Twin Lake Operating Plan – Feasibility Study

Goals

1. Reduce 100-year water level in Twin Lake
2. No increase to 100-year water level in Owasso Basin
3. No increase to 100-year water level in Gervais Lake
4. No discharge from MnDOT drainage system to Twin Lake until Waldo Pond reaches 877.0
Twin Lake Operating Plan

• Feasibility Study Operating Plan
  1. Summer (February 16 – November 14)
     • Typical gate position is closed
     • Gate opened if
       • Twin Lake water level reaches 873.5 AND no forecast for rainfall greater than 2-inches within 12-hours AND Owasso Basin water level within 0.4-feet of the outlet
       • Waldo Pond water level exceeds 877.0
  2. Winter (November 15 – February 15)
     • Gate position is open
Twin Lake Operating Plan

• Feasibility Study Operating Plan

1. Summer (February 16 – November 14)
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     • Waldo Pond water level exceeds 877.0

2. Winter (November 15 – February 15)
   • Gate position is open

Based on simulated historic record. Elevation 873.5 is exceeded less than 1-percent of the time

Figure 5-15  Alternative 4 Twin Lake Elevation-Duration Curve
Twin Lake Operating Plan - Questions

• Why can’t outlet remain open all year?
  • Allows for runoff from interstate drainage system to be conveyed into Twin Lake, which may adversely affect water quality.
  • Increases the 100-year water level in Gervais Lake.
  • Potential to increase the 100-year water level in Owasso Basin.

• Why wasn’t a backflow preventor considered?
  • Increases the 100-year water level in Gervais Lake.
  • Potential to increase the 100-year water level in Owasso Basin.
# Twin Lake Operating Plan – Impacts

## Change in the 100-year elevation
Assuming Twin Lake starts at 873.5

<table>
<thead>
<tr>
<th></th>
<th>Open</th>
<th>Flap Gate</th>
<th>Operating Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Twin Lake</td>
<td>-0.50</td>
<td>-0.54</td>
<td>-0.2 (^1)</td>
</tr>
<tr>
<td>Owasso Basin</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00 (^1)</td>
</tr>
<tr>
<td>Gervais Lake</td>
<td>0.08</td>
<td>0.08</td>
<td>0.00 (^1)</td>
</tr>
</tbody>
</table>

\(^1\) Change based on continuous simulation

## Change in the 10-year elevation
Assuming Twin Lake starts at 873.5

<table>
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</tr>
</thead>
<tbody>
<tr>
<td>Twin Lake</td>
<td>-0.64</td>
<td>-0.54</td>
<td>0.00</td>
</tr>
<tr>
<td>Owasso Basin</td>
<td>0.01</td>
<td>0.02</td>
<td>0.00</td>
</tr>
<tr>
<td>Gervais Lake</td>
<td>0.04</td>
<td>0.04</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**Red text** indicates there is an increase in water level at a structure below the floodplain.
Twin Lake Operating Plan – Ongoing Evaluation

- Evaluate impacts of lowering 873.5 elevation.
- Evaluate November 15 – February 15.
- Design outlet to allow flexibility to modify operating plan in the future if downstream system modifications are made to accommodate additional discharge.
- Confirm that operating plan should minimize the increase in downstream water levels when there are habitable structures within the floodplain?
Twin Lake Outlet – Schedule Update

- **January 30** – Met with property owner regarding easement acquisition
- **February 5** – Meet with BP staff to locate pipeline
- **Mid February** – Provide plans for easement acquisition coordination
- **March** – Submit plans for approvals
  - Excel
  - BP
  - MnDOT
- **Summer 2020** – anticipated construction

Preliminary Draft for an outlet structure to Waldo Pond