

**Date** | 10-29-2010

**To** | Chisago Lakes LID Board of Managers

**cc** | Jerry Spetzman

**From** | Greg Graske

**Regarding** | Fall Channel and Outlet Structure Inspection

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On September 29<sup>th</sup>, 2010 an inspection of the Chisago Lakes Outlet Channels and Structures was conducted. Subsequent follow up visits and inspections were conducted as needed. Chisago County staff Jerry Spetzman and Monica Kinny along with EOR engineer Greg Graske performed the field inspection. Also, along for the inspection was Manager Sibik. The following summarizes the inspection, actions performed, and any future actions recommend. Actions in red are recommended for action in the near future, actions in orange are action that require future follow or monitoring up but are not urgent, and actions in green are minor maintenance items that were completed in field prior to this report.

### **Channel from Chisago Lake to Wallmark Lake**

The entire length of the channel from Chisago Lake to Wallmark Lake was walked. Erosion in the channel near the connection with Chisago Lake has proceeded to occur since the last inspection. The channel has widened and bank failures continue to worsen. Plans for repair of this section have been prepared and initial meetings with the contractor and landowner have occurred. Repair of this section is scheduled for this fall. Additional construction materials and construction oversight is anticipated due to the increased failures that have occurred in this section. A delta is starting to form at the outlet of the channel due to erosion. The District may wish to consider having this delta removed.



Photos: left-exposed/eroding bank caused by head cut, delta at connection with Chisago Lake

Just downstream of these areas is a large box culvert that flows under Stinson Avenue and Highway 8. At the down stream end of this pipe some of the large rock placed for erosion control purposes is currently sitting above the invert of the pipe. This may be obstructing some of the flows from upstream. The landowner at the upstream end of the box culvert is concerned about water levels and stormwater flowing towards Chisago Lake that he feels should be flowing out towards Wallmark Lake. Removal of this rock

and further investigation of drainage in this area is warranted. Previous direction by the Board was to hold off on further investigation until after the rock is removed to determine if that action would alleviate the concerns.

North of North Avenue it was noted that several large branches had been placed across the channel to provide a crossing for a path from the nearby tot lot. The branches were removed from the channel as has been done on previous inspections. Because this appears to be an ongoing problem the LID has directed District Staff to work with the park owner to determine if a bridge should be placed at this location to allow for crossing the channel without placing obstructions in the channel. Discussions are ongoing.

Logs and Debris were noted at the Sportsman Drive crossing on the west side. Some of the debris was removed from the trash rack during inspection, however further removal/cleanup is recommended. A downed tree was also noted just to the east of where the channel crosses Lake Pointe Drive. The downed tree should be removed.



Photos: left-rock placed above pipe invert, right-branches placed in channel

#### Recommended Action:

- Proceed with fall project to repair erosion issues in the channel near Chisago Lake.
- Rearrange rip rap at box culvert outlet such that it is not obstructing upstream flows.
- Remove debris and logs at the Sportsman Drive Crossing
- Remove downed tree east of Lake Pointe Drive

#### Suggested Follow Up:

- Continue discussions with park owner regarding placement of small foot bridge across the channel. We suggest LID consider providing cost share funding with park owner being responsible for installation and on-going maintenance.
- District Board to discuss and consider the need for removal of the sediment delta in Chisago Lake

#### Minor Maintenance Items Completed:

- Removed branches placed in channel
- Removed obstructions to culvert at Sportsman Drive Crossing
- Lopped off brush growing on overflow weir control structure

### Channel from Wallmark Lake to County Road 19



Jerry Spetzman and Greg Graske canoed to the outlet of Wallmark Lake. The outlet was undefined from the lake side with flow moving through the cattail mats to the outlet channel. In a follow up visit Mary Christopherson and Jerry Spetzman went to the house near the outlet of Wallmark Lake and got permission from the landowner to check the outlet channel. They made it to the halfway point between between the driveway and the location that was reached by canoe. There is a well constructed bridge across the channel that appears not to be used. No channel obstructions or beaver activity was found

#### Suggested Follow Up:

- Continue to monitor Wallmark Lake levels relative to the OHW for any indication of obstruction.

### Channel from Chisago Lake to Green Lake

The entire length of the channel from Chisago Lake to Green Lake was walked. Between Chisago Lake and County Road 83 a beaver dam was observed that had been constructed since the last inspection. About midway between County Road 83 and the outlet structure going into Green Lake a large beaver dam was observed this dam was holding back approximately 2 feet of water. This dam was observed on the previous inspection. It is recommended that District staff coordinate with local trappers to have the beavers removed. Once the beavers are removed then the dams should be taken out. A couple trees had been taken down by beavers along the channel, one crossing the trail and one crossing the channel. These trees should be removed.



Photos: left-tree down in channel, right - new beaver dam near Chisago Lake

Further down the channel erosion was noted on the banks of the channel. The erosion appeared to be caused by runoff from the adjacent farm field concentrating at the locations of erosion. One of these locations was scheduled for the fall maintenance. A second location was located above a drain tile outlet.

The repair needed at the second location is minor and could be taken care of at the same time as the schedule fall project. Strategic placement of rock will be used to stop the erosion.

**Recommended Action:**

- Remove beavers prior to removal of beaver dams.
- Proceed with fall erosion maintenance project and include newly identified erosion area.
- Remove downed trees crossing the trail and channel

**Suggested Follow Up:**

- Remove beaver dams after removal of beavers.

**Outlet Structure from Chisago Lake Outlet Channel into Green Lake**

The outlet structure connecting the channel from Chisago Lake to Green Lake was visited. Branches were noted that appeared to be placed inside the weir structure by a beaver. At the time of the inspection the water levels were significantly higher on one side of the structure versus the back side of the structure that contains the outlet pipe. An attempt was made to open the gates separating the two areas to assure operation. The gates were difficult to operate and it was decided to hold off on forcing them open to avoid damage to mechanisms. Larry Rainer of the Highway Department was the person previously responsible for opening and closing the weirs. Larry Raineer and Jerry Spetzman visited the Lofton Avenue weir on October 25<sup>th</sup>. One side of the high water weir was clogged with beaver debris. They were able to open the other side of the weir and the outlet pipe to Green Lake. The water from the ponded area is draining into Green Lake. Lowering of the water level in the weir will facilitate beaver debris removal. Once the beaver debris is removed the gates should be returned to the closed position.

The undertow sign is in need of replacement. District Staff is in the process of ordering new signs for this weir and the Lake Ellen weir.



Photos: left-Branches inside of control structure, right-faded undertow sign

**Recommended Action:**

- Remove branches from overflow weir.

**Suggested Follow Up:**

- Purchase or have another tool made for operating the control gates (currently there is only one tool between the two control structures). Engineer to obtain and review original project specifications for gate model, recommended maintenance practices and check on availability of a portable motorized tool for operating gates.
- Monitor site for continued beaver activity and need for beaver control.
- Replace faded undertow warning sign.

**Minor Maintenance Items Completed:**

- Greased the fittings in each of the crank boxes.

### Outlet Structure and Pipe between Lake Ellen and Swamp Lake

The outlet structure on Lake Ellen was visited. Debris was removed from around the Lake Ellen structure earlier this year. The gate was exercised and appeared to be operational. The emergency management plan calls for the gate to be open when the lake level is 891.5. The plan also says that the gate may remain closed when lake levels are below 891.0. Lake Ellen was at elevation 889.2 on 10/20/2010 per the District monitoring report, therefore the gate was left closed. It appeared that the Beavers might be rebuilding the dam around the outlet structure. This should be monitored and if this is the case, the beaver should be removed.



Photos: left-potential mud build up from beaver, right- new ramp replaced after last inspection

Leaving the outlet structure is a long pipe that discharges to Swamp Lake. About a third of the way downstream is a manhole with an inlet structure that is located in the middle of the farm field. It was recommended previously that a sediment control device or structure modifications be located above or around this structure to limit sediment into pipe. The District Board previously authorized placement of a sediment control device at this location this fall. The Engineer has tried to contact the landowner, but has not yet been successful. The down stream end of the pipe is partially submerged and the water at the outlet was cloudy. It was unclear what was causing the murkiness in the water. Televising the pipe has been proposed and it is recommended that this occur when possible. It may be possible to sand bag the end of the pipe and dewater in order to get the camera inside of the pipe. Maintenance at the downstream end of Swamp Lake (see Swamp Lake of report) may also help with lowering water levels.

#### Recommended Action:

- Proceed with farm field inlet control device installation this fall after making contact with landowner.

#### Suggested Follow Up:

- Monitor Beaver Activity going forward and determine need for additional beaver control if beaver debris build-up continues to be a major problem at this location.
- Periodically exercise the gates to maintain them in working order.
- Purchase or have another tool made for operating the control gates (currently there is only one tool between the two control structures). Engineer to obtain tool cost information and also explore availability of powered tool for operating gates.
- Engineer to obtain and review plans and make recommendation for dewatering pipe prior to televising, if maintenance at Swamp Lake outlet does not sufficiently lower water levels.
- Order undertow warning sign similar to Lofton Avenue wier.

#### Minor Maintenance Items Completed:

- Greased the fittings in each of the crank boxes.
- Exercised Gate

### Swamp Lake Outlet

The Swamp Lake outlet pipes under County Road 80 were visited. This location has 7 pipes under the road to convey flow. Water was flowing at the time of the inspection. As noted during the previous inspection the pipes were partially filled with water due to rock and debris just downstream of the culverts that appeared to be obstructing some of the flow causing tailwater on the pipes. The water drop across the obstruction was estimated at about half a foot.



Photos: Outlet End of pipes leaving Swamp Lake

#### Recommended Action:

- Minor clean-out at outlet end of pipes and reconfigure rip rap.

### Ivy wood Outlet Structure



The culvert crossing under Ivywood Trail was visited. This structure does not provide any conveyance due to the outlet channel to Carlos Avery WMA never being completed.

No Action Needed.

### **Bloomquist Creek Crossings @ County Road 19 and Ivywood Trail**

The Bloomquist Creek Crossing at Ivywood Trail was visited. Water was flowing through the stream and no maintenance issues were noted. The Bloomquist Creek Crossing at County Road 19 was also visited and water was flowing at this location also. The upstream end of the pipe was submerged as noted in the previous inspection report. It was unclear why the upstream end of this culvert was submerged and further investigation is warranted. Beaver dams both north and south of County Road 19 were reported by a landowner to District staff. District staff has indicated that the District likely does not have easements for these properties and landowner permission would be needed to remove these beaver dams. It is recommended that District staff follow up with landowner contact and if possible remove the beavers and then the dams.



Photos: Left-Bloomquist Creek Crossing @ Ivywood, Center-Upstream end of Bloomquist creek crossing @ CR 19, Right-Downstream end of crossing @ CR 19 (photos from previous inspection)

#### **Suggested Follow Up:**

- Engineer to obtain plans for County Road 19 crossing to determine original design.
- Engineer to make recommendations for further action depending on the outcome of the design plan review.
- District staff to follow up with landowner contact and if possible remove the beavers and then the dams from the creek.