

# Delhi Dam and Head Cut Update

October 14, 2010

## **Stopping the Delhi Head Cut Up the Lake Bed**

The DNR rivers team has been managing the effort, in cooperation with DNR engineering and NRCS, to survey the ongoing head cut through the former lake bed and develop a plan to halt ongoing damage. Nearing the county road X29 bridge, the head cut is now more than 10,000 feet upstream of the dam. The head cut alone has contributed more than 200,000 cubic yards of new sediments to the Maquoketa River downstream, and may threaten road infrastructure upstream. The silt has been reported to fill formerly deep pools — important habitat for aquatic species.

The head cut is in a critical vicinity where it must be stopped due to difficult construction access in most areas of the lake bed. For this reason, Gov. Chet Culver issued an emergency proclamation Wednesday that will allow state resources to be deployed rapidly to stop the problem, with \$670,000 available for the bed stabilization effort.

The plan is to create a temporary 6' to 8' rock riffle downstream of Hartwick Bridge. In addition, the streambed will be stabilized in the vicinity of the dam breach.

## **The Importance of Addressing the Emergency Stabilization Work at Lake Delhi**

### **Why is the work being done now? Why wasn't it done earlier?**

Problems associated with eroding sediment were recognized immediately after the July 24th breach of the Lake Delhi dam. Initial remedies investigated were much more long-term, comprehensive and costly. It has only been in recent weeks that a more complete understanding has been gained of how quickly and unpredictably the erosion has been occurring, making it evident stabilization work must occur quickly. It is also imperative to get the work done before winter weather occurs. The work is intended to stop the severe impacts of what is known as a "head cut" (see below). It is estimated that equivalent of 18,000 dump truck loads of sediment has already been released downstream of the dam.

### **What is a "head cut?"**

When a river channel bed is abruptly lowered or a dam breaches, the upstream riverbed is perched higher than the lower riverbed. In the case of the head cut at Lake Delhi on the Maquoketa River, the lake bed had accumulated decades of fine silt since 1929 when the dam was constructed. After the dam breached, a pour-over that initially looked like a waterfall formed. The force from this waterfall immediately began to tear up the channel and move farther and farther upstream. Until a head cut makes its way through all sediments and reaches equilibrium, it will not stop. Each day the head cut goes unchecked, it churns up sediment and creates new gullies adding even further to the sediment load and the fix becomes more expensive.

### **What work is being done?**

In-water rock structures are being placed across the river channel at two points to slow down the rate of erosion taking place. Clean up of debris near the dam breach will be done because of safety concerns associated with river navigation. Aerial surveys are being taken of the river channel and former lake bed. This information will assist in helping determine how the channel and lake bed are changing over time

and assist in future planning for the area. Samples of the sediment will be taken and analyzed to better understand the affects of sedimentation over time and to determine if there are potentially hazardous materials in the sediment such as heavy metals. Monitors will also be installed to measure turbidity both above and below where most of the erosion is occurring. This stabilization project will not clear the water, but will assist with removing the heaviest silt and keep the situation from getting worse.

#### **What are the potential problems of not acting?**

The roads and bridge infrastructure not anchored into bedrock are threatened by this head cut and associated erosion. The same can be said for roads and homes on tributary creeks. As the erosion continues on the river, this causes problems with maintenance to parks and boat ramps and jeopardizes the structural integrity of the bridge piers at the County Road X-29 and the concrete structures at the breach location. Removal of these sediments from these locations will be costly and inefficient compared to stabilizing the headcut.

Aquatic wildlife that lives downstream of the dam including freshwater mussels, stream invertebrates, and 30 native fish species are negatively impacted by sedimentation and turbidity originating from the head cut and lake basin. The area below the dam breach supported an exceptional smallmouth bass fishery and a high-quality catfish and walleye fishery that are imperiled by continued sedimentation and turbidity. Aquatic wildlife continues to be severely negatively impacted by the dam breach due to sedimentation and water turbidity. The emergency measures will address water quality problems on more than 25 miles of the Maquoketa River downstream of the Delhi Dam breach. The Maquoketa River downstream of the dam breach is an important recreational area for fishing, hiking, hunting, and water sports as it flows through the communities of Hopkinton, Monticello, and 6 public recreation areas.

Stabilization of sediment will reduce these impacts.

#### **How much are the anticipated costs?**

The estimated costs as of Oct. 15th were approximately \$667,000 for the channel stabilization to slow down erosion and an estimated \$133,000 for the monitoring, debris clean-up and aerial survey. The Governor's Office has identified appropriate funding sources to address this emergency.

#### **When is the work going to occur?**

Work is expected to begin by the week of Oct. 25th and the sediment control structures in the water are expected to be completed by late-November.

#### **Why should state dollars be used on this effort?**

With each day, more than 100 additional feet of channel are destabilized and this emergency measure will arrest upstream movement of the destabilized area and associated water quality problems. The State realizes that this ongoing water quality pollution problem is time sensitive and is acting to improve and repair it in a timely manner.

#### **Why is the state taking responsibility for sedimentation stabilization for the area above the Lake Delhi dam breach?**

The potential impacts being caused by accumulated sediment eroding into and downstream on the Maquoketa River is of state-wide importance. The Maquoketa River is a state-wide resource. At this point in time, the State of Iowa is in the best position in terms of authority to get stabilization and clean-up work done quickly. Gov. Culver's emergency declaration issued on Oct. 13th addresses this

emergency. This project is being accomplished through a partnership with Delaware County, the Lake Delhi Recreation Association, Homeland Security and Management Division, Lake Delhi Taskforce and federal agencies such as the Natural Resources Conservation Service (NRCS), Army Corp of Engineers and the U.S. Geological Survey.

**Will the work being done now have any impact on future plans for the Lake Delhi area?**

No. In an earlier Executive Order, Gov. Culver established the Lake Delhi Recover and Rebuild Task Force led by Bret Mills, director of the Iowa Department of Economic Development, to develop strategies assisting in the recovery and rebuilding of the Lake Delhi area and to determine if, and under what conditions, the Lake Delhi Dam should be rebuilt. That report is due on Dec. 1st.

**The project area:**



*Delhi Dam breach area for stabilization*

*Breach area for stabilization and clean up*



*Head cut on September 17th #1*



*Head cut on September 17th #2*



*Riffle at bend, October 5th*



*Riffle near Hartwick Point, September 17th*

