



Iona Island Wastewater Treatment Plant Projects – Conceptual Design

Iona Island Wastewater Treatment Plant Projects

CITY OF VANCOUVER – STANDING COMMITTEE ON POLICY & STRATEGIC PRIORITIES

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metrovancouver

OUTLINE

1. Background
2. Conceptual Design
3. Schedule
4. Projects Underway
5. Cost
6. Funding Strategy
7. Working with City Staff

VANCOUVER SEWERAGE AREA

Jurisdictions served by Iona Island Wastewater Treatment Plant

Receives wastewater from:

- Vancouver (~95% of total)
- Richmond
- Burnaby
- Electoral Area A, UBC

Building for projected growth:

- 750,000 people in 2021
- 946,000 people in 2051



SERVICING A COMBINED SEWER SYSTEM

Vancouver is largely a combined sewer system

- Sanitary flow
- Stormwater flow

Plant design relies on Vancouver sewer separation, which will:

- Reduce frequency and volume of overflows (discharge of untreated sewage to our waters)
- Allow for more sanitary flow in pipes

New plant designed to match current combined flows with capacity becoming available to accommodate growth as separation progresses

WHY NOT A SERIES OF SMALLER PLANTS?

Centralized Plant Brings Best Value to Sewerage Area

A comprehensive study in 2009 found:

- Challenges with distributed system
- Costs savings associated with a centralized system
- New sewer system required
- Availability and cost of land in Vancouver

A review in 2021 confirmed the recommended approach

A single, centralized plant remains the best option from cost, risk, and schedule perspectives

WHY IONA ISLAND?

Consideration of Alternative Sites

- Iona was chosen during a comprehensive study in 2009
- Three other sites in Vancouver Sewerage Area were evaluated
- A review in 2021 confirmed the 2009 conclusions

Iona Island remains the best location for upgraded treatment plant from cost, risk, and schedule perspectives



Alternative sites considered

RESILIENCY

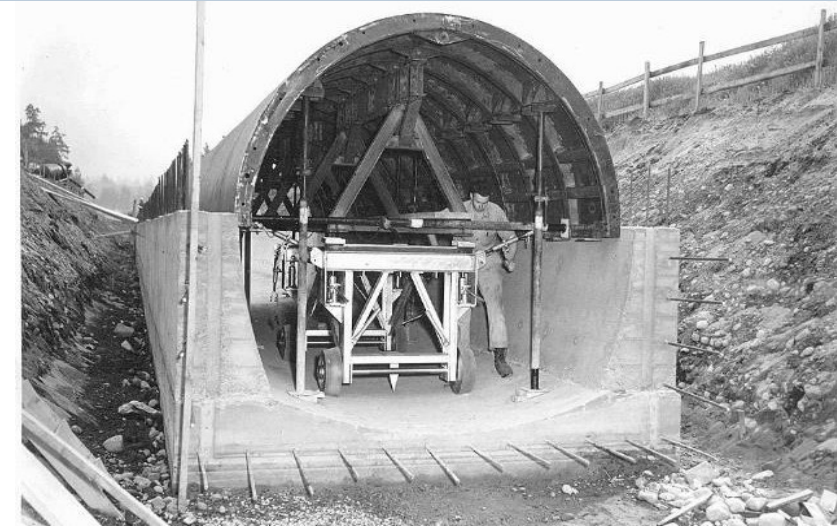
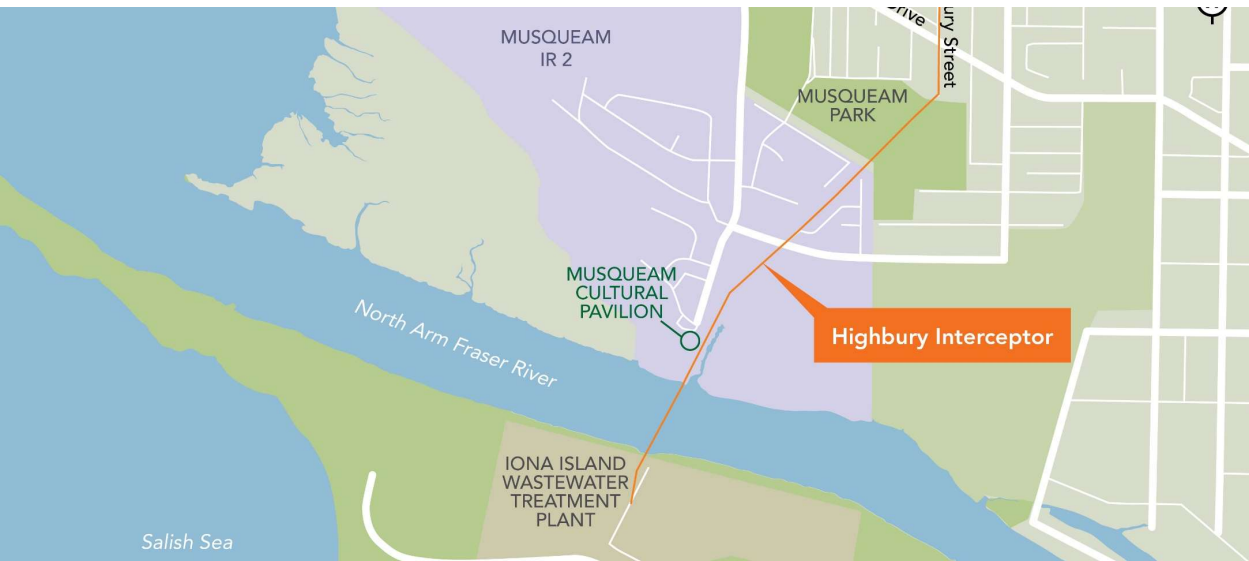
Ensuring the plant is operational following earthquakes and floods

The new plant will be designed for earthquake and climate-change (sea-level rise) resiliency

- Treatment plants need to be located near receiving waters and at low elevations to accommodate gravity flow into plant
- Ground conditions are similar at other Metro Vancouver treatment plants located near Fraser River
- Ground improvements provide stability
- Facilities will be built to applicable provincial and national codes
- Critical components will be built above flood control levels

MUSQUEAM INDIAN BAND

- Legacy of treatment plant and sewer pipe (Highbury Interceptor)
- Working collaboratively to develop the projects



Highbury Interceptor construction – late 1950s



Iona Island Wastewater Treatment Plant – 1963 opening

GOALS



Wastewater
Treatment

Resource
Recovery

Community and
Park Integration

REGULATORY REQUIREMENTS

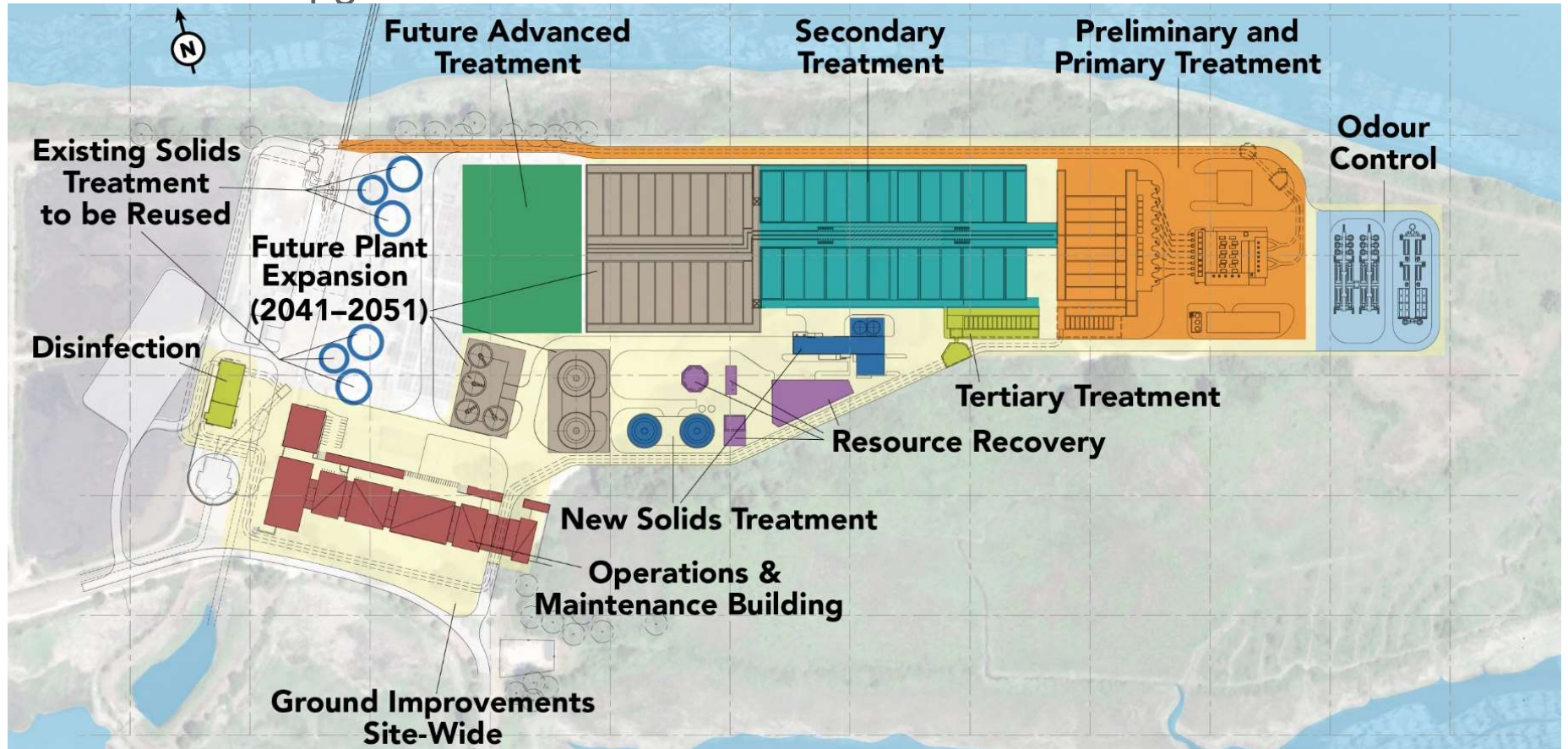
- Federal *Fisheries Act* Wastewater Systems Effluent Regulations
 - Lions Gate (North Shore) WWTP by 2020
 - Iona Island WWTP by 2030
- Provincial *Environmental Management Act*
 - Metro Vancouver's Integrated Liquid Waste and Resource Management Plan (2011)
 - Upgrade dates confirmed

Canada 



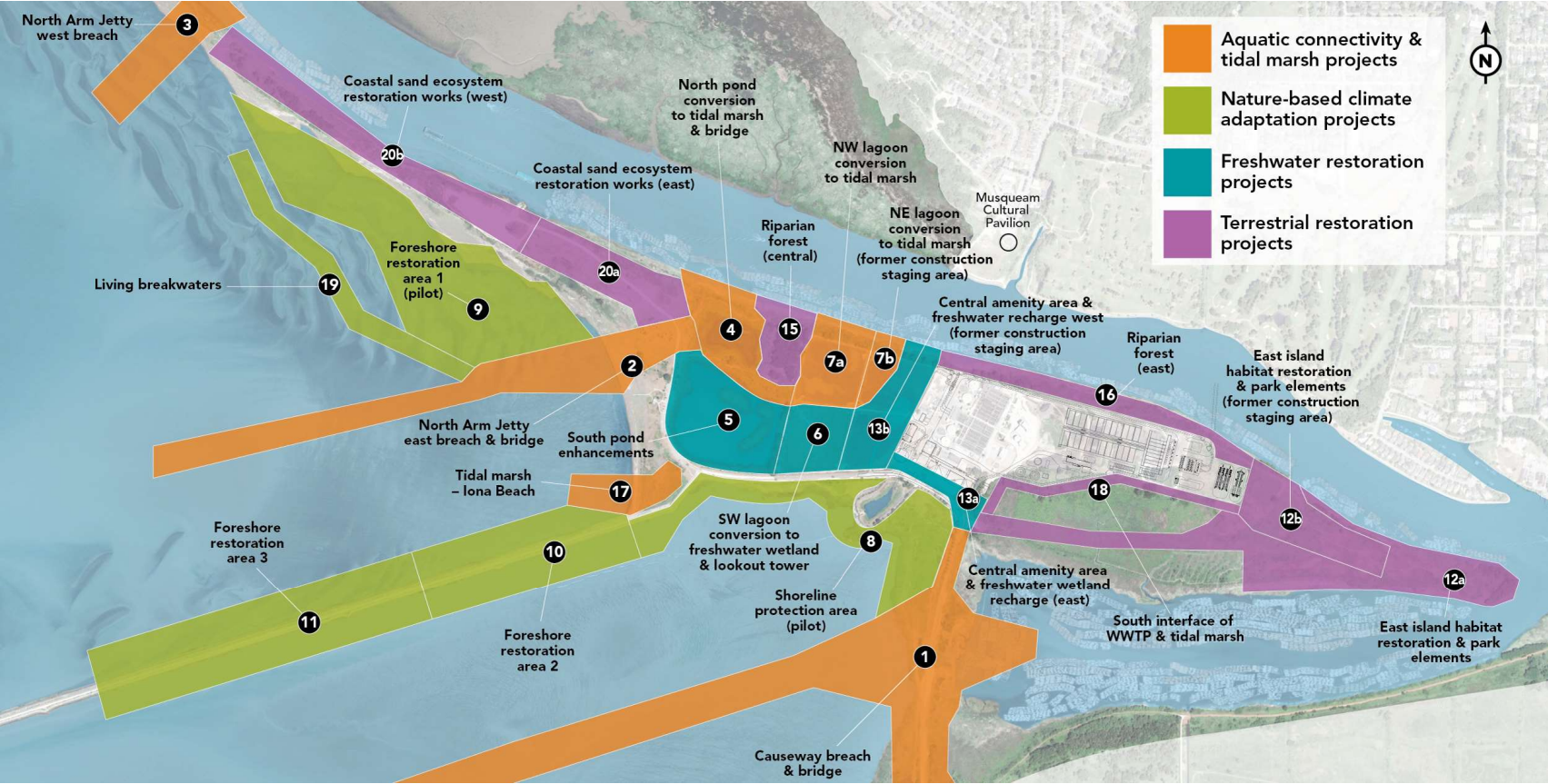
CONCEPTUAL DESIGN

Treatment Plant Upgrades

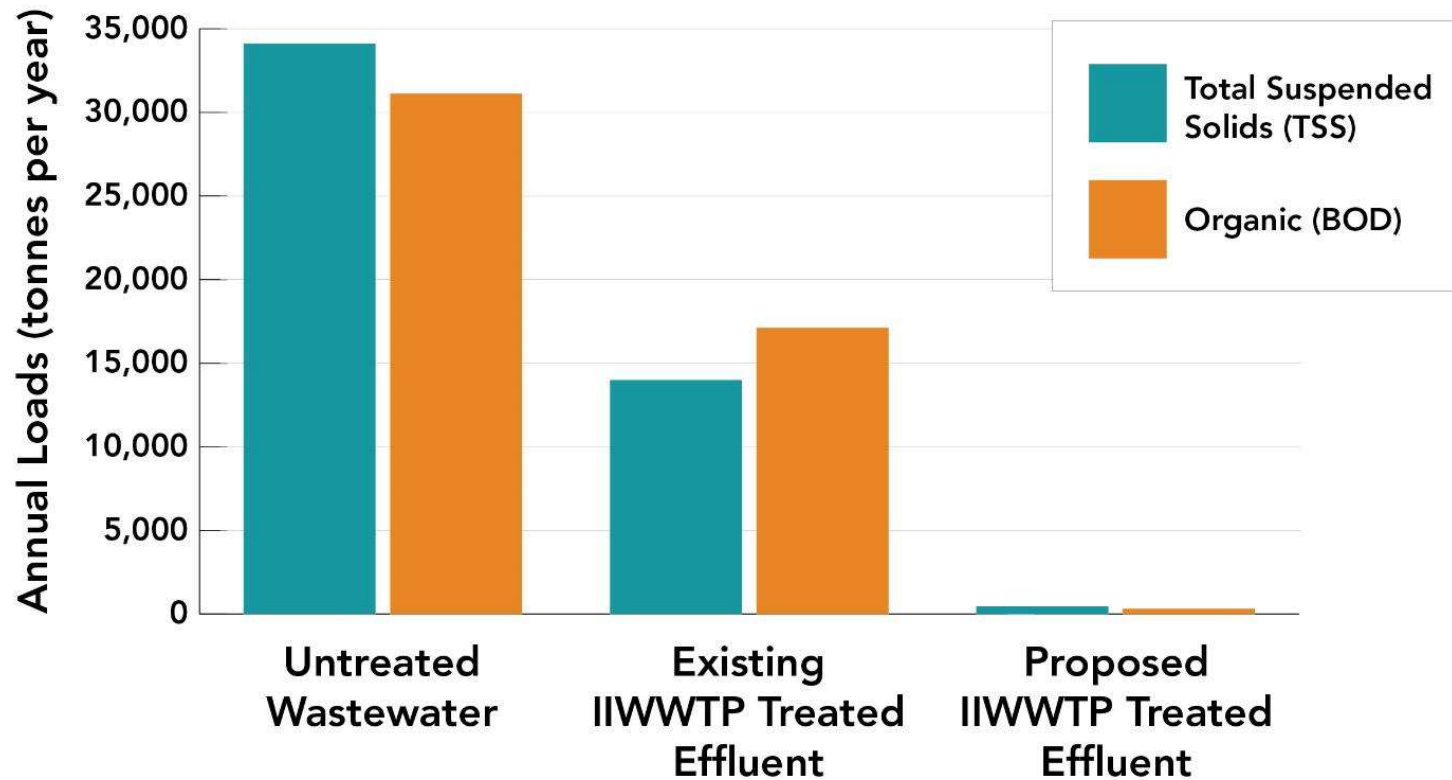


CONCEPTUAL DESIGN

Ecological Restoration and Park Projects



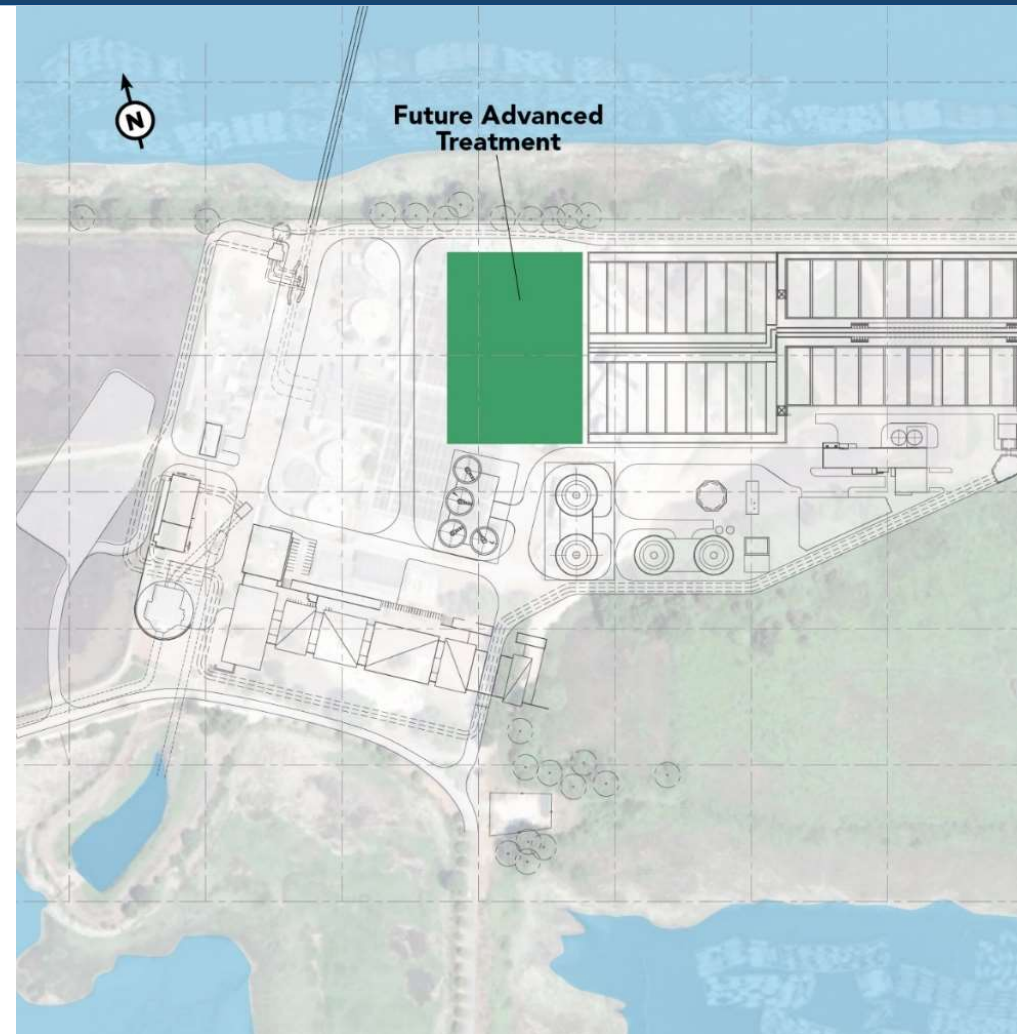
PROTECTING PUBLIC HEALTH & THE ENVIRONMENT



PLANNING FOR THE FUTURE

Preparing for future technologies and possible regulatory changes:

- Hydrothermal processing (HTP) pilot plant at Annacis Island treatment plant
- Delaying replacement of digesters at Iona
- Allocating space at Iona



Space allocated for future technologies and regulatory changes – Conceptual Design

CONTAMINANTS OF EMERGING CONCERN (CECs)

Wastewater sector has no control over chemicals entering its treatment systems, and the 'cocktail effect' of different substances remains a major knowledge gap.

What Metro Vancouver is doing:

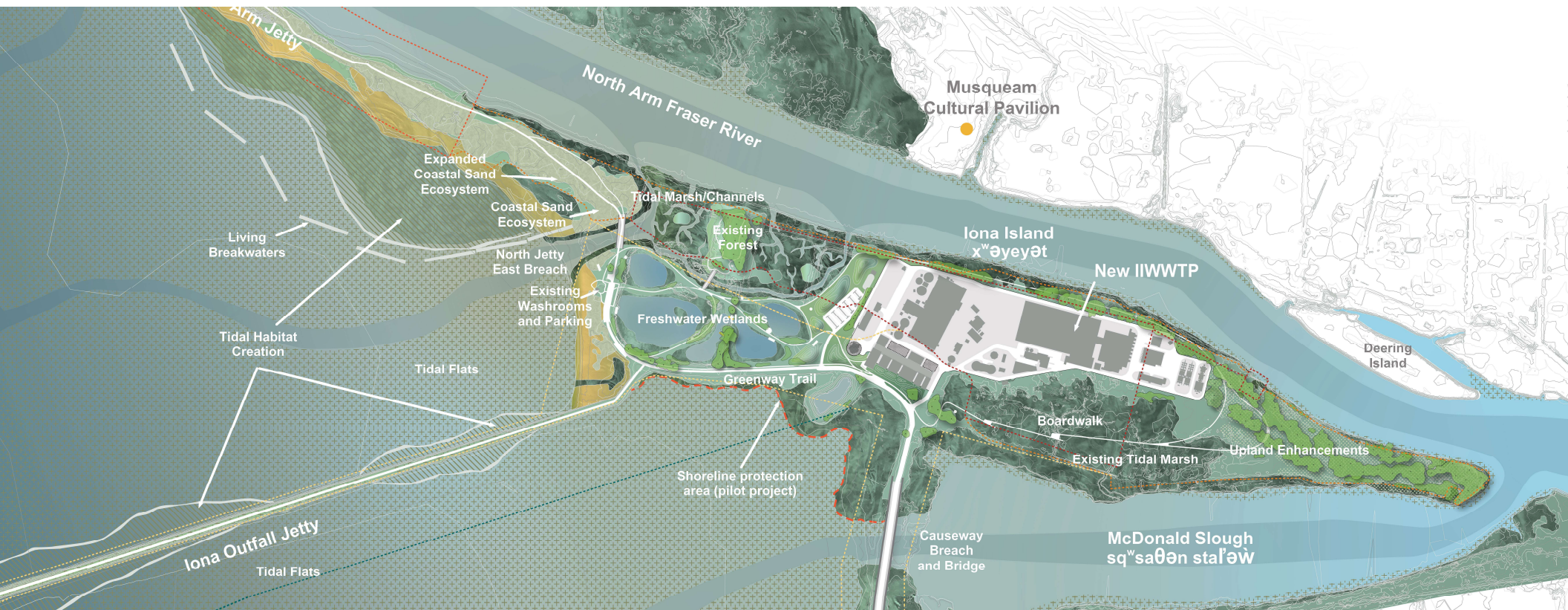
- Testing wastewater, biosolids, and receiving environment for selected CECs
- Participating in Environment and Climate Change Canada study on CECs
- Partnering with academic institutions on investigation of fate and effect of CECs on the receiving environment



Secondary treated wastewater (effluent)

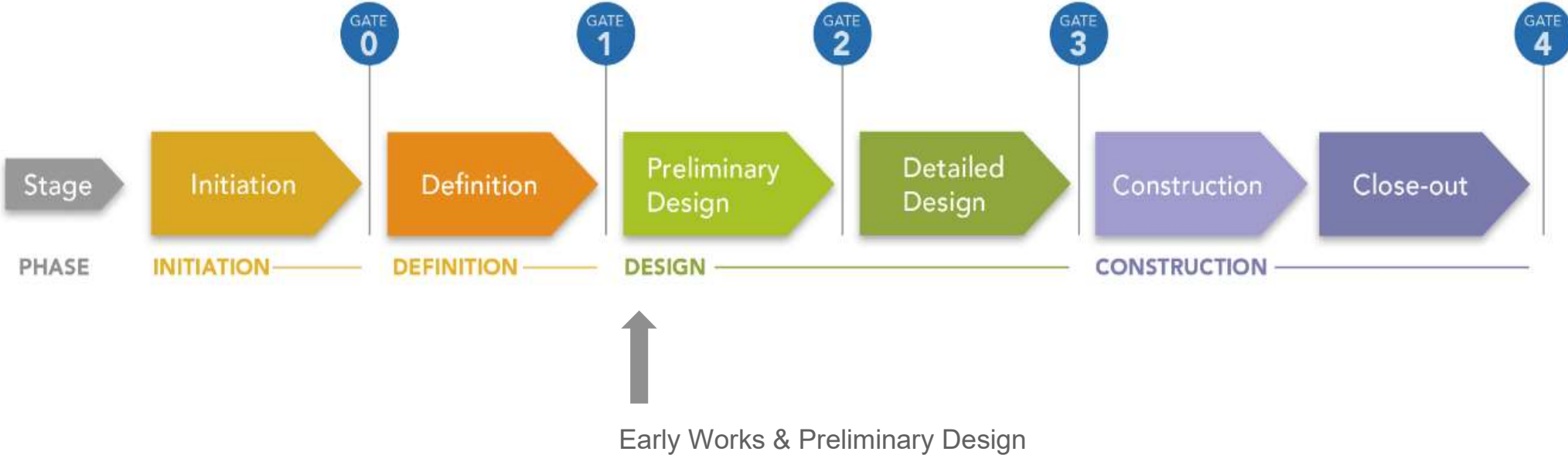
FINAL PROJECT SITE PLAN

After completion of plant upgrades, ecological projects and park integration

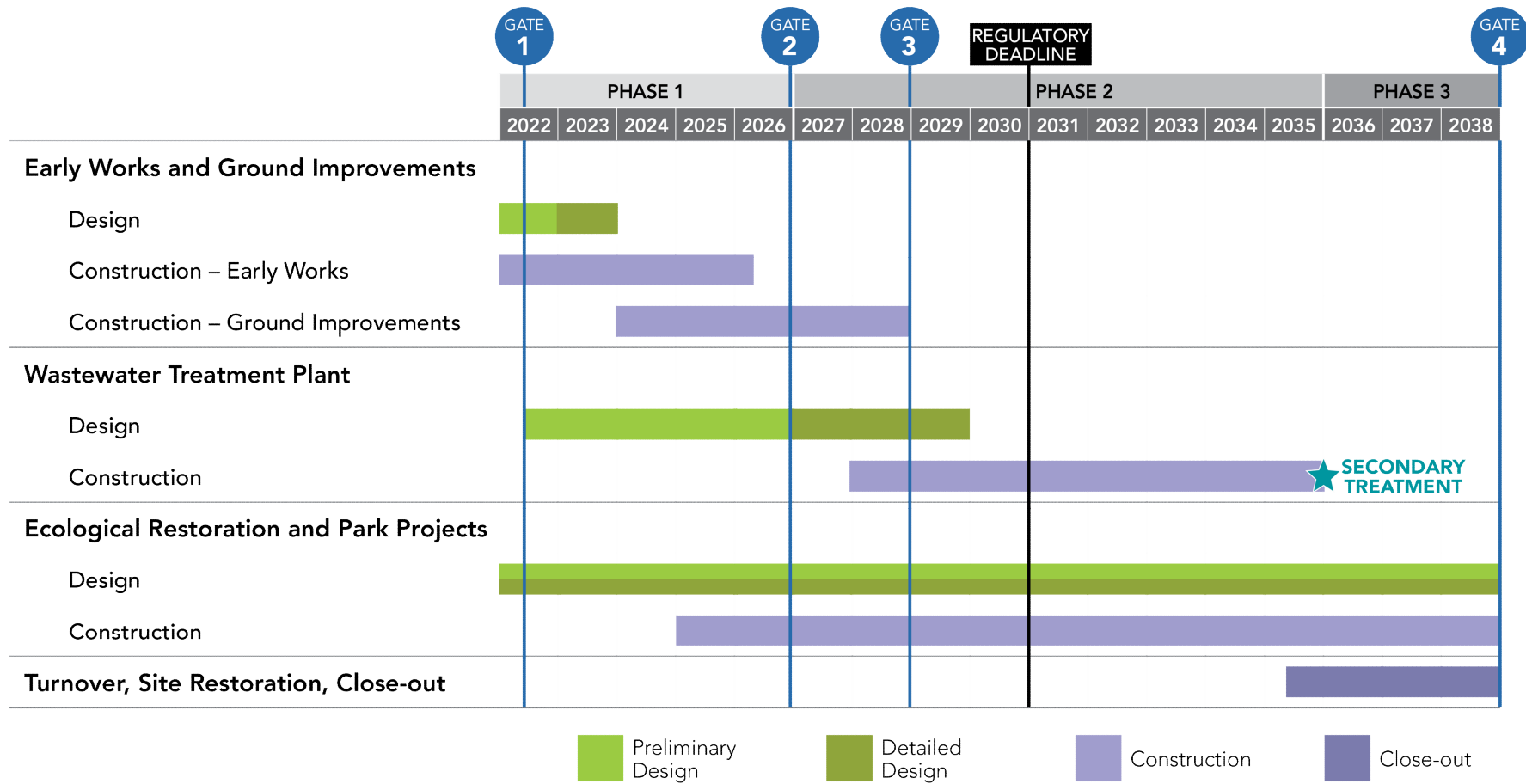


WHERE WE ARE

Stage Gate Process



DELIVERY SCHEDULE — OVERVIEW



PROJECTS UNDERWAY



CAPITAL COST ESTIMATES

Initial Design – 2021

Costs	Initial Design 2021		
Total Design & Construction Costs	\$6.9 B		
Total Cost Estimate (with escalation and risk reserve added)	\$10.6 B		





CAPITAL COST ESTIMATES

Revised Design – 2022 and Savings

Costs	Initial Design 2021	Approved Design 2022	Savings
Total Design & Construction Costs	\$6.9 B	\$6.4 B	7%
Total Cost Estimate (with escalation and risk reserve added)	\$10.6 B	\$9.9 B	6%

FUNDING STRATEGY

Combination of Approaches

		Source of Funding	Phase 1	Future Phases	Status/Comments
1.		Federal Government	\$250M	?	• Discussions underway
2.		Provincial Government	\$250M	?	• \$250M grant secured
3a.		Metro Vancouver	\$250M	?	• Grant Applications submitted/in progress for: <ul style="list-style-type: none"> - Salmon Restoration Fund - Disaster Mitigation and Adaptation Fund
3b.		Canada Infrastructure Bank	-	?	• Working with CIB on potential low interest debt opportunities
		TOTAL	\$750M	\$9,190M	

WORKING WITH CITY OF VANCOUVER STAFF

VSA staff and other meetings

Monthly meetings
(continuing in 2023)

Topics of interest:

- Impact to ratepayers and municipal budgets
- Long term financial plan
- Governance





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Thank you!

Questions?

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Together we make our region strong