

Sewer Extension South Liquid Waste Management Plan Addendum
Joint Technical and Public Advisory Committees
Meeting #1 – September 21, 2022



Welcome

The CVRD respectfully acknowledges that the proposed Sewer Extension South Project will be constructed and operated on the unceded traditional territory of the K'ómoks First Nation, the traditional keepers of the lands and waters this project strives to protect.

Today's Goals

Introduction to:

- Each other
- The LWMP process
 - Comox Valley Sewer Service LWMP
 - Sewer Extension South LWMP Addendum
- Committee Roles and Responsibilities
- Decision Making Process
- Meeting #2

Introductions

- Name
- Affiliation

Abbreviations

CVRD	→	Comox Valley Regional District
CVSC	→	Comox Valley Sewage Commission
EASC	→	Electoral Areas Services Committee
CVSS	→	Comox Valley Sewage Service
CVWPCC	→	Comox Valley Water Pollution Control Center
EIS	→	Environmental Impact Study
LWMP	→	Liquid Waste Management Plan
SES	→	Sewer Extension South
PAC	→	Public Advisory Committee
TAC	→	Technical Advisory Committee
MoECCS	→	Ministry of Environment and Climate Change Strategy

Discussion Paper #1

LWMP Objectives



WSP's LWMP Experience in BC

We have completed over 20 LWMPs for communities throughout BC and wrote the provincial guidelines for liquid waste management planning.

District of Tofino, LWMP Stage 3 (2015-2017) www.tofino.ca/lwmp

Comox Valley Regional District, Sanitary Sewerage Master Plan Update (as a sub-consultant to McElhanney for wastewater treatment expertise), 2008.

Regional District of Kootenay Boundary, LWMP Stage 1 (2005 to 2008), Stage 2 (2008-2017), Stage 3 (currently nearing completion)

Town of Ladysmith LWMP, Stages 1 to 3 (Stage 3 approved in 2013)

City of Powell River, LWMP Stage 2 (2004 to 2011) and Stage 3 (currently underway)

City of Salmon Arm, LWMP, Stages 1, 2 and 3 (2002 to 2005) City of Armstrong Master Sewer Plan (2013)

Town of Smithers Sanitary Sewer Master Plan (2007).

Town of Fort Nelson Sanitary Sewer Master Plan (2006).

Capital Regional District, Performance Audit of Core Area LWMP (2011)

Resort Municipality of Whistler, LWMP Stages 1, 2 and 3 (1991 to 1993) and LWMP Update (2000 to 2005) and LWMP Update (2015-2018)

City of Revelstoke, LWMP Stage 1 to 3 (2006 to 2012)

District of Campbell River, LWMP (1991 to 1992)

Regional District of Nanaimo, LWMP Northern Community, Phase 1, Stages 1, 2 and 3 (1993)

Regional District of Nanaimo, LWMP Northern Community, Phase 2, Stages 1 and 2 (1995 to 1996)

Regional District of Nanaimo, LWMP Southern Community, Stages 1 and 2 (1995 to 1997)

Regional District of Nanaimo, LWMP, Stage 3, Northern and Southern Communities combined (1997)

City of Vernon, LWMP Update, Stages 1, 2 and 3 (1994 to 1999)

Sunshine Coast Regional District - LWMP (3 plan areas) (1992 to 2002)

Cowichan Valley Regional District, LWMP, Stages 1, 2 and 3, Central Sector (1995 to 1999)

Fraser Valley Regional District, LWMP (1999), Stage 1

City of Kimberley, LWMP, Stage 1 (1999)

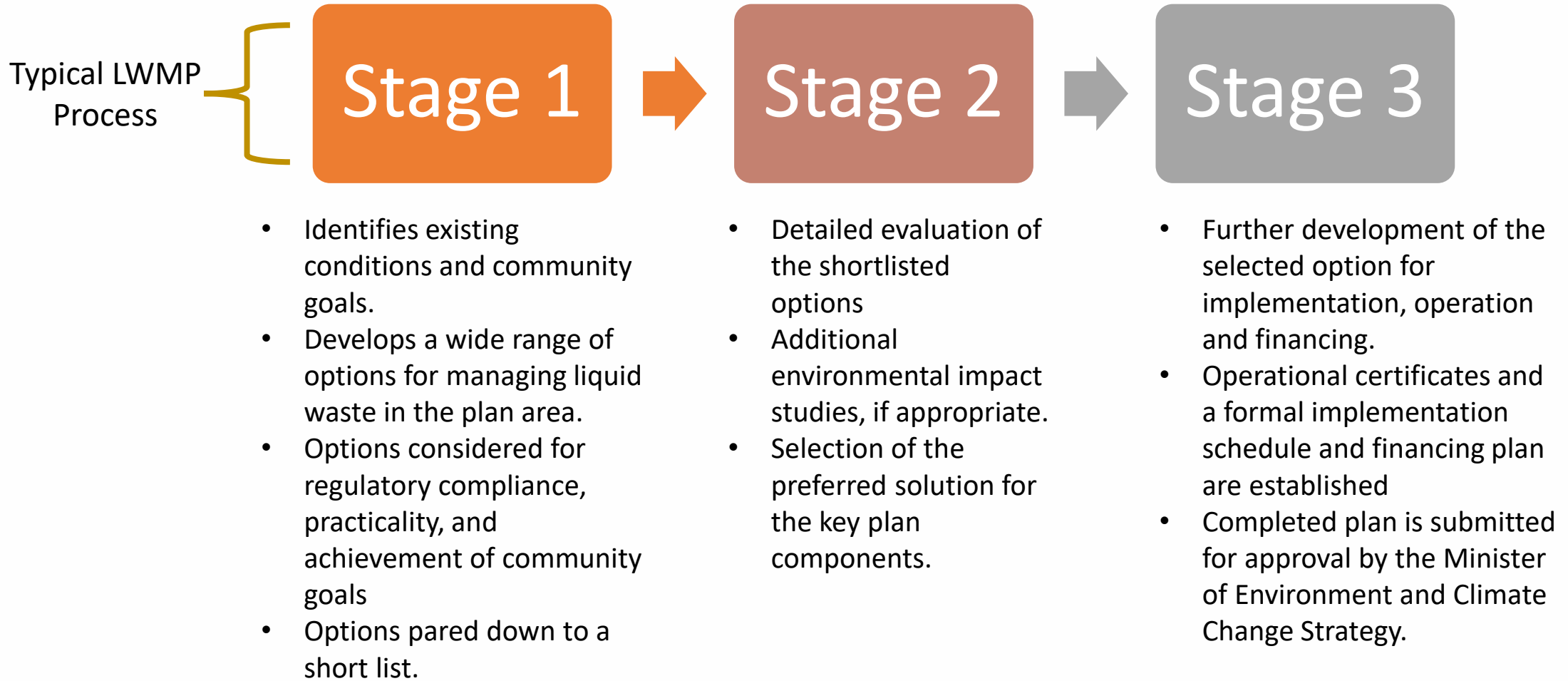
North Okanagan Regional District - LWMP, EA A, B and C (1990)

What is a Liquid Waste Management Plan?

A three-stage process for managing liquid waste while meeting regulatory requirements.

- examines long term wastewater management needs for the whole community.
- is designed to be a participatory process, involving stakeholders and the public to guide decision making.
- acts as a written record of a community's decisions and plans for managing liquid wastes.
- provides borrowing authorization to implement capital projects.

LWMP 3-Stage Process





Committees

Steering Committee

- Guide and receive input for the advisory committees and make recommendations to the local government
- CVSS LWMP – Comox Valley Sewage Commission
- Sewer Extension South – CVRD Electoral Areas Services Committee

Public Advisory

- Represent community and stakeholder interests
- Draft Terms of Reference for the SES LWMP PAC have been developed and will be discussed later today

Technical Advisory

- Provides input on regulatory and technical requirements.
- Draft Terms of Reference for the SES LWMP TAC have been developed and will be discussed later today

CVSS LWMP Status

Stage 1*

- Produce a detailed list of liquid waste management options
- Provide a high level technical evaluation of options including feasibility, risks and high level costing.
- Recommendations for more detailed costing and evaluation in Stage 2

Stage 2*

- Provide a more detailed evaluation and costing of options.
- Support advancement of one option for each of the three major study areas to a Stage 3 LWMP.
- Results in a draft CVSS LWMP

*The draft CVSS LWMP Stage 1 and 2 combined report is currently being reviewed by K'ómoks First Nation and the CVSS LWMP TAC/PAC.

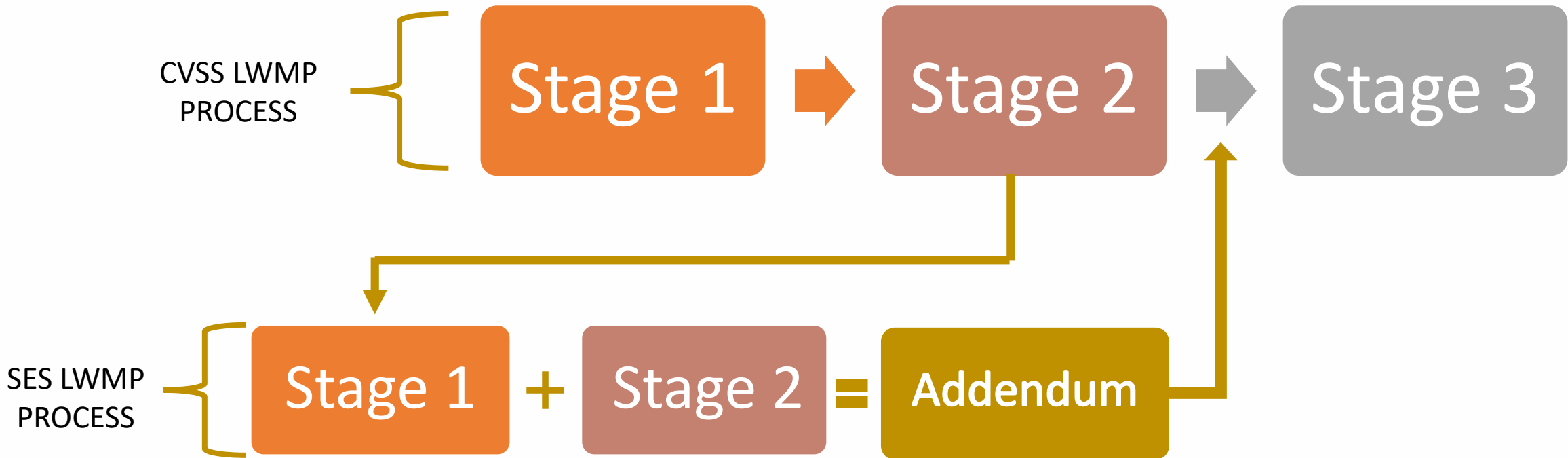
Stage 3

- Upon provincial approval of the CVSS LWMP Stage 1 and 2 report, the CVRD would then move forward with developing a CVSS LWMP Stage 3 report.

Need for SES 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
- Consider SES project within the context of the CVSS LWMP
- Summarize completed technical work in support of the LWMP addendum
- Development of the addendum will follow provincial LWMP guidelines, including the involvement of the TACPAC and public engagement

LWMP 3-Stage Process



SES LWMP Status

Stage 1*

- Produce a detailed list of liquid waste management options
- Provide a high level technical evaluation of options including feasibility, risks and high level costing.
- Recommendations for more detailed costing and evaluation in Stage 2

Stage 2*

- Provide a more detailed evaluation and costing of options.
- Support advancement of one option for each of the three major study areas to a Stage 3 LWMP.
- Results in a draft CVSS LWMP

*The draft CVSS LWMP Stage 1 and 2 report is currently being reviewed by K'ómoks First Nation and the CVSS LWMP TAC/PAC.

Addendum

- Expanding the CVSS service area to include a portion of Electoral Area A (Sewer Extension South)
- Development of an addendum to the Stage 1 and 2 CVSS LWMP following provincial LWMP guidelines including the involvement of TAC/PAC

Stage 3

- Upon provincial approval of the CVSS LWMP Stage 1 and 2 report, and a Sewer Extension South LWMP Addendum Stage 1 and 2 report, the CVRD would then move forward with developing a CVSS LWMP Stage 3 report which will include the south region.

Planning components

Planning components already included in the CVSS LWMP that will not be required in the SES LWMP addendum:

- Reclaimed water
- Combined sewer and sanitary overflows
- Wastewater treatment – central plant
- Stormwater management
- Integrated resource recovery

Way Forward

Title	Progress
TAC/PAC Meeting #1 (September 21, 2022)	
Discussion Paper 1: LWMP Objectives	✓
Discussion Paper 2: LWMP Summary of Past work	✓
Discussion Paper 3: Flows and Loads	✓
TAC/PAC Meeting #2 (November 23, 2022)	
Discussion Paper 1: Conveyance Piping Design and Cost	
Discussion Paper 2: Collector System Design	
Discussion Paper 3: Pump Station Design and Sitting	
Draft Stage 1 EIS	
TAC/PAC Meeting #3 (December 12, 2022)	
Discussion Paper 1: Collection System and Project Phasing	
Decision Matrix	
TAC/PAC Meeting #4 (May 10, 2023)	
Draft Addendum Report	
TAC/PAC Meeting #5 (September 13, 2023)	
Final Stage 1 EIS	

Questions



Sewer Extension South Addendum

Public Consultation Plan

June 2022



Public Participation Spectrum

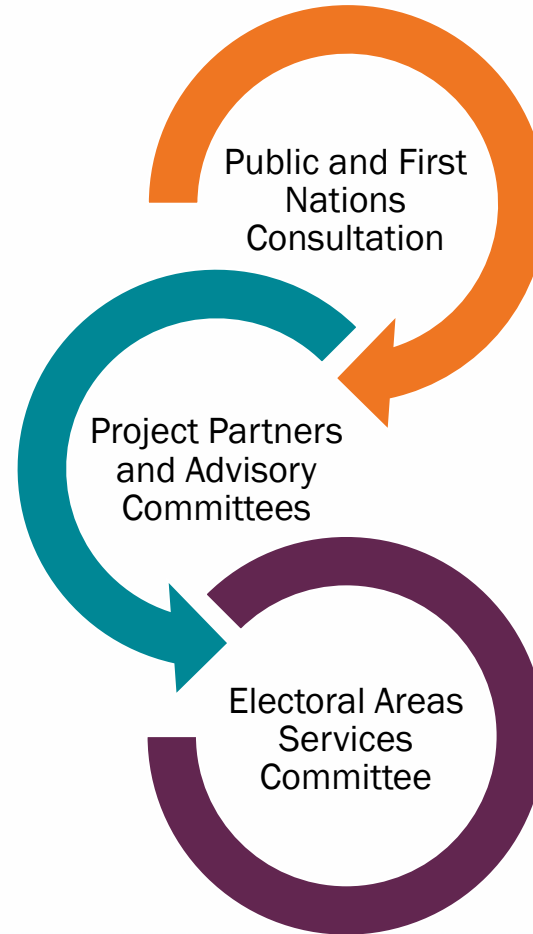
Increasing level of public involvement in decision-making 

INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
Keep residents informed about the process	Obtain feedback from residents on analysis of options	Work directly with residents to address concerns	Partner with residents to develop a preferred solution	Place final decision making in the hands of residents

Engagement Process

Collaborate

- Project Partners
- Technical Advisory Committee
- Public Advisory Committee



Consult

- First Nations
- Online consultation
- Open House
- Email/phone

Inform

- Project webpage
- Mailouts
- Attend/view PAC/TAC meetings

Consultation with Impacted First Nations

Core Territory

- K'ómoks First Nation

Land and marine territory including Royston, Union Bay and Baynes Sound

- Wei Wai Kum First Nation
- We Wai Kai first Nation (Cape Mudge Band)
- Homalco First Nation
- Tla'amin Nation
- Qualicum First Nation
- Stz'uminus First Nation

Marine territory including Baynes Sound

- Ts'uubaa-asatx Nation (formerly Lake Cowichan First Nation)
- Penelakut First Nation
- Lyackson First Nation
- Cowichan Tribes
- Halat First Nation
- Snaw'naw'as First Nation



Comox Valley Record, July 11, 2019

Engagement timelines

DATES	PROJECT MILESTONES
May-Sept. 2022	<p>Phase 1/Project Initiation</p> <ul style="list-style-type: none"> INFORM – Update the community about the next steps for wastewater planning in the region, building on already-completed updates in Nov/Dec 2021(mailer/open house) and May 2022 (letter) COLLABORATE – Invite residents to join public advisory committee and host first meeting INFORM – Invite interested residents to observe public advisory committee meetings. CONSULT – Initiate consultation with First Nations.
Oct 2022- Jan. 2023	<p>Phase 2: Phasing, Collection System, Pump Station</p> <ul style="list-style-type: none"> COLLABORATE – Work with TAC/PAC to review proposed project phasing and components, evaluation and selection of collection options. CONSULT – In early 2023, host update for community about planning work and collect feedback on collection options, pump station siting/design. CONSULT – Continue consultation with First Nations.

DATES	PROJECT MILESTONES
Jan. 2023- June 2023	<p>Phase 3: Development of Draft Addendum</p> <ul style="list-style-type: none"> COLLABORATE – PAC/TAC meetings, draft review/direction CONSULT – Host open house event for residents to share update on draft addendum, collect feedback for consideration. CONSULT – Continue consultation with First Nations
June -Sept 2023	<p>Phase 4: Review/Approval</p> <ul style="list-style-type: none"> COLLABORATE – Work with PAC/TAC to report on final draft INFORM – Share final draft with community along with public consultation summary and Environmental Impact Study CONSULT – Continue consultation with First Nations
October 2023	<p>Submit Final Draft Addendum and Environmental Impact Study</p> <ul style="list-style-type: none"> INFORM: Provide project update to all audiences.

Questions



Discussion Paper #2

Summary of 2014-2016 South region Stage 1/2 LWMP Work

Michal Simhon, M.A.Sc., P.Eng.
Associated Engineering



Objectives of the 2022 Summary Report

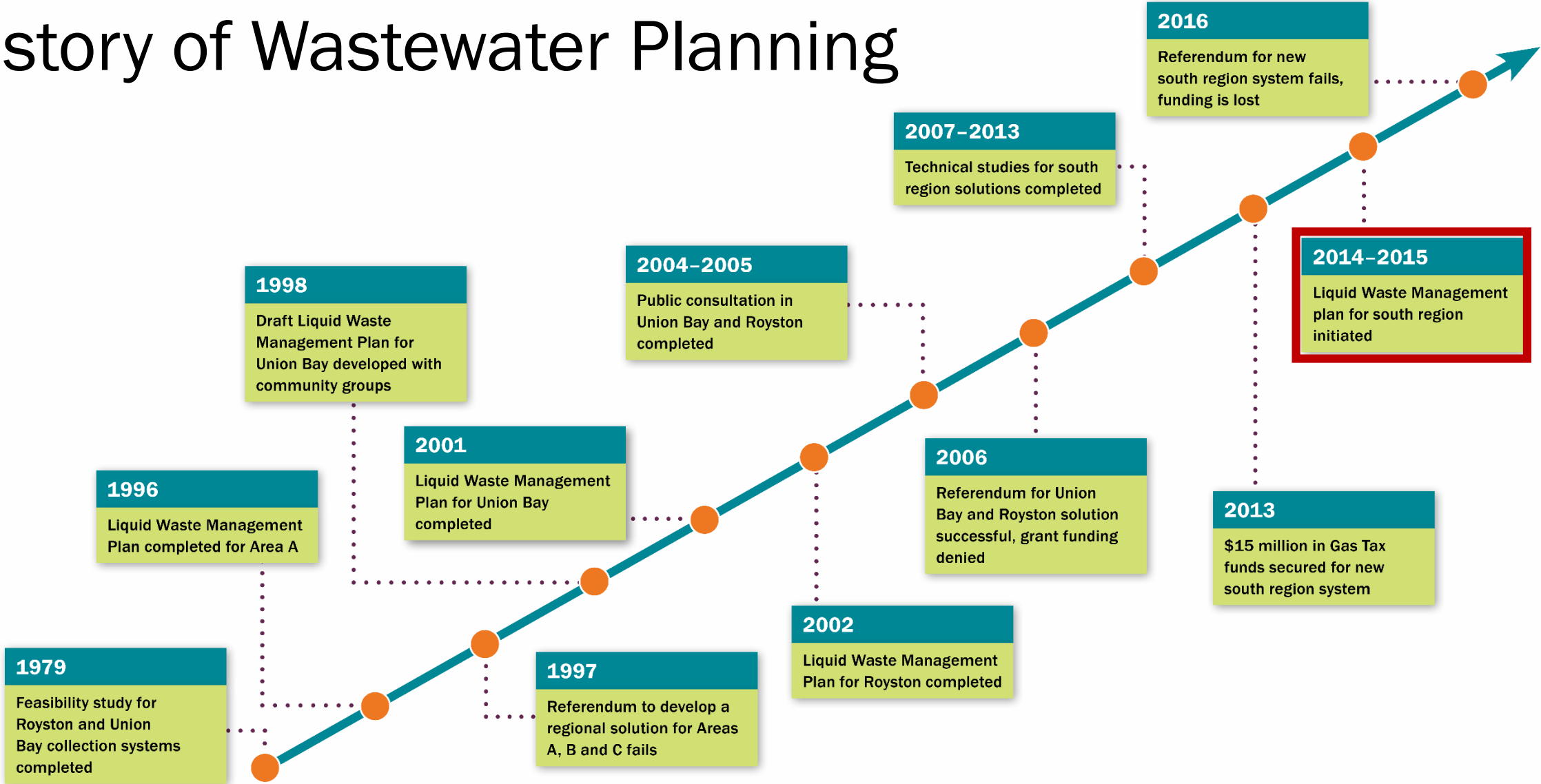
- Provide the newly formed TAC/PAC with a summary of the 2014-2015 South Region LWMP Stage 1 and 2 efforts
- Provide assistance to the CVRD and TAC/PAC members by providing history/context



Objectives of the 2014-2015 South Region LWMP

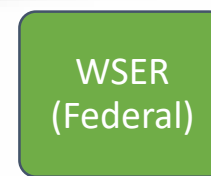
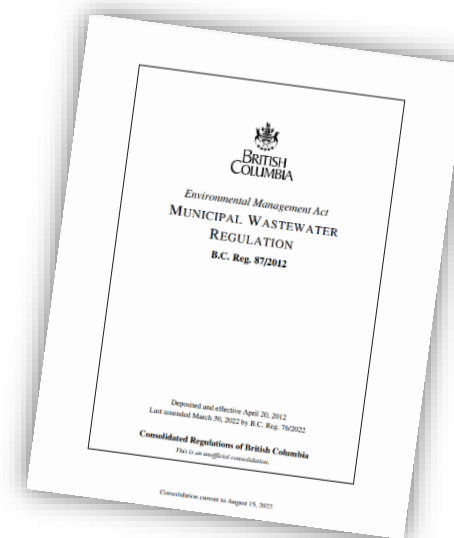
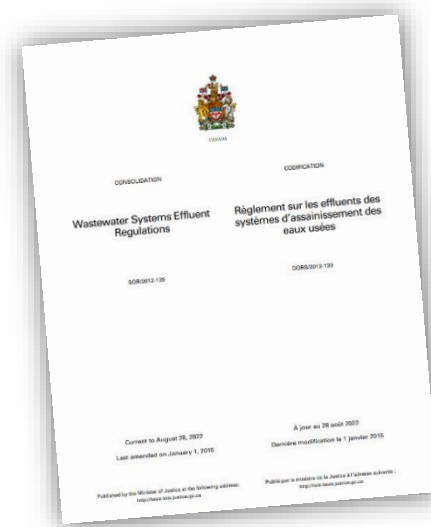
- Combined Stage 1/2 LWMP
 - *Develop an overall plan for municipal wastewater management through adequate public consultation that protects public health and the environment.*

History of Wastewater Planning



Regulatory Framework

- Provincial
 - Municipal Wastewater Regulation (2012)
 - Vancouver Island Phosphorus In-Stream Objective (non-marine)
- Federal
 - Wastewater Systems Effluent Regulation (2015)



Development of Flows and Loads

Flow Projections:

- 2060 for Royston, Union Bay and Village of Cumberland
- Considerations for Inflow and Infiltration

Load Projections:

- Typical generation rates



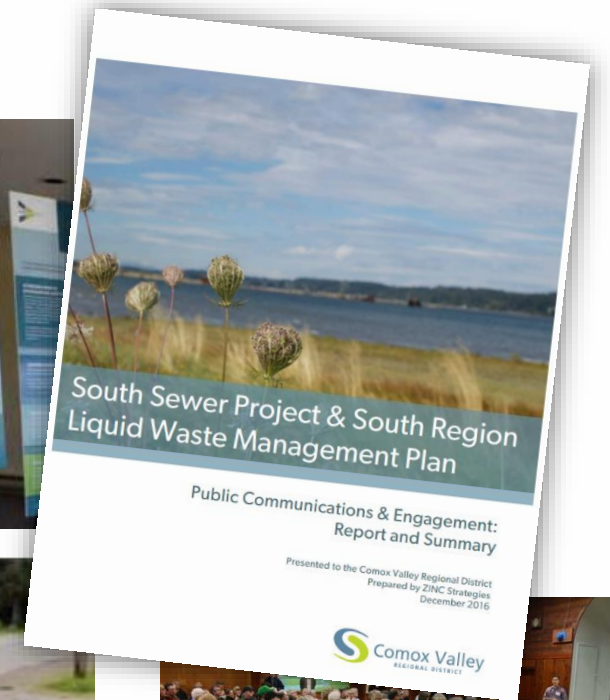
Environmental Impact

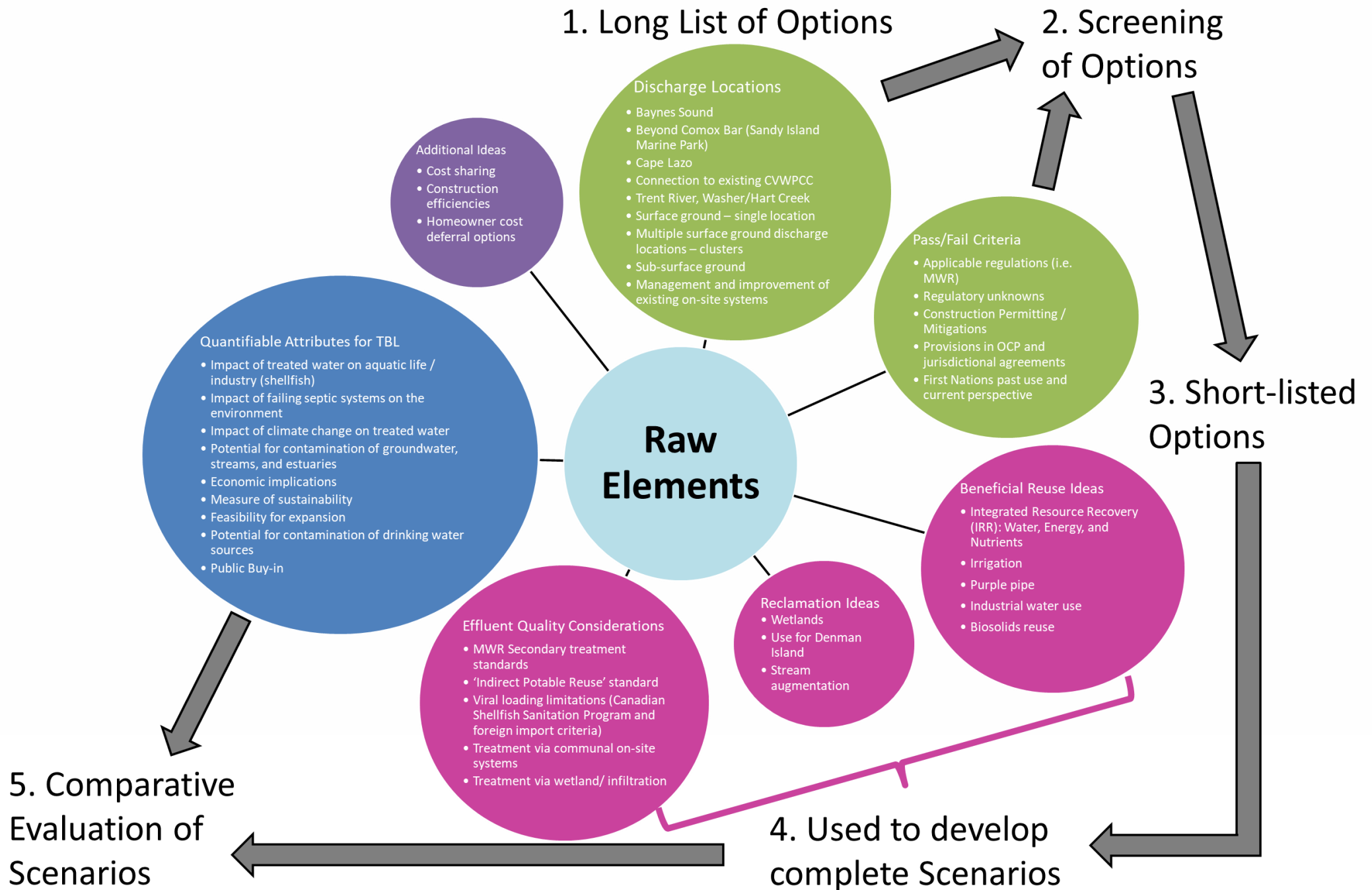
- Investigations in support of the TBL evaluation
 - *E.g. Discharge to ground, private septic system, Cape Lazo discharge options*
- Stage 1 and 2 Environmental Impact Study (not complete)



Advisory Committees and Public Outreach

- First Nation
- Public Outreach
 - Three Open Houses (2014-2015)
- Formation of the Technical and Public Advisory Committees (TAC/PAC)
 - Five Meetings (2014-2015)





Long List of Options

- Nine (9) Options Considered
- Options were first reviewed in the TAC/PAC Meeting #3, and some options eliminated
- Remaining options were then reviewed by the Steering Committee, who removed other options from consideration.

Locations and identify any "show stopper" attributes that on their own would eliminate the alternative from any further consideration in terms of advancing it to a short-list of alternatives that would be subjected to a comparative evaluation

 Sufficient information exists at this time to make a PASS judgement on this alternative attribute and a PASS has been assigned
 Sufficient information exists at this time to make a FAIL judgement on the alternative attribute
 Sufficient information exists at this time to make a FAIL judgement on the alternative attribute and a FAIL judgement has been assigned

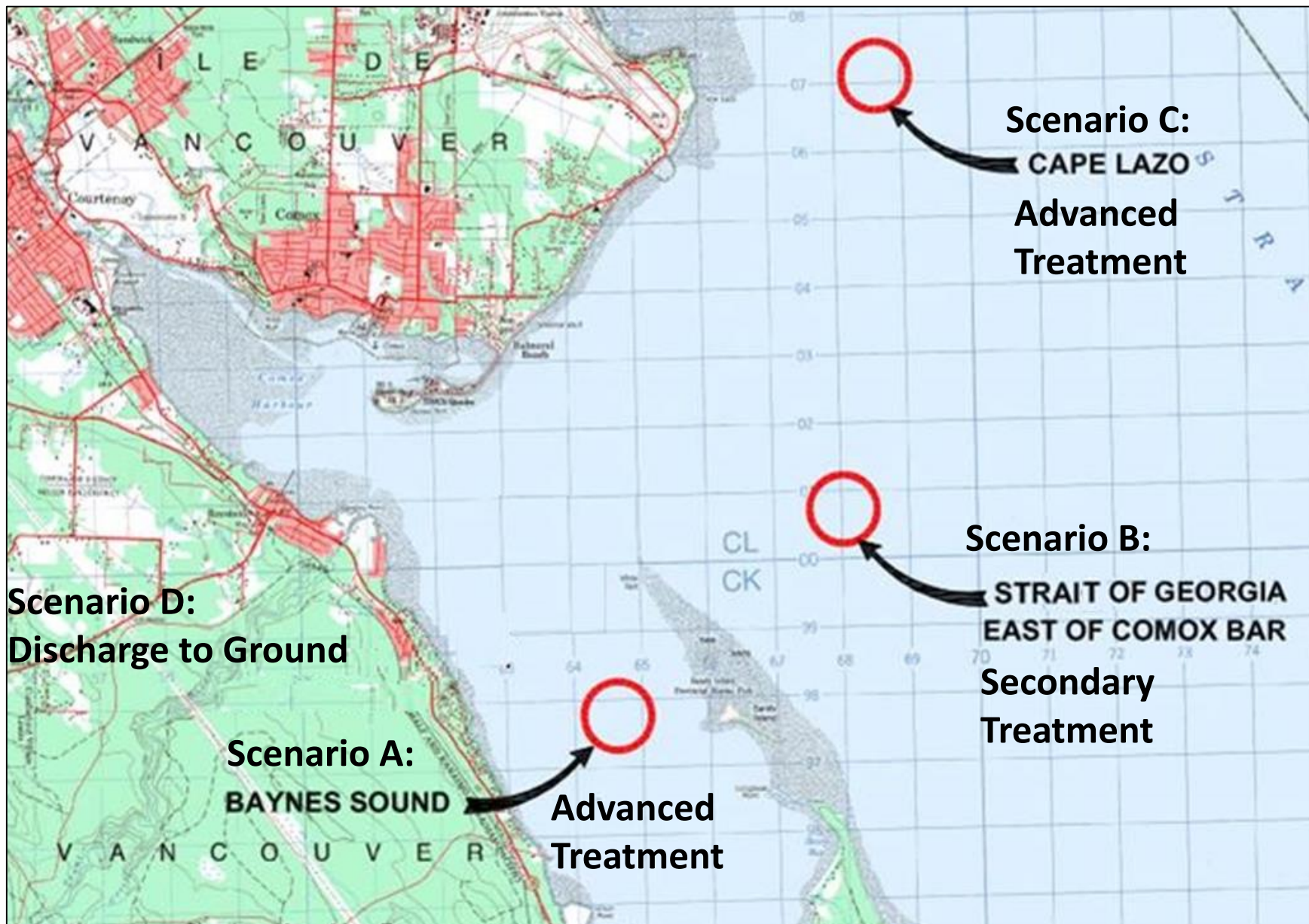
	Option 1 Discharge to Baynes Sound	Option 2 Discharge to beyond Comox Bar (Sandy Island Marina Park)	Option 3 Discharge to Cape Lazo	Option 4 Connect to the existing Courtenay/Comox CWWPC	Option 5 Discharge to the Trent River, Washer/Hart Creek	Option 6 Ground discharge to a single location	Option 7 Ground discharge to multiple locations	Option 8 Discharge to sub-surface ground (i.e. injection)	Option 9 Management and improvement of existing on-site systems
low water	Location meets 10 m minimum depth requirement (AE Report, 2011).	Location meets 10 m minimum depth requirement (AE Report, 2011).	Location meets 10 m minimum depth requirement (AE Report, 2011).	Existing location meets 10 m minimum depth requirement	N/A	N/A	N/A	N/A	N/A
edge of water	Location meets the 300 m radius requirement from edge of E2Z to sensitive areas based (AE Report, 2011)	Location meets the 300 m radius requirement from edge of E2Z to sensitive areas based (AE Report, 2011)	Location meets the 300 m radius requirement from edge of E2Z to sensitive areas based (AE Report, 2011)	Existing location meets the 300 m radius requirement from edge of E2Z to sensitive areas based	N/A	N/A	N/A	N/A	N/A
charge to	Discharge greater than 100 L is available year round (AE Report, 2011)	Discharge greater than 100 L is available year round (AE Report, 2011)	Discharge greater than 100 L is available year round (AE Report, 2011)	Discharge greater than 100 L is available year round (AE Report, 2011)	Discharge greater than 100 L is available year round (AE Report, 2011)	Discharge greater than 100 L is available year round (AE Report, 2011)	Discharge greater than 100 L is available year round (AE Report, 2011)	Discharge greater than 100 L is available year round (AE Report, 2011)	Discharge greater than 100 L is available year round (AE Report, 2011)
	N/A	N/A	N/A	N/A	N/A	Further field work and data analysis required to identify land and examine aquifer conditions	Further field work and data analysis required to identify land and examine aquifer conditions	Further field work and data analysis required to identify land and examine aquifer conditions	Further field work and data analysis required to identify land and examine aquifer conditions
high water	N/A	N/A	N/A	N/A	N/A	Further field work and data analysis required to identify land and drinking well proximity	Further field work and data analysis required to identify land and drinking well proximity (Phyllis Burby, 2006)	Further field work and data analysis required to identify land and drinking well proximity	N/A
	N/A	Further investigation required re submissions under Parks Act, SARA, Wildlife Act, and Fisheries Act related to potential habitat loss	N/A	N/A	N/A	N/A	N/A	There is a lack of precedent for sub-surface injection under the MWR. Discussions are required with the MDC to confirm whether MWR or WCDR takes precedence	N/A
Health	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Wastewater System Regulations must be met. New Standard Practice Manual (V.3) expected later in 2014 or 2015
Industrial Wastewater	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Further field work and data analysis required to address the requirements of Waste Discharge Regulation. If MWR does not take precedence
noise	N/A	N/A	N/A	N/A	Discharge by MDC 2012 Program Objective that is subject to background program requirements in the Trent River (AE Report, 2011)	N/A	N/A	N/A	N/A
	Nothing obvious that would significantly impact engineering feasibility	Feasibility of a pipeline crossing Sandy Island requires further investigation	Nothing obvious that would significantly impact engineering feasibility	Nothing obvious that would significantly impact engineering feasibility	Nothing obvious that would significantly impact engineering feasibility	Nothing obvious that would significantly impact engineering feasibility	Nothing obvious that would significantly impact engineering feasibility	Nothing obvious that would significantly impact engineering feasibility	Nothing obvious that would significantly impact engineering feasibility
	N/A	N/A	N/A	The existing governance structure for the Comox Valley Sewerage Service does not include provision of sewerage service to Area A or Cumberland. Board support of an agreement to the governance structure would be required	N/A	N/A	N/A	N/A	Further investigations into the OCP required
respectives	N/A	Archaeological investigations and discussions required with the First Nations to address the crossing of Sandy Island	Archaeological investigations and discussions required with the First Nations to address the crossing of Comox Estuary	Archaeological investigations and discussions required with the First Nations to address the crossing of Comox Estuary	N/A	N/A	N/A	N/A	N/A

- Outcome after TAC/PAC Meeting #3 and Steering Committee Meeting #2

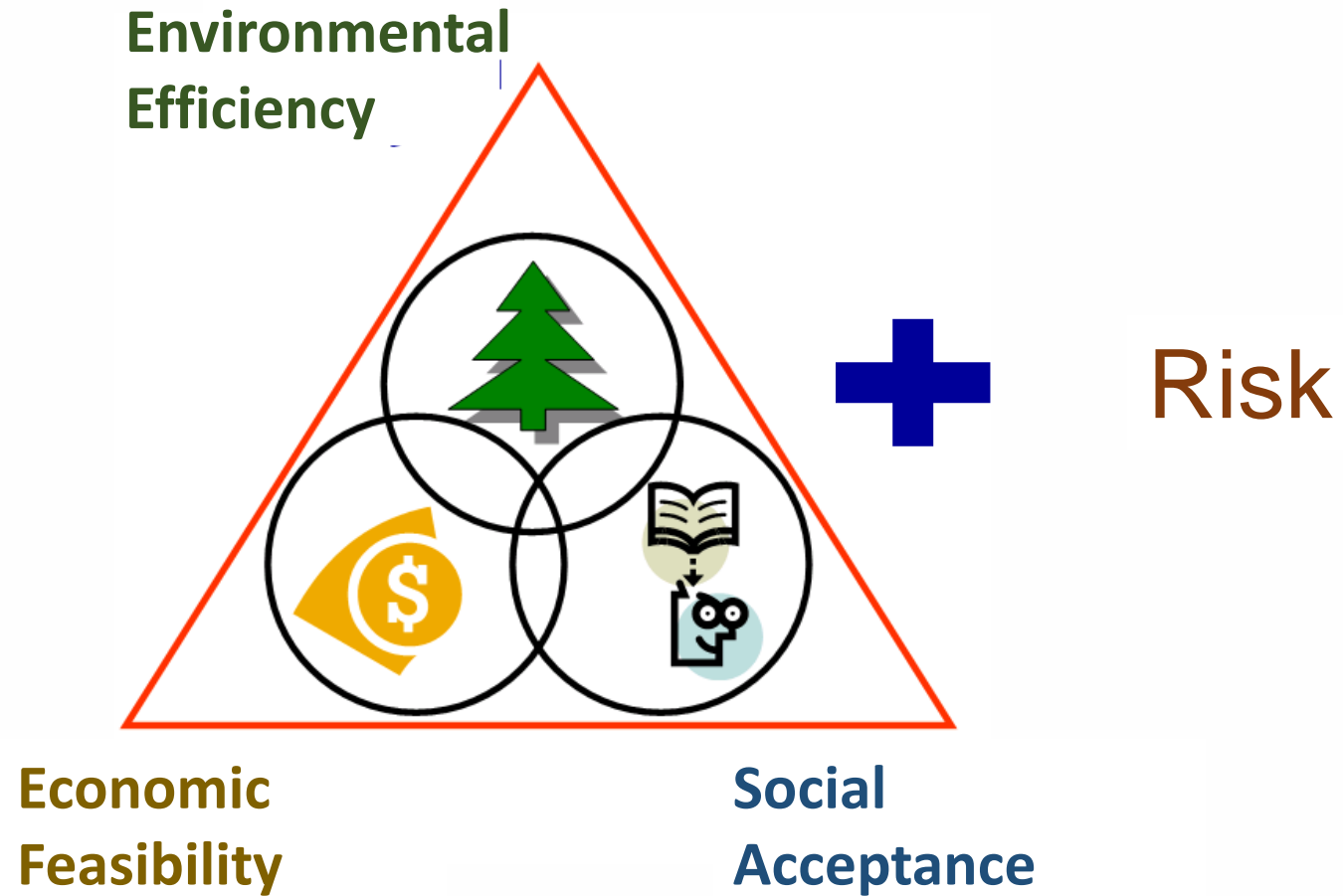
Discharge Option	Consensus
Option 1: Discharge to Baynes Sound	Develop into a scenario
Option 2: Discharge to Georgia Strait	Develop into a scenario
Option 3: Discharge to Cape Lazo	Eliminate
Option 3b: Treatment in the South Region, conveyance of treated effluent from the South Region to the CVWPCC to be combined with Courtenay/Comox, and discharge to the existing location in Cape Lazo	Develop into a scenario
Option 4: Connection to the existing Courtenay/Comox CVWPCC (for treatment)	Eliminate
Option 5: Discharge to Trent River / Washer Creek	Eliminate
Option 6: Discharge to ground (single location)	Eliminate
Option 7: Discharge to ground (multiple locations)	Eliminate
Option 8: Discharge to sub-surface ground	Develop into a scenario
Option 9: Management and improvement of existing on-site system	Eliminate

Developed Scenarios

- Four Options were developed into scenarios:
 - A. Discharge to Baynes Sound
 - B. Discharge to Strait of Georgia beyond Comox Bar
 - C. Treatment in the South Region and conveyance of treated effluent to the CVWPCC
 - D. Discharge to sub-surface / ground



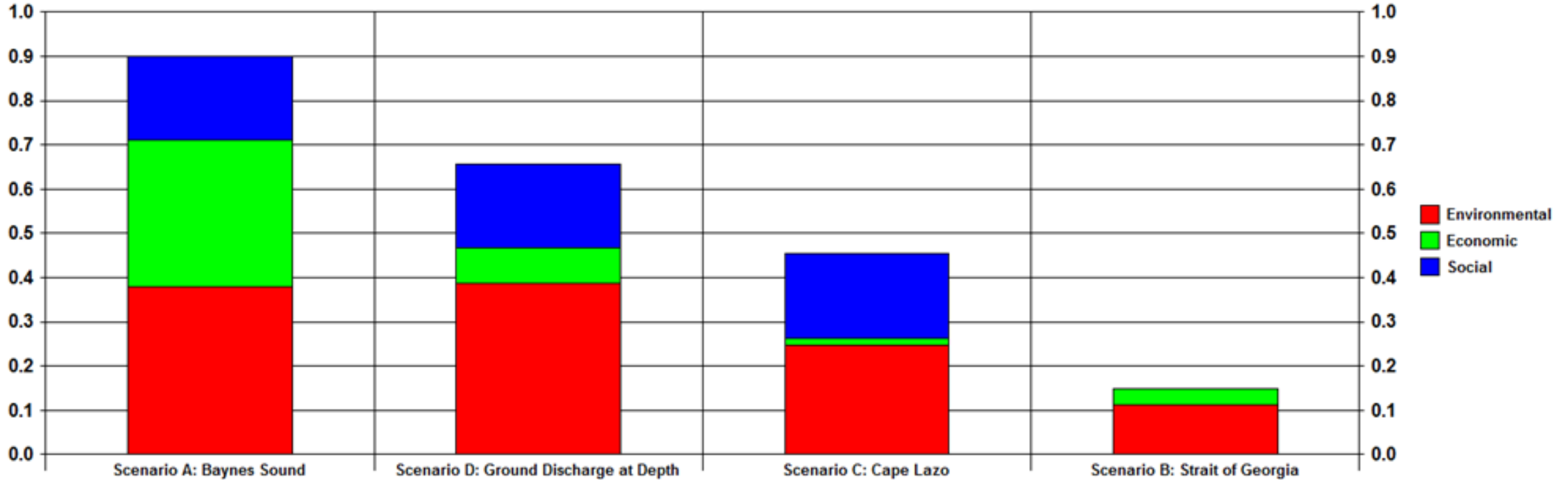
Comparative Evaluation



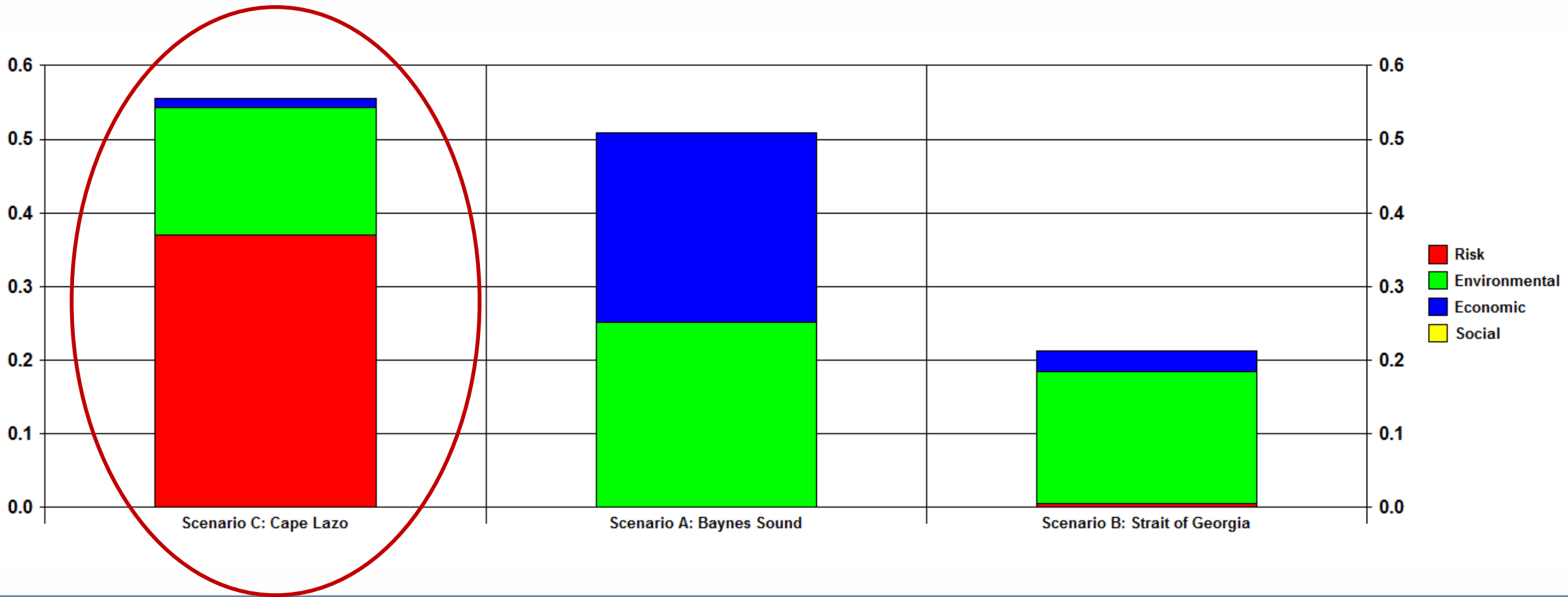
Multi-Criteria Analysis

- Attribute score per Scenario
= Quantifiable Attribute x **Weighting of Importance**
- Risk = Likelihood of Occurrence x Severity of Impact
- Total Scenario Score = Σ (Attribute Score including Risk)

Results – Without Risk



Results – With Risk



Termination of LWMP Process

- LWMP process was paused and a referendum was held on the preferred option (South Sewer Project)
- On June 18, 2016, the referendum for the South Sewer Project failed to achieve support of the electorate.
- Collaboration with the Comox Valley Sewage Commission has since resulted in a revised proposal

Questions



What's Changed Since 2016?



REVIEW (2018)

- Sewage Commission supports request by Electoral Area A to assess extension of services.
- Analysis includes technical, regulatory and financial impacts of possible extension.



DECISION (2020)

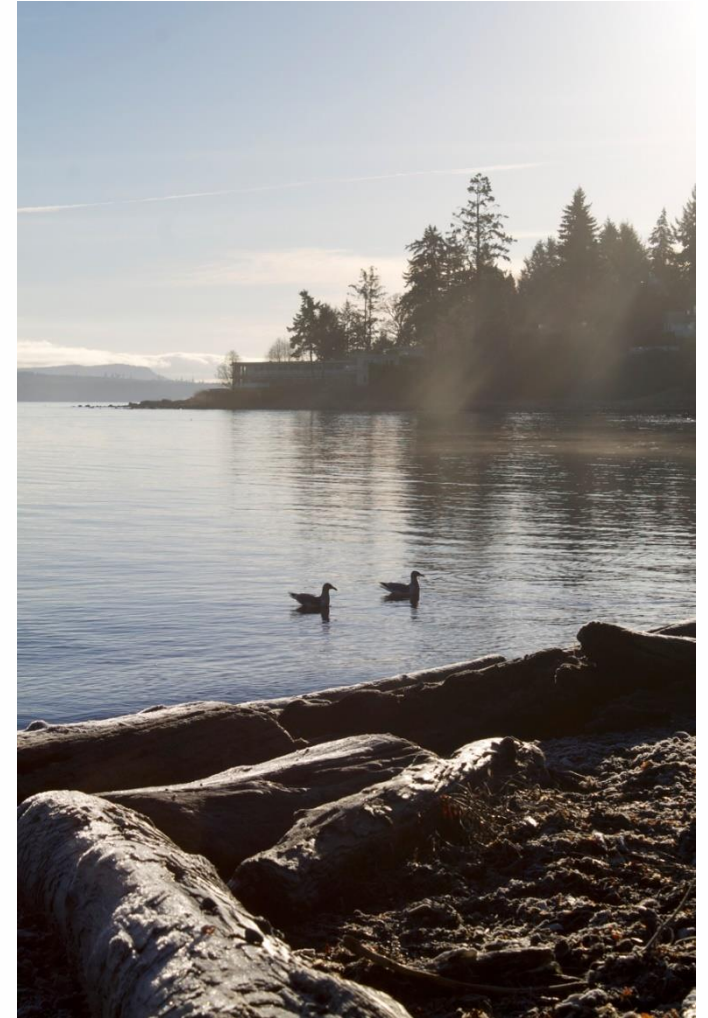
- After reviewing assessment, Sewage Commission agrees to receive wastewater from Royston, Union Bay and K'ómoks First Nation south lands.



GRANTS (2020)

- CVRD partners with K'ómoks to apply for grant funding to support connection to Comox Valley Sewer Service.
- Supported by Union Bay Estates.
- 2020 Grant not successful.
- Revised application submitted in February 2022.

Why Sewer Service?





“By working together in the spirit of reconciliation we can set the examples for other municipalities and Indigenous communities nationwide to ensure that we all move forward together.”

- Chief Nicole Rempel

CVRD / K'ómoks Community Benefit Agreement

Community Benefit Agreement Commitment to work together to implement sewer services south:

- Supports K'ómoks in building capacity towards independent government
- Restores natural environment, protect water resources and access to shellfish in traditional territories
- Shows measurable steps towards better relationship



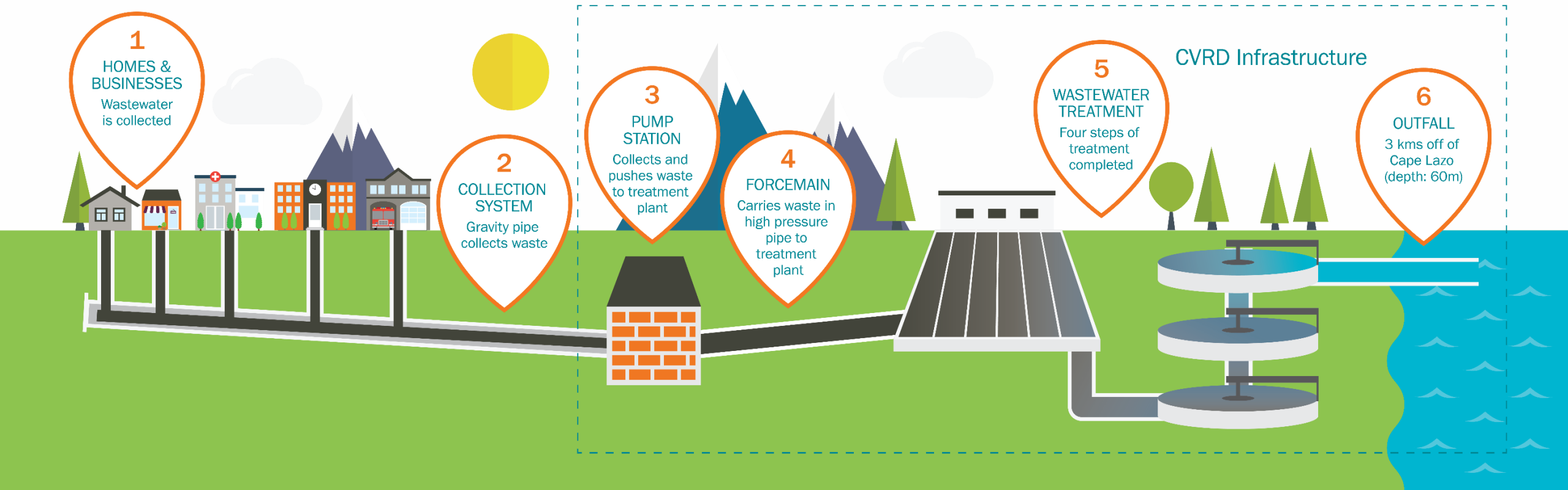
Comox Valley Regional Sewer Service

ABOUT THE EXISTING SERVICE:

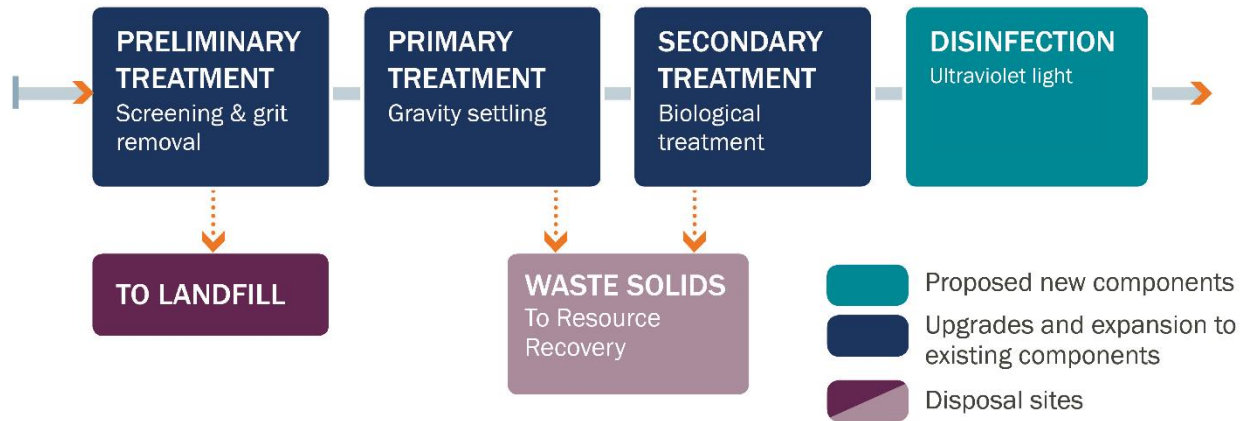
- 40,000 people, Courtenay/Comox
- Comox Valley Water Pollution Control Centre (CVWPPCC)
- Discharge at outfall near Cape Lazo

BENEFITS OF CONNECTING

- Improved Efficiencies
- Reduced Regulatory Hurdles
- Protect Baynes Sound
- High Quality Treatment

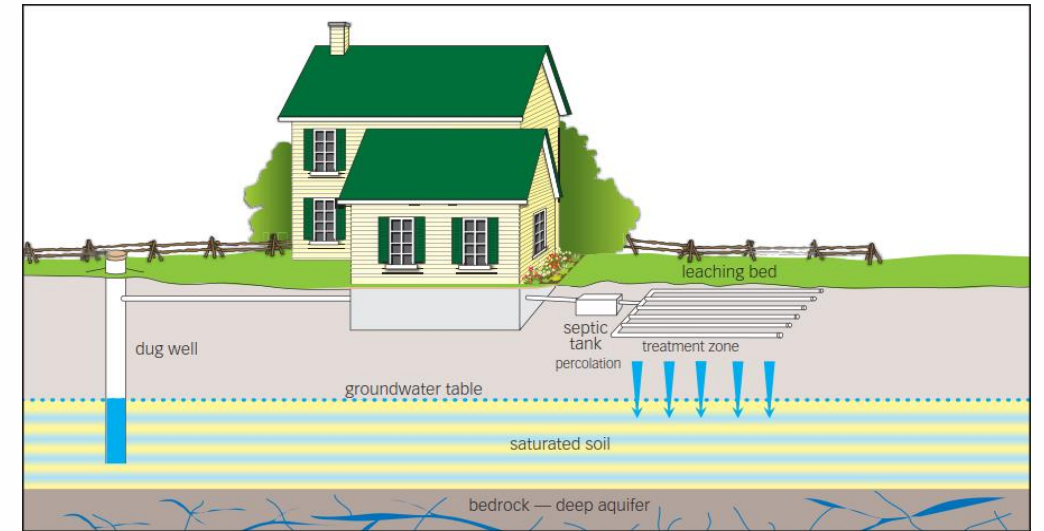


Sewer vs. Septic



SEWAGE TREATMENT:

- Existing municipal system exceeds regulatory requirements to discharge to ocean
- All wastewater goes through secondary treatment
- Plan to install UV disinfection
- 24/7 operation with qualified, professional operators

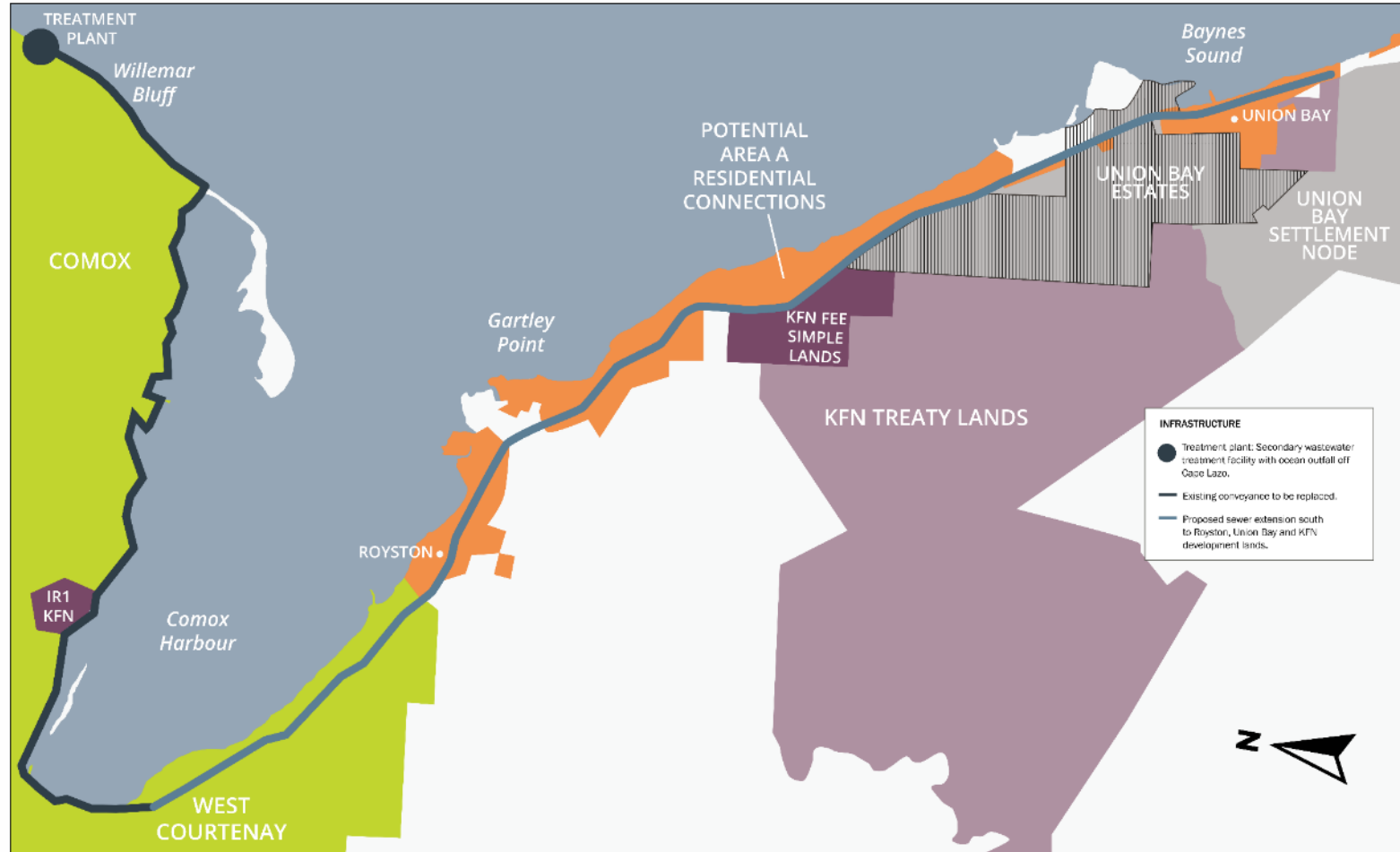


SEPTIC SYSTEMS:

- Regular maintenance required
- Poorly maintained systems pose threat to environment and health
- Analysis of septic records shows many systems predate provincial septic regulations
- Replacement is expensive: \$15,000-\$50,000+
- Additional regulatory tools may be required to address issues in area

Sewer Extension South – Project Overview

- 13km sewer forcemain
 - Union Bay to Courtenay
- Local collection systems
- Pump stations
- Several phases
- Expansion for future development



Questions



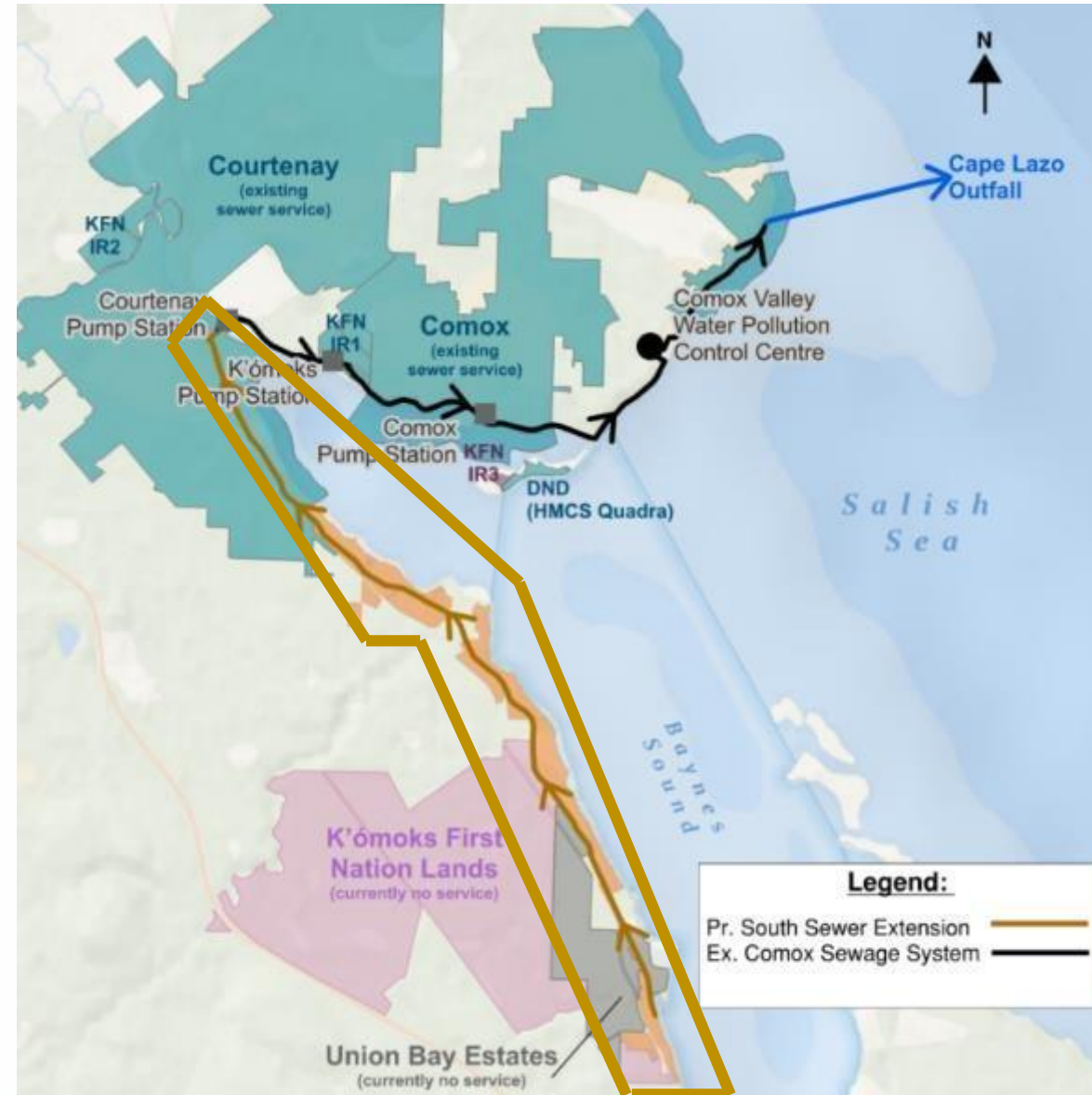
Discussion paper #3

FLOWS AND LOADS FOR THE SEWER EXTENSION SOUTH LWMP ADDENDUM & BACKGROUND AND PROVISIONS IN THE COMOX VALLEY SEWER SERVICE LWMP



Background – South Region

- Privately owned onsite septic systems with a history of failure
- CVSC supports expansion of sewer service into south region
- Sewage service proposed expansion to include:
 - South region (incl. Royston and Union Bay)
 - K'ómoks First Nation
 - Union Bay Estates development

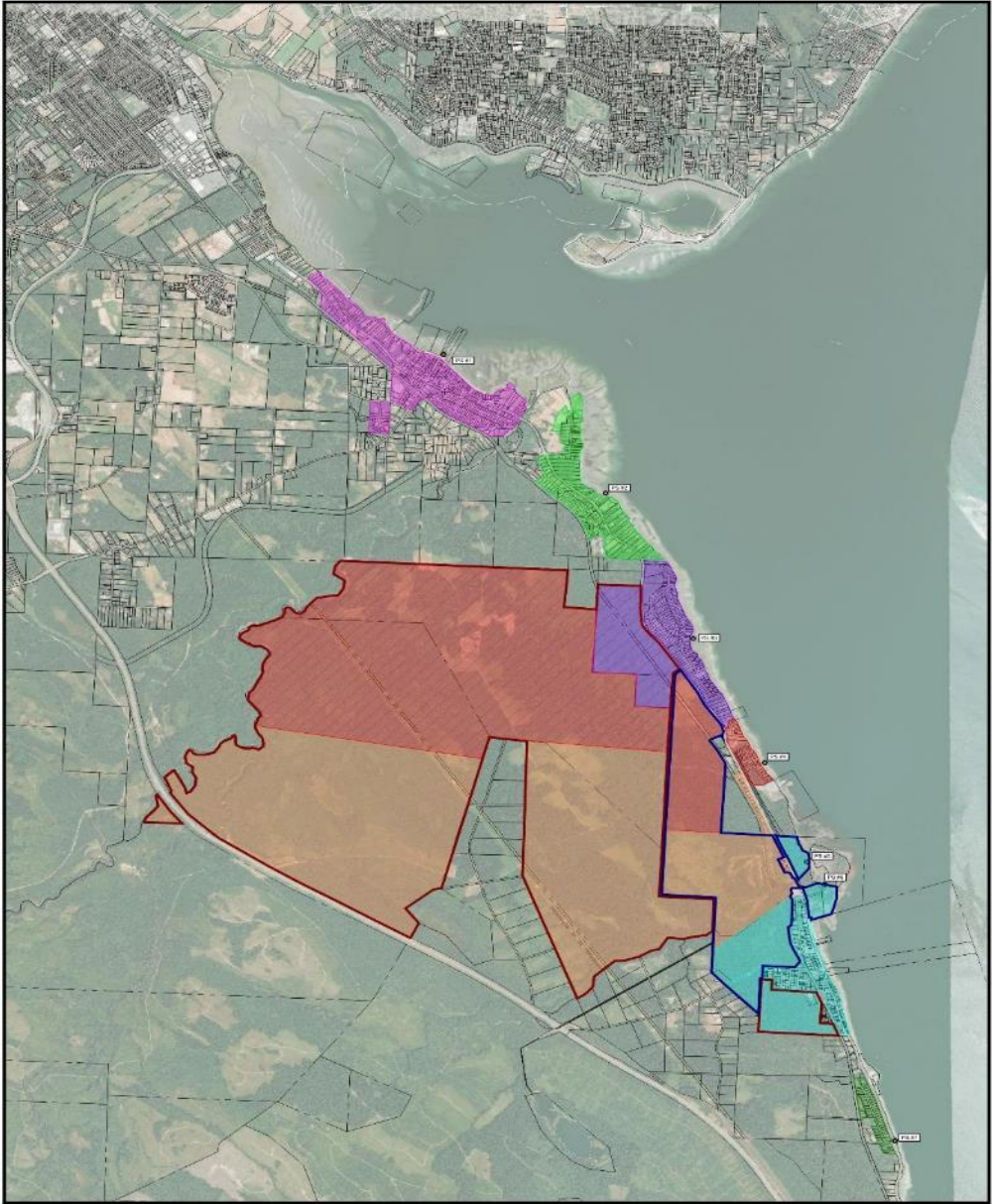


Population Projections

- Development projections are varied and changing
 - Multiple residential development projects proposed
 - Uncertainty for future build-out populations
- High, medium and low growth scenarios were developed over the course of 50 years (2020 - 2070)

YEAR	ROYSTON	GARTLEY	KILMARNOCK	UNION BAY	NEW DEVELOPMENT AREAS	TOTAL
2020	986	372	593	819	0	2,770
2025	1,011	381	608	839	258	3,098
2040	1,090	411	655	905	3,428	6,489
2070	1,266	477	761	1,051	10,688	14,243

Catchment Areas



LEGEND

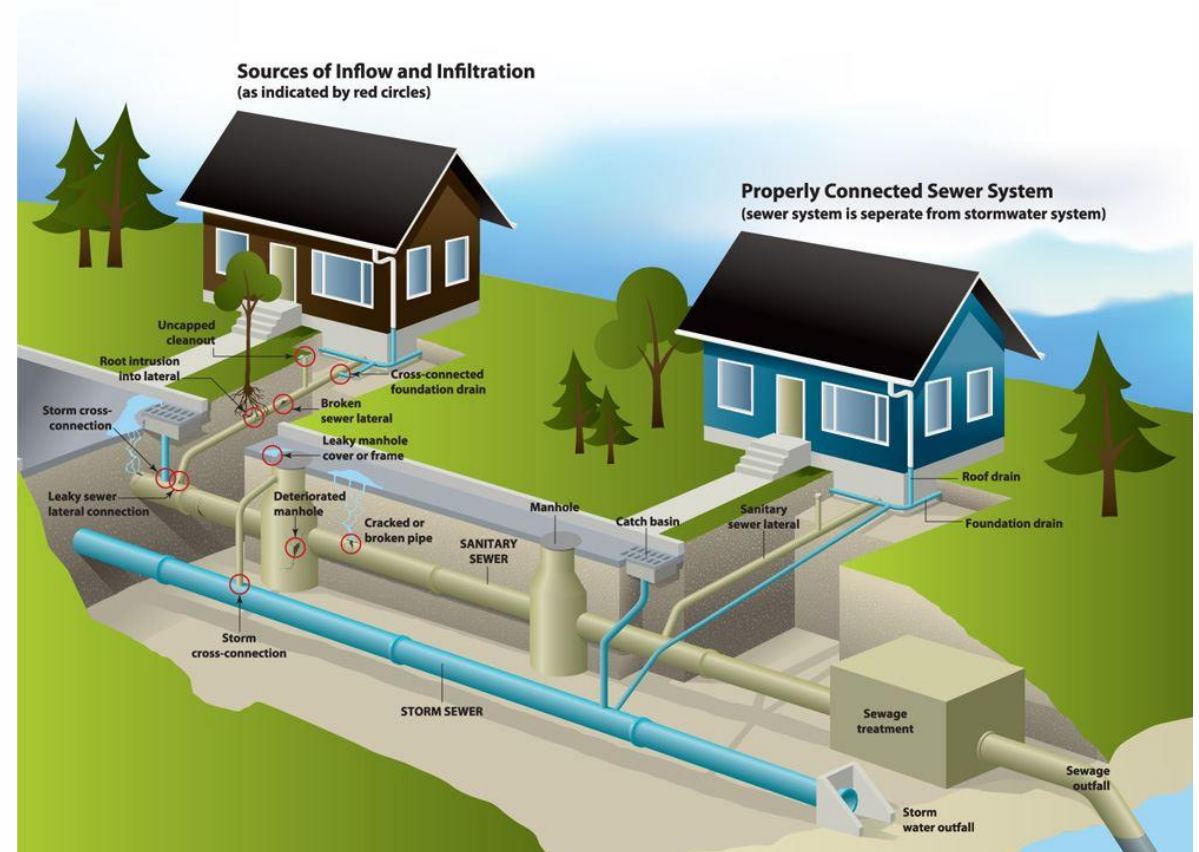
- PS#1 CATCHMENT
- PS#2 CATCHMENT
- PS#3 CATCHMENT
- PS#4 CATCHMENT
- PS#5 CATCHMENT
- PS#6 CATCHMENT
- PS#7 CATCHMENT
- K'ÓMOKS AREA
- UBE AREA

**PUMP STATION CATCHMENT AREAS
SOUTH REGION SEWER AREA**

Flows – Contributing Factors

- Average Dry Weather Flow (ADWF): average daily sewage flow entering a Sewage system with minimal infiltration
- Peak Dry Weather Flow (PDWF): peak sanitary flow during a typical dry weather day.
- Inflow and Infiltration (I&I): excess water that flows into sewer pipes from groundwater and stormwater.
- The Peak Wet Weather Flow (PWWF): adding Inflow and Infiltration to the Peak Dry Weather Flow

$$\text{PWWF} = \text{PDWF} + \text{I\&I}$$



Source: Inflow and Infiltration | DeSoto, TX - Official Website

Catchment Flows

		PS#1	PS#2	PS#3	PS#4	PS#5	PS#6	PS#7
		Catchment	Catchment	Catchment	Catchment	Catchment	Catchment	Catchment
2025	Population	1011	381	547	155	120	776	108
	Area (ha)	133	81	72	115	151	128	15
	Peaking Factor	3.2	3.2	-	-	-	-	3.2
	ADWF (L/s)	2.8	1.1	3.5	0.4	0.3	2.2	0.3
	PDWF (L/s)	9.0	3.4	11.2	1.4	1.1	6.9	1.0
	I&I (L/s)	8.0	4.9	4.3	6.9	9.1	7.7	0.9
	PWWF (L/s)	17.0	8.2	15.5	8.3	10.1	14.6	1.8
2070	Population	1266	477	2943	3111	4085	3615	135
	Area (ha)	133	81	145	169	206	163	15
	Peaking Factor	3.2	3.2	-	-	-	-	3.2
	ADWF (L/s)	3.5	1.3	20.9	8.6	11.3	11.8	0.4
	PDWF (L/s)	11.3	4.2	62.7	25.6	33.3	36.6	1.2
	I&I (L/s)	8.0	4.9	8.7	10.2	12.3	9.8	0.9
	PWWF (L/s)	19.2	9.1	71.4	35.8	45.6	46.4	2.1

Organic Load Terminology

Five-Day Biochemical Oxygen Demand (BOD₅): amount of oxygen used by microorganisms to degrade organic matter

Total Suspended Solids (TSS): measurement of the total solids in wastewater that are retained by filtration

Total Kjeldahl Nitrogen (TKN): sum of organic nitrogen, ammonia, and ammonium



Source: <https://lagoons.com/blog/algae/lagoon-tss-to-bod5/>



Organic Load Contributions

Historical Influent Loading (g/capita/day)

Year	INFLUENT UNIT LOADING			
	Average BOD ₅	Max Month BOD ₅	Average TSS	Max Month TSS
2013	84	107	86	110
2014	92	223	103	154
2015	89	137	96	130
2016	62	163	104	165
2017	69	100	96	121
2018	64	127	101	157
2019	96	129	74	161
Average	79	127	94	142

South Region Load Projection (kg/day)

	2040
Population Projection	6489
Average BOD ₅	513
Max month BOD ₅	825
Average TSS	610
Max month TSS	921
Average TKN	84
Max month TKN	93

CVSS LWMP VS. SES LWMP

- Population and sewage flow estimates were developed for the south region in the CVSS Stage 1 and 2 LWMP
 - Limited information was available on the expected population growth and development
- For the SES LWMP Addendum, future flows projected using the same assumptions with updated population information
- Difference in projected populations is negligible between the two reports
 - <11% population difference in 2040
 - <1.2% population difference on the entire system

YEAR	CVSS LWMP	UPDATED FLOW PROJECTION	DIFFERENCE
2020	2,837	2,770	-67
2030	4,129	4,460	331
2040	5,798	6,489	691
2050	7,424	12,305	4,881
2060	9,059	13,270	4,211
2070	10,702	14,243	3,541

Wastewater Treatment

Metric	CVWPCC Monthly Avg (mg/L)	FWSER Limit (mg/L)	MWR (mg/L)	Permit No. 5856 (mg/L)
TSS	5 – 15	25	45	60
cBOD5	5 – 15	25	45	45

CVWPCC – Comox Valley Water Pollution Control Centre

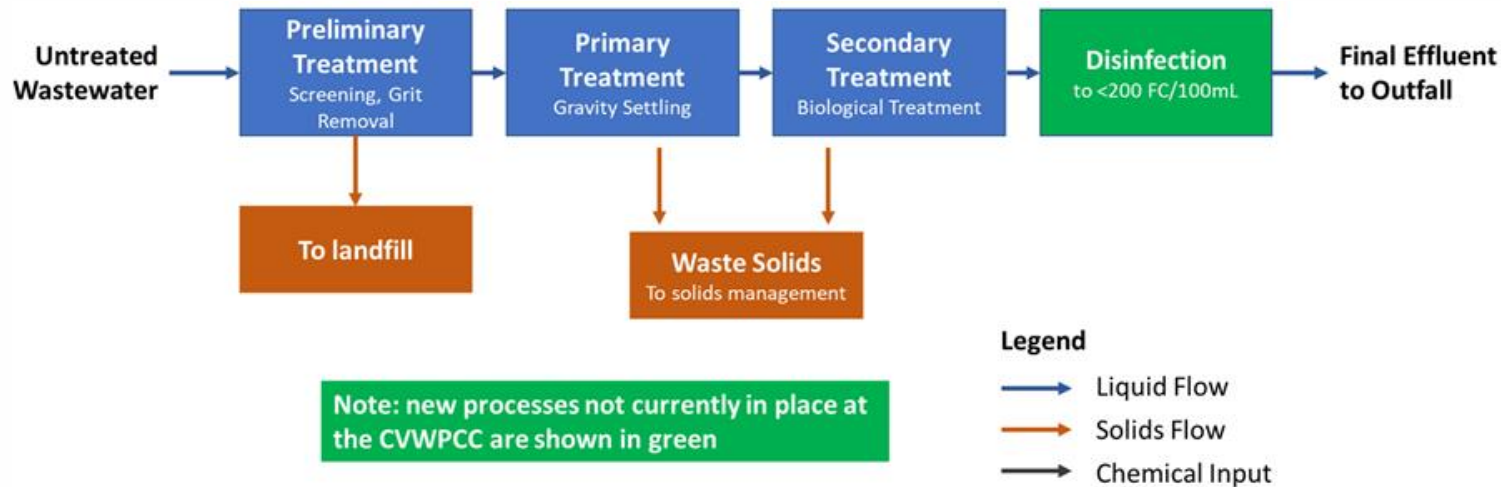
FWSER: Federal Wastewater Systems Effluent Regulation

MWR: Municipal Wastewater Regulation

- Average percent removal of TSS: 90 – 99%
- Average percent removal of cBOD₅: ~93%
- However, volume of discharge exceeds allowable daily maximum (Permit No. 5856) by more than 10%
 - CVRD will apply for an Operational Certificate under the LMWP in Stage 3

Treatment Options

- Stage 1: high-level discussion of 4 options based on effluent quality
- Stage 2: high-level option assessment to enable decision-making
- Recommendation: Maintain the current level of treatment with the addition of effluent disinfection (UV)
 - SES flows and loads do not impact this recommendation



Treatment Capacity

- CVWPCC will require upgrades due to increased flow and loads from overall growth in CVSS service area, including potential addition of Area A.
- Facility Master plan underway to develop basis of design for future plant expansion.



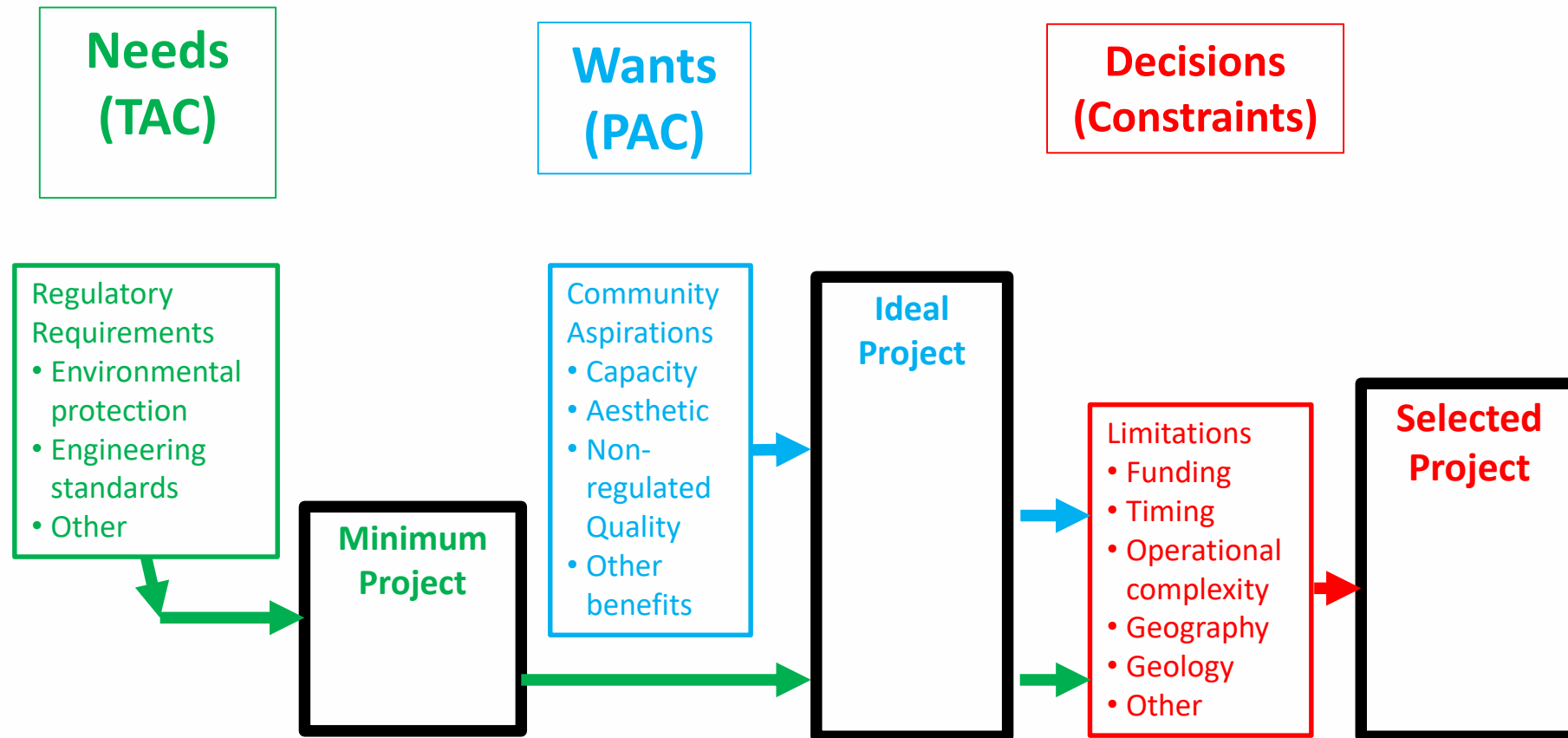
Questions



TAC/PAC Committee Process

- Work according to the Terms of Reference
- TAC and PAC will operate as a joint committee
 - Unless there is a specific need to do otherwise
- Decisions to be made by consensus
 - Balance project “needs” and community “wants”

Reconciling Needs, Wants and Reality



TAC/PAC Committee Process

Decision making areas of focus:

- Conveyance – Hwy 19a forcemain: social concerns & mitigation measures
- Conveyance – Pump Stations: social/environmental considerations
- Collection systems: type/configuration, phasing

Support for overall project concept & phasing?

Next Meeting – November 23

- Sewer Extension South Project
 - Design, costs, phasing
- Collection system options and cost comparisons
- Pump stations design and siting options
- Draft Stage 1 Environmental Impact Study

Round Table

Discussion / Questions

