



Class Environmental Assessment Sundial Creek Subwatershed Public Information Centre

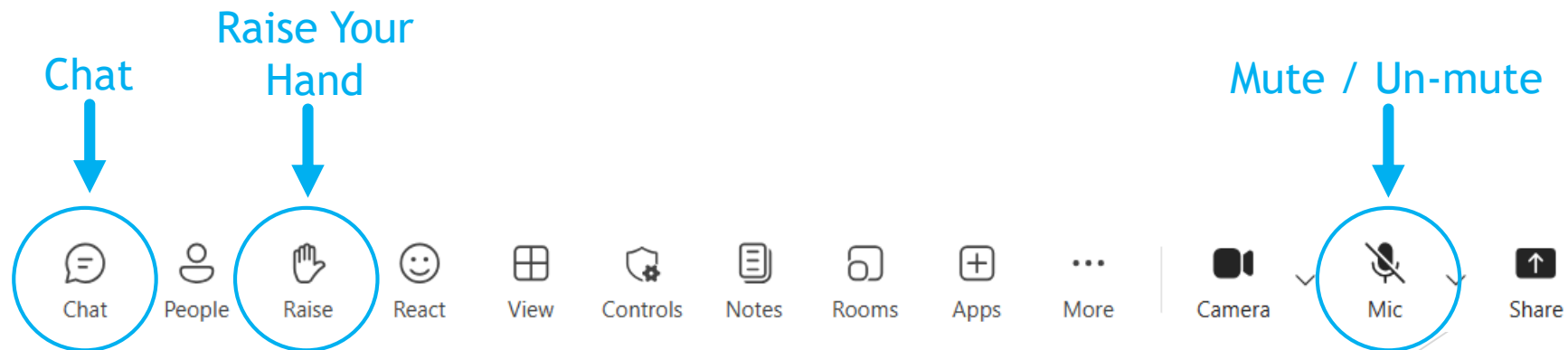
Date: June 9, 2026

Time: 7pm

Location: virtual presentation

Housekeeping Items

- ▶ Staff introductions
 - ▶ City: Pat MacDonald
 - ▶ Aquafor Beech: Chris Denich, Peter Hebert, Graham Eby
- ▶ Discussion at the end of the presentation
- ▶ Keep your microphone on mute during the presentation
- ▶ To ask a question:
 - ▶ Use the “raise your hand” feature and un-mute yourself when called on, or
 - ▶ Use the “chat” option



Agenda

1. Project Overview

- ▶ Agenda Review & Introductions
- ▶ Project Overview & Project Context
- ▶ Study Area & Study Timeline

2. Study Process & Next Steps

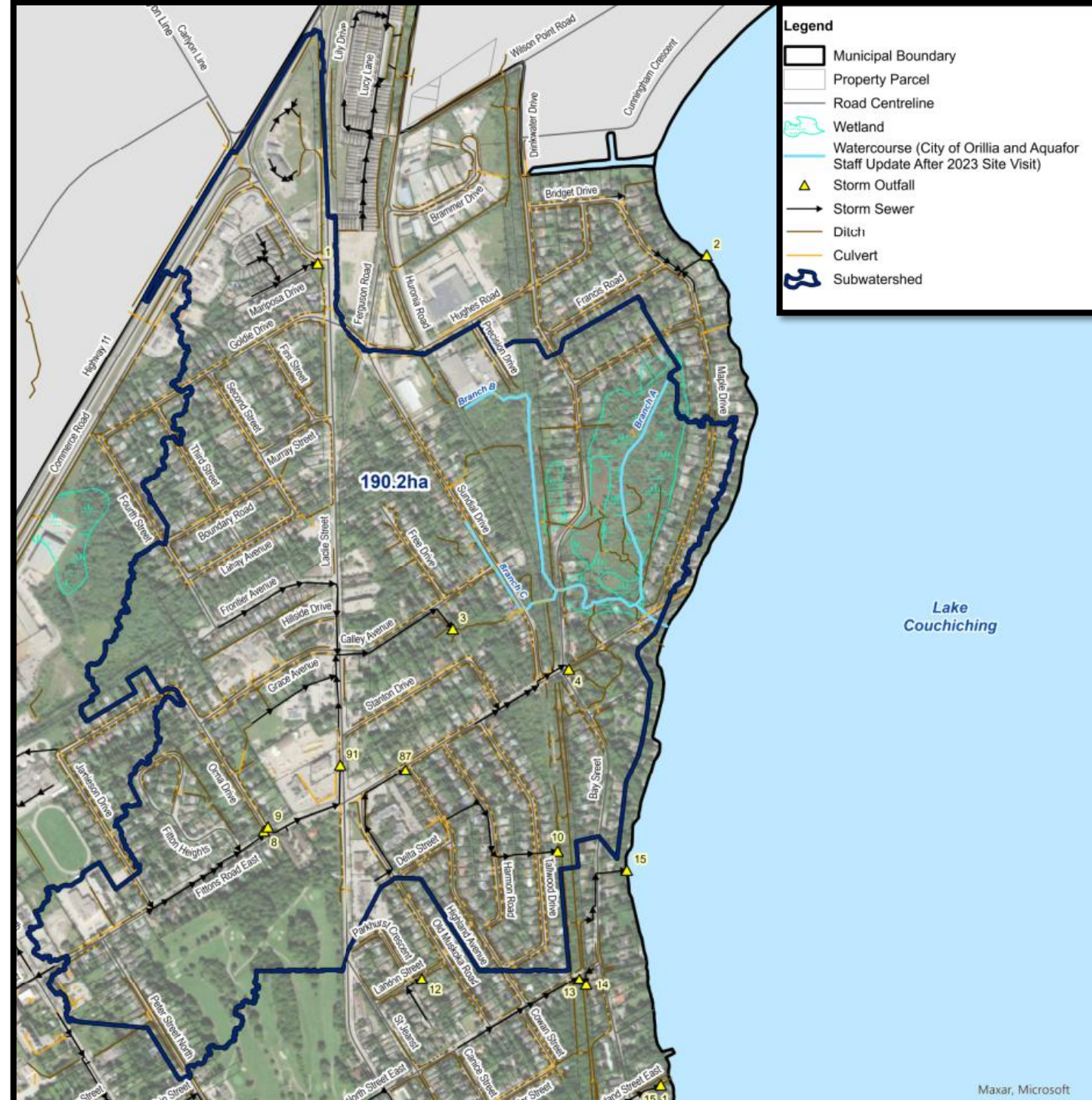
- ▶ Existing Conditions
- ▶ Long List of Alternatives
- ▶ Evaluation of Alternatives
- ▶ Next Steps

Introduction



Project Introduction

- ▶ Sundial Creek is an urban coldwater creek system
- ▶ Heavily urbanized with residential development
- ▶ Couchiching Conservancy began monitoring subwatershed in 2016 due to concerns of ecosystem health
- ▶ Elevated nitrate-nitrogen levels in Grant Wetland/Sundial Creek area
- ▶ Findings brought to the Environmental Advisory Committee which led to this study



Project Background

- ▶ Extensive impervious surfaces in subwatershed have:
 - ▶ Altered natural hydrology
 - ▶ Degraded environmental health
- ▶ Three primary problems in subwatershed:
 - ▶ Surface Water Quality Degradation
 - ▶ Increase in nitrate, chloride and sediment loading
 - ▶ Aquatic Habitat Degradation
 - ▶ Barriers to fish movement
 - ▶ Declining water quality
 - ▶ Presence of Invasive Species
 - ▶ Threaten ecosystem biodiversity



Project Purpose

▶ Problem Statement

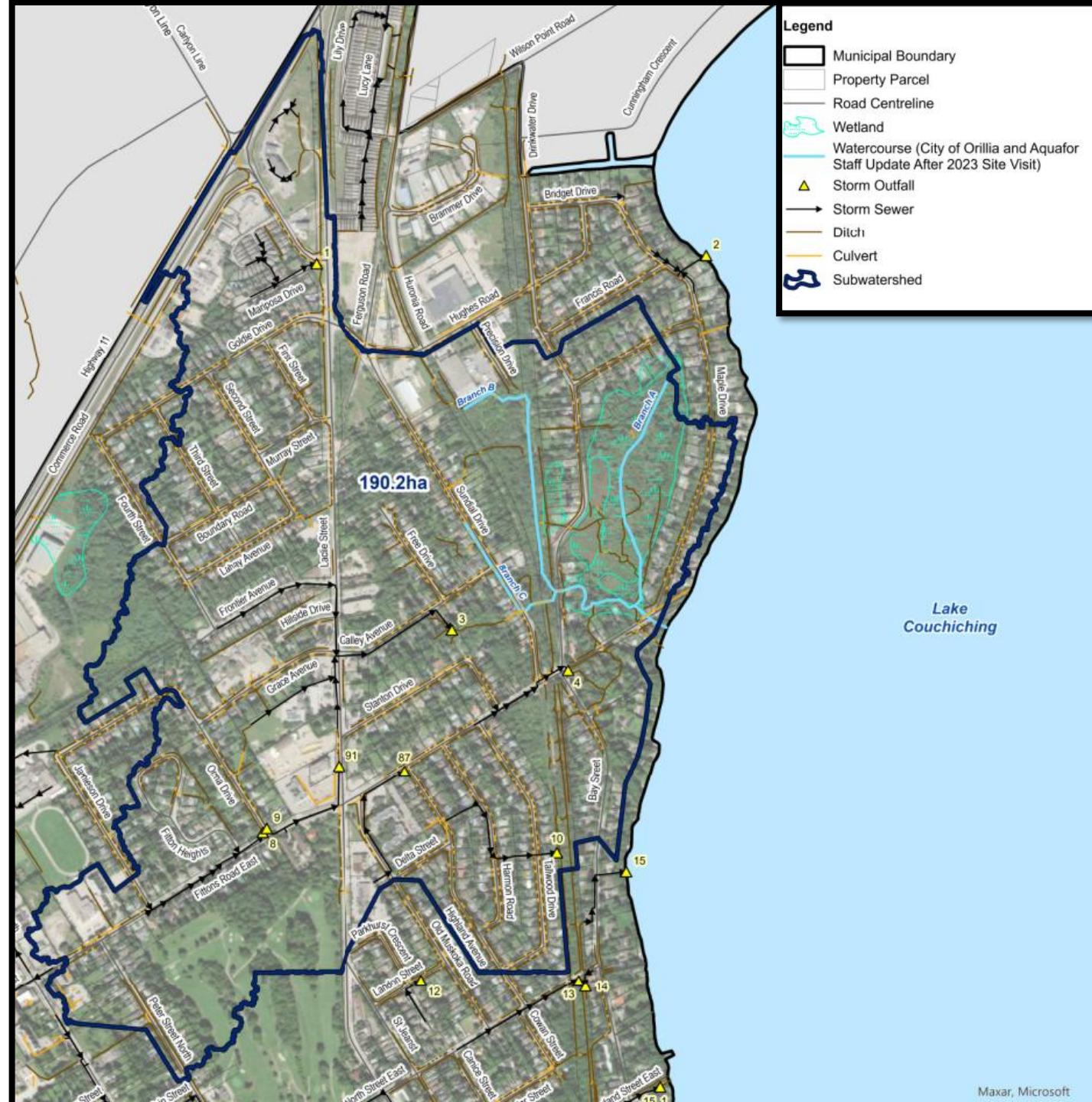
- ▶ Urban development within the Sundial Creek subwatershed has degraded the health of the creek
- ▶ To help restore local ecologic health, specifically for Brook Trout, this EA investigates several stormwater-based solutions.

▶ Project Objective:

- ▶ In residential areas:
 - ▶ Public education, stewardship, and incentive-based residential stormwater strategies
 - ▶ Residential source controls and pollution prevention
- ▶ On public property:
 - ▶ Creek channel restoration
 - ▶ Water quality treatment along roadways

Project Area

- ▶ 190 ha subwatershed
- ▶ Primary outlet between 255 and 259 Fittons Road East
- ▶ Secondary outlet where Fittons Road East meets Lake Couchiching
- ▶ Watercourse is fed by groundwater springs and 7 municipal stormwater outlets

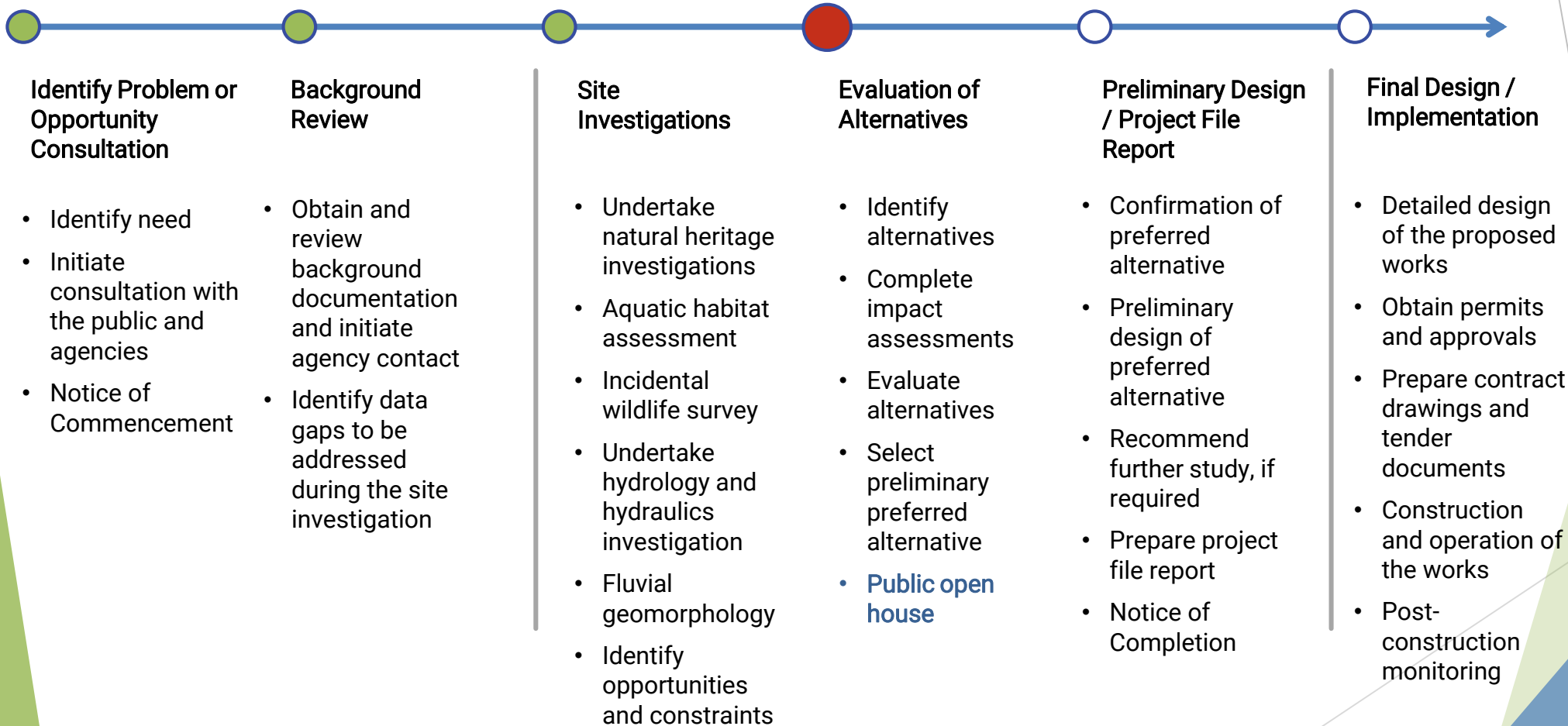


Class EA Process

Class EA Phase 1

Class EA Phase 2

Implementation



Identify Problem or Opportunity Consultation

- Identify need
- Initiate consultation with the public and agencies
- Notice of Commencement

Background Review

- Obtain and review background documentation and initiate agency contact
- Identify data gaps to be addressed during the site investigation

Site Investigations

- Undertake natural heritage investigations
- Aquatic habitat assessment
- Incidental wildlife survey
- Undertake hydrology and hydraulics investigation
- Fluvial geomorphology
- Identify opportunities and constraints

Evaluation of Alternatives

- Identify alternatives
- Complete impact assessments
- Evaluate alternatives
- Select preliminary preferred alternative
- **Public open house**

Preliminary Design / Project File Report

- Confirmation of preferred alternative
- Preliminary design of preferred alternative
- Recommend further study, if required
- Prepare project file report
- Notice of Completion

Final Design / Implementation

- Detailed design of the proposed works
- Obtain permits and approvals
- Prepare contract drawings and tender documents
- Construction and operation of the works
- Post-construction monitoring

Phase 1: Identification of Problems and Opportunities



Existing Conditions - Aquatic Habitat

▶ Branch A

- ▶ Flows primarily through wetland
- ▶ High sediment loading
- ▶ Sparse vegetation in creek
- ▶ Reasonable shade coverage

▶ Branch B

- ▶ Flows through natural areas
- ▶ Intermittent/ephemeral stream
- ▶ No aquatic vegetation observed
- ▶ Ample shade coverage

▶ Branch C

- ▶ Begins as road ditch along Sundial Dr.
- ▶ Several culverts restrict fish passage
- ▶ Upstream streambed covered with vegetation
- ▶ Intermittent shade coverage



Existing Conditions - Fish Communities

- ▶ Brook Trout are the dominant species throughout Sundial Creek
- ▶ Historic data shows they are most often observed in roadside ditch
- ▶ Conflicting anecdotal evidence:
 - ▶ Brook Trout and fry observed downstream of Sundial Drive culvert in spring 2023
 - ▶ Others suggest trout have not been seen in ditch for years
- ▶ Historical evidence of Brook Trout community slowly declining due to urbanization



Roadside Ditch Along Sundial Dr.

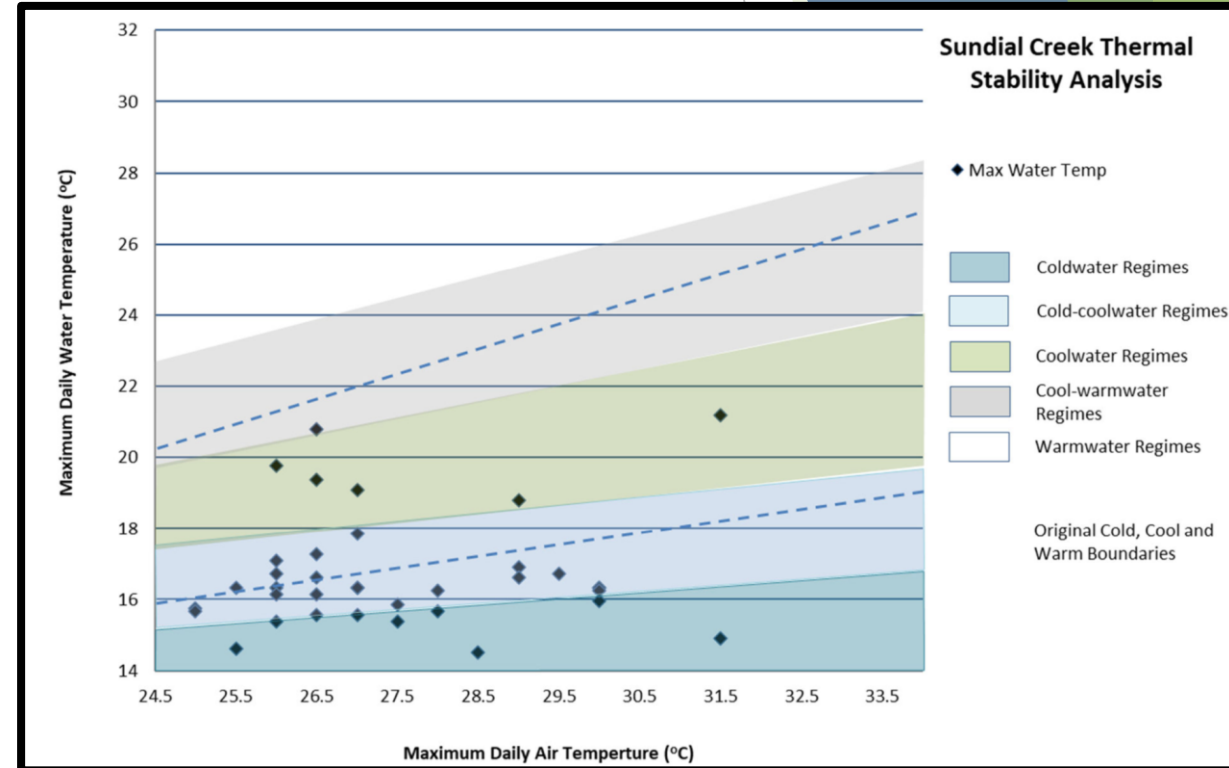
Existing Conditions - Benthic Invertebrates

- ▶ Benthic invertebrates are aquatic insects and small organisms living in streams
- ▶ Important in assessing health of stream as they are:
 - ▶ Highly sensitive to pollution and habitat change
 - ▶ Reflect long-term local water quality changes
 - ▶ Important food source for fish
- ▶ Dominant species are highly tolerant of disturbance: Scuds, No-see-ums, Sow Bugs, and Midge
- ▶ Sensitive species such as Mayflies, Stoneflies, and Caddisflies were scarce or not observed
 - ▶ Indicates poor aquatic habitat



Existing Conditions - Water Quality

- ▶ Sampling conducted by Couchiching Conservancy between 2016-2021
- ▶ General water quality is acceptable:
 - ▶ Average phosphate levels well below algae growth threshold, but peak close to threshold
 - ▶ Average and maximum turbidity in acceptable range
 - ▶ Nitrate below long- and short-term exposure guidelines, but suggest mild stress on aquatic life
 - ▶ Chloride below long-term exposure guideline, suggest mild chronic stress on aquatic life
- ▶ Nitrate and Chloride levels do not vary with seasons
 - ▶ Most likely coming from groundwater
- ▶ Water temperature is warming outside of the coldwater range



Existing Conditions - Aquatic Stressors in Sundial Creek

- ▶ Three main stressors
 - ▶ Channel modification and encroachment
 - ▶ Human-made fish barriers (3 perched culverts)
 - ▶ Channelization and hardening
 - ▶ General encroachment
 - ▶ Water quality
 - ▶ Increased stream temperature
 - ▶ Pollutants (e.g., suspended solids, hydrocarbons, fertilizers)
 - ▶ Urbanization and urban stormwater impact
 - ▶ Reduced natural features
 - ▶ Altered route of watercourse
 - ▶ No stormwater controls

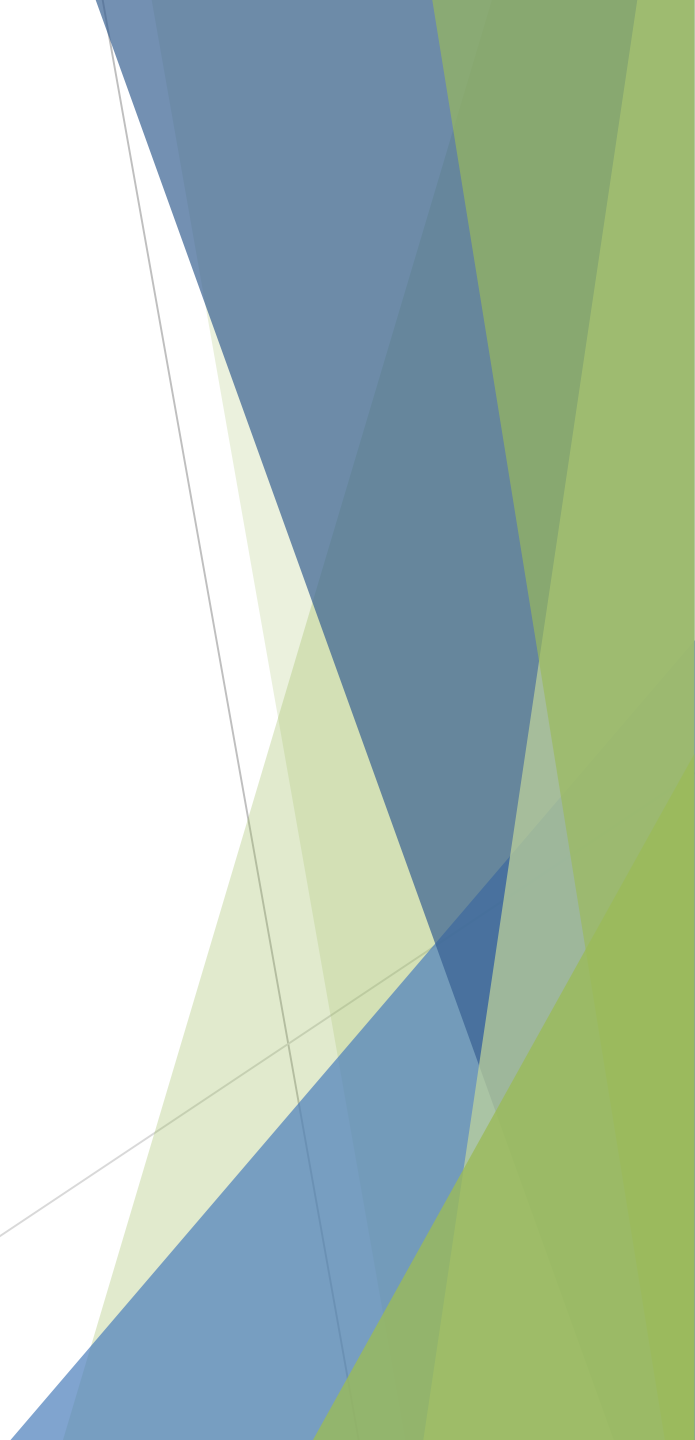


Sundial Creek - Stormwater Network



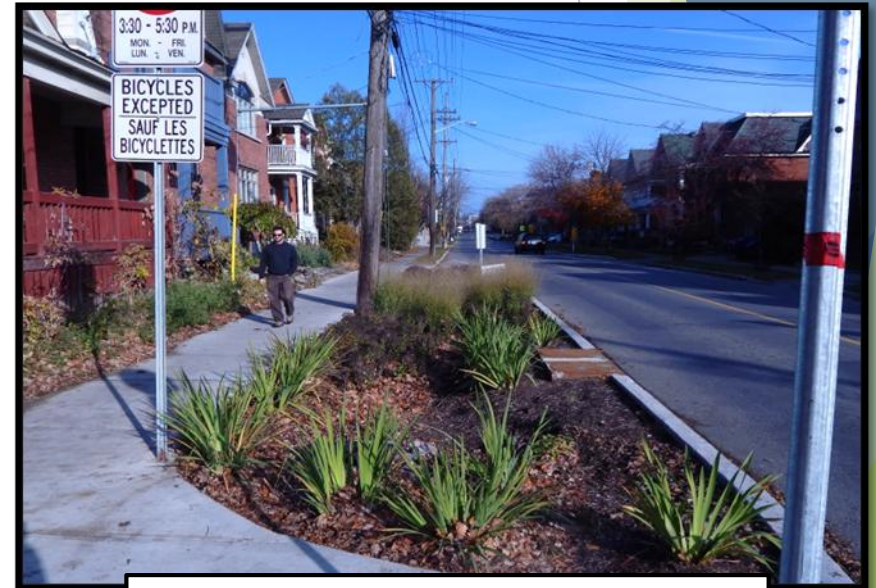
Map of Stormwater Network in Sundial Creek Subwatershed

Phase 2: Identification and Evaluation of Alternatives



Long List of Alternatives

- ▶ Created once problems and opportunities have been identified
- ▶ A wide variety and combination of management actions need to be assessed
- ▶ Several Management Actions considered:
 - ▶ Low Impact Developments (LIDs) on Road Right-of-Ways
 - ▶ Bioswales
 - ▶ Boulevard Bioretention
 - ▶ Perforated Pipe
 - ▶ Oil and Grit Separators (OGS)
 - ▶ Stormwater Management Facilities (ponds)



Boulevard Bioretention

Long List of Alternatives

- ▶ Several Management Actions considered (continued):
 - ▶ LID on Private Property
 - ▶ Downspout disconnection
 - ▶ Rain gardens
 - ▶ Permeable Driveways
 - ▶ Rain barrels
 - ▶ Creek Restoration Measures
 - ▶ Restoration Measures at Crossings and Culverts
 - ▶ Modified Winter Road Maintenance



Disconnected Downspout

Subwatershed Strategy Approach

Table 5.1: Management Alternatives and Subwatershed Issues

	Alternatives that Target Water Quality				Alternatives that Target Stream and Riparian Areas		
	LID in ROW	SWM Ponds	LID on Private Property	OGS Units	Creek Restoration	Crossings and Culvert	Winter Roads Maintenance
Surface Water Quality	✓	✓	✓	✓	✗	✗	✓
Aquatic Habitat	✓	✗	✓	✗	✓	✓	✗
Invasive Plants	✗	✗	✗	✗	✓	✗	✗

- ▶ To address the 3 main issues, a combination of stormwater quality and stream ecological management alternatives must be applied
- ▶ Subwatershed strategies refer to this grouping of management alternatives
- ▶ All proposed subwatershed strategies address these areas of concern

Riparian Area Improvements

- ▶ Improvements would include:
 - ▶ Invasive plant species monitoring and control
 - ▶ Monitoring of sedimentation
 - ▶ Enforcement of erosion and sediment controls
 - ▶ Removal of fish barriers (3 culverts)
 - ▶ Complete a floodplain mapping study
- ▶ Incorporated into Subwatershed Strategies 2-6



Perched culvert under Sundial Dr.

Subwatershed Strategy 1: Do Nothing

- ▶ Benchmark for Environmental Assessment process
 - ▶ No mitigation methods have been applied
 - ▶ No subwatershed health improvements
 - ▶ No capital costs



Current outlet of creek at Fittons Road East

Subwatershed Strategy 2: SWM Facility + Targeted Stream and Riparian Area Improvements

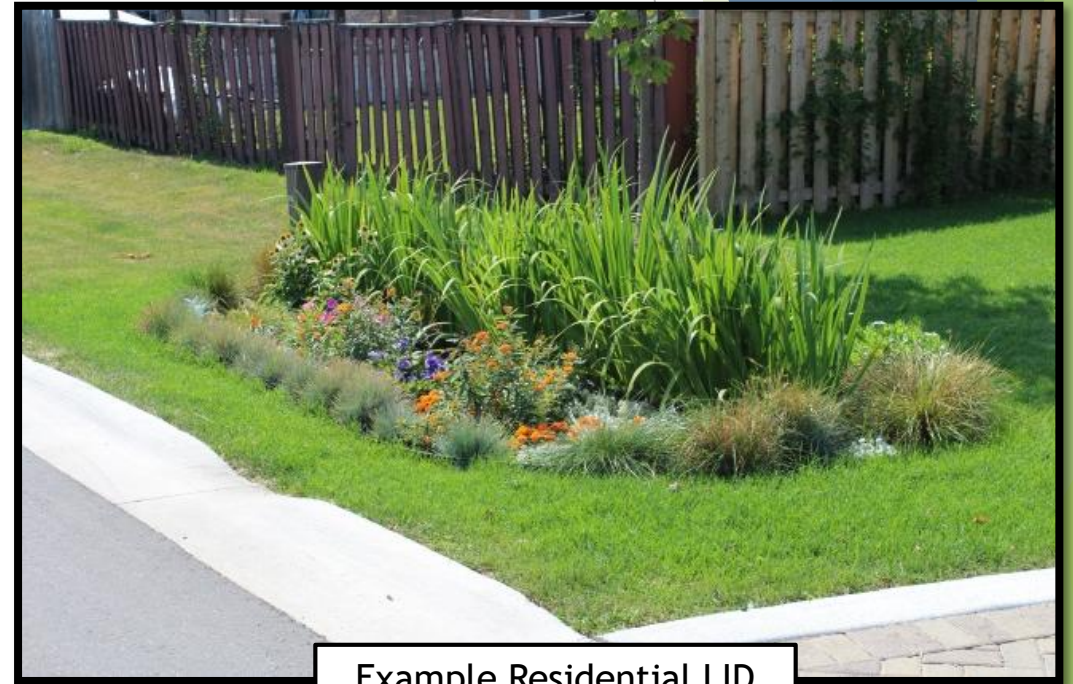
- ▶ Construct new stormwater management facility
 - ▶ Improves water quality, including sediment removal
 - ▶ Provides flood storage
- ▶ Three municipal undeveloped locations for the pond were identified:
 - ▶ Grant Wetland
 - ▶ Mac Carter Park and area immediately south
 - ▶ Property north of Fittons and between Bay Street and Sundial Drive
- ▶ High groundwater levels make construction of pond challenging



Construction of a Storm Pond

Subwatershed Strategy 4: Residential LID Implementation + Targeted Stream and Riparian Area Improvements

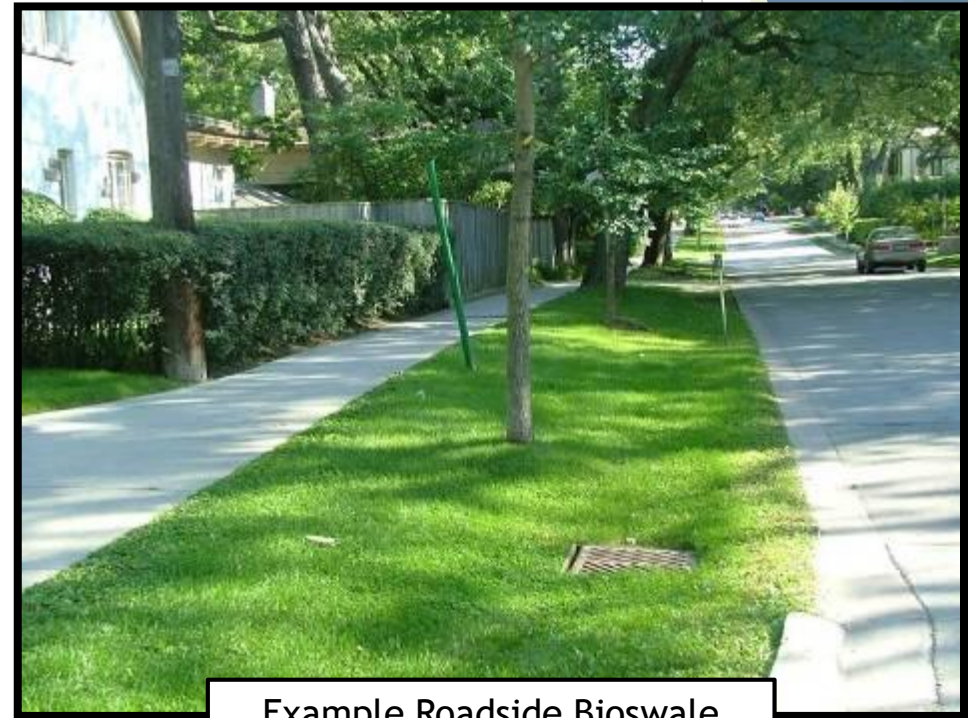
- ▶ Includes LID implementation on private property throughout the subwatershed
- ▶ Long-term effectiveness of LIDs on private property rely on community uptake
 - ▶ Marketing campaign may be required by the City
- ▶ Stormwater fee credits for private installations may also be considered



Example Residential LID

Subwatershed Strategy 5: Conveyance Control Measures + Targeted Stream and Riparian Area Improvements

- ▶ Includes LID conveyance control in road rights-of-way
 - ▶ Roadways make up 19.1% of the total Sundial Creek Catchment area
- ▶ Efficient to use paved roadway surfaces to assist in water quality improvements
 - ▶ Turning roadside ditches into bioswales
- ▶ Avoiding Brook Trout migration routes along with the shallow water table:
 - ▶ Bioswales would be limited to roads west of Sundial Drive



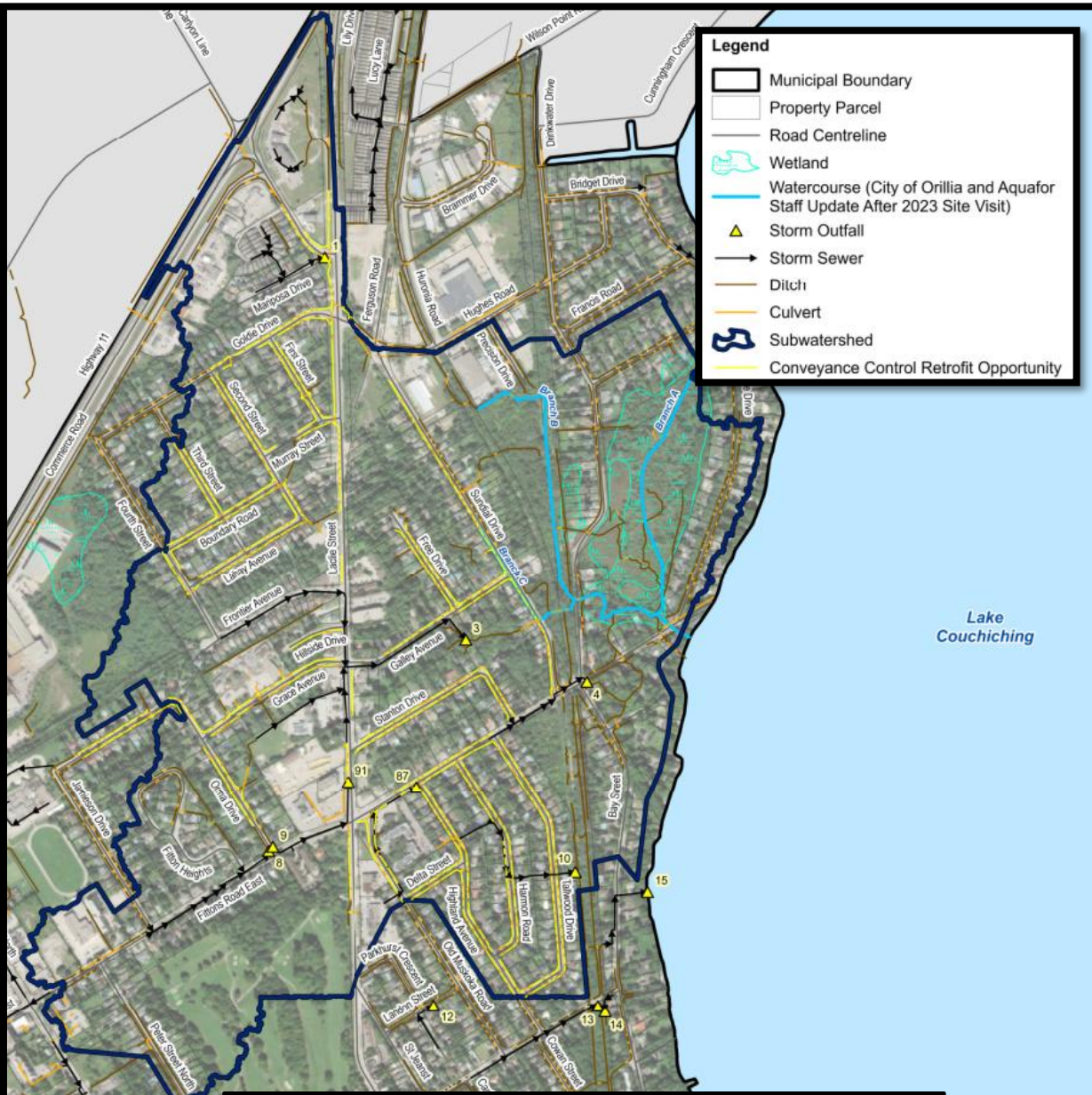
Example Roadside Bioswale

Subwatershed Strategy 6: OGS and Opportunistic LID Integration + Targeted Stream and Riparian Area Improvements

- ▶ Combination of:
 - ▶ Roadway conveyance control methods (bioswales)
 - ▶ OGS unit at location 1 (393 Sundial Drive)



Brook Trout



Map of Potential Bioswale Opportunities



OGS Location 1 and OGS Catchment

Evaluation Criteria

- ▶ Four categories of criteria used to evaluate the 6 Subwatershed Strategies
 - ▶ Natural Environment
 - ▶ Social/cultural Environment
 - ▶ Economical / Financial
 - ▶ Technical Feasibility
- ▶ Five levels of scoring:



Category	Criteria
Natural Environment	Impact on erosion and sedimentation
	Impact on water quality
	Impact on water budget
Social / Cultural Environment	Potential disruption to community
	Potential benefit to community
Economical / Financial	Estimated construction cost
	Estimated operation and maintenance cost
	Potential requirements for property acquisition / easements
Technical Feasibility	Technical feasibility of construction and long-term function

Evaluation of Alternatives

Category	Criteria	Strategy 1: Do Nothing	Strategy 2: SWM Facility	Strategy 3: Oil Grit Separator	Strategy 4: Source Control Measures	Strategy 5: Conveyance Control Measures	Strategy 6: Conveyance Control Measures + OGS
Natural Environment	Impact on erosion and sedimentation						
	Impact on water quality						
	Impact on water budget						
Social / Cultural Environment	Potential disruption to community						
	Potential benefit to community						
Economical / Financial	Estimated construction cost						
	Estimated operation & maintenance cost						
	Potential requirements for property acquisition / easements						
Technical Feasibility	Technical feasibility of construction and long-term function						
Overall Evaluation		4.5	4.5 but low feasibility	4.25 + high feasibility	6.5 but low feasibility	6.5 + high feasibility	6.5 + high feasibility

* Strategies 2-6 also include Targeted Stream and Riparian Area Improvements

Preferred Alternative

- ▶ Alternative 6 chosen:
 - ▶ Oil and grit separator
 - ▶ Roadside conveyance controls (bioswales)
 - ▶ Targeted stream and riparian area improvements

Component	Cost (\$)
OGS unit near 393 Sundial Drive (includes pre-design through construction phases)	\$2.5 million † *
Conveyance Control Feasibility Study <ul style="list-style-type: none"> • Site Visits • Survey • Infiltration Testing • Selection of Preferred LID Type 	\$20,000
Conveyance control implementation (7.6km)	\$3.04 million
Invasive Plant Species Monitoring and Control Herbicide Management Homeowner Outreach	\$2,000/ha \$2,000/year
Monitoring of Sedimentation (6 visits per year)	\$5,000/year
Enforcement of Erosion and Sediment Controls	Integrate into existing programs
Removal of Fish Barriers: Sundial Drive (assumed 44m culvert length) Paved Rail Trail (assumed 15m culvert length) 393 Sundial Drive (assumed 7m culvert length)	\$1.13 million \$800,000 \$560,000
Floodplain Mapping Study	\$25,000

Next Steps

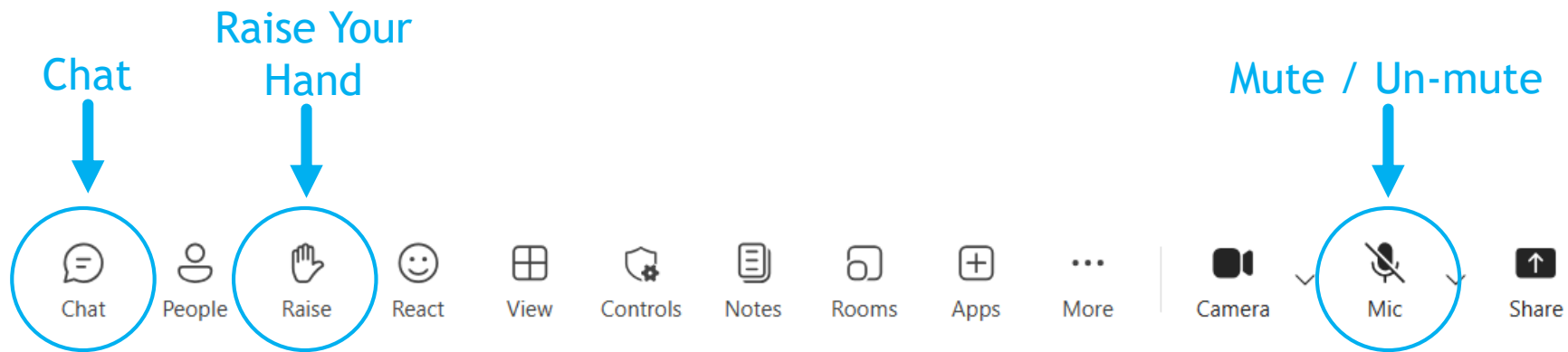
- ▶ **Finalize Environmental Assessment:**
 - ▶ Receive and incorporate comments from the public
 - ▶ Finalize report and circulate Notice of Completion
- ▶ **Implementation:**
 - ▶ Additional supporting studies recommended to commence in 2027
 - ▶ Project design recommended to begin in 2029



Questions

We welcome your questions and feedback!

- ▶ To ask a question:
 - ▶ Use the “raise your hand” feature and un-mute yourself when called on, or
 - ▶ Use the “chat” option



Thank-you

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