258) – The Water Commission's construction crew made repairs to a concrete chute drop structure located on Walsh County Drain No. 27. The vertical construction joints of the structure had separated which allowed the potential loss of embankment material. The work consisted of plugging

the separated joints and placing steel plates on both sides of the joints to prevent the loss of embankment material. The work also included the placement of fill in eroded areas. The project was completed in July 2003, at a cost of approximately \$8,000.

Drayton Dam (SWC Project #681) – Drayton Dam is located in Pembina County on the main stem of the Red River and consists of a concrete weir. The weir is approximately 165 feet in length and has a vertical drop of approximately 12 feet. There is a large area of hydraulic disturbance at the toe of the dam, and over the years, this area has been responsible for numerous people drowning.

The Water Commission was contacted by a Pembina County Commissioner concerning debris buildup on the Dam. The Water Commission’s construction crew visited the site and determined it was necessary to remove the debris. The debris consisted of large trees, with some of the trees having diameters in excess of nine feet. The construction crew was able to remove the majority of the debris, with the exception of a large tree located in the middle of the weir. Due to the difficulty in attaching a cable to this tree and the known risks with this site, it was determined to leave this tree in place. The project was completed in August 2003, at a cost of approximately \$10,000.

Fish Creek Dam (SWC Project #479) – Fish Creek Dam is located in south central North Dakota southwest of Mandan in Morton County. The Water Commission entered into an agreement with the Morton County Park Board and the North Dakota Game and Fish Department to make repairs to the 48-inch diameter corrugated metal pipe (CMP) and the 12-inch diameter low-level drawdown at Fish Creek Dam. A separated joint in the 48-inch diameter CMP was sealed by the use of an expansion band. An expansion band, which is a short segment of corrugated metal, was placed inside the 48-inch CMP and then expanded by the use of bolts to fit snugly inside the CMP. The 12-inch diameter low-level drawdown pipe also had a separated joint. This joint was repaired by packing it with a special epoxy material. The repairs were completed in August 2003, at a cost of approximately \$3,000.

Dead Colt Creek Dam (SWC Project #1671) – Dead Colt Creek Dam is located south of Lisbon in Ransom County. The construction crew replaced a manhole on the top of the drop inlet at Dead Colt Creek Dam. The inlet is approximately 40 feet high, and thus, the missing manhole created a safety hazard. The total cost of the work was approximately \$1,000, and was completed in September 2003.

LaMoure Dam (SWC Project #485) – The Water Commission’s construction crew completed the

DAM SAFETY FORMAL INSPECTIONS

Name of Dam	County	Hazard
Big Coulee Dam	Towner	Medium
Camel Butte Dam	Golden Valley	Medium
Chyle Dam	Walsh	Medium
Colt Dam	Mercer	Low
Crown Butte Dam	Morton	Medium
Daub Dam	Oliver	Medium
Devils Lake Roads	Ramsey	
Drayton Dam	Pembina	Medium
Erie Dam	Cass	Medium
Harvey Dam	Wells	Medium
Hunter Dam	Cass	High
Lisbon Dam	Ransom	Medium
Matejcek Dam	Walsh	High
Minto Dam	Walsh	Low
Mott Watershed Dam	Hettinger	High
Mount Carmel Dam	Cavalier	Medium
Nelson Lake Dam	Oliver	High
New Rockford RR Dam 1	Eddy	Low
North Lemmon Lake Dam	Adams	Medium
Odland Dam	Golden Valley	Low
Olson Dam	Pembina	High
Pheasant Lake	Dickey	Medium
Portland Dam	Traill	Low
Raleigh Dam	Grant	Medium
Renwick Dam	Pembina	High
Senator Young Dam	Cavalier	High
Sheep Creek Dam	Grant	Low
Short Creek Dam	Burke	Medium
Square Butte Creek Dam #4	Oliver	Medium
Square Burre Creek Dam #5	Oliver	High
Sweetbriar Creek Dam	Morton	Medium
Tioga Dam	Williams	High
Tolna Dam #1	Nelson	Medium
Valley City Mill Dam	Barnes	Medium
Vigness Dam	Walsh	Low
White Earth Dam	Mountrail	Medium
Wilson Dam	Dickey	Low

modifications and repairs to LaMoure Dam that were started during the 2002 construction season. The dam is located in LaMoure County on the James River, and it is used by the USGS as a primary gaging station. The repairs to the structure date back to 1991 and 1992, when the Commission performed major repairs to both abutments of the dam. The final repairs and modifications to the dam were delayed due to high water conditions starting in 1993 and continuing through 2001.

DAM SAFETY SITE VISITS

Name	County	Hazard	Name	County	Hazard
Anheluk Dam	Billings	Low	Kota Ray Dam	Williams	Low
Antler Creek Dam	Bottineau	Low	Kulm Edgeley Dam	Lamoure	Low
Armourdale Dam	Towner	Low	Lake George	Foster	Low
Arnegard Dam	McKenzie	Low	Lake Metigoshe	Bottineau	Low
Arrowhead Dam	Mercer	Low	Lake Tobiason	Steele	Low
Balta Dam	Pierce	Low	Lamoure City Dam	Lamoure	Low
Baukol-Noonan Dam #1	Divide	Low	Lisbon Dam	Ransom	Medium
Beach Dam	Golden Valley	High	Long Creek Dam	Divide	Low
Beaver Creek	Steele	Medium	Mayville Dam 2	Traill	Low
Beaver Lake Dam	Logan	Low	McGregor Dam	Williams	High
Belfield Dam	Stark	Low	McKee Dam	Barnes	
Beulah Flood Control Dam	Mercer	High	McVile Railroad Dam	Nelson	Medium
Big Coulee Dam	Towner	Medium	Metcalfe Trust Dam 1	Golden Valley	Low
Blacktail Dam	Williams	Medium	Meyer Dam #1	Sioux	
Braddock Dam	Emmons	Low	Middle Branch Park River #5	Walsh	Medium
Brown Dam	Barnes	Low	Minot Water Supply Dam	Ward	Medium
Bruce Bitterman Dam	Mercer	Low	Minto Dam	Walsh	Low
Bucephalia Dam	Foster	Low	Mirror Lake Dam	Adams	Medium
Buffalo Lake Diversion Dam	Pierce	Low	Mott City Dam	Hettinger	Low
Burlington Dam #1	Ward	High	Mount Carmel Dam	Cavalier	Medium
Burlington Dam #2	Ward	High	Neideffer Flood Control Dam	Burleigh	Low
Burlington Dam #3	Ward	Low	New Rockford RR Dam 1	Eddy	Low
Burlington Park Dam	Ward	Low	Niagara RR Dam #1	Grand Forks	Low
Camel Butte Dam	Golden Valley	Medium	Niagara Township Dam #2	Grand Forks	Low
Cat Coulee Dam	Grant	Low	Nieusema Dam	Emmons	
Cedar Lake Dam	Slope	Medium	Norman Schaefer Dam	Mercer	Low
Center Dam	Oliver		North Lemmon Lake Dam	Adams	Medium
Christine Dam	Richland	Low	Northgate Dam	Burke	Medium
Clausen Springs Dam	Barnes	High	Nygren Dam	Morton	Low
Coleharbor Water Supply Dam	McLean	Low	Odland Dam	Golden Valley	Low
Colt Dam	Mercer	Low	Painted Woods Lake	McLean	Low
Cottonwood Creek Dam	Lamoure	Medium	Pembina City Dam	Pembina	Medium
Crown Butte Dam	Morton	Medium	Pheasant Lake	Dickey	Medium
Danzig Dam	Morton	Medium	Portland Dam	Traill	Low
Daub Dam	Oliver	Medium	Queen City Dam	Stark	Medium
Davis Fish Dam (Speck Davis)	Slope	Low	Raleigh Dam	Grant	Medium
Dead Colt Creek Dam	Ransom	Medium	Regent Dam	Hettinger	Low
Des Lacs City Dam	Ward	Low	Rick Rice Dam	Dunn	Low
Devils Lake Outlet Project			Riverside Park Dam	Grand Forks	Medium
Dickey County WPA #9	Dickey	Low	Rosenquist Dam	Divide	Low
Drayton Dam	Pembina	Medium	Sarnia Dam	Nelson	Low
Earl Rundle Dam	Slope		Schlenker (Lehr-Beglau) Dam	Lamoure	
East Broadway Dam	Stark	Low	Schmidt Dam	Lamoure	Low
Ellendale Water Supply Dam	Dickey	Medium	Scophammer Dam	Renville	Low
Elm River #1	Steele	Medium	Sheep Creek Dam	Grant	Low
Enderlin Park Dam	Ransom	Low	Sheyenne River Diversion Dam	Cass	Medium
English Coulee Dam	Grand Forks	High	Short Creek Dam 1	Burke	Medium
Epping Dam	Williams	Medium	Silver Creek	Nelson	Medium
Erie Dam	Cass	Medium	Silver Lake Dam	Sargent	Low
Fargo 12th Ave. North Dam	Cass	Low	Si's Dam	Sioux	Low
Fargo 4th St. South Dam	Cass	Low	Siverton Dam	McKenzie	Medium
Fargo Dam #2 (Country Club)	Cass	Low	Smishek Lake Dam	Burke	Low
Fargo Dam #3	Cass	Low	Soldiers Home Dam	Ransom	Low
Fish Creek Dam	Morton	Low	Spring Lake Dam	Bowman	Low
Fort Ransom Dam	Ransom	Low	Stanley Dam	Mountrail	Medium
Froelich Dam	Sioux	Low	Surrey Lagoons	Ward	Low
Gascoyne Lake Dam 2	Bowman	Low	Sussex Dam	Steele	Low
Gascoyne Township Dam	Bowman	Low	Sweetbriar Creek Dam	Morton	Medium
Gerving, Glen #2 and #3	Morton	Low	Sykeston Dam	Wells	Medium
Glen Ullin RR Dam 2	Morton	Medium	Temvik Dam	Emmons	Low
Golden Lake Dam	Steele	Low	Tioga Dam	Williams	High
Grafton RR Dam	Walsh	Low	Tolna Dam	Nelson	Medium
Green Lake Outlet Control	McIntosh	Low	Ueland Dam	Griggs	Low
Greenview Dam	Steele	Low	Valley City Mill Dam	Barnes	Medium
Harvey Dam	Wells	Medium	Valley City Park Dam	Barnes	High
Hickson Dam (Fargo Dam #3)	Cass	Low	Vigness Dam	Walsh	Low
Hillsboro Dam	Traill	Low	Vivatson Pond	Pembina	Low
Hoskins Lake Dam	McIntosh	Low	Wakopa Dam	Rolette	Low
Hunter Dam	Cass	High	Warsing Dam	Eddy	Low
Indian Creek Dam	Hettinger	Medium	Wayne Hoger Dam	Morton	Low
Jackman Coulee Dam 1	Burleigh	Low	Welk Dam	Emmons	Low
Jackman Coulee Dam 2	Burleigh	High	White Earth Dam	Mountrail	Medium
Jamestown Ice House Dam	Stutsman	Low	Wild Rice Dam	Cass	Low
Justin Jacobs Dam	Burleigh		Williams Creek Dam	Golden Valley	Low
Kapustensky Dam	Morton		Williams Lake	Golden Valley	Low
Karey Dam	Hettinger	Low	Williston Dikes	Williams	
Kathryn Dam	Barnes	Low	Wilson Dam	Dickey	Low
Koldok Dam	Barnes	Low	Wolf Butte Dam	Adams	Low
Kordon Dam	Billings		Wyand Dam	Foster	Low
			Yanktonai Dam	McLean	Medium

The lower flows on the James River allowed the remaining work to start on the dam during the 2002 construction season. The work in 2003 involved completing the concrete cap started in 2002 and construction of the low-flow measuring section. The concrete cap will stabilize the structure and the low-flow measuring section will greatly assist the USGS in obtaining accurate river flow data during periods of low flow. This work was completed in October 2003, at a cost of approximately \$41,000.

Sweetbriar Creek Dam (SWC Project #642) – Sweetbriar Creek Dam is a major recreation site located approximately 25 miles west of Mandan, on Interstate 94 in Morton County. The embankment of Sweetbriar Creek Dam is also the roadway embankment for Interstate 94. The upstream face of the concrete inlet at Sweetbriar Creek Dam was severely damaged by ice action. Therefore, the Commission worked with the North Dakota Department of Transportation (DOT), the Game and Fish Department, and Morton County to develop a project to make repairs to the structure. The repair project was included into the DOT project replacing a portion of Interstate 94 at this location. The low bidder for the DOT project was Northern Improvement, with the cost for the repairs being approximately \$101,700. Northern Improvement sublet the work at the dam to Industrial Builders out of Fargo.

The Project entailed the removal of damaged concrete from the upstream (north) face of the inlet, and replacing the damaged concrete with more heavily reinforced concrete. The work also included the construction of a new low-level drawdown and plugging the existing low-level drawdown by filling it with a sand/cement grout. The construction of the new low-level drawdown and plugging the existing low-level was performed by

the Water Commission's construction crew at a cost approximately \$29,000. The project was completed in October 2003, at a total cost of approximately \$137,000.

A separate project in 2004 at Sweetbriar Creek Dam involved several emergency recommendations given to the State Water Commission by GEI Consultants, Inc. out of Denver, Colorado. GEI Consultants found evidence of ongoing internal erosion at the dam and therefore recommended several measures to improve the immediate safety of the dam. The Water Commission, Game and Fish Department, and Morton County Park Board entered into an agreement to share the costs.

The project included installation of four core-hole filters in the spillway floor, excavation of the toe drain channel to allow the toe drain to actually drain, and construction of an earth-fill cofferdam downstream of the stilling basin to raise the tailwater and reduce the hydraulic gradient through the dam. Work was completed in December 2004, at a cost of approximately \$7,000.

Arnegard Dam (SWC Project #613) – Arnegard Dam is located in western North Dakota, just north of the City of Arnegard in McKenzie County. The Water Commission, Game and Fish Department, and McKenzie County Water Resource District entered into an agreement to share the costs associated with the relocation of the principal spillway. The old spillway had started to corrode severely, causing the end of the pipe to rot away, creating a severe erosion problem. The entrance to this spillway was choked with cattails, causing the emergency spillway to flow frequently, creating erosion problems at that location as well.

The project included dewatering the reservoir, excavation of the CMP spillway on the west side of the dam, and placement of fill to

rebuild the embankment at the old CMP. Also, a new 60-inch diameter CMP riser and 48-inch diameter CMP spillway were installed at mid-embankment near deeper water. A sand-collar and outlet pipe were installed around the new spillway pipe to control any seepage near the pipe. The emergency spillway was also reshaped. Work was completed in June 2004, at a cost of approximately \$55,000.

Armourdale Dam (SWC Project #665) – Armourdale Dam is located in north central North Dakota a few miles east of Rolla. The Water Commission, North Dakota Game and Fish Department, and Towner County Water Resource District entered into an agreement to share the costs associated with repair of the entrance channel to the chute spillway. High flows and undersized riprap had led to erosion of material where the entrance channel meets the concrete chute spillway.

The project included excavation of the entrance channel, placement of a geotextile fabric, and installation of 18 Reno mattresses filled with rock riprap. Work was completed in July 2004, at a cost of approximately \$18,000.

Inspection assistance at Sweetbriar Dam, Epping Dam, and Big Coulee Dam - Three dams were inspected by GEI Consultants, Inc. at the request of the State Water Commission. These three dams have designs similar to Mount Carmel Dam, which failed in 2003. The construction crew pumped out the stilling basin at each dam before the inspection. Fine materials were found at Sweetbriar Dam which would not have been found without the stilling basin being pumped out. Further investigation will be required at the three dams.

Locating toe drains at Crown Butte Dam, Sweetbriar Dam, Crown Butte Dam, and Daub Dam - Several dams throughout the state have toe drains, abutment drains,

and blanket drains where the exit point is unknown. The drain outlets at these dams were located, uncovered, and cleaned out by the construction crew. A fence post was driven in at the outlet of each drain. Several outlets are underwater and most are so low on the toe that there is not adequate slope for them to drain downstream.

Walsh County Drain No. 25 (SWC Project #1256) – The Walsh County Drain No. 25 outfall is located just west of Park River in northeast North Dakota. The outfall consists of a steep pipe buried in a large embankment, which takes water from the drain into the Park River. Two large sinkholes had formed on the downstream side of the outfall embankment. The sinkholes were excavated and inspected for larger voids and for any signs that material may be piping through the embankment. Upon finding no problems, the holes were backfilled and compacted. The work was completed in May 2005, at a cost of approximately \$2,500.

Crown Butte Dam (SWC Project #870) – Crown Butte Dam is located approximately 10 miles west of Mandan on Interstate 94 in Morton County. Interstate 94 serves as the embankment for the dam. Several items needed to be addressed at the dam; namely, differential settlement of the spillway pipe causing material to seep through the joints, sinkholes on the upstream and downstream sides of the dam, a lack of a working low-level valve, and non-functioning toe drains. The North Dakota Department of Transportation (DOT) and the Water Commission inspected the dam in December 2004. Both agencies agreed that the best method to make the repairs was to include the work into the reconstruction of the west-bound lanes of the interstate in 2005.

The low bidder for the project was Northern Improvement Company, who sublet the work on the inlet to Weisz & Sons, Inc. out of Bismarck. The low bid of \$147,000 included work to construct a new concrete drop inlet, replace 28 feet of spillway pipe, install a vent pipe, and install a portion of a new low-level drawdown system. The Water Commission's construction crew finished the installation of the low-level drawdown, installed a sand-collar near the downstream end of the spillway pipe, and improved the drainage of the toe drain. The old four-inch low-level will be grouted shut at a later date when the reservoir is back to normal pool level.

The DOT and Water Commission entered into an agreement to share costs of the work and the Water Commission, Game and Fish Department, and Morton County Park Board entered into a separate agreement to share the non-DOT costs of the project. The work was completed in June 2005. It is estimated that the work by Weisz & Sons will cost nearly \$160,000 and the Water Commission work will cost nearly \$35,000, for a total project cost of approximately \$195,000.

USGS Gaging Stations (SWC Project #1373) – The North Dakota Water Commission's construction crew repaired several United States Geological Survey gaging stations throughout North Dakota. The work involved installation of orifice lines, installation of staff gages, removal of gage houses, installation of gage houses, and repairs to sheet pile control sections.

The construction crew also installed orifice line and water quality monitoring gages above and below the Devils Lake outlet on the Sheyenne River. In addition, they installed an acoustic velocity meter and water quality gage in Fargo on the Red River, and a radar gage in Watford City on the Little Missouri River.

Municipal, Rural & Industrial Water Supply

In Federal Fiscal Years 2004, and 2005, the Garrison Diversion Municipal, Rural, and Industrial (MR&I) water supply program received \$6.17 million in federal grant funds for the development of water supply facilities in the state. In coordination with the State Water Commission, the Garrison Diversion Conservancy District also provided funding toward project development.

Projects that were allocated funds during Federal Fiscal Years 2004 and 2005 included the All Seasons Water Users, North Valley Water District – Pembina, McKenzie Rural Water, Mountrail County Rural Water, Northwest Area Water Supply, Park River, Stutsman Rural Water, Traill County Rural Water, and Williams Rural Water Phase III. This brought the total received from the federal government to \$193.8 million since the program was authorized in 1986.

A total of 112 applicants have requested assistance through the MR&I program. Of these, 54 projects have been approved for MR&I funding by the Garrison Diversion Conservancy District and the State Water Commission.

Since the program began, 44 projects have been completed, including: Abercrombie, Agassiz Water Users, All Seasons Rural Water System 4, South Central Regional Water District, Carson, Cavalier, Crown Butte, Dickey Rural Water Users District, Dunn Center, Edgeley, Elgin, Englevale, Fargo, Fingal, Gackle, Garrison Rural Water, Glenfield, Grand Forks Water Treatment, Grand Prairie Estates, Grandin, Gwinner, Hankinson, Hebron, Kindred, Langdon, Langdon Rural Water Phase I, II, IV, Marion, McLean-Sheridan Rural Water, Medora, Minto, Missouri West Water Phases I and II, Neche, New Town Water Storage, North



Celebration of Southwest Pipeline water reaching Beach, October 8, 2004.

Valley Water District, Ramsey Rural Water, Ransom-Sargent Rural Water, Riverside Park Dam, Riverview Heights, Rugby Phase I,II, Stanley, Tolna, Tri-County Rural Water Users, and Walhalla.

Nine additional projects were in design and/or construction phases at the end of the biennium, including: All-Seasons Water System 5, McKenzie Rural Water, Northwest Area Water Supply, Park River, Southwest Pipeline Project, Stutsman Rural Water, Underwood, Williams Rural Water Phase III, and Williston.

The total estimated cost of the 112 projects is \$840 million. This cost includes \$145 million for the Northwest Area Water Supply Project, and \$150 million for the Southwest Pipeline Project.

Red River Office

Located in West Fargo, the Red River office consists of one full-time position. During the 2003-2005 biennium, Red River office personnel coordinated the State Water Commission's activities in eastern North Dakota and provided:

- Technical assistance to the Red River Joint Water Resource District in pursuing flood control projects in the Red River watershed;
- Assistance with reconnaissance level studies of potential dams;
- Assistance to individual water resource boards on 25 drainage problems or other water-related issues;
- Inspections on 19 projects that the State Water Commission had approved for cost-sharing; and
- Technical assistance on various committees that were formed as a result of the Red River basin's flooding problems.

These committees include the Flood Damage Reduction and Drainage teams for the Red River Basin Commission, the Technical Team for the U.S. Army Corps of Engineer's Fargo-Moorhead and Upstream Study, the hydrology subcommittee for the International Red River Basin Board, the border dike subcommittee for the International Red River Basin Board, the Red River Basin Institute, and various other groups.

Personnel have also represented the State Water Commission at meetings of the Red River Joint Water Resource Board, Pembina River Basin Advisory Board, Red River Basin Riparian Advisory Board, EERC, and the Sheyenne River Joint Water Resource Board.

Southwest Pipeline Project

At the start of the biennium, the Southwest Pipeline Project served as the water supply for Belfield, Carson, Dickinson, Dodge, Dunn Center, Elgin, Gladstone, Glen Ullin, Golden Valley, Halliday, Hebron, Hettinger, Manning, Mott, New England, New Hradec, New Leipzig, Reeder, Regent, Richardton, Scranton, South Heart, and Taylor, as well as approximately 2,200 rural water customers in seven service areas.

Construction on the project continued to expand it as a regional water supply system during the 2003-2005 biennium, with completion of the Bowman-Scranton regional service area and the main transmission pipeline serving the Medora-Beach regional service area. Completion of the Medora-Beach main transmission pipeline in the autumn of 2004 allowed service to be available to Medora, Beach, and Sentinel Butte in October, 2004.

The main transmission pipeline also accommodated service to a portion of the Fryburg Service Area, serving about 70 rural customers between Belfield and Sentinel Butte - including the Bully Pulpit Golf Course and the Badlands Ministries south of Medora, the Theodore Roosevelt Medora Foundation campground west of Medora, and Home On The Range north of Sentinel Butte.

Perkins County Rural Water system in South Dakota began using water from the project in September 2004, although, construction took place in the 1997-1999 biennium.

During the biennium, an additional 242 rural customers were connected to the project, making the total population served by the Southwest Pipeline at the end of the biennium 32,350 people.

Capital repayments from the Southwest Pipeline Project totaled \$3,277,319 for the biennium. Of this amount, \$2,000,880 was deposited with our Trustee, Wells Fargo Bank, NA, to pay bondholders, and the balance of \$1,276,439 was deposited in the Resources Trust Fund.

Northwest Area Water Supply

At the start of the biennium, the NAWS Project was in its second year of construction with approximately 9.5 miles of pipe in the ground of the roughly 45 miles of pipe between Minot and the Missouri River. By the end of the biennium, pipeline construction had reached the City of Max with approximately 30 miles of pipe in the ground. A contract for the last 14.9 miles from Max to the Missouri River was awarded in April but construction had not yet begun.

Environmental issues continued to be a challenge for the NAWS project during the 2003-2005



Construction south of Minot on Northwest Area Water Supply project.

biennium. Oral arguments on the Manitoba lawsuit were heard in Washington D.C. District Court in July 2004. In February 2004, the judge remanded the case to the Bureau of Reclamation for completion of an environmental assessment that reconsiders treatment within the Missouri River basin and the possibility of leakage. The judge deferred ruling on Manitoba's request for an injunction at that time, ruling on that issue in April 2005.

At that time the judge granted that pipeline construction could continue while Reclamation conducted its environmental analysis. The judge also said that construction of other facilities could occur if it could be demonstrated to the court that their construction would not impact Reclamation's decision on treatment.

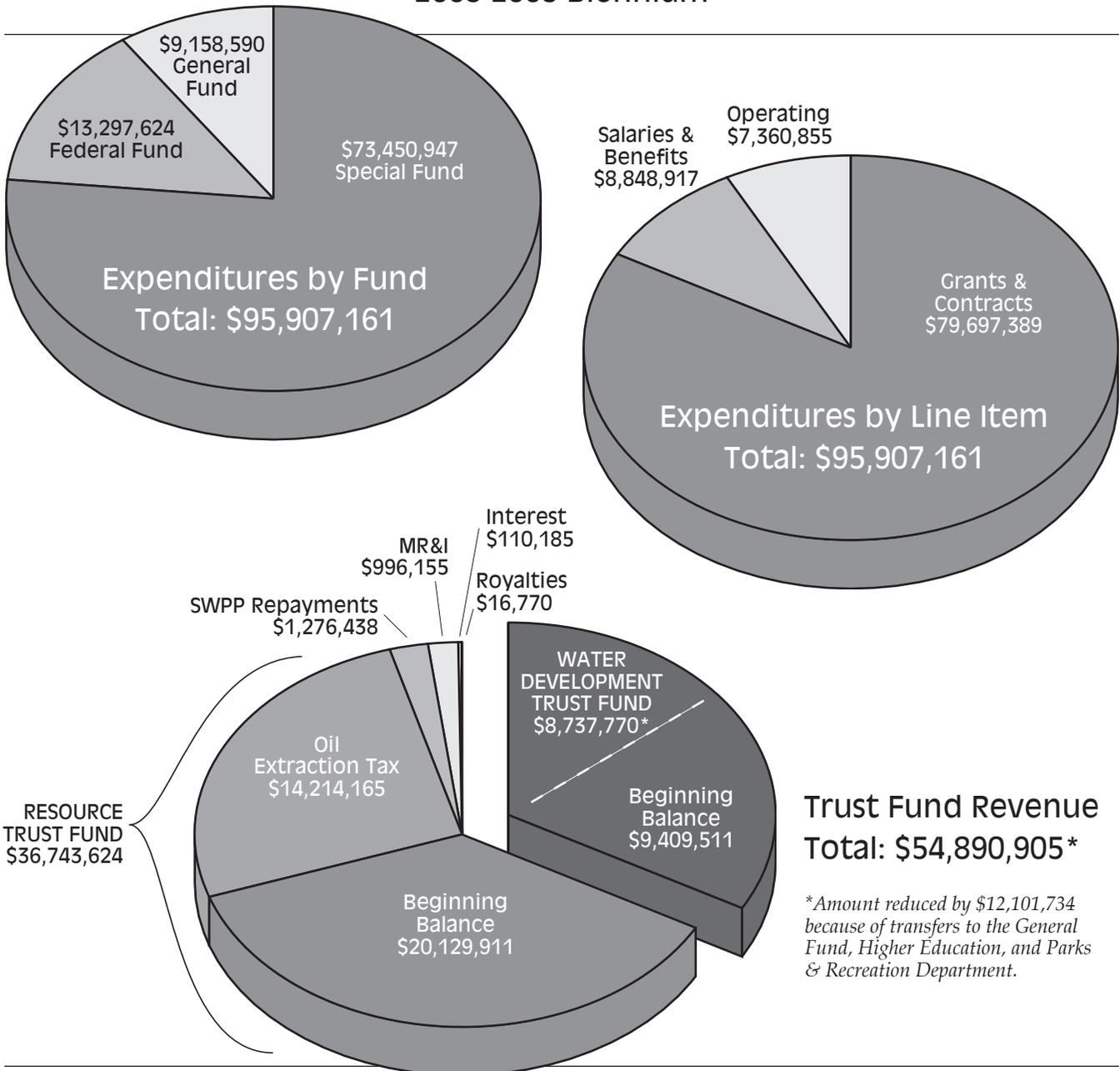
FINANCIAL INFORMATION

The following pages contain financial information summarized in various formats. There are pie charts classifying the agency's expenditures by fund and by line item. There is a chart identifying expenditures by division and line item, and there is a detailed listing by object code.

The trust fund revenue pie chart on this page includes both the Resources Trust Fund and Water Development Trust Fund revenue. The Water Development Trust Fund revenue does not include \$10,070,373, money transferred to the general fund, or \$1,456,074, money transferred to the North Dakota University System, or \$575,287, money transferred to the North Dakota Parks & Recreation Department.

And, finally, the remainder of the report addresses project and program obligations, completed projects, object expenditures, long-term debt, and resources available from the agency.

State Water Commission Appropriations 2003-2005 Biennium



State Water Commission

Program Budget Expenditures for Biennial Period Ending June 30, 2005

AGENCY PROGRAM	SALARIES & BENEFITS	OPERATING EXPENSES	GRANTS & CONTRACTS	PROGRAM TOTALS
ADMINISTRATION				
Allocated	\$1,305,484	\$770,751	\$0	\$2,076,235
Expended	\$1,301,624	\$701,710	\$0	\$2,003,334
Percentage	100%	91%	0%	96%
PLANNING AND EDUCATION				
Allocated	\$816,777	\$212,547	\$352,000	\$1,381,324
Expended	\$815,558	\$187,170	\$335,724	\$1,338,452
Percentage	100%	88%	95%	97%
WATER APPROPRIATION				
Allocated	\$2,372,161	\$454,828	\$970,000	\$3,796,989
Expended	\$2,325,839	\$481,923	\$892,122	\$3,699,884
Percentage	98%	106%	92%	97%
WATER DEVELOPMENT				
Allocated	\$3,429,643	\$521,528	\$229,500	\$4,180,671
Expended	\$3,262,525	\$458,518	\$118,431	\$3,839,474
Percentage	95%	88%	52%	92%
ATMOSPHERIC RESOURCE				
Allocated	\$606,294	\$467,080	\$4,354,430	\$5,472,804
Expended	\$573,900	\$386,124	\$884,432	\$1,844,456
Percentage	95%	83%	20%	34%
SOUTHWEST PIPELINE				
Allocated	\$242,816	\$2,365,000	\$5,600,000	\$8,207,816
Expended	\$275,306	\$1,875,066	\$4,201,155	\$6,351,527
Percentage	113%	79%	75%	77%
NORTHWEST AREA WATER SUPPLY				
Allocated	\$370,683	\$4,371,285	\$26,121,912	\$30,863,880
Expended	\$294,165	\$3,270,344	\$12,039,665	\$15,604,174
Percentage	79%	75%	46%	51%
STATEWIDE WATER PROJECTS				
Allocated			\$106,924,135	\$106,924,135
Expended			\$61,225,860	\$61,225,860
Percentage			57%	57%
AGENCY TOTALS				
Allocated	\$9,143,858	\$9,163,019	\$144,551,977	\$162,858,854
Expended	\$8,848,917	\$7,360,855	\$79,697,389	\$95,907,161
Percentage	97%	80%	55%	59%

**State Water Commission - Projects/Grants/Contract Fund - Program Obligations
July 1, 2003 - June 30, 2005**

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
CITY FLOOD CONTROL					
1907-01	Grand Forks	12/07/01	18,106,229	14,325,854	3,780,375
1907-03	Wahpeton	10/23/01 & 08/16/04	990,051	838,408	151,643
1907-04	Grafton	08/16/01	519,000	19,000	500,000
	Fargo		2,584,750	0	2,584,750
	Subtotal City Flood Control		22,200,030	15,183,262	7,016,768
MR&I					
2373-01	Langdon	10/23/01	5,206,224	4,999,405	206,819
2373-02	McKenzie	10/23/01 & 11/03/03	900,000	389,526	510,474
2373-03	Ramsey	10/23/01	2,878,422	2,592,324	286,098
2373-04	Tri-County	10/23/01	2,061,960	1,813,511	248,449
2373-05	City of Underwood	06/22/05	0	0	0
	Subtotal MR&I		11,046,606	9,794,766	1,251,840
IRRIGATION DEVELOPMENT					
1389	NDSU Williams County Irrigation Research Site	05/01/02	239,500	214,032	25,468
1389	BND AgPace Program	10/23/01	930,415	238,053	692,362
	ND Irrigation Caucus	11/03/03	100,000	100,000	0
	ND Irrigation Caucus, Irrigation Development Enhancement	11/03/03	590,600	16,100	574,500
	Sioux Irrigation District - McKenzie County	12/06/02	21,060	0	21,060
	Subtotal Irrigation Development		1,881,575	568,185	1,313,390
FLOOD CONTROL					
300	Baldhill Dam Flood Pool Raise	04/30/98 & 09/11/00	760,127	383,969	376,158
1878/1344	Maple River Dam Construction Project	02/04/92 & 12/00	4,002,167	0	4,002,167
1878	Maple River Dam Engineering & Study	01/00/00	497,833	251,141	246,692
	Subtotal Flood Control		5,260,127	635,110	4,625,017
EASTERN DAKOTA WATER SUPPLY					
1912	Eastern Dakota Water Supply		127,014	25,242	101,772
DEVILS LAKE BASIN DEVELOPMENT					
416-05	Devils Lake Outlet Awareness Manager	12/06/02	8,433	8,433	0
416-05	Devils Lake Outlet Awareness Manager	12/05/03	12,748	12,748	0
416-05	Devils Lake Outlet Awareness Manager	12/10/04	15,000	7,332	7,668
416-01	Devils Lake - LEMC (Ramsey)	05/21/97	429	0	429
416-01	USGS - QW monitoring Sheyenne & Red Rivers	06/29/04	6,170	0	6,170
416-02	Devils Lake Levee Raise (Phase II)	03/26/97	66,921	0	66,921
1882-02	Devils Lake Emergency Response Plan (Ramsey)	11/29/95	7,986	58	7,928
416-01	Devils Lake/Twin Lakes Temporary Emergency Outlet	09/11/00	75,000	0	75,000
416-04	Dept. of Interior, USGS, Sheyenne & Red Rivers		1,103	1,103	0
416-01	E. Devils Lake/Black Slough Outlet Sediment Study (NDGS)	03/21/02	3,979	0	3,979
416-01	Devils Lake Basin Joint Water Resource Manager	12/06/02	11,825	11,825	0
416-01	Devils Lake Basin Joint Water Resource Manager	12/05/03	24,954	24,953	1
416-01	Devils Lake Basin Joint Water Resource Manager	12/10/04	26,000	13,117	12,883
416-07/-01	Devils Lake Outlet	02/20/02	26,930,383	21,652,559	5,277,824
416-01	City of Devils Lake Levee System	12/06/02	4,074,202	900,000	3,174,202
1882-07	Devils Lake Upper Basin Water Utilization Test Project	08/06/03	302,000	106,645	195,355
	Subtotal Devils Lake		31,567,133	22,738,773	8,828,360

Water Commission - Projects/Grants/Contract Fund - Program Obligations (cont.)
July 1, 2003 - June 30, 2005

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
GENERAL WATER MANAGEMENT					
	Hydrologic Investigations		880,000	0	880,000
779	Byron Mankowski (Pump Installation)		1,250	1,250	0
818	Judi Hintz		11,172	6,251	5,012
862	Wade Bjorgen		4,596	3,107	1,489
956	University of North Dakota		12,000	12,000	0
1395	Dept. of Interior, USGS		350	0	350
1395	Dept. of Interior, USGS, Streamflow Monitoring on Souris River, Eaton Project		58,712	58,712	0
1395	Devils Lake Water Quality, USGS		57,750	28,875	28,875
1395	Water Resource Investigations USGS 10/01/03 - 09/30/04		322,750	322,750	0
1395	Water Resource Investigations USGS 10/01/04 - 09/30/05		335,050	335,050	0
1395	Eaton Irrigation Project USGS 04/01/04 - 09/30/04, 02/05 - 09/05		28,000	28,000	0
1400	Linda Werner (through 12/02/02)		5,941	4,035	1,906
1690	Mary Lou McDaniel		5,846	3,631	2,215
1703	Neil Flaten		5,889	4,550	1,339
1703	KBM, Inc.		6,320	0	6,320
1707	Neil Flaten		5,167	3,519	1,648
1714	David Robbins		5,247	3,536	1,711
1760	Monica Vrana		844	844	0
1761	Gloria Roth		1,719	1,292	427
1761	Fran Dobitz		1,520	1,871	-351
779	University of Waterloo		320	0	320
1845-01	Environmental Isotope Laboratory		2,682	0	2,682
1908-01	UND, Karlsruhe Aquifer Study of Denitrification		21,513	21,513	0
	Subtotal for Hydrologic Investigations Obligations		906,632	846,210	60,422
	Remaining Hydrologic Investigations Authority		-26,632	0	-26,632
	Hydrologic Investigations Authority Less Payments		0	0	0
1896-03	Flood Mitigation Assistance Program (2000) City of Fargo		6,165	6,165	0
1896-02	Flood Mitigation Assistance Program (2002) Hettinger County		875	875	0
1896-02	Flood Mitigation Assistance Program (2002) Benson County		958	958	0
1896-03	Flood Mitigation Assistance Program (2002) City of Fargo		2,340	0	2,340
	Subtotal for Flood Mitigation Assistance Program		10,338	7,998	2,340
	General Projects Obligated		9,647,776	3,761,191	5,886,585
	General Projects Completed		1,414,389	1,414,389	0
	Subtotal General Water Management		11,952,503	6,029,788	5,922,715
SOUTHWEST PIPELINE					
1736	Southwest Pipeline Project		1,257,816	3,137,280	-1,879,464
1736	Southwest Pipeline Project		4,891,184	2,801,683	2,089,501
	Subtotal Southwest Pipeline Project		6,149,000	5,938,963	210,037
WEATHER MODIFICATION					
	Weather Modification		350,000	350,000	0
NORTHWEST AREA WATER SUPPLY					
237-04	Northwest Area Water Supply		2,400,000	416,446	1,983,554
TOTAL PROJECTS/GRANTS/CONTRACT FUND - PROGRAM OBLIGATION			92,933,988	61,680,535	31,253,453

Water Commission - Projects/Grants/Contract Fund - Project Obligations (cont.)
July 1, 2003 - June 30, 2005

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
GENERAL PROJECT OBLIGATIONS					
1293	Mountrail County Irrigation Project Feasibility Study	06/09/99	2,681	0	2,681
841	Upper Maple Retention Dam Feasibility Study	11/05/99	20,000	0	20,000
1069	Cass County Drain No. 13	04/10/00 & 06/12/03	293,163	62,712	230,451
1070	Cass County Drain No. 14	04/10/00	176,212	107,347	68,865
1075	Cass County Drain No. 21	07/14/00	103,268	0	103,268
576	BOMM Missouri River Coordinated Resource Mgmt. Prog.	03/06/01	46,678	7,470	39,208
1401/1905	Cavalier /Pembina Drains 2 & 3 (Manitoba, Canada)	03/06/01	357,000	178,500	178,500
1420	Trail County WRD Drain No. 9-18-29	05/01/02	236,794	197,465	39,329
1751-06	Digital Aerial Survey Phase I & II, Cass County	06/24/02	45,795	0	45,795
1916	Salt Cedar, Williams & McKenzie Counties	07/12/02	14,462	6,555	7,907
1922	Richland Co. WRD Fargo/Moorhead & Upstream Feas. Study	08/15/02	267,430	124,750	142,680
847	Maple River - Retention Study Rush River Joint WRD	08/15/02	25,000	0	25,000
1751	Red River Flood Insurance Mapping & Hydraulic Analysis	08/15/02	35,646	0	35,646
1851	Drought Disaster Livestock Water Assistance Program	08/15/02	268,866	220,897	47,969
1918	Southeast Cass WRD, Normanna Twp. Improvement	08/15/02	64,750	0	64,750
1228	Trail County Drain No.6	12/06/02	61,742	50,859	10,883
1271	Ring Dikes - Maple River WRD	12/06/02	46,874	0	46,874
1271	Ring Dikes - Rush River WRD	12/06/02	25,000	0	25,000
1271	Ring Dikes - Southeast Cass WRD	12/06/02	259,784	25,000	234,784
1705	Red River Joint WRD Coordinator	12/06/02 & 06/12/03	18,000	0	18,000
1066	Cass County Drain No. 9 Drop Structure	03/05/03	20,939	0	20,939
1232	Trail County Drain No. 13	03/05/03	250,000	0	250,000
1247	Trail County Drain No. 30, Brokke Drain	03/05/03	169,507	75,972	93,535
331-1	Hay Creek Flood Insurance and Mapping Project	04/16/03	15,598	0	15,598
1346	Mount Carmel Dam Incident Consultant	04/28/03	338,571	319,072	19,498
1346	Mount Carmel Dam Incident	03/11/04	2,900,000	2,089,627	810,373
1392	Schultz, Ph.D. Economic Damage Study, Missouri R. Lawsuits	05/08/03	7,600	0	7,600
1252	Walsh County Drain No. 31 Improvement Project	06/12/03	35,559	0	35,559
1071	Cass County Drain No. 15	06/23/03	18,321	10,600	7,721
847	Swan Creek Diversion, Cass County	12/06/02-03/10/05	78,303	9,473	68,830
1232	Trail County Drain No. 13	08/06/03	89,072	0	89,072
1328	Cass County Drain No. 23, North Cass WRD	06/12/03	56,199	7,808	48,391
1090	Cass County Drain No. 40, Southeast Cass WRD	06/12/03	250,000	0	250,000
1921	Square Butte Dam No. 6, Morton County WRD	06/12/03	500,000	10,334	489,666
644	32nd Ave. Fargo South Dam Modification	11/03/03	76,435	0	76,435
1082	Cass County Drain No. 30	12/05/03	66,850	0	66,850
1176	Richland County Drain No. 2, Colfax Watershed	12/05/03	245,385	40,236	205,149
1705	Red River Joint WRD Coordinator	12/05/03	18,000	3,287	14,713
	Will and Carlson Consulting Contract	12/05/03	70,000	42,170	27,830
1070	Cass County Drain No. 14 Reconstruction	03/11/04	88,900	0	88,900
1075	Cass County Drain No. 21C Reconstruction	03/11/04	75,250	0	75,250
1080	Cass County Drain No. 27 Reconstruction	03/11/04	182,481	0	182,481

Water Commission - Projects/Grants/Contract Fund - Project Obligations (cont.)
July 1, 2003 - June 30, 2005

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
GENERAL PROJECT OBLIGATIONS (Cont.)					
1890	Coburn Drain No. 2 Reconstruction	03/11/04	44,546	0	44,546
1334	Traill County Drain No. 38 Reconstruction	03/11/04	222,172	0	222,172
1401	International Boundary Roadway Dike, Pembina County	03/11/04	200,000	49,122	150,878
1142	Pembina County Drain No. 16	04/16/04	37,415	33,304	4,111
1346	Mount Carmel Dam Engineering Services Project	04/30/04	5,000	0	5,000
247	Lynch Dam Repair, Steele County WRD	06/28/04	28,000	0	28,000
1331	Richland County Drain No. 14 Reconstruction Project	06/28/04	103,992	71,282	32,710
346	Epping Dam Review & Investigation	09/30/04	18,420	17,348	1,072
1077	Cass County Drain No. 24 Erosion Control Measures	09/30/04	7,000	0	7,000
1117	Grand Forks County Drain 27A Outlet Improvement	11/01/04	15,750	0	15,750
1925	Cooper Drain No.3 Construction, Griggs County	12/10/04	34,394	0	34,394
847	Lower Swan Creek Channel Improvement	12/10/04	140,000	0	140,000
568	Sheyenne River Snagging & Clearing	12/10/04	60,000	0	60,000
1303	Silver Lake Bak Stabilization Project, Sargent County	12/10/04	23,338	0	23,338
1588	Red River Basin Commission Operations (NRFP)	12/10/04	50,000	0	50,000
322	ND Water: A Century of Challenge	12/10/04	48,800	0	48,800
1842	Richland County WRD, Wild Rice Snagging & Clearing	01/31/05	17,000	0	17,000
870	Crown Butte Dam - Morton County	03/10/05	24,000	0	24,000
1926	Steele-Traill County Drain No. 2	03/10/05	250,000	0	250,000
1878	Maple River Flood Insurance Mapping Analysis	08/06/03	28,470	0	28,470
1929	Kummer Drain Outlet Improvement Reconstruction	04/14/05	1,165	0	1,165
616	McVile Dam Hydraulic Model Study	05/31/05	10,000	0	10,000
847	Casselton Township Improvement District No. 64	06/22/05	117,250	0	117,250
1919	Steele-Traill Drain No. 17 Construction Project	06/22/05	101,294	0	101,294
1931	Walsh County Assessment Drain 4B Construction	06/22/05	97,713	0	97,713
847	Swan Creek Tributary Channel Improvements No. 2	06/27/05	16,012	0	16,012
1114	High Flow Diversion, English Coulee to GF Drain No. 18	06/27/05	16,704	0	16,704
1930	Tyrol Lateral Drain No. 4	06/27/05	7,226	0	7,226
TOTAL GENERAL PROJECTS			9,647,776	3,761,191	5,886,585

Water Commission - Projects/Grants/Contract Fund - Completed Projects
July 1, 2003 - June 30, 2005

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
COMPLETED GENERAL PROJECTS					
1919	Steele-Traill Drain No. 17	12/06/02	45,127	0	45,127
1224	Traill County Drain No. 59, Garfield-Viking Drain)	06/12/03	250,000	0	250,000
543	North Lemmon Lake Dam Repair of Low-Level Drawdown	06/26/03	4,560	4,560	0
1486	Griggs County, Cooperstown Drain No. 3 Eng. Feas. Study	07/01/03	4,644	4,644	0
1270/1751	City of Bismarck Comprehensive Stormwater Mgmt. Plan	09/17/01	11,000	11,000	0
1772	Des Lacs River Upper Basin Emergency Floodwater Storage	07/23/02	19,183	19,183	0
1909	USGS Red River Wetland Monitoring & Modeling Project	03/17/03	18,000	18,000	0
	Sioux Irrigation District	12/06/02	21,060	16,781	4,279
568	Sheyenne River Snagging & Clearing	03/05/03	16,029	14,631	1,398
492	Lake George Outlet Control Structure Project 01/10/03 &	04/14/03	19,902	19,902	0
1271	Leonard Township EWP Natural Drainage Way Reconstruct.	08/26/02	7,092	6,838	254
828	Homme Dam Beach & Sidewalk Project (Walsh)	07/18/03	20,000	20,000	0
1746	Sweetwater-Morrison Lake Storage Contracts	11/03/03	27,750	27,750	0
1270	Brookfield Estates Diversion Ditch Extension Project	01/25/03	7,315	7,315	0
1117	Grand Forks County Drain No. 27	08/06/03	49,537	38,547	10,990
1625	Missouri River/Sertoma Park Purple Loosestrife Control	09/02/03	2,000	1,395	605
1392	NDSU Steven Shultz Econ Value of L. Sakakawea Fishing	06/13/03	1,820	1,820	0
568	Sheyenne River Snagging & Clearing	01/27/04	19,250	19,250	0
839	Upper Elm River Watershed Analysis & Channel Improv.	06/07/02	15,000	10,284	4,716
1271	Rush River WRD Amenia Township CAT Drop Structure	05/29/02	3,595	3,134	461
222	Buford-Trenton Irrigation Dist. Pump House & Controls	05/01/02	990	0	990
1117	Grand Forks County Drain No. 27A	08/16/01	250,000	215,512	34,488
1117	Grand Forks County Drain No. 27A	08/06/03	7,775	0	7,775
1919	Steele-Traill Drain No. 17	12/06/02	45,127	0	45,127
847	Swan Creek Diversion, Cass County	07/14/00	12,690	3,033	9,657
1826	North Dakota Natural Resources Trust	12/05/03	16,289	16,289	0
1080	Cass County Drain No. 27	09/11/00	7,263	0	7,263
1244/1232	Traill County Drain No. 27	03/05/03	250,000	0	250,000
1915	Traill County Drain No. 58 Construction Project	03/13/03	18,341	15,360	2,981
1842	Wild Rice River Snagging & Clearing	01/26/04	18,750	18,527	223
839	Elm River Dam No. 3, North Cass WRD	01/30/04	8,538	8,372	166
	Will and Carlson Consulting Contract	12/06/02	9,559	3,768	5,791
1296	Pembina County Drain No. 4	04/18/02	175	0	175
1588-1	Red River Basin Commission PIRC Funding	03/17/03	50,000	50,000	0
1591	ND Water Resource Districts Assn. (Handbook Revision)	08/16/01	28,153	23,419	4,734
305	Red River Basin Commission Main Stem Modeling Project	03/13/03	12,500	12,500	0
	ND Water Education Foundation 2004 Water Tours	03/08/04	2,500	2,500	0
1904	Walhalla Township Drain No. 3, Cavalier/Pembina	06/09/99	52,490	0	52,490
1905	Walhalla Township Drain No. 2, Cavalier/Pembina	06/09/99	95,311	0	95,311
1826	NDNRT Research on Sequestered Carbon Study	08/06/03	50,000	0	50,000
1694	Tongue River Snagging and Clearing	08/06/03	18,750	17,469	1,281
1638	Red River & Morais River Agricultural Dikes Survey	04/23/03	15,744	15,744	0
1923	Pembina County Drain No. 66	04/16/04	70,158	0	70,158
1303	Silver Lake Bank Stabilization Project	09/25/01	10,840	0	10,840
1315	Twelve Mile & Truax Township Pipeline, Williams County	01/27/97	87,800	50,809	36,991
1081	Cass County Drain No. 29A	07/14/00	42,769	42,769	0
1077	North Cass Water Resource District, Cass County Drain	08/15/02	116,614	116,614	0
1588-1	Red River Basin Commission Operations	12/05/03	100,000	100,000	0
1826	ND Natural Resources Trust	12/10/04	17,104	17,103	1
	2004 Water Tours		2,500	2,500	0
568	Sheyenne River Demonstration Practices, Snagging & Clear.	07/02/04	3,041	2,636	405
1403	North Dakota Water Resources Research Institute	12/10/04	13,862	13,862	0
1197	Richland County Drain No. 39	06/12/03	36,470	29,911	6,559
1919	Steele-Traill County Drain No. 17	11/03/03	92,333	0	92,333
1520	Walsh County Drain No. 30	12/06/02	76,944	27,058	49,886
568	Barnes County WRD, Sheyenne R. Snagging & Clearing	01/31/05	3,000	1,580	1,420
642	Sweetbriar	09/30/04	18,420	18,420	0

Water Commission - Projects/Grants/Contract Fund - Completed Projects (cont.)
July 1, 2003 - June 30, 2005

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
COMPLETED GENERAL PROJECTS (Cont.)					
591	City of Fargo, 12th Ave. North Dam	08/23/01	13,862	0	13,862
1803	City of Belfield Watershed Project Phase I	12/20/91 & 05/22/01	35,547	0	35,547
828	Homme Dam (Walsh)	11/29/95 & 09/13/99	15,500	0	15,500
1894	Tri-County Joint WRD Flood Control Study Project	05/01/02	24,640	0	24,640
1312	Phase I, Rural Ring Dike Project (Walsh County WRD)	08/13/98	25,000	25,000	0
642	Sweet Briar Dam, Morton County	03/05/03	29,344	29,343	1
	ND Water Magazine	08/06/03	36,000	36,000	0
1859	Section 319 Health Department	08/06/03	200,000	200,000	0
1258	Walsh County Drain No. 27	11/03/03	34,836	34,836	0
1418	Big Coulee Dam	09/30/04	18,420	18,420	0
TOTAL COMPLETED PROJECTS			2,658,813	1,414,389	1,244,425

State Water Commission

**Object Expenditures
for Biennial Period Ending June 30, 2005**

Permanent Salaries.....	\$ 6,416,341
Temporary Salaries and Overtime Salaries	297,860
Fringe Benefits	2,134,716
Travel	695,545
Supplies - IT Software	94,175
Supplies/Materials - Professional	279,782
Food and Clothing	2,061
Building, Grounds, Vehicle Supply	145,736
Miscellaneous Supplies	45,282
Office Supplies.....	14,583
Postage.....	29,528
Printing	26,240
IT Equipment under \$5,000	147,462
Other Equipment under \$5,000.....	47,378
Office Equipment & Furniture - Under \$5,000	3,553
Utilities.....	25,388
Insurance	7,402
Rentals/Leases - Equipment & Other.....	1,506
Rentals/Leases - Building/Land	82,100
Repairs	20,697
IT - Data Processing	83,269
IT - Communications	77,233
IT - Contractual Services and Repairs.....	52,725
Professional Development.....	143,308
Operating Fees and Services.....	322,425
Fees - Professional Services	5,013,476
Other Capital Payments (Includes Southwest Pipeline Project)	42,820,184
Grants, Benefits, and Claims	36,449,362
Transfers	<u>427,844</u>
TOTAL.....	\$95,907,162

State Water Commission

LONG-TERM DEBT

The State Water Commission has issued revenue bonds for the Southwest Pipeline Project. We have also issued bonds for statewide water development projects. The following table shows the State Water Commission's long-term debt as of June 30, 2005:

Water Development Bonds

PROJECT	SERIES	AMOUNT
Southwest Pipeline Project	1997 Series A	\$6,085,000
Southwest Pipeline Project	1997 Series B.....	3,225,950
Southwest Pipeline Project	1999 Series A	966,500
Southwest Pipeline Project	2000 Series A	1,275,000
Southwest Pipeline Project	2000 Series B.....	388,500
Southwest Pipeline Project	2001 Series A	490,000
Southwest Pipeline Project	2002 Series A	1,845,700
Southwest Pipeline Project	2003 Series A	1,540,000
Statewide Water Development Projects.....	2000 Series A	7,740,000
Statewide Water Development Projects.....	2005 Series A	21,630,000
Statewide Water Development Projects.....	2005 Series B.....	62,205,000

Resources Available from the Agency

Minutes of meetings held may be obtained by writing to:

ND State Water Commission
State Office Building Dept 770
900 East Boulevard Avenue
Bismarck, ND 58505-0850

Or, via the Internet: <http://www.swc.state.nd.us/reports/commeet.html>

Data available for public use:

- | | |
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| <ul style="list-style-type: none"> • Government Land Office Plats • Survey Horizontal and Vertical Control • Various Ground-Water Studies • Well and Site Location Data • Lithologic Data • Water Chemistry Data • Water Level Data | <ul style="list-style-type: none"> • Growing Season Rainfall & Hail Data • Water Permit Data • Drainage Permit Data • Stream Flow Data • Construction Permit Data • Retention Structure Data • Digital Map Data |
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Additional information about the State Water Commission is available on our web site on the Internet at <http://www.swc.state.nd.us/>.