City of Mountain Park Community Meeting

Sediment Removal Options Summary Lake Garrett

July 25, 2018

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Introductions & Meeting Summary

I. Introductions & Meeting Summary
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I. Introduction

Cardno is an award winning environmental and civil engineering firm with over 3,000 employees in North America.

Cardno has teamed with Great Lakes Environmental & Infrastructure (GLE&I), which is the largest dredging and marine infrastructure contractors in the country.

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GLE&I

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GREAT LAKES ENVIRONMENTAL & INFRASTRUCTURE

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II. Background

- Lake Garrett has historic sedimentation issue
- The City of Mountain Park requested Cardno to complete:
  - Summary of sediment removal options for Lake Garrett
  - Permitting requirements for each option
  - Useful life of Lake Garrett
- Cardno and Team provided summary options to the City in February 2018

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III. Permitting

- Multiple State and Federal permitting steps are required prior to any dredging work
  - Clean Water Act (Wetlands)
  - Endangered Species Review
  - Stormwater
- Depending on dredging option, different permits may be needed
- Wetland impacts primary permitting issue
  - US Army Core of Engineers (USACE) reviews all permit applications
  - May take up to a year to make a determination
  - May deny proposed options

Permits	Authorizing Agency	Description	Time	Estimated Cost
Federal				
Clean Water Act (CWA), Section 404 – Nationwide Permit	U.S. Army Corps of Engineers (USACE) Savannah District	Wetland disturbance determination - No significant impacts to wetlands, endangered species, or cultural resources	45-60 Days	$5,000
Clean Water Act (CWA), Section 404 – Individual Permit	U.S. Army Corps of Engineers (USACE) Savannah District	Wetland disturbance determination - Potential impacts to wetlands, endangered species, or cultural resources	TBD	$60,000 +/-
Endangered Species Act	U.S. Department of Interior, U.S. Fish and Wildlife Service (USFWS), Georgia Ecological Services Field Office	Verify project will not impact Federal endangered species list; required with USACE permit	45-60 Days	$500
State				
State Listed Endangered Species Consultation	Georgia Department of Natural Resources (GA DNR), Wildlife Resources Division (WRD)	Verify project will not impact State endangered species list; required with USACE permit	45-60 Days	$500
CWA Section 401 Water Quality Certification	GA DNR, Environmental Protection Division (GA EPD)	Verify State CWA requirements; required with USACE permit.	Dependent on USACE permit type	$1,000
Storm Water General Permit	GA DNR Watershed Protection Branch	State regulation of storm water discharge	45-60 Days	$2,000
Stream Buffer Variance	GA DNR Watershed Protection Branch	Determination of stream buffer requirements	45-60 Days	$1,000
NHPA, Section 106 Consultation	GA DNR, Historic Preservation Division	Verify project will not impact State historic areas; required with USACE permit.	45-60 Days	$500

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IV. Sediment Removal Options

> **Option 1: No Action**

- No action proposed
- Cost: $17,000 per year in upkeep of current facilities
- Permitting Requirements: None
- Pro: Cheapest option
- Con: No remediation of sedimentation

Simple Earthen Weir

> **Option 2: Install a Weir or Spillway**

- Install a weir or sediment trap to limit incoming sediment from entering from Rocky Creek (similar to the one installed along Russel Road)
- Permitting Requirements: Moderate
- Maintenance: $45,000 per year
- Cost: Summarized on Next Slide
- Pro: Relatively cheap, reduces future sedimentation issues
- Con: Does not address current sedimentation issues

Spillway

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Option 2 Costs – Install a Weir or Sediment Trap

Application	Type/Notes	Low Quality Wetland Costs	Medium Quality Wetland Costs	High Quality Wetland Costs
Permitting	USACE Individual Permit	$68,000	$68,000	$68,000
Mitigation Credits	0.5 acres	$100,000	$150,000	$200,000
Sediment Sampling	None	$11,000	$11,000	$11,000
Construction	Earthen reinforced weir	$100,000	$100,000	$100,000
	Spillway similar to Russel Road	$400,000	$400,000	$400,000
Engineering/Design	Earthen reinforced weir	$20,000	$20,000	$20,000
	Spillway similar to Russel Road	$80,000	$80,000	$80,000
Total Cost	Earthen reinforced weir	$299,000	$349,000	$399,000
	Spillway similar to Russel Road	$659,000	$709,000	$759,000

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IV. Sediment Removal Options

> **Option 3: Dewater/Dredge Lake, Haul of Sediment**

- Dig and haul sediment out via dump trucks
- Permitting Requirements: Minimal
- Cost:
  - 40,000 cubic yards (2 feet) removed - $2,904,000
  - 80,000 cubic yards (4 feet) removed - $4,690,000
- Maintenance: $17,000 per year
- Pro: Quickest Option & No Mitigation Required
- Cons:
  - Costly
  - Potential for significant road damage,
  - Does not address future sedimentation issues

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Option 3 Cost - Dewater/Dredge Lake, Haul of Sediment

Application	Type/Notes	Costs
Permitting	USACE Nationwide Permit	$8,000
Mitigation Credits	None	$0
Sediment Sampling	None	$0
Construction	40,000 cubic yards	$2,330,000
	80,000 cubic yards	$3,860,000
Engineering/Design and Inspection	40,000 cubic yards	$466,000
	80,000 cubic yards	$722,000
Road Damage	Anticipated from truck usage	$100,000
Total Cost	40,000 cubic yards	$2,904,000
	80,000 cubic yards	$4,690,000

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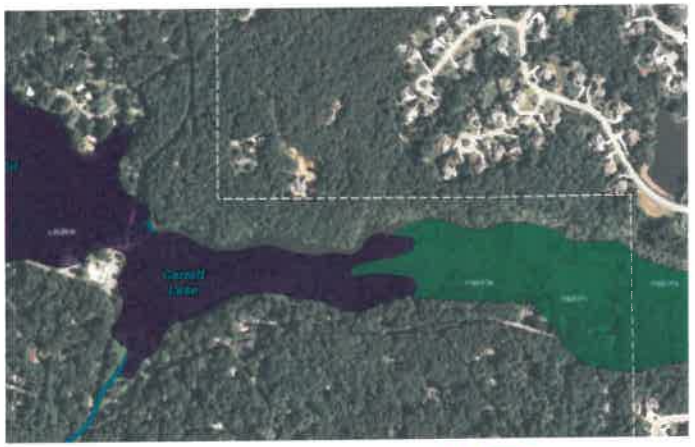
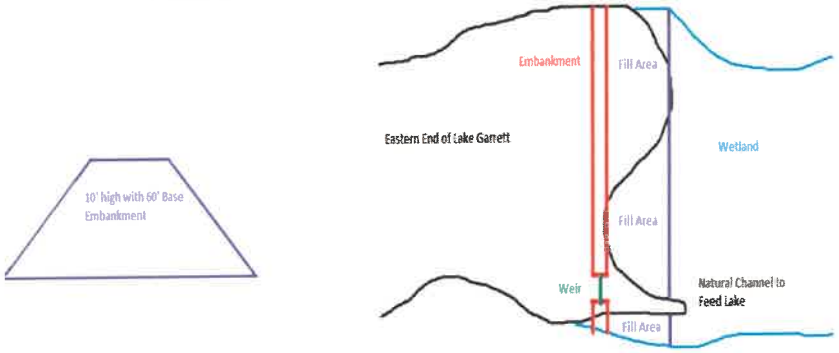
IV. Sediment Removal Options

- **Option 4: Dewater/Dredge Lake, Haul into Adjacent Wetlands, Install Weir**
  - Dig and haul sediment and place on adjacent wetland area, install weir along incoming Rocky Creek
  - Permitting: Extensive
  - Cost: Summarized on Next Slide
  - Maintenance: $45,000 per year
  - Pro: Adequately resolves current and future sedimentation issues
  - Cons:
    - Difficult permitting process
    - Costly

Wetland Map





Proposed embankment and weir

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Option 4 Costs– Dewater/dredge Lake and Haul Sediment to Wetland East of Lake Garret

Application	Type/Notes	Low Quality Wetland Costs	Medium Quality Wetland Costs	High Quality Wetland Costs
Permitting	USACE Individual Permit	$68,000	$68,000	$68,000
Mitigation Credits	2.5 acres	$500,000	$750,000	$1,000,000
	5.5 acres	$1,100,000	$1,650,000	$2,200,000
Sediment Sampling	-	$11,000	$11,000	$11,000
Construction	40,000 cubic yards	$1,800,000	$1,800,000	$1,800,000
	80,000 cubic yards	$2,600,000	$2,600,000	$2,600,000
Engineering/Design	40,000 cubic yards	$360,000	$360,000	$360,000
	80,000 cubic yards	$520,000	$520,000	$520,000
Total Cost	40,000 cubic yards (2.5 acres wetland)	$2,739,000	$2,989,000	$3,239,000
	80,000 cubic yards (5.5 acres wetland)	$4,830,000	$5,380,000	$5,930,000

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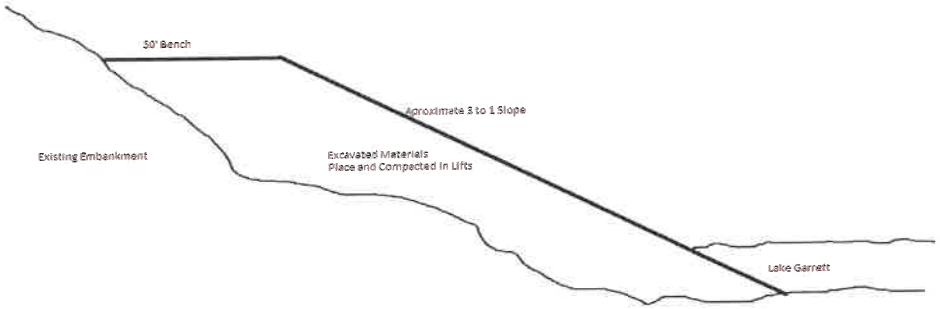
IV. Sediment Removal Options



> **Option 5: Dewater/Dredge, Haul Sediment to North Bank**

- Dig and haul sediment onto north bank of Lake Garrett
- Cost: Summarized on Next Slide
  - 40,000 cubic yards (2 feet) removed - $2,229,000
  - 80,000 cubic yards (4 feet) removed - $3,189,000
- Permitting Requirements: Moderate
- Maintenance: $25,000 per year
- Pros:
  - Limited permitting issues
  - Can develop trail or park along new embankment
  - No Mitigation
- Con: Does not address future sedimentation issues

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Option 5 Costs - Dewater/Dredge, Haul Sediment to North Bank

Application	Type/Notes	Costs
Permitting	USACE Individual Permit	$58,000
Mitigation Credits	None	$0
Sediment Sampling	N/A	$11,000
Construction	40,000 cubic yards	$1,800,000
	80,000 cubic yards	$2,600,000
Engineering/Design and Inspection	40,000 cubic yards	$360,000
	80,000 cubic yards	$520,000
Total Cost	40,000 cubic yards	$2,229,000
	80,000 cubic yards	$3,189,000

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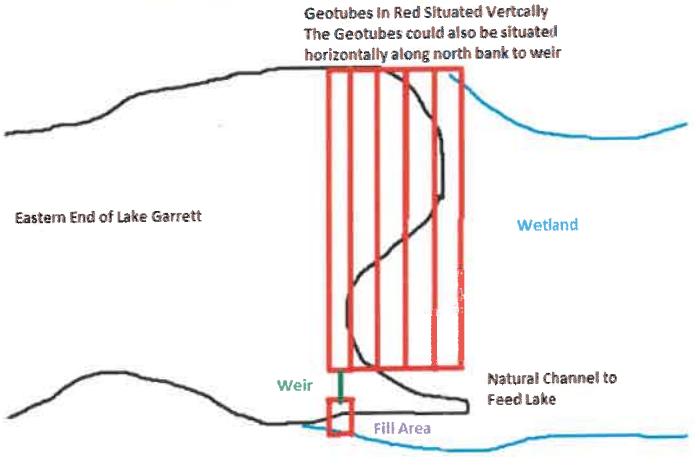
IV. Sediment Removal Options

> **Option 6: Dewater/Dredge Lake, Haul into Adjacent Wetlands in Geotubes, Install Weir**

- Dig and haul sediment and place on adjacent wetland area via geotubes, install weir along incoming Rocky Creek
- Cost:
  - 40,000 cubic yards (2 feet) removed - $817,000
  - 80,000 cubic yards (4 feet) removed - $1,475,000
- Permitting Requirements: Very Extensive
- Maintenance: $45,000 per year
- Pros: Cheapest solution which resolves current and future sedimentation issues
- Cons: Most difficult permitting process

Geotubes



Proposed locations of Geotubes

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Option 6 Costs – Dewater/dredge Lake and Place in Geotubes along Wetlands East of Lake Garret

Application	Type/Notes	Low Quality Wetland Costs	Medium Quality Wetland Costs	High Quality Wetland Costs
Permitting	USACE Individual Permit	$68,000	$68,000	$68,000
Mitigation Credits	2.5 acres	$500,000	$750,000	$1,000,000
	5.5 acres	$1,100,000	$1,650,000	$2,200,000
Sediment Sampling	None	$11,000	$11,000	$11,000
Construction	40,000 cubic yards	$490,000	$490,000	$490,000
	80,000 cubic yards	$880,000	$880,000	$880,000
Engineering/Design	40,000 cubic yards	$98,000	$98,000	$98,000
	80,000 cubic yards	$176,000	$176,000	$176,000
Total Cost	40,000 cubic yards (2.5 acres wetland)	$1,678,000	$2,178,000	$2,678,000
	80,000 cubic yards (5.5 acres wetland)	$2,235,000	$2,785,000	$3,335,000

IV. Sediment Removal Options - Summary

Option	Summary	USACE Permit Type	Removal Amount	Low Quality Wetland Costs	Medium Quality Wetland Costs	High Quality Wetland Costs	Medium Quality Wetland Cost Ranking Lowest to Highest
1	No Action	None	None	$0	$0	$0	1
2	Install weir on incoming Rocky Creek-Earthen Reinforced Weir	Individual	None	$299,000	$349,000	$399,000	2
	Install weir on incoming Rocky Creek- Spillway similar to Russel Road	Individual	None	$659,000	$709,000	$759,000	3
3	Dredge and haul sediment off-site	Nationwide	40,000 cy	$2,904,000	$2,904,000	$2,904,000	8
			80,000 cy	$4,690,000	$4,690,000	$4,690,000	10
4	Dredge and haul sediment to adjacent wetland	Individual	40,000 cy	$2,739,000	$2,989,000	$3,239,000	7
			80,000 cy	$4,830,000	$5,380,000	$5,930,000	11
5	Dredge and haul sediment on north-slope	Individual	40,000 cy	$2,229,000	$2,229,000	$2,229,000	5
			80,000 cy	$3,189,000	$3,189,000	$3,189,000	9
6	Dredge and haul sediment into geotubes on adjacent wetland	Individual	40,000 cy	$1,678,000	$2,178,000	$2,678,000	4
			80,000 cy	$2,235,000	$2,785,000	$3,335,000	6

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V. Useful Life of Lake Garrett

> Cardno conducted a basic mathematical model to review the useful life of Lake Garrett and determined:

Scenario	Type/Notes	Approximate Useful Life
1	No Action	65 Years
3	Removal of 40,000 cubic yards of sediment	100 Years
4	Removal of 80,000 cubic yards of sediment	130 Years
5	Removal of 40,000 cubic yards of sediment and installation of weir	>150 Years
6	Removal of 80,000 cubic yards of sediment and installation of weir	>180 Years
7	Installation of weir only	82 Years

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VI. Additional Considerations

- All options will have ongoing annual costs
  - Upkeep of equipment
  - Occasional removal of sediment from weir or spillway
  - Possible wetland mitigation/protection
- Alternative Options:
  - Considering landscaping and trail development along, or island within Lake Garrett
  - Reduce incoming sediment by enforcing stricter soil erosion controls

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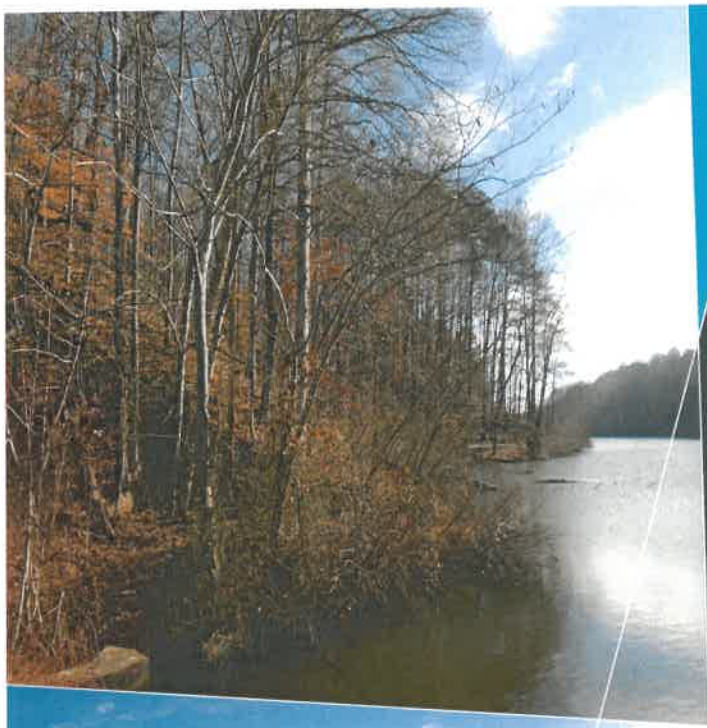

THANK YOU

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