

2011 ROAD REPAIR ESTIMATES FROM THE ND DOT

11 MILLION CUBIC YARDS OF BORROW

ESTIMATED 200 to 250 trucks moving that borrow

ND 57 – Riley Bros Construction = \$29.2 M (1460 Grade Elevation, Approximate elevation of 1462 top of asphalt elevation)

ND 20 (Spring Lake) – Bemus Construction = \$12.9 M (1460 Grade Elevation, Approximate elevation of 1462 top of asphalt elevation)

ND 20 – Ames Construction = \$56.6 M (1460 Grade Elevation, Approximate elevation of 1462 top of asphalt elevation also included Acorn Ridge and City dike to an approximate elevation of 1470 top of asphalt)

ND 19 (Minnewaukan Flats, Mauvais Coulee and 6 Mile Bay) – Bemus Construction = \$27.4 M (1460 Grade Elevation, Approximate elevation of 1462 top of asphalt elevation)

ND 19 (City Dike) – Park Construction = \$6.2 M (1460 Grade Elevation, Approximate elevation of 1462 top of asphalt elevation)

US 281 – Park Construction = \$11.7 M (1460 Grade Elevation, Approximate elevation of 1462 top of asphalt elevation)

US 2 (Near Penn) – Bemus Construction = \$13.4 M

Grahams Island – Ames Construction = \$15.2 M (not 100% sure on elevation)

Rough estimates to bring ND 20, ND 57 and ND 19 to an elevation of 1465 top of asphalt are \$25 M. At this time we are not looking at raising ND 20 (Spring Lake) and US 281 (North of Churches Ferry) to an elevation of 1465.

Preliminary estimates for 2011 event (US 2 near Churches Ferry and Haybale Bay) are \$60 M with a top of asphalt elevation of 1465.

TOTALS:.....\$257.6 MILLION

DEVILS LAKE DIKE/DAM EMBANKMENT BORROW AMOUNTS

<u>Phase 1</u>		<u>Phase 2a</u>	
Clay, CY	570,610	Clay, CY	131,000
Sand, CY	72,885	Sand, CY	21,900
Rock, CY	60,854	Rock, CY	2,350
Rock, Tons	54,024	Rock, Tons	33,450

<u>Phase 2b</u>		<u>Phase 3</u>	
Clay, CY	894,588	Clay, CY	1,200,700
Sand, CY	128,477	Sand, CY	192,330
Rock, CY	10,055	Rock, CY	14,550
Rock, Tons	124,666	Rock, Tons	193,710

<u>Total</u>	
Clay, CY	2,796,898
Sand, CY	415,592
Rock, CY	87,809
Rock, Tons	405,850

**DL DIKE/DAM EMBANKMENT TOTAL BORROW NEEDED: 3,706,149
CUBIC YARDS**

TOTAL BORROW FOR BOTH ROADS & DAM: 14,706,149 CUBIC YARD!!

DEVILS LAKE FLOOD INFRASTRUCTURE EXPENDITURES (1994 – 2012)

In the 18 years since Devils Lake began its historic rise, local, state, and federal entities have invested heavily in protecting people and places in the basin. The purpose of this memo is to provide, as best is possible, an accurate accounting of the money spent on infrastructure protection, including what is intended to or may be spent through 2012.

There have been many different agencies involved in infrastructure in the Devils Lake basin. This document breaks out expenditures by agency in some cases, and in general project areas in others. Wherever possible, double-counting expenditures has been avoided.

Expenditures are listed in order of decreasing amounts.

Total Expenditure 1994-2012

DOT	\$485,306,943
Devils Lake Levee	\$172,987,729
FEMA	\$44,400,000
Devils Lake Outlet	\$131,000,000
Corps	\$26,215,000
Rail Repair	\$106,075,737.80
HUD	\$3,000,000
Total	\$968,985,409.80

DOT

The North Dakota Department of Transportation (DOT) has been a key player in combating the floods rise. Between 1994 and 2010, and through the 2012 construction season, the DOT is expected to have spent approximately \$485,306,943.

State System (1994-2010)	\$304,726,655
County System (1994-2010)	\$50,834,025
BIA (1994-2010)	\$14,800,263
New Construction (Estimate cost 2011-2012)	<u>\$114,946,000</u>

Devils Lake Levee

The Devils Lake levee was first built in 1984. Subsequent lake raises have required periodic expansions and increases in the levee. Cost for the levee has been borne by local, state, and federal entities. Between 1996 and 2009 \$59,987,729 was spent on raising and extending the levee. With the Devils Lake reaching new record highs in the last two years, an additional \$113,000,000 is needed to bring the top of the levee to elevation 1,465' amsl. In general, levee expansions have been funded by a 75% federal cost-share, with the United States Army, Corps of Engineers coordinating the efforts.

Levee Construction 1996-2009	\$59,987,729
Levee Expansion to 1,466-1,469' amsl	<u>\$113,000,000</u>
Total	\$172,987,729

FEMA

The Federal Emergency Management Agency (FEMA) has been another important partner in battling the lakes rise. Chiefly, FEMA has been involved in purchase of or relocation of structures. While not very active in recent years, with the lake rising to new record levels, it is likely that will become active again.

Acquisition of the City of Churchs Ferry	\$4,000,000
Relocation of BTR Cooperative Elevator in Churchs Ferry	\$11,400,000
500 claims (salvage, relocation, and demolition)	\$28,000,000
and 250 claims for the protection of existing structures	
Ramsey County rural sewer pipe relocation	<u>\$1,000,000</u>
Total	\$44,400,000

Devils Lake Outlet

Built by the State Water Commission, the Devils Lake Outlet was completed in 2005, and an expansion of pumping capacity from 100 cfs to 250 cfs was completed in the summer of 2010. In 2011, the construction of a 350 cfs outlet from East Devils Lake and a control structure on the Tolna Coulee will begin construction. Once the outlet expansion and control structure are completed, total expenditures are expected to be \$131,000,000.

Original 100 cfs State Outlet	\$26,000,000
Outlet Expansion to 250 cfs	\$16,000,000
East End Outlet (Estimated Cost Range \$60-\$80 million)	\$80,000,000
Tolna Coulee Control Structure (Estimated Cost)	<u>\$9,000,000</u>
Total	\$131,000,000

Corps

The United States Army, Corps of Engineers (Corps) is another significant partner in flood protection, from studies, to levee protection, to a funding partner. Between 1995 and 2008, the Corps is estimated to have spent approximately \$26,215,000 in federal money.

Federal Outlet Funds (study, design, etc..)	\$16,045,000
Ramsey County Sewer	\$850,000
Emergency Operations	\$3,032,000
Hazard Mitigation	\$65,000
Roads Acting As Dams	\$319,000
Devils Lake Water Supply	<u>\$7,504,000</u>

Railroads

Rail lines have seen some effects from the previous rise of the lake, with both Burlington Northern Santa Fe and Canadian Pacific Railway being the railroads active in the basin. Significant issues are expected to occur as the lake approaches 1,460' amsl, which may result in completely rerouting trains around the Devils Lake region, if sufficient funds are not available.

BNSF Rail raise near Churchs Ferry (2001) (28% State Funding)	\$1,075,737.80
Necessary Grade Raises For Maintaining Amtrak Service (2011)	\$77,000,000
Necessary New Rail Lines For Maintaining Amtrak Service (2011)	\$28,000,000
Total	\$106,075,737.80

HUD

The U.S. Department of Housing and Urban Development (HUD) Community Development Block Grant (CDBG) Programs have spent \$3,000,000 in the Devils Lake basin since 1995.

HUD CDBG	\$3,000,000
Total	\$3,000,000

Information compiled by Michael Noone, North Dakota State Water Commission

Agricultural Economic Impact in the Devils Lake Area Flooding in 2011

This analysis quantifies the extent of lost agricultural production in the Devils Lake Basin due to rising water levels in Devils Lake and Stump Lake and the surrounding area. The potential production that will not be produced in 2011 represents lost income to area producers as well as the region's economy. The total impact of this loss to the region is further increased in the form of indirect losses as this money is not available to be spent in other economic sectors of the economy.

Production data for the most recent five-year period, as reported by North Dakota Agricultural Statistics Service, were used in this analysis. Lost income due to increased water levels in the Devils Lake basin was assumed to be the value of the crop production that could have been produced on this acreage if it had been available to plant in 2011. Therefore, this acreage will not contribute to the economic activity in the region in 2011.

Acreage and yield data for 14 major crops grown in Benson and Ramsey counties for the years 2005 through 2009 were summarized. Average yields for the region are shown in Table 1. These yields were weighted based on the production from each county. The average percentage of acreage devoted to each crop is shown in Table 2. This crop mix is based on the sum of all acres produced over this 5-year period.

These estimates were prepared by Dwight Aakre and Randal Coon, Department of Agribusiness and Applied Economics, and Bill Hodous Ramsey County Extension Agent, North Dakota State University. February 2011.

Table 1. Weighted Average Yields for Benson and Ramsey Counties, 2005-2009.

Crop	Average Yield/Acre
Barley	59.4
Corn Grain	97.9
Alfalfa Hay	1.9
Other Hay	1.7
Winter Wheat	49.2
Durum	35.4
Spring Wheat	38.2
Canola	1408.5
Flaxseed	18.2
Soybeans	27.7
Oil Sunflowers	1403.9
Conf Sunflowers	1234.5
Edible Beans	14.1
Dry Edible Peas	18.0

and Ramsey Counties, 2005-2009.

Crop	Percent of Total Acre
Barley	13.0%
Corn Grain	9.5%
Alfalfa Hay	2.1%
Other Hay	3.5%
Winter Wheat	3.3%
Durum	1.0%
Spring Wheat	28.1%
Canola	6.9%
Flaxseed	1.7%
Soybeans	17.2%
Oil Sunflowers	2.5%
Conf Sunflowers	1.8%
Edible Beans	8.5%
Dry Edible Peas	1.0%

Table 2. Major Crops Grown in Benson

The current estimate of inundated area is 163,450 acres for 2011. This acreage data is from The Devils Lake Basin Joint Water Resources Board's website. The 163,450 acres represents the acreage inundated as the lake level has risen from 1422.9 feet in 1993 to a forecasted level of 1455.0 feet above sea level in 2011. Potential lost production per year is summarized in Table 3. This table includes the average acreage of each crop, the estimated market price, and the total value for each crop. The estimated value of production that could have been produced on this acreage for 2011 is \$52,757,993. This is an estimate of the direct loss that will incur in 2011.

Table 3. Potential Lost Production per Year in the Devils Lake Basin with 163,450 Acres of Cropland Inundated.

Crop	Average Yield	Average Acreage	Estimated Price	Value Per Year
Barley	59.4	21,321	4.50	5,696,335
Corn Grain	97.9	15,487	5.00	7,584,470
Alfalfa Hay	1.9	3,427	65.00	425,201
Other Hay	1.7	5,786	45.00	431,803
Winter Wheat	49.2	5,449	7.50	2,009,731
Durum	35.4	1,622	8.50	487,364
Spring Wheat	38.2	45,917	8.50	14,914,236
Canola	1408.5	11,235	0.220	3,481,445
Flaxseed	18.2	2,760	13.00	653,204

These estimates were prepared by Dwight Aakre and Randal Coon, Department of Agribusiness and Applied Economics, and Bill Hodous Ramsey County Extension Agent, North Dakota State University. February 2011.

Soybeans	27.7	28,053	12.00	9,319,860
Oil Sunflowers	1403.9	4,041	0.240	1,361,571
Conf				
Sunflowers	1234.5	2,954	0.330	1,203,384
Edible Beans	14.1	13,823	25.00	4,877,513
Dry Edible Peas	18.0	1,575	11.00	311,875
Market Value of Lost Production				\$52,757,993

Total Economic Loss

The market value of the potential production that will not be produced represents the direct loss to the region's economy. Additional losses accrue in the form of indirect loss throughout the economy. The indirect impact is the economic activity created by the spending and re-spending of the direct impacts.

Total impact on business activity in the region from both direct and indirect losses is estimated at \$194,419,000. The major losses are \$57.6 million to the crop sector, \$50.9 million to the households sector (personal income), and \$42.9 million to the retail trade sector. The remainder of the \$194.4 million loss is distributed among several other sectors of the economy.

This loss of business activity ultimately is reflected in lost jobs in the region. Employment loss is estimated at 1,150 jobs for the region.