

Carnelian-Marine Watershed District

12405 Otchipwe Avenue North, Stillwater, Minnesota 55082

TURTLE LAKE WEIR, OPERATIONAL PLAN

for

BIG MARINE LAKE - TURTLE LAKE CONTROLS

REVISED DRAFT FEBRUARY, 1998

by

**TOLTZ, KING ANDERSON AND ASSOCIATES, INC.
CARNELIAN MARINE WATERSHED DISTRICT ENGINEERS**

Commission No. 8053-98A

**OPERATIONAL PLAN
BIG MARINE-TURTLE LAKE CONTROLS**

I. SUMMER FLOW CONTROL OPERATIONS

A. Discharge Rate Control

Control of the discharge rate has been established at two points:

1. **Big Marine Lake Weir:** This weir has no provision for manipulation of flow rate. All discharge control has been designed into the weir length. No operational manipulation is contemplated beyond ice and floating bog control.
2. **Turtle Lake Weir:** This weir has two 7-foot stop log bays with a total depth of 1.33 feet. Three removable stop logs (1-8 inch and 2-4 inch high boards) are provided in each bay for flow control. During flow events, the stop logs are removed or added according to the flow control procedures identified in paragraph "C". Once all the stop logs are removed the flow from Turtle Lake is controlled by the channel grade and 36-inch x 58-inch RCP arch culverts under 155th Street and the downstream driveway. During extreme flood events, downstream flooding will occur regardless of the control exercised at Turtle Lake due to additional inflows from the Carnelian Creek Watershed.

B. Target Elevations

Agreements made with the Minnesota Department of Natural Resources call for the water surface elevation on the south side of County Road 4 to be targeted at an elevation of 940.5 (approximately 0.2-ft below Big Marine Weir Crest).

C. Procedure

The purpose of this procedure is to maintain as free an outflow over the Big Marine weir as possible while still maintaining the integrity of the wetlands located between the Turtle Lake weir structure and County Road 4. It is understood that due to the hydrology of the watershed, water may flow north into Big Marine Lake for short periods of time following significant runoff events.

1. Head-water (Big Marine Lake) and tail-water (south side of Co. Rd. 4) elevations are monitored on a biweekly basis at the Big Marine weir. Stop logs are then added or removed from the Turtle Lake weir structure according to the procedures listed below.
2. When the water surface elevations for the Big Marine weir have fallen to a point where the weir tail-water elevation (south side of Co. Rd. 4) is below the

crest (top) of the weir more than 2.5 inches (0.2-ft), one stoplog will be added to each bay of the Turtle Lake structure. If the tail-water at the Big Marine weir continues to be low after two weeks, an additional stop log should be added to each bay of the Turtle Lake structure.

3. When the Big Marine weir tail-water surface elevation has risen to a point where the tail-water is less than 2.5 inches below the crest of the weir, one stoplog shall be removed from each bay of the Turtle Lake structure. If the tail-water at the Big Marine weir continues to be high after two weeks, an additional stop log should be removed from each bay of the Turtle Lake structure.
4. The process of removing and adding stop logs will continue on a biweekly basis until all stop logs are either in place or removed from the Turtle Lake weir structure.

II. WINTER FLOW CONTROL

- A. Prior to winter freeze up additional stop logs may be removed to provide a winter draw-down for wetland enhancement. The extent of winter draw-down, if any, will be based on recommendations from the Minnesota Department of Natural Resources.