



Memorandum

To: Bassett Creek Watershed Management Commission
From: Barr Engineering Co.
Subject: Item 5C: BCWMC DeCola Ponds B & C Improvement Project Feasibility Study Summary
BCWMC April 19, 2018 Meeting Agenda
Date: April 11, 2018

Recommendations:

1. For discussion.

1.0 Introduction

The Bassett Creek Watershed Management Commission's (BCWMC) current Capital Improvement Program (CIP) includes the DeCola Ponds B & C Improvement Project, a project identified as part of the Medicine Lake Road and Winnetka Avenue Area Long-Term Flood Mitigation Plan (Barr, 2016) developed by the Cities of Golden Valley, New Hope, and Crystal. The DeCola Ponds B & C Improvement Project (2019 CIP Project BC-2, BC-3 & BC-8) builds on the Liberty Crossing flood mitigation project that was completed in 2017 by the City of Golden Valley to help alleviate flooding at the low point along Medicine Lake Road to allow for the passage of emergency vehicles, reduce the number of structures at-risk of flooding around this area, and reduce flood elevations on the DeCola Ponds. At their October 2017 meeting, the BCWMC approved the proposal from for the BCWMC Engineer to prepare a feasibility study for the DeCola Ponds B & C Improvement Project. The complete feasibility study report will be presented at the May BCWMC meeting.

DeCola Ponds B and C and the Pennsylvania Woods area are located in the City of Golden Valley, east of Rhode Island Avenue and south of Medicine Lake Road, and receive runoff from the Cities of Golden Valley, New Hope, and Crystal. Discharge from the ponds ultimately drains to the Main Stem of Bassett Creek. DeCola Ponds B and C are listed as Public Water Inventory Basins and are Minnesota Department of Natural Resources (MnDNR) public waters (MnDNR #27-0647P). DeCola Ponds B and C are located within Pennsylvania Woods Park, a public, urban, walking park consisting of deciduous forest, wooded knolls, and various wetland communities. The portion of the Pennsylvania Woods Park area directly north of DeCola Pond B is located on property owned by Dover Hill Apartments, LLC and the City of Golden Valley secured a drainage and utility easement for this area in 2015.

2.0 Feasibility Design Concepts and Impacts

Three (3) conceptual flood mitigation designs were investigated during this feasibility study. The major difference between each concept is the amount of additional flood storage developed, the area of

disturbance (and resulting tree removal), and the additional water quality treatment volume that can be developed. The three concepts are generally summarized below and are shown on the attached graphics.

- **Concept 1: Maximize Flood Storage** (resulting in the most significant disturbance area and tree removal)
- **Concept 2: Maximize Tree Preservation** (minimizing disturbance area and tree removal while developing flood storage)
- **Concept 3: Hybrid of Concepts 1 & 2** (balancing the need for flood storage with tree preservation)

The attached figures summarize the components of the three feasibility concepts. There are several shared components between each concept, including: 1) the box culvert connection to the Liberty Crossing site; 2) a sediment forebay; and 3) modifications to the DeCola Pond C outlet structure, including the lowering of the normal water level and the raising of the overflow from DeCola Pond C to DeCola Pond D.

We evaluated the design concepts using the BCWMC Phase 2 XP-SWMM and P8 model to quantify the impacts of each concept on flood reduction and water quality improvement. We also quantified habitat impacts, including estimated tree removals, and wetland and upland restorations, based on the proposed concepts.

The attached matrix summarizes the estimated impacts of each of the three concepts, including the planning level cost estimates. Also attached is a summary of public feedback received at the public open house held in November 2017 and the response to these comments.

3.0 Recommended Concept

Based on review of the project impacts for each of the three concepts, the recommended concept is Concept 3, which balances the development of flood migration volume with tree preservation. However, we also recommend that during the design process, the city pursue opportunities to increase the flood mitigation volume within the general concept disturbance footprint, with the goal to maximize the impact on flood elevation reductions around the low point on Medicine Lake Road and the downstream DeCola Ponds.

The planning level estimated cost for the recommended Concept 3 is \$3.8 million (-20%/+30%). The BCWMC CIP budget for this project is \$1.6 million. The BCWMC CIP funding (ad valorem tax levied by Hennepin County on behalf of the BCWMC), is not the sole source of funding for this project. The remainder of the funding will come from a variety of sources, including the City of Golden Valley, Hennepin County, Minnesota Department of Natural Resources (MnDNR) Flood Damage Reduction Grant program, and other sources (e.g. other grants, as appropriate).

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Page: 3

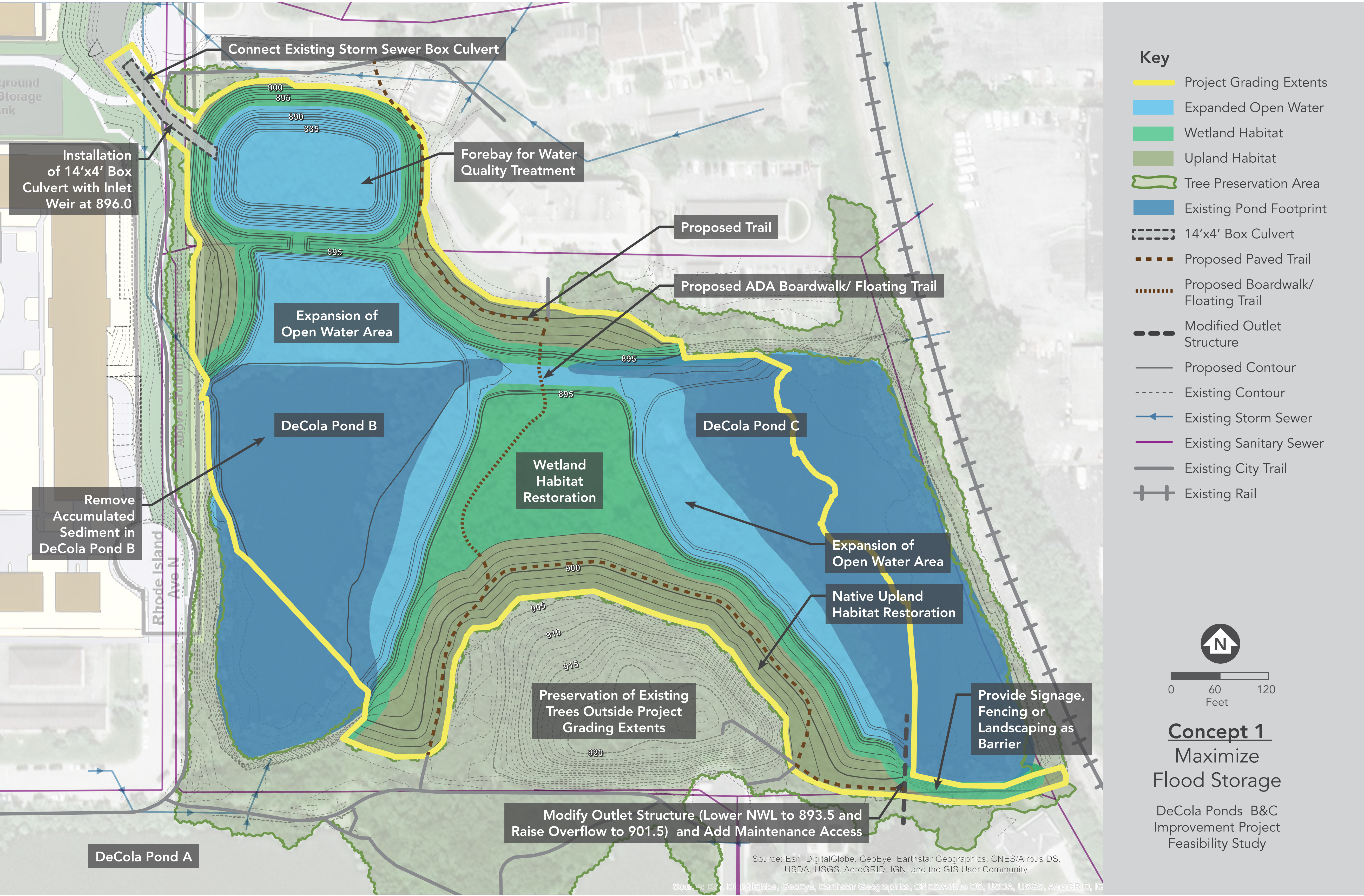
3.1 Permitting Requirements

The proposed project is expected to require the following permits/approvals for the selected concept:

- Clean Water Act Section 404 Permit from the U.S. Army Corps of Engineers
- Public Waters Work Permit from the MnDNR
- Section 401 Water Quality Certification from the Minnesota Pollution Control Agency (MPCA)
- Construction Stormwater General Permit from the MPCA
- Compliance with the MPCA's guidance for managing dredged material
- Compliance with the MPCA's guidance for managing contaminated material and debris-containing fill, managed in accordance with the MPCA-approved Response Action Plan and Site Contingency Plan (Barr, 2015)
- Compliance with the Minnesota Wetland Conservation Act

Concept 1: Maximize Flood Storage

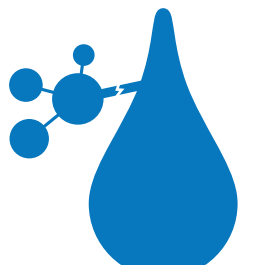
Estimated Cost (-20%/+30%) = \$5.7 Million



Concept Summary

 **Flood Mitigation Volume:**
33 acre-ft

 **Open Water Expansion:**
2.7 Acres

 **Increase in Phosphorus Removal:**
10.5 lbs/year

 **Restored Wetland & Upland:**
4.0 acres

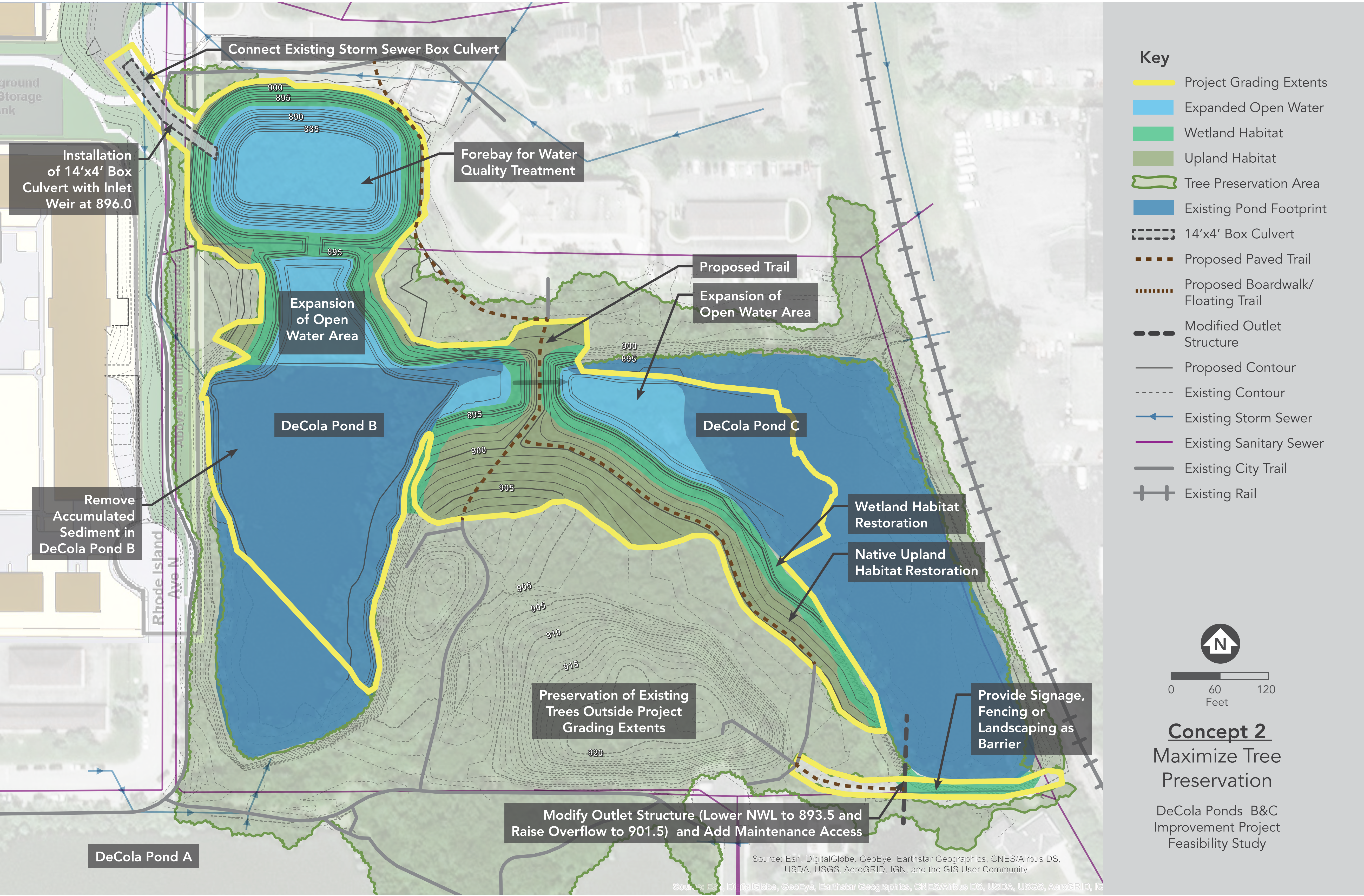
 **Medicine Lake Road 100-Year Flood Depth**
1.7 Feet

 **Reduction of Flood Level on Ponds**

DeCola Pond	Feet
A,B,C	- 0.6'
D	- 1.2'
E,F	- 0.1'

Concept 2: Maximize Tree Preservation

Estimated Cost (-20%/+30%) = \$3.5 Million



Concept Summary

Flood Mitigation Volume:
17 acre-ft

Open Water Expansion:
1.6 Acres

Increase in Phosphorus Removal:
8.0 lbs/year

Restored Wetland & Upland:
2.5 acres

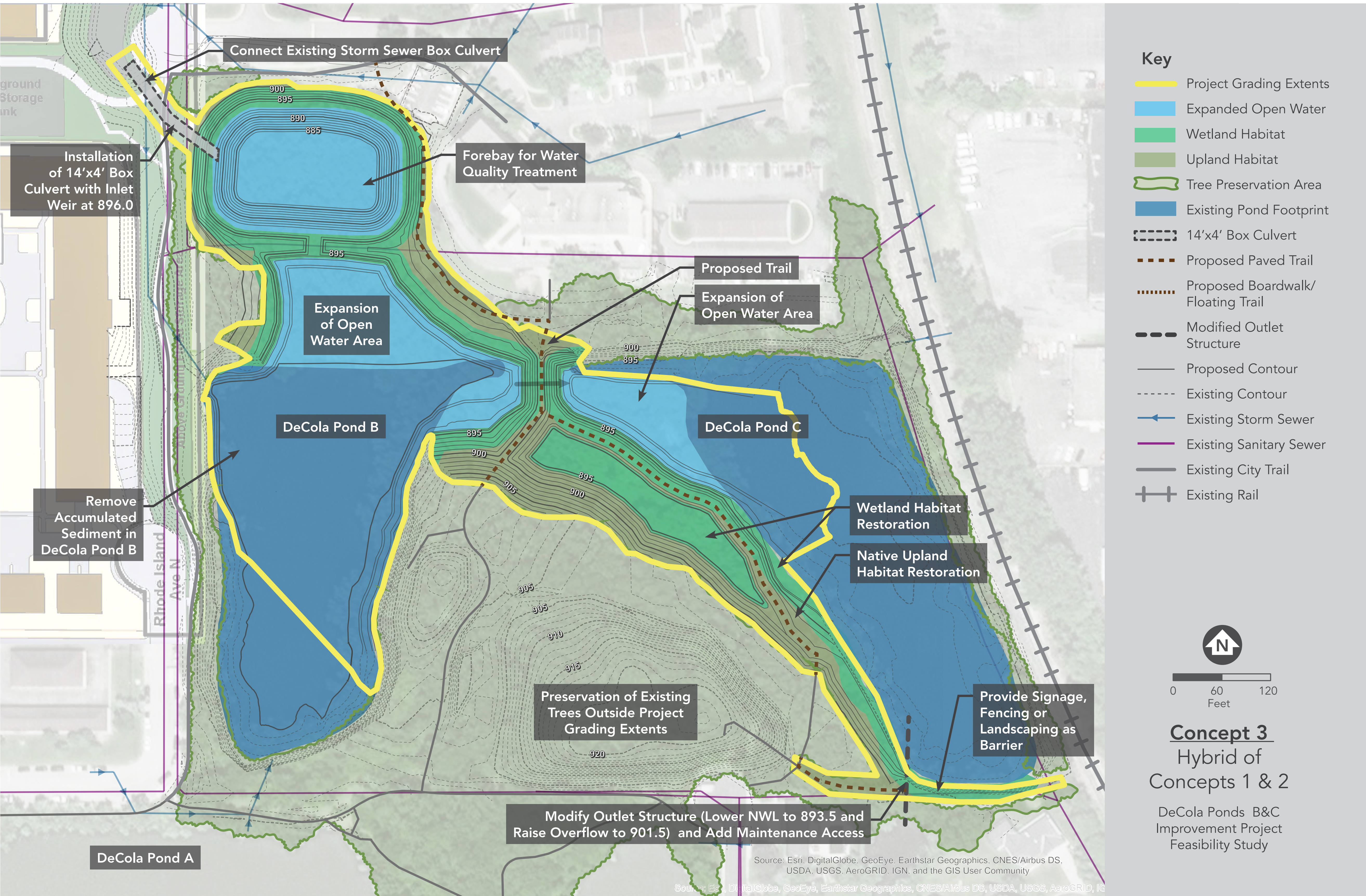
Medicine Lake Road 100-Year Flood Depth
1.8 Feet

Reduction of Flood Level on Ponds

DeCola Pond	Feet
A,B,C	- 0.3'
D	- 0.3'
E,F	- 0.1'

Concept 3: Hybrid of Concepts 1 & 2

Estimated Cost (-20%/+30%) = \$3.8 Million



Concept Summary

 **Flood Mitigation Volume:**
22 acre-ft

 **Open Water Expansion:**
1.9 Acres

 **Increase in Phosphorus Removal:**
9.0 lbs/year

 **Restored Wetland & Upland:**
2.7 acres

 **Medicine Lake Road 100-Year Flood Depth**
1.8 Feet

 **Reduction of Flood Level on Ponds**

DeCola Pond	Feet
A,B,C	- 0.5'
D	- 0.5'
E,F	- 0.1'

Concept Design: Summary Matrix

Category	Item	Concept 1: Maximize Flood Storage	Concept 2: Maximize Tree Preservation	Concept 3: Hybrid Alternative
Flood Mitigation	Increase in Flood Mitigation Volume	33 acre-ft	17 acre-ft	22 acre-ft
	100-Year (1% Chance) Depth of Flooding at Medicine Lake Road	1.7 ft	1.8 ft	1.8 ft
	Reduction in 100-Year Flooding at DeCola Ponds A, B, & C	0.6 ft	0.3 ft	0.5 ft
	Reduction in 100-Year Flooding at DeCola Pond D	1.2 ft	0.3 ft	0.5 ft
	Reduction in 100-Year Flooding at DeCola Ponds E & F	0.1 ft	0.1 ft	0.1 ft
	Number of Structures No Longer in 100-Year Floodplain	1	1	1
Water Quality	Open Water Expansion	2.7 acres	1.6 acres	1.9 acres
	Expansion of Water Quality Treatment Volume	10.3 acre-ft	6.5 acre-ft	7.5 acre-ft
	Increase in Total Phosphorus Removal	10.5 lbs/yr	8.0 lbs/yr	9.0 lbs/yr
Trees	General Tree Preservation	Good	Best (of 3 Concepts)	Better
	Preservation of Hardwood Trees on Knoll & Screening Trees	Yes	Yes	Yes
Other Habitat	Restored Wetlands and Upland Areas	4.0 acres	2.5 acres	2.7 acres
Trails	Preserve and Expand Trails	Yes	Yes	Yes
Project Costs	Planning Level Cost Estimate (-20%/+30%) (Original Estimate: \$4.6 million)	\$5.7 million	\$3.5 million	\$3.8 million
	Flood Mitigation Volume Unit Cost	\$174,000/acre-ft	\$203,000/acre-ft	\$173,000/acre-ft

Feedback From the November 2017 Open House

Comment Themes	Response
Desire for Trail Accessibility & Maintenance	New trails will be designed to be ADA-compliant
	Trail locations will consider and optimize maintenance and usability
	Existing trash and debris will be removed as part of project construction
	As part of final design, City will consider locations for trash receptacles, benches, overlooks, signage and other park amenities
Management of Debris, Litter, and Trash	The proposed forebay will help capture trash from upstream and will be accessible for inspections and maintenance by City
Management of Invasive Species (e.g. Buckthorn)	Buckthorn and other invasive plant species within the disturbed areas will be removed/managed
	Disturbed areas will be restored with ecologically beneficial native wetland and upland plant and tree species (pollinator habitat)
Management of Trees	Trees within the disturbance limits, including downed or dying trees, will be removed
	All trees outside the disturbance limits will be preserved, including those hardwoods on the knolls between Ponds A, B, and C
	Trees providing existing screening of the Liberty Crossing site will remain (along south & east side of Pond B)
	New upland habitat will include native trees and shrubs
Concern about Sedimentation & Stagnant Water	Accumulated sediment will be removed from Pond B
	The forebay will provide water quality treatment of runoff, including an access for inspection and maintenance by City
	The open water area of Ponds B & C will be expanded and there is an opportunity to deepen the channel connecting Ponds B & C
	The outlet from Pond C will be modified to prevent debris from accumulating on the outlet structure/pipe
Concerns about Safety & Security due to Density of Trees/Undergrowth	The restored areas will be more open providing more visibility in these areas
	On and around the knoll and along the undisturbed shorelines, the tree density will be the same as existing conditions
Concerns about Pond Safety	A 10 foot safety bench will be incorporated along disturbed/expanded shorelines
	Slopes will be designed at 3:1 side slopes (standard)
	Wetland buffer vegetation will be planted along all disturbed shorelines
	Ponds B & C will be ~4 feet deep (same as existing)
Special Assessments to Property Owners	No special assessments will be used to fund this project
	Pursuing a variety of funding sources including City of Golden Valley, BCWMC Capital Improvement Project (CIP) Funds, MnDNR Flood Damage Reduction Grants, Hennepin County, and Others