

**North Dakota State Water Commission**

**Meeting To Be Held At  
State Office Building  
Lower Level Conference Room  
Bismarck, North Dakota**

**March 7, 2012  
1:30 P.M., CST**

**AGENDA**

- A. Roll Call
- B. Consideration of Agenda *Information pertaining to the agenda items is available on the State Water Commission's website at <http://www.swc.nd.gov>*
- C. **Consideration of Draft Minutes of Following SWC Meetings:**
  - 1) **December 9, 2011 State Water Commission Meeting** \*\*
  - 2) **February 2, 2012 SWC Audio Conference Call Meeting** \*\*
- D. State Water Commission Financial Updates:
  - 1) Agency Program Budget Expenditures
  - 2) 2011-2013 Biennium Resources Trust Fund and Water Development Trust Fund Revenues
- E. Fargo Moorhead Metropolitan Area Flood Risk Management Project Update
- F. Consideration of Following Requests for State Cost Participation:
  - 1) **Hobart Lake Outlet - Barnes County** \*\*
  - 2) **Lake Shore Estates Project - Mercer County** \*\*
  - 3) **Pembina County Drain No. 8 Reconstruction Project** \*\*
  - 4) **Mergenthal Drain No. 5 Reconstruction - Traill County** \*\*
  - 5) **City of Pembina Flood Control Levee Certification** \*\*
  - 6) **James River Basin Feasibility Study** \*\*
  - 7) **Valley City Flood Risk Management Feasibility Study** \*\*
  - 8) **City of Lisbon Flood Property Acquisition** \*\*
  - 9) **Burleigh County Flood Protection Project** \*\*
- G. Devils Lake:
  - 1) Projects Update:
    - a) **Drain Permit 3457, Devils Lake West Outlet** \*\*
  - 2) **Low Water Crossing, Sheyenne River (Gleason)** \*\*

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- H. Missouri River:
  - 1) Update
  - 2) ***Missouri River Geomorphic Assessment*** \*\*
- I. Red River Basin Commission, Long-Term Flood Solutions Plan
- J. Garrison Diversion Conservancy District
- K. Mouse River Enhanced Flood Control Project:
  - 1) Project Status Report
  - 2) Preliminary Engineering Report - Executive Summary
- L. Southwest Pipeline Project:
  - 1) Construction Update
  - 2) Project Update
  - 3) ***Seasonal Customers Type 3*** \*\*
- M. Northwest Area Water Supply (NAWS) Project Update
- N. Western Area Water Supply (WAWS) Project:
  - 1) Project Update
  - 2) Independent Water Providers
  - 3) Western Area Water Supply Project Authority
- O. Other Business:
  - 1) ***Resolution of Appreciation - LeRoy A. Klapprodt*** \*\*
- P. Adjournment

**\*\* BOLD, ITALICIZED ITEMS REQUIRE SWC ACTION**

To provide telephone accessibility to the State Water Commission meeting for those people who are deaf, hard of hearing, deaf and/or blind, and speech disabled, please contact Relay North Dakota, and reference ... TTY-Relay ND ... 1-800-366-6888, or 711.



## **MINUTES**

### **North Dakota State Water Commission Bismarck, North Dakota**

**March 7, 2012**

The North Dakota State Water Commission held a meeting at the State Office Building, Bismarck, North Dakota, on March 7, 2012. Governor Jack Dalrymple, Chairman, called the meeting to order at 1:30 P.M., and requested Todd Sando, State Engineer, and Chief Engineer-Secretary to the State Water Commission, to call the roll. Governor Dalrymple announced a quorum was present.

#### **STATE WATER COMMISSION MEMBERS PRESENT:**

Governor Jack Dalrymple, Chairman  
Doug Goehring, Commissioner, North Dakota Department of Agriculture, Bismarck  
Arne Berg, Member from Devils Lake  
Maurice Foley, Member from Minot  
Jack Olin, Member from Dickinson  
Harley Swenson, Member from Bismarck  
Robert Thompson, Member from Page

#### **STATE WATER COMMISSION MEMBERS ABSENT:**

Larry Hanson, Member from Williston  
Douglas Vosper, Member from Nече

#### **OTHERS PRESENT:**

Todd Sando, State Engineer, and Chief Engineer-Secretary,  
North Dakota State Water Commission, Bismarck  
State Water Commission Staff  
Approximately 50 people interested in agenda items

The attendance register is on file with the official minutes.

The meeting was recorded to assist in compilation of the minutes.

#### **CONSIDERATION OF AGENDA**

The agenda for the March 7, 2012 State Water Commission meeting was presented; there were no modifications to the agenda.

*It was moved by Commissioner Foley, seconded by Commissioner Olin, and unanimously carried, that the agenda be accepted as presented.*

**CONSIDERATION OF DRAFT MINUTES  
OF DECEMBER 9, 2011 STATE WATER  
COMMISSION MEETING - APPROVED**

The draft final minutes of the December 9, 2011 State Water Commission meeting were approved by the following motion:

*It was moved by Commissioner Goehring, seconded by Commissioner Thompson, and unanimously carried, that the draft final minutes of the December 9, 2011 State Water Commission meeting be approved as prepared.*

**CONSIDERATION OF DRAFT MINUTES  
OF FEBRUARY 2, 2012 STATE WATER  
COMMISSION AUDIO CONFERENCE  
CALL MEETING - APPROVED**

The draft final minutes of the February 2, 2012 State Water Commission audio conference call meeting were approved by the following motion:

*It was moved by Commissioner Goehring, seconded by Commissioner Thompson, and unanimously carried, that the draft final minutes of the February 2, 2012 State Water Commission audio conference call meeting be approved as prepared.*

**STATE WATER COMMISSION  
BUDGET EXPENDITURES,  
2011-2013 BIENNIUM**

In the 2011-2013 biennium, the State Water Commission has two line items - administrative and support services, and water and atmospheric resources expenditures. The allocated program expenditures for the period ending January 31, 2012, reflecting 29 percent of the 2011-2013 biennium, were presented and discussed by David Laschkewitsch, State Water Commission accounting manager. The expenditures, in total, are within the authorized budget amounts. **SEE APPENDIX "A"**

The Contract Fund spreadsheet, attached hereto as **APPENDIX "B"**, provides information on the committed and uncommitted funds from the Resources Trust Fund, the Water Development Trust Fund, and the general fund project dollars. The total amount allocated for projects is \$341,451,270, leaving a balance of \$48,384,312 available to commit to projects in the 2011-2013 biennium.

**RESOURCES TRUST FUND  
AND WATER DEVELOPMENT  
TRUST FUND REVENUES,  
2011-2013 BIENNIUM**

Oil extraction tax deposits into the Resources Trust Fund total \$83,484,211 and are currently \$27,977,078 or 50.4 percent above budgeted revenues.

No deposits have been received for the Water Development Trust Fund (tobacco settlement) in the 2011-2013 biennium. The first planned deposit is for \$10,300,000 in April of 2012.

**FARGO-MOORHEAD METROPOLITAN  
AREA FLOOD RISK MANAGEMENT  
PROJECT UPDATE  
(SWC Project No. 1928)**

The U.S. Army Corps of Engineers posted its Final Feasibility Report and Environmental Impact Statement (FEIS) on September 28, 2011 for the proposed Fargo-Moorhead Metropolitan Area

Flood Risk Management project. The 30-day public comment period on the FEIS began on October 7 and ended on November 7, 2011. The Corps of Engineers Chief's Report was executed in December, 2011 endorsing the Corps' Final Feasibility Report and Environmental Impact Study on the project. By signing the report, the Chief recommended that the diversion project be authorized as described in the final report prepared by the Corps for the Fargo-Moorhead Metropolitan Area Flood Risk Management project, and recommended that Congress authorize the project.

The President's Fiscal Years 2011 and 2012 provided the Corps of Engineers approximately \$15,000,000 to begin design, and the President's budget for Fiscal Year 2013 recognizes the importance of this project by including \$5,000,000 to fund the project design. The local sponsors have their funding in place and are committed to implementing the project.

The Corps of Engineers released the Fargo, N.D., Moorhead, Minn. Flood Risk Management Project Value Engineering Study report on March 6, 2012. Project representatives and the Corps of Engineers provided a summary of the value engineering study report, which is attached hereto as **APPENDIX "C"**. The Corps' team accepted 13 value-based proposals from the study for future consideration during the design phase, and will continue to look for ways to improve the proposed project and increase its value.

**HOBART LAKE OUTLET PROJECT  
(BARNES COUNTY) - CONDITIONAL  
APPROVAL OF STATE COST  
PARTICIPATION (\$266,100)  
(SWC Project No. 1989)**

A request from the Barnes County Water Resource District was presented for the State Water Commission's consideration for state cost participation for the Hobart Lake Outlet project to reduce the impacts of the flooding conditions

caused by high water levels on Hobart Lake. The current water surface elevations are causing damages to local businesses, threatening to overtop roadways and are inundat-

ing many acres of productive cropland. In 2011, the lake rose to a level that was more than seven feet higher than it was in 2006. The proposed project will create a controlled outlet for Hobart Lake and lower the lake approximately five feet to an elevation of 1414.0. The project is located approximately five miles west of Valley City, North Dakota.

The proposed project involves the construction of an outlet consisting of a combination of open channels and buried pipe. The open channel sections will be constructed with a 10-foot channel bottom with 4:1 side slopes and a relatively flat bottom slope to minimize channel erosion. A portion of the excavation will involve improvements to an existing natural drainage way to accommodate the depth and size of the new outlet. The buried pipe sections will be constructed of 36-inch diameter pipe. Discharges from the lake will be controlled by a control gate located on the upstream end of the outlet. Additional culverts will be installed on the open channel portions of the project and all culvert crossings have been designed to comply with stream crossing standards.

The proposed alignment would divert water around two existing grain elevator complexes and connect to an existing natural waterway that would eventually cross Interstate 94 and drain into the Sheyenne River south of Valley City.

The project engineer's cost estimate is \$815,000, of which \$591,325 is determined eligible for state cost participation as a rural flood control project at 45 percent of the eligible costs (\$266,100). The proposed project was submitted for conditional approval pending an assessment vote, and satisfaction of the required permits. The State Water Commission's cost share policy provides for conditional approval of rural flood control projects subject to the satisfaction of conditions. The request before the State Water Commission is for a 45 percent state cost participation in the amount of \$266,100.

It was the recommendation of Secretary Sando that the State Water Commission approve conditional state cost participation as a rural flood control project at 45 percent of the eligible costs, not to exceed an allocation of \$266,100 from the funds appropriated to the State Water Commission in the 2011-2013 biennium (S.B. 2020), to the Barnes County Water Resource District for the Hobart Lake Outlet project.

***It was moved by Commissioner Berg and seconded by Commissioner Thompson that the State Water Commission approve conditional state cost participation as a rural flood control project at 45 percent of the eligible costs, not to exceed an allocation of \$266,100 from the funds appropriated to the State Water Commission in the 2011-2013 biennium (S.B. 2020), to the Barnes County Water***

***Resource District for the Hobart Lake Outlet project. This action is contingent upon the availability of funds, a positive assessment vote, satisfaction of the required drain permit, and receipt of the final engineering plans.***

***Commissioners Berg, Foley, Goehring, Olin, Swenson, Thompson, and Governor Dalrymple voted aye. There were no nay votes. Governor Dalrymple announced the motion unanimously carried.***

***LAKE SHORE ESTATES HIGH FLOW  
DIVERSION PROJECT (MERCER  
COUNTY) - CONDITIONAL APPROVAL OF  
STATE COST PARTICIPATION (\$43,821)  
(SWC Project No. 1990)***

A request from the Mercer County Water Resource District was presented for the State Water Commission's consideration for state cost participation for the Lake Shore Estates High Flow Diversion project north of Beulah.

Recent rain and snowfall have caused a pond with no natural drain to inundate properties and disable sewage systems in the Lake Shore Estates rural subdivision. The diversion will redirect high flows away from the pond and across Corps property to Lake Sakakawea in Section 9, Township 146 North, Range 87 West. The Corps of Engineers and the North Dakota Game and Fish Department have been directly involved in the development of this diversion and have approved the construction of the diversion pipe across the Dakota Waters Recreation area.

The project engineer's cost estimate is \$119,510, of which \$97,380 is considered eligible for state cost participation as a rural flood control project at 45 percent of the eligible costs (\$43,821). The proposed project was submitted for conditional approval pending an assessment vote, and satisfaction of the required permits. The State Water Commission's cost share policy provides for conditional approval of rural flood control projects subject to the satisfaction of conditions. The request before the State Water Commission is for a 45 percent state cost participation in the amount of \$43,821.

It was the recommendation of Secretary Sando that the State Water Commission approve conditional state cost participation as a rural flood control project at 45 percent of the eligible costs, not to exceed an allocation of \$43,821 from the 2011-2013 biennium (S.B. 2020), to the Mercer County Water Resource District for the Lake Shore Estates High Flow Diversion project.

***It was moved by Commissioner Goehring and seconded by Commissioner Foley that the State Water Commission approve conditional state cost participation as a rural flood control project at***

**45 percent of the eligible costs, not to exceed an allocation of \$43,821 from the 2011-2013 biennium (S.B. 2020), to the Mercer County Water Resource District for the Lake Shore Estates High Flow Diversion project. This action is contingent upon the availability of funds, a positive assessment vote, satisfaction of the required drain permit, and receipt of the final engineering plans.**

**Commissioners Berg, Foley, Goehring, Olin, Swenson, Thompson, and Governor Dalrymple voted aye. There were no nay votes. Governor Dalrymple announced the motion unanimously carried.**

**PEMBINA COUNTY DRAIN NO. 8  
RECONSTRUCTION PROJECT -  
CONDITIONAL APPROVAL OF STATE  
COST PARTICIPATION (\$123,725)  
(SWC Project No. 1138)**

A request from the Pembina County Water Resource District was presented for the State Water Commission's consideration for state cost participation for the reconstruction of Pembina County Drain No. 8.

The landowners assessed to Pembina County Drain No. 8 have petitioned the Board to reconstruct approximately 2 miles of the drain starting from a point located in the NE1/4NW1/4 of Section 30, Township 163 North, Range 52 West, following the existing drain upstream, and concluding in the NE1/4 of Section 23.

Drain No. 8 overflows in several areas which allows water to overflow into Drain No. 42. The drain is currently on both sides of the east-west township road. The reconstruction project will occur to position the drain on only the south side of the township road as well as increase the capacity to minimize overflows. The current drain has 2.2:1 side slopes with a bottom width of 2-4 feet. The proposed drain would consist of establishing a workable grade, widening and deepening where needed, and establishing 3:1 side slopes with a bottom width of 16-24 feet.

The project engineer's cost estimate is \$316,741, of which \$274,945 is determined eligible for state cost participation as a rural flood control project at 45 percent of the eligible costs (\$123,725). The proposed project was submitted for conditional approval pending an assessment vote, and satisfaction of the required permits. The State Water Commission's cost share policy provides for conditional approval of rural flood control projects subject to the satisfaction of conditions. The request before the State Water Commission is for a 45 percent state cost participation in the amount of \$123,725.

It was the recommendation of Secretary Sando that the State Water Commission approve conditional state cost participation as a rural flood control project at 45 percent of the eligible costs, not to exceed an allocation of \$123,725 from the funds appropriated to the State Water Commission in the 2011-2013 biennium (S.B. 2020), to the Pembina County Water Resource District for the reconstruction of Pembina County Drain No. 8.

***It was moved by Commissioner Berg and seconded by Commissioner Goehring that the State Water Commission approve conditional state cost participation as a rural flood control project at 45 percent of the eligible costs, not to exceed an allocation of \$123,725 from the funds appropriated to the State Water Commission in the 2011-2013 biennium (S.B. 2020), to the Pembina County Water Resource District for the reconstruction of Pembina County Drain No. 8. This action is contingent upon the availability of funds, a positive assessment vote, satisfaction of the required drain permit, and receipt of the final engineering plans.***

***Commissioners Berg, Foley, Goehring, Olin, Swenson, Thompson, and Governor Dalrymple voted aye. There were no nay votes. Governor Dalrymple announced the motion unanimously carried.***

***MERGENTHAL DRAIN NO. 5  
RECONSTRUCTION PROJECT -  
CONDITIONAL APPROVAL OF STATE  
COST PARTICIPATION (\$84,670)  
(SWC Project No. 1227)***

A request from the Traill County Water Resource District was presented for the State Water Commission's consideration for state cost participation for the reconstruction of Mergenthal Drain No. 5.

Traill County Mergenthal Drain No. 5 was constructed in 1904. The original crossings have been replaced, and channel maintenance was completed in 1978. The channel is approximately 4-1/2 miles in length and outlets into an unnamed coulee that flows into the Goose River in the SE1/4 of Section 28, Township 146 North, Range 50 West. The watershed is predominately cropland. The project should have a minimal effect to any identified wetlands as none are to be drained by this project.

The project engineer's cost estimate is \$287,638, of which \$188,155 is determined eligible for state cost participation as a rural flood control project at 45 percent of the eligible costs (\$84,670). The proposed project was submitted for conditional approval pending an assessment vote, and satisfaction of the required permits. The State Water Commission's cost share policy provides for conditional approval of rural flood control projects subject to the satisfaction of conditions. The request before the State Water Commission is for a 45 percent state cost participation in the amount of \$84,670.

It was the recommendation of Secretary Sando that the State Water Commission approve conditional state cost participation as a rural flood control project at 45 percent of the eligible costs, not to exceed an allocation of \$84,670 from the funds appropriated to the State Water Commission in the 2011-2013 biennium (S.B. 2020), to the Traill County Water Resource District for the reconstruction of Mergenthal Drain No. 5.

***It was moved by Commissioner Swenson and seconded by Commissioner Thompson that the State Water Commission approve conditional state cost participation as a rural flood control project at 45 percent of the eligible costs, not to exceed an allocation of \$84,670 from the funds appropriated to the State Water Commission in the 2011-2013 biennium (S.B. 2020), to the Traill County Water Resource District for the reconstruction of Mergenthal Drain No. 5. This action is contingent upon the availability of funds, a positive assessment vote, satisfaction of the required drain permit, and receipt of the final engineering plans.***

***Commissioners Berg, Foley, Goehring, Olin, Swenson, Thompson, and Governor Dalrymple voted aye. There were no nay votes. Governor Dalrymple announced the motion unanimously carried.***

**CITY OF PEMBINA FLOOD CONTROL SYSTEM FEMA LEVEE CERTIFICATION AND ACCREDITATION PROJECT - APPROVAL OF ADDITIONAL STATE COST PARTICIPATION (\$108,000) (SWC Project No. 1444)**

On March 11, 2010, the State Water Commission considered a request from the City of Pembina for state cost participation in their costs to analyze the city's flood control levee system for compliance with FEMA guidelines as outlined in the Code of Federal

Regulations (CFR), Title 44 Part 65.10. The analysis is required for FEMA to accredit the levee system, flood insurance mapping purposes, operations are designed and/or to the current standards, and provides protection from the 100-year flood. The analysis of the city's flood protection system will produce a statement from a registered professional engineer as to whether the elements of the system are designed in accordance with sound engineering practices to comply with the requirements in the CFR, Title 44 Part 65.10. The State Water Commission approved an allocation not to exceed \$27,156 from the funds appropriated to the State Water Commission in the 2009-2011 (H.B. 1020).

In May of 2011, the City of Pembina submitted a conceptual proposal to the Corps of Engineers to raise the floodwall and levee as part of the certification process because any modification to the Pembina protection system requires Corps of Engineers approval. The review comments were received on September 23, 2011 and a technical meeting was held to discuss the comments on October 12, 2011.



Based upon the proposed levee and floodwall raises, the Corps has indicated that the proposed changes to the flood protection system will definitely be considered a major modification requiring a Section 408 review. This process involves detailed technical submittals by the project proposer, technical reviews by the Corps of Engineers, and an agreement between a project sponsor and the Corps of Engineers in order for the major modification to proceed. The major modification also requires the sponsor to provide funding to the Corps.

The estimated total cost for the City of Pembina's Corps of Engineers Section 408 review is \$230,000, of which \$108,000 is determined eligible for state cost share participation at 60 percent (\$108,000). A request from the City of Pembina was presented for the State Water Commission's consideration for a 60 percent state cost participation in the amount of \$108,000.

It was the recommendation of Secretary Sando that the State Water Commission approve state cost participation at 60 percent of the eligible costs, not to exceed an allocation of \$108,000 from the funds appropriated to the State Water Commission in the 2011-2013 biennium (S.B. 2020), to the City of Pembina to support the Corps of Engineers Section 408 review for the City of Pembina's flood control system FEMA levee certification and accreditation project.

***It was moved by Commissioner Goehring and seconded by Commissioner Berg that the State Water Commission approve state cost participation at 60 percent of the eligible costs not to exceed an allocation of \$108,000 from the funds appropriated to the State Water Commission in the 2011-2013 biennium (S.B. 2020), to the City of Pembina to support the Corps of Engineers Section 408 review for the City of Pembina's flood control system FEMA levee certification and accreditation project. This action is contingent upon the availability of funds.***

***Commissioners Berg, Foley, Goehring, Olin, Swenson, Thompson, and Governor Dalrymple voted aye. There were no nay votes. Governor Dalrymple announced the motion unanimously carried.***

***JAMES RIVER BASIN IN NORTH  
DAKOTA, ENGINEERING FEASIBILITY  
STUDY, PHASE I - APPROVAL OF STATE  
COST PARTICIPATION (\$160,480)  
(SWC Project File PSWRDJAM)***

A request from the James River Joint Water Resource District was presented for the State Water Commission's consideration for state cost participation for a Corps of Engineers feasibility study on the James River. The focus of the study is to look at possible flood reduction alternatives within the boundaries of the North Dakota James River basin consisting of Wells, Eddy, Foster, Stutsman, LaMoure and Dickey counties.

The District is working to secure permanent solutions to the numerous flooding problems which have occurred along the James River over the past several years. The repeated flooding events in 2009, 2010 and 2011 resulted in significant damages to include economic and environmental impacts within each of the counties.

The James River Joint Water District sponsored a supporting Corps of Engineers reconnaissance study for the North Dakota James River basin with federal funds secured by the North Dakota congressional delegation in 2009/2010. The results of this study that was completed in 2011, reflects a federal interest and recommendation for pursuit of a Corps feasibility study.

The Corps Feasibility Study Program Management Plan (PMP) has been drafted to include two phases. The Corps feasibility studies are cost shared 50 percent federal and 50 percent local non-federal. The estimated total cost of the James River Joint Water Resource District's feasibility study, Phase I, is \$755,688, of which the local non-federal costs are projected at \$378,000 (50 percent). A request from the James River Joint Water Resource District was presented for the State Water Commission's consideration for state cost participation in the non-federal costs. As part of the work in-kind contribution for their local costs, the District has requested assistance from the State Water Commission with the bathymetry collection for the lower James River basin (Interstate 94 to the North Dakota/South Dakota border). The Commission's staff has projected the cost for this assistance at \$57,040. The request before the State Water Commission is for a 50 percent state cost participation in the amount of \$160,480 (local non-federal eligible costs of \$378,000, less \$57,040 for State Water Commission in-kind services).

Phase I is anticipated to be completed in 12-18 months. If the District decides to continue with Phase II, the projected cost is \$1,320,000, with the local non-federal share of \$660,000 (50 percent). The successful completion of this study, and a recently completed feasibility study on the James River in South Dakota, will provide both states additional leverage towards their allocation of federal assistance for the potential implementation of identified solutions.

It was the recommendation of Secretary Sando that the State Water Commission approve state cost participation at 50 percent of the eligible non-federal costs, not to exceed an allocation of \$160,480 from the funds appropriated to the State Water Commission in the 2011-2013 biennium (S.B. 2020), and the in-kind services for the bathymetry work (\$57,040), to support the James River Joint Water Resource District engineering feasibility study, Phase I, James River basin in North Dakota.

***It was moved by Commissioner Foley and seconded by Commissioner Berg that the State Water Commission approve state cost participation at 50 percent of the eligible non-federal costs, not***

***to exceed an allocation of \$160,480 from the funds appropriated to the State Water Commission in the 2011-2013 biennium (S.B. 2020), and the in-kind services for the bathymetry work (\$57,040), to support the James River Joint Water Resource District engineering feasibility study, Phase I, James River basin in North Dakota. This action is contingent upon the availability of funds.***

***Commissioners Berg, Foley, Goehring, Olin, Swenson, Thompson, and Governor Dalrymple voted aye. There were no nay votes. Governor Dalrymple announced the motion unanimously carried.***

***CITY OF VALLEY CITY FLOOD RISK  
MANAGEMENT FEASIBILITY STUDY,  
PHASE I - APPROVAL OF STATE  
COST PARTICIPATION (\$115,244)  
(SWC Project No. 1504)***

A request from the City of Valley City was presented for the State Water Commission's consideration for state cost participation in a Flood Risk Management Feasibility study to be completed by the U.S. Army Corps of

Engineers. The study will consist of three phases, the primary product of Phase 1 will be a feasibility report and associated NEPA documents that will focus on a flood damage reduction project for the city and determine if there is a federal interest in its implementation. Completion of a study does not mean a justified federal project will be identified.

The primary study objectives will focus on the following: 1) reduce average annual flood damages to the city; 2) maximize access to the city's essential city services during flood events; 3) reduce risks to public safety during flood events and improve social wellbeing; 4) restore riverine and riparian habitat in and along the Sheyenne River through the city; and 5) increase recreational opportunities where compatible with other flood risk management features.

These study efforts will be documented in a Screening Letter Report (Phase I), a draft Feasibility Report and Environmental Assessment (Phase 2), and a final Feasibility Report and Environmental Assessment (Phase 3). Phase I will include an analysis of a number of potential alternative plans and project features and will compare various plans. This phase will also include a public notice about the study as well as conducting an informational public workshop. This screening of alternatives will include preliminary evaluations of a variety of possible flood reduction features and identification of possible national ecosystem restoration features.

The estimated total cost of Phase I of the feasibility study is \$460,974, of which the non-federal share equates to \$230,487 (50 percent). The request before the State Water Commission is for a 50 percent state cost participation of the eligible non-federal costs (\$230,487) in the amount of \$115,244.

It was the recommendation of Secretary Sando that the State Water Commission approve state cost participation as an engineering feasibility study at 50 percent of the eligible non-federal costs, not to exceed an allocation of \$115,244 from the funds appropriated to the State Water Commission in the 2011-2013 biennium (S.B. 2020), to the City of Valley City to support Phase I of a flood risk management feasibility study.

***It was moved by Commissioner Thompson and seconded by Commissioner Goehring that the State Water Commission approve state cost participation as an engineering feasibility study at 50 percent of the eligible non-federal costs, not to exceed an allocation of \$115,244 from the funds appropriated to the State Water Commission in the 2011-2013 biennium (S.B. 2020), to the City of Valley City to support Phase I of a flood risk management feasibility study. This action is contingent upon the availability of funds.***

***Commissioners Berg, Foley, Goehring, Olin, Swenson, Thompson, and Governor Dalrymple voted aye. There were no nay votes. Governor Dalrymple announced the motion unanimously carried.***

**CITY OF LISBON FLOODWAY  
PROPERTY ACQUISITION  
PROJECT - STATE COST  
PARTICIPATION  
(2011 SENATE BILL 2371 - \$645,000)  
(SWC Project No. 1991-05)**

A request from the City of Lisbon was presented for the State Water Commission's consideration for state cost participation in their project to acquire property for permanent flood control. The city has acquired 6 properties at a total cost of \$222,567, and it

is the city's intent to acquire 19 additional properties through buyout or relocation at an estimated purchase price for these properties at \$637,433, for a total of \$860,000. The request before the State Water Commission is for a 75 percent state cost participation in the amount of \$645,000.

It was the recommendation of Secretary Sando that the State Water Commission approve state cost participation at 75 percent of the eligible costs, not to exceed an allocation of \$645,000 from the funds appropriated to the State Water Commission in 2011 Senate Bill 2371, to the City of Lisbon to support the city's property acquisition project.

***It was moved by Commissioner Goehring and seconded by Commissioner Berg that the State Water Commission approve state cost participation at 75 percent of the eligible costs, not to exceed an allocation of \$645,000 from the funds appropriated to the State Water Commission in 2011 Senate Bill 2371, to City of Lisbon to support the city's property acquisition project. This action is contingent upon the availability of funds, and satisfaction of the State Water Commission's floodway property acquisition cost share policy criteria.***

***Commissioners Berg, Foley, Goehring, Olin, Swenson, Thompson, and Governor Dalrymple voted aye. There were no nay votes. Governor Dalrymple announced the motion unanimously carried.***

***BURLEIGH COUNTY FLOODWAY  
PROPERTY ACQUISITION PROJECT -  
APPROVAL OF STATE COST  
PARTICIPATION  
(2011 SENATE BILL 2371 - \$1,425,000)  
(SWC Project No. 1992-05)***

A request from the Burleigh County Water Resource District was presented for the State Water Commission's consideration for state cost participation in their project to acquire 4 properties located on Hogue Island for a future flood control project at an estimated

purchase price of \$1,900,000, all of which is determined eligible for a 75 percent state cost participation in amount of \$1,425,000.

The District has been asked by the Burleigh County Commission to act as the County's agent for this undertaking. It is the intent of the District to negotiate a price with the affected property owners, which will be based on pre-flood value. The project will not advance if an agreement cannot be reached with all of the landowners.

It was the recommendation of Secretary Sando that the State Water Commission approve state cost participation at 75 percent of the eligible costs, not to exceed an allocation of \$1,425,000 from the funds appropriated to the State Water Commission in 2011 Senate Bill 2371, to the Burleigh County Water Resource District to support the District's property acquisition project on Hogue Island.

***It was moved by Commissioner Foley and seconded by Commissioner Berg that the State Water Commission approve state cost participation at 75 percent of the eligible costs, not to exceed an allocation of \$1,425,000 from the funds appropriated to the State Water Commission in 2011 Senate Bill 2371, to the Burleigh County Water Resource District to support the District's property acquisition***

***project on Hogue Island. This action is contingent upon the availability of funds, and satisfaction of the State Water Commission's floodway property acquisition cost share policy criteria.***

***Commissioners Berg, Foley, Goehring, Olin, Swenson, Thompson, and Governor Dalrymple voted aye. There were no nay votes. Governor Dalrymple announced the motion unanimously carried.***

***DEVILS LAKE HYDROLOGIC,  
AND PROJECTS UPDATES  
(SWC Project No. 416-17)***

The Devils Lake hydrologic report, and project updates were provided, which are detailed in the staff memorandum, dated February 27, 2012, and attached hereto as ***APPENDIX "D"***.

***APPROVAL OF MODIFICATION TO  
DRAIN PERMIT NO. 3457, DEVILS  
LAKE WEST END OUTLET,  
ELIMINATION OF CONDITION NO. 2  
(SWC Project No. 416-17)***

Drain Permit No. 3457, Devils Lake West End Outlet, was executed by the North Dakota State Engineer on June 3, 2010. Condition No. 2 of the permit stipulates, "Discharge of water to the Sheyenne River shall not cause the 600

cubic feet per second (cfs) channel capacity of the Sheyenne River to be exceeded."

Due to the above-normal inflows over the years, and despite operation of the Devils Lake west end outlet (channel capacity of 250 cfs), Devils Lake continued to rise causing further devastation and economic losses in the Devils Lake basin. The State of North Dakota is currently constructing a second outlet, referred to as the east end outlet, with a channel capacity of 350 cfs. The total combined outlets capacity is 600 cfs. It is the intent of the state to operate the Devils Lake outlets to remove as much water from Devils Lake as possible while adhering to the state laws and the limitations set forth in the operating plan.

The Devils Lake Outlet Mitigation Plan was completed by the State Water Commission on June 22, 2011, which includes two key components to reduce the risk of downstream damages from a Devils Lake overflow: 1) the construction of emergency outlets to remove floodwater from Devils Lake in a controlled fashion to help prevent new damages around the Sheyenne River and reduce the risk of a natural catastrophic spill; and 2) addressed issues downstream that may result from the emergency outlet projects.

It was the recommendation of Secretary Sando the State Water Commission request the North Dakota State Engineer to eliminate Condition No. 2 to Drain Permit No. 3457, Devils Lake West End Outlet, so that the discharge of water from the Devils Lake outlets to the Sheyenne River would not cause the 600 cfs channel capacity of the Sheyenne River to be exceeded.

***It was moved by Commissioner Goehring and seconded by Commissioner Berg that the State Water Commission shall hereby request that the North Dakota State Engineer eliminate Condition No. 2 to the Drain Permit No. 3457, Devils Lake West End Outlet, in order that the discharge of water from the Devils Lake outlets to the Sheyenne River shall not cause the 600 cfs channel capacity of the Sheyenne River to be exceeded.***

***Commissioners Berg, Foley, Goehring, Olin, Swenson, Thompson, and Governor Dalrymple voted aye. There were no nay votes. Governor Dalrymple announced the motion unanimously carried.***

***DEVILS LAKE WEST END OUTLET -  
GLEASON CROSSING UPGRADE  
(EDDY COUNTY) - APPROVAL OF  
STATE COST PARTICIPATION (\$60,000)  
(SWC Project No. 416-7)***

In 2010, two crossings were identified in Eddy county as impacted when the Devils Lake west end outlet capacity was increased from 100 cubic feet per second (cfs) to 250 cfs. On December 10, 2010, the State Water Commission

approved an allocation not to exceed \$500,000 from the funds appropriated to the State Water Commission in the 2009-2011 biennium (H.B. 1020) to support the upgrade of the Langley crossing (previous referred to as Crossing A).

The Eddy County Commission did not have an interest in upgrading Crossing B. Therefore, at its meeting on December 10, 2010, the State Water Commission tabled a motion that state funds not be allocated for the upgrade of Crossing B (referred to as the Gleason crossing), located in Section 35, Township 150 North, Range 62 West, in Eddy county.

A petition containing over 800 signatures was presented in 2011 to the State Water Commission by Mr. and Mrs. Gleason. The Eddy County Commission has agreed to be a local sponsor for the project, and that Freeborn township would be responsible for the project maintenance.

***It was moved by Commissioner Berg, seconded by Commissioner Swenson, and unanimously carried, that the State Water Commission take the question from the table (December 10, 2010 meeting - that state funds not be allocated for the upgrade of Crossing B located in Section 35, Township 150 North, Range 62 West, in Eddy county).***

At the direction of the State Water Commission, the staff evaluated alternatives because of the concerns that the crossing has limited traffic and is on private land without public right-of-way. Upgrading the crossing to an additional 250 cfs capacity would require four 48-inch diameter culverts. at an estimated cost of \$60,000. Using the Commission's construction crew and equipment, the total estimated cost is \$60,000.

It was the recommendation of Secretary Sando that the State Water Commission approve an allocation not to exceed \$60,000 from the funds appropriated to the State Water Commission in the 2011-2013 biennium (S.B. 2020), to the Eddy County Commission to support the Gleason crossing upgrade.

***An amendment to the original motion was offered by Commissioner Berg and seconded by Commissioner Foley that the State Water Commission approve an allocation not to exceed \$60,000 from the funds appropriated to the State Water Commission in the 2011-2013 biennium (S.B. 2020), to the Eddy County Commission to support the Gleason crossing upgrade. This action is contingent upon the availability of funds.***

***Governor Dalrymple called the question on the amendment to the original motion, and asked for a roll call vote.***

***Commissioners Berg, Foley, Goehring, Olin, Swenson, Thompson, and Governor Dalrymple voted aye. There were no nay votes. Governor Dalrymple announced the amendment to the original motion unanimously carried.***

***Governor Dalrymple then called the question on the original motion, as amended, and asked for a roll call vote.***

***Commissioners Berg, Foley, Goehring, Olin, Swenson, Thompson, and Governor Dalrymple voted aye. There were no nay votes. Governor Dalrymple announced the original motion, as amended, unanimously carried.***

**MISSOURI RIVER REPORT  
(SWC Project No. 1392)**

The Missouri River report was provided, which is detailed in the staff memorandum, dated February 27, 2012, and attached hereto as **APPENDIX "E"**.



**MISSOURI RIVER GEOMORPHIC  
ASSESSMENT - APPROVAL OF STATE  
COST PARTICIPATION (\$140,000)  
(SWC Project No. 1392)**

A proposal from the U.S. Geological Survey to conduct a geomorphic assessment on the Missouri River in North Dakota was presented for the State Water Commission's consideration.

Several products are expected to result from this assessment including 1) conceptual model of governing geomorphic processes in the Missouri River, and the role of the 2011 flood; 2) conceptual model of Lake Oahe delta dynamics; 3) numerical model of the Bismarck/Mandan area of interest, prediction of channel evolution and sediment transport under certain management strategies; 4) sediment balance; and 5) vegetation analysis.

The assessment will utilize several data sets that have been collected and maintained over the years including the bathymetric data and aerial photography that was collected by the State Water Commission.

Geomorphic and sediment transport processes dictate all aspects of river management, enabling the State Water Commission to be proactive in understanding and creating a comprehensive and sustainable approach to river management in which solutions and common interest can be found for all stakeholders. A more thorough understanding of the geomorphology and sediment transport processes will allow critical decisions to be made on river management with a more scientific basis.

The total estimated cost of the assessment is \$1,076,000 over three years, of which \$516,000 is U.S. Geological Survey National Research program in-kind cost. The U.S. Army Corps of Engineer has committed \$100,000 through their Title VII program, reducing the unfunded balance to \$460,000. The Survey has the ability to cost share with state and local governments up to 50 percent of the remaining \$460,000, with funding commitments from the city of Bismarck (\$10,000); city of Mandan (\$10,000); Burleigh county (\$10,000); Morton county (\$10,000); North Dakota Department of Transportation (\$25,000); North Dakota Game and Fish Department (\$15,000); North Dakota Department of Health (\$10,000); and the North Dakota State Water Commission (\$140,000). The request before the State Water Commission is for state cost participation in the amount of \$140,000.

It was the recommendation of Secretary Sando that the State Water Commission approve state cost participation not to exceed an allocation of \$140,000 from the funds appropriated to the State Water Commission in the 2011-2013 biennium (S.B. 2020), to the U.S. Geological Survey to support the Missouri River geomorphic assessment.

***It was moved by Commissioner Olin and seconded by Commissioner Berg that the State Water Commission approve state cost participation not to exceed an allocation of \$140,000 from the funds***

***appropriated to the State Water Commission in the 2011-2013 biennium (S.B. 2020), to the U.S. Geological Survey to support the Missouri River geomorphic assessment. This action is contingent upon the availability of funds.***

***Commissioners Berg, Foley, Goehring, Olin, Swenson, Thompson, and Governor Dalrymple voted aye. There were no nay votes. Governor Dalrymple announced the motion unanimously carried.***

***RED RIVER BASIN COMMISSION -  
(SWC Project File AOC/RRC)***

Flood Solutions for the Red River Basin", attached hereto as ***APPENDIX "F"***.

Lance Yohe, Red River Basin Commission executive director, provided a report on the Commission's "Long Term

***GARRISON DIVERSION  
CONSERVANCY DISTRICT  
REPORT  
(SWC Project No. 237)***

Dakota and possible options for meeting those needs. The Act identified two project-related studies: the *Report on Red River Valley Water Needs and Options*, and the *Red River Valley Water Supply Project Environmental Impact Statement (EIS)*. The Bureau of Reclamation completed the *Report on Red River Valley Water Needs and Options*. The State of North Dakota and the Bureau jointly prepared the EIS. Governor Hoeven designated the Garrison Diversion Conservancy District to represent the state in this endeavor.

The Dakota Water Resources Act of 2000 authorized the Secretary of the Interior to conduct a comprehensive study of the water quantity and quality needs of the Red River valley in North

The final EIS was available to the public on December 28, 2007. The Secretary of the Interior executed a memorandum on January 15, 2009 disclosing the following: the project selected to meet the needs of the Red River Valley is the preferred alternative, pipeline from the McClusky Canal to Lake Ashtabula; and, the identified treatment processes are adequate to meet the requirements of the Boundary Waters Treaty. The U.S. State Department requested that the Bureau of Reclamation delay executing the Record of Decision until discussions with Canada have been concluded.

Dave Koland, Garrison Diversion Conservancy District general manager, provided a status report relating to the specific efforts of the Red River Valley Water Supply project, and the District's ongoing activities.

**MOUSE RIVER ENHANCED FLOOD  
PROTECTION PROJECT UPDATE  
(SWC Project No. 1971-01)**

The city of Minot intends to develop a flood control project that would provide the city and communities/developments outside of the city limits with protection

from the magnitude of flood events experienced in 2011. Because the proposed project is located outside of the city of Minot limits, the Souris River Joint Water Resource Board agreed to sponsor the project.

Resolution No. 3004, adopted by the Minot City Council on August 1, 2011, requested that the State Water Commission sponsor improvements to the Mouse River flood control system that would control floods of the magnitude of the 2011 flood, and that the State Water Commission search for and retain an engineering firm to design the project improvements.

The goal of the project is to provide protection for the Mouse River basin from a flood of the magnitude experienced in 2011. The first objective is levee alignment for Minot and Burlington of sufficient quality and accuracy to guide the owners of flood-damaged homes in their decision making. The second objective is a preliminary engineering report that will identify alternatives and features for the entire basin. On August 17, 2011, the State Water Commission passed a motion to proceed with the project and conduct an engineering selection process.

On September 7, 2011, the Commission authorized the Secretary to the State Water Commission to execute the engineering agreement with Barr Engineering, Minneapolis, MN. The conceptual plan and the preliminary alignment plan were available in November, 2011.

The total cost of the preliminary engineering work was estimated at \$2,500,000. On September 7, 2011, the State Water Commission approved an allocation not to exceed \$750,000 from the funds appropriated to the State Water Commission in the 2011-2013 biennium (S.B. 2020) to Barr Engineering for the preliminary engineering work for the Mouse River Enhanced Flood Control project; and on October 31, 2011, the Commission approved an additional allocation of \$1,750,000 for the preliminary engineering work. On December 9, 2011, the Commission approved an allocation not to exceed \$50,000 from the funds appropriated to the State Water Commission in the 2011-2013 biennium (S.B. 2020) to the Souris River Joint Water Resource Board to support their responsibilities as the local sponsor for the project.

Public workshops relating to defining the alignment for the Mouse River project were held in October, 2011; the initial alignment was defined and released on November 3, 2011; and public meetings were held on November 8, 9 and 10, 2011 in Minot. Recommended modifications in the alignments related to flood bypass diversions that would reduce the number of road closures and

the length of the dike alignment, and reduce the number of acquisitions required. The November meetings produced comments from people in the upstream and downstream areas of the project. The alignment in its final form was released on November 30, 2011.

On January 31, 2012, the Minot City Council held a special session to consider the two main modifications to the levee alignments in Minot. After public input, the Council adopted the Maple Diversion and the 27th Street SE diversion options.

On February 16, 2012, the Souris River Joint Water Resource Board's advisory committee met to conduct a workshop in Minot to address issues in the rural reaches of the project. This is a complex matter since there are different discharge and timing tolerances in the various areas. If these can be addressed, flexibility in operations of the rest of the system may be gained.

The preliminary engineering report executive summary was delivered on February 29, 2012, which is attached hereto as **APPENDIX "G"**.

**SOUTHWEST PIPELINE PROJECT -  
CONSTRUCTION/CONTRACT REPORTS  
(SWC Project No. 1736-05)**

The Southwest Pipeline Project construction and contracts reports were presented which are detailed in the staff memorandum, dated February 13, 2012, and attached hereto as **APPENDIX "H"**.

**SOUTHWEST PIPELINE PROJECT -  
APPROVAL OF SEASONAL CUSTOMER  
TYPE 3 CLASS  
(SWC Project No. 1736-05)**

The final design for Southwest Pipeline Project Contract 7-9D, which encompasses the north Zap rural distribution system, is in process. An on-site meeting was conducted at several Beulah Bay recreational area sites on January 9, 2012. There is a high density of seasonal users in the area and it is evident the seasonal users would not use as much water as the standard rural customers since there will be limited lawn watering and livestock use by these users. In order to avoid overdesigning the system by considering each seasonal home as a standard rural customer, and to encourage the users to sign up for Southwest Pipeline project water, a new seasonal customer type is proposed.

The Southwest Pipeline Project currently has two types of seasonal users which includes Type 1 (cemeteries) and Type 2 (parks), recreational areas, golf courses and seasonal cabins. Type 1 customers pay

6 months of standard minimums and have 12,000 gallons included with their minimum payment. Type 2 customers also have 12,000 gallons included with their minimum payment. There are currently no Type 1 customers being served by the project. Service to Type 2 customers is designed for a maximum flow rate of 7 gallons per minute.

The following criteria is proposed for the Seasonal Customer Type 3 class: 1) a customer should be located in a platted or recorded rural subdivision, which is considered a high-density area in the vicinity of a lake or reservoir within a recognized recreational area; 2) structures will be limited to a single-story building, double wide mobile home or smaller; 3) water use by the customer will be seasonal single-family household use with limited yard watering; 4) the customer will agree to a 3-gallon flow restrictor; and 5) no water is included in the annual minimum.

In the design, Seasonal Customer Type 3 will be considered as one half of an equivalent standard service unit, therefore, one half of the capital repayment required from a standard rural customer is proposed.

It was the recommendation of Secretary Sando that the State Water Commission approve the Seasonal Customer Type 3 Class, and that the corresponding capital repayment requirement is equivalent to one-half of the capital repayment required from a standard rural customer.

The Commission members questioned serving seasonal residents on this system while permanent residents are waiting to be served on other portions of this system as well as other systems around the state.

***It was moved by Commissioner Berg and seconded by Commissioner Swenson that the State Water Commission reject the recommendation.***

Ensuing discussion highlighted the main objective of the proposed user class to reduce the system capacity allocated to users meeting proposed criteria to enable the system to serve additional users in the future. Reservations were expressed relative to objectively selecting which users are served and which are denied as any user meeting feasibility criteria within the service area has been served in the past. The Commission staff expressed the opinion of the reduced capital repayment as not being an issue because construction costs per user for the proposed user class would likely be greatly reduced compared to typical construction costs for most rural users.

***An amendment to the original motion was offered by Commissioner Goehring and seconded by Commissioner Olin that the State Water Commission approve the Seasonal Customer Type 3 Class; and that the Secretary to the Commission and the Commission staff be directed to further review the capital repayment schedule for the proposed user class.***

***Commissioners Berg, Foley, Goehring, Olin, and Governor Dalrymple voted aye. Commissioners Swenson and Thompson voted nay. The recorded vote was 5 ayes; 2 nays. Governor Dalrymple announced the amendment to the original motion carried.***

***Governor Dalrymple then called the question on the original motion, and asked for a roll call vote:***

***Commissioners Berg, Foley, Goehring, Olin, and Governor Dalrymple voted aye. Commissioners Swenson and Thompson voted nay. The recorded vote was 5 ayes; 2 nays. Governor Dalrymple announced the original motion carried.***

***NORTHWEST AREA WATER  
SUPPLY (NAWS) PROJECT -  
STATUS REPORTS  
(SWC Project No. 237-04)***

The Northwest Area Water Supply (NAWS) project and construction status reports were provided, which are detailed in the staff memorandum, dated February 27, 2012, and attached hereto as ***APPENDIX "I"***.

***WESTERN AREA WATER SUPPLY  
(WAWS) PROJECT UPDATE  
(SWC Project No. 1973)***

2011 House Bill 1206 created the Western Area Water Supply (WAWS) project, under chapter 61-40 of the North Dakota Century Code.

On June 21, 2011, the State Water Commission passed a motion to approve the Western Area Water Supply project, Phase I, an allocation not to exceed \$25,000,000 authorized in 2011 House Bill 1206 from the funds appropriated to the State Water Commission in the 2011-2013 biennium for project construction, and that the Commission staff be delegated to review the specific plans and specifications. In order for the Authority to access the remaining loans of \$85,000,000, the Bank of North Dakota's letter of conditions, dated September 16, 2011, required the State Water Commission's approval of Phase II, Tier I. On December 9, 2011, the State Water Commission approved the Western Area Water Supply project, Phase II - Tier I projects, up to a total plan approval of \$100,000,000.

The Western Area Water Supply project status report was provided, which is detailed in the staff memorandum, dated February 7, 2012, and attached hereto as **APPENDIX "J"**.

The Independent Water Providers presented information relative to concerns regarding water needs and water development in North Dakota, which is attached as **APPENDIX "K"**.

The Western Area Water Supply project progress report was provided by the executive director of the Western Area Water Supply Authority, which is attached hereto as **APPENDIX "L"**.

Following lengthy discussion, Governor Dalrymple referred to 2011 House Bill 1206, 61-40-06. Oversight of authority projects. The legislation states, in part, "The authority shall comply with the policy of the state water commission as the policy relates to bidding, planning, and construction of the project. The policy must include provisions for insurance, including general liability insurance, in adequate amounts. The authority shall report to and consult with the state water commission regarding the operation and financial status of the project, as requested by the state water commission. ...

Based on 2011 House Bill 1206, Governor Dalrymple directed the Secretary to the Commission to draft policy of the State Water Commission focusing on the legislative intent, and issues including liability and indemnification, minimizing impacts on private water providers, and public availability of water. Governor Dalrymple stressed the importance of communication among the groups to resolve issues as the projects proceed.

*(Note: Based on Governor Dalrymple's direction, the State Water Commission's cost share policy committee met on March 29, 2011.)*

**RESOLUTION OF APPRECIATION  
TO LEROY A. KLAPPRODT, STATE  
WATER COMMISSION EMPLOYEE  
(SWC Resolution No. 2012-03-527)**

A resolution of appreciation to LeRoy A. Klapprodt was presented for the State Water Commission's consideration. Mr. Klapprodt admirably served the State of North Dakota as an employee of the State Water Commission for more than 40 years. Mr. Klapprodt announced his retirement as Director of the Planning and Education Division of the State Water Commission, effective December 26, 2011.

***It was moved by Commissioner Olin, seconded by Commissioner Berg, and unanimously carried, that the State Water Commission approve Resolution No. 2012-03-527, Resolution of Appreciation to LeRoy A. Klapprodt. SEE APPENDIX "M"***

Secretary Sando announced that Patrick M. Fridgen, presently the natural resource economist with the State Water Commission's planning and education division, was hired for the position vacated by Mr. Klapprodt.

There being no additional business to come before the State Water Commission, Governor Dalrymple adjourned the meeting at 6:15 P.M.



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Jack Dalrymple, Governor  
Chairman, State Water Commission

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Todd Sando, P.E.  
North Dakota State Engineer,  
and Chief Engineer-Secretary  
to the State Water Commission



STATE WATER COMMISSION  
 ALLOCATED PROGRAM EXPENDITURES  
 FOR THE PERIOD ENDED JANUARY 31, 2012  
 BIENNium COMPLETE: 29%

APPENDIX "A"  
 March 7, 2012

PROGRAM	SALARIES/ BENEFITS	OPERATING EXPENSES	GRANTS & CONTRACTS	Z/REP-12 PROGRAM TOTALS
<b>ADMINISTRATION</b>				
Allocated	1,926,299	1,303,575		3,229,874
Expended	555,259	272,545		827,804
Percent	29%	21%		26%
			Funding Source:	
			General Fund:	791,322
			Federal Fund:	36,482
			Special Fund:	0
<b>PLANNING AND EDUCATION</b>				
Allocated	1,285,138	212,198	99,000	1,596,336
Expended	362,004	45,781	25,522	433,306
Percent	28%	22%	26%	27%
			Funding Source:	
			General Fund:	337,576
			Federal Fund:	61,529
			Special Fund:	34,202
<b>WATER APPROPRIATION</b>				
Allocated	3,949,169	446,511	1,130,000	5,525,680
Expended	1,118,788	158,543	70,416	1,347,748
Percent	28%	36%	6%	24%
			Funding Source:	
			General Fund:	1,322,282
			Federal Fund:	0
			Special Fund:	25,466
<b>WATER DEVELOPMENT</b>				
Allocated	5,634,922	9,772,937	265,000	15,672,859
Expended	1,472,172	2,084,879	31,531	3,588,581
Percent	26%	21%	12%	23%
			Funding Source:	
			General Fund:	1,347,696
			Federal Fund:	470,940
			Special Fund:	1,769,945
<b>STATEWIDE WATER PROJECTS</b>				
Allocated			325,881,750	325,881,750
Expended			103,065,593	103,065,593
Percent			32%	32%
			Funding Source:	
			General Fund:	0
			Federal Fund:	158,353
			Special Fund:	102,907,240
<b>ATMOSPHERIC RESOURCE</b>				
Allocated	901,205	712,307	4,694,692	6,308,204
Expended	251,707	54,891	424,906	731,503
Percent	28%	8%	9%	12%
			Funding Source:	
			General Fund:	478,886
			Federal Fund:	0
			Special Fund:	252,617
<b>SOUTHWEST PIPELINE</b>				
Allocated	437,264	6,201,500	38,744,857	45,383,621
Expended	151,382	831,923	15,358,388	16,341,693
Percent	35%	13%	40%	36%
			Funding Source:	
			General Fund:	0
			Federal Fund:	12,073,154
			Special Fund:	4,268,539
<b>NORTHWEST AREA WATER SUPPLY</b>				
Allocated	604,626	5,235,500	49,976,971	55,817,097
Expended	132,297	1,088,007	7,578,571	8,798,875
Percent	22%	21%	15%	16%
			Funding Source:	
			General Fund:	0
			Federal Fund:	2,162,296
			Special Fund:	6,636,580
<b>PROGRAM TOTALS</b>				
Allocated	14,738,623	23,884,528	420,792,270	459,415,421
Expended	4,043,608	4,536,570	126,554,925	135,135,103
Percent	27%	19%	30%	29%
<b>FUNDING SOURCE:</b>	<b>ALLOCATION</b>	<b>EXPENDITURES</b>	<b>REVENUE</b>	
GENERAL FUND	14,995,199	4,277,761	GENERAL FUND:	980
FEDERAL FUND	53,984,383	14,962,754	FEDERAL FUND:	16,392,376
SPECIAL FUND	395,985,838	115,894,588	SPECIAL FUND:	128,342,915
<b>TOTAL</b>	<b>464,965,420</b>	<b>135,135,103</b>	<b>TOTAL:</b>	<b>144,736,271</b>

STATE WATER COMMISSION  
PROJECTS/GRANTS/CONTRACT FUND  
2011-2013 BIENNIUM

	<i>Jan-12</i>				
	BUDGET	SWC/SE APPROVED	OBLIGATIONS EXPENDITURES	REMAINING UNOBLIGATED	REMAINING UNPAID
<b>CITY FLOOD CONTROL</b>					
FARGO/RIDGEWOOD	50,941	50,941	0	0	50,941
FARGO	66,473,088	66,473,088	12,654,570	0	53,818,518
GRAFTON	7,175,000	7,175,000	0	0	7,175,000
MINOT	2,550,000 a	2,550,000	1,301,633	0	1,248,367
WAHPETON	1,013,000	1,013,000	0	0	1,013,000
<b>FLOODWAY PROPERTY ACQUISITIONS</b>					
MINOT PHASE 1	17,750,000 b	17,750,000	0	0	17,750,000
BURLINGTON PHASE 1	1,039,000 b	1,039,000	0	0	1,039,000
WARD COUNTY PHASE 1	11,500,000 b	11,500,000	0	0	11,500,000
VALLEY CITY PHASE 1	3,000,000 a	3,000,000	0	0	3,000,000
<b>FLOOD CONTROL</b>					
RENWICK DAM	1,246,571	1,246,571	0	0	1,246,571
<b>WATER SUPPLY</b>					
REGIONAL & LOCAL WATER SYSTEMS	22,952,898	22,952,897	6,601,719	0	16,351,179
VALLEY CITY WATER TREATMENT PLANT	15,386,800	15,386,800	11,523,407	0	3,863,393
FARGO REVERSE OSMOSIS PILOT STUDY	15,000,000	600,000	285,348	14,400,000	314,652
RED RIVER WATER SUPPLY	62,224	62,224	0	0	62,224
WESTERN AREA WATER SUPPLY	25,000,000	25,000,000	12,841,679	0	12,158,321
SOUTHWEST PIPELINE PROJECT	22,369,199	22,369,199	4,268,539	0	18,100,660
NORTHWEST AREA WATER SUPPLY	19,432,008	13,932,008	3,564,056	5,500,000	10,367,952
IRRIGATION DEVELOPMENT	3,608,353	1,097,422	821,469	2,510,931	275,953
<b>GENERAL WATER MANAGEMENT</b>					
OBLIGATED	23,541,847	23,541,847	2,368,335	0	21,173,511
UNOBLIGATED	15,467,363			15,467,363	0
<b>DEVILS LAKE</b>					
BASIN DEVELOPMENT	92,340	92,340	8,506	0	83,834
DIKE	12,254,788	12,254,788	9,987,540	0	2,267,248
OUTLET	2,420,212	2,420,212	651,317	0	1,768,895
OUTLET OPERATIONS	6,215,627	6,215,627	1,700,305	0	4,515,322
DL TOLNA COULEE DIVIDE	4,366,720	4,366,720	4,261,738	0	104,982
DL EAST END OUTLET	71,848,290	61,342,273	31,303,005	10,506,017	30,039,268
DL GRAVITY OUTFLOW CHANNEL	17,000,000	17,000,000	0	0	17,000,000
DL JOHNSON FARMS STORAGE	125,000	125,000	0	0	125,000
WEATHER MODIFICATIONS	894,314	894,314	14,113	0	880,201
<b>TOTALS</b>	<b>389,835,582 b</b>	<b>341,451,270</b>	<b>104,157,278</b>	<b>48,384,312</b>	<b>237,293,992</b>

a Includes \$5,550,000 approved December 13, 2011 by the Budget Section.

b Includes \$30,289,000 that will be requested at the March 13, 2012 Budget Section.

STATE WATER COMMISSION  
PROJECTS/GRANTS/CONTRACT FUND  
2011-2013 Biennium

PROGRAM OBLIGATION

Approved SWC		Dept		Initial Approved Date	Total Approved	Total Payments	Jan-12 Balance
By	No						
<b>General Projects Obligated</b>					<b>21,291,545</b>	<b>992,618</b>	<b>20,298,927</b>
<b>General Projects Completed</b>					<b>1,350,301</b>	<b>1,350,301</b>	<b>0</b>
<b>Subtotal General Water Management</b>					<b>23,541,847</b>	<b>2,368,335</b>	<b>21,173,511</b>
<hr/>							
<b>Devils Lake Basin Development:</b>							
SWC	416-01	5000	Devils Lake Basin Joint Water Resource Manager	6/15/2011	60,000	0	60,000
SWC	416-02	5000	City of Devils Lake Levee System Extension & Raise	7/1/2011	12,254,788	9,987,540	2,267,248
SWC	416-05	2000	Devils Lake Outlet Awareness Manager	6/16/2011	32,340	8,506	23,834
SWC	416-07	5000	Devils Lake Outlet	7/1/2011	2,420,212	651,317	1,768,895
SWC	416-10	4700	Devils Lake Outlet Operations	7/1/2011	6,215,627	1,700,305	4,515,322
SWC	416-13	5000	DL Tolna Coulee Divide	7/1/2011	4,366,720	4,261,738	104,982
SWC	416-15	5000	DL East End Outlet	7/1/2011	61,342,273	31,303,005	30,039,268
SWC	416-17	5000	DL Emergency Gravity Outflow Channel	9/21/2011	17,000,000	0	17,000,000
SWC	416-18	5000	DL Johnson Farms Water Storage Site	6/10/2011	125,000	0	125,000
<b>Devils Lake Subtotal</b>					<b>103,816,960</b>	<b>47,912,411</b>	<b>55,904,549</b>
<hr/>							
SWC		7600	Weather Modification	7/1/2011	894,314	14,113	880,201
<b>TOTAL</b>					<b>341,451,270</b>	<b>104,157,278</b>	<b>237,293,992</b>

**STATE WATER COMMISSION  
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**PROGRAM OBLIGATION**

Approved SWC By	No	Dept	Initial Approved Date	Total Approved	Total Payments	Jan-12 Balance
<b>City Flood Control:</b>						
SWC	1927	5000	6/22/2005	50,941	0	50,941
SB 2020	1928	5000	6/23/2009	66,473,088	12,654,570	53,818,518
SWC	1771	5000	3/11/2010	7,175,000	0	7,175,000
SB 2371	1974	5000	9/21/2011	2,500,000	1,301,633	1,198,367
SB 2371	1974	5000	12/9/2011	50,000	0	50,000
SWC	518	5000	7/1/2011	1,013,000	0	1,013,000
<b>Subtotal City Flood Control</b>				<b>77,262,029</b>	<b>13,956,203</b>	<b>63,305,826</b>
<b>Floodway Property Acquisitions:</b>						
SB 2371	1974-05	5000	1/27/2012	17,750,000	0	17,750,000
SB 2371	1987-05	5000	1/27/2012	1,039,000	0	1,039,000
SB 2371	1523-05	5000	1/27/2012	11,500,000	0	11,500,000
SB 2371	1504-05	5000	12/9/2011	3,000,000	0	3,000,000
<b>Subtotal Floodway Property Acquisitions</b>				<b>33,289,000</b>	<b>0</b>	<b>33,289,000</b>
<b>Flood Control:</b>						
SWC	849	5000	5/17/2010	1,246,571	0	1,246,571
<b>Water Supply Advances:</b>						
	2373-09	5000	6/23/2008	1,295,056	46,861	1,248,195
	2373-31	5000	6/23/2008	3,295,000	1,770,701	1,524,299
	2373-24	5000	8/18/2009	2,355,670	484,263	1,871,407
<b>Water Supply Grants:</b>						
	2373-17	5000	6/23/2008	490,452	0	490,452
	2373-18	5000	12/17/2008	1,868,153	1,868,153	0
	2373-25	5000	6/23/2009	868,327	0	868,327
	2373-28	5000	3/11/2010	2,352,244	2,173,613	178,631
	2373-29	5000	7/28/2010	97,218	0	97,218
	2373-32	5000	6/21/2011	3,150,000	0	3,150,000
	2373-33	5000	6/21/2011	6,800,000	0	6,800,000
<b>Subtotal Water Supply</b>				<b>22,572,121</b>	<b>6,343,591</b>	<b>16,228,530</b>
<b>HB No. 1305 Permanent Oil Trust Fund</b>						
	2373-21	5000	6/23/2009	189,415	66,766	122,649
	2373-22	5000	6/23/2009	191,362	191,362	0
<b>Subtotal Permanent Oil Trust Fund</b>				<b>380,777</b>	<b>258,128</b>	<b>122,649</b>
	2373-26	5000	8/18/2009	15,386,800	11,523,407	3,863,393
	1984	5000	6/21/2011	600,000	285,348	314,652
	1912	5000	3/17/2008	62,224	0	62,224
	1973	5000	7/1/2011	25,000,000	12,841,679	12,158,321
	1736-05	8000	7/1/2011	22,369,199	4,268,539	18,100,660
	2374	9000	7/1/2011	13,932,008	3,564,056	10,367,952
<b>Subtotal Water Supply</b>				<b>77,350,231</b>	<b>32,483,028</b>	<b>44,867,203</b>
<b>Irrigation Development:</b>						
SWC	1389	5000	10/23/2001	98,907	8,555	90,352
SWC	AOC/IRA	5000	8/16/2011	100,000	25,000	75,000
SWC	1968	5000	6/1/2010	898,515	787,914	110,601
<b>Subtotal Irrigation Development</b>				<b>1,097,422</b>	<b>821,469</b>	<b>275,953</b>
<b>General Water Management</b>						
<b>Hydrologic Investigations:</b>				<b>900,000</b>		
SWC	1400/12	3000	10/10/2010	8,500	6,372	2,128
SWC	1400/13	3000	11/7/2011	17,000	9,345	7,655
	862	3000	6/1/2011	1,508	1,508	0
	967	3000	6/1/2011	0	0	0
	1690	3000	6/1/2011	2,184	2,184	0
	1703	3000	6/1/2011	1,740	1,740	0
	1707	3000	4/26/2011	1,137	1,136	0
	1761	3000	6/1/2011	462	461	0
	1761	3000	6/1/2011	0	0	0
	1395A	3000	10/18/2011	432,303	0	432,303
	1395	3000	4/14/2011	2,670	2,670	0
<b>Hydrologic Investigations Obligations Subtotal</b>				<b>467,503</b>	<b>25,416</b>	<b>442,087</b>
<b>Remaining Hydrologic Investigations Authority</b>				<b>432,498</b>		
<b>Hydrologic Investigations Authority Less Payments</b>						

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GENERAL PROJECT OBLIGATIONS

Approved SWC By	No	Dept	Approved Biennium		Initial Approved Date	Total Approved	Total Payments	Jan-12 Balance
SE	269	5000	2009-11	Fordville Dam Emergency Action Plan/GF CO.	3/3/2010	9,600	0	9,600
SWC	275	5000	2011-13	City of Fort Ransom Engineering Feasibility Study	10/19/2011	40,000	0	40,000
SWC	281	5000	2009-11	Three Affiliated Tribes/Fort Berthold Irrigation Study	10/26/2010	37,500	0	37,500
SWC	322	5000	2009-11	ND Water: A Century of Challenge	2/22/2010	36,800	0	36,800
SWC	347	5000	2009-11	City of Velva's Flood Control Levee System Certification	3/28/2011	102,000	0	102,000
SE	391	5000	2011-13	Sargent Co WRD, Silver Lake Dam Emergency Repairs	10/12/2011	2,800	0	2,800
SE	501	5000	2009-11	Pheasant Lake Dam Emergency Action Plan	4/20/2011	9,600	0	9,600
SWC	528	5000	2009-11	McGregor Dam Emergency Action Plan	6/23/2009	25,000	0	25,000
SWC	568	5000	2009-11	SCWRD Sheyenne River Snagging & Clearing Project	12/10/2010	362,250	184,467	177,783
SWC	568	5000	2011-13	Sheyenne River Snagging & Clearing Reaches 1-3 , Southeast Cass WRD	9/21/2011	255,750	0	255,750
SE	571	5000	2009-11	Oak Creek Snagging & Clearing Project	1/28/2011	5,000	0	5,000
SWC	620	5000	2007-09	Mandan Flood Control Protective Works (Levee)	9/29/2008	125,396	0	125,396
SE	642	5000	2009-11	Morton Co/Sweetbriar Dam Emergency Action Plan	5/17/2010	15,200	0	15,200
SWC	646	5000	2009-11	Christine Dam Recreation Retrofit Project	10/26/2010	184,950	0	184,950
SWC	646	5000	2009-11	Hickson Dam Recreation Retrofit Project	10/26/2010	44,280	0	44,280
SWC	829	5000	2011-13	Rush River Dam Preliminary Soils & Hydraulic Study/Rush River WRD	9/21/2011	57,500	0	57,500
SWC	829	5000	2011-13	Rush River WRD Berlin's Township Improvement District No. 70	10/19/2011	500,000	0	500,000
SE	847	5000	2009-11	Absaraka Dam Safety Analysis	8/31/2009	5,719	0	5,719
SWC	847	5000	2009-11	Swan Creek Diversion Channel Improvement Reconstruction	12/11/2009	76,528	0	76,528
SWC	847	5000	2009-11	Swan-Buffalo Detention Dam No. 12 Flood Control Dam Safety Project	7/28/2010	114,783	0	114,783
SWC	980	5000	2011-13	Maple River Watershed Food Water Retention Study/ Maple River WRD	9/21/2011	82,500	0	82,500
SWC	1069	5000	2009-11	Cass County Drain No. 13 Improvement Reconstruction	8/18/2009	122,224	0	122,224
SWC	1070	5000	2009-11	Cass County Drain No. 14 Improvement Recon	9/21/2011	415,610	55,665	359,945
SWC	1088	5000	2009-11	Cass County Drain No. 37 Improvement Recon	8/18/2009	92,668	0	92,668
SWC	1093	5000	2007-09	Cass Co. Drain No. 45 Extension Project	3/17/2008	124,757	0	124,757
SWC	1101	5000	2011-13	Dickey Co. WRD, Yorktown-Maple Drainage Improvement Dist No. 3	9/21/2011	242,795	0	242,795
SWC	1101	5000	2011-13	Traill Co./Brokke Drain No. 30, Ervin Township	9/21/2011	23,660	0	23,660
SWC	1101	5000	2011-13	Riverdale Township Improvement District #2 - Dickey -Sargent Co. WRD	9/21/2011	500,000	0	500,000
SB 2020	1131	5000	2009-11	Nelson Co. WRD/ Flood Related Water Projects	6/1/2011	250,000	79,638	170,362
SWC	1161	5000	2009-11	Pembina Co. Drain 55 Improvement Reconstruction	3/28/2011	88,868	0	88,868
SWC	1164	5000	2009-11	Pembina County Drain No. 64 Outlet Area Improvement	12/10/2010	41,480	0	41,480
SWC	1180	5000	2009-11	Richland Co. Drain No. 7 Improvement Reconstruction	3/11/2010	71,933	0	71,933
SWC	1219	5000	2011-13	District Drain No. 4 Reconstruction Project/ Sargent Co. WRD	9/21/2011	60,620	0	60,620
SWC	1219	5000	2011-13	City of Forman Floodwater Outlet - Sargent Co. WRD	9/21/2011	348,070	0	348,070
SWC	1224	5000	2011-13	Traill Co. WRD Preston Floodway Reconstruction Project	10/19/2011	208,570	0	208,570
SWC	1232	5000	2009-11	Traill Co. Drain No. 13 Channel Extension Project	8/18/2009	23,575	0	23,575
SWC	1244	5000	2009-11	Traill Co. Drain No. 27 (Moen) Reconstruction & Extension	3/11/2010	678,485	238,719	439,766
SWC	1245	5000	2009-11	Traill Co. Drain No. 28 Extension & Improvement Project	3/28/2011	336,007	0	336,007
SWC	1252	5000	2011-13	Walsh Co. Reconstruction Drain No. 97	9/21/2011	50,551	0	50,551
SWC	1267	5000	2011-13	Bottineau County LIDAR Collect/ Mike Hall	10/19/2011	90,000	0	90,000
SE	1289	5000	2009-11	McKenzie Co. Weed Control on Sovereign Lands	3/4/2011	11,705	0	11,705
SE	1291	5000	2009-11	Mercer County WRD Knife River Snagging & Clearing	11/1/2010	20,000	0	20,000
SWC	1296	5000	2011-13	Pembina County WRD Cook Bridge Riverbank Stabilization	10/21/2011	36,649	0	36,649
SE	1296	5000	2011-13	Pembina Co. WRD/ Bourbonais Dam 2012 EAP	2/6/2012	10,000	0	10,000
SE	1296	5000	2011-13	Pembina Co. WRD/ Goschke Dam 2012 EAP	2/6/2012	10,000	0	10,000
SE	1296	5000	2011-13	Pembina Co WRD/ Herzog Dam 2012 EAP	2/6/2012	10,000	0	10,000
SE	1296	5000	2011-13	Pembina Co WRD/ Weiler Dam 2012 EAP	2/6/2012	10,000	0	10,000
SE	1301	5000	2009-11	City of Lidgerwood Engineering & Feasibility Study for Flood Control	2/4/2011	15,850	0	15,850
SE	1301	5000	2011-13	City of Wahpeton Water Reuse Feasibility Study/Richland Co.	9/8/2011	2,500	0	2,500
SE	1303	5000	2011-13	Shortfood Creek Watershed Feasibility Study/ Sargent Co. WRD	9/15/2011	7,500	0	7,500
SE	1312	5000	2011-13	Walsh Co. WRD/Bylin Dam 2011 EAP	12/15/2011	14,800	0	14,800
SE	1312	5000	2011-13	Walsh Co. WRD / Matejcek Dam 2011 EAP	12/14/2011	5,360	0	5,360
SE	1312	5000	2011-13	Walsh Co. WRD/ Melstad Dam 2011 EAP	12/15/2011	9,088	0	9,088
SE	1312	5000	2011-13	Walsh Co. WRD/ Skyrud Dam 2011 EAP	12/15/2011	10,000	0	10,000
SE	1312	5000	2011-13	Walsh Co. WRD/ Union Dam 2011 EAP	12/15/2011	10,000	0	10,000
SE	1312	5000	2011-13	Walsch Co. WRD/Willow Creek Dam 2012 EAP	1/27/2012	10,000	0	10,000
SE	1313	5000	2011-13	Ward Co. 2011 LIDAR Review & Data Creation Products	10/11/2011	16,311	0	16,311
SWC	1313	5000	2009-11	City of Minot/Ward Co. Aerial Photo & LIDAR	3/11/2010	186,780	0	186,780
SWC	1344	5000	2009-11	Southeast Cass Sheyenne River (Horace Diversion Channel Site A)	3/11/2010	1,762,380	0	1,762,380
SWC	1344	5000	2009-11	Southeast Cass Sheyenne Sheyenne Pump Station	3/28/2011	60,750	47,426	13,324
SWC	1344	5000	2011-13	Southeast Cass Sheyenne River Diversion Low-Flow Channel Areas 3 & 4	6/14/2011	2,802,000	0	2,802,000
SWC	1392	5000	2011-13	U. S. Geological Hydrographic Survey of the Missouri River Bis - Washburn	6/15/2011	55,000	17,700	37,300
SE	1396	5000	2009-11	Dale Frink Consultant Services Agreement	10/26/2010	18,600	0	18,600
SWC	1401	5000	2009-11	International Boundary Roadway Dike Pembina	9/21/2009	227,431	0	227,431
SE	1403	5000	2011-13	ND Water Resources Research Institute - Fellowship Program 2012-13	2/1/2012	13,850	0	13,850
SE	1431	5000	2009-11	NDDOT Aerial Photography - Missouri River	11/19/2010	39,279	39,279	0
SWC	1438	5000	2009-11	Mulberry Creek Drain Partial Improv Phase III	3/28/2011	226,118	0	226,118
SWC	1444	5000	2011-13	City of Pembina's Flood Control FEMA Levee Certification	12/14/2011	16,936	0	16,936
SE	1577	5000	2009-11	Burleigh Co - Fox Island 2010 Flood Hazard Mitigation Evaluation	8/9/2010	11,175	0	11,175
SWC	1577	5000	2009-11	Hazen Flood Control Levee (1517) & FEMA Accreditation	3/11/2010	449,500	0	449,500
SWC	1603	5000	2011-13	Rush River Drain No. 69, Armenia Township, Cass Co.	9/21/2011	313,500	0	313,500
SE	1607	5000	2011-13	Flood Inundation Mapping of Areas Along Souris & Des Lacs River	6/15/2011	13,011	0	13,011
SE	1625	5000	2009-11	Sovereign Lands Rules - ND Game & Fish	2/23/2010	6,788	0	6,788
SWC	1638	5000	2009-11	Red River Basin Non-NRCS Rural/Farmstead Ring Dike Program	6/23/2009	424,262	159,362	264,900
SWC	1667	5000	2009-11	Traill Co/Goose River Snagging & Clearing	9/1/2010	12,890	0	12,890
SWC	1667	5000	2011-13	Traill Co./Goose River Snagging & Clearing	9/21/2011	48,000	0	48,000
SWC	1671	5000	2011-13	Ransom Co WRD/ Dead Cold Creek Dam 2011 Emergency Action Plan	6/14/2011	22,800	0	22,800
SWC	1705	5000	2011-13	Red River Basin Flood Control Coordinator Position	6/10/2011	36,000	0	36,000
SWC	1705	5000	2011-13	Red River Joint WRD Watershed Feasibility Study - Phase 2	9/21/2011	60,000	0	60,000
SE	1785	5000	2009-11	Sweetbriar Dam EAP	2/17/2010	15,200	0	15,200
SWC	1785	5000	2009-11	Maple River Dam EAP	8/18/2009	25,000	0	25,000
SWC	1792	5000	2009-11	SE Cass Wild Rice River Dam Study Phase II	12/11/2009	130,000	0	130,000

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Approved SWC By	No	Dept	Approved Biennium		Initial Approved Date	Total Approved	Total Payments	Jan-12 Balance
SWC	1806	5000	2011-13	City of Argusville Flood Control Levee Project	9/21/2011	25,432	0	25,432
SE	1842	5000	2009-11	SCWRD Wild Rice River Snagging & Clearing	5/28/2009	4,331	0	4,331
SWC	1842	5000	2009-11	SCWRD Wild Rice River Snagging & Clearing	12/10/2010	100,625	71,680	28,945
SWC	1842	5000	2011-13	SCWRD Wild Rice River Snagging & Clearing	9/21/2011	99,000	0	99,000
SWC	1859	5000	2011-13	ND Dept of Health Non-Point Source EPA Pollution Program Priority Project	9/21/2011	200,000	0	200,000
SWC	1918	5000	2001-13	Maple River WRD Normanna Township Improvement District No. 71	12/9/2011	287,900	0	287,900
SWC	1921	5000	2007-09	Square Butte Dam No. 6/(Harmon Lake) Recreation Facility	3/23/2009	852,251	0	852,251
HB 1020	1932	5000	2005-07	Michigan Spillway Rural Flood Assessment Drain	8/30/2005	500,000	0	500,000
SWC	1932	5000	2005-07	Michigan Spillway Rural Flood Assessment	8/30/2005	1,012,219	0	1,012,219
SWC	1941	5000	2011-13	Walsh County Drain No. 4a Cost Overrun	12/9/2011	9,759	0	9,759
SWC	1960	5000	2009-11	Puppy Dog Flood Control Drain Construction	8/18/2009	796,976	0	796,976
HB 2305	1963	5000	2009-11	Beaver Bay Embankment Feasibility Study	8/10/2009	258,406	14,535	243,871
SWC	1964	5000	2009-11	Hydraulic Effects of Rock Wedges Study- UND	11/12/2009	11,651	11,457	194
SE	1965	5000	2011-13	ND Silver Jackets Team Charter & Action Plan	7/1/2011	2,999	2,999	0
SWC	1966	5000	2009-11	City of Oxbow Emergency Flood Fighting Barrier System	6/1/2010	188,400	0	188,400
SE	1967	5000	2009-11	Grand Forks County Legal Drain No. 55 2010 Construction	11/30/2010	9,652	0	9,652
SWC	1968	5000	2011-13	Absaraka Dam Improvement Rehabilitation Project	8/12/2011	114,783	0	114,783
SWC	1968	5000	2011-13	McClusky Canal Mile Marker 7.5 Irrigation Project Phase 1, GDCCD	12/14/2011	898,515	0	898,515
SWC	1969	5000	2009-11	Walsh Co. Construction of Legal Assessment Drain # 71	3/28/2011	304,141	0	304,141
SWC	1970	5000	2009-11	Walsh Co. Construction of Legal Assessment Drain # 72	3/28/2011	144,807	0	144,807
SWC	1975	5000	2011-13	Walsh Co. Drain No. 31 Reconstruction Project	9/21/2011	111,116	0	111,116
SWC	1977	5000	2011-13	Jackson Township Improvement Dist. #1/Dickey-Sargent Co WRD	9/21/2011	500,000	0	500,000
SWC	1978	5000	2011-13	Richland & Sargent WRD RS Legal Drain No. 1 Extension & Channel Improvem	10/19/2011	245,250	0	245,250
SWC	1979	5000	2011-13	Southeast Cass WRD Wild Rice Riverbank Stabilization Project	10/21/2011	149,568	0	149,568
SWC	1983	5000	2001-13	City of Harwood Engineering Feasibility Study	12/9/2011	62,500	0	62,500
SB 2020	1986	5000	2011-13	USDA-APHIS North Dakota Wildlife Services - animal control/beaver mgmt	6/1/2011	250,000	0	250,000
SWC	1878-02	5000	2009-11	Maple-Steele Upper Maple River Dam PE & PD	12/10/2010	187,710	0	187,710
SWC	1878-02	5000	2011-13	Upper Maple River Dam Project Development & Preliminary Engineering	7/19/2011	187,710	0	187,710
SWC	1882-01	5000	2009-11	(ESAP) Extended Storage Acreage Program	8/18/2009	63,554	0	63,554
SWC	1882-07	5000	2009-11	NDSU Development of SEBAL	9/1/2010	15,244	0	15,244
SWC	642-05	5000	2007-09	Sweetbriar Creek Dam Project	3/6/2009	148,956	60,691	88,265
SWC	928/988/1508	5000	2007-09	Southeast Cass WRD Bois, Wild Rice, & Antelope	6/23/2008	60,000	0	60,000
SE	AOC/RRBC	5000	2009-11	Red River Basin "A River Runs North"	6/30/2010	5,000	0	5,000
SWC	AOC/RRBC	5000	2011-13	Red River Basin Commission Contractor	8/2/2011	200,000	0	200,000
SWC	AOC/WEF	5000	2011-13	ND Water Education/North Dakota Water Magazine	6/10/2011	36,000	9,000	27,000
SWC	CON/WILL-CA	5000	2011-13	Garrison Diversion Conservancy - Will Carlson Project	10/17/2011	70,000	0	70,000
SE	PBS	5000	2009-11	PBS Documentary on Soil Salinity/Lake Agassiz RC & D	1/29/2010	1,000	0	1,000
SWC	PS/IRR/NES	5000	2009-11	NDSU Williston Research Extension Center - purchase of irrigation equip	3/28/2011	60,050	0	60,050
SE	PS/WRD/MRJ	5000	2011-13	Missouri River Joint Water Board, (MRJWB) Start up	8/2/2011	20,000	0	20,000
SWC	PS/WRD/MRJ	5000	2011-13	Missouri River Joint Water Board (MRRIC) T. FLECK	8/2/2011	40,000	0	40,000
SE	PS/WRD/USR	5000	2011-13	Upper Sheyenne River WRB Administration (USRJWRB)	6/15/2011	6,000	0	6,000
TOTAL						21,291,545	992,618	20,298,927

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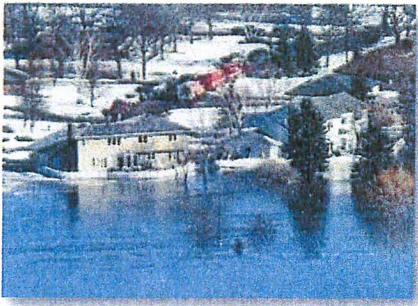
**COMPLETED GENERAL PROJECTS**

Approvec By	SWC No	Dept	Approved Biennium		Initial Approved Date	Total Approved	Total Payments	Jan-12 Balance
SE	266	5000	2011-13	Tolna Dam 2011 EAP, Nelson County WRD	8/23/2011	9,600	8,540	1,060
HB 1020	322	5000	2009-11	Long-Term Red River Flood Control Solutions Study (AOC/RRC)	6/23/2009	7,720	7,720	0
SWC	327	5000	2009-11	White Earth Dam EAP	8/18/2009	25,000	25,000	0
SE	568	5000	2007-09	Barnes Co/Sheyenne River Snagging & Clearing Project	4/11/2008	5,000	0	5,000
SE	839	5000	2009-11	Elm River Detention Dam No. 3 EAP	12/6/2010	12,160	7,162	4,998
SE	839	5000	2009-11	Elm River Detention Dam No. 1 EAP	1/10/2011	12,160	8,440	3,720
SWC	846	5000	2009-11	Morton Co.Square Butte Dam No. 5 EAP	12/10/2010	24,000	20,930	3,070
SE	929	5000	2009-11	Walsch Co. -Chyle Dam EAP	5/6/2011	10,000	7,546	2,454
SE	929	5000	2009-11	Walsch Co. -Soukop Dam EAP	3/2/2011	10,000	7,760	2,240
SE	985	5000	2009-11	Kolding Dam Emergency Action Plan	5/29/2009	9,600	5,960	3,640
SWC	1068	5000	2009-11	Cass County Drain No. 12 Improvement Reconstruction	8/18/2009	741,600	0	741,600
SE	1131	5000	2009-11	Elm River Detention Dam No. 2 Emergency Action Plan	12/6/2010	12,160	8,310	3,850
SWC	1299	5000	2009-11	City of Fort Ransom Riverbank Stabilization	9/1/2010	60,803	47,205	13,598
SWC	1331	5000	2009-11	Richland Co. Drain No. 14 Improvement Reconstruction	3/11/2010	116,988	16,549	100,439
SWC	1378	5000	2009-11	Clausen Springs Dam Emergency Spillway Repair	10/26/2010	790,975	770,746	20,229
SE	1378	5000	2011-13	Clausen Springs Dam Emergency Action Plan /Barnes Co. WR	8/23/2011	20,000	0	20,000
SWC	1413	5000	2009-11	Trails Co/Buffalo Coulee Snagging & Clearing	9/1/2010	26,000	19,659	6,341
SWC	1413	5000	2011-13	Trails Co/Buffalo Coulee Snagging & Clearing	9/21/2011	25,000	14,960	10,040
SE	1433	5000	2009-11	Whitman Dam Emergency Action Plan	4/14/2011	10,000	8,348	1,652
SWC	1842	5000	2009-11	Richland Co. Wild Rice River Snagging & Clearing Project - Re.	3/28/2011	47,500	47,466	34
SE	1842	5000	2009-11	Richland Co. - Ph 2- Wild Rice River Snagging & Clearing	2/1/2011	15,000	11,603	3,397
SWC	1932	5000	2009-11	Peterson Slough into Dry Run Emergency	5/28/2010	32,150	32,150	0
SWC	1942	5000	2009-11	Walsh County Assessment Drain 10, 10-1, 10-2	9/21/2009	37,267	13,544	23,723
SWC	1953	5000	2009-11	Walsh County Drain No. 73 Construction Project	8/18/2009	109,919	109,919	0
SWC	1971	5000	2009-11	DES Purchase of Mobile Stream Gages	3/28/2011	16,457	16,457	0
SE	1971	5000	2011-13	DES Purchase of Mobile Stream Gages (2 temporary stream ga	7/19/2011	8,000	8,000	0
SE	1312/929	5000	2011-13	Fischer Land Surveying & Engineering/Harriston Township Dike	12/12/2011	6,000	6,000	0
SE	AOC/ARB/ND	5000	2009-11	NDSU Dept of Soil Science - NDAWN Center	3/8/2010	3,000	3,000	0
SWC	AOC/RRBC	5000	2009-11	Red River Basin Commission Contractor	7/1/2009	100,000	100,000	0
SWC	PS/WRD/MRJ	5000	2011-13	Missouri River Joint Water Board (MRRIC) T. FLECK	6/30/2009	6,470	6,470	0
SWC	PS/WRD/MRJ	5000	2007-09	Missouri River Joint Water Board, (MRJWB) Start up	12/5/2008	14,829	10,857	3,972
<b>TOTAL</b>						<b>2,325,358</b>	<b>1,350,301</b>	<b>975,056</b>



# FM Metro Area Diversion

SPRING 2012 CONGRESSIONAL VISIT BRIEFING



## Flooding Threatens Vitality of Fargo-Moorhead

The Red River has exceeded flood stage in 48 of the past 109 years, and every year from 1993 through 2011. The flood stage of a 100-year event exceeds our flood fighting capabilities and would be devastating to the Fargo-Moorhead area. A 500-year event would flood nearly all of Fargo and a large portion of Moorhead, as well as a major portion of West Fargo and several surrounding communities in an area with a combined population of over 200,000 people.

Extreme flood events, like those experienced in Bismarck and Minot in 2011, could lead to more than \$10 billion (B) in damages to our area. We have made significant investments to improve our infrastructure. In recent years, the City of Fargo alone has invested more than \$43 million toward flood risk reduction projects. Even so, we had to mobilize the entire community to fight floods in 2009 (the flood of record), 2010, and 2011.

Our flood fighting was stretched to the maximum to prevent the 2009 flood, a 50-year event, from destroying our cities. This flood problem exceeds our local capabilities. Our people are tired, and the flooding impacts our economy.

The Fargo-Moorhead metro area generates over 103,000 jobs and more than \$4.35 billion (B) in annual non-farm wages. The economic center generates over \$2.77 billion (B) in annual taxable sales. Flood risk presents the largest threat to our vital economic center.

## Project Status

- Corps' Feasibility Study and Environmental Impact Statement are complete.
- Chief of Engineers of the U.S. Army Corps of Engineers signed the Chief's Report in December 2011 and recommended Congress authorize the project.
- President's budget for FY-13 recognizes the importance of this project by including \$5 million to fund project design.
- The local sponsors have their funding in place and are committed to implementing the project.
- We appreciate the President's budget in FY-11 and FY-12 that provided the Corps approximately \$15 million to begin design. We have our \$15 million FY-12 matching funds and program in place, and we will successfully execute the design program this year.

## Project Needs

- In order to keep this project on schedule to provide reliable flood protection at the earliest time, the Corps St. Paul District's reported capability for FY-13 was \$30 million. We have our cost sharing plan in place to match the Corps appropriations now and in future years. Delays in authorization and funding will prolong an unacceptable level of risk for the Fargo-Moorhead area.
- Beyond the FY-13 budget, the project needs Congressional authorization and continued federal funding for design, as well as construction appropriations.

The residents of Fargo-Moorhead have been successful at preventing significant damages by constructing emergency levees along large portions of the Red River. However, the work takes significant financial and human resources, disrupts business and traffic, and taxes the social fabric of the communities. Moreover, emergency levees carry a high risk of failure.

- The U.S. Corps of Engineers and the cities of Fargo and Moorhead began the Fargo-Moorhead Metro Feasibility Study over three years ago to investigate possible permanent flood risk reduction projects.

- The Federally Recommended Plan is a North Dakota-side diversion with upstream staging and storage. It was chosen as the preferred plan of the cities of Fargo and Moorhead, and Cass and Clay Counties.

- The Cities of Fargo and Moorhead, Counties of Cass and Clay, and adjoining water resources districts, formed the Flood Diversion Authority in 2011 to represent the local sponsors.

- The Diversion Authority is committed to developing and implementing permanent, reliable flood risk reduction for the Fargo-Moorhead area. The project will provide risk reduction for a 100-year flood, and ensure that even more extreme events are "flood fightable" and do not devastate the region.

- Along with implementing the project, the Diversion Authority is working diligently to address local challenges associated with project





## Core Messages

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# FM Metro Area Flood Diversion Project Core Messages

## Topical Focus: President's Budget

PREPARED FOR: FM Metro Flood Diversion Authority  
PREPARED BY: Program Management Consultant (PMC)  
DATE: February 17, 2012

### Topical Focus – President's Budget

- The President's budget for Fiscal Year (FY) 2013 contains \$5 million to fund the design of the Fargo-Moorhead Metro Area Flood Diversion Project. The addition of local matching funds brings the total design funds in fiscal year 2013 for the Diversion Project to \$10 million.
- The President's Budget is only the first step in the annual appropriations process. Congress will determine the actual amount of FY-13 funding for the project.
- The Diversion Project is very highly regarded by the U.S. Army Corps of Engineers and the President. It received over 25% of the entire Corps' budget for projects in design phase across the nation.
- The project sponsors and Corps will continue to pursue opportunities for additional FY'13 funding from Congress and other Corps projects and departments.
- The original design schedule and budget request of \$30 million laid by out the Corps was very aggressive.
- While the reduced funding could affect the FY-13 schedule, we are confident that additional funding may be provided by the Congress, the Corps or the Authority. We will re-prioritize our activities for FY'13, and we look forward to moving the project forward.
- We are pleased the President has recognized the importance of the Diversion Project and has asked for funding to keep this project moving.

## **Problem and Project Need**

- We need permanent flood protection. We know that we are prone to cycles of severe flooding in this region. In fact, flooding has become more frequent and severe during the last 20-years.
- Extreme flood events, like those experienced in Bismarck and Minot earlier this year, could lead to more than \$10 billion (B) in damages to our area.
- As community leaders, it is our responsibility to develop and implement permanent, reliable flood protection for the Fargo-Moorhead area. The Diversion Project will provide protection for a 100-year flood and ensure that even more extreme events do not devastate the region.
- People in our communities understand the need for permanent flood protection because the “next flood” could be devastating to our infrastructure, economy and way of life.

## **The Plan**

- Three years ago, after the Corps of Engineers conducted numerous studies and projects in the F-M area, the Corps and the cities of Fargo and Moorhead began the Fargo-Moorhead Metro Feasibility Study to investigate the possibility of a diversion.
- Several designs, alignments and features of several alternatives were refined.
- The current plan, now referred to as the Federally Recommended Plan, is a North Dakota-side diversion with upstream staging and storage. It was chosen as the preferred plan of the cities of Fargo and Moorhead, and Cass and Clay Counties.
- The cities of Fargo and Moorhead are doing good work on building protection within their boundaries.

## **Tough Decisions**

- Any permanent solution to provide flood protection for the vast majority of families and businesses in our communities will have adverse impacts on some.
- We are committed to minimizing these impacts and pledge to treat those who are affected fairly, respectfully and with just compensation.

## **Treat Those Affected Fairly**

- There has already been the opportunity for public comments on the project alternatives. Those comments will be considered in developing the best overall project.
- We will move forward with more public communication and consider public input.
- We understand that some people will need to be relocated... their homes and lifestyles will change; but
- We also promise to promote the most viable flood-protection plan that minimizes adverse impacts to families and communities; and
- We will treat all those touched by the Fargo-Moorhead Metro Area Diversion Project fairly.

## **Benefit**

- The flood protection project will achieve reliable flood protection that will protect our communities, our economy and quality of life.
- Our communities will not be paralyzed every spring by the increasing severe and frequent flooding as we have been in recent years.



## Future Without Project Conditions

- Study updated hydrology and hydraulics
- Expert panel (EOE) met to discuss climate variability – recommended non-traditional hydrologic analysis.
- **Flows**

	<u>1% Chance</u>	<u>0.2% Chance</u>
▶ EOE (wet cycle):	34,700 cfs (42.4')	61,700 cfs (46.7')
▶ Traditional Period of Record:	33,000 cfs	66,000 cfs
▶ Existing FEMA regulated:	29,300 cfs	



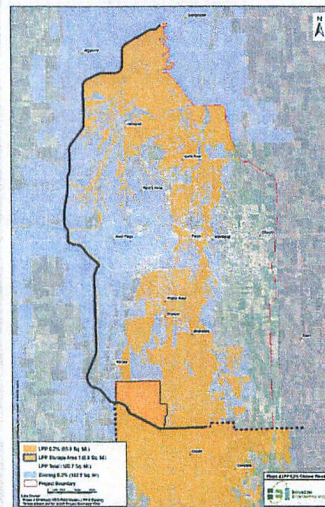
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## Level of Risk Reduction

- Project does not target specific level of flood risk reduction
- Project formulated on economic, social, and environmental criteria
- Project provides 1-percent (100-year) chance level of risk reduction to Fargo and Moorhead
- Project does **NOT** provide 0.2-percent (500-year) level of risk reduction to Fargo-Moorhead
- Project formulated similar to projects developed for Grand Forks/East Grand Forks (250-year) and Roseau (100-year)

\* Map indicates anticipated flooding during 500-year flood event with project



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## In-Town Levees to Mitigate Impacts Due to Project Operations.

Implementing additional levees in town could allow additional water to pass through control structures:

- Requires project to operate less frequently.
- Further reduce connectivity and geomorphic concerns.
- Relatively costly to implement.



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## Mitigation Efforts

Event (Year)	5-yr event	15-year event	Month	Last date flows above 9,600 cfs
	Days >= 9600	Days >= 20,000 cfs		
1943	8	--	April	4/11/1943
1952	11	--	April	4/22/1952
1965	3	--	April	4/16/1965
1966	2	--	March	3/22/1966
1969	13	4	March	4/24/1969
1975	7	--	July	7/6/1975
1978	10	--	March/April	4/9/1978
1979	10	--	April	4/25/1979
1989	7	--	April	4/13/1989
1993	2	--	April	4/6/1993
1994	7	--	March/April	4/6/1994
1995	4	--	March	3/23/1995
1995	3	--	March/April	4/2/1995
1996	2	--	April	4/16/1996
1997	29	14	April/May	5/5/1997
2001	15	1	April	4/23/2001
2005	2	--	June	6/16/2005
2006	12	--	April	4/12/2006
2007	7	--	June	6/12/2007
2009	36	8	March/April	4/28/2009
2009	5	--	June	6/24/2009
2010	20	3	March/April	4/4/2010
2011	30	8	April/May	5/4/2011
<b>Total</b>	<b>195</b>			
<b>Number of Events</b>	<b>23</b>	<b>6</b>		
<b>Avg. days &gt;= event</b>	<b>10.7</b>	<b>6.3</b>		
<b>Median days/evt</b>	<b>7.0</b>	<b>6.0</b>		
<b>Events &lt;= 7 Days</b>	<b>12</b>	<b>3</b>		

Assessed levees that could protect up to approximately 21,000 cfs through town (compared to 9,600 cfs).

Levees could cost approximately \$25M.

If viable could be one of first construction projects.

Effects on Project Operation:

- ✓ operate less frequently
- ✓ reduce duration of operation
- ✓ reduce frequency and duration of operation during summer crop-damaging events



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## Local Outreach

Met with Reed Township – February 14

Met with upstream concerned elected officials - City of Comstock (MN), Holy Cross Township (MN), Walcott Township (ND) - February 21

Scheduled meeting with Richland (ND) and Wilkin (MN) Counties – March 19

Public informational meeting tentatively scheduled - June/July timeframe



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## Project Schedule

- Dec 2011 Sign Chief's Report - Completed
- Dec 2011 Submit Chief's Report to ASA(CW) for administrative review
- Apr 2012 ASA(CW) submit report to Congress
- Fall 2012 Sign Project Partnership Agreement\*
- Spring 2013 Begin Construction\*
- Spring 2021 Project Operable\*



*\* Requires authorization and funding from Congress*



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# Mitigation Efforts

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	Days >=9600	Days >= 20,000 cfs		
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1965	3	--	April	4/16/1965
1966	2	--	March	3/22/1966
1969	13	4	March	4/24/1969
1975	7	--	July	7/8/1975
1978	10	--	March/April	4/9/1978
1979	10	--	April	4/25/1979
1989	7	--	April	4/13/1989
1993	2	--	April	4/6/1993
1994	7	--	March/April	4/6/1994
1995	4	--	March	3/23/1995
1995	3	--	March/April	4/2/1995
1996	2	--	April	4/16/1996
1997	29	14	April/May	5/5/1997
2001	15	1	April	4/23/2001
2005	2	--	June	6/18/2005
2006	12	--	April	4/12/2006
2007	7	--	June	6/12/2007
2009	36	8	March/April	4/28/2009
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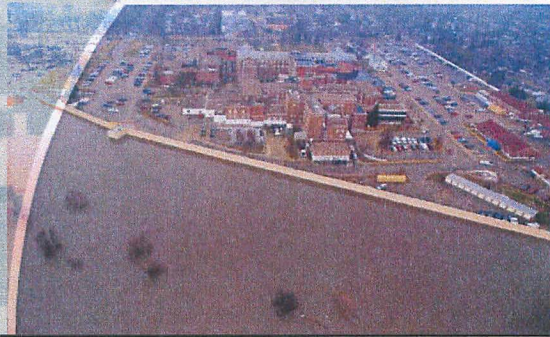




**Fargo-Moorhead Metropolitan Area Flood Risk Management Feasibility Study and Environmental Impact Statement**

***Fargo-Moorhead Diversion***

7 March 2012  
Bismarck, ND



US Army Corps of Engineers  
**BUILDING STRONG®**

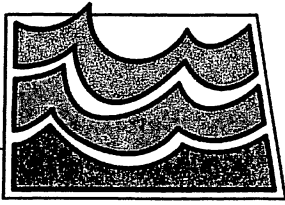
**Federally Recommended Plan**



- Plan components
  - ▶ 20,000 cfs ND diversion channel
  - ▶ 50,000 acre feet storage area
  - ▶ 150,000 acre feet staging area
  - ▶ 36-mile diversion
  - ▶ 10 miles of tie-back levees
  - ▶ Control structures on the Red & Wild Rice rivers
  - ▶ Aqueduct & spillway structures on the Sheyenne & Maple rivers
  - ▶ Drop structure on the Lower Rush & Rush rivers
  - ▶ Non-structural mitigation for impacts in the storage & staging areas




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# North Dakota State Water Commission

900 EAST BOULEVARD AVENUE, DEPT 770 • BISMARCK, NORTH DAKOTA 58505-0850  
701-328-2750 • TTY 800-366-6888 • FAX 701-328-3696 • INTERNET: <http://swc.nd.gov>

## MEMORANDUM

**TO:** Governor Jack Dalrymple  
Members of the State Water Commission  
**FROM:**  Todd Sando, P.E., Chief Engineer/Secretary  
**SUBJECT:** Devils Lake – Projects and Hydrologic Update  
**DATE:** February 27, 2012

### Hydrologic Update

The Devils Lake water surface elevation has lowered slightly from the previous update.

	<b>CURRENT</b>	<b>1 MONTH AGO VALUE   CHANGE</b>		<b>1 YEAR AGO VALUE   CHANGE</b>	
Elevation (ft-msl)	1453.3	1453.5	-0.2	1451.3	+2.0
Area (acres)	197,000	199,000	-2,000	175,000	+22,000
Volume (acre-feet)	4.00 million	4.01 million	-10,000	3.60 million	+400,000

The volumes and areas above were obtained from the area-capacity table found on the Commission's website.

### West End Outlet

The repairs to the Josephine Pumps Station intake and canal are complete. The canal was lined with approximately 26,000 tons of riprap to minimize erosion and the growth of aquatic weeds, which led to capacity problems in the channel early in the season last year. The Josephine Pump Station intake has been repaired and modified by removing the remaining gabion baskets and installing sheet-pile shoring, riprap and a trash rack. The trash rack will prevent foreign material from entering the pumps, which contributed to the damage and ultimate failure of the three of the pumps last year. Two of the four pumps at Josephine Pump Station are being repaired and they are both scheduled for delivery to the site in April. The attached proposed letter requests a modification of the Drain Permit, which currently limits discharge of water to the Sheyenne River to not exceed the 600 cfs channel capacity.

### East End Outlet

The contractors on this project continue to make good progress. The installation of 27,000 feet of 96-inch pipe between the intake and outfall structures is complete with the exemption of vaults and restoration of the disturbed areas, which will be done during the coming summer. The contractor for the intake structure has installed the foundation piers and concrete base slab of the intake, and is currently working on forming and placing rebar for the walls. Other work at the

JACK DALRYMPLE, GOVERNOR  
CHAIRMAN

TODD SANDO, P.E.  
CHIEF ENGINEER AND SECRETARY



intake includes installation of the 96-inch diameter manifold pipe, construction of the valve vault and construction of the electrical substation. The contractor at the outfall structure has begun construction of both the rock filter structure and the terminal structure.

### **Emergency Gravity Water Transfer Channel**

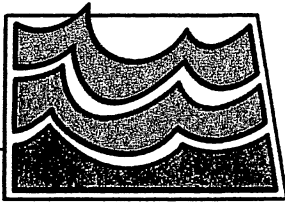
The court hearing on the right of entry was successful, and the State Water Commission drilling crew performed four of the eight proposed soil borings the week of February 6th. The preliminary results indicate some challenges with the high water table and granular material. The next step would be to hire a geotechnical engineering firm to bore the remaining four court approved sites and collect soil samples and perform laboratory testing on the materials to determine its engineering properties. Wetland delineation is also planned for this coming spring as soon as vegetation has reached a point that it can be delineated.

### **Tolna Coulee Control Structure**

The work on this project is progressing very nicely. A majority of the sheet pile cutoff wall has been installed. Approximately half of the concrete for the base of the stop log structure has been placed. Public comments have been received on the operating plan (Standing Instructions To The Project Manager For Water Control), and the U. S. Army Corps of Engineers is preparing responses to them.

**I recommend the State Water Commission request a change to the Conditions to Drain Permit 3457, Devils Lake West End Outlet, eliminating Condition 2, which limits the discharge of water to the Sheyenne River.**

TS:JK:mmb/416



# North Dakota State Water Commission

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Mr. Todd Sando, P.E.  
State Engineer  
900 East Boulevard Ave.  
Bismarck, ND 58505-0850

February 27, 2012

RE: Devils Lake West Outlet Drain Permit Conditions

Dear Mr. Sando,

As Chairman of the State Water Commission I request a change to the Conditions to Drain Permit No. 3457, Devils Lake West End Outlet.

Currently Condition 2 of the permit states "Discharge of water to the Sheyenne River shall not cause the 600-cfs channel capacity of the Sheyenne River to be exceeded."

Due to above normal inflows over the years, Devils Lake has continued to rise despite the operation of the West End Outlet causing further devastation and economic losses in the Devils Lake Basin. Therefore, the State of North Dakota through the State Water Commission is currently constructing a second outlet. This outlet, located on East Devils Lake, will add another 350 cfs of water to the Sheyenne River, for a combined outlet capacity of 600 cfs. It is our intent to operate the Devils Lake outlets to remove as much water from Devils Lake as possible while adhering to State Laws and the limitations set forth in the operating plan with input from the Devils Lake Outlet Advisory Committee.

Therefore, I request that Condition 2 be eliminated from Drain Permit No. 3457 since the 600-cfs channel capacity may be exceeded. To help mitigate this the State of North Dakota through the State Water Commission has developed a Devils Lake Outlet Mitigation Plan. The plan has two key components to reducing the risk of downstream damages from a Devils Lake overflow. The first has been the construction of emergency outlets to remove floodwater from Devils Lake in a controlled fashion to help prevent new damages around the lake and reduce the risk of a natural catastrophic spill. The second is addressing issues downstream along the Sheyenne River that may result from the emergency outlet projects. Through an application form, landowners can submit claims on impacts from the State outlets. Once a claim has been submitted the State Engineer will review the claim and determine the reimbursement for the impacts.

If you have any questions or comments regarding this request, please contact Jon Kelsch, P.E., – Water Development Division.

Sincerely,

Jack Dalrymple, Chairman

JACK DALRYMPLE, GOVERNOR  
CHAIRMAN


TODD SANDO, P.E.  
CHIEF ENGINEER AND SECRETARY



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## MEMORANDUM

**TO:** Governor Jack Dalrymple  
Members of the State Water Commission  
**FROM:**  Todd Sando, P.E., Chief Engineer/Secretary  
**SUBJECT:** Missouri River Update  
**DATE:** February 27, 2012

### **System/Reservoir Status –**

On February 20, system storage in the six mainstem reservoirs was 56.4 million acre-feet (MAF), 0.4 MAF below the base of flood control. This is 3.6 MAF above the average system storage for the end of February, and 1.0 MAF less than last year. The February runoff forecast for 2012 is 25.6 MAF, 103% of normal. Runoff into the system for 2011 totaled 61.2 MAF, 247% of normal, the previous record of 49 MAF was reached in 1997.

On February 20, Lake Sakakawea was at an elevation of 1838.2 feet msl, 0.7 feet above the base of flood control. This is 0.6 feet lower than a year ago and 7.4 feet above its average end of February elevation. The minimum end of February elevation was 1806.9 feet msl in 2007, and the maximum end of February elevation was 1842.8 feet msl in 1973. Reservoir Elevations are expected to reach 1837.7 feet msl on March 1, 0.2 feet above the March 1 target elevation. Releases from the reservoir will average 22,000 cfs until March 1, and then drop to 21,000 cfs by the second week of March.

The elevation of Lake Oahe was 1605.4 feet msl on February 20, 2.1 feet below the base of flood control. This is 1.1 feet lower than last year and 5.0 feet higher than the average end of February elevation. The minimum end of February elevation was 1572.3 feet msl in 2007, and the maximum end of February elevation was 1611.1 feet msl in 1996. Reservoir elevations are expected to reach 1605.8 feet msl on March 1, 1.7 feet below the base of flood control.

The elevation of Ft. Peck was 2234.2 feet msl on February 20, 0.2 feet above the base of flood control. This is 1.6 feet lower than a year ago and 7.6 feet higher than the average end of February elevation. The minimum end of February elevation was 2196.3 feet msl in 2007, and the maximum end of February elevation was 2243.5 feet msl 1976. Reservoir elevations are expected to reach 2234.2 feet msl on March 1, 0.2 feet above the base of flood control. Releases will average 9,000 cfs until the end of February after that releases will be reduced to 6,500 cfs until the second week in March.

The Mountain Snowpack water content above Fort Peck on February 20 was 81% of normal. The Mountain Snowpack water content between Fort Peck and Garrison was 91% of normal. Normally 79% of the peak snow accumulation has occurred by March 1.

The Corps of Engineers' basic forecast, 25.6 MAF of runoff, shows a full season, full service navigation season. The actual length of the navigation season will be determined by the amount of water in storage on July 1.

There will be no spring pulse this year, due to last year's flood and the ongoing review of the Gavins Point spring pulse by the Independent Science Advisory Panel.

### **Ice Conditions**

With the current channel configuration ice conditions have dramatically affected the stage of the river this winter. In early January the stage recorded at the Bismarck gage rose 3 feet in 30 minutes and then another 3 feet over the next day pushing the Bismarck gage above 11 feet. However, this doesn't necessarily reflect the full effect of the ice-constricted flow in the river. Less than 3 miles downstream of the gage, water began to intrude on the parking lot of the Fox Island boat ramp, something that does not occur until around a stage of around 13 feet during open water conditions. This caused concern among the citizens and sand bag stations were opened in some areas. Since then, the gage has continued to display wide fluctuations in stage associated with changing ice conditions with cooler weather coinciding with higher stages and warmer weather reflected in lower stages. These short-term effects may be caused by the thickening and thinning of the ice sheet during multiple days of similar weather. From observations it seems as though the channel south of Fox Island has become a wide shallow channel, in which channel capacity is rather quickly affected by ice cover. Therefore, when the river freezes over the limited capacity of the channel forces the stage to increase more than has been customary.

### **MRRIC**

MRRIC is a committee that was authorized by Congress in the Water Resources Development Act of 2007 (2007 WRDA). The Committee was formed to make recommendation and provide guidance on a study of the Missouri River and its tributaries known as the Missouri River Ecosystem Recovery Plan (MRERP), and activities in the Missouri River recover and mitigation program (MRRP), although MRERP was defunded in December 2011.

The MRRIC has nearly 70 members including representatives from state, tribal, federal, and 28 stakeholders. The stakeholders represent interests such as agriculture, flood control, hydropower, etc. There are representative from local, state, tribal and federal interests throughout the basin. Currently, the Stakeholder group is made up of 16 members from Iowa, Kansas, Missouri, and Colorado; 5 members from Nebraska; 6 members from Montana, Wyoming and South Dakota; and 1 from North Dakota. Terry Fleck is the stakeholder from North Dakota representing Recreation.

On December 13, 2011 the Governor designated Michelle Klose as the State representative to MRRIC (Missouri River Recovery Implementation Committee) and Kelly Casteel as her alternate. I am asking you to work with Michelle and Kelly to ensure the needs of North Dakota are not overlooked in the attempts to recover the Missouri River ecosystem.

### **Surplus Water**

On February 17, 2012 a memorandum, which is attached, from Jo-Ellen Darcy, Assistant Secretary of the Army for Civil Works, was released. The memorandum directed the Omaha District “to begin immediate processing of surplus water use applications for irrigation purposes only.” It also stated that separate guidance will be issued to address other surplus water use applications.

### **Section 33**

Due to the massive amounts of erosion that occurred from last years flood the Corps has allocated three million dollars in 2012 for Section 33 projects. The Section 33 program was authorized by Congress in the Water Resources Development Act (WRDA) of 1988 allowing the Corps of Engineers to assist affected landowners in alleviating the effects of erosion caused by releases from the dams. The authorized measures include maintaining or rehabilitating existing bank stabilization structures, constructing new bank stabilization structures, purchasing affected property, and monetary compensation to affected landowners. Reaches that are eligible for the Section 33 program include 383 miles of open-river in the reaches below the dams. To date, the Corps has made one inspection in North Dakota and is planning to do more.

### **AOP**

The Corps will likely hold an Annual Operating Plan (AOP) meeting in mid April to present the final 2011-2012 Annual Operating Plan.

BE:KC/1392



**DEPARTMENT OF THE ARMY  
OFFICE OF THE ASSISTANT SECRETARY  
CIVIL WORKS  
108 ARMY PENTAGON  
WASHINGTON DC 20310-0108**

FEB 17 2012

**MEMORANDUM FOR COMMANDER, U.S. ARMY CORPS OF ENGINEERS,  
ATTN: DIRECTOR OF CIVIL WORKS**

**SUBJECT: Lake Sakakawea Surplus Water Report and Pending Irrigation Use  
Applications**

- 1. Reference: Pending CEWD-NWD memorandum dated 19 April 2011, subject: Garrison Dam/Lake Sakakawea, North Dakota, Surplus Water Report and Requests for Applications for Irrigation Use.**
- 2. As I promised in my memo to you dated December 1, 2011, I sent Mr. Craig Schmauder, Deputy General Counsel (Installations, Environment & Civil Works), to meet with the Governors and Attorneys General of North and South Dakota and their staffs in early January 2012, regarding pending applications for water use from Lake Sakakawea and Lake Oahe. Both state contingents requested a change to the current U.S. Army Corps of Engineers (Corps) policy which is holding or suspending action on applications for surplus water use by irrigators. Following his return, I am advised that Mr. Schmauder discussed this request with your Chief Counsel and his legal staff and obtained their agreement that such irrigation applications should be processed immediately, with no further delay, since the Corps has no applicable legal authority under which it can charge irrigators a fee for such use.**
- 3. As we have discussed and agreed previously, I therefore direct the Corps to advise Omaha District to begin immediate processing of surplus water use applications for irrigation purposes only. I will address the other surplus water use applications in separate guidance.**

  
**Jo-Ellen Darcy  
Assistant Secretary of the Army  
(Civil Works)**





# RED RIVER BASIN COMMISSION'S

## LONG TERM FLOOD SOLUTIONS

For the Red River Basin



### Report Includes:

LTFS Executive Summary

Conclusions and  
Recommendations for  
Action

Funding Timeline for  
Project Implementation  
Costs: Along the Red  
River of the North and  
Tributaries



*March 7, 2012*

September 2011

Red River Basin Commission

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### **VISION**

A Red River Basin where residents, organizations, and governments work together to achieve basin-wide commitment to comprehensive integrated water stewardship and management.

### **MISSION**

To create a comprehensive integrated basin-wide vision, to build consensus and commitment to the vision, and to speak with a unified voice for the Red River Basin.





# Red River Basin Commission's Long Term Flood Solutions for the Red River Basin

March 2012

**THE RED RIVER BASIN** is an international, multi-jurisdictional watershed of 45,000 square miles, with 80 percent of the basin lying in the United State and 20 percent in Manitoba, Canada. Eighteen Minnesota counties and 22 North Dakota counties lie wholly or partially in the basin. The economic impact of the basin, from both urban-generated activity and a vibrant agricultural economy, is significant. This basin is home to more than half a million people, and serves as a jobs, education and medical hub, in addition to a world-renowned agricultural producer.

## NEED FOR ACTION

The increase in frequency and magnitude of flooding in the Red River basin is unmistakable. The spring flood of 1997 that decimated the metro center of Grand Forks-East Grand Forks and gravely threatened areas throughout the basin introduced a decade of flooding. Since 2000, the basin has experienced damaging flooding in all but two years. Since 1997, most sites along the main stem have seen levels of flooding at or close to 100-year levels, some in more than one flood event. And tributary areas have experienced up to 500-year flood levels during the past decade. We know today that larger floods are both possible and probable.

## THE IMPETUS

Before the major flood waters of 2009 had even receded, state legislators in North Dakota and Minnesota asked the Red River Basin Commission (RRBC), as an international basin-wide organization, to spearhead the effort to develop a comprehensive, proactive plan that responds to and mitigates flooding throughout the watershed. Corresponding with the legislative charge were appropriations of half a million dollars from each state to execute the project. The RRBC was uniquely positioned for this endeavor given its ongoing organized effort to further commitment to shared land and water stewardship goals in the basin, including the goal of flood damage reduction.

## THE PROCESS

The LTFS study process brought together professional and citizen water managers from all levels and from all the reaches of the basin. In addition to hands on involvement from the RRBC Board of Directors, umbrella committees were assembled (Policy, Technical) and specific issue workgroups to dissect the issues and identify solutions. In addition, a number of outside experts and agencies were contracted to develop information and analysis for central questions addressed in the study. Most importantly, the study was a grass-roots effort. It was launched with an extensive public engagement process of 21 public flood forums held in the



Minnesota, North Dakota and South Dakota portions of the basin, with more than 1,000 attendees in total. Citizens' experiences, problems and concerns with flooding in the basin were solicited, together with suggestions for solutions. It was this public input that helped shape the study's committees and issues to explore. A second series of public meetings was held in spring of 2011 in order to gather feedback from citizens

on the primary directions and conclusions of the study. That feedback helped to guide final conclusions and recommendations. The results of the overall study findings are presented in this report to assist the basin's residents, community leaders, water managers and policy makers.

## ASSUMPTIONS FOR FUTURE CONDITIONS

### Pertinent to the LTFS plan development

*adopted by RRBC Board 2010*

Components of the LTFS plan are intended to be developed and implemented over the next 50 years. It is important to understand the assumptions under which this plan was developed. The following describe basic assumptions about several issue areas in the Red River basin that are key to plan development.

**Agriculture** will continue to be the dominant land use through out the basin. Adequate surface drainage has been and will continue to be integral to maintaining productivity of cropland. Sub-surface drainage is likely to become increasingly popular.

**Current development** trends will continue into the foreseeable future. The major urban centers and communities will continue in their present locations. Major metro areas will continue to grow. Future development will occur in compliance with floodplain management regulations.

**Floods** will continue into the future. Floods larger than historically experienced can be expected to occur.

**Flood damage reduction** will need to be implemented in the basin based primarily on the identified needs of the basin residents and their willingness to provide or seek the funding necessary to implement the measures which they believe are appropriate, effective, and justified. State and federal agencies will support the implementation of the various measures based on their policies, regulations and availability of funding. Flood damage reduction is just one issue that affects the sustainability of the region.

**Other key resource issues need to be considered** as this plan is developed and implemented, including droughts, water supply, water quality, recreation and other natural resource areas.



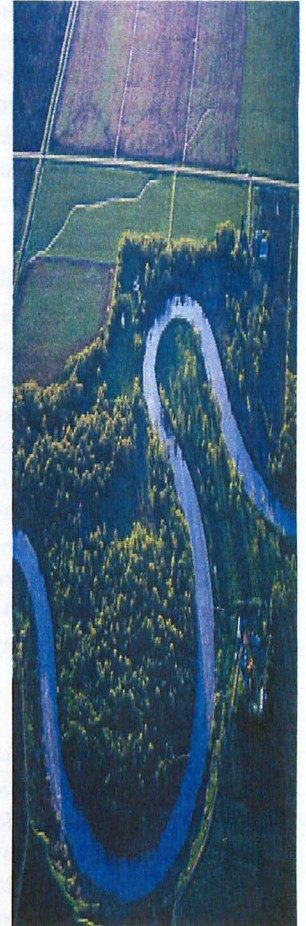


***GUIDELINES FOR PROTECTION IN THE BASIN***

Before the LTFS study, the only site protection guideline for levels of protection was the federal (FEMA) requirement that mortgaged structures in 100-year floodplains (or lower) carry flood insurance. The problem with these guidelines for the Red River basin is that 100-year flood levels have been experienced on most reaches of the main stem and far surpassed in some tributary areas. RRBC developed baseline goals for levels of flood protection during the project.

**Level of Flood Protection Goals**

The LTFS review of current local protection policies and practices revealed that the basin lacks adequate guidelines on levels of protection appropriate for various basin locations. The following goals for levels of protection were developed as part of the study and approved by the RRBC to serve as a guideline for the residents of the Red River basin, its communities, and state/provincial and federal agencies, as they plan and implement future local protection projects (see Appendix D, Table D-3). The intended outcome of the goals is to provide a long-term objective for communities and sites that will cumulatively reduce the risk of flooding and flood damages from potential floods of larger size than the basin has experienced in the recent past. The goals can help move the basin beyond a mode reactive to the last large flood to a proactive mode of using risk and damage assessments to put adequate protection into place to reduce flood risk across the basin.



***Level of Flood Protection Goals for the Red River Basin***

<u>Area Protected</u>	<u>Estimated Recurrence Interval</u>
Major urban/metropolitan areas (1) (2) (4)	500 year or greater
Critical infrastructure (1) (2)	500 year or greater
Cities/municipalities (1) (2)	200 year or greater
Rural residences & farmsteads (1) (2)	100 year or greater
Agricultural cropland: Summer flood	10 year or greater
Transportation (2) (3) Critical transportation system and emergency service links	200 year or greater

**Notes**

- (1) Protection for urban areas, critical infrastructure, cities, rural residences, and farmsteads should all have appropriate freeboard (i.e., contingency or risk and uncertainty allowance) with any projects designed to provide the specified level of protection.
- (2) If a flood of record has occurred which exceeds the specified level of protection goal, the flood of record should be used in place of the specified level of protection goal.
- (3) The critical transportation systems should be maintained passable during a flood of the described level of protection to assure safe and reliable transportation and provision of emergency services. The transportation system should not increase flooding problems either upstream or downstream.
- (4) Includes Fargo-Moorhead, Grand Forks-East Grand Forks, and Winnipeg.

***The Red River Basin Commission (RRBC) is a group of people working together to achieve common goals for water protection and management within the Red River Basin.***

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See the full report on our website:  
[www.redriverbasincommission.org](http://www.redriverbasincommission.org)



## CURRENT LEVELS OF PROTECTION VERSUS NEEDS IN THE BASIN

Although the strategy of local protection dates back many decades in the basin, the extent of existing site protection is still modest. The following table summarizes the levels of local site protection currently in place at basin communities and then compares that with RRBC's levels of protection goals to identify the gaps and the needs. The table reveals that flood protection for events exceeding the 100-year level is an exception and that almost a third of the communities, on the average, have no permanent protection. Of those communities having permanent protection, fewer than half are protected to a 100-year level or higher.

### Comparison of Existing Flood Protection with Recommended Guidelines for Level of Protection

City/Location	RRBC Recommended Guideline for Level of Flood Protection	Existing Level of Protection					Existing Protection meets RRBC Recommended Guideline for Level of Flood Protection?
		500 year	200 year	100 year	Less than 100 year	No Permanent Protection	
<b>Red River Main Stem</b>							
Wahpeton, ND	200 year			X			No
Breckenridge, MN	200 year			X			No
Fargo, ND	500 year				X		No
Moorhead, MN	500 year				X		No
Perley, MN	200 year				X		No
Hendrum, MN	200 year				X		No
Hallstad, MN	200 year		X				Yes
Nielsenville, MN	200 year					X	No
Grand Forks, ND	500 year		X				No
East Grand Forks, MN	500 year		X				No
Oslo, MN	200 year	X					Yes
Drayton, ND	200 year				X		No
Pembina, ND	200 year			X			No
St. Vincent, MN	200 year				X		No
Noyes, MN	200 year			X			No
Emerson, MB	200 year			X			No
Morris, MB	200 year			X			No
Winnipeg, MB	500 year	X					Yes
<b>Minnesota Tributaries</b>							
Georgetown	200 year				X		No
Ada	200 year				X		No
Shelly	200 year				X		No
Climax	200 year					X	No
Crookston	200 year				X		No
Warren	200 year			X			No
Alvarado	200 year			X			No
Argyle	200 year			X			No
Hallock	200 year				X		No
Roseau	200 year				X		No
<b>North Dakota Tributaries</b>							
Abercrombie	200 year				X		No
Valley City	200 year				X		No
Lisbon	200 year				X		No
Horace	200 year			X			No
West Fargo	500 year	X					Yes
Enderlin	200 year			X			No
Casselton	200 year			X			No
Mapleton	200 year			X			No
Harwood	200 year				X		No
Argusville	200 year			X			No
Devils Lake	200 year			X			No
Minnewaukan	200 year					X	No
Grafton	200 year				X		No
Nesche	200 year				X		No



## Flood Routing Models

Using MIKE 11, a flow routing model, the LTFs study was able to use the modeling information from sub-basins to predict the effect that reduced flows due to additional floodwater storage sites from the tributaries would have on various points on the main stem Red River.

20% Reduction Model		Based on WMC Mike 11 Model and tributary hydrologic models						cla 1/16/2011		
<b>Summary of Tributary Flow Reductions</b>										
<b>1997 Spring Flood</b>										
		<b>Planned by WSDs</b>				<b>Original Allocation</b>				
	<b>Peak Flow</b>	<b>Peak Flow</b>	<b>Volume</b>	<b>Volume</b>	<b>Peak Flow</b>	<b>Volume</b>	<b>Volume</b>	<b>Reduction Focus</b>		
	<b>Reduction</b>	<b>Reduction</b>	<b>Reduction</b>	<b>Reduction</b>	<b>Reduction</b>	<b>Reduction</b>	<b>Reduction</b>			
<b>Tributary Areas</b>	<b>cfs</b>	<b>%</b>	<b>%</b>	<b>acft</b>	<b>%</b>	<b>%</b>	<b>acft</b>			
<b>BdS R @ White Rock</b>	1048	13%	16%	51219	20%	20%	61760	Store early water		
<b>Rabbit R @ TH 75 ung</b>	1425	31%	39%	47639	35%	26%	24377	Peak flow reduction		
<b>BdS ungaged</b>	0	0%	0%	0	13%	9%	12119	No reduction		
<b>Ottertail R @ Orwell</b>	0	0	0	0	0%	0%	0	No reduction		
<b>Ottertail ung</b>	500	13%	12%	7217	13%	12%	7217	Peak flow reduction		
<b>Wildrice ND @ Abercrombie</b>	3150	32%	6%	23702	35%	17%	57908	Peak flow reduction		
<b>Fargo ungaged</b>	3000	13%	13%	30433	13%	13%	30433	Store late water		
<b>Sheyenne R @ Harwood</b>	2401	23%	11%	68395	23%	11%	68395	Peak flow reduction		
<b>Rush R @ Armeria</b>	508	35%	13%	4324	35%	13%	4324	Peak flow reduction		
<b>Buffalo R @ Dilworth</b>	2549	30%	17%	36091	35%	17%	38158	Peak flow reduction		
<b>Wild Rice MN @ Hendrum</b>	2315	23%	20%	76545	35%	20%	74385	Peak flow reduction		
<b>Halstad ung</b>	7500	13%	13%	81002	13%	13%	81002	Store late water		
<b>Goose R @ Hillsboro</b>	2620	35%	16%	35356	35%	16%	35356	Peak flow reduction		
<b>Marsh R nr Shelly</b>	135	3%	8%	6819	51%	18%	15247	Peak flow reduction		
<b>Sand Hill R @ Climax</b>	43	1%	18%	19184	35%	21%	22161	Peak flow reduction		
<b>Red Lake R @ Crookston</b>	5200	18%	8%	74830	35%	13%	119097	Peak flow reduction		
<b>RLR ung</b>	1600	12%	10%	11427	12%	10%	11427	Store late water		
<b>GF ungaged</b>	4400	12%	10%	32015	12%	10%	32015	Store late water		
<b>Turtle R nr Arvilla</b>	90	10%	13%	4615	10%	13%	4615	Store late water		
<b>Forest R @ Minto</b>	300	14%	7%	5875	14%	7%	5875	Store late water		
<b>Snake R ung</b>	1334	24%	16%	20210	16%	15%	17128	Store late water		
<b>Middle R @ Argyle</b>	751	20%	13%	8371	35%	23%	15067	Store late water		
<b>Park R @ Grafton</b>	2422	47%	31%	40739	35%	20%	26462	Peak flow reduction		
<b>Tamarac R ung</b>	1150	24%	13%	11533	13%	12%	7179	Store late water		
<b>Drayton ung</b>	1370	8%	10%	22208	8%	10%	22208	Store late water		
<b>S Br Two R @ Lake Bronson</b>	503	12%	26%	21735	27%	14%	15208	Store late water		
<b>Tongue R @ Akra</b>	50	7%	4%	1580	7%	4%	1580	Store late water		
<b>Pembina R @ Neche</b>	1900	13%	9%	51113	13%	9%	51113	Peak flow reduction		
<b>Emerson ung</b>	3000	7%	7%	23364	7%	7%	23364	Store late water		
<b>Average/Total</b>		<b>17%</b>	<b>13%</b>	<b>817540</b>	<b>22%</b>	<b>13%</b>	<b>885177</b>			
<b>Summary of Mainstem Flow Reductions</b>										
<b>1997 Spring Flood</b>										
	<b>Upstream</b>	<b>Peak</b>	<b>Peak</b>	<b>Upstream</b>	<b>Upstream</b>	<b>Upstream</b>				
	<b>Contributing???</b>	<b>Flow</b>	<b>Flow</b>	<b>Tributary</b>	<b>Tributary</b>	<b>Tributary</b>				
	<b>Drainage</b>	<b>Reduction</b>	<b>Reduction</b>	<b>Volume</b>	<b>Volume</b>	<b>Volume</b>				
	<b>Area</b>	<b>Reduction</b>	<b>Reduction</b>	<b>Reduction</b>	<b>Reduction</b>	<b>Reduction</b>				
<b>Mainstem Locations</b>	<b>sqmi</b>	<b>cfs</b>	<b>%</b>	<b>acft</b>	<b>acft</b>	<b>%</b>				
<b>Wahpeton</b>	4010	2723	21%	801206	106075	13%				
<b>Fargo</b>	6210	5459	19%	1425717	180209	11%				
<b>Halstad</b>	15430	14236	20%	3307686	426566	13%				
<b>Grand Forks</b>	21690	14985	14%	5149686	606198	12%				
<b>Drayton</b>		20679	16%	5912194	719749	12%				
<b>Emerson</b>		25861	20%	5915848	817540	12%				
		Less than allocation or goal								
		Meets allocation or goal								
		Exceeds allocation or goal								
		Hydrologic models not completed								



## Potential Retention Projects

From the Mike 11 modeling, individual watershed district can identify potential sites to achieve their allocation towards the 20 percent reduction on the main stem Red River. Here, Minnesota's Bois de Sioux Watershed District in the very southeast portion of the basin put forth possible projects to be considered that would more than meet a 20 percent reduction.

<b>Impoundment sites included in Flow Reduction Strategy</b>				<b>RRBC 20% plan Reduction (ac ft)</b>
<b>Bois de Sioux Watershed District</b>				
<b>4/19/2009</b>				
	<b>Gated Storage (ac ft)</b>	<b>Ungated Storage (ac ft)</b>	<b>Total Storage (ac ft)</b>	
<b>White Rock watershed</b>				
Red Path	13100	3100	16200	
Red Path West	5501	545	6046	
Eldorado 7	1700	755	2455	
Big Lake	463	1325	1788	
Moonshine Lake	2723	686	3409	
Moonshine 13	1520	328	1848	
Moonshine 4	885	322	1207	
Leonardsville 31E	1046	413	1459	
Dollymount 30	5484	872	6356	
Leonardsville 31W	1592	350	1942	
Tara 12	3071	843	3914	
Leonardsville 12	6630	1031	7661	
Croke 17	2142	605	2747	
Dollymount 24	1499	552	2051	
Walls 36	1897	850	2747	
Moose Head	1622	896	2518	
Walls 30	3831	937	4768	
Delaware 17	1695	518	2213	
Everglades	1965	890	2855	
Township Slough	3802	950	4752	
South Dakota site(s)	8771	2193	10964	
Subtotal	<b>70939</b>	<b>18961</b>	<b>89900</b>	<b>61760</b>
<b>Rabbit watershed</b>				
North Ottawa	16160	2050	18210	
Brandrup S23	3020	980	4000	
Bradford S34	3042	627	3669	
Lawrence S19	5892	1061	6953	
Tintah S34	833	160	993	
Daniels	867	223	1090	
Subtotal	<b>29814</b>	<b>5101</b>	<b>34915</b>	<b>24377</b>
<b>Bois de Sioux Ungaged</b>				
Subtotal	0	0	0	<b>12119</b>
<b>Total BdS watershed</b>	<b>100753</b>	<b>24062</b>	<b>124815</b>	<b>98256</b>



## Potential Effects of Storage on Cities

The potential effects of flow reduction were evaluated in several ways. In the following table, the approximate potential flow and stage reductions from the 1997 flood are computed for each of six points on the main stem using the proposed reduction allocations and proposed storage for subbasins upstream of each of the six sites (see Appendix D, Table D-17). The resulting flow reductions range from 17% at Grand Forks-East Grand Forks to 24% at Emerson. The resulting stage reductions for the 1997 flood would have ranged from 1.3 feet near the border at Emerson to 2.8 feet at Grand Forks-East Grand Forks.

### Effects of Potential Additional Storage on 1997 Flood Peak Stages

Upstream/Tributary Drainage Areas	Total Volume of 1997 Flood (Mike 11 Model)	Peak Flow of 1997 Flood (Mike 11 Model)	Proposed Storage in Watershed	Modified Peak Flow with Proposed Storage	Peak Flow Reduction of Proposed Storage	Peak Flow Reduction of Proposed Storage	Approx. Peak Stage Reduction of Proposed Storage
	ac-ft	cfs	ac-ft	cfs	cfs	%	ft
Bois de Sioux @ White Rock Dam		7,820	78,900	6,780	1,050	13%	
Rabbit River @ TH 75 ungaged		4,570	34,900	3,140	1,430	31%	
Bois de Sioux ungaged		8,540	0	8,540	0	0%	
Otter Tail River @ Orwell Dam		1,500	0	1,500	0	0%	
Otter Tail River ungaged		3,800	11,000	3,300	500	13%	
<b>Wahpeton/Breckridge</b>	<b>742,000</b>	<b>12,890</b>	<b>124,800</b>	<b>10,170</b>	<b>2,720</b>	<b>21%</b>	<b>2.4</b>
Wild Rice River @ Abercrombie		9,930	75,500	6,780	3,150	32%	
Fargo ungaged		23,000	42,000	20,000	3,000	13%	
<b>Fargo/Moorhead</b>	<b>1,450,000</b>	<b>28,570</b>	<b>242,300</b>	<b>23,110</b>	<b>5,460</b>	<b>19%</b>	<b>2.3</b>
Sheyenne River @ Harwood		10,300	120,000	7,900	2,400	23%	
Rush River @ Amenia		1,450	14,900	940	510	35%	
Buffalo River @ Dilworth		8,370	63,000	5,820	2,550	30%	
Wild Rice River @ Hendrum		10,150	118,000	7,840	2,310	23%	
Halstad Ungaged (includes Elm River)		57,000	142,000	49,500	7,500	13%	
<b>Halstad</b>	<b>3,310,000</b>	<b>71,390</b>	<b>700,200</b>	<b>57,160</b>	<b>14,200</b>	<b>20%</b>	<b>1.7</b>
Goose River @ Hillsboro		8,060	62,000	5,240	2,820	35%	
Marsh River near Shelly		4,070	0	3,930	140	3%	
Sand Hill River @ Climax		4,370	39,000	4,320	50	1%	
Red Lake River @ Crookston		28,980	270,000	23,780	9,400	32%	
Red Lake River ungaged		13,600	20,000	12,000	1,600	12%	
Grand Forks ungaged		36,400	56,000	32,000	4,400	12%	
<b>Grand Forks/East Grand Forks</b>	<b>5,130,000</b>	<b>110,750</b>	<b>1,147,200</b>	<b>95,770</b>	<b>19,000</b>	<b>17%</b>	<b>2.8</b>
Turtle River near Arvills		930	11,500	840	90	10%	
Forest River @ Minto		2,100	10,000	1,800	300	14%	
Snake River ungaged		5,510	30,000	4,180	1,330	24%	
Middle River @ Argyle		3,710	26,000	2,960	750	20%	
Park River @ Grafton		5,110	50,300	2,690	2,420	47%	
Tamarac River ungaged		4,820	13,000	3,670	1,150	24%	
Drayton ungaged		17,170	39,000	15,800	1,370	8%	
<b>Drayton</b>	<b>5,820,000</b>	<b>128,320</b>	<b>1,327,000</b>	<b>107,640</b>	<b>26,000</b>	<b>20%</b>	<b>1.7</b>
South Branch Two Rivers @ Lake Bronson		4,060	27,000	3,560	500	12%	
Tongue River @ Akra		680	3,000	630	50	7%	
Pembina River @ Nache		14,300	90,000	12,400	1,900	13%	
Emerson ungaged		42,000	41,000	39,000	3,000	7%	
<b>Emerson</b>	<b>6,740,000</b>	<b>129,800</b>	<b>1,488,000</b>	<b>103,940</b>	<b>31,000</b>	<b>24%</b>	<b>1.3</b>

Indicates that Flow Reduction Goals were exceeded

Indicates that Flow Reduction Goals were met

Indicates that Flow Reduction Goals were not met



# Results of Complementary Floodplain Management Approaches

Reducing flood risk in the Red River basin requires the working together of the three complementary approaches of floodplain management: 1) nonstructural attention to the physical floodplain and land use practices, both urban and rural, together with participation in federal programs such as NFIP; 2) local site protection for vulnerable damage sites such as communities, urban centers and, as possible, agricultural lands; and 3) reduction of peak flood flows through a basin-wide effort.

## Level of Protection at Cities along the Red River

City/Location	Level of Protection							Additional Measures Needed to Meet RRBC Recommended Guideline?
	RRBC Recommended Guideline	Current Conditions	Meets RRBC Recommended Guideline?	Future Conditions including Planned Upgrades	Meets RRBC Recommended Guideline?	Future Conditions including Planned Upgrades plus Proposed Upstream Flood Storage	Meets RRBC Recommended Guideline?	
Red River Main Stem								
Wahpeton, ND	200 yr	100-125 yr	No	100-125 yr	No	< 200 yr	No	Yes
Breckenridge, MN	200 yr	100-125 yr	No	100-125 yr	No	< 200 yr	No	Yes
Fargo, ND	500 yr	< 100 yr	No	> 200 yr	No	> 200 yr	No	Yes
Moorhead, MN	500 yr	< 100 yr	No	> 200 yr	No	> 200 yr	No	Yes
Georgetown, MN	200 yr	< 100 yr	No	100 yr	No	> 200 yr	Yes	No
Perley, MN	200 yr	< 100 yr	No	100 yr	No	> 200 yr	Yes	No
Hendrum, MN	200 yr	< 100 yr	No	100 yr	No	> 200 yr	Yes	No
Halstad, MN	200 yr	250 yr	Yes	250 yr	Yes	> 250 yr	Yes	No
Shelly, MN	200 yr	< 100 yr	No	100 yr	No	> 200 yr	Yes	No
Nielsville, MN	200 yr	no permanent protection	No	100 yr	No	> 100 yr	No	Yes
Climax, MN	200 yr	no permanent protection	No	100 yr	No	> 100 yr	No	Yes
Grand Forks, ND	500 yr	250 yr	No	250 yr	No	> 500 yr	Yes	No
East Grand Forks, MN	500 yr	250 yr	No	250 yr	No	> 500 yr	Yes	No
Oslo, MN	200 yr	> 200 yr	Yes	> 200 yr	Yes	> 200 yr	Yes	No
Drayton, ND	200 yr	< 100 yr	No	< 100 yr	No	< 100 yr	No	Yes
Pembina, ND	200 yr	100 yr	No	100 yr	No	> 100 yr	No	Yes
St. Vincent, MN	200 yr	< 100 yr	No	>100 yr	No	200 yr	Yes	No
Noyes, MN	200 yr	100 yr	No	100 yr	No	> 100 yr	No	Yes



## Summary of Damages Prevented by Potential LTFS Projects

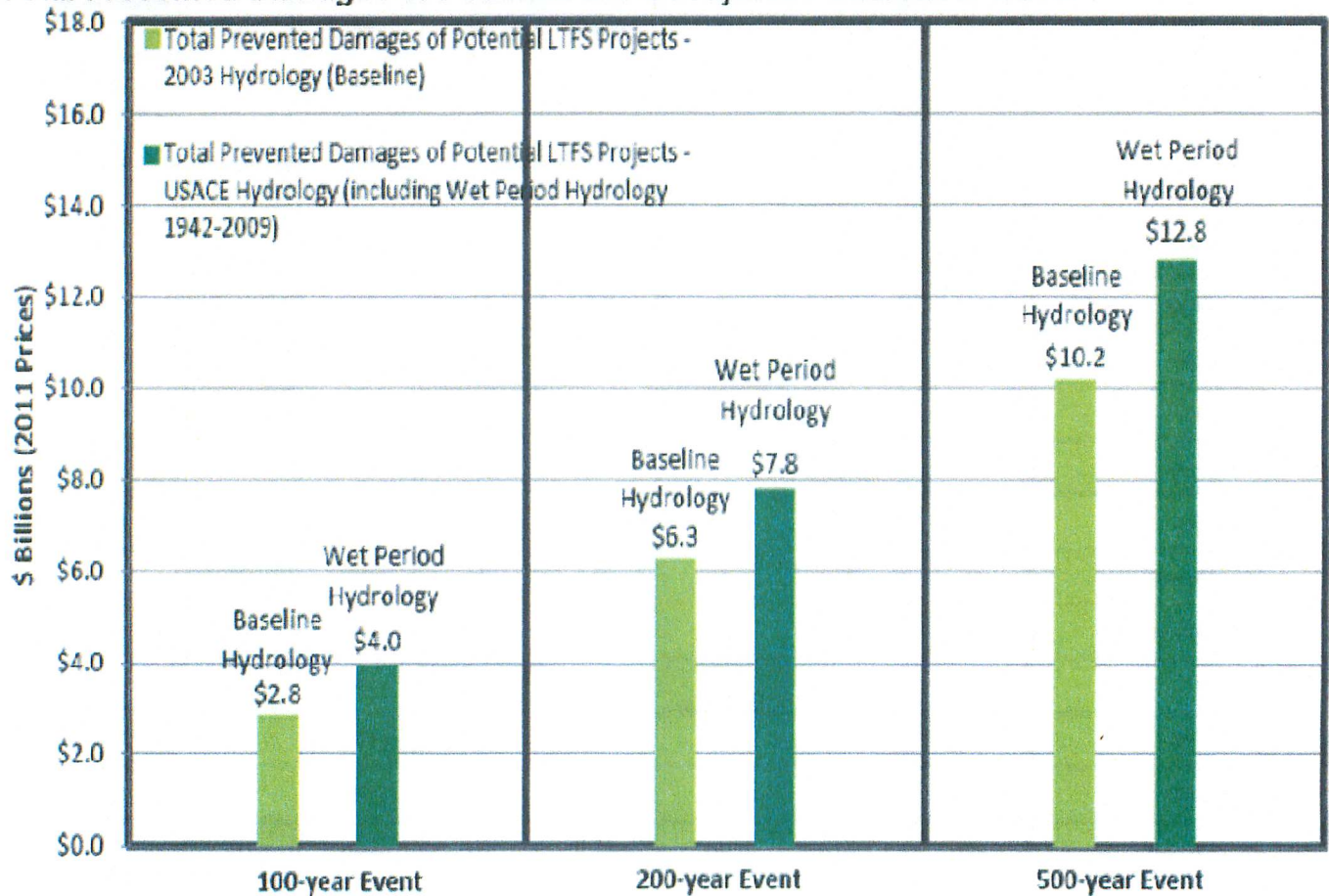
The following figure summarizes the estimated damages prevented by the potential LTFS local protection projects, combined with a 20% flow reduction on the Red River main stem. Prevented damages are estimated for 100-year, 200-year and 500-year floods.

Prevented damages are computed for both 1) baseline hydrology, or that currently used by the USACE and 2) wet period hydrology, or that recommended by the current USACE feasibility study for Fargo-Moorhead flood protection.

Depending on the hydrology used, damages prevented by the potential LTFS projects will range from about \$3 to 4 billion for a single 100-year flood, from \$6.5 to 8 billion for a single 200-year flood, and from \$10 to 13 billion for a single 500-year flood.

Working together with sound, proactive floodplain management, the potential LTFS projects can make a profound, measureable difference far into the future for the Red River basin.

**Total Prevented Damages of Potential LTFS Projects – Red River Basin**





## PART IV: MOVING AHEAD WITH INTEGRATED ACTION

### 10

## Conclusions and Recommendations for Action

The basin of the Red River of the North, historically subject to widespread chronic flooding, regularly sustains millions of dollars in economic damages for each flood event. The **Red River Basin Commission (RRBC)** identified the following conclusions on structural and nonstructural strategies needed for permanent flood solutions in the basin and recommendations for action for states (individually and collectively) and the federal government to consider as they fund and implement Long Term Flood Solutions (LTFS) for the Red River Basin in Minnesota and North Dakota. These recommendations are built around the basin-wide LTFS Level of Protection Goals” adopted by the RRBC in 2010 together with related flood risk reduction needs. The recommendations aim to move basin leaders from the usual response of reacting to the most recent major flood experience to a proactive, long-term plan with appropriate protection levels basin wide. If implemented, these recommendations will significantly reduce the risk of flood damages, and minimize disruption and economic loss and thus facilitate and expedite recovery after spring and summer floods.

**These recommendations cannot be successful without the dedicated local, state and federal participation in funding and commitment to implement.**

### Immediate Needs/Critical Risks: Fargo-Moorhead, Devils Lake

- Under current conditions, the Fargo-Moorhead metropolitan area could get, in a major 500-year level flood, **\$9 to \$10 billion or more in basin damages**, according to the USACE.
- **Current levels of protection for Fargo-Moorhead are inadequate.** Protection should be increased to enable a successful 500-year flood fight.
- Protection measures for Fargo-Moorhead should be **economically viable** and provide the **least level of adverse impacts** to others.
- A **diversion** of the Red River around Fargo-Moorhead would provide the protection needed to endure a successful 500-year flood fight if it were supplemented by retention and other available options to achieve the RRBC’s proposed LTFS level of protection goals.
- **Retention** to achieve the potential 20 percent flow reduction on the main stem should be aggressively pursued upstream of Fargo-Moorhead to decrease the duration, scope, and level of floods in the Fargo-Moorhead area, downstream communities, and rural areas.

#### Recommendation for Action 1.1

The **flood protection trajectory** that has increased protection in the Fargo-Moorhead metro area since the 2009 flood should continue. State and federal funds, with local government cost share, should continue supporting ongoing dike construction, property acquisitions, flowage easements, and flood infrastructure projects to be able to fight at least a 100-year flood, and upwards of a 500-year flood in the long term.

## **Recommendation for Action 1.2**

Progress towards the proposed \$1.77 billion **diversion should be continued** utilizing local, state, and federal funds so that, combined with current flood protection strategies, this community will have the capacity within 10 years to wage a successful flood fight equal to or greater than the LTFS 500-year flood.

## **Recommendation for Action 1.3**

Retention upstream of the Hickson and Abercrombie stream gage for a flow reduction of 20 percent (minimum) should be advanced with shared funding by the F-M flood Diversion Authority working with local and joint water boards, using city, local, state, and federal funds.

## **Recommendation for Action 1.4**

Leaders in state government in North Dakota and Minnesota, along with key local government officials and with input from the Diversion Authority and federal agencies, should convene by early 2012 to determine the **non-federal cost share formula for the Locally Preferred Plan (\$1.77 billion) diversion**, and related \$3.5 million operational estimates.

- **Rising levels of water in the Devils Lake region** have increased the potential for a natural overflow that could discharge approximately 14,000 cubic feet per second (cfs) of water into the Sheyenne River, triggering prolonged flooding and catastrophic downstream water quantity and quality problems in the Sheyenne and Red Rivers. This crisis should continue to be addressed with immediate local, state and federal action.

## **Recommendation for Action 1.5**

The recommendations developed by the **Devils Lake Executive Committee** through the work of the Devils Lake Collaborative Working Group should continue to be supported by the state of North Dakota, local authorities, and federal and tribal governments to guard against critical risks.

## **Recommendation for Action 1.6**

The RRBC and IRRB should distribute information with downstream interests and jurisdictions providing **progress and timelines** on Devils Lake activities.

## **Recommendation for Action 1.7**

A comprehensive model using real-time data to determine the effects of **releases of Devils Lake water** via the various outlet channels on the Sheyenne and Red Rivers should be examined by local leaders and state and federal agencies to determine needs and related costs. The examination should include the integration of various models already in use by the USGS, the NWS, the NDSWC, and the USACE and be facilitated by the RRBC.

## **Cornerstone Solutions: Floodplain Management**

**2A Floodplain Management – Nonstructural Strategies**

**2B Floodplain Management – Raising Levels of Protection**

**2C Floodplain Management – Retention**

## 2A Floodplain Management – Nonstructural Strategies

- A majority of the basin population lives adjacent to the Red River main stem and its tributaries at the lowest geographic elevation subject to flooding with **no comprehensive, basin-wide approach to floodplain management**, nor is there a mechanism to align the variations in local, state, and federal rules, regulations, and approaches.
- **Nonstructural floodplain management strategies** should be an integral component of reducing flood damage risks in the basin.
- The most effective overall technique for living with floods is for basin citizens to take **personal responsibility for their own flood risk** and for the sustainability of our natural resources.
- Minnesota and North Dakota should fund and administer **flood mitigation policy** consistently throughout the Red River basin so that a flood event in excess of the 100-year becomes the benchmark for managing the risk of flooding, regulating development in the floodplain, and for developing flood risk reduction projects around existing and newly developed areas.

### Recommendation for Action 2A.1

State floodplain regulations and local zoning ordinances should contain criteria for **new residential, commercial, industrial, and agri-business development** that requires the largest of the following protection standards:

- 100-year flood plus three feet
- 200-year flood plus one foot
- flood of record plus one foot

### Recommendation for Action 2A.2

**Buildings located in at-risk areas** where structural measures cannot accomplish the recommended flood protection levels or are not economically feasible should be publicly acquired and removed over the next three to five years.

### Recommendation for Action 2A.3

Local governments in the basin should **update floodplain ordinances** in the next three years, **not permit new development in areas of high risk of flooding** immediately adjacent to the Red River and tributaries, and **minimize the use of variances**, unless protected by elevation or another acceptable FEMA strategy.

### Recommendation for Action 2A.4

A review of basic **floodplain regulations and programs** should be undertaken by appropriate agencies and stakeholders of local, state and federal standards, to include:

- 2A.4.1 An evaluation of the appropriate **standards and regulations for development** throughout the basin, including the adequacy of the 100-year regulatory minimum standard (to include FIRMS) and the consideration of future standards to reduce losses;
- 2A.4.2 An analysis of community and state compliance with the **flood insurance** program, to include an analysis of proposed mandatory flood insurance for structures protected by dikes, identification of impediments to, and potential tools and

resources for, participation in FEMA's community Rating System, determination of the feasibility of insurance development, and a strategy to prompt a basin-wide reduction in flood insurance rates;

- 2A.4.3 An analysis of the use of **variances by local governments**; the reasons for and consequences of using variances for individuals, communities, and state; and most effective way(s) to track and document the use of variances.

### **Recommendation for Action 2A.5**

Every community and county in the basin should work toward joining or improving their rating through the national FEMA **Community Rating System** to achieve lower flood insurance premiums for their residents (40-45 percent discounts) by 2015 as part of their mitigation plan update.

### **Recommendation for Action 2A.6**

A **Floodplain Bill of Rights**, to include a floodplain map and flooding history, should be developed by RRBC with local government, realtors, builders, developers, FEMA, and state agency participation (2012).

### **Recommendation for Action 2A.7**

RRBC should develop **education materials** on the floodplain related to the floodplain, insurance, personal decisions, and the Floodplain Bill of Rights, to be distributed to the public, realtors, lenders, and others (2012).

### **Recommendation for Action 2A.8**

The USACE nonstructural assessment of identified structures has been completed for the F-M diversion project along the main stem in six counties deemed economically feasible for **nonstructural mitigation**.

- 2A.8.1 The USACE should **expand its assessment** along the entire main stem.
- 2A.8.2 A **local sponsor** should be identified to provide the non-federal cost share of 35 percent and implement the mitigation in the next three to five years.
- 2A.8.3 Congress should **authorize such a project and appropriate approximately \$12 million** in funding for the 65 percent federal cost share to mitigate.

### **Recommendation for Action 2A.9**

Minnesota and North Dakota should use their respective state Silver Jackets (Flood and Hazard Mitigation) teams to regularly communicate issues regarding flood mitigation efforts in the Red River Basin. Silver Jackets team members from Minnesota and North Dakota should contribute to a **collaborative interstate strategy for flood recovery and projects for mitigation efforts** for the Red River of the North basin, to be coordinated with the RRBC and others as deemed appropriate.

## **2B Floodplain Management - Raising Levels of Protection**

- Comprehensive and strategic level of protection goals are needed for the entire basin. To this point, existing levels of protection have been based most often on the most recent flood experience, political will, and funding availability.

- The Minnesota and North Dakota legislatures should use the RRBC *Level of Flood Protection Goals* as a guide to future basin flood risk reduction strategies. (See *Level of Flood Protection Goals*” adopted by the RRBC Board (2010) in LTFS Report, Ch. 8. Analysis assumes required freeboard.

### **Major Urban/Metropolitan Areas**

- **Fargo-Moorhead** (see Section 1. Biggest Risks).
- **Grand Forks-East Grand Forks.** Over the next 20 to 25 years, Minnesota and North Dakota should support increasing protection to a **500-year flood level for Grand Forks-East Grand Forks** by improving the cities’ current 200- to 250-year protection with upstream retention that achieves the potential minimum 20 percent flow reduction on the Red River main stem at Grand Forks.
- **Winnipeg** has elevated its level of protection to 700 years by recent expansion of their diversion following the 1997 flood. Since its construction and subsequent first use in 1969, the floodway has operated over 20 times and prevented more than \$10 billion in flood damages. This model shows the importance of long range planning to realize the protection required from potential large floods.

### **Recommendation for Action 2B.1**

Grand Forks and East Grand Forks should each request the **500-year or greater level of protection** through the appropriate state and federal legislative avenues. Planning should recognize the degree to which the strategy of retention can assist in achieving this level of protection for the two cities.

### **Recommendation for Action 2B.2**

The RRBC shall facilitate an exchange between officials in **Winnipeg, Manitoba**, and Fargo-Moorhead local government officials, the F-M Diversion Authority, and the public for the purpose of **sharing Winnipeg’s experiences and expertise on the development and expansion of that city’s diversion**, including engineering, construction, and operation and maintenance of the Red River Floodway.

### **Critical Infrastructure:**

- **Critical infrastructure needs to be protected from flooding to the greatest levels practical.** If adversely affected by flooding, infrastructure such as water and waste water facilities, airports, hospitals, transportation, regional communications facilities, or chemical storage sites can experience major disruptions, resulting in harm to the people, economy, and environment of the basin.

### **Recommendation for Action 2B.3**

Over the next three to five years, state emergency management officers shall facilitate the identification and documentation of **at-risk critical basin infrastructure** and report to the state legislatures in the annual LTFS update.

### **Small Cities and Municipalities:**

- By 2015, cities in Minnesota and North Dakota on the main stem, tributaries, and in other flood prone areas should achieve protection to the **100-year level or three feet of freeboard the largest flood in their area plus three feet of freeboard**, whichever is greater.

- Once cities have achieved this level of protection, additional protection should be pursued towards achieving greater than **200-year flood protection** using upstream retention. Flood flow reduction from upstream retention can further complement the current levees and other strategies underway or contemplated.

### **Recommendation for Action 2B.4**

**Community structural projects** in collaboration with the RRWMB and RRJWRD should be funded in the next state funding cycle for each respective state. *See attached funding timeline table D-31 and Level of Protection Appendix D, D-3.1, p. 12 with state, local and federal funding.*

#### **Rural Residences and Farmsteads**

Funding ring dikes or elevating of buildings for **rural residents and farmsteads** in flood prone areas should protect to three feet above the 100-year level or three feet above the largest flood in their area, whichever is greater.

### **Recommendation for Action 2B.5**

Structural projects identified in collaboration with the RRWMB and RRJWRD for **rural areas, including ring dikes and rural property acquisitions**, should be funded beginning in the next state funding cycle through 2015 for each respective state. For those projects that become necessary only after future floods, funding shall become available in subsequent funding cycles. *See attached funding table D-31 and Level of Protection Appendix D, D-3.1, p. 12.*

#### **Agricultural Cropland**

- **Agriculture is an economic mainstay** of the basin, with basin farms experiencing composite net returns of \$3 billion or more annually.
- **Adequate drainage**, whether surface or tile, is crucial to crop production in the basin.
- Studies such as the **timing analysis study** suggest that improvements to drainage systems in areas that contribute consistently to the rising side of the Red River flood hydrograph (early water) have the potential to help reduce Red River flood peaks if they can move runoff through the system ahead of flood peaks. (*Minnesota Flood Damage Reduction Workgroup Technical Paper No. 11*)
- At this time, no comprehensive, systematic approach exists to **coordinate the release of water in the current drainage system** based upon this timing analysis. Recent improvements in modeling, flow data, and elevation data can be utilized to better manage water to reduce flooding on the Red River.
- The **strategies that slow water** or hold it on the land slightly longer (while allowing for timely movement in the drainage system) are best implemented through land use and easement programs that take into account landowner impacts, as well as benefits to the local area the main stem .
- Potential exists to appropriate **new federal funding for land management** to the basin through the next U.S. Farm Bill that will assist landowners in reducing runoff, reducing erosion, and improving water quality. This effort will come through programs administered by the Natural Resource Conservation Service or its designee.

### **Recommendation for Action 2B.6**

The RRRA, RRWMB, and RRJWRD, with appropriate state agencies, local government, and commodity group participation and support, should **develop a multipurpose drainage strategy** for agricultural land that evaluates the following:

- 2.10.1 Designed and engineered for both private benefits and public water management objectives.
- 2.10.2 Temporary detention (slowing down of water) by land management practices and land use changes.
- 2.10.3 Side inlet controls for all ditches.
- 2.10.4 Use of drainage for peak flow reductions and erosion control.
- 2.10.5 Rate and volume of water related to field and drain capacity.
- 2.10.6 Timing and movement of water in an equitable manner.
- 2.10.7 Landowner incentives and needs.
- 2.10.8 Adding drainage components to hydrologic models.
- 2.10.9 Need for studies, strategies, moratoriums, and additional information.

### **Recommendation for Action 2B.7**

**River channel maintenance** such as snagging and clearing of trees, including the removal of trees that have or are at risk of falling into rivers and waterways, should be continued as necessary to maintain open waterways systems. The two states should continue to fund this effort: under current policies, North Dakota at its level of about \$1 to \$2 million, and Minnesota to restore its historic level of \$150,000 per year.

### **Recommendation for Action 2B.8**

For purposes of achieving long-term flood retention and other benefits, Minnesota should provide state funding through bonding of \$10 million a biennium for the Red River basin through the Board of Water and Soil Resources for **Reinvest In Minnesota (RIM)** easements to **match or supplement federal USDA conservation funding** such as the Wetland Reserve Program, Conservation Reserve Program, EWP, and Environmental Quality Assurance Programs to achieve long term flood retention to leverage federal funding in the next five-year farm bill and for other benefits.

### **Recommendation for Action 2B.9**

A basin **wetland bank** whereby farmers/landowners can purchase and exchange wetland credits should be developed by Minnesota, North Dakota, and South Dakota in partnership with NRCS and the local joint water resource districts in North Dakota and joint watershed districts in Minnesota.

### **Recommendation for Action 2B.10**

The following **pilot projects, demonstrations, and studies** should be authorized and funded:

- 2B.10.1 Drainage as a Flood Reduction Tool Analysis: The RRRA, with appropriate state agency support, shall initiate an analysis of how to better utilize the **surface drainage system** to lower spring flood hydrographs by removing water on the rising side of the hydrograph consistent with the early, middle, and late zones.
- 2B.10.2 Culvert Inventory: An analysis outlining the advantages, disadvantages, benefits, and costs of a **basin-wide culvert inventory** gathered at the local water board level should be completed by RRBC and presented to the appropriate local and state entities with recommended funding from local, state, and federal sources (2012).
- 2B.10.3 Culvert Size Demonstration Project: A demonstration project in partnership with NRCS and affected local water boards should be implemented to analyze the flow

reduction benefits of **small distributed and culvert-sizing retention**. The project, estimated to cost about \$1.5 million, should be 75/25 percent federal/non-federal cost shared (2012).

- 2B.10.4 Ag Damage Report: The 1980 and 2002 basin **agriculture flood damage reports** should be updated and documented in a continuously updated data base, with federal funds provided through USDA to provide local project benefit/cost information to assist in local impoundment strategies at the local landowner and water board level.
- 2B.10.5 Wetland Water Level Management Pilot Project: Within the next two years, a pilot project should be funded by NRCS in cooperation with the RRRRA and other appropriate state and federal agencies to **draw down wetlands in the autumn enabling spring storage** and determining benefits and impacts for habitat and retention.
- 2B.10.6 Multi-Purpose Pilot Project: A demonstration project with funding and participation from farm and commodity groups and other interested parties should be developed and implemented in 2012, with RRBC assistance, to gather data on the timing and impacts on flooding from the following: **tile drainage, surface drainage, wetland restoration, early water ditch drainage, and culvert sizing**.
- 2B.10.7 Tile Drainage Study: A **tile drainage analysis** by the RRRRA through the Basin Technical and Scientific Advisory Committee under the staff direction of the International Water Institute should be funded by the RRWMB and RRJWRD and completed in 2012.
- 2B.10.8 Buffer Strip: Buffer strips should be established and enforced at the local level for all natural, altered, and man-made waterways to a minimum of 16.5 feet (1 rod) and a maximum of 50 feet or more with incentives provided to landowners to reduce sediment for water quality and maintenance cost benefits and to slow the flow of water into the waterways.

### **Recommendation for Action 2B.11**

The **rural flood control systems** that protect agricultural productivity and the economy from spring and summer floods should continue to be implemented throughout the basin. The goal is to reduce crop loss and to reduce planting delays by moving water off of land by mid-May in the spring and maximize flood control designs for peak run off for a 24-hour summer rainfall event with a 10 year reoccurrence interval.

### **Critical Transportation System and Emergency Services**

- The **Red River basin** covers approximately 45,000 square miles or 28 million acres, a majority directly in active agricultural production, with an extensive system of highways, roads, and bridges that provide for the movement of goods and people to enhance the economic output of the region.
- The RRBC should facilitate discussions with regional organizations, state and federal departments of transportation, and EMOs, to identify a strategy **for critical transportation preservation** including potential road elevations during 100-, 200-, and 500-year flood levels compatible with the LTFS level of protection goals.
- **Critical transportation and emergency services** throughout the basin are inconsistent with each other and fail to operate effectively for a typical flood event.



### **Recommendation for Action 2B.16**

Minnesota and North Dakota should each explore the issues surrounding **dedicating a portion of state aid for highway funding for culvert sizing and related road modifications** that benefit basin flood damage reduction strategies and introduce legislation to change state law if necessary. The RRBC shall assist with facilitation the discussion and analysis, by the end of 2013.

### **Recommendation for Action 2B.17**

An analysis of planned and proposed **road elevations** for 100-, 200-, and 500-year flood protection at township, county and state levels for emergency, population sustainability, and agricultural and economic production needs shall be developed. Engineering expertise funded and directed by the RRWMB, RRJWRD, and appropriate state agencies should identify needs by location and hydrologic impacts on flooding by change of flows, elevation of the flood stage, and other related impacts using the new LiDAR data.

### **Recommendation for Action 2B.18**

Minnesota and North Dakota should develop through their Departments of Transportation, a state and local funding **strategy to assist in county and township flood-related road repairs** and implement additional flood mitigation efforts once the protection goals are achieved and federal emergency aid under a disaster declaration is less likely.

### **Recommendation for Action 2B.19**

The RRBC should facilitate discussions with relevant regional organizations, state and federal departments of transportation, and emergency management offices to identify a **strategy for critical transportation preservation**, including potential road elevations during the 100-, 200-, and 500-year flood levels, and to identify state and federal funding needs.

## **2C Floodplain Management - Retention**

- No **comprehensive, basin-wide strategy** exists to implement the LTFS minimum 20 percent flow reduction goal for the main stem while achieving local tributary flood damage reduction.
- The impacts of retention are often dependant **on timing** and location. Not all sites are equally beneficial for local tributary and basin main stem flood damage reduction.
- Flow reduction through retention as demonstrated by **modeling** can reduce flows and stages on the Red River main stem as well as provide local benefits on tributaries. However, due to the variability of flood events, retention must be used in conjunction with other structural and non-structural measures to achieve the LTFS goals that will result in basin-wide improved levels of protection.
- The minimum goal for flow reduction on the Red River main stem at the **international boundary** for a 100-year flood equates to around 1.5 million acre feet of storage upstream accounting for timing of flow and costing approximately \$1.5 billion.
- Retention using the minimum **20 percent flow reduction goal basin-wide** can be achieved over the next 20 years if local, state, and federal funds are leveraged to provide comprehensive local, tributary and main stem benefits for residents, property, and the environment.
- **Retention** that will cumulatively achieve the basin minimum 20 percent flow reductions over the next 20 to 25 years should be managed to improve flood control, improve water

quality, include natural resource enhancement opportunities, and provide potential water supply during extended droughts.

- Numerous small, aged PL 83-566 **flood control dams** throughout the basin could provide additional capacity for flood storage retention with refurbishment.

### **Recommendation for Action 2C.1**

**Federal funding** should be provided for retention at \$25 million per year or \$500 million over the next 20 years, with Minnesota, North Dakota, and local governments providing cost share funding for retention to achieve a minimum 20 percent reduction in peak flows on the Red River.

### **Recommendation for Action 2C.2**

**Cost for retention projects** should be shared among federal (50 to 75 percent), states of Minnesota and North Dakota (25 to 35 percent), and the RRWMB, RRJWRD and local water boards (10 to 25 percent) over a period of 20 years staying within the current local joint board two mil levy.

### **Recommendation for Action 2C.3**

A **review of federally operated reservoirs**, identifying the potential for increased storage during flood events, should be conducted by USACE and state agencies, and Wildlife Management Areas by the USFWS, reporting to relevant state agencies and the RRRRA.

### **Recommendation for Action 2C.4**

The newly formed RRRRA should work with each water management board to **plan, design, and implement retention**, to achieve 25 percent of the retention goal every five years for their respective areas, with the goal of achieving the minimum 20 percent flow reduction for the Red River main stem over 20-25 years.

### **Recommendation for Action 2C.5**

A **project prioritization methodology** for the use of federal funds reflecting local and main stem needs and benefits should be developed by the RRRRA by 2012.

### **Recommendation for Action 2C.6**

The **permitting process** for water retention projects should be coordinated by the RRRRA and a federal agency liaison in the basin working with appropriate state and federal agencies to help streamline the process to decrease timelines for project implementation, allow a one-stop permitting process, and provide general permits for certain projects.

### **Recommendation for Action 2C.7**

NRCS and/or the states of Minnesota and North Dakota should provide \$400,000 to **expand the Project Planning and Permit Evaluation demonstration project** to the entire Red River basin through the International Water Institute as part of the USACE Basin Watershed Feasibility Study.

### **Recommendation for Action 2C.8**

**Public outreach on retention programs** and a survey to determine landowner interest in storing water on their land should be completed in two years by the RRWMB and RRJWRD (or

the RRRRA) to assist in future planning for retention projects and determine achievable timelines and cost expectations that correspond to local participation.

### **Recommendation for Action 2C.9**

Regarding the ongoing USACE Red River Basin-wide Feasibility Study:

- 2C.9.1 The current ongoing **study shall be continued with federal funding at \$1 million per year** and corresponding \$1 million non-federal match.
- 2C.9.2 The updating of HMS (hydrologic modeling system) of the remaining major watersheds should be completed by the end of 2012. This modeling will provide the tools necessary to **identify retention projects** on tributaries that provide local benefits and cumulatively benefit the basin.
- 2C.9.3 Modeling of the remaining **main stem** Hydrologic Engineering Centers River Analysis System **HEC-RAS** reach to the Canadian border presently underway, including the work needed to tie all the main stem reaches together into one model from White Rock, South Dakota, to the Canadian border, should be completed by the end of 2012.
- 2C.9.4 The HEC-RAS main stem model, in conjunction with the new watershed HMS models, should be finalized in such a way that they can be utilized to provide the basis for a RRRRA **“Project Prioritization Process”** needed for evaluating proposed projects, their effectiveness, and downstream impacts in contributing to the RRBC’s flow reduction goals on the major tributaries and Red River main stem.

### **Recommendation for Action 2C.10**

NRCS, in conjunction the RRRRA, shall **evaluate PL 83-566 and other dams that have flood control capacity in the basin to determine the feasibility of restoration** for the purpose of adding potential flood water retention storage, including the identification of specific structures for rehabilitation, specific strategies and funding necessary, and proposed timelines. NRCS shall issue its findings to the RRRRA by September 30, 2012. Federal funding of up to \$6 million is needed for the evaluation and an additional estimated \$10-\$15 million for refurbishment.

## **Information and Tools for Maximizing Efforts Going Forward**

- The Red River Basin, a vast geographic area of three states and one Canadian province, **has great need for cooperation** across boundaries for uniform data and information gathering efforts, an understanding of our differences, and a shared vision of what needs to be accomplished.
- The current local, state, and federal partnership in comprehensive flood risk reduction strategies is **disjointed and operates in a piecemeal fashion**.
- **Each flood varies**, creating unique issues regarding preparation and protection needs.
- **Levels of protection** recommended by RRBC for the LTFS Report will provide the safety net needed and allow for variations in floods, weather, and forecasting.
- **Further improvements in flood forecasting** such as new data sets, modeling improvements, and real time information to account for variables related to precipitation and temperature are needed to build upon those instituted after the 1997 flood.
- **Additional efforts and information** are needed as a guide for the future as updated needs become evident.

### **Recommendation for Action 3.1**

The RRBC shall, for the next 10 years, conduct an **annual evaluation of flood mitigation progress towards the implementation of the LTFS Report Recommendations**. This evaluation shall be submitted to Minnesota, North Dakota, South Dakota, and Manitoba.

### **Recommendation for Action 3.2**

Jurisdictional Multi-Boundary Coordination should be implemented wherever possible through the RRBC.

- 3.2.1 The Minnesota, North Dakota, and South Dakota governors and the Manitoba Premier should meet at least once every two years, along with the relevant legislative committee chairs of the state and provincial governments, to receive an **update on progress towards the LTFS recommendations** on flood reduction strategies, water quality, water quantity, and other relevant natural resource issues.
- 3.2.2 With the assistance of RRBC, the **International Legislators Forum** among Manitoba, Minnesota, North Dakota, and South Dakota legislators should be continued to discuss current topics, including flood risk reduction strategies.
- 3.2.3 Minnesota should coordinate through the Board of Water and Soil Resources and the state legislature the **inclusion of all subwatersheds** on the Minnesota side as Watershed Districts (Ottertail) and membership in the RRWMB (Ottertail and Buffalo-Red Watershed District).
- 3.2.4 Federal agencies should utilize their **regional structures in innovative new ways** to accommodate Red River basin hydrologic boundaries.
- 3.2.5 When necessary, RRBC shall coordinate a **jurisdictional meeting** of heads of state, legislative leaders, and key agency officials to prompt dialogue and development of unified action on such issues.

### **Recommendation for Action 3.3**

LTFS should be expanded to include the entire Red River basin:

- 3.3.1 Manitoba should continue funding RRBC's efforts to model the 20 percent **flow reduction strategy in Manitoba** and also continue and accelerate the gathering of Light Detection and Ranging (LIDAR) data, at \$70,000 through 2012.
- 3.3.2 **South Dakota** and local leadership should determine the feasibility of establishing watershed organizations in Roberts and Marshall counties through the International Legislators Forum within the next two years.

### **Recommendation for Action 3.4**

RRBC should coordinate development of a basin-wide strategy and identification of funding sources for **improving flood forecasting** during 2012 among local, state, provincial, and federal agencies.

- 3.4.1 The generation of **relevant time appropriate data** (real time rain and snowmelt, soil moisture, frost depth information, and other information) and improved modeling through a volunteer network and the development of a real time network shall be addressed.
- 3.4.2 The feasibility of establishing an **on-site decision support service** to the region during spring and summer flood events by hosting a US National Weather Service

hydrologist in the basin shall be considered, as well as identifying a funding source for such an effort.

### **Recommendation for Action 3.5**

The USGS, RRWMB, RRJWRD, and their member water boards, NDSWC, MNDNR, and other key stakeholders, should **develop a stream gage strategy** by 2012 with associated costs and funders for the basin for the main stem Red River and its tributaries that will support the new hydrologic and hydraulic models that will provide a long term record for accurate, timely, and consistent flow data for model development, aid in flood reduction strategies, and include water quality modeling needs in the next two years.

### **Recommendation for Action 3.6**

RRBC should **update the LTFS Report in 2021** with the inclusion of Manitoba and South Dakota and shared funding from the four jurisdictions.

## **Resources to Implement**

- Minnesota and North Dakota, cost sharing with local, state, and federal funds, should implement actions consistent with the LTFS to maintain the basin's social, economic, and environmental welfare and protection from future large floods, as this investment over the next 10 years will significantly **reduce the risk of \$11-13 billion in losses** from a large flood and protect the economic output of the basin.

### **Recommendations for Action 4.1**

The states of Minnesota and North Dakota, cost sharing with local and federal partners, should make a **financial investment** of about \$3.54 billion over the next 10 years to immediately address flooding in the basin with a structural approach.

- 4.1 **Funding in Minnesota** needed for the next 10 years is \$270.9 million, from local and state sources.
- 4.2 **Funding in North Dakota** needed for the next 10 years is \$536.4 million from local and state sources.
- 4.3 **Local funding** at the RRWMB and RRJWRD levels should be increased and maintained at a two mil levy.

*See attached funding timeline table D-31 and Level of Protection Appendix D, D-3.1, p. 12 with state, local and federal funds.*

Funding Timeline for Project Implementation Costs  
Along the Red River of the North and Tributaries

**Table D-31 Funding Timeline for Project Implementation Costs along the Red River of the North and Tributaries<sup>(6)(7)</sup>**

All costs in millions and are estimated at 2011 price levels

The best available information as of September 2011 is presented in this table. However it is not complete as much of the information has yet to be developed. These costs will change as additional information is developed.

	Total Project Cost	Remaining Project Costs 1st Ten Years (Starts 1 July 2011)					Remaining Funding for Future (After 2021)	Notes
		Total Funding	Federal Funding	Non-Federal Funding <sup>(1)</sup>	Non-Federal Funding in Minnesota	Non-Federal Funding in North Dakota		
<b>Local Protection Projects</b>								
<b>Red River Main Stem</b>								
Red	Farmstead and Rural Residence Ring Dikes	\$17.0	\$3.2	\$1.8	\$0.4	\$1.0	TBD	(8)
Red	Minnesota Rural Area Buyouts	\$12.0	\$12.0		\$12.0		TBD	
Red	North Dakota Rural Area Buyouts	\$7.0	\$7.0	\$3.6		\$3.4	\$0.0	
Red	Stanley Township, Cass County, ND Levees	\$4.0	\$4.0			\$4.0	\$0.0	
Red	Breckenridge, MN	\$41.0	\$0.7		\$0.7		\$0.0	
Red	Oxbow, ND	\$0.4					\$0.0	
Red	Fargo/Moorhead Diversion Project	\$1,770.0	\$1,770.0	\$785.0	\$985.0		\$0.0	(1, 6)
Red	Fargo, ND - Other Non-Diversion Projects	\$200.0	\$200.0			\$200.0	\$0.0	
Red	Moorhead, MN - Other Non-Diversion Projects	\$70.0	\$25.0		\$25.0		\$0.0	
Red	Oakport Twp, MN	\$33.0	\$8.7		\$8.7		\$0.0	
Red/ Buffalo	Georgetown, MN	\$3.2	\$3.2		\$3.2		\$0.0	
Red	Perley, MN	\$2.7	\$0.3		\$0.3		\$0.0	
Red	Hendrum, MN	\$2.5	\$0.3		\$0.3		\$0.0	
Red/ Marsh	Shelly, MN	\$3.0	\$2.0		\$2.0		\$0.0	
Red	Nielsville, MN	\$3.0	\$1.8		\$1.8		\$0.0	
Red/ Sand Hill	Cimax, MN	\$3.0	\$2.3		\$2.3		\$0.0	
Red	Oslo, MN	\$9.0	\$9.0		\$9.0		\$0.0	
Red	Drayton, ND	TBD						
Red	Pembina, ND	\$0.1					\$0.0	
Red	St. Vincent, MN	\$2.9	\$2.9		\$2.9		\$0.0	
<b>Tributaries</b>								
<b>Sheyenne/Maple/Rush Rivers (ND)</b>								
Sheyenne	Valley City, ND	\$60.0	\$60.0	\$39.0		\$21.0	\$0.0	
Sheyenne	Fort Ransom, ND	TBD						
Sheyenne	Lisbon, ND	\$10.0	\$10.0				\$0.0	
Sheyenne	Kindred, ND	\$3.0	\$3.0				\$0.0	
Sheyenne	Horace, ND						\$0.0	(2)
Sheyenne	West Fargo, ND						\$0.0	(2)
Sheyenne	Relle's Acres, ND						\$0.0	(2)
Maple	Enderlin, ND	\$0.3					\$0.0	
Maple	Mapleton, ND	\$0.1					\$0.0	
Rush	Amenia, ND	TBD						
Sheyenne	Harwood, ND						\$0.0	(2)
Sheyenne	Reed Township, Cass County, ND	\$4.5	\$4.5	\$1.8		\$2.7	\$0.0	

**Table D-31 Funding Timeline for Project Implementation Costs along the Red River of the North and Tributaries<sup>(6)(7)</sup>**

All costs in millions and are estimated at 2011 price levels

The best available information as of September 2011 is presented in this table. However it is not complete as much of the information has yet to be developed. These costs will change as additional information is developed.

		Total Project Cost	Remaining Project Costs 1st Ten Years (Starts 1 July 2011)					Remaining Funding for Future (After 2021)	Notes
			Total Funding	Federal Funding	Non-Federal Funding <sup>(3)</sup>	Non-Federal Funding in Minnesota	Non-Federal Funding in North Dakota		
<b>Wild Rice River (MN)</b>									
Marsh	Ada, MN	\$9.4	\$6.0			\$6.0	\$0.0		
Felton Ditch	Felton, MN	\$2.7	\$2.7			\$2.7	\$0.0		
Wild Rice	Buyouts	\$1.5	\$0.3			\$0.3	\$0.0		
<b>Red Lake River (MN)</b>									
Cty Ditch 1	Thief River Falls, MN	\$1.0					\$0.0		
Red Lake	Crookston, MN	\$40.0	\$6.0			\$6.0	\$0.0		
<b>Middle/Snake Rivers (MN)</b>									
Snake	Alvarado, MN	\$3.0	\$3.0			\$3.0	\$0.0		
Middle	Argyle, MN	\$0.8	\$0.3			\$0.3	\$0.0		
<b>Park River (ND)</b>									
Park	Grafton, ND	\$42.1	\$41.0	\$31.6		\$9.4	\$0.0		
<b>Pembina River (ND)</b>									
Pembina	Neché, ND	\$3.0	\$3.0	\$1.9		\$1.1	\$0.0		
<b>Roseau River (MN)</b>									
Roseau	Roseau, MN	\$40.0	\$20.0	\$14.0		\$6.0	\$0.0		
<b>Devils Lake (ND)</b>									
Devils Lake	Devils Lake, ND (City of)	\$150.0					\$0.0		
Devils Lake	Minnewaukan, ND	\$10.5					\$0.0		
Devils Lake	Fort Totten, ND	\$120.0	\$120.0	\$120.0			\$0.0		
Devils Lake	Tolna Coulee - Control Structure	\$14.0	\$13.4	\$9.9		\$3.5	\$0.0	(3)	
	West End Outlet	TBD					\$0.0	(6)	
	East End Outlet	\$85.0	\$85.0			\$85.0	\$0.0		
	Gravity Outlet	\$17.0	\$17.0			\$17.0	\$0.0		
	Buyouts	TBD					\$0.0		
	Raise federal aid roads	\$190.0	\$190.0	\$190.0			\$0.0		
	Raise township roads	TBD					\$0.0		
	Raise railroads	\$97.0	\$97.0	\$64.7		\$32.3	\$0.0	(4)	
Increase Upper Basin Storage	\$75.0	\$75.0	\$75.0			\$0.0			
<b>Subtotal - Local Protection - In United States</b>		<b>\$3,163.5</b>	<b>\$2,809.6</b>	<b>\$1,338.2</b>	<b>\$985.0</b>	<b>\$92.9</b>	<b>\$380.4</b>	<b>\$0.0</b>	

**Table D-31 Funding Timeline for Project Implementation Costs along the Red River of the North and Tributaries<sup>(6)(7)</sup>**

All costs in millions and are estimated at 2011 price levels

The best available information as of September 2011 is presented in this table. However it is not complete as much of the information has yet to be developed. These costs will change as additional information is developed.

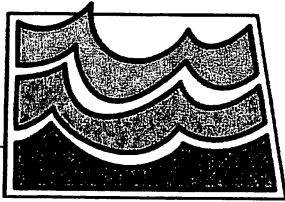
	Total Project Cost	Remaining Project Costs 1st Ten Years (Starts 1 July 2011)					Remaining Funding for Future (After 2021)	Notes
		Total Funding	Federal Funding	Non-Federal Funding <sup>(4)</sup>	Non-Federal Funding in Minnesota	Non-Federal Funding in North Dakota		
<b>Upstream Storage Projects</b>								
	<b>Potential Upstream Storage Projects</b>	<b>\$1,463.0</b>	<b>\$700.0</b>	<b>\$350.0</b>		<b>\$175.0</b>	<b>\$175.0</b>	<b>\$763.0</b> (5)
<b>Other Flood Related Activities</b>								
	Pilot Projects	\$10.0	\$5.0	\$2.5		\$1.3	\$1.3	\$5.0
	Decision Support Network	\$4.0	\$4.0	\$2.0		\$1.0	\$1.0	\$0.15/yr
	Forecasting	\$2.0	\$2.0	\$1.0		\$0.5	\$0.5	\$0.15/yr
	FEMA Flood Plain Mapping with LIDAR data	TBD						
	Transportation Upgrades	TBD						
	404 Retention Permitting Coordination	\$1.0	\$1.0	\$0.5		\$0.3	\$0.3	\$1.0
	Drainage	TBD						
	Conservation Program Funding	TBD						
	<b>Subtotal - Other Flood Related Activities</b>	<b>\$17.0</b>	<b>\$12.0</b>	<b>\$6.0</b>	<b>\$0.0</b>	<b>\$3.0</b>	<b>\$3.0</b>	<b>\$6.0</b>
<b>TOTAL FOR UNITED STATES IN RED RIVER BASIN</b>		<b>\$4,643.5</b>	<b>\$3,521.6</b>	<b>\$1,694.2</b>	<b>\$985.0</b>	<b>\$270.9</b>	<b>\$558.4</b>	<b>\$769.0</b>

TBD To be determined

Notes:

- (1) The estimated amounts of the Federal and non-Federal Fargo/Moorhead LPP Diversion project total costs are based on the Fargo-Moorhead Metropolitan Area Flood Risk Management project Supplemental Draft Feasibility Report and Environmental Impact Statement, April 2011. Final cost sharing amounts between the non-Federal partners have not yet been determined.
- (2) Additional local protection included as a part of the Fargo-Moorhead LPP North Dakota diversion project cost listed under Fargo and Moorhead at the top of this table.
- (3) Toina Coulee cost includes \$14 million for the control structure to prevent significant erosion in case of a natural overflow.
- (4) Cost sharing for raising railroad embankment at Devils Lake estimated to be one-third cost shared by Burlington Northern Santa Fe Railway, one-third by Amtrak, and one-third by the North Dakota Department of Transportation through a US Department of Transportation grant.
- (5) Federal participation in potential upstream storage projects is assumed to be available through future U.S. Farm Bill at approximately 50 percent cost sharing; however, actual Federal funding availability and cost sharing amounts is uncertain. Also, implementation of projects in each state is assumed to be at comparable levels, however this will depend on project implementation schedules by each state.
- (6) Operation and maintenance (O&M) costs of projects are not included in this tabulation, even though in some cases the O&M costs may be substantial. O&M costs are typically a non-Federal or local responsibility and should also be considered in the implementation decision for a project.
- (7) Information on specific projects at individual communities can be found on the City Assessment tables in Appendix C.
- (8) Funding for farmstead and rural ring dikes depend on the number of landowners requesting assistance. A rough estimate based on funding from recent years is included.





# North Dakota State Water Commission

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## MEMORANDUM

**TO:** Governor Jack Dalrymple  
Members of the State Water Commission  
**FROM:** Todd Sando, P.E., Chief Engineer and Secretary  
**SUBJECT:** Mouse River Enhanced Flood Protection Plan  
**DATE:** February 29, 2012

Progress continues on the Mouse River Plan. On January 31, the Minot City Council held a special session to consider the two main modifications to the levee alignments in Minot. After public input, the Council adopted the Maple Diversion and the 27<sup>th</sup> Street SE diversion options. This completes the preliminary alignments.

On February 16, the Souris River Joint Water Resource Board's Advisory Committee met to conduct a workshop in Minot to begin addressing issues in the rural reaches of the project. This is a complex matter, since there are different discharge and timing tolerances in the various areas. If these can be addressed, flexibility in operations of the rest of the system may be gained. Much valuable input was provided.

The Preliminary Engineering Report was delivered on February 29. A copy of the executive summary is attached.

A summary of project features and quantities is given below, and the opinion of probable cost follows:

**Table 10-1 Project Construction Feature Summary**

Category	Item	Units	Reaches Upstream of Minot <sup>1</sup>	Reaches Through Minot <sup>1</sup>	Reaches Downstream of Minot <sup>1</sup>	All Project Reaches <sup>1</sup>
Flood Risk Reduction Features	Length of Levee	feet	38,200	46,300	29,500	114,000
	Length of Floodwall	feet	1,100	11,800	2,000	14,900
	Roadway Closures	each	1	16	2	19
	Railroad Closures	each	1	4	6	11
	River Closures	each	0	4	0	4
	Pump Stations	each	8	16	9	33
	High Flow Diversion or Channel Realignment	feet	6,700	8,800	500	16,000
Municipal Infrastructure	Sanitary Sewer	feet	7,000	13,600	900	21,500
	Watermain	feet	6,500	27,400	600	34,500
	Storm Sewer	feet	3,800	26,400	1,100	31,400
	Bridges to be Modified	each	1	5	2	8
	Road Re-alignment (horizontal road adjustments only)	feet	5,000	8,300	1,200	14,500
	Road Raise (includes Bridge Approaches and Highways only)	feet	2,000	7,100	26,700	35,800

<sup>1</sup> Lengths are rounded to the nearest 100 feet.

<b>Cost Breakdown Element</b>	<b>OPC</b>
Mobilization / Demobilization	\$34M
Infrastructure Modifications	\$48M
Ecological Mitigation	\$4M
Roads, Road Raises, Railroads and Bridges	\$56M
Channel Improvements and Hydraulic Structures	\$96M
Levees, Floodwalls, and Closures	\$219M
Interior Flood Damage Reduction Systems (Pumping Stations)	\$68M
Recreation Features	\$11M
Cultural Resource Investigations and Mitigation	\$5M
Hazardous Waste Mitigation	\$24M
<b>Estimated Construction Costs<sup>1 2 3 4</sup></b>	<b>\$565M</b>
Lands and Easements	\$154M
Planning, Engineering and Design	\$57M
Permitting and Regulatory Approvals	\$4M
Construction Management	\$40M
<b>Estimated Total Project Cost<sup>1 2 3 4</sup></b>	<b>\$820M</b>

- (1) Includes contingency, see discussion
- (2) Includes costs for the Upstream of Minot Reach, Minot Reach and Downstream of Minot Reach as defined herein.
- (3) This feasibility-level (Class 4, 10-15% design completion per ASTM E 2516-06 and USACE EI 01D010 (9/1/97)) cost estimate is based on feasibility-level design alternatives; alignments, quantities and unit prices. Costs will change with further design. Time value-of-money escalation costs are not included. The estimated accuracy range for the Total Project Cost as the project is defined is -20% to +40%. The accuracy range is based on professional judgment considering the level of design completed, the complexity of the project and the uncertainties in the project as scoped. This accuracy range is not intended to include costs for future scope changes that are not part of the project as currently scoped or risk contingency.
- (4) Does not include temporal escalation costs, operation and maintenance costs, relocations or betterments.

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# Mouse River Enhanced Flood Protection

## Preliminary Engineering Report: Executive Summary



Prepared for North Dakota State Water Commission

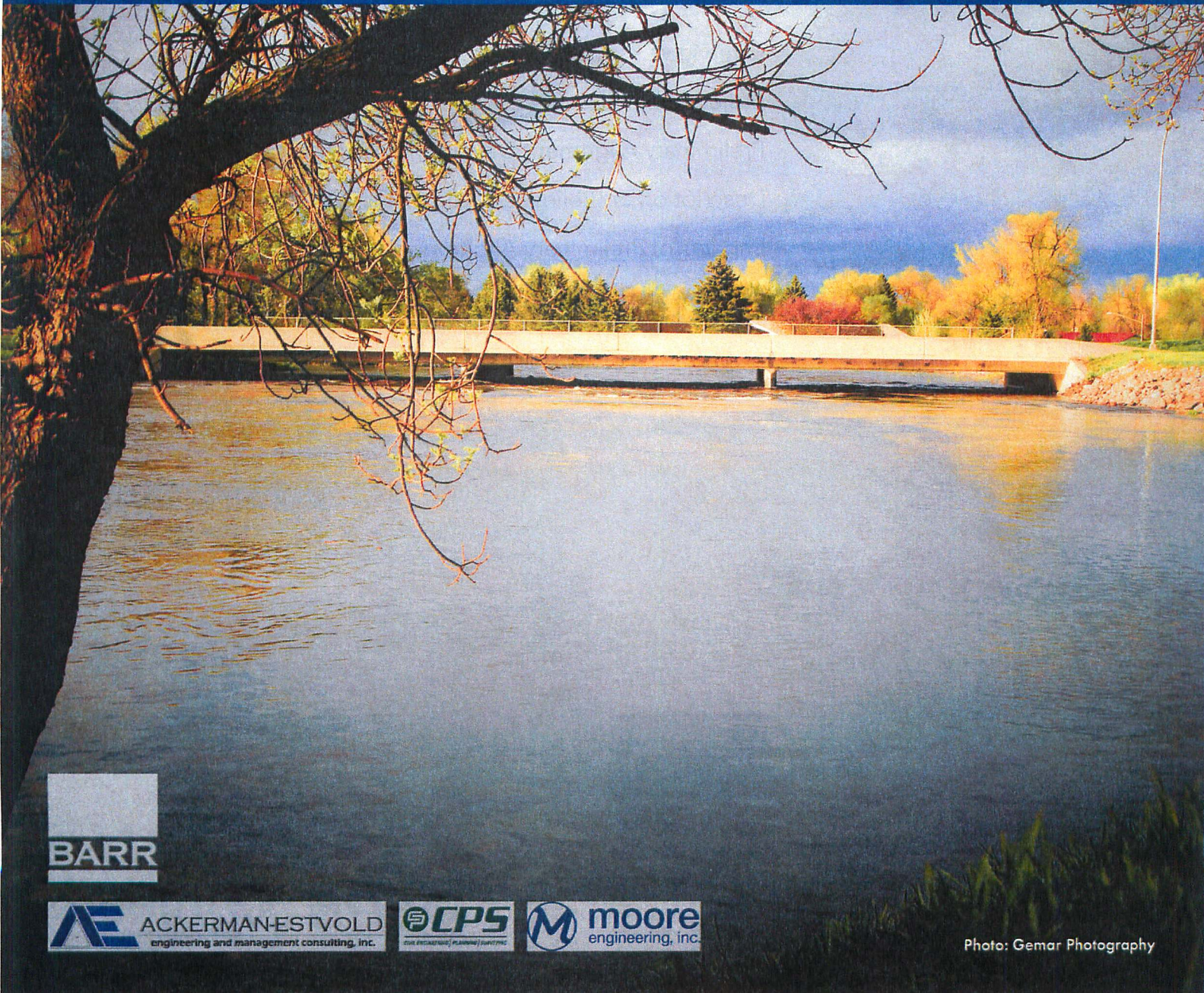


Photo: Gemar Photography



# Contents

## Mouse River Enhanced Flood Protection Project Executive Summary

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Description of Preliminary Alignment.....	ES-4
Impacts of Preliminary Alignment .....	ES-5
Implementation of Flood Risk Reduction Project.....	ES-6

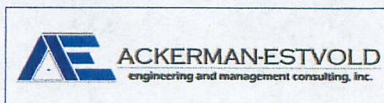




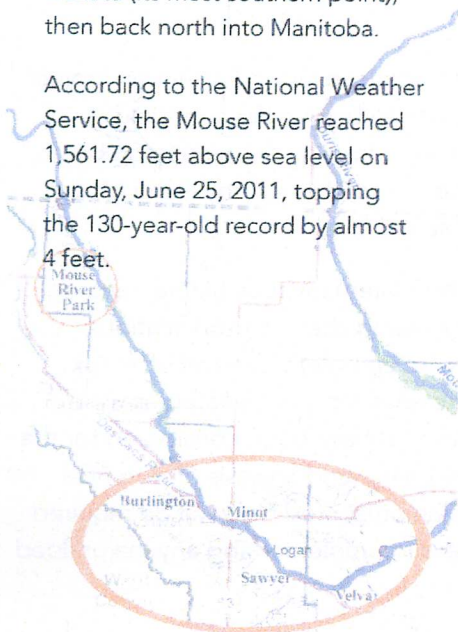


Photo: Gemar Photography, Minot

The sun sets over the Mouse River and Zoo Bridge in Minot.

The Mouse River, known also by its French name, the Souris, is about 435 miles in length, flowing from the Canadian province of Saskatchewan, to Velva, North Dakota (its most southern point), then back north into Manitoba.

According to the National Weather Service, the Mouse River reached 1,561.72 feet above sea level on Sunday, June 25, 2011, topping the 130-year-old record by almost 4 feet.

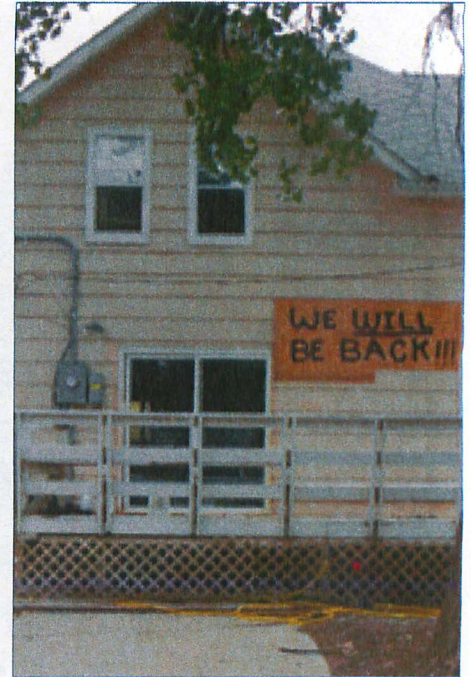


On June 25, 2011, the Mouse River flowed under Minot's Broadway Bridge at a record rate of 27,400 cubic feet per second (cfs)—more than five times the rate that existing channels and levees had been designed to handle and close to nine times the rate of any flood documented since construction of four upstream storage reservoirs. Not since 1882, a time when commercial production of automobiles was just beginning, had flows in excess of 20,000 cfs been seen. For days, during the 2011 flood, water levels were too high for cars to safely cross numerous area bridges.

The record-breaking flow overwhelmed most flood fighting efforts along the entire reach of the Mouse River through North Dakota, causing extensive damage to homes, businesses, public facilities, infrastructure, and rural areas. According to the U.S. Army Corps of Engineers (USACE), 4,700 commercial, public, and residential structures in Ward and McHenry counties sustained building and content damage totaling more than \$690 million.

If no emergency flood fighting measures had been implemented, potential building and content damages would total roughly \$900 million. This includes the 1,500 structures protected by the emergency levees but still considered at risk. This estimate does not reflect the cost of rebuilding in areas outside of the flood zone, where real estate values are particularly high.

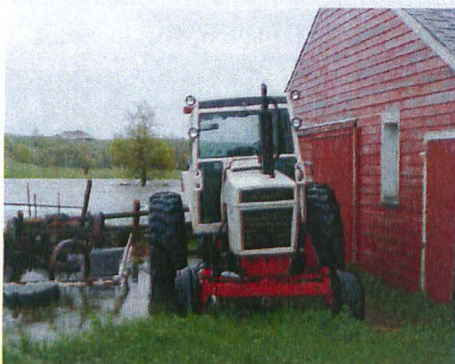




The heroic efforts of residents, volunteers, local officials, and state and federal agencies prevented significant damages. Still, more than 11,000 residents were displaced by the 2011 flood. A preliminary alignment plan was a high priority so that affected residents and business owners could make decisions on whether to rebuild or relocate. (Photo, above left, courtesy of FEMA)

### Rural Considerations

The rural areas of the Mouse River Valley, upstream of Burlington and downstream of Velva, were also devastated by the 2011 flood. Damage came in the form of flooded homes and farmsteads, erosion, sedimentation and debris deposition, lost crop production, and road and bridge washouts. These areas will be the focus of further study to address the circumstances and constraints specific to agriculture. A workshop was held on February 16, 2012, to gather stakeholder input for the engineering evaluation of rural areas.



In the aftermath of the flood, local government recognized the need to develop a plan that could provide direction during recovery and better protect the Mouse River community from similar future events. The Souris River Joint Board issued a request to the North Dakota State Water Commission to retain an engineering team to develop a "Mouse River Enhanced Flood Protection Project," including preliminary alignments for levees and floodwalls. The Preliminary Engineering Report provides a summary of the efforts undertaken to develop a preliminary alignment, as well as engineering, environmental, and cost considerations for plan implementation.

### Project Objectives and Scope

The primary objective for the Mouse River Enhanced Flood Protection Project (Project) is to develop a preliminary plan that can be used as a guiding document to help reduce the risk of damages from river flows comparable to those seen during the June 2011 flood. The scope of this study is the Mouse River Valley from Burlington to Velva and Mouse River Park.

There are a wide range of flood risk reduction alternatives available, ranging from restoration and maintenance of the existing channel modifications, levees, and upstream flood storage system, to complete removal of at-risk properties within the 2011 flooded area. Previous reports and studies were reviewed to determine the range of options that have been considered for the Mouse River Valley. A more comprehensive review and analysis of potential alternatives to the preliminary alignment plan presented here will be required to comply with the regulatory review process for implementing any major flood risk reduction plan.





A series of workshops and public meetings were held to get stakeholder input and feedback used in the development of the preliminary alignment plan. Community members were also able to stay informed and offer feedback through the Project website ([www.mouseriverplan.com](http://www.mouseriverplan.com)), Facebook, and Twitter. Over the course of the Project over 1,200 public comments were received.

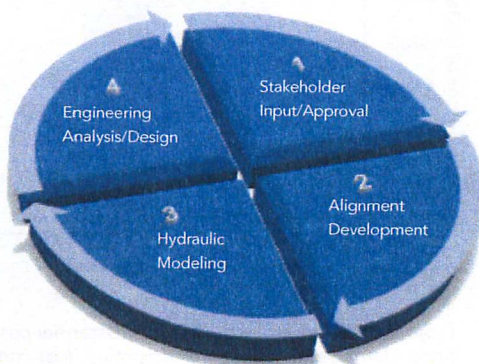
## Preliminary Alignment Development Process

The development of a preliminary alignment, including measures such as levees and floodwalls, is a complex process that requires both significant technical analysis and substantial stakeholder input. Rapid identification of an alignment corridor is a key first step because it allows affected property owners to make informed decisions about rebuilding or relocating.

The preliminary alignment described in this report was developed through an iterative process consisting of: (1) obtaining stakeholder input, (2) alignment development, (3) performing detailed hydraulic modeling of the alignment, and (4) performing engineering analysis and design.

Initial input was gathered at an October 2011 workshop. The primary objective for this workshop, which consisted of presentations, dialog, and work sessions, was to engage participants in a discussion of priorities and strategies for flood risk reduction. The resulting consensus priorities and alignments were used to complete hydraulic modeling and plan refinements.

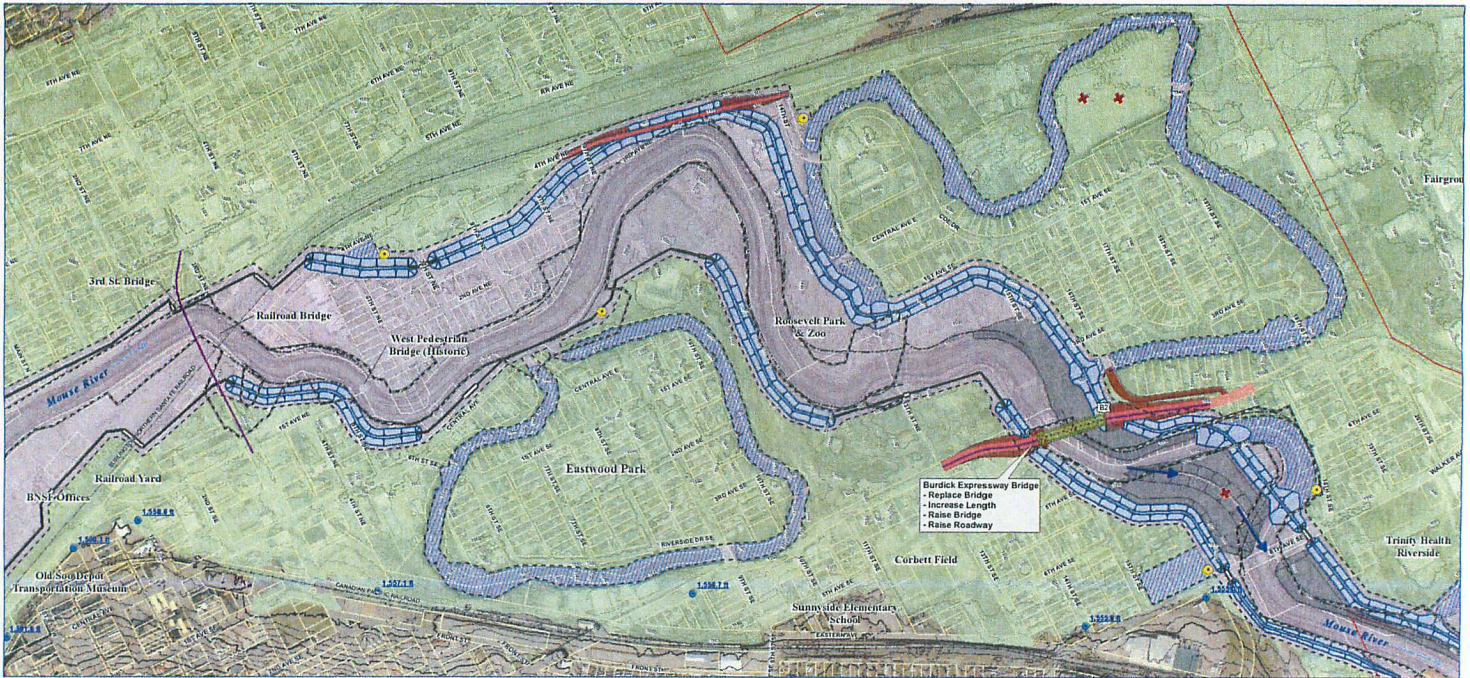
A draft preliminary plan was published on November 3, 2011, for public review and comment. Three additional cycles of input, alignment, and modeling revision (as well as dozens of intermediate iterations) occurred between November 3, 2011, and January 31, 2012. Plan revisions were posted to the Project website ([www.mouseriverplan.com](http://www.mouseriverplan.com)).



## Project Objectives and Constraints

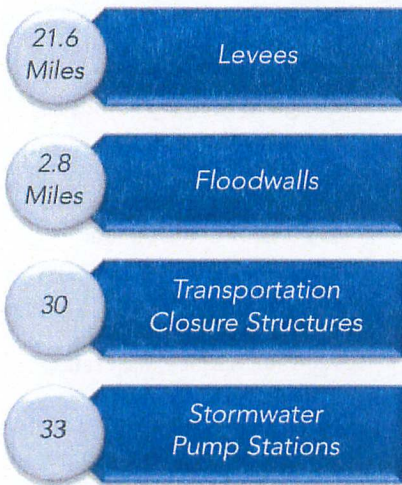
- (1) Reduce the risk of flood damage to as many homes as reasonably possible
- (2) Minimize the Project footprint and number of residential acquisitions required
- (3) Minimize increases in flood level water surface, flow rates, and duration
- (4) Develop a Project that can be implemented at the lowest practical cost
- (5) Establish key transportation corridors that can remain open during flood events
- (6) Minimize environmental impacts to facilitate necessary regulatory approvals
- (7) Design a Project that is consistent with the long-range objectives of the affected communities





The preliminary alignment plan includes levees, floodwalls, and river diversions and closure features to reduce the risk of flooding in populated areas along the Mouse River.

### Primary Features

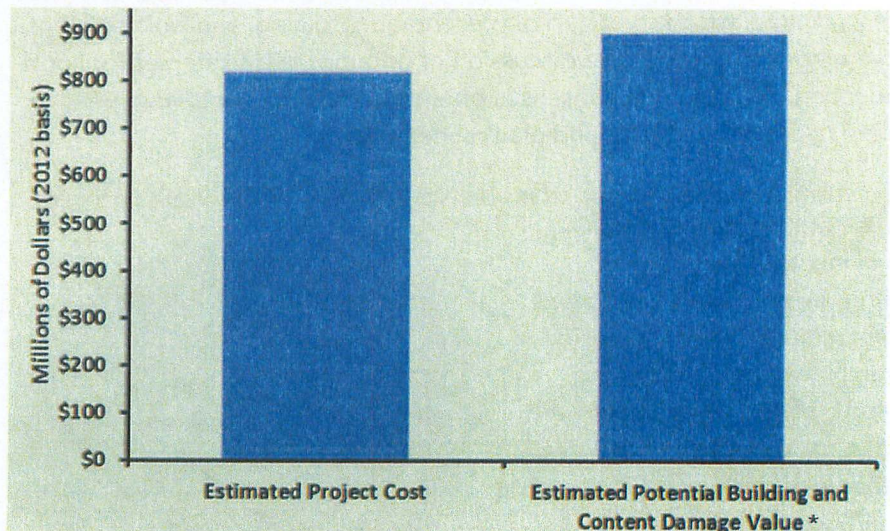


### Description of the Preliminary Alignment

The preliminary alignment plan consists of levees, floodwalls, river diversions and closure features, transportation closure structures, interior pump stations, and 2011 floodplain buyouts. Levees comprise almost 90 percent of the alignment, totaling 21.6 miles. The remainder of the alignment consists of 2.8 miles of floodwalls, and 30 transportation closure structures (19 roadway and 11 railroad). In addition, the Project would require 33 stormwater pump stations.

The estimated total Project cost is \$820 million, based on the current level of design and Project understanding. This Project cost is a point estimate, in current dollars, and does not consider the likelihood of cost escalation over the period of implementation. Of the estimated cost, \$565 million is related to construction, \$154 million is related to property acquisition, and the remaining \$101 million covers planning, engineering, and program management costs.

### Estimated Project Cost Compared to Potential Damages from Flood Similar to 2011



\* Project costs shown exclude the substantial costs related to emergency flood fighting, evacuations, damages to public infrastructure, lost commerce—and the incalculable human costs.





Photo: courtesy of FEMA

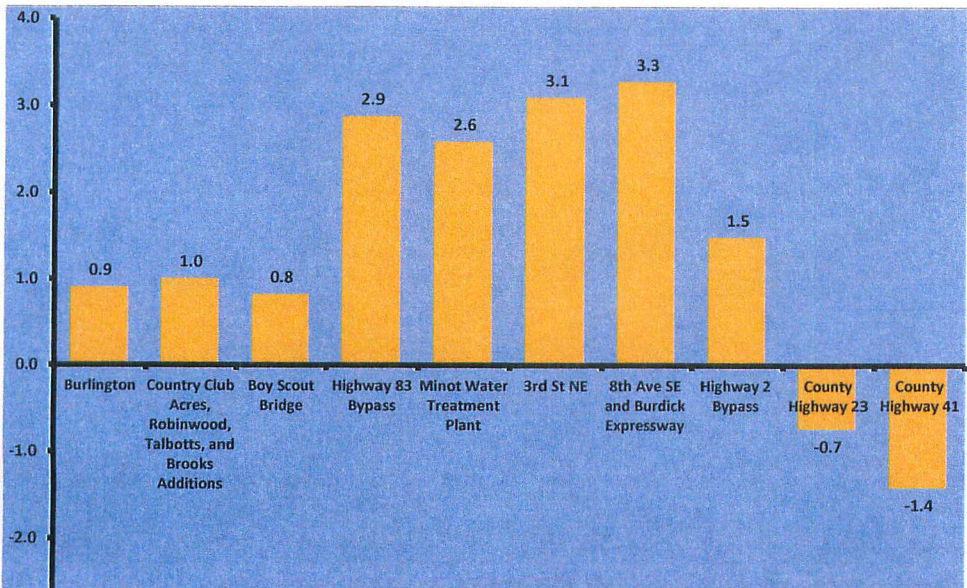
## Impacts of Preliminary Alignment

### Flood Level Impacts

One of the most critical design constraints of a flood risk reduction system is the estimation of the design water surface elevation. This defines the required height for constructed features such as levees and floodwalls. Potential hydraulic effects of the proposed alignment on upstream and downstream water surface elevations also need to be considered.

The Project will change the flood profile for the design flow (27,400 cfs) at most locations (see chart below). In the majority of cases, this is the result of efforts to narrow the floodplain—minimizing the Project footprint and the number of property acquisitions required.

Summary of Project Effect on 2011 Flood Profile (feet)



### Property Impacts

Construction of levees, floodwalls, road raises, road realignments, etc., will require acquisition of property. The table below provides a summary of the estimated number of residential properties that would need to be acquired to implement the Project. This estimate is limited by information available in the Project area.

Summary of Residential Properties to be Acquired for the Preliminary Alignment Project

	Up-stream	Minot	Down-stream	Total
Number of Residential Properties <sup>1</sup>	90	278	15	383

<sup>1</sup> Residential properties includes parcels classified as single family, two-family, and multi-family with a dwelling unit. Data is not readily available for estimating the number of housing units represented by this property count.





### Pre-Construction Implementation Steps

- ✓ Identifying funding mechanisms (local, state, federal)
- ✓ Extending the Project to consider rural areas downstream of Velva
- ✓ Investigating additional Project alternatives (e.g., lesser design events, reservoir modification, combinations, etc.)
- ✓ Adopting a final plan
- ✓ Performing the necessary field investigations (e.g., geotechnical investigations, wetlands, surveys, etc.)
- ✓ Completing engineering and environmental studies (e.g., hydrologic, hydraulic, geotechnical, socio-economic, biological resources, etc.)
- ✓ Developing detailed design
- ✓ Obtaining permitting and regulatory approvals (e.g., NEPA compliance; USACE Section 10, 404, and 408 approvals; Section 401 water quality certification; FEMA certification, etc.)
- ✓ Acquiring Project properties
- ✓ Preparing the corridor
- ✓ Continuing stakeholder and agency coordination

### Implementation of an Enhanced Flood Risk Reduction Project

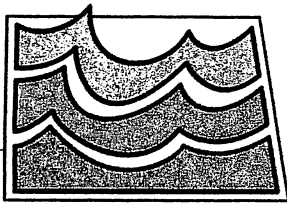
Implementation of an enhanced flood risk reduction plan is a multi-step process. Phased implementation may provide desirable flexibility for funding and construction of high-priority elements. Steps that must be completed prior to construction are listed in the table shown at left.

The estimated time frame for planning, engineering, environmental, and regulatory steps for the entire Project could be 5 years—or longer. Select components or individual levee system modifications, which have minimal environmental impacts, could potentially proceed on a separate path and at a faster pace. Construction of a project similar to the preliminary alignment plan described in this report is likely to take a minimum of 5 years, and could be phased over an extended period if necessary.



*Rendering of the Maple Diversion area, part of the Enhanced Flood Risk Reduction Project*






# North Dakota State Water Commission

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## MEMORANDUM

**TO:** Governor Jack Dalrymple  
Members of the State Water Commission  
**FROM:**  Todd S. Sando, P.E., Chief Engineer - Secretary  
**SUBJECT:** SWPP Construction Update  
**DATE:** February 13, 2012

### **Oliver, Mercer, North Dunn (OMND) Regional Service Area**

*Contract 3-1D OMND Water Treatment Plant Building and Membrane Equipment Installation:* Work at the water treatment plant is progressing very well. The general contractor, PKG Contracting Inc., has installed all of the big equipment, such as the membrane skids and vertical turbine pumps. Most of the process piping and process pumps have been installed. The studs and dry wall in the administration and lab areas have been installed. Painting in the lower level, the administration and lab area, is currently progressing. The case works in the lab, ceiling and floor tiles are expected to be done by the end of this month or early next month.

The electrical subcontractor, Edling Electric, Inc., is continuing to feed wires from the distribution panels to equipment locations. The lights and unit heaters at the plant were energized in early January. Currently, the contractor is installing the electrical feed and instrumentation wires to different SCADA equipment.

The mechanical subcontractor, Coffell's Plumbing & Heating, has installed the in-slab plumbing, domestic water plumbing, the compressed air piping, and HVAC ductwork.

All three contractors have signed a change order establishing milestone completion dates of April 1, 2012 for production of filtered but un-softened water, and May 1, 2012 for production of finished water for contract users.

*Contract 3-1E OMND Water Treatment Plant Concentrate Disposal Facility:* The contract was awarded to Carstensen Contracting, Inc. on August 31, 2011 and work began on September 27, 2011. This contract includes an 8" concentrate discharge and a 10" potable water line to serve some rural users. The installation of the concentrate disposal line is complete. The concentrate discharge line includes approximately 9 miles of 8" PVC pipe, a control vault, approximately 2500 ft of 8" HDPE pipe directionally drilled into the lake, and a diffuser structure installed at the lake bottom. Diver services were required to install the diffuser structure. Video evidence was provided by the diving subcontractor, Mainstream Commercial Divers Inc., which showed all hardware on the diffuser structure is in place and correctly installed. The concentrate discharge line is necessary for the production of finished water in April of 2012.

The contractor has installed all but approximately ½ mile of the 10" potable water pipe with several skips. The 10" line also has a pressure reducing valve (PRV) vault, which remains to be installed. The PRV vault is scheduled to be delivered during the week of February 27, 2012. Total project cost is \$4.7 million.

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CHAIRMAN

TODD SANDO, P.E.  
CHIEF ENGINEER AND SECRETARY

*Contract 2-8B Main Transmission Line from Hazen to Stanton and Beulah to Center Elevated Tank:* This contract was awarded to Kamphuis Pipeline Company last July and work began on April 18, 2011. The only items remaining on this contract are administrative items, final clean up, testing of piping installed between the OMND water treatment plant and the Zap potable reservoir, and chlorination. Estimated total project cost is \$5.1 million.

*Contract 5-15A Zap Potable Reservoir:* This contract was awarded to Maguire Iron, Inc. in July 2010. Site work began in late October. The reservoir was erected in early August and painting was completed by the end of September. The tank was considered substantially complete on November 3, 2011. The substantial completion date stipulated in the contract was June 15, 2011. The contractor has accepted a proposal to pay liquidated damages for 30 days of delay, along with installing non-skid tape to the roof of the tank to improve safety. Estimated total project cost is \$1.4 million.

*Contract 5-16 Center Elevated Tank:* Landmark Construction began work this summer. The concrete pedestal and most of the site work was complete by September. Welding of the metal tank structure on the ground commenced in October and the steel tank structure was jacked into position on November 8, 2011. The contractor will return in the spring for painting. The substantial completion date is July 15, 2012. Estimated total project cost is \$1.8 million.

*Contract 2-8C/D Main Transmission Line from Center Elevated Tank to Center:* This contract was awarded to Niebur Development on May 31, 2011. Construction began in July and has progressed very well. The installation of pipeline from the Center Elevated Tank to the City of Center is complete. The installation of the pipeline from Hannover to the Missouri West Water System is almost complete with only two and one-half miles of pipeline left to be installed. Substantial completion is scheduled for July 2012. Estimated total project cost is \$7.2 million.

*Contract 7-9C Zap Service Area Rural Distribution Line Phase I:* This project was bid August 4, 2011. The Commission approved award of the contract to Northern Improvement Co. at its August 17, 2011 conference call meeting. We received the concurrence of award from the Garrison Diversion Conservancy District and the Bureau of Reclamation. The contract documents have been executed. The contractor does not plan on starting construction until Spring 2012. Estimated total project cost is \$5.9 million.

*Contract 7-9D Zap Service Area Rural Distribution Line Phase II:* The SWC has received the submittal set of plans from the Engineer. This contract will consist of 140 miles of PVC pipeline serving 232 users. The fieldwork for the cultural resource work was completed in October. The report from the archaeology subcontractor, UND Archeological Research, is completed for this area and has been forwarded to the Bureau of Reclamation for review and concurrence. Any route changes suggested by the Bureau of Reclamation will be incorporated into the final plans.

A design meeting and an onsite meeting with the Engineer and Southwest Water Authority (SWA) were conducted for this contract area. During the site visit the density of several mobile homes in the recreational areas was observed. Based on that observation it was proposed to

include a new type of seasonal user to the customer types. This new seasonal user type will be discussed in detail in a separate memo. Estimated total project cost is \$5.6 million.

*Contract 2-8E/2-8F Main Transmission Line from OMND Water Treatment Plant to West of Killdeer:* Contract 2-8E will be the Main Transmission Line from the OMND water treatment plant to a combination reservoir and booster station north of Halliday. Contract 2-8F will be the second segment west of Halliday.

The submittal set of plans from the Engineer is pending since the size of the pipeline depends on the City of Killdeer's decision to sign on to the project. The State Water Commission has also been approached by a private corporation willing to share in the cost of constructing part of this pipeline in return for providing exclusive rights to selling water to the oil industry.

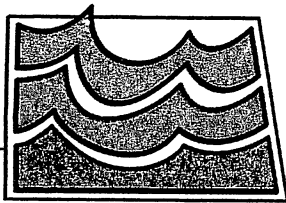
A meeting was held with the City of Killdeer's representatives, their engineer, SWA, Bartlett & West /AECOM and SWC staff. The City of Killdeer plans to put the question of service from the SWPP on the June ballot. According to the 2010 census data the City of Killdeer's population is 751. The city's representatives during the meeting expressed interest in securing 600 gallons per minute allocation from the SWPP which would meet the needs of the future population growth to 2,300 at 375 gallons per capita per day. It was also indicated during the meeting that until the city grows to the projected population they intend to sell the water to the oil industry.

#### **Other Contracts**

*Contract 4-3A/4-4A Upgrades at the Ray Christensen and Jung Lake Pump Stations:* This contract adds a 400kW standby generator and a third variable frequency drive (VFD) for the 300 HP pump at the Jung Lake pump station, and replaces one 50 HP pump with a 100 HP pump at the Ray Christensen pump station. The generator and the VFD at the Jung Lake pump station have been installed. The 100 HP pump for the Ray Christensen pump station will be shipped next week and the installation will be coordinated with the SWA.

*Contract 4-1D Dodge Water Depot:* The final inspection of this contract is complete. The final pay estimate has been paid and all parties have signed the final change order adjusting the quantities.


TSS:SSP/1736-05



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## MEMORANDUM

**TO:** Governor Jack Dalrymple  
Members of the State Water Commission  
**FROM:**  Todd S. Sando, P.E., Chief Engineer - Secretary  
**SUBJECT:** SWPP Project Update  
**DATE:** February 14, 2012

### Capital Improvement Plan of the Project

As the design and construction of the Oliver Mercer North Dunn Regional Service Area (OMND) continues, the population growth in southwestern North Dakota because of the recent oil boom has resulted in the existing South West Pipeline Project (SWPP) infrastructure reaching its design capacity. In order to meet the growing water needs, the raw water intake capacity, the raw water transmission capacity and the treatment capacity has to be increased. The population growth is also resulting in many cities annexing more land which impacts the project.

### Raw water intake capacity

Currently, the SWPP jointly uses the Basin Electric Power Cooperative's (BEPC) intake structure on Lake Sakakawea at Renner Bay. SWPP has an agreement with BEPC and a permit from the State Engineer, which allow for a pumping rate of 10,600 gallons per minute (gpm). This capacity is not sufficient to meet all of OMND's needs and the growing future project needs. The preliminary engineering report (PER) completed for the OMND regional service area estimated the raw water need for the OMND service area to be 3,350 gpm. The PER assumed a reverse osmosis recovery rate of 85%, which was changed to 80% after consultation with membrane manufacturers bidding on membrane procurement Contract 3-1C. This would result in a raw water need of 3,520 gpm. It should be noted that in the PER the City of Killdeer was not included in the capacity estimation because of the City's previous declination of service. However, an estimate of the cost of pipeline capacity to include service to Killdeer at 150 gpm was included. If the existing Dodge pumping station's capacity of 9,150 gpm is reserved to the areas served by the Dickinson water treatment plant, then the intake capacity required to meet current need is 12,670 gpm. This number does not take include any additional capacity for population growth in the SWPP project area because of oil exploration. BEPC has indicated through several rounds of discussions that they are not willing to grant any additional capacity to the SWPP, therefore construction of a state owned supplementary raw water intake facility will be critical to meeting the capacity needs of the SWPP.

The design of the supplementary raw water intake is an elaborate process that includes bathymetric surveys, geotechnical investigations and permits from the US Army Corps of Engineers (USACE). The State Water Commission (SWC) has signed a Specific Authorization (SA) with Bartlett & West/AECOM (BW/AECOM) authorizing them to prepare the bid ready contract documents for the supplementary raw water intake. The estimated compensation for this SA is \$700,000. We plan to use federal municipal, rural and industrial FY 2010 funding for this

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CHAIRMAN

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CHIEF ENGINEER AND SECRETARY

engineering work and we plan to bid the contract in a couple of years. The estimated cost for the entire contract is \$6.5 Million.

### **Raw Water Transmission Capacity**

The SWC authorized BW/AECOM to study the ability of existing raw water facilities to provide additional transmission flows to the Dickinson water treatment plant. The report titled "System improvement study for raw water main transmission line facilities of the Southwest Pipeline Project" was completed in July 2008. The report estimated probable costs for different transmission flows. The report estimates around \$43 million dollars for a transmission capacity of 16,000 gpm from the intake, with 13,125 gpm there of allocated to the Dickinson water treatment plant.

### **Treatment Capacity**

The OMND water treatment plant was designed to be constructed in two phases. In order to serve the entire OMND the construction of the second phase of the water treatment plant is necessary. The estimated project cost for the construction of the second phase the OMND water treatment plant is \$4.3 million and it is planned to be constructed in the next biennium.

The water treatment plant at Dickinson is nearing its design capacity. The current design capacity of the Dickinson water treatment plant is 12 million gallons per day (MGD) of which 6 MGD is allocated to the City of Dickinson. The allocated 6 MGD design capacity to Dickinson can serve a population of 24,000 at a design capacity of 250 gallons per capita per day (gpcd). During the recent Southwest Authority (SWA) board meeting the City of Dickinson's administrator gave a presentation on the City of Dickinson's annexation plan and growth projection. The following information was presented at the meeting. They estimate the current city of Dickinson's population to be between 21,000 and 22,000. They have hired North Dakota State University (NDSU) to do a population projection for the City. The draft report released by NDSU projects the population of Dickinson to be between 30,000 and 35,000 by the end of 2015.

The above numbers indicate the current water allocated to the City of Dickinson is not sufficient to meet the anticipated needs of the City's projected population. The remaining design capacity of the Dickinson water treatment plant is already allocated for the existing SWPP contract customers and rural users. So the water treatment plant needs to be upgraded to meet the growing needs. In 2009, BW/AECOM at the request of the SWA, conducted a study assessing the Dickinson water treatment plant. The study reported though the plant is producing very good quality water and is meeting the current needs of the City of Dickinson and SWPP, it is unlikely that the plant can continue to provide the needed supply of treated water for thirty or more years without some major refurbishments of equipment, structural repairs and other improvements.

A SA has been signed with BW/AECOM authorizing them to assess the projected water needs for the SWPP, perform an analysis of existing process and facilities, develop upgrade options for

existing facilities and develop new facility options. The estimated compensation for this SA is \$250,000 and we plan to use the funding from the resources trust fund.

The 2009 study indicates that the first item, which needs to be addressed to extend the useful life of the Dickinson water treatment plant, is to construct a separate finished water pumping facility. At present, the filtered water leaves the plant in four different directions. The four different directions include to the City of Dickinson's distribution system from the north and south clear well, to the SWPP's Ray Christenson's pump station and to the 6 MGD storage reservoir. A schematic of the Dickinson water treatment plant is attached. The City of Dickinson's pumps, and the SWPP transfer pumps are all located in the basement of the water treatment plant. The existing City pumps are nearing the end of their design life, and their capacity between 3700 – 3900 gpm (5.3 – 5.6 MGD) is insufficient to meet the growing need. The pumps should be replaced.

Having filtered water leaving the plant in four different directions complicates any future plan of treating taste and odor problems. A pumping facility constructed to receive water downstream of the 6 MG reservoir would facilitate any post filtration process and also would make some space available in the plant for any future upgrade of the plant. If abandonment of the plant was ultimately chosen, the new pumping facility would be more easily incorporated into the new configuration of the project wide water delivery system. The estimated cost for the new pumping service facility is \$3.5 million.

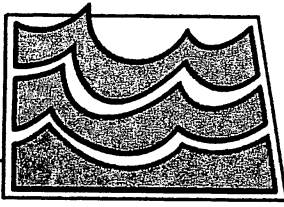
### **City Annexations**

Population growth because of the oil boom has resulted in the expansion, or plan for expansion, of many cities in southwest North Dakota by annexation. This affects the SWPP, since some rural customers currently served, and future customers who could be served, are lost to the respective cities. Those customers will be still served by the SWPP project water, but the revenue that the project receives back from them would be much lower as they will be served under the city's contract with the SWPP. The lost revenue from those customers includes the capital repayment cost to the SWC and the operation and maintenance cost to the SWA. In addition, the infrastructure that was put in by the project to serve those customers would become redundant. The SWC and the SWA are in discussion with the cities and legal counsel for the SWC and SWA to determine an appropriate agreement to mitigate the lost revenue.

TSS:SSP:/1736-05







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## MEMORANDUM

**TO:** Governor Jack Dalrymple  
Members of the State Water Commission  
**FROM:** Todd Sando, P.E., Chief Engineer-Secretary  
**SUBJECT:** NAWS – Project Update  
**DATE:** February 27, 2012

### Supplemental EIS

Reclamation is holding a cooperating agency meeting on March 7 for the NAWS Supplemental EIS. Agenda included purpose and need, alternative analysis, water needs and supply, transbasin effects, resource analysis, Missouri River depletion, climate change, and the schedule. When the Supplemental EIS is completed, the report will be provided to the federal court.

### Manitoba & Missouri Lawsuit

The Federal Court issued an order on March 5, 2010, requiring Reclamation to take a hard look at (1) the cumulative impacts of water withdrawal on the water levels of Lake Sakakawea and the Missouri River, and (2) the consequences of biota transfer into the Hudson Bay Basin, including Canada. The most recent order dated October 25, 2010, allows construction on the improvements in the Minot Water Treatment Plant to proceed, however it does not allow design work to continue on the intake.

### Design and Construction Update

**Table 1 - NAWS Contracts under Construction**

Contract	Contract Award	Contractor	Contract Amount	Remaining Obligations
2-2C Kenmare	10/1/08	Northern Improvement	\$4,853,166.87	\$4,000.00
5-2C Storage	3/27/09	Caldwell Tanks, KY	\$1,843,903.64	\$93,270.18
2-2D Mohall	7/24/09	American Infrastructure, CO <b>In Default – Being taken on by the Bonding Co - EMC</b>	\$5,196,586.13	\$128,207.84
2-3A Minot AFB	1/4/11	S.J. Louis Construction	\$5,864,000.00	\$1,887,361.48
2-3B Upper Souris/Glenburn	1/4/11	S.J. Louis Construction	\$3,747,982.00	\$679,010.88
7-1A Minot WTP Filter Rehab and SCADA	11/30/11	PKG Contracting, Inc. Main Electric, Inc.	\$7,910,108.00	\$7,338,315.50
<b>Total Remaining Construction Contract Obligations</b>				<b>\$10,130,165.88</b>

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CHAIRMAN

TODD SANDO, P.E.  
CHIEF ENGINEER AND SECRETARY

<b>Table 2 – Design Work on Upcoming NAWs Construction Contracts</b>		
	<b>Bid Opening</b>	<b>Contract Cost Estimate</b>
4-2A Westhope	Spring 2012	\$7,160,000
2-3C Renville Corner	Winter 2013	\$5,900,000

Contract 2-2C – The contract includes 52 miles of 10”-12” pipeline for the Kenmare-Upper Souris pipeline. The contract was awarded to Northern Improvement on October 1, 2008. The substantial completion letter was signed on November 20<sup>th</sup>. Water service to Kenmare was started on December 7, 2009. Water service to Upper Souris Water District at the Donnybrook turnout started December 22, 2009. The seeding for portions of the contract has completed, however there are several areas requiring reseeding. Contract closeout is expected following final seeding.

Contract 5-2C - The contract includes a 1 million gallon storage reservoir near Kenmare. The welded tank was lifted in place on the concrete pedestal on November 18, 2009. The tank is now in service. This contract should be closed out in the near future after start up of the cathodic protection system.

Contract 2-2D - The contract covers 62 miles of pipeline for the Mohall/Sherwood/All Seasons pipeline. The contract was awarded to American Infrastructure, Colorado. The Contract Surety, EMC took over the contract and hired S.J. Louis Construction to complete the remaining work. This project was substantially complete October 27, 2011 350 days after the substantial completion date.

Contract 2-3A – The contract covers 13 miles of 24” pipeline between the north side of Minot to the Minot Air Force Base. Work began in early September. The contractor, S.J. Louis, is making moderate progress and is roughly 20% complete.

Contract 2-3B – The contract covers the 13 miles of 16” pipeline north of the Minot Air Force Base along Highway 83 to provide service to Upper Souris Water District at their treatment plant and at Glenburn. Work began in late August and is over 60% complete.

Contract 7-1A – The Federal Court on October 25, 2010, approved construction in the Minot Water Treatment Plant with the piping and filters. The SCADA telemetry system for the Northern Tier has been incorporated into this contract, as well as the design and programming for the SCADA for the entire project. The contract was awarded to PKG Contractors, and Main Electric. All asbestos abatement has been completed in both filter bays. The filters in the newer filter bay have been cleaned and coated with the new underdrain system currently being installed. Demolition of the corresponding piping gallery is complete and coatings are currently being applied. We have met with Preferred Controls to finalize the programming for the SCADA system and for the SCADA system for the treatment plant.

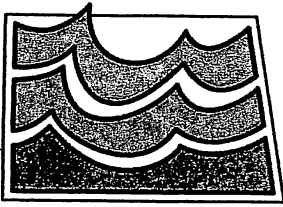


Contract 4-2A – This contract will cover the 20 miles between Renville Corner at the intersection of Highway 83 and Highway 5 and the City of Westhope. This pipeline will serve numerous connections to All Seasons Rural Water including the City of Westhope.

Contract 2-3C – This contract will cover 18 miles between Forfar and Renville Corner including a pipeline to the City of Lansford and will complete the looped portion of the Northern Tier of the NAWS system. This pipeline will be instrumental to provide additional service to areas of growth on the system and providing peak day flows once water is available from Lake Sakakawea.

Regional Growth/Higher Water Demands – The City of Minot and surrounding communities are seeing a population growth due to increased oil industry activity in the region. Housing and industrial developments are in early stages of planning in communities served by the NAWS system. We are currently developing plans to address the growing needs in the area as well as possible until and after a supply of water is received from Lake Sakakawea.


TSS:TJF/237-4



# North Dakota State Water Commission

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## MEMORANDUM

**TO:** Governor Jack Dalrymple  
Members of the State Water Commission  
**FROM:**  Todd Sando, P.E., Chief Engineer-Secretary  
**SUBJECT:** Western Area Water Supply – Project Update  
**DATE:** February 27, 2011

The Western Area Water Supply Authority (Authority) is making progress on water service contracts with each of the communities and rural water systems that will be served by the system. The Bank of North Dakota has requirements that the contracts must be finalized prior to accessing funding above the initial \$25 million. The Authority is pursuing construction and design work that does obligate more than the \$25 million at this time, however they believe they will have the water service contracts in place before actual payments will be needed.

The Authority did approve the depot locations. The Independent Water Providers, through Steve Mortenson, has still expressed concern over the 13-mile corner location and the amount of water service that would be available at that location.

The engineering firm increased rates without notice to the Authority. The Authority accepted the rate increase during the review of bills and asked for notification on future rate increases. The engineering firm indicated the increase was approximately four percent. Our rough review indicated rate increases ranged from 4% - 22%, with the Project Managers rate increase at 7.9%, from \$165 per hour to \$178 per hour. The State Engineer representative on the Authority has suggested negotiation of engineering rates when the contract was initially established and again at this time, however no action is taken on this recommendation.

### Design Work

The Western Area Water Supply Authority (Authority) has provided 65% design review plans and specifications for three projects to be bid in March. SWC staff is currently reviewing.

- The pipeline project is thirty miles of 20" to 24" transmission line from north of Williston to the 13 mile corner, then heading east to Ray.
- The pump station project is construction on five pump stations which include a 6 MGD near 13 mile corner; a 3 MGD at the Ray water treatment plant; and three 4.5 MGD along the pipeline heading south from Williston at Lewis and Clark, Indian Hills, and Alexander; and construction of buildings over six control vaults.
- The reservoir project is construction of three 0.5 MG reservoirs at Alexander, Arnegard, and Wildrose; and two 2 MG reservoirs at 13-mile corner and Ray.

JACK DALRYMPLE, GOVERNOR  
CHAIRMAN

TODD SANDO, P.E.  
CHIEF ENGINEER AND SECRETARY

**Construction Update**

State Water Commission staff reviewed and approved specific plans and specifications on the following projects.

<b>Project</b>	<b>Description</b>	<b>Contractor</b>	<b>Cost</b>	<b>Completed</b>	<b>Completion</b>
Res No. 1 to Bakken Ind. Park Pipeline	30" to 24" pipeline NW of Williston	Merryman Excavation	\$4,055,539.17	\$3,986,128.17	5/31/2012
US 2 to County Hwy No. 7 Watermain	24" to 12" pipeline west side Williston	Metro Construction	\$3,986,068.58	\$3,986,068.58	Completed 12/2011
26 <sup>th</sup> St Pump Station	Increase discharge pressure	John T Jones Construction	\$738,011.00	\$710,286.91	5/31/2012
<b>Total</b>			<b>\$8,779,618.75</b>	<b>\$8,682,483.66</b>	

Engineering services totaled \$5,802,684.01, legal services \$148,462.55, and easements \$250,725.69 thru January 2012.

**Funding**

The State Water Commission has made payment on \$13.7 million of project expenses approved by the Authority.

TS:MK/1973



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Williston, ND 58801  
Home Phone (701) 572-5873  
Cell Phone (701) 770-0942  
smortens@wil.midco.net

To the North Dakota State Water Commission:

The Independent Water Providers (“IWP”) would like to thank you for allowing us to share information about our group and concerns we have regarding water needs and water development in North Dakota. IWP is an organization of farmers, ranchers and private business owners that have invested hundreds of thousands, and in some cases millions of dollars, of their own resources to develop private water depots and pipelines to serve the industrial water needs of northwestern North Dakota. IWP has grown from one privately owned, industrial water depot to approximately seventy-three (73) industrial water depots and a network of significant pipeline infrastructure at the end of 2011. We project that by the end of this year approximately 100 private water depots will be in place. The competition within the private sector providing water to the oil industry is vigorous. IWP estimates that 70-80% of the oil industries’ water needs were provided by the private sector in 2011. Our goal is simple— to efficiently serve the water needs of the oil industry with cost effective water sources and facilities to provide shorter distances for trucks, and water pipelines for oil well locations.

Our growth in the last four years has not been without challenges. In addition to the necessary updating and expansion of depots and pipelines to keep pace with demand, we have been denied access to Lake Sakakawea by the US Army Corp of Engineers and are threatened with competition from the government sponsored and State guaranteed, Western Area Water Supply Project (“WAWSP”). We’ve always been supportive of State water projects that serve the potable water needs resulting from the tremendous growth and influx of people in northwestern North Dakota. But, the emphasis of the WAWSP is now first and foremost on the supply of industrial water sales, not the delivery of drinking and municipal water to area residents as represented by the project proponents during the 2011 Legislative Session. The WAWSP needed the commitment of five entities to join the project for it to be considered viable—McKenzie County Water District, Williams Rural Water, City of Williston, BDW Water System Association and R&T Water Supply Association. At this point, only McKenzie County Water District has joined.

As part of its relationship with WAWSP, McKenzie has begun its Regional Water Service Project that will distribute water to outlying rural areas by means of interconnected pipelines. Further, McKenzie and the Western Area Water Supply Authority (“WAWSA”) have requested a real estate easement from the United States Army Corp of Engineers (“Corps”) for the pipeline crossing the Missouri River near Williston. In connection with this request from the Corps, McKenzie was required to have completed an Environmental Assessment (“EA”) and secure a Finding of No Significant Impact (“FONSI”). Although the EA has been completed and the FONSI signed by the Corps, it remains to be seen whether the findings will be challenged given the reported deficiencies. Finally, WAWSA and McKenzie are now securing easements from private landowners for the WAWSP. However, unlike the IWP, the WAWSA is attempting to secure easements from private landowners without paying for them.

As of February 13, 2012 the WAWSP was nearly \$20 million over budget and costs are projected to escalate at least another \$60-\$70 million. These projections are from Advanced Engineering and Environmental Services, Inc. (“AE2S”)—the same engineering firm responsible for preparing and submitting the business plan relied upon by the North Dakota Legislature in passing the WAWSP legislation in 2011, the same engineering firm utilized for the WAWSP, and the firm responsible for the EA submitted to the Corps for the McKenzie Project, and which raised its rates on WAWSP by 4% at the end of 2011 without prior approval. In addition, only one engineering firm bid on the project—at the outset: AE2S. The WAWSA board should not have accepted this unfortunate circumstance, and a new bidding process should have been started to assure the public interest was fully protected. (The WAWSP is a \$150 million project, fully guaranteed by the State of North Dakota, \$110 million of which was authorized in 2011). The authorizing legislation contains several provisions of particular importance, including the mandate that the project was to minimize impacts to private water providers; that the State Water Commission has final approval of the project, and if the project defaulted, the State would ultimately own it. With this backdrop, WAWSP will ask the Legislature for an additional \$40 million in 2013, which should be considered in view of the issues expressed herein.

In addition, other State agencies have now taken it upon themselves to use the WAWSP as a reason to object to petitions for the private appropriation of water. As you can see from the attached letter, the North Dakota Game & Fish Department is now using the WAWSP as a tool to object to private requests for appropriation of water. According to Game & Fish, “[t]he approval and permitting of this proposed water appropriation would be in conflict and direct competition with the WAWS project.” IWP members believe that this view of WAWSP by state agencies is erroneous and urge the Water Commission and the State Engineer to reject this view in evaluating water appropriation requests, and applying water policy for North Dakota. It is disturbing to think an agency of State government sees private industry as competition for another government entity.

IWP has a number of concerns relating to WAWSP, but we also offer some solutions:

1. As indicated in the past, IWP members continue to provide private assistance in maintenance of public roads associated with our facilities (including gravel, blading and dust retardant). Our members will continue to assist with those impacts as part of being good neighbors.
2. We have embraced and publicly support the regular reporting requirement (30 days) of all industrial water permits, and the vigorous enforcement of water permit limits.
3. While we appreciate the need for continued expansion of drinking and municipal water, we urge the State Water Commission to review the WAWSP and determine exactly how the taxpayers’ money has been spent thus far and whether a change in project direction is needed before additional money is allocated in the next legislative session.
4. We suggest that a change in funding should be considered for the next legislative session as well. One example would be a small tax on each barrel of water used by the oil industry as calculated by the State Water Commission. This would allow private industry to compete freely without government interference/competition, and would provide immediate and predictable funding for the necessary infrastructure needed to expand rural water availability.
5. Finally, we would ask the State Water Commission to convene staff, IWP and WAWSP for a detailed review of the project plan, scope and size, its financial condition, and a review of plan design in response to the legislative mandate to “minimize impacts” before providing approval by the State Water Commission. (Frankly, we feel we have met with modest response to our request to WASWP to minimize impacts to our facilities as required by the legislation).

We continue to believe the State Water Commission would have appropriately handled this project from the beginning and should be considered for stronger oversight in the 2013 Session. We appreciate the opportunity to share information about our group and express our concerns, especially as they relate to the WAWSP. Thank you.

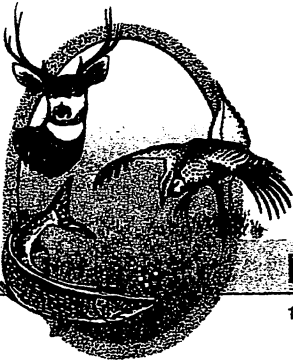
/S/

Steve Mortenson

President

Independent Water Providers





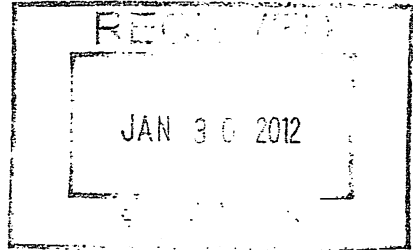
"VARIETY IN HUNTING AND FISHING"

**NORTH DAKOTA GAME AND FISH DEPARTMENT**

100 NORTH BISMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5095 PHONE 701-328-6300 FAX 701-328-6352

January 27, 2012

Todd Sando  
State Engineer  
900 East Boulevard  
Bismarck, ND 58505



Dear Mr. Sando:

Re: Redland LCC's Petition for Appropriation of Water  
Application No. 6319

The North Dakota Game & Fish Department has been notified of Redland LCC's water permit application. The application requests authorization to divert and appropriate water from the Missouri River utilizing a point of diversion in the SW1/4 of Section 7, Township 152 North, Range 102 West in McKenzie County, North Dakota. The appropriation would be pumped at a rate of 7,000 gallons/minute with an annual appropriation of 10,000 acre-feet of water for industrial use.

The surge in industrial water permit applications for oil production from both ground water and surface water sources has raised concerns over potential impacts to fish and wildlife resources. A primary component of an environmental review processes is to minimize impacts through an alternative analysis. The proposed point of diversion is located in a relatively remote area of the Missouri River. This reach of the river possesses the federally endangered pallid sturgeon and three additional species including the paddlefish, sicklefin chub and the sturgeon chub that are all listed on the North Dakota Species of Conservation Priority list. If approved, this water appropriation has the potential to negatively impact these species through entrainment and impingement.

Additionally, this proposed industrial intake will be in close proximity to the Western Area Water Supply (WAWS) project, a \$150 million dollar project approved by the North Dakota Legislature. The approval and permitting of this proposed water appropriation would be in conflict and direct competition with the WAWS project. The Department requests this water permit application be denied based on negative impacts to fish and wildlife resources as well as less damaging alternatives available to the industry in close proximity to this point of diversion.

Sincerely,

Greg Link  
Chief

Conservation & Communication Division

## **Western Area Water Supply Project Update**

**March 7, 2012**

Good Afternoon Governor and Commission Members. Thank you for the opportunity today to update you on the progress of the Western Area Water Supply Project. My name is Jaret Wirtz, and I am the Executive Director of the Western Area Water Supply Authority.

First, allow me to review the Western Area Water Supply Project with you. House Bill 1206 created the Western Area Water Supply Authority consisting of the City of Williston, the McKenzie County Water Resource District, the Williams Rural Water District, the R&T Water Supply Association, and the BDW Rural Water District. House Bill 1206 further allocated \$110 million dollars in loan funding for the 2011 to 2013 biennium.

The Business Plan that was developed for the project established three project phases. The initial loan agreement with the Bank of North Dakota allowed the Authority to proceed with \$25 million dollars in Phase I projects immediately. Those projects include the following:

1. Phase I Williston By-Pass Transmission Line
2. Northwest Williston Regional 5 Million Gallon Reservoir
3. Regional Transmission Line to Crosby/BDW
4. McKenzie County System IV Rural Water System

I am happy to report that all Phase I projects have been bid and awarded. Construction began in mid 2011 on the Phase I Williston By-Pass Transmission Line Project. That project is approximately 95 percent complete with 10 out of the planned 10.5 miles of transmission line constructed in 2011 and serving water to expanding industrial parks on the west and north side of Williston. The other projects will begin construction this spring and be completed this year with the exception of the McKenzie Rural Water project which will be completed in 2013.

In addition to Phase I project progress, the Authority has also advertised portions of Phase II as well. The transmission lines, pump stations, and reservoirs that will deliver water from Williston to the cities of Watford City and Ray (which will make additional water available for the cities of Ray, Tioga, Stanley, Ross, Wildrose, Crosby, Columbus, Fortuna, and Ambrose) are currently being advertised with bid openings set for early April. The transmission line to Ray will provide the R & T Water Supply Association with a desperately needed additional and dependable supply of water. The transmission line to Watford City will allow Watford City and McKenzie County Rural Water to replace their current source of groundwater with treated Missouri River water. These projects are scheduled to be completed by the end of 2012.

The reservoirs and pump stations also needed to deliver water to Ray and Watford City will be constructed simultaneously with the pipelines. Those facilities are scheduled to be operational by the end of 2012. Additionally, the Williston Water Treatment Facility is under design to be expanded from 10 to 14 million gallons per day (MGD). The Authority is also considering a bid alternate to accelerate

the expansion of the Williston Water Treatment Facility from 14 to 21 MGD. The Williston Water Treatment Facility Expansion will be bid in May of this year and have expanded capacity in the fall of 2013.

In addition to the work on the primary transmission infrastructure, the Authority has also been busy canvassing rural areas of northwest North Dakota to gain better insight regarding the regional demand for rural water service. It is anticipated that the rural water demand will be much greater than originally planned for in the Business Plan. As an example, the McKenzie System IV Rural Water System in western McKenzie County was planned to have 100 users but ballooned to nearly 300 after the passage of House Bill 1206. While the increase in users was welcome, it also tripled the cost of service for this area.

The Authority also finalized bulk fill depot locations along our pipeline route at our December meeting. Several iterations on depot sizing and location were considered by the Authority. The final approved locations reduced the number of depots from 15 in the Business Plan to 12. The reduction in depots was based on several factors including considerations of private depots, input from oil companies, and water availability. The following depots are in operation or under construction:

1. Williston 2<sup>nd</sup> Street Fill Depot (operational)
2. McKenzie System II Fill Station (operational)
3. North Williston Fill Depot (under construction)
4. Indian Hill - Fill Depot (under construction)

The depots the Authority has authorized our engineer to proceed with final design include the following:

1. 13 Mile Corner Fill Depot
2. R&T Fill Depot (modification of an existing depot)
3. Alexander Fill Depot
4. Watford City Fill Depot (relocation and modification of an existing fill depot)

The following depots have been delayed by the Authority due to various water availability issues:

1. 29 Mile Corner Fill Depot (water supply pipeline has been reprioritized)
2. Stanley High Point Fill Depot (limited water availability)
3. Crosby Fill Depot (limited water availability)
4. Johnsons Corner Fill Dept (water supply pipeline has been reprioritized)

While moving forward with the design and construction of project segments, the Authority has also successfully drafted comprehensive water supply agreements with its Members. As required by the Bank of North Dakota, the Authority must sign membership agreements with all of its Members in order to access Phase II project funding. To date, the McKenzie County Water Resource District, the City of Williston, and BDW Rural Water boards and commissions have all authorized the agreements. Williams Rural Water District and R&T Water committed to sign the agreements at their upcoming board meetings later this month. This a significant accomplishment for the Authority, as these agreements



were quite complex and took several revisions to satisfy each of the Members. It also shows the commitment the Members have to a regional water solution and, perhaps most importantly, allows the Authority to access \$85 million dollars in Phase II project funding.

As I mentioned previously, the Authority was allocated \$110 million dollars for Phase I and Phase II projects for the 2011-2013 biennium. You have been provided a handout that summarizes our current project cost estimate for all project phases.

Phase	Estimated Total Project Cost
Phase I Projects	\$31,595,192
Phase II Projects	\$70,262,539
<b>Phase I &amp; II Subtotal</b>	<b>\$101,857,731</b>
Phase IIa Projects	\$45,116,361
Phase III Projects	\$21,599,100
<b>Total</b>	<b>\$168,573,192</b>

As noted, the current Phase I and II total is just under \$102 million dollars. To summarize, that investment will get water from Williston to Ray and Watford City, expand the Williston Water Treatment Facility from 10 to 14 MGD, provide service to 200 rural residents in western McKenzie County, and construct 4 more fill depots. The Authority deliberately scheduled projects to keep Phase I and II costs near \$100 million dollars to afford the Authority a contingency to allow for unforeseen bid abnormalities and/or some flexibility to reprioritize projects as water demands develop in northwest North Dakota.

To provide that flexibility and project prioritization, a list of Phase IIa projects was also included in the cost estimate to reflect the Authority’s reprioritization of the Business Plan in response to the increasing water demand developments over the past year. As mentioned previously, the Authority is currently considering accelerating the expansion of the Williston Water Treatment Facility from 14 to 21 MGD, accelerating a rural water expansion project west of Williston, delaying service to 29 Mile corner and the City of Grenora north of Williston and Johnson’s Corner east of Watford City, including two water depots planned as part of those projects, and delaying a portion of the McKenzie County System IV project.

The Authority is seeing a significant increase in the demand for rural water service. The original Business Plan included approximately \$15,000,000 for service to an estimated 400 users in four service areas. The demand in those service areas has increased to an estimated \$26,000,000 just one year later. Although we currently only show three project phases, the Authority will likely be adding a fourth and fifth phase in response to ever increasing rural water service requests to service rural areas in and around Crosby/BDW and Stanley, two rural water service areas not included in the original Business Plan. Currently, Williams Rural Water District, the R&T Water Supply Association, and the McKenzie County Water Resource District have requests for rural water service numbering in the thousands. To service those requests may take an additional estimated \$40 to \$50 million.

With that said, as we review our current total project cost estimate of over \$168 million dollars, an \$18 million dollar increase over the Business Plan, \$11,000,000 of that increase is due to expanded rural

water service. The remaining \$7,000,000 is due to changes in the design of the project (increased pipeline diameter to Crosby/BDW), inflation over the past year, and the bidding environment of northwest North Dakota. However, that project total is expected to grow as the Authority continues to develop and evaluate the increasing water demands in the region. The Board considered its current financial situation along with the growth in water demand and voted to seek an additional \$80 million of project funding for the 2013 to 2015 biennium.

In closing, the Authority has made substantial progress since its organizational meeting held in June of 2011. In nine short months, the Authority has accomplished the following:

1. Bid all Phase I projects
2. Is on track to bid Phase II projects in the coming months (while staying close to the original Business Plan cost estimates with the exception of expanding water service requests)
3. Drafted water purchase agreements expected to be executed by all Members by the end of March Crosby Fill Depot (limited water availability)

On behalf of the Western Area Water Supply Authority and its Board of Directors, we want to sincerely express our appreciation for the funding and trust the State of North Dakota and State Water Commission have given us to complete this historic project. Thank you for this opportunity to update you on the Western Area Water Supply Project. We look forward to working with the State Water Commission members and staff to complete the project.

<b>Report Name</b>	<b>Phase I - III Executive Construction Summary</b>
<b>Capital Costs Incurred Through Date</b>	<b>1/31/2012</b>

	<b>Business Plan Estimate</b>	<b>Best Estimate To-Date</b>	
<b>Phase I</b>			
Task Order No. 4 - Regional Water Service Phase I Pipeline	\$ 10,225,000	\$ 10,226,420	*1
Task Order No. 5 - Regional Water Service Phase I Reservoir	\$ 5,000,000	\$ 5,609,890	*1
Task Order No. 6 - Regional Water Service to Crosby/BDW	\$ 4,000,000	\$ 5,860,472	*1
Task Order No. 7 - Regional Water Service System IV - Phase I	\$ 3,700,000	\$ 9,266,840	*1
Task Order No. 8 - Board Development and Administration	\$ -	\$ 631,571	
<b>Phase II</b>			
Task Order No. 10 - Williston Water Treatment Facility Expansion	\$ 11,000,000	\$ 10,855,000	
Task Order No. 11 - Transmission Pipeline Improvements	\$ 41,280,000	\$ 35,083,933	
Task Order No. 12 - Reservoirs and Pump Stations	\$ 14,695,000	\$ 12,742,865	
Task Order No. 13 - Hydraulic Modeling	\$ -	\$ 150,000	
Task Order No. 14 - Fill Depots	\$ 4,825,000	\$ 5,216,840	
Task Order No. 15 - Rural Water System Expansions	\$ -	\$ 554,000	*2
Task Order No. 16 - Right of Way Procurement	\$ -	\$ 1,200,000	*3
Phase III Engineering, Legal, and Administration	\$ 4,330,000	\$ 4,459,900	*4
<b>Phase II (A) *5</b>			
Task Order No. 7 - Reg Water Service System IV - Phase II (a)	\$ -	\$ 6,765,000	
Task Order No. 10 - Williston WTP Expansion from 14 - 21 mg	\$ 21,000,000	\$ 15,325,000	
Task Order No. 11 - Transmission Pipeline Improvements	\$ -	\$ 10,125,067	
Task Order No. 12 - Reservoirs and Pump Stations	\$ -	\$ 1,398,135	
Task Order No. 14 - Fill Depots	\$ -	\$ 2,321,159	
Task Order No. 15 - Rural Water System Expansions	\$ 9,000,000	\$ 8,882,000	*2
Task Order No. 16 - Right of Way Procurement	\$ -	\$ 300,000	*3
<b>Phase III</b>			
Williston Phase II By-Pass Transmission Lines	\$ 8,460,000	\$ 8,713,800	
Williston Intake Expansion from 14mg to 21mg	\$ 11,700,000	\$ 12,051,000	
Service to Grenora	\$ 810,000	\$ 834,300	

	<b>Business Plan Estimate</b>	<b>Best Estimate To-Date</b>
<b>Phase I Totals</b>	\$ 22,925,000	\$ 31,595,192
<b>Phase II Totals</b>	\$ 76,130,000	\$ 70,262,539
<b>Phase I - II Total</b>	\$ 99,055,000	\$ 101,857,731
<b>Phase II (A) Total</b>	\$ 30,000,000	\$ 45,116,361
<b>Phase III Totals</b>	\$ 20,970,000	\$ 21,599,100
<b>Project Total</b>	\$ 150,025,000	\$ 168,573,192

\*1 - A portion of basic engineering services were paid with the \$1.5M State Water Commission grant provided to McKenzie County Water Resource District. These fees are not included in the estimated total project cost so as to only track estimated loan dollars utilized for the project.

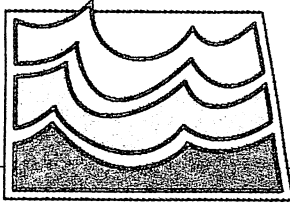
\*2 - Task Order No. 15 is expected to be much greater than originally estimated; best estimate expected to be significantly larger (potentially \$50M-\$70M).

\*3 - An increase of Task Order No. 15 could increase the estimated cost of right of way procurement due to a larger rural water system expansion.

\*4 - A scope increase of Task Order No. 15 could increase the estimated engineering, legal, and admin costs due to an increase in project scope/size.

\*5 - Phase II (A) consists of Phase II and Phase III projects that have been grouped together for future reprioritization by WAWSA.





# North Dakota State Water Commission

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## RESOLUTION NO. 2012-03-527

### *In Appreciation To LeRoy A. Klapprodt*

**WHEREAS**, LeRoy A. Klapprodt began his career with the North Dakota State Water Commission in 1971 and has ably served the State of North Dakota for more than 40 years by facing North Dakota's water management challenges diligently, tirelessly and proactively, and doing so in the past 15 years as Director of the Planning and Education Division; and

**WHEREAS**, Lee has provided vision, leadership and guidance to the North Dakota State Water Commission, the State Engineer, and its staff, as well as to local, state, and regional and international water management entities; and

**WHEREAS**, Lee has represented the State Water Commission, the State Engineer, and North Dakota's water interests on numerous boards, committees, work groups and commissions involving local, state, regional, interstate, and international water management entities; and

**WHEREAS**, Lee's leadership and guidance were instrumental in the development of numerous local, state, interstate, and international water management reports and documents including the North Dakota State Water Management Plan, and all of its updates, as well as the development and implementation of North Dakota's Water Education Program; and

**WHEREAS**, Lee's skills, knowledge and expertise have earned him the respect and admiration of his peers among local, state, regional, interstate and international entities; and

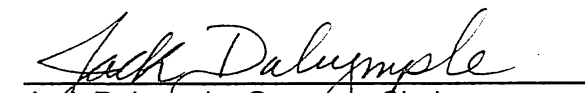
**WHEREAS**, Lee retired as Director of the Planning and Education Division of the North Dakota State Water Commission on December 26, 2011.

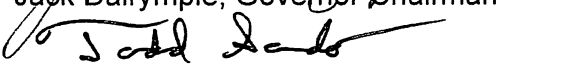
**NOW, THEREFORE, BE IT RESOLVED** that Governor Jack Dalrymple, Chairman of the North Dakota State Water Commission; its members; Todd Sando, State Engineer; and the Commission staff, assembled this 7th day of March, 2012, in Bismarck, North Dakota, hereby convey their gratitude and appreciation to LeRoy A. Klapprodt for his admirable and dedicated service to the people of the Great State of North Dakota as an employee of the State Water Commission; and

**BE IT FURTHER RESOLVED** that we wish Lee and his wife, Adeline, the best of health and happiness in their future endeavors.

**FOR THE NORTH DAKOTA STATE WATER COMMISSION:**



  
\_\_\_\_\_  
Jack Dalrymple, Governor-Chairman

  
\_\_\_\_\_  
Todd Sando, North Dakota State Engineer  
and Chief Engineer-Secretary