Implementation & Compliance Monitoring Committee (ICMC)

Steering Committee Meeting #9

Minutes - Draft

Thursday October 3, 2013
6:30 p.m. – 8:30 p.m.
Metro Hall, Room 303
55 John Street, Toronto, ON

Attendance:

Karen Buck	Citizens for a Safe Environment
David Done	Safe Sewage Committee
Jim Neff	
Michael Rosenberg	Economics of Technology Working Group
Karey Shinn	Safe Sewage Committee
Dalton Shipway	Watersheds United

CH2M Hill:

Daniel Olsen	Assistant Project Manager
Matthew Elliot	Project Manager

City of Toronto:

Nancy Fleming	Senior Engineer, Toronto Water
Mike Logan	Public Consultation Unit

1. Welcome and Introductions

Mike Logan called the meeting to order at 6:35 p.m. and all present introduced themselves.

Dalton Shipway distributed two newspaper articles and asked that they be appended to the minutes.

2. Presentation on Outfall Modeling Study by CH2M Hill

Daniel Olsen introduced himself and reminded the committee that CH2M Hill is the prime consultant for the Ashbridges Bay Treatment Plant outfall modeling study. Hatch Mott MacDonald and Baird & Associates are also part of the consulting team. Daniel explained that at the last ICMC meeting CH2M Hill attended, they presented the background, objectives and approach to be used for the outfall modeling study. This update presentation will focus on the preliminary evaluation of various outfall lengths being considered..

The presentation given by Daniel Olsen is appended to these minutes.

Questions and Answers

David Done asked what the impact will be on the water intake pipes at the R.C. Harris Filtration Plant.

Daniel Olsen explained that one of the primary objectives of the modeling exercise was to ensure that the mixing zone [where effluent mixes with lake water] does not interfere with the intake pipes. The recommended length of the outfall, based on the results of the modeling, will avoid impacts as much as possible.

Michael Rosenberg asked why the outfall would be tunneled through bedrock rather than dredged or built on the surface. Will the project team identify an optimal depth and then choose the appropriate construction technique, or identify the best construction technique and then use that to determine the depth?

Daniel Olsen explained that there are advantages and disadvantages to various possible construction techniques, and the depth of the outfall is dependent on the technique chosen. The next stage of the project will fully evaluate all possible construction techniques based on factors such as disturbance, cost and structural stability and identify the best one.

Dalton Shipway asked what will come out of the end of the outfall, and where will it go?

Daniel Olsen revisited the presentation slide that showed the animation of predicted water flows. He reiterated that Provincial Water Quality Objectives (PWQO) would be met within a small mixing zone around the end of the outfall. This means that effluent will not have a deleterious effect further away e.g. on the

shoreline.

Dalton Shipway stated that he felt that the PWQO was not stringent enough.

Karen Buck asked Daniel Olsen to explain what specific parameters are being modeled to determine the mixing zone.

Daniel Olsen explained that total Phosphorus (TP) is the governing parameter of the PWQO, but the objectives also include total suspended solids (TSS), *E.Coli*, unionized ammonia and ammonia. Each of these parameters are considered by the model.

Karen Buck stated that while the concentration of each parameter might be acceptable, studies have shown that the cumulative effects of these parameters can still be toxic.

Daniel Olsen explained that the PWQO are *objectives* and not standards or regulations. The Ministry of the Environment, and the approval authority, will not look favourably on a proposed solution that does not show it achieves compliance with these water quality objectives.

Karen Buck pointed out that there is still a "red zone" shown on the model. She asked what the exceedance of PWQO will be within that zone.

Dalton Shipway stated that the pollutants are not eliminated, just diluted.

Daniel Olsen confirmed that the point is to diffuse the pollutants to meet PWQO.

Karen Buck stated that the current mixing zone is 20:1. She asked what the ratio of the proposed mixing zone will be?

Daniel Olsen responded 70:1.

Karen Buck said that she is also concerned that we are just diffusing the pollutants rather than eliminating them.

Daniel Olsen reiterated that the purpose of the study is to achieve PWQO, through diffusion, within a small mixing zone.

Karey Shinn asked what happens at the end of the pipe. How does the effluent get into the lake if the outfall is buried in the substrate?

Daniel Olsen explained that vertical shafts called diffusers, spaced 20m apart, are drilled into the top of the outfall pipe near the end of the pipe.

Karey Shinn asked if the substrate in this area is shale. She suggested that shale cannot be drilled through.

Daniel Olsen explained that if tunneling is identified as the preferred construction technique, the outfall will be dug with a tunneling machine and lined with concrete just like a subway tunnel.

Karey Shinn asked if the geologic survey found any evidence of old outfalls.

Daniel Olsen explained that the survey was looking for bathymetric characteristics that would affect sediment transport. Chemical composition of the substrate was not surveyed.

Michael Rosenberg asked if sedimentation will occur in the outfall pipe.

Daniel Olsen replied that it would not be possible for any significant sedimentation to occur because flow through the outfall is designed to be faster than in the clarifiers, where suspended solids are removed from the effluent. Sediments found in the lake will not be able to enter the outfall because there will be a constant outward flow of effluent from the outfall.

Michael Rosenberg asked the consultant team to explain how the mixing zone is identified in the model. Is it a physical characteristic?

Daniel Olsen explained that the mixing zone is not defined physically. The mixing zone is the area within which concentration of pollutants are mathematically projected to exceed the PWQO. This calculation is highly dependent on physical conditions such as currents and wave action. Therefore, you can imagine the task as minimizing the size of the mixing zone.

Michael Rosenberg stated that both concentration and mass of pollutants are important.

David Done asked how chlorination effects the required length of the outfall.

Nancy Fleming explained that the chlorination/dechlorination process is not related to the outfall because it will occur before the effluent enters the outfall.

David Done said that he feels it will be difficult to achieve sufficient contact time for chlorination.

Nancy Fleming replied that this issue is part of the disinfection system design and not related to the outfall design.

Dalton Shipway said that water is a special substance and has meaning. We can't keep using our lakes and rivers like this. He feels that the ICMC has a role

to play.

Jim Neff asked if the cumulative effect of all the sewage effluent around Lake Ontario would meet government standards.

Daniel Olsen replied that this was out of the scope of the current study.

Karen Buck asked if the outfall would also be used for the planned stormwater treatment facility. How has this been considered in the design?

Daniel Olsen explained that the same outfall will be used when sanitary and stormwater is treated separately. The outfall is being designed for all flows.

Michael Rosenberg said that we need to pay attention to the overall pollution in the lake.

David Done asked for clarification on the projected cost and time it would take to complete the outfall.

Daniel Olsen explained that the preliminary cost estimate for construction is $350 million, but a more detailed costing exercise will be done as part of this project once the conceptual design has been finalized.

3. Review and Approval of ICMC SC minutes

Meeting #7 - March 7, 2012

Minor changes were identified.

Karey Shinn moved to approve the minutes from Meeting #7. **Karen Buck** seconded the motion. The minutes were approved as amended.

Meeting #8 - January 30, 2013

David Done moved to approve the minutes from Meeting #8. **Karen Buck** seconded the motion. The minutes were approved.

4. Adjournment & Next Meeting

The meeting was adjourned at 8:30 p.m.

ABTP - OUTFALL CONCEPTUAL DESIGN AND RECEIVING WATER ASSESSMENT

ICMC – Meeting #2

October 2013

MEETING AGENDA

- **Introduction of ICMC & Project Team**
- **Re-cap of Previous Meeting**
- **Presentation: Preliminary Evaluation of Alternatives**
  - Selection of Alternative Outfall Lengths
  - Preliminary Evaluation and Findings
- **Discussion**

INTRODUCTION OF ICMC & PROJECT TEAM

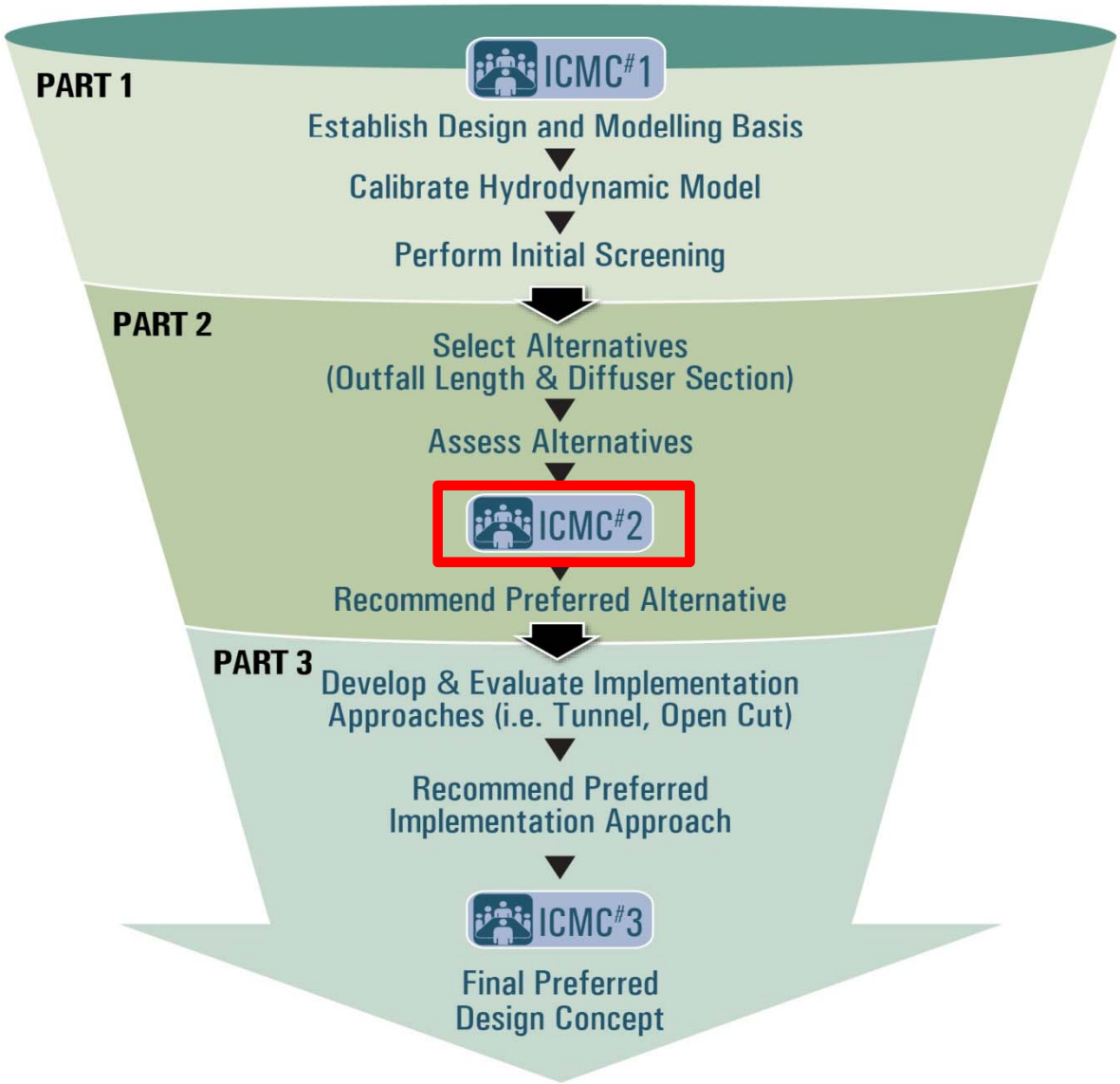
- **Personal Introductions**
- **Project Team**
  - Includes three consultants:
    - CH2MHILL – prime consultant
    - Hatch Mott MacDonald – outfall design and agency consultation
    - Baird – lake modelling and sediment modelling
  - Site-Specific Experience - ABTP, Lake Ontario
  - Technical Experience - Outfall Conceptual Designs, Public/Agency Consultation, Tunneling, Lake Modelling

RECAP OF PREVIOUS MEETING

PROJECT PURPOSE

Deliver a conceptual design for a new outfall that meets regulatory acceptance and improves nearshore water quality in Lake Ontario

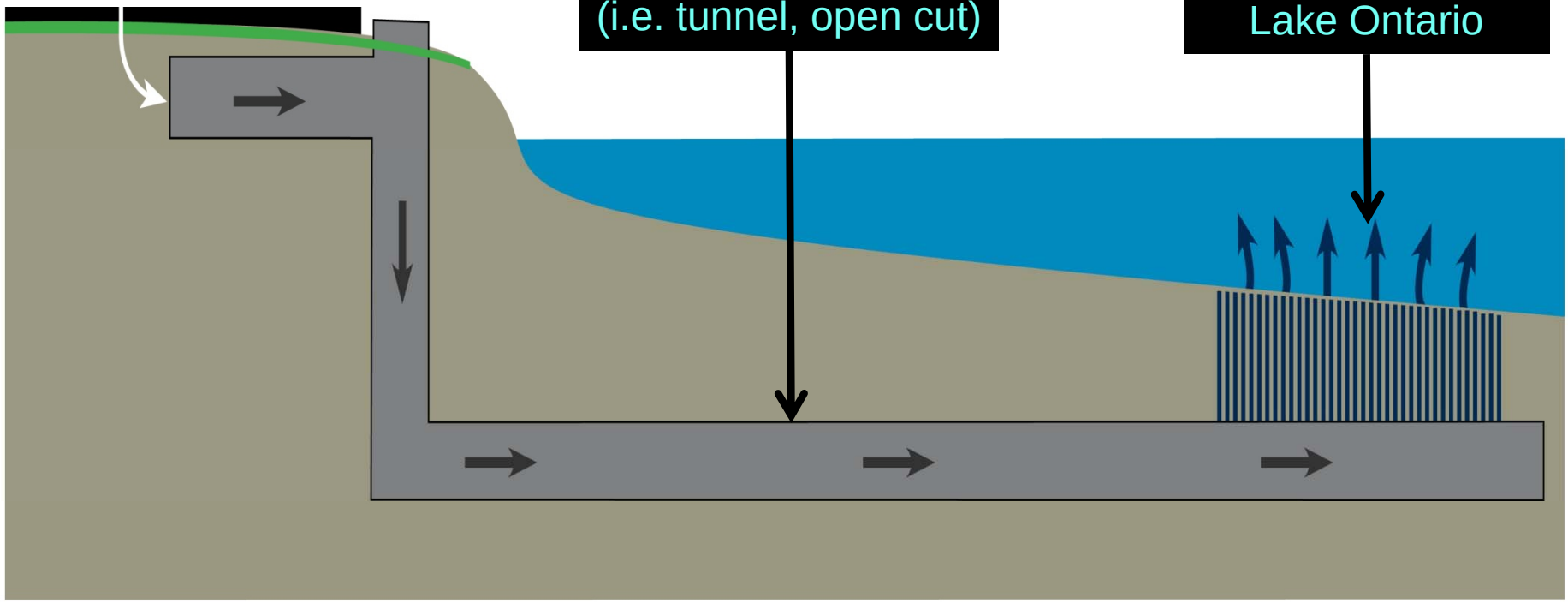
PROJECT APPROACH



PROJECT APPROACH

Part 3 – Select Implementation Approach for conveying plant effluent to the lake (i.e. tunnel, open cut)

Part 2 – Select Outfall Length where effluent is discharged to the Lake Ontario

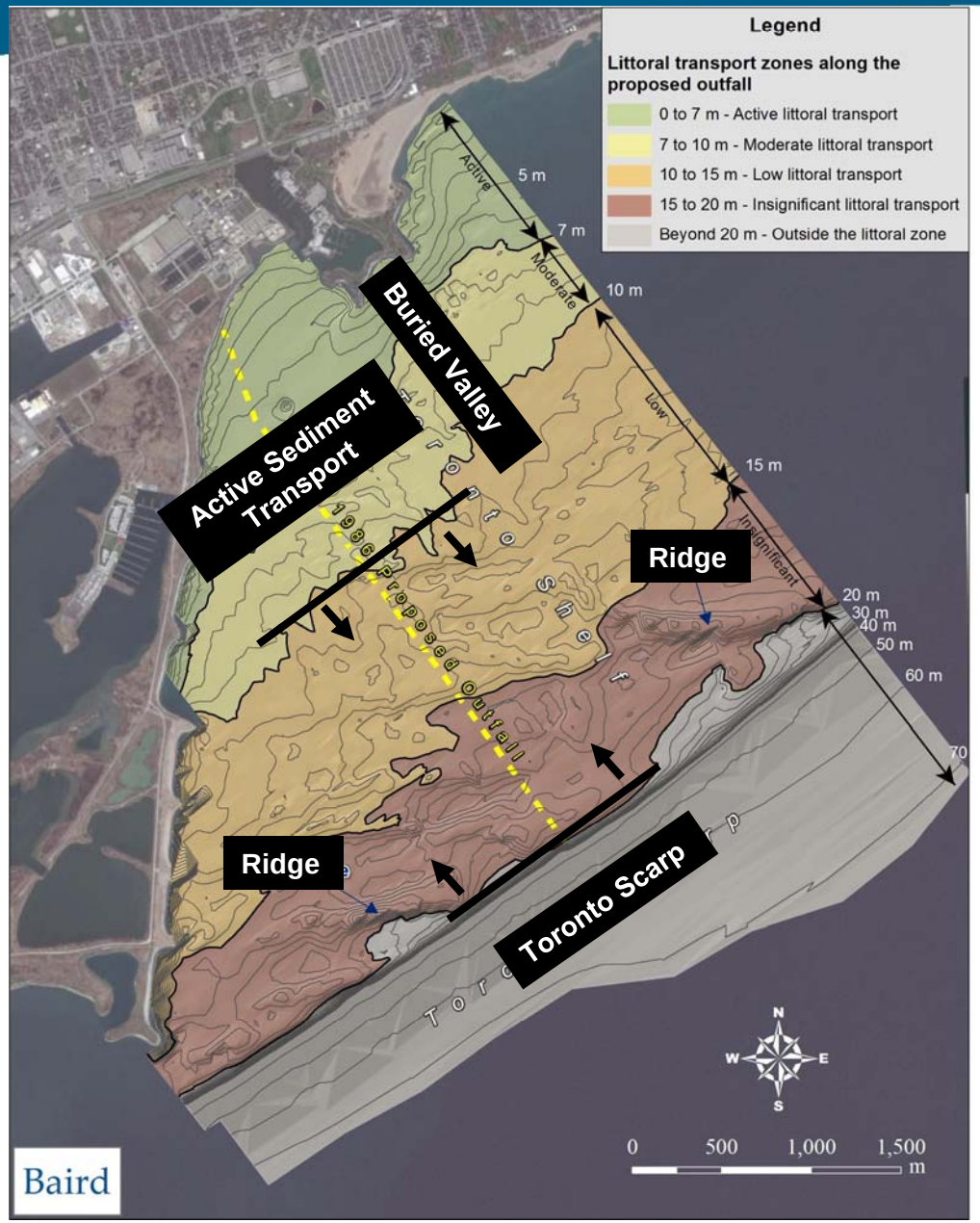


PRESENTATION

Preliminary Evaluation of Alternative Outfall Lengths

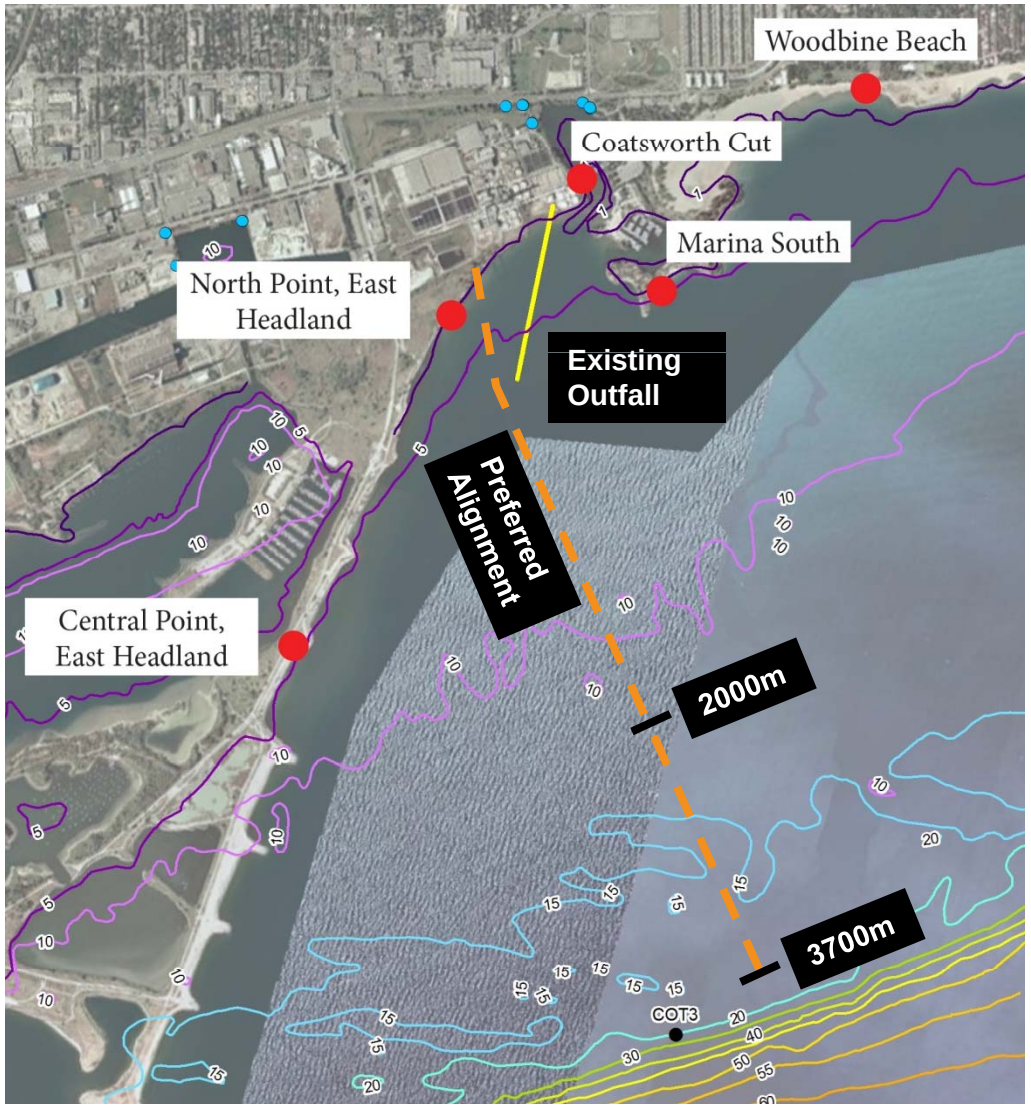
SELECTION OF ALTERNATIVE OUTFALL LENGTHS

- **Geotechnical and Sediment Field Studies Performed**
- **Alternatives selected that were:**
  - Offshore from sediment transport zone (1500m)
  - Inshore from scarp (3700m)
  - Along 1986 preferred alignment which is clear of buried valley and ridge features

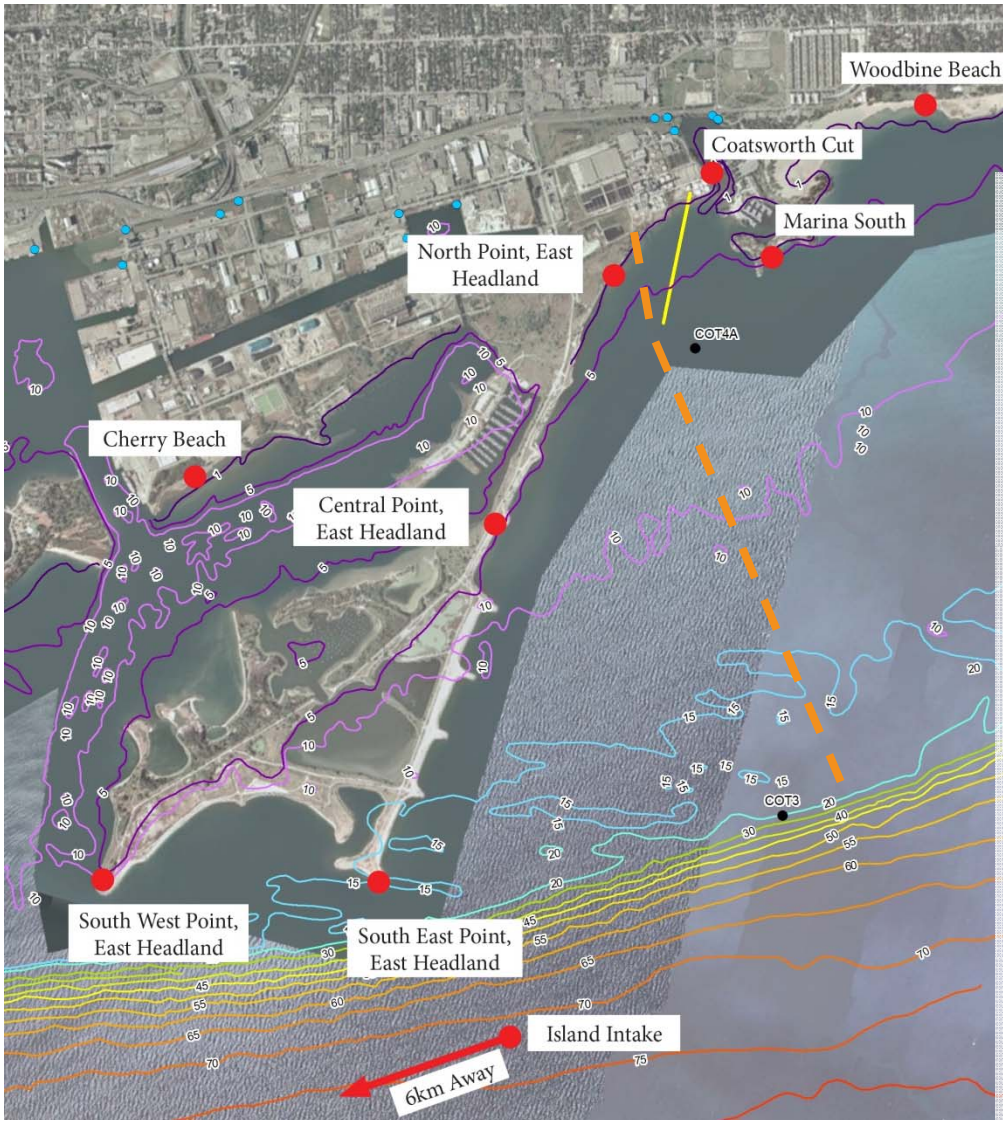


SELECTION OF ALTERNATIVE OUTFALL LENGTHS

- **Alternative Outfall Lengths Selected**
  - Total Outfall Lengths range from (2000m – 3700m)
    - Includes the 1986 concept (3700m outfall)



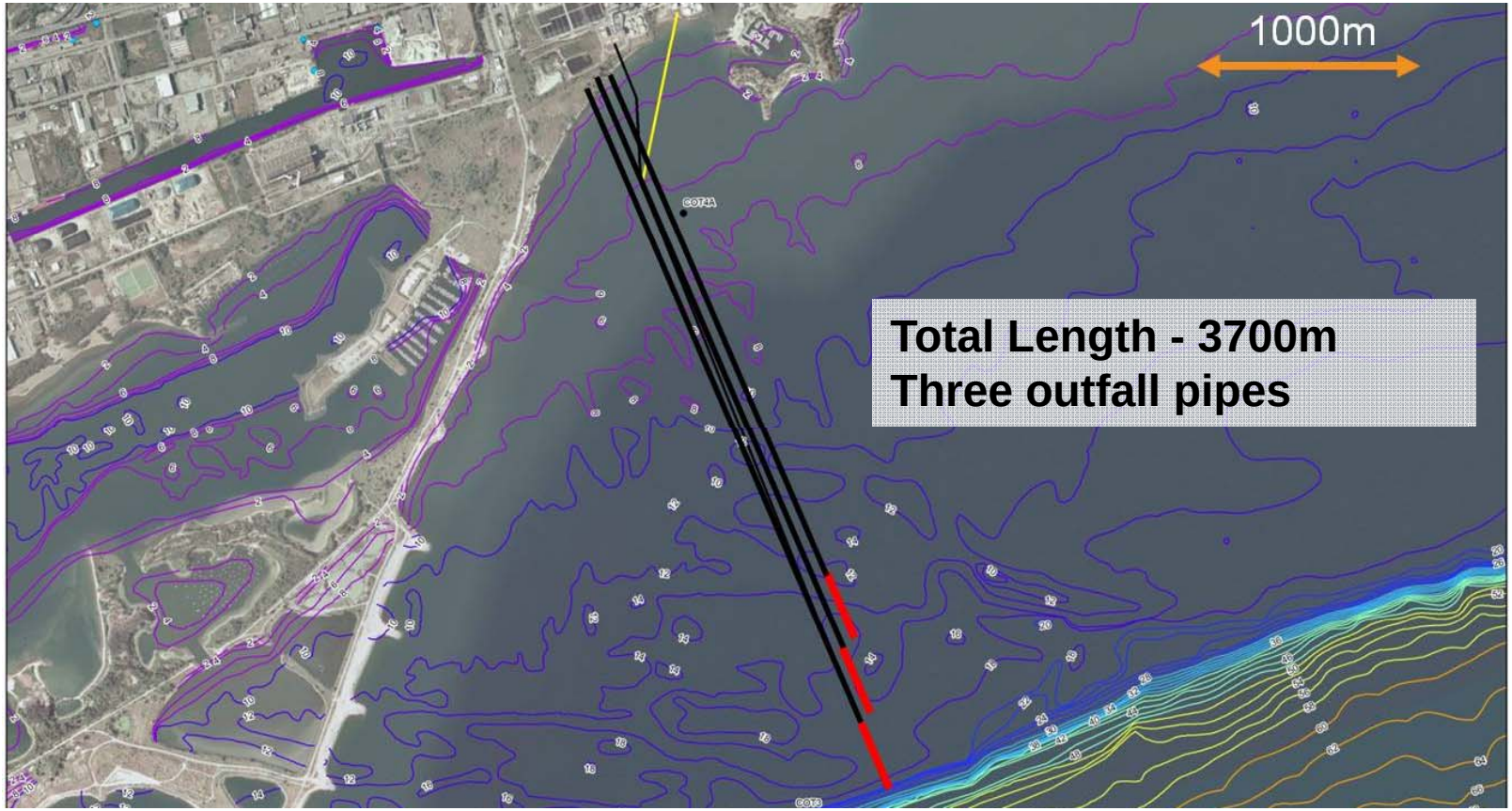
EVALUATION OF ALTERNATIVE OUTFALL LENGTHS



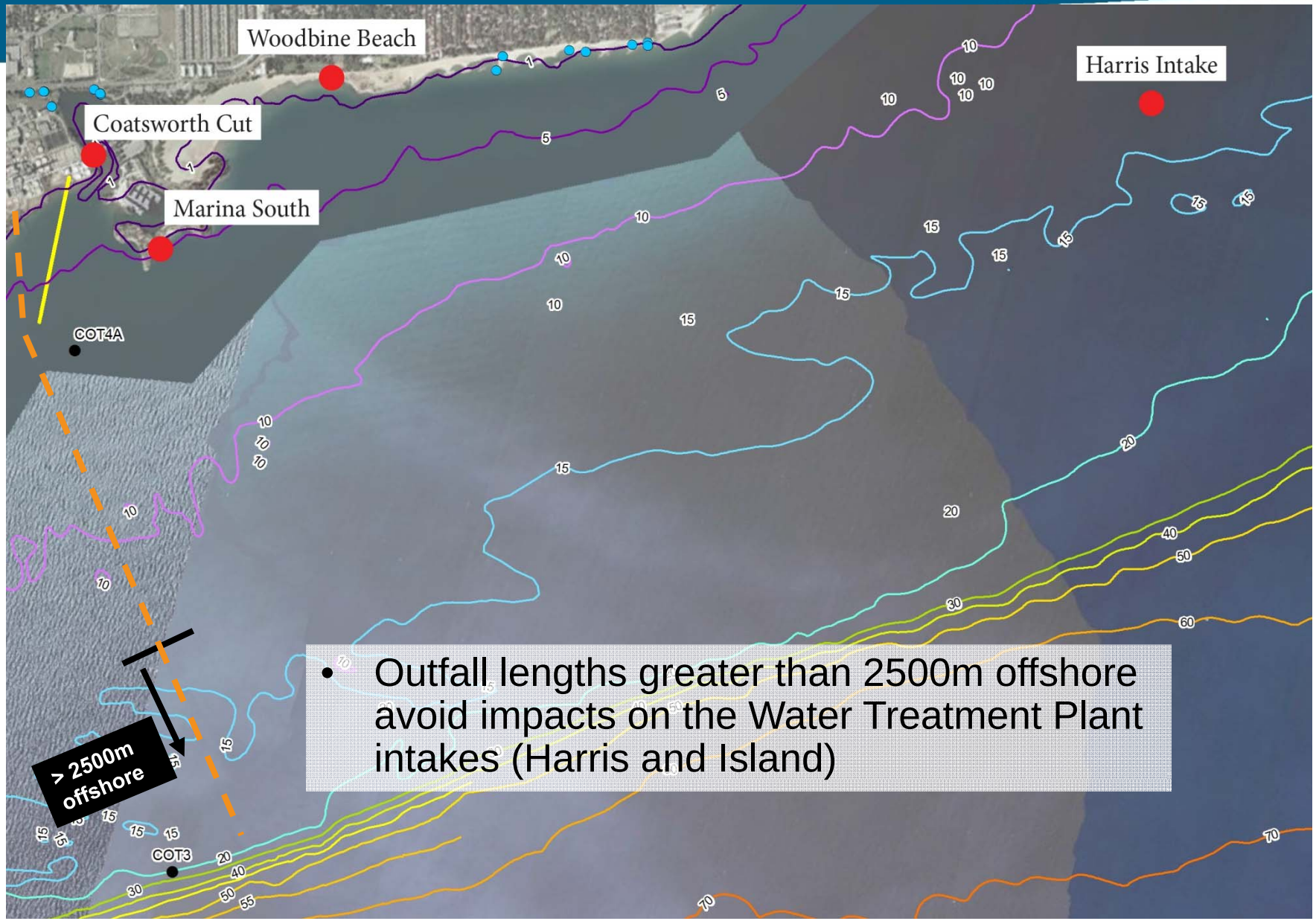
- **Water quality criteria used to evaluate alternatives included:**
  1. Meets Provincial Water Quality Objectives (PWQO) within the mixing zone for total phosphorus, *E.coli*, unionized ammonia
  2. Eliminates the near shore discharge impacts of the existing outfall and avoids impacts at the Water Treatment Plant Intakes

1986 OUTFALL CONCEPT

- Preferred alternative from 1986 study does not meet Provincial Water Quality Objectives (PWQO) at edge of mixing zone
  - Only one pipe operated during average conditions

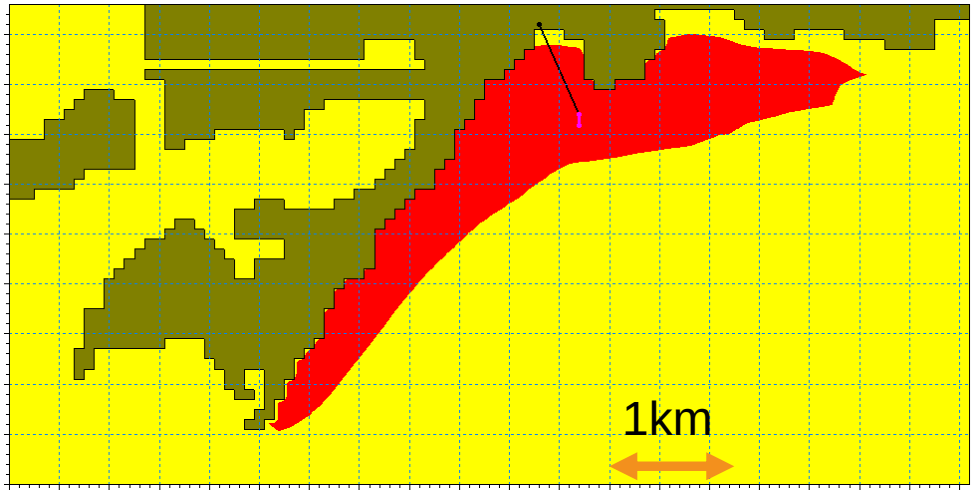


IMPACT ON WATER INTAKES



MEETING WATER QUALITY OBJECTIVES AT NEAR SHORE

- **Existing Outfall Nearshore Impact**
  - PWQO standard is not met at nearshore

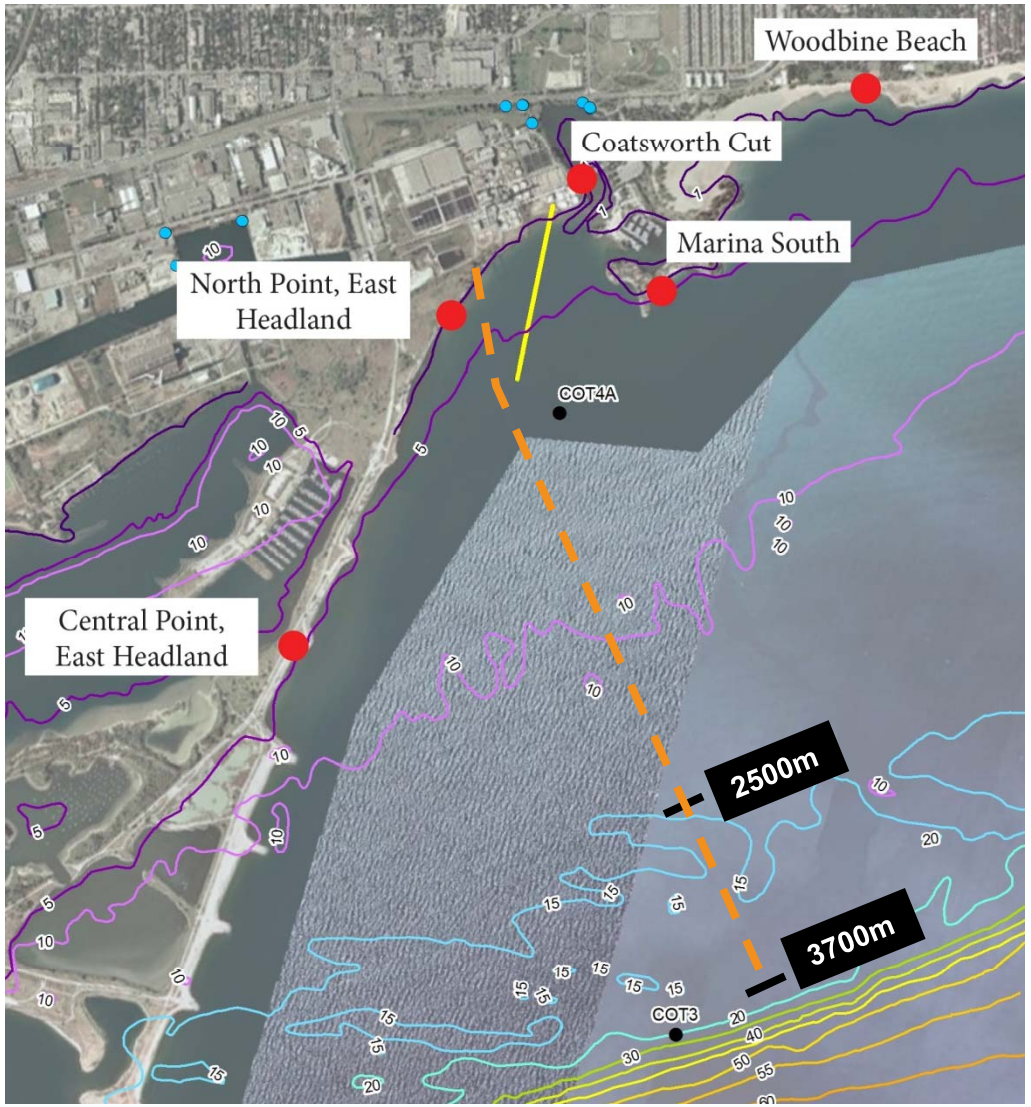


- **Outfall Alternatives – Eliminate Nearshore Impact**
  - PWQO standard is met at nearshore

Graphs show area of phosphorus concentrations greater than the PWQO

SUMMARY OF FINDINGS

- **Outfall length required to meet water quality criteria include:**
  - Total outfall length greater than 2500 m
  - Limiting length between 3500 and 3700 m
    - Geotechnical “scarp” constraint



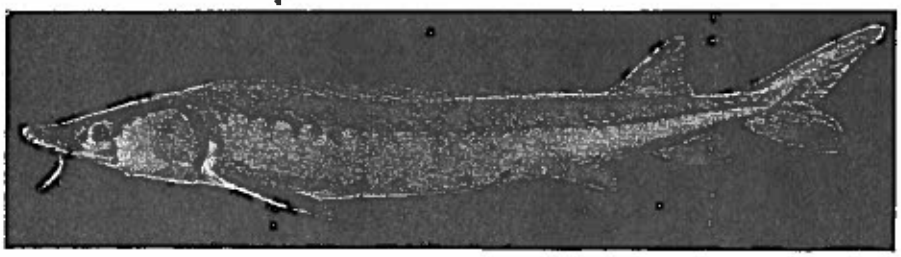
NEXT STEPS AND TIMELINE

NEXT STEPS

- **October, 2013**
  - Finalize Selection of Preferred Alternative Outfall Length
- **November, 2013**
  - Evaluate and Select Preferred Implementation Approach (i.e. Tunnelling, Open Cut)
- **January, 2013**
  - Conceptual Design Report

DISCUSSION & QUESTIONS

Acipenser fulvescens Rafinesque



LAKE STURGEON
Acipenser fulvescens Rafinesque

Other common names: Rock sturgeon, sturgeon, esturgeon de lac.

Distinguishing features: The lake sturgeon has an elongate, almost cylindrical body, which tapers toward the head and tail. The snout is long and pointed. The toothless mouth is situated beneath the head. On the underside of the head, halfway between the tip of the snout and the upper lip of the mouth, is a row of 4 barbels. The upper lobe of the caudal fin is larger and more developed than the lower lobe. There are 5 horizontal rows of heavy, bony plates along the body. The bony plates on young fish have sharp, elongated spines, but become smooth and partly embedded in adults. The coloration of the lake sturgeon changes with size. Young fish are usually buff or reddish, often with dark blotches of slate gray or black on the sides. The slate-gray colour predominates on older fish. Large lake sturgeon are usually dark gray, dark green, or black and have a smooth skin.

Size: In the Great Lakes, lake sturgeon approaching 300 pounds in weight, and 7 feet in length were formerly caught. Such large fish are now of rare occurrence although a male fish weighing 220 pounds, caught in Lake Erie, was examined by the author in 1948. In inland lakes the fish are smaller and seldom exceed 100 pounds in weight.

Occurrence: This fish occurs in the upper St. Lawrence River and Lake Champlain, in all the Great Lakes, and in Lake of the Woods. Inland, in Ontario and Quebec, it is found in the large lakes and rivers northward to Hudson Bay. Except in some of these northern lakes, the lake sturgeon is not nearly as common as in former years.

→ it's coming back !

Life history and habits: The lake sturgeon is a bottom living fish of the shallow waters of lakes and large rivers. Spawning occurs in the spring or early summer at temperatures of 55 to 60°F. It may ascend streams for this purpose or spawn in the shallow water of lakes. The lake sturgeon is a slow growing and long-lived fish, many years being required for it to reach maturity. It is known to reach an age of 50 years in Ontario and Quebec. At this age it may be about 5 feet long. At an age of approximately 20 years, it attains a length of 40 inches and a weight of 15 to 20 pounds (upper St. Lawrence River).

Food: The lake sturgeon is a bottom feeding fish. Using its large mouth, which can be extended tube-like, it sucks up quantities of bottom material from which the edible portions are separated. The 4 barbels in front of the mouth are sensitive and assist the fish in locating its food. The principal organisms eaten are molluscs (snails and small clams), aquatic insect larvae (especially of mayflies, caddis flies, and midges), crayfish, small amounts of fish, and aquatic vegetation.

← a bottom feeding fish

W.B. Scott
Freshwater Fishes
of Eastern Canada
Second Edition 1967
U. of T. Press

Submitted by Dalton C. Shipway

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»GREATEI

Miller

Conservation group lauds Toronto's 'greenest mayor'

PATTY WINSA
URBAN AFFAIRS REPORTER

Former mayor David Miller ha named head of the Canadian one of the world's most res environmental foundations.

Miller will take the reins as dent and CEO of the World W Fund-Canada in September.

ON ON0

THE GLOBE WAS FOUNDED IN 1844.

Editorial & Comment

PUBLIC INFRASTRUCTURE

Modern urban flood prevention: more ideas, fewer emissions

We can simultaneously fight climate change and adapt to it – but we need to act now

DAVID MILLER
Mayor of Toronto, 2003 to 2010

After Hurricane Hazel, which killed dozens of people in 1954, Torontonians made strong decisions through their local and provincial governments – such as banning development from flood plains and creating conservation authorities – that proved extremely effective in preventing a repeat of the mayhem. Considering the recent storms and flooding in Calgary and Toronto, and Hurricane Sandy's devastation to the United States last year, we need to take equivalent bold measures today. The only question is our political will: Do we have the same courage we had in 1954?

The first step is obvious, but an uncomfortable truth for some. What is happening is climate change – period. And as my high-school math teacher Howard David used to say, "When you are in a hole, stop digging."

We need to do everything we can to stop increasing greenhouse gas emissions, then take steps to lower them. In this context, rapidly expanding the exploitation of fossil-fuel deposits without a plan to deal with the resulting huge increase in carbon emissions can only be seen as reckless.

Our government's decision to abandon the Kyoto Protocol was wrong, but the Kyoto targets are still the international standard. Some say it's too late, we can't meet those targets now. That's not true – at a national level, we haven't even tried. And if we did try, we might be surprised by the results. For example, through innovative strategies and the closing of coal-fired plants, Toronto's greenhouse gas emissions are down 15 per cent from 1990 levels. (Kyoto called for 6 per cent.)

According to a study for the C40 – a group of the world's largest cities committed to fighting climate change – most greenhouse gas emissions can be traced to cities, and of those, most come from three sources: heating and cooling buildings, transportation and electricity generation. Strategies exist worldwide in all of these areas that help dramatically reduce emissions (and create jobs). Projects like energy retrofits in high-rise buildings, and new information and communications technologies to lower energy consumption, have exciting possibilities. Increased public transit, and support for cycling and walking, can help reduce our automobile-dependent lifestyles and create livable cities.

Flood waters in Toronto's Don Valley after Hurricane Hazel in 1954: Do we have the same courage to take bold measures? THE GLOBE AND MAIL

Many cities and towns have taken steps on these issues, but our building codes don't even mandate the highest green standards for new buildings – and there is no national plan for supporting public transit.

Electricity has tremendous potential, by moving to green sources of electricity powered by a smart grid. The general idea is to conserve, manage demand and create a system of distributed small-scale generation – like neighbourhood-based district energy. Such a system can lower emissions and create a system that's far more resilient in the face of disasters.

It also illustrates the second step – learning to adapt.

As the climate changes, extreme weather events will become far more likely. Municipal infrastructure was built on the assumption that such storms were infrequent. It's an expensive but critical task to plan for such events and rebuild our infrastructure to cope with them. Electricity is a perfect example – the need for a feed-in tariff like Germany's is often justified by the jobs and economic boost it provides, but its biggest benefit might be to create a truly resilient electricity grid, offering the chance for each building to literally become its own power plant.

As we rebuild this infrastructure, which will require significant public investment, we need to keep modern green lessons in mind. We need an adaptation strategy – Toronto's is called "Ahead of the Storm." We need to act in numerous ways at the same time.

And, critically, we need to remember that natural systems work, so they should be incorporated in our plans – expanding hard infrastructure, such as sewers, isn't always the right way to cope with flooding. Settling ponds, green roofs, downspout disconnections, tree bylaws and requirements for permeable paving all have their places, as do innovations such as the Gowanus Sponge Park in Brooklyn, New York. The preservation of green space itself, including planting huge numbers of new trees in our cities, is of great importance. We have allowed too much of our land to be paved over, including mistakes like reverse-slope driveways, leading to extreme flooding problems for affected homeowners.

With political will, modern techniques and the latest ideas from cities and governments around the world, we have the capacity to reduce emissions and adjust to climate change at the same time. But we do need to act, and now would be a good time to start.

David Miller is the Future of Cities Global Fellow at NYU-Poly, where he teaches the politics of urban sustainability.

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