APPENDIX

A TACPAC MEETING #1 DISCUSSION PAPERS & MINUTES

APPENDIX

A-1 TACPAC #1 DISCUSSION PAPER 1

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

DISCUSSION PAPER 1: LWMP OBJECTIVES

SEPTEMBER 21, 2022

CONFIDENTIAL

IMAGE SOURCE:
HTTPS://WWW.COMOXVALLEYRD.CA/SEWEREXTENSION

1 LIQUID WASTE MANAGEMENT PLAN

1.1 LWMP PROCESS

The provincial Liquid Waste Management Plan (LWMP) process is designed to allow BC communities to develop their own solutions for managing liquid waste while meeting regulatory requirements. The scope of work for a LWMP is specific to each local government, reflecting the communities' goals and objectives, and is discussed at the outset of the process with the Ministry of Environment and Climate Change Strategy Regional Manager.

The strategy provided in the plan must ensure the management and disposal of treated waste are sufficiently protective of public health and the environment. Public, stakeholder and rightsholder consultation is a key component of plan development to ensure that multiple interests have been considered and that the LWMP is supported by the community. An approved LWMP confers two critical authorizations to the local government:

- Regulatory authorisation to proceed with the works identified in the plan, and for treated water discharges.
- Borrowing authorisation to finance the works identified in the plan.

Provincial LWMP guidelines describe a three-stage planning process, each involving meaningful public, stakeholder, and rightsholder consultation, and with Ministry of Environment and Climate Change Strategy review after each stage. Figure 1 includes a detailed summary of a typical LWMP process. The three stages are summarized below:

- Stage one identifies existing conditions and community goals and then develops a wide range of options for managing liquid waste in the plan area. The options are considered for regulatory compliance, practicality, and achievement of community goals, and pared down to a short list.
- Stage two is a detailed evaluation of the shortlisted options, and additional environmental impact studies, if appropriate. Stage two ends with the selection of the preferred solution for the key plan components.
- Stage three consists of further development of the selected option for implementation, operation and financing. Operational certificates and a formal implementation schedule and financing plan are established, and the completed plan is submitted for approval by the Minister of Environment and Climate Change Strategy.

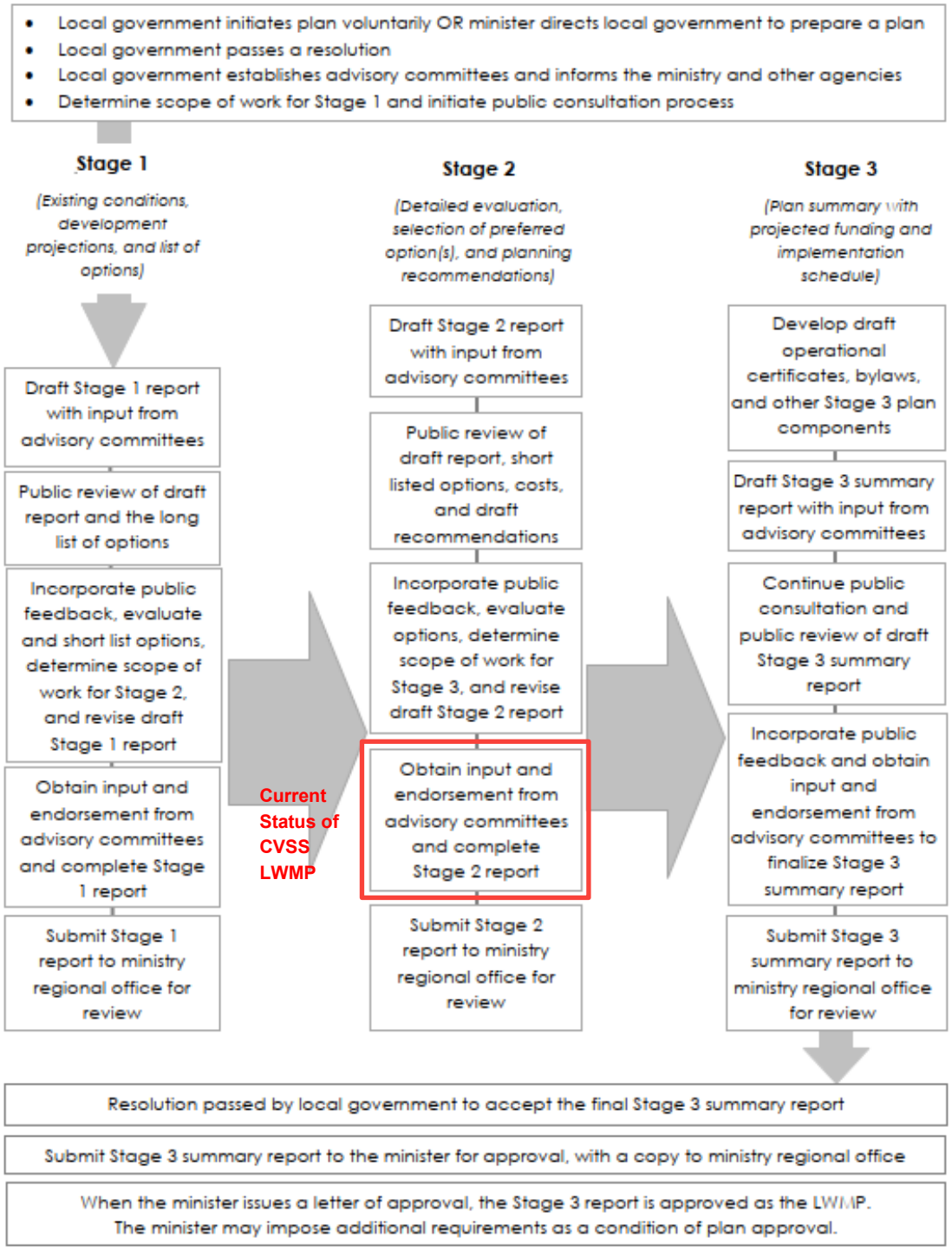

Figure 1 Typical Three-Stage Planning Process

The stages are often combined to make use of prior investigations and past planning work. The Comox Valley Sewer Service (CVSS) LWMP currently underway, has combined Stages 1 and 2 in the planning process. The Sewer Extension South LWMP Addendum is also combining Stages 1 and 2 due to the considerable body of past planning work that has been completed for the area.

1.2 COMMITTEES

In addition to the technical work required to complete an LWMP, plan development is also informed through input from three committees:

- Public Advisory Committee
- Technical Advisory Committee
- Steering Committee

In certain circumstances, local governments may find it beneficial to establish a single advisory committee to fulfill the role of both the public and the technical advisory committee to improve communication and reduce the number of meetings required. In this specific case for the Sewer Extension South LWMP Addendum process, the public and technical advisory committee meetings are being combined.

After the LWMP is complete and approved a fourth committee, the plan monitoring committee, will be developed to aid in plan implementation, monitoring, and to provide ongoing advice to the local government council or board of directors and staff. It is desirable for a plan monitoring committee to have continuity of membership from the advisory committee(s).

1.2.1 STEERING COMMITTEE

The steering committee will guide and receive input and recommendations from the public and technical advisory committees and make recommendations to the local government council or board of directors. The steering committee will normally include senior political and technical representatives of the local government. The Ministry of Environment and Climate Change Strategy and the consulting team may also be represented on the steering committee.

For the CVSS LWMP process, the Comox Valley Sewage Commission acts as the Steering Committee, and for the Sewer Extension South LWMP Addendum, the CVRD Electoral Areas Services Committee will act as the Steering Committee.

1.2.2 PUBLIC ADVISORY COMMITTEE (PAC)

The public advisory committee will represent community and stakeholder interests in the planning process. In order to ensure that the public advisory committee best reflects community interests, local governments should seek to invite representation from each of the following sectors or groups, which exist in the community:

- Elected representative(s) from the municipalities or electoral area(s) within the plan area;
- First Nations within or adjacent to the plan area;
- Local environmental groups;
- Residents of electoral area(s) or municipalities in the plan area;
- Local business groups and rate-payer associations;
- Generators of large liquid waste discharges;
- Local school districts;
- A technical advisory committee representative;
- The consulting team; and
- The Ministry of Environment.

A draft Terms of Reference for the Sewer Extension South LWMP Addendum PAC, further describing the roles and responsibilities of the PAC and its membership, has been developed and will be provided for consideration at the first meeting.

1.2.3 TECHNICAL ADVISORY COMMITTEE

The technical advisory committee will be established concurrently with the public advisory committee. In order to ensure that the technical advisory committee primarily reflects government interests, the local government should seek and invite representation from the following governments, agencies and organizations:

- The Ministry of Environment;
- Engineering and/or planning departments of the regional district and member municipalities;
- First Nations;
- Health Authorities;
- Provincial and federal ministries or agencies who have indicated interest or whose mandate will be affected by or will affect the planning process; and
- A public advisory committee representative, including at least one non-governmental and one governmental representative from that committee.

A draft Terms of Reference for the Sewer Extension South LWMP Addendum TAC, further describing the roles and responsibilities of the TAC and its membership, has been developed and will be provided for consideration at the first meeting.

2 CVSS LWMP

2.1 SUMMARY

The Comox Valley Regional District (CVRD) owns and operates the Comox Valley Sewerage System (CVSS) which provides regional conveyance, treatment and disposal of wastewater for the City of Courtenay, Town of Comox, Department of National Defense (DND) and the K'ómoks First Nation (K'ómoks).

The Comox Valley Water Pollution Control Centre (CVWPCC), which was largely constructed in the 1980's, treats wastewater from approximately 20,000 households in the service area, discharging an average daily flow of about 17,000 m^3 of treated effluent to the Strait of Georgia via a 3 km outfall. Upgrades will be required to improve effluent quality to meet community commitments, to increase plant capacity due to population growth, and to renew existing plant infrastructure.

To appropriately consider regional, long-term liquid waste management planning questions for the service, the CVRD is preparing a combined Stage 1 and 2 LWMP. The plan aims to:

1. Facilitate a decision on required upgrades to the regional conveyance system,
2. Develop options for upgrades to the Comox Valley Water Pollution Control Centre to achieve effluent quality targets and resource recovery options, and
3. Advance solutions within a rigorous framework of stakeholder and rightsholder consultation to inform each stage of decision-making. Throughout each stage, decision-making was advanced through the Technical and Public Advisory Committee (TACPAC), consultation with K'ómoks First Nation, and public consultation meetings.

Stage 1 of the CVSS LWMP process was completed in 2018-2019 and included:

- A review of background information, including past work and definition of the service plan area, regulatory requirements, treatment standards, and design criteria;
- Consultation with K'ómoks First Nations as well as Public Advisory Committee (PAC) and Technical Advisory Committee (TAC) meetings were held
- A long list of conceptual alternative options and associated cost estimates for wastewater conveyance, treatment and resource recovery was developed in consultation with the TACPAC to develop a short-list of preferred options to carry forward to Stage 2 of the LWMP;

Stage 2 of the CVSS LWMP process was completed between 2019-2022 and includes:

- Further development of the shortlisted options for wastewater conveyance, treatment and resource recovery that were carried forward from Stage 1, including more detailed technical evaluation and cost estimates;
- Short-listed options were evaluated in consultation with the TACPAC and preferred options for advancement to Stage 3 of the LWMP were identified;
- Consultation with K'ómoks First Nation and Public consultation was held to obtain input on proposed LWMP solutions, including the development of a Community Benefits Agreement

The draft Stage 1 and 2 LWMP report is currently being reviewed by K'ómoks First Nation and the CVSS LWMP TACPAC. The report will be presented to the Comox Valley Sewage Commission, with a recommendation to approve the report. Upon incorporation of requested changes from K'ómoks and the TACPAC, and approval from the Sewage Commission, the report is anticipated to be submitted to the MoECCS this fall. Upon provincial approval of the Stage 1 and 2 report the CVRD would then move forward with developing a CVSS LWMP Stage 3 report.

3 SEWER EXTENSION SOUTH LWMP ADDENDUM

3.1 OVERVIEW

The intention of the addendum is to include consideration of the Sewer Extension South (SES) project within the context of the Comox Valley Sewerage Service (CVSS) Liquid Waste Management Plan (LWMP). Technical work in support of the LWMP addendum will summarize the work completed to date for the Sewer Extension South Project, including the design development of the forcemain and pump stations and collection system options. It will also involve the preliminary design of local collection systems and a Stage 1 Environmental Impact Study (EIS). LWMP addendum development will be informed by the Sewer Extension South Technical and Public Advisory Committee, consultation with K'ómoks First Nation, and public consultation meetings.

3.2 BACKGROUND

Establishing a regional wastewater service in the communities of Royston and Union Bay has long been a topic of discussion, with a number of failed attempts at introducing a service in the past. In 2015, a nearly complete Stage 1/2 South Region Liquid Waste Management Plan (LWMP) process resulted in the development of the South Sewer Project, a proposal that would see treated effluent from a new south wastewater treatment plant conveyed to the existing CVSS outfall at Cape Lazo for discharge. A 2016 referendum on this proposal was unsuccessful, causing the loss of grant funds that had been allocated to the project, thus curtailing progress towards a wastewater solution for the area.

Following the 2016 referendum, efforts continued to examine options for providing sewer servicing to the CVRD South Region. In 2018, the Comox Valley Sewage Commission agreed in principle to the concept of receiving wastewater flows from portions of Electoral Area A and K'ómoks First Nation, subject to the resolution of governance, terms of service, financial impact and regulatory considerations. In 2020, the Sewage Commission supported several recommendations to allow for the future receipt of Electoral Area A and K'ómoks First Nation wastewater into the existing Comox Valley sewer system.

The combined CVSS LWMP Stage 1 and 2 draft plan referenced above speaks to the potential for acceptance of wastewater from these areas, and bylaw amendments are in development to facilitate the expansion of the CVSS service area accordingly. Notably, the first of these, an amendment to the "Comox Valley Sewer Service Establishment Bylaw No 2541, 2003" expanding the CVSS service area to include a portion of Electoral Area A was adopted by the CVRD board in August 2022.

Recognizing the extensive planning, engineering and engagement work that has been completed for the CVSS LWMP, and similar work that has been completed for the Sewer Extension South Project, CVRD is moving forward with an addendum to the CVSS LWMP to include consideration of the Sewer Extension South Project. The development of the addendum is following provincial LWMP guidelines, including the involvement of public and technical advisory committees (PAC/TAC) and further public engagement. Should the project be supported by the community through the LWMP addendum process, a Sewer Extension South LWMP Addendum Stage 1 and 2 report is anticipated to be submitted to the province in fall 2023.

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, reflecting an expanded CVSS service area that includes those portions of Electoral Area A expected to be serviced by the Sewer Extension South project.

3.3 PLANNING COMPONENTS

The following Table 1 shows the planning components listed in the BC Interim Guidelines for preparing Liquid Waste Management Plans that are included in the Sewer Extension South LWMP Addendum process. The table also indicates the work completed by the CVSS LWMP that is therefore not required in the Sewer Extension South LWMP addendum.

Table 1 LWMP Addendum Sections

COMPONENTS	COMMENTS	INCLUDED IN CVSS LWMP	INCLUDED IN SES LWMP ADDENDUM
5.1 Plan Area	Area anticipated for servicing by Sewer Extension South (existing Electoral Area A neighborhoods, UBE & K'ómoks)	✓	✓
5.2 Land Use and Development	Summarize existing plans, as provided in previous reports	✓	✓
5.3 Environmental Resources and Impacts	Cape Lazo discharge location covered by CVSS LWMP. Include discussion of prior South Sewer Project work that ruled out other discharge options	Limited inclusion	
5.4 Existing infrastructure, including flow and load projections	Review and include existing information, as provided in previous reports	✓	✓
5.5 Source control	Consideration of Source Control requirements given anticipated land uses in future collection system service areas	✓	✓
5.6 Volume Reduction	Analyse the per capita flows and compare with other communities to see if there is scope for reductions.	Limited inclusion	
5.7 Reclaimed Water	Covered by CVSS LWMP	✓	✗
5.8 Inflow and Infiltration	Analyze proportions of I&I in influent stream, as part of flow and load projections. Discussion of potential I&I reduction measures in accordance with CVSS LWMP targets.	Limited inclusion	
5.9 Combined Sewer and Sanitary Overflows	None are present in Electoral Area A	✓	✗
5.10 (a) Wastewater Treatment – central plant	Covered by CVSS LWMP	✓	✗
5.10 (b) Wastewater Treatment – unserviced areas and on-site systems	Summary of existing on-site systems, based on analysis of Island Health records provided by CVRD, and previous septic risk assessment work completed by WSP	✓	✓
5.11 Non-Point source pollution	Summary of impacts of non-point source pollution (ie shellfish norovirus)	✓	✓
5.12 Stormwater Management	Not within scope of Sewer Extension South project	✓	✗
5.13 Septage and Biosolids	CVRD Biosolids management plan is already in place, and to be included for information and completeness	Limited inclusion	
5.14 Integrated Resource Recovery	Covered by CVSS LWMP	✓	✗
5.15 Cost Estimates	Class D cost estimates for long list options (provided in previous reports) and Class C for short list options.	✓	✓

1. ✓ – Included within the respective report.
2. ✗ – Excluded from the Addendum report.
3. 'Limited inclusion' – included in reports as short summaries.

3.4 WAY FORWARD

The following TAC/PAC meetings are scheduled for the duration of the Sewer Extension South LWMP addendum. Table 2 also includes the proposed materials and discussion papers to be presented for TAC and PAC consideration at each meeting.

K'ómoks First Nation is a key Sewer Extension South project partner. The CVRD is committed to its partnership with K'ómoks and recognizes that community wastewater service to the Royston/Union Bay area is a shared priority that is important for reconciliation. Consultation with K'ómoks continues through an established process with Chief and Council and staff. In addition to this ongoing engagement, K'ómoks is also represented on the TAC/PAC.

Table 2 Summary of Materials for TAC/PAC Meetings

TITLE	DESCRIPTION	PROGRESS
TAC/PAC Meeting #1 (September 21, 2022)		
Discussion Paper 1: LWMP Objectives	A discussion paper outlining LWMP objectives and process as well as the purpose and scope of the Sewer Extension South addendum.	✓
Discussion Paper 2: LWMP Summary of Past work	Summary of past work undertaken during the 2014-2015 South Region LWMP process.	✓
Discussion Paper 3: Flows and Loads for the SES as well as background and provisions in the CVSS LWMP	A discussion paper summarising the flows and loads per population projections, treatment objectives as identified in CVSS LWMP, and brief summary of existing CVSS LWMP work and its provisions for flows from Area A.	✓
TAC/PAC Meeting #2 (November 23, 2022)		
Discussion Paper 1: Conveyance Piping Design and Cost	A discussion paper summarising the conveyance piping design and cost estimate. This paper will be a summary of the work completed in the South Region Royston Union Bay Sewer Extension Preliminary Design.	
Discussion Paper 2: Collector System Design	A discussion paper summarising the collector system design options to be considered, including capital, operating and life cycle cost comparisons.	
Discussion Paper 3: Pump Station Design and Siting	A discussion paper summarising pump station design and siting, including capital and operating costs.	
Draft Stage 1 EIS	Draft Stage 1 Environmental Impact Study (EIS).	
TAC/PAC Meeting #3 (December 12, 2022)		
Discussion Paper 1: Collection System and Project Phasing	A discussion paper summarising the collection system and project phasing options	
Decision Matrix	A decision matrix for the selection of preferred project options	
TAC/PAC Meeting #4 (May 10, 2023)		
Draft Addendum Report	Draft Sewer Extension South Addendum Report.	
TAC/PAC Meeting #5 (September 13, 2023)		
Final Stage 1 EIS	Final Stage 1 Environmental Impact Study (EIS) Final Sewer Extension South Addendum Report.	

APPENDIX

A-2 TACPAC #1 DISCUSSION PAPER 2

Sewer Extension South Addendum

Public Consultation Plan

June 2022

Comox Valley
REGIONAL DISTRICT

comoxvalleyrd.ca

CONTENTS

1.0 Introduction

The Comox Valley Regional District (CVRD) is preparing to engage the public in the development of an addendum to the Comox Valley Sewer Service (CVSS) Liquid Waste Management Plan (LWMP), with the goal of developing a regional wastewater solution for the communities of Royston, Union Bay and K'ómoks lands south of Courtenay.

This document outlines the consultation plan, intended to collect feedback and input on the planning of a new service critical to the protection of Baynes Sound, community health, sustainable development and reconciliation.

This consultation is based on the INFORM, CONSULT and INVOLVE areas of the International Association for Public Participation (IAP2)'s engagement spectrum. The commitment to the community for this level of engagement is that the CVRD will obtain feedback on analysis, alternatives and/or decisions, and will implement public engagement throughout the process to ensure concerns and goals are understood and considered.

Consultation will be held between September 2022 and summer 2023 and will include a range of tools including online and in-person opportunities for discussion with the general community, establishment of the public and technical advisory committees and ongoing consultation with K'ómoks First Nation through an established process, as well as outreach to 14 Nations with overlapping traditional territories.

This extensive consultation, phased through the development of the addendum, will ensure the community can help determine the plan ahead as it is created, rather than being tasked with a referendum decision once a plan is complete. A successful LWMP consultation on this project will allow a path forward for this critical service in the area.

2.0 Overview

BACKGROUND

Establishing a regional wastewater service in the communities of Royston and Union Bay has long been a topic of discussion, with a number of failed attempts at introducing a service in the past due to a number of reasons. Most recently, a referendum on the South Sewer Project in 2016 was unsuccessful, causing the loss of grant funds that had been allocated to the project and curtailing the progress of a community wastewater solution in the area.

This lack of progress has allowed impacts on the Baynes Sound Shellfish Industry to continue and has created roadblocks to reconciliation with the K'ómoks First Nation both on the basis of protection of culturally significant areas and pursuing economic development interests in the area.

Following an analysis of the existing infrastructure and capacity of the Comox Valley Sewer Service – which currently services Courtenay, Comox and K'ómoks First Nation - the Comox

Valley Sewage Commission made the unprecedented decision in 2020 to receive wastewater from the Royston/Union Bay area. This opened the door to a collaborative waste management solution for the region that would see wastewater collected into the current conveyance system, treated at the existing Comox Valley Water Pollution Control Centre on Brent Road, and released via the marine outfall at Cape Lazo.

Between 2018-2022 the CVRD has undertaken a LWMP planning process for the Comox Valley Sewer Service (CVSS), which resulted in a Stage 2 draft plan being prepared for submittal to the province in summer of 2022. The plan includes direction on conveyance, treatment and resource recovery for the CVSS.

Recognizing the extensive planning work that has already been completed for the CVSS LWMP, and also the extensive planning and engagement work that has been completed for the sewer extension south area, it's proposed that an addendum to the CVSS LWMP be pursued, to include plans for the Royston/Union Bay area.

CONSULTATION AREA AND TARGET AUDIENCE

While the engagement for the CVSS LWMP included extensive outreach within the City of Courtenay, Town of Comox and K'ómoks First Nation, the proposed addendum to extend the sewer south is proposed to focus on those in the highest environmental risk communities of Royston and Union Bay with service also planned for the K'ómoks south lands and Union Bay Estates.

Primary target audiences for public consultation activities include:

- Residents, property and business owners in Royston and Union Bay
- Environmental stewardship and industry organizations
- Community groups

First Nations consultation includes:

- K'ómoks First Nation
- Wei Wai Kum Nation
- We Wai Kai First Nation
- Homalco First Nation
- Tla'amin Nation
- Qualicum First Nation
- Lake Cowichan First Nation
- Penelakut Tribe
- Lyackson First Nation
- Cowichan Tribes
- Halalt First Nation
- Stz'uminus First Nation
- Snuneymuxw First Nation
- Snaw'naw'as First Nation

Partners include:

- K'ómoks First Nation
- Union Bay Estates

Secondary audiences include:

- Local media
- Comox Valley Sewage Commission (City of Courtenay, Town of Comox, Department of National Defence)

REGIONAL INTERESTS

For the wider Comox Valley region, planning for a Sewer Extension South LWMP addendum will raise interest particularly around:

Ensuring that the CVSS can accommodate the new area and that there is a fair sharing of operational and capital costs on the existing system

- The importance of protecting Baynes Sound – for environmental and public health, recreation, reconciliation and for the economic value of seafood production in the area
- Protecting the work and schedule already completed for the CVSS LWMP and maintaining confidence that the decisions achieved through that process will be retained.

LOCAL INTERESTS

For property owners and residents in Royston/Union Bay, there is expected to be a high degree of interest, in particular around:

- **Details about the proposed service**: Residents have long discussed the concept of a community wastewater service, and are well-versed enough to have interest in specifics such as collection routes, pump station locations, timing and of course, cost
- **The process ahead**: With a wide range of opinions on the proposed service, there will be interest in the planning and approval processes, and the likelihood the process has in delivering the new service,
- **Affordability:** The question of a community wastewater service has ultimately come down to cost a few times already. This includes capital and operational costs, as well as insight into individual costs for connecting to the service, decommissioning of septic systems and affordability strategies for those who have recently installed new systems, or who are on fixed incomes.

Given the long history of this discussion in the community, individual interests will be quite specific, and for many, opinions will be influenced by proposals presented in the past and their outcomes.

FIRST NATIONS INTERESTS

The Sewer Extension South Project includes K'ómoks First Nation fee simple lands and K'ómoks treaty settlement lands, which include ancient historical sites that hold great cultural, environmental and economic value for the K'ómoks peoples. Key to reconciliation for the Nation is the reclaiming of these lands that will enable K'ómoks to become self-determining and prosperous.

The CVRD is committed to supporting K'ómoks in its goal of reclaiming and protecting these lands from the environmental risk posed by leaking septic systems that are threatening the health

of Baynes Sound. Recent Norovirus outbreaks have negatively impacted the aquaculture interests of the K'ómoks First Nation and the health of Baynes Sound directly affects the economic, food, social and ceremonial rights of the K'ómoks people.

A dedicated First Nations consultation will help the CVRD to understand any concerns or interests from the other 14 Nations with overlapping territory in the areas of Royston, Union Bay, Hornby Island and Denman Island.

STUDY PROCESS

With the larger CVSS LWMP draft prepared for submittal, the Sewer Extension South addendum will require a smaller, more focused engagement. There will still be stages for feedback through the plan development, ensuring the community can participate as details are confirmed and options are narrowed.

The CVRD is proposing four phases in the development of the addendum, from initiation to submittal. Each will include PAC/TAC meetings, updates for the K'ómoks First Nation and an opportunity for the community to learn more and weigh in with feedback.

The framework for this consultation is outlined in the following section.

3.0 Public Consultation Framework

While a full LWMP requires broad and extensive engagement, the proposed addendum will be more focused on the particular area it applies to and the degree of service that is proposed to be installed there (collection and conveyance – not treatment). All engagement though will follow the principles that guided the wider LWMP process.

PRINCIPLES

The following principles will guide public consultation:

- Follow IAP2 Spectrum of Public Participation: This acknowledged best practice of public engagement will guide consultation.
- Meet provincial LWMP Requirements: The specific requirements of the LWMP process ensure meaningful input is sought from the public – these will guide consultation plans.
- Support the Work of the LWMP Technical Consultant/Engineer: Public consultation will support and align with the efforts of the technical consultant.
- Demonstrate transparency and competency in planning: Sharing information and working through planning and decision-making processes with interested and affected parties (IAPs).
- Offer options for community involvement: By using a range of tools, the public will be able to engage in a method that suits them.

OBJECTIVES

1. Provide information about LWMPs, and the process for the Comox Valley Sewer Service

2. Offer opportunities for active public involvement and clear opportunities for feedback.
3. Explain how feedback will be received and considered.
4. Create a record of engagement at the end of the process
5. Demonstrate how engagement was considered and how input influenced final decisions.

TEAM ROLES

The development of the technical portion of the LWMP will be managed by the CVRD's Engineering Department with the support of consulting engineers. Management of the Public Advisory Committee (PAC) will primarily be led by the engineering department.

The CVRD's Senior Manager of Strategic Initiatives, with support of public engagement and communications consultants will plan, deliver and manage the public engagement, community outreach and First Nations Consultation portion of the LWMP development work.

CONSULTATION MILESTONES AND ESTIMATED TIMELINE

DATES	PROJECT MILESTONES
May-Sept. 2022	Phase 1/Project Initiation • 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	Phase 2: Phasing, Collection System, Pump Station • 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.
Jan. 2023- June 2023	Phase 3: Development of Draft Addendum • 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	Phase 4: Review/Approval • 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	Submit Final Draft Addendum and Environmental Impact Study • INFORM: Provide project update to all audiences.

4.0 Consultation Methods and Tools

In order to collect information from as many people as possible, the CVRD will use a range of tools to share information and receive feedback. Using online, mail and in-person tools will allow people to participate in a way that works best for them. The tools expected to be used are outlined below.

4.1 ONGOING TOOLS

PROJECT WEBSITE

The project website – already started at www.comoxvalleryd.ca/sewerextension - will continue to serve as an information hub for engaged participants. Along with introductory information such as FAQs, this will be the location for linking staff reports and outlining timelines ahead. It will include:

- Up-to-date project information
- Link to ConnectCVRD – the CVRD's online engagement forum
- Calendar of public events, PAC/TAC meetings
- Resource materials (e.g. FAQs, staff reports, studies)

ONLINE CONSULTATION FORUM

The CVRD has a well-established online consultation hub at ConnectCVRD, which is regularly updated for active projects and has a strong foundation of already-active members. The CVSS LWMP consultation plan included an active ConnectCVRD page that hosted surveys, ideas boards, Q&A sections and videos.

The CVRD will create a ConnectCVRD page specifically for the Sewer Extension South Addendum that will again be used as a central collection point for feedback. This online forum will be promoted through the outreach materials.

SOCIAL MEDIA

Using the CVRD's social media accounts, brief updates will be provided as milestones are reached and new engagement opportunities are identified. Any social media updates will link to the ConnectCVRD, encouraging the posting of questions/comments.

PUBLIC ADVISORY COMMITTEE (PAC)

A public advisory committee will be established as part of the LWMP addendum process and tasked with gathering and relaying public feedback and providing comment to the technical team. The opportunity to join the PAC will be promoted via ads in newspapers, newsletter and online. Members will be recruited from residents and homeowners in the area, with the goal of fair representation, across the geographic area, and from those with relevant experience. Meetings will be open to the public for interested members of the community to observe.

PHONE/EMAIL LOG

A phone/email log will be created to record questions and comments that are submitted to the project team outside of events/online consultation forum.

TRADITIONAL MEDIA

Traditional media channels (radio, print) will be used as appropriate to keep the public informed as project milestones are achieved and to invite participation in specific phases of engagement.

4.2 MILESTONE-SPECIFIC TOOLS

OPEN HOUSES: ONLINE AND IN-PERSON

Community information events will be held to share updates at key stages and to collect feedback at critical decision points. Events will be offered both in-person at a local venue, as well as online for those who prefer to participate that way. Events will include information boards, feedback opportunities and will be staffed by CVRD and project team members. Questions/comments will be recorded and will form part of the formal record of engagement.

PROMOTIONAL MATERIALS

Using tools like advertising or handouts, promotional materials will be used as needed to highlight engagement opportunities for the public.

DIRECT MAIL

To ensure that critical information reaches all properties within the proposed service area, direct mail will be used. The CVRD has already usSewer ed direct mail to share letters and newsletters about the proposed sewer extension project, generating good activity and feedback in previous outreach opportunities.

5.0 Outcomes and Products

PUBLIC CONSULTATION REPORT

The proceedings of consultation activities will be documented and available as part of the submitted draft addendum at the end of the LWMP process. It will include:

- An overview of consultation activities related to each phase of the engagement process
- Samples of informational materials provided to the public and stakeholders
- Record of reach and participation
- Synopsis of feedback themes, trends and findings
- Summary of incorporation of public feedback in the final plan

COMMENT LOG/INPUT RECEIVED

All input/comments received, including comment logs, will be provided to the CVRD in their raw form at project end, to form part of the official record of the public consultation process.

Associated Engineering | 75 YEARS

SUMMARY OF THE 2014-2016 SOUTH REGION STAGE 1/2 LWMP PROGRAM

Comox Valley Regional District

SEPTEMBER 2022

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1 INTRODUCTION

1.1 Overview

Baynes Sound is one of the most productive ecosystems on the east coast of Vancouver Island, with significant recreational, cultural, and economic value. Protection of shellfish in and around Baynes Sound is of key importance to the local economy, a significant portion of which is based on the harvesting of shellfish resources.

For many years, there has been concern that a large number of on-site septic systems in the waterfront communities of Royston and Union Bay were failing and impacting the water quality of Baynes Sound. Evidence indicating problems with the effectiveness of these systems due to system age, environmental constraints, lot size and density has resulted in significant focus over the years to deliver improved wastewater services to these communities.

The CVRD's planning efforts, studies and investigations have established a sizeable body of knowledge about the wastewater management needs of the South Region, with work dating back over 30 years. The following list provides a summary of reports and investigations that had been conducted prior to initiating the Stage 1/2 South Region LWMP process in 2014:

1. Integrated Resource Recovery Interim Report: South Region Project, Farallon Consulting, August 2012
2. South Region Sewage Collection, Treatment and Discharge Study, Associated Engineering, April 2011
3. Comox Valley Regional District Regional Growth Strategy, Bylaw No. 120, 2010
4. Comox Valley Regional District Sanitary Sewer Master Plan, McElhanney Consulting, 2010
5. Royston/Union Bay Sewage Collection, Treatment and Discharge Study Update, Koers and Associates, November 2009
6. Royston and Union Bay Sewage Study: Effects of Onsite Sewage Systems on Water Quality, Payne Engineering Geology, May 2009
7. Royston/Union Bay Sewage Collection, Treatment and Discharge Study, Koers and Associates, September 2005
8. Royston/Union Bay Liquid Waste Management Plan Comparative Evaluation of Integrated Wastewater Management Alternatives, Komex International, January 2005
9. Royston Union Bay Sewage Project: Feasibility of Soil Based Treatment of Wastewater, Payne Engineering Geology, July 2005
10. Marine Disposal Feasibility Report, Royston/Union Bay Sewage Collection, Treatment and Disposal Study, Komex International, December 2004
11. Royston Liquid Waste Management Plan Stage 1, Anderson Civil Engineering, May 2002
12. Union Bay Liquid Waste Management Plan Stage 2 Report, February 2001
13. Review of Secondary Wastewater Treatment Technologies for Union Bay, Leslie Consultants, December 2000
14. Union Bay Liquid Waste Management Plan Stage 1 Report - September 1998
15. Comox-Strathcona Electoral Area A Liquid Waste Management Plan Stage 1, Stanley Associates Engineering, April 1996
16. Impact of Connecting Cumberland and Royston to the Comox-Strathcona Regional Collection System and Wastewater Treatment Plant, NovaTech Consultants, May 1992
17. Royston, Union Bay Sewerage System Preliminary Review, Associated Engineering, December 1979

In 2013, a $15 million grant from the Gas Tax Strategic Priorities Fund (SPF) was allocated towards construction of a wastewater collection system and treatment facility for the area in partnership with the Village of Cumberland (Cumberland) and the K'ómoks First Nation (KFN).

In 2014, following the allocation of SPF funding, the Comox Valley Regional District (CVRD) retained Associated Engineering (B.C.) Ltd. (AE) to complete a combined Stage 1 and 2 Liquid Waste Management Plan (LWMP) and an Environmental Impact Study (EIS) for the South Region. The overall objective of the LWMP was to evaluate wastewater management alternatives and with the help of the Technical Advisory Committee (TAC) and Public Advisory Committee (PAC), establish a firm direction for the CVRD to move forward with a sewage collection, treatment and disposal system for the CVRD's South Region. Through the evaluation of options, the LWMP eventually focused on the implementation of the South Sewer Project (SSP), which included construction of a new collection system, treatment facility, and conveyance infrastructure which would transport treated wastewater to the CVRD's regional Comox Valley Water Pollution Control Centre for discharge through the existing outfall off Cape Lazo. The concept of a new outfall into Baynes Sound was not supported by the LWMP Public and Technical Advisory Committees.

At the time of study, the communities within Electoral Area A that were included in the South Region LWMP were:

- Royston
- Union Bay

Note: the Village of Cumberland was undergoing a separate LWMP to the CVRD's South Region LWMP, but, were included as project partners in the South Sewer Project and were thus included in the CVRD's overall plan. K'ómoks First Nation (KFN) was also partner in the South Sewer Project.

In 2015, the LWMP development process was paused, and in 2016, after an unsuccessful referendum on the South Sewer Project, it was evident that there was a need to pivot the LWMP process. This summary memorandum generally covers the work performed between July 2014 to March 2015.

In 2022, the Sewer Extension South Project is now being developed with a new lens. The new plan will be developed in cooperation with the KFN as a key partner and will support environmental protection of Baynes Sound. The proposal builds on the options evaluated through the South Region LWMP, supporting discharge to the environment via the existing outfall at Cape Lazo, while providing greater cost efficiencies through a partnership with the Comox Valley Sewer Service.

1.2 Objectives

The objectives of this summary memorandum are as follows:

- Provide the newly formed LWMP TAC/PAC with a summary of the 2014-2015 LWMP Stage 1 and 2 efforts for the South Region, including Royston, Union Bay and Cumberland.
- Provide assistance to the CVRD and new TAC/PAC members by providing the history/context for LWMP efforts that are being restarted in 2022.

2 DESCRIPTION OF 2014-2015 LWMP PROGRAM

2.1 Objectives

The LWMP process is normally divided into three stages. Stage 1 involves high-level investigations that examine the current wastewater management strategies. Stage 2 uses information developed during Stage 1 as well as supplemental studies to evaluate specific questions related to future wastewater management strategy alternatives. And finally, Stage 3 uses the information developed in both Stage 1 and Stage 2 to establish and advance the implementation plan for the communities preferred wastewater management strategy. The 2014-2015 South Region LWMP process summarized in this report was being developed as a combined Stage 1/2 process, relying on the previous planning work that had already been undertaken.

The objective of the 2014 Stage 1/2 South Region LWMP process was to develop an overall plan for municipal wastewater management through adequate public consultation that protects public health and the environment. Additional objectives of the LWMP were to address topics such as water conservation, climate change adaptation, sustainable financial management, and resource and energy recovery. The public consultation portion of the LWMP aimed to provide adequate consultation of stakeholders, general public, and local First Nation communities to facilitate the development of community acceptance and ownership.

As part of the Stage 1/2 South Region LWMP, an environmental impact study (EIS) of the receiving environment was initiated. EIS investigations, which were largely focused on the shortlisted wastewater management scenarios and supported the analyses of options for the discharge of treated wastewater to the environment.

2.2 Regulatory Requirements

2.2.1 Provincial Regulations

The regulatory landscape for wastewater collection, treatment, and management in British Columbia is somewhat complex. In 2014, there were two different pathways for a local government to obtain a formal authorization for a return of treated effluent to the environment from the British Columbia Ministry of Environment (BC MOE). Note this process is generally the same in 2022.

Municipal Wastewater Regulation (MWR)

The MWR Registration pathway requires the discharger be fully compliant with the MWR. In order to register, the discharger must submit a formal detailed application for review and acceptance by BC MOE. Registration formally replaces any/all previous discharge permits.

- British Columbia Municipal Wastewater Regulation (MWR),
  - https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/87_2012

Liquid Waste Management Planning Process (LWMP)

- Liquid Waste Management Process
  - https://www2.gov.bc.ca/gov/content/environment/waste-management/sewage/liquid-waste-management-plans

The LWMP process is intended to provide a more flexible pathway to an Owner for formal authorization. As mentioned in **Section 2.1**, it is a three-stage planning process, that requires the Owner to form a Technical Advisory Committee (TAC) and Public Advisory Committee (PAC) and work with these committees to form a waste management plan that is tailored to the community. It can also provide a community with additional time to achieve

full compliance with the MWR, if necessary and beneficial. Acceptance of a Stage 3 LWMP by the BC MOE grants the Owner an Operational Certificate.

One added advantage of an approved LWMP is that it provides the local government the necessary authority to move forward with plan implementation (Section 24(7) of the Environmental Management Act) without requiring further elector assent or approval. By contrast, registration under the MWR does not provide the same authority, therefore an assent process in alignment with the *Local Government Act* is required to borrow funds and construct new liquid waste infrastructure.

The CVRD elected to follow the LWMP process, as it provided the community with more flexibility and the ability to manage community-specific priorities of the South Region.

2.2.2 Federal Regulation

The Wastewater Systems Effluent Regulation (WSER), was first introduced in 2012, and came into effect in 2015. The requirements set out in WSER impact the majority of wastewater dischargers in Canada, including the CVRD, and require that all facilities meet at least secondary treatment standards.

- https://laws-lois.justice.gc.ca/PDF/SOR-2012-139.pdf

The WSER includes some treated effluent discharge criteria that are not contained in the provincial MWR.

2.2.3 Other Considerations

Vancouver Island In-Stream Phosphorus Objective

In 2012, the BC MOE published a Vancouver Island Phosphorus Objective for streams. This objective sets an average allowable limit of 0.005 mg/L, and a maximum no greater than 0.010 mg/L for Total Phosphorus levels in Vancouver Island streams during the summer season (May 1st to September 31st). The objective of the guidance is to control excessive nutrient input and resulting impact to steams.

- https://www2.gov.bc.ca/assets/gov/environment/air-land-water/water/waterquality/water-quality-reference-documents/phosphorous_management_vi_streams_guidance_2014.pdf

2.3 Flows and Loads

2.3.1 Flows

Population projections were made to the year 2060, using a steady annual growth rate of 2.7% for the following areas:

- Royston
- Union Bay
- Village of Cumberland

At the time, 2006 BC Statistics were used to estimate the present-day population at the time (to 2010) for the communities of Royston and Union Bay, while 2010 BC Statistics were used for the Village of Cumberland. The South Region LWMP considered that development projects on the horizon would increase the contributing population, potentially in the order of 9900 units from 2010 to 2030.

For the South Region LWMP, flows were projected from 2010 to 2060. The average dry weather flows were developed based on a per-capita flow rate of 240 L/cap/day. Since municipal wastewater flows have daily and seasonal variation, a variety of "peaking factors" are used to estimate the range of municipal wastewater flows that the system will need to manage, as follows:

- Average Dry Factor 1.25
- Maximum Month Factor 1.5
- Maximum Day Factor (2010) 2.0
- Maximum Day Factor (2035) 1.9
- Maximum Day Factor (2060) 1.8
- Peak Hour Factor 3.0

Inflow and Infiltration (I&I) is a key component contributing to peaking factors. I&I is classified as groundwater and/or stormwater that enters into a wastewater collection system. This can occur through groundwater seeping into broken sewer pipes and stormwater entering through improper connections from sump pumps, roof drains, yard drains, manhole lids, and catch-basins. Projected wastewater flows for the South Region collection included I&I allowances in accordance with the guidelines provided in The Master Municipal Construction Document Associated (MMCD).

In 2014, the Village of Cumberland was underway to separate stormwater and wastewater collection systems in an effort to reduce I&I which was reported to be as high as 0.17 L/s/ha. Conversely, a Royston/Union Bay study conducted by Koers and Associates (2005) assumed I&I for the design of the wastewater collection system was a conservative estimate of 0.06 L/s/ha.

2.3.2 Loads

The characteristics of the wastewater were estimated based on the product of the 2035 Average Dry Weather Flow or the 2035 Maximum Month Flow by the typical constituent generation rate (Metcalf & Eddy, 2003). **Table 2-1** shows the assumed wastewater quality characteristics developed in 2014.

Table 2-1
Estimated Wastewater Characteristics

Constituent	Unit	During Average Dry Weather Flow Conditions	During Wet Weather Flow Conditions
5-day biochemical oxygen demand (BOD_5)	mg/L	335	280
Chemical oxygen demand (COD)	mg/L	735	610
Total suspended solids (TSS)	mg/L	370	305
Ammonia nitrogen (NH_3-N)	mg/L	28	24
Total phosphorus (TP)	mg/L	12	10
Temperature	°C	20	12

2.3.3 Biosolids Production

For the purpose of the South Region Stage 1/2 LWMP, it was assumed that the dewatered solids produced from treatment would be trucked to the CVRD's Skyrocket Composting facility. At the time, CVRD was readying to expand the Skyrocket facility to provide capacity for growth.

2.4 Environmental Impact

As part of the LWMP development, an important requirement from the BC MOE was that an Environmental Impact Assessment be completed prior to any authorization being granted. The South Region project was considered to be a "greater risk" project according to the Ministry guidelines since the location of the treatment effluent discharge would be in a sensitive receiving environment, in proximity to shellfish and commercial fishing. This required the EIS to be undertaken in two stages.

The intent of the first stage (Stage 1) was to review existing information and develop recommendations for site-specific data collection and analysis. After completion of a Stage 1 assessment, the intention would have been for the BC MOE to provide comment and confirm the scope of the Stage 2 investigation. The key outcome of the Stage 2 EIS would have been to determine whether or not the level of treatment specified in the MWR was adequate to protect human health and the environment. If not, recommendations on additional treatment or other mitigation measures would be made.

During the South Region LWMP, neither a Stage 1 nor Stage 2 EIS was completed due to the cancellation of the program. Notwithstanding, the work that was completed can be grouped into two categories:

1. Investigations that supported the analyses of the options for the discharge of treated wastewater to the environment, which are presented in **Section 3.** The major environmental technical memorandums that were completed during the LWMP work are summarized in **Table 2-2.**
2. Initial preparations for the Stage 1 Environmental Impact Study (EIS) for the preferred option. This work was only completed to a 30% level before the program was cancelled. The background data collected and reviewed prior to cancellation included the following:
    - Geospatial information for mapping sensitive areas (eelgrass beds, shellfish tenures, herring spawning areas, etc.).
    - Water quality data from shellfish harvesting areas collected by Environment Canada.
    - Literature on the local shellfish industry.
    - Previously completed environmental assessment and monitoring reports from the Comox Valley Water Pollution Control Centre (CVWPCC).
    - Fisheries data.

Table 2-2
Summary of Environmental Assessment Work undertaken during the 2014-2015 LWMP process

Document Date	Title	Key Findings
November 2014	South Region Liquid Waste Management Plan Discharge-to-Ground Options Technical Memorandum	Led to the decision to carry out field investigations.
April 2015	Feasibility of Continuing to Use Private Septic Systems as Primary Wastewater Strategy Technical Memorandum	Led to the TAC/PAC recommending that CVRD not pursue an "enhanced status quo" option that would see private on-site systems remain as the wastewater treatment system in the region. The "enhanced" aspect is that on-site systems would be subject to a new bylaw that would require higher construction and maintenance standards. Click here for a link to the memorandum.
April 2015	Southern Region Liquid Waste Management Plan Subsurface Discharge Options Technical Memorandum	The TAC/PAC chose not to proceed further with this option because the Vancouver Island Health Authority expressed concerns over potential future effects on drinking water wells.
November 2015	Advantages and Disadvantages of Cape Lazo Discharge Options and Regulatory Requirements for CVWPCC Upgrades Technical Memorandum	Led to the recommendation that a single outfall combining the CVWPCC and new South Region would be preferred over separate outfalls based on a combination of lower ecological footprint, regulatory risk, and operation, maintenance, and monitoring costs.
May 2016	South Region Wastewater Project Environmental Overview Study: Treated Effluent Main and Water Reclamation Facility Site	Was completed to provide a resource for future discussions regarding the selected option

2.5 Advisory Committees and Public Outreach

Input from local First Nations, stakeholders, and the local public was sought to guide the development of the LWMP so that it would be in-line with the community's goals and objectives and accepted by the community as a whole. A Technical Advisory Committee (TAC) and a Public Advisory Committee (PAC) were established for this purpose. (Refer to **Appendix A** for a summary of the TAC and PAC members during the 2014 South Region LWMP.)

In addition to the TAC/PAC, a public consultation program was undertaken through multiple avenues. Public events were held where members of the general public viewed information regarding the LWMP, and interacted with the project team. Information was also exchanged through the CVRD's LWMP website (www.comoxvalleyrd.ca under Departments – Sewer Services – Regional Sewer Initiatives – South Region) where meeting minutes and newsletters were made available, comment forms submitted to southsewer@comoxvalleyrd.ca, and PlaceSpeak (www.placespeak.com/southregionlwmp), an online public forum. A comprehensive summary of the public engagement efforts undertaken to support 2014-15 LWMP efforts is available on the CVRD's website (click here for link).

2.6 Timeline of Meetings

Five joint TAC/PAC meetings were held as part of the LWMP Stage 1/2 process. A summary of the meeting timelines is provided in **Table 2-3**. The recommendations from the PAC and TAC were directed to the Steering Committee (SC).

Table 2-3
Summary of TAC/PAC Meetings during the 2014 South Region LWMP

Meeting Title	Meeting Date	Objectives
TAC/PAC Meeting #1	July 14, 2014	The purpose was to discuss the LWMP committee's terms of reference and provide an overview of the LWMP process and environmental impact study.
TAC/PAC Meeting #2	September 9, 2014	The purpose was to brainstorm and gather feedback from the TAC/PAC membership to assist AE in developing a long list of options to initiate the screening and evaluation process.
TAC/PAC Meeting #3	October 30, 2014	The purpose was to present an overview of the screening and comparative evaluation process, review the raw elements, and undertake a discharge option location screening exercise.
TAC/PAC Meeting #4	January 13, 2015	The purpose was to present an overview of the updated screening table of the short list of options and undertake a scenario development exercise.
TAC/PAC Meeting #5	Part a March 4, 2015 Part b March 5, 2015	Part a The purpose was to present the results of previous investigations to the committees and to engage the committee members in the triple bottom line analysis (TBL). The results of the TBL analysis were then carried forward to day two of the workshop, which included a TBL plus risk (TBL + R) analysis. Part b On Day two, the objective was to review the TBL analysis conducted on the previous day for the four scenarios, and to add the risk factors to the analysis. The committee would then be able to make a recommendation to the steering committee for a preferred south region wastewater management solution.

3 DESCRIPTION OF 2016 LWMP OPTIONS ANALYSIS

3.1 Overview of the Triple Bottom Line Methodology and Glossary of the Options

The desired goal for the Stage 1/2 South Region LWMP was for the CVRD, stakeholders, and the public to have confidence that all viable alternatives have been considered and evaluated in an unbiased, understandable, documented and defensible manner. The purpose of the process utilized throughout the CVRD's South Region LWMP was to conduct a thorough analysis, ultimately resulting in a preferred wastewater management scenario. The following sequence of events describes the step-wise process used to select the preferred scenario:

1. Achieve an understanding of the framework (i.e. the provincial and federal regulations) applicable to the LWMP
2. Collect the raw elements (including interests, ideas, values, and risks)
3. Organize the raw elements into discharge options for the proposed wastewater treatment facility (long list of options)
4. Identify any 'show stoppers' and screen the discharge options
5. Develop the short list of scenarios (a scenario is comprised of a collection and conveyance system, a wastewater treatment system, potential IRR opportunities, and a discharge location)
6. Conduct a comparative evaluation for the short-listed scenarios
7. Select the preferred wastewater management scenario

For Step 6, a structured Triple Bottom Line + Risk (TBL + R) evaluation process was used to optimize the delicate balance between social, environmental and economic considerations.

The TBL+R process is a comparative evaluation framework that combines familiar multi-criteria analyses with standard risk assessment methodologies. The key strength of this approach is the discussion it generates over a series of interactions between attributes, which ultimately enables stakeholders, First Nations, and the general public to develop evaluation criteria, weight these criteria according to their values, and then make comparisons between alternatives based on the information the analysis provides to them. The output from the TBL+R process illustrates the relative ranking of the alternative scenarios in a consistent and understandable format that accurately reflects the community's values. This approach also encourages contributions and input that will directly inform the decision-making process.

For each option, quantifiable metrics were developed (e.g. how many kilometers a truck is going to need to drive). From here, for each metric, the team developed weightings in a collaborative approach using input from the TAC/PAC. A score was assigned to each of the metrics for each option, and from here, a final score was attributed to each option. In addition, a risk assessment of the wastewater management scenarios was subsequently conducted to understand how the consideration of risk affected the TBL ranking.

The process is further illustrated by the graphic included in **Appendix B**.

3.2 Long List Discharge Options Overview

Nine wastewater discharge options were developed in 2014, which were based on previous studies as well as feedback received from the TAC/PAC. The discharge options are summarized in Column 1 of **Table 3-1**.

In order for high-level screening of the long list, each of the discharge options was evaluated based on screening categories. A detailed colour-coded table was developed for the purpose of documenting the high-level evaluation. The following categories were reviewed:

- Compliance with the MWR
- Other regulatory implications
- Wastewater treatment implications
- Social community aspects
- Archaeological considerations

Column 2 of **Table 3-1** summarizes the overall findings and decision made for each of the options on the long-list of discharge options. From the nine different discharge options, four scenarios were developed (Scenarios A through D).

Table 3-1
Summary of discharge options and screening exercise results

Discharge Option	Decision
1. Discharge to Baynes Sound	- Developed into Scenario A
2. Discharge to Strait of Georgia beyond Comox Bar (Sandy Island Marine Park)	- Developed into Scenario B
3. a. Discharge to Cape Lazo	- Eliminated by the Steering Committee due to redundancy of having twin outfall pipes side by side
3. b. Treatment in the South Region, conveyance of treated effluent to the CVWPCC to be combined with final effluent discharge to the outfall off Cape Lazo	- Developed into Scenario C
4. Connect to the existing Comox Valley Water Pollution Control Centre (CVWPCC)	- Although this option was under consideration by the TAC/PAC, it was eliminated by the Steering Committee because it involved conveyance of raw wastewater across the estuary - The governance of Comox Valley Sewerage Service did not have provision for sewerage service to Electoral Area A or to the Village of Cumberland. Board support to an amendment to the governance structure would have been required
5. Discharge to the Trent River or to Washer / Hart Creek	- Eliminated given the inability to meet the dilution requirements as set in the MWR and the In-stream Phosphorus objective set by the MOE
6. Ground Discharge to a single location	- Eliminated due to the insufficient land availability and capacity
7. Ground discharge to multiple locations	- Eliminated due to inadequate soil characteristics and water table conditions
8. Discharge to sub-surface ground (i.e. injection)	- Developed into Scenario D
9. Management and improvement of existing on-site systems	- Eliminated based on the feasibility of upgrading the existing on-site systems for full compliance

3.3 Short List Scenarios Overview

The short-listed discharge options were developed into the scenarios shown in **Table 3-2**. For all scenarios, collection and conveyance would be through eight pumps stations, separated into three phases.

The discharge locations for the shortlisted options are shown in **Figure 3-1.**

On the treatment side, all treatment options would be sited in the South Region and flows from the Village of Cumberland were included in the planning.

From a resource recovery perspective, all options could consider an energy recovery system and reuse of treated/reclaimed effluent.

Table 3-2
Shortlisted Scenarios for LWMP

	Scenario A: Discharge to Baynes Sound	Scenario B: Discharge to the Strait of Georgia	Scenario C: Discharge to Cape Lazo	Scenario D: Discharge to Ground at Depth
Treatment	- Advanced secondary treatment to produce high quality effluent	- Secondary treatment to meet the regulatory effluent requirements	- Advanced secondary treatment to produce high quality effluent	- Advanced secondary treatment to produce high quality effluent
Discharge	- Discharge to Baynes Sound	- Discharge to the Strait of Georgia beyond Comox Bar (Sandy Island Marine Park)	- Discharge to Cape Lazo through a shared/upgraded outfall with the CVWPCC	- 6 discharge wells, with approximately 300 m to 600 m spacing between each well
Resource Recovery Opportunities	- Beneficial reuse of biosolids from SkyRocket composting facility	- Beneficial reuse of biosolids from SkyRocket composting facility	- Beneficial reuse of biosolids from SkyRocket composting facility	- Beneficial reuse of biosolids from SkyRocket composting facility

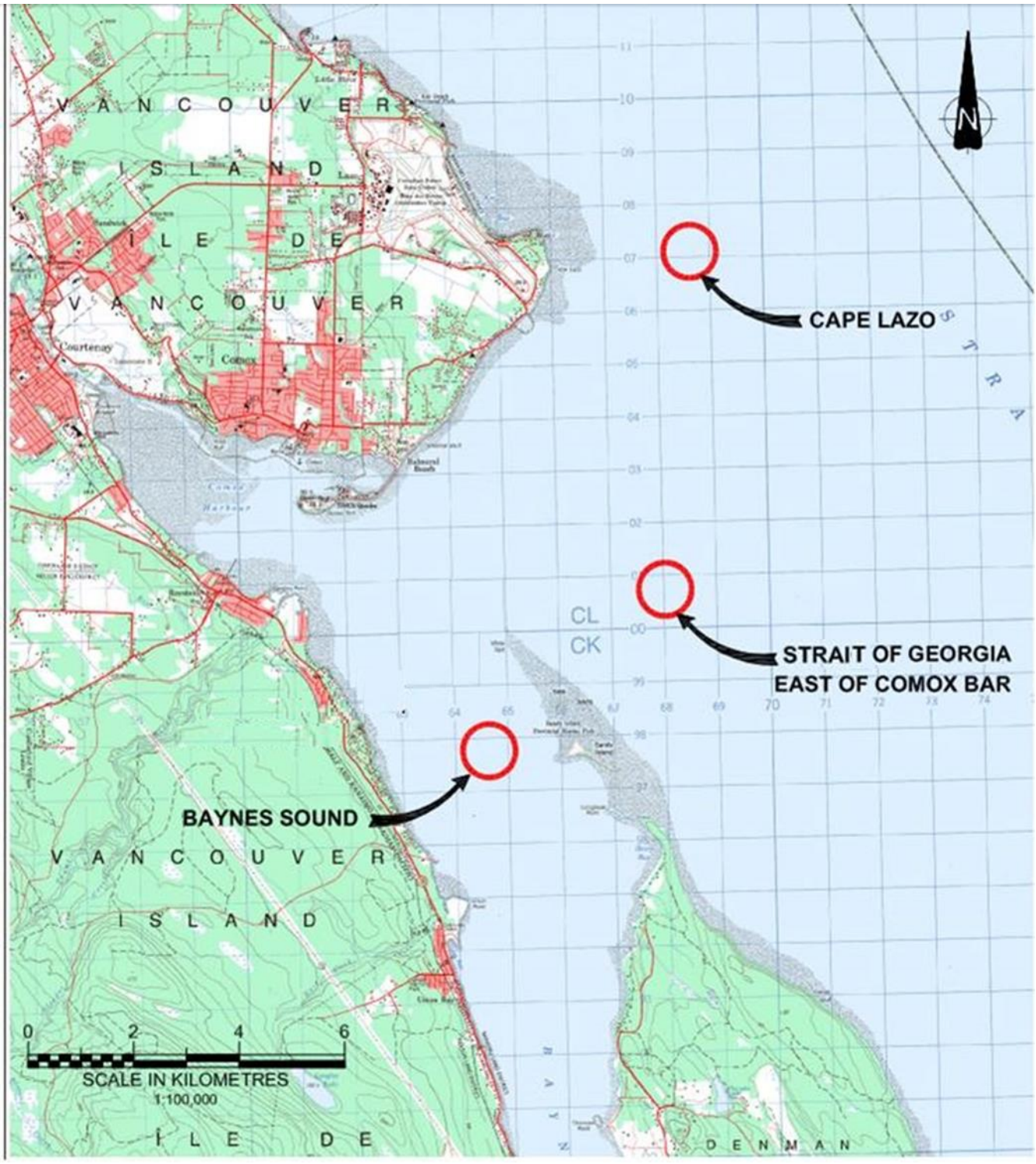


Figure 3-1
Marine Discharge Locations for the Short-Listed Scenarios (Scenario A = Baynes Sound; Scenario B = Strait of Georgia beyond Comox Bar (Sandy Island Marine Park); Scenario C = Cape Lazo; Scenario D = not indicated (ground discharge)

3.4 Evaluation and Selected Scenario

The TBL method required that quantifiable metrics be developed for use in the evaluation of options. **Table 3-3** summarizes the quantifiable attributes that were utilized in the Stage 1/2 South Region LWMP.

Table 3-3
Summary of Quantifiable Metrics Developed for the TBL Analysis

TBL Category	Quantifiable Attribute	Method of Quantification	Units
Environmental	Carbon footprint	Green House Gas (GHG) emissions associated with operations over an analysis horizon from 2019 to 2060	tonnes of Carbon Dioxide (CO_2) emissions
	Receiving environment loading	The sum of the anticipated ratio of the effluent to the influent concentrations for Biochemical Oxygen Demand (BOD_5), Total Suspended Solids (TSS), total phosphorus, and total nitrogen	Unitless
	Effluent dilution potential	The dilution ratio in the receiving environment at the edge of the Initial Dilution Zone (IDZ) as defined by the MWR	Dilution : 1
	Sensitive land and foreshore disturbance	Disturbed terrestrial and foreshore area in locations classified as 'sensitive ecosystems'	Area in m^2
Social	Residential area truck traffic	The number truck trips associated with transporting solids to the SkyRocket facility with operations over an analysis horizon from 2019 to 2060	Number of trucks
Economic	Life cycle costs	Total net present value of capital and O&M costs, as well as revenues from IRR opportunities to year 2060	2015 dollars
	Initial Phase 1 capital costs	Phase 1 (2018) Capital Costs for property, collection, treatment, and outfall	2015 dollars

In addition to the quantifiable attributes within the TBL framework, six risk factors (RF) were developed to address the stakeholder's concerns:

- RF 1: Need to address viruses in the short term
- RF 2: Need to address viruses in the long term
- RF 3: Need to address trace organic compounds in the long term
- RF 4: Need to address microplastics in the long term
- RF 5: Regulatory rejection
- RF 6: Schedule delay

For each Scenario, the RFs were evaluated as the product of the probability of such an event occurring and its severity should the event occur. The scoring included input from experts in the field (Brian Kingzett – Vancouver Island University) as well as local knowledge provided by the TAC/PAC members.

3.4.1 Weightings

Once the quantified attributes and the risk factors were presented to the TAC/PAC, the committee participated in an exercise that yielded an agreed-upon weighting for each of the criteria. The TAC/PAC were instructed to rate the main attribute (i.e. Environmental, Social, Economic, Risk) that is of most importance at 100. All other main attributes were to be rated in relation to the most important one. Similarly, within each main attribute, the sub-attribute that is of most importance was rated at 100. All remainder sub-attributes were weighted in relation to the most important sub-attribute.

Table 3-4 summarizes the weighting of the main attributes and the sub-attributes as adopted by the TAC/PAC. The Environmental and Risk categories were of most importance to the TAC/PAC. Within the Environmental Category, the Receiving Environment Loading was of the most importance.

Table 3-4
Summary of Weightings

Main Attribute	Sub-Attribute	Weighting	
Environmental		**100**	
	Carbon footprint		50
	Receiving environment loading		100
	Effluent dilution potential		100
	Sensitive land disturbance		60
Social		**40**	
	Residential area truck traffic		100
Economic		**70**	
	Life cycle cost (2018 to 2060)		100
	Initial capital cost (2018)		100
Risk		**100**	
	Risk Factor Consequence		100

3.4.2 Results

Figure 3-2 and **Figure 3-3** show the results of the TBL assessment without risk, and with risk, respectively. Risks associated with Scenario D were determined to be inherent (i.e. risks that could not be mitigated by design) and as a result, Scenario D was not shown in **Figure 3-3**, and this scenario was eliminated.

In addition, for the risk analysis (**Figure 3-3**), the Social category was removed (i.e. a total weighting = 0). Although the number of truck trips associated with Scenario B was greater than that associated with the remainder of the scenarios, the number of truck trips for all scenarios was agreed to be inconsequential over a time period of one year.

The modifications to the attributes and weightings resulted in a considerable change from the analysis that excluded consideration of risk. Based on the weightings agreed upon by the TAC/PAC, and the changes applied to the analysis, Scenario C (Discharge to Cape Lazo) had the highest score. This is attributed to the favourable scoring in the risk

category (shown by the size of the Red-coloured bar) and the Environmental Category (shown by the size of the Green-coloured bar).

Scenario A (Baynes Sound) scored highest until inherent risks were considered. The TAC/PAC expressed considerable concern over the short- and long-term risk to the shellfish industry in Baynes Sound including the potential for future international regulations that could hurt the shellfish industry. This was a key contributor to the collapse of social license for this option.

Notwithstanding the addition of the Risk category to the analysis (which was the most detrimental to Scenario A, the total score associated with Scenario A (discharge to Baynes Sound) trailed only slightly behind Scenario C. This is owing to Scenario A being the most economically feasible. Finally, Scenario B (discharge to the Strait of Georgia) had the lowest score due to its lower economic feasibility, and increased risk associated with the scenario.

On March 5, 2015, after five meetings over seven months, the TAC and PAC recommended discharge to the Strait of Georgia off Cape Lazo through a combined outfall with the existing Comox Valley Waste Pollution Control Centre (CVWPCC) as the preferred solution (Scenario C).

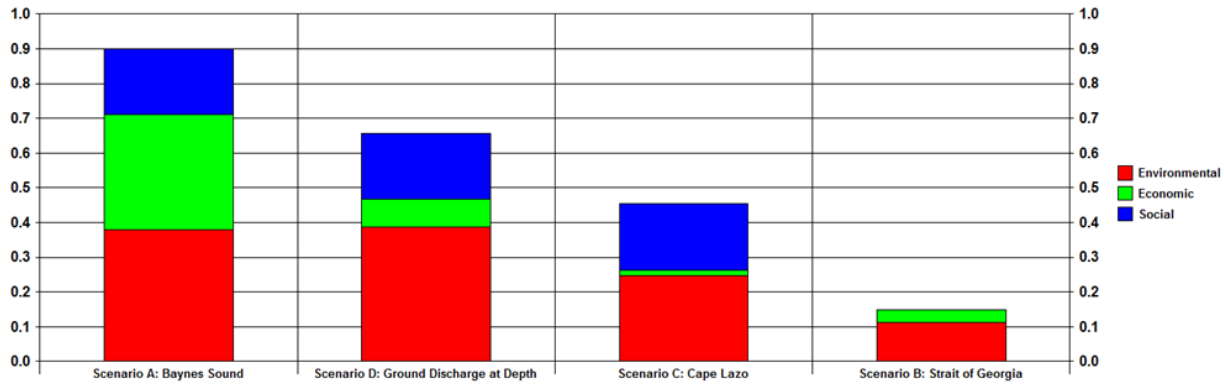


Figure 3-2
TBL Results (without risk metrics)

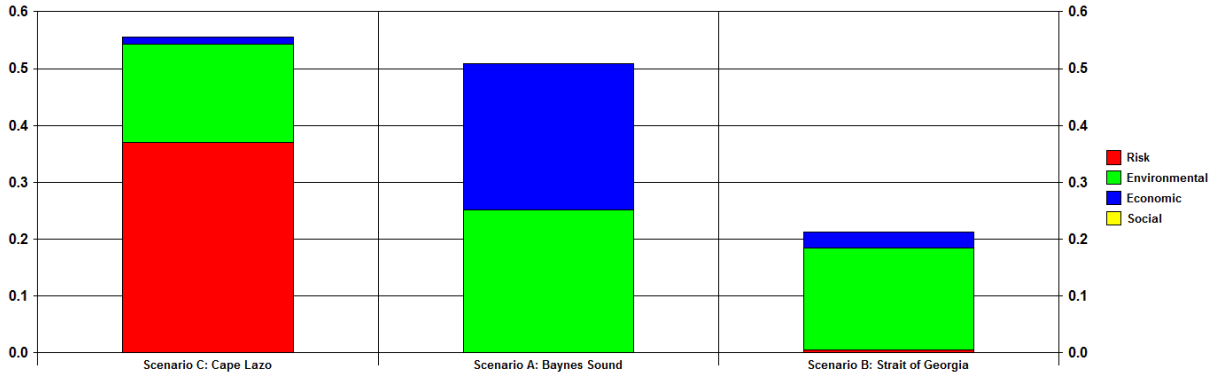


Figure 3-3
TBL Results (with risk metrics)

3.5 Capital Cost Overview

As part of the TBL analysis, capital and life-cycle costs for the different scenarios were developed for the four scenarios (**Table 3-5**). The estimates were developed in $CAD 2015 and at the time, it was recognized that the level of accuracy for the cost estimates was +/- 30%. Due to this level of precision, the attributes under the Economic category were determined to be not statistically different among the four scenarios. This resulted in a slightly lower weighting of the Economic category relative to the Environmental and Risk categories.

Table 3-5
Capital and Lifecycle Costs Developed during the 2014-2015 LWMP TBL Evaluation ($CAD 2015)

Criteria	Units	Scenario A	Scenario B	Scenario C	Scenario D
Life cycle cost (2018 to 2060)	2015 $	$163,910,000	$179,100,000	$183,320,000	$176,180,000
Initial capital cost (2018)	2015 $	$49,700,000	$58,850,000	$57,890,000	$57,770,000

4 TERMINATION OF LWMP PROCESS

Despite the collaborative approach taken on the LWMP, on June 18, 2016, a referendum for the South Sewer Project failed to achieve support of the electorate.

Following the referendum, extensive collaboration with the Comox Valley Sewage Commission has resulted in a revised proposal whereby untreated wastewater from the south region would be conveyed into existing Comox Valley Sewer Service infrastructure for treatment at the Comox Valley Water Pollution Control Centre and discharge via the Cape Lazo outfall, thus eliminating the need for a separate treatment plant in the south.

Concurrent to these efforts, the Comox Valley Sewer Service is part way through a LWMP process, being executed as a combined Stage 1 and 2 process. The final LWMP Stage 1 and 2 report outlining the preferred options for conveyance, treatment and resource recovery is expected to be submitted for provincial review this fall.

Through consultation with the BC Ministry of Environment and Climate Change Strategy, the decision was made to consider the extension of sewer services south through an addendum to the Comox Valley Sewer Service LWMP that is currently underway.

CLOSURE

This report was prepared for the Comox Valley Regional District.

The services provided by Associated Engineering (B.C.) Ltd. in the preparation of this report were conducted in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions. No other warranty expressed or implied is made.

Respectfully submitted,
Associated Engineering (B.C.) Ltd.

Sylvia Woolley, M.A.Sc., P.Eng.
Wastewater Process Engineer

Tom Robinson, M.A.Sc., P.Eng.
Project Manager

TR/fd

APPENDIX A – TAC/PAC MEMBERS

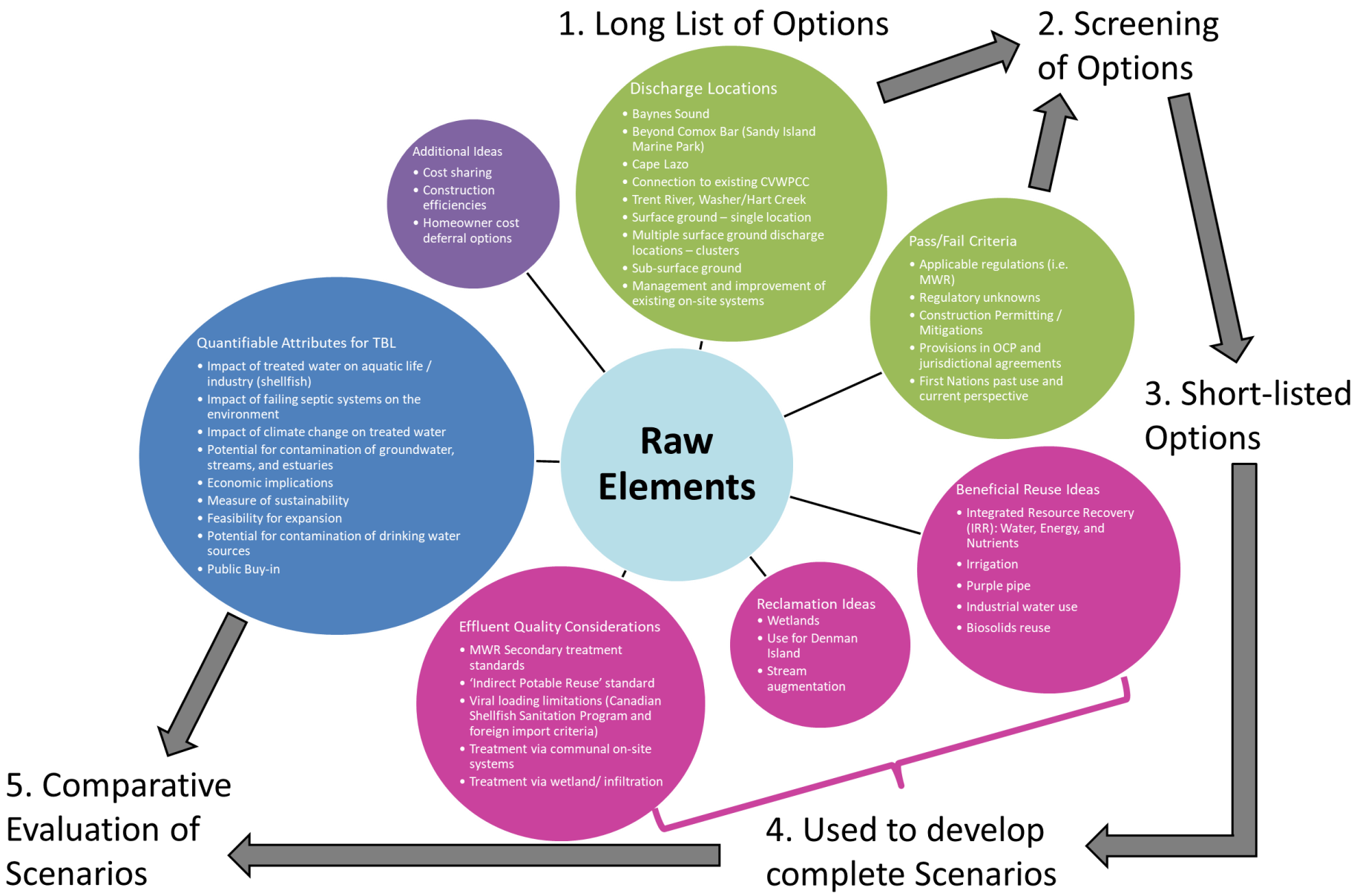
Table A-1
List of Technical Advisory Committee Members

Organization	Appointed	Alternate
Union Bay Improvement District	Alan Webb	Kevin Douville
Ministry of Community, Sport, and Cultural Development	Catriona Weidman	Brian Bedford
Island Health	David Cherry	Gary Anderson
Fisheries and Oceans Canada	Juanita Rogers	
Ministry of Environment	Kirsten White	
City of Courtenay	Lesley Hatch	Craigh Parry
Village of Cumberland	Rob Crisfield	Sundance Topham
Town of Comox	Shelly Ashfield	Glenn Westendorp
K'ómoks First Nation	Pam Shaw	Wilma Mack/Nicole Rempel
Island Trust	Rob Milne	Courtney Simpson

Table A-2
List of Public Advisory Committee Members

Organization	Appointed	Alternate
Resident, Royston	Alun Jones	
Resident, Union Bay	Anne Alcock	Bruce Livesey
Resident, Royston	Claudette Dlawse	
Comox Valley Environmental Council	Larry Peterson	
Underwater Harvesters Association	Grant Dovey	Mike Atkins
Friends of Baynes Sound Society	Phil Robertshaw	Norm Prince
BC Shellfish Growers Association	Roberta Stevenson	
Resident, Royston	Brigid Walters	
Resident, Kilmarnock, Union Bay	Susanna Kaljur	Rob Smith
Estuary Working Group	Wayne White	Bill Heath
Association of Denman Island Marine Stewards	Edina Johnston	
Resident, Denman Island	David Critchley	
Association of Denman Island Marine Stewards	Liz Johnson	David Graham

APPENDIX B – OVERVIEW OF THE SELECTION PROCESS GRAPHIC


1. Long List of Options
2. Screening of Options
3. Short-listed Options
4. Used to develop complete Scenarios
5. Comparative Evaluation of Scenarios
Raw Elements
Discharge Locations
• Baynes Sound
• Beyond Comox Bar (Sandy Island Marine Park)
• Cape Lazo
• Connection to existing CVWPCC
• Trent River, Washer/Hart Creek
• Surface ground – single location
• Multiple surface ground discharge locations – clusters
• Sub-surface ground
• Management and improvement of existing on-site systems
Additional Ideas
• Cost sharing
• Construction efficiencies
• Homeowner cost deferral options
Pass/Fail Criteria
• Applicable regulations (i.e. MWR)
• Regulatory unknowns
• Construction Permitting / Mitigations
• Provisions in OCP and jurisdictional agreements
• First Nations past use and current perspective
Quantifiable Attributes for TBL
• Impact of treated water on aquatic life / industry (shellfish)
• Impact of failing septic systems on the environment
• Impact of climate change on treated water
• Potential for contamination of groundwater, streams, and estuaries
• Economic implications
• Measure of sustainability
• Feasibility for expansion
• Potential for contamination of drinking water sources
• Public Buy-in
Beneficial Reuse Ideas
• Integrated Resource Recovery (IRR): Water, Energy, and Nutrients
• Irrigation
• Purple pipe
• Industrial water use
• Biosolids reuse
Reclamation Ideas
• Wetlands
• Use for Denman Island
• Stream augmentation
Effluent Quality Considerations
• MWR Secondary treatment standards
• 'Indirect Potable Reuse' standard
• Viral loading limitations (Canadian Shellfish Sanitation Program and foreign import criteria)
• Treatment via communal on-site systems
• Treatment via wetland/ infiltration

APPENDIX

A-3 TACPAC #1 DISCUSSION PAPER 3

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

DISCUSSION PAPER 3: FLOWS AND LOADS FOR THE SEWER EXTENSION SOUTH LWMP ADDENDUM & BACKGROUND AND PROVISIONS IN THE COMOX VALLEY SEWER SERVICE LWMP

CONFIDENTIAL

SEPTEMBER 21, 2022

1 DISCUSSION PAPER #3

1.1 BACKGROUND

The south region of the CVRD, part of Electoral Area A Baynes Sound, is located south of the City of Courtenay, bordering the waters of Baynes Sound. This area produces 70% of BC's cultured oysters and is a prized natural feature of the Comox Valley that holds important cultural, economic, environmental, and recreational value. There is no centralized sewage collection system in the area, and privately owned onsite septic systems are utilized for wastewater management. These systems are reported to have a history of failures with the potential to negatively impact the environment and public health.

In 2018, the Comox Valley Sewage Commission agreed in principle to the concept of receiving wastewater flows from portions of Electoral Area A and K'ómoks First Nation (K'ómoks), subject to the resolution of governance, terms of service, financial impact and regulatory considerations. In 2020, the Sewage Commission supported several recommendations to allow for the future receipt of Electoral Area A and K'ómoks wastewater into the existing Comox Valley sewer system.

Expansion of the area serviced by the Comox Valley Sewer Service (CVSS) would provide sewage services to existing developed areas in the south region, including Royston and Union Bay. The service expansion would also facilitate future sewer servicing for K'ómoks development lands in the south and Union Bay Estates (UBE), a comprehensive development area anticipated to include almost 3,000 future dwelling units and commercial, institutional, recreational and resort facilities. The servicing of these areas is anticipated to proceed in phases.

Currently, wastewater is conveyed from the City of Courtenay, Town of Comox, K'ómoks, and the Department of National Defence to the Comox Valley Water Pollution Control Centre (CVWPCC), where it receives secondary treatment followed by outfall discharge to open marine waters in the Strait of Georgia near Cape Lazo. The layout of the system is illustrated in Figure 1 below. The figure also includes the illustration of the proposed Sewer Extension South project, indicating how the south region could tie into the CVSS.

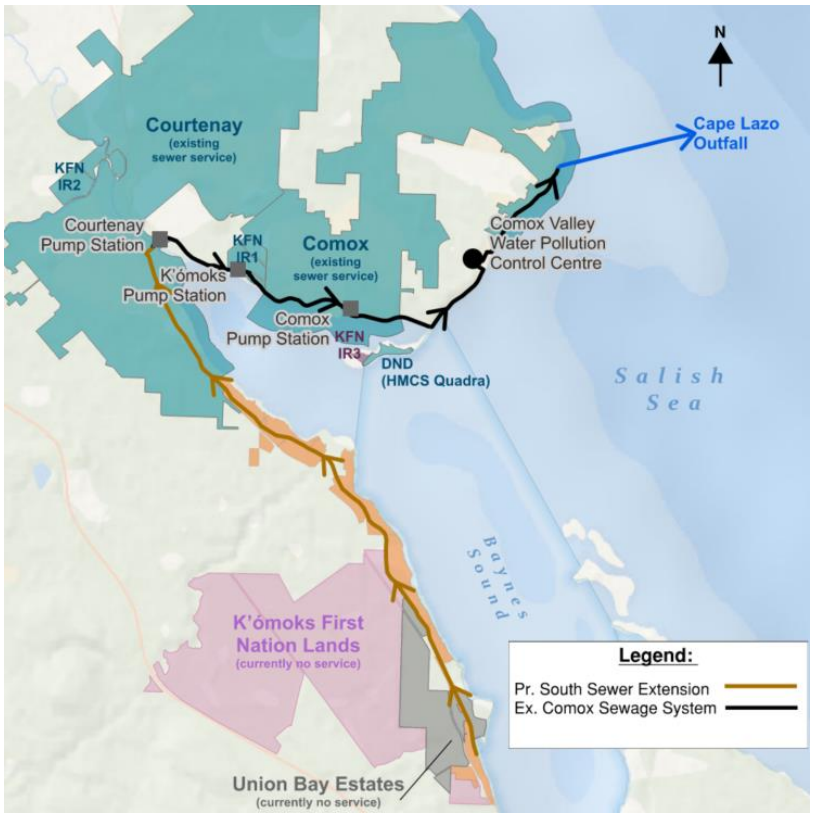


Figure 1 System Overview

1.2 BRIEF

The discussion paper includes the following information:

- Summary of flows and loads per population projections.
- Summary of treatment objectives as identified in CVSS LWMP.
- Summary of ongoing CVSS LWMP work and its provisions for flows from Area A.

2 POPULATION & DESIGN FLOWS

Per the provincial LWMP guidelines, a LWMP process is an effective tool in areas where there is considerable growth and development, or where there are known problems with existing liquid waste infrastructure. As a forward-looking planning document, an LWMP is intended to anticipate a community's future liquid waste management needs. As a key input into this work, it is necessary to consider potential future growth and development within the community and translate this into population projections.

The following section outlines the assumptions used to develop the population projections and design flow calculations for the south region as discussed in the Population and Flow Basis of Design memo and summarised in the following sections.

2.1 POPULATION PROJECTIONS

The population growth projections of the existing and future developments are summarised in **Table 1** below.

Table 1: Population Projections

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**
2030	1,037	391	623	861	1,548	**4,460**
2035	1,063	401	639	882	2,488	**5,473**
2040	1,090	411	655	905	3,428	**6,489**
2045	1,117	421	672	928	6,258	**9,396**
2050	1,146	432	689	951	9,088	**12,305**
2055	1,175	443	706	975	9,488	**12,787**
2060	1,204	454	724	1,000	9,888	**13,270**
2065	1,235	465	742	1,025	10,288	**13,755**
2070	1,266	477	761	1,051	10,688	**14,243**

The following assumptions were used to develop the population projections:

- The number of dwellings in the existing developed areas was obtained from the 2017 CVRD South Regional Sewer Service Map.
- The residential density of 2.1 persons/property from the 2016 Census for the CVRD for Area 'A' was used for determining the population in 2017.
- The growth rate for the existing developed areas was 0.91% for the years 2017-2019 from the 2016 Census for the CVRD for Area 'A'. From 2020 onwards, a medium growth scenario was assumed with a growth rate of 0.5%.
- Union Bay Estates (UBE) assumes a growth rate consistent with McElhanney's Kensington Union Bay Estates Sanitary Master Plan (2019).

- The K'ómoks development is assumed to begin in 2025 with 80 persons. A medium growth scenario was used, this corresponded to a population growth rate of 80 persons per year with a residential density of 2.1 persons per unit.

Development projections in the area are varied and changing, with multiple residential development projects proposed, which creates uncertainty for future build-out populations. According to the information supplied by the CVRD, the proposed developments are either in the planning and/or design/construction phase. Union Bay Estates will be developed in phases with civil works construction underway in the anticipated first phase area. Development of K'ómoks lands had not commenced at the time of writing this report.

The catchment areas, comprised of existing and future new development areas, for each of the proposed future pump stations are shown in **Figure 2**.

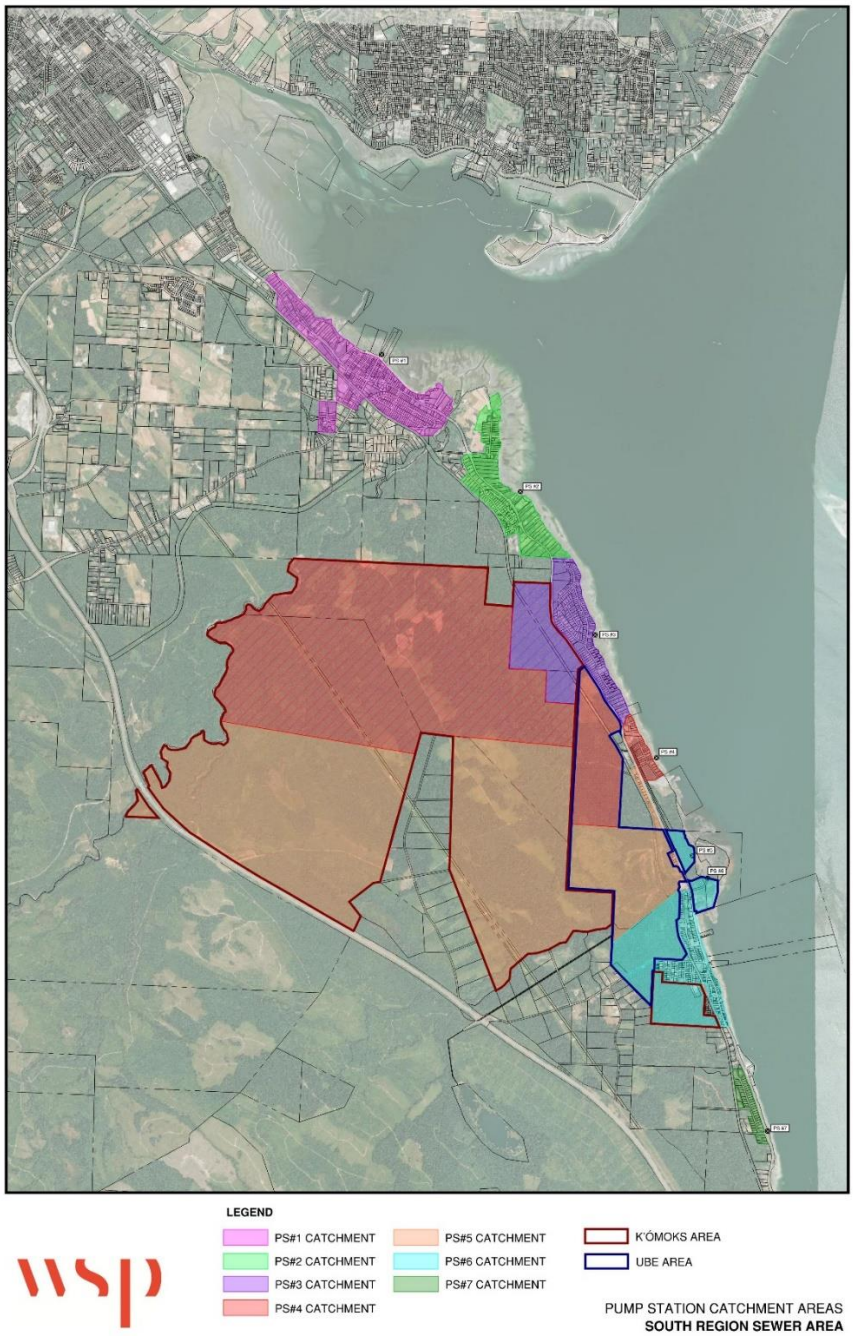


Figure 2: Pump Station Catchment Areas

2.2 FLOWS

Table 2 summarises the contributing Average Dry Weather Flow (ADWF), Peak Dry Weather Flow (PDWF) and Peak Wet Weather Flow (PWWF) for the projected populations in 2025 and 2070 for each pump station catchment. The ADWF represents the average daily sewage flow entering a Sewage system with minimal infiltration. The PDWF is defined as the most likely peak sanitary flow during a typical dry weather day. The PWWF is obtained by adding inflow and infiltration to the peak dry weather flow.

Table 2: Pump Station Catchment Population, Area and Flow

		PS#1 Catchment	PS#2 Catchment	PS#3 Catchment	PS#4 Catchment	PS#5 Catchment	PS#6 Catchment	PS#7 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

The following assumptions were used in the calculation of the flows:

- 240 L/cap/day was used as specified in the 2014 MMCD Design Guidelines for ADWF.
- The peaking factor was calculated using the formula from the 2014 MMCD Design Guidelines of PF = 3.2/P0.105, where P is the population in thousands rounded to the nearest thousand.
- The inflow and infiltration (I&I) rate for all existing and proposed developments is 0.06 L/s/ha as specified in the 2014 MMCD Design Guidelines.
- The PWWF was calculated using the formula for design flow from the 2014 MMCD Design Guidelines, where the design flow, Q = population x per capita flow x peaking factor + I&I contribution

2.3 ORGANIC LOAD CONTRIBUTION

The same data and assumptions that were used for the determination of the loads in the CVSS LWMP were used to determine the organic load contributed by the south region. The information below indicates the loads and the assumptions made in the CVSS LWMP submission of stages 1 and 2 dated August 8, 2022.

Historical (2013 to 2019) CVWPCC influent 5-day Biochemical Oxygen Demand (BOD_5) and Total Suspended Solids (TSS) loadings were used to develop average per capita unit loading rates. The $cBOD_5$ and TSS data were taken from weekly composite samples. Table 3 shows the historical per capita loads.

Table 3 Historical Influent Loading, 2013 to 2019

		HISTORICAL INFLUENT LOADING [1] KG/D				INFLUENT UNIT LOADING G/C/D			
Year	Population [2]	Average BOD_5	Max Month BOD_5	Average TSS	Max Month TSS	Average BOD_5	Max Month BOD_5	Average TSS	Max Month TSS
2013	39,714	3,327	4,241	3,425	4,383	84	107	86	110
2014	40,369	3,720	8,983	4,144	6,198	92	223	103	154
2015	41,266	3,675	5,641	3,977	5,351	89	137	96	130
2016	42,354	2,605	6,919	4,405	6,988	62	163	104	165
2017	42,962	2,946	4,306	4,116	5,189	69	100	96	121
2018	43,498	2,764	5,530	4,375	6,824	64	127	101	157
2019	44,370	4,245	5,722	3,292	7,145	96	129	74	161
					Average	**79**	**127[3]**	**94**	**142**

1 Plant Data. We have assumed this data includes all return streams from the plant.
2 Population was obtained from BC Stats.
3 Refer to table 5-4: CVWPCC historical Loading, 2013 to 2019

No data were available for Total Kjeldahl Nitrogen (TKN), therefore loading data is based on per capita unit rates from ISL (2016). The TKN loading determined in ISL (2016) was based on 13 g/c/d, which is considered typical for domestic wastewater without any industrial loading. ISL (2016) also determined a peaking factor of 1.1 between average and max month loading. These same values were carried forward for projecting TKN load to the CVWPCC. Table 4 shows the projected future loads to the CVWPCC for BOD_5, TSS, and TKN.

Similar values to those used for the CVSS LWMP have been used in the table below to project the organic loads contributed by the south region. These values are conservative as it is calculated by the combined organic load and no distinction has been made between industry & commercial effluent and domestic sewage. This indicates that the Influent Unit loading is based on a combination of industry & commercial effluent and domestic sewage, thus provision has been made for possible industry & commercial effluent from the south region.

Table 4: South Region Load Projections, 2020-2060 to the CVWPCC

	2020	2030	2040	2050	2060
Population Projections	2770	4460	6489	12305	13270
Average BOD_5 (kg/d)	219	352	513	972	1048
Max month BOD_5 (kg/d)	352	567	825	1565	1688
Average TSS (kg/d)	260	419	610	1157	1247
Max month TSS (kg/d)	393	633	921	1747	1884
Average TKN (kg/d)	36	58	84	160	173
Max month TKN (kg/d)	40	64	93	176	190

3 CVSS LWMP PROVISIONS

3.1 POPULATION

During the development of Stage 1 and 2 LWMP for the Comox Valley Sewer System, population and sewage flow estimates were developed for the south region based on previous work and more recent information regarding planned development. This information was used to assess the impacts of conveying the south region wastewater flows to connect with the CVRD wastewater conveyance and treatment systems. The impacts of the planned K'ómoks development, as well as planned development in existing developed areas of the south region were included in the evaluation.

The existing developed areas under consideration for servicing include Royston, Union Bay, and neighborhoods between, shown in orange on Figure 3 below.

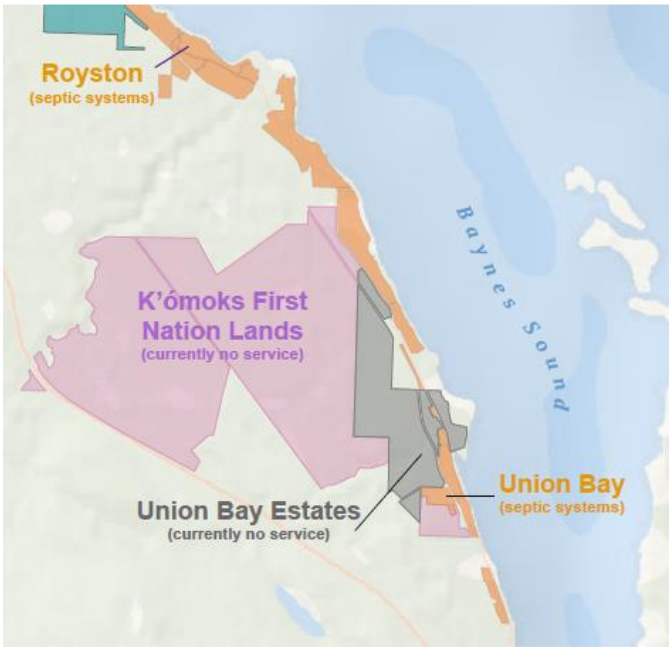


Figure 3 Areas under Consideration

It was assumed that the development would be limited in these areas to maintain their existing density. There were no available data for the current population; for the purpose of this study, the existing population was estimated based on the existing number of dwellings and an assumed population density of 2.1 people per dwelling taken from the 2016 Census for the CVRD's Area A. As of 2019, the estimated population of the south region was estimated at 2,756 people.

A medium growth scenario was used in the Stage 1 and 2 LWMP for the Comox Valley Sewer System, resulting in a service population for the south region of approximately 9,100 people by the year 2060.

Table 5 below provides the population provisions that were made for in the CVSS LWMP.

Table 5: Projected South region population

YEAR	EXISTING	NEW DEVELOPMENT AREAS	TOTAL
2019	2,756	0	2,756
Projected			
2020	2,770	67	2,837
2030	2,912	1,217	4,129
2040	3,061	2,737	5,798
2050	3,217	4,207	7,424
2060	3,382	5,677	**9,059**
2070	**3,555**	**7,147**	**10,702**

Notes: Table from the "*South Region Service Area Impacts on CVSS Conveyance and Wastewater Infrastructure,* and *South Region Forcemain Cost Estimate"* report

At the time of the development of the CVSS LWMP, limited information was available on the expected population growth and development in the south region. With the assistance of the CVRD the estimated population and development projections have been updated in the WSP Technical Memorandum with regards to the populations and flows, as shown in section 2.1 Population above. All the future flows are projected by using the assumption with available information. As information, such as master planning documentation, Census and development plans are updated, the assumptions will be more accurate, and the future projections will have a higher degree of accuracy.

The differences between the CVSS LWMP population projections (Table 5) and the more recent Sewer Extension South population projections above are shown in Table 6 below.

Table 6: Population differences

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

For the next 20 years (2040), the difference in projected populations is negligible between the two reports. The difference of 691people in 2040 is less than 11%. Such a small variance will not have a large impact on the flows and loads of the entire system and is acceptable in terms of planning purposes. On the entire system contributing to the CVWPCC, the difference in population is less than 1.2%. As more studies and planning are done for the south region, the figures will be updated.

3.2 CVSS – WASTEWATER TREATMENT

3.2.1 BACKGROUND

One of the planning components for a LWMP is the study of the wastewater treatment plant. This will identify treatment objectives for the plan area and relate to LWMP goals of protection of public health and the environment. Preventing wastewater management impacts to the marine environment is a key driver for both the CVSS LWMP process and the Sewer Extension South LWMP Addendum process.

The Wastewater Treatment plant assessment has been completed as part of the CVSS LWMP. Below is a summary of the treatment objectives and outcomes of the CVSS Stage 1 and 2 LWMP process.

3.2.2 LOCATION OF THE CVWPCC

The CVRD has a single existing wastewater treatment facility (located at Brent Road near Cape Lazo) and outfall that currently serves the communities of Courtenay and Comox, CFB Comox and K'ómoks. The existing treatment plant, the Comox Valley Water Pollution Control Centre (CVWPCC), has an adequate unused area for major expansions of the facilities in the future as required.

3.2.3 CVWPCC TREATMENT PERFORMANCE FOR THE CVSS LWMP

The CVWPCC effluent quality data were reviewed and analyzed for the period from 2014 to 2019. The effluent was sampled and analyzed for five-day carbonaceous biochemical oxygen demand ($cBOD_5$) and total suspended solids (TSS) at least once a month as required by the discharge permit.

The monthly average TSS concentration exceeded the Federal Wastewater Systems Effluent Regulation (WSER) criteria of 25 mg/L only once during the review period (in 2017). The effluent daily TSS concentration was consistently below the allowable maximum specified in both Permit No. 5856 (60 mg/L) and the Municipal Wastewater Regulation (MWR) (45 mg/L). The monthly average effluent TSS concentration was typically in the range of 5 mg/L to 15 mg/L from 2014 to 2019.

The plant effluent quality for $cBOD_5$ was within the regulatory limits specified in the WSER, the MWR, and Permit No. 5856. Similar to the data for TSS, the monthly average $cBOD_5$ concentration was typically in the range of 5 mg/L to 15 mg/L.

The average percentage removal of TSS during the assessed period (2014 to 2019) was consistently high, ranging from 90% to 99% with an average effluent concentration of less than 9 mg/L. The removal rate of $cBOD_5$ was consistently at least 93% with an average effluent concentration of less than 7 mg/L. This is indicative of excellent performance for a secondary treatment plant.

3.2.4 OPERATIONAL CERTIFICATE

The effluent discharge from the CVWPCC reflects a very high-performing secondary wastewater treatment facility, with effluent quality parameters well within regulatory requirements. However, the volume of the discharge chronically exceeds the allowable daily maximum of 18,500 m3/d specified in the plant Discharge Permit No. 5856 by more than 10%; this means that a permit amendment will not be granted by the Ministry of Environment and Climate Change Strategy (MECCS). The CVRD will begin the process of applying for an Operational Certificate (OC) under the LWMP in Stage 3 of the LWMP. Effluent quality should meet the requirements of both the provincial MWR and the federal WSER.

An updated Stage 2 Environmental Impact Study (EIS) based on the applicable discharge flow and effluent quality will be required to support the application for an Operational Certificate (OC); this and other required supporting information is listed in the Information Requirements Table Issued by the MECCS. Since the Stage 2 EIS will be based on the proposed maximum day discharge contained in the OC, it is prudent to consider using a discharge flow projected well into the future, at least to the year 2030 (45,000 m3/d) and possibly to 2040 (51,000 m3/d); this will avoid having to re-do the EIS for an increase in flow prematurely. To avoid paying excessive permit discharge fees in the near term, and to avoid repeated revisions to the OC to accommodate increasing flows, it may be possible to include a table in the OC that ties allowable maximum day discharge to system service population; this should be discussed with MECCS when the draft OC is developed in Stage 3 of the LWMP.

3.2.5 OPTIONS FOR TREATMENT

— *Stage 1*

During Stage 1 of the CVSS LWMP, four options for treatment were identified for discussion with the TAC/PAC. The four options were based on the effluent quality to be produced and were presented as concepts for the planning of future expansions and/or upgrades. Option 1 would be to meet the provincial and federal discharge standards; these standards have been developed to protect the receiving environment, and the provincial regulation allows the

regulating body to impose additional standards in specific cases where this is shown to be needed to protect the environment. Options 2, 3 and 4 were based on voluntarily enhancing effluent quality beyond what is required by the regulations.

— *Stage 2*

The Stage 2 work was a high-level review of the estimated capacity of the existing infrastructure at the CVWPCC, what would be required for expansion to handle 2040 flows and loads, and cost estimates for different levels of wastewater treatment at the CVWPCC.

The objective of the Stage 2 wastewater treatment options assessment was to enable decision-making to identify the desired level of wastewater treatment to provide at the CVWPCC by comparing the costs and benefits of the different options.

— *Recommendation*

During stage 2 and the engagement meetings, the recommended level of treatment for the next CVWPCC expansion is to maintain the current level of treatment (i.e., secondary treatment for the entire plant flow) with the addition of effluent disinfection. This is shown in Figure 4 below.

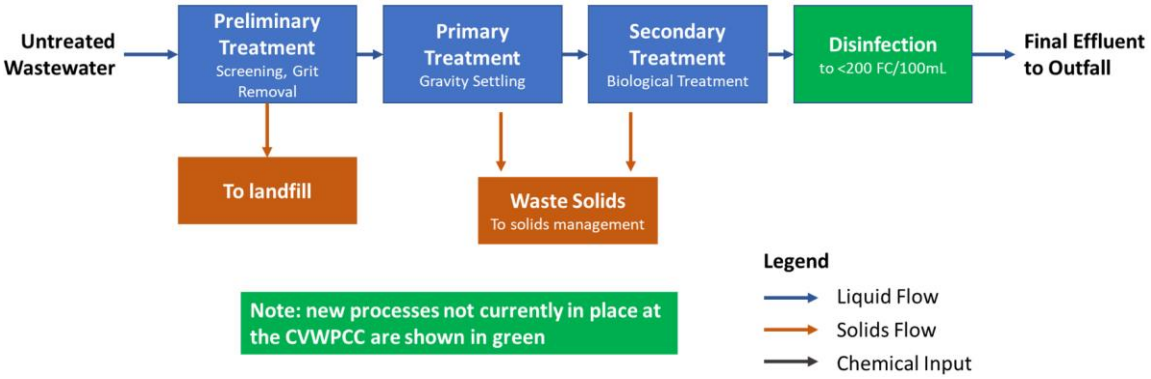


Figure 4: CVWPCC recommended Option

The proposed method for disinfection is Ultraviolet (UV) and has the following advantages:

— Effective inactivation of most viruses, bacteria, and spores
— Physical process rather than a chemical disinfectant
— No residual by-products that could harm humans or aquatic life

3.2.6 IMPACT OF THE SES LWMP ADDENDUM ON THE CVWPCC

The impact of the south region's flows and loads contribution does not impact the decision of the preferred wastewater treatment process option selected through the Stage 1 and 2 CVSS LWMP.

The CVWPCC will require capacity upgrades due to the increased flow and load from overall growth in the population of the CVSS service area, including the potential future addition of portions of Electoral Area A. A Facility Master Plan, currently underway, is being completed to develop the basis of design for this future plant expansion. Should the population in the service area, including the south region, expand quicker than currently projected, the main result is a reduced capacity horizon, meaning that an upgrade of the plant will be required earlier.

4 WAY FORWARD

The population and flow projections outlined in this report will be discussed with the Sewer Extension South LWMP Addendum PAC/TAC at meeting number one and will be used as the basis of design for the upcoming technical reports being considered by the committee through the addendum process.

APPENDIX

A-4 TACPAC #1 MINUTES

Comox Valley REGIONAL DISTRICT

Minutes

Minutes of the meeting of the Sewer Extension South (SES) Liquid Waste Management Plan (LWMP) Addendum Joint Technical and Public Advisory Committee (TACPAC) held on September 21, 2022 in the CVRD Civic Room at 770 Harmston Avenue, Courtenay, and via Zoom conference commencing at 12:30 pm

PRESENT:

A. Habkirk, Chair & Facilitator	Facilitator
M. Rutten, General Manager of Engineering Services	CVRD
D. Monteith, Manager of Liquid Waste Planning	CVRD
V. Van Tongeren, Environmental Analyst	CVRD
C. Wile, Senior Manager of Strategic Initiatives	CVRD
A. Mullaly, General Manager of Planning and Development Services	CVRD
T. Trieu, Manager of Planning Services	CVRD
M. Briggs, Branch Assistant – Engineering Services	CVRD
M. Simhon	Associated Engineering
I. Snyman	WSP
M. Levin	WSP
C. Peters	WSP
C. Davidson, City of Courtenay	TAC
C. Marshall, City of Courtenay	TAC
S. Ashfield, Town of Comox	TAC
M. Kamenz, Town of Comox	TAC
G. Kosmider, Fisheries and Oceans Canada	TAC
N. Clements, Island Health	TAC
E. Derby, Island Health	TAC
M. Mamoser, Ministry of Environment and Climate Change Strategy	TAC
L. Johnson, Ministry of Health	TAC
I. Munro, Electoral Area A Alternate Director	PAC
M. Hewson, Association for Denman Island Marine Stewards	PAC
N. Prins, BC Shellfish Growers Association	PAC
M. Cowen, BC Shellfish Growers Association	PAC
C. Pierzchalski, Comox Valley Conservation Partnership	PAC
A. Gower, Comox Valley Chamber of Commerce	PAC
I. Heselgrave, School District No.71	PAC
M. Atkins, Underwater Harvesters Association	PAC
N. Prince, Craigdarroch Resident Representative	PAC
R. Steinke, Craigdarroch Resident Representative	PAC
T. Donkers, Royston Resident Representative	PAC
K. Newman, Royston Resident Representative	PAC
J. Elliott, Union Bay Resident Representative	PAC
R. Lymburner, Union Bay Resident Representative	PAC

Item	Description	Owner
1.1	**Call to Order and Territorial Acknowledgement** The meeting was called to order at 12:30 pm. A. Habkirk acknowledged that the committee is meeting on and the Sewer Extension South Project will be constructed and operated on the unceded traditional territory of the K'ómoks First Nation (K'ómoks).	**A. Habkirk**
1.2	**Welcome** D. Monteith welcomed the committee members to the CVRD office and first TACPAC meeting.	**D. Monteith**
1.3	**Introductions** The committee members introduced themselves to the committee. A. Habkirk introduced the topics to be discussed this meeting and set the goals for the day.	**A. Habkirk**
1.4	**Discussion Paper #1: LWMP objectives and purpose** I. Snyman explained the common acronyms for the project, as well as detailed WSP's involvement in the project and previous experience with LWMPs. Explained the objectives and purpose of the LWMP process. LWMP is a three-stage process for managing liquid waste. Stage 1 identifies existing conditions and community goals, and develops a wide range of options for managing liquid waste. Stage 2 involves a detailed evaluation of shortlisted options and selection of preferred option. Stage 3 includes further development of the selected option and final submittal of plan to the Ministry of Environment and Climate Change Strategy (MoE) for approval. LWMP is set up with three committees: the Steering Committee, Public Advisory Committee (PAC), and Technical Advisory Committee (TAC). The SES LWMP Addendum's steering committee is the Electoral Areas Service Committee (EASC). The PAC represents community and stakeholder interests. The TAC provides input on regulatory and technical requirements. Q: Is the Stage 1 and 2 LWMP currently completed, or just at Stage 1? A: The Comox Valley Sewer Service (CVSS) LWMP is being completed as a combined Stage 1 and 2 plan. The draft plan is currently out for review and approval before being submitted to Ministry of Environment and Climate Change Strategy (MoECCS). The SES LWMP will be added as an addendum to the Stage 2 and 3 CVSS LWMP. An update was provided on the CVSS LWMP status. The CVSS TACPAC looked at various options for pump stations, conveyance, treatment and resource recovery, and developed a short list of options before deciding upon a preferred solution for each. The Stage 1 and 2 LWMP is currently being reviewed by Kómoks and the CVSS	**I. Snyman**

	TACPAC. Stage 3 will follow after MoECCS review of the Stage 1 and 2 plan. An overview was provided for why the SES LWMP addendum is needed. In August 2022, the CVRD Board approved the expansion of the CVSS service boundary to include a portion of Electoral Area A and K'ómoks First Nation lands due to the need to protect Baynes Sound and support reconciliation. Sewer Extension South project development work will follow the LWMP process and be submitted as addendum to CVSS Stage 1 and 2 LWMP. Both processes will then move forward together with development of a combined Stage 3 LWMP. Some items are already included in CVSS LWMP so not required for the addendum, such as reclaimed water, combined overflows, wastewater treatment, stormwater management, and integrated resource recovery. A brief overview was given of what will be discussed at each meeting. Q: Has the identification of alternatives to the SES been excluded due to the LWMP being an addendum or are alternatives being considered? A: CVRD went through a previous LWMP process that identified long-listed and short-listed options. Will be building off previous work completed, focusing on the concept of a regional sewerage service, but will look at options for phasing, collection, etc. Q: Will this become an extension of the existing service rather than separate service in respect to taxes and user fees? A: Yes and no. The south region will be included in the regional service, but there will also be individual service areas for local collection works, with residents paying into both the local collection system service and regional service. Q: What is an example of a service area? A: Catchment areas will be shown in presentation, but roughly follow major neighbourhood boundaries.	
1.5	**Public Consultation – SES LWMP Addendum** C. Wile gave an overview of public consultation for the SES LWMP Addendum. CVRD follows the International Association of Public Participation's engagement spectrum to identify the level of involvement with the public. Focused on informing the community on next steps and project status, consulting residents for feedback on options and working with First Nations, and collaboration with stakeholders and partners. K'omoks First Nation is project partner. Province identifies roughly a dozen First Nations with land or marine territory in Royston, Union	**C. Wile**

	Bay, and Baynes Sound. CVRD has reached out about interest in project and how they'd like to be engaged. Public engagement will occur in four phases. Phase 1 is project initiation; phase 2 is phasing, collection system, and pump stations; phase 3 is development of draft addendum; and phase 4 is review/approval.	
1.6	**Discussion Paper #2: Summary of past work** M. Simhon gave an overview of previous work done for the 2014-2015 South Region Stage 1 and 2 LWMP, including Associated Engineering's involvement in the process. Previous work dates as far back as the 1970s, but focus will be on Associated Engineering's work done from 2014-2016. Identified legislation relevant to the LWMP process, including the Municipal Wastewater Regulation, Vancouver Island Phophorus In-Stream Objective, and Wastewater Systems Effluent Regulation. Noted that an Environmental Impact Study is done separate from the LWMP. The Stage 1 and 2 study was not completed. The South Region LWMP work included First Nation consultation, three open houses, and five meetings of a combined TACPAC. Associated Engineering worked with the South Region TACPAC to develop raw elements of what's important to the members, screened options, developed them into more comprehensive scenarios, and then compared the options. Nine discharge options were developed, and then reviewed during TACAC Meeting #3 to identify obstacles, concerns, and benefits. Narrowed down to four: discharge to Baynes Sound, discharge to Strait of Georgia, treatment in south region and discharge to Lazo outfall, and discharge to sub-surface ground. Connection to existing CVSS system initially eliminated since it involved forcemain across estuary. Discharge to Trent River/Washer Creek, discharge to ground (both single and multiple locations, and management and improvement of existing on-site systems were ruled out. Evaluations compared environmental, economic (capital costs and life cycle costs), and social (truck traffic for sludge) factors, as well as risks (items that did not fit other categories but could impact preferred solution). Developed multi-criteria approach to quantify options and apply a scenario score. First looked at results of environmental, economic, and social factors without risk, with the options ranked from highest to lowest as Baynes Sound, ground discharge, Cape Lazo, and Strait of Georgia. The TACPAC decided to remove the social aspect and add risk, with the options now ranked from highest to lowest as Cape Lazo, Baynes Sound, and Strait of Georgia. Cape Lazo had lowest risk due to less regulatory requirements due to existing outfall system,	**M. Simhon & D. Monteith**

	as well as lower risk to shellfish and other unknown factors. Cape Lazo put forth as preferred option. LWMP process paused as referendum was held in 2016 on preferred option. The referendum failed and staff then looked to collaborate with the Sewage Commission. Q: How many trucks per day were expected to be leaving the treatment facility? Comox Valley Water Pollution Control Centre (CVWPCC) likely only 1-2 trucks per day. A: TACPAC felt looking at social factors wasn't worth considering, so did not investigate in depth. 5-6 trucks mentioned only as an example; actual number not certain. Q: What other social factors were considered besides truck traffic? A: At the time, only truck traffic was considered. D. Monteith gave an update on what has changed since the 2016 referendum. Environmental issues in south region still not resolved. Sewage Commission supported request to investigate impacts of extending service to Electoral Area A in 2018. Sewage Commission agreed to accept wastewater from Electoral Area A in 2020. Initial grant in 2020 was not successful, but CVRD submitted second grant in 2022 with K'ómoks as partner. Identified the various reasons for why a sewer service is needed, including Baynes Sound water quality, aging septic system (70% over 25 years old), high density of homes (some areas similar to municipalities), poor soil conditions, environmental impacts, proposed growth in areas (Union Bay as designated settlement area), to support community services, and to support reconciliation with K'ómoks. Provided background information on the CVRD-K'ómoks Community Benefit Agreement. Commits both parties to work together to implement sewer services south. Provided background information on the CVSS. Treats wastewater from Courtenay, Comox, K'ómoks IR#1, and Department of National Defence at the CVWPCC, and discharges to Cape Lazo. Benefits to connecting to existing system includes improving efficiencies (no need for independent treatment plant), shared costs, reduced regulatory requirements, protecting Baynes Sound by using existing outfall, and providing access to high quality treatment. CVSS already meets regulatory requirements, has secondary treatment and will add UV treatment, and has operators available 24/7. Septic systems require regular maintenance and discharges to ground. Poorly maintained systems may pose environmental and health risk, and older systems predate provincial regulations. Replacement may cost as much as	

	$15,000-$50,000+ depending on conditions of lot. CVRD looking at additional regulatory tools for addressing septic issues. Gave an overview of the project, including a rough map of the potential service areas and forcemains. Q: Where does the current forcemain go? A: To West Courtenay. Q: Why was the 2020 grant unsuccessful? A: There was a lot of competition for a small amount of money. Other projects likely scored higher. Q: What is the anticipated chance of success for the 2022 grant? A: Currently uncertain, but have been communicating regularly with the Province and other agencies. Comment: Costs were primary reason for failed referendum and should be kept down. Existing residents shouldn't be paying for new system designed for 2060 that will service new areas. Should be cost offset, especially if Union Bay Estates (UBE) does not provide expandable treatment system as part of Master Development Agreement (MDA). Staff have heard similar concerns from residents and are taking them into consideration. Costs will be reviewed at later meeting. Comment: Important to show what costs will be if we don't have sewer. Q: What happens if we don't get grant? A: Project will be expensive, so senior government funding will be important however, LWMP is needed regardless of current grant and developing plan will prove key to any future grant opportunities. Q: How much is grant request and what percent will be covered? A: $27 million. Unsure what overall percentage will be until costs determined. Project partners will also provide contributions. Q: Why step away from referendum? A: Staff identified many benefits to LWMP process over referendum. Gives opportunity to take in public feedback and consultation and involve them in the process. Q: Has there been investigative work into reusing water? A: CVSS LWMP looked at options for water reuse. Q: Any more work done on looking at separate community treatment facilities?	

	A: Significant benefit to not develop standalone treatment, including reduced costs. Proposal to develop separate treatment plant failed at referendum. Q: What proportion of waterfront properties on Baynes Sound included? A: Unsure of percentage, but properties shown in orange on map included. Discussion on phasing covered later in process. Q: Any discussion of extending to Fanny Bay? A: Not at the moment. Union Bay may cover the maximum extent that the wastewater can be pumped without causing additional technical or operational issues. Q: Has UBE confirmed partnership on the project? A: The MDA commits them to providing sewer amenities to the community. Q: UBE already has lots up for sale. Will they have septic systems? A: Work being done by UBE is anticipatory. MDA still requires lots to be connected to sewer system. Q: Would tertiary treatment improve the options of what can be done with the wastewater? A: Will discuss later in meeting when discussing CVSS LWMP. Q: For newly developed areas with good septic systems, how does the LWMP anticipate including areas that are currently excluded? A: Will be determined by land-use policies, zoning and public/environmental health considerations. It's inefficient to service larger rural lots.	
1.7	**Break** The committee took a 15-minute break at 2:15pm.	
1.8	**Discussion Paper #3: South wastewater flows and loads, treatment objectives, Comox Valley Sewer Service LWMP** I. Snyman provided background on the south region sewer extension proposal. Wastewater will be conveyed by a series of pump stations into CVSS, starting in Union Bay. Issue with onsite septic systems needs to be addressed and shouldn't keep being deferred. WSP looked at high, medium, low growth scenarios over 50 years (2020-2070). Provided an overview of the proposed catchment areas based on topography, slopes and other factors. Explained the various flows that are considered such as average dry weather flow, peak dry weather flow, inflow and infiltration (I&I), and	**I. Snyman**

	peak wet weather flow. The CVSS does not have a combined stormwater and wastewater system, but infiltration may occur. Q: Is stormwater included in the process? A: Not included and will not have combined storm/sanitary system. Q: Is there a formal stormwater system? A: Rural areas rely on road ditching and drainage on individual properties. Q: Do we have varying I&I numbers for age of the system? I&I rates seem high for brand new system. A: Being conservative since there isn't any data available yet. Gave conservative estimates of various flows for proposed catchment areas for 2025 and 2070. Q: Has pipe sizing and flows been considered for staging of different service areas and the cost implications? Would we be required to use a smaller pipe if only servicing part of the area or can we install a larger pipe in anticipation of higher flows when phasing is completed? A: Can only pump a certain amount of head with raw sewage, and the longer the pipe the greater the loss of head. 0.75 m/s flow required to keep solids and liquids together. Need to make sure velocity is high enough to ensure this, but not too high or will experience loss of head. Slower flows may also lead to increased odours. Will need to phase to accommodate. Q: Estimated I&I flows for 2025 and 2070 seem similar. Has climate change been accounted for in estimates? A: Wastewater system is meant to be separate from stormwater system, so ideally weather events should have minimal impact on sewer system. Impacts from climate change will only occur due to infiltration. Secondary process is based on organic load, quantified based on five-day biochemical oxygen demand (BOD), total suspected solids (TSS), total kjeldahl nitrogen (TKN). CVSS LWMP looked at average contribution of BOD by measuring it every day for a year and using those values to predict future values. Used similar calculations to estimate projections for south region. CVSS LWMP included flow estimates for south region. Updated population projections are slightly higher, but minimal impact on system. <11% difference in 2040 and <1.2% difference for whole system. Wastewater treatment, TSS and CBOD5 averages 5-15mg/L, which shows that the CVWPCC is operating very efficiently.	

CVSS LWMP looked at treatment options. Stage 1 included high-level discussion of four options, and Stage 2 involved a high-level option assessment. Recommended maintaining current level of treatment with addition of UV treatment. SES flows and loads do not impact recommendation. UV treatment is physical process with no byproduct and effective at killing pathogens.

CVSS TACPAC thoroughly investigated UV treatment and considered it a strong recommendation. CVWPCC is currently conventional activated sludge plant. Cost of tertiary treatment considered high for small improvement so TACPAC felt existing secondary treatment was sufficient with potential for future tertiary treatment if needed.

Q: Are pharmaceuticals and microplastics currently measured at the CVWPCC?
A: Not at the moment, and is not currently being looked into by staff.

Noted that tertiary treatment and phosphorus removal typically used in inland treatment due to discharging to freshwater. Less of a concern for marine discharge.

Q: Plant in Edmonton met requirements but was warned that regulatory requirements may change in 10 years. Will we account for potential increased treatment requirements?
A: CVWPCC is currently working efficiently and there is space to expand if improved treatment is needed.

Q: Requested clarification on bypassing the plant. Current plant exceeds flow limits on permit, so can it accept south flows?
A: Everything will go through whole treatment process. Will seek revision to operational certificate if project goes forward to accommodate increased flows.

Staff are developing site master plan for CVWPCC. Looking at future plant expansion, options, placing of new infrastructure and when they will be required. Planning for 50-year horizon. Looking to maximize use of existing system and how to handle solids. Noted that treatment is outside scope of SES LWMP.

Q: Existing plant is somewhat configured to do BNR (Biological Nutrient Removal), but has there been thought to do BNR at plant?
A: BNR is biological nutrient removal process that removes nitrates and ammonia. Staff have not looked at modifying aeration basins to accommodate BNR.

Q: Has the anoxic zone been piped for return flow? Does that infrastructure exist already or does it have to be modified?
A: Unsure if currently is, but was at one point.

	Q: Is plant ready for stricter MoE regulations? A: Not aware of any upcoming changes, but have accommodated for future upgrades. Would be more of a challenge if there was limited space for expansion at the plant, which is not the case.	
1.9	**TAC/PAC Committee Process** A. Habkirk gave an overview of how the TAC and PAC will function, referencing the draft Terms of Reference (ToR). The TAC and PAC will serve as a joint committee unless otherwise needed. Decisions to be made by consensus. The TAC will focus on needs (regulatory requirements, environmental protection, engineering standards), while the PAC will focus on wants (community aspirations, capacity aesthetic, non-regulated quality, other benefits). Jointly decide on ideal project and then confront constraints (funding, timing, operational complexity, geography, geology) to determine the recommended project. TACPAC decisions will be focused on conveyance (Hwy 19A forcemain and pump stations) and collection system (type/configuration, phasing). Treatment is not included. Staff put forward the TAC and PAC ToR for adoption, and requested any recommendations or changes. Gave an overview of the code of conduct for TAC and PAC members. MOTION: Adopt the Technical Advisory Committee Terms of Reference – M. Mamoser SECONDED: E. Derby CARRIED UNANIMOUSLY MOTION: Adopt the Public Advisory Committee Terms of Reference – K. Newman SECONDED: I. Munro CARRIED UNANIMOUSLY The committee requested that the list of members be updated before adoption. Q: The ToR references electing a chair. How is that done? Is it done this meeting? A: Will leave to the committee to decide if there should be joint chair or separate for TAC or PAC. Can elect one chair for now and elect second if separate meetings required. A. Gower put forth his name as chair. Q: What is the purpose of the chair?	**A. Habkirk**

	A: The chair may be required to present to or communicate with the steering committee about the TACPAC's discussions and decisions. MOTION: To nominate A. Gower as chair of the Sewer Extension South Liquid Waste Management Plan Addendum Joint Technical and Public Advisory Committee – I. Munro SECONDED: R. Lymburner CARRIED UNANIMOUSLY	
1.10	**Preview of Meeting #2** A. Habkirk gave a summary of what will be covered at the next TACPAC meeting. Q: Union Bay residents have heard rumours of UBE proposing discharge to Washer Creek. Is this part of this project? A: This project is only considering conveyance to the CVWPCC. Q: Can the CVRD set specific wastewater quality requirements in an area after the LWMP is adopted? A: The MoECCS requires that permit applications must meet provincial regulations as well as requirements of any adopted LWMP in the affected areas. Q: How will information and agendas be shared with the committee? A: Agendas will be provided a week before each meeting, and the presentation will be shared with the committee.	**A. Habkirk**
1.11	**Round table discussion** Q: What is the expected timeline for when we can expect sewer in the south? A: Will depend on outcome of this LWMP process. Combined Stage 3 LWMP will follow. Also dependent on grant outcome. Still a few years away. Q: How long do Stage 3 LWMPs take? A: Likely a year to develop and 6-8 months to review by MoECCS. Plan must be endorsed by MoECCS. Q: Can properties opt out? A: Expensive project with small number of participants, so people opting out increases costs for everyone else. Currently not considering opting out option. Q: Is there a better map of areas included? A: Will be available for next meeting. Q: Are the boundaries set or changeable? A: Nothing is finalized and will take into consideration committee input.	**A. Habkirk**

	Q: Do we have bullet points of drivers for project, such as failing systems and growth/development? A: Environmental concerns and water quality are primary issues since this has been an ongoing issue since the 70s. Reconciliation with K'ómoks is also key priority. Comment: No one opposes protecting Baynes Sound, but this process is very much development driven, so the committee should consider that going forward. Q: During the 2015-2016 process, were there any other environmental concerns besides shellfish? A: Shellfish were considered a risk factor rather than environmental concern. Looked at greenhouse gas emission and carbon footprint of plant. Also included pharmaceuticals and other health factors. Q: Do we know the contributions of the project partners (since it will impact resident contribution)? A: Staff are still working with partners to determine contributions. More information will be shared at a future meeting during the discussion on costs.	
1.12	**Adjournment** The meeting adjourned at 4:07pm.	**A. Habkirk**

GENERAL:
The next SES LWMP Addendum Joint PACTAC meeting will be held on November 23, 2022 commencing at 9:00 am in the CVRD Civic Room at 770 Harmston Avenue, Courtenay, and via Zoom conference.

APPENDIX

B

TACPAC MEETING #2 DISCUSSION PAPERS & MINUTES

APPENDIX

B-1 TACPAC #2 DISCUSSION PAPER SCHEDULE

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

UPDATED COST ESTIMATE FOR TACPAC MEETING #2

CONFIDENTIAL

NOVEMBER 7, 2023

SCHEDULE FOR TACPAC MEETING #2 – DISCUSSION PAPER 1: CONVEYANCE PIPING DESIGN AND PROJECT PHASING

FORCEMAIN COST ESTIMATE

Table 1 illustrates an updated forcemain cost estimate for Phase 1A, taking into account the most current pricing and project modifications that have been discussed. This table replaces Table 7 in **TACPAC Meeting 2, Discussion Paper 1: Conveyance Piping Design and Project Phasing**.

Table 1: Forcemain Cost Estimate Summary

ITEM	DESCRIPTION	COST
1	**Highway 19A Forcemain**	
1.1	Forcemain	$ 11,030,000
1.2	Appurtenances and Tie-Ins	$ 2,796,000
1.3	Roadworks and Restoration	$ 1,627,000
1.4	Future Provision	$ 1,083,000
	Subtotal Item 1	$ 16,536,000
2	**General**	
2.1	Mobilization and demobilization (~3%)	$ 500,000
2.2	Health and safety (~3%)	$ 170,000
2.3	Environmental protection plan and monitoring (~3%)	$ 170,000
2.4	Allowance for water management and bypass pumping (~3%)	$ 300,000
2.5	Sediment and Erosion Control	$ 170,000
2.6	Coordination with Hydro	$ 175,000
2.7	Traffic Management	$ 500,000
2.8	Rock Clearing	$ 450,000
	Subtotal Item 2	$ 2,435,000
	Subtotal All Items	$ 18,971,000

ITEM	DESCRIPTION	COST
	Contingency (30% of Subtotal)	$ 5,691,000
	Engineering (10% of Subtotal + Contingency)	$ 2,466,000
	Total	$ 27,128,000

The following general assumptions were used for preparing the cost estimate:

- All taxes are excluded.
- The estimate is based on prices in September 2023. Pricing and lead times are subject to change as they currently have shown to be volatile from materials & equipment suppliers within the industry, due to the current market conditions and other global issues.
- Does not include Owner costs or other soft costs (permitting, land acquisition, etc.)
- Complete with electrofusion coupling fittings (every 10m) & thrust blocks, trench excavation, bedding, backfill, and surface restoration. Surface restoration is assumed as trench width only for forcemains.
- Assumed HDD for the two river crossings, Trent River and Hart Creek.
- Air valves are located at high points of the profile and every 500 metres.
- Blowdowns are located at low points of the profile.
- Isolation valves and pigging stations located every 500 metres along the forcemain.
- Future provision includes 1800mm dia concrete culverts at insection and highway crossings and the additional costs installing twin forcemain with caps by HDD at river crossings.
- Construction of the forcemain is estimated to be 232 days.
- Traffic management is assumed as 2 crew x 2 flagger @$100/hour, 10hours/day for 232 days
- Rock Removal based on the Geotechnical Concept Level Review. A detailed review of rock clearing to be completed at detail design via GPR.

SCHEDULE FOR TACPAC MEETING #2 – DISCUSSION PAPER 3: PUMP STATION DESIGN AND OPERATING COSTS

PUMP STATION #1 AND #6 COST ESTIMATE

Tables 1 to 4 show the updated cost estimates for Royston Pump Station (also referred to as PS#1) and Union Bay Pump Station (also referred to as PS#6), considering the latest pricing and discussed project alterations. In total, there are three options for Pump Station #1 and a single option for Pump Station #6.

The Royston Pump station was designed on the same basis as the Union Bay Pump station, however a further evaluation was requested, as part of the Value Engineering process. Concerns were raised about both locations being within the coastal flood zone, therefore a flood mitigation assessment (Appendix H) was completed to assess alternative options for Royston Pump Station. The report indicated three viable options, Options 1, 2 and 3.

These tables replace Table 2 in **TACPAC Meeting 2, Discussion Paper 3: Pump Station Design and Operating Costs** as well as the Appendix H Royston Pump Station Flood Mitigation

Table 1: Royston Pump Station Option 1 (Flood resilient building) Cost Estimate Summary

ITEM	DESCRIPTION	TOTAL
1.1	Earthworks and Site Works	$ 120,000
1.2	Building	$ 645,000
1.3	Mechanical	$ 737,000
1.4	Electrical	$ 610,000
2.0	General	$ 370,000
	Subtotal	$ 2,112,000
	Contingency (40%)	$ 993,000
	Engineering (10%)	$ 521,000
	TOTAL	**$ 3,996,000**

Table 2: Royston Pump Station Option 2 (Regional PS with small local PS) Cost Estimate Summary

ITEM	DESCRIPTION	TOTAL
1.1	Earthworks and Site Works	$ 49,000
1.2	Building	$ 123,000
1.3	Mechanical	$ 545,000
1.4	Electrical	$ 504,000

1.5	Interim PS	$ 265,000
2.0	General	$ 310,000
	Subtotal	$ 1,796,000
	Contingency (40%)	$ 718,000
	Engineering (10%)	$ 251,000
	TOTAL	**$ 2,765,000**

Table 3: Royston Pump Station Option 3 (Building PS with mechanical/electrical outside flood zone) Cost Estimate Summary

ITEM	DESCRIPTION	OPTION A BUILDING	OPTION B KIOSK
1.1	Earthworks and Site Works	$ 51,000	$ 48,000
1.2	Building	$ 321,000	$ 123,000
1.3	Mechanical	$ 704,000	$ 545,000
1.4	Electrical	$ 643,000	$ 643,000
2.0	General	$ 340,000	$ 300,000
	Subtotal	$ 2,059,000	$ 1,659,000
	Contingency (40%)	$ 824,000	$ 664,000
	Engineering (10%)	$ 288,000	$ 232,000
	TOTAL	**$ 3,171,000**	**$ 2,555,000**

Table 4: Union Bay Pump Station Cost Estimate Summary

ITEM	DESCRIPTION	OPTION A BUILDING	OPTION B KIOSK
1.1	Earthworks and Site Works	$ 55,000	$ 39,000
1.2	Building	$ 331,000	$ 118,000
1.3	Mechanical	$ 639,000	$ 491,000
1.4	Electrical	$ 414,000	$ 454,000
2.0	General	$ 290,000	$ 250,000
	Subtotal	$ 1,729,000	$ 1,352,000

Contingency (25%)	$ 432,000	$ 338,000
Engineering (10%)	$ 216,000	$ 169,000
TOTAL	**$ 2,377,000**	**$ 1,859,000**

The following general assumptions were used for preparing the cost estimates:

- Pump cost for PS#1 based on 1 duty + 1 standby, Flygt Model NP 3301 HT, 468 330mm impeller, 63 kW (85 HP), 600 V, 3 phase. Cost for upgraded pumps not included.
- Mechanical installation is based on 2 people, 15 days, $100/hr
- Odour control is assumed to be Pureair Odor Control Unit w/ Dry Chemical media, draw thru blower, mist eliminator - 250 cfm, w/ 1.5 HP motor, 600V/3 Ph, Class 1 Div 1 rated. A detailed study is required to confirm the odour control.
- Paving area estimated as 100m^2 for option A and 50m^2 for Option B, area to be confirmed at detail design.
- Option A cost include costing of a concrete pump station building, with separate underground wet well, flowmeter and valve chambers. Option B cost include costing of individual kiosks and units for the MCC, odour control and genset, with separate underground wet well, flowmeter and valve chambers.

APPENDIX

B-2 TACPAC #2 DISCUSSION PAPER 1

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

DISCUSSION PAPER 1: CONVEYANCE PIPING DESIGN AND PROJECT PHASING

CONFIDENTIAL

NOVEMBER 23, 2022

wsp

1 BACKGROUND

The Comox Valley Regional District (CVRD) operates and maintains the sewerage system for the Comox Valley Sewer Service (CVSS) which provides service to the City of Courtenay and the Town of Comox, and to the K'ómoks First Nation and Department of National Defence (under contracts with each).

The South Region of the CVRD, also known as Electoral Area 'A', is located south of the City of Courtenay. The area does not have a centralized sewage collection system, and privately owned onsite septic systems are utilized for wastewater management. These systems are reported to have a history of failures, with the potential to impact the surrounding environment and public health. In 2022 the CVSS service area boundary was expanded to include portions of Electoral Area 'A', including Royston, Union Bay and K'ómoks First Nation (KFN) lands. Consideration is now being given to the extension of sewage infrastructure south through an addendum to the Stage 1/2 CVSS Liquid Waste Management Plan.

The proposed design involves the collection of sewage from neighborhoods in the Royston and Union Bay area through collection systems to eight pump stations. It will then be pumped to the existing Courtenay River Siphon and conveyed to CVSS treatment works. The servicing of these areas is proposed to be completed in phases given the high cost of servicing these areas. The discussion paper will outline the following:

- Design constraints
- Proposed project phasing and process flow diagrams
- Forcemain design
- Forcemain Class "C" cost estimate

The forcemain design development will focus on the forcemain for Phase 1A as shown in **Figure 1** below.

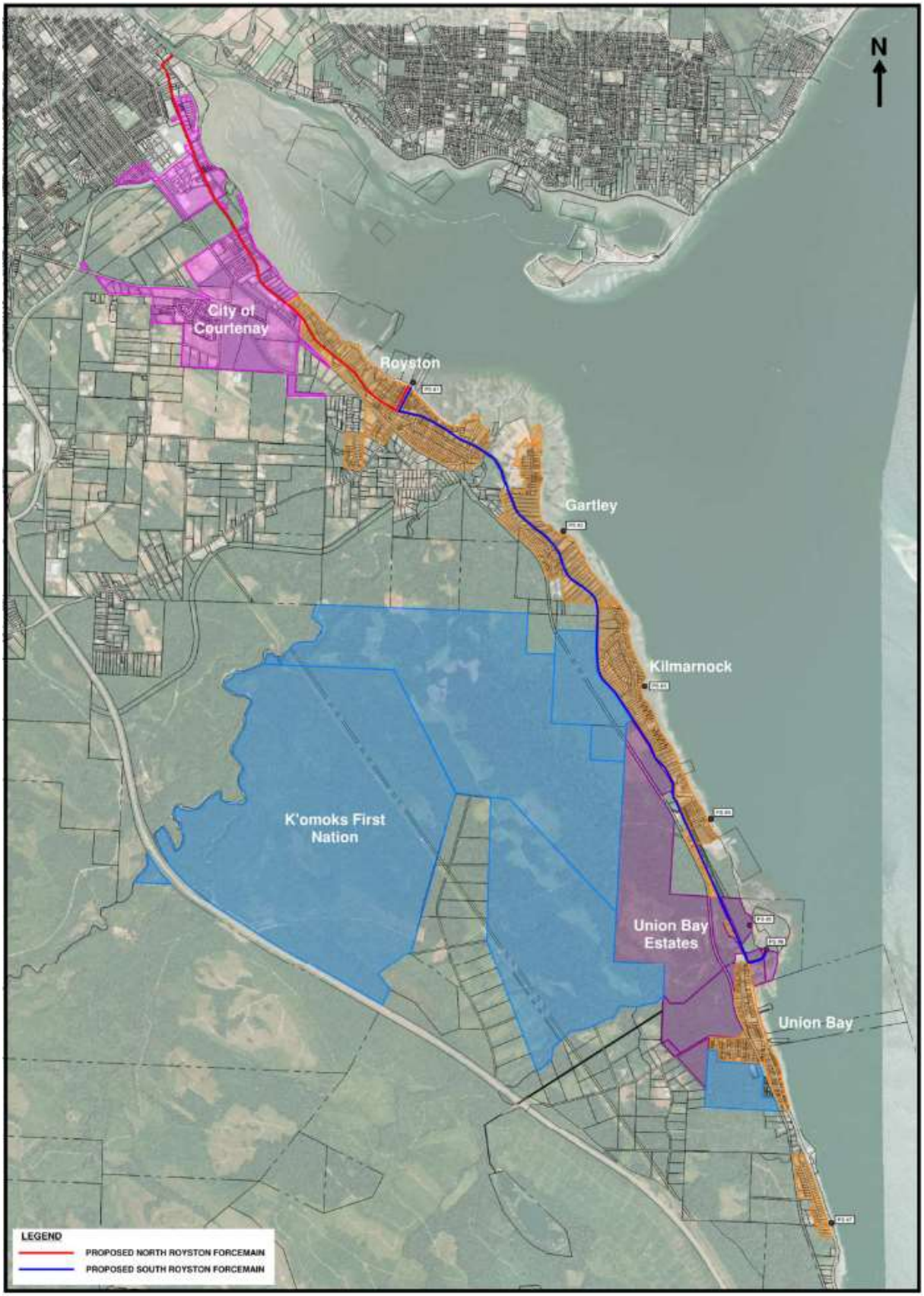


Figure 1: Forcemain Alignment

1.1 POPULATION PROJECTIONS

The population growth projections of the existing and future developments are summarised in **Table 1** below. The populations are shown in 5-year increments from 2020 to 2070.

Table 1: Population Projections

POPULATION	ROYSTON	GARTLEY	KILMARNOCK	UNION BAY	FUTURE NEW DEVELOPMENTS	TOTAL
2025	1,011	381	608	839	258	**3,098**
2030	1,037	391	623	861	1,548	**4,460**
2035	1,063	401	639	882	2,488	**5,473**
2040	1,090	411	655	905	3,428	**6,489**
2045	1,117	421	672	928	6,258	**9,396**
2050	1,146	432	689	951	9,088	**12,305**
2055	1,175	443	706	975	9,488	**12,787**
2060	1,204	454	724	1,000	9,888	**13,270**
2065	1,235	465	742	1,025	10,288	**13,755**
2070	1,266	477	761	1,051	10,688	**14,243**

The following assumptions were used to develop the population projections:

- The number of dwellings in the existing developed areas was obtained from the 2017 CVRD South Regional Sewer Service Map.
- A residential density of 2.1 persons/property from the 2016 Census for the CVRD for Area ‘A’ was used for determining the base population.
- A medium growth scenario was assumed for the existing developed areas and K’ómoks First Nation.
- Union Bay Estates future development population was assumed to be consistent with McElhanney’s Kensington Union Bay Estates Sanitary Master Plan (2019).

The total catchment areas, comprised of existing and future new development areas, for each of the seven pump stations are outlined in **Table 2**. The catchment areas are shown in **Figure 2**.

Table 2: Pump Station Contributing Areas

	AREA (HA)
Pump Station No. 1 (PS#1) (1)	133
Pump Station No. 2 (PS#2)	81
Pump Station No. 3 (PS#3)	145
Pump Station No. 4 (PS#4)	169
Pump Station No. 5 (PS#5)	206
Pump Station No. 6 (PS#6)	163
Pump Station No. 7 (PS#7)	15
Total	**912**

(1) Under future phasing, an eighth pump station will be constructed. Pump Station No. 1 will be transitioned to pump local flows from the Pump Station No. 1 Catchment to the new Regional Pump Station collecting flows from all upstream catchments No. 1 through No. 7. Refer to Discussion Paper No.1 for more details.

The following assumptions were used in establishing the pump station contributing areas:

- The areas are the assumed contributing areas for 2070 flow.
- The contributing areas have been allocated to the pump stations due to proximity to pump station and phasing.

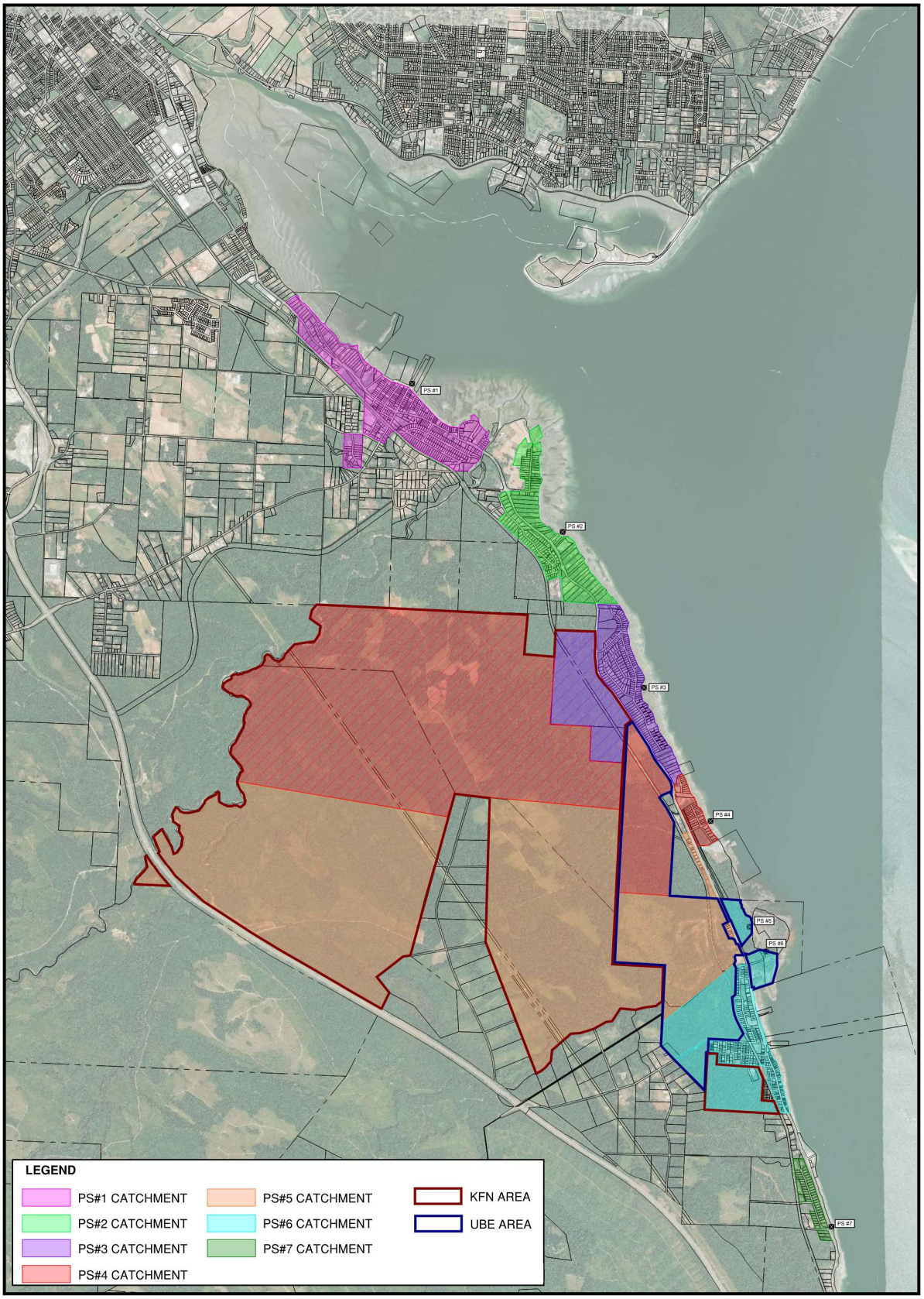


Figure 2: Pump Station Catchment Areas

1.2 WASTEWATER FLOWS

The flow projections for the Peak Wet Weather Flow (PWWF) in 2025 and 2070 of each pump station contributing area are summarised in **Table 3** below.

Table 3: Contribution Flow Rates

	2025 FLOW CONTRIBUTION (L/S)	2070 FLOW CONTRIBUTION (L/S)
PS#1	17.0	19.2
PS#2	8.2	9.1
PS#3	15.5	71.4
PS#4	8.3	35.8
PS#5	10.1	45.6
PS#6	14.6	46.4
PS#7	1.8	2.1

Table 4 summarises the contributing Average Dry Weather Flow (ADWF) and Peak Wet Weather Flow (PWWF) for the projected populations in 2025 and 2070 for each pump station catchment.

Table 4: Pump Station Catchment Population, Area and Flow

		PS#1 Catchment	PS#2 Catchment	PS#3 Catchment	PS#4 Catchment	PS#5 Catchment	PS#6 Catchment	PS#7 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

The following assumptions were used in the calculation of the flows:

- 240 L/cap/day was used as specified in the 2014 MMCD Design Guidelines for ADWF.
- The peaking factor was calculated using the formula from the 2014 MMCD Design Guidelines of $PF = 3.2/P^{0.105}$, where P is the population in thousands rounded to the nearest thousand.
- The inflow and infiltration (I&I) rate for all existing and proposed developments is 0.06 L/s/ha as specified in the 2014 MMCD Design Guidelines.
- The PWWF was calculated using the formula for design flow from the 2014 MMCD Design Guidelines, where the design flow, Q = population x per capita flow x peaking factor + I&I contribution.

1.3 DESIGN CONSTRAINTS

WSP developed concepts for an overall system configuration that could accommodate the wide range of flows anticipated between the system initiation and the ultimate build-out projections. The following subsections outline the design considerations and engineering principles accounted for during the development of the system configuration.

1.3.1 MINIMUM FLUSHING VELOCITY

The forcemains should be designed to achieve a minimum velocity to reduce the settlement of solids and subsequently reduce the accumulation of solids within the pipe by ensuring remobilization during every pump cycle. The flow within the pipe should achieve the 0.75 m/s (Master Municipal Construction Document (MMCD) Design Guidelines 2014) to ensure flushing velocities. If this velocity is not achieved, solids can accumulate along the bottom of the pipe and eventually reduce the pipe's capacity.

Further to the flow in the pipe not reaching flushing velocities, limited flow in the pipe would create anaerobic conditions due to raw sewage stagnation within the pipe. This will create odour and gas formation concerns with the buildup of H_2S gasses in the pipe as well as in the pump stations. Both accumulation of solids and H_2S gas can lead to operational issues including equipment corrosion, odour nuisance, and increased operations and maintenance costs.

Table 5 outlines the flow required to achieve the minimum flushing velocity for a range of pipe sizes.

Table 5: Required Flows to Achieve 0.75 m/s Flushing Velocity with DR17 HDPE Pipes

PIPE SIZE (NOMINAL, MM)	PIPE SIZE (ID, MM)	MINIMUM FLOW TO ACHIEVE 0.75 M/S FLUSHING VELOCITY (L/S)
200	192	21.7
250	239	33.7
300	283	47.3

1.3.2 WET WELL SIZING

To mitigate low flows and velocities in pipes sized for future build-out conditions, incoming flows could be contained in the pump station wet well until sufficient volume has accumulated to facilitate pumping at the required higher flow rate required to meet flushing velocity criteria. However, this approach has several implications, including:

- The wet well would initially be oversized relative to the volume of the incoming flow;
- The residence time in the wet well is greater, leading to odour problems requiring robust odour control systems such as aeration and Granular Activated Carbon (GAC) filters at both the upstream and downstream pump stations;
- Pumps are initially oversized relative to the incoming flows, resulting in larger pump motors that have higher installed instantaneous energy demand; and
- Anaerobic conditions within the forcemain due to infrequent pumping.

1.3.3 SYSTEM REFINEMENT, OPTIMIZATION & PHASING

The preferred approach to mitigating low flows is to refine the system configuration and forcemain sizing through development of an overall phased implementation strategy that considers the level of development at the initial stage as well as the ultimate build out scenario. It is challenging to implement one system that is suitable for both the initial level of development and the anticipated future development without additions or upgrades to the system when there is a wide range of anticipated flows.

1.3.4 PUMP CAPABILITY

The preferred pump used by the CVRD's operational staff are Flygt submersible pumps. In general, wastewater pumps need to be of a centrifugal type that can handle solids and abrasive grit in the wastewater. These requirements will be considered in the design.

1.3.5 TRANSIENT PRESSURES

Transient pressure is the changes in the flow in the forcemains, caused by valve closure and opening or pump speed changes, resulting in pressure surges which propagate along the pipe from the source. For the South Region Royston Union Bay sewer extension, the high pressures are attributed to the long forcemain lengths, velocity and flow variance over the long planning horizon between 2025 and 2070.

There are a number of risks associated with high pressure including pipe material, equipment selection, operating practices and upset conditions. The pressures are typically mitigated through the following measures:

- Pipe material such as HDPE;
- Specification levels of valves, air/vacuum breaks, fittings and specials at the pump station;
- VFDs on the pumps; and
- Dampened check valves.

At higher than typical operating pressures, the risk related to the transient pressure increases and requires management. The management of transient pressure will be implemented at the detailed design stage, once the parameters are sufficiently clarified to conduct a transient pressure study.

2 PROCESS FLOW DIAGRAMS

The Process Flow Diagram (PFD) is used as an illustration to show the relationship between the major components of the CVRD South Region conveyance system.

1 Phase 1A (Short term)
2 Phase 1B (Medium term)
3 Future phase (Long term)
4 Ultimate build out phase

The scope of this work focuses primarily on Phase 1A and 1B. The Future phase and Ultimate Build Out phase will vary according to the master planning and the availability of funding for future phasing. The level of uncertainty at this stage of the project creates challenges in determining the flows and the sequencing of the phasing due to the various stakeholders and partners that CVRD is engaged with.

The following subsections outline the design considerations and engineering principles accounted for during the development of the system phasing and PFDs.

2.1.1 PHASE 1A

The PFD for Phase 1A is shown in **Figure 3** below. Phase 1A includes two pump stations, PS#1 and PS#6 and two forcemains. The contributing sub catchments for PS#1 and PS#6 include:

— PS#1: Royston existing developed area
— PS#6: Union Bay central existing developed area, and future new development areas

To satisfy the design considerations outlined in Section 3.1, a 250 mm HDPE forcemain will convey 34 L/s from PS#6 to PS#1 to maintain the minimum flushing velocity as discussed in Section 1.3.1. This flow corresponds to a population equivalent of 2722 persons and an equivalent dwelling unit number of 1296 dwellings.48 L/s will be conveyed from PS#1 to the Courtenay River Siphon through a 250 mm HDPE between PS#1 and Highway 19A, and then increasing to a 300 mm HDPE forcemain from the highway to the Courtenay River siphon.

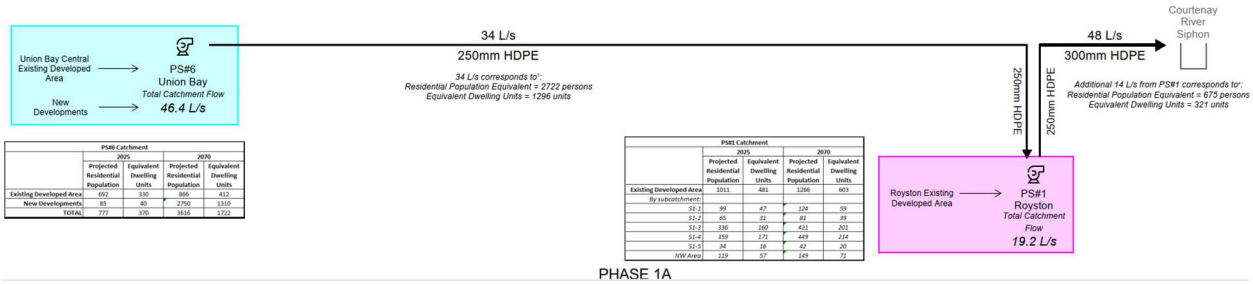


Figure 3: PFD – Phase 1A

2.1.2 PHASE 1B

The PFD for Phase 1B is shown in **Figure 4** below. This phase includes the addition of PS#3 located between PS#6 and PS#1. The contributing sub catchments for PS#3 include the Kilmarnock North existing developed area and future new developments. There is uncertainty about when the new developments will be constructed. This phase accommodates the flow of the new developments that will be constructed within PS#3's catchment area. As in Phase 1A, the collection flow from PS#6 is 34 L/s to maintain the minimum flushing velocity as outlined in Section 1.3.1. This flow is conveyed to PS#3 through the 250 mm HDPE forcemain. From PS#3, 58 L/s is conveyed to PS#1 through the 250 mm HDPE forcemain. The additional 24 L/s from PS#3 corresponds to a population equivalent of 1719 persons and equivalent dwellings of 819 units. The configuration downstream of PS#1 is the same as Phase 1A, 72 L/s will be conveyed through this section in Phase 1B.

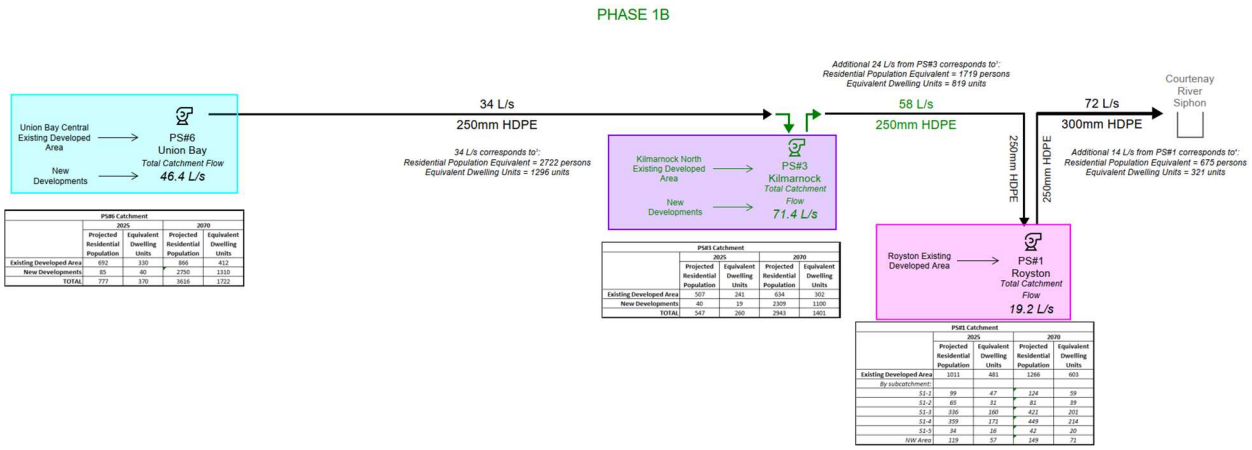


Figure 4: PFD - Phase 1B

2.1.3 FUTURE PHASE

The PFD for the Future Phase is shown in **Figure 5** below. The phase includes the addition of the Future Regional Pump Station in Royston between PS#3 and Courtenay River Siphon. PS#3 will feed directly to the Future Regional Pump Station, and the existing 250 mm HDPE forcemain from PS#1 to Highway 19A will instead connect to the Future Regional Pump Station. The 300 mm forcemain from the Future Regional Pump Station to the siphon will convey 80 L/s. This phase accommodates the expected increase in flows from new developments and PS#1.

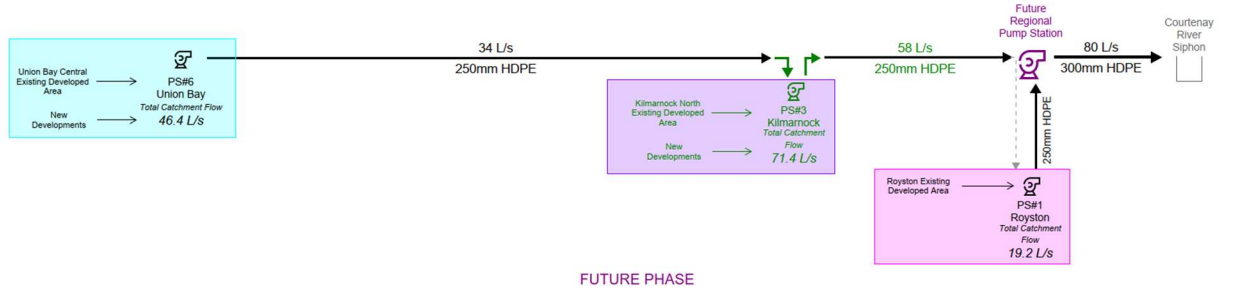


Figure 5: PFD - Future Phase

2.1.4 ULTIMATE BUILD OUT

The PFD for the Ultimate Build Out is shown in **Figure 6** below. In the Ultimate Build Out, all eight pump stations are in operation.

PS#7 has a catchment flow of 2 L/s which is pumped to PS#6, which is in operation from Phase 1A. The forcemain from PS#6 to PS#3 conveys 49 L/s in the ultimate build out.

PS#5 has a catchment flow of 46 L/s from the Union Bay North existing developed area and future new developments; this flow is conveyed to PS#4. PS#4 has a catchment flow of 36 L/s from the Kilmarnock South existing developed area and future new developments. The total flow from PS#4, 81 L/s, is conveyed through an additional forcemain to PS#3 which is in operation from Phase 1B.

A second forcemain from PS#3 conveys a flow of 143 L/s to the Future Regional Pump Station in addition to the 250 mm forcemain conveying 58 L/s from Phase 1B. PS#2, which collects flow (9 L/s) from the Gartley existing developed area, is conveyed to PS#1. A total of 28 L/s is then conveyed from PS#1 to the Future Regional Pump Station. Provision for an additional 75 L/s conveyed to the Future Regional Pump Station from South Courtenay has also been included.

In addition to the forcemain conveying 80 L/s from the Future Regional Pump Station to Courtenay River Siphon from the Future Phase, a second forcemain will convey the remaining 149 L/s (224 L/s if South Courtenay contribution is included) to the siphon.

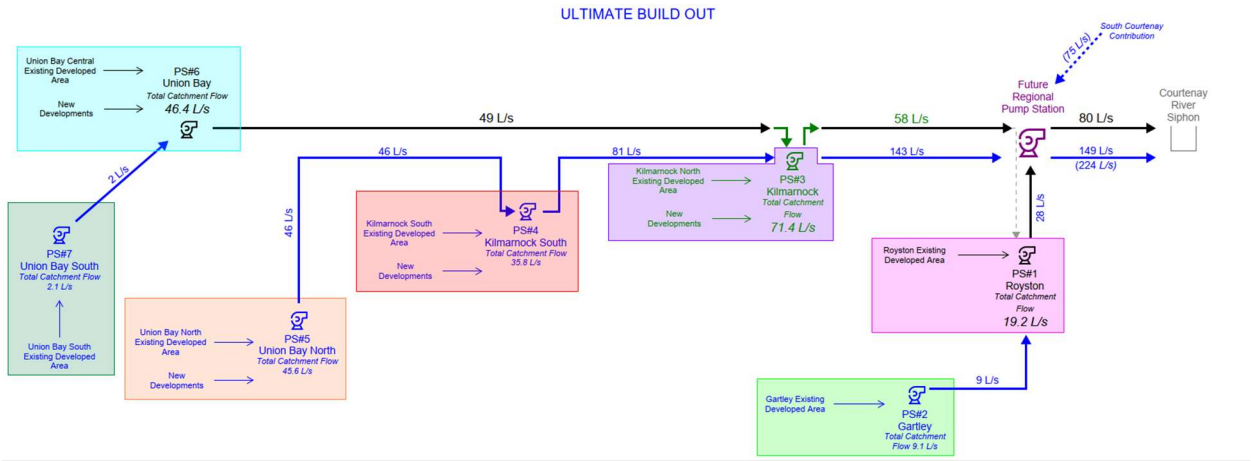


Figure 6: PFD - Ultimate Build Out

2.2 CATCHMENT SELECTION

As discussed in Section 1.3, the initial phase of the project involves the construction of PS#1 and PS#6. PS#1 will service the existing area of Royston. The catchment area for PS#6 includes the existing development of Union Bay central and future developments of K'ómoks First Nation and Union Bay Estates.

The catchment for PS#1 is shown in **Figure 7** below. The catchment area was selected based on proximity to the proposed pump station and discussions with the CVRD. Discussion Paper #2 provides further information on the Royston sub-catchment that is proposed for servicing in the initial phase of the project.

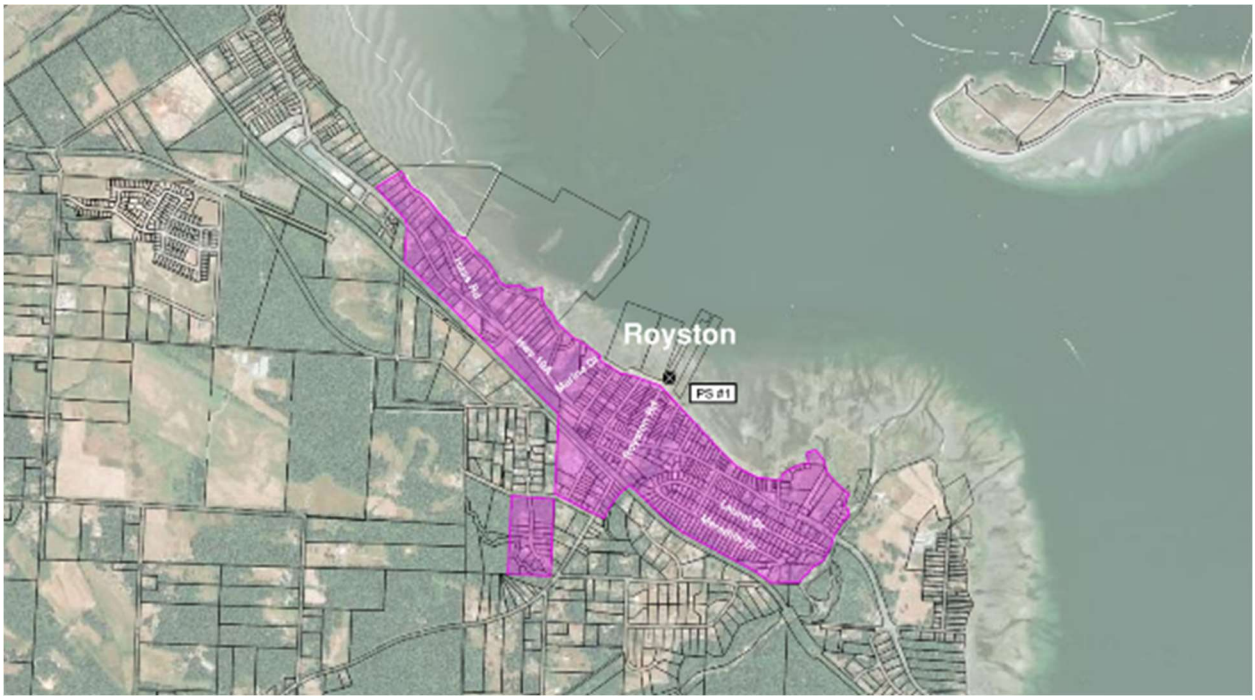


Figure 7: PS#1 Catchment

The catchment for PS#6 is shown in **Figure 8** below. The catchment area was selected based on proximity to PS#6 and discussions with the CVRD. The selection of the contributing area for the Union Bay Estates future development was based on the phasing provided in the Kensington Union Bay Estates Sanitary Master Plan (2019). The areas located in close proximity to PS#5 and PS#6 are part of Union Bay Estates proposed Phase 1 and as such are expected to be developed within the next 10 years. The remaining Union Bay Estates area included in the

catchment is in the Master Plan Phase 2 and as such are expected to be developed in the next 20 years. K'omoks First Nation lands south of McLeod Road are also included in the catchment due to proximity to the proposed PS#6.

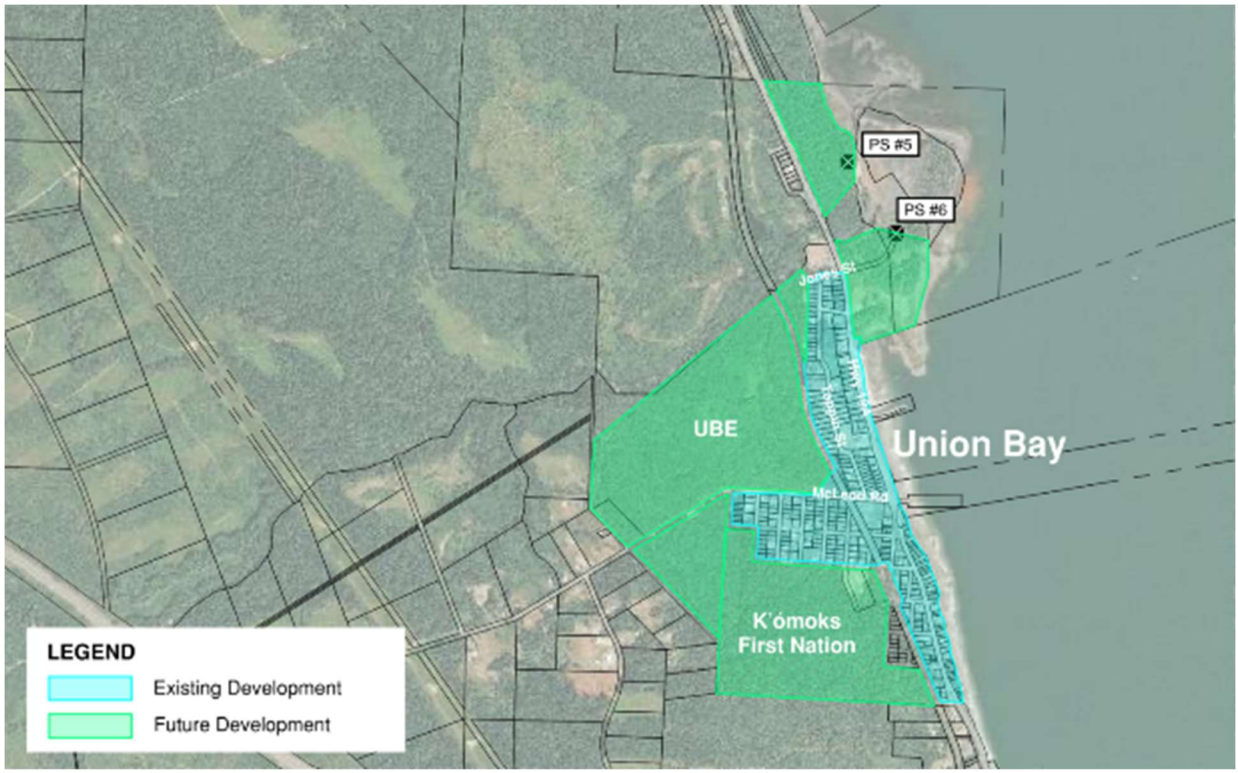


Figure 8: PS#6 Catchment

2.3 PHASING CONSIDERATIONS

As discussed in Section 1.3, due to the scale and uncertainty of the project, the project will need to be phased. The four main stages are listed below:

1. Phase 1A (Short term)
2. Phase 1B (Medium term)
3. Future phase (Long term)
4. Ultimate build out phase

These phases were selected based on technical, environmental and financial considerations. The technical considerations have been discussed in Section 1.2 design constraints. These constraints determined the overall system configuration including pump station sizing, location and forcemain sizing. Environmental considerations included future flood risk along the shore due to predicted changes in climate. The phasing was updated to add a Regional Pump Station out of the flood risk area to remove this risk of flooding. Additional considerations for phasing were provided by the CVRD, taking into account existing land use patterns and analysis of septic system records provided by Island Health. Phase 1A areas were identified as they have the highest dwelling density with a significant proportion of properties with septic system that are several decades old.

3 HIGHWAY 19A FORCEMAIN DESIGN DEVELOPMENT

The Highway 19A forcemain consists of two proposed forcemains, North Royston Forcemain and South Royston Forcemain. They are routed along Highway 19A to connect proposed PS#6 at Union Bay to the existing Courtenay River Siphon in Courtenay via proposed PS#1 at Royston. The siphon discharges into the existing Courtenay Pump Station for pumping to the CVWPCC. It is assumed that the proposed forcemains will be constructed within the BC Ministry of Transportation and Infrastructure (MOTI) road right of way and therefore no private property acquisition is required.

As the alignment is along a provincial secondary highway, MOTI approvals will be required. The pipe material for the forcemains is HDPE DR17. The proposed pipe depth varies along the length of the forcemains but generally follows the ground profile with a minimum cover of 1m as required by MMCD (2014). The pipe bedding and fill will follow MMCD "Utility Trench" Standard Detail Drawing.

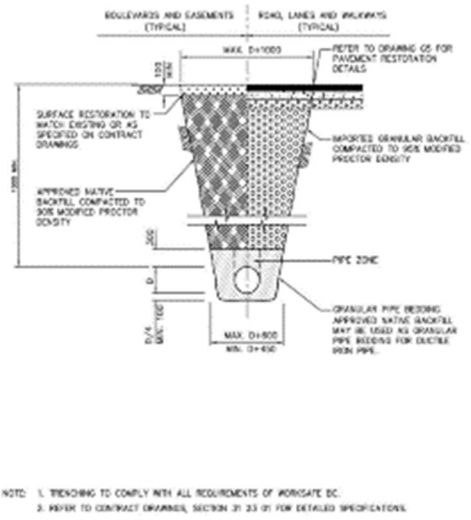


Figure 9: Trench Detail (MMCD, 2009)

The forcemain alignments outlined in the following sections were selected using information from the City of Courtenay, available survey at Royston, BC One Call information and CVRD GIS data, including land parcels and utilities (watermains, FortisBC, BC Hydro, Telus and Shaw).

3.1 NORTH ROYSTON FORCEMAIN

3.1.1 ALIGNMENT

The North Royston forcemain conveys flow from PS#1 to the existing Courtenay River Siphon at 20th Street as shown in **Figure 10**. The proposed forcemain has two different diameters along the route. The initial 275 m of the forcemain from PS#1 on Royston Road to Highway 19A will be a 250 mm HDPE pipe. For the remaining 5.125 km to the siphon, the pipe increases to a 300 mm HPDE forcemain in anticipation of future flows in future phases. The forcemain ties into an existing sanitary manhole upstream of the Siphon on 20th Street. The installation method of the pipe is proposed to be open cut.

The alignment along the highway begins at Royston Road which is rural highway. From Anfield Road to the siphon at 20th Street, the alignment will be in the urban roadway. The alignment has been selected to maintain minimum clearances to existing utilities and minimize conflicts as well as minimising traffic impacts. The utilities identified along the alignment include buried watermains and gas mains as well as overhead communication and hydro lines and poles. A minimum horizontal clearance of 3m to the existing watermains is provided along the route to comply

with MMCD (2014) utility clearance requirements. A minimum horizontal clearance of 3 m has been provided for hydro poles and gas mains.

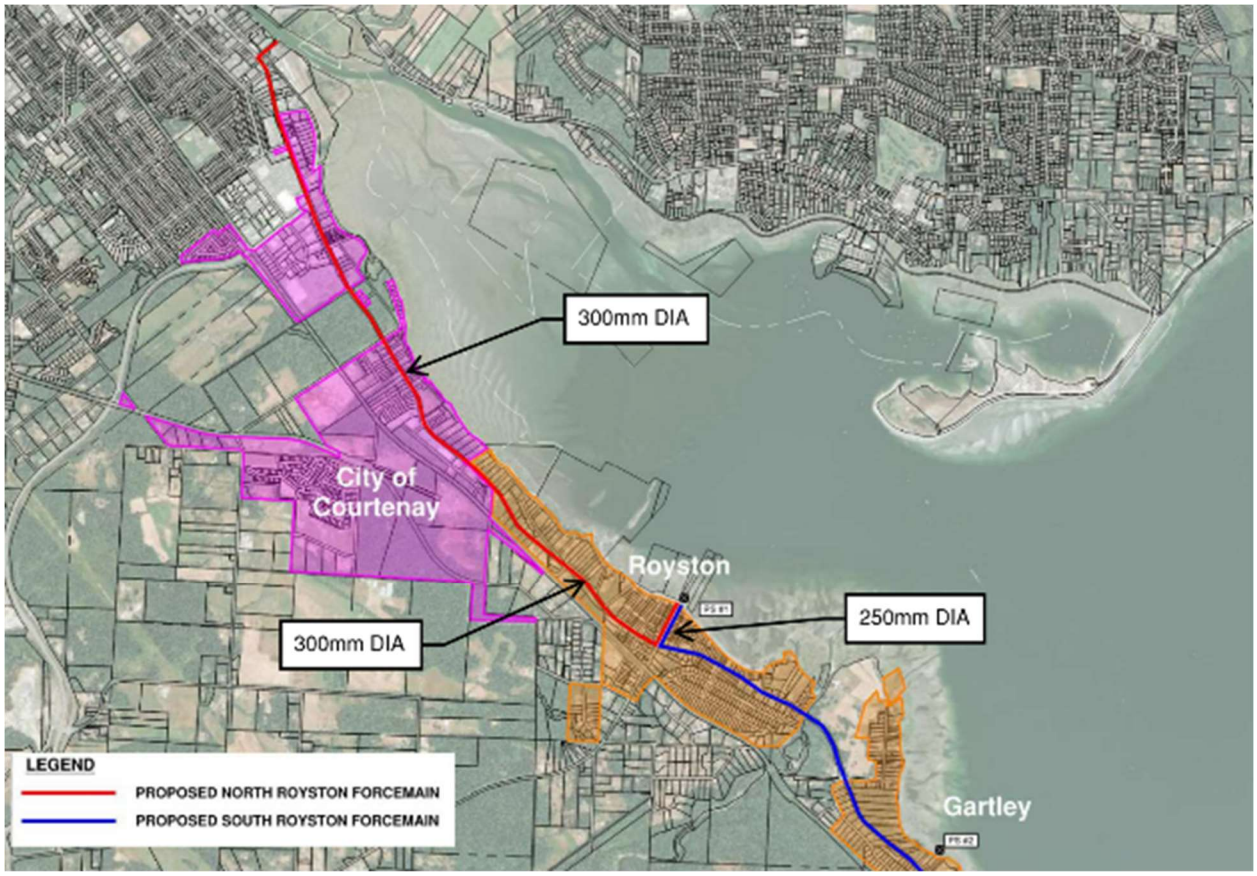


Figure 10: North Royston Forcemain Alignment

3.1.2 ALTERNATIVE ALIGNMENT IN CITY OF COURTENAY

An alternative alignment for the forcemain in Courtenay was identified in WSP's February 2020 memo *"CVRD LWMP – South Region Forcemain Cost Estimate".* The forcemain would be routed along the Courtenay Riverway Walk from Mansfield Drive to 20th Street. This alignment would reduce traffic impacts that would be experienced if the forcemain was routed through Cliffe Avenue.

This option was reviewed and found the walkway has several existing utilities including a 450mm storm sewer, 350mm twin sanitary sewers and a Telus conduit at locations along the route. This option was eliminated due to the congested utility corridor being unable to accommodate the proposed forcemain and the future twin forcemain required for future conditions, while complying with minimum clearance requirements.

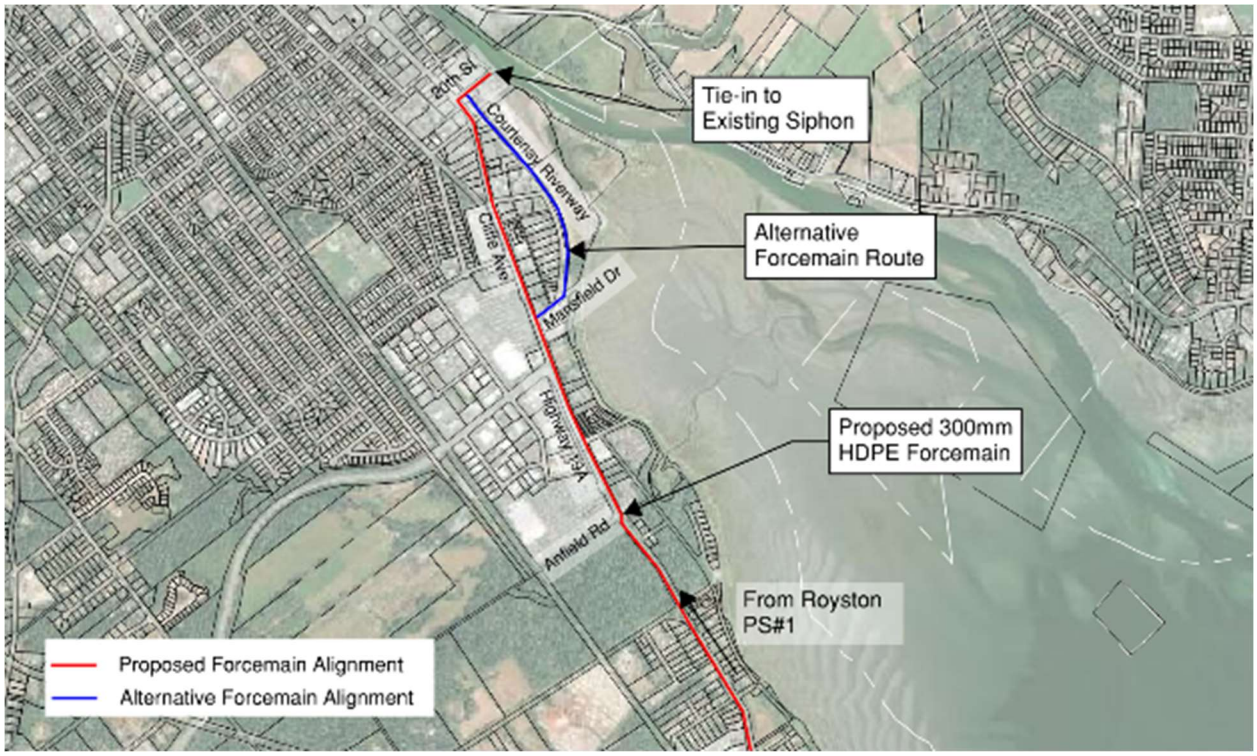


Figure 11: Alternative Forcemain Alignment

3.2 SOUTH ROYSTON FORCEMAIN

3.2.1 ALIGNMENT

The proposed forcemain from PS#6 to PS#1 is a 250mm HDPE pipe. The forcemain begins at PS#6 at Jones St, Union Bay and conveys flow along Highway 19A to PS#1 on Royston Road. The proposed length of the forcemain is 8.6 km.

The proposed alignment is located on the boulevard from PS#6 to PS#1. The forcemain is proposed to be on the shoulder of the west bound lane. The alignment has been selected to maintain minimum clearances to existing utilities and minimize conflicts. The utilities identified along the alignment include, watermains, gas mains and hydro poles. A minimum clearance of 3m to the existing watermains is provided along the route. A minimum clearance of 3 m has been provided for hydro poles and gas mains.

There are two river crossings on this section: the Trent River south of Royston, and Hart Creek, north of Union Bay. These crossing, 40m and 20m in length respectively, are proposed to be completed using horizontal directional drilling (HDD), with a pipe bridge under consideration for the Trent River crossing. The remaining forcemain will be installed using open cut methods.

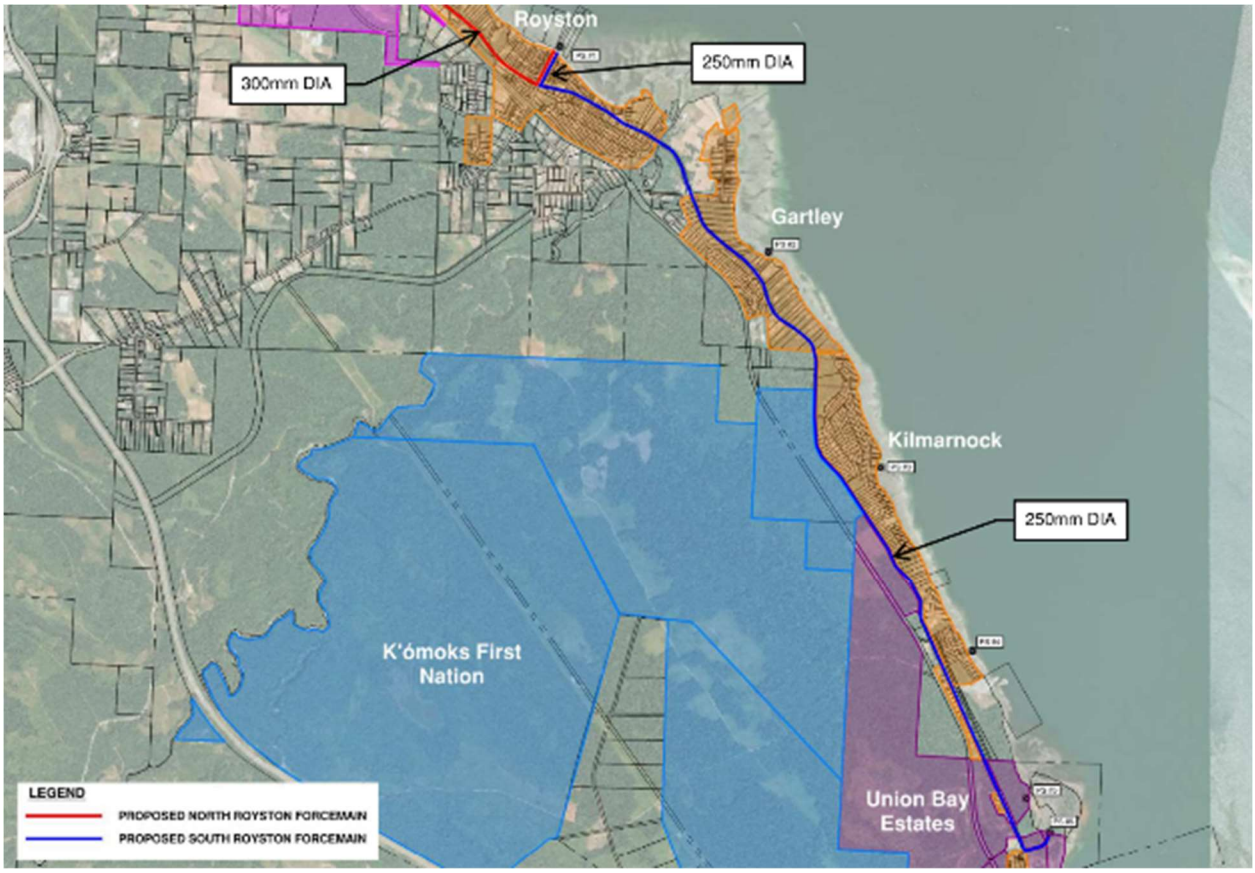


Figure 12: South Royston Forcemain

3.3 FUTURE PROVISION

The system configuration described above outlines a number of phases of development. This will involve the twinning of the forcemain along Highway 19A, from PS#6 to the siphon, in the ultimate build out phase. To avoid causing repeated traffic impacts, it is proposed that during the construction of the Phase 1A forcemains, concrete sleeves will be constructed at busy highway intersections. This will allow the future forcemain to be installed without closing the intersections. The sleeves will be 1800mm diameter concrete culverts.

At the watercourse crossings, it is proposed that the future twin forcemain will be installed at the same time by HDD. The twin pipe will be a larger diameter to accommodate the future flow. This will avoid having to use HDD to install the future forcemain which is expensive and time intense. This will reduce the impact to traffic.

The intersections and watercourse crossings where the allowance for future installation of the twin forcemains are made are outlined in the table below.

Table 6: River and Intersection Crossings to avoid disruption of future twin pipe installation

FORCEMAIN	CHAINAGE	TYPE	LOCATION
PS#6 to PS#1	1 + 440	Watercourse	Trent River
PS#6 to PS#1	8 + 240	Watercourse	Hart Creek
PS#6 to PS#1	1 + 980	Road Intersection	Highway 19A and Briardale Rd
PS#1 to Siphon	0 + 120	Road Intersection	Cliffe Ave and 29th St

PS#1 to Siphon	0 + 940	Road Intersection	Cliffe Ave and Mansfield Dr
PS#1 to Siphon	0 + 680	Road Intersection	Cliffe Ave and 26th St
PS#1 to Siphon	0 + 460	Road Intersection	Cliffe Ave and Mansfield Dr
PS#1 to Siphon	0 + 140	Road Intersection	Cliffe Ave and 21st St
PS#1 to Siphon	1 + 760	Road Intersection	Cliffe Ave and Anfield Road

3.4 CONSTRUCTION AND TRAFFIC IMPACTS

The alignment of the proposed forcemains is along Highway 19A as discussed in the previous sections. Highway 19A is a provincial secondary highway that serves as an alternative route to Highway 19 and connects several communities on the east coast of Vancouver Island. The majority of the highway consists of two lanes with narrow shoulders and ditches on both sides. This limits the available construction workspace and laydown area. The alignment was selected to reduce the traffic impacts by limiting construction to one lane of the highway. This will allow access to homes and businesses for local residents through traffic management measures. With the assumption of two crews installing 30m of pipe per day, the construction duration is expected to be 232 days. The two river crossings will involve trenchless installation of the pipes and take a month each to complete in addition to the 232 days estimated.

Construction of the forcemain through the urban area of Courtenay could have an impact on the local businesses and residents along Highway 19A/Cliffe Ave. The forcemain alignment also traverses several arterial intersections, which will have an added impact on traffic in the Courtenay region. Such impacts can be reduced through effective traffic management.

A potential benefit of this concept is the opportunity to incorporate improvements along the highway shoulder for active transportation in conjunction with the forcemain installation along Highway 19A.

3.5 ENVIRONMENTAL IMPACTS

Sea level rise is the most significant impact identified for this system. Sea level rise may lead to flooding along the coastline as well as contribute to increased coastal erosion. Sea level rise in combination with storm surge increases the risk of coastal flooding. The CVRD has recently completed the Coastal Flood Mapping Project which is the first phase of their Coastal Flood Adaptation Strategy. The Coastal Flood Mapping Project analyzed and modeled coastal flood hazards and included the development of regulatory coastal floodplain mapping. Future project design will integrate findings from the Coastal Flood Mapping Project and Adaptation Strategy in order to understand and adapt to risks related to coastal flooding. For infrastructure located in coastal flood zones, measures to monitor and reduce coastal erosion and protect infrastructure are required.

4 COST ESTIMATE

At the preliminary design stage of projects, a Class "C" cost estimate is prepared. Preliminary design is when the space program of a project has, for the most part, been developed but additional changes or additions to the program are still being made. The Class "C" cost estimate has a 30% contingency to account for any unforeseen changes in detailed design. A Class "B" cost estimate will be completed in the "Detailed Design" stage of the project as part of the Stage 3 LWMP.

The Class "C" cost estimate of the forcemains in Phase 1A is summarised in **Table 7**.

Table 7: Cost Estimate Summary

ITEM	DESCRIPTION	COST
1	**Highway 19A Forcemain**	
1.1	Forcemain	$ 14,341,000
1.2	Appurtenances and Tie-Ins	$ 2,420,000
1.3	Roadworks and Restoration	$ 1,466,000
1.4	Future Provision	$ 826,000
	Subtotal Item 1	$ 19,053,000
2	**General**	
2.1	Mobilization and demobilization (~3%)	$ 580,000
2.2	Health and safety (~3%)	$ 200,000
2.3	Environmental protection plan and monitoring (~3%)	$ 200,000
2.4	Allowance for water management and bypass pumping (~3%)	$ 290,000
2.5	Sediment and Erosion Control	$ 200,000
2.6	Coordination with Hydro	$ 175,000
2.7	Traffic Management	$ 928,000
2.8	Rock Clearing	$ 450,000
	Subtotal Item 2	$ 3,023,000
	Subtotal All Items	$ 22,076,000
	Contingency (30% of Subtotal)	$ 6,623,000
	Engineering (10% of Subtotal + Contingency)	$ 2,870,000
	Total	$ 31,569,000

The following general assumptions were used for preparing the cost estimate:

- All taxes are excluded.
- The estimate is based on prices in July 2022. Pricing and lead times are subject to change as they currently have shown to be volatile from materials & equipment suppliers within the industry, due to the current market conditions and other global issues.
- Does not include Owner costs or other soft costs (permitting, land acquisition, etc.)
- Complete with electrofusion coupling fittings (every 10m) & thrust blocks, trench excavation, bedding, backfill, and surface restoration. Surface restoration is assumed as trench width only for forcemains.
- Assumed HDD for the two river crossings, Trent River and Hart Creek.
- Air valves are located at high points of the profile and every 500 metres.
- Blowdowns are located at low points of the profile.
- Isolation valves and pigging stations located every 500 metres along the forcemain.
- Future provision includes 1800mm dia concrete culverts at insection and highway crossings and the additional costs installing twin forcemain with caps by HDD at river crossings.
- Construction of the forcemain is estimated to be 232 days.
- Traffic management is assumed as 2 crew x 2 flagger @$100/hour, 10hours/day for 232 days
- Rock Removal based on the Geotechnical Concept Level Review. A detailed review of rock clearing to be completed at detail design via GPR.
- Cost excludes contaminated soil allowance which will be reviewed in detail design.

APPENDIX

B-3 TACPAC #2 DISCUSSION PAPER 2

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

DISCUSSION PAPER 2: COLLECTION SYSTEM OPTIONS

CONFIDENTIAL

NOVEMBER 23, 2022

1 BACKGROUND

The Comox Valley Regional District (CVRD) operates and maintains the sewerage system for the Comox Valley Sewer Service (CVSS) which provides service to the City of Courtenay and the Town of Comox, and to the K'ómoks First Nation and Department of National Defence (under contracts with each).

The South Region of the CVRD, also known as Electoral Area 'A', is located south of the City of Courtenay. The area does not have a centralized sewage collection system, and privately owned onsite septic systems are utilized for wastewater management. These systems are reported to have a history of failures, with the potential to impact the surrounding environment and public health. In 2022 the CVSS service area boundary was expanded to include portions of Electoral Area 'A', including Royston, Union Bay and K'ómoks First Nation (KFN) lands. Consideration is now being given to the extension of sewage infrastructure south through an addendum to the Stage 1/2 CVSS Liquid Waste Management Plan.

The proposed design involves the collection of sewage from neighborhoods in the Royston and Union Bay area through collection systems to eight pump stations. It will then be pumped to the existing Courtenay River Siphon and conveyed to CVSS treatment works. The servicing of these areas is proposed to be completed in phases given the high cost of servicing these areas. The discussion paper will outline the following:

- Wastewater Collection System Options Overview & Evaluation
- Wastewater Collection System Conceptual Design
- PS#1 and PS#6 Short-Term Design Considerations and Class "D" Cost Estimate

2 WASTEWATER COLLECTION SYSTEM OPTIONS

This section summarizes the sewer collection systems options and alternatives that were previously identified and evaluated in WSP's February 2021 Report titled "Royston/Union Bay Local Collection System Options & Design Updates.". The 2021 Report identified and evaluated sewer collection system options and associated conceptual cost estimates for the South Region.

While the pumped conveyance system design has advanced and changed since the 2021 Report (including the number of pumps required for the proposed phased buildout), the options analysis and relative weighting of alternatives for the collection system in the 2021 Report remain valid and are summarized below.

In total, seven (7) different collection system alternatives were evaluated for a sanitary collection system to service the CVRD South Region:

1. Gravity Sewers
2. Low Pressure Sewer (LPS) System
3. Vacuum Sewer (VS) System
4. Septic Tank Effluent Gravity/Pump (STEG/STEP) Hybrid System
5. Gravity/LPS Hybrid System
6. Gravity/Vacuum Hybrid System
7. LPS/Vacuum Hybrid System

The hybrid gravity/vacuum sewer collection system option was the least expensive option identified on capital and operation and maintenance costs. However, due to the limited installation of vacuum sewer technology in Canada and the potential risks, this option did not score the highest overall, despite the lowest capital and O&M costs. Based on the detailed evaluation, a hybrid Gravity/LPS collection system has the highest comparative evaluation score and therefore offered the most benefit. Additionally, the Gravity/LPS system was found to be the third least expensive on a capital cost basis.

Table 1:Weighted Scoring of Sewage Collection System Alternatives

ALTERNATIVE	FINAL SCORE
GS/LPS	74.9
STEG/STEP	73.8
GS/VS	69.8
GS	67.4
LPS	59.0
LPS/VS	50.8

A hybrid Gravity Sewer - LPS system (with grinder pumps) was identified as the preferred approach to service the area. The properties located along the shoreline in Union Bay are proposed to be serviced by LPS, while remaining properties are anticipated to be provided gravity servicing. An alternative approach would be for properties on the west side of Hwy 19A (high ground elevation) to be accommodated by the gravity system, with those located on the east side of Hwy 19A (low ground elevation) being accommodated by LPS system.

The subsections below provide more detail on the gravity sewer and LPS options, as well as general advantages and disadvantages.

2.1 GRAVITY SEWER (GS)

Gravity sewer systems are most commonly used to collect and transport domestic wastewater. A well-designed system is reliable and requires a minimum level of maintenance that can handle grit and solids in sanitary sewage.

Compared to other alternatives, the gravity sewer system has a longer service life and lower operating costs. The wastewater from each source is conveyed through a building sewer to a collection main. If gravity flow is not

possible throughout the system, lift stations are used. Lift stations are installed at the lowest elevations of the network to pump the sewage to convey it through the collection system and ultimately to the treatment plant.

2.1.1 CONSIDERATION

If deep excavation is required, the gravity system can result in a high construction cost. If the development is low-density and fewer lots are to be serviced; the gravity sewer cost is not feasible.

The site topography also plays a major role in determining the viability of gravity sewer construction. Significant elevation variations in the service area can result in a complex and high-cost gravity sewer system and may require multiple lift stations. A detailed list of the advantages and disadvantages of traditional gravity sewers is listed in Table 2: .

Table 2: General Advantages and Disadvantages of Gravity Sewer System

ADVANTAGES	DISADVANTAGES
Most common wastewater collection and conveyance system	Deep excavation may be required to achieve gravity flow
Suitable for areas with a natural slope towards the discharge location	Potential of leakage in pipes and manholes (Inflow & infiltration)
System primarily constructed in the road allowances	May require multiple lift stations depending on the area topography; manholes are also required at regular spacing, resulting in higher construction cost
No mechanical/electrical components required on private properties	Owner connection costs can be high for low-density development areas
Simultaneous removal of both liquid and solid components of wastewater from the property	The existing septic tanks need to be decommissioned by the owners
Low O&M cost of the gravity sewer	High O&M cost of the lift stations
	[1]High groundwater table will increase costs and leakage

[1]Gravity sewer will be difficult and expensive to construct in the ground with a high water table. This is more significant in the Union Bay area. A 2009 study determined the winter water table be approximately 0.1 - 0.6m below grade.

2.2 LOW PRESSURE SEWER SYSTEM (LPS)

In a Low Pressure Sewer (LPS) system, each connection point uses a two-chamber septic tank and effluent pump to transport the wastewater through the system. There are two predominant types of LPS systems: Septic Tank Effluent Pump (STEP) style and grinder pumps. Grinder pumps to serve individual homes are usually low horsepower of 1 – 2 H.P. STEP pumps are usually fractional horsepower.

The primary difference between the two types of LPS system is in solids handling. The STEP system is a two-chamber septic tank where the solids are separated, and only the liquid component is pumped into a pressure sewer network. Conversely, in a grinder pump style network, the pump sends all solids into the sewer creating the potential for long-term operational issues associated with the build-up of solids and odour generation.

The STEP style low pressure sewer and the separation of solids from the wastewater stream allow the system to operate at lower pressures and velocities as there is a minimal concern related to the deposition of solids.

The primary reason for the use of pressure sewers is economical, as the system requires a minimal depth of cover and is well suited to trenchless installation. In some areas experiencing slow growth development LPS is economically attractive to avoid the significant cost associated with lift stations and manholes. In some areas where the groundwater level is high, the decision to choose LPS is environmentally motivated.

LPS can also be used in conjunction with the gravity system. Where some low-lying properties do not allow gravity flow into a conventional fronting sewer, i.e., for waterfront properties in Union Bay, a grinder pump or a STEP can be used at those properties to discharge to the sewer.

2.2.1 CONSIDERATION

One of the main challenges that should be considered for the LPS system is the potential for bacterial upsets to occur in the septic tank caused by misuse of the system by residents, which can result in a severe undesirable downstream sludge release into the collection system and pipeline blockage.

Potential power outages can affect the overall system operation, and the impact and mitigation measures need to be determined on a case basis. There is limited storage capacity (up to 24 hr) in each septic tank/grinder pump tank, and power outages can cause system backup for each connection.

The ownership model of the sewer infrastructure, for all the options, is defined to be divided at the property line; where the CVRD would be responsible for infrastructure within the Right of Way (ROW) up to the property line, while the individual homeowners have the responsibility for infrastructure between the house and the property line.

For the LPS option, both the septic tank and pump are owned by each property owner located on private property, and the CVRD would bear no responsibility for the sewer infrastructure on the private properties. However, for project planning purposes, supply and installation costs for LPS pumps and tanks may be borne by the CVRD as part of the overall project. Homeowners also are responsible for the operation and maintenance (O&M) cost of the system on their property, e.g., pumping energy and sludge removal cost. Currently, the existing property owners in the study area with private septic systems are responsible for their systems' maintenance.

A detailed list of the advantages and disadvantages of LPS systems is listed in Table 3: .

Table 3: General Advantages and Disadvantages of LPS System

ADVANTAGES	DISADVANTAGES
Shallow and narrow excavation and potential for trenchless installation	Pump and tank units installed on private property
Pipeline can follow the ground topography	Ongoing operation and maintenance costs for each property owner
Minimal inflow and infiltration into the system	Each property owner required to supply and pay for power to the onsite pump
Lower initial capital costs due to shallow excavation and small size of pipes	Limited storage capacity in the septic tank during power outages
A portion of a sewage pre-treatment is provided onsite	Potential for pump blockages and malfunctions, and tank overflow
In the case of using a grinder pump, a smaller tank is required	Potential odour generation
Suitable to accommodate future growth and phasing	Regular tank cleanout is required

3 CONCEPTUAL DESIGN

This section discusses the conceptual design of the preferred sewer collection alternatives for the South Region (including Royston and Union Bay area) to connect the South Region sewer system to the CVSS. As discussed with the CVRD and presented in the previous sections, a hybrid Gravity Sewer - LPS system (with grinder pumps) was identified as the preferred approach to service the area.

As part of the preferred hybrid approach, an LPS system is being considered for limited use in areas located on the east side of Highway 19A in Union Bay only. The generated wastewater from the remaining properties located on the west side of Highway 19A would be conveyed via gravity system.

3.1 LPS – GRINDER PUMPS

The LPS system has been discussed in detail in previous sections. The pressure sewers are typically small diameter sewer pipelines following the existing ground profile. The minimum depth of burial is usually dictated by the frost penetration depth and additional depths, if required, to avoid other buried utility interference. PVC or HDPE are the two types of pipe material used in LPS collection systems.

Each house on the LPS system will be connected to a common LPS main and will use a small pump to discharge to the main. Two types of pumps are in general use; a grinder pump and a septic tank effluent pump reviewed in the earlier stage of the study.

The concept of a grinder pump system consists of replacing the septic tank with a holding tank. All solids introduced into the sewage holding tank are ground and then pumped to the low-pressure sewer system. Each time the grinder pump is activated, the contents of the holding tank will be removed. Grinder pumps eliminate the septic tank so that there is no longer any need to pump solids from the septic tank. With the smaller tank capacity, grinder pumps pump fresher sewage, reducing odour problems. The grinder pump system will also reduce inflow and infiltration into the holding tank and, since each grinder pump station is similar, it provides a uniform approach.

It is generally recommended that cleanout or flush out assemblies be installed at key points in the pressure sewer system. The purpose of the cleanouts is to allow maintenance staff to flush the lines periodically to remove deposited sediments from sections of the sewer line. Clean out locations are generally placed at the following points to facilitate cleaning:

- The end of every line;
- Every connection to a branch line;
- Every sharp bend in the system; and,
- In the middle of long lengths of pipe (lengths greater than 1,000 m).

3.1.1 ENVIRONMENT ONE METHOD

In the LPS system, grinder pumps with a minimum 60-gallon holding tank do not all operate simultaneously. Published data shows that only a percentage of the grinder pumps operate simultaneously, under normal operating conditions. The larger the system, the less percentage of grinder pumps operate simultaneously.

The design handbook of Environment One Corporation, manufacturers of progressive cavity-type grinder pumps and effluent pumps, tabulates the number of pumps expected to be running simultaneously versus the number of pump cores connected to the system, as shown in Table 4.

Table 4: Maximum Number of Grinder Pumps Cores Operating Daily

NUMBER OF GRINDER PUMPS CONNECTED	MAXIMUM NUMBER OF GRINDER PUMPS OPERATING SIMULTANEOUSLY
1	1
2 – 3	2
4 – 9	3

NUMBER OF GRINDER PUMPS CONNECTED	MAXIMUM NUMBER OF GRINDER PUMPS OPERATING SIMULTANEOUSLY
10 – 18	4
19 – 30	5
31 – 50	6
51 – 80	7
81 – 113	8
114 – 146	9
147 – 179	10
180 – 212	11
213 – 245	12
246 – 278	13
279 – 311	14
312 – 344	15

Under typical conditions, the grinder pump's flow is approximately 0.69 L/s (11 gpm). The maximum anticipated design flow for the LPS zone can be determined by the product of 0.69 L/s (the pump's discharge rate) times the number of pumps running.

3.2 CONSTRUCTION CONSIDERATIONS

3.2.1 HIGHWAY CROSSINGS

In the proposed Gravity/LPS system, there will be eighteen (18) highway crossing locations throughout the South Region area. In these locations, the proposed sewer line crossing is assumed to be constructed via HDD to reduce interference with Highway 19A. Foreshore Installation Review

A high-level review of the proposed collection pipe location was completed in an effort to identify locations where the pipe may be proposed within the foreshore area. The following criteria was used to identify, at a high-level, whether an installation would be deemed as a foreshore installation:

- Along the cost, and
- Not under an existing road, and
- Not under an existing Right of Way (ROW), and
- Not under a known utility corridor.

Using the above criteria, the proposed gravity collection system layout was refined to eliminate foreshore installation of gravity sewer, to minimize sensitive habitat disturbance during construction and avoid difficult operation and maintenance over the lifecycle of the system (i.e. access for cleaning, inspections, working in tidal areas, etc). In areas where the proposed alignment was revised, LPS must be employed for collection.

4 SHORT-TERM DESIGN CONSIDERATIONS

Construction of the pump stations is proposed to be broken out over the following phases.

1. Phase 1A (Short term)
2. Phase 1B (Medium term)
3. Future phase (Long term)
4. Ultimate build out phase

Phase 1A includes the design of PS#1 at Royston and PS#6 at Union Bay. Refer to Discussion Paper 1 for the Process Flow Diagrams of each phase.

The feasibility of implementing the collection system for the PS#1 catchment area in phases rather than a full buildout at system onset was explored in WSP's February 2022 Technical Memorandum entitled "CVRD LWMP CCO#14 – South Region Collection & Conveyance Options" to provide flexibility to ensure costs remain reasonable. Sub-catchment areas were divided based upon areas with similar density composition, locations, and crossings required to carry out the servicing of each area, as shown in **Figure 1**. The subcatchment areas for PS#6 are shown **in Figure 2**.

For the purpose of the collection system, all PS#1 sub-areas require sub-area S1-3 to be completed before servicing can occur as this sub-area will include the installation of a 375 mm collection main conveying the sewage to the pump station. As such, S1-3 was identified as the first sub-area to be serviced if funding limitations preclude buildout of the entire PS#1 catchment area at system onset. The sub-area on the Northwest is not included as it can be incorporated into the collection system at a later phase.

It is worth noting that some sub-areas may be configured as an extension to other sub-areas and therefore phasing and additional cost-sharing should take this into consideration. As well, the entire PS#1 catchment has been considered in the capacity of the Phase 1A pump station design, even if the sub-area collection systems are not all built as part of the first phase of construction.

The development of the hydraulic sanitary model for PS#1 and PS#6 catchments to review the collector system sizing for Phase 1A is currently underway by WSP. Based on preliminary modelling, the pipe sizing for Royston and Union Bay collector systems is sufficient to convey 2070 design flows. A detailed assessment will be discussed in future TAC/PAC meetings, outlining the preliminary design of the PS#1 and PS#6 collector systems and incorporating feedback received from the Technical and Public Advisory Committee on the conceptual design presented in this paper.

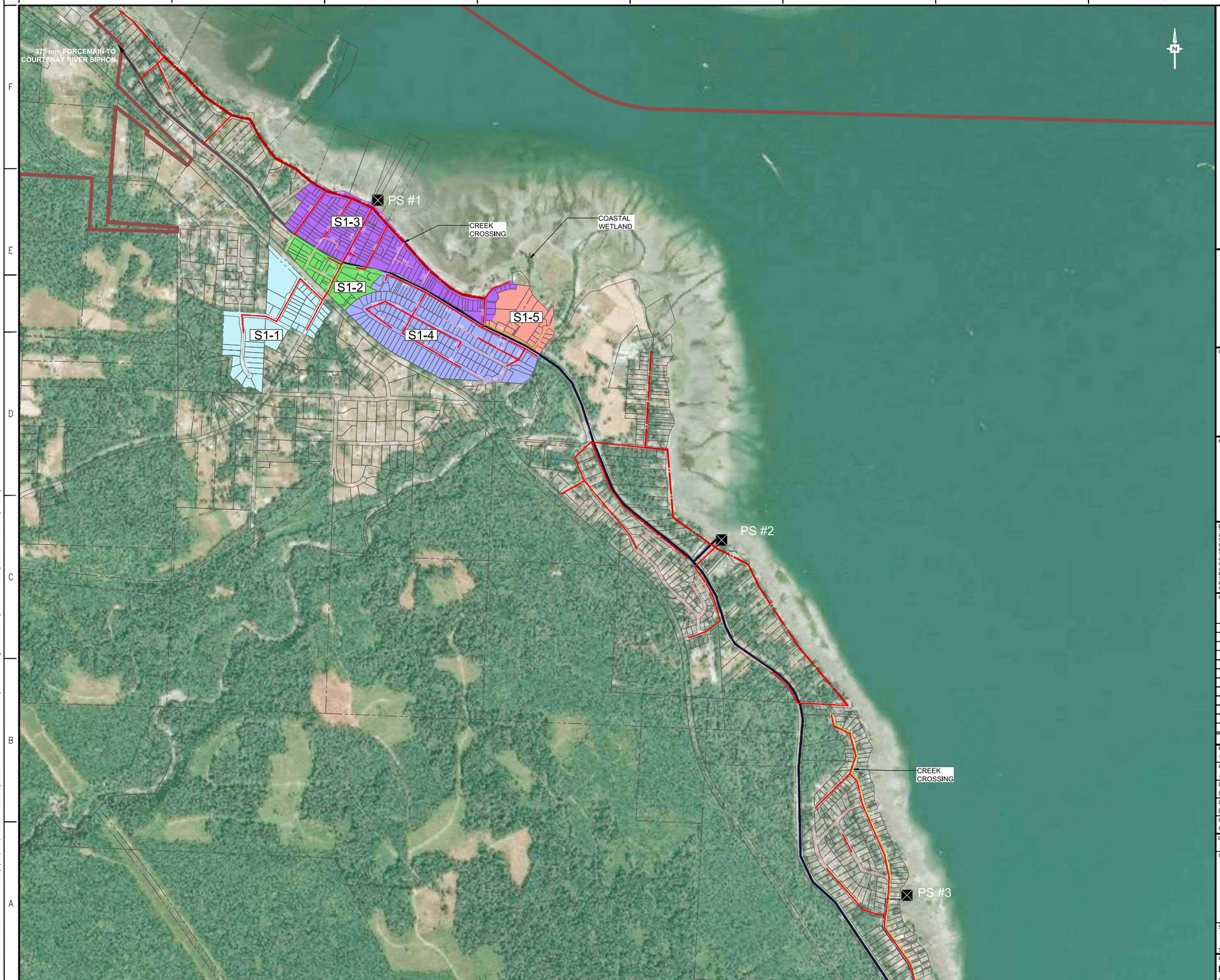
The collector system may have potential impacts on existing properties in some areas. A detailed study will be required to determine the actual ROW boundaries based on considerations for construction and operations. This is assumed to be completed during the detailed design phase as part of the Stage 3 LWMP.

The design criteria being used to review the Phase 1A collection system is in accordance with the MMCD design guidelines as summarized in Table .

Table 5: Design Criteria

DESIGN PARAMETER	VALUE
Minimum Velocity	Gravity sewers: 0.60 m/s
Minimum Pipe Diameter	200mm except for the upstream section of a residential sewer where future extension is not possible, in which case 150mm is acceptable.
Maximum/Full Depth	80% full (d/D=0.8)
Minimum Grade	Minimum grades of gravity sewers are as required to obtain the minimum velocity of 0.60 m/s except for the upstream section of a residential sewer serving a design population of 25 or less in which case the minimum grade is 0.6%, unless otherwise approved by the local authority.

Depth	Minimum cover without concrete encasement: 1.0 m. Maximum cover depth: 4.5 m, except under special circumstances and with local authority approval.
Manhole Locations	Manholes are required at the following locations: – Every change of pipe size. – Every change in grade. except as indicated in the Curved Sewers section. – Every change in direction, except as indicated in the Curved Sewers section. – Downstream end of curved sewers. – Every pipe intersection except for 100 mm and 150 mm service connections and junctions with trunk sewers 900 mm diameter and larger. – Upstream end of every sewer line. – Every future pipe intersection. – 150 m maximum spacing.
Hydraulic drops	Minimum drop in invert elevations across manholes: – Straight run: 5 mm drop – Deflections up to 45 degrees: 20 mm drop – Deflections 45 to 90 degrees: 30 mm drop



LEGEND:

- 150mm GRAVITY SEWER
- 200 mm GRAVITY SEWER
- 250 mm GRAVITY SEWER
- 300 mm GRAVITY SEWER
- 375 mm GRAVITY SEWER
- 75 mm LOW PRESSURE SEWER
- 100 mm LOW PRESSURE SEWER
- 150 mm LOW PRESSURE SEWER
- 100 mm FORCEMAIN
- 150 mm FORCEMAIN
- 200 mm FORCEMAIN
- 250 mm FORCEMAIN
- 300 mm FORCEMAIN
- 375 mm FORCEMAIN
- REGIONAL BOUNDARY
- EXISTING ROAD AND PROPERTY LINES
- PUMP STATION
- SX-X PUMP STA. CATCHMENT/SUB-CATCHMENT AREA

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CLIENT:

Comox Valley REGIONAL DISTRICT

COMOX VALLEY REGIONAL DISTRICT

PROJECT:

ROYSTON / UNION BAY
LOCAL COLLECTION SYSTEM
OPTIONS & DESIGN UPDATES

ISSUED FOR – REVISION:

IS	RE	DATE	DESCRIPTION
0		2022-02-03	ISSUED FOR REVIEW

PROJECT NO: 18P-00276-00	DATE: 2022/02/03
ORIGINAL SCALE: AS SHOWN	IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.
DESIGNED BY: E.K. / C.K.	
DRAWN BY: I.M. / E.S.	
CHECKED BY: M.S. / N.T.	25mm

DISCIPLINE: MUNICIPAL / SEWER

TITLE:

GRAVITY AND LPS
ROYSTON, GARTLEY & KIMARNOCK
REGIONS

SHEET NUMBER: C203

SHEET #: 1 OF 2

ISSUE: ISSUED FOR REVIEW — REV #: 0

DATE OF: 2022-02-03

Filename: C:\Users\CAES072310\ACCDocs\WSP Canada projects (AMER)\18P-00276-00 - Cv RD\Project Files\Pr 2\WIP\ACAD\18P-00276-00 Gravity and LPS North.dwg - Tab: C203 Gravity Sewer North Plotted By: CAES072310 02/04/2022 [Fri 9:23am]

LEGEND:

- 150mm GRAVITY SEWER
- 200 mm GRAVITY SEWER
- 250 mm GRAVITY SEWER
- 300 mm GRAVITY SEWER
- 375 mm GRAVITY SEWER
- 75 mm LOW PRESSURE SEWER
- 100 mm LOW PRESSURE SEWER
- 150 mm LOW PRESSURE SEWER
- 100 mm FORCEMAIN
- 150 mm FORCEMAIN
- 200 mm FORCEMAIN
- 250 mm FORCEMAIN
- 300 mm FORCEMAIN
- 375 mm FORCEMAIN
- REGIONAL BOUNDARY
- EXISTING ROAD AND PROPERTY LINES
- PUMP STATION
- SX-X PUMP STA. CATCHMENT/SUB-CATCHMENT AREA

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CLIENT:

COMOX VALLEY REGIONAL DISTRICT

PROJECT:

ROYSTON / UNION BAY
LOCAL COLLECTION SYSTEM
OPTIONS & DESIGN UPDATES

ISSUED FOR – REVISION:

IS	RE	DATE	DESCRIPTION
0		2022-02-03	ISSUED FOR REVIEW

PROJECT NO: 18P-00276-00	DATE: 2022/02/03
ORIGINAL SCALE: AS SHOWN	IF THIS BAR IS NOT 25mm LONG, ADJUST YOUR PLOTTING SCALE.
DESIGNED BY: E.K. / C.K.	
DRAWN BY: I.M. / E.S.	
CHECKED BY: M.S. / N.T.	25mm

DISCIPLINE: MUNICIPAL / SEWER

TITLE:

GRAVITY AND LPS
KILMARNOCK, UNION BAY ESTATES,
& UNION BAY REGIONS

SHEET NUMBER: C204

SHEET #: 2 OF 2

ISSUE: ISSUED FOR REVIEW

DATE OF: 2022-02-03

REV #: 0

STAMP

5 COST ESTIMATE

The Class "D" capital cost estimates for the collection systems in the PS#1 and PS#6 catchments are captured below in Tables 6 and 7. The costs are based on the unit rates from the 2021 Report, and include collection system costs for gravity and forcemain pipes, appurtenance and tie-ins, and service connection to property lines. Class "D" cost estimates are an order of magnitude cost estimate to inform decision making at feasibility or conceptual design stage; as such, the cost estimates below include 40% contingency and 15% allowance for engineering and contractor overhead and pricing. All costs were inflated to 2022 dollars and subtotals and totals are rounded to the nearest $10,000. Class "C" cost estimates as part of the preliminary design are being developed and will be presented to the committee at future meetings.

The following assumptions were made for the Class "D" cost estimation:

- All pipe installation is assumed to be cut and cover unless otherwise specified,
- Low-pressure property pumps and septic tanks are included in CVRD capital cost,
- Low-pressure service connection cost includes a valve chamber,
- The river/creek crossings are assumed to be constructed via HDD.

Table 6: PS#1 Catchment Capital Cost Estimate

ITEM	DESCRIPTION	UNIT	QTY	UNIT COST	PRICE
1	**Collection system**				
1.1	Gravity – PVC SDR35				
1.1.1	150 mm	lm	1735	$430	$747,000
1.1.2	200 mm	lm	4671	$470	$2,196,000
1.1.3	375 mm	lm	1150	$520	$598,000
1.2	Forcemain-HDPE DR17				
1.2.1	75 mm	lm	100	$200	$20,000
1.2.2	150 mm	lm	300	$300	$90,000
1.3	Appurtenances and Tie-Ins				
1.3.1	Manhole	each	60	$5,500	$330,000
1.3.2	Creek Crossing	LS	1	$265,000	$265,000
1.3.3	Highway 19A crossings	LS	5	$12,000	$60,000
1.3.4	Railroad crossing	LS	1	$127,000	$127,000
1.3.5	Road-way Allowance	lm	3978	$100	$398,000
1.4	Service Connection to prop. Line				
1.4.1	Gravity	LS	383	$2,327	$892,000
1.4.2	LPS	LS	20	$3,701	$75,000
1.4.3	LPS – Lift Station and Septic Tank	LS	20	$15,000	$300,000
				Subtotal 1 Collection System	**$6,098,000**
				Contingency (40% of Subtotal)	$2,439,000
				Engineering (15% of Subtotal All + Contingency)	$1,281,000
				Contractor Overhead and Pricing (15% of Subtotal All + Contingency)	$1,281,000
				Total	**$11,099,000**

Table 7: PS#6 Catchment Capital Cost Estimate

ITEM	DESCRIPTION	UNIT	QTY	UNIT COST	PRICE
1	**Collection system**				
1.1	Gravity – PVC SDR35				
1.1.1	150 mm	lm	3717	$430	$1,599,000
1.1.2	200 mm	lm	2077	$460	$977,000
1.1.3	375 mm	lm	875	$520	$455,000
1.2	Forcemain-HDPE DR17				
1.2.1	75 mm	lm	1110	$200	$222,000
1.3	Appurtenances and Tie-Ins				
1.3.1	Manhole	each	61	$6,000	$369,000
1.3.3	Creek Crossing	LS	1	$265,000	$265,000
1.3.4	Highway 19A crossings	LS	3	$12,000	$36,000
1.3.5	Road-Way Allowance	lm	3890	$100	$389,000
1.4	Service Connection to prop. Line				
1.4.1	Gravity	LS	259	$2,327	$603,000
1.4.2	LPS	LS	49	$3,701	$182,000
1.4.3	LPS – Lift Station and Septic Tank	LS	49	$15,000	$735,000
				Subtotal 1 Collection System	**$5,832,000**
				Contingency (40% of Subtotal)	$2,333,000
				Engineering (15% of Subtotal All + Contingency)	$1,225,000
				Contractor Overhead and Pricing (15% of Subtotal All + Contingency)	$1,225,000
				Total	**$10,615,000**

In addition to the costs noted above, each property owner will be responsible for costs associated with connecting to the regional services at their respective property lines. The cost of service connections between each house and property line have been estimated for ranges of connection lengths. The cost estimate includes a number of assumptions for gravity and low-pressure sewer connections. The service connection for gravity and LPS is assumed to be 100mm diameter pipes as per MMCD Design Guidelines (2014). The first 10m of the gravity and LPS connections from the property line cost $1,500 and $250 per meter after this. The connection costs presented in **Table 8** below are the maximum costs within each connection length range. Property connecting to the LPS system require a septic tank and lift station, which cost $8,000 and $7,000 respectively. The property estimates are subject to the extent of onsite structures and landscape encountered.

Table 9: Property Line to House Service Connection Costs

CONNECTION TO SYSTEM	CONNECTION LENGTH	CONNECTION[1]	LIFT STATION/ SEPTIC TANK[2]	TOTAL COST
Gravity	0-10m	$1,500	-	$1,500
	11-30m	$6,500	-	$6,500
	31-50m	$11,500	-	$11,500
Low Pressure	0-10m	$1,500	$15,000	$16,500
	11-30m	$6,500	$15,000	$21,500

Notes:

1 Cost provided correspond to the higher length in the range

2 Lift station and septic tank costs provided as a reference. The cost of the lift station and tank will not be a property owner cost.

APPENDIX

B-4 TACPAC #2 DISCUSSION PAPER 3

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

DISCUSSION PAPER 3: PUMP STATION DESIGN AND OPERATING COSTS

CONFIDENTIAL

NOVEMBER 23, 2022

1 DISCUSSION PAPER #3

1.1 BACKGROUND

The sewer extension south region, as outlined in Discussion Paper #1, consists of eight pump stations to convey sewerage from existing neighborhoods in the Royston and Union Bay area as well as future development to the existing Courtenay River Siphon. The location of the pump stations is shown in **Figure 1**. Construction of the pump stations is required to be phased, with the following phases proposed:

1. Phase 1A (Short term)
2. Phase 1B (Medium term)
3. Future phase (Long term)
4. Ultimate build out phase

Phase 1A involves the design of PS#1 at Royston and PS#6 at Union Bay. Refer to Discussion Paper #1 for the Process Flow Diagrams of each phase.

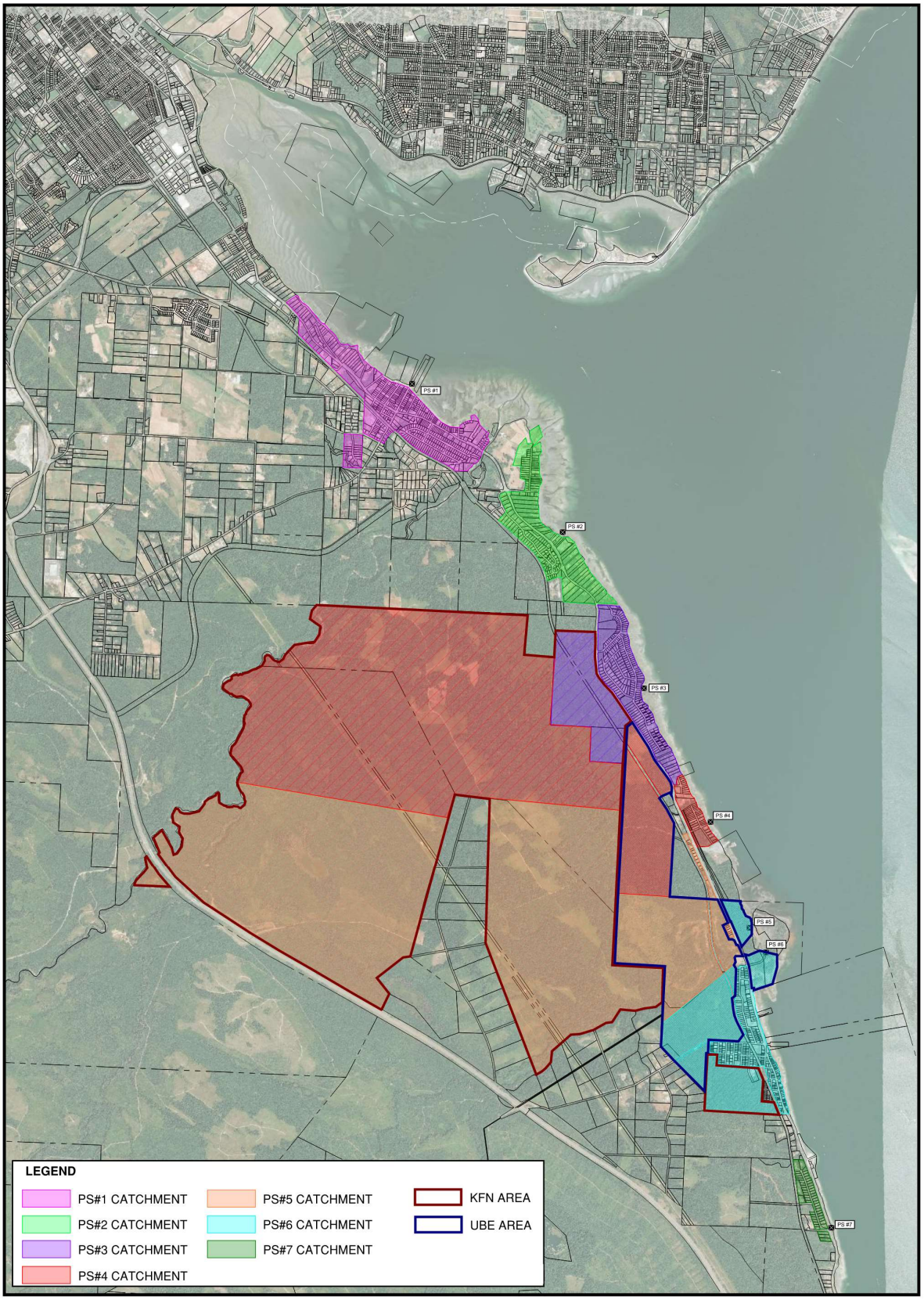

Figure 1: Pump Station Locations

1.2 BRIEF

The discussion paper includes the following information for PS#1 and PS#6, proposed to be constructed as part of Phase 1A:

- Summary of pump station siting options.
- Summary of pump station design.
- Summary of pump station cost estimate.

2 PUMP STATION DESIGN

A conceptual pump station sizing was completed for Phase 1A considering the information available at the time of assessment. Given the relatively long service life of asset infrastructure such as pump stations, it can be expected that the pump stations constructed in the initial phase will continue to be operated throughout the future phases of development up to build-out.

2.1 SITING CONSIDERATIONS

2.1.1 PS#1

PS#1 is located in Royston to collect the flow from the Royston catchment area as well as the South Royston Forcemain as shown in **Figure 2**. A previous study by Koers & Associates Engineering in 2016 reviewed locations for the pump station at Royston. Three site options where considered, two at the intersection of Marine Drive and Royston Road and one site at Marine Drive and Hayward Avenue. The options, Marine Drive at Royston Road (north) and Marine Drive at Royston Road (south), were recommended in the review as they had lower estimated costs.

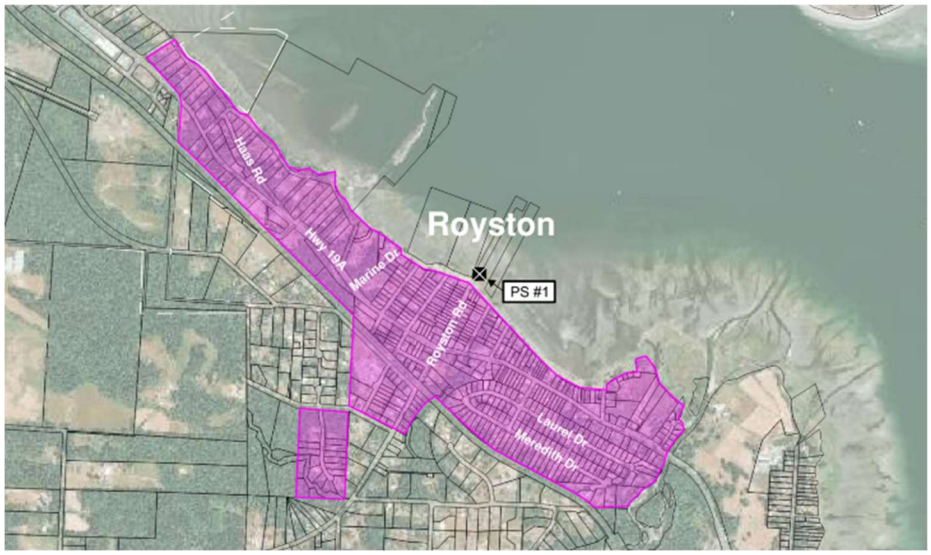

Figure 2: PS#1 Location

The Marine Drive at Royston Road (north) site (Location 1) is located on the grass area between the road shoulder and the Royston Seaside Trail gravel path on the northside of Marine Drive as shown in **Figure 3** below. The site is located within the dedicated road allowance owned by the Ministry of Transportation and Infrastructure (MoTI). The pump stations have two configuration options, building and kiosks, which are shown in the Siting figures below.

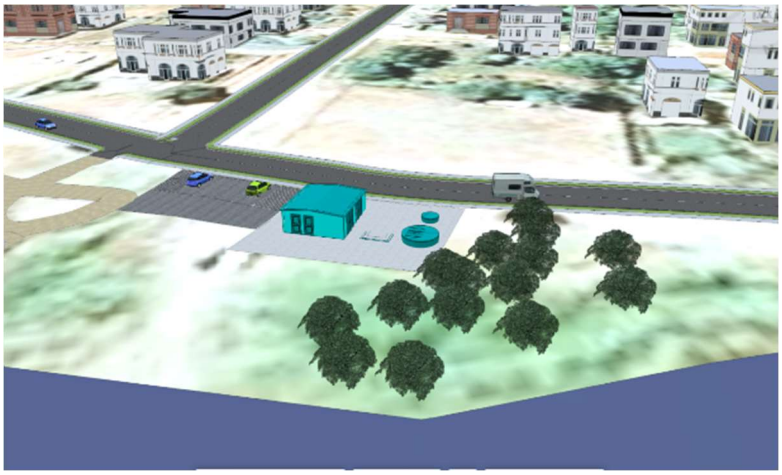

Figure 3: PS#1 Location 1 Option A

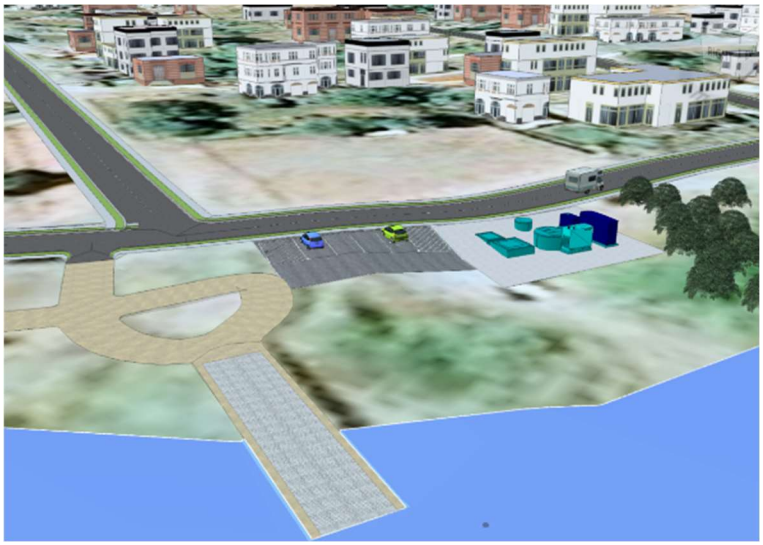

Figure 4: PS#1 Location 1 Option B

The Marine Drive at Royston Road (south) site option (Location 2) is located on the grass area between the road shoulder and the Royston Seaside Trail gravel path on the south side of Marine Drive as shown in **Figure 5** below. The site is also located within the dedicated road allowance owned by the Ministry of Transportation and Infrastructure (MoTI). The pump stations have two configuration options, building and kiosks, which are shown in the siting figures below.

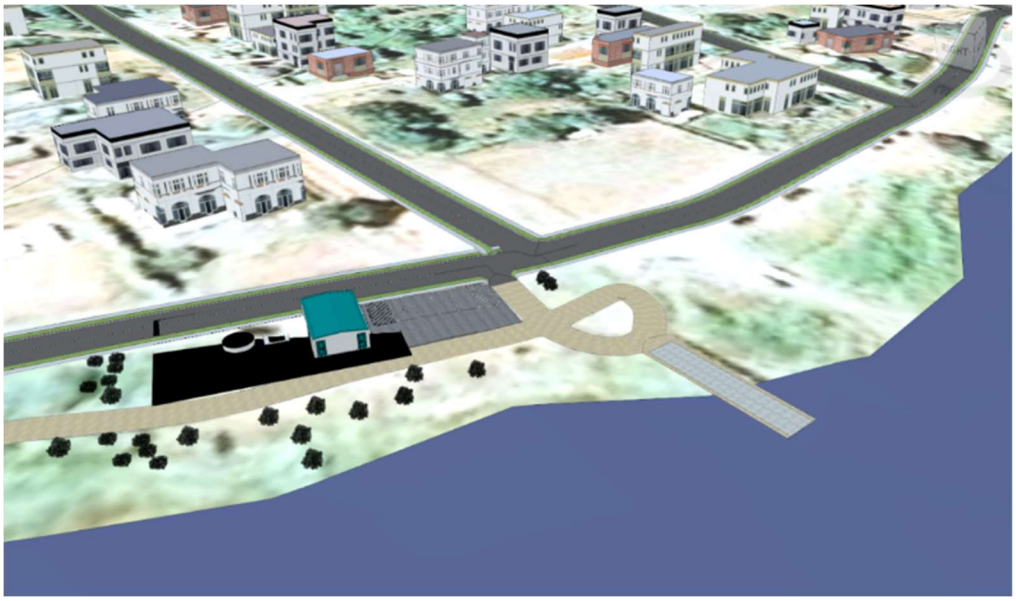

Figure 5: PS#1 Location 2 Option A

Figure 6: PS#1 Location 2 Option B

2.1.2 PS#6

A siting review was completed by Koers & Associates Engineering in 2016 for the pump station in Union Bay. Three options were considered, Highway 19A road allowance (opposite the parking lot of the Highwayman Pub), public boat ramp parking area, and south of the public boat ramp. The review recommended the Highway 19A road allowance site as it had the lowest estimated cost. Subsequent discussions have since led to consideration of an alternate preferred location north of the Highway 19A road allowance site. This site is located on Union Bay Estates land west of Jones Street as shown in **Figure 7** below.

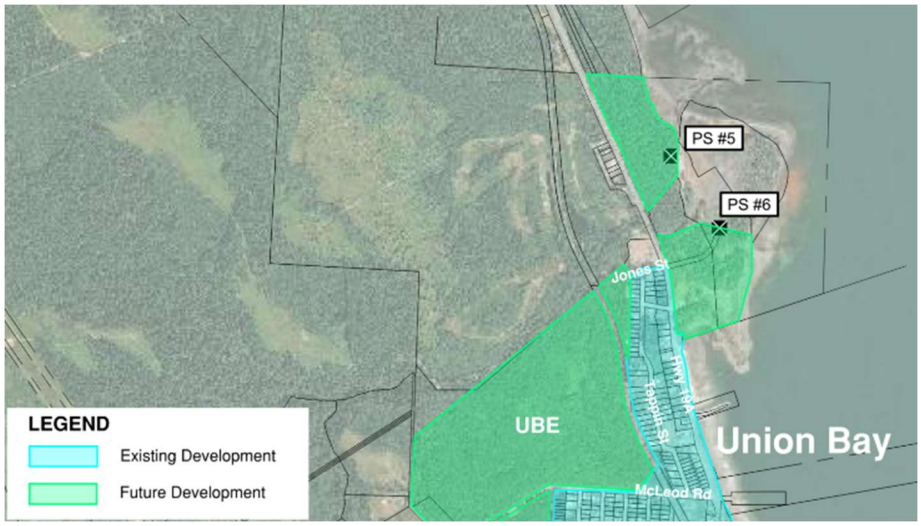

Figure 7: PS#6 Site Location

2.2 PRELIMINARY DESIGN

2.2.1 PUMP STATION #1

PS#1 is sized to convey a minimum flow of 48 L/s and maximum flow of 72 L/s to the existing Courtenay River Siphon. Once the regional pump station is constructed, PS#1 will only pump the required 28 L/s from PS#1 and PS#2 catchments to the regional pump station. The pump station will have a duty/standby configuration. An issue to consider is the coastal flooding risk of the pump station site. It is within Coastal Zone 64 which has a flood level of 5.1m according to available floodplain maps. The proposed ground level of the pump station is 3.3m to 3.5m. This indicates that the equipment could be approximately 1.6m below the flood level resulting in damage to the equipment. There are several measures that could be taken to eliminate or minimise the risk of a flood event on the pump station. The pump station will have submersible pumps and so will not be influenced by a flood event. The remaining pump equipment, such as valves and pipes, do not have electrical components that can be damaged by a flood event. The MCC and generator can be relocated to above the flood level.

PROPOSED PUMP STATION LAYOUT

Two options have been considered for the pump station configuration. Option A, pump station with a building, and Option B, pump station with kiosks, are outlined below.

OPTION A (BUILDING)

Option A consists of control building for the MCC, genset and odour control. The control building will contain backup generator, onboard fuel tank, an electrical room to accommodate the electrical equipment and SCADA system, odour control room and public washrooms.

The pump station will consist of a Fibre Reinforced Plastic (FRP) feeding manhole as shown in **Figure 8** for the collection of flow from the catchment areas as well as the forcemain from PS#6. This configuration also provides the possibility of constructing an additional manhole pump station in the future if this should be required, without the need to isolate PS#1. The pump station will have a 3.1m diameter FRP wet well and two submersible pumps. In the initial phases, two Flygt 85HP pumps will be installed. At a later phase they will be replaced with two Flygt 105HP pumps.

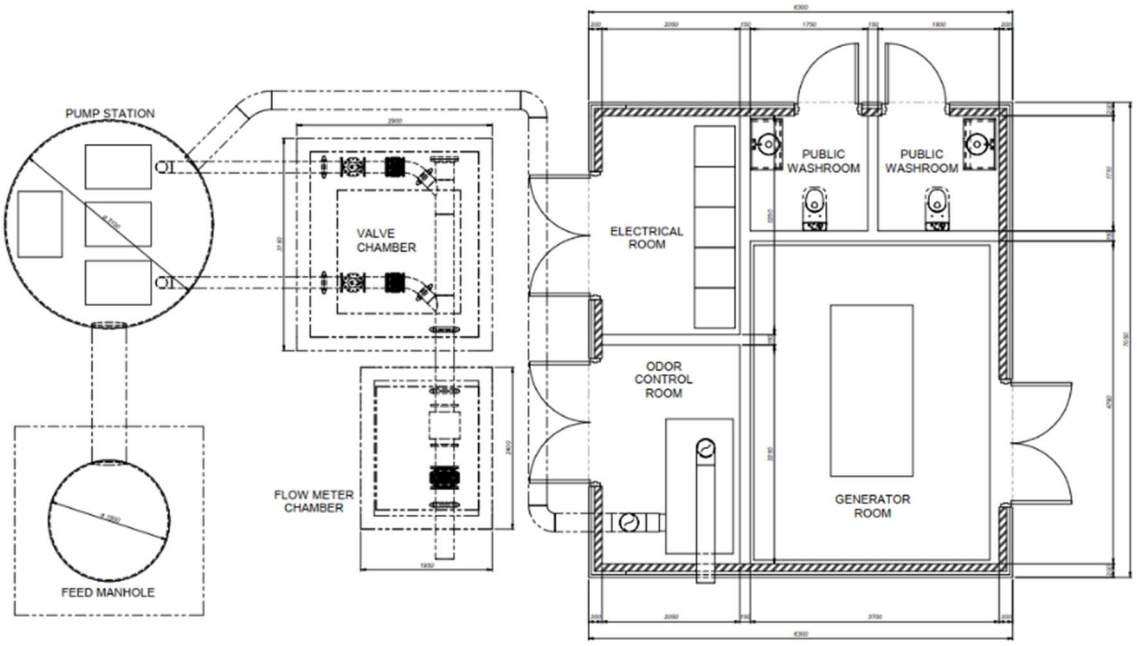

Figure 8: PS#1 Option A Plan

The 3.1m diameter wet well is sized to receive 72 L/s. To limit the standing/retention time of the sewage in the wet well, the operating levels can be reduced to ensure shorter standing time by pumping a smaller volume per cycle.

The configuration will also include a flowmeter located on the forcemain with an isolation valve for maintenance and a valve chamber with a separate hatch access. The pumps will be removed by a crane truck (or other suitable mobile rig) in lieu of an overhead gantry to limit the visual impact of the pump station on local residents.

The configuration of the pump station is shown in **Figure 9** below.

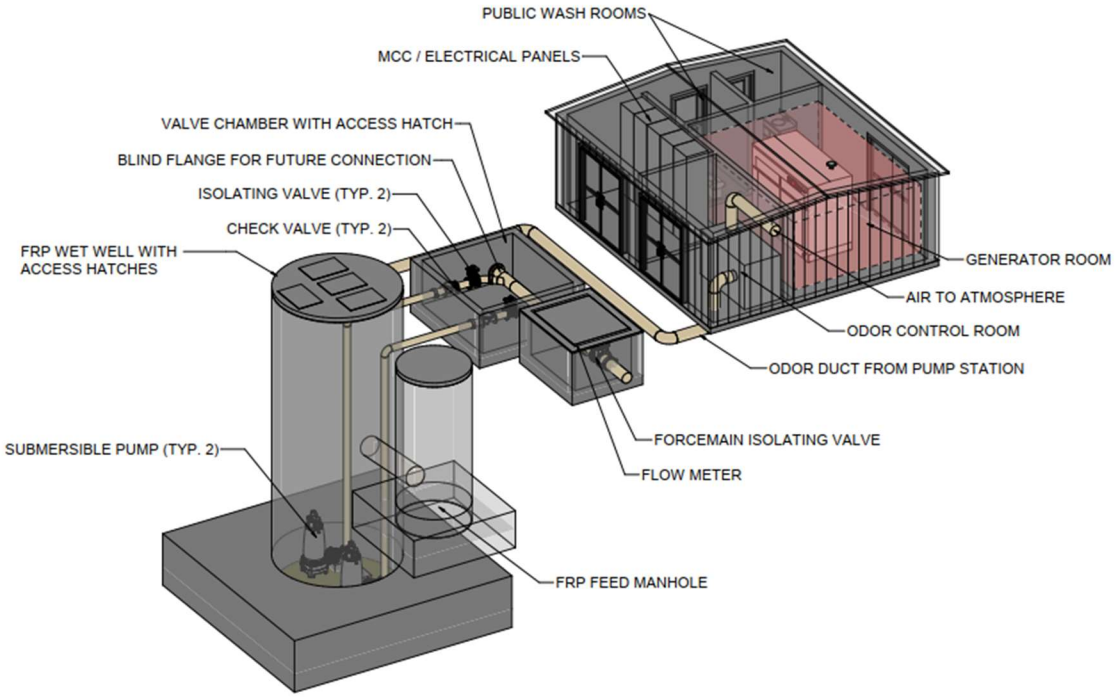

Figure 9: PS#1 Option A Configuration

OPTION B (KIOSKS)

The alternative option (Option B) for PS#1 configuration consists of individual units instead of a control building as shown in **Figure 10** and **Figure 11.** The generator, MCC and electrical kiosk and odour control unit would all be individual unitsFigure 10: PS#1 Option B Plan. The electrical equipment and SCADA system would be housed in the electrical kiosk. The pump station and valve chambers would be below ground level and have a similar configuration to Option A with a feed manhole, isolation valve chamber and flow meter chamber.

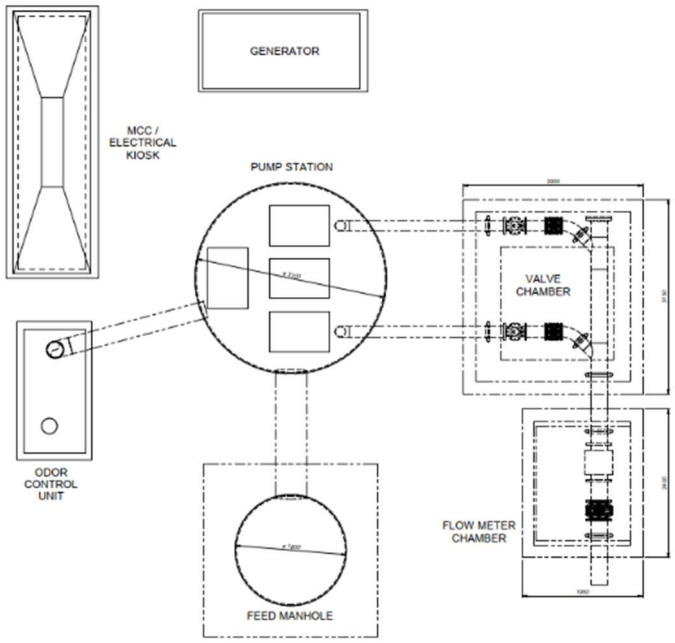

Figure 10: PS#1 Option B Plan

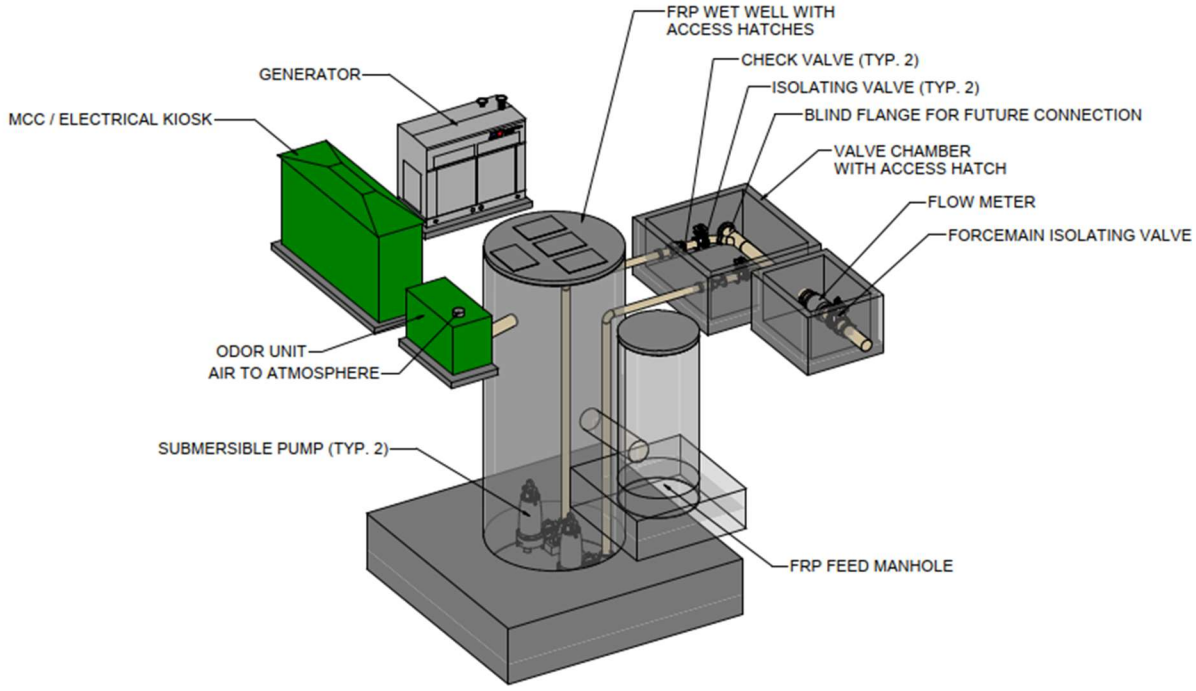

Figure 11: PS#1 Option B Configuration

This configuration requires less space than Option A, however there could be a noise issue during power failures when the generator is operational. The equipment would also be more susceptible to vandalism as they would not be enclosed with a fence or building.

ODOUR CONTROL

At the start-up stage of the project, the incoming flow could be very low compared to the design flows, if certain sub-catchments are not included in the initial collection scheme. The long standing/retention time in the wet well and forcemain may create odours that will need to be treated.

Wastewater contains a large spectrum of organic and inorganic compounds that are degraded by mainly anaerobic, anoxic and aerobic biological treatment processes. At wastewater pump stations, many odorous compounds may be formed, especially under anaerobic conditions as by-products of this natural degradation process.

We proposed to use active carbon adsorption columns for the odour control as default option. The active carbon adsorption columns have the following advantages:

- Simple operation in a variety of applications.
- Additive compounds (caustic, permanganate) can substantially increase the adsorption capacity.
- High air flows can be accommodated in multiple granular activated carbon (GAC) units.
- High removal efficiency of both H_2S and organic sulphur compounds.

The disadvantages are also important to note:

- Activated carbon is imported and expensive.
- Activate carbon has limited life depending on sulphur loading.
- Spent activated carbon must be regenerated and will lose adsorption capacity over time.

2.2.2 PUMP STATION #6

PS#6 is sized to convey a flow of 34 L/s to PS#1. Once PS#3 has been constructed (Phase 1B), PS#6 will pump a minimum flow of 34 L/s and maximum flow of 49 L/s to PS#3. The pump station will have a duty/standby configuration.

PROPOSED PUMP STATION LAYOUT

Two options have been considered for the pump station configuration. Option A, pump station with a building, and Option B, pump station with kiosks, are outlined below.

OPTION A (BUILDING)

The pump station will consist of an FRP manhole for the collection of flow from the catchment areas. This configuration also provides the possibility of constructing a future manhole pump station in the future if this should be required, without the need to isolate PS#6. PS#6 will have a 3.1m diameter FRP wet well and two submersible pumps with quick release couplings to remove the need for manual removal of the pumps. The wet well is sized to allow for the future installation of a third pump within the same wet well. The initial two pumps will be NP3171SH 35HP pumps with 100 mm discharge connections. For the future phases, a third NP3171SH 35HP can be installed in the wet well. The conceptual layout is shown in **Figure 12**.

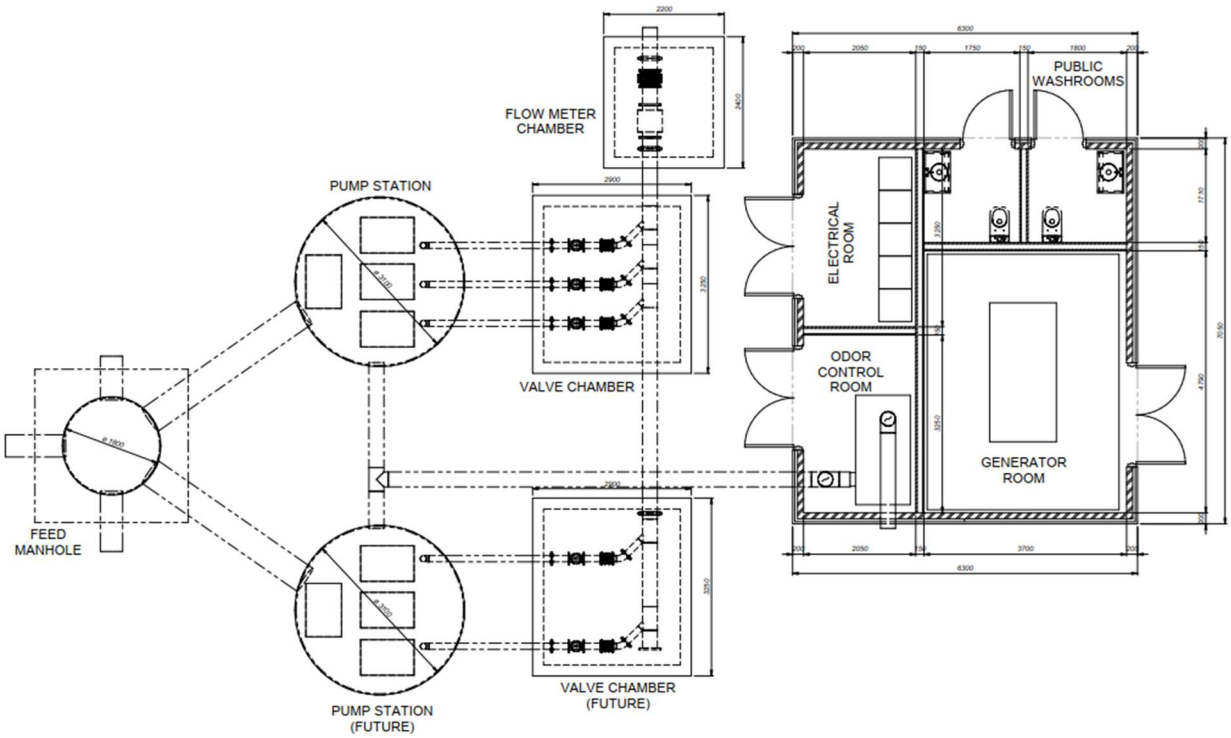

Figure 12: PS#6 Option A Plan Layout

The pump station will have a flowmeter chamber with a flow meter and isolation valve. Each pump outlet pipe will have an isolation valve and a non return valve in a valve chamber with a separate access hatch to the wet well. The pumps will be removed by a crane truck in lieu of an overhead gantry to limit the visual impact of the pump station on local residents.

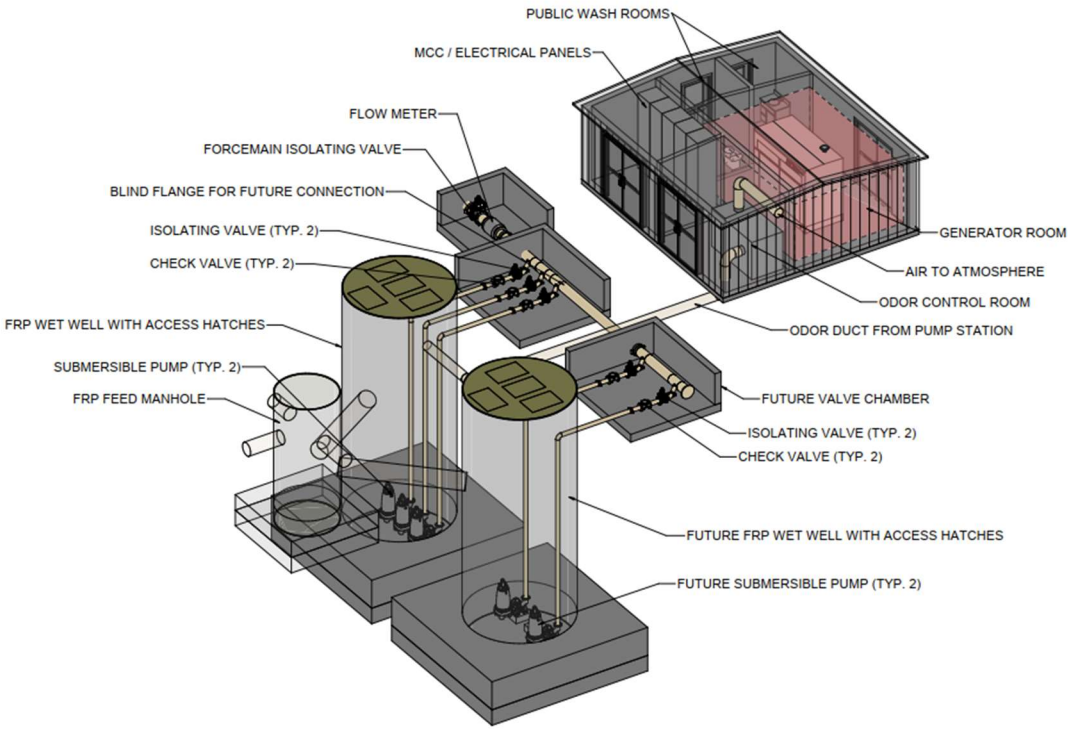

Figure 13: PS#6 Option A Configuration

Additional features of the pump station include a control building with a backup generator and an onboard fuel tank, an odour control room, and an electrical room to accommodate the electrical equipment and SCADA system as shown in **Figure 13**. The building will also house public washrooms.

OPTION B (KIOSKS)

Similar to PS#1, PS#6 Option B configuration consists of individual units for the generator, MCC and electrical and odour control as shown in **Figure 14** and **Figure 15** below. The electrical equipment and SCADA system will be housed in the electrical kiosk.

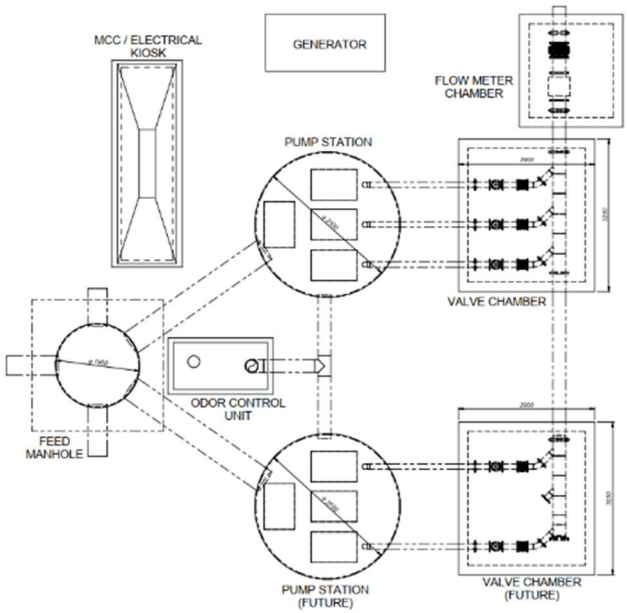

Figure 14: PS#6 Option B Plan Layout

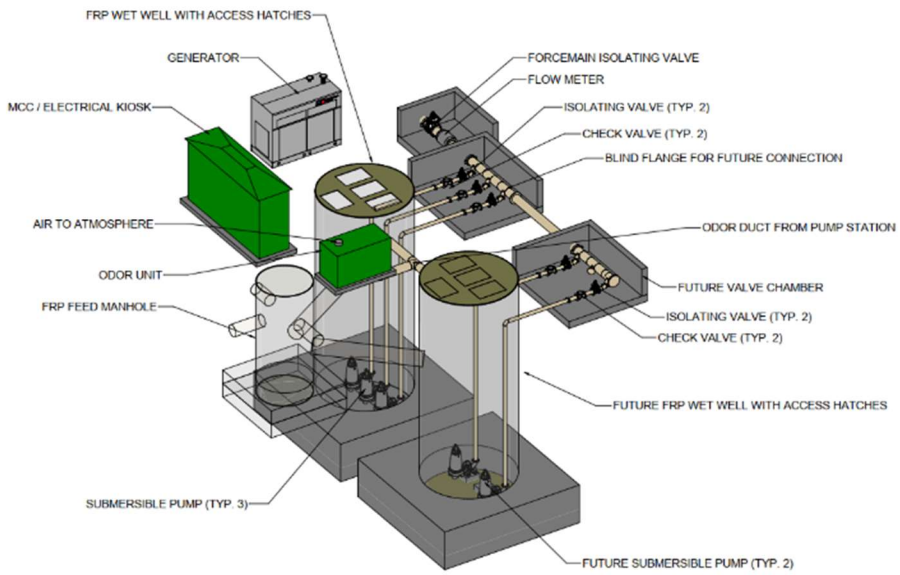

Figure 15: PS#6 Option B Configuration

The other elements of the pump station configuration are similar to Option A, with below ground wet well, valve chamber and flow meter chamber. This option has similar issues as PS#1, with a risk of vandalism and noise issues when the generator is in operation.

ODOUR CONTROL

Similar to PS#1, the incoming flows at system initiation will be low compared to the ultimate design flows, as the initial level of development and areas serviced by the collection system is smaller than the ultimate build out. With the initial low flows, long standing/retention time in the wet well and forcemain may create odour issues.

Wastewater contains a very large spectrum of organic and inorganic compounds that are degraded by mainly anaerobic, anoxic and aerobic biological treatment processes. At wastewater pump stations, many odorous compounds may be formed, especially under anaerobic conditions as by-products of this natural degradation process.

We proposed to use active carbon adsorption columns for the odour control as default option at PS#6 as well. Refer to Section 2.2.1 for advantages and disadvantages of active carbon adsorption columns.

2.2.3 PUMP STATION LAYOUT COMPARISON

The two options for the layout for PS#1 and PS#6 has been outlined in the sections above. There are two options, pump station with control building (Option A) and pump station with kiosks (Option B). The advantages and disadvantages of the options are summarized in the table below.

Table 1: Pump Station Layout Comparison

	OPTION A (BUILDING)	OPTION B (KIOSKS)
Advantages	• Opportunity for public facilities provided (washrooms)	• Reduces visual impact of the pump station • Lower cost associated with kiosks

Disadvantages	• Visual impact of the pump station building • Higher costs for construction of building	• Does not provide opportunity for any public facilities • Risk of vandalism • Increased noise, in particular if the genset is operating

2.3 FUTURE REGIONAL PUMP STATION

The Future Regional Pump Station will be constructed in the Future Phase of the project. It will convey a minimum flow of 80 L/s and maximum flow of 229 L/s to the Courtenay River Siphon. In the design flow scenario, the pump station will be conveying flow from all seven pump stations to the Courtenay River Siphon. There is also the potential for an additional 75 L/s from South Courtenay which will increase the flow to 304 L/s via two forcemains. The location of this regional pump station has not been confirmed and has not been included in this phase of design.

The primary reasoning for the addition of a regional pump station is due to the limited space available at the position of PS #1 as well as the visual impact for the community of a large pump station on the waterfront. Further to the construction of the regional pump station, the proposed position of PS#1 is within the Coastal flooding zone. The chosen position of the regional pump station should be outside the coastal flood level ensuring this pump station is not damaged should a coastal flood occur.

2.4 MITIGATION

VISUAL

As outlined in Section 2.3, the addition of the Future Regional Pump Station is to mitigate a number of concerns with having a large pump station at the location of PS#1. The addition of the Future Regional Pump Station reduces the size of pump station required for PS#1 which is proposed to be located at the waterfront along Marine Drive. The reduced pump station size at PS#1 reduces the visual impact for the local community at this location.

The option of constructing the kiosks and units rather than a control building further reduces the visual impact of the pump station; this is particularly beneficial for PS#1.

CLIMATE CHANGE

The location of PS#1 is within Coastal Zone 64 which has a flood level of 5.1m according to the floodplain maps. The addition of the Future Regional Pump Station at a location out of the coastal flooding zone will ensure that the large pump station is undamaged from coastal flooding. Flooding impacts will be limited to the smaller PS#1. There are several measures that can be incorporated into the design to reduce the risk of damage from a flood event at PS#1. Refer to Section 2.1.1 for the mitigation measures discussed.

ODOUR

As outlined in Discussion Paper #1, the wet wells are initially oversized to the volume of in the incoming flow. This may lead to increased retention time and so active carbon adsorption columns for the odour control are proposed for PS#1 and PS#6 as discussed in the previous sections.

2.5 COST ESMITATE

2.5.1 CAPITAL COST

As discussed in Discussion Paper 1, at the preliminary design stage of projects a Class “C” cost estimate is prepared. The Class “C” cost estimate has a 30% contingency to account for any unforeseen changes in detailed design.

The “Class C” cost estimate of PS#1 and PS#6 in Phase 1A is summarised in **Table 2**. The summary costs of Option A for both pump stations and Option B for both pump stations are outlined in the table.

Table 2: Cost Estimate Summary

ITEM	DESCRIPTION	OPTION A	OPTION B
1	**Pump Station 1**		
1.1	Earthworks and Site Works	$ 67,000	$ 52,000
1.2	Building	$ 223,000	$ 100,000
1.3	Mechanical	$ 675,000	$ 528,000
1.4	Electrical	$ 471,000	$ 453,000
	Subtotal Item 1	$ 1,436,000	$ 1,133,000
2	**Pump Station 6**		
2.1	Earthworks and Site Works	$ 70,000	$ 49,000
2.2	Building	$ 201,000	$ 100,000
2.3	Mechanical	$ 632,000	$ 451,000
2.4	Electrical	$ 405,000	$ 453,000
	Subtotal Item 2	$ 1,308,000	$ 1,053,000
3	**General (Pump Stations)**		
3.1	Mobilization and demobilization (~3%)	$ 90,000	$ 80,000
3.2	Health and safety (~3%)	$ 90,000	$ 80,000
3.3	Environmental protection plan and monitoring (~3%)	$ 90,000	$ 80,000
3.4	Allowance for water management and bypass pumping (~3%)	$ 90,000	$ 80,000
3.5	Sediment and Erosion Control	$ 90,000	$ 90,000
3.6	Coordination with Hydro	$ 50,000	$5 0,000
	Subtotal Item 3	$ 500,000	$ 460,000
	Subtotal All Items	$ 3,244,000	$ 2,646,000
	Contingency (30% of Subtotal)	$ 974,000	$ 794,000
	Engineering (10% of Subtotal + Contingency)	$ 422,000	$ 344,000
	Total	$ 4,640,000	$ 3,784,000

The following general assumptions were used for preparing the cost estimate:

- Pump cost for PS#1 based on 1 duty + 1 standby, Flygt Model NP 3301 HT, 468 330mm impeller, 63 kW (85 HP), 600 V, 3 phase. Cost for upgraded pumps not included.
- Mechanical installation is based on 2 people, 15 days, $100/hr
- Odour control is assumed to be Pureair Odor Control Unit w/ Dry Chemical media, draw thru blower, mist eliminator - 250 cfm, w/ 1.5 HP motor, 600V/3 Ph, Class 1 Div 1 rated. A detailed study is required to confirm the odour control.
- Paving area estimated as $100m^2$ for option A and $50m^2$ for Option B, area to be confirmed at detail design.
- Option A cost include costing of a concrete pump station building, with separate underground wet well, flowmeter and valve chambers. Option B cost include costing of individual kiosks and units for the MCC, odour control and genset, with separate underground wet well, flowmeter and valve chambers.

2.5.2 OPERATING COST

The operating costs of PS#1 and PS#6 are presented in **Table 3** and **Table 4** below. The annual O&M costs includes operating costs, energy costs and maintenance costs per year. The non-annual replacement cost includes the replacement of pumps (every 25 years) and electrical equipment, HVAC and Odour Control and Genset (every 20 years) for the 50-year life cycle period.

Table 3: PS#1 O&M Cost

O&M COST ITEM	PS#1 (OPTION A)	PS#1 (OPTION B)
Annual Operating Cost		
Overhead	-	-
Operator Salary	$91,000	$91,000
Subtotal	**$91,000**	**$91,000**
Annual Energy/Fuel Cost		
Average Annual Pump cost	$10,868	$10,868
Energy (HVAC/Lighting/Odour/Plumbing)	$31,663	$1,666
Genset Fuel	$7,200	$7,200
Subtotal	**$49,732**	**$19,734**
Annual Maintenance and Repair Cost		
Building Maintenance	$4,460	-
Process Mechanical Maintenance	$4,200	$4,440
Process Electrical Maintenance & Genset	$8,880	$8,880
Odour Control & HVAC Maintenance	$6,350	$5,100
Subtotal	**$23,890**	**$18,420**
Total Annual O&M Costs	**$164,622**	**$129,154**
Non-annual Replacement or Upgrade Cost		
Replacement	$$748,000	$$664,000
Total Non-Annual O&M Costs	**$$748,000**	**$$664,000**

O&M COST ITEM	PS#1 (OPTION A)	PS#1 (OPTION B)
LCC		
Total Net Present Value (NPV)	**$15,177,689**	**$10,538,323**

Table 4: PS#6 O&M Costs

O&M COST ITEM	PS#6 (OPTION A)	PS#6 (OPTION B)
Annual Operating Cost		
Overhead	-	-
Operator Salary	$91,000	$91,000
Subtotal	**$91,000**	**$91,000**
Annual Energy/Fuel Cost		
Average Annual Pump cost	$3,510	$3,510
Energy (HVAC/Lighting/Odour/Plumbing)	$31,663	$1,666
Genset Fuel	$7,200	$7,200
Subtotal	**$42,374**	**$12,376**
Annual Maintenance and Repair Cost		
Building Maintenance	$4,020	$0
Process Mechanical Maintenance	$3,700	$3,670
Process Electrical Maintenance &Genset	$8,940	$8,880
Odour Control & HVAC Maintenance	$6,350	$5,100
Subtotal	**$23,010**	**$17,650**
Total Annual O&M Costs	**$156,384**	**$121,026**
Non-annual Replacement or Upgrade Cost		
Replacement	$745,250	$655,250
Total Non-Annual O&M Costs	$745,250	$655,250
LCC		
Total Net Present Value (NPV)	**$13,988,260**	**$9,712,446**

The following general assumptions were used for preparing the cost estimates:

— All costs are in 2022 dollars,

— Building maintenance annual costs are 2% of the building capital costs, process mechanical maintenance process and electrical maintenance annual costs are 1% of equipment capital costs

— Net present value costs are based on 50 years of operation, maintenance, and component replacement,
— All taxes are excluded,
— Inflation and escalation to account for actual expected prices at the time of tendering have not been accounted for at this time, and
— Life cycle costs have been estimated based on inflation factor of 1.48 %, energy cost escalation of 3.0% and the present value factor of 2%.

APPENDIX

B-5 TACPAC #2 MINUTES

Comox Valley REGIONAL DISTRICT

Minutes

Minutes of the meeting of the Sewer Extension South (SES) Liquid Waste Management Plan (LWMP) Addendum Joint Technical and Public Advisory Committee (TACPAC) held on November 23, 2022 in the CVRD Civic Room at 770 Harmston Avenue, Courtenay, and via Zoom conference commencing at 9:01 am

PRESENT:

A. Habkirk, Facilitator	Facilitator
R. Dyson, Chief Administrative Officer	CVRD
J. Warren, Deputy Chief Administrative Officer	CVRD
M. Rutten, General Manager of Engineering Services	CVRD
D. Monteith, Manager of Liquid Waste Planning	CVRD
V. Van Tongeren, Environmental Analyst	CVRD
A. Mullaly, General Manager of Planning and Development Services	CVRD
M. Briggs, Branch Assistant – Engineering Services	CVRD
I. Snyman	WSP
M. Levin	WSP
D. Wilson	Zinc Strategies
S. Ashfield, Town of Comox	TAC
E. Derby, Island Health (Alternate)	TAC
R. Beise, Island Health (Alternate)	TAC
T. O'Dell, Ministry of Agriculture and Food	TAC
M. Mamoser, Ministry of Environment and Climate Change Strategy	TAC
L. Johnson, Ministry of Health	TAC
D. Arbour, Electoral Area A Director	PAC
I. Munro, Electoral Area A Alternate Director	PAC
M. Hewson, Association for Denman Island Marine Stewards	PAC
N. Prins, BC Shellfish Growers Association	PAC
M. Cowen, BC Shellfish Growers Association	PAC
C. Pierzchalski, Comox Valley Conservation Partnership	PAC
A. Gower, Comox Valley Chamber of Commerce	PAC
I. Heselgrave, School District No.71	PAC
M. Atkins, Underwater Harvesters Association	PAC
N. Prince, Craigdarroch Resident Representative	PAC
R. Steinke, Craigdarroch Resident Representative	PAC
T. Donkers, Royston Resident Representative	PAC
K. Newman, Royston Resident Representative	PAC
J. Elliott, Union Bay Resident Representative	PAC
R. Lymburner, Union Bay Resident Representative	PAC

Item, Time	Description	Owner
2.1 9:01-9:04am	**Call to Order and Territorial Acknowledgement** The meeting was called to order at 9:01 am. The CVRD acknowledged that the committee is meeting on and the proposed Sewer Extension South Project will be constructed and operated on the traditional unceded territory of the K'ómoks First Nation. MOTION: Adopt the agenda – A. Gower SECONDED: R. Lymburner CARRIED UNANIMOUSLY	**A. Habkirk**
2.2 9:04-9:09am	**Welcome and Introductions** The committee members introduced themselves to the committee.	**A. Habkirk**
2.3 9:09-9:13am	**TACPAC Meeting #1: Minutes, follow-up items** D. Monteith addressed a question from TACPAC meeting #1: can we set water quality requirements within the area after the LWMP is adopted? Water quality criteria and restriction of discharges to sensitive water bodies can be included in scope of the LWMP addendum for those areas proposed to be serviced by project. Process could include bringing forward technical memo outlining considerations and then developing a policy. M. Mamoser explained that the TACPAC can develop a policy as part of the LWMP addendum, but would need to be approved by the Minister and include evidence that stakeholders were consulted. Would not affect current applications until LWMP is approved, and then would impact any future applications or amendments to ongoing applications, since they cannot conflict with the LWMP. Comment: This process is for future development, since it would only apply to systems that have a discharge of 22,700L/day as governed by the Municipal Wastewater Regulation. MOTION: Adopt the minutes of the September 21, 2022 SES LWMP Addendum Joint TACPAC meeting – I. Munro SECONDED: R. Lymburner CARRIED UNANIMOUSLY	**A. Habkirk & D. Monteith**
2.4 9:13-9:32am	**Recap: Project overview, purpose and objectives** A. Habkirk introduced the topics to be discussed and set the goals for the day. D. Monteith gave a recap of the previous TACPAC meeting and summarized the history of wastewater planning in Electoral Area A. Provided an overview of the LWMP process, which includes the Sewer Extension South LWMP serving as addendum to the Comox Valley Sewer System (CVSS) LWMP, ending in a combined Stage 3	**A. Habkirk & D. Monteith**

	LWMP. Reviewed overall project concept, which includes a 13km forcemain from Union Bay to Courtenay, local collection systems and pump stations. Q: Was a crossing from Gartley Point to Goose Spit considered? A: Not considered in most recent technical analysis but was looked at during South Sewer Project. Concerns about raw wastewater crossing the estuary. Q: Doesn't it already have to cross somewhere? A: Currently crosses at Courtenay River siphon, which has capacity for south flows and is a much shorter crossing. A. Habkirk acknowledged that the project is heavily focused on connection to CVSS due to other options having been removed due to previous studies or referendums, and requested that the committee share any concerns with this focus. Past analyses can be provided if requested. Q: Do we have information on how the boundaries were determined that the committee can share? A: Planning process based on past work, so boundaries are historic boundaries. Based on residential lot density and cost impacts. Q: Noted that Cameron Estates not included. Wouldn't it be more cost effective to include as many properties as possible, especially the more concentrated areas? A: The committee can consider recommending specific neighbourhoods be added to the service area if there is interest. Would need to consider system age, lot size and costs for connection in the analysis. Staff can provide additional information on boundaries. Q: Has age been considered for included properties? Old or new systems will have to connect. Need to communicate how those who have installed new systems will be accommodated or compensated. A: Generally looking at cumulative impact of septic systems. Will present later during meeting on this topic. Q: Would the conveyance line have capacity for future flow volume not included in initial phase? A: Planning includes entire proposed service area. Comment: Union Bay residents are concerned about communication. There haven't been letters since TACPAC formed, so follow-up letters would be appreciated.	
2.5.1 9:32-10:20am	**CVRD Updates** **Septic system records (Island Health)** R. Beise provided a high-level overview on septic systems. Septic systems provide an environmentally friendly and economical solution	**R. Beise**

	when no domestic wastewater treatment system exists, but failing systems may pose significant risk to environment. Typical lifespan is 15-40 years depending on type. Type 1 system requires less maintenance but is designed to slowly fail and be replaced at end of life. Type 2 and 3 systems require more maintenance and involve engineered treatment. Q: Are all three types of systems permitted now or did the regulation change at one point? A: All included in Sewerage System Regulation (SSR). Complexity of system depends on property constraints (setbacks, property lines, water bodies, onsite soil conditions, lot size, etc.). Island Health (IH) recommends minimum lot size of 1Ha for properties with well water and 0.2Ha for properties with municipal water. Explained how treatment in septic system works. Wastewater treated in septic tank and then effluent is moved to distribution system and dispersed to ground. Responsibility for maintenance placed on owner. Must be done by Authorized Person (AP), which includes Registered Onsite Wastewater Practitioners (ROWP) and Professional Engineers (P.Eng.), or under supervision of AP. Q: Is P.Eng. required for Type 1-3 systems with over 9,100L/day or just Type 3 system no matter the flow? A: P.Eng. can approve all systems, but P.Eng. is required for Type 3. Shared example of Capital Regional District (CRD) septic system bylaw requirements. Type 1 must pump out tank every 5 years. Type 2 and 3 must have AP provide maintenance plan and complete annual maintenance. Estimated costs for septic system replacement were shared: $10k-20k for Type 1, $20k-30k for Type 2, and $30k-50 for Type 3. These estimates are likely low. Q: Is there any CVRD bylaw for septic systems? A: No bylaw at moment, but will speak to this later. Q: Septic regulation bylaws are a moot point if no enforcement. How can these be enforced? A: CRD has compliance threshold. Does not often resort to hard enforcement but may send warning letters. Q: Are there any provincial guidelines?	

	A: Requirement for maintenance is included in SSR, which covers systems under 22,700L/day. Some measures for enforcement included, but delegated to local health authorities. For health authority to enforce, they need to issue order under Public Health Act, but this requires active health hazard. Comment: Only ever seen enforcement in response to a complaint. Response: IH is keeper of septic documents and permits, and addresses complaints. Q: If IH's role is to ensure all buildings with plumbing have system in compliance and IH is not ensuring compliance, are they then not carrying out their mandate? A: Regulatory change in 2005 saw shift of obligation to AP and removed direct role of IH from ensuring correct installation and maintenance of septic systems. IH may investigate instances where non-AP installing or maintaining systems, as well as following up on complaints. Comment: Local government also involved in septic systems because local government won't approve building permits unless evidence shown that property will have sewer servicing. Comment: CRD sets policy for septic systems, so CVRD could follow a similar method. Staff clarified that the Ministry of Transportation and Infrastructure is the approving authority for rural areas. Ultimately comes back to AP and reliance on their approval of a system. Statistics on septic systems were shared with the committee, which included the total number of lots in Union Bay, Craigdarroch and Royston with septic systems that are below the 0.2Ha IH recommendation for minimum lot size and without any septic records. Also included age of systems and system types. Noted that 30 per cent of all lots had no septic records, indicating they were likely built before requirement of records (pre-1970s) or installed without a permit. Q: Is it fair to assume that the 30 per cent of lots with no records are likely older septic systems? A: Yes, systems would most likely predate 1970s. Q: Did the breakdown of system type assume that the systems without records were Type 1 or were those numbers not included? A: Excluded, since nothing can be interpreted from them without records.	

	Q: Did Type 2 and 3 systems exist pre-70s? Is it safe to assume most unknown systems are Type 1? A: Unsure if Type 2 and 3 existed, but legislation at time tended to push people to install Type 1. May have had alternative designs, which would have required approval of health authority to install. Likely that unknown systems are Type 1. Lot size and proximity to ocean likely will require more complex and expensive options when replacing failing systems. Without records of system, would require entire system to be dug up to verify what is there before repairs or upgrades, so replacing system may be cheaper option. Without regular maintenance, Type 1 has lifespan of 10-15 years. Estimated replacement and maintenance cost over 25 years: $25k for Type 1, $60k for Type 2, and $80k for Type 3. Q: When discussing need to replace system, this would be based on system failure rather than just age? Is it possible there may be older systems functioning properly? A: Yes, need to replace system is based on failure. Older systems may be functioning properly. Q: Without evidence of failure, how can we tell if older systems are prone to failure? How many complaints has IH responded to in the proposed service area over the last five years? A: Don't have numbers available, but there have been complaints in the area. Complaints is one way of telling when system is failing. System may be failing in area where not noticeable. CVRD staff noted that a groundwater study was conducted for the area showing evidence of failing systems. When following up on complaint and finding evidence of failure, IH follows up with health order. Usually greatest issue with ensuring compliance is lack of funds to replace system. Connection to municipal service can often be amortized through property tax, and frees up space where field was located. Q: Should include comparison of both capital and maintenance costs, as well as impact on property taxes, for septic systems and to connect to municipal system. Do we know incremental costs to connect to municipal sewer service? A: Will cover per property and annual costs at next meeting. Comment: Would appreciate cost comparison showing cost to homeowners rather than just overall costs.	

	Comment: May see changes to groundwater flow and nutrients when taking all these properties off septic. May see trees drying up and thus leading to change in water use, such as additional irrigation. Should consider potential impacts and plan accordingly.	
2.6 10:20-10:32am	**Break** The committee broke for recess at 10:20 am and reconvened at 10:32 am.	
2.5.2 10:32-10:43am	**CVRD Updates (continued)** **Septic system regulatory options** V. Van Tongeren gave an overview of septic system regulatory options. CVRD launched septic education workshops in 2018, and a maintenance program options study was completed in 2020 that determined Royston and Union Bay as priority areas for septic failure. Maintenance program options include mandatory pump-out, mandatory inspection, and mandatory inspection and maintenance, with estimated costs ranging from $330k to 1.8 million. Maintenance program can have limited effect in resolving septic issues in areas with high density, poor soil quality, and high winter water table. Q: Are program costs for regulatory efforts, not mandatory pump ups? A: Costs presented include administrative and enforcement costs and mandatory pump outs. Mandatory pump outs could be paid by owner to reduce program property tax impacts. Option of using zoning bylaw as means of regulating septic systems. Current zoning bylaw allows secondary dwelling, but could revise to restrict secondary dwellings until sewer servicing in place. Comment: Seems unfair to penalize those willing to install septic systems properly. Q: Is it practical to inspect Type 1 systems if they're designed to fail? Sounds like you can't tell they're failing until they fail, so would enforcement even be effective? A: Pump out isn't necessarily all the maintenance that is required. Q: Inspection can spot other issues? A: Can spot issues with condition of tank or field. **Value planning workshop** V. Van Tongeren gave an overview of the value planning workshop held for the Sewer Extension South Project. Third-party review by a team of experts to consider project function vs resources lens.	**V. Van Tongeren**
2.7	**Discussion Paper #1: Forcemain design, costs, phasing considerations**	**I. Snyman**

10:43-11:59am	Ian Snyman provided an overview of Discussion Paper #1. Utilized population projections for service area from 2020 to 2070. Shared map of proposed pump station catchment areas, as well as expected flows (peaking factor, dry & wet weather flows, I&I, etc.) for 2025 and 2070. Large variance of flows, so need to design system accordingly. Need minimum of 0.75m/s velocity, which will limit what size pipe and wet well can be use based on expected flows. Q: Calculations used provincial standards. Will final projections be based on actual water usage? I&I may be less for new system, which may lead to oversizing system. A: Values are conservative. Don't have actual data for some values, so have to go off provincial standards. The longer sewage stands still in the system, the more likely it will become anaerobic and cause odour. Needs to be in motion at all times. Q: What is the overall system design window in terms of years? A: Based on 2070 figures. Q: Do we have the water to support that population base? Has this been planned for? A: Union Bay Water Master Plan recently completed, so good understanding of water capacity. Agreement in place to supply water from Comox Valley Water System to K'ómoks southlands, which covers bulk of supply for water in area. Q: What is the analysis for full build-out for area? What will happen beyond 2070? Development of treaty lands could be size of Town of Comox at full build-out. A: Medium growth scenario used, looking at low, medium, and high growth projections for each area, with projections from UBE used for their development. Expect minimal new development on existing lots. Looking beyond 2070 is difficult due to many unknowns. Not sure when K'ómoks will proceed with development, but designed to be easily scaled. Q: So design or analysis was looked at for full build-out but scaled down? Understand can't design for full build-out without issues with stagnancy and flows due to oversizing. How has the CVRD planned out for future development? Is the density that's used from the Regional Growth Strategy (RGS)? A: RGS plans for 20-year planning horizon. Difficult to plan out so far into future, with accuracy decreasing the further ahead you look. Important to keep both infrastructure and land-use planning in mind moving forward.	

	Comment: LWMP process is meant to be reviewed every five years, so can be revised as new issues arise. Comment: Regional growth proposes significant problem to infrastructure planning. May need to coordinate with land-use planning. CVRD staff noted that there is existing zoning and land-use policies in place. CVRD has also coordinated with K'ómoks for water and sewer. Treaty lands not subject to RGS and other CVRD policies, so collaboration with K'ómoks key to providing service. Q: How can zoning change for sewer for commercial lots? How will commercial properties affect flows? A: Commercial properties were considered, but data shown as population projection for simplicity. Q: Regarding extreme weather events, values show that wet weather events may have large impact on flows. To what extent can we model that? A: Sewage and stormwater should be separate. Shouldn't have to accommodate for it, and should be channeled away from system. New system should have less I&I. Infiltration will dilute system, but impact should be minimal compared to combined systems. I. Snyman detailed the phases of pump stations, with a series of pump stations from Union Bay to Royston required to maintain flows over such a long distance. Phase 1 is focused on Pump Station #6 (PS6) in Union Bay and Pump Station #1 (PS1) in Royston, with PS6 pumping 8km to PS1 and then PS1 pumping to the Courtenay River siphon. Phase 1B includes addition of Pump Station #3 (PS3) near Craigdarroch, connecting between PS6 and PS1. The long-term phasing includes a future regional pump station in Royston, with PS3 and PS1 feeding into it and then pumping on to siphon. Ultimate buildout includes several pump stations and future twinning of conveyance pipeline. Pipeline won't be twinned initially to avoid having to pay now for infrastructure that won't be used for 20-30 years. Better to design infrastructure to allow for easier future installation, with large culvert that adds space for twinned pipe. Q: Is ultimate build-out for beyond 2070? A: Proposed ultimate build-out is for 2070. Q: Has impact on Courtenay River siphon and infrastructure from siphon to treatment plant been considered? A: Provision for south flows being made within CVSS LWMP and CVWPCC site master plan. Sewer System Conveyance Project (SSCP) is for 2100 and proposed to accommodate south flows.	

	Q: If this is to 2070 and SSCP is to 2100, the SSCP then is designed for full build-out? A: Yes. Q: Variation in pump station flows throughout phasing may lead to challenges to design. Will this considered when sizing wet wells and pump configuration? A: Will be addressed in later presentation. Q: Is Kilmarnock included with original pipeline or twinned line? A: Will be included in original pipe. Pumps will be upgraded when line is twinned. Maps of the proposed catchment areas were shared. South Royston Forcemain will be HDPE pipe and follow Highway 19A as much as possible, as most conservative proposal. Q: Any consideration for K'ómoks southlands, especially those closer to Highway 19 (Inland Island Highway), connecting via different route or catchment? A: Other options considered, such as pumping upland and then utilizing gravity main, but forcemain considered best option. North Royston Forcemain runs through City of Courtenay. Route designed to avoid as many utilities as possible. Class C cost estimate for forcemain currently at $31,590,000, including both contingency and engineering. Costs can be further refined as design proceeds, which is accounted for in the contingency. Q: Do these costs exclude UBE and K'ómoks? A: These are overall costs for the system. UBE and K'ómoks contributions may cover part of overall costs. Q: Is $31,590,000 for the entire project? A: Amount is just for the forcemain. D. Monteith advised the committee that the project will need to be phased. First phase will include historic Royston and Union Bay core. Identified as area with most environmental impact. Initial phase is limited in scope to better improve chances of receiving grant funding and to minimize overall costs. Q: So Phase 1 is for the forcemain to Union Bay and piping to individual lots? A: Infrastructure will include forcemain from Union Bay to Courtenay, two pump stations in Royston and Union Bay, and collection system for Royston between Highway 19A and Marine Dr, as well as the core Union Bay area.	

Q: Noticed Royston Elementary not included in Phase 1 despite concerns about septic system. Why is it not included?
A: Investigating options for connecting Royston Elementary sooner rather than later, and will be discussing further with SD71.

Q: Will costs for additional connections in later phases be different amounts depending on available grant funding?
A: Unsure what costs will be, but may be different. Later connections will be paying for their collection system rather than previous infrastructure.
Q: How is that fair? Need to consider that people may want to connect during earlier phase if they think it will be cheaper. Should be able to communicate that those connecting to same sewer system will pay same amount.
A: Two main high-cost aspects of project: the collection systems, and the forcemain and pump stations. Can't guarantee what future costs will be, but will be aiming to keep them as close as possible. Limited by amount of available grant funding. Will be investigating other funding options when looking at installation of later collection systems.

Comment: Royston Elementary is currently 50 per cent over capacity. Septic system is tested annually, and only allows for 315 students. Prefer to be added to earlier phase, and recognize that as larger user would bear greater costs.

Comment: Existing residents make up about 20 per cent of proposed service area, with 80 per cent for future development. Ideally future development should be paying for bulk of costs. Grants ultimately come from taxpayers, so should not rely solely on grants.
Response: Will be looking more in-depth at numbers next meeting. Not intended for residents to pay for future developments.

Comment: Should show that funds from partners will go to shared infrastructure such as forcemain and pump stations.

Comment: Some neighbourhoods will cost more to service, so argument could be made that it's unfair for residents with cheaper connection to pay as much as more expensive connections. Have to balance costs across system and be able to explain these costs.
Response: Phase 1 will service high density areas first because it will be cheaper.

Q: Will we see different costs for different phases and be able to share them?
A: Challenge with knowing when next phase will be developed. Difficult to estimate inflation as well.

	Q: Understood that residents wouldn't have choice to opt out, but earlier stated that neighbourhood can choose to join in later phases. Will it be opt-in/opt-out? A: If neighbourhood costing for an area isn't included in LWMP, an amendment would be required later as areas are added. Could also resort to referendum or Alternate Approval Process. Should be outlined in LWMP how new phases will be added. Must amend LWMP if costs have changed significantly, which requires public consultation and approval by the Minister. Q: Will costs be on property taxes or separate entity? There are many people that defer property taxes, but can't defer certain things. Would especially impact seniors. Would there be option to pay full amount up-front? A: Will discuss these topics at next meeting.	
2.8 11:59am-12:02pm	**Committee Process: Forcemain alignment, project phasing** D. Monteith explained the committee process and what the TACPAC should prepare to discuss for next meeting. Looking for the committee to make decisions on initial phasing and criteria for future phasing. Comment: Documents roughly cover what costs will be per meter, so can deduce from that what people will be paying. Response: Property connection costs shared are for costs of connecting from house to property line. There will be additional costs for community collection and conveyance infrastructure.	**D. Monteith**
2.11 12:02-12:35pm	**Lunch** The committee broke for lunch at 12:02 pm and reconvened at 12:35 pm.	
2.9 12:35-1:10pm	**Discussion Paper #2: Collection system options, cost comparison** M. Levin gave an overview of Discussion Paper #2. Seven collection system alternatives considered: Gravity Sewer (GS) System, Low Pressure Sewer (LPS) System, Vacuum Sewer (VS) System, Septic Tank Effluent Gravity/Pump (STEG/STEP), and combinations of the first three. Gravity requires less maintenance and is preferred where possible, but limited by topography. STEP uses septic tank to treat solids and then effluent is distributed to system. LPS with grinder pumps is similar but utilizes grinder pump to break up solids and distributes all waste to system. VS utilizes centralized vacuum station to pull wastewater towards itself, and works well in flat areas. GS/VS is cheapest option, but VS rarely used in Canada and requires specialists for maintenance and monitoring. GS/LPS hybrid was highest rated system. GS is ideal where usable. Could be impacted by high water table like in Union Bay. LPS has small holding tank on property, meaning sewage is sitting for less time. Less impacted by topography due to pumping.	**M. Levin**

	Comment: With LPS the homeowner owns the pump and the local government only owns from main to the service box. Places additional burden on homeowner. Response: Yes, pump is owned by homeowner. Needs to be properly maintained or may cause blockages in main. May be concerns with pump not working without power, with tank usually having 24-hour storage. Hybrid GS/LPS allows for flexibility and to utilize benefits of both systems. Q: Is the system shown on the Low Pressure Sewer System slide a GS/LPS system? Mentions gravity sewer from house. A: Gravity flow from home to LPS tank. Main is still pressurized. Could have some properties pumping via LPS tank into gravity system, but most neighbourhoods investigated will be either GS or LPS. Short-term conceptual design includes 18 highway crossings, review of GS foreshore installation to replace with LPS, and phased approach to buildout. Q: Which catchment areas are LPS and which are GS? A: Considering LPS for waterfront properties in Union Bay. Most other catchment areas will be gravity. Cost estimate for PS1 catchment area (Royston) is $11,099,000, which includes engineering and contingency. Cost estimate for PS6 (Union Bay) is $10,615,000. Q: Will septic system tanks be connected to system? A: No. Q: Does LPS use old septic tank? A: Will need new tank since smaller size is required, but there is possibility of reusing old infrastructure. Q: With properties where septic tank is not on street side, will the new tank need to be installed in new location? A: Depends on where it makes most sense to have tank. Q: Is there noticeable difference in maintenance costs for the CVRD with LPS with residents maintaining their own tanks? Imagine if resident is paying to maintain own grinder that they will be more careful with what they flush. A: Maintenance costs could be lower for CVRD. Comment: Recommend that pump stations be referred to by location rather than number to make them more recognizable.	

	Q: What is the usability of the two options? With GS can residents be less careful with what we flush into the system since there's no pump to go through? A: Additional material still needs to be screened out, just at treatment plant instead of at tank. Q: So those with LPS will have more to worry about than GS? A: Yes, since they have infrastructure on property. Q: How would we address power outages for LPS? Would a VS work instead with a generator for the vacuum? A: Power failures are a concern. Would have roughly 24 hours of storage in tank. Many communities have LPS systems, so there are examples to look to for dealing with power outages. VS would limit power concerns to one station, but system cannot be used effectively over long distances and requires special training to maintain and monitor. Also risk of blockages impacting suction and causing sewage to sit in the line until vacuum is restored. Comment: Vacuum system would have greater cost overall for residents in comparison to LPS. Q: Can we put the pump chamber in the septic tank? If there is a reason to remove tank, need good explanation for why. A: Agree, but will be on case-to-case basis depending on condition of tank. Using the septic tank for storage may cause odour issues. Comment: Recommend putting pump chamber in septic tank, not using tank as pump chamber. Q: Will certain setbacks be required for tanks? A: Likely yes, but with less conditions. Most setbacks are tied to the dispersal field, which will be eliminated with using the pump. Q: Would location of existing septic system be factor if being used to store pump? A: Location, condition of tank, and costs of keeping in same location but with longer service line that would be considered. Q: Would footprint be less than with septic tank? A: Yes, since no dispersal field and smaller pump chamber. Comment: LPS are often maintenance nightmares. Should resort to gravity wherever possible. Q: Understanding from previous South Sewer Project that it would be deep trench gravity-fed system. What has changed? What would be cost difference between using GS vs LPS for those being considered for LPS? A: System will be primarily gravity-fed. LPS will be for those along foreshore to avoid installing pipe on foreshore.	

	Q: Understood that foreshore properties were originally going to be gravity-fed but changed to deep trenching beneath the road. What are the cost difference between these options and why might this no longer be feasible? A: Deep trench installations have very high up-front capital costs and difficult to justify to owners. Q: Not at discretion of owner what type of system will be used, so will it be moot point from perspective of owner? Residents aren't going to be given an option. A: May be circumstances where LPS is ideal for some properties, in which case the option may be given to the property owner. Q: Can we get a map of those fed by gravity and those with LPS? A: Will be shared later. Q: Will installation of LPS pump chamber be included in project costs and maintenance covered by owner? A: Yes, project will cover costs of pump installation. Infrastructure would become homeowner's responsibility afterwards. Q: Will project pay for gravity connection from house to property line? A: No. Project will only cover pumps and chambers but not connections – same for both LPS and GS.	
2.10 1:10pm-1:15pm	**Committee Process: Collection system options** D. Monteith advised the committee on what input is being sought for next meeting. Seeking decision on proposed configuration and if broader application of LPS vs GS would be preferred. A. Habkirk noted the need to allow time to discuss these options and ask questions at the next meeting. May need additional meeting in new year. Q: Are we voting on this at next meeting? A: Yes, will seek consensus at next meeting after providing more information. If additional meeting is added decisions can be deferred to that meeting. Comment: Archaeology on list but we haven't discussed. Response: Will be bringing forward Environmental Impact Study to next meeting. Comment: Might be worth connecting with Town of View Royal regarding offsets and setbacks since they utilize LPS.	**D. Monteith**
2.12 1:15-1:48pm	**Discussion Paper #3: Pump station design options, cost comparison**	**CVRD**

	Ian Snyman gave an overview of Discussion Paper #3. Provided two options for PS1 (Royston) and PS6 (Union Bay), Option A being the building design and Option B being the kiosk design. PS1 expect low flows at system initiation, so need to mitigate potential odour impacts. Don't want to have constrained access. Option for public washrooms with Option A. Option B has less visual impact. Q: Have you looked at above ground valve chambers? A: Did not include because wanted to minimize visual impact and will have less space constraints. PS6 will start with two pumps, one duty and one standby. Room will be left for additional pumps to address future flows. In future will have a duty pump, assist pump, and standby pump. As with PS1, Option B will have less visual impact. Option A (building) has the advantage of opportunity for public washrooms, but has higher construction costs and greater visual impact. Option B has less visual impact and costs, but does not provide public facilities and is at risk of being vandalized or producing more noise when generator in operation. Comment: For PS1 (Royston), the public washrooms would be considered a disadvantage by neighbours. Proposed locations for PS1 is along Marine Dr near Royston Rd. Chosen due to low-lying area and property within Ministry of Transportation and Infrastructure road right of way. Provided visual comparison of Option A and B for two locations. Q: Will this be a fenced compound? A: Will be up to CVRD and residents. Does not need to be fenced. Q: How high up will this facility need to be to meet post-disaster standards? A: Will just be smaller pump station, with options to move controls across road. Location was originally indicated by 2016 study. It is at risk to future coastal flooding that is a consideration going forward. Comment: May want fencing for security, but could also landscape property. There are examples of pump stations landscaped so you can't tell they're even there. Something to consider when we start looking at designs. Response: Examples of unfenced kiosks in Comox Valley exist, and lack of fencing does significantly reduce visual impact. Comment: Two-story building would avoid flooding risks.	

	Response: Would be expensive to build two-story building and greater visual impact on waterfront. Q: Are we at the level of detail where we are comparing site locations? Royston location may see pushback if not treated sensitively since it's a popular recreational area. A: Locations are presented to committee to discuss and put forward recommendations to Steering Committee. Comment: Very easy to make pump station not look like pump station. Q: Is odour control for the building? A: Odour control takes odour out of the sewage. Q: Is it only included with the building option? A: Will be in both. PS6 (Union Bay) locations proposed on UBE property. Previous LWMP recommended parking lot opposite Highwayman Pub. Future Regional Pump Station will be constructed when additional capacity required, and convey wastewater from all pump stations to Courtenay River siphon. Should be located close to forcemain. Option A (building) estimated to cost $4,640,000 for all pump stations and Option B (kiosk) estimated to cost $3,784,000, including engineering and contingency. Operation and maintenance costs for PS1 and PS6 over 50 years are estimated to be $15,177,689 and $13,988,260 respectively for Option A and $10,538,323 and $9,712,446 for Option B. Q: What does odour control do? Is it down to no smell or minimal smell? A: Goal is to treat all odour. Q: When will we talk about other pump station siting? A: So far just focused on Phase 1 pump stations, but can look at others if TACPAC interested. Q: Will we be reaching a consensus at a later meeting about building type and location? A: Will be considering at a later meeting and putting forward recommendation. Can book an additional meeting if more time is needed for discussion. Comment: Need to lay out what decision points are before each meeting.	

	Comment: Campbell River built a number of pump stations along waterfront with washrooms. Should be considered for areas along walking paths.	
2.13	**Committee Process: Pump station design options** This agenda item was skipped due to time constraints.	
2.14 1:47-1:51pm	**TACPAC Meeting #3 Preview** D. Monteith gave an overview of the next meeting, which will be more focused on discussion than providing information. Staff will be bringing forward a draft Stage 1 Environmental Impact Study, briefing note on sewer service structure, high-level resident costs, and a discussion on committee decisions.	**D. Monteith**
2.15 1:51-1:53pm	**Roundtable** A. Habkirk asked the committee if there were any questions, concerns, or comments about the process for the next meeting. Comment: Communication about project and TACPAC work is important. Should share on social media. Response: Public open houses are scheduled for spring 2023, with one in Union Bay, one in Royston, and one held virtually. Will send out project update with invitation to open houses.	**A. Habkirk**
2.16 1:53pm	**Adjournment** The meeting adjourned at 1:53 pm.	**A. Habkirk**

GENERAL:
The next SES LWMP Addendum Joint PACTAC meeting will be held on December 12, 2022 commencing at 9:00 am in the CVRD Civic Room at 770 Harmston Avenue, Courtenay, and via Zoom conference.

TERMINATION:
The meeting terminated at 1:53 pm.

APPENDIX

C TACPAC MEETING #3 DISCUSSION PAPERS & MINUTES

APPENDIX

C-1 TACPAC MEETING #3 MINUTES

Comox Valley REGIONAL DISTRICT

Minutes

Minutes of the meeting of the Sewer Extension South (SES) Liquid Waste Management Plan (LWMP) Addendum Joint Technical and Public Advisory Committee (TACPAC) held on December 12, 2022 in the CVRD Civic Room at 770 Harmston Avenue, Courtenay, and via Zoom conference commencing at 9:02 am

PRESENT:

A. Habkirk, Facilitator	Facilitator
R. Dyson, Chief Administrative Officer	CVRD
M. Rutten, General Manager of Engineering Services	CVRD
D. Monteith, Manager of Liquid Waste Planning	CVRD
V. Van Tongeren, Environmental Analyst	CVRD
C. Wile, Senior Manager of Strategic Initiatives	CVRD
A. Mullaly, General Manager of Planning and Development Services	CVRD
T. Trieu, Manager of Planning Services	CVRD
M. Briggs, Branch Assistant – Engineering Services	CVRD
I. Snyman	WSP
M. Levin	WSP
D. Silvester	Current Environmental
H. Sungaila	Current Environmental
C. Davidson, City of Courtenay	TAC
N. Clements, Island Health	TAC
E. Derby, Island Health (Alternate)	TAC
M. Mamoser, Ministry of Environment and Climate Change Strategy	TAC
L. Johnson, Ministry of Health	TAC
D. Arbour, Electoral Area A Director	PAC
I. Munro, Electoral Area A Alternate Director	PAC
M. Hewson, Association for Denman Island Marine Stewards	PAC
N. Prins, BC Shellfish Growers Association	PAC
C. Pierzchalski, Comox Valley Conservation Partnership	PAC
A. Gower, Comox Valley Chamber of Commerce	PAC
I. Heselgrave, School District No.71	PAC
N. Prince, Craigdarroch Resident Representative	PAC
R. Steinke, Craigdarroch Resident Representative	PAC
T. Donkers, Royston Resident Representative	PAC
K. Newman, Royston Resident Representative	PAC
J. Elliott, Union Bay Resident Representative	PAC
R. Lymburner, Union Bay Resident Representative	PAC

Item	Description	Owner
3.1 9:02- 9:03am	**Call to Order and Territorial Acknowledgement** The meeting was called to order at 9:02 am. The CVRD acknowledged that the committee is meeting on and the proposed Sewer Extension South Project will be constructed and operated on the traditional unceded territory of the K'omoks First Nation.	**A. Habkirk**
3.2 9:03- 9:05am	**Welcome** The CVRD thanked the committee for their attendance. The CVRD's consultants from Current Environmental introduced themselves to the committee.	**D. Monteith**
3.3 9:05- 9:11am	**Meeting #2: Meeting Minutes, Follow Up Items** MOTION: Adopt the minutes of the November 23, 2022 SES LWMP Addendum Joint TACPAC meeting. – I. Munro SECONDED: R. Steinke CARRIED UNANIMOUSLY V. Van Tongeren addressed questions from the previous meeting. Staff will be providing an update to residents early in the new year. Alternate forcemain alignments such as crossing the estuary were considered during previous LWMP process, but estuary crossing was rejected by the steering committee due to risk of carrying raw wastewater under estuary. WSP investigated an alignment under the estuary and determined it would be far more costly. More information on catchment areas and boundaries, as well as connection of newer septic systems, will be provided at next meeting. Staff have investigated example in Langford where delayed connection for new systems was allowed. Q: Environment risks were substantial for crossing and other options cheaper. Will additional studies be done, especially since Courtenay River siphon is at more environmentally sensitive area? A: Investigated capacity of siphon. Third pipe in place, but not yet used, that can provide capacity until 2060. Comment: Third pipe may be shown in drawings but not actually there. Recommend confirming presence of third pipe.	**A. Habkirk / CVRD**
3.4 9:11- 9:52am	**Draft Environmental Impact Study** D. Silvester gave an overview of the Environmental Impact Study (EIS) and its objectives. Investigated known contaminated sites, including possible sites for pump stations, and investigated low, medium, and high risk sites. 60 sites near alignment identified as possibly contaminated, with 9 designated high risk sites. The committee broke for recess due to technical issues at 9:21 am and reconvened at 9:29 am.	**Current Environmental**

	Investigated potential contaminated sites near Royston pump station, including spill in the 90s on property across street that impacted adjoining properties and the roadway. Union Bay pump station is adjacent to coal sites, with some remediation occurring in the area. Site investigation recommended for all pump station sites. Unsure if investigation done on Union Bay Estates (UBE) roadway where trenching would occur. H. Sungaila gave an overview of environmentally sensitive areas. Investigated 13 possible ecological risks, including various bird and fish species, and four sensitive habitats within 100m around pump station and 30m around forcemain alignment. For Royston pump station, foreshore is considered Sensitive Ecosystem Inventory habitat, which will require mitigation efforts during construction. 70+ possible bird species (13 at risk), a variety of mammals, and 14 possible amphibian and reptile species (four at risk) identified in project area. Five active bald eagle nests in close proximity to alignment (two near Trent River), with potential for Great Blue Heron habitats in area. Ground survey not completed yet, but should be conducted when breeding year corresponds with construction. Nine possible at-risk vegetation species. Invasive species present near pump station locations, and will require special handling and disposal during construction. 15 streams/ditches (nine fish-bearing) within project area. Not expecting interaction with stream channel during construction, but mitigation efforts necessary when working near watercourses. D. Silvester noted that the bird nesting window is March 15 to August 15 and the in-stream reduced risk window is June 15 to September 15 (no direct incursion expected), which may require DFO request for review or *Water Sustainability Act* Section 11 notification. *Contaminated Sites Regulation* requires Phase 2 assessment if contaminated materials moved off-site for disposal. Archaeological permits required from the province and K'ómoks First Nation. Anticipated impacts and overall risk considered low. Q: Are streams unlikely to be directly affected due to forcemain not being very deep in ground? A: Required trenching will be relatively shallow compared to distance between road and culvert. Some maintenance may be required if culverts are damaged or at risk of collapse. Q: Remediation for UBE pump station location was done, but believe it was just covering it with dirt. When will testing be	

	conducted in area to see what is actually there? Will residents be paying for work in UBE lands? A: Method of sampling not yet determined, but recommending that it occur. Will be addressed once have more detailed design. Q: Has a similar study been done for archaeological impact? A: Archaeological study completed in 2015, concluding most of the work will be done in heavily disturbed areas. A: Is pump station #3 in middle of archaeological zone? A: Yes. Q: Is the archaeological report available? A: Can be provided to the committee.	
3.6 9:52:- 11:37am	**CVRD Updates** **Committee Process** D. Monteith reiterated the LWMP process. Gave an overview of the committee structure and process for design making. Involves the TACPAC presenting recommendations to the SES Steering Committee (Electoral Areas Services Committee and Sewage Commission Chair), then decisions sent to Comox Valley Sewerage Service (CVSS) LWMP Steering Committee (Sewage Commission and Electoral Area A Director) and on to the CVRD Board. Goal of TACPAC Meeting #3 and #3.5 to provide recommendations to SES Steering Committee. SES Steering Committee will review recommendations and provide direction to proceed with draft addendum and consult First Nations and public. TACPAC Meeting #4 will review draft addendum and provide comments to be considered by SES Steering Committee and CVSS LWMP Steering Committee. Review addendum report at TACPAC Meeting #5 and direct to steering committees for review before submittal to province. Q: Will grant funding impact the process? A: Recommend committee put forward considerations regarding grant funding. Should form resolutions that consider what if grant funding doesn't happen, but can also acknowledge that it may not be possible without grant funding. **Sewer Service Structure** Amendment to expand CVSS service area adopted in August 2022 to include portions of Electoral Area A. CVSS responsible for conveyance, treatment, and discharge, with Area A contributing to operations and maintenance. Q: Conveyance and pump stations become part of CVSS, but collection systems are separate services? A: Yes.	**CVRD**

	Project Costs Q: Some areas may not see services for 5-10 years. Will they be paying for capital costs when there's no services available? A: Collection system infrastructure expected to be paid by area being serviced. Comment: Example of properties annexed into City of Courtenay who now pay higher taxes but haven't been provided with additional services. Response: Structure being contemplated would not see people paying before being provided service. Regional districts have service establishment option, which allows for only those participating in service to pay for service, rather than collected through broad-based tax. Q: Will grants and project partner contributions be applied only to the conveyance system or collection systems as well? A: Will discuss later. Currently have Class C cost estimate for conveyance infrastructure and Class D for local collection infrastructure. Applied for $26.4M in grant funding, with decision expected in spring 2023. Provided an overview of Phase 1A and why the area was chosen for the initial phase to maximize the grant funding and address environmental risk. Q: Have we discussed later phases for areas in Royston? A: Timing not identified yet, but can discuss later. Q: Will outer areas join during or after Kilmarnock? A: Not determined yet. For properties connecting to CVSS, a Capital Improvement Cost Charge (CICC) is required for related upgrades to CVSS conveyance and treatment works. $6,941 per unit for single family residential property, as defined in Bylaw No. 3008. Q: So any property within service area connecting to system would pay this fee? A: Yes. Same amount as paid through Development Cost Charges in the municipalities. Q: Would the CICC rate be paid for secondary dwellings too? A: Will investigate during break. Q: Are there alternate payment options other than one-time charge? A: Still evaluating options. Phase 1A with grant funding estimated to be $0 per property for shared infrastructure (forcemain and pump stations), covered by	

	project partners and grant funding. Without grant funding, would replace grant contribution with $6.8M in borrowing and require an estimated $13-17k per property for shared infrastructure. Q: Any consideration for parcel tax options? A: Options will be provided later in meeting. Q: Is $13-17k in addition to CICC charge? A: Yes. Q: These charges don't include work required on each property? A: Yes. Q: So there are three components to be paid by property owners: contribution to CVSS (CICC), shared infrastructure, and on-site infrastructure? A: Yes, as well as collection infrastructure. Phase 1A with grant funding estimated to be $13-17k per property for local collection infrastructure. Without grant funding, costs estimated to be $41-45k per property for local collection infrastructure. On a per-year payment schedule, estimated to be $900-1,200 per year for 25 years with grant funding, or $3,900-4,200 per year for 25 years without grant funding. On-lot costs estimated at $1,500-6,500 for connection from home to property line and $1,000-2,000 to decommission septic system. Operation and maintenance costs estimated to be $590 per year. Per property annual costs estimated to be $1,430-1,850 per year with grant funding, or $1,930-2,350 with CICC charges included. One-time costs estimated to be $9,441 or higher with CICC, or $2,500 or higher with CICC paid over time instead. Still evaluating payment options for CICCs. Q: Why was a 25-year term for borrowing chosen when infrastructure has a closer to 100-year lifetime? Does this mean it's no longer on taxes after 25 years? A: Wouldn't be on taxes after term is up. Option to look at 30-year term, but don't believe terms longer than 30 years currently offered. Q: What does it cost if we don't do this? People likely to not like additional costs. Need to provide comparison of costs if properties stayed on septic, including costs if inspection and maintenance program implemented. A: Expect that once inspected, most older systems will need to be replaced. Could see $25-50k cost for replacement, $1-1.6k for annual inspection and maintenance, and $200-300 for septic regulatory program annual parcel tax.	

	Q: How can that be represented as an annual cost comparison? Average homeowner will want to see simple comparison of numbers. A: Benefit of public sewer service is the option to borrow over a long term and to distribute costs over many users, while septic system will place burden on individual property owners. Also need to consider asset life, with septic systems needing to be replaced over time. Q: What about next phases? May have very different charges per property for each phase, since grant funding may be different or absent. Should be able to include mechanism in place to ensure same charge for all users. A: Will be discussing costs for future phases at next meeting. Can look at different cost sharing structures, with or without grant funding. Comment: Need to consider the difficulty of keeping phase costs the same when some of them are 5-10 years away. Q: Why is UBE excluded from Phase 1A? A: UBE is responsible for the costs of their own infrastructure. First phase includes initial infrastructure that will include additional costs, such as the forcemain, while additional phases will require less infrastructure and likely see smaller grant amounts required. Can include language that adds principles in plan to help level costs for phases. Q: Everyone needs to know they're being treated fairly. Phase 1A said $0 for shared infrastructure with grant funding. How will costs for future pump stations be addressed? A: Kilmarnock pump station will be considered regional infrastructure. Comment: Doesn't seem fair that a future phase may need to pay for pump station infrastructure when first phase may not. Comment: Do see fairness in that as phases join they pay for their pump station. Comment: First phase pays less and benefits from service. Parcel tax contemplated to cover borrowing costs, which is eligible for deferral. Q: These cost associated with the sewer connection that are eligible for deferral, does the province transfer the funds to the services?	

	A: Yes, province will contribute to service to make up for deferral. Property owner will owe to province rather than the service. Q: What portion of costs are eligible for deferral? A: Borrowing costs for capital infrastructure.	
3.5 10:37-10:56am	**Break** The committee broke for recess at 10:37 am and resumed its session at 10:56 am.	
3.7 10:56-11:57am	**Committee Process / Questions** A. Habkirk discussed the motion process with the committee. **Costs** D. Monteith requested any questions or comments regarding costs. What considerations regarding funding support would the TACPAC like to see included in the plan? Will be discussing more on costs of future phases at next meeting. Q: Is Plan B septic system inspections? Q: Yes, that is what was put forward at last meeting. Presenting language on option is something that can be considered by the committee. Q: Is there an option for both sewer and septic? Most people think cost of septic is zero as long as no maintenance required. Septic enforcement may seem like a threat and people might not think it is a reality. A: CRD does have active enforcement. Q: If both sewer and septic are options, wouldn't that imply inspections required for those remaining on septic? Wouldn't staying on septic also not be possible since connection to sewer is still required to ensure costs are still equitable? A: Septic inspection may serve as holdover for those neighborhoods joining in later phases. Q: So wouldn't be septic maintenance program for Phase 1A but would be implemented for later phases? A: Staff can investigate further. Comment: Inspections should be conducted or organized by CVRD or Island Health (IH), since a Registered Onsite Wastewater Practitioner would benefit from additional work to replace a failing system. Q: Is CICC a one-time payment or paid over time? A: Both options proposed during last project. Comment: Would be useful to know what the one-time upfront cost would be.	**A. Habkirk / CVRD**

	Comment: No matter what option goes forward, a service for septic inspection and maintenance should be implemented. Comment: Committee should direct staff through motions to prepare analyses and information to help make key decisions at end of next meeting. MOTION: That staff prepare an analysis showing the estimated costs per connection by implementation phase, presuming no further grants and no further contributions from partner organizations, and further that staff present options and recommendations with respect to creating equitable costs per connection across all phases. – I. Munro SECONDED: R. Lymburner Further discussion was requested by the committee. Q: Can staff provide minutes and terms of reference? A: Should be included in agendas, but can distribute later. Q: In regards to equitable costs, different areas and different phases will have different costs. Are we proposing that phases that may cost less to connect will be subsidizing phases with higher costs? A: Yes, intention of motion is to make costs equal. From homeowners' perspective, they are using the system the same way as everyone else, so why would their costs be higher than others. Costs per property shouldn't be determined by circumstances such as geography or grant availability. Q: How do we define fair? Do we define it by geographical terms or timing? Need to reach consensus on definition. A: Staff should propose options and recommendations on what should be considered equitable. Example of equitable could be property assessment, water taken into house, pay the same as neighbor, etc. Q: How do you obtain that degree of equitableness when the service isn't already established? How do you fund the project and maintain the same costs from now compared to 10 years later? Q: Can we investigate options from other municipalities? A: Staff can investigate other regional districts. Comment: Motion asks staff to prepare analysis and propose recommendation at next meeting so the committee can consider the options. Q: Has the assumption been that the cost would be attributed on a parcel basis rather than assessment basis. A: Assumptions have been based on per parcel basis.	

	Comment: Resolution is asking to develop options, so essentially provide information. Q: Would phases be defined by catchment areas in motion? A: Yes, motion can be reworded to use catchment areas. MOTION: That staff prepare an analysis showing the estimated costs per connection by catchment area, presuming no further grants and no further contributions from partner organizations, and further that staff present options and recommendations with respect to creating equitable costs per connection across all catchment areas. – I. Munro SECONDED: R. Lymburner CARRIED UNANIMOUSLY. Comment: Will still need comparison of costs for septic maintenance program. Q: Are we asking CVRD and IH to investigate systems of all properties in proposed area? A: No, but to draft potential proposed bylaw and propose costs for septic regulation service. Would like to see analysis of costs for sewer and septic. Q: So suggesting comparing costs of septic system to sewer system over 25-year period? Costs for sewer would decrease after borrowing paid off, so maybe 50-year window better. A: Yes, if that sounds reasonable. Q: What is the estimated life of a properly maintained Type 2/3 septic system? A: Staff have been using 25-year life span for septic systems. 25 years is a common standard for IH, although some systems may fail after 10 years and others may fail after 40 years. Comment: Analysis of each community's failing septic systems should be brought back to committee. The committee was asked to consider the following questions: Are there other issues that can be considered in analysis? What happens if nothing is done? What about properties where septic is not ideal or possible? Does the committee want to consider these other options or explore consequences of doing nothing? Q: Isn't the intention of the committee that doing nothing isn't an option? Comment: Committee should consider motion to support a septic inspection program regardless of outcome of sewer. Would this only apply to Area A or have implications for Area B and C?	

	Response: Would be helpful to consider a motion for implementation of septic maintenance service at next meeting. Q: Understood that enforcement was complaint based, so how will septic inspection and maintenance program be implemented? A: Proposed system wouldn't be complaint based but inspections would occur in regular intervals. Q: If you live in the next phase but your system fails, is the owner expected to pay for a new system when they have to connect to sewer in the near future? How can we implement a bylaw that accounts for this? Comment: We're requesting bylaw to see what it looks like, not to implement bylaw yet. Response: Bylaw doesn't need to be drafted, just the key points. Doesn't need to be adopted at this point. Up to staff to draft up bylaw and committee can consider language. Comment: Proposed service area is only one-third of south. Bylaw will still be required for area not in service area. Response: What the TACPAC can contemplate is restricted to the proposed service area. Could still bring forward similar bylaw to Electoral Areas Services Committee for whole area. MOTION: That staff prepare an analysis of the estimated "all in" annual costs of the sewer compared to the estimated "all in" estimated annual costs of a septic inspection, maintenance and enforcement bylaw. – I. Munro SECONDED: R. Steinke CARRIED UNANIMOUSLY Q: Capital costs of forcemain and pump stations are reliant on project partners. Is there are feeling of how it will be received by the project partners? A: Proposed costs have been discussed with project partners. Q: Has timing been considered as well, so not provided 10 years down the road? A: Yes. Comment: Low Pressure Sewer (LPS) system is less flexible and reliable, and more expensive. Don't get choice on type of system, since determined by geography. LPS should be made as equitable as possible. Potential for CVRD to supply pumps and cover costs for pump maintenance Q: What do other jurisdictions do in these cases where there is LPS and gravity? A: Generally property owner looks after infrastructure on property. As for costs, still investigating.	

	Comment: 20-year system up-island with neighbourhood with grinder pumps and there is dispute about who pays for pump replacement. Comment: Should follow concept of polluter pays. Q: Will there be further investigation and resolution on LPS issue? A: Will have more fulsome discussion on collection systems later in meeting, and can discuss including private property infrastructure in shared costs. Comment: Would be for mandated unique private infrastructure such as the LPS grinder pump, not connection from house to property line. Response: Recommendation on LPS systems and costs could be suggested as policy. Comment: Not questioning use of LPS, just to make costs equitable. Q: Is there not an existing system in valley? What is used in those systems? A: Believe the municipal collection systems are primarily gravity based, but would need to investigate further if there is LPS. Q: So the costs would fall on the homeowner to maintain their systems? A: Yes. **Committee Process** A. Habkirk reviewed the committee process for the TACPAC. The committees work according to their terms of reference and act as a joint committee unless otherwise specified. Decisions are to be made by consensus, balancing project needs and community wants. Seeking impressions and preferences on options at today's meeting, with clear direction provided at next meeting. Q: Constraints mentioned geology and geography. Hasn't a geological assessment been done already? A: Desktop analyses done so far, but deeper investigation to occur as part of more detailed design. Comment: Not sure what a resolution by the committee would look like. Response: Provided example of input being requested (ex. Does the TACPAC have any considerations regarding the forcemain alignment?). Input was requested from the committee on the proposed forcemain alignment.	

	Q: How do you fold value engineering into the committee decision-making process? A: Discussed value management at last meeting. Potential cost savings identified and will be brought back before committee. Seeking input from committee based on the information they have so far. Comment: Comfortable with the forcemain alignment using existing corridors and process will be done properly. Q: Can the committee share the information presented today with the public? A: Yes, it is a public meeting, so members may share information with the public. Open houses will be hosted in Spring.	
3.8 11:57am-12:34pm	**Lunch** The committee broke for lunch at 11:57 am and reconvened at 12:34 pm.	
3.9 12:34-1:55pm	**Committee Process / Questions Continued** A. Habkirk and D. Monteith reviewed the committee process. D. Monteith provided questions to be considered by the committee for the forcemain, pump stations, collection system, phasing, and costing. Forcemain: Does the TACPAC have any considerations regarding the forcemain alignment? Pump Stations: Which of the pump station designs does the TACPAC prefer? Which pump station location is preferred? Can consider locations outside coastal flood zone, but will limit use of gravity system. Collection System: Which of the collection options does the TACPAC prefer? Is there support for LPS for properties along foreshore? Are there other applications for LPS that should be considered? Phasing: Does the TACPAC support Phase 1A as proposed? Would the TACPAC like to develop criteria to assist in determining timing of future phases? Criteria could include partnership opportunities, grant funding potential, environmental need, property owner petitions, etc. Project Costs: TACPAC comments regarding costs? What considerations regarding funding support would the TACPAC like to see included in the plan? Q: CVSS LWMP had process of weighted scores in a matrix. Will that be utilized here?	**A. Habkirk / CVRD**

	A: For forcemain, only one option evaluated, so just requesting comments. Pump stations may require use of matrix. Can use matrix in situations where there are alternatives. Comment: Agree that matrix not needed for forcemain, since only one logical option, but would like matrix for others. Response: Have considered using matrix and weighting from CVSS LWMP as basis. **Forcemain** A. Habkirk requested any comments or concerns regarding the proposed forcemain alignment. Comment: Pump stations in Royston in recreational area. Ideally shouldn't be in such a highly used area. Response: Will address pump stations later in process. MOTION: The committee supports in principle the forcemain alignment as recommended by the CVRD's engineering consultant, WSP. – T. Donkers SECONDED: I. Munro CARRIED UNANIMOUSLY **Pump Stations** D. Monteith presented the questions asked of the committee regarding the pump station designs and locations. Q: Are these questions applicable by each individual pump station? Could one be a building and another a kiosk? A: Yes. A sample matrix for the pump stations was shared with the committee. The committee agreed that the use of a matrix would be helpful, and can work through the matrix and develop scoring at the next meeting. The matrix will be shared in advance of the next meeting. Q: How is the percentage calculated for each component total? A: All totals together would be 100 per cent, with weighting for each component. The committee performed a test run with the sample matrix, considering how the committee would weight the categories at a high level. Q: How is the environmental component being calculated? Seems to only show restoration and enhancement. A: Could add additional goals to each component if needed. Idea that mitigation efforts would be applied across the board, so not included.	

	Comment: Technical aspects include environmental aspects, so some overlap. Comment: Some technical aspects are pretty much required, such as resilience to natural disasters and seasonal impact. Response: More for comparing impact that various options will have on aspects. Comment: Don't recall costs being very different for pump station options, so that should impact scale given to affordability. Comment: Should base percentage on what the public would consider most important. Q: Are we talking about all pump stations or certain ones? A: Only Phase 1A at this time. Comment: Cost difference between pump stations is about $1M. Response: $1M is for cost difference between Royston and Union Bay pump stations. The difference between building and kiosk option is closer to $100k. A. Habkirk requested comments from the committee on any preferences for above ground or below ground pump stations. Comment: Above ground is more affordable to build and maintain, safer for operators, and has options for public amenities. Can be designed to not look like pump station. Comment: Preference depends on location. Above ground is safer from operational standpoint. Kiosk more likely to be vandalized or damaged. I. Snyman clarified that both options would have submersible pumps. Above ground has everything contained within building, while below ground does not have everything enclosed. Q: Is there difference in operator safety for these two options? A: Both require confined space entry for pumps, so little difference. Can be designed to minimize differences. Q: Will one option be quieter than the other? A: Generator will be largest contributor of noise. Enclosing in building will dampen impact of noise. Q: A significant difference? A: Not that much of a difference, since both will have acoustic hoods to dampen noise.	

	Q: Wouldn't the system operate automatically with only operator intervention required when necessary? A: All pump stations require regular maintenance. Don't need 24/7 presence of operator, but need to visit regularly. Q: Beyond the washrooms, are there any other public amenities that could be provided? Public parking? Any other options that could be provided, or would lessen visual impact such as landscaping? Neighbourhoods likely want kids' facility. A: This is type of input being sought from committee, and encouraged to suggest ideas. Q: What is the difference for planned maintenance activity (access, frequency, etc.)? How will access to the wet wells be impacted? How often would access to confined spaces be needed? A: For both pump station option, there would be no difference since above ground would have access available to pull pump. Should only need to pull pumps every few months. For confined space, may be needed annually to perform visual inspection, but not part of regular maintenance. Comment: Overcomplicating decision-making process. Differences in resilience are minimal, so if they perform the same, should go for cheaper option and then consider public amenities and environmental impact. Response: Functionality and environmental impact is mostly the same. Kiosk may have slighter shorter lifespan due to exposed components. Quicker to build kiosk, but factored into costing. Comment: Decision seems highly knowledge based. Should be providing weighting for components and then consultant can provide recommendation. Q: Why include certain aspects in matrix if all options provide same impact? Could remove identical operational and environmental components. A: Can remove options that seem the same and then focus on those deemed more important, such as costs and social benefits. The committee requested that the proposed site visuals be shown while discussing the pump stations. The site plans for the Royston pump station were shared. I. Snyman advised the committee that the costs were $1.4M for the building and $1.1M for the kiosk, so $300k more for building. Q: Are we deciding between the two locations as well? A: Yes.	

	Q: The southern option seems close to Roy Creek. Is there an impact? A: It shouldn't be close enough to the creek to impact it. Q: What is the difference in reliance between the above ground and below ground options? A: Very few operational differences. Building may be more effective in resisting weather events. Pumps and valves not impacted, but electrical components will be influenced. Can put on second story, but then visual impact. Comment: Kiosk would be more impacted by vandalism. Comment: Preference for building since area is marine environment. Can provide washrooms for operators and public. Operators can store tools in building. Can elevate the electrical components in the building to mitigate risks. Q: Has climatic event frequencies been modeled when considering options? A: Looked at most recent coastal flooding map, which looks at 200-year event. Comment: Pump stations tend to only have problems during poor weather, so building would be better for operators. Comment: When working on the matrixes for the CVSS LWMP, TAC only dealt with technical aspects and PAC only dealt with public aspects. Should we consider similar approach for this TACPAC? Comment: If cost difference is just 0.2 per cent of the total costs, preference should be given to above ground due to additional social benefits. Comment: Option A (building) in northern Royston location preferred due to proximity to picnic benches and public amenities, and to keep all activity in one area. Comment: Northern location is across from empty lot that is unlikely to be developed due to prior history of contamination. Comment: Residents will want to see modelling. Response: Staff can prepare architectural drawings once a preferred option is decided. Comment: Should consider additional public amenities, such as playground.	

	MOTION: The committee recommends Option A (above ground) for the Royston pump station. – I. Munro SECONDED: J. Elliot CARRIED UNANIMOUSLY Comment: Pump station be further from the barbeque pit. Comment: Pump station should be near public area to provide washrooms or other amenities. Q: Are there options to locate pump station west of the highway? A: Can look into it at committee recommendation, but need to consider impacts on collection system, such as additional use of LPS. Q: Was there concern from others about the location? A: Current proposed location allows for gravity collection system, while westward location may require small pump station on Marine Dr to collect wastewater. LPS wouldn't be enough to convey to highway. Q: Would it be more expensive or cheaper to have pump station west of highway. A: Westward location would increase costs. Typically want pump station at low point of land. Comment: Ideally don't want to add more LPS or extra pump stations, so lower site is preferred. Q: Would a westward pump station improve resilience of system? A: Regional pump station proposed near highway, which will have all pump stations connected to it. Royston pump station will eventually only be for Royston. MOTION: The committee recommends locating the Royston pump station in the proposed northerly location. – I. Munro SECONDED: T. Donkers CARRIED UNANIMOUSLY **Collection System** D. Monteith requested comments on the collection system from the committee to consider at the next meeting. Comment: Would like to know where LPS would be considered. Would be helpful to be shown on a map. Q: Would like more information on infrastructure along foreshore. What type of infrastructure would be installed? Would it only be for gravity system? A: Foreshore construction would only be needed for properties along foreshore if using gravity system.	

	Q: Is that feasible? Not a lot of land in front of properties along shore. A: Would be very challenging to install. **Phasing** A. Habkirk asked the committee if there was any additional information on phasing requested for next meeting. Comment: Would like to better understand how Phase 1A was chosen. Understood that strategy was to maximize the grant funding per household. Should it be to minimize the cost per household? Response: Can provide cost per household if Phase 1A scope was expanded.	
3.10 1:55-1:56pm	**Meeting #4 Preview** D. Monteith shared a slide detailing the items to be discussed at the next meeting.	**D. Monteith**
3.11 1:56-1:56pm	**Roundtable** A. Habkirk requested that if the committee requires any additional information before the next meeting, that it be requested beforehand.	**A. Habkirk**
3.12 1:56pm	**Adjournment** The meeting adjourned at 1:56 pm.	**A. Habkirk**

GENERAL:
The next SES LWMP Addendum Joint PACTAC meeting will be held on February 6, 2023 commencing at 9:00 am in the CVRD Civic Room at 770 Harmston Avenue, Courtenay, and via Zoom conference.

TERMINATION:
The meeting terminated at 1:56 pm.

APPENDIX

D TACPAC MEETING #3.5 DISCUSSION PAPERS & MINUTES

APPENDIX

D-1 TACPAC MEETING #3.5 DISCUSSION PAPER 1

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

TACPAC MEETING 3.5

DISCUSSION PAPER 1: KILMARNOCK PUMP STATION AND COLLECTOR SYSTEM DESIGN

March 08, 2023

CONFIDENTIAL

wsp

DISCUSSION PAPER #1

BACKGROUND

As the Sewer Extension South Liquid Waste Management Plan Addendum process has progressed, the Comox Valley Regional District (CVRD) has requested additional work to update the design and cost estimates for the Kilmarnock neighbourhood in order to assist the Public and Technical Advisory Committee in considering project phasing. This discussion paper includes design considerations and cost estimates for the collection system as well as the pump station for the Kilmarnock area.

The Kilmarnock Area is in Electoral Area 'A', located about 5km from Royston as shown in Figure 1. Electoral Area 'A' does not have a centralized sewage collection system and uses privately owned onsite septic systems for wastewater management.

As per CVRD direction, the PS #3 Kilmarnock catchment will also facilitate sewer loading from the future K'ómoks First Nation development west of Highway 19A.

The discussion paper includes the following information for the Kilmarnock neighbourhood:

- Summary of Kilmarnock collector system design.
- Summary of collector system cost estimate.
- Summary of pump station siting options and design.
- Summary of pump station cost estimate.

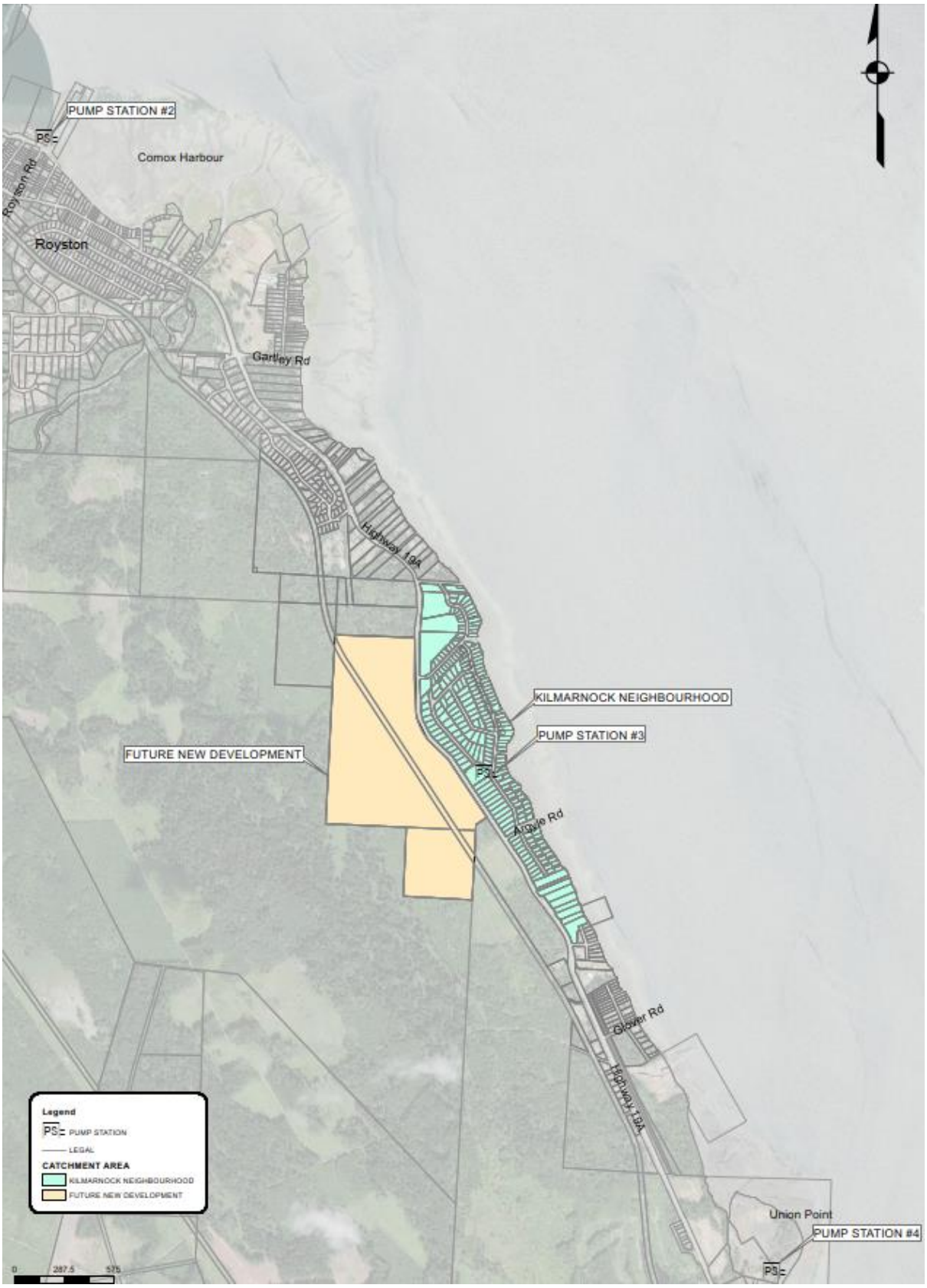

Figure 1: Pump Station Location

POPULATION AND DESIGN FLOW SUMMARY

The population and flow projections for the PS#3 Kilmarnock catchment were calculated in a previous stage of the project. Design criteria and detailed development can be referred to in the "South Region Service Area Impacts on CVSS Conveyance and Wastewater Infrastructure" report dated January 9, 2019. Table 1 summarises the contributing Average Dry Weather Flow (ADWF) and Peak Wet Weather Flow (PWWF) for the projected populations in 2025 and 2070.

Table 1: Pump Station #3 Kilmarnock Catchment Population, Area, and Flow

		PS#3 KILMARNOCK CATCHMENT	FUTURE NEW DEVELOPMENT	TOTAL
2025	**Population**	507	40	**547**
	Area (ha)	65	7.5	**72.5**
	Peaking Factor	3.2	3.2	**-**
	ADWF (L/s)	1.4	2.1	**3.5**
	PDWF (L/s)	4.5	6.7	**11.2**
	I&I (L/s)	3.9	0.4	**4.3**
	PWWF (L/s)	8.4	7.1	**15.5**
2070	**Population**	634	2309	**2943**
	Area (ha)	64.6	80.7	**145.3**
	Peaking Factor	3.2	3.0	**-**
	ADWF (L/s)	1.8	19.2	**21.0**
	PDWF (L/s)	5.7	57.0	**62.7**
	I&I (L/s)	3.9	4.8	**8.7**
	PWWF (L/s)	9.5	61.9	**71.4**

The following assumptions were used in the flow calculations:

- 240 L/cap/day was used as specified in the 2014 MMCD Design Guidelines for ADWF.
- The peaking factor was calculated using the formula from the 2014 MMCD Design Guidelines of PF = 3.2/P0.105, where P is the population in thousands rounded to the nearest thousand.
- The inflow and infiltration (I&I) rate for all existing and proposed developments is 0.06 L/s/ha as specified in the 2014 MMCD Design Guidelines.
- The PWWF was calculated using the formula for design flow from the 2014 MMCD Design Guidelines, where the design flow, Q = population x per capita flow x peaking factor + I&I contribution.

The collector system was designed using the 2070 projected flows for the projected development in the area.

SYSTEM PHASING

The phasing of the CVRD South Region conveyance system has been outlined in previous discussion papers and TACPAC meetings. The focus of these discussion papers has been as on the initial phase which involved PS#1 and PS#6, this scope of work focuses on the addition of PS#3 located between PS#6 and PS#1. The process flow diagram (PFD) is shown in Figure 2 below. The contributing sub-catchments for the PS#3 include the Kilmarnock North existing developed area and future new developments. There is uncertainty about when the new developments will be constructed. This phase accommodates the flow of the new developments that will be constructed within PS#3's catchment area.

As in Phase 1A, the collection flow from PS#6 (Union Bay) is 34 L/s to maintain the minimum flushing velocity of 0.75m/s. Once constructed, this flow will be conveyed to PS#3 (Kilmarnock) through the 250 mm HDPE forcemain. From PS#3, 58 L/s is conveyed to PS#1 (Royston) through the 250 mm HDPE forcemain. The additional 24 L/s from PS#3 corresponds to a population equivalent of 1719 persons and equivalent dwellings of 819 units. The configuration downstream of PS#1 to the Courtenay River siphon is the same as Phase 1A, 72 L/s will be conveyed through this section in Phase 1B.

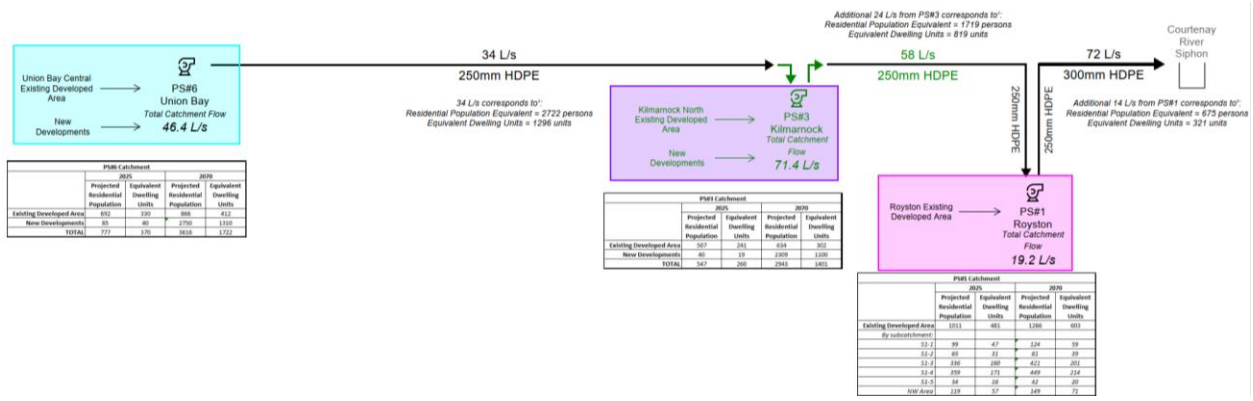

Figure 2: PFD - Phase 1B

COLLECTOR SYSTEM DESIGN

MODEL

PCSWMM modeling software was used to design the Kilmarnock collector system. This software ensures that the system has the required capacity. Using the combination of LIDAR and GIS components, the pipe invert levels were calculated, and the manholes were located and spaced according to The Master Municipal Construction Documents (MMCD 2021) requirements. A projected load for each parcel was calculated based on the area using the flow required. Parcel sub-catchments were assigned to the closest manhole. Sanitary loads from the future new development were evenly distributed between the three manhole locations as shown in Figure 2 below.

DESIGN STANDARDS AND CONSIDERATIONS

The proposed pipe depth varies along the length of the sanitary sewers but generally follows the ground profile with a minimum cover of 1m and maximum cover of 4.5m as required by MMCD (2021). Manholes are provided at every change of pipe size, change in grade and direction with the maximum spacing of 150m as required by MMCD (2021). Minimum grades of 0.6% are stipulated in the MMCD standards to maintain a minimum velocity of 0.6m/s. Collector systems are to have a minimum pipe size of 200mm or 150mm for upstream sections of a residential sewer where future extension is not possible. The pipes are designed to be flowing at a maximum capacity of 80%.

ALIGNMENT

During the design development of the collector system, achieving the minimum velocity requirements caused several challenges. To achieve the minimum velocity, pipe diameter and slope were reviewed. After discussions with the CVRD about the challenges, 100mm diameter pipes were designed for the upstream sections of the collector system. The decision to use smaller diameter pipes was made to strike a balance between velocity, grading and depth requirements.

To ensure the depths of the downstream sewers and the pump station are within MMCD guidelines while maintaining the cleansing velocity, three connections to the proposed 250mm South Royston forcemain were included. Flushing the system is required periodically to prevent the sewer line from the deposition or settlement of solids within the pipeline. The forcemain connection includes a 100mm tie-in connection to the forcemain with a chamber with actuated valve and flowmeter. The additional flow from the forcemain connections is estimated at 6L/s.

Two designs were proposed for the PS#3 Kilmarnock collector system shown in Figure 3 and Figure 4**.** The two options are similar, the only difference is the alignment at top of Montrose Drive and Inverness Road and the loads assigned.

In Option 1, the Future Development load is applied to the start of the Inverness Road and Arran Road line and the forcemain connection is applied to the upstream manhole on Montrose Drive. In Option 2, the Future Development load is applied to the upstream manhole on Montrose Drive and the forcemain connection is applied to the upstream manhole of the Inverness Road and Arran Road line. Both designs passed the MMCD capacity requirements of flowing 80% full and the minimum velocity of 0.6 m/s to ensure the self-cleaning of the pipelines. Both options were designed with three forcemain connections and three future new development sanitary loads noted in Figure 3 and Figure 4. Pipe sizes for both options range between 100-350 mm.

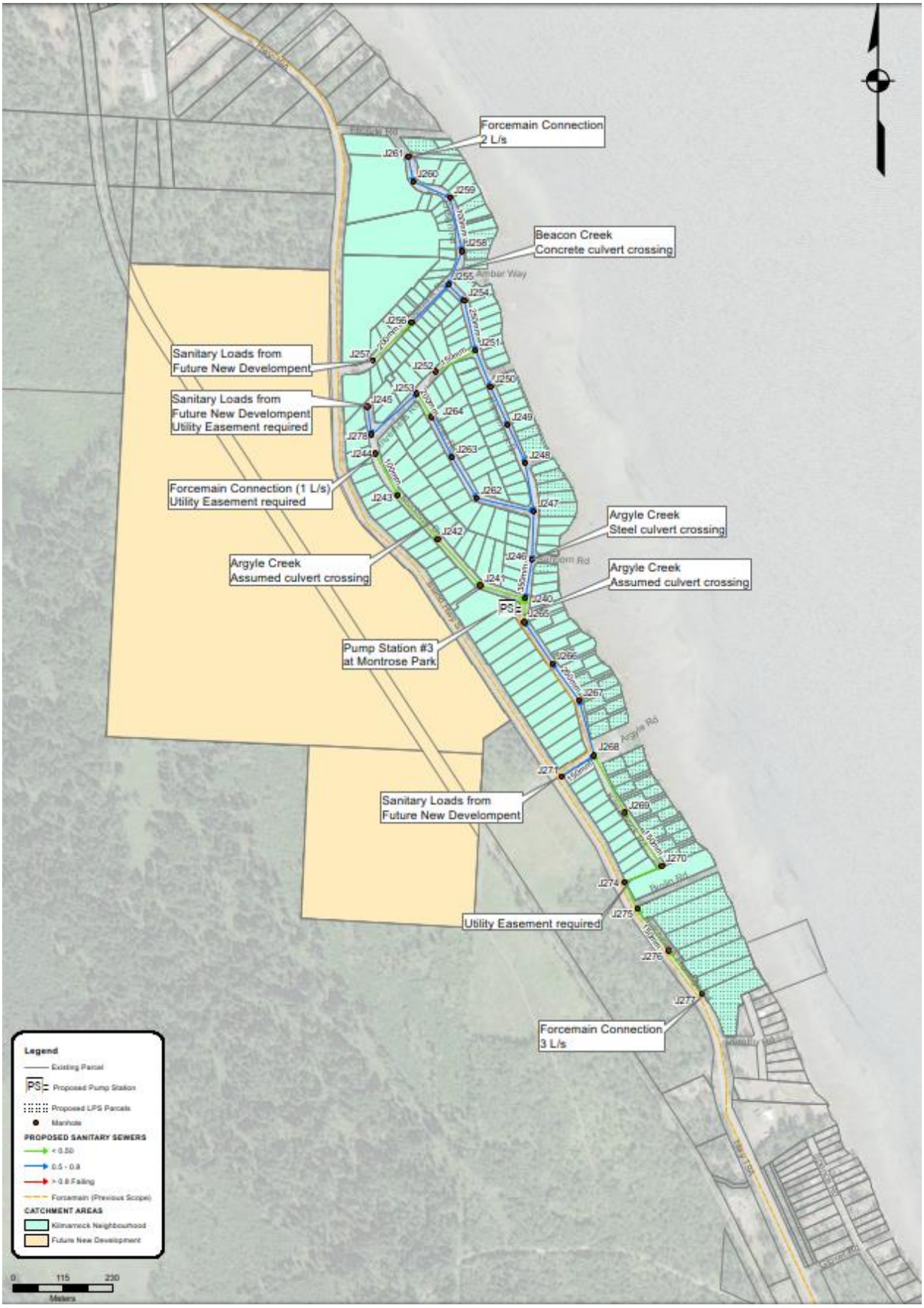

Figure 3: Pump station #3 Kilmarnock Neighbourhood proposed collector system – Option 1

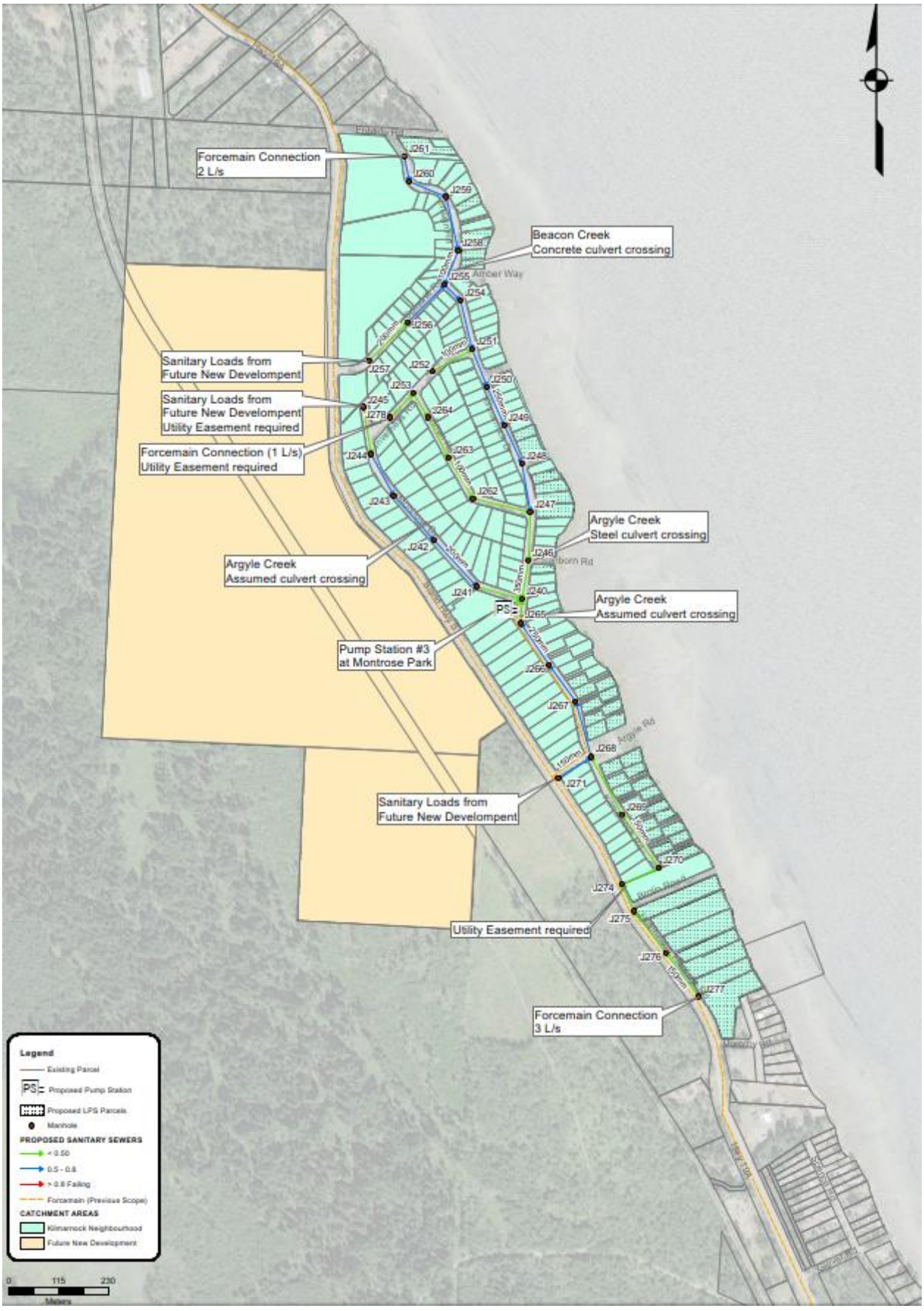

Figure 4: Pump station #3 Kilmarnock Neighbourhood proposed collector system – Option 2

LOW PRESSURE SEWERS (LPS)

In a Low Pressure Sewer (LPS) system, each connection point uses an effluent pump housed in either a lift station or two-chamber septic tank to transport the wastewater through the system. The proposed hybrid gravity LPS system uses grinder pumps in lift stations. These pumps serve individual homes with a low horsepower of 0.5 – 2 H.P.

A total of 46 parcels are identified as requiring an LPS system in Figure 3 and Figure 4. Parcels that are low lying causing the service connection to be less than 1m can't make use of conventional gravity sewers. Properties additional to those shown may require LPS connections dependent upon the depth of their service connections in relation to the sewer main in the fronting road.

COST ESTIMATE

At the preliminary design stage of projects, a Class "C" cost estimate will be prepared. For the purpose of the TACPAC meeting #3.5, a Class "D" cost estimate has been prepared with a 40% contingency to account for any unforeseen changes in detailed design. A Class "C" cost estimate will be provided in the draft Sewer Extension South Addendum Report. The Class "D" cost estimate of the Kilmarnock collector system is summarized in Table 4.

Table 2: Kilmarnock Collector System Cost Estimate

ITEM	DESCRIPTION	OPTION 1	OPTION 2
1.0	Sanitary Sewer- Gravity & LPS	$3,475,000	$3,460,000
2.0	Forcemain Connection	$223,000	$223,000
3.0	Site Works	$954,000	$949,000
4.0	General	$468,000	$466,000
	Subtotal	$5,120,000	$5,098,000
	Contingency (40%)	$2,048,000	$2,039,000
	Engineering (15%)	$1,075,000	$1,071,000
	TOTAL	**$8,243,000**	**$8,208,000**

The following general assumptions were used for preparing the cost estimate:

- Costs are rounded to the nearest $1,000.
- Costs related to ROW and utility easements were not included in this estimate.
- Gravity service connection to property line not included.
- Cost of LPS lift station for properties with LPS service connections not included.

PUMP STATION DESIGN

A conceptual pump station sizing was completed for Kilmarnock PS#3 considering the information available at the time of assessment. Given the relatively long service life of asset infrastructure such as pump stations, it can be expected that the pump stations constructed in the initial phase will continue to be operated throughout the future phases of development up to build-out.

SITING CONSIDERATIONS

PS#3 is located in Kilmarnock to collect the flow from the Kilmarnock catchment area as well as the flow from the South Royston forcemain as shown in Figure 5. A previous study by Koers & Associates Engineering in 2016 reviewed locations for the pump station at Kilmarnock.

Three site options were considered,

- one site at Sanborn Road (Option 1) and
- two at Montrose Park (Option 2a, 2b)

The options, Montrose Park at Montrose Drive and Montrose Park at Kilmarnock Drive, were recommended in the review as they had lower estimated costs and were the public's preference.

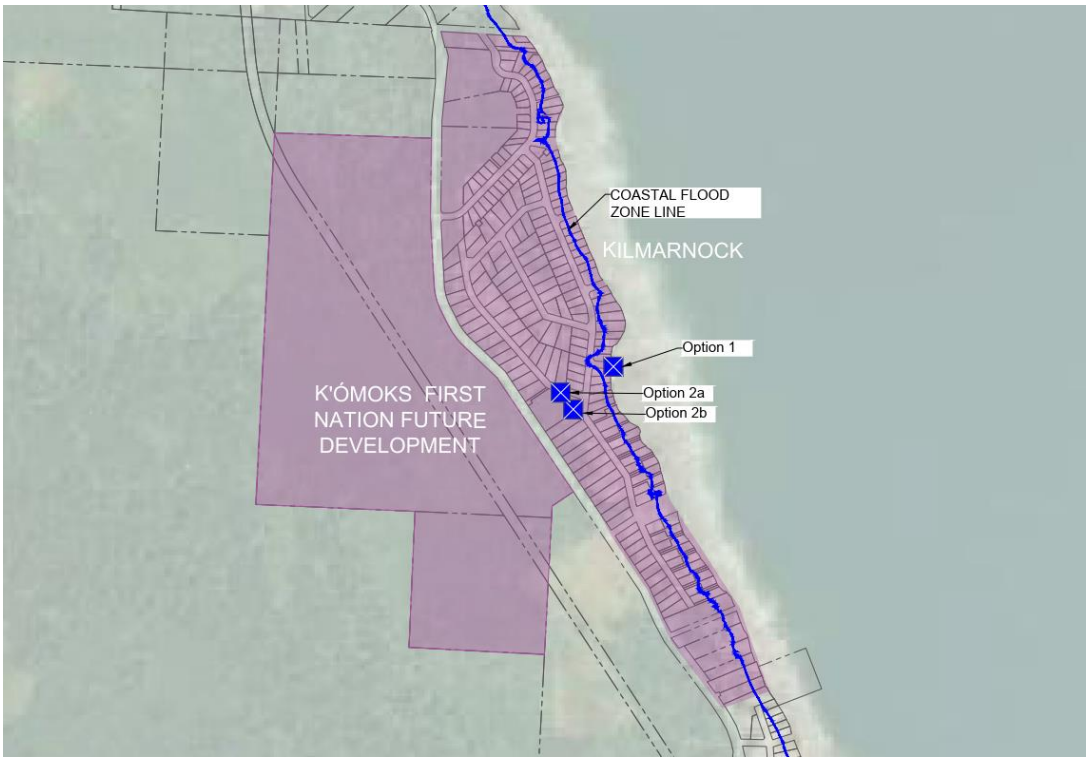

Figure 5: PS#3 Location

Option 1 is within the coastal flood zone as shown in Figure 5. Montrose Park is outside of the coastal flood zone, therefore Option 2a and 2b are not at risk of coastal flooding and do not require flood protection measures. As such, the preferred location of the pump station is at Montrose Park.

PRELIMINARY DESIGN

As discussed in the Section above, the preferred site location for the pump station is in Montrose Park. The site layout of the proposed pump station is shown in Figure 6 below.

Figure 6: PS#3 Site Layout

The pump station will consist of a fibre-reinforced plastic (FRP) manhole wet well for the collection of flow from the catchment areas. This configuration also provides the possibility of constructing a second manhole wet well in the future if this should be required, without the need to isolate PS#3. PS#3 will have an FRP wet well and submersible pumps with quick release couplings to remove the need for manual removal of the pumps. The conceptual layout of PS#3 is shown in Figure 7.

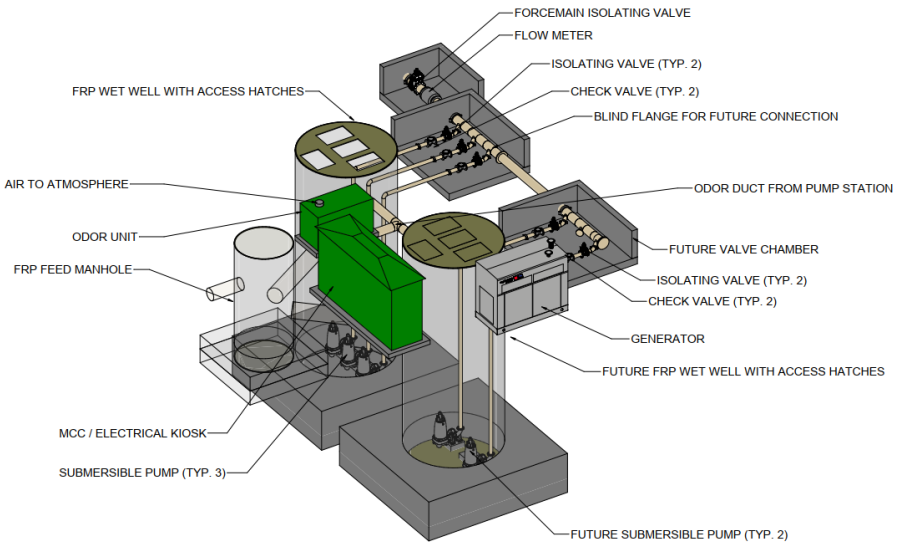

Figure 7: PS#3 Configuration

The wet well is sized for the initial flow of 58 L/s and not for future capacity upgrades. This reduces potential issues with residence time which could lead to odour problems. Provision of an additional sump has been made at PS#3 for future flows; this will be used to convey the additional flows from the catchment area and PS#6 as well as the flows conveyed from PS#4 and PS#5. The provision of an additional sump in the future phase allows for the selection of

smaller pumps at the initial stage that are potentially more energy efficient as the flow the pumps are required to convey is smaller. The pump station will have a flowmeter chamber with a flow meter and isolation valve. The isolation valve will be positioned at the required distance from the flowmeter to ensure the accuracy of the flow measurements.

Each pump outlet pipe will have an isolation valve and a check valve in a valve chamber with a separate access hatch to the wet well. The check valve will be a gate or plug valve and will prevent backflow to the pump, and the isolation valve is for maintenance purposes. The pumps will be removed by a crane truck in lieu of an overhead gantry to limit the visual impact of the pump station on local residents.

The generator, Motor Control Centre (MCC) and electrical kiosk and odour control unit are all in individual units. The electrical equipment and SCADA system would be housed in the electrical kiosk.

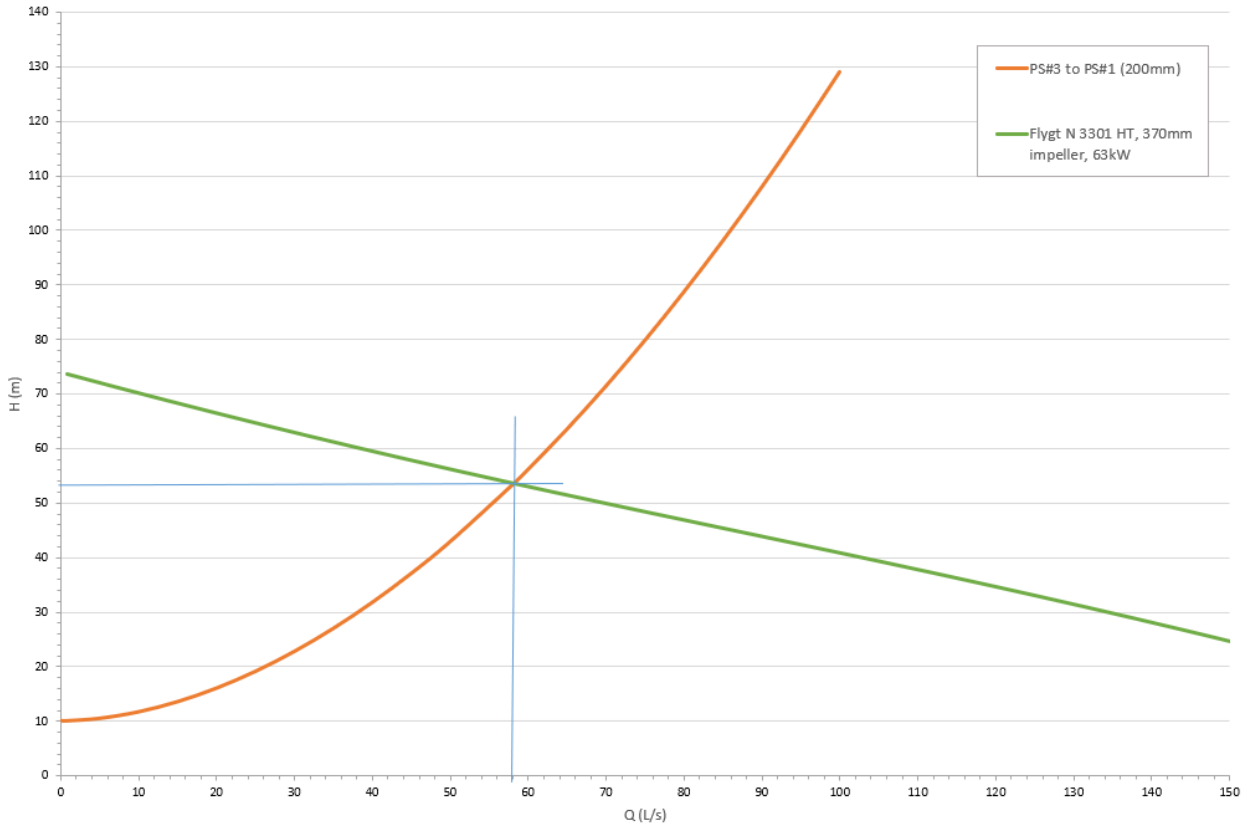

Figure 8: Pump Curve

The Flygt N3301 pump was selected for a 250mm forcemain for the duty point of 58 L/s at 54m as shown in Figure 8. The pump station will convey 34 L/s from PS#6 as well as additional flow from the PS#3 catchment. Table 3 outlines the additional flow of 24 L/s from the Kilmarnock catchment that can be conveyed for 250mm forcemains as well as the equivalent population and dwelling units.

Table 3: Design flow

	DESIGN FLOW	FLOW FROM PS#6	POPULATION EQUIVALENT	DWELLING UNITS
250 mm	58 L/s	34 L/s	1719	819

COST ESTIMATE

The PS#3 is very similar to the PS#6 and the majority of the cost have been used to calculate the Class "C" cost estimate. For the purpose of the TACPAC meeting #3.5, a Class "C" cost estimate has been prepared with a 30% contingency to account for any unforeseen changes in detailed design. The Class "C" cost estimate of PS#3 is summarized in Table 4.

Table 4: PS#3 Cost Estimate Summary

ITEM	DESCRIPTION	TOTAL
1.1	Earthworks and Site Works	$79,000
1.2	Building	$100,000
1.3	Mechanical	$483,000
1.4	Electrical	$462,000
2.0	General	$230,000
	Subtotal	$1,354,000
	Contingency (30%)	$406,000
	Engineering (15%)	$264,000
	TOTAL	**$2,024,000**

The following general assumptions were used for preparing the cost estimate:

- Cost totals are rounded to the nearest $1,000.
- Pump cost based on 1 duty + 1 standby, Flygt Model N 3301 HT, 370mm impeller, 63 kW (85 HP), 600 V, 3 phase.
- Mechanical installation is based on 2 people, 15 days, $100/hr
- Odour control is assumed to be Pureair Odor Control Unit w/ Dry Chemical media, draw thru blower, mist eliminator - 250 cfm, w/ 1.5 HP motor, 600V/3 Ph, Class 1 Div 1 rated. A detailed study is required to confirm the odour control.
- Cost excludes tree removal at the site.

APPENDIX

D-2 *TACPAC MEETING #3.5 DISCUSSION PAPER 1 SCHEDULE*

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

UPDATED COST ESTIMATES FOR TACPAC MEETING #3.5

CONFIDENTIAL

NOVEMBER 7, 2023

SCHEDULE FOR TACPAC MEETING #3.5 – DISCUSSION PAPER 1: KILMARNOCK PUMP STATION AND COLLECTOR SYSTEM DESIGN

COLLECTOR SYSTEM COST ESTIMATE

Table 1 shows the updated cost estimates for Kilmarnock's collector system. This table replaces Table 2 in **TACPAC Meeting 3.5, Discussion Paper 1: Kilmarnock Pump Station and Collector System Design**.

Table 1: Kilmarnock Collector System Cost Estimate

ITEM	DESCRIPTION	OPTION 1	OPTION 2
1.0	Sanitary Sewer – Gravity & LPS	$3,455,000	$3,443,000
2.0	Forcemain Connection	$223,000	$223,000
3.0	Site Works	$954,000	$949,000
4.0	General	$420,000	$420,000
	Subtotal	$ 5,052,000	$5,035,000
	Contingency (30%)	1,516,000	$1,511,000
	Engineering (15%)	985,000	$982,000
	TOTAL	**$ 7,553,000**	**$ 7,528,000**

The following general assumptions were used for preparing the cost estimate:

- Costs related to ROW and utility easements were not included in this estimate.
- Gravity service connection to property line not included.
- Cost of LPS lift station for properties with LPS service connections not included.

PUMP STATION #3 COST ESTIMATE

Table 2 shows the updated cost estimates for Kilmarnock Pump Station (also referred to as PS#3). In total, there are two options for Kilmarnock Pump Station, one option consists of a building while the other is a kiosk. This table replaces Table 4 in **TACPAC Meeting 3.5, Discussion Paper 1: Kilmarnock Pump Station and Collector System Design**.

Table 2: Kilmarnock Pump Station Cost Estimate Summary

ITEM	DESCRIPTION	OPTION A	OPTION B
1.1	Earthworks and Site Works	$59,000	$45,000

1.2	Building	$331,000	$100,000
1.3	Mechanical	$749,000	$601,000
1.4	Electrical	$414,000	$463,000
2.0	General	$290,000	$250,000
	Subtotal	$ 1,843,000	$1,459,000
	Contingency (25%)	461,000	$406,000
	Engineering (15%)	230,000	$264,000
	TOTAL	**$ 2,534,000**	**$ 2,098,000**

The following general assumptions were used for preparing the cost estimate:

- Cost totals are rounded to the nearest $1,000.
- Pump cost based on 1 duty + 1 standby, Flygt Model N 3301 HT, 370mm impeller, 63 kW (85 HP), 600 V, 3 phase.
- Mechanical installation is based on 2 people, 15 days, $100/hr
- Odour control is assumed to be Pureair Odor Control Unit w/ Dry Chemical media, draw thru blower, mist eliminator - 250 cfm, w/ 1.5 HP motor, 600V/3 Ph, Class 1 Div 1 rated. A detailed study is required to confirm the odor control.
- Cost excludes tree removal at the site.

APPENDIX

D-3 TACPAC MEETING #3.5 MINUTES

Comox Valley REGIONAL DISTRICT

Minutes

Minutes of the meeting of the Sewer Extension South (SES) Liquid Waste Management Plan (LWMP) Addendum Joint Technical and Public Advisory Committee (TACPAC) held on March 14, 2023 in the CVRD Civic Room at 770 Harmston Avenue, Courtenay, and via Zoom conference commencing at 9:02 am

PRESENT:

A. Habkirk, Chair and Facilitator	Facilitator
R. Dyson, Chief Administrative Officer	CVRD
M. Rutten, General Manager of Engineering Services	CVRD
D. Monteith, Manager of Liquid Waste Planning	CVRD
V. Van Tongeren, Environmental Analyst	CVRD
C. Wile, Senior Manager of Strategic Initiatives	CVRD
A. Mullaly, General Manager of Planning and Development Services	CVRD
T. Trieu, Manager of Planning Services	CVRD
M. Briggs, Branch Assistant – Engineering Services	CVRD
I. Snyman	WSP
M. Levin	WSP
N. Clements, Island Health	TAC
E. Derby, Island Health	TAC
M. Mamoser, Ministry of Environment and Climate Change Strategy	TAC
L. Johnson, Ministry of Health	TAC
I. Munro, Electoral Area A Alternate Director	PAC
M. Hewson, Association for Denman Island Marine Stewards	PAC
N. Prins, BC Shellfish Growers Association	PAC
M. Cowen, BC Shellfish Growers Association	PAC
A. Gower, Comox Valley Chamber of Commerce	PAC
N. Prince, Craigdarroch Resident Representative	PAC
R. Steinke, Craigdarroch Resident Representative	PAC
T. Donkers, Royston Resident Representative	PAC
K. Newman, Royston Resident Representative	PAC
J. Elliott, Union Bay Resident Representative	PAC
R. Lymburner, Union Bay Resident Representative	PAC

Item	Description	Owner
3.5.1 9:02- 9:03am	**Call to Order and Territorial Acknowledgement** The meeting was called to order at 9:02 am. The CVRD acknowledged that the committee is meeting on and the proposed Sewer Extension South Project will be constructed and operated on the traditional unceded territory of the K'omoks First Nation.	**A. Habkirk**
3.5.2 9:03- 9:04am	**Welcome** A. Habkirk reviewed the goals for the meeting and requested any comments from the committee.	**A. Habkirk**
3.5.3 9:04- 9:16am	**Meeting #3: Meeting Minutes, Follow Up Items** MOTION: Adopt the minutes of the December 12, 2022 SES LWMP Addendum Joint TACPAC meeting. – I. Munro SECONDED: A. Gower CARRIED UNANIMOUSLY D. Monteith gave an overview of what was discussed at the previous meeting. The committee was provided briefing notes to address questions from the previous meeting. V. Van Tongeren provided answers for questions not addressed prior to the meeting. Property owners who opt for property tax option can't change to option to pay lump sum at a future date. Would be registered to title and future property owners who purchase the property would be locked into property tax option. In regards to if Capital Improvement Cost Charges (CICC) apply to secondary dwellings, CICCs are paid per dwelling unit. Staff are looking into options for financing CICCs. Q: Stated per dwelling unit, so are they defined as a structure? Includes secondary dwellings? A: Dwelling units typically are units where someone can reside in full-time, so includes secondary dwelling. Q: So a suite would be considered a separate dwelling? A: Could be considered that way. Based on water use and load introduced to sewer system. Q: So would they pay two CICCs? A: Yes, based on staff interpretation of bylaw. Comment: Requested breakdown of costs that can be deferred and what cannot be deferred. Response: Can go into more detail at next meeting. Generally capital costs that will be borrowed can be deferred (CICCs and capital), and operating costs cannot be deferred. Q: How much is the CICC? A: $6,941.	**A. Habkirk / CVRD**

	Comment: For those homes with secondary suite, should we issue forewarning or guidance for those who may choose to decommission unused suite? What would be the process for recommissioning the suite? Comment: Some clarity on what constitutes a secondary dwelling would be beneficial. Q: If charging two CICCs, will we be providing two connections? With septic system, there would presumably be a second connection for a secondary dwelling or separate septic system. This should be defined in the Comox Valley Sewerage Service (CVSS) bylaw and would need to be considered by the Sewage Commission (SC), so would this need to apply globally outside south area? Comment: Bylaw is currently applied only by Courtenay and Comox for the connection of homes there, it is not currently applied anywhere in the electoral areas. Will need to check in with municipalities to ensure it is applied consistently. Will check in with CVRD wastewater staff as well and get back to the committee near the end of the meeting if we are able to get a response. Comment: Definition of dwelling unit may be different for each municipality. Comment: Municipalities usually only ever allow single connection per property.	
3.5.4 9:16-9:18am	**Meeting Overview: Committee Decision Points** D. Monteith gave an overview of the committee decision points provided to the committee to consider. A. Habkirk reviewed the TACPAC decision making process.	**A. Habkirk / CVRD**
3.5.5 9:18-9:50am	**CVRD Updates and Briefing Notes – On-site Septic Systems** **#1: Septic/Sewer – 50-year cost comparison** V. Van Tongeren gave an overview of the cost comparison between sewer and septic. Estimated that costs for sewer would be $2,000 per year and septic would be $3,060 per year. **#2: Septic Regulatory Program** V. Van Tongeren reviewed the concept of a septic regulatory program. Would see mandatory inspection in high risk areas and mandatory pump out for remaining areas. Shared the proposed timeline for implementation of program. Costs cover administration and enforcement, with other costs such as repairs or maintenance being borne by the property owner. Q: Would the proposed costs just be staff costs? This wouldn't cover pump out trucks and repairs required? A: Correct, just staff costs.	**CVRD**

	Staff are actively discussing with the province options for the CVRD to gain necessary authority for a septic system regulatory program. Additional information and options will be presented to the Electoral Areas Services Committee (EASC) later in the spring. Q: What happens after the mandatory inspection? What happens if you fail? A: Inspection would include recommendations to rectify issues. Would be responsibility of property owner to act on recommendations. Q: There will be properties where it will be impossible to remediate current system. Are there means to require remediation if homeowner can't afford it? A: Definitely an issue that will need to be considered going forward. Q: Does CRD have an enforcement component to their program? A: Don't believe so. Developed on premise that once property owner is notified of deficiencies, they are now provided with the necessary information to act on it. Options proposed in 2020 staff report include option for mandatory enforcement that would see inspector follow up at later date to ensure recommendations have been implemented. Q: Would Island Health determine when a septic system is a health risk and perform enforcement? A: Island Health would follow up on any complaints directed to them and address any public health risks by issuing orders to implement repairs. Comment: Looks like referral to Island Health would be the enforcement action. Comment: 44 per cent of people in Union Bay with no record of septic system, so obviously will not want to put in $50k system and would be coerced to favour sewer. Comment: Acknowledged that doing nothing is not an option, leaving property owners with a difficult choice. There will be properties that require expensive work, but we have to move forward with something that protects the environment. Response: The option of an enhanced onsite septic disposal program was considered during previous LWMP process, but not deemed feasible. Comment: Having more information on septic enforcement helps the committee and the public realize that sewer is the better path. Q: Part of Hornby Island are shown on the inspection map. Is the intent to cover the rest of Electoral Area A as well in the inspection requirement area?	

	A: Option being discussed internally that could apply throughout all electoral areas and phased in over five-year period. Will be a decision considered by the EASC, while this committee is discussing whether they support a regulatory program within the plan area. Comment: Financial analysis based on a type 2 system every 25 years. Systems being recommended by Registered Onsite Wastewater Practitioners are often pressurized type 1, so need to clarify how that part of the industry will be brought into decision-making in the area. Choice of system type and how often they need to be replaced is greatest determinant of the overall presented cost for septic enforcement. Need to clarify why we chose type 2 system and 25 years for cost comparisons. May need to justify during public consultation. Response: Type 2 was determined to be middle point for cost estimates, but can look into providing more details for open houses. Comment: Looking at situation in Union Bay where there are small properties with likely failed septic systems that would have to install a type 3 system, those people are more motivated to support sewer. Would be good to have low-medium-high examples instead of just middle point. Comment: Easy to make assumption that there are failed systems. Criteria should be as Island Health defines it, if creating a health risk. System can fail after 25 years, but if only one person in house may last 50 years or more, and not all older systems have failed. All based on soil conditions and use. Comment: If including larger area in program, should provide communication to Denman and Hornby or include in consultation if included in program. Response: If EASC supports program, will outreach to affected property owners in first year of implementation. Comment: Had discussed passing on enforcement to Island Health and not using heavy-handed approach, but from experience developing program without clear and effective enforcement process is waste of time. Need clearer idea on how it would work. Q: We must respond to health risks, but what is the lower standard? Is a different standard required for environmental risks compared to health risks? Island Health enforcement may not be enough to address environmental issues and require more nuanced approach. A: Health authorities should be able to adequately address environmental risks, since they overlap with health risks and there's always both. Type 2 is benchmark, since most likely to be used based on size of lots. Type 2 and 3 are fairly similar, with difference usually only UV treatment.	

	Comment: Island Health requires very definitive evidence of risk, shown through dye test or pooling effluent. Harder to find evidence if contamination dilutes into Baynes Sound. Need to be able to defend issuance of orders or tickets in court if needed. **#3: New Septic Systems – Deferral Program Options** V. Van Tongeren presented options for a deferral program for newer septic system, based on example by City of Langford. Options assessed include septic systems less than five years old or type 2 and 3 systems less than five years old. May range from $30-260 per year based on systems included and whether financing is covered. Q: What are costs in reference to? Homeowner cost per year? A: Incremental cost to sewer service. Example, if five per cent qualified and all participated, would not be paying into operating costs for several years, so costs would be for those currently paying into service. Q: Initial plan included everyone connecting. Could those deferring receive connection and pay operating costs, but defer capital costs? A: Yes, would be roughly $80 per year. Q: Did you consider frontage tax, so pay $x if line runs in front of property regardless of participation? Is CICC just for sewer? A: Just for sewer.	
3.5.6 9:50-10:18am	**Committee Recommendations – On-site Septic Systems** **1. Does the committee support a septic regulatory program in the plan area?** MOTION: To support a regulatory program in the plan area. – I. Munro SECONDED: A. Gower The committee further discussed the motion. Comment: Second question may modify motion. Would like to better understand enforcement options. May need something more than Island Health enforcement. Can modify motion subject to greater understanding of proposed bylaw on enforcement. Comment: Hard to narrow down due to numerous factors to consider. Should keep motion general for now. Maybe extend to all areas in the regional district with small lots. MOTION: To support a regulatory program in the plan area. – I. Munro SECONDED: A. Gower CARRIED UNANIMOUSLY	**A. Habkirk**

	The committee was asked if they would like to make a motion on enforcement. Comment: Issue is nuanced and technical, but maybe motion should be that staff bring back additional information on what enforcement might look like. Comment: Keep in mind that not all on-site systems are bad. Enforcement should be based on environmental or health risk, not on age of system. Should define enforcement as not just including replacement but repairs as well. Response: May be option to put on title. May be softer option to encourage owner to act. MOTION: That an internal enforcement program be developed by the regional district that addresses the gap left by the Island Health regulatory scheme. – A. Gower SECONDED: T. Donkers & I. Munro The committee further discussed the motion. Q: Are there examples of similar programs in other regional districts? A: This would be first enforcement program by a regional district in BC. Comment: Would be good to gain better understanding from others who may have considered similar programs, especially from those with similar environmental issues such as a nearby sensitive body of water. MOTION: That an internal enforcement program be developed by the regional district that addresses the gap left by the Island Health regulatory scheme. – A. Gower SECONDED: T. Donkers & I. Munro CARRIED UNANIMOUSLY The committee was asked if they had any other motions they'd like to put forward regarding the regulatory program. **2. Does the committee support the concept of a sewer connection deferral program?** Q: Sewer connection has multiple components—CICC and private connection. Private connection would be greater financial burden. Would deferral just be for CICC or other financial aid? A: Various options, but doesn't include physical connection to property line. Can install later if deferring. Q: If opted for deferral due to newer system, you would still pay capital and operating costs?	

	A: Various options, but looking for guidance on what preferred program would look like. The more costs deferred, the greater impact on remaining service members. Comment: If line runs in front of property, there definitely should be a cost. Frontage tax may work. Maybe timeline for how long property has to connect based on current system. Q: Deferment of capital costs seem high. Will there be similar reduction in costs following end of deferral program? Can it be levelled out to show costs over time? A: Costs show what it would be during deferment. Could take closer look at how financing schedule could work. Q: In principle support deferral to help owners who just installed new system, but don't want to raise costs for participating members. Is there a way to extend beyond five years? Should acknowledge those who did the right thing. Acknowledged that the committee has expressed support for a deferral program in principle, with everyone eventually connecting. Requested details for what such a program would entail. Q: Seeing as earliest connection is likely in next three years, what happens to systems currently five years old or people building houses at the moment? Might end up putting freeze on new construction until sewer system is complete or builders will face a dilemma on what to do. Some areas in later phases might not connect for years down the road. A: The five years would be for systems built within five years from the time when the area is connected. Deferral program would just be for properties in first phase, and similar program to be considered for later phases. Q: Shouldn't we be thinking about entire area? Seems unfair that some areas may not receive deferral. A: Deferral can be offered for all areas, but the cut-off dates would be different based on when that phase connected. Comment: Timing should be based on when septic system first becomes active, so you get five years from when it was installed to connect to sewer. Comment: Should be set years when system was installed that would be covered by deferral program. For example, those who installed system in 2022-2027 if sewer is installed in 2027 would get five years. Q: When is first connection expected to be installed? A: Possibly 2027. Q: Need more details. What about those who installed new Type 3 system designed to last 50 years? Staff should come back to committee with a few more scenarios on how a deferral program would work.	

	A: There are options for those who know sewer service is expected. Could install holding tank if sewer service is a year away, but need to be clear on timeline when sewer is installed. Q: Does deferral program need to be nuanced to address different types of systems? A: Really dependent on conditions of individual systems. Comment: Some Type 2 systems fail in 5 years, so many different factors that may impact when a system fails. MOTION: Support in principle the concept of a deferral program. – I. Munro SECONDED: R. Lymburner CARRIED UNANIMOUSLY The committee requested that the agenda be varied to bring forward agenda item 3.5.8.	
3.5.8 10:18-10:41am	**Kilmarnock Collection System – Design Considerations and Cost Update** I. Snyman presented on the Kilmarnock collection system. When designing system, collection system requires velocity of 0.6m/second. Need to consider minimum (1m) and maximum (4.5m) cover for trench. Minimum pipe size of 150-200mm required for upstream sections if future extension not possible. Pipe designed to flow at maximum capacity of 80 per cent. If relying on slope to allow flow, will see extensive excavation near pump station, so looking at additional options such as flushing with additional flows of 3-5L/second of water. Need to consider where future development may occur. 46 properties identified as needing Low Pressure Sewer (LPS) based on LiDAR data. Cost estimates provided for options 1 and 2 for Kilmarnock collection system. $3,475,000 for option 1 and $3,460,000 for option 2, so only $15,000 difference. Comment: CVRD Parks department looking at installation of playground and other infrastructure in Montrose Park, with public meeting held on site in two weeks. Montrose Park is reasonably large, so should be space. Opportunity for coordination to better develop park. General neighbourhood opinion is to leave back of property undeveloped to maintain buffer. Option 1 included pump station on beach, but avoided due to foreshore location. Pump station in Montrose Park will need to be constructed near corner of Montrose Dr and Kilmarnock Dr as low-lying part of park.	**WSP**

	Q: Assume that pump station would be mostly unobtrusive based on previous discussions? A: Yes. Only kiosk would be above ground, while most infrastructure would be below grade, accessed through manholes. Can look at building option if needed, but will add additional costs and require more space. Comment: Plan for playground is to be on Kilmarnock Dr, so need to ensure CVRD Parks department is aware of proposed plans for pump station. Maybe member of project team should attend March 31 meeting in Kilmarnock neighbourhood. Cost estimate provided for the Kilmarnock pump station. Option A is estimated at $2,024,000. Q: Pump station being designed to support four times the households that currently exist in the Kilmarnock area, so do the current owners end up paying for the entire pump station while remaining development also gets the benefits? Does costing account for future development contributing down the line? A: Can address at future meeting. Q: Any motion required? A: Just looking for general comments. Q: Because it's a park, is there the option for a bathroom facility? A: Should be easy to tie-in bathroom to system. Q: Preferred option is for location at Kilmarnock side of Montrose Park, but can it be moved elsewhere in park? Playground should be small, so will be more of which one is on which side of frontage. A: Yes, but will lead to additional costs if placed closer to highway due to deeper trenching required. Should be little difference if one of two proposed locations.	
3.5.7 10:41-10:54am	**Break** The committee broke for recess at 10:41 am and resumed its session at 10:54 am	
3.5.9 10:54-11:25am	**CVRD Updates and Briefing Notes – Collection System #4: LPS Considerations** V. Van Tongeren gave a presentation on LPS. Two factors when considering use of LPS: avoiding infrastructure on foreshore and limiting excavation depths for gravity mains and pump stations. Proposed reliability/equity measures include CVRD providing pump-outs during prolonged power outages, initial installation cost being included in service costs, and CVRD keeping a supply of pumps to provide to property owners at cost. Maps of the areas where the use of LPS is proposed were shared, with 44 properties in Union Bay, 20 in Royston, and 45 in Kilmarnock.	**CVRD**

Q: LPS seems right technical decision, but involves inequity between properties for costs. Seems unfair to pay for pumps at all, and should be covered by service. How do we make it easy for LPS properties to support sewer so they aren't taking on additional costs?
A: Based on usual design for sewer systems, LPS is on private property and responsibility of owner.
Comment: We are imposing responsibility on specific property owners.

Q: What is initial cost of pump?
A: Depends on size of chamber. Pump itself is around $3k, but $5-7k if including pump chamber.

Comment: Lots with house farther from property line will need to pay more for connection to service than house near property line, so cost inequity is everywhere and unavoidable. Gravity might be too expensive due to deeper trench. To make it equal to everyone, should provide service and owner pays to connect at property line.

Comment: Does not having to dig deep trench offset costs of LPS? Could be considered fair that entire service benefits from specific properties using LPS.
Response: Generally see LPS required for higher valued waterfront property. Fairness should be that owner pays for their own connection. When reaching a certain depth, trenching costs increase exponentially.

Comment: Collective decision impacts everyone. Not everyone can afford LPS.
Response: Could argue similar for those who need to connect on a certain side of the property. Owner should pay for their own connection.

Comment: Should have additional financial aid for those who will have LPS system. Maybe those on LPS should have different program.

Q: CVRD will provide initial LPS pump? Should highlight at open houses.
A: Cost estimates include allowance for initial pump.

The proposed reliability/cost equity measures were reviewed. The CVRD does not have ongoing responsibility on private property. Program can cover initial costs, but up to property owner afterwards.

Comment: Would like option for those who prefer LPS option to be able to participate in LPS program.
Response: May have property owners who choose LPS once they know CVRD will cover costs. May lead to properties being subsidized by service.

	Q: Are there maintenance issues related to the LPS pump? Does the CVRD provide support for ongoing maintenance? A: Case study of area that installed LPS systems in early 2000s. Systems performed better than anticipated, and failures were usually due to installation challenges. There are maintenance issues, but can be mitigated by proper installation. Two questions on collection systems were presented to the committee to be considered. Which of the collection options does the TACPAC prefer (hybrid, gravity, LPS)? For the hybrid (gravity/LPS) option, does the committee support LPS to minimize installation of infrastructure along the foreshore and to limit excavation depths, and are there other application where LPS should be considered? **Decision Matrix** A decision matrix for the collection systems was shared with the committee to assist with decision making. The matrix was pre-populated with values by the technical team, but to be adjusted by the committee as needed. M. Levin gave an overview of the matrix, comparing various components of a gravity, LPS, and hybrid system categorized by technical, affordability, environmental, and social. Affordability given 50 per cent weighting, technical 20 per cent, and environmental and social 15 per cent each. Q: Are the current scoring values from the technical team? A: Yes. It was noted that the CVSS LWMP TACPAC used a similar exercise. Affordability weighted higher due to feedback from earlier meetings. Committee can adjust weighting as needed. Q: Is the committee already supportive of the hybrid system before proceeding? Q: Why is LPS rated lower from an environmental perspective? A: Considered greater risk for climate change adaption and groundwater sources due to greater susceptibility to storm events and power outages. LPS also uses more electricity, and pressured system so more likely to experience leaks.	
3.5.10 11:25am-12:10pm	**Committee Recommendations – Collection System** **3. Which of the collection options does the TACPAC prefer (hybrid, gravity, LPS)?** The committee was asked if they wanted to consider options or support a system. MOTION: To adopt the hybrid (gravity/LPS) system. – R. Lymburner	**A. Habkirk**

SECONDED
CARRIED UNANIMOUSLY

4. For the hybrid (gravity/LPS) option, does the committee support LPS to minimize installation of infrastructure along the foreshore and to limit excavation depths, and are there other application where LPS should be considered?

The committee was asked if they supported the hybrid system as proposed in the conceptual design.

MOTION: To accept the hybrid system as proposed. – R. Steinke
SECONDED: I. Munro
CARRIED UNANIMOUSLY

Staff have put forward a number of options to provide greater equity in the system. Seeking feedback on options for LPS cost equity or if property owners should pay for everything on their lot.

Comment: Support accommodations put in proposal. Should accept proposals for those properties designated LPS by the committee, but not those who choose LPS.

MOTION: To adopt the proposal for LPS support as written. – I. Munro
SECONDED: K. Newman
The committee further discussed the motion.

Comment: Opposed that costs be covered by the service. Property owner should be responsible for connection to property line. Technical committee likely didn't look at every lot, so there may be additional lots that require LPS.

MOTION: Recommend that chambers and grinder pumps be provided for properties where LPS is not optional. – I. Munro

Several abstains were noted from TAC members. Clarified that abstains were treated as votes in support, so a revote was requested with votes to be counted individually. Staff stated that they would bring up the Terms of Reference (TOR) to clarify if both the TAC and PAC are required to vote on all issues.

The motion was repeated, with concerns raised about the definition of "not optional." A reworded motion was suggested replacing "where LPS is not optional" with "designated as an LPS connection by the design."

Comment: There will be properties that may not be designated as LPS in the design but may require it.

	Response: Not optional meant whether a property could connect by gravity or not would be determined once we know the depth of the main, so if below grade is not optional and would require LPS. MOTION: Recommend that chambers and grinder pumps be provided for properties designated as an LPS connection by the design. – I. Munro Any amendments to the motion were requested. MOTION: That grinder pumps and chambers be provided for any property so desiring. – J. Elliott The motion was denied due to not qualifying as an amendment. Comment: Will be some properties where there might be a rock in the way of the line or other issue, which may not be identified by the committee, making LPS a more cost-effective option. The TOR for the TAC was reviewed for motions and voting. Recommendations to the Steering Committee will be made by consensus. Recommendations may be recorded as non-consensus if after adequate deliberation members are not all in accord, and the non-consensus party must provide a written submission outlining their rationale. Comment: Should be able to come up with wording for where LPS is used for properties where gravity is technically difficult. Current wording implies LPS chosen by whim. Staff raised concerns regarding option for deciding who gets grinder pumps. If lay of land allowed for gravity, would have gone for gravity as preference. Not ready as project team to allow people to pick and choose whether they want LPS or gravity. Costs so far only include LPS for those properties previously considered. Costs will be higher if additional properties opt for LPS. Q: Is there anything preventing someone with a gravity connection changing to LPS later? A: Everything up to property line is traditionally the home owner's responsibility. Q: If it's the property owner's choice, they pay for it. Is there a legislative or technical reason for why you wouldn't want LPS as option for properties where it's not required? A: Will look at municipal bylaws to see what they require. Will we even know if home owner decides to install grinder pump? Project team not quite ready to allow people to choose LPS when not required, since it could change the collection system from the proposed design.	

	Comment: "Where possible" is key wording. Where gravity is not possible, LPS should be used. If doing it for some homeowners, should offer it to all properties where gravity is not possible. Q: Isn't that what was originally proposed? A: Original motion limited provision of pumps to those properties designated by the technical committee. MOTION: That LPS, grinder pumps and chambers as recommended are provided where a gravity connection is not possible as determined by the design team. – I. Munro Comment: Some properties by a gravity main may require pump to connect due to placement of house and configuration of lot. Response: Then that would be considered not possible as determined by the installation team. Will get finer level of detail of who can and cannot connect by gravity later in project. Comment: LPS system is where property is fronted by shared LPS forcemain, but may have some properties fronted by gravity main but require pumped connection. Only fair way is for homeowner to pay for everything on their property. Q: If fronted by a gravity main, can a grinder pump connect to it? A: Yes. Comment: Where installation team says LPS is needed, that's where it should be applied. The committee reviewed the proposed motion, providing LPS where a gravity connection is not possible as determined by the design team, and the core of the motion was noted as whether the project or property owners pay for grinder pumps. Input was sought from the committee. Several TAC members noted that they did not feel appropriate voting on the matter or providing input as part of a regulatory body or due to viewing the issue as a community decision. Comment: Owner should pay for everything on property. Comment: Only way to define something as vague as fair is to go with what was done in the past and have owner pay for everything up to the property line. Comment: Should go for gravity system, but if not technically feasible should utilize grinder pumps that should not be at the expense of the homeowner. Confusion could be ameliorated if motion better clarified what the committee wanted. Comment: If the initial pump is provided by the CVRD, everything else to the property line is the homeowner's responsibility.	

	Staff noted that the CVRD proposal includes provision of initial pump, pump out in case of emergencies, and stockpile of pumps to be provided at cost to property owners. Clarified that motion is on if CVRD taking on initial costs or if everything up to property line is property owner's responsibility. Motion is intended to implement proposed CVRD program for LPS. Comment: CVRD should pay for anything provided by the CVRD, but property owner pays for everything else. Comment: Property owner should pay for everything up to property line. Providing stockpile of pumps may be problematic due to various sizes of pumps. Comment: Assumptions may have been made that connecting by gravity is cheaper, but that may not be the case for properties that require deeper connection or due to other factors. Haven't looked at costs for properties not currently identified as LPS, so can't assume LPS will be more expensive. Most equitable approach is to provide service at property line and owner pays for rest. Comment: Committee is getting lost in definition of fairness and equitability. Need to focus on procedural fairness. Could be argument that project should subsidize those properties forced to use LPS because they can't connect by gravity, but could potentially have unfair situation where you're forced to use gravity. Most procedurally fair option would be that the owner pays for everything up to the property line. Comment: Suggested amending TOR for TAC regarding what matters to vote on. It was noted in the Master Municipal Construction Document that the regional district may consider approving an LPS system where a gravity system is not possible or there is not economic justification for a pump station. Technical team may not have all details on where property will connect. Properties with basement suite may need to connect at lower depth, but CVRD will not know that. Municipalities traditionally put in core infrastructure and it's up to the property owner to connect, whether by gravity or LPS. Cannot feasibly design for every house. Comment: Looking to lessen financial impact on homeowners. The committee was asked if they are comfortable with only the PAC voting. The committee agreed, noting a potential conflict of interest for TAC members. The PAC members were asked if they supported the previously proposed motion.	

	MOTION: That LPS, grinder pumps and chambers as recommended are provided where a gravity connection is not possible as determined by the design team. – I. Munro IN FAVOUR: I. Munro, K. Newman, R. Lymburner, T. Donkers, M. Hewson OPPOSED: N. Prince, R. Steinke, A. Gower, J. Elliott, N. Prins NOT CARRIED Comment: Those in support should write up explanation for why they voted that way to provide to the Steering Committee, and same for opposition. Response: Representatives from each side should provide one-page statement on their reasoning and provide to the committee within a week.	
3.5.11 12:10-12:40 pm	**Lunch** The committee broke for lunch at 12:10 pm and reconvened at 12:38 pm. M. Rutten provided an update on CICCs in follow-up to a previous question on secondary dwellings. The CICC bylaw for the CVSS states per parcel, but references a table in the bylaw that states per unit. Currently interpreted as one charge for single building (including suites), but second charge for detached dwellings. Bylaw will require review.	
3.5.12 12:40 12:47pm	**CVRD Updates and Briefing Notes – Project Phasing** **#5: Phase 1A Scope Methodology** D. Monteith provided an overview of the proposed project phasing. Phase 1A includes historic Union Bay and Royston, two pump stations, and 13km of sewer main. Properties were chosen for first phase due to oldest septic systems, smallest lots, technical considerations (system hydraulics, pipe sizing, etc.), and project funding (creating a service area that maximizes successful grant funding, etc.). **#6: Cost Equity between Phases** D. Monteith discussed staff consideration of cost equity between phases. Noted that future grant funding could allow for cost equity, and smaller amounts required due to most infrastructure having been constructed during first phase. Many uncertainties surrounding timing, inflation and grant funding make cost equity difficult to achieve. Costs in briefing note only include collection systems, not pump stations. Recommend that the committee put forward policy statements.	**CVRD**
3.5.13 12:47: 1:08	**Committee Recommendations – Project Phasing** **5. Does the TACAC support Phase 1A as proposed?** **6. What policy statements would the TACPAC like to see added to the plan to address cost equity between phases?** **7. Does the TACPAC have other comments regarding costs?**	**A. Habkirk**

	Q: Have other areas in Royston and Union Bay been considered? What about those with larger lots that won't benefit from sewer as much? A: Those with larger lots have been considered for future phasing due to lower risk. Q: Is Royston Elementary not currently in Phase 1A? Is there a reason it wasn't included? A: Correct. Focused on waterfront area, so wouldn't be continuous. Staff have discussed with SD71 and WSP has looked into possibility of connecting Royston Elementary. SD71 are considering their options. Currently investigating way to include in project, but wanting to make sure not to impact per property project costs. Q: Does Union Bay area include K'ómoks lands near McLeod Rd? A: Only includes existing Union Bay area, but capacity for K'ómoks lands to connect to system. Q: Any update on grants? A: Still outstanding, but expecting response in spring. MOTION: To adopt Phase 1A as proposed. – A. Gower SECONDED: J. Elliott CARRIED Q: Is discussion on Royston Elementary about being connected to service? When will the committee be advised of the outcome of discussions? A: Correct. If committee considers connecting Royston Elementary in first phase a priority, it can be expressed via motion. MOTION: That the committee support the addition of the Royston Elementary School to Phase 1A subject to costing and design considerations. – R. Steinke SECONDED: N. Prince The committee further discussed the motion. Q: How would CICC apply to a school? A: CICC bylaw does speak to institutions, so charge based on square metres of building. Comment: Was mentioned that school board looking at other options. Isn't it prudent to wait for what SD71's alternative options are? Q: Why would connecting the school in the first phase be an important thing to do? A: Based on how school catchments currently work, they are moving kids away from south area due to capacity issues related to septic system.	

	Comment: Not sure if connecting to Phase 1A is the school's best option. Upgrading septic system may be ideal solution if need immediate solution. Response: Maybe instead of including them, should request more information on both options, how short-term the issue is, and if adding them to the service would solve any problems. R. Steinke and N. Prince withdrew their previous motion. MOTION: That the committee request more information from School District 71 on the options being considered so the committee can better understand how short-term the septic system capacity issue is and if it would be of value to the community to have Royston Elementary added to Phase 1A – R. Steinke SECONDED: I. Munro The committee further discussed the motion. Comment: SD71 has member on committee, although isn't currently present. Can request additional information for next meeting. Comment: Is there any intent for there to be an addition built onto the school that prompted this discussion? It is public infrastructure so it will come out of public funds regardless. If expansion planned, good investment to connect to sewer rather than put in new system and connect down the road. Septic also affects available footprint for additions. MOTION: That the committee request more information from SD71 on the options being considered so the committee can better understand how short-term the septic system capacity issue is and if it would be of value to the community to have Royston Elementary added to Phase 1A – R. Steinke SECONDED: I. Munro CARRIED Q: Regarding Kilmarnock, pump station is being costed out on existing connections but will support much larger catchment area. How do we ensure cost equity when pump station pertains to overall collection system and supports additional development? Should some of funding from project partners be dedicated to pump station? A: Developers will need to pay Development Cost Charges when developing land that will contribute to service. Comment: Unsure how much infrastructure is being put in for just Kilmarnock, a larger catchment area, or the whole service. Should develop policy statements capturing overarching idea for cost equity, but good to clarify details for open houses. Response: Due to uncertainty around timing and funding, difficult to break down how costs for Kilmarnock pump station will be shared.	

	Should be split between existing properties and new developments. Support including policy statements from committee. Q: How much of infrastructure is being put in initially for consideration of future phases? Comment: Can include policy on everyone paying their fair share and current occupants won't take on a disproportionate burden for development costs. Comment: Statement as presented says all phases, so implies future phases. Need to be clear that all anticipated phases join existing catchment area have their costs rebalanced to ensure equity between phases. Comment: Problematic to impose too many details. Comfortable with statement as written. MOTION: To adopt the policy statement as written: "The Comox Valley Regional District will make all reasonable efforts to identify and secure additional grants, partnerships and funding opportunities to help create equitable costs between all phases of the Sewer Extension South Project." – I. Munro SECONDED: A. Gower CARRIED	
3.5.14 1:08- 1:12pm	**CVRD Updates and Briefing Notes – Value Planning #7: Value Planning** V. Van Tongeren provided a summary of the value planning process. 60 ideas presented by value management team, with four advanced for further consideration: Use the E&N rail corridor for all or some of the forcemain alignment, modify sewer loading design criteria to reduce size, use majority of native soil as backfill material, and move pump stations above coastal flood level. Technical memo in development, to be presented to Steering Committee in the spring. Q: Will fate of E&N railway impact potential of use of corridor? Q: Requested clarification on what is happening with E&N railway. A: A meeting occurred today (March 14) on the fate of the E&N railway. Federal and provincial governments announced that part of the corridor is to be returned to First Nations and further consultation to occur for the rest of the corridor.	**CVRD**
3.5.15 1:12- 1:23pm	**Next Steps, Meeting #4 Preview** A. Habkirk and D. Monteith gave a summary of next steps. TACPAC recommendations to be shared with Steering Committee on May 8, with TACPAC Chair invited to attend on the committee's behalf. Open houses will be hosted in June. Draft addendum report will be developed in July-August, including Class C estimates. Next TACPAC meeting is September 13.	**A. Habkirk /CVRD**

	Chair A. Gower stated that he will be unavailable for the May 8 Steering Committee meeting. The committee was asked if an alternate chair should be appointed. I. Munro was nominated as the alternate chair. Member of the TACPAC were encouraged to attend the June open houses. Q: Will we know if the grant is approved by then? A: Hopefully. The committee was asked if they approve I. Munro representing the committee at the Steering Committee as the alternate chair. Approved by the committee. Q: Sewer may be a hard sell due to previous failed referendum. Is there a plan in place for the open houses providing information in support of the project? A: Information will be prepared for the open houses, but also rely on committee to discuss project with the committee. There is an engagement plan in place. Might be worth committee members reviewing engagement plan, and can be distributed to the group again. Comment: Despite failure of previous referendum, have only heard positive responses. Comment: Request that open houses have at least one evening option. Response: Noted that CVSS LWMP open houses were usually in the evening. Will definitely host one or two meetings in evening. Q: Prior to public meetings, will CVRD have firm commitments from Union Bay Estates (UBE)? Concerns amongst community that UBE is proceeding with plans to discharge to Washer (Hart) Creek, so commitment will help assuage concerns. A: UBE is key partner. Working to amend Master Development Agreement to better align with project and current goals. Will be investigating options such as contribution agreement, but unsure what will be completed by time of open houses.	
3.5.16 1:23-1:28pm	**Roundtable** The meeting was opened to comments from the committee. The committee members thanked each other for the candid and respectful discussions. CVRD staff expressed appreciation to the public members for their input and technical members for their insight, and commended the members for their contribution to their community.	**A. Habkirk**

	Comment: May be worth bringing in outspoken people and getting them involved in public outreach to help diffuse situation by bringing them onside. Worked well for Comox Valley Water Treatment Project.	
3.5.17 1:28pm	**Adjournment** The committee adjourned at 1:28pm.	**A. Habkirk**

GENERAL:
The next SES LWMP Addendum Joint PACTAC meeting will be held on September 13, 2023 commencing at 9:00 am in the CVRD Civic Room at 770 Harmston Avenue, Courtenay, and via Zoom conference.

TERMINATION:
The meeting terminated at 1:28 pm.

APPENDIX

E

TACPAC #4
DISCUSSION PAPERS
& MINUTES

Comox Valley REGIONAL DISTRICT

Minutes

Minutes of the meeting of the Sewer Extension South (SES) Liquid Waste Management Plan (LWMP) Addendum Joint Technical and Public Advisory Committee (TACPAC) held on Wednesday, November 22, 2023 in the CVRD Civic Room at 770 Harmston Avenue, Courtenay, and via Zoom conference commencing at 9:02 am

PRESENT:

A. Habkirk, Chair and Facilitator	Facilitator
J. Warren, Chief Administrative Officer	CVRD
M. Rutten, General Manager of Engineering Services	CVRD
D. Monteith, Manager of Liquid Waste Planning	CVRD
V. Van Tongeren, Environmental Analyst	CVRD
C. Wile, Senior Manager of Strategic Initiatives	CVRD
A. Mullaly, General Manager of Planning and Development Services	CVRD
M. Briggs, Branch Assistant – Engineering Services	CVRD
I. Snyman	WSP
S. McNally	WSP
C. Davidson, City of Courtenay	TAC
M. Hall, Island Health	TAC
E. Derby, Island Health (Alternate)	TAC
M. Mamoser, Ministry of Environment and Climate Change Strategy	TAC
L. Johnson, Ministry of Health	TAC
D. Arbour, Electoral Area A Director	PAC
M. Hewson, Association for Denman Island Marine Stewards	PAC
T. Clinton, Association for Denman Island Marine Stewards (Alternate)	PAC
N. Prins, BC Shellfish Growers Association	PAC
C. Pierzchalski, Comox Valley Conservation Partnership	PAC
A. Gower, Comox Valley Chamber of Commerce	PAC
I. Heselgrave, Comox Valley Schools	PAC
N. Prince, Craigdarroch Resident Representative	PAC
R. Steinke, Craigdarroch Resident Representative	PAC
T. Donkers, Royston Resident Representative	PAC
K. Newman, Royston Resident Representative	PAC
J. Elliott, Union Bay Resident Representative	PAC
R. Lymburner, Union Bay Resident Representative	PAC

Item	Description	Owner
4.1 9:02 – 9:03 am	**Welcome and Territorial Acknowledgement** The meeting was called to order at 9:02 am. The CVRD acknowledged that the committee is meeting on and the proposed Sewer Extension South Project will be constructed and operated on the traditional unceded territory of the K'ómoks First Nation.	Facilitator
4.2 9:03 – 9:05 am	**Meeting #3.5: Meeting Minutes, Follow-Up Items** MOTION: Adopt the minutes of the March 14, 2023 SES LWMP Addendum Joint TACPAC meeting. – K. Newman SECONDED: T. Donkers CARRIED UNANIMOUSLY The terms of reference for the Technical Advisory Committee (TAC) and Public Advisory Committee (PAC) were revised to allow TAC members to abstain on community decisions or where there may be a perceived conflict with the member's role as a regulatory body and the PAC to abstain on technical matters that don't impact the community. Motion: Adopt the revised Technical Advisory Committee and Public Advisory Committee terms of reference. – R. Steinke SECONDED: M. Mamoser CARRIED UNANIMIOUSLY	Facilitator
4.3 9:05 – 9:14 am	**Communications Update** C. Wile gave an overview of public engagement for the project since 2021. Staff have held three open houses and two webinars, and have sent out three mail updates to residents in the project area. The project page has been viewed 2,500 times and staff have responded to 170 email and phone enquiries. 50 per cent of traffic was directed from the CVRD website, and 32 per cent from direct contact (mailout, email, etc.). The CVRD hosted open houses in June, attended by staff and several TACPAC members. Topics discussed with	CVRD

	residents included phasing, funding, resident and project costs, pump station and conveyance system location and designs, the LWMP process, and the timeline for the project. Topics of most interest to the community during public consultation were: • costs/affordability; • timing/costs for future phases; • interested in connecting to system now; • no option for referendum/AAP; • project being prioritized to benefit private property development; and • "get the job done" as quickly as possible. Several residents from future phases also asked to be added to an earlier phase, and some residents who recently installed a septic system requested a deferral option. Over 200 people attended the June open houses, with 34 feedback forms submitted. 43 people attended the webinar, with 201 views on YouTube in total, and 12 feedback forms submitted online. Letters communicating project updates were mailed to over 900 households. An electronic update will be distributed to the project email list next week, providing a high-level summary of this meeting, a link to the What We Heard report, and notification of upcoming open houses in January. For January, will post draft addendum online and mail out invitations to open houses to residents in project area. Staff will report back to the committee in March/April. Staff have engaged with K'ómoks First Nation (K'ómoks), as well as 14 other First Nations. Four First Nations have provided responses and the rest have no questions or comments so far. First Nations were provided an update on the LWMP process, and staff will share the draft addendum. There will be two more opportunities for input for the draft addendum and the Stage 3 LWMP.	

4.4 9:14 – 9:18 am	**Roundtable** A. Habkirk requested any comments or feedback from those TACPAC members who had attended the June open houses. Comment: Attended Royston open house and noted a surprisingly positive feeling in room. Only met one person who was opposed to project and just wanted to express opinion. Comment: Attended both open houses and surprised that most people were resigned to project happening even if not all happy. Cost is a big concern to residents. Union Bay still recovering from $5 million water treatment plant and upcoming water rate increases. Most acknowledge sewer will happen sooner or later. The agenda was varied to bring forward agenda items 4.6 and 4.7.	Facilitator
4.6 9:18 – 9:50 am	**Overview of draft addendum report** D. Monteith gave an overview of the LWMP process and how it fits into the Comox Valley Sewerage Services (CVSS) LWMP process. Provincial approval of LWMP gives local government ability to borrow for projects. LWMP is effective for regions where there is considerable growth and development or where there is a need to protect public health and the environment. Purpose is to protect environment and properly consult public. I. Heselgrave joined the meeting at 9:19 am. The draft LWMP Addendum Report includes seven sections: • Section 1 – Introduction • Section 2 – Consultation: Includes summary of TACPAC meetings and consultation with K'ómoks and First Nations, as well as public consultation. Will be updated with activities in early 2024. • Section 3 – Service Area, Land Use, Development, Population: Provides context for how servicing plans for the south region were developed,	CVRD/ WSP

	including service area boundaries, population projections and land use policies. Mostly addressed at TACAC Meeting #1. • Section 4 – Regulations & Guidelines: Includes guidelines for inflow and infiltration, wastewater volume reduction, source control and septic systems. Most topics covered by CVSS LWMP, so mostly includes details specific to south region, such as septic systems. Island Health presented on septic systems at previous meeting, and this section will include details on a septic regulatory program. • Section 5 – Project Design: Includes project design summarizing flows and load projections for the region and discusses design considerations accounted for during development of system configuration. Bulk of report details proposed phasing and infrastructure for collection systems, pump stations and the forcemain. • Section 6 – Environmental Impact Study (EIS) – Summarizes Draft EIS developed by Current Environmental and presented at TACPAC Meeting #3. Current Environmental will be updating the EIS to include Phase 1B, to be presented at the next meeting. EIS identifies environmentally sensitive areas and contaminated sites, along with mitigation strategies. Section also includes archaeological survey from Baseline Archaeological Services in 2015. • Section 7 – Project Cost Impacts: Includes Class C cost estimates for Phase 1A and 1B, updated in October 2023. Also includes estimates for cost escalation and CVRD internal costs for administration and land negotiations, as well as the TACPAC policy statement regarding cost equity. Costs for Phase 1A property owners have been reduced by $200 since last presented. I. Snyman gave an update on the collection system design. Described the engineering design process from conceptual to detailed design. Steps involve identifying problems, determining if feasible, determining if the	

	design is practical, and then proceeding to detailed design where design is optimized. Detailed design is about 40 per cent of process. Currently in preliminary design phase, with detailed design phase to occur with the Stage 3 LWMP. Conceptual design involved high-level information to show where pipelines will be, made based on past practices and assumption that rights of way will be used. Residents expressed concerns about rights of way through their property so investigated options that avoid private property where possible. As progressed into preliminary design, added additional information using LiDAR and performed hydraulic modelling for pipes. Conducted value engineering to identify potential issues or alternatives for design. Maps were shared showing the difference between the conceptual design and preliminary design for Royston and Union Bay. Kilmarnock went straight to preliminary due to extra information gathered from Royston and Union Bay. Q: As you refined the designs, did you look at change in impact on residents by altering the collection system? Did you look at cost changes from moving pipes around? A: Looked at cost implications, both on capital and residents, and did best to reduce costs. Moving out of rights of way into road may see additional costs if going to low pressure sewer (LPS) from gravity, but also removes costs of right of way negotiations and does not account for peace of mind of not having pipe on property. Q: Could you give an example of what moving a pipe from private property to the road might look like on the map? A: Shared map of Union Bay where pipe originally proposed between properties along 6th and 7th St. Route would require costs for lawyers and negotiations with residents, which is difficult to account for in costing, so opted to move pipe to road to avoid these complications.	

	Cost estimates are made more accurate over time as design is refined and more information is available. Cost estimates were updated due to additional information from LiDAR and hydraulic modelling, fluctuation in construction costs, design updates, changes to highway and railway crossing, and input from the public. An overview was given of the changes to capital cost estimates from last TACPAC to October 2023 estimates, with the cost for the forcemain decreasing by $4.4 million, the Royston collection system increasing by $6.5 million, the Kilmarnock collection system decreasing by $690k, the Union Bay collection system increasing by $3.5 million, and the Kilmarnock and Union Bay pump stations increasing by roughly five per cent. Mostly due to changes in design and proposed service area. R. Lymburner joined the meeting at 9:47am. Q: Is the Union Bay portion of the forcemain included in the North Royston and South Royston forcemain costs? A: Yes, includes total cost of forcemain to Union Bay. Q: If the costs go up or down, will the residents pay or save the difference? A: More information on resident costs to be shared later in meeting. There has been a slight increase in project costs but also greater allocation of grant funding, which has impacted the costs for residents.	
4.7 9:50 – 10:18am	**Committee Considerations** D. Monteith shared updated resident costs for Phase 1A with the committee. One-time costs now include LPS equipment for those who may require it, but have not changed for gravity connections. Borrowing costs have been reduced by $200 following allotment of $3.6 million reserve grant funding and the addition of $1.25 million in community works funds. Q: What page are the costs shared in the report? A: Table 12 on page 55. The table in the addendum does not include previous cost estimates.	CVRD

	M. Rutten gave an overview of a staff report on projected tax escalation for the south region presented to the Electoral Areas Services Committee (EASC) and referred to the TACPAC. This committee focuses on sewer, but there are more service pressures in south region. The staff report identified cost pressures in south region, including the impact of the SES, Water South Extension Project, recreation facilities, enhanced garbage collection and the utility water rate review. The Water South Extension Project includes providing K'ómoks south lands with water from the Comox Valley Water System, as well as providing water to Royston and disconnecting it from the Village of Cumberland water system so the Village can better support its own growth. All of the CVRD participates in recreation service, with major refurbishment required. Potential for enhanced garbage collection for Royston, as collection companies move to automated bins and trucks. The CVRD conducted asset-management focused work on all water systems, including Royston and Union Bay. Rate increases projected for water systems to save funds for infrastructure replacement in the future. Fire hall replacement planned for Union Bay. Analysis completed based on information available at time. Staff used Class D estimates for SES, with costs already reduced in Class C estimate. One-time connection costs were not included in analysis. Values were calculated based on single family residential property. Comment: Analysis based on $500k-800k property value, which does not seem accurate. Property values in south region are likely higher now. Response: Used $500k for older years, but $800k used for 2023 as median from BC Assessment as average across entire area. Could be different for Royston and Union Bay. Shared projected tax estimates for Royston and Union Bay for 2023 and 2027, which does not include SES. Royston projected to go from $2,170 to $3,135 and Union Bay from $3,132 to $3,866. Water and fire services mostly driving increases. SES Phase 1A borrowing and operating costs	

	are expected to add roughly $2,190 to the 2027 charges, down $200 from when the staff report was published. Q: What is unique services tax? A: Unique services tax is mostly for fire services for Royston and Union Bay. Staff report further explains how numbers are developed. Comment: CVRD letter outlining water rate increases mentioned replacement renewal. Suspect watermains will be upsized for future development, but didn't see increase in Capital Improvement Cost Charge. Costs should be put on future development. Response: Agreed, and included in staff report. Upsizing costs will be covered by future development, not existing homeowners. Q: Where do subsequent fees collected from Union Bay Estates (UBE) properties go? Does it go into general revenue or back to residents who initially paid for the system? A: Speaking for collection system, forcemain, or both? Q: All infrastructure. If new properties join after system is complete, will presumably be charged connection fee. Fees collected should go back to residents who paid for system, but suspect will go back into general revenue. A: A new service will be created for new collection systems and all revenue will go into that service. If a new property joins an existing service, fees will go towards paying off debt. New neighbourhoods will go through same process with a new system required and with separate costs and service area. Anyone who connects will be paying a user rate and parcel tax. All money collected for project will go towards just that project. Comment: Money collected from late adopters should go back to early adopters. Early adopters are subsidizing late adopters, since if they joined earlier it would have meant lower costs. Response: Scenario assumes that the existing system would not need to be expanded. If the system needs to be	

	extended to include new properties, that would require additional costs borne by the late adopters. Comment: System will be designed for expansion to include UBE and K'ómoks south lands. Response: There is a difference between collection system infrastructure and conveyance system. For collection systems, new properties added to service area will share in borrowing costs, and overall costs would be reduced if a significant number of properties joined the service. For conveyance system, new properties will pay Development Cost Charge towards new infrastructure or upsizing to accommodate development. With combination of grant funding and partner contributions, residents will not be paying towards conveyance infrastructure but only their collection system. Q: Will there be a Development Cost Charge for new development? A: Yes. W: Are these numbers based on mandatory connection? Have staff addressed what to do with mandatory connection? A: All properties in the service area will have to connect, with an option for deferral offered for those with new septic systems. Q: If all the borrowing costs are paid, do property taxes go down? A: Yes, once the debt is retired, taxes would be reduced. Director Arbour joined the meeting at 10:15 am. Q: Can we see a wider range of cost impacts for higher-valued properties? Some properties are valued at $1-2 million. A: Staff can get back with estimates. Some costs are parcel taxes, so same for each property, while others are based on property value.	

4.5 10:18 – 10:31am	**Break** The committee broke for recess at 10:18 am and reconvened at 10:31 am. The agenda was varied to bring forward agenda items 4.9 to 4.12.	
4.9 10:31 – 11:04am	**Committee Considerations (continued)** V. Van Tongeren provided an overview of discussion paper #1 (collection system design considerations). From conceptual to preliminary design, went from 43 (Royston) and 64 (Union Bay) rights of way on private property to 4 and 4 respectively, and LPS connections went from 20 (Royston) and 44 (Union Bay) to 88 (Royston) and 111 (Union Bay). Kilmarnock's numbers, 4 right of ways and 46 LPS connections, have not changed. Numbers are on conservative side, and will have better understanding on grades and depths required for pipes after topographical survey. Q: Is there a map that shows the changes in rights of way and LPS connections between designs? A: Preliminary design shows most changes, but still in early stages. Updated map will be shared at next open houses. Comment: Rethinking committee decision on LPS. Can the committee revisit the topic and has anyone rethought their decision? With an expected increase in taxes for residents in south region, this is one spot where the committee can impact costs for residents. Was not aware of full picture at time of voting. Q: How has reducing the number of rights of way versus increasing the number of LPS connections affected costs? A: Have not quantified total costs of acquiring rights of way, but estimate that costs would be 50 per cent of land value where right of way is located. Comment: Committee had previously discussed an option for the CVRD to provide a stock of grinder pumps at no cost to property owners, but now there are more	CVRD

	estimated LPS properties. Would like to reconsider decision on LPS. Q: Are the rights of way versus LPS changes negligible? A: Table shows estimated difference in numbers of each. Q: Are you proposing including LPS grinder pump costs in overall project costs? A: Yes, since number of LPS connections was lower at time of vote. Not proposing design change or anything with rights of way, but just revisiting LPS decision. If no support for revisiting LPS, then would just like to express opinion. V. Van Tongeren shared proposed changes to phasing and boundary changes from discussion paper 2. The proposed changes include adding properties along Hyland Rd and Royston Rd to Phase 1B, and moving properties near Marine Dr up into Phase 1A. Staff are also in discussion with the Kingfisher Resort and Spa regarding a potential connection in an earlier phase. Comment: If can expand system with little to no increase in project costs, adding additional properties will help to better fund system. Q: Had previous discussion about Royston Elementary School but never resolved. Does adding the school to Phase 1B solve their problem? A: Proposed properties are those not already in service area. Royston Elementary is already in Phase 1B, but still in discussion with Comox Valley School about moving up to Phase 1A. Q: All new properties would be added to Phase 1B subject to cost analysis? A: If the committee supports including properties in service area and there is minimal impact to project costs, staff will approach the property owners.	

	Comment: If there are more owners who want to join the service area and the cost impacts are minimal, the committee should support their inclusion. A. Habkirk asked the committee if they were generally supportive of the proposed additions to the service area. There were no objections from the committee. V. Van Tongeren gave an overview of the draft addendum report. The report included design changes for the collection system, Royston pump station (flood risk mitigation) and a potential alternate forcemain alignment along the E&N railway. D. Monteith summarized the next steps for the project. Staff will be presenting the draft addendum report to the LWMP Addendum Steering Committee and CVSS LWMP Steering Committee. Staff will host open houses and a webinar in January 2024, where staff will provide updated costs estimates and preliminary design. The updated LWMP addendum will be presented in March/April to the TACPAC for review and comment, and then presented to the steering committees in April. A. Habkirk asked the committee if they were comfortable with the draft addendum report in its current form, or to discuss any concerns or issues. Q: After the draft addendum report is sent to the province, what is the timeline for a response and estimated construction start date? A: Estimate provincial review time is six months. Once reviewed by province, the report can be revised accordingly and then attached to the CVSS Stage 2 LWMP. The project will proceed into a combined Stage 3 LWMP, which includes more detailed design work, updated cost estimates and an additional public consultation process. Q: When do you estimate final approval of the Stage 3 LWMP?	

	A: Estimate submitting Stage 3 LWMP to province in summer/fall 2025, and depending on review process and feedback, will then proceed to tender process for construction. Q: Mentioned potential changes for flood risk mitigation for Royston Pump Station. Will this be discussed? A: Had included measures at previous meeting and incorporated in all designs. Once designs and costs are further refined, can bring back to committee. Q: Can anything be shared about partner funding contributions? Has there been any progress? What is the timeline for when it will be finalized? A: Negotiations are confidential, so difficult to discuss and be transparent. Partner contributions from K'ómoks and UBE would support conveyance pipe, since it also supports their development. In general partnership is split a third between each party, but grant funding is also there to support residents and K'ómoks, with UBE paying their full share. Trying to ensure system provided meets requirements of UBE Master Development Agreement. UBE is in full support of SES as long-term solution and discussions are going well. Q: What would be reasonable timeline to have commitment? A: Early 2024 for UBE, but later in 2024 for K'ómoks due to treaty process. Comment: Important to gain security and certainty for project. Grant funding was first step in providing stability. K'ómoks and UBE recognize need for project. Have not given up on finding other ways to fund project, and may be other resources available for project. A. Habkirk asked the committee if they were comfortable with the draft addendum report proceeding to the steering committee as is. There were no objections from the committee.	

4.10 11:04 – 11:22am	**Updates** V. Van Tongeren gave an overview of the proposed septic deferral program. Approved by the LWMP Addendum Steering Committee in May 2023. Septic systems under five years in age at date of required sewer connection (~2028 for Phase 1A) are eligible. Deferred costs would include the operating and private property (connection and septic decommissioning) costs, and can be deferred for five years or until property is sold. Q: Is 2028 date based on installation of Phase 1A? A: Estimated date for when pipes are all installed and properties will be required to connect. Program will include all systems installed within five years of that required connection date and can defer for five years. Q: Five years from installation of septic system? A: No, would be looking at five years from date of required connection, so connection likely deferred until 2033. Q: Based on the 2028 date, would this essentially exclude anyone with an existing septic system and only include new builds starting from this year? A: Correct. Q: Will any notice be given to people after project approval to not put in new septic system unless necessary? A: Staff will provide constant communication with community. There may be temporary options, including a holding tank. Q: If 2028 is expected connection date but proposed taxes are for 2027, would that impact the costs? Would the charges start when properties connect or when the forcemain is installed? A: 2027 is an estimate. When discussing connecting in 2028, pipes will be in ground with construction having occurred. Will require funds before then for construction to occur. Once construction occurs and CVRD has taken	CVRD

	out loan, debt payments will start. Conceivable that charges start year of construction. Q: Would just charge the capital costs and not operational initially, or the full amount? A: Operational costs would not be charged until system is operational. Comment: Should provide clarification on financing at open houses or next committee meeting. Q: Had originally discussed residents not paying until residents had service. If holdup in construction, residents would be paying for service they don't have. Not fair to pay for service that residents cannot use yet. Could be archaeological discoveries or material shortages that may delay project. A: Will discuss with finance staff and determine timeline and financial options. V. Van Tongeren gave a summary of the septic maintenance program. Presented region-wide program to EASC in October. Program would include mandatory inspections for high-risk areas and mandatory pump-outs for all other areas. Program would also require order in council from BC Cabinet, with public engagement in spring and request to be submitted summer 2024. If approved, service establishment would proceed in 2025 and could see implementation in 2026. Inclusion in addendum report allows program to proceed for SES service area if region-wide system does not proceed. Q: If included in addendum report, can proceed with septic maintenance program if order in council not successful? A: Would still require order in council. Comment: Support concept of mandatory pump-outs and septic program. Should use carrot rather than stick approach, and should think outside box to find ways to fund systems and have subsidy to support homeowners.	

	50 per cent subsidy for properties in Phase 1A could be about $5 million. Priority should be to protect Baynes Sound. Q: If addendum report is approved, will this septic program not occur at all? A: Septic program is on parallel track. If SES proceeds, service area would not fall under program because they would no longer have septic systems. Program would apply to other CVRD areas. Comment: Regardless of what happens in SES process, UBE Master Development Agreement still requires expandable service, so may be source of funding.	
4.11 11:22 – 11:36am	**Next Steps** A. Habkirk noted that the next TACPAC meeting was scheduled for January, but will be moved to March or April. D. Monteith thanked the committee for their participation and invited them to attend the January open houses. Q: Did we vote on the Royston pump station design? A: The committee voted on location and supported building with amenities. WSP has looked at additional flood risk mitigation, which is included in report. Location is the same with alternate options to look and feel. Staff need to take a closer look during detailed design phase to determine cost implications, then come back to committee. Q: Have we discussed the Union Bay pump station? A: Union Bay pump station proposed to be located on UBE lands. Still in discussion with developer on exact location. Will discuss building or kiosk option with landowner and the committee. A. Habkirk advised the committee that there will be a motion to support the LWMP addendum report at the March/April TACPAC meeting.	Facilitator

	Q: Concern in community about other projects occurring at same time, such as water, and don't want the roads being dug up multiple times. Would like streamlined, so is this something being considered? Can we put water and sewer lines in trench at same time? A: Staff intend to minimize impact and will coordinate where possible. Sewer and water infrastructure usually end up on opposite sides of the road due to setback requirements. The Water South Extension Project is expected to happen ahead of the SES, but makes sense to have at different time since pipes will be on opposite sides of road and will likely extend to Argyle Rd. Water distribution system upgrades estimated for 15-20 years down the road, so can't coordinate with more recent projects. Q: Whole concept of project is to protect Baynes Sound. What empirical data was used to determine that there is an impact on Baynes Sound? What reports were used and when were they conducted? A few committee members will be attending EcoForum on Sunday and would like to discuss who has this data. A: Need to acknowledge that there are multiple contributors to health of Baynes Sound. Project will only cover part of sound, so this is why septic program also proposed. 2015 report served as basis. A 2009 groundwater monitoring study was completed by Payne Engineering and Environmental Canada has conducted water quality monitoring in the area. Island Health has provided data on septic system age and related health concerns. Multiple norovirus outbreaks in area, known to be mostly caused by sewage from unknown sources. BC Centre for Disease Control is starting genome mapping project in Baynes Sound next year to assist in determining source of sewage contamination. Multiple agencies involved regarding health of Baynes Sound. Four reports included on public consultation site and can distribute via email as well.	

4.12 11:36am	**Adjournment** The committee adjourned at 11:36 am.	Facilitator

GENERAL:
The next SES LWMP Addendum Joint TACPAC meeting, currently scheduled for January 16, 2024, will be rescheduled to March/April 2024, to be held in the CVRD Civic Room at 770 Harmston Avenue, Courtenay, and via Zoom conference.

TERMINATION:
The meeting terminated at 11:36 am.

APPENDIX

F

TACPAC #5
DISCUSSION PAPERS
& MINUTES

Comox Valley REGIONAL DISTRICT

Minutes

Minutes of the meeting of the Sewer Extension South (SES) Liquid Waste Management Plan (LWMP) Addendum Joint Technical and Public Advisory Committee (TACPAC) held on March 14, 2024 in the CVRD Civic Room at 770 Harmston Avenue, Courtenay, and via Zoom commencing at 9:03 am

PRESENT:

A. Habkirk, Chair and Facilitator	Facilitator
M. Rutten, General Manager of Engineering Services	CVRD
D. Monteith, Manager of Liquid Waste Planning	CVRD
V. Van Tongeren, Environmental Analyst	CVRD
M. Briggs, Branch Assistant – Engineering Services	CVRD
I. Snyman	WSP
D. Silvester	Current Environmental
C. Davidson, City of Courtenay	TAC
M. Hall, Island Health	TAC
E. Derby, Island Health (Alternate)	TAC
D. Arbour, Electoral Area A Director	PAC
I. Munro, Electoral Area A Alternate Director	PAC
M. Hewson, Association for Denman Island Marine Stewards	PAC
N. Prins, BC Shellfish Growers Association	PAC
A. Gower, Comox Valley Chamber of Commerce	PAC
I. Heselgrave, Comox Valley Schools	PAC
N. Prince, Craigdarroch Resident Representative	PAC
R. Steinke, Craigdarroch Resident Representative	PAC
T. Donkers, Royston Resident Representative	PAC
K. Newman, Royston Resident Representative	PAC
J. Elliott, Union Bay Resident Representative	PAC

Item	Description	Owner
5.1 9:03 – 9:04	**Welcome and Territorial Acknowledgement** The meeting was called to order at 9:03 am. The CVRD acknowledged that the committee is meeting on and the proposed Sewer Extension South Project will be constructed and operated on the traditional unceded territory of the K'ómoks First Nation.	Facilitator

5.2 9:04 – 9:19	**Meeting 4** MOTION: Adopt the agenda of the March 14, 2024 SES LWMP Addendum Joint TACPAC meeting, with an alteration to include a request for motion to advance the final draft report with any proposed amendments to the Steering Committee following the EIS presentation. – A. Gower SECONDED: I. Munro CARRIED UNANIMOUSLY MOTION: Adopt the minutes of the November 22, 2023 SES LWMP Addendum Joint TACPAC meeting. – A. Gower SECONDED: T. Donkers CARRIED UNANIMOUSLY D. Monteith provided an overview of public engagement for the project since 2021. Staff hosted open houses in January, with the goal to inform the community of feedback heard following the June open houses, to provide an update on project costs, collection system design and the septic deferral and maintenance programs, and to share the draft addendum report. Themes heard during public engagement included: • project costs/costs for residents; • one-time costs/specific property-related questions; • phasing/timing enquiries; • grinder pumps; • pump stations (aesthetics and environmental concerns); and • community impact. Questions were more focused on specific details like pump stations, pipe locations and individual property connections. Feedback compiled in What We Heard report, to be shared with community in coming weeks and in addendum report. 118 people attended the in-	Facilitator

	person open houses and 28 people attended the online webinar, with 36 feedback forms received. Q: Relative to other engagement, is that a high turnout? A: Yes Q: How does the total population engaged relate to the total population the project will serve? What percentage of people who will have to connect are being engaged? A: Roughly 900 properties in service area being engaged with directly, with high percentage attending open houses. Q: Looks about 50 per cent, which is good for public engagement. Important for people to understand that half of those in service area may have been receiving project information but staff haven't heard from them yet. Is the number of total attendees at the open houses unique visitors or total? A: Did not track unique visitors at open houses, but did hear from new people at more recent events. Comment: Might be worth tracking number of unique visitors. Don't want to start project and hear from someone who haven't spoken up yet. Response: Postcards that were sent to invite residents to open houses also included backgrounder on project. D. Monteith gave an overview of next steps for public engagement, with staff reaching out to the community again in 2025 following submittal of the draft addendum and start of Stage 3 LWMP process. Q: Had previously discussed six months for approval of addendum. Is the estimated 2026 approval date because the addendum will come back from the province, be submitted as part of the full sewer LWMP and be followed by another approval process? A: Yes. Anticipate to receive comments back on addendum before submittal of Stage 3 LWMP, which will be sent to province for final approval.	

	Q: How does timeline affect shovels in ground? Understood Phase 1A would be completed in 2026. If we won't have approval until 2026, does that mean construction can't start until then? Darry: Yes. Construction expected for 2027-2028, depending on timeline of provincial approval process. Q: Do we have timeline for estimated date for partner funding? A: Expect to have that confirmation this fall and will share with community then. Q: Unsure if engaging Registered Onsite Wastewater Practitioners (ROWP) has been included in plan but is a critical step in the process. Property owners looking to build or renovate homes may need to hire ROWP to build or upgrade septic system, but then required to connect to sewer system soon after. Worthwhile to engage with ROWPs so they can strategize and advise their clients properly. Is there are a plan to engage with ROWPs? A: Yes, intend to engage with ROWP. Will coordinate with Island Health as the regulatory body. Q: Have been in discussions with neighbour on Kilmarnock Pump Station. How is that discussion included in public feedback? When is the appropriate time to discuss those questions? Question from resident mentioned decision not to have regional pump station across highway and that Kilmarnock will eventually become a regional pump station. A: Included in general terms in What We Heard report. Can discuss further during roundtable. Summarized consultation with K'ómoks First Nations and other First Nations with traditional territories overlapping with project area.	
5.3 9:19 – 9:43	**Communications Update & Roundtable** D. Monteith opened the meeting to discuss feedback received by TACPAC members.	CVRD

	Comment: Received feedback from resident living near site of proposed Kilmarnock Pump Station. Raised concerns around decision to turn PS#3 (Kilmarnock) into de-facto regional pump station. Referenced details on Royston Pump Station where decisions were made to reduce impact on neighbours. Why wasn't Kilmarnock given same consideration with a regional pump station sited across highway? What considerations have been given or what considerations can we give? Response: When looking at planning work for project, regional pump station concept was added after Phase 1B as necessity to add increased system capacity. After looking at Royston Pump Station location, realized that mitigation options would need to be considered because it's in coastal flood zone. Looked at advancing regional pump station at earlier phase as one option to mitigate coastal flood impacts. Other options have also been considered and will be brought forward into Stage 3 planning work. Response: PS#3 is still several years away, so design is preliminary. Still requires geotechnical, archaeological and environmental surveys before developing detailed design. Final positions of pump stations have not been set yet. PS#3 will have higher flows but not until 2070 based on phased approach, and is not intended to be regional pump station. Do we need to look at something similar to PS#1 like having a smaller pump station that pumps across highway to regional pump station? Can consider as option, but will increase costs. PS#1 received more consideration at this time as it is in Phase 1A, has gone through value engineering process, has limited space for building and is in coastal flood zone. Final decision on PS#1 has not been made yet. As for PS#3, looking at moving pump station further into park, likely near the middle, and position has not been finalized and may be moved again. Information referenced was from earlier stage of project. Regarding odour control, initially will pump approximately 60L/s with one duty and one standby	

	pump. Phased approach would see additional duty pump and wet well. Wet well volume is kept reduced to maintain minimum flows. Carbon filters will be installed to recirculate air. Comment: Can direct information to resident. Not looking to change design, but recognize that design and location is not locked in. Response: Current Environmental will provide more details later in meeting on environmental considerations in Montrose Park. Comment: Residents are skeptical about partner funding, so the sooner that can be nailed down, the better. People fear it will fall through and that the project won't happen. Also noted that pump stations don't make much noise. Comment: Odour depends on type of system. Smaller pump stations move effluent more regularly and in smaller volumes, so are less likely to have odour, while a regional pump station receives larger volumes that have been in the system longer and is more likely to have odour. Feedback from clients included people looking at new systems before sewer is put in, and how the septic deferral program will work and what that investment and pay-off looks like. Comment: Process has been good at engaging residents, but is there segment of population that remains ignorant of project and is hard to engage with? Is there any way we can find out what percentage of residents remain unaware of project? Q: Any statistics on unique hits on project site? A: Don't have specific numbers on hand, but included in What We Heard report. Comment: Heard questions at open houses on septic regulatory bylaw and how that will impact people in different phases, as well as on decommissioning septic	

	tanks, such as if they can repurpose their tank for rainwater irrigation purposes. Comment: Undertone of discussions at open houses was that people want it to happen but it costs a lot. Is there more that can be done? More sources of funding? Cost is biggest issue for residents. Will greatly impact low-income households. Also need to consider how to keep cost equity in place for future phases. Q: As a result of the community engagement, were there changes to the addendum report? Were those changes due to engagement or other sources? A: Will go over report later in meeting, but generally feedback following June 2023 meetings was incorporated into report. Didn't hear any new significant feedback in January 2024, so no major changes, although comments were incorporated into report. No significant technical changes to report. Comment: CVRD has done a good job of trying to engage residents. Will be subset of population that doesn't actively engage. Believe we have done enough to engage public. The agenda was varied to bring forward agenda item 5.5.	
5.5 9:43 – 9:53	**Overview of Final Draft Addendum Report** D. Monteith gave an overview of the final draft addendum report. Detailed goals and process for LWMP. Project will be further advanced as part of Stage 3 LWMP. Summarized the sections of the LWMP and what information they contain. Changes since previous draft includes updated Environmental Impact Study (EIS) with changes related to inclusion of Phase 1B, revised collection system maps used at January open houses and engagement updates. Q: Is the purpose of the septic regulatory bylaw to determine if a system is operating within existing standards or to have people upgrade their systems to	CVRD/WSP

	current standards? If a system is working fine but is not to current standards, will that be acceptable? When building bylaws have been updated, people aren't asked to update building to current standards. If a system is working, don't believe there is a need to intervene. A: Proposed bylaw has two tiers. Most properties would just have mandatory pump-outs. For high risk areas with smaller lots, would require inspection by ROWP. If system is operating as intended, it will get a pass. Q: As long as system has not failed, system will be considered fine under bylaw? A: Yes, if system is operating as intended. Inspection may identify and provide recommendations for remediation and maintenance. N. Prins joined the meeting at 9:52 am. A motion will be requested following the presentation on the EIS to forward the draft report to the Steering Committee for consideration, with any additions and changes recommended by the committee.	
5.4 9:53 – 10:13	**Break** The committee broke for recess at 9:53 am and reconvened at 10:13 am. D. Silvester joined the meeting at 10:12 am.	
5.6 10:13 – 11:51	**Final Environmental Impact Study (EIS)** D. Silvester summarized the updates to the EIS and the objectives of the study. Added Kilmarnock and PS#3. In December 2022, looked at contaminated sites and environmentally sensitive areas. For PS#1 (Royston), nearby road and private lot had fuel spill, with remedial excavation conducted in 2000 and 2012. Delineation of site contamination was never completed, so recommend further investigation (Phase 2 ESA). Private lot was excavated to bedrock to remove contaminants.	Current Environmental

	For PS#6 (Union Bay), there is a known history of contamination in general area from coal slags. Boundaries of contamination currently unknown, so further investigation recommended. Provided a general overview of environmentally sensitive areas. Majority of work done along highway, so minimal interactions with watercourses. 15 streams/ditches within project area, with mitigation determined on case-by-case basis. For PS#3 (Kilmarnock), two Argyle Creek tributaries run along northeast and southeast boundary of Montrose Park. Identified nearby wetlands on eastern and northern corners of park, and recommend access be halfway along Montrose Dr. Will need to investigate trees that may serve as animal habitats. No known contamination for site. Summarized regulatory requirements, including bird nesting window, in-stream reduced risk window, DFO Request for Review (specific to Montrose Park that would require new crossing), Phase 2 assessments per the *Contaminated Sites Regulation* and archaeological permits (provincial and KFN). Anticipated impacts and risks to environment are low, as most work is within road rights of way. Careful planning and proper permitting required to avoid impact to Montrose Park wetland, stream crossings and bird nesting habitats. Q: What is the likelihood of success for *Water Sustainability Act* approvals for modifying water courses? Even water courses heavily modified by humans can fall under act, and have had instances of receiving hard no as response. How big of a risk is that bureaucratic hurdle to the project? A: There is a risk, and depends on who you speak to. If can come up with reasonable rationale for why there is no other option for avoidance, or can present an	

	approach that provides a net improvement to habitat quality, more likely to receive approval. May need to offset impacts through environmental improvements elsewhere. Comment: Will need to be considered in capital planning. Definite risk with cost implications. Q: What is the impact of removing septic field flow from the groundwater regime? May account for up to 1 million L/day. During drought conditions, may be only source of groundwater flows in area. May need assessment on impact of reduced groundwater flow. Could impact vegetation, and in denser and more populated areas, may see reduced flows in water courses. Spoke to arborist and first thought was that cedar trees will die off. A: When considering the modification of a human-made situation (septic fields), first need to look at what existed before. Would be taking away natural and modified flow regime without replacing anything. Base flows will be reduced and will see impact to vegetation. Cedars are at risk everywhere, and are not recommended when planting unless site is wet. Most water courses in areas are small and rely on groundwater input in dry seasons, so may dry up earlier and stay dry longer. Salmon spawn in several of the water courses, and in some instances, there is barely enough flows to support them, so might not have enough water. Not something that can be mitigated. Comment: Important to include in reporting. Can't be avoided but should include in report as it will cause a permanent impact and will be noticeable enough to upset people. Q: There has been some discussion of collecting rainwater in septic tank. Would that provide some mitigation? A: Definitely ways to provide mitigation. Rainwater systems have limited volume. Greywater systems	

	would be more efficient, but little regulatory support. Would be voluntary systems, so hard to mitigate risk. Q: Was Current Environmental involved in EIS for Union Bay Estates land before trees were cleared? A lot of bird habitats were in the area and curious what was done to mitigate impact or provide alternative habitats. A: Not retained on project. Q: What is adaptation strategy for loss of septic water? Change in strategy of vegetation planted? What is the typical approach? A: Short-term impact in a forest's lifespan. Will see existing vegetation die off and there will be a need to manage danger tree removal. Will naturally see development of drier forest type over course of decades/centuries. Residents can start planting vegetation better suited for drier climate or watering more often. Comment: Worth including impact of reduced septic flows into report. Reasonable to alert people to possibility for when planning landscaping. Q: Comfortable adding section on loss of septic flow to report? A: Mostly conjecture, but would need to rely on other professionals or create separate report as outside scope of assessment. Could keep high level without any specific numbers or calculations. Comment: As bare minimum should include section alerting residents to possibility of reduced groundwater flows. Should retain a hydrogeologist, hydrologist and ROWP, as you'll need someone who understands onsite wastewater flows and groundwater flows, as well as an arborist and QAP. Due to overlapping areas of practice involved, not fair to ask Current Environmental to include as it would be	

	conjecture. Should be easy to put together at a relatively low cost. Comment: Many Denman and Hornby residents have separation of septic and greywater. Could this be encouraged to help water vegetation? What would be the impact to the sewer system if residents moved to separate greywater system? Would that lead to significant reduction in flows? Q: How would you assess the probability of siting a pump station in Montrose Park? A: Difficulty is with permitting rather than the suitability of the site itself. Lots of area to work with, but will need to consider placement as may require additional driveway area. Crossing access into site should be easy to achieve if avoiding wetland. Trees appeared weighted towards one side of park, so could determine siting based on operational requirements of pump station. Consider location only moderate risk. A. Habkirk asked the committee if they would be comfortable with an addition included in the report addressing the loss of septic water on a high level or in more detail. D. Monteith advised the committee that additions and recommendations to the report can be brought forward to the Steering Committee for consideration, and then if supported, staff will undertake the work and share the results with the committee before providing to the Steering Committee for final approval. Comment: Recommend contacting the committee members by email to finalize the additions rather than hold a separate meeting. MOTION: That the addendum report be forwarded to the Steering Committee, with additional reporting on the impacts to groundwater flow and the impacts on	

	terrestrial and aquatic habitat from the loss of septic water take place before finalization. – A. Gower SECONDED: I. Munro CARRIED UNANIMOUSLY	
5.7 10:51 – 10:58	**Briefing Note #1** V. Van Tongeren gave an overview of the process leading into the Stage 3 LWMP. Lots of overlap in membership between SES and Comox Valley Sewerage Service (CVSS) LWMP TACPAC, with those organizations on this committee not originally represented on the CVSS TACPAC to be invited to participate in Stage 3. Looking to have one member from each area serve on Stage 3 TACPAC with one alternative each. Current PAC members can serve as a primary or alternate, or not continue on with Stage 3. Q: Is it two or three members from Area A? A: Three members and three alternates for Area A, but two for each neighbourhood (Royston, Union Bay, Kilmarnock). Q: What is included in the scope of the Stage 3 TACPAC? Will discuss upgrade of entire sewer system? A: First meeting in fall 2024 and another in spring 2025. Yes, will discuss full system, with representatives here bringing Area A lens to process. N. Prince put himself forward as the representative for Craigdarroch, with R. Steinke serving as alternate. J. Elliott put himself forward as the representative for Union Bay. Staff will reach out to R. Lymburner to determine level of interest in serving as an alternate. T. Donkers put herself forward as the representative for Royston, with K. Newman serving as alternate. MOTION: That Norm Prince, Jim Elliott and Tabitha Donkers be appointed as the primary representatives for Electoral Area A for the Stage 3 LWMP, and that Rosanne Steinke and Ken Newman be appointed as	CVRD

	alternates, with the third alternate to be determined at a later date. – I. Munro SECONDED: A. Gower CARRIED UNANIMOUSLY	
5.8 10:58 – 11:05	**CVRD Updates** V. Van Tongeren advised the committee that a staff report was put forward to the Electoral Areas Services Committee requesting that Capital Improvement Cost Charges (CICC) be maintained at current rates for the south region in the event of any rate increases. The Sewage Commission will consider the request in the next month or two. The septic deferral program as presented at TACPAC meeting #4 was approved by the Steering Committee, with the recommendation that the program be written into the future sewer use bylaws for the south region. Staff are making progress on the septic regulatory program. Open house to be held in April in support of the Order in Council request, to then be submitted to the province in summer, with further engagement in spring 2025. Service startup is anticipated for 2026. Q: What is the service area for the septic regulatory bylaw? A: Entire CVRD electoral areas. If sewer provided to south region, would not be included in bylaw. Q: How would the service be funded and what would it look like? A: For any work required for property owners to do on their own property, would be arranged and paid by the property owners. Administration and any enforcement would be paid by property tax. Q: Property tax would be electoral area-wide then? A: Yes. Comment: Project should be considered in-process for CICCs, although future phases may be different story. Hopefully Sewage Commission agrees as numbers	CVRD

	have been communicated to public and change would not be taken well. Response: Strong case for Sewage Commission to support keeping CICC rate as is for south region. The agenda was varied agenda to bring forward agenda item 5.10.	
5.10 11:05 – 11:15	**Next Steps** D. Monteith summarized upcoming dates for next steps, noting that they will likely change to accommodate additional work requested by the committee. The LWMP addendum will go to SES and CVSS LWMP steering committees in early April and CVRD Board in late April. May be brought back if further changes required. Submittal to province expected in May, and Stage 3 TACPAC expected to meet in fall 2024. Project team will continue with development of detailed design, including environmental, geotechnical and archaeological studies, as well as additional surveys, to be included in Stage 3 LWMP. Staff will also be developing service area and sewer use bylaws. Q: Will detailed design go out with RFP so local firms can bid? A: Yes. D. Monteith asked if the committee supports issuing revised work requested by the committee via email instead of holding an additional meeting. The committee supported the suggestion. The project team thanked the committee for their time and contribution. The committee thanked the project team for ensuring the public is involved and properly consulted, and the consultants for all the work they've contributed.	Facilitator
5.11 11:15	**Adjournment** The committee adjourned at 11:15 am.	Facilitator

GENERAL:
Per the Sewer Extension South LWMP Addendum TACPAC's Terms of Reference, the committee is to be dissolved at the conclusion of the addendum process and combined with the Comox Valley Sewerage Service (CVSS) LWMP TACPAC. The first meeting of the Stage 3 CVSS LWMP TACPAC is anticipated to be scheduled for fall 2024.

TERMINATION:
The meeting terminated at 11:15 am.

APPENDIX

G FIRST NATIONS ENGAGEMENT CONSULTATION FRAMEWORK

First Nations Engagement Consultation Framework

Phase 1: Preparation	
Planning Phase July - August 2022	Identify impacted Nations within Electoral Area A with Statement of Intent or territory maps that include Baynes Sound using the Province's Consultative Areas Database. <u>Core Territory</u> - K'ómoks First Nation <u>Land and marine territory including Royston, Union Bay and Baynes Sound (Fanny Bay, Denman Island and/or Hornby Island) include:</u> - Wei Wai Kum First Nation - We Wai Kai Nation (Cape Mudge Band) - Homalco First Nation - Tla'amin Nation - Qualicum First Nation - Stz'uminus First Nation <u>Marine territory including Baynes Sound (Fanny Bay, Denman Island and/or Hornby Island)</u> - Ts'uubaa-asatx Nation (formerly Lake Cowichan First Nation) - Penelakut Tribe - Lyackson First Nation - Cowichan Tribes - Halalt First Nation - Snaw'naw'as First Nation Note: In June 2023, an additional Nation was identified by the province through the database for outreach: - Snuneymuxw First Nation Obtain information about each Nation: - Culture - History - Economy - Political/Governance Structure - Treaty Status Decision on method for initial engagement: - As partner and the Nation with core territory, the Comox Valley Regional District (CVRD) will continue to engage with the K'ómoks First Nation through an already **established process that includes regular Chief and Council meetings and working through staff**. - For Nations with Statement of Intent or territory maps with land and marine territory including Royston and Union Bay: **Send letter from**

	Board Chair introducing project and requesting meeting with Chief and Council and staff. - For Nations with Statement of Intent or territory maps with marine territory including Fanny Bay, Denman Island and/or Hornby Island, but excluding Royston and Union Bay: **Send letter from Board Chair introducing project and offer meeting**. Nations appearing in the Province's Consultative Areas Database that do not appear to have traditional territory claims in Baynes Sound include the following. - Hupacasath First Nation* - Tseshaht First Nation* *The CVRD will reach out to these Nations via CAO to Band Manager to determine if they wish to be included in the consultation or receive updates about the project.
Phase 2: Engagement	
Provide information and seek input August 2022 – September 2022	Letter #1 sent to impacted Nations from Board Chair: <u>Objective 1: Provide Information</u> - Project Summary - Description of Liquid Waste Management Plan (LWMP) addendum process, including work to date on Comox Valley LWMP and agreement with K'ómoks First Nation. - Timeline and next steps for report submittal and provincial decision. - Key milestones where further updates will be provided. <u>Objective 2: Seek feedback</u> - Determine if project is of interest. - Request or invitation to meet staff to staff or government to government and provide more information. - Seek guidance on best way to engage Nation on the project. Letter #2 sent to impacted Nations to follow-up with a project summary document after 30 days. *If no additional information or meetings are requested, no further outreach is planned until the next project milestone.
Engage First Nations October 2022 – July 2023	Follow-up on questions or requests for further information. Meet with interested Nations either with staff or Chief and Council as advised. Hold community open houses to engage with Nation membership if advised to do so. Record any issues identified by impacted Nations, or additional requests for information, and detail how the CVRD responded and/or accommodated where required.

Milestone 1: Preferred Option Identified August 2023	Letter #3 sent to Impacted Nations from Board Chair along with a project update document. <u>Objective 1: Provide information</u> - Share project update summarizing preferred options identified by Public Advisory Committee. - Share update on Comox Valley Sewerage Service LWMP Stage 1&2 Plan. - Provide timeline and next steps for submittal of draft Addendum report and Stage 3 LWMP. - Review proposed consultation timeline and key milestones where further updates will be provided. <u>Objective 2: Seek feedback</u> - Follow-up on meeting request (for Nations with impacted land and marine territory). - Follow-up on offer to meet (for Nations with impacted marine territory). * If no additional information or meetings are requested, no further outreach is planned until the next project milestone.
Engage First Nations September 2023 – December 2024	Follow-up on questions or requests for further information. Meet with interested Nations either with staff or Chief and Council as advised. Hold community open houses to engage with Nation membership if advised to do so. Record any issues identified by impacted Nations, or additional requests for information, and detail how the CVRD responded and/or accommodated where required.
Milestone 2: Draft Addendum Spring 2024	Letter #4 sent to Impacted Nations from Board Chair along with a project update document. <u>Objective 1: Provide information</u> - Share project update summarizing draft Addendum. - Provide timeline and next steps for submittal of draft Addendum report and Stage 3 LWMP to the Ministry of Environment and Climate Change Strategy. - Review proposed consultation timeline and confirm last key milestone update.

	Objective 2: Seek feedback - Follow-up on meeting request (for Nations with impacted land and marine territory). - Follow-up on offer to meet (for Nations with impacted marine territory). *For Nations that do not request any additional information or meetings, no further outreach is planned until the next project milestone.
Phase 3: Submission of Draft Addendum	
Milestone 1: Reporting Spring 2024	The draft addendum report will be submitted to the Ministry with the preliminary First Nations consultation summary and communication/engagement logs. Ministry to provide guidance on whether engagement process meets provincial requirements.
Milestone 2: Continued engagement Summer 2024	The CVRD will continue to work with Nations to address any concerns or feedback through the remainder of 2024. This feedback and any resulting accommodations will be reflected in the final consultation report.
Phase 4: Submission of draft Stage 3 LWMP	
Milestone 3: Stage 3 LWMP Late 2024/Early 2025	Letter #5 sent to Impacted Nations from Board Chair along with a project update document. Objective 1: Provide information - Share project update summarizing draft Stage 3 LWMP prior to submission to the Ministry of Environment and Climate Change Strategy.
Late 2024/Early 2025	Submit final First Nations Consultation Report as part of Stage 3 LWMP.

Supporting Documentation

- Communications/Engagement Logs
- Interest/Concern Tracking Sheets

APPENDIX

H PUBLIC ENGAGEMENT

Comox Valley Regional District Sewer Extension South

Community Events – Summary Report
February 2024

Comox Valley
REGIONAL DISTRICT

comoxvalleyrd.ca

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Executive Summary

Phase 3 of engagement on the project had a primary focus to introduce the draft addendum report to the public. It kicked off in November 2023, with email outreach directly to project followers, sharing updates from the latest PACTAC meeting and the first 'What We Heard' report.

Community open houses were then held in January 2024. Project details had been refined since the June 2023 open houses, on components like collection system design and costs to homeowners – and it was time to share these updates. In particular, cost estimates were updated from conceptual design (Class D cost estimates) to preliminary design (Class C cost estimates).

The community events included in-person open houses in Royston and Union Bay, and a noon webinar via ZOOM. Staff and consultants were at the events to hear questions and comments from the public, and feedback forms were available in-person and online.

All event materials (information boards, webinar video and backgrounder) were made available on the project page. Additionally, a summary of the addendum report was created to help simplify review of the report.

Between the three open houses, approximately 146 residents participated (118 in-person and 28 online). A variety of tools were used to invite residents to the events, including: direct mail letter, news release, social media posts, email and print ads. An infosheet summarizing project details was also mailed out with the invitation, and is available online.

Main themes from this round of engagement included:

- continued concerns about high costs for residents and questions about how costs are broken down per property
- residents are becoming familiar with project information; more certainty/understanding about which phase residents are located in and project boundaries
- general hope and support for the project's completion; encouragement to complete it as quickly as possible
- fewer questions/comments about overall project plans; more about specific details like pump station/pipe locations and connections to individual homes

This "What We Heard" report has been informed by the feedback gathered at these events as well as by phone and email. This report will be included as part of the final draft addendum that is submitted to the province.

Engagement Overview

1.1 Approach

November 2023

A Public and Technical Advisory Committee (PACTAC) meeting was held on November 22, 2023 to share the draft addendum report, provide a summary of public feedback from the June 2023 open houses and an update on project plans. A recording of this meeting, and the full addendum report, were posted to the CVRD's project page.

Following this meeting, the 'What We Heard' Summary Report, summarizing public feedback from June 2023, was posted to the engagement page, and an update was sent out to project followers and the project email list. The update included a notification that the engagement summary report was available, an overview of the PACTAC meeting and notice of the upcoming public open houses. Website content was also updated to reflect revised project timing.

January 2024

In advance of sending open house invites, the project page was updated in early January to add a summary of the draft addendum report. The invitation was then also used to drive residents to the engagement page to view the report summary.

Three community open houses ran in late January 2024. The events aimed to inform the community on:

- Summary of June 2023 'What We Heard' report & how public feedback informed project updates
- Updated project costs/costs to homeowners
- Collection system design updates
- Septic deferral program and septic maintenance program updates
- Overview of the draft addendum report to be submitted to the province
- Next steps for the project; including detailed timeline

The events included the following methods of approach:

In-Person Community Open Houses

- Thursday, January 25, 5:30 pm to 7:30 pm – Union Bay
- Wednesday, January 31, 3:00 pm to 5:00 pm – Royston

Options to attend an afternoon or evening session were offered to help increase the number of participants. Around six members of the project team were on hand to answer questions as well as two technical consultants. Elected

officials and members of the Public Advisory Committee were also in attendance. The events included:

- 15 information boards
- Handout on Annual Projected Tax and User Fee Increases for Royston and Union Bay
- Handout on the capital cost and capital improvements charge payment options
- Hard copies of the report summary
- Large map printouts highlighting phasing and grinder pump properties
- Feedback forms

ZOOM Webinar

- Monday, January 29, 12:00 pm to 1:00 pm via ZOOM

Darry Monteith, Manager of Liquid Waste Planning, provided a 30-minute overview presentation summarizing the content of the information boards. James Warren, Chief Administrative Officer at the CVRD, Lucy Wiwcharuk, Chief Financial Officer at the CVRD, and Ron Frank of K'ómoks First Nation also presented. This was followed by a Q&A period for participants to pose questions to the project team. There were six panelists available to respond to questions.

Engagement Page Updates

- Information from events posted to page (information boards, webinar recording, project backgrounders and infosheet)
- Feedback form added (open until February 16, 2024)
- 'Key Topics' revised to reflect project updates

1.2 Community Engagement Goals

This project is undergoing an LWMP addendum and the CVRD is required to demonstrate how feedback was incorporated into the final plan. Feedback compiled here will be included in the addendum report submitted to the province in Spring 2024.

The goal of the community events was to INFORM and collect feedback from the community. In addition, the November 22nd Public Advisory Committee meeting falls under COLLABORATE on the International Association of Public Participation (IAP2) spectrum for public engagement (see table below). For more details on the project background, please see previous summary reports.

Increasing level of public involvement in decision-making

INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
Provide balanced and objective information to residents.	Obtain feedback on analysis, alternatives and/or decisions from residents	Work directly with residents to address concerns	Partner with residents to develop a preferred solution	Place final decision making in the hands of residents

1.3 Promotion

The following blend of tools was used to promote, inform and encourage participation from the community:

Direct-Mail Letter: A letter of invitation was distributed via Canada Post to over 900 Union Bay/Royston households. Also included in the letter was an infosheet providing an overview of project details.

News Release: A news release was distributed on January 11 to announce the open houses and webinar.

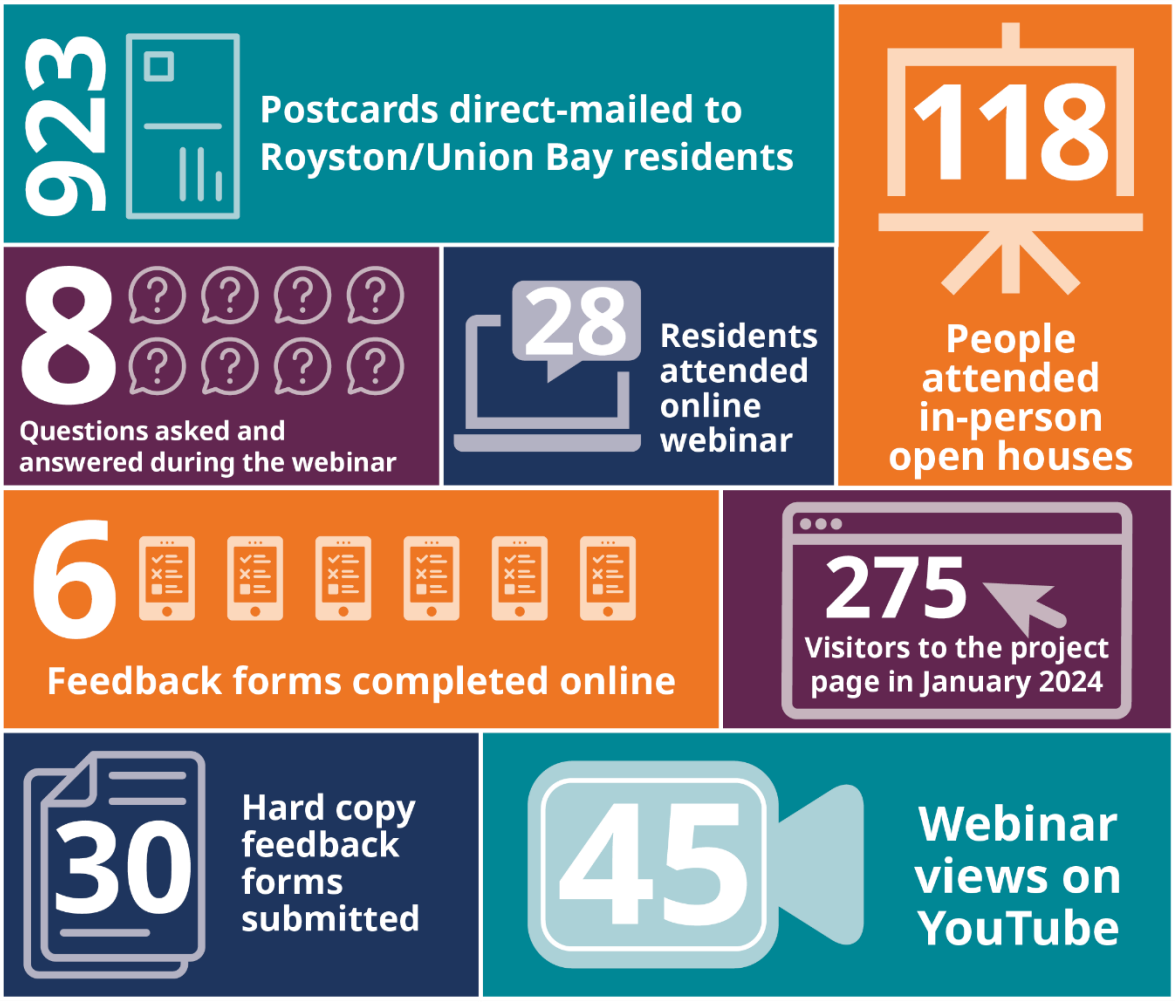
Social Media Posts: Promotional posts were posted to the CVRD's Facebook, Instagram + X accounts.

Print Ad: Ads ran in the January 10, 17 & 24 editions of the Comox Valley Record newspaper.

Email: A notice was distributed to the project email list, which includes 320 individuals who have signed up to receive project updates. It was also distributed to 47 followers of the engagement page.

1.4 By the Numbers

The numbers below highlight key data collected leading up to and from the events (until Feb. 16, 2024).



1.5 Themes of Comments

The themes of feedback listed below are compiled from five sources:

- feedback shared with staff members at in-person events
- questions posed by participants during online webinar
- feedback forms submitted at the events and online
- questions/comments submitted via phone and email
- questions posed to online Q&A

Themes are listed in order of interest/popularity.

1. **Project costs/costs for residents:**
    - Concerns about the high costs affecting homeowners, especially for single mothers and elderly residents
    - Calls for more grants, options for deferral or financial relief
    - Questions about the timeline and payment plans over the next few years; and when residents will start paying for the project
    - Questions about breakdown of costs for residents, distinguishing between one-time costs and annual costs
    - Clarifications that work on private property is the responsibility of the property owner
    - Concerns about contractors charging a premium
    - Concerns about pricing people out of homes
    - Concerns about potential underestimation of costs, even from those who support the project
    - Questions about partner commitment
    - Several questions/interest about the option to pay all costs up front
    - Concern about costs for subsequent phases being proportional to Phase 1A properties (grant dollars going to Phase 1A only)
    - Suggestions for advance notice of upcoming costs
2. **One-time costs/specific property-related questions:**
    - Questions about the factors that influence variation in one-time costs from property to property
    - Questions about planning for pipe installation, connections and decisions on access points for homes
    - Concerns about complicated routing for connecting sewer lines
    - Requests for information on how property updates in the next few years will align with the sewer hookup (i.e. landscaping, fences etc)
    - Questions from residents interested in buying/selling properties located in Phases 1A/B (or building on empty lots); wondering about costs and options while waiting for sewer
    - Suggestions for CVRD to offer a list of preferred contractors
3. **Phasing/timing inquiries:**
    - Questions about the timing of Phase 1B and residents keen to connect as soon as possible; why Phase 1A properties were selected
    - Inquiries about future phases and when they will proceed
    - Inquiries about timing to understand whether to invest in septic systems or wait for sewer

- Union Bay Estates: when it will proceed, whether they will pay fair share of costs and seeking reassurances that the developer will not benefit more than residents

4. **Grinder pumps:**
   - Numerous questions about grinder pumps and when they would be required
   - Concerns about the cost of grinder pumps and which properties will need them
5. **Pump stations: aesthetics and environmental concerns:**
   - Concerns about pump stations detracting from natural beauty of the area; particularly in Royston
   - Concerns about potential negative impacts to Royston neighborhood due to public amenities attracting unwanted activities (if included in design)
   - Looking for more information on design, with a hope for local input
   - Support to consider locations that are above coastal flood level
   - Concerns about odour impacts if pump station located near private residences (Kilmarnock)
   - Opposition to the proposed location of the Kilmarnock Pump Station; suggestion to move it further inside the park, away from properties
   - Support for playground at Montrose Park, at site of proposed Kilmarnock station
6. **Community impact:**
   - Calls for additional community projects during construction like:
     - a walking trail along Marine Drive built over the new gravity main
     - bike paths
     - expanding waterfront walking trail from Royston south
     - undergrounding power lines
   - Questions about the forcemain location
7. **CVRD Septic Maintenance Program:**
   - Uncertainty about the septic regulation program, including who it applies to, what is included/excluded and the role of oversight by the CVRD
   - Questions about high-risk areas identified for mandatory inspection
   - Some support for the program
8. **Decommissioning septic tanks:**
   - Interest in repurposing old septic tanks for rainwater storage
   - Questions about using old septic tanks as grinder pump chambers
9. **Septic systems:**
   - Some inquiries about newer septic systems being exempt from the program
   - Notice that Seaview Seniors' Village in Union Bay has had its septic system upgraded recently

Conclusion

This round of public outreach was successful in re-engaging affected community members and driving home the project benefits, components and costs. While it introduced some updated information, much of it was repeated from the first round of public engagement and provided residents a second chance to fully absorb the details of this complicated project. The general consensus from staff attending the events was that there was less concern from the public about the plans and more understanding that it's moving ahead.

As at the last events, cost concerns remain the top issue, followed by questions about phasing and timing for future phases. With the changes to the collection system design, there was much more interest in understanding grinder pumps, including where they'll be required, costs and installation. Residents are beginning to turn their attention to the implementation of this project, and how it will affect them and the community assets that they use.

There was a mix of participants who had attended the last in-person events and those who had not; the CVRD is reaching 'new' residents in person, and continuing to engage informed residents via email and online. The comments/concerns collected at this stage are similar to those heard during the last round of engagement, providing the project team a solid foundation of public input.

Next Steps

- **Spring 2024:** A draft report summarizing the proposed project and all public feedback will be considered by the Steering Committee. Then, the approved draft report will be forwarded to the province and the Sewer Extension South Project will become part of the overall Comox Valley Liquid Waste Management Plan (Regional Sewer Plan).
- **2025**: The final draft of the Regional Sewer Plan will be shared with the community before it is submitted to the province for final approval.
- **2026**: Estimated provincial approval of the plan.

Appendices

Appendix 1 – Information Boards

Appendix 2 – Promotion Samples

Appendix 3 – Direct Mail Letter

Appendix 4 – Infosheet

Appendix 5 – Addendum Report Summary

Appendix 6 – Feedback Form

Appendix 7 – Feedback Form Responses

Appendix 8 – Backgrounders