

**Preliminary
Engineer's
Feasibility Study,
Norton Avenue NW
Erosion Control
Project**

Prepared for



Wenck

**Clearwater River
Watershed District**

July 2007



Wenck Associates, Inc.
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July 11, 2007

Mr. Marvin Brunsell, Treasurer
Clearwater River Watershed District
9701 Jeske Avenue NW
Annandale, MN 55302

Re: Preliminary Engineer's Feasibility Study, Norton Avenue NW Erosion Control
Project
Wenck File #0002-110

Dear Mr. Brunsell:

There has been a history of erosion problems in steep areas adjacent to Lake Augusta, especially along the northern shore. The Lake Augusta Erosion Control Project, was constructed in the 1980s, was partially funded (80%) by the lake restoration grant and the remainder was funded by the impacted residents.

A ravine along Norton Avenue (not part of the 1980s project) has experienced severe erosion problems several times over the past three decades and again in early 2007. An inspection of this site was made by area residents, Merle Anderson and Norm Wenck on June 13, 2007 and the situation was discussed at the June 13, 2007 District Board Meeting.

On June 13, 2007, the Board of Managers ordered a Preliminary Engineer's Feasibility Study of potential corrective actions for this area.

The area was surveyed on June 14, 2007 and several potential corrective actions were identified and field located.

Figure 1 presents the results of the field survey. Table 1 presents the estimate costs for the four identified potential actions. The actions listed on Table 1 are in order of the most upland actions to the most downstream actions.

The proposed south sedimentation basin would be constructed mostly in the roadway ditch of 100th Street NW, would have a volume of approximately 0.3 acre-feet and would include a weir on the upstream end of the culvert. This basin would approximately retain the runoff from a one inch rainfall on the direct watershed above 100th Street NW. The retained runoff would then infiltrate. Larger rainfalls would overflow to the existing 24 inch reinforced concrete pipe culvert under 100th Street NW. The estimated cost of this action is \$11,000.

The proposed north sedimentation basin would require a berm approximately 12 feet high with a riprapped spillway at the same elevation as the above 24 inch culvert (1077.33').

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This basin would retain an estimated volume of 2 acre-feet and would result in slow draw down via an eight inch diameter outlet pipe. It is estimated that the drawdown will take approximately three days. The basin would be considered a dry basin. This basin results in reducing most high flow events in the ravine area. The estimated cost of this action is \$54,000.

The installation of check dams in the ravine area will result in the reduction of flow velocities and will remove some of the sediment before it reaches Norton Avenue. The checks dams would be approximately six feet high (above the ravine flow line), tie into the ravine side slopes and would include a filter fabric inbedded in the riprap dam. Three of the check dams are proposed. The estimated cost of this action is \$22,000.

There is evidence of groundwater seepage on the ravine slope slopes in a critical area between 100th Street NW and Norton Avenue. It is proposed to install drain tile with sock in the flow line of the ravine and approximately 200 feet of the west side slope and 100 feet of the east side slope. This drain tile will stabilize the side slopes from eroding into the ravine and flowing to Norton Avenue and Lake Augusta. The estimated cost of this action is \$11,000.

Implementing all four actions is the ultimate solution, however, each action has its own benefits and the actions could be installed in a phased manner.

This preliminary work is presented for your review and discussion. We are available to address any questions and concerns that you have.

Respectfully Submitted,

WENCK ASSOCIATES, INC.



Norman C. Wenck
District Engineer

Enclosures

Table 1 Revised

Norton Avenue Erosion Control Project
 Clearwater River Watershed District
 Wenck Project No. 0002-110

	Unit	Quantity	Unit Cost	Estimated Cost
1 South Sedimentation Basin (No Easement Cost)				
Mobilization and Restoration	LS	1	\$1,000.00	\$1,000.00
Clear and Grub	LS	1	\$500.00	\$500.00
Excavate	CY	500	\$10.00	\$5,000.00
Install Baffle	LS	1	\$500.00	\$500.00
Administration, Engineering, Legal	LS	1	\$2,000.00	\$2,000.00
Contingency				\$2,000.00
			Estimated Total	\$11,000.00
2 North Sedimentation Basin (No Easement Cost)				
Mobilization and Restoration	LS	1	\$2,000.00	\$2,000.00
Clear and Grub	LS	1	\$2,000.00	\$2,000.00
Clay Berm	CY	2500	\$10.00	\$25,000.00
*Discharge Pipe w/Seepage Collar	LS	1	\$2,000.00	\$2,000.00
Emergency Overflow	SY	40	\$25.00	\$1,000.00
Restoration	LS	1	\$5,000.00	\$5,000.00
Administration, Engineering, Legal	LS	1	\$9,000.00	\$9,000.00
Contingency				\$8,000.00
			Estimated Total	\$54,000.00
3 Check Dam (Estimate 3 each) (No Easement Cost)				
Mobilization and Restoration	LS	1	\$1,000.00	\$1,000.00
Clear and Grub	LS	1	\$1,000.00	\$1,000.00
Riprap	CY	240	\$50.00	\$12,000.00
Filter Fabric	SY	50	\$40.00	\$2,000.00
Administration, Engineering, Legal	LS	1	\$3,000.00	\$3,000.00
Contingency				\$3,000.00
			Estimated Total	\$22,000.00
4 Drain Tile w/Sock (No Easement Cost)				
Mobilization and Restoration	LS	1	\$1,000.00	\$1,000.00
Bottom of Valley	LF	600	\$5.00	\$3,000.00
Sides of Valley	LF	300	\$10.00	\$3,000.00
Administration, Engineering, Legal	LS	1	\$2,000.00	\$2,000.00
Contingency				\$2,000.00
			Estimated Total	\$11,000.00
5 North Check Dam (No Easement Cost)				
Mobilization and Restoration	LS	1	\$1,000.00	\$1,000.00
Clear and Grub	LF	1	\$1,000.00	\$1,000.00
Riprap	CY	80	\$50.00	\$4,000.00
Filter Fabric	SY	125	\$40.00	\$5,000.00
Administration, Engineering, Legal	LS	1	\$2,000.00	\$2,000.00
Contingency				\$2,000.00
			Estimated Total	\$15,000.00

might replace 1 or 2 noted in 3.

Drain Tile

Lake Levels

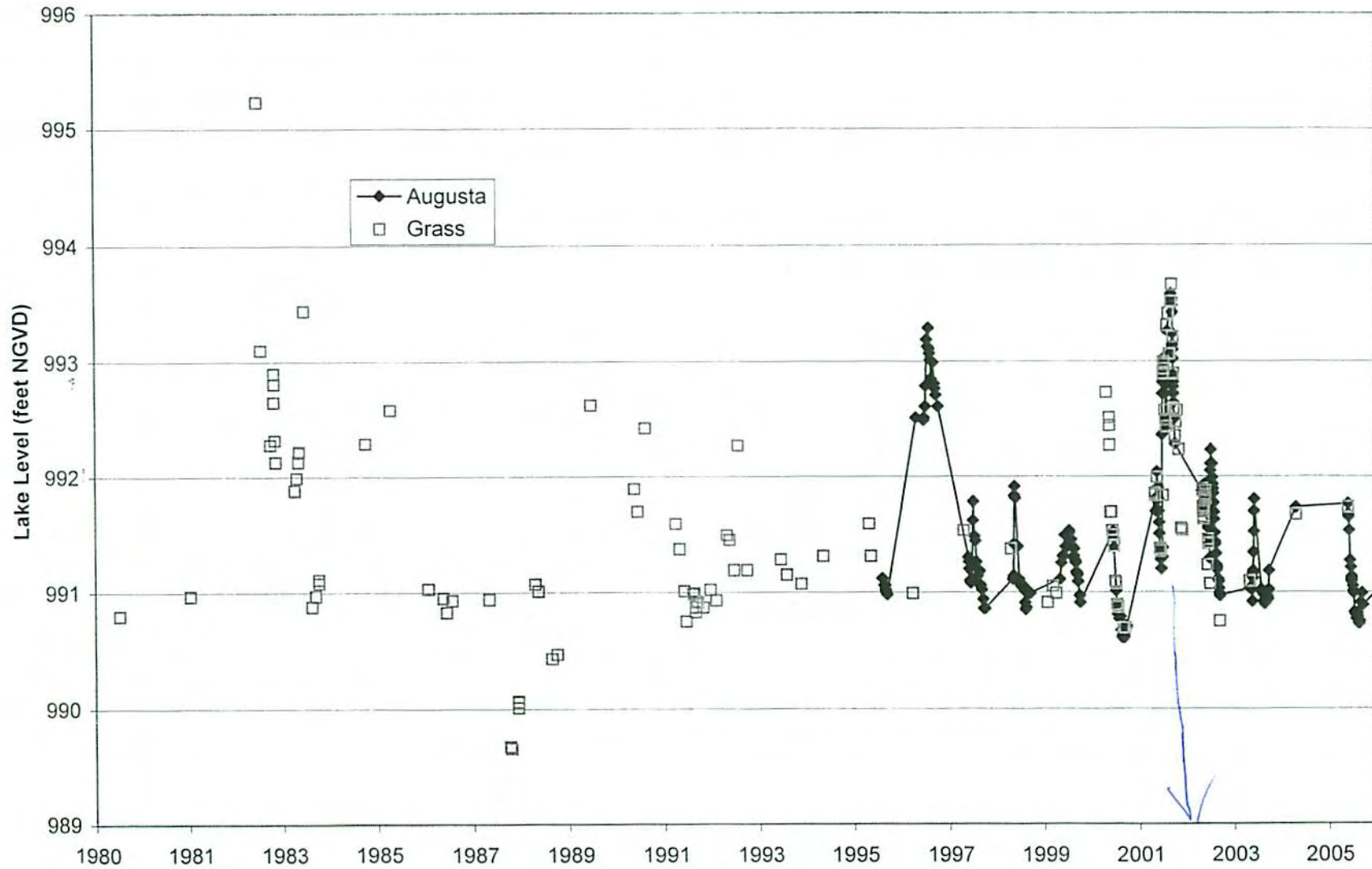


Table 1

Norton Avenue Erosion Control Project
 Clearwater River Watershed District
 Wenck Project No. 0002-110

	Unit	Quantity	Unit Cost	Estimated Cost
1 South Sedimentation Basin (No Easement Cost)				
Mobilization and Restoration	LS	1	\$1,000.00	\$1,000.00
Clear and Grub	LS	1	\$500.00	\$500.00
Excavate	CY	500	\$10.00	\$5,000.00
Install Baffle	LS	1	\$500.00	\$500.00
Administration, Engineering, Legal	LS	1	\$2,000.00	\$2,000.00
Contingency				\$2,000.00
			Estimated Total	\$11,000.00
2 North Sedimentation Basin (No Easement Cost)				
Mobilization and Restoration	LS	1	\$2,000.00	\$2,000.00
Clear and Grub	LS	1	\$2,000.00	\$2,000.00
Clay Berm	CY	2500	\$10.00	\$25,000.00
Discharge Pipe w/Seepage Collar	LS	1	\$2,000.00	\$2,000.00
Emergency Overflow	SY	40	\$25.00	\$1,000.00
Restoration	LS	1	\$5,000.00	\$5,000.00
Administration, Engineering, Legal	LS	1	\$9,000.00	\$9,000.00
Contingency				\$8,000.00
			Estimated Total	\$54,000.00
3 Check Dam (Estimate 3 each) (No Easement Cost)				
Mobilization and Restoration	LS	1	\$1,000.00	\$1,000.00
Clear and Grub	LS	1	\$1,000.00	\$1,000.00
Riprap	CY	240	\$50.00	\$12,000.00
Filter Fabric	SY	50	\$40.00	\$2,000.00
Administration, Engineering, Legal	LS	1	\$3,000.00	\$3,000.00
Contingency				\$3,000.00
			Estimated Total	\$22,000.00
4 Drain Tile w/Sock (No Easement Cost)				
Mobilization and Restoration	LS	1	\$1,000.00	\$1,000.00
Bottom of Valley	LF	600	\$5.00	\$3,000.00
Sides of Valley	LF	300	\$10.00	\$3,000.00
Administration, Engineering, Legal	LS	1	\$2,000.00	\$2,000.00
Contingency				\$2,000.00
			Estimated Total	\$11,000.00

w/o Land

3 days drain times 8" pipe

Total

*choose 1 = Drain Tile (w)
 #2 = #3 & 4 & add another 300' drain tile \$1500.00
 estimated cost \$34500.00*



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