Stage 3 Liquid Waste Management Plan (LWMP)

TACPAC Meeting #12
December 2, 2024

Please Note: Workshop will be recorded and posted to the CVRD website

Comox Valley
REGIONAL DISTRICT

The Comox Valley Regional District respectfully acknowledges the land on which we gather is on the unceded traditional territory of the K’ómoks First Nation, the traditional keepers of this land.

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Agenda

1. Introductions
2. Review of Sewer Service
3. Summary of LWMP Process and Decisions Made to Date
4. How the South Addendum LWMP Fits
5. Work Underway- Stage 3 LWMP Scope
6. Next Steps and TACPAC Engagement

Today's objectives
Bring new members up to speed
Refresh & update existing members on work underway

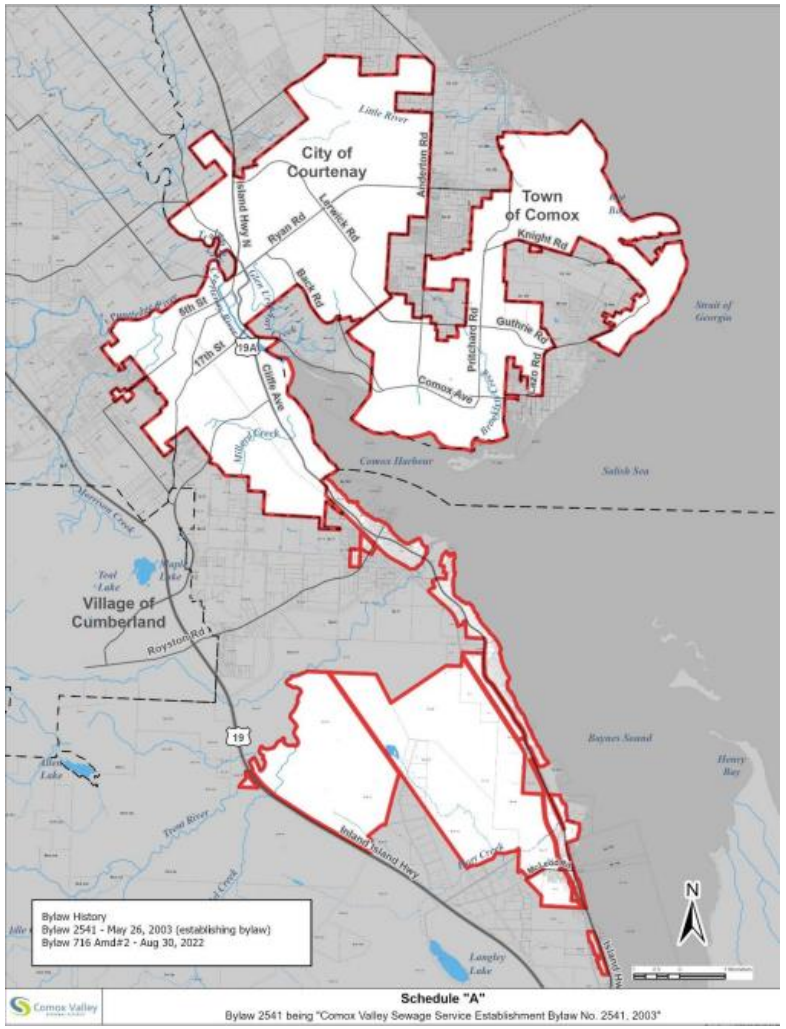
Comox Valley Sewer Service

Purpose: Transmission, treatment and disposal of wastewater

Participants: Town of Comox, City of Courtenay, Department of National Defence and K'ómoks First Nation IR#1

Governance: Sewage Commission, Sewer Advisory Committee

Operations: 14 operators working from two location



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History

Prior to 1984

- Courtenay: primary effluent to estuary
- Comox: untreated wastewater to estuary
- DND: primary discharge to Queen's Ditch

1984

- Pump station & conveyance system
- Comox Valley Water Pollution Control Centre
- Ocean outfall

1999

- Biosolids composting facility & 1st stage odour control

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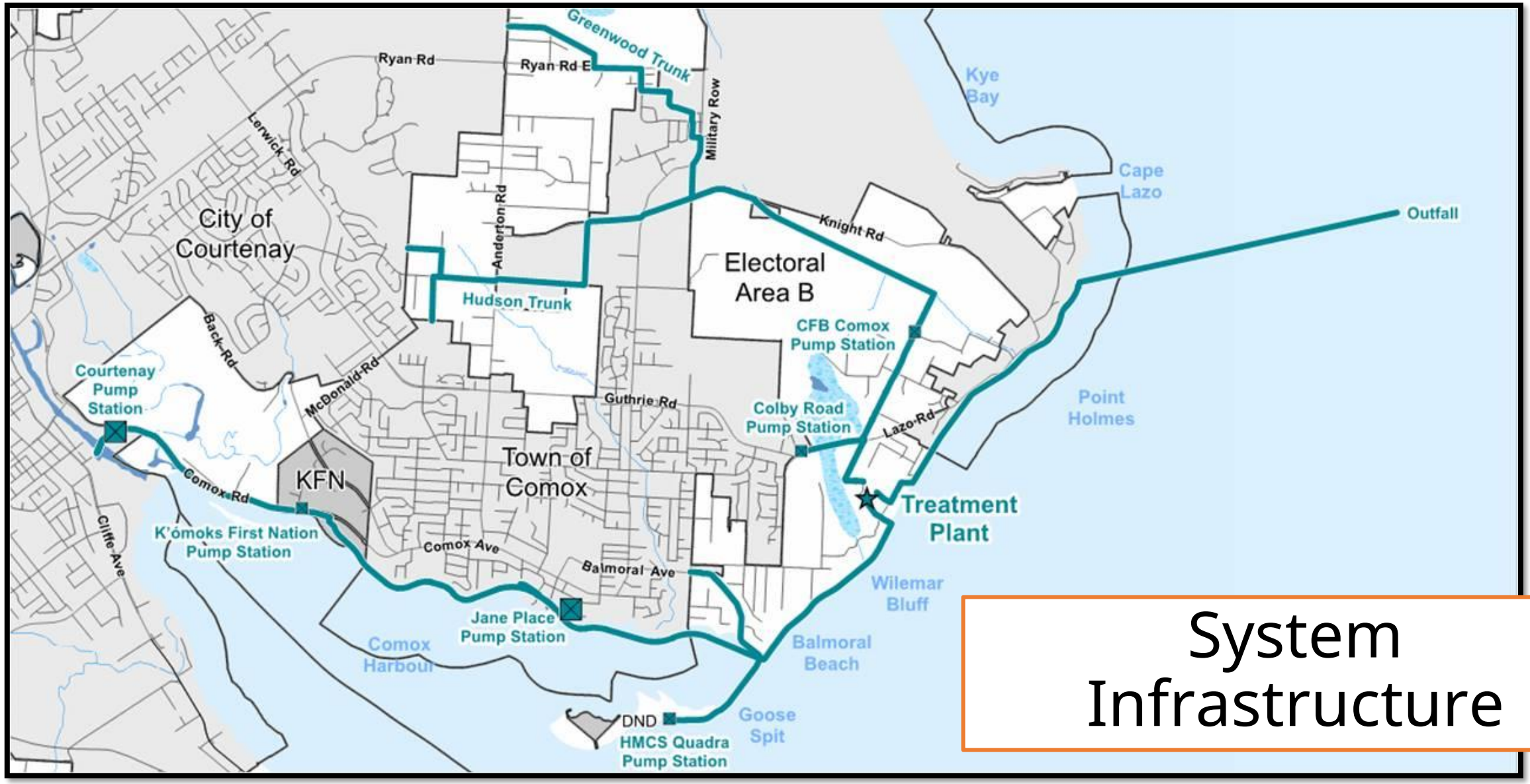

System Infrastructure

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Comox Valley Water Pollution Control Center (CVWPCC)

- Sewer system operations center
- Secondary treatment all flows
- Gravity outfall to the Georgia Straight
- EQ basin added to existing effluent storage basin in 2018 to help manage wet weather flows
- Odour control system
- Solids residuals to offsite composting facility

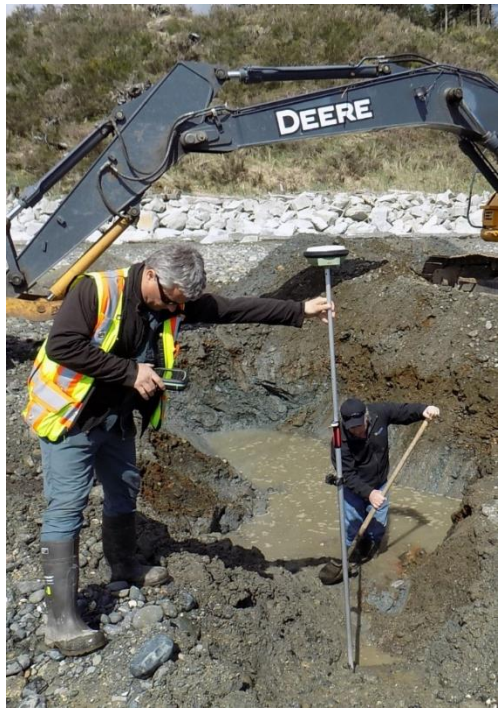
CVWPCC Challenges

- Redundancy requirements under MWR
- Plant age (constructed 1980’s)
- Peak wet weather flows
- Capacity to accommodate accelerating community growth
- Changing environmental regulations
- Solids residuals management
- Proximity to residential properties

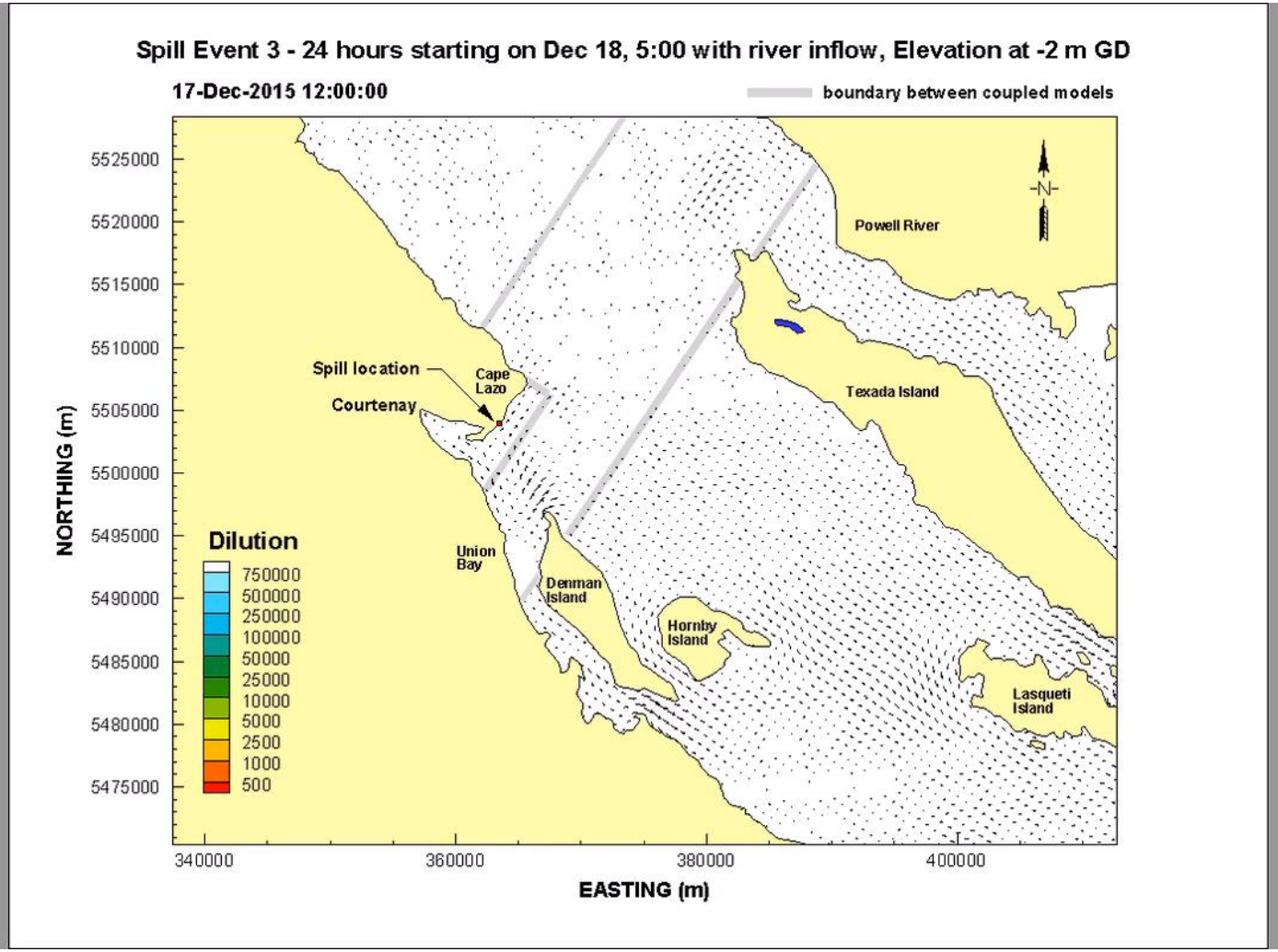
Conveyance Challenges: Time to Act

Exposed forcemain

Gabion baskets



Risk/condition assessment



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Review of LWMP Process & Decisions Made

WSP

CVSS Stage 1&2 LWMP Review

Michael Desilets, P. Eng., PMP
Principal Engineer
Water and Wastewater Treatment and Facilities
WSP Canada Inc.

Outline

1. LWMP Process Overview
2. Stage 1&2 LWMP Overview
3. Stage 1&2 Wastewater Treatment Options
4. Stage 1&2 Resource Recovery Options
5. Stage 1&2 Conveyance Options
6. Stage 1&2 LWMP Summary

LWMP PROCESS OVERVIEW

Purpose and Objectives of a LWMP

- LWMP is an economical and effective method of providing a comprehensive plan for building, financing, and managing a community's liquid waste
- Completed through multi-year planning, engineering, and public consultation process to develop long-term community-specific solutions

Regulatory Context

Key Authorizations

- BC Environmental Management Act allows local governments to develop a Liquid Waste Management Plan (LWMP) for approval by the Minister of Environment
- Approved LWMP, through provisions of EMA provide the necessary authorizations through the issuance of Operational Certificates
- Approved LWMP through provisions of EMA also allow local governments to borrow money without the approval of electors for implementation of an approved LWMP

Key Requirements

- The LWMP must demonstrate that an adequate process for comprehensive review and consultation with the public is provided - EMA Section 27(1)(2).
- The LWMP must comply with the governing regulations respecting the management of municipal liquid waste - EMA Section 24(1).
- The Ministry will also consider satisfaction of the “Interim Guidelines for the preparation of Liquid Waste Management Plans” in approval of the LWMP.


This Act is current to November 26, 2024

See the Tables of Legislative Changes for this Act's legislative history, including any changes not in force.

ENVIRONMENTAL MANAGEMENT ACT

[SBC 2003] CHAPTER 53

Part 1 — Introductory Provisions

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Environmental Management Act

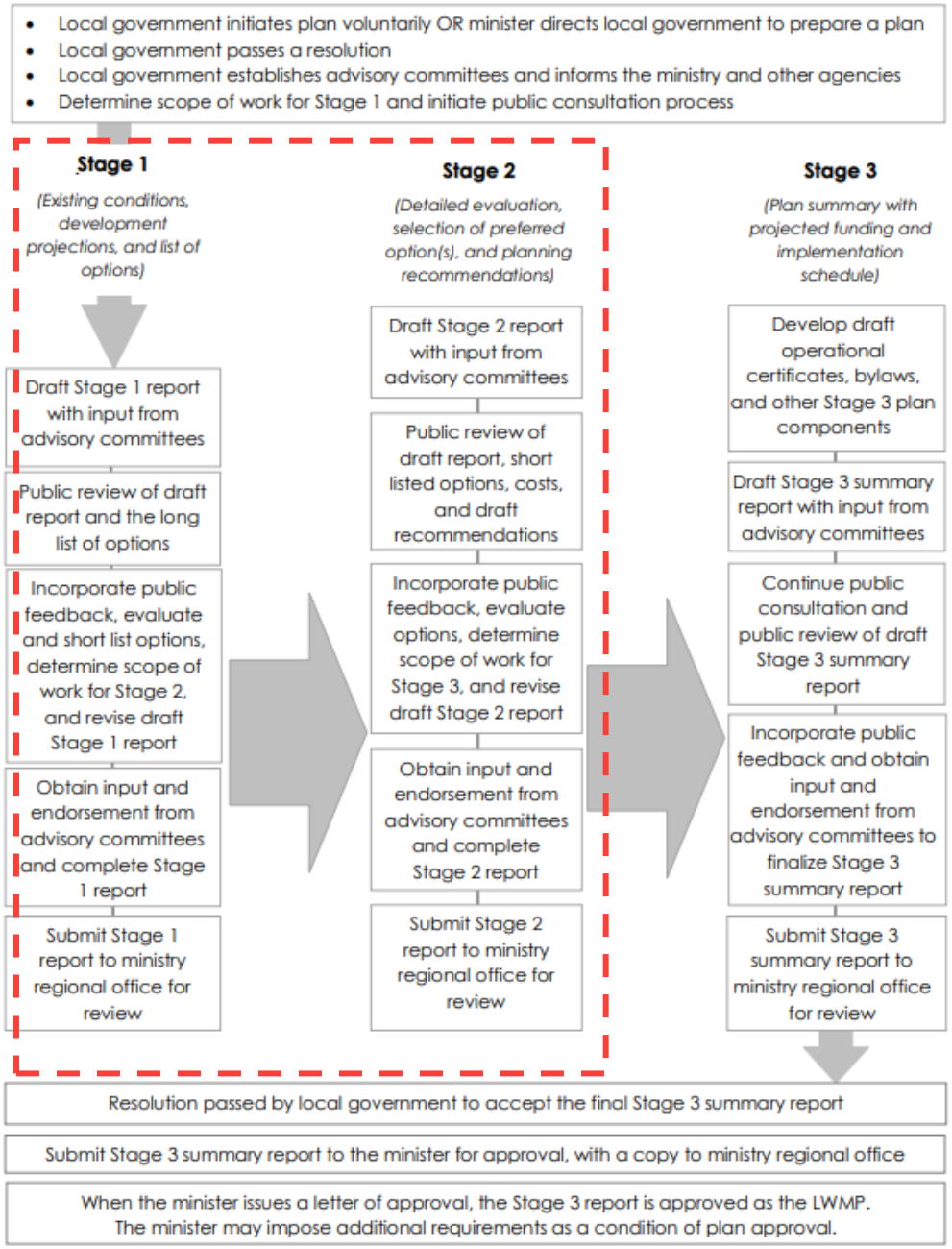
MUNICIPAL WASTEWATER REGULATION

B.C. Reg. 87/2012

INTERIM GUIDELINES FOR PREPARING LIQUID WASTE MANAGEMENT PLANS

BRITISH COLUMBIA | Ministry of Environment

LWMP Process



Stage 1&2
LWMP Overview

Stage 1&2 LWMP Focus

- Facilitate a decision on required upgrades to the regional conveyance system
- Develop options for upgrades to the Comox Valley Water Pollution Control Centre
- Advance solutions within a rigorous framework of stakeholder and rightsholder consultation to inform each stage of decision making.

Stage 1&2 LWMP Scope

- Definition of Plan Area and Regulatory Requirements
- Review Historical Information and Design Criteria
- Establishment and Implementation of TACPAC
- Establish Goals and Objectives
- Long List Options Development
- Short List Options Development and Evaluation
- First Nations Consultation
- Public Consultation

Planning Components

Consultation Framework

Objectives and Goals

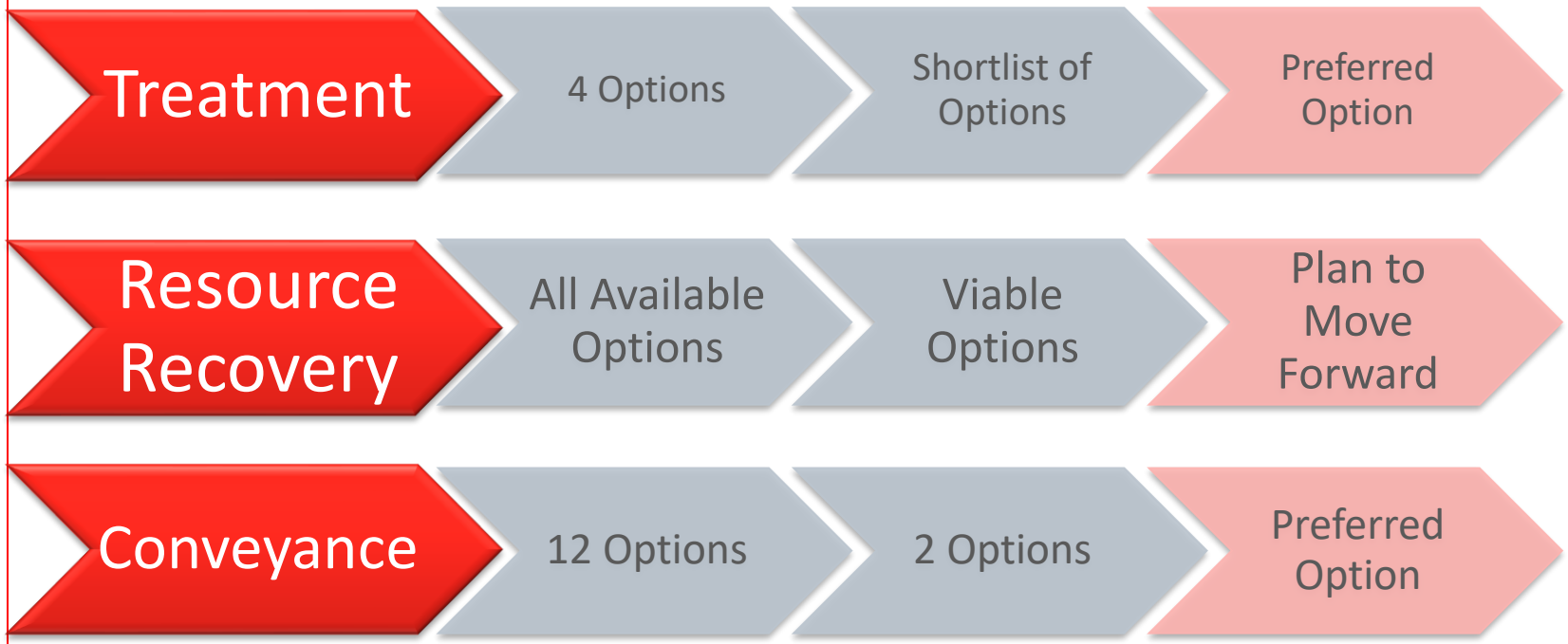
Options Development

Options Development

Evaluation

Consultation

Main LWMP planning components:



The “best” option is the one that achieves all the objectives and as many of the goals as possible

Community Specific Goals and Objectives

Categories:

1. Technical
2. Affordability
3. Economic Benefit
4. Environmental Benefit
5. Social Benefit

Developed in consideration of:

Public feedback themes

- Concern about negatively impacting the environment
- Importance of long-term planning
- Importance of moving forward quickly due to risks of ageing infrastructure.

CVRD Major Planning Documents

- Official Community Plan
- Regional Growth Strategy
- Comox Valley Sustainability Strategy

Regulatory Requirements

- Municipal Wastewater Regulations
- Provincial Objectives for LWMPs

Stage 1&2 LWMP Wastewater Treatment Options

Wastewater Treatment Options

Focused on deciding the level of treatment and capacity for future upgrades

Stage 1 Wastewater Treatment Options

- Development of Design Criteria
- Conceptual Development of Long List Options
- Development of Goals and Evaluation matrix
- Approval of Long List Options
- Review and Evaluation of Long List Options

Stage 2 Wastewater Treatment Options

- Selection of Short List Options
- Further Development of Short List Options
- Considered capacity assessment of existing CVWPCC
- Development of Capital Cost Estimates
- Included additional option of providing reclaimed water for in-plant use (applicable to all options)
- Selection of Preferred Treatment Option

Wastewater Treatment Options

Final Goal and Evaluation Matrix – Treatment

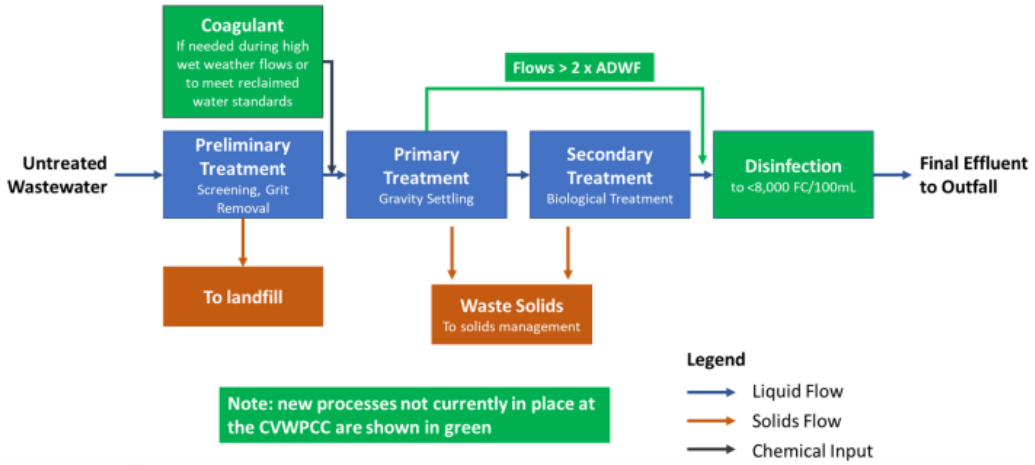
Category	Goals	Weighting%
Technical	Resilience to External Factors	10
	Resilience to Internal Factors	15
	Flexibility to accommodate future changes	5
Technical Total		**30%**
Affordability	Minimize Lifecycle Cost	30
Affordability Total		**30%**
Economic Benefits	None	0
Economic Total		**0%**
Environmental Benefits	Quality of treatment exceeds current standards	15
	Remove artificial contaminants	5
	Mitigate climate change impacts	5
Environmental Total		**25%**
Social Benefit	General social benefit	15
Social Total		**15%**
Grand Total		**100%**

Wastewater Treatment Options

Treatment of Flows Up to 2xADWF

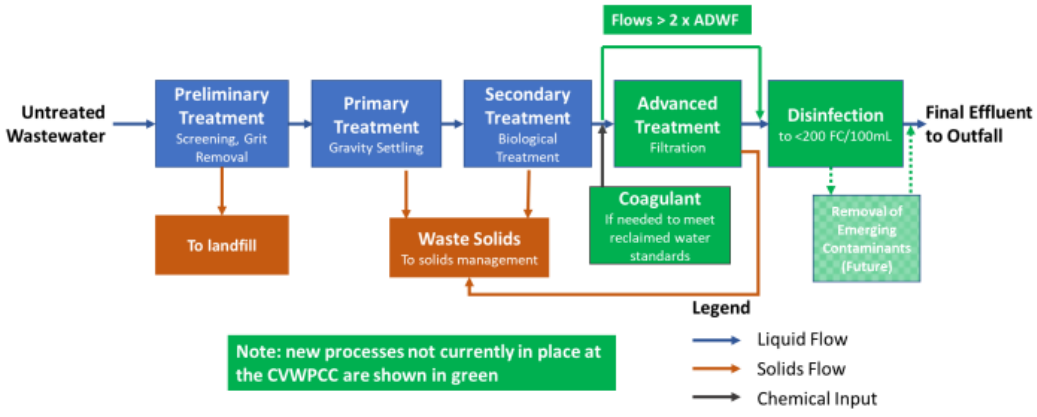
Secondary Treatment + Disininfection

1



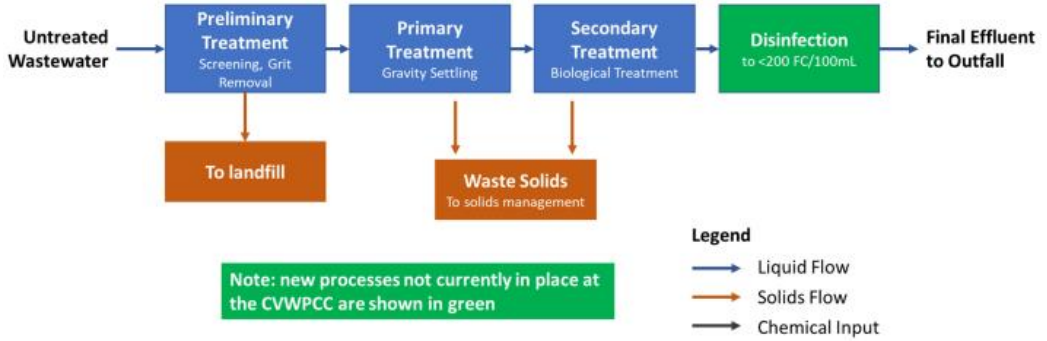
Advanced Treatment + Disininfection

3



Treatment of All Flows

2



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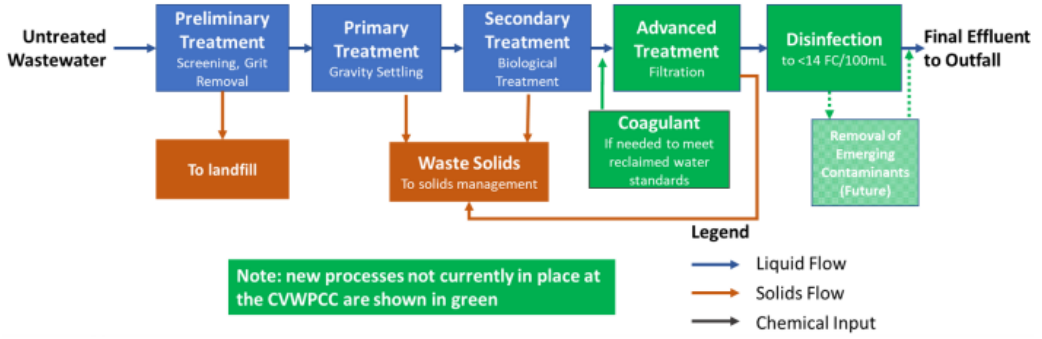
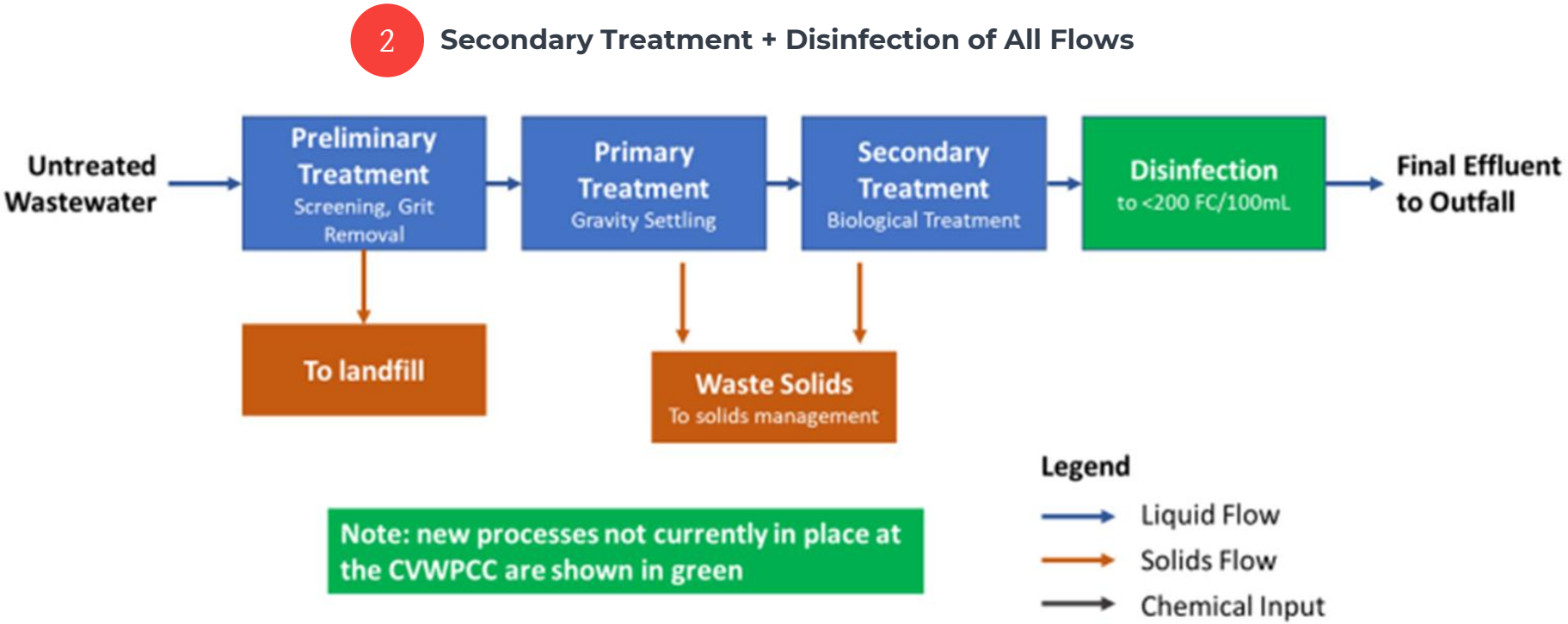


Wastewater Treatment Options

Wastewater Treatment Options Evaluation

- Advanced treatment not currently regulatory requirement
- Cost for advanced treatment &8M -$11M more than secondary treatment
- Option 2 selected with provision to implement options for advanced treatment if and when required
- Recommended further design/planning, condition assessment, and site studies to inform upgrade definition and costs



Stage 1&2 LWMP Resource Recovery Options

Resource Recovery Options

Focused on determining viable options and plan to move forward for decision making

- Development of Long List Conceptual Options
- Consideration of discretionary nature of resource recovery
- Consideration of multiple or no options
- Consideration of option feasibility dependent on scale
- Approval of Long List
- Evaluation of Long List
- Recommendations for next steps

Resource Recovery Options

- Option 1 – Reclaim Water
- Option 2 – Heat Recovery
- Option 3 – Biogas Production
- Option 4 – Beneficial Use of Biosolids
- Option 5 – Nutrient Recovery
- Option 6 – Outfall Hydroelectricity Generation

Resource Recovery Options

Final Goal and Evaluation Matrix – Resource Recovery

Category	Goals	Weighting%
Technical	Commercially available technology	10
	Resiliency to internal factors	5
	Anticipate future demand for resources	5
	Improve performance of treatment plant	5
Technical Total		**25**
Affordability	Maximize revenue or cost offset	10
	Minimize life cycle cost	20
	Potential for Grant Funding	10
	Potential for external partnerships	10
Affordability Total		**50**
Economic Benefits	Grow the local economy	5
Economic Total		**5**
Environmental Benefits	Energy efficiency and GHG reductions	5
	Habitat restoration or enhancement	5
	Displacement of potable water	5
Environmental Total		**15**
Social Benefit	Ability to maintain irrigation of critical public facilities during drought conditions.	5
Social Total		**5**
Grand Total		**100%**

Resource Recovery Options

Resource Recovery Options Evaluation

- Outfall hydroelectricity generation not viable due to head limitations
- Nutrient Recovery not viable due to scale and treatment processes currently in use
- Biogas production currently not feasible due to scale and treatment processes currently in use
- Implementation of heat recovery at CVWPCC potentially viable for future upgrades
- Current production of Class A compost (SkyRocket) provides beneficial reuse and should continue
- Off-site reclaimed water use not currently feasible. On-site reclaimed water is the most practical and viable resource recovery option
- Decision to undertake analysis/business case for reclaimed water use at the CVWPCC as part of Master Plan
- Further assessment and decisions will be in the future as part of Master Plan / Stage 3 LWMP.

Stage 1&2 LWMP Conveyance Options

Conveyance Options

Focused on deciding the best route and associated construction methods for replacement of existing foreshore conveyance system between the Courtenay PS and the CVWPCC

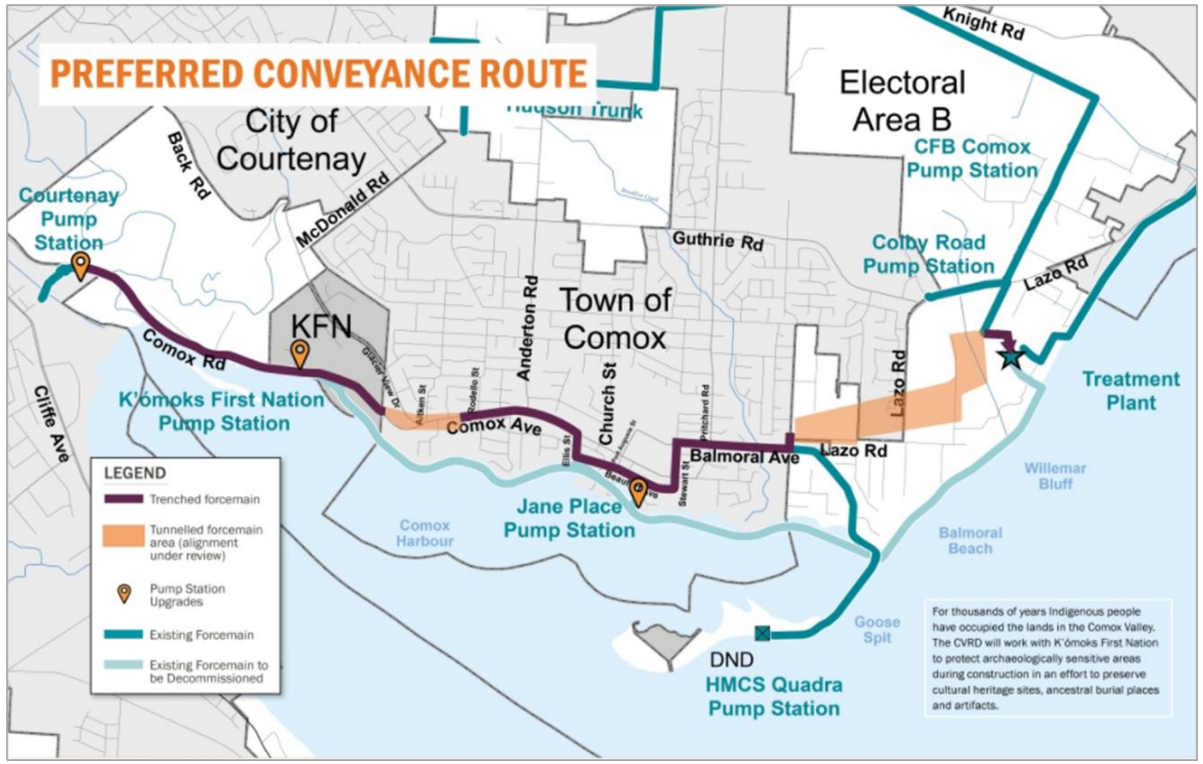
- Stage 1 Conveyance Options – Long List
- Stage 2 Conveyance Options - Short List
- Option Evaluation
- Selection of Preferred Conveyance Option

Proposed Final Goal and Evaluation Matrix – Conveyance

Component	Conveyance	
Category	**Proposed Revised Goals**	**Proposed %**
Technical	Resilience to External Factors	15
	Resilience to Internal Factors	15
	Long term solution	10
	Flexibility to accommodate future changes	5
Technical Total		**45%**
Affordability	Minimize Lifecycle Cost	14
	Long Term Value	4
	Attract Grant Funding (evaluate to offset capital cost)	0
Affordability Total		**18%**
Economic Benefits		0
Economic Total		**2%**
Environmental Benefits	Minimize risk of impacts to sensitive environment	12
	Mitigate climate change impacts (Energy, and GHG's)	6
Environmental Total		**18%**
Social Benefit	Minimize noise, odour and visual impacts in operation	10
	Minimize community disruption during construction	3
	Maximize community and recreational amenity value	4
Social Total		**17%**
Grand Total		**100%**

Conveyance Options

- Option 2 combination trenching/tunnel option completed in single phase selected as preferred Conveyance Option
- Conveyance upgrades identified as the biggest priority to address the urgent environmental risk
- The conveyance project was broken out of the LWMP process to fast-track implementation
- CVRD entered an Alternate Approval Process (AAP) to obtain authorization for borrowing to finance the conveyance project
- The AAP was conducted between May and July 2021, and borrowing was approved on July 8, 2021.



Stage 1&2 LWMP Summary

Summary of Key Decisions and Recommendations

Wastewater Treatment & Resource Recovery

- Begin the process of applying for an Operational Certificate (OC) during Stage 3 LWMP
- Complete updated Environmental Impact Study (EIS) to support the OC application
- Upgrades to the conveyance system and the CVWPCC should include additional flows and loads from the South Region
- Secondary treatment for all flows with the addition of effluent disinfection was selected as the preferred treatment option
- Master Plan to be completed to develop the basis of design for the plant expansion and privde required implementation schedule/details and costs for Stage 3 LWMP
- Master Plan to further consider on-site reclaimed water use and other potentially viable resource recovery options

Summary of Key Decisions and Recommendations

Outfall

- Inspections of the outfall have revealed surface corrosion and some areas where the concrete encasement has separated from the pipe.
- The capacity of the outfall is a concern during high tide/high wastewater flow conditions.
- An effluent storage and equalization basin are in use to prevent overflows, but there are concerns that increasing wastewater flows may lead to overflows
- Upgrading or replacement of the outfall will be required by the year 2030
- Upgrades including a new outfall pipe with pumped assistance was recommended for future flows

Summary of Stage 1&2 LWMP Key Decisions and Recommendations

Conveyance

- Option 2 combination trenching/tunnel option completed in single phase selected as preferred Conveyance Option
- Conveyance component was removed from the LWMP process to fast-track implementation.
- The CVRD entered an Alternate Approval Process (AAP) to obtain authorization for borrowing to finance the conveyance infrastructure upgrades
- The AAP was conducted between May and July 2021, and borrowing was approved on July 8, 2021.

Questions on Stage 1&2 LWMP?

Why sewer service for the south region?

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Towards a regional sewer service

REVIEW (2018)

Sewage Commission supports request by Electoral Area A to assess extension of services.

DECISION (2020)

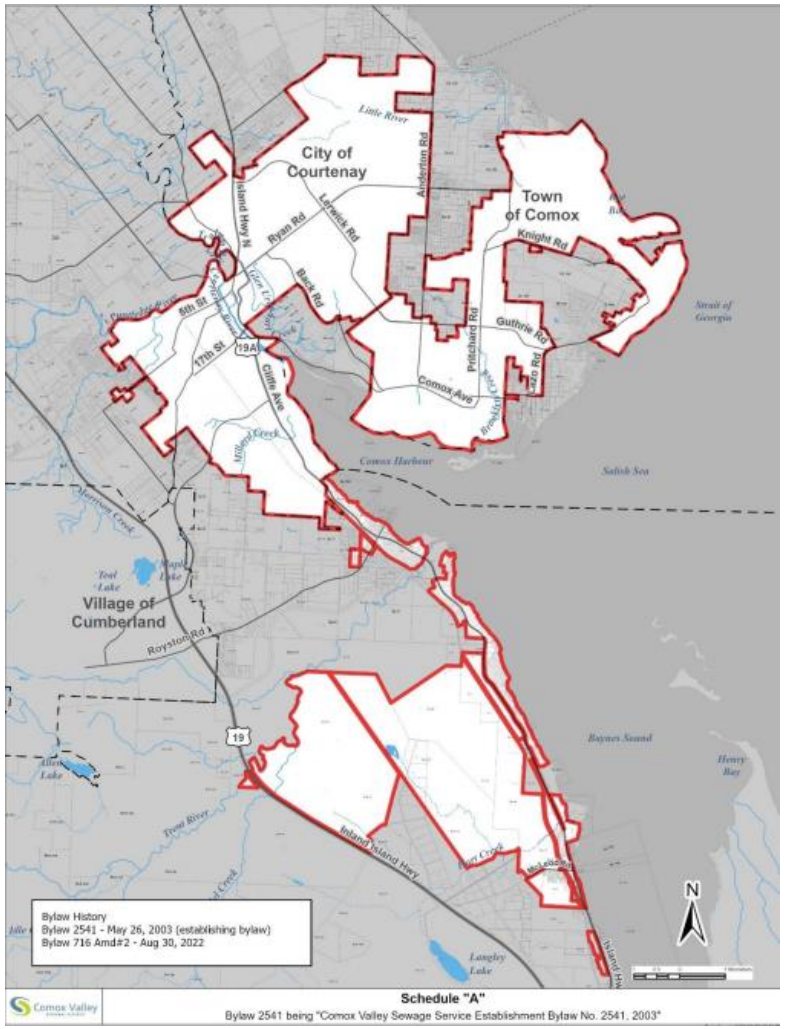
After reviewing assessment, Sewage Commission agrees to receive wastewater from Royston, Union Bay and K'ómoks First Nation south lands.

K'ómoks CBA (2021)

CVRD and K'ómoks ratify Community Benefit Agreement, commit to working collaboratively on a regional solution for sewer.

Need for LWMP Addendum

- Expansion of the CVSS service area to include a portion of Electoral Area A was adopted by the CVRD board in August 2022
- Environmental protection of Baynes Sound
- Consideration of Sewer Extension South Project within the CVSS LWMP



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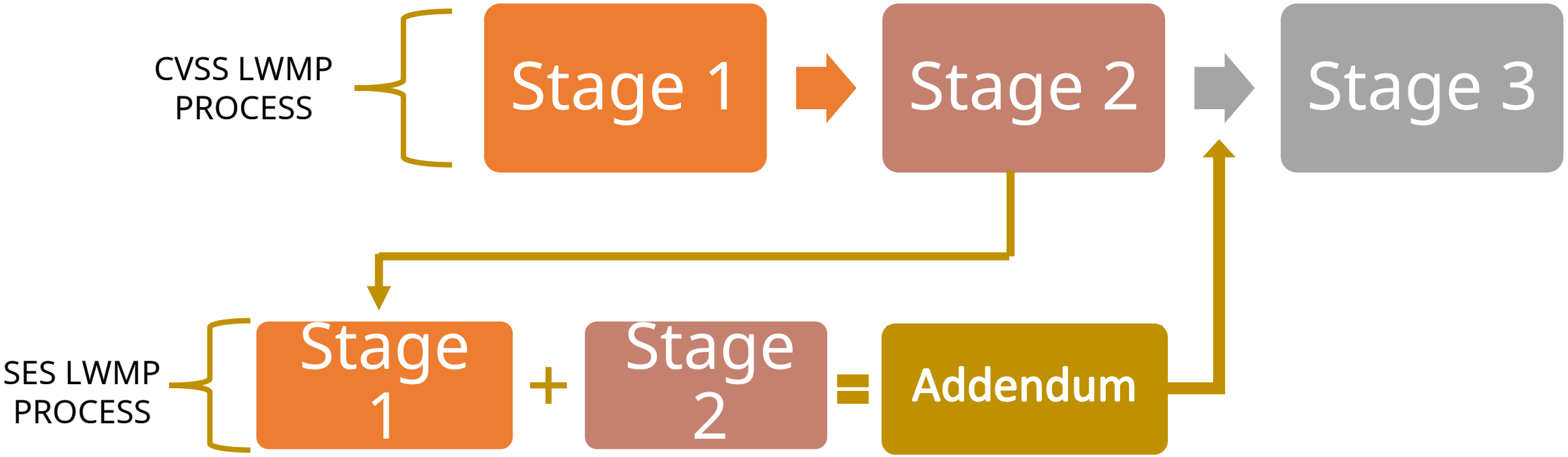
LWMP 3-Stage Process



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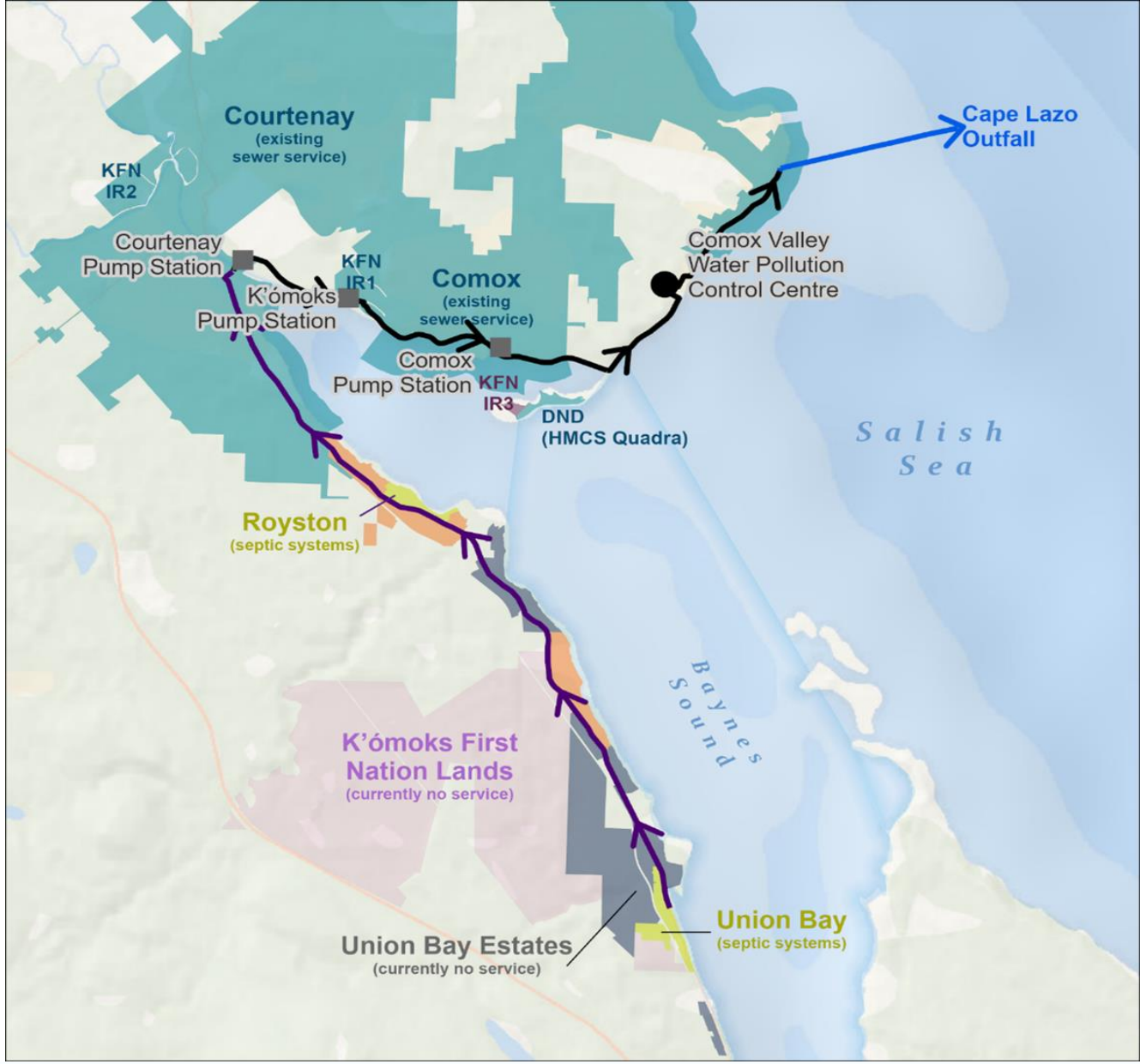
Sewer Extension South

- 13 km forcemain, from Union Bay to Courtenay
- Neighbourhood collection systems
- Pump stations
- Implemented in multiple phases



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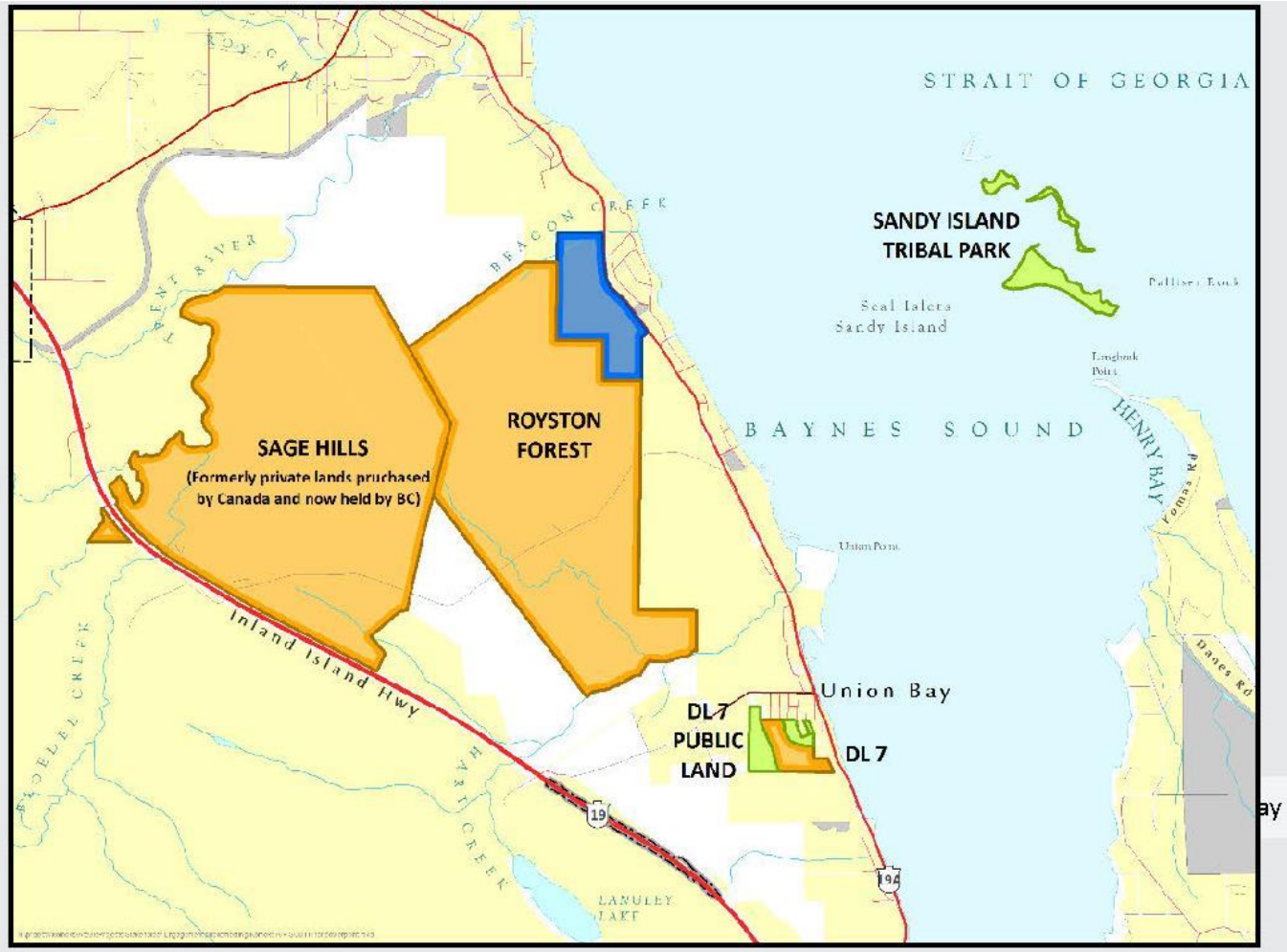
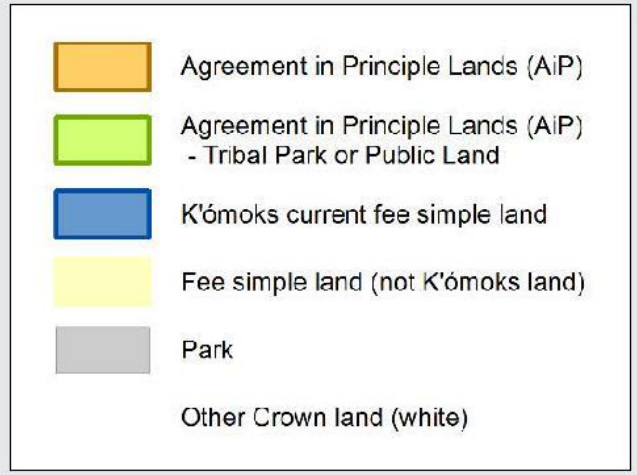
hɛhɛwčɩs; Hayuthela la xens: Moving Forward Together





K'ómoks Treaty is intended to create jobs, promote investment and economic development, build housing, support tourism and encourage investments in infrastructure which will benefit the entire Comox Valley and surrounding area.

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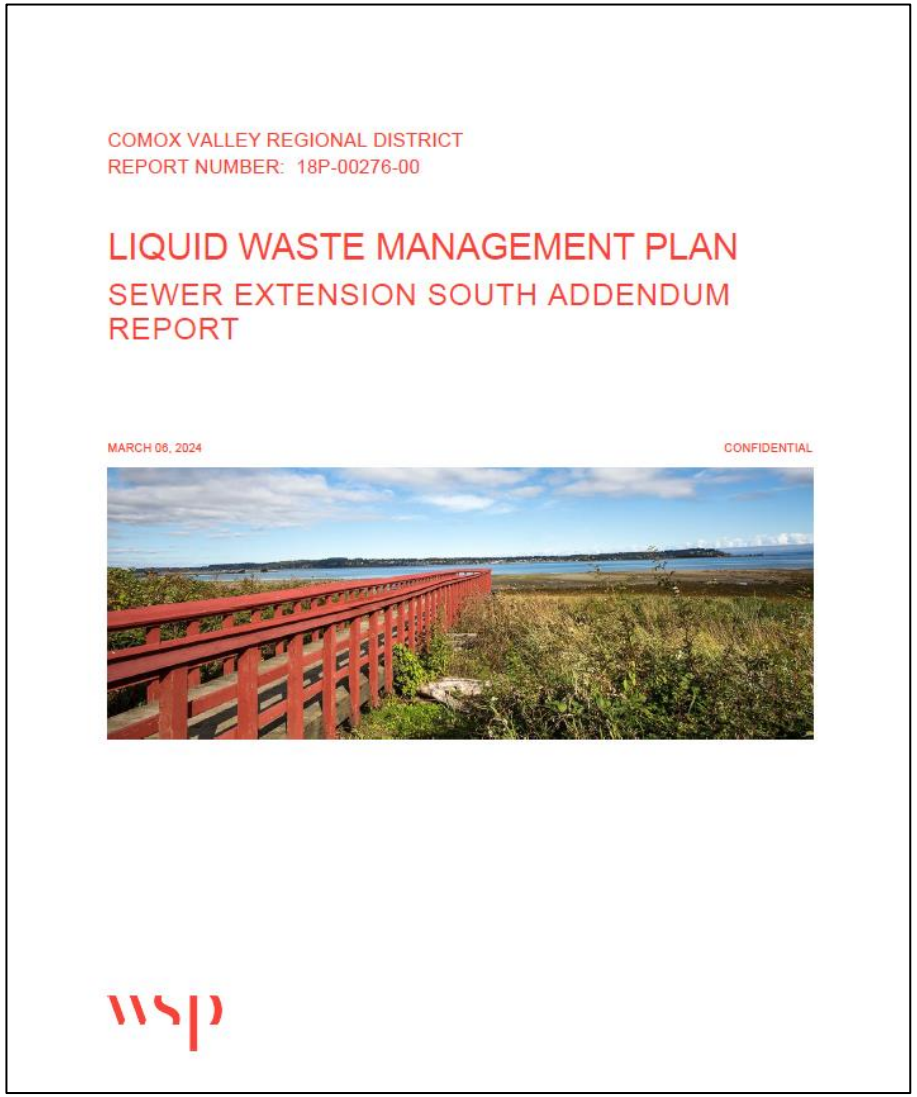
LWMP Addendum Report

- Consultation Summary
- Service Area, Land Use, Development, Population
- Regulations and Guidelines
- Project Design and Phasing
- Environmental Impact Study
- Cost Impacts


COMOX VALLEY REGIONAL DISTRICT
REPORT NUMBER: 18P-00276-00

LIQUID WASTE MANAGEMENT PLAN

SEWER EXTENSION SOUTH ADDENDUM REPORT

MARCH 06, 2024 CONFIDENTIAL

Comox Valley REGIONAL DISTRICT

Project Timeline

Mid-2024: Addendum report sent to province for review

Project becomes part of Comox Valley LWMP

2025: Development and review of Stage 3 LWMP, includes further design of SESP

2026: Provincial review of LWMP

2027: Anticipated provincial approval of LWMP

Provides CVRD authority to move forward with SESP

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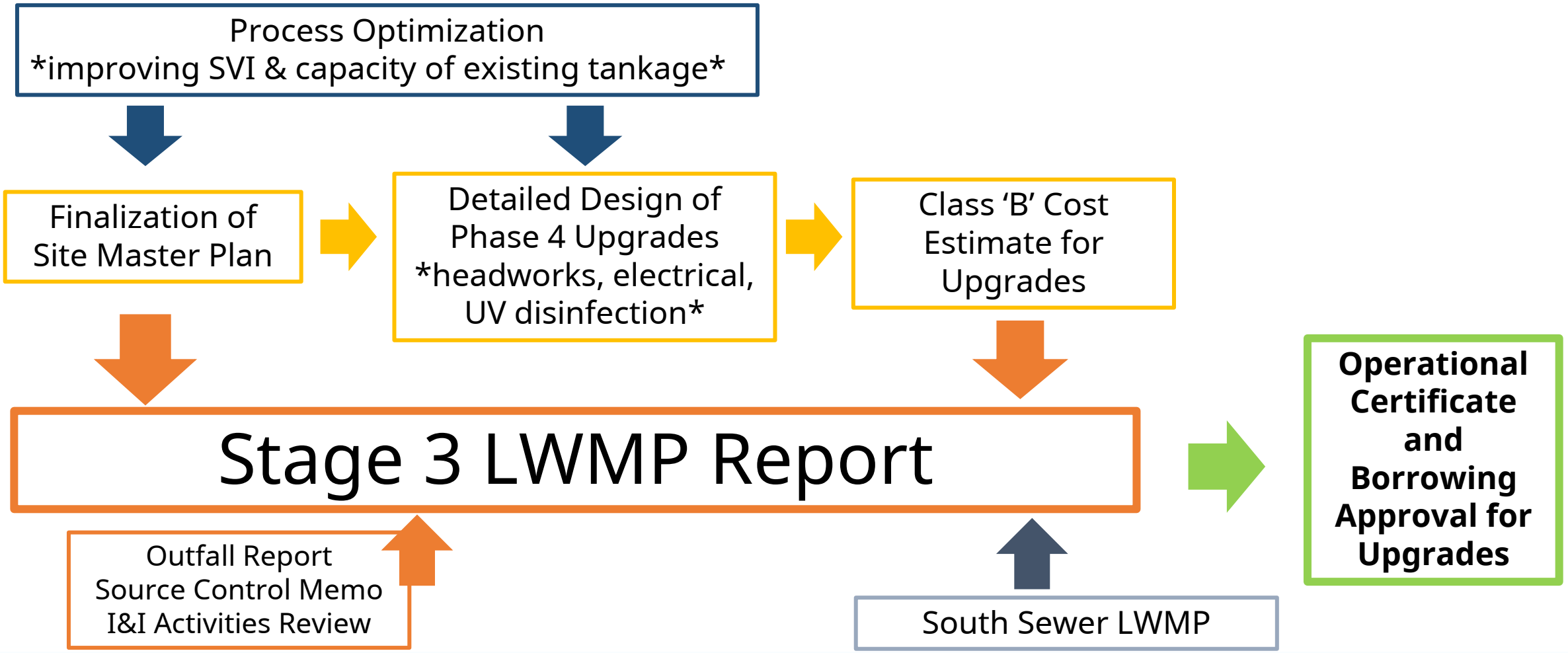
Stage 3 Work Underway

Ministry Letter

Outlined Requirements for Stage 3 LWMP Report:

- Site master plan
- Phase 4 Upgrade class ‘B’ cost estimate
- Environmental impact study
- Timing of outfall replacement
- Source control and I&I
- Resource recovery recommendations
- Cost impacts to users
- Engagement with First Nations & TAC/PAC
- Establishment of plan monitoring committee

Path to Stage 3 LWMP Report Submittal



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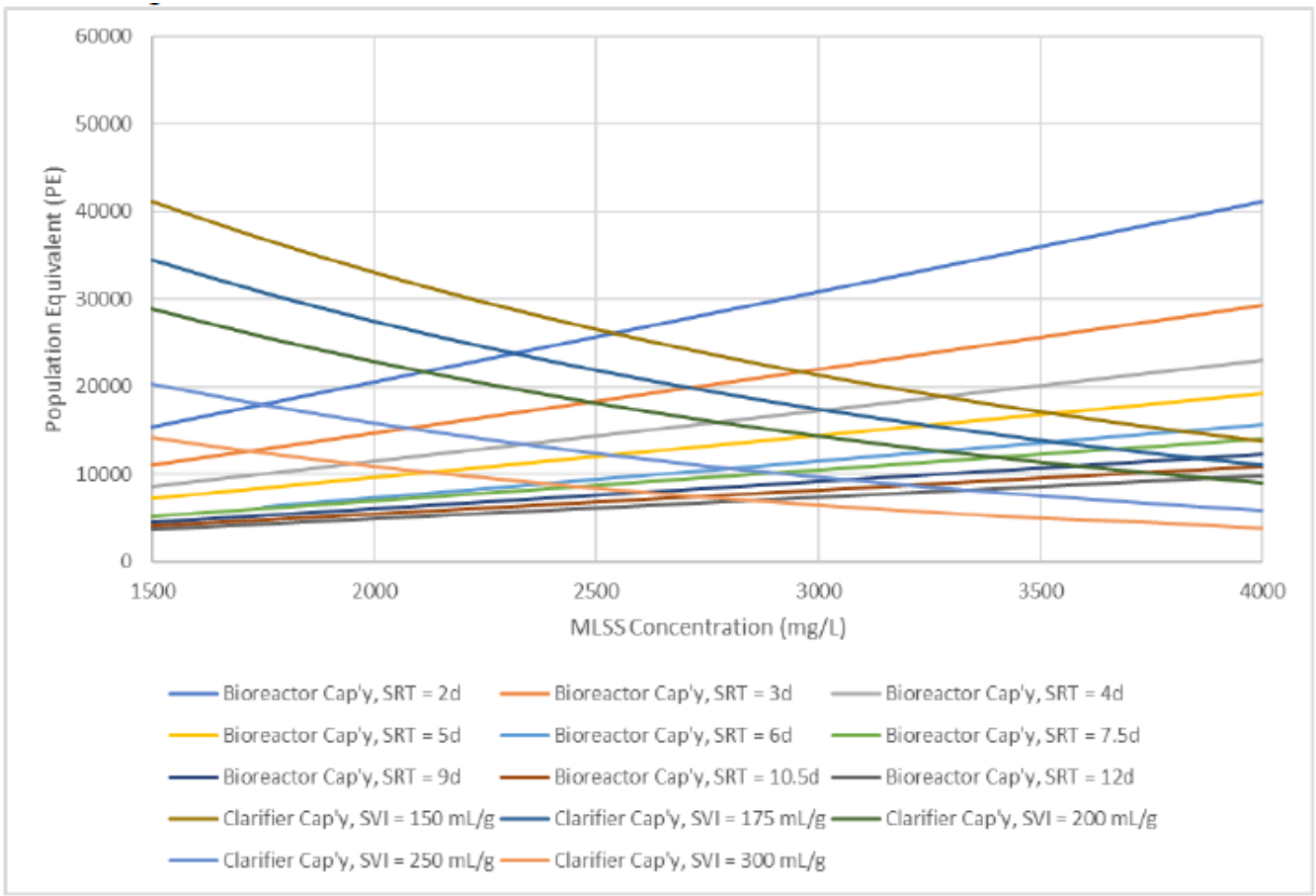
Process Optimization

- Population servicing capacity of **existing** infrastructure can greatly vary depending on process
- Working with process expert on stress testing and options to improve process to maximize capacity of existing tankage



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Stage 3 LWMP Components
WSP

CVSS Stage 3 LWMP Update

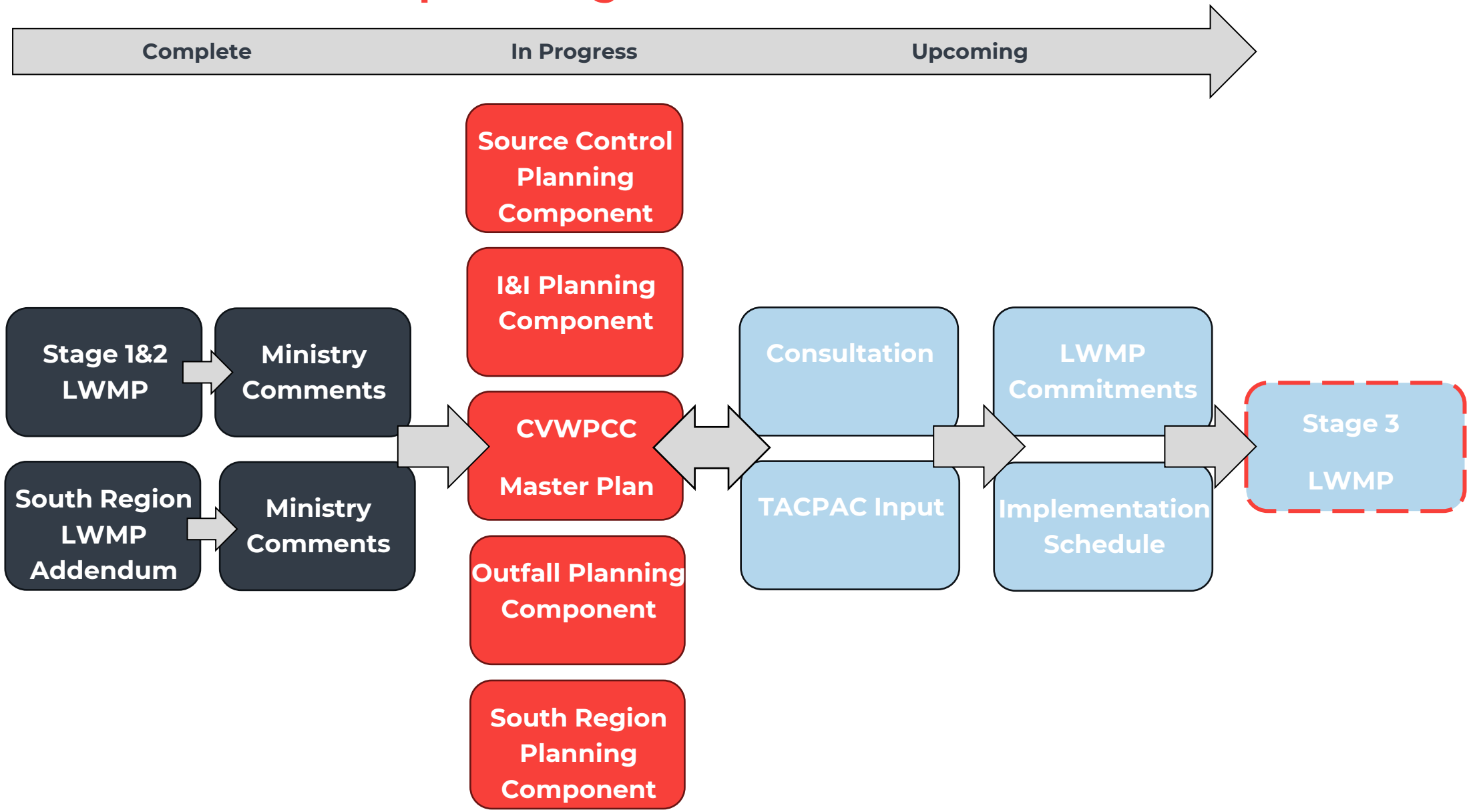
Michael Desilets, P. Eng., PMP
Principal Engineer
Water and Wastewater Treatment and Facilities
WSP Canada Inc.

Outline

1. Stage 3 LWMP Overview
2. Source Control Program
3. Inflow and Infiltration Reduction
4. CVWPCC Operational Certificate
5. Environmental Impact Study
6. Cape Lazo Outfall Upgrade

Stage 3 LWMP Overview

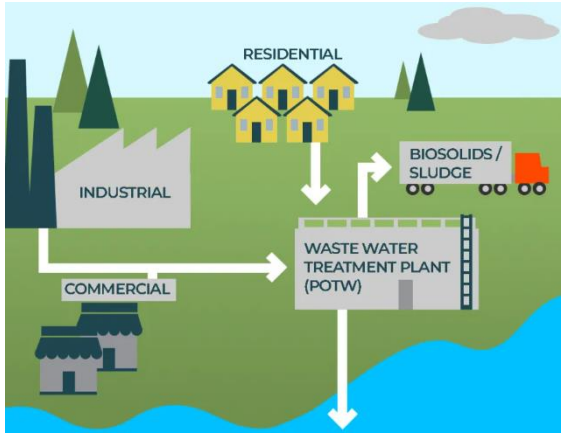
Focus and Roadmap for Stage 3 LWMP



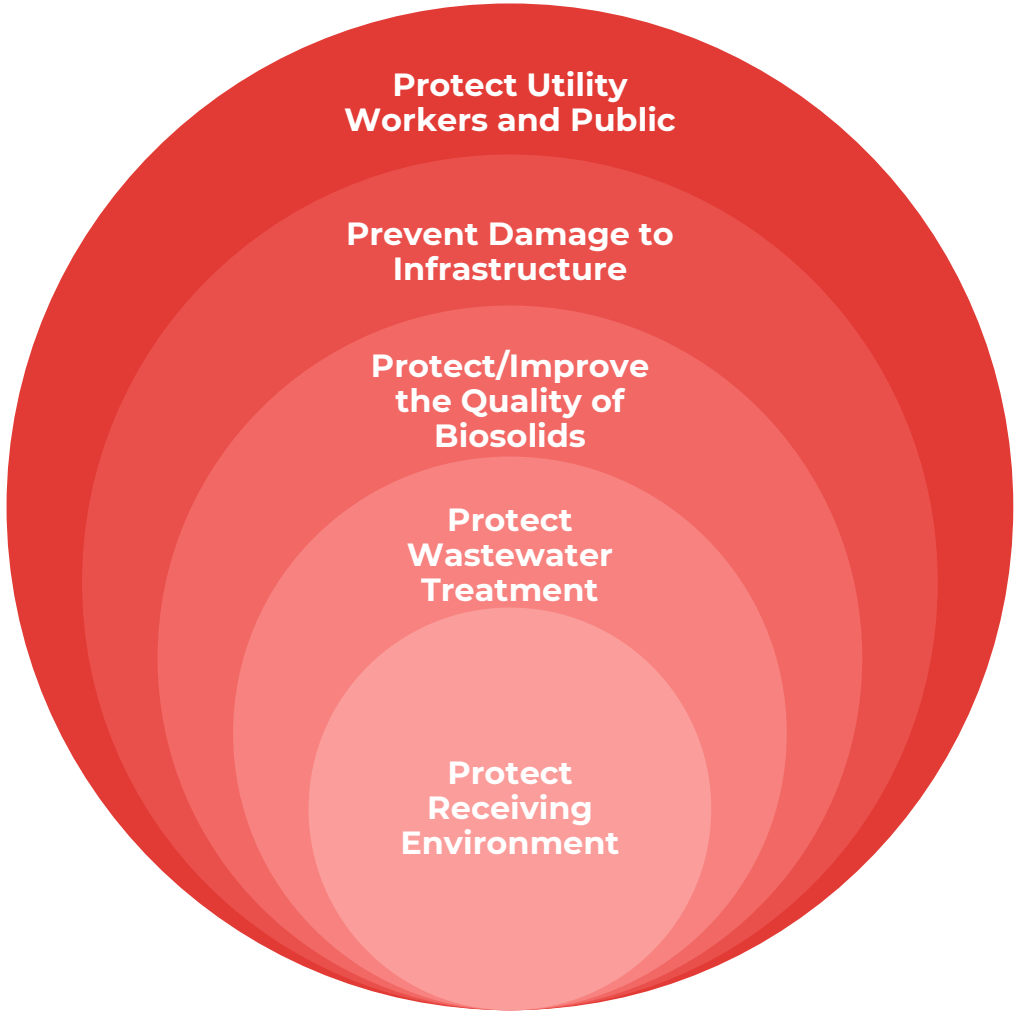
Source Control Program

Source Controls Overview

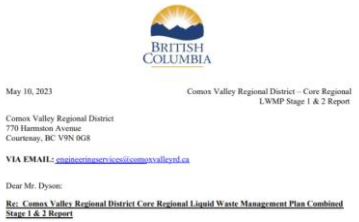
Best Practices used to discourage and reduce problematic pollutants at their source before they enter the sewage system



Objectives of Source Control Programs



Drivers for Source Control Program


BRITISH COLUMBIA

May 10, 2023 — Comox Valley Regional District – Core Regional LWMP Stage 1 & 2 Report

Comox Valley Regional District
770 Harmston Avenue
Courtenay, BC V9N 0G8

VIA EMAIL: engineeringservices@comoxvalleyrd.ca

Dear Mr. Dyson:

Re: Comox Valley Regional District Core Regional Liquid Waste Management Plan Combined Stage 1 & 2 Report

Address Ministry Comments Stage 1&2 LWMP

Ensure Stage 3 LWMP includes commitment to develop Source Control Program

Meet Ministry LWMP Guidelines

Source Control important planning component for approval of LWMP and based on community specific issues and priorities

Meet BC MWR Regulatory Requirement

Source Control Bylaw requirement for acceptance of non-domestic wastewater.

Incorporate and Address Public Feedback

Public concerns around contaminants of emerging concern (CECs), microplastics and a need for education around what not to flush.

Approaches to Source Control

Approach	Focus and Implementation	What's Included
Educational What Are You Putting Down Your Pipes? 	• Focus on both domestic and non-domestic discharges • Implemented through education programs and campaigns	• Municipality Fact Sheet Web Pages • Printed brochures • Social media/online campaigns • Public workshops
Regulatory Bylaw Lookup 	• Focused on non-domestic discharges (ICI) • Implemented through Sewer Use Bylaw	• Restricted and prohibited compounds • Requirements for permits and authorizations • Monitoring and enforcement • Industry / business specific codes of practice

Stage 3 LWMP Work on Source Control

Review Current Source Controls → Review Sources and Pollutants → Development of LWMP Recommendations → Collaboration and Consultation → Finalize LWMP Commitments

What Are You Putting Down Your Pipes?

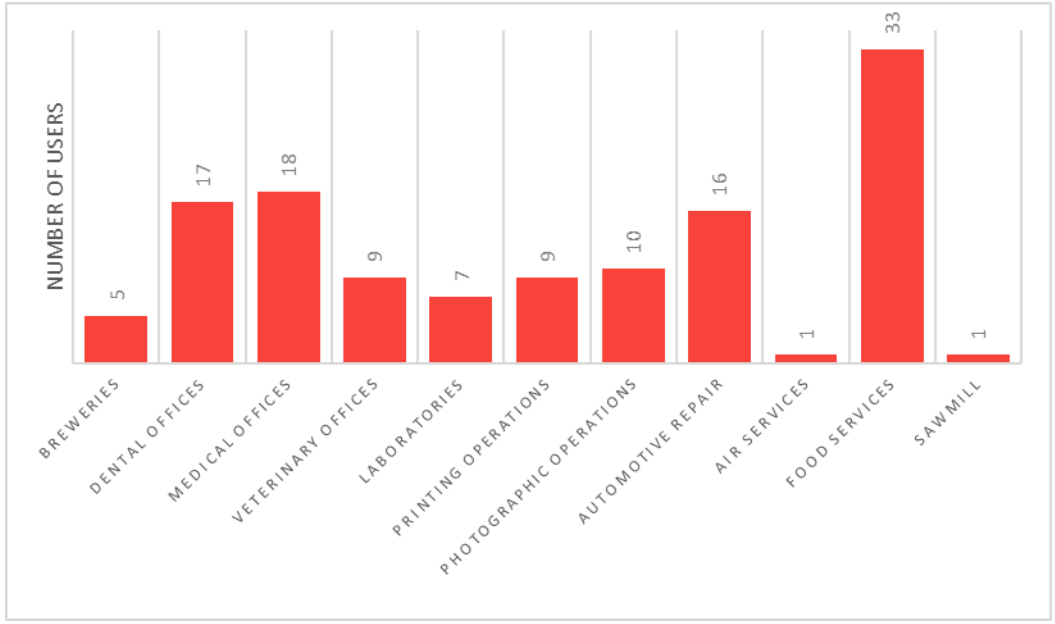
Contact | Address | Print | CVRD Contact

Engineering Services - 250-334-6000 (main) | Contact Form

Sanitary Sewer Use, Extension and Connection Bylaw No. 1327, 1983 [PDF - 117 KB]

Sanitary Sewer Use, Extension & Connection Consolidated Bylaw No. 713

- **Comox Valley Sewerage Service Development Cost Charges Bylaw No. 572** *Liquid Waste*
- **Sewage Commission Bylaw No. 650** *Liquid Waste*
- **Sewage Service Establishment Bylaw No. 2541** *Liquid Waste*
- **Sewage Service Expansion Principles Bylaw No. 617** *Liquid Waste*
- **Sewerage Service Regulation Fees and Charges Bylaw No. 71** *Liquid Waste*
- **Sewerage System Capital Improvement Charge Bylaw No. 3008** *Liquid Waste*



Outcomes and Benefits

Key Commitment: Develop framework for an effective source control program including improved or added source control measures

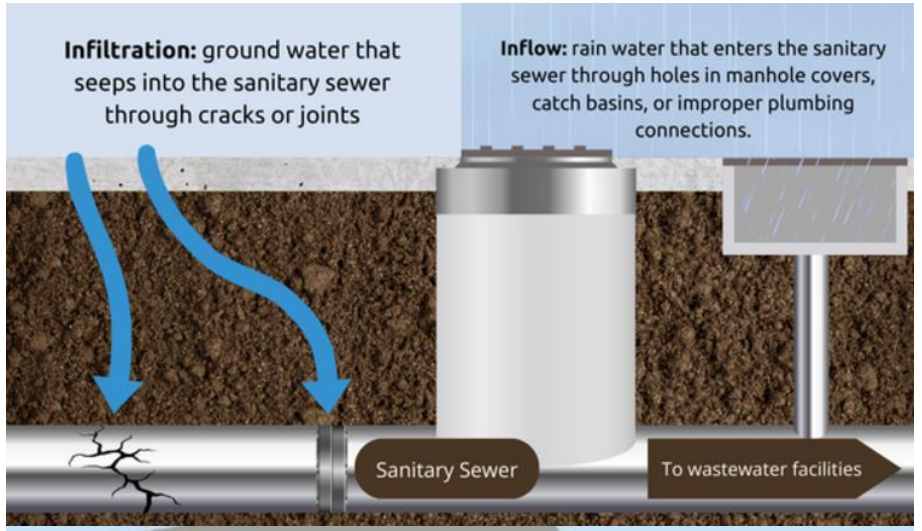
- Expected to be well received by the public
- Established based on community specific issues and priorities
- Discourage/regulate/reduce the discharge of problematic waste
- Contribute to reduced capital and O&M costs associated with infrastructure
- Account for operability or treatment concerns at the CVWPCC
- Demonstrate further action to address public and stakeholder feedback
- Specific Project/initiative approval through LWMP
- Meet regulatory requirements for regulation of non-domestic discharges
- Ministry's requirements and expectations for approval of the Stage 3 LWMP

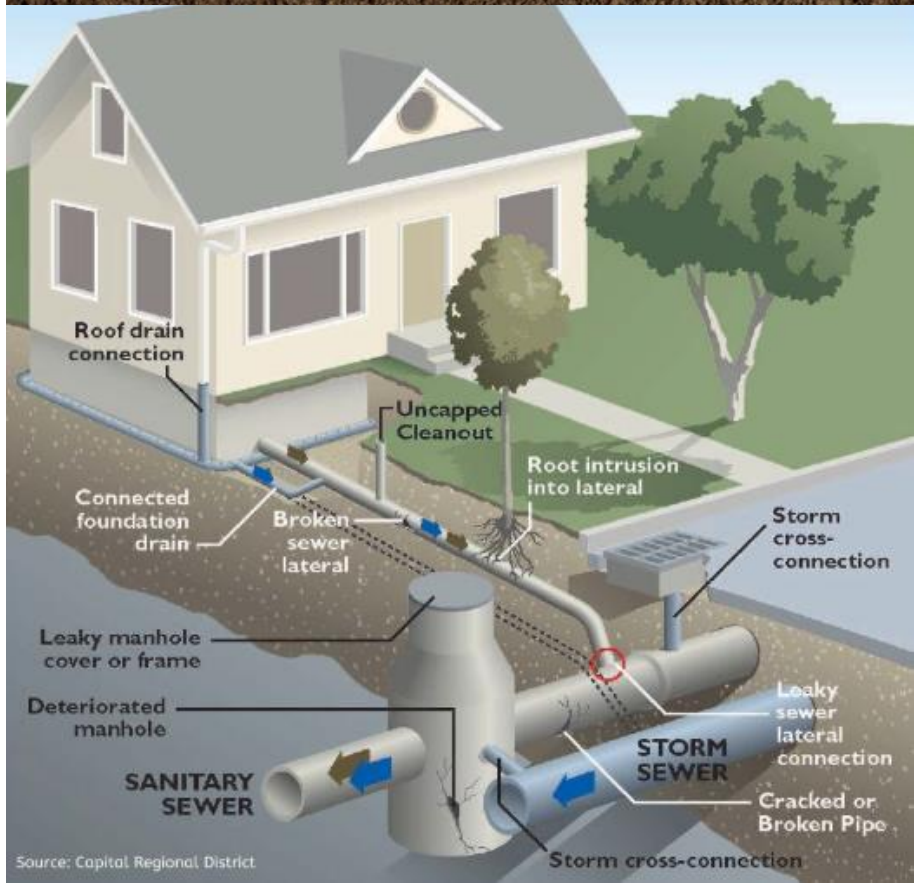
Questions on Source Control LWMP Planning Component?

Inflow and Infiltration Reduction

Inflow and Infiltration (I&I) Overview

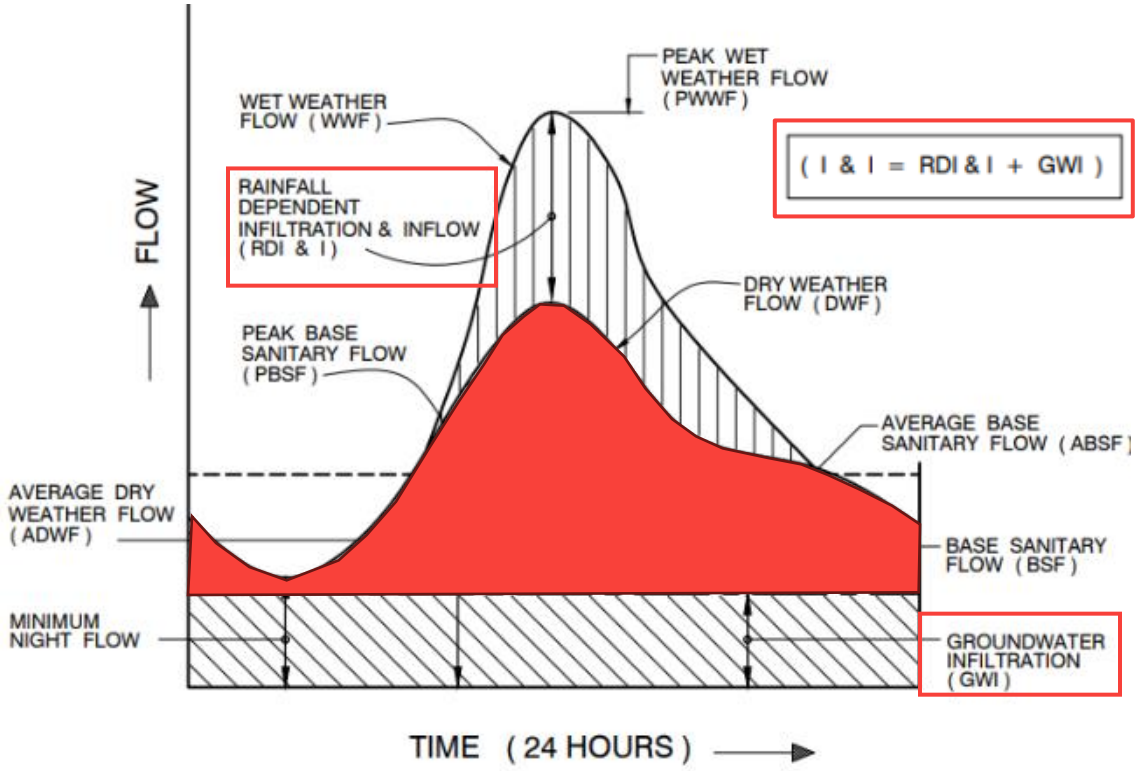
- All Non-Sanitary Flows entering sewer
- Infiltration - primarily groundwater entering through defects
- Inflow – flow entering from variety of sources
- Rainfall Dependent I&I – combined flows entering sewer from rainfall
- Amount of I&I is function of integrity of sewer system etc.
- I&I can substantially increase the volume of wastewater arriving at treatment facilities



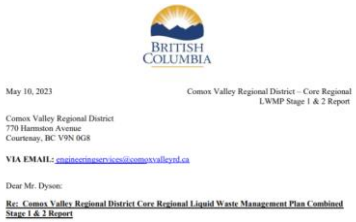


Objectives of I&I Reduction

- Critical role in prolonging the existing life expectancy/capacity of the CVWPCC
- Reduce or defer capacity driven infrastructure upgrades to CVSS member collection systems
- Minimizing capital costs associated with the need to size infrastructure for excessive I&I.



Drivers for I&I Reduction


BRITISH COLUMBIA

May 10, 2023

Comox Valley Regional District – Core Regional LWMP Stage 1 & 2 Report

Comox Valley Regional District
770 Harmston Avenue
Courtenay, BC V9N 0G8

VIA EMAIL: engineeringservices@comoxvalleyrd.ca

Dear Mr. Dyson:

Re: Comox Valley Regional District Core Regional Liquid Waste Management Plan Combined Stage 1 & 2 Report

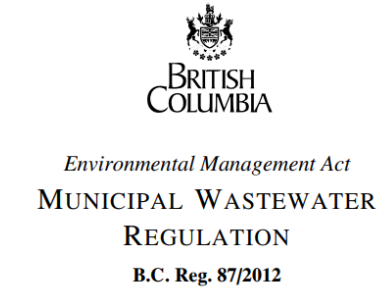
Address Ministry Comments Stage 1&2 LWMP

Ensure Stage 3 LWMP includes commitment to implement a staged I&I reduction program

Meet Ministry LWMP Guidelines

I&I Reduction important planning component for approval of LWMP, specific goals should be identified and supported by industry and public education programs

Staged I&I reduction program should be included as part of the LWMP recommendations


BRITISH COLUMBIA

Environmental Management Act

MUNICIPAL WASTEWATER REGULATION

B.C. Reg. 87/2012

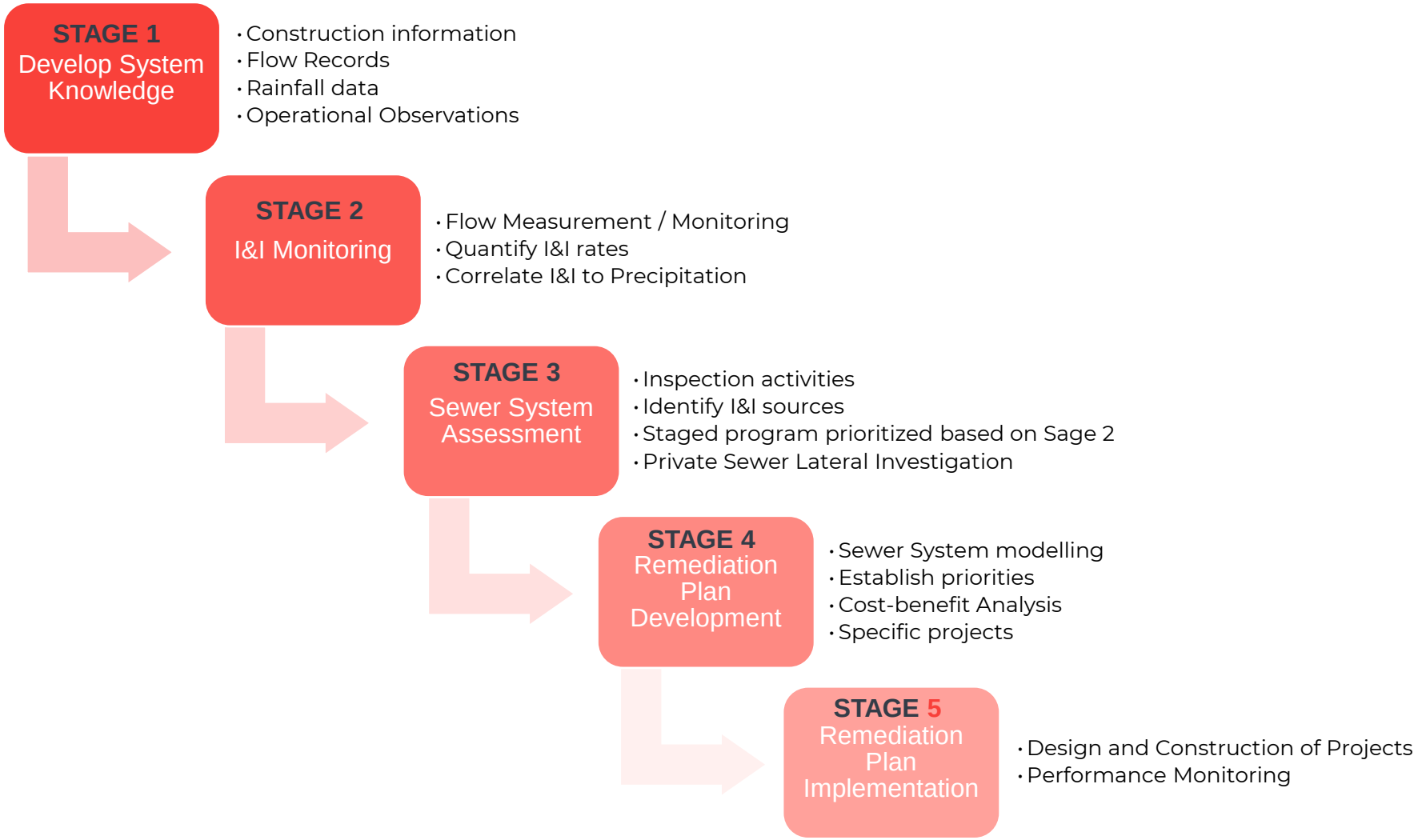
Meet BC MWR Regulatory Requirement

Requires I&I not result in maximum flows exceeding 2xADWF unless reduction addressed in LWMP

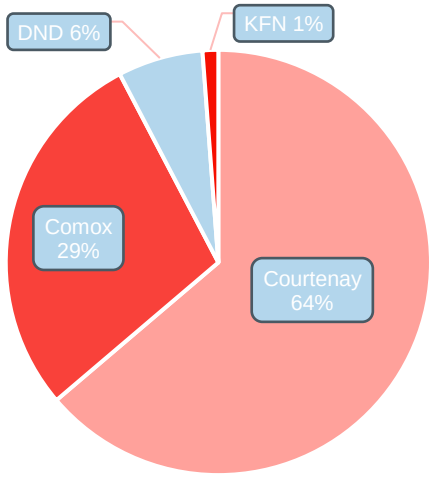
Meet Public Feedback and Stage 1&2 Commitment

Stage 1&2 LWMP committed to provide full secondary treatment with disinfection for all flows

Components of Staged I&I Reduction Program

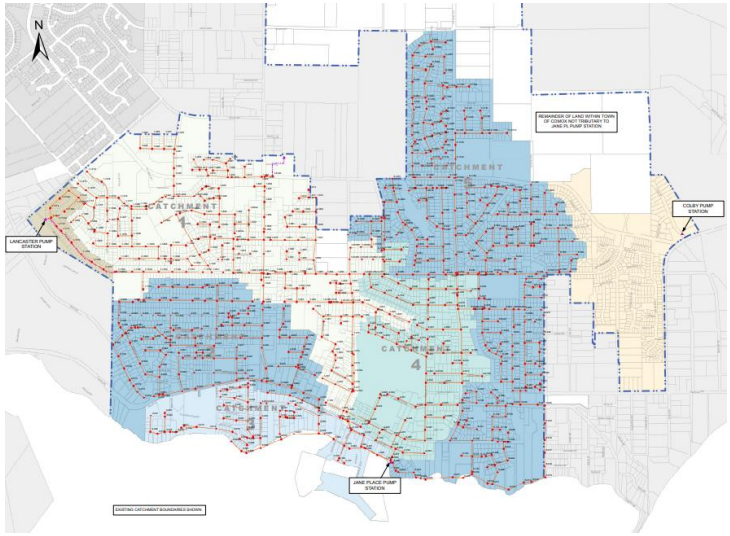


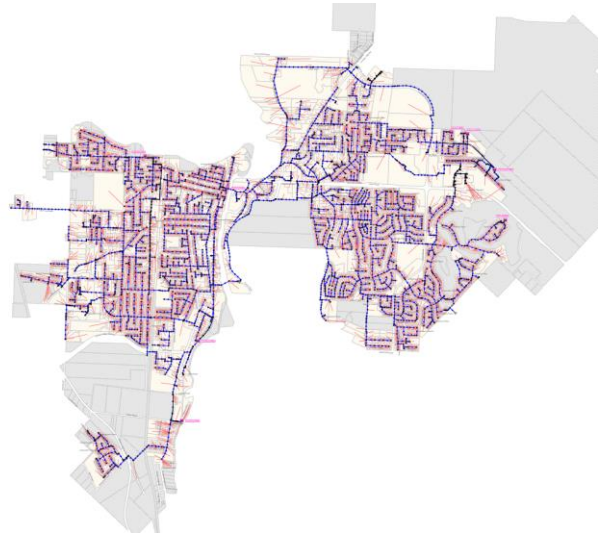
Other Considerations



- Jurisdictional Boundaries and Regional Collaboration
- Review/Update Bylaws and Engineering Standards
- Annual I&I Reporting

Stage 3 LWMP Work on I&I Reduction





Review Flows and I&I rates → Review I&I Reduction Efforts → Master Plan I&I Reduction Scenario → Develop LWMP Recomm. → Collaboration and Consultation → Finalize LWMP Commitments

YEAR	ADWF (M^3/D)	MDF FLOW (M^3/D)	RATIO MDF:ADWF	NO. OF DAYS WHEN RATIO MDF:ADWF > 2.0
2013	12,113	21,225	1.8	0
2014	11,900	38,462	3.2	8
2015	11,503	37,253	3.2	11
2016	11,506	39,998	3.5	33
2017	11,709	34,965	3	11
2018	11,877	41,168	3.5	22
2019	11,264	34,726	3.1	4

Outcomes and Benefits

Key Commitment: Intiate Staged I&I Reduction Program

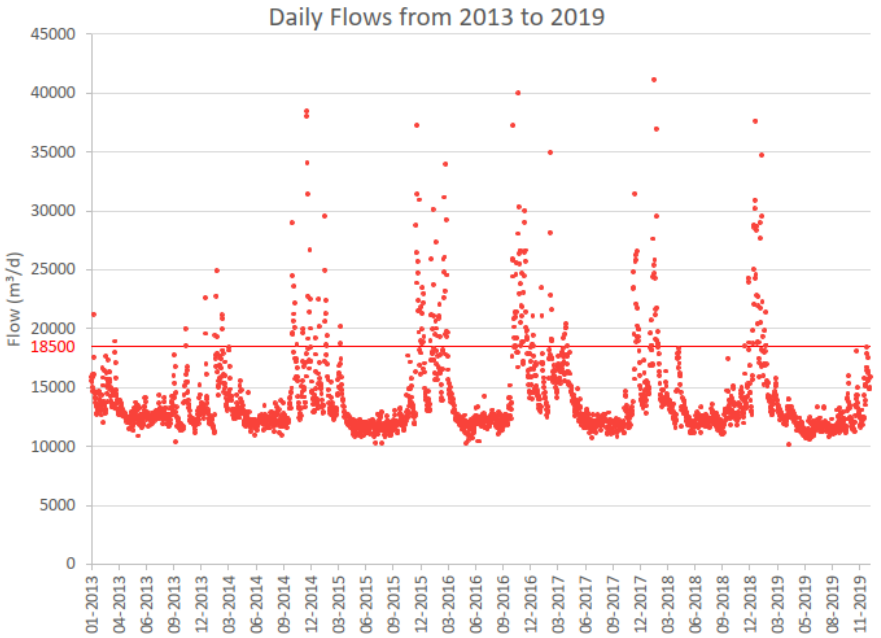
- Reduce extraneous flows while meeting Stage 1&2 commitments
- Play a critical role in prolonging the existing life expectancy/capacity of the CVWPCC and minimizing associated capital costs
- Reduce or defer capacity driven infrastructure upgrades to CVSS member collection systems
- Reduction in sewage levies
- Specific Project/initiative approval through LWMP
- Meet regulatory requirements to address I&I in LWMP
- Meet Ministry's requirements and expectations for approval of the Stage 3 LWMP

Questions on I&I Reduction Planning Component?

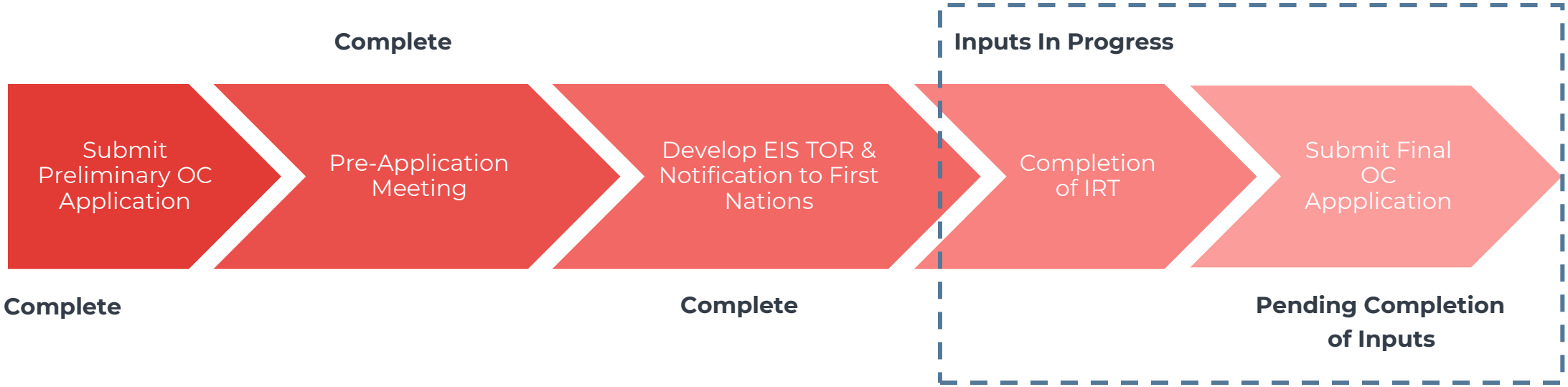
CVWPCC Operational Certificate

Requirements for Operational Certificate

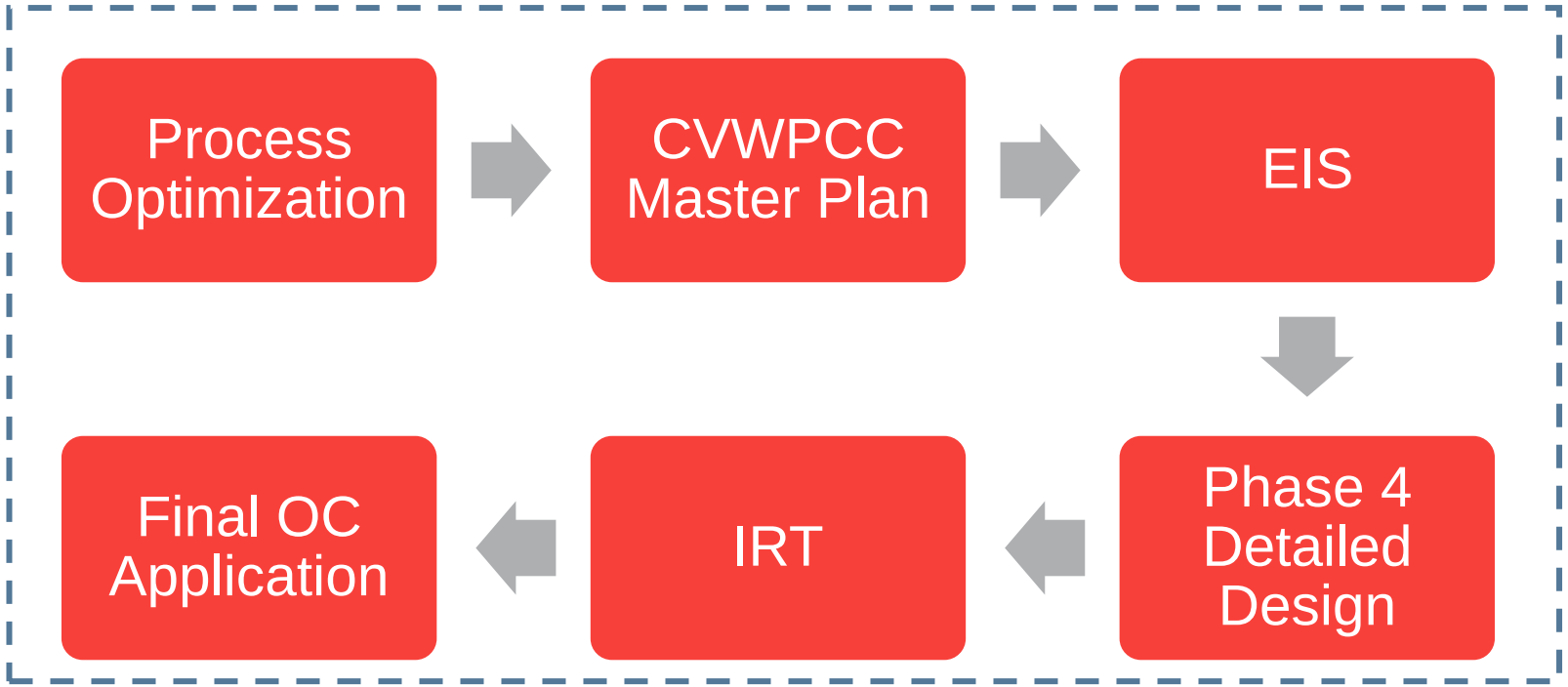
- CVWPCC maximum discharge rate exceeds current permit
- Major amendment and MWR registration process for CVWPCC expansion
- LWMP provides alternative discharge authorization through issuance of Operational Certificate on approval of LWMP
- Update in accordance with new MWR
- Application process provides guidance on the requirements for the environmental impact study.



Stage 3 LWMP Operational Certificate Application Process



Stage 3 LWMP Operational Certificate Inputs for Completion of IRT



- OC application process is concurrent with Finalization of Stage 3 LWMP
- Issuance of OC pending approval of Stage 3 LWMP

Key Outcome and Benefits

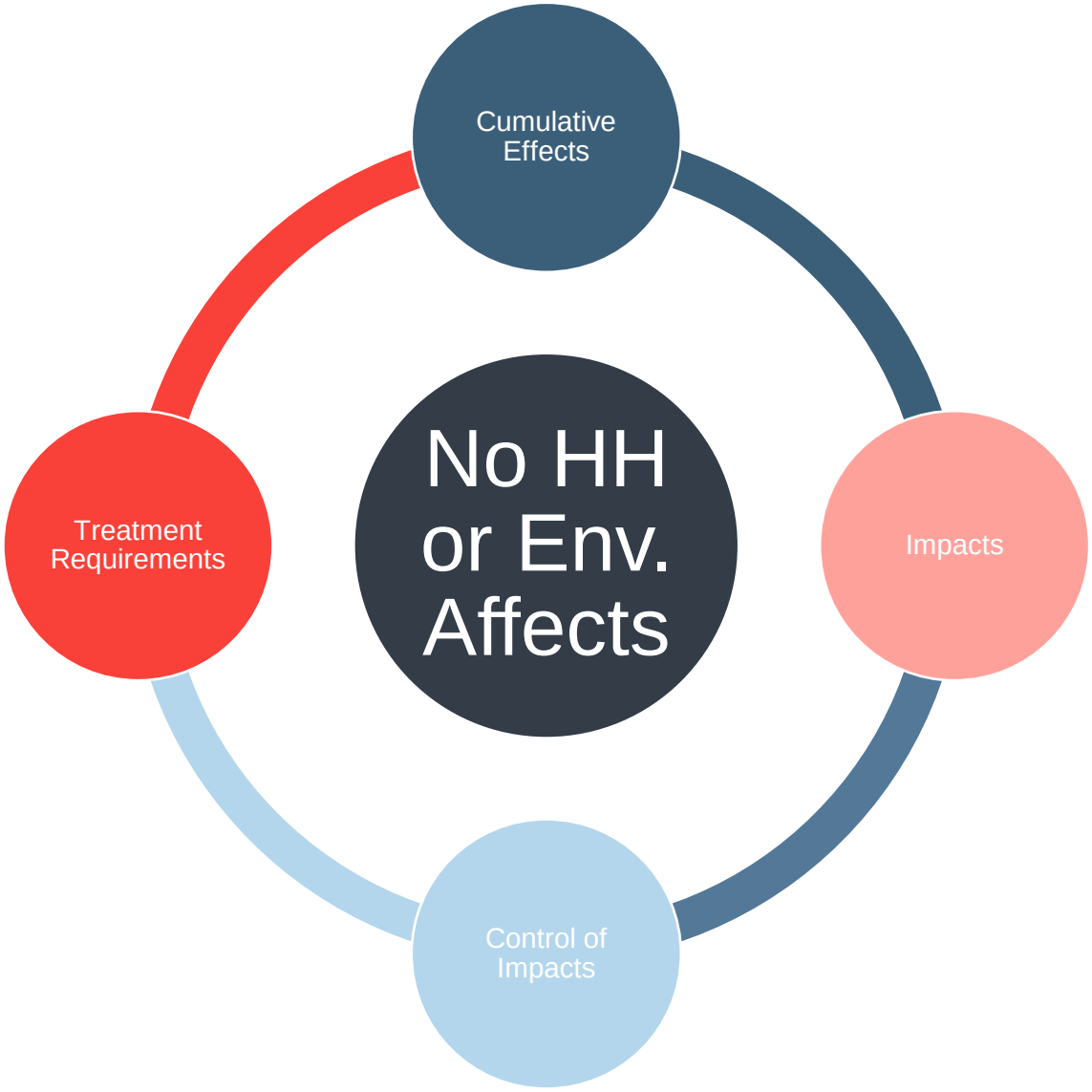
New Discharge Authorization: CVWPCC Operational Certificate

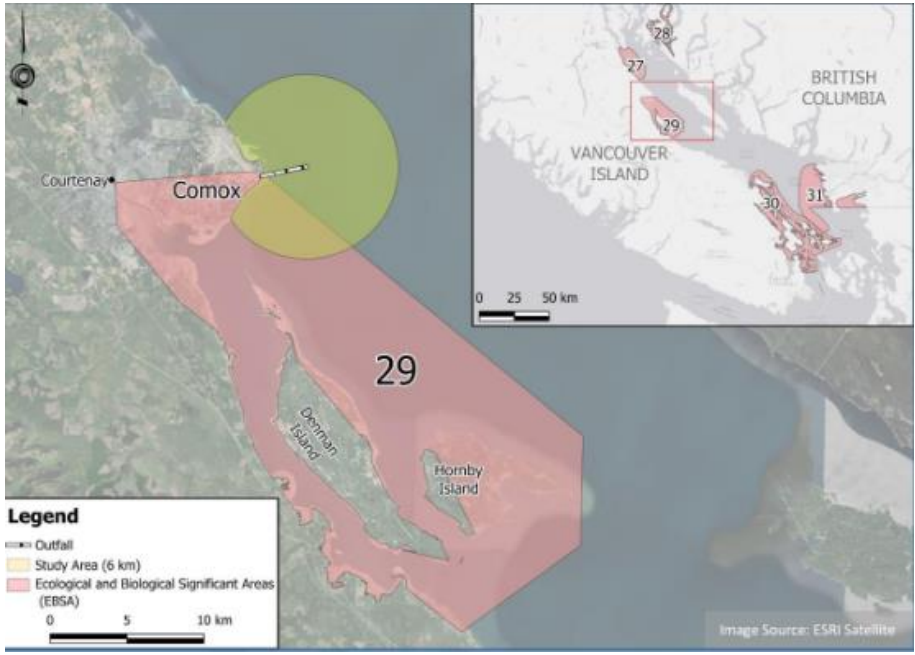
- Allows to increase maximum discharge for long term future flows, eliminating risk of non-compliance
- Updated in accordance with current regulations
- Enhanced effluent discharge quality meets public feedback
- Required updated Environmental Impact study help address public and stakeholder feedback for protection of the environment

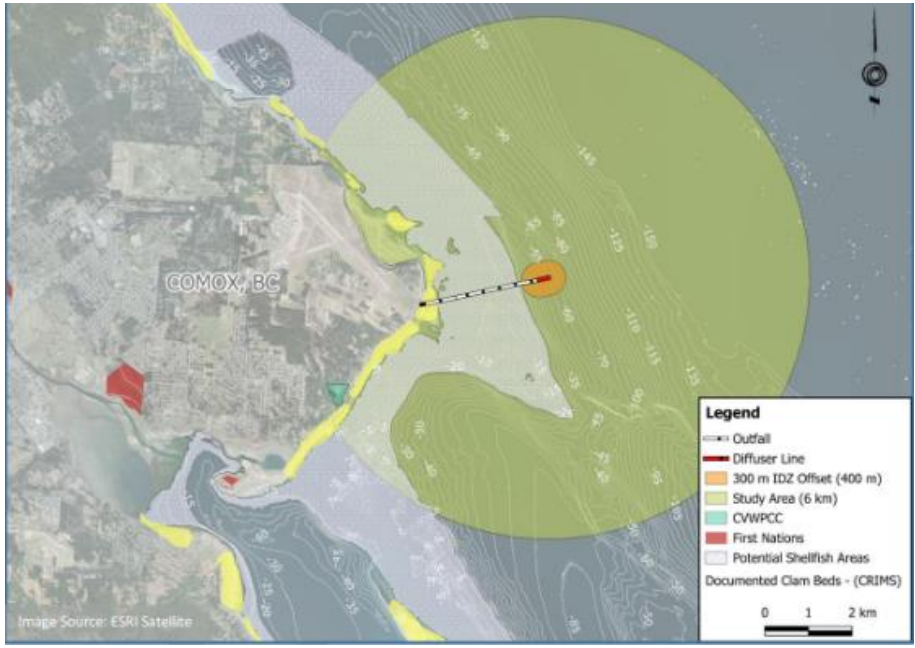
Questions on CVWPCC Operational Certificate?

Environmental Impact Study

Requirement and Objectives for EIS

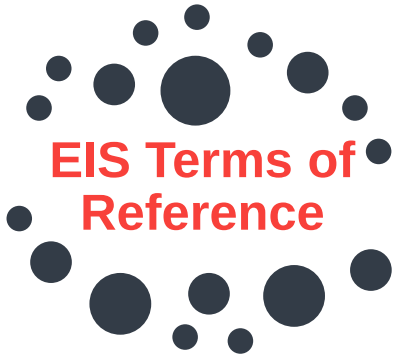






EIS Stages

Complete



- First Nations Engagement
- Develop and review TOR
- Pre-application meeting with ministry

In Progress

Master Plan

Complete

Stage I EIS

- Present Status Receiving Environment Monitoring Plan
- Impact Assessment
- Preliminary Dilution Modeling
- Historical Data Review
- Review Study Area Characteristics
- Define Study Area and Treatment System

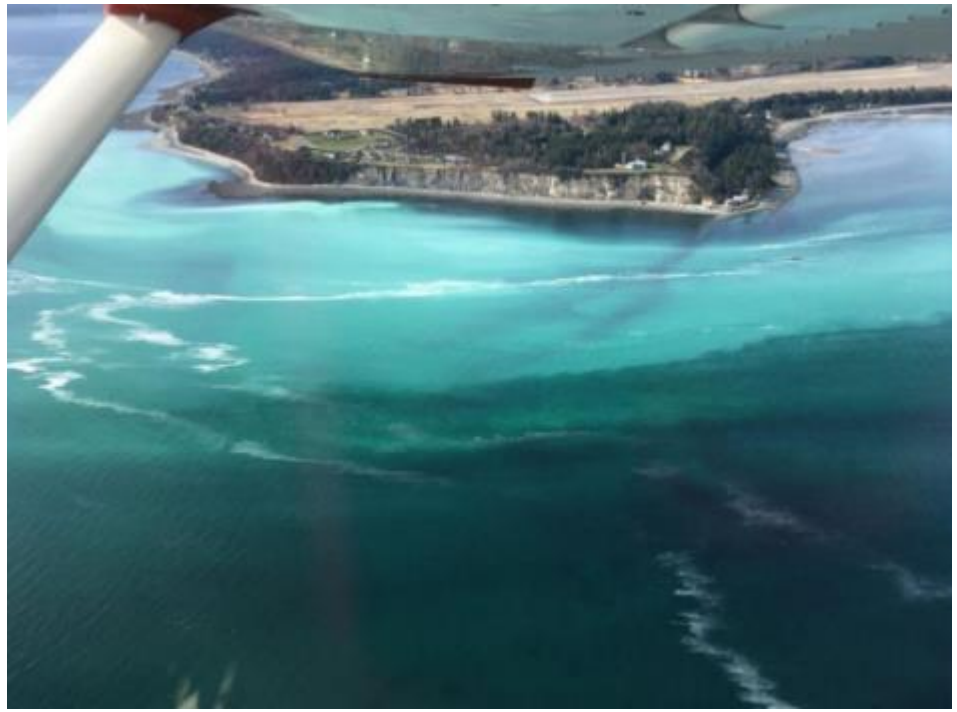
Pending

Stage II EIS

- Present Status Receiving Environment Monitoring
- Effluent Monitoring
- Update Dilution Model
- Update Impact Assessment
- Post Discharge Receiving Environment Monitoring Plan

Finalization of EIS

- Stage I EIS Desktop review of current outfall complete
- Stage II EIS “Present Status” REMP scheduled for 2025
- Pending any Changes to Outfall resulting from Master Plan
- Completion of Stage II EIS is key input for issuance of CVWPCC Operational Certificate

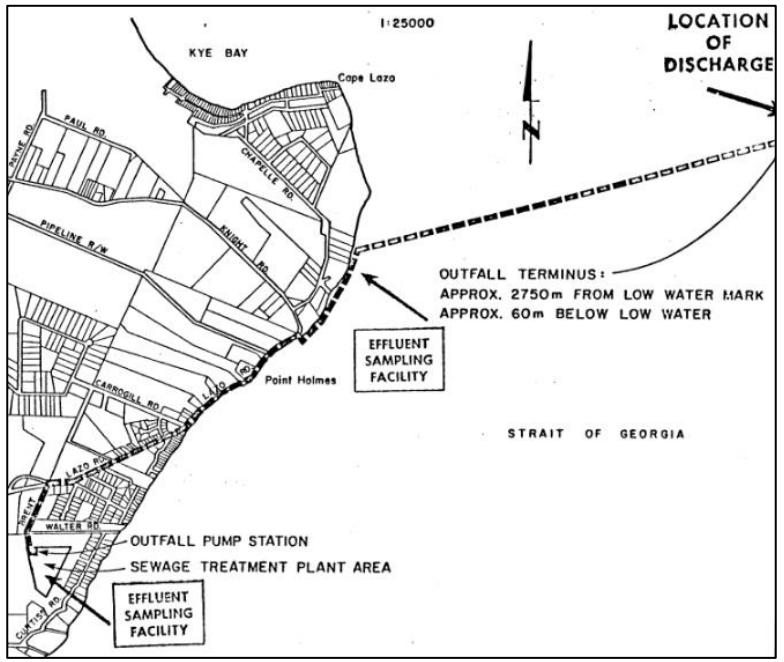


Questions on Environmental Impact Study?

Cape Lazo Outfall Upgrade

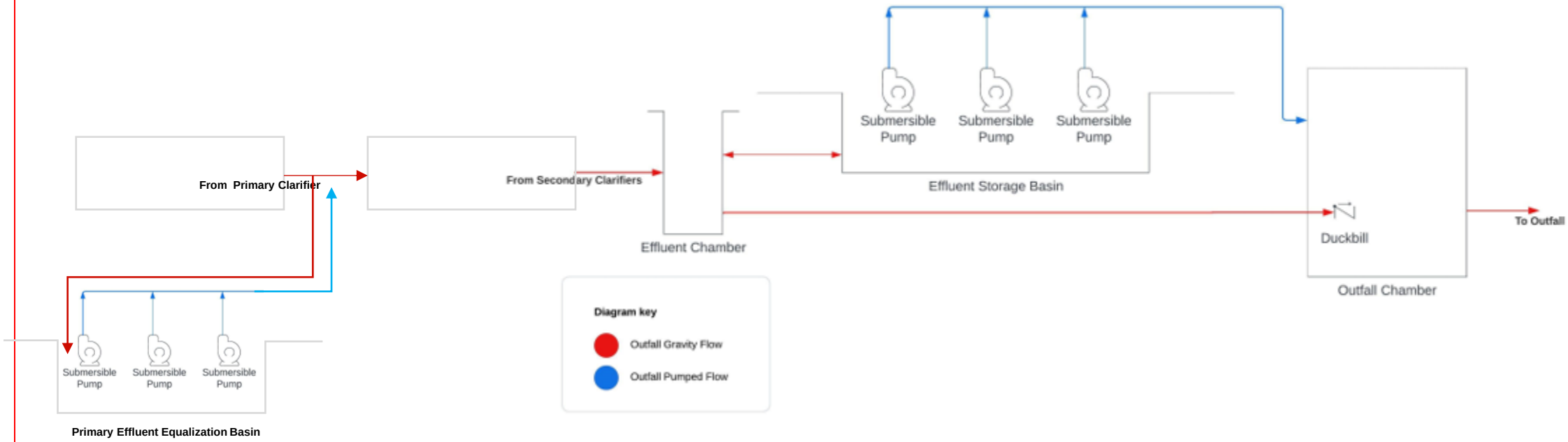
Outfall Overview

- Constructed in 1982
- In-Land and Marine Sections
- Outfall System
- Capacity limitations during Peak Wet Weather Flow and High Tides
- Increased reliance on effluent storage basin and pump station
- Previous Studies identified outfall capacity reached
- Primary Effluent Equalization Basin (PEEQ) commissioned in 2020 as temporary stop gap measure
- Predicted “Combined” capacity of outfall system with PEEQ to year 2031
- Options for upgrade replacement assessed in Stage 1&2 LWMP
- **Ministry Comment that timing and costs for Outfall replacement need to be determined as part of Stage 3 LWMP**

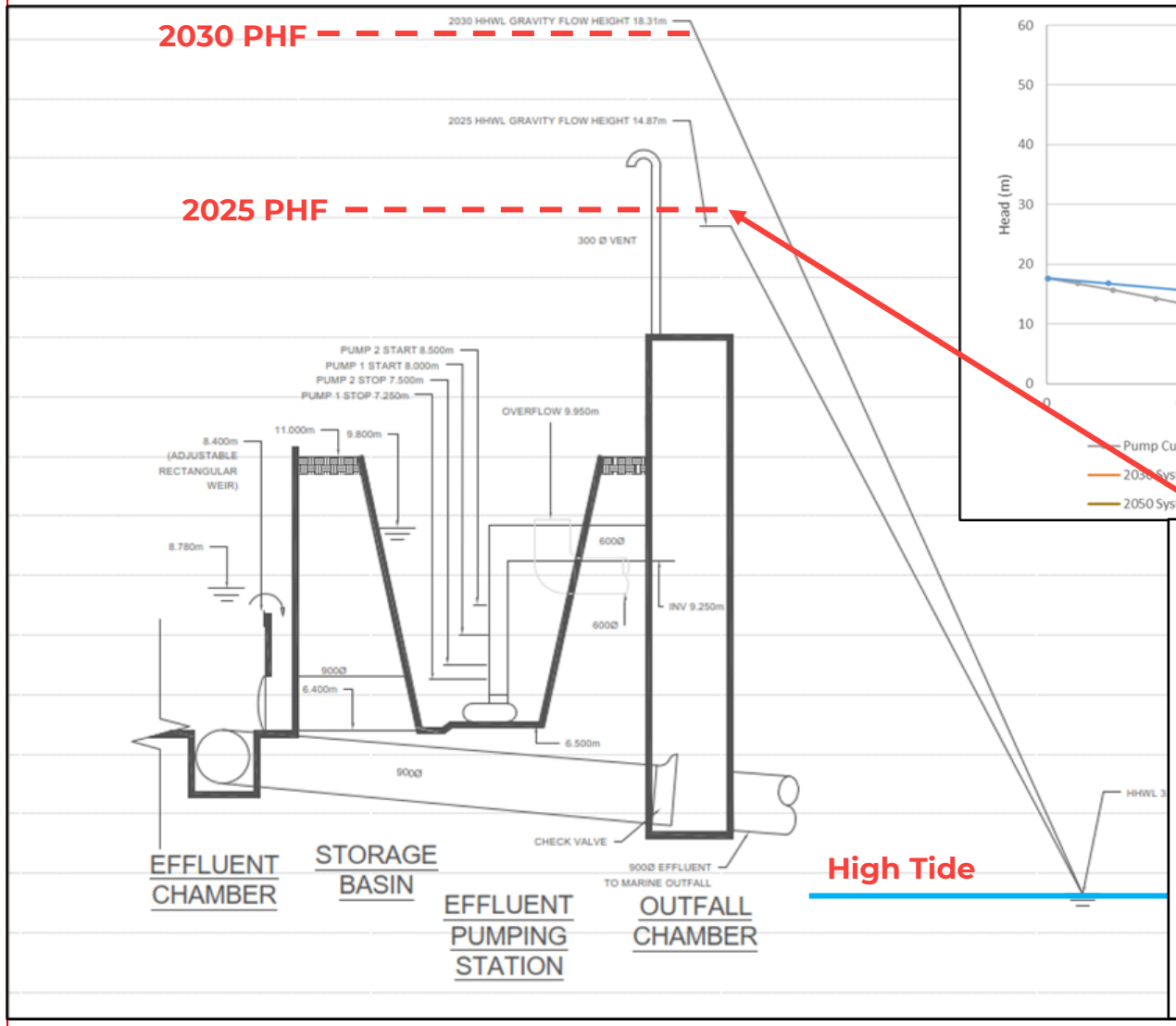


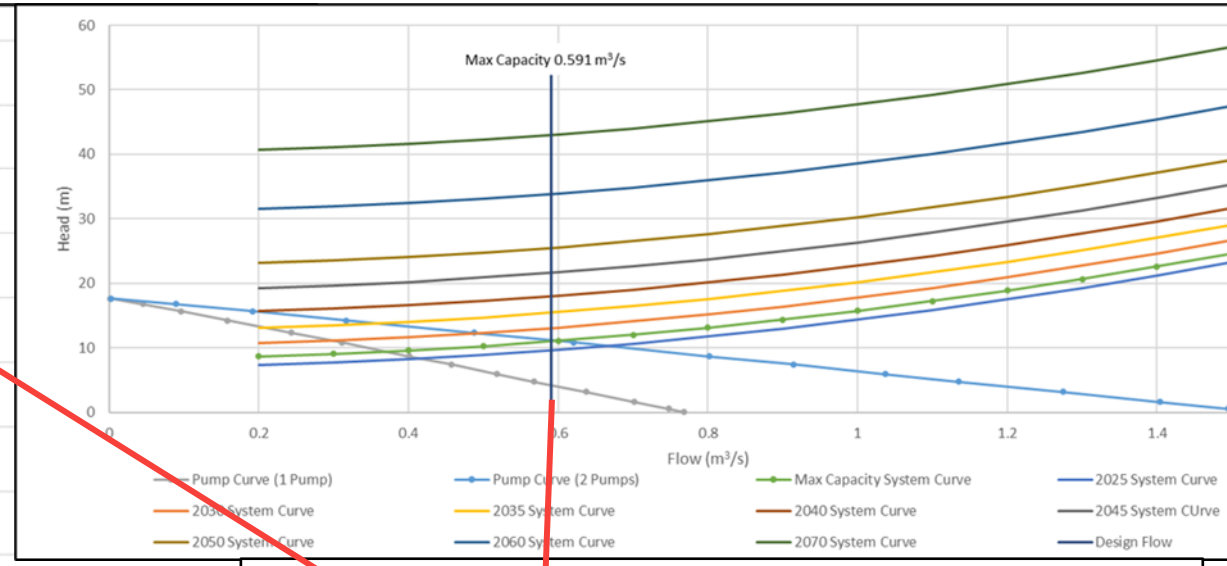
Background and Stage 3 LWMP Outfall Assessment

- Hydraulic analysis based on future flow predictions including South Sewer Extension
- Worst Case Scenario Analysis
- Design basis consistent with MWR (OC)
- Assessed gravity flow limitations
- Assessed pumped flow limitations



Background and Stage 3 LWMP Outfall Assessment





	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
PHF (L/s)	571	659	714	770	843	916	996	1,057	1,127	1,196
Outfall Chamber TWL Required (m)	14.87	18.31	20.71	23.27	26.88	30.76	35.34	39.08	43.54	48.24
Outfall Chamber Height Increase (m)	1.87	5.31	7.71	10.27	13.88	17.76	22.34	26.08	30.54	35.24
Pressure Increase from Current TWL (psi)	4	8	12	15	20	26	33	38	44	51

Conclusions and Next Steps

- Capacity primarily limited by the outfall chamber lid elevation
- Pump station capacity is also limited (2030)
- Upgrades to the outfall components are required to meet future flow requirements
- It is expected that the previously predicted “combined” capacity of the outfall system with the PEEQ and Secondary Effluent up to the year 2031 remains valid.
- While the outfall pipe itself is not the limiting factor, increasing flows to the outfall will exert additional pressure on the pipe
- Investigating the condition of the outfall is recommended prior to deciding on full-scale or staged upgrading
- Timing and details of Outfall replacement/upgrade phasing to be determined during Master Plan
- Consultation is key aspect for Outfall replacement/upgrade
- Final commitment to be incorporated in Stage 3 LWMP

Questions on Cape Lazo Outfall Upgrade?

Thank you

wsp.com

Site Master Plan and Detailed Design
Carollo

Comox Valley
REGIONAL DISTRICT

Comox Valley Regional District

Site Master Plan Update & Phase 4 Detailed Design

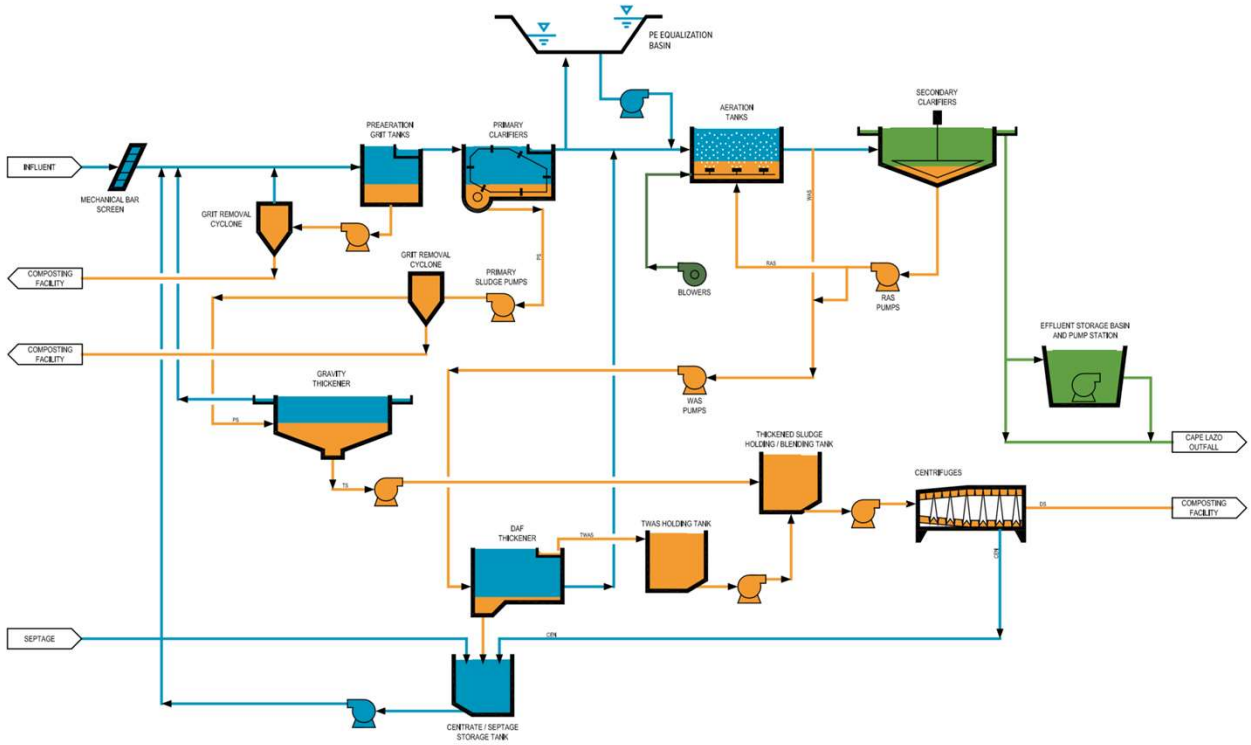
Technical Advisory Committee & Public Advisory Committee (TACPAC) Meeting

December 2, 2024

carollo

Presentation Objective

- Provide a summary of the work Carollo is currently undertaking to support planning for upgrades to the Comox Valley Water Pollution Control Centre (CVWPCC)
- Relationship of Site Master Plan to LWMP
- Description of deliverables

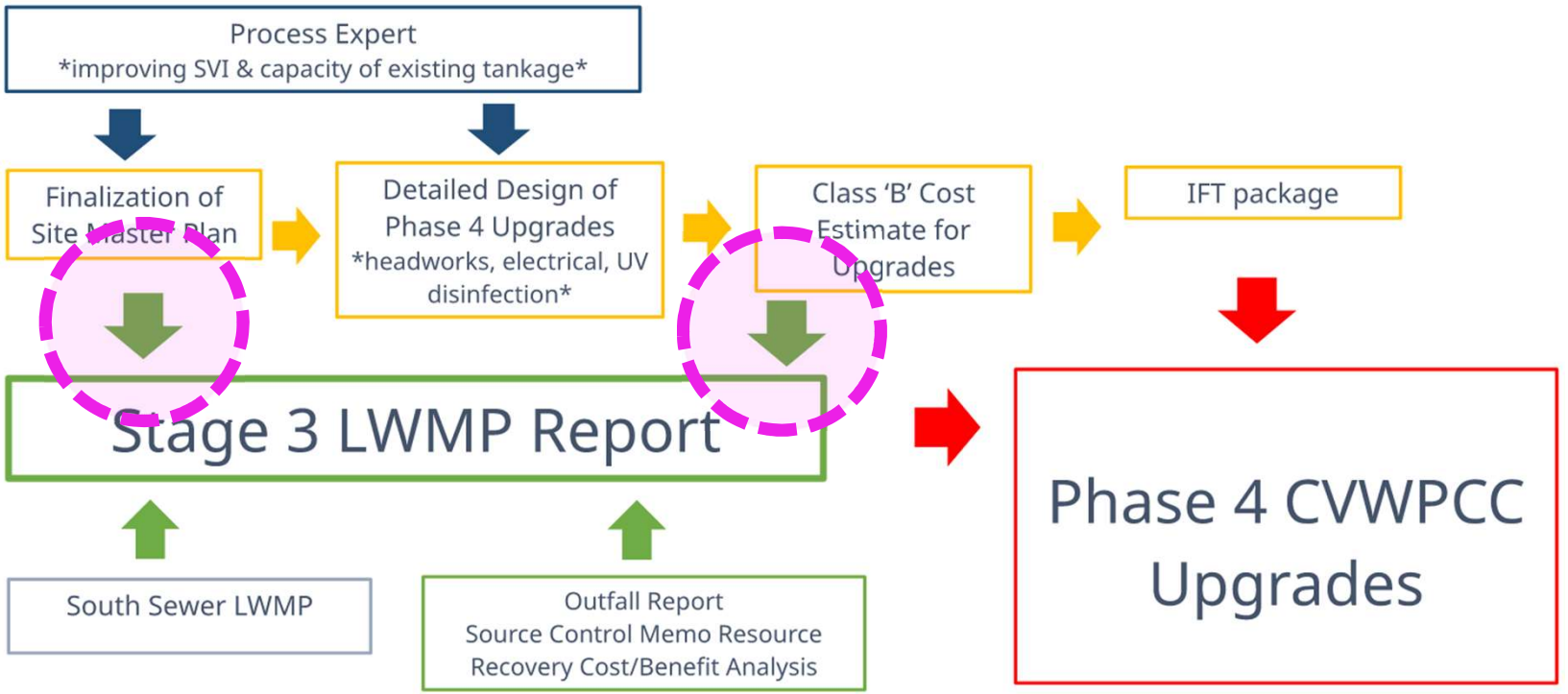


01

Site Master Plan and LWMP Integration

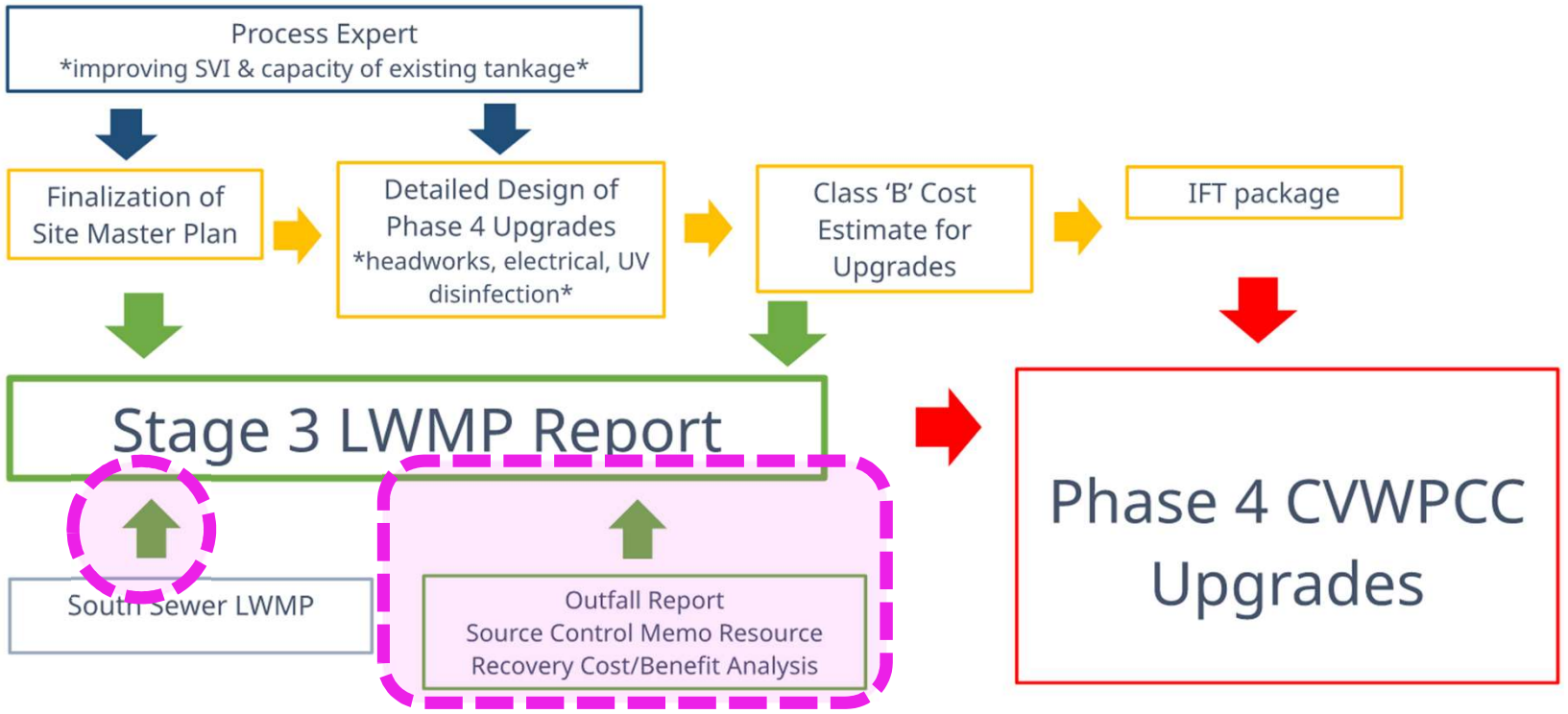
Final Master Plan as Input to the LWMP

- Finalizing the site master plan will consider future plant expansion and timing of upgrades to meet population growth
- Developing preliminary designs will establish detail required for cost estimate



Final Master Plan as Input to the LWMP

- Update service population projections to account for new service areas
- Business case for implementing biosolids digestion
- Best way to utilize waste heat and reclaimed effluent

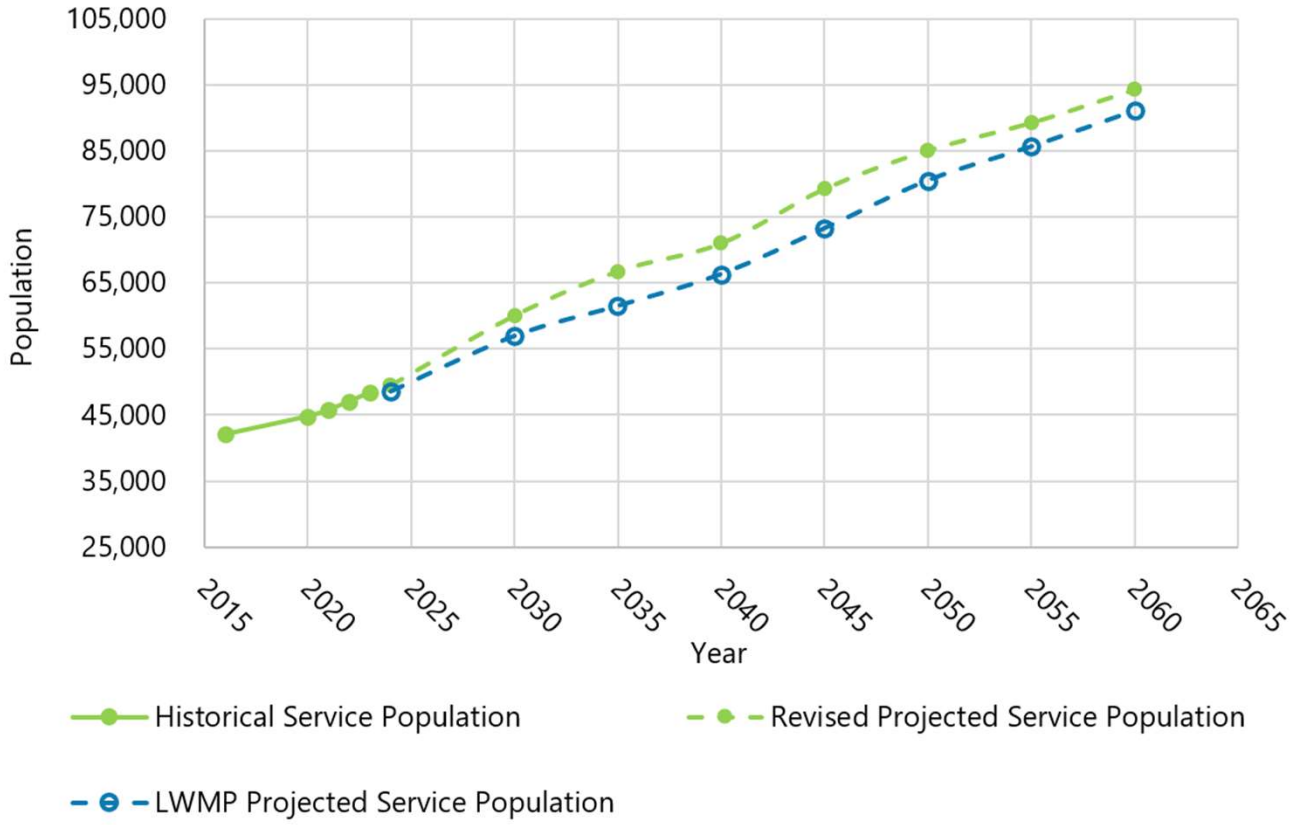


02

Deliverables and Potential Challenges

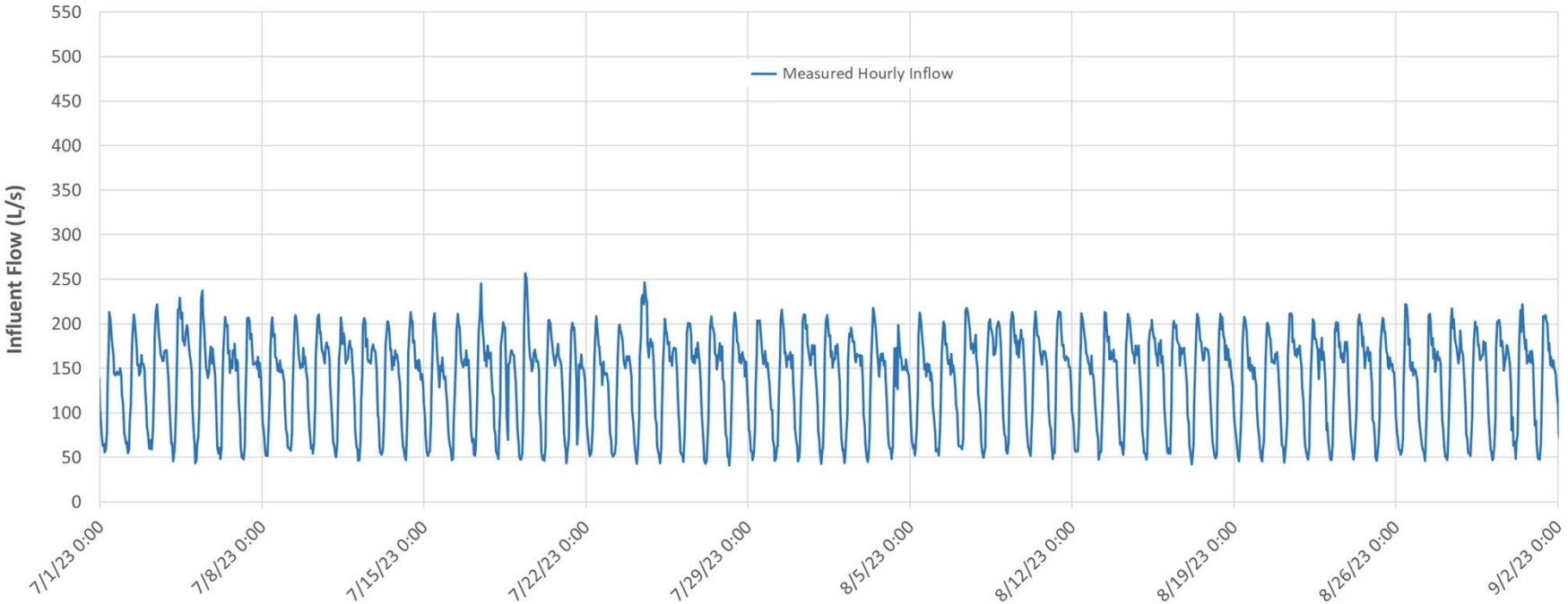
Deliverables – Service Population Forecast

- Since 2022, Province passed Bill 44 – designed to improve housing affordability
- Service population forecast will be revised to account for Bill 44
- Will include South Sewer service area



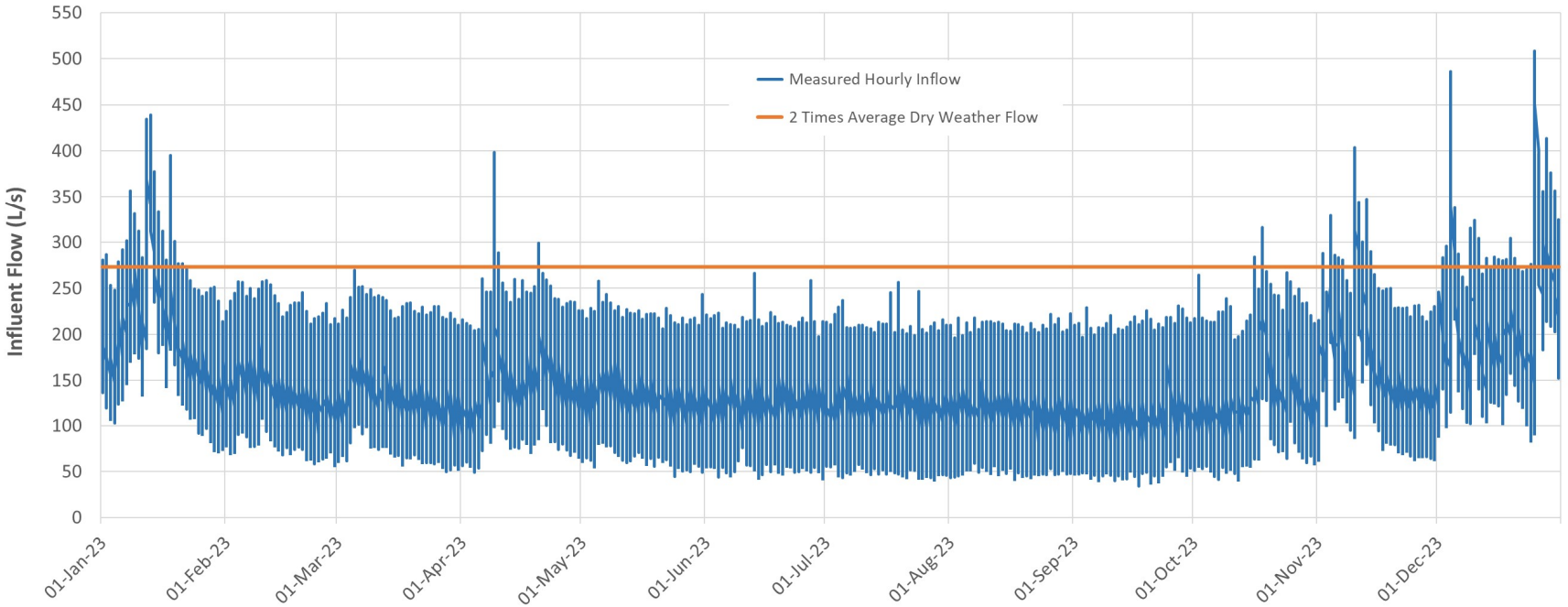
Deliverables– Source Control Assessment

- Inflow and infiltration (I&I) has significant influence on future upgrades
- During dry weather flow to the CVPCC has a regular pattern – we are creatures of habit



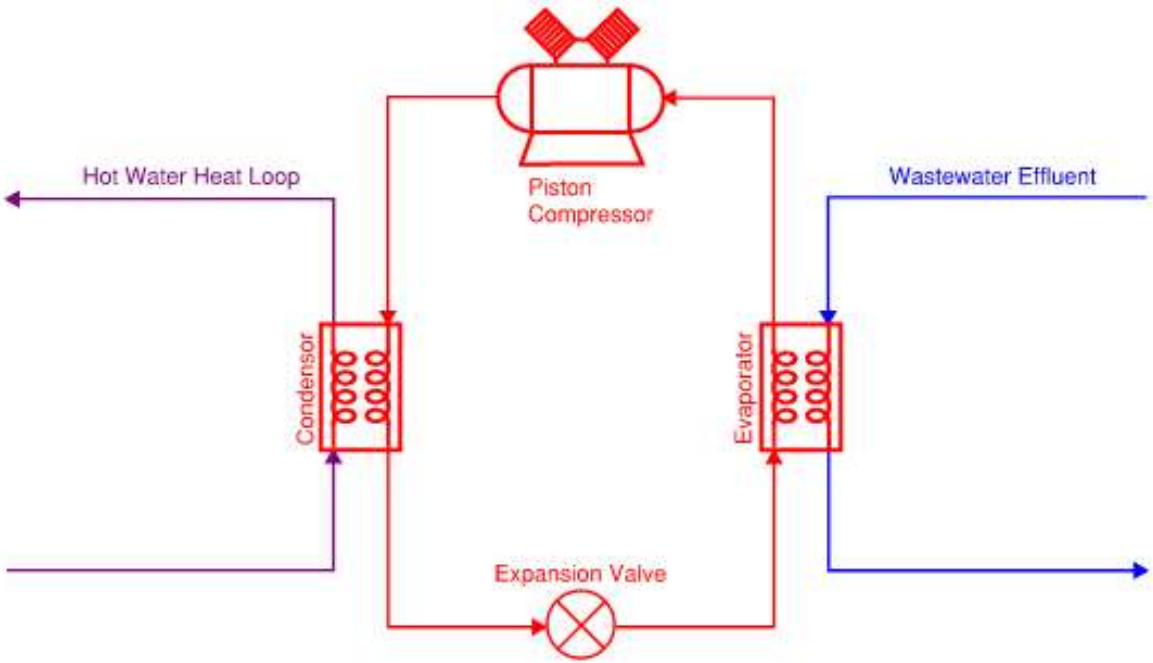
Deliverables– Source Control Assessment

- During rain events water leaks into the collection piping, causing high flows
- Wet weather flow is defined as anything that exceeds 2 times dry weather flow
- Additional unit processes required to treat the dilute wastewater
- Cost of I&I and associated wet weather flows will be evaluated



Deliverables – Heat Recovery

- Heat pumps can be used to extract energy from final effluent for building heat
- Reduces energy costs and carbon emissions
- Master Plan will assess most cost-effective way to utilize this renewable energy



Deliverables – Effluent Reuse

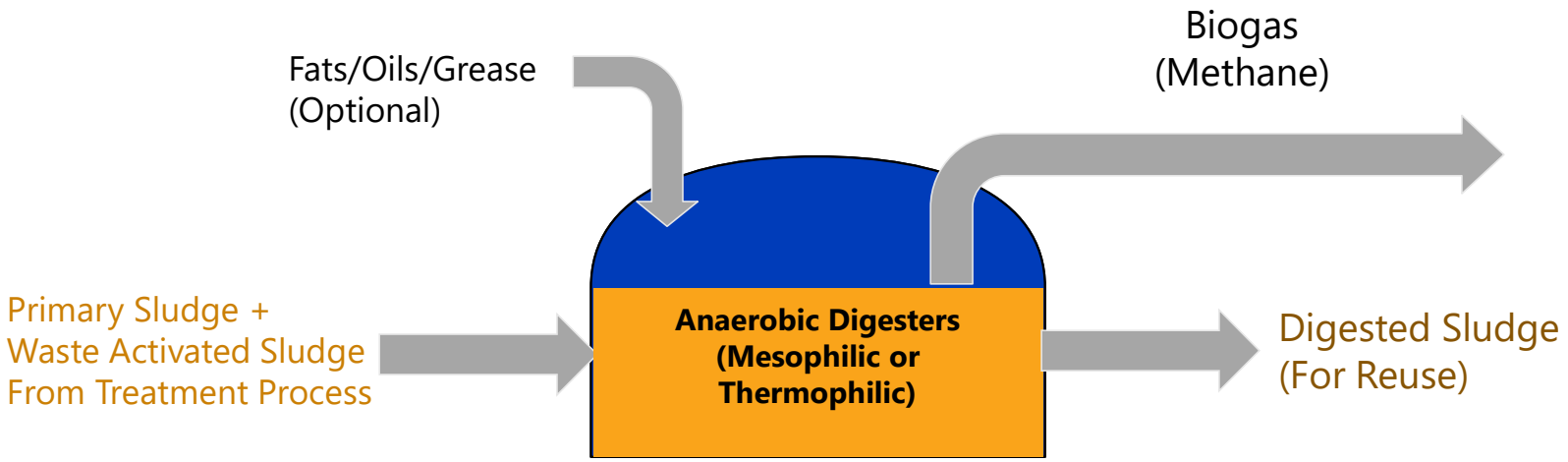
- Effluent reuse reduces potable water demand
- Chlorinated, filtered effluent is safe and regulated under MWR
- Can be used for irrigation, wash-down, toilet flushing and process applications
- Master plan will consider uses and infrastructure requirements (ie., pumping, pipes and treatment)

Deliverables – Biosolids Digestion Feasibility

- Currently, CVRD composts biosolids from CVWPCC to generate SkyRocket
- A nutrient-rich, soil amendment
- Produced by aerating piles of biosolids mixed with wood chips

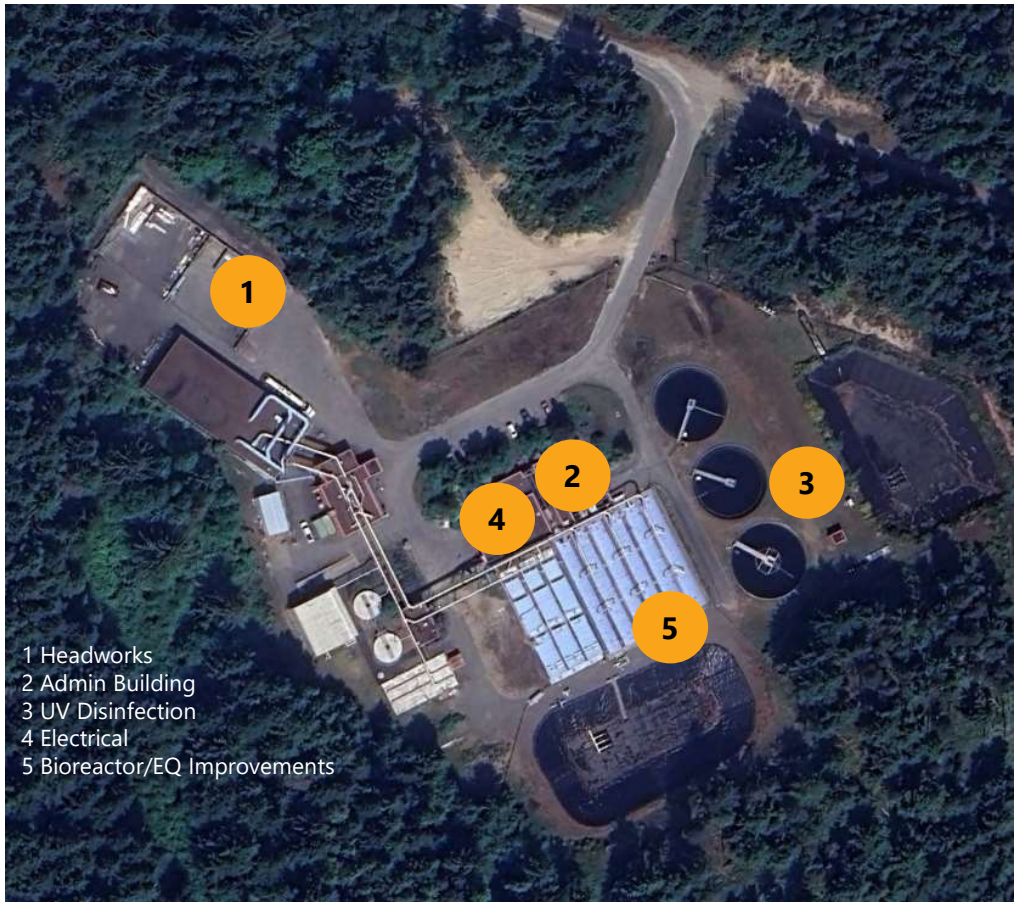
Deliverables – Biosolids Digestion Feasibility

- Anaerobic digestion is an alternative to composting for biosolids stabilization
- Doesn't require aeration but needs a large, sealed tank
- Provides opportunity for methane recovery – a carbon neutral energy source



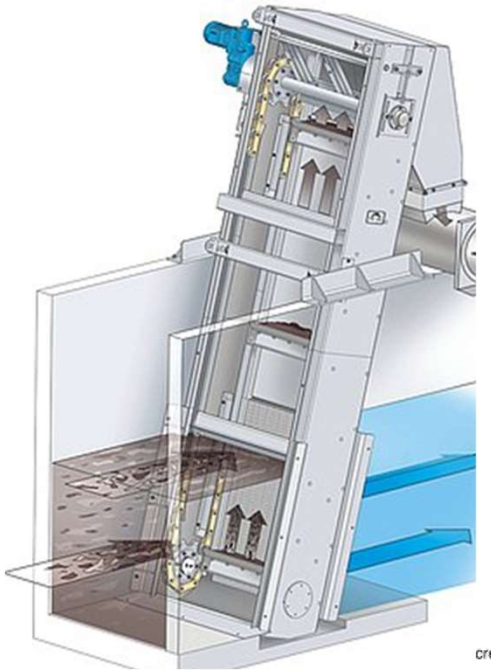
Deliverables – Stage 4 Upgrades & Cost Estimates

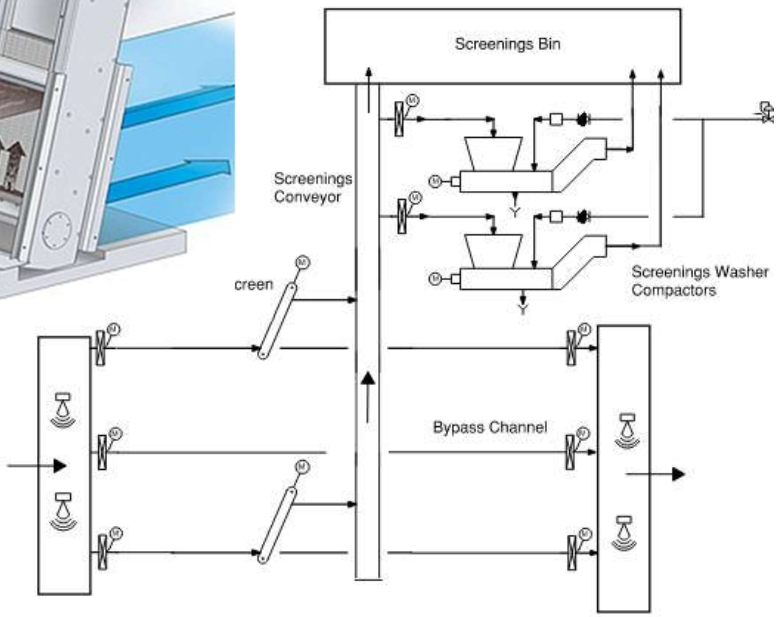
- Preliminary designs are progressing for known Stage 4 upgrades
- Will be used to develop Class B capital cost estimates
- Headworks
- Administration Building
- UV disinfection
- Electrical upgrades
- Bioreactor & EQ basin improvements



Deliverables – Headworks Upgrade

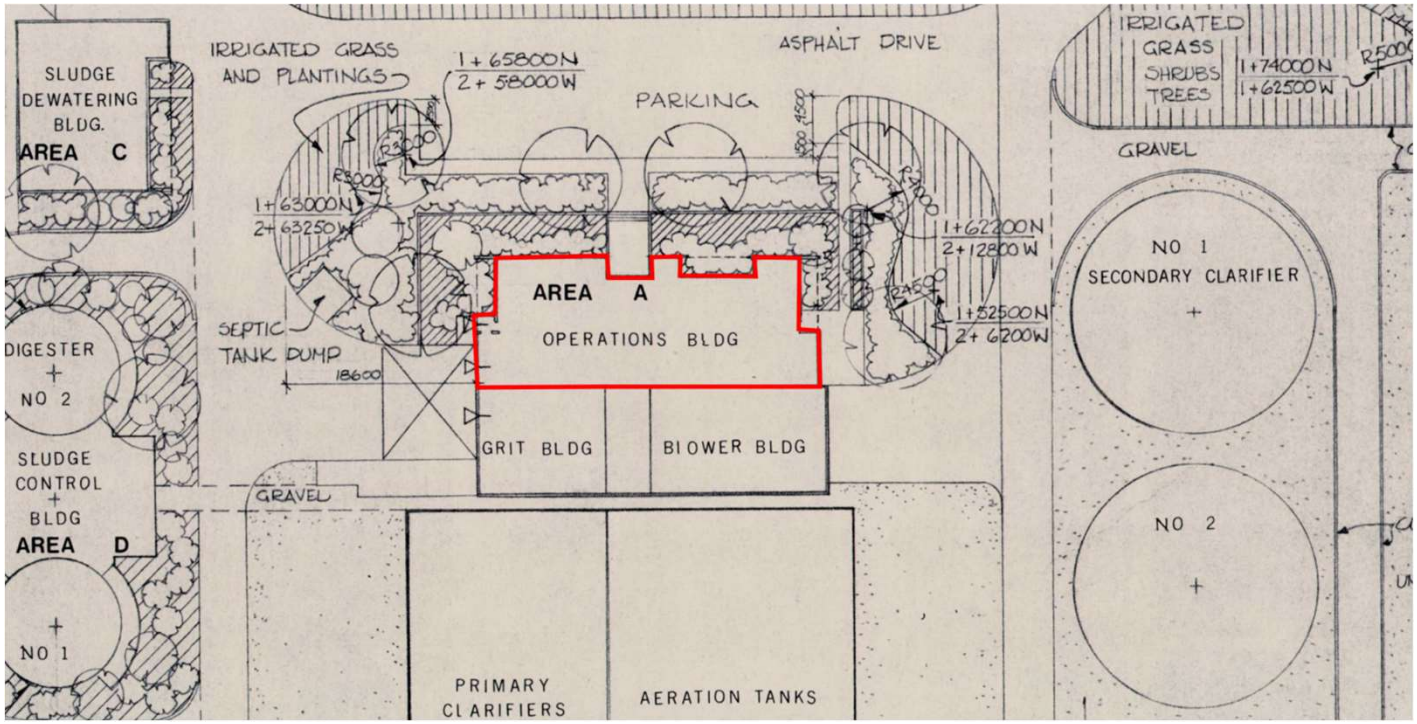
- Screening of influent raw wastewater removes and washes inorganic material
- Important for protecting treatment process and biosolids quality
- Technology selection will be completed for mechanical screens





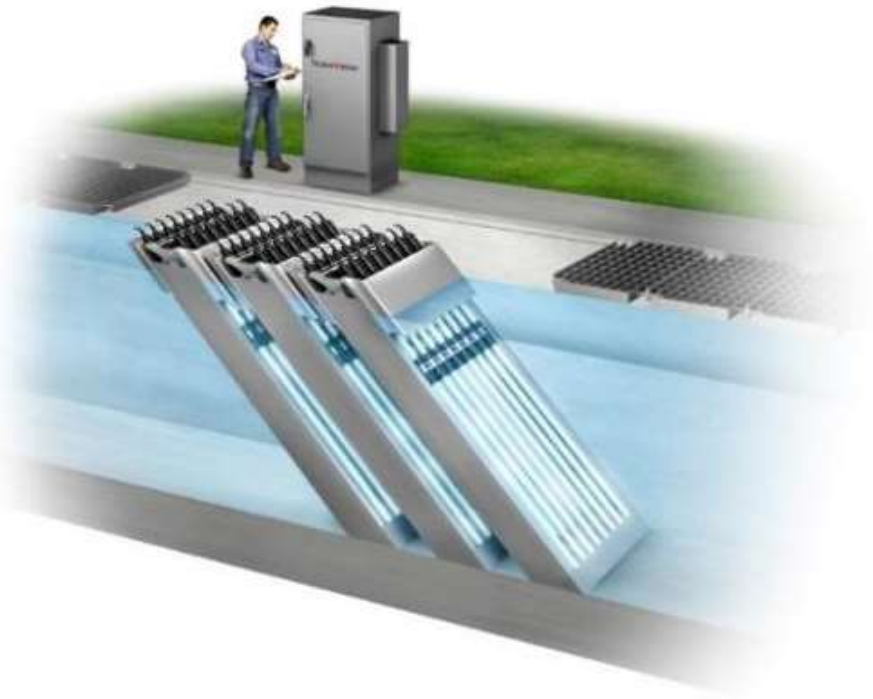
Deliverables – Administration Building Upgrade

- Existing Administration Building constructed in 1982
- The goal is to modernize facilities and provide space for operations staff to 2060



Deliverables – UV Disinfection

- Currently, effluent discharged to Sea is not disinfected
- Upgrades will include effluent disinfection using UV light
- UV dose response testing being undertaken by UBC to optimize sizing
- Technology will be evaluated to inform preliminary design based on features and life-cycle cost



Thank you!

Timing and Engagement with TACPAC

Stage 3 LWMP Timing

- **Now until Fall 2025:** Drafting Stage 3 LWMP Report
- **Fall 2025- Winter 2026:** Stage 3 report review
- **Early 2026:** Stage 3 LWMP report submittal
- **2026:** Provincial Review
- **2027:** Plan approval and begin Phase 4 Upgrades

Planned TACPAC Meetings