Welcome to the Public Information Centre

West Aldershot Creek Erosion Control Study City of Burlington

Municipal Class Environmental Assessment (Schedule 'B')

PUBLIC INFORMATION CENTRE (PIC) NO. 1

Aldershot Pool, Community Room

50 Fairwood Place West, Burlington, ON L7T 1E5

December 3, 2018 • 6:00 pm to 8:00 pm

HOW *YOU* CAN GET INVOLVED

- This Public Information Centre provides an opportunity for public comment and input related to the study process and the information presented at the PIC.
- Please register your name on the sign-in sheet provided.
- Take time to review the displays and ask questions.
- Comment sheets are available if you wish to provide written comments. Please deposit your comment sheets in the Comment Box provided or forward them by mail or e-mail to the contacts indicated on the sheet by December 17, 2018.

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Purpose of the PIC

The purpose of this PIC is to provide the general public with an overview of the Class EA progress to date including the following:

- The Study process and background;
- Problem/opportunity being considered for the Study;
- Key considerations and issues associated with the Study;
- Description of the alternative design concepts; and
- Next steps in the Class EA process.

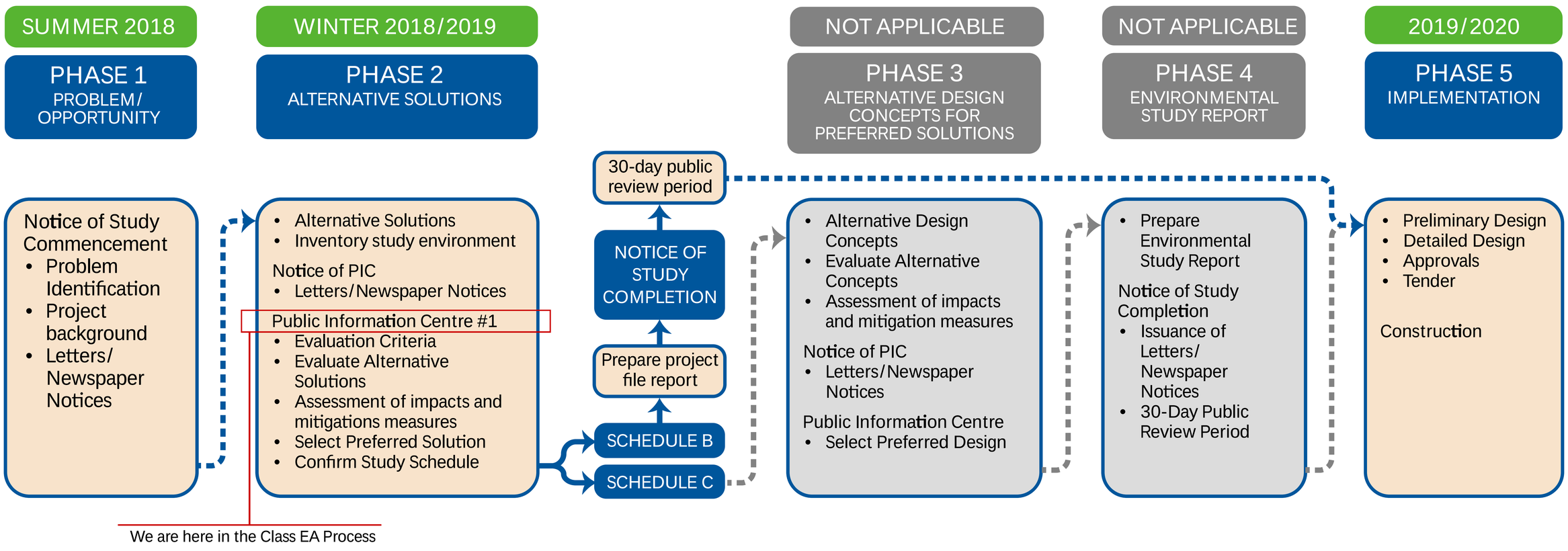
The PIC also provides an opportunity for community input on:

- Existing conditions information;
- Proposed alternative design concepts; and
- Proposed evaluation criteria.

The Process

The Municipal Class Environmental Assessment Planning and Design Process (Class EA process) is used by municipalities to ensure that the requirements of the Environmental Assessment Act are met when undertaking capital works projects.

West Aldershot Creek Erosion Control is being carried out as a Schedule B undertaking (Phases 1, 2, and 5).



The Study Team

THE CITY

City of Burlington – City Hall
426 Brant St, P.O.Box. 5013
Burlington, ON L7R 3Z6

Key Contact:
Umar Malik, M.Eng., P.Eng.
Stormwater Engineer
905-335-7600 x7426
umar.malik@Burlington.ca

Study Support:
Amy Daca, M.Sc.
Stormwater Management Technologist
905-335-7600 x7576
amy.daca@burlington.ca

THE CONSULTANT

Associated Engineering (Ont.) Ltd.
509 Glendale Ave. E. Suite 300
Niagara-on-the-Lake, ON L0S 1J0

Key Contacts:
Stan Mathew, P.Eng.
Project Manager
905-346-0990
mathews@ae.ca

Andrea LaPlante, P.Eng.
Class EA Lead
905-346-0990
laplantea@ae.ca

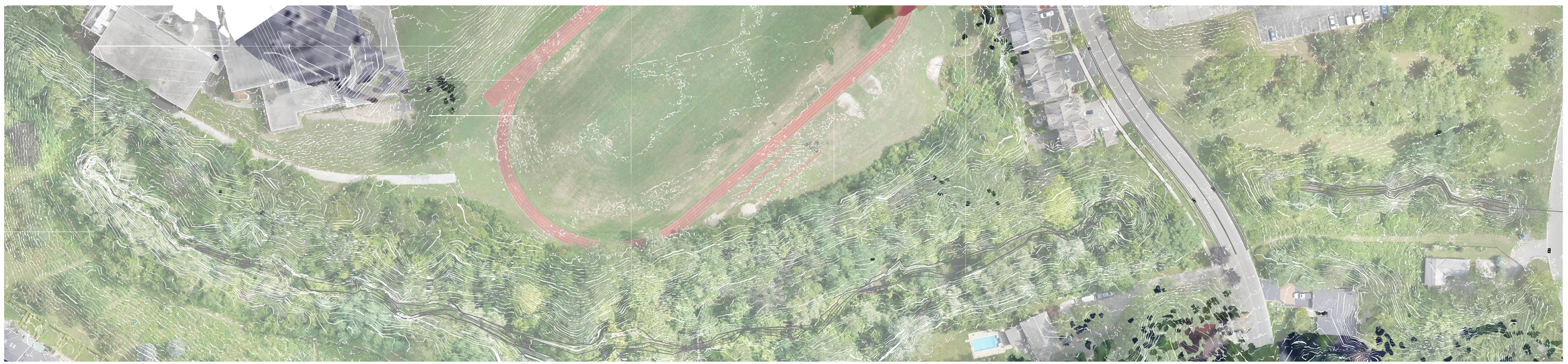
STUDY SPECIALISTS:

Palmer Environmental Consulting Group Inc.
Robin McKillop, M.Sc., P.Geo
Senior Fluvial Geomorphologist

Austin Adams, M.Sc., EP
Senior Terrestrial Ecologist

Rick Palmer, M.Sc., R.P.Bio.
Senior Aquatic Biologist

Study Background



Study Area includes West Aldershot Creek between Fairwood Place and Lake Ontario. West Aldershot Creek exhibits widespread bed and bank erosion, including locally severe undercuts, as a result of fast-flowing surface runoff and floodwater during storm events.



Storm Outfall Structure - Undermined



Creek Downcuttings - Vertical Slopes



Erosion Impacts - Exposed Sanitary Sewer Manholes

Study Approach

For the purposes of assessment and planning erosion control solutions, West Aldershot Creek has been divided into three (3) reaches, each of which exhibits different erosion-related issues. We have developed a range options including alternative erosion control concepts for each of the reaches. The boards that follow highlight the existing conditions of the three reaches and proposed alternative solutions.



Problem / Opportunity Statement

PROBLEM

Ongoing excessive erosion in West Aldershot Creek has been identified between Fairwood Place and Lake Ontario. Continuous down-cutting of the creek bed and undercutting of the banks presents a risk to public and private property, municipal infrastructure, and aquatic habitat.

OPPORTUNITY

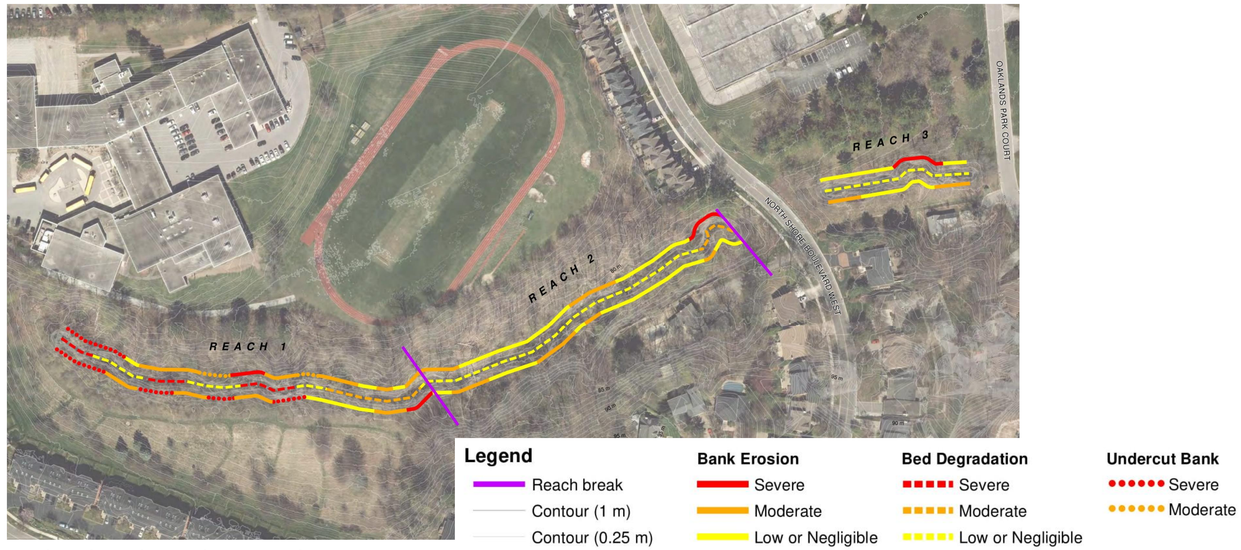
This project presents an opportunity to improve the environmental and social benefits offered by the Study area. It will help characterize and utimately combat excessive erosion along West Aldershot Creek to mitigate risk and enhance aquatic habitat. Creek stabilization and restoration will reduce the risk to public and private property and improve aesthetics.



Existing Environmental Conditions

FLUVIAL GEOMORPHOLOGICAL STUDY

- Widespread and locally severe erosion along its bed and banks are exhibited through the West Aldershot Creek. The creek is characterized according to three (3) distinct reaches:
- Reach 1 is the predominant source of sediment for downstream reaches and the creek mouth – sediment transports from Reach 1.
    - The source flow to Reach 1 is via storms sewers, whose flows have low sediment content.
    - Channel down-cutting occurs due to lack of sediment transport from upstream.
    - The channel is confined along the bottom (V-shaped ravine).
    - There is little floodplain accessible to attenuate flow energy.
    - Disproportionately deep, fast flows accelerate erosion.
    - The result is undercutting of banks and toppling of trees.
- Reach 2 exhibits negligible to moderate erosion, but has ample energy to transport sediment it receives from Reach 1
    - The channel exhibits meandering along the bottom of a narrow valley, with a discontinuous, moderately accessible floodplain.
    - Bank erosion is concentrated along the outer banks of channel bends and where woody debris rafted downstream from Reach 1 accumulates and forms in-stream obstructions.
    - In-stream woody debris jams temporarily impede sediment transport and fish passage.
- Reach 3 is a low-gradient reach that temporarily stores sediment sourced from Reaches 1 and 2, primarily upstream of woody debris jams, before it flushes the material through to its mouth.
    - The channel appears to have man-made origin, given its straightness and the uniformity of its trapezoidal cross-section.
    - Apart from localized widenings and benches along the bottom of the trapezoidal channel, few opportunities exist for flood attenuation.
    - A large blow-out has formed along the left bank, where flows have accelerated over and around a large, in-stream woody debris jam.
    - The large woody debris jam has temporarily impeded sediment transport and fish passage.

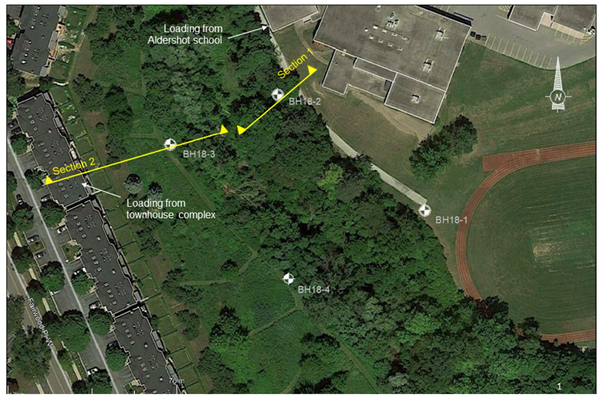


Bed and Bank Erosion Severity

Existing Environmental Conditions

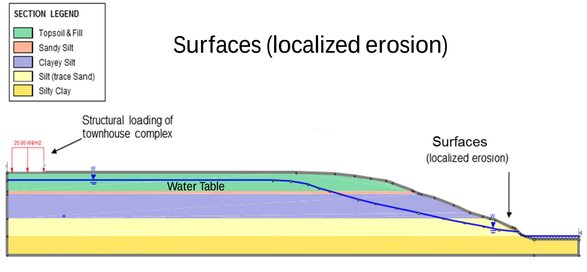
GEOTECHNICAL / HYDROGEOLOGICAL STUDY

- This Study was completed to understand soil conditions, groundwater levels, and potential instabilities. The findings will inform the development of erosion control solutions to mitigate risk to property, infrastructure and the valley ecosystem.
- Four (4) boreholes were advanced with groundwater monitors installed for hydrogeological assessment and allow monitoring of groundwater.

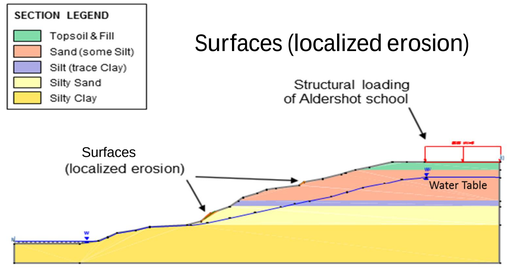


Geotechnical and Hydrogeological Plan

- Geological cross-sections at key slopes were analyzed for long-term stability under existing conditions, such as those between the creek and adjacent townhouses and those beside the school.



Section at Townhouse Complex (looking upstream)



Section at Aldershot School (looking upstream)

FISH HABITAT ASSESSMENT

- Creek Chub, Western Blacknose, Dace and Spottail Shiner were observed by Conservation Halton. Minnow species were observed by the project team. MNRF has records of two aquatic species at risk – American Eel and Eastern Pond Mussel – within or near West Aldershot Creek.
- Two large woody debris jams, one in Reach 2 and one in Reach 3, currently impede fish passage.
- Erosion has compromised physical aquatic habitat.
- Localized channel widening and coarsening of the bed has eliminated a defined low-flow channel along sections of Reach 1.
- The gravel-cobble bed at the downstream end of Reach 2 has become embedded in sand primarily sourced from Reach 1.
- The dense canopy cover along Reaches 1 and 2 inhibits growth of aquatic vegetation.
- The dredged and armoured harbour at the creek mouth increases accessibility to species that may not otherwise enter the stream.



Flat cobble bed with defined no low-flow channel for fish passage in Reach 1

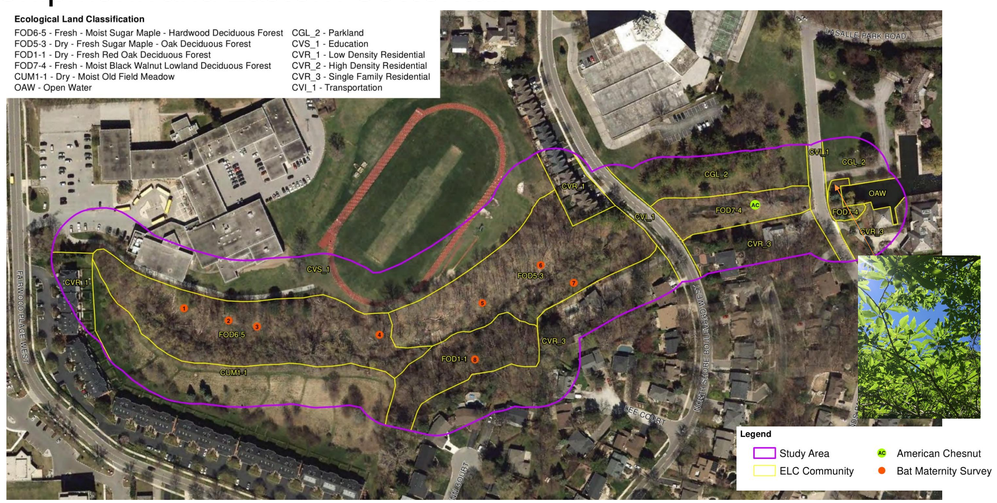


Woody debris jam responsible for severe bank erosion and impeding fish passage in Reach 3

Existing Environmental Conditions

TERRESTRIAL ECOLOGY STUDY

- The Study Area supports a mix of high-quality, native forest within an urban area. Sugar Maple and Red Oak predominates, with localized presence of non-native plants such as Manitoba Maple, European Buckthorn, Tree-of-Heaven, European Euonymus and Ground Ivy.
- Swampy areas support species such as Skunk Cabbage, Spotted Jewelweed and Field Mint. Poison Ivy inhabits the valley floor.
- An Endangered tree species, American Chestnut, was observed along the creek bank adjacent to the pumping station.
- 13 bird species were documented, with no species at risk. Canada Goose and Northern Cardinal displayed probable breeding evidence. There is potential to find other species at risk habitats within the valley.
- Incidental observations of wildlife include: Green Frog, Eastern Chipmunk and Eastern Cottontail.



Ecological Land Classification and Natural Heritage Features

ARCHAEOLOGICAL ASSESSMENT

- The Stage 1 archaeological assessment determined that no previously registered archaeological sites are located within one kilometre of the Study Area;
- Research shows that portions of the Study Area exhibit archaeological potential. These lands require a Stage 2 archaeological assessment (test pit and pedestrian survey) prior to any proposed works;
- The remainder of the Study Area does not retain archaeological potential due to deep and extensive land disturbance, or slopes in excess of 20 degrees. These lands do not require further archaeological assessment.



Archaeological Property Classification

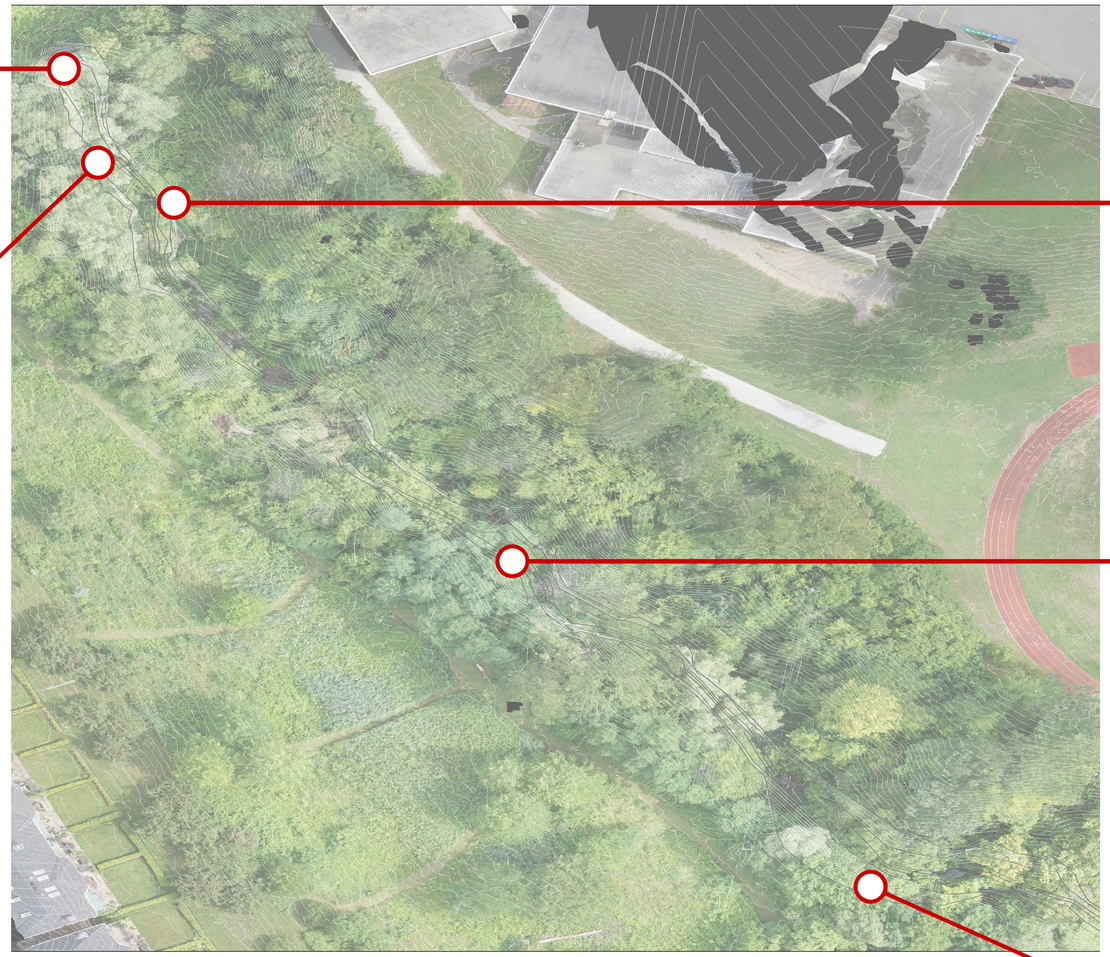
Existing Issues - Reach No. 1



Storm Outfall - Undermined



Vertical Down-Cutting and Undermining of Trees





Toppling of Riparian Trees
Vertical Down Cutting of Channel



Infrastructure Impacts - Sanitary Sewer



Infrastructure Impacts - Storm Outfall

Existing Issues - Reach No. 2





Instream Woody Debris Jams



Exposed Sanitary Manhole



Exposed Vegetation

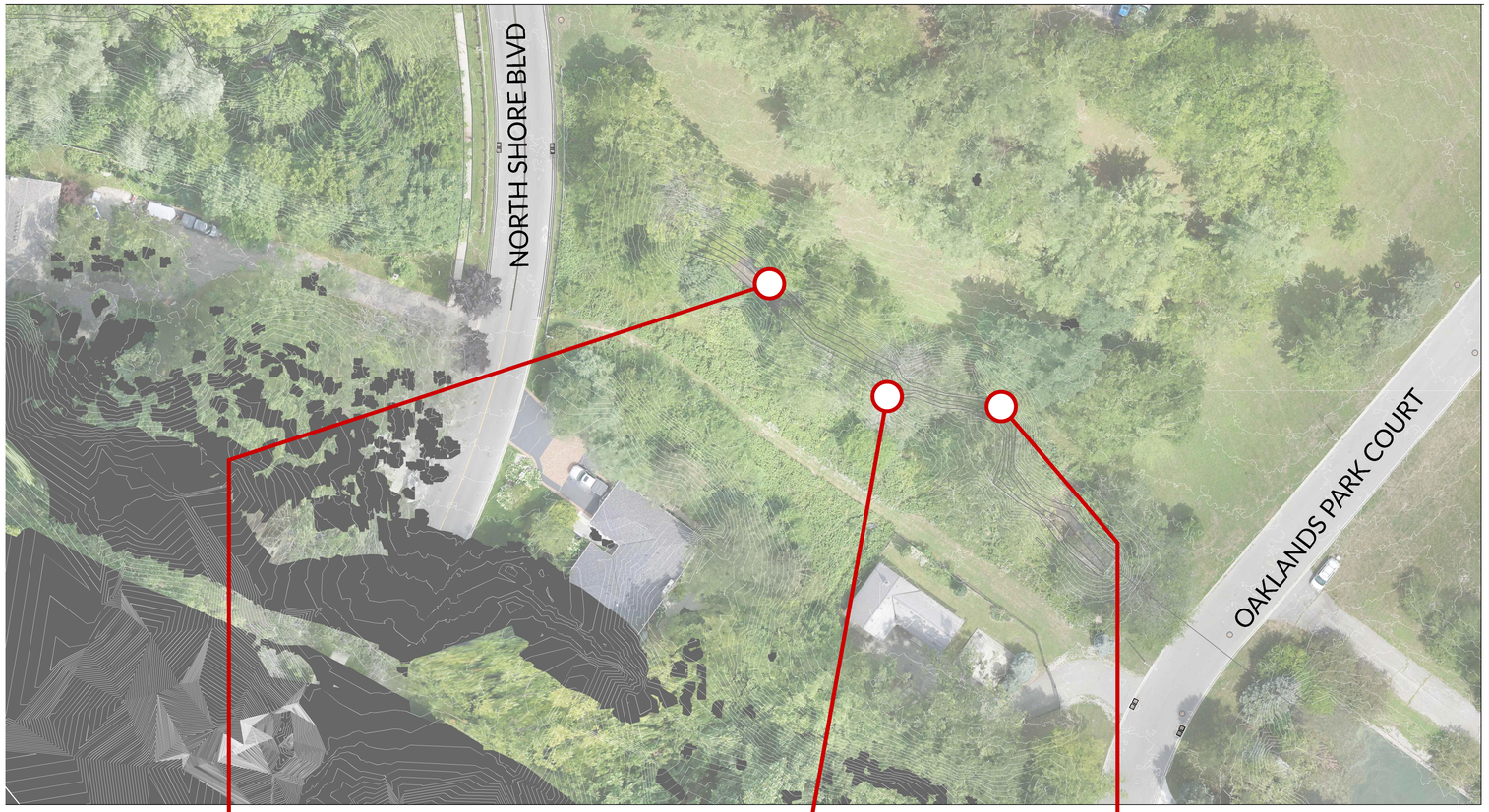


Erosion of Outside Bank



Sharp Meander Immediately Upstream of Culvert

Existing Issues - Reach No. 3





Localized Widening and Benching

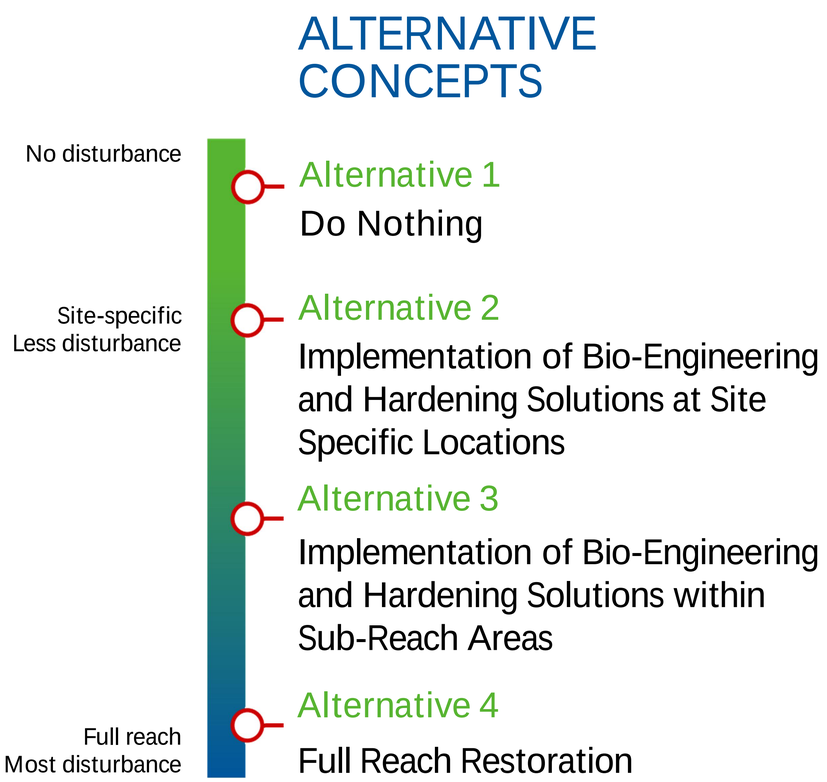


Woody Debris Jam



Blowout of Left Bank

Proposed Alternatives



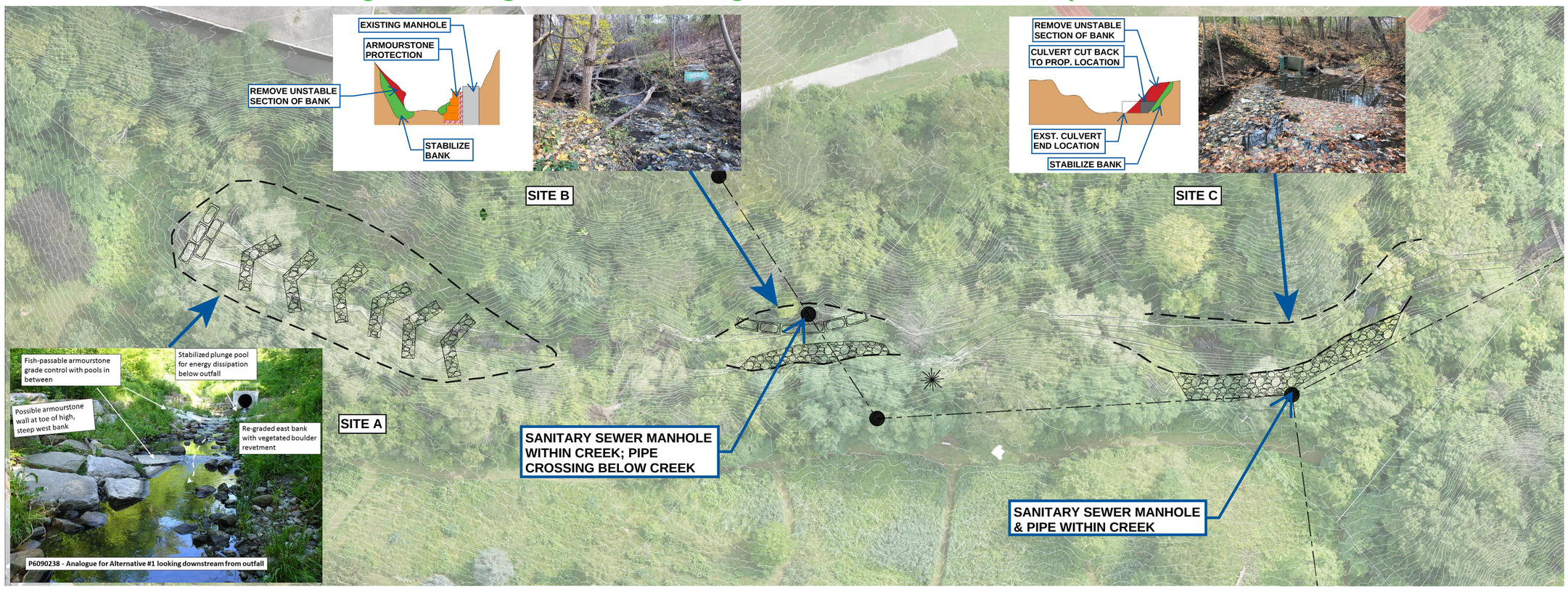
- Alternative 1
  - No intervention
  - Excessive erosion of the bed and bank will continue in the form of down-cutting, widening and planform adjustment.
  - Risks to aquatic habitats, riparian habitats, private property and boat slips (at creek mouth) will increase.
  - No mitigation costs, however costs associated with erosion damages.
- Alternative 2
  - Targeted measures that will provide localized protection for private properties and infrastructure.
  - Excessive erosion will continue in non-targeted areas.
- Alternative 3
  - Extended measures that will be implemented along with the targeted measures in Alternative 2.
  - Bank regrading or reconstruction to provide slope stabilization, and provide protection for larger trees and private properties.
  - Increasing floodplain accessibility through riffle enhancement will allow for flood energy to be attenuated, reducing erosive high flows in the creek.
  - Removal of large woody debris to limit potential for future obstructions to fish passage and sediments.
- Alternative 4
  - Complete restoration and reconstruction of full reach.
  - Benefits from Alternatives 2 and 3.
  - New equilibrium for Aldershot Creek would be established.
  - Highest monetary cost associated, however most long-term benefits provided.

WEST ALDERSHOT CREEK EROSION CONTROL - MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

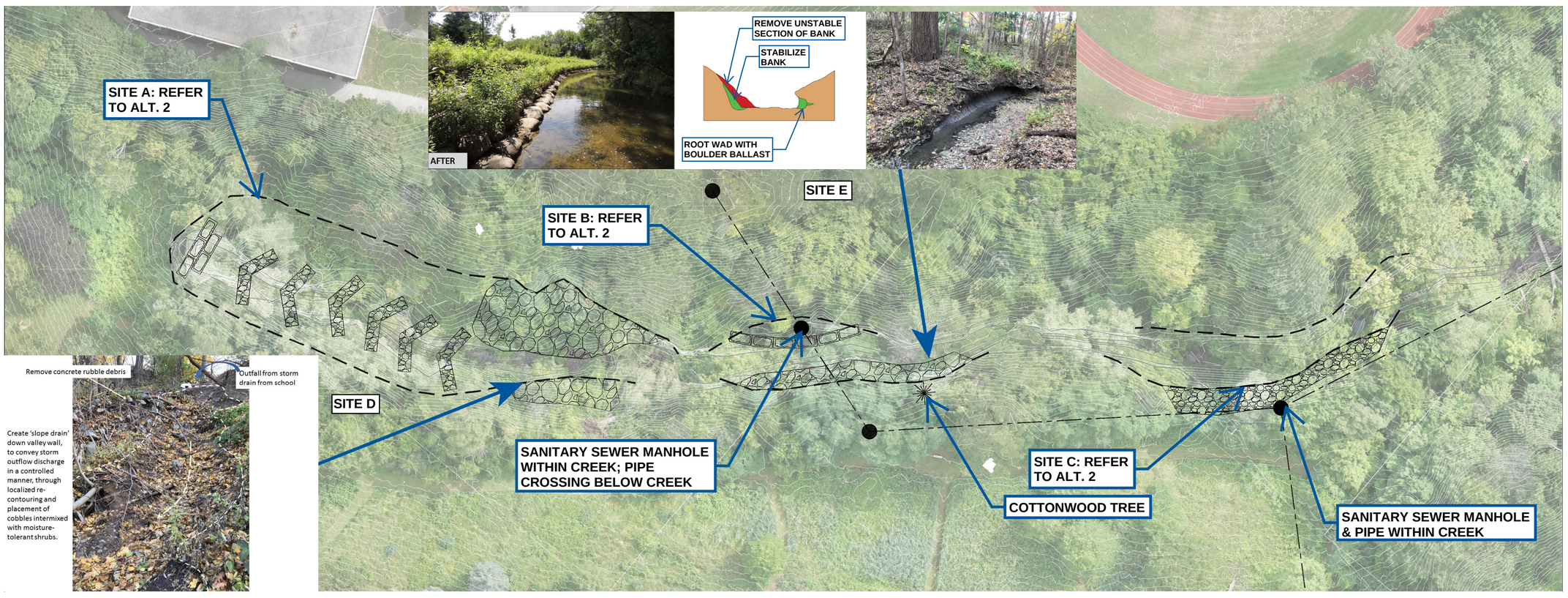
Reach No. 1 Alternatives

Alternative 1: Do Nothing.

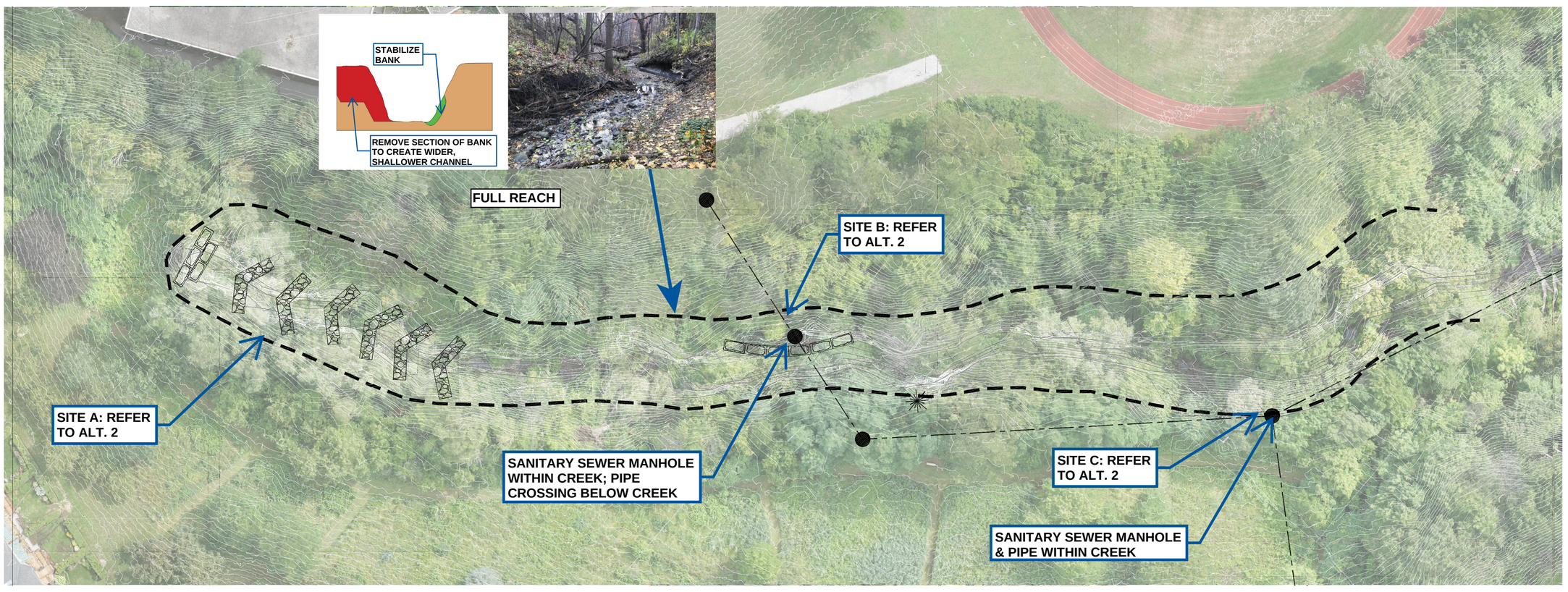
Alternative 2: Bio-Engineering & Hardening Solutions in Site Specific Locations



Alternative 3: Bio-Engineering & Hardening Solutions within Sub-Reach Areas



Alternative 4: Full Reach Restoration



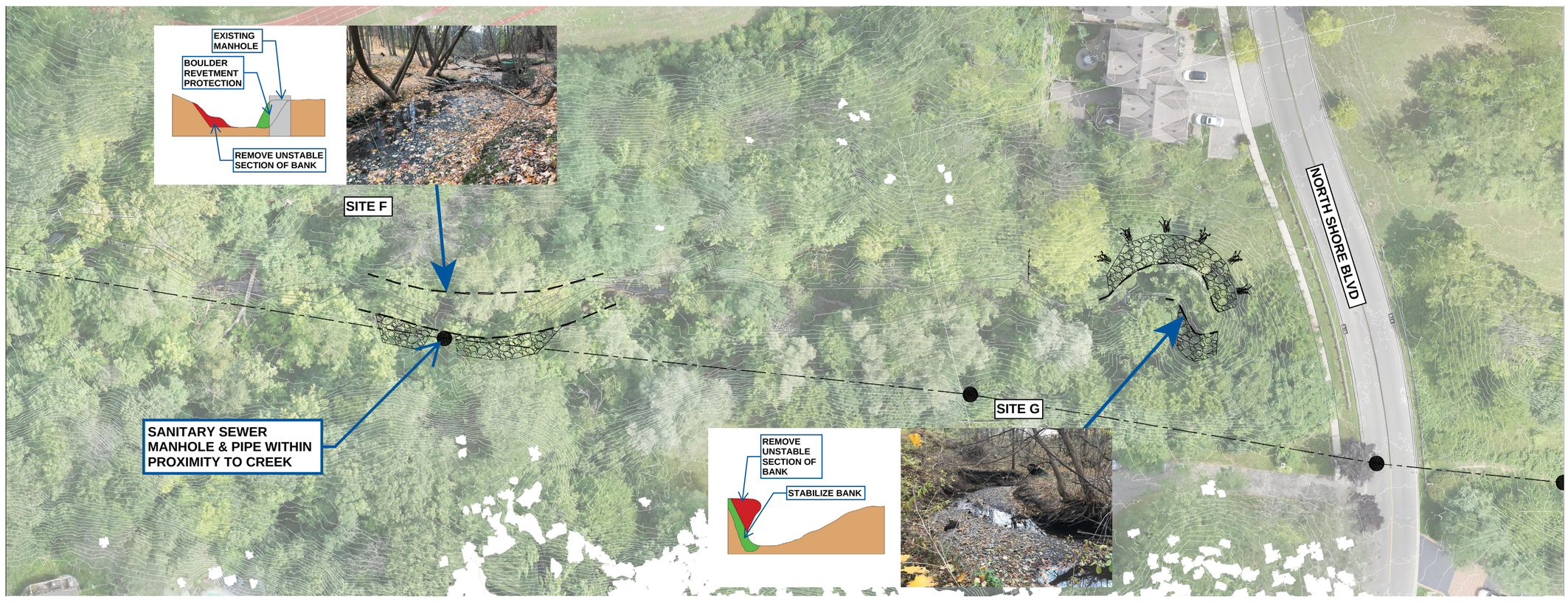
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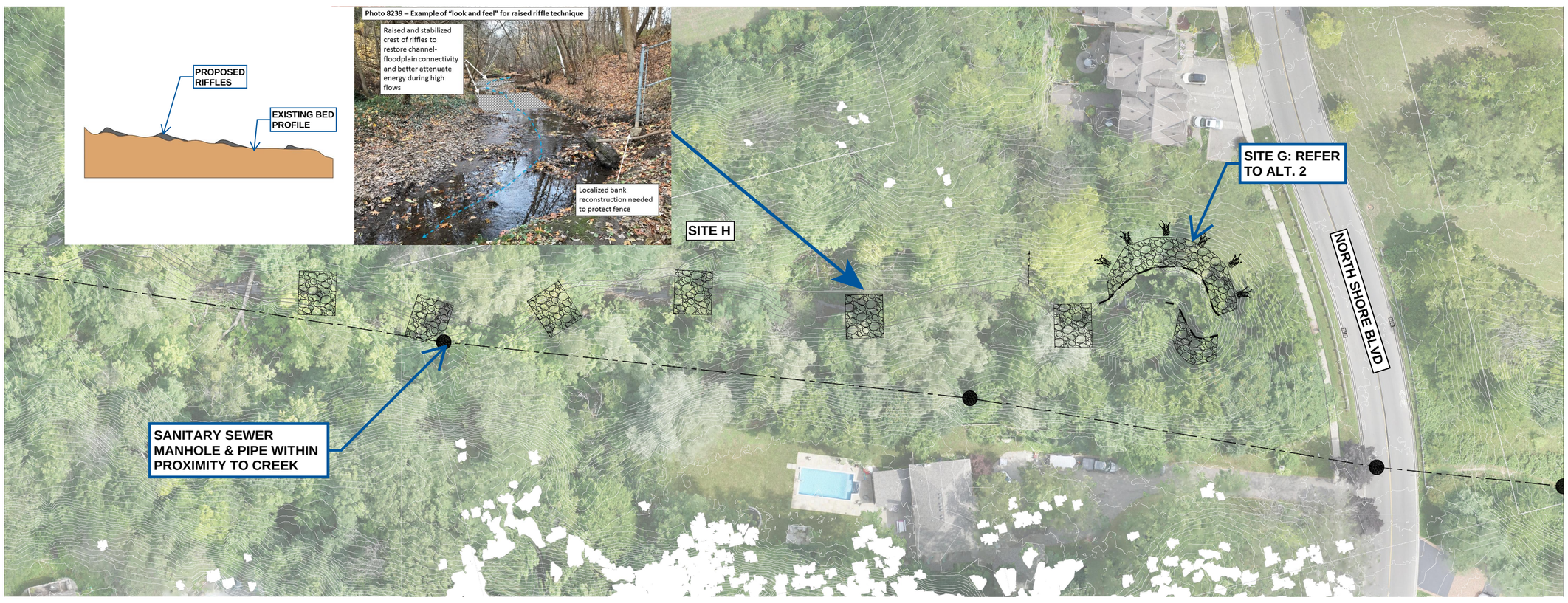
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Reach No. 2 Alternatives

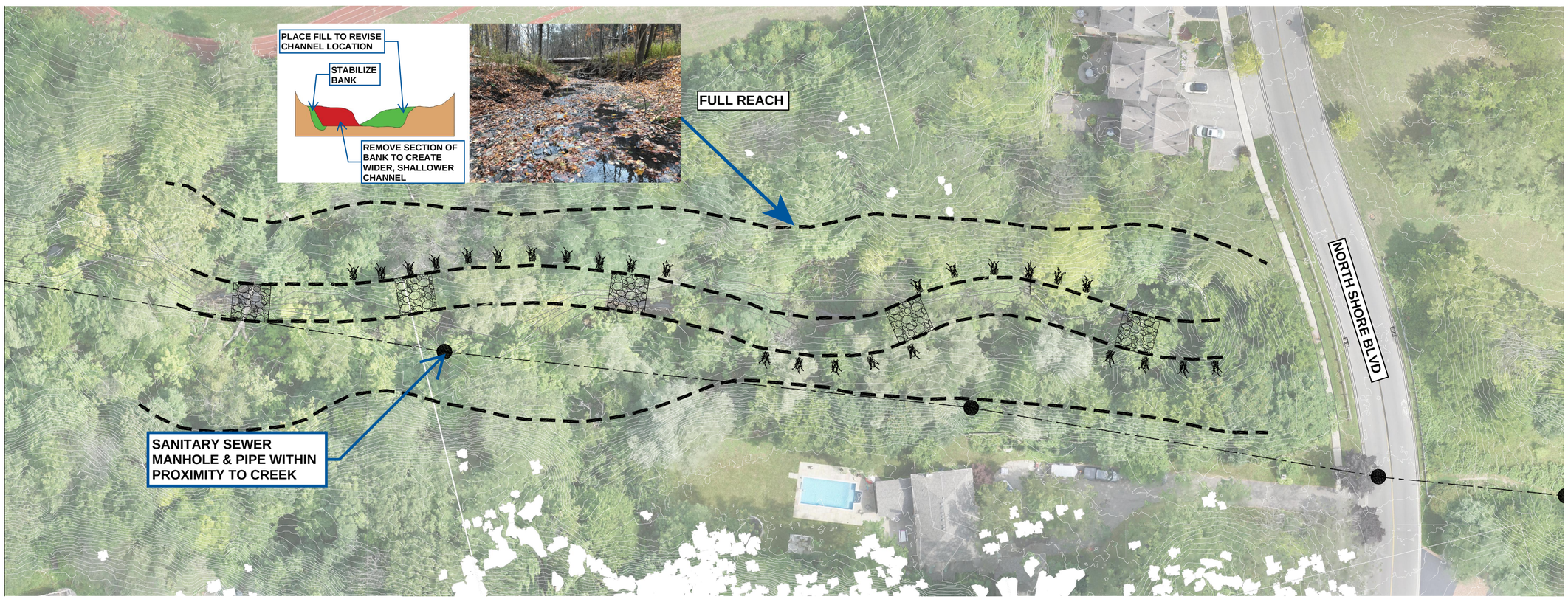
Alternative 2: Bio-Engineering & Hardening Solutions in Site Specific Locations



Alternative 3: Bio-Engineering & Hardening Solutions within Sub-Reach Areas

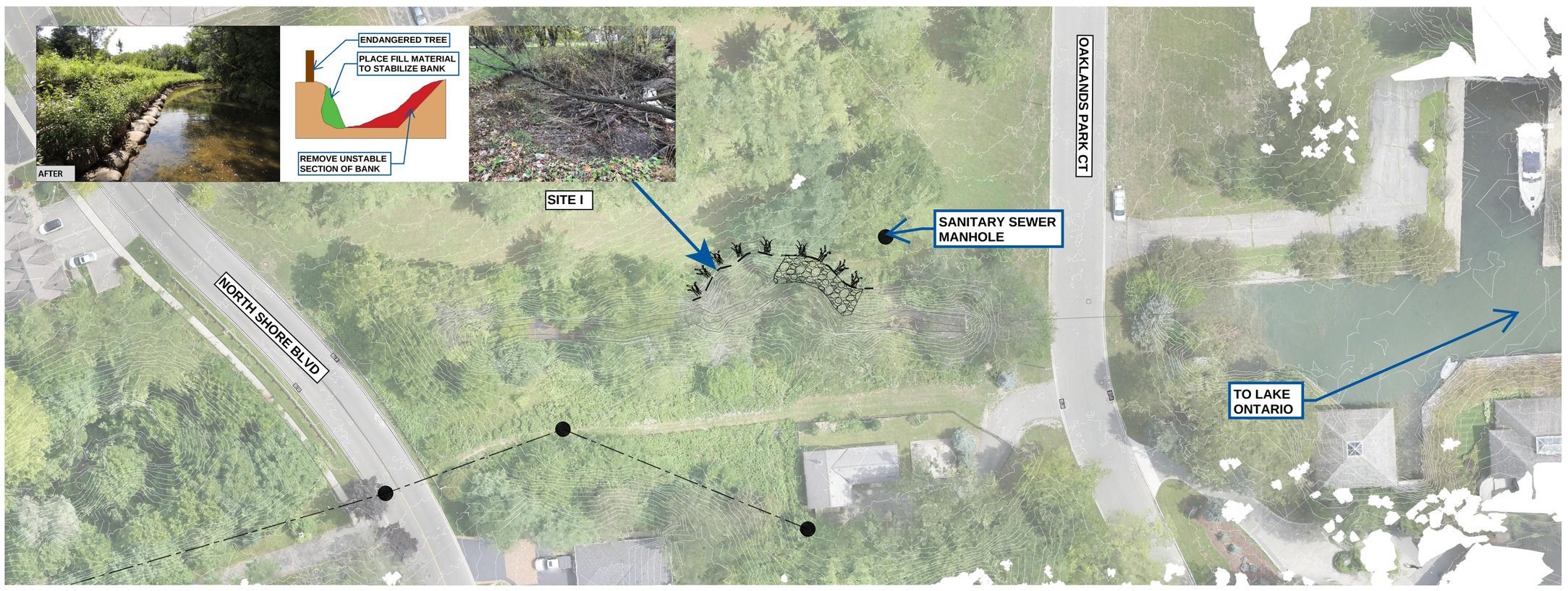


Alternative 4: Full Reach Restoration

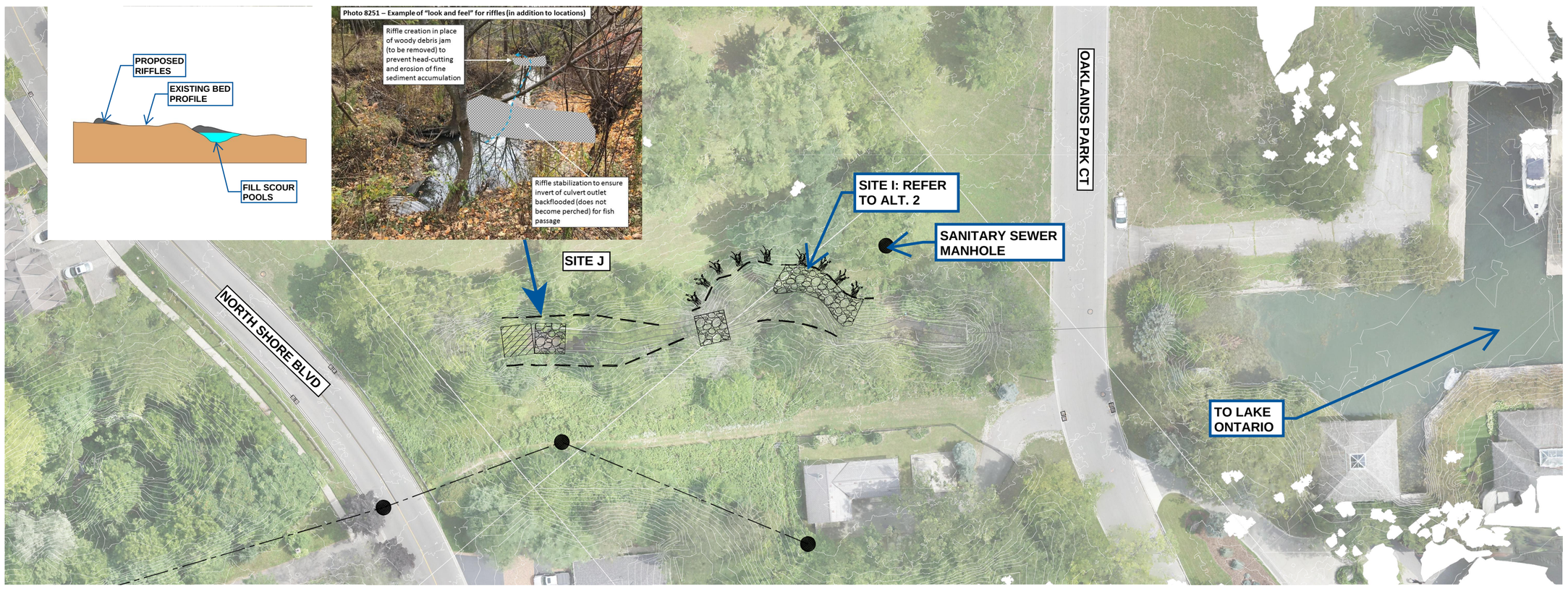


Reach No. 3 Alternatives

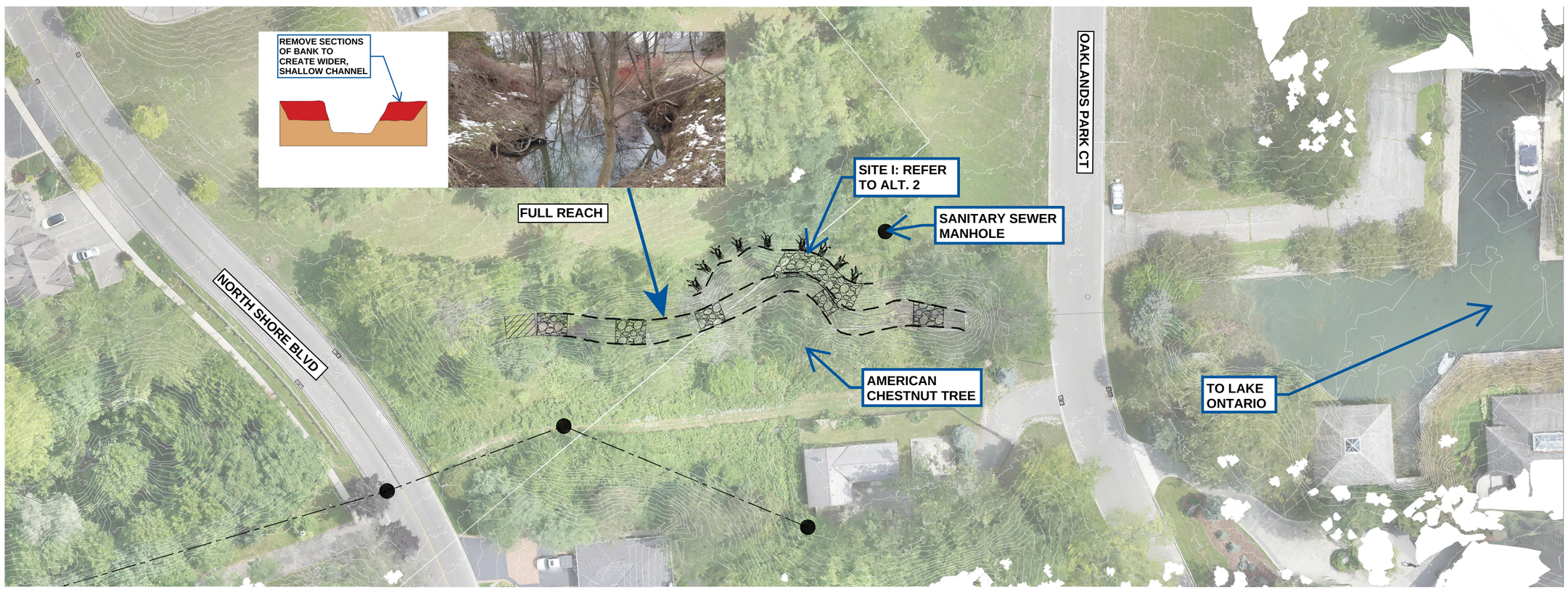
Alternative 2: Bio-Engineering & Hardening Solutions in Site Specific Locations



Alternative 3: Bio-Engineering & Hardening Solutions within Sub-Reach Areas



Alternative 4: Full Reach Restoration



Next Steps

- Review study proposed alternative concepts in light of comments and suggestions received from review agencies and the public following this PIC.
- Evaluate alternatives based on established criteria.
- Select the preferred solution based on the study findings, evaluation and comments received.
- Prepare Preliminary Design of preferred solution.
- Complete targeted investigations of study area including Archaeological Assessment (Stage 2) and Tree Inventory.
- Prepare the Project File Report for Public Review and issue Notice of Study Completion.
- Prepare Detailed Design of preferred solution.
- Public Information Centre #2
- Tender proposed works and proceed to construction.

JAN 2019

FALL 2019



Please submit your comments before December 17, 2018
Thank you for your attendance tonight

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