

## West Devils Lake Outlet Begins Operating



On April 2, the West Devils Lake Outlet began pumping water from Devils Lake to the Sheyenne River for the 2012 operating season.

Following its initial completion in 2005, the West Devils Lake Outlet's earliest start date was April 21, 2008. But this year, because of an unseasonably warm spring, below average run-off, and no apparent threat of flooding along the Sheyenne River, the pumps were turned on as the calendar turned to April.

"This spring has been a welcome change from the flooding problems we've seen in all corners of the state the last few years," said Bruce Engelhardt, Director of the Water

Commission's Water Development Division (which oversees outlet development and operation). "With reduced run-off into Devils Lake this spring, and the early outlet start-up, we're hopeful we can make some additional headway on the lake's elevation this year," continued Engelhardt. "Of course, it's a long summer, and there's always the potential for a lot of rainfall to occur."

As of the date this article was written, the West Devils Lake Outlet was pumping 125 cubic feet per second (cfs). The maximum operating capacity of the outlet

is 250 cfs, but two pumps at the Josephine Intake site were still being repaired out of state, after receiving damages during the 2011 operating season. In May, the remaining two pumps are expected to be returned and in operation, restoring the maximum capacity of the west outlet to 250 cfs.

On the other side of Devils Lake, the East Devils Lake Outlet project is making good progress. The east outlet will have a maximum capacity of 350 cfs and is expected to be complete and begin operation in June. With the West and East Devils Lake Outlets operating, the state's outlet projects will be able to

remove up to 600 cfs from Devils Lake, helping to reduce flooding impacts to a region devastated by years of inundation.

In addition, construction on the Tolna Coulee control structure, which is being built in order to prevent catastrophic damages from an overflow from Devils Lake, is also making good progress, with final completion expected in August.

After a dry and warm winter, and an unprecedented rapid construction process, the State Water Commission's projects to ease flooding affecting the Devils Lake basin, and reduce the chances of a catastrophic natural overflow, have increased the state's ability to lower the lake's elevation.

## SWC Revises Floodway Property Acquisition Policy

At their Mar. 29 meeting, the State Water Commission (SWC) revised their policy regarding floodway property acquisitions.

The record floods in North Dakota in 2011, resulted in significant needs for disaster recovery, and the U.S. Department of Housing and Urban Development's Community Development Block Grants (CDBG) Disaster Program was created specifically for these types of events. The majority of CDBG disaster funds must be allocated in order to benefit low to moderate-income individuals. Regular CDBG funding often requires that costly additional conditions be applied to funded projects, while CDBG disaster funding commonly provides waivers for these requirements, ultimately lowering total project costs.

Typically, communities and individuals receiving CDBG disaster resources have been able to utilize

On Mar. 22, 2012, North Dakota's Office of the State Engineer issued approval of the East Devils Lake Outlet drain permit – paving the way to remove water from Devils Lake, via the outlet project, to Tolna Coulee – and ultimately into the Sheyenne River.

North Dakota's Office of the State Engineer approved the East Devils Lake Outlet drain permit with the following conditions:

- The permit authorizes the permit holder to drain water from Devils Lake at a rate not to exceed 350 cfs. Expansion of the project's capacity would require a new permit.
- The State Engineer reserves the right to order modifications to the project if the State Engineer determines that modifications are required to protect downstream property or fish and wildlife resources.
- Drainage is only authorized when the level of Devils Lake is above 1445.0 feet.
- The permittee shall implement the Devils Lake Outlet Mitigation Plan for the duration of the project. The State Engineer must approve any modification of the Devils Lake Outlet Mitigation Plan.

these funds for application towards local cost-share for federal programs. While federal law requires that CDBG disaster funds be the last source of funding, SWC policy has been that federal funds must be applied first, with the remaining portion being eligible for cost share. Unfortunately, that condition meant that projects funded by the SWC were ineligible for CDBG disaster funding, and vice-versa. Local units of government were not aware of the SWC's CDBG disaster funding policy, and the SWC has had little involvement with the CDBG disaster program in the past.

Because the SWC recognized that floodway property acquisition



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policy unintentionally impacted the ability of local units of government to take advantage of federal sources of funding, the SWC acquisition policy was revised to include the following text: "Eligible applicants must fund the local cost share for acquisitions. Local cost shares will not be waived. Community Development Block Grant disaster funding may be used for local cost share and will not be considered as federal funds."

With the SWC acquisition policy amended in order to enable the use of CDBG disaster funding, the vital work of recovering from unprecedented flooding can continue.

## International Water Institute Releases - *Tile Drainage Study*

In 2011, The Red River Retention Authority commissioned the International Water Institute to form a Basin Technical and Scientific Advisory Committee (BTSAC) charged with investigating the hydrologic effects from subsurface drainage (tile drainage) systems in the Red River Basin.

The BTSAC published two papers describing the effects of subsurface drainage and options for managing subsurface drainage systems. The first briefing paper entitled: *Impacts of Subsurface Agricultural Drainage on Watershed Peak Flows* reviewed over 45 scientific publications and concluded that general field scale hydrologic effects include:

- 1) Decreased peak discharge
- 2) Delayed peak discharge
- 3) Increased total water yield from a field (primarily in fall and spring when plants are not growing)

The BTSAC also noted that effects of extensive drainage on the flood hydrograph of large watersheds (i.e. the Red River basin) is complex and depends on many factors, including the type of drainage (e.g. surface or subsurface), location of the subsurface drainage within a watershed or basin, topography, soil type, design criteria for the drainage system, and the extent of the drainage infrastructure within a watershed. Therefore, the BTSAC discouraged any statement implying that subsurface drainage decreases – or increases – flood peaks because of the complex processes involved.

The BTSAC's second briefing paper, *Water Management Options for Subsurface Drainage* was released in April 2012. The paper investigates the larger hydrologic effects of subsurface drainage, and

outlines a strategy for permitting or otherwise managing subsurface drainage systems in the Red River basin to maximize benefits - while minimizing impacts. Based on the information in the first briefing paper, hydrologic modeling results, and the professional judgment of BTSAC members, there were two conclusions drawn:

- 1) There are situations where adding uncontrolled subsurface drainage to areas of the landscape has the potential to increase flooding.
- 2) The inclusion and operation of control structures on existing and proposed subsurface drainage systems can maximize water storage potential and reduce flood flows.

The issue of concern for Red River basin water managers is not that tile drainage will always and everywhere have a negative effect on flooding. Rather it is that within the many and complex potential scenarios for the interactions between climate, soils, crops, hydrology and management, there are scenarios that must be considered when evaluating risk.

BTSAC formulated a series of management options to create a "tool box" of measures for water managers to consider when subsurface drainage systems exist, or are being developed within their jurisdictions. These considerations include:

- Controlled subsurface drainage using control boxes, shut off valves, and lift stations that can be shut off.
- Water storage trading to provide incentives to use managed/controlled subsurface drainage systems to provide water storage during floods.

- Lower subsurface drainage coefficients (design standards) as an alternative to other control methods.
- On or offsite floodwater storage projects to store water during flood events.
- Culvert sizing - to increase temporary storage in existing ditch systems.

The management options implemented should consider the known risks and potential benefits from subsurface drainage systems and utilize the concepts of early, middle, and late water to address mainstem flood reduction goals developed by the Red River Basin Commission.

The BTSAC papers are available for download at [www.rrbdin.org](http://www.rrbdin.org).

### BTSAC Technical Representation

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MN Board of Water and Soil Resources

MN Center for Environmental Advocacy

MN Department of Agriculture

MN Department of Natural Resources

MN Red River Watershed Management Board

Moorhead, MN

ND and MN Natural Resources Conservation Service

ND Red River Joint Water Resources Board

ND State Water Commission

US Army Corps of Engineers

US Fish and Wildlife Service

US Geological Survey