Iona Island Wastewater Treatment Plant

Online Community Meetings

Tuesday, May 19 & Thursday, May 21, 2020

metrovancouver

SERVICES AND SOLUTIONS FOR A LIVABLE REGION

47255811

Iona Island Wastewater Treatment Plant
Project Definition Update

MV Project Team

May 19 & 21, 2020

Online Public Meeting

metrovancouver
SERVICES AND SOLUTIONS FOR A LIVABLE REGION

Online Meeting Tips

Thank you for joining us for an online meeting about the Iona Island Wastewater Treatment Plant Project.

The meeting will start shortly. To help things go smoothly:

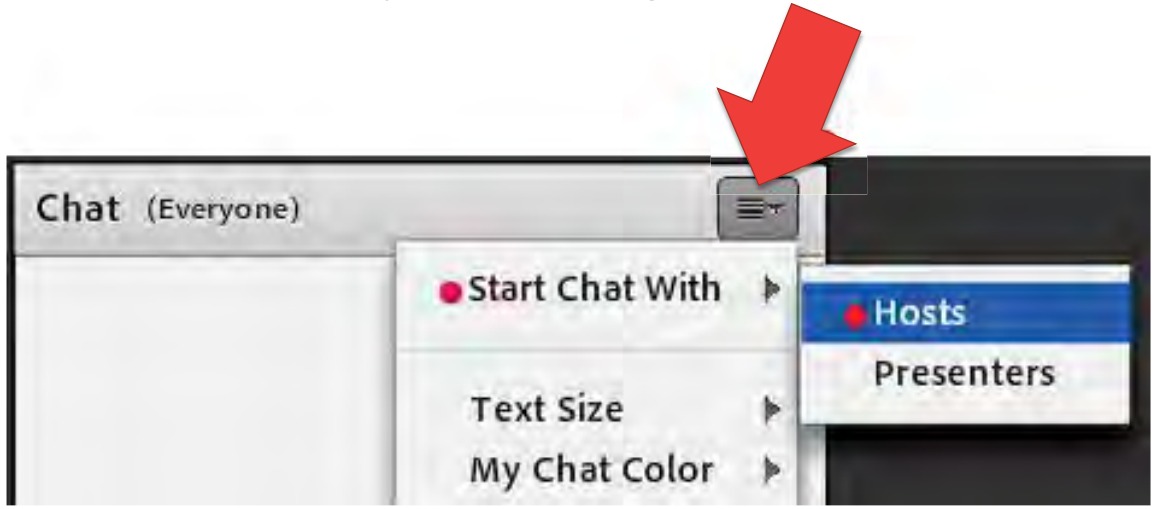
When you are not speaking:
Please press the green microphone or telephone button at the top of your screen to mute your microphone

To ask a question or provide a comment:
Please press the raise hand button and the moderator will address you at the appropriate time

Online Meeting Tips

To ask a technical question:

- Click drop down arrow at the top corner of the chat window to “Start Chat With → Hosts”
- A separate tab will open in the chat window where you can type in your question
- When finished, select the “Everyone” tab to go back to the main chat



1. WELCOME

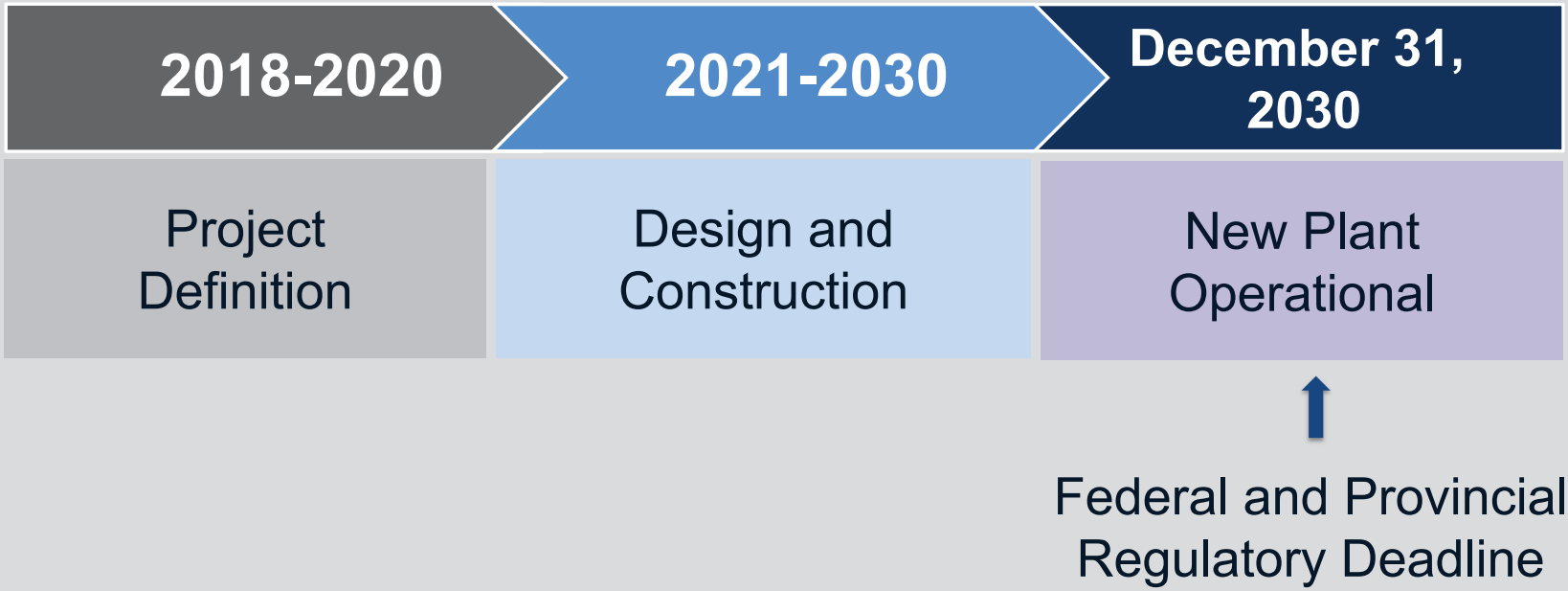
Morgan Guerin, Councillor, Musqueam Indian Band

Presentations (discussion throughout)

1. Welcome
   Morgan Guerin, Councillor, Musqueam Indian Band
2. Project definition overview & update
   Bryan Shoji, Director of Policy, Planning and Analysis, LWS, MV
3. Community engagement
   Tom Sadleir, Program Manager, Community Engagement, LWS, MV
4. Resource recovery and wastewater treatment options
   Rick Bitcon, Senior Engineer, AECOM
5. Iona Island context and ecological priorities
   Robyn Worcester, Natural Resource Management Specialist, MV
6. Design concepts and habitat enhancement opportunities
   Jeff Cutler, Landscape Architect, Space2Place

2. PROJECT DEFINITION OVERVIEW

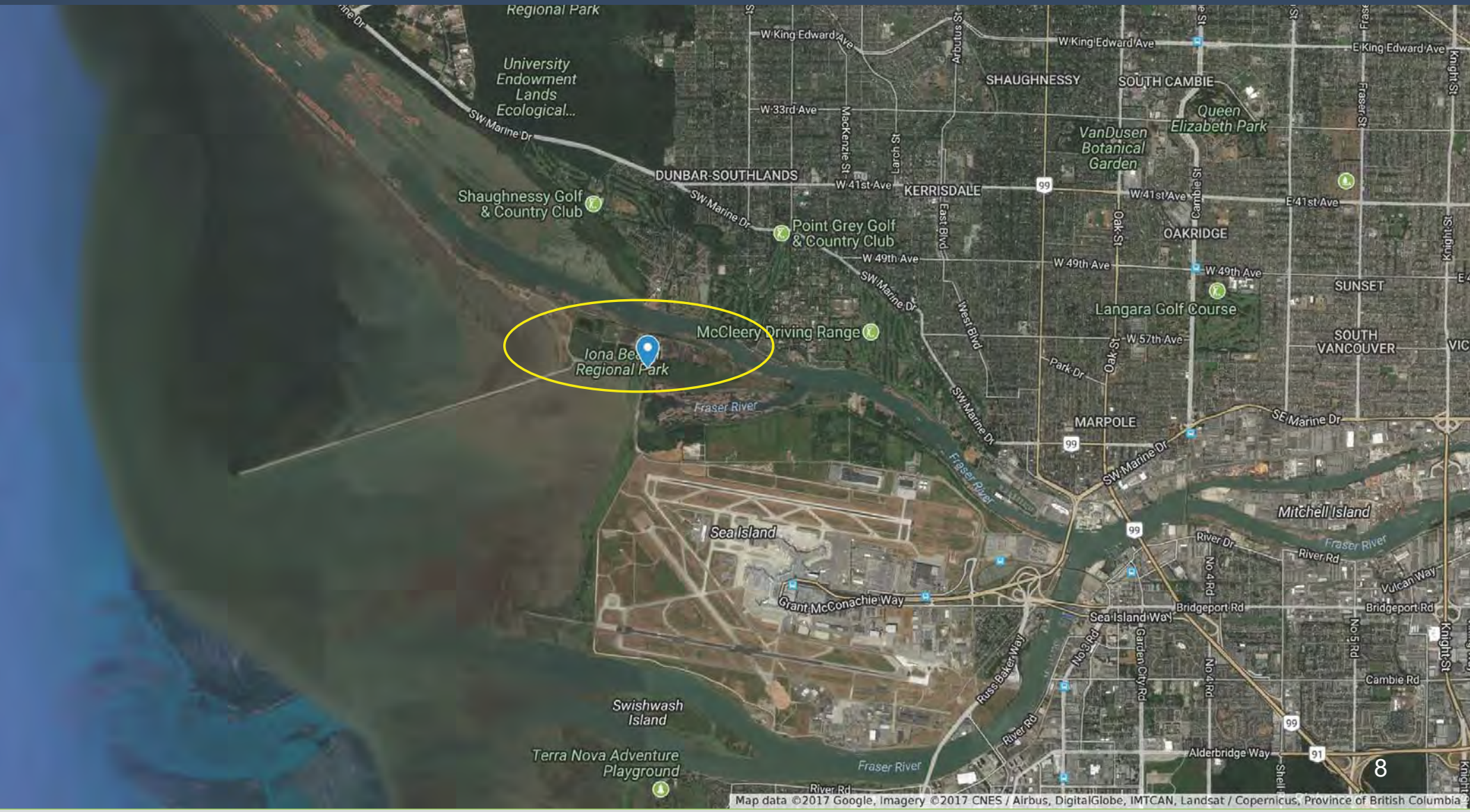
Overall project timeline



Project Definition Goals

- Wastewater Treatment
- Community and Park Integration
- Resource Recovery

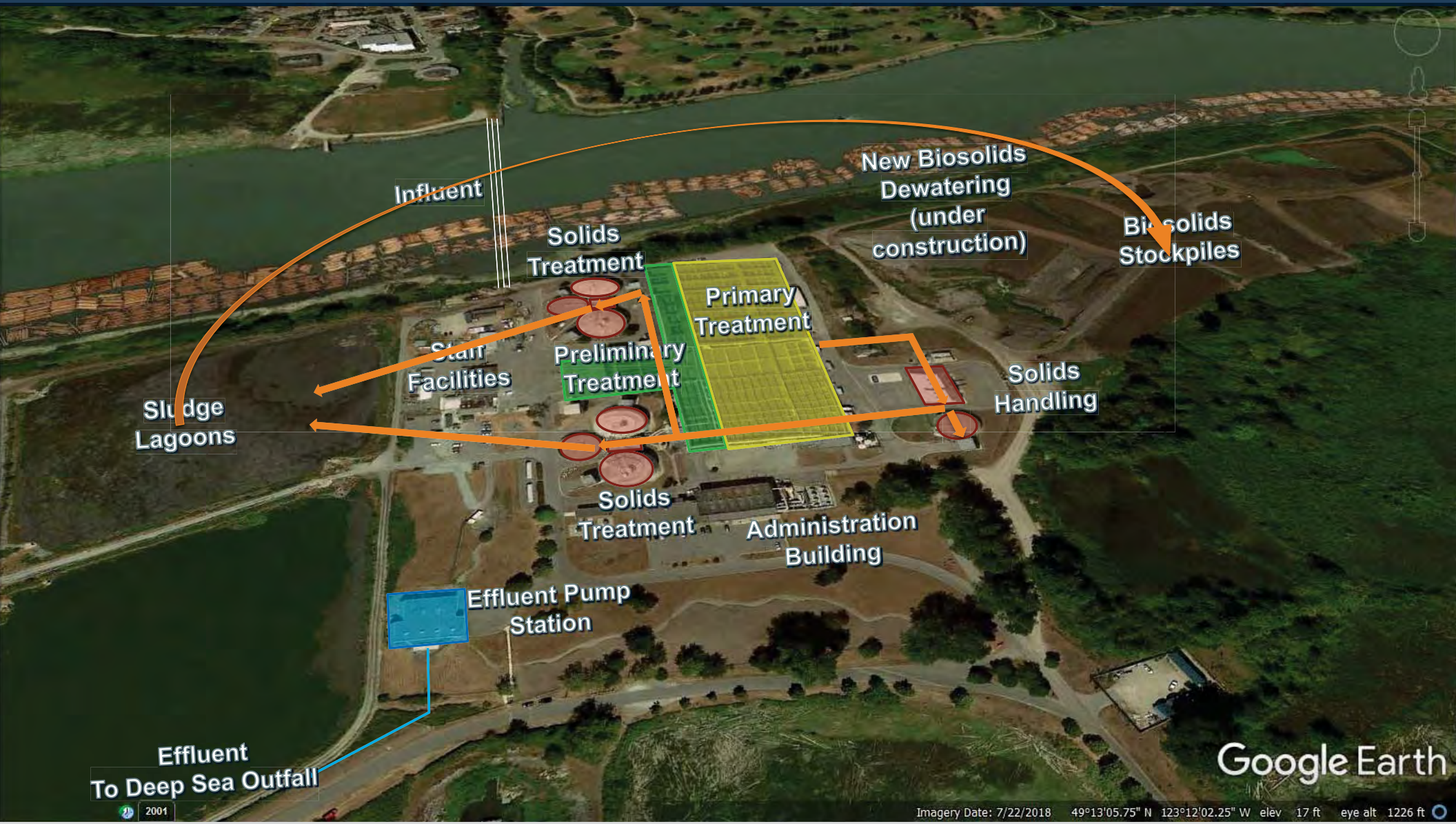
Plant Location



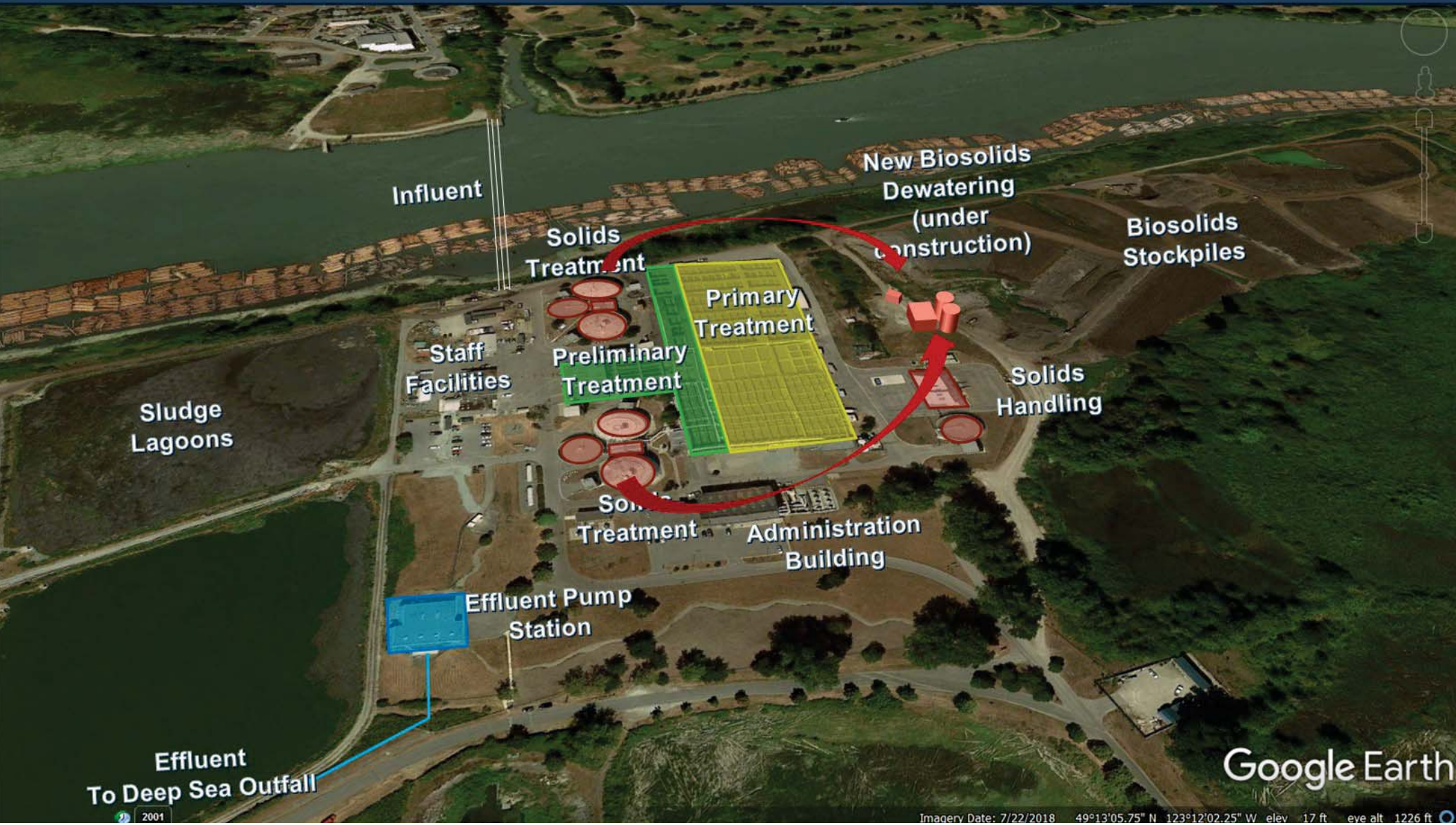
Existing Plant Layout

Existing Plant Layout

Existing Plant Layout



Existing Plant Layout



Project Definition Design Considerations

CLIMATE CHANGE RESPONSE

EDUCATION

BIRDING

ADAPTABILITY + RESILIENCE

LEADERSHIP

COMMUNITY HEALTH

ARCHITECTURE

FACILITY INTEGRATION

STEWARDSHIP

DELIGHT

HISTORY + CULTURE

LIFE IN WATER

LIFE ON LAND

RECREATION


Questions?

3. COMMUNITY ENGAGEMENT

- VSA members
- Residents
- Businesses
- Special interests
- Musqueam Indian Band
- GVS&DD Board (LWC, Regional Parks)

Technical Workshop 4, Musqueam Indian Band, July 24, 2019

What We've Heard

Community Workshop 1, January 9, 2019, Richmond

- Increase treatment level
- Reduce odour
- Reduce plant lighting
- Maintain access to park
- Protect fish and fish habitat
- Coordinate removal of existing lagoons with new habitat
- Maintain Musqueam views

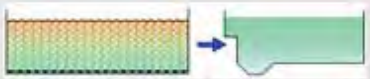
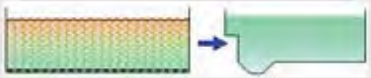
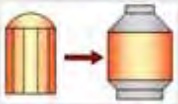
Committee & Engagement Overview (2020)

Timeline	Activity
February 7	Liquid Waste Committee Present design concepts. No decision sought.
February 22	Council of Councils Design concepts
March 11	Regional Parks Committee Park integration and habitat enhancement
May – June	Community Engagement Design concepts
July	Liquid Waste Committee and GVS&DD Board Recommend preferred concept, review input received. Seek approval.
January 2021	Liquid Waste Committee and GVS&DD Board Present Indicative Design and Project Definition Report. Seek approval.


Questions?

4. RESOURCE RECOVERY & WASTEWATER TREATMENT OPTIONS

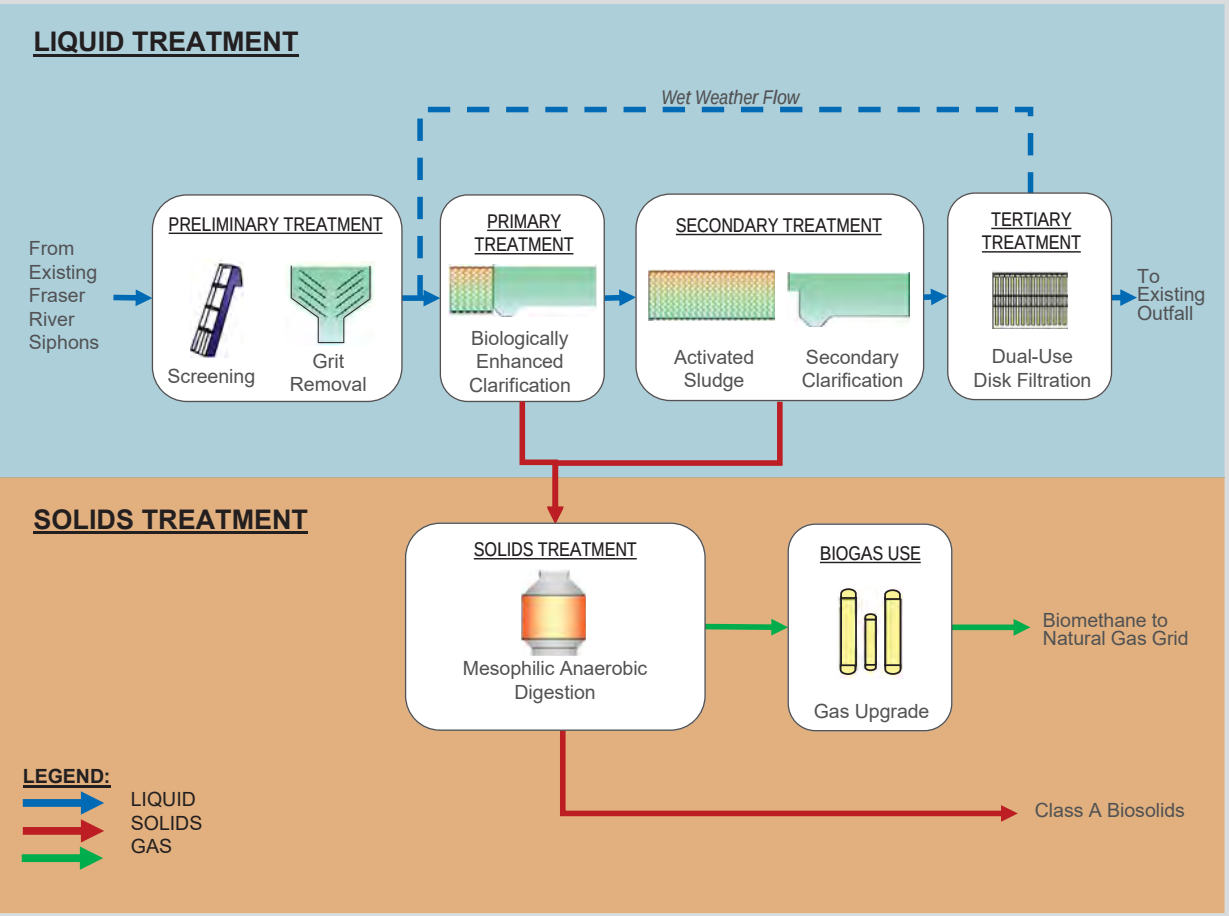
Wastewater Treatment Options

	Concept 1 Secondary	Concept 2 Tertiary Filtration	Concept 3 Tertiary MBR
Primary Treatment Options	INCLINED PLATE CLARIFIERS 	BIOLOGICALLY ENHANCED CLARIFICATION 	INCLINED PLATE CLARIFIERS + CHEMICALS 
Secondary Treatment Options	ACTIVATED SLUDGE 	ACTIVATED SLUDGE 	MEMBRANE BIOREACTOR 
Tertiary Treatment Options		TERTIARY FILTRATION 	MEMBRANE BIOREACTOR 
Solids Treatment Options	THERMAL HYDROLYSIS + MESOPHILIC DIGESTION 	THERMOPHILIC DIGESTION 	SLUDGE WASTE-TO-ENERGY 

Comparison of Options

Criteria	Concept 1 Base Secondary	Concept 2 Tertiary Filtration	Concept 3 Tertiary MBR
Operational Complexity	Medium	Low	High
Maintenance Requirements	High	Low	High
Health and Safety Risks	High	Low	High
Odour Release Risks	High	Medium	Low
Footprint	Large	Medium	Small
Ability to Adopt Future Technological Innovations	Medium	High	Low
Capital Cost (2020 Dollars)	Highest	Lowest	Medium
Annual Operating Cost	Medium	Lowest	Highest

Preferred Wastewater Treatment Plant Concept



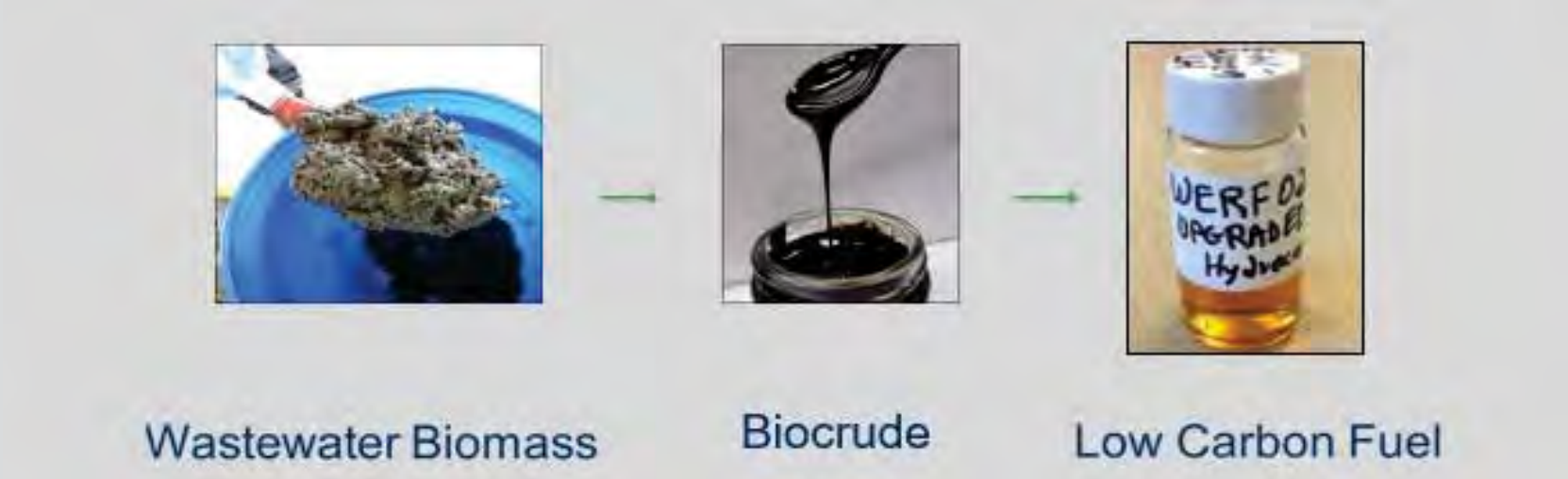
Key Features

- Enhanced primary followed by secondary clarification
- Tertiary effluent
- Opportunities for effluent reuse
- Biogas upgraded to biomethane
- Higher energy recovery
- Smaller secondary tanks

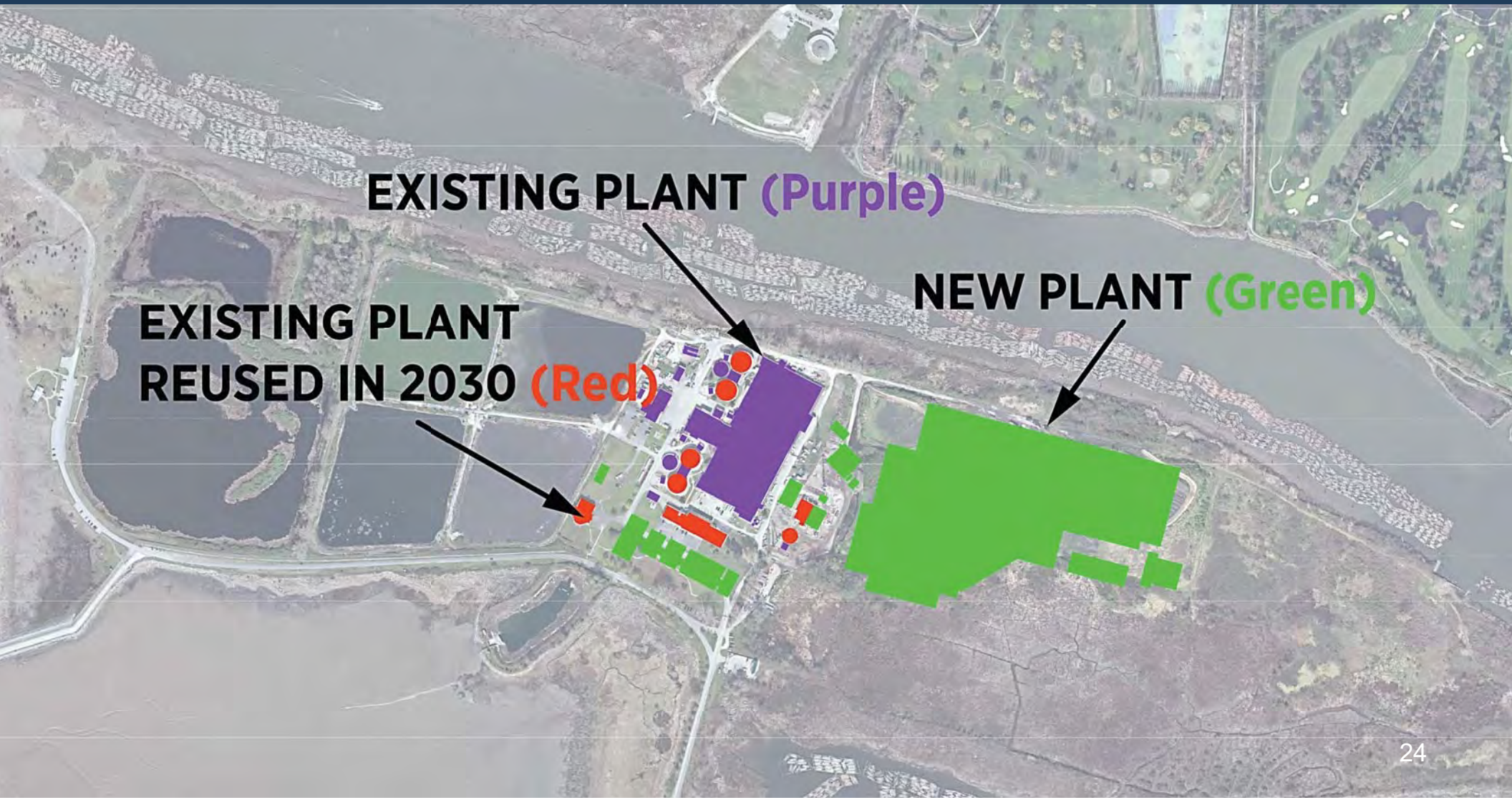
Staged Implementation of Concept 2

Key considerations for staging:

- Re-using certain assets will reduce capital costs
- Flexibility for future innovation (hydrothermal liquefaction)



Existing and New Plant Layouts



Resource Recovery Opportunities

Inputs

Wastewater

Trucked Liquid Waste

Iona Island Wastewater Treatment Plant

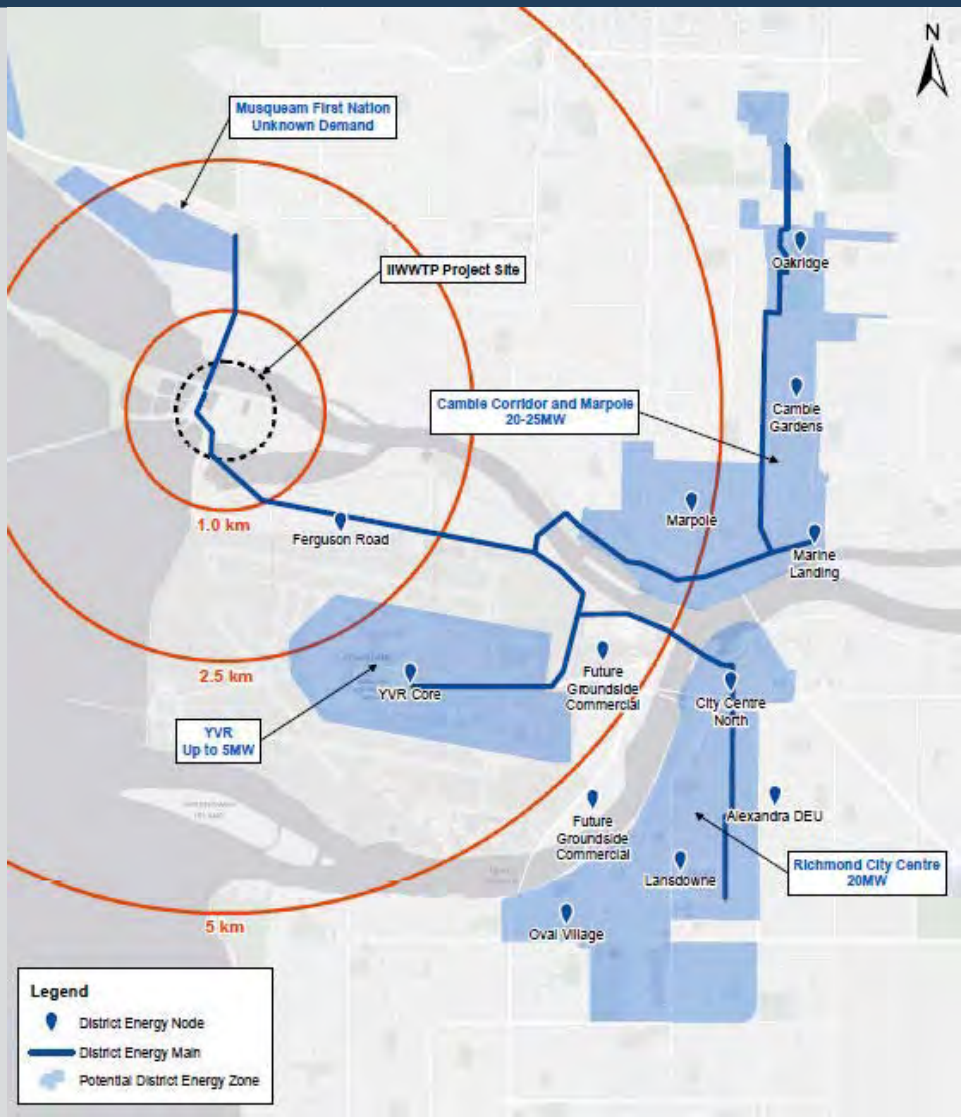
Potential Products

- **Reclaimed Water**
- **Electricity**
- **Heat**
- **Biofuel**
- **Nutrients / Biosolids**

Effluent Heat Recovery

Heat recovery from plant effluent

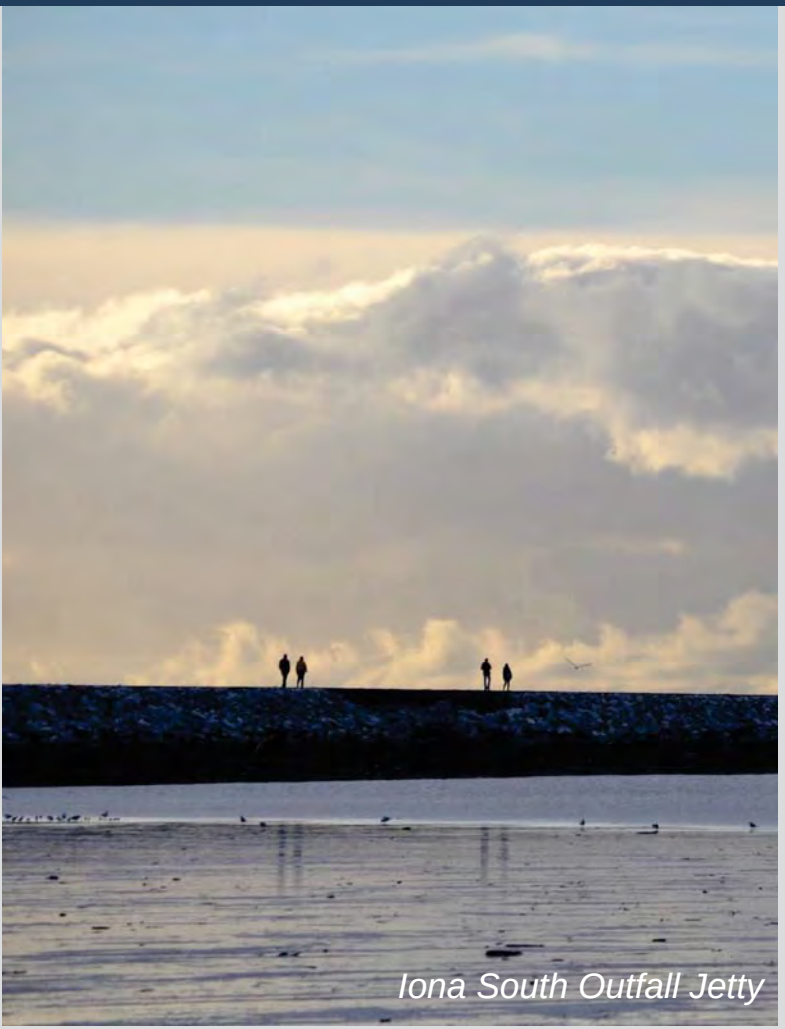
- Onsite heating and cooling needs
- Export to district energy system
- Equivalent to heating energy use of 50,000 apartment units




Questions?

5. IONA ISLAND AND ECOLOGICAL PRIORITIES

Iona Beach Regional Park



Iona South Outfall Jetty

Interpretive Programs

Coastal Sand Ecosystem

The Fraser River Basin

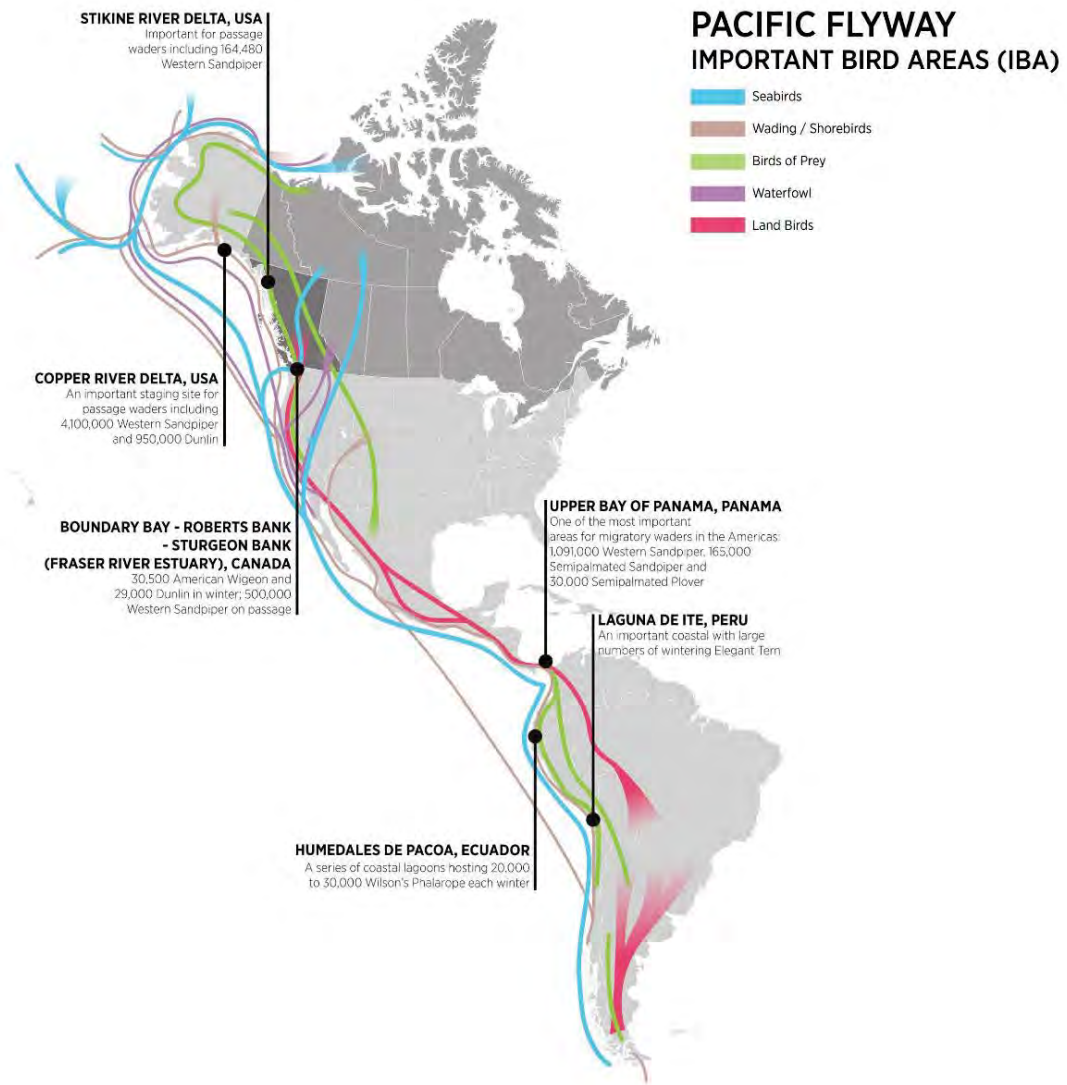
The Fraser River Basin drains more than a quarter of British Columbia, and supports more salmon runs than any other river in the world

source: Rivershed Society

Salmon Migration Routes

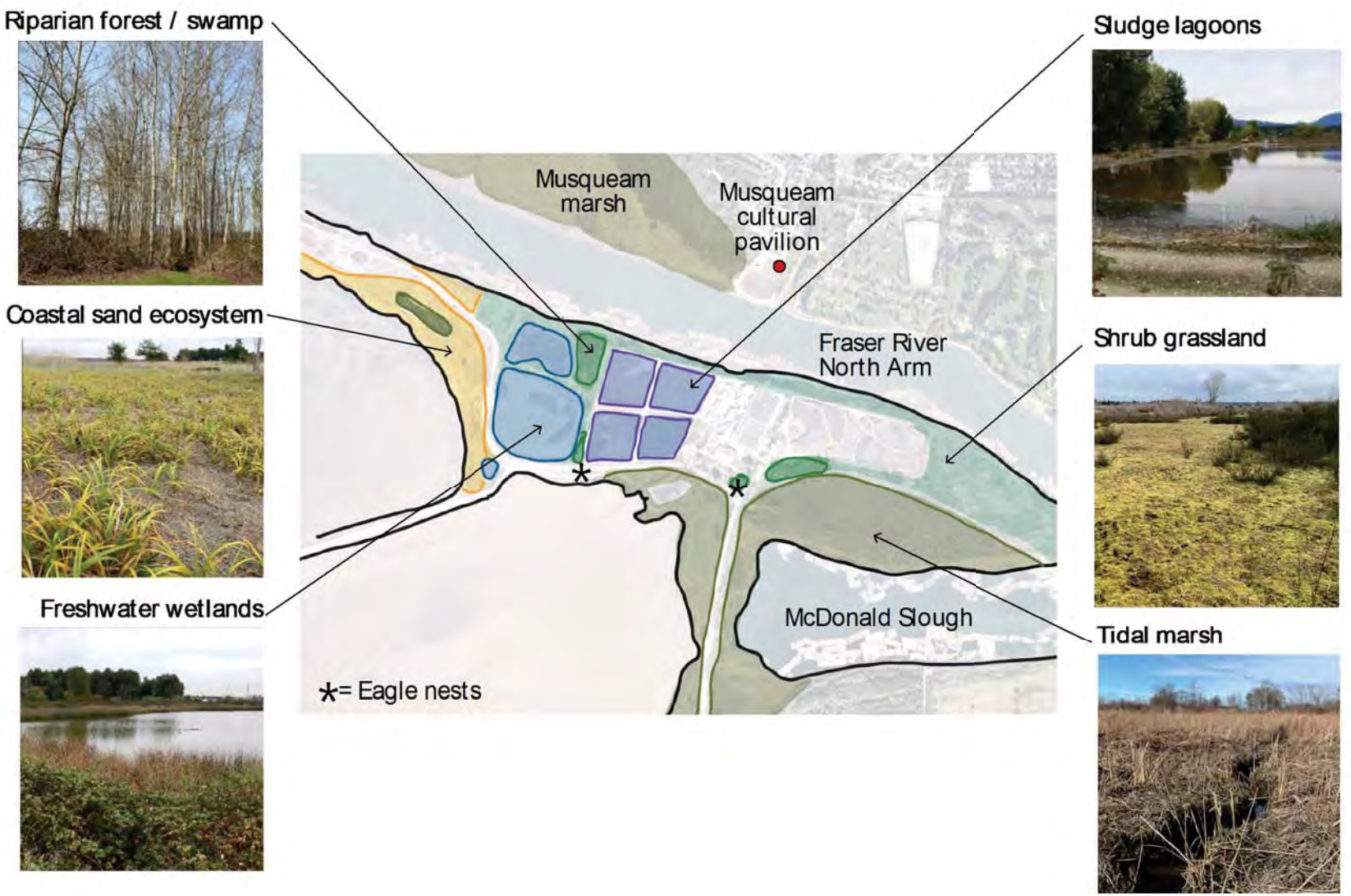
source: Cohen Commission

Pacific Flyway

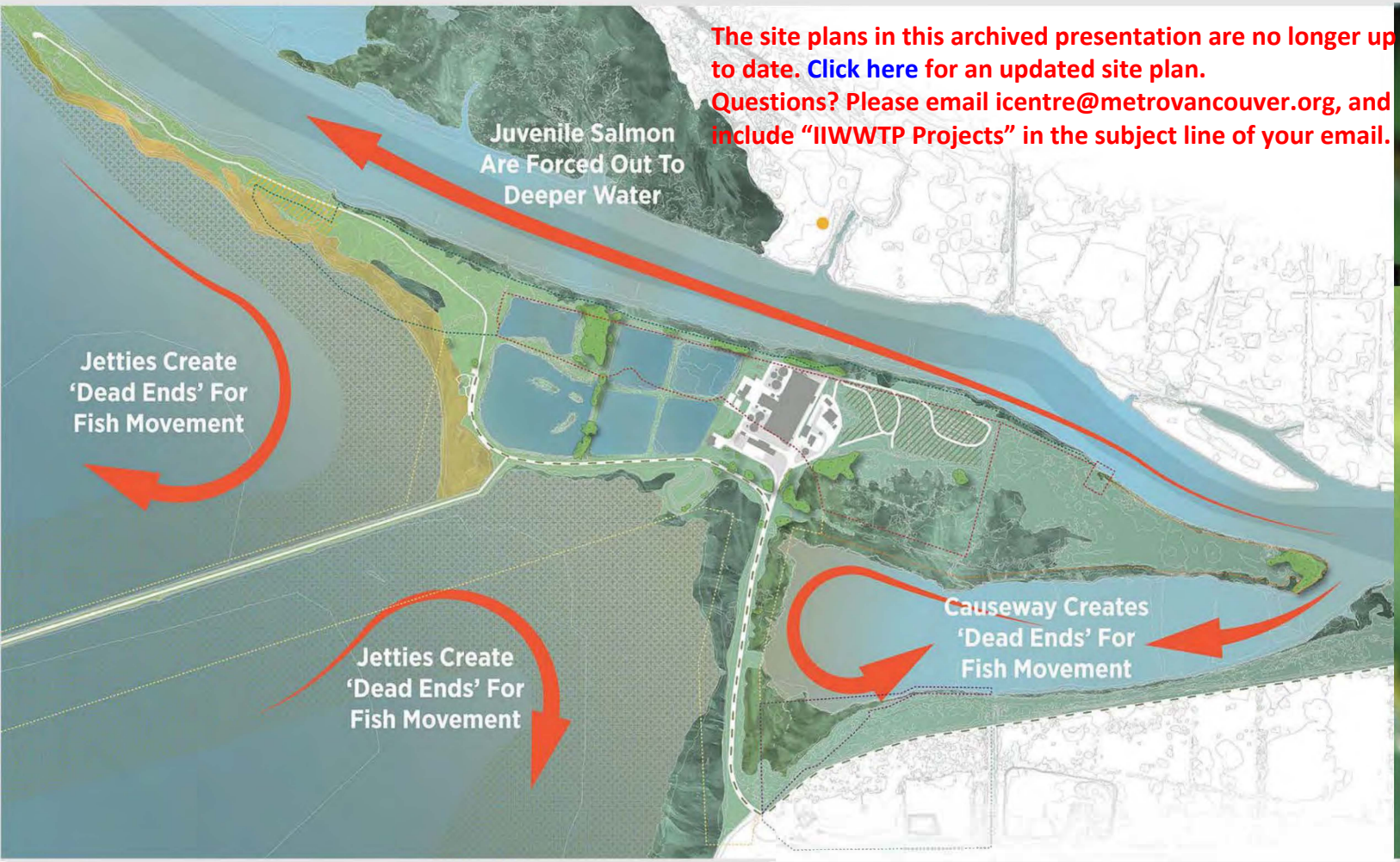


source: National Geographic

Ecosystems of Iona Island



Disconnected Salmon Migration



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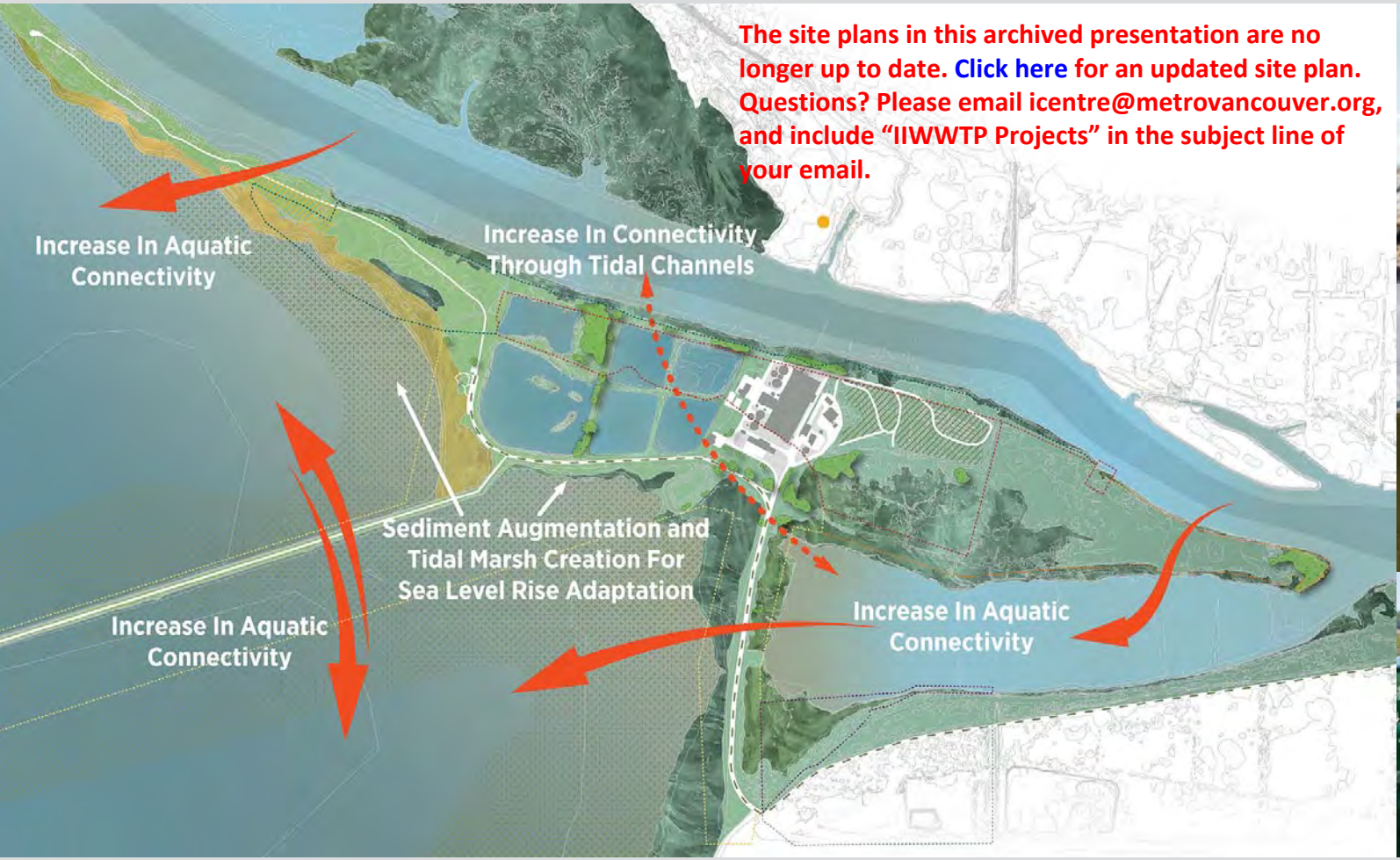
Questions? Please email icentre@metrovancouver.org, and include "IIWWTP Projects" in the subject line of your email.

Connected Salmon Migration



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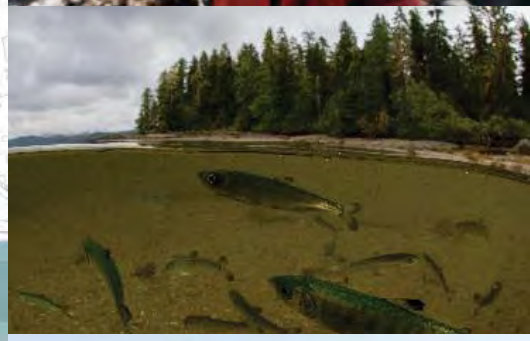
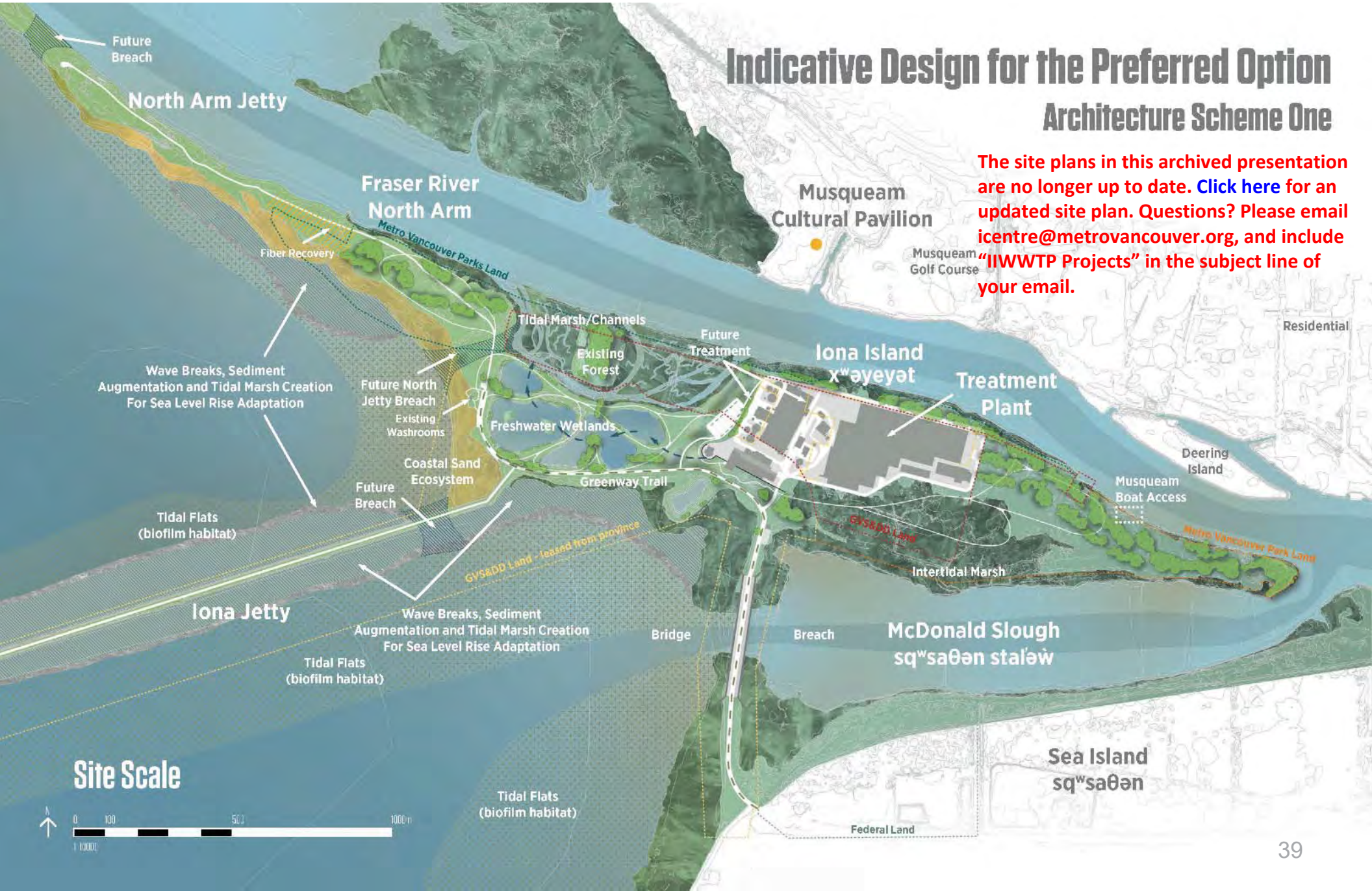


Ecological Priorities


Questions?

6. DESIGN CONCEPTS FOR PLANT AND HABITAT ENHANCEMENT OPPORTUNITIES


Indicative Design for the Preferred Option
Architecture Scheme One
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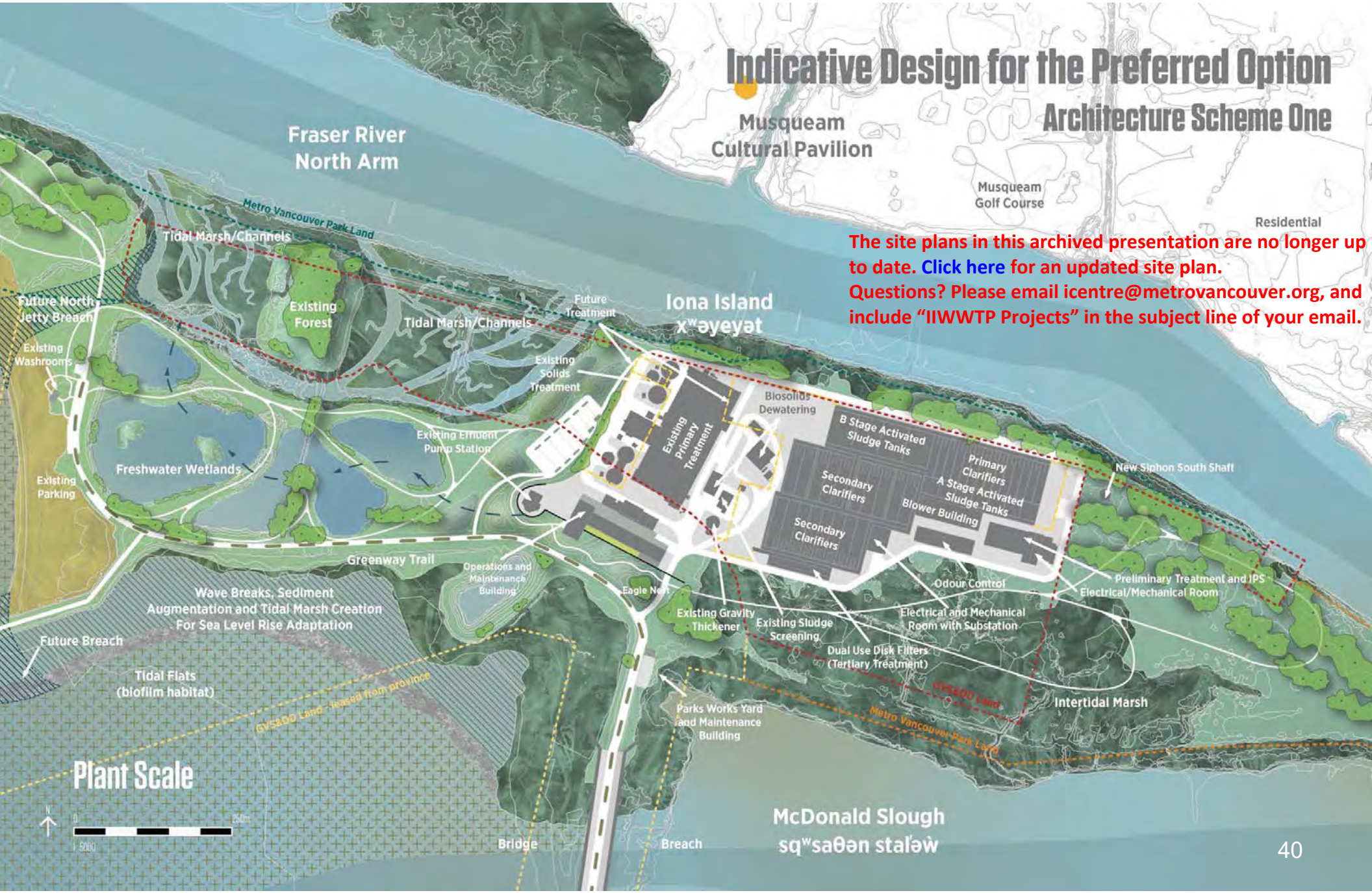
Future Breach
North Arm Jetty
Fraser River North Arm
Metro Vancouver Parks Land
Fiber Recovery
Musqueam Cultural Pavilion
Musqueam Golf Course
Residential
Tidal Marsh/Channels
Existing Forest
Future Treatment
Iona Island xʷəyeyət
Treatment Plant
Wave Breaks, Sediment Augmentation and Tidal Marsh Creation For Sea Level Rise Adaptation
Future North Jetty Breach
Existing Washrooms
Freshwater Wetlands
Coastal Sand Ecosystem
Future Breach
Greenway Trail
Deering Island
Musqueam Boat Access
Tidal Flats (biofilm habitat)
GVS&DD Land - leased from province
GVS&DD Land
Metro Vancouver Park Land
Intertidal Marsh
Iona Jetty
Wave Breaks, Sediment Augmentation and Tidal Marsh Creation For Sea Level Rise Adaptation
Bridge
Breach
McDonald Slough sqʷsaθən staɬəw̓
Tidal Flats (biofilm habitat)
Site Scale
Sea Island sqʷsaθən
Tidal Flats (biofilm habitat)
Federal Land



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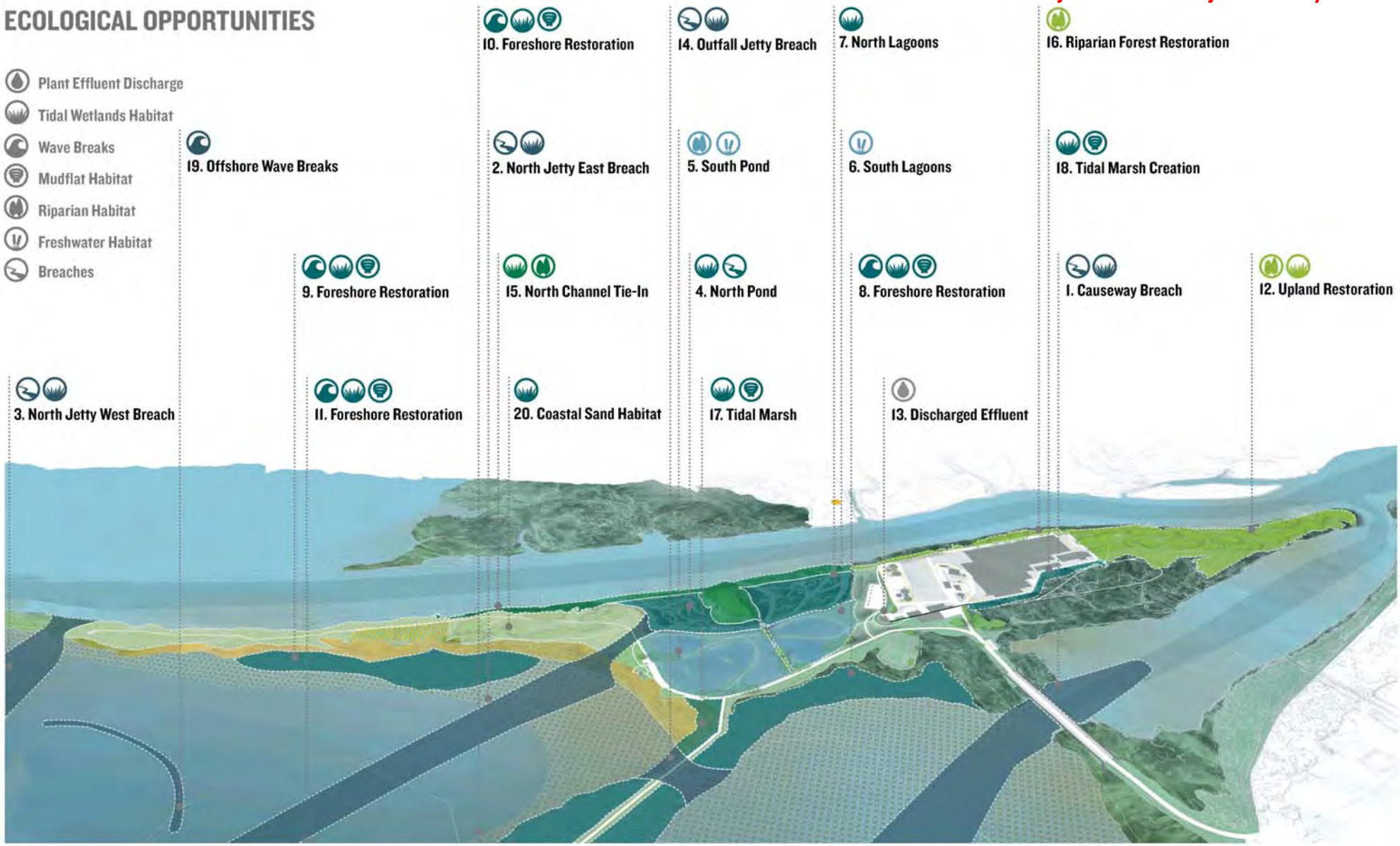
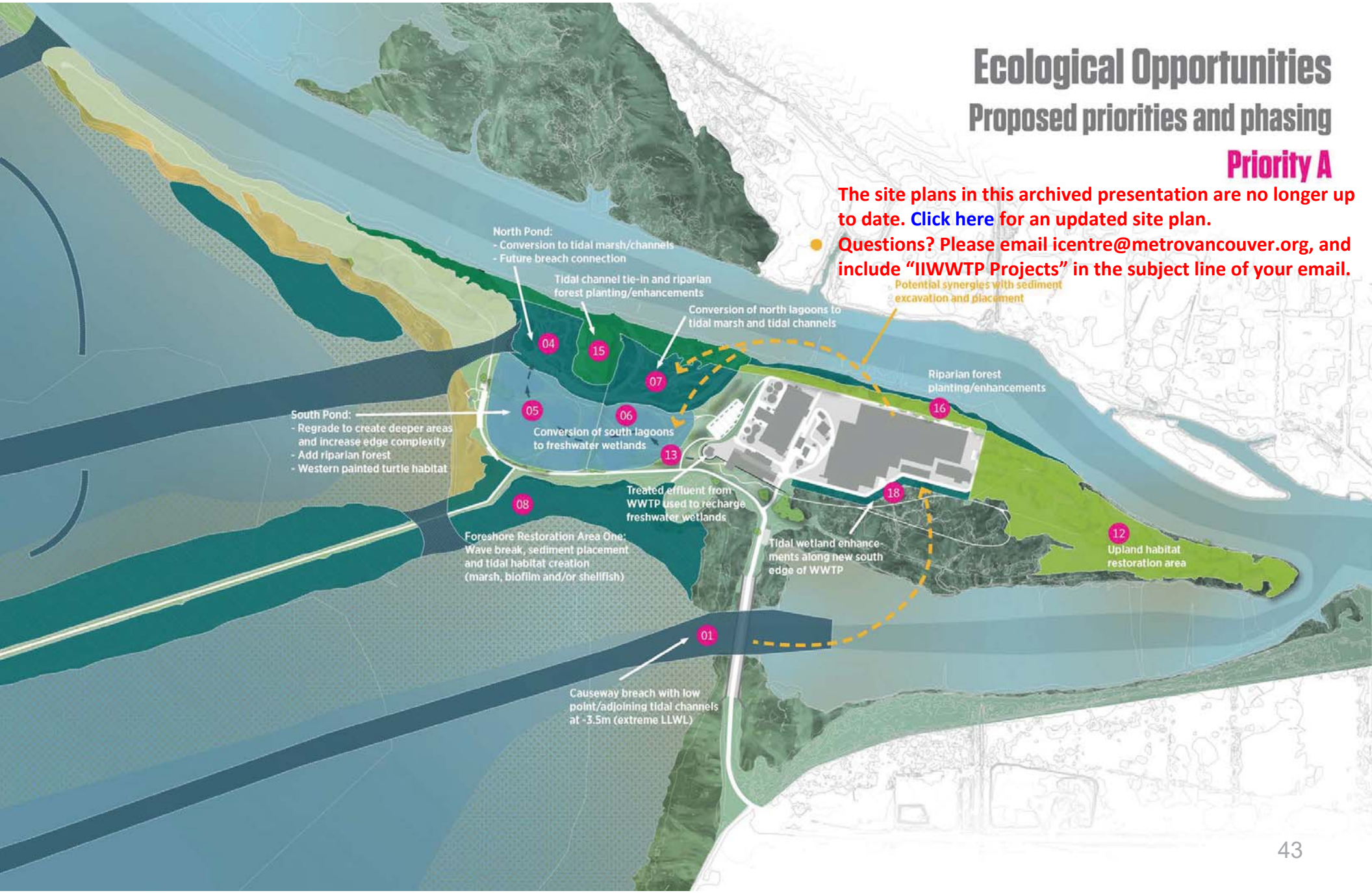


Park Connection Opportunities

- Enhance park ecology
- Improve circulation, connections and visitor experience
- Opportunities for education, recreation programming
- Park expansion (access to more area)
- Sea level rise and climate change mitigation
- New partnerships and community connections


Ecological Opportunities
Proposed priorities and phasing
Priority A
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Questions? Please email icentre@metrovancouver.org, and include "IIWWTP Projects" in the subject line of your email.
North Pond:
- Conversion to tidal marsh/channels
- Future breach connection
Tidal channel tie-in and riparian forest planting/enhancements
Conversion of north lagoons to tidal marsh and tidal channels
Potential synergies with sediment excavation and placement
Riparian forest planting/enhancements
South Pond:
- Regrade to create deeper areas and increase edge complexity
- Add riparian forest
- Western painted turtle habitat
Conversion of south lagoons to freshwater wetlands
Treated effluent from WWTP used to recharge freshwater wetlands
Foreshore Restoration Area One: Wave break, sediment placement and tidal habitat creation (marsh, biofilm and/or shellfish)
Tidal wetland enhancements along new south edge of WWTP
Upland habitat restoration area
Causeway breach with low point/adjoining tidal channels at -3.5m (extreme LLWL)
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IONA ISLAND WASTEWATER TREATMENT PLANT

MILLER HULL space2place local.


SOUTHERN INTERTIDAL WETLANDS


KNOLLS AND FRESHWATER WETLANDS


TIDAL CHANNELS, FRESHWATER WETLANDS AND THE PLANT
ARCHITECTURE SCHEME ONE

SOUTHERN VIEW FROM MUSQUEAM

ILLUSTRATION SHOWING PROPOSED VIEW WITH TREES REMOVED

Questions?

7. NEXT STEPS & CLOSING

- Submit input by Monday June 8 via **ionawwtp@metrovancouver.org**

- MV will consider and incorporate additional input, where possible
- Recommend a preferred concept to LWC and GVS&DD Board (July 2020)
- Indicative Design and Project Definition Report to LWC & Board (January 2021)