Wilcox Lake Dam: Dam Study & Recommendations

Presented by

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WilcoxC Lake Dam: Study/Recommendations

WilcoxC Lake Dam:
Dam Study

By
Darryl Walker,
Stormwater Program Manager
Wilcox Lake Dam Study

• Dam Failure Analysis (DFA) performed by Consultant
• Originally completed in 2015
• Updated in late 2018
Wilcox Lake Dam Study

• Inundation Study performed to comply with the Virginia Impounding Structure Regulations (VISR)

• VISR compliance is required by the Virginia Department of Conservation and Recreation (DCR)
Wilcoxon Lake Dam Study: DFA Results

- Wilcoxon Lake Dam: “High Hazard” dam classification (failure of impounding structure would cause probable loss of life or serious economic damage)

- Dam spillway significantly undersized to pass required storm event

- Out of compliance with the VISR
Wilcox Lake Dam Study: DFA Results

- DFA needs to be submitted to DCR (before this update becomes outdated)

- DCR will probably require the City to bring the Dam into compliance with VISR with a schedule TBD

- Non-compliance? DCR may require the Dam to be drained due to the “High Hazard” classification
Wilcox Lake Dam: Study/Recommendations

Wilcox Lake Dam: Alternatives Analysis
Alternatives Analysis

• Performed by Consultant to prepare for DFA submittal to DCR

• Three (3) design alternatives developed:
  1) New Spillway
  2) HydroTurf™ Overtopping Protection
  3) Lowering Impoundment Volume/Water Level (Additional Water Quality Features Installed – “BMP’s”)
Alternatives Analysis: Alternative #1 – New Spillway
Alternatives Analysis: Alternative #2 – HydroTurf™

Wilcox Lake Dam: Study/Recommendations
Alternatives Analysis: Alternative #3 – Lower Volume/Level
### Alternatives Analysis: Estimated Costs

<table>
<thead>
<tr>
<th>ALTERNATIVE</th>
<th>1) New Spillway</th>
<th>2) HydroTurf™</th>
<th>3) Lowering Volume/BMP’s</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Design Cost</strong></td>
<td>$262,062.50</td>
<td>$89,750.00</td>
<td>$281,500.00</td>
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<tr>
<td><strong>Construction Cost</strong></td>
<td>$1,733,750.00</td>
<td>$897,500.00</td>
<td>$2,815,000.00</td>
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<tr>
<td><strong>Mat’l’s. Testing/Insp.</strong></td>
<td>$52,012.50</td>
<td>$13,462.50</td>
<td>$42,225.00</td>
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<td><strong>TOTAL COST</strong></td>
<td>$2,045,825.00</td>
<td>$1,000,712.50</td>
<td>$3,138,725.00</td>
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</tbody>
</table>
Alternatives Analysis: Estimated Costs

• Alternative 3 – $3.14M
  ▪ Best grant opportunity (design and construction)
  ▪ BMP’s – Water Quality Benefit
    - Pollutant reduction
    - Helps address City’s TMDL* Requirements for 2025
      (*TMDL = Total Maximum Daily Load)
Alternatives Analysis: Estimated Costs

• Alternative 3 – $3.14M
  ▪ Most Expensive
    - Match required (50%)…even with total grant funding, would still require $1.57M in City funds
    - Reimbursement grant – City will be required to encumber FULL MATCH before receiving reimbursement
  ▪ Would significantly change the appearance of Wilcox Lake
Wilcox Lake Dam: Study/Recommendations

Alternatives Analysis: Estimated Costs

• Alternative 1 – $2.05M
  ▪ More expensive of the two remaining Alternatives
  ▪ Demolition of the “Old White Pump House”
  ▪ Would also require lowering the existing water level to accommodate the New Spillway (changing the appearance of the Lake)
Alternatives Analysis: Estimated Costs

- Alternative 2 (Most Feasible) – $1.00M
  - Least expensive Alternative
  - Would allow Wilcox Lake to maintain its current appearance
Wilcox Lake Dam: Study/Recommendations

Wilcox Lake Dam:
City Staff Recommendations
City Staff Recommendations: Alternative 2

- If Council selects Alternative 2…
  - DFA certified/signed by City Staff and submitted to DCR
  - City Staff works with DCR to develop compliance schedule (timeframe for Alternative 2 is about 18-24 months)
  - Quarterly status updates provided to Council
    - Development of compliance schedule
    - Progress during design and construction phases
City Staff Recommendations: Other Considerations

• Full public access to Wilcox Lake Dam area recently approved (emphasizing the need to):
  ▪ Resolve compliance issues
  ▪ Improve safety

• Current conditions **DO NOT** indicate imminent dam failure
City Staff Recommendations: Request to City Council

To authorize the City Manager to:

• Move forward with certifying the Wilcox Lake Dam Study for submittal to DCR

• Upon determination of compliance schedule with DCR, pursue Alternative 2 as recommended by City Staff to bring Wilcox Lake Dam back into regulatory compliance and improve safety