Iona Island Wastewater Treatment Plant Projects

PROJECT DEFINITION UPDATE

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GVS&DD Board - July 30, 2021
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Greater Vancouver Sewerage and Drainage District

OUTLINE

1. How we got to here
2. Project definition
3. July 2020 Board-endorsed Design Concept
4. Challenges identified since July 2020
5. Addressing challenges

HOW WE GOT TO HERE

A brief video history of the Iona Island Wastewater Treatment Plant

PROTECTING PUBLIC HEALTH & THE ENVIRONMENT

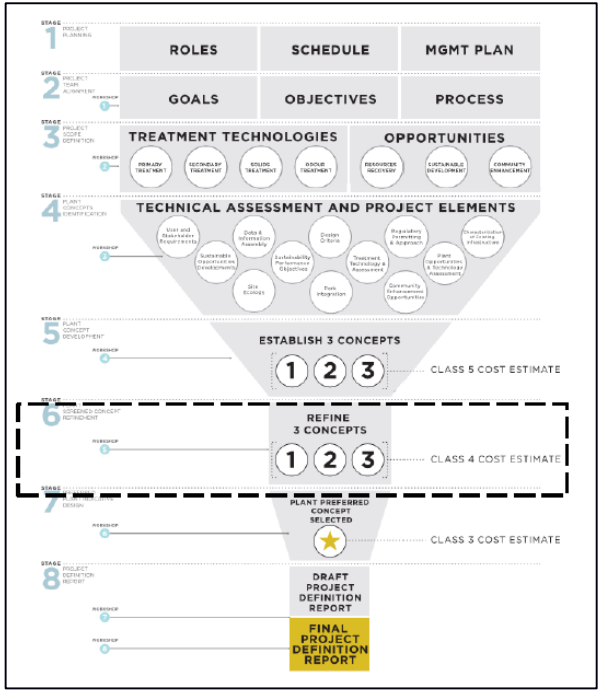
Project Definition

PROJECT DEFINITION GOALS

December 31, 2030 – Federal and Provincial Regulatory Deadline

PROJECT DEFINITION PROCESS

- Interdepartmental Metro Vancouver team
- Multi-disciplinary consultant team
- Integrated design process (8 workshops)
- Public and First Nations engagement
- Structured decision making (trade-off analysis – 3 concepts)



EVALUATION OF CONCEPTS – 2020

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
Net Energy Use	Medium	Low	High
Greenhouse Gas Emissions	Medium	Low	High
Capital Costs (2020 Dollars)	Highest	Lowest	Medium
Annual Operating Cost	Medium	Lowest	Highest

July 2020 Board-endorsed Design Concept

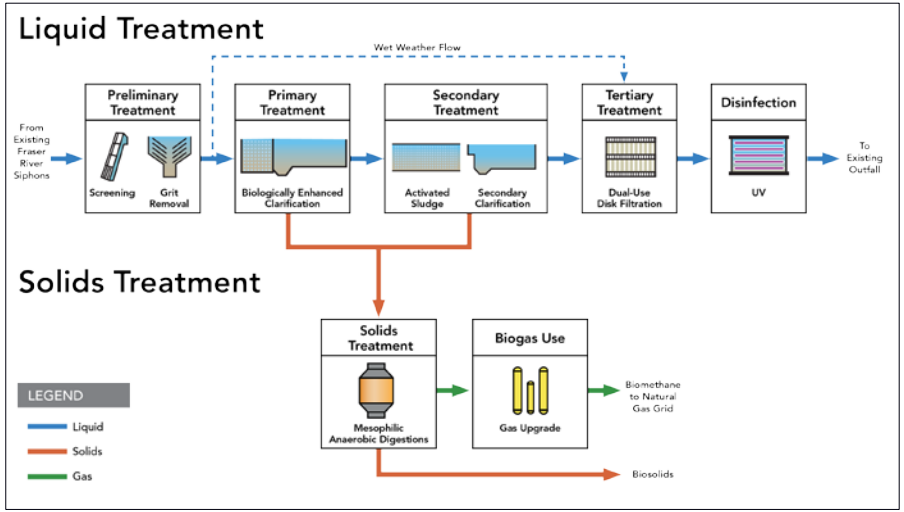
Greater Vancouver Sewerage and Drainage District

JULY 2020 BOARD-ENDORSED DESIGN CONCEPT

- Tertiary-level treatment (disk filtration), odour control, climate-change resiliency, adaptability to future technologies
- Further exploration of resource recovery opportunities
- Range of ecological projects

THE NEW TREATMENT PLANT

- Biologically enhanced primary treatment
- Activated sludge secondary treatment followed by clarification
- Tertiary filtration and UV disinfection
- Reuse of existing assets
- Effluent reuse for heat, district energy and reclaimed water
- Biogas upgraded to biomethane



RESOURCE RECOVERY OPPORTUNITIES

Inputs

Wastewater

Trucked Liquid Waste

Iona Island Wastewater Treatment Plant

Recovered Resources

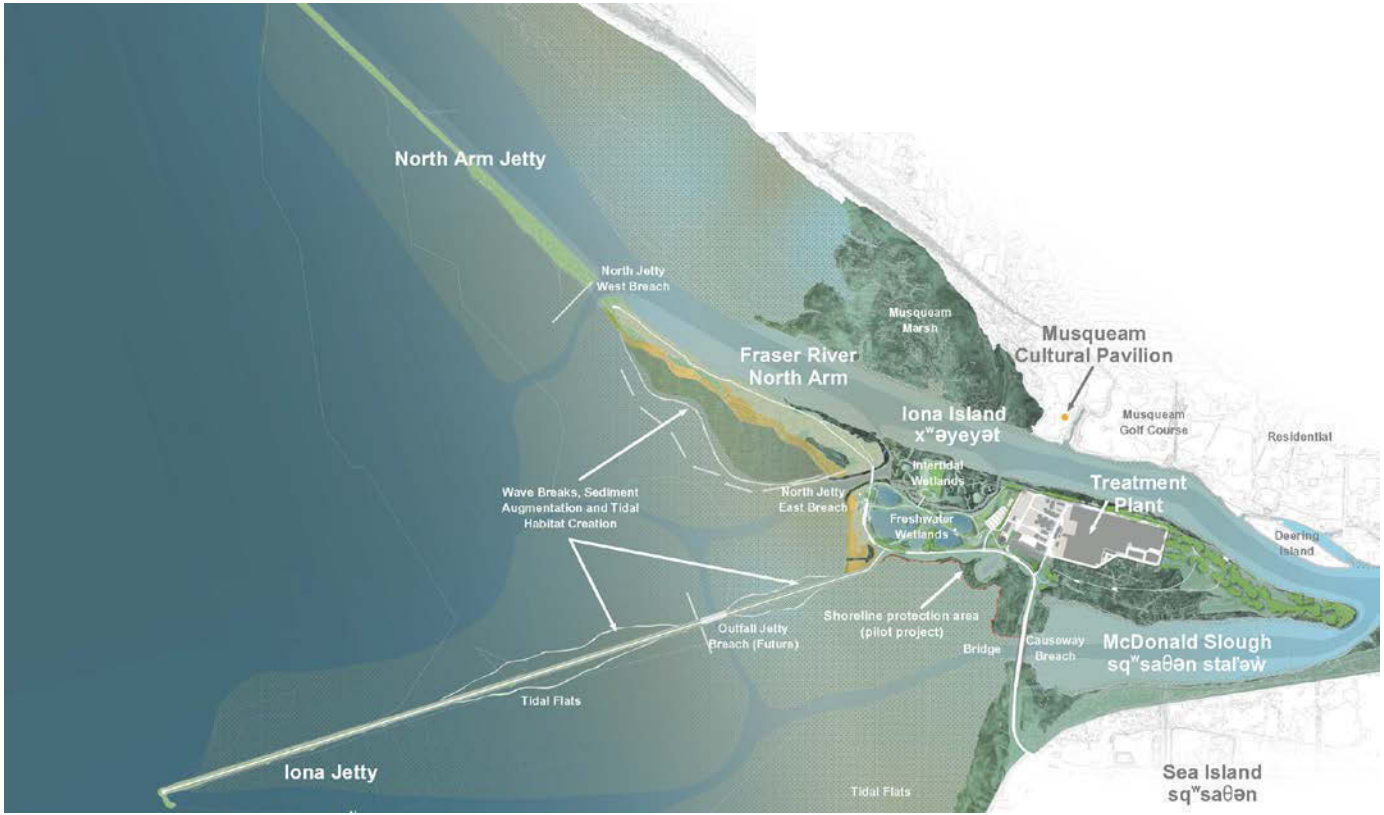
Reclaimed Water
(Onsite and Offsite use)

Effluent Heat Recovery
(Onsite heating needs and export to District Energy System)

Renewable Natural Gas
(Export to grid)

Biosolids
(Land application and low-carbon fuel)

THE ECOLOGICAL RESTORATION PROJECTS



Challenges identified since July 2020

TRANSITION TO DELIVERY

Focus shifted to:

- Advancing Design Concept
- Constructability review
- Off-site and enabling project requirements
- Delivery strategy and options
- Risk assessment
- Schedule refinement
- Class 3 cost estimates
- Applying new Metro Vancouver cost-estimating framework

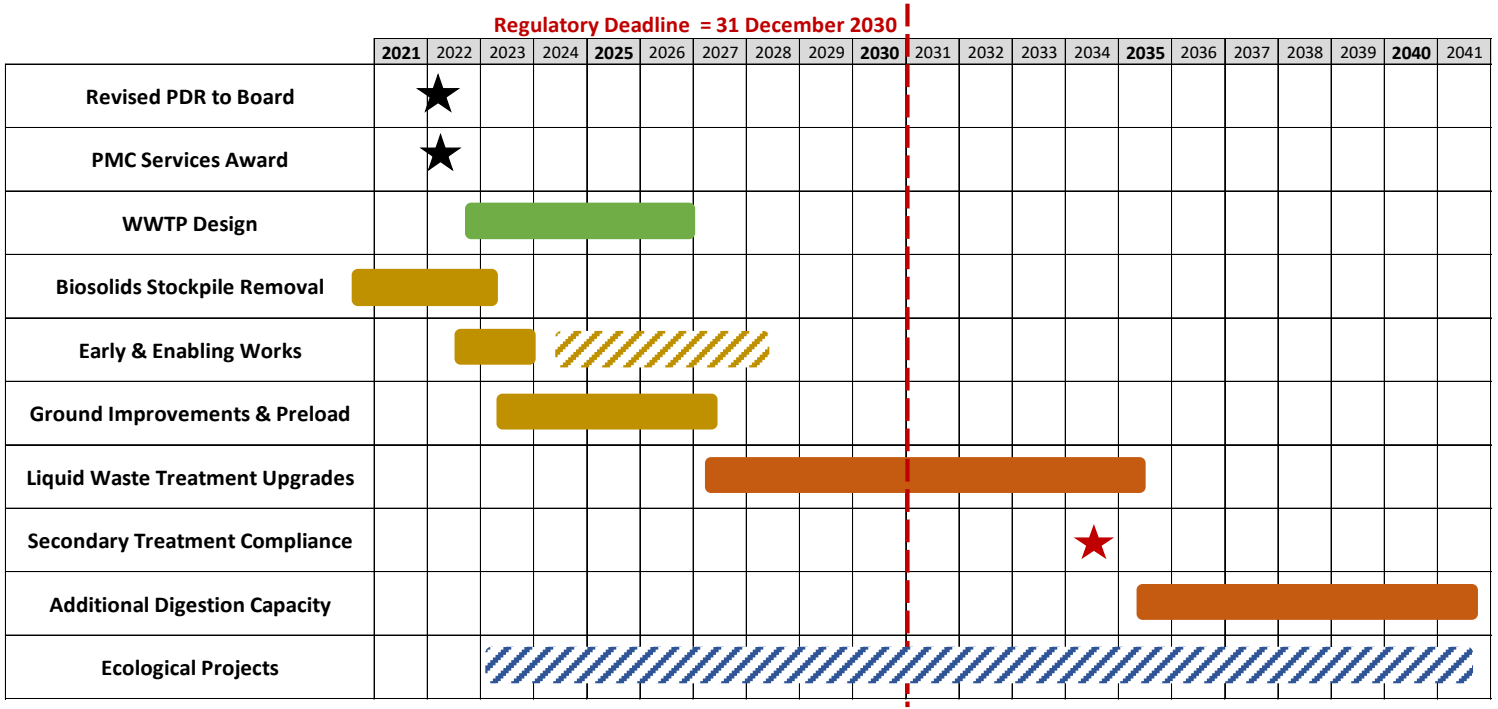
Possible crane locations (24) on a tight site

CHALLENGES

- Constructability
- Regional solids management
- Schedule constraints

Significantly higher than anticipated cost estimates

DESIGN CONCEPT DELIVERY SCHEDULE



DESIGN CONCEPT – PRELIMINARY COST ESTIMATE

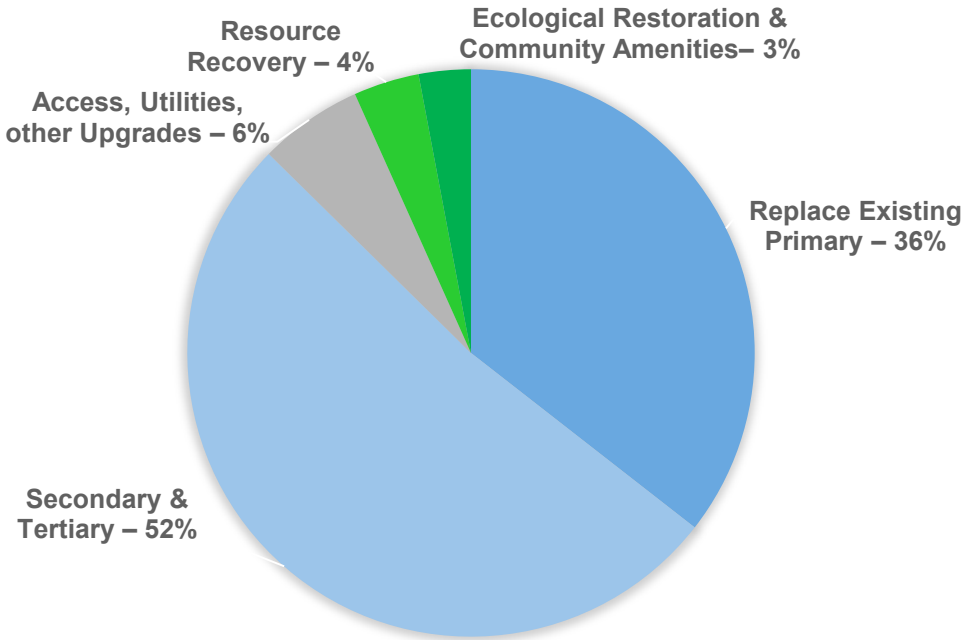
$ shown in billions

Total Project Costs (2021 dollars)	**$6.7**
Total Estimated Costs (over 20-year duration of projects including escalation and risk reserve)	**$10.4**
range - low	$8.7
range - high	$11.4

COST ESTIMATE BY PHASE – DESIGN CONCEPT

PHASE 1 2021 – 2025	PHASE 2 2026 – 2034	PHASE 3 2035 – 2042
$750 M	**$6.7 B**	**$3.0 B**
• Early works • Ground improvements • Access roads and utilities • Ecological projects	• Complete early works • Replace preliminary and primary liquid treatment facilities • Upgrade liquid stream to secondary/tertiary treatment • Re-use of existing solids treatment facilities • Ecological projects	• Two new digesters for extra sludge from liquid treatment process upgrades • Ecological projects

COST ESTIMATE BY KEY COMPONENTS



Ground improvements and seismic resiliency ~ 20% of total costs

PRELIMINARY HOUSEHOLD IMPACTS

July 2020 Design Concept

- Determining ratepayer impacts is challenging for such a complex, lengthy project
- Average impact on Vancouver Sewerage Area households, based on Design Concept costs and cash flows, estimated to be in the order of additional $400 to $500 annually, calculated on a present value basis
- Other sewerage areas in the order of an additional $60 to $115 annually
- Further analysis on financial impact will continue to be undertaken as project definition work continues to be refined

Addressing Challenges

VALUE ENGINEERING & ALTERNATIVES

Value Engineering – Challenge Review

- Blue-ribbon panel - subject matter experts not involved in project definition
- Challenge design concept to look for cost savings and value-added opportunities
- Revisit alternative technologies, site footprint and address constructability challenges

Development of a Revised Design Concept

- Further evaluation of options, incorporating value engineering findings
- Revised structured decision-making process
- Recommend a Revised Design Concept for Board consideration

Blue-Ribbon Panel

Roy Simm – Stantec
Ken Abraham – HDR
Viji Fernando – Golder
Frank Margitan (Rtd) – Kiewit
Jeff Plant – Major Projects Advisor
Pippa Brasher – Scape Studio
Brendan Avery – Francl Architecture
Shannon Katt – PMA Consultants
Ryan Ziels – UBC

PRIORITY DELIVERY ACTIVITIES

Critical activities – independent of ongoing evaluations – are continuing

- Removal of biosolids stockpiles and dewatering of sludge lagoons
- Geotechnical and environmental investigations
- Technical studies for ecological projects
- Wharf for materials transportation
- Addressing land tenure issues
- Permitting requirements
- Exploring synergies with other projects
- Updating member jurisdictions
- Finalizing agreements with Musqueam

WORKING WITH MEMBER JURISDICTIONS

- Monthly updates to VSA jurisdiction staff
- Council presentations, as requested
- Quarterly updates to FIC, LWC, Board
- Regular updates to REAC, RFAC and RAAC
- Ongoing engagement on resource recovery opportunities

RECONCILIATION THROUGH PARTNERSHIP

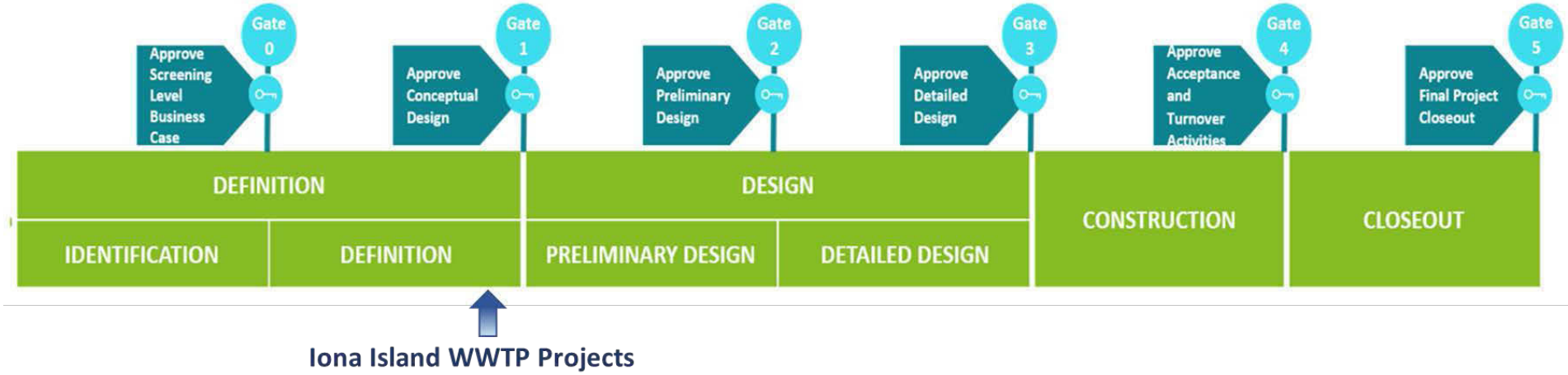
- Apprenticeship training
- Employment
- Procurement
- Economic partnerships and development opportunities

PUBLIC AND FIRST NATIONS ENGAGEMENT

Fall 2021

- Provide project update
- Engage on aspects of the projects that could potentially be revised
- Key stakeholders, public, First Nations
- Report findings to committees and Board in November

STAGE GATE PROCESS



COMMITTEE & BOARD REPORTING

Nov 2021
FIC/LWC/Board

To present:
- Value engineering outcomes
- Results of options evaluation
- Recommended revised design concept

Recommendation: Approve revised design concept; staff to finalize PDR with refined schedule and budget

Early 2022
FIC/LWC/Board

To present:
- Final PDR
- Revised design concept w/ Class 3 cost estimates/budget, schedule, and delivery strategy

Recommendation: Approve indicative design and budget

WHAT SUCCESS LOOKS LIKE

Successful delivery of the IIWWTP projects over the next 20 years will:

- Provide reliable tertiary wastewater treatment for generations to come
- Enhance protection of human health and the marine environment
- Significantly improve water quality in the Salish Sea and Fraser River estuary
- Enhance protection of salmon and southern resident killer whales
- Meaningfully integrate Musqueam cultural values and interests
- Stimulate the local economy through job creation

Provide these far-reaching benefits in a financially responsible manner

REGIONAL ADMINISTRATORS ADVISORY COMMITTEE

Motion – July 22, 2021

RAAC expresses concern about proceeding with the project in the absence of more certainty with respect to senior government funding.

Discussion

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Together we make our region strong