Comox Valley REGIONAL DISTRICT

Agenda

Notice of meeting of the
LIQUID WASTE MANAGEMENT PLAN (LWMP)
JOINT TECHNICAL AND PUBLIC ADVISORY COMMITTEES (TACPAC)
Monday, June 16, 2025
CVRD Civic Room, 770 Harmston Avenue, Courtenay and Zoom
9:00 am – 2:00 pm

Item, Time	Description	Owner
1.1 9:00	Call to Order and Territorial Acknowledgement	Allison Habkirk
1.2 9:00-9:05	December 2, 2024 Meeting Minutes	Allison Habkirk
1.3 9:05-9:20	Update on LWMP Process and Work Underway	Kris La Rose, CVRD
1.4 9:20-11:15	Review of Draft Site Master Plan Executive summary attached to agenda detailing implementation plan for upgrades at the wastewater treatment plant	Piero Galvagno, Carollo
Break		
1.5 11:30-12:00	Stage 3 LWMP Scope- Source Control Review of source control commitments and language to be embedded in the Stage 3 LWMP Report	Mike Desilets, WSP
Lunch		
1.6 12:30-1:15	Update on the Outfall Path Forward and Results of Condition Assessment	Kris La Rose, CVRD
1.7 1:15-1:30	Sewer Extension South Update	Darry Monteith, CVRD
1.8 1:30-2:00	Next Steps and TACPAC Engagement	Kris La Rose, CVRD
1.9 2:00	Adjournment	Allison Habkirk

Attachments

1. December 2, 2024 LWMP TACPAC Meeting Minutes
2. Site Master Plan – Executive Summary, Carollo, June 2025
3. Source Control Review and Recommendations, WSP, June 3, 2025

More information on the Stage 1 & 2 LWMP and the South LWMP Addendum can be found on the CVRD's website.

Comox Valley REGIONAL DISTRICT

Minutes

Minutes of the meeting of the Liquid Waste Management Plan (LWMP) Joint Technical and Public Advisory Committee (TACPAC) held on Monday, November 18, 2024, in the CVRD Civic Room at 770 Harmston Avenue, Courtenay, and via Zoom commencing at 9:02 am

PRESENT:

A. Habkirk, Chair and Facilitator	Facilitator
M. Rutten, General Manager of Engineering Services	CVRD
R. Sellentin, Manager of Wastewater Services	CVRD
D. Monteith, Manager of Liquid Waste Planning	CVRD
Z. Berkey, Senior Engineering Analyst	CVRD
M. Briggs, Branch Assistant – Engineering Services	CVRD
M. Desilets, WSP	WSP
P. Galvagno, Carollo Engineers	Carollo
C. Davidson, City of Courtenay	TAC
S. Ashfield, Town of Comox	TAC
M. Hall, Island Health	TAC
E. Derby, Island Health (Alternate)	TAC
M. Mamoser, Ministry of Environment and Parks	TAC
L. Johnson, Ministry of Health	TAC
M. Swift, Town of Comox Elected Official	PAC
I. Munro, Electoral Area A Alternate Director	PAC
N. Prins, BC Shellfish Growers Association	PAC
T. Clarke, Comox Valley Chamber of Commerce	PAC
C. Pierzchalski, Comox Valley Conservation Partnership	PAC
M. Proudfoot, Comox Valley Schools	PAC
S. Carey, City of Courtenay Resident Representative	PAC
L. Paulovich, City of Courtenay Resident Representative	PAC
J. Dacombe, City of Courtenay Resident Representative (Alternate)	PAC
K. van Velzen, Town of Comox Resident Representative	PAC
M. Crilly, Town of Comox Resident Representative	PAC
K. McPhail, Town of Comox Resident Representative	PAC
C. Finley, Town of Comox Resident Representative (Alternate)	PAC
N. Prince, Area A (Craigdarroch) Resident Representative	PAC
K. Newman, Area A (Royston) Resident Representative (Alternate)	PAC

J. Elliott, Area A (Union Bay) Resident Representative	PAC
M. Schaffer, Area B (CVWPCC) Resident Representative (Alternate)	PAC
M. Lang, Area B (Croteau Beach) Resident Representative	PAC
L. Aitken, Area B (Croteau Beach) Resident Representative (Alternate)	PAC

Item	Description
1.1 9:02 – 9:05	**Call to Order** The meeting was called to order at 9:02 am. The CVRD acknowledged that the committee is meeting on and the Comox Valley Sewerage Service (CVSS) is operated on the traditional unceded territory of the K'ómoks First Nation.
1.2 9:05 – 9:13	**Introductions** The committee members introduced themselves to the committee. M. Rutten provided a summary of the agenda.
1.3 9:13 – 10:10	**Review of Comox Valley Sewerage Service** M. Rutten provided an overview of the Comox Valley Sewerage Service, including its participants, governance and operations. Provided a brief history of the service since its creation in 1984 and how wastewater was treated differently prior and after its creation. M. Mamoser joined the meeting at 9:17 am. Q: Did the standard of treatment improve to secondary or tertiary in 1984? A: Secondary treatment was constructed at time, although standards likely did not require it. Secondary treatment was not used by previous municipal systems. Treatment was originally planned as primary, but due to community concerns, it was adjusted to secondary treatment. Summarized the system infrastructure, including the regional pump stations and major sewer mains, and how they connect into the system and transport wastewater to the treatment plant. All treated effluent is discharged to outfall along Cape Lazo. Most of the foreshore forcemain was installed along intertidal zone, which allowed for easy installation but complicates replacement. Balmoral and Willemar Bluff pipe

became exposed and work has been done to protect the forcemain, leading to the need for the now in-progress Sewer Conveyance Project.

A synopsis of the treatment plant infrastructure and treatment process was provided. Wastewater is screened and primary treatment settles heavy material, followed by biological secondary treatment process. Two equalization basins are used to manage wet weather flows. Plant has long history of odour control. Biosolids originally treated on-site but moved to Cumberland landfill after class action lawsuit in 90s. Tanks recently covered, with odorous air treated through odour control system before being discharged.

Q: Is UV treatment used?
A: Not yet but will be included in the next upgrade.

Q: Is stormwater supposed to get into the system?
A: No, but it does, and it contributes to the peaking factor.

Q: Are the two large pits not covered? Is that where any potential odour comes from?
A: The storage basins are not covered. Secondary basin holds treated effluent so no odour. Primary basin would create odour, but only used when necessary and neighbours are notified if used. Primary basin usually only used for under 24 hours and is cleaned out afterwards. Used maybe once or twice a year.

Comment: System at its inception had long retention time in forcemain, as it was designed for today's flows and does contribute to odour.

M. Hall joined the meeting at 9:36 am.

Challenges with the treatment plant were discussed, including redundancy requirements under provincial legislation, the plant's age, peak wet weather flows, capacity required to accommodate growth, changing regulations, solids residuals management and proximity to residential properties.

Q: Have in-depth records of rainfall in Comox thanks to CFB Comox. Any idea what peak rainfall is planned for? Rainiest day on record is five inches. Are there plans to account for 100-year events?

	A: Planning for peak wet weather flow. Sewer systems are designed for certain peaking factors and past practice based on population. Inflow and infiltration (I&I) increases over time, so proportion of rainfall getting into sewer also increases over time. Usually account for increasing I&I over time when planning out sewer systems, but no set value used. Q: Any projection on growth and other factors for when current plant would exceed its parameters and require second plant? A: Focus of the site master planning work underway is to review growth projections, flows and loads and develop master plan that determines how to expand the treatment plant to accommodate growth into the future rather than building a second treatment plant. Q: I&I has always been a big problem. What program does the City of Courtenay and Town of Comox have to mitigate I&I? Has I&I declined, stayed the same or increased with programs in place? A: City and Town have programs in place, and I&I mostly staying the same. Dense development tends to have less I&I, which is being built more often now. Ministry of Environment and Climate Change Strategy (MoE) requested as part of Stage 1&2 LWMP to better address I&I as part of Stage 3 process. Q: Where are stats on I&I for City and Town compared to other communities? A: Don't have information on hand, but don't believe any worse than other municipalities. Participants are aware of need to address I&I. Summarized the challenges for the conveyance system and the factors leading to the Sewer Conveyance Project as a solution. Forcemain became exposed on beach and CVRD installed gabion baskets to reduce erosion. Performed modelling of environmental impact of a potential forcemain break, with significant amount of sewage anticipated to leak into Baynes Sound. Sewer Conveyance Project developed as means to avoid environmental risk by moving forcemain inland. Q: Was there ever an analysis done on lessons learned from the failure of the planning and engineering system that caused this fault? Why did it happen?

	A: Installation of foreshore pipe was planned out over 50 years ago when different environmental standards were in place. Installing in intertidal zone avoided other infrastructure. Required smaller pumps to pump along original alignment, whereas new inland forcemain will require larger pumps. Cost, ease of installation and efficiency likely had a major impact. **Note: The spill scenario shared at the meeting was modelling of a potential spill, not an actual spill event.** Q: Victoria installed sewer main across bay. How did that turn out? A: Method used was horizontal directional drilling, so not on the ocean floor but underground instead. Comment: Town of Comox does not have formal I&I program in place but addresses I&I as it comes up and when working on road improvements. Also documenting condition of assets while building asset management plan. Q: If I&I is leaking into system, could effluent leak out of the pipes? A: Pumped forcemain systems are completely sealed and don't usually leak. Gravity systems don't have pressure within the pipe so effluent doesn't tend to leak out, and groundwater pressure is higher than pressure in pipes so groundwater can seep in. I&I occurs through small gaps in joints. Hard to have 100 per cent sealed system. Q: How is I&I detected? A: Run cameras through system or by monitoring difference between summer and winter flows. Comment: Worked at Kelowna wastewater treatment plant. Believe I&I may have been at 10 per cent of daily flows. I&I is incredibly high if flows are tripling from summer to winter. Q: Effluent during summer is more concentrated but effluent in winter is diluted due to I&I, so does it require less treatment? A: Yes, more diluted in winter. Biological process is slower in winter due to the cold weather. Main difficulty is due to hydraulics of tanks, as extra flows max out capacity of system. Regarding I&I during winter, flows aren't always triple, just during extreme storm events. When cold and no rain, winter flows are comparable to summer flows. Peaking factor not high all the time.

	P. Galvagno joined the meeting at 10:02 am.
1.4 10:10 – 10:30	**Summary of LWMP Process and Decisions Made to Date** M. Desilets presented on the Stage 1&2 LWMP process and decisions made to date. Elaborated on the purpose of a LWMP, the regulatory authorizations and requirements, the stages of the LWMP process, the establishment of an advisory committee, consultation with the public and First Nations, the focus and scope of the Stage 1&2 LWMP, the LWMP planning components and development of community specific goals and objectives. Q: Acknowledge that the sewer service is different than the CVRD, but LWMP is a CVRD plan and great amount of waste in CVRD is treated via septic systems. CVRD would benefit from regulations and bylaws for septic systems. How does that fit into bigger LWMP? A: On-site systems regulated by Island Health, although CVRD does have information on best practices. Generally, a plan area is chosen for a LWMP. For Stage 1&2 LWMP, service area was focused on CVSS and the treatment plant, but septic systems were discussed for south addendum. Q: Are the categories for the community goals and objectives the defaults ones or were the categories ranked? A: Categories were determined by TACPAC and options were weighted. Used triple bottom line approach, but TACPAC determined weighted ranking for categories. Provided an overview of the wastewater treatment options reviewed during the Stage 1&2 LWMP, which focused on level of treatment and capacity of plant. Shared evaluation matrix for treatment options, with focus on technical, affordability and environmental factors. Summarized proposed treatment options, based on either secondary or advanced treatment and flows up to two times average dry weather flows (2xADWF) or all flows, with secondary treatment with 2xADWF option removed by TACPAC. Option 2 (secondary treatment of all flows) was chosen, with option for inclusion of future treatment technology.
	Break The committee broke for recess at 10:30 am and reconvened at 10:42 am.

1.4 10:42 – 10:57	**Summary of LWMP Process and Decisions Made to Date (continued)** M. Desilets presented on resource recovery options for the sewer service, including reclaiming water, heat recovery, biogas production, beneficial use of biosolids, nutrient recovery and outfall hydroelectricity generation. Shared evaluation matrix for resource recovery, with 50 per cent weighting given to affordability due to not being mandatory. Most options deemed currently not feasible, but heat recovery is potentially viable and biosolids are being used for SkyRocket compost. Further assessment will be done as part of treatment plant Site Master Plan and Stage 3 LWMP. Outlined the Stage 1&2 conveyance options, which transitioned into the Sewer Conveyance Project. Shared evaluation matrix, with 45 per cent weighting given to technical. Option 2 (trenching/tunnel option) was chosen and taken out of LWMP process to fast-track implementation. Will not be considered under Stage 3 LWMP. Summarized Stage 1&2 LWMP key decisions and recommendations. Will need to apply for operational certificate during Stage 3, to be supported by an Environmental Impact Study (EIS). Site Master Plan to be developed in parallel with Stage 3 LWMP.
1.5 10:57 – 11:20	**How the South Addendum LWMP Fits** D. Monteith gave an overview of why a sewer service is needed for the south region, which includes concerns with Baynes Sound water quality, aging and failing septic systems, potential growth and high density of homes, benefits of higher wastewater treatment and long-term cost savings, and servicing K'ómoks First Nation (K'ómoks) treaty lands. Sewage Commission agreed to receive wastewater from south region in 2020, and CVRD and K'ómoks ratified Community Benefits Agreement for sewer in 2021. CVSS service area expanded in 2022 to include south region, to be included within Stage 3 LWMP. Shared map of proposed south region service area, which includes a 13 km forcemain, collection systems and pump stations, to be implemented in multiple stages. Summarized the Sewer Extension South LWMP Addendum report and timeline for the project, with approval anticipated in 2027. L. Johnson left the meeting at 10:59am.

	Q: How does the status of Union Bay Estates (UBE) impact the Sewer Extension South Project? A: Capital funding for the project includes grant funding, borrowing from service area and partner funding from K'ómoks and UBE. UBE is facing financial challenges and staff are unsure what outcome will be. CVRD committed to advancing project and hopeful foreclosure actions will be resolved, but staff are prepared to work with K'ómoks and province to proceed with project. Q: If there should be significant changes to committed funding, would that require public consultation? Generally strong support for sewer, but significant concerns from residents about cost. A: Costs recognized as primary concern, so any changes to costs will be brought back for public consultation. Q: Will residents be required to connect to the new system? A: Phased approach, so those in each phase will be required to connect during their phase. Q: Does the siphon at the Courtenay River have capacity for the Sewer Extension South Project? A: Yes, it has been reviewed and the syphon has capacity to accept flows. Q: How long will grant funding remain available if timelines are delayed? Are there other options if UBE can't contribute, such as a scaled-down system that goes as far as Royston during the first phase? A: Will be considering options with project partners. Will have discussions with province about grant extensions. Q: Are there any updates on the draft or proposed bylaw for septic regulations? A: Regulation of septic systems in Sewer Extension South service area for later phases considered as part of project. Separately have considered septic regulation for all electoral areas, which involves long process to gain authority for work. Staff conducted initial public engagement on mandatory pump-outs, mandatory inspection in high-risk areas, etc. General feedback not supportive of plan, so staff are working on addressing feedback and looking at next steps. Require order-in-council from province to regulate septic systems. Septic regulation can still be considered for service area within LWMP.

	Q: So is it still within this committee's purview to consider septic systems as part of the LWMP? A: Yes. Still need approval from province, but LWMP can serve as elector approval for service area. Outside service area would require a separate elector approval process. Comment: Baynes Sound is impetus for septic regulation. Given age of systems, lot sizes, etc., there is significant risk if Sewer Extension South scope changes. Costs previously presented could be impacted. Necessary for committee to consider fate of south region.
1.6 11:20 – 12:29	**Work Underway – Stage 3 LWMP Scope** M. Rutten provided an overview of the Stage 3 LWMP process and work underway. Staff received a letter from MoE outlining requirements for the Stage 3 LWMP, which includes a site master plan for the treatment plant, Phase 4 upgrade class B cost estimates, an EIS, outfall replacement timing, addressing source control and I&I, recommendations for resource recovery, addressing cost impacts to users, engagement with First Nations and the TACPAC, and establishment of a plan monitoring committee. Summarized the path towards submittal of the Stage 3 LWMP report. Key benefit of LWMP process is that it provides borrowing approval for needed upgrades. Detailed work underway for process optimization to maximize capacity of existing infrastructure. Q: Is the Sewer Extension South Project and treatment plant capacity upgrades tied together financially or do they have separate budgets and grant funding? A: Capital funding for Sewer Extension South will be paid through grant funding, partner contributions and residents in service area. Plant upgrades are paid by entire CVSS. South region has already paid lump sum contribution to be included into service. When properties are connected, residents will pay Capital Improvement Cost Charge to contribute towards impact on sewer service. Q: When do we receive feedback on Sewer Extension South report? How does it get folded into overall process? Would the combined committee consider any comments, or would the previous Sewer Extension South committee reconvene? A: Review time varies between six months to a year but expect comments back soon. Processes are now merged, so combined

committee will consider updated designs and costs for project, but public consultation will be held separately.

Q: Sewer Extension South has 13 km pipeline with no branch lines shown. Are there extra costs for arterial lines to pipe waste to shoreline?
A: Map is oversimplified, as it does not show designs for collection systems. K'ómoks and UBE responsible for their own collection systems.

Q: Has someone determined total cost for servicing a parcel of land in south region?
A: Grant funding and partner contributions will alleviate cost pressures. Calculations were included in LWMP addendum and will be updated with development of class B cost estimates. Public consultation was focused on balancing costs for property owners and ensuring the project goes forward.

M. Desilets gave an update on actions to date and proposed plans for the Stage 3 LWMP. The LWMP is an umbrella for multiple projects (treatment plant upgrades, Sewer Extension South, etc.) but will become individual projects after LWMP complete. Reviewed roadmap for Stage 3 LWMP, with next steps including addressing MoE comments and requirements, seeking TACPAC input, further public consultation and finalization of LWMP commitments and implementation schedule.

M. Proudfoot rejoined the meeting at 11:38 am.

Q: Understand that conveyance was removed from the LWMP, but won't the costs be folded back into the overall cost to the system? How does that happen within the LWMP process?
A: Public consultation on cost impacts for Sewer Conveyance Project held separate from LWMP process and approved through Alternate Approval Process. Total project costs and cost impact per year were addressed. Costs going forward will include Sewer Conveyance Project, but it won't be re-highlighted as part of LWMP. As project is happening now, the costs are already there and the borrowing has already happened.

Q: Do the costs for Sewer Extension South include the cost impact of the Sewer Conveyance Project?
A: Yes.

M. Desilets provided an overview of source control and its objectives, which includes best practices of preventing pollutants detrimental to the treatment process being introduced into the sewer system. Commented on drivers for source control, which includes provincial guidelines and requirements and to address public feedback. Approaches to source control mostly involve education for residential users and regulatory sewer use bylaws for non-domestic users. Reviewed work already done on source control and work to be done going forward, with recommendations developed. Summarized outcome and benefits of source control. Source control commitments need to be included in Stage 3 LWMP and must be addressed within a set timeline afterwards.

Q: Why is source control addressed at a regional or municipal level? Seems a larger issue that would be consistent across communities, so why not addressed at higher level?
A: Many regional districts moved to implement region-focused source control as they often manage treatment. Good practice for municipalities operating their own system to have their own regulation in place to protect their infrastructure. Harmonization between CVRD and City of Courtenay and Town of Comox would ensure consistency on what to do regarding source control.
Q: Why doesn't the province do their own public consultation or education campaign to avoid duplication of material and effort?
A: There are various educational programs, but local governments have taken on most responsibility.

Q: Will the information presented at this meeting, such as on source control, come back to the TACPAC for consideration?
A: Yes.

M. Desilets provided a brief overview of I&I. Reduction of I&I driven by provincial guidelines and requirements and to address public feedback. CVRD has committed to treating all flows, so I&I has a significant impact on planning for capacity of infrastructure. Will need to consider jurisdictional boundaries as I&I typically happens within collection

system, which are owned and operated by the municipalities. Reviewed work done and to be done for reducing I&I.

Presented on the treatment plant operational certificate. Will need to update to higher maximum discharge flow. Currently working on completion of Information Requirements Table and submittal of final operational certificate application. Process optimization, Site Master Plan, EIS and Phase 4 detailed design all feed into the Information Requirements Table and operational certificate application.

Q: Will each of these pieces come back to the committee and will the committee provide recommendations or comments to the Sewage Commission?
A: Yes.

Q: What is the current maximum volume permitted to be discharged into the strait per day?
A: 18,500 m^3.
Q: What is the environmental or engineering rationale for having a limit on the amount discharged? Why can't we discharge as much as we need?
A: Effluent volume and quality impact the receiving environment, so need to undergo EIS to determine impact. Permits generally need to be updated over time as communities grow.
Q: So is the outfall having an impact on the receiving environment?
A: Goal is to have no impacts but need to review as part of LWMP process. If there are impacts, will need to implement additional treatment.

Q: Will the new operational certificate change the treatment criteria?
A: Yes, will follow relatively new legislation implemented after plant was built.

Q: Will the impact of the outfall on the shellfish production area be included as part of the EIS?
A: Yes.

M. Desilets briefly explained the purpose, requirements and objectives of an EIS. A Stage 1 EIS has been completed, with a Stage 2 EIS scheduled for 2025.

	L. Johnson rejoined the meeting at 12:10pm. M. Rutten confirmed that everything presented at the meeting is a preview, with the TACPAC to consider the issues at a later date with more information provided. P. Galvagno presented on the Site Master Plan and upgrades to the treatment plant, reviewing the parts integrated into the Stage 3 LWMP. Will need to revise population projections to incorporate Sewer Extension South and account for Bill 44. Shared dry weather flows for 2023 and compared to wet weather flows, with intention to determine costs of additional processes required to treat the diluted wastewater. Investigating potential of utilizing heat recovery and reusing treated effluent for irrigation, toilet flushing and process applications. Biosolids currently composted into SkyRocket, but investigating potential alternate methods such as anaerobic digestion. Developing cost estimates for the headworks, administrative building, UV disinfection, electrical upgrades, and bioreactor and EQ basin improvements. Provided highlight of proposed upgrades and what will be involved, with these topics to be addressed at later meetings.
	Lunch The committee broke for lunch at 12:29 pm and reconvened at 12:49 pm.
1.7 **12:49 – 1:02**	**Next Steps and TACPAC Engagement** M. Rutten provided an overview of the role of the TACPAC and timeline for the Stage 3 LWMP. Drafting Stage 3 LWMP and reviewing components until fall 2025. Reviewing the final draft report from fall 2025 to winter 2026, with report to be submitted to province for review in 2026. Stage 3 LWMP report approval anticipated in 2027, followed by beginning of Phase 4 upgrades. Next TACPAC meetings currently anticipated for spring 2025, fall 2025 and winter 2026 to review Site Master Plan and draft Stage 3 LWMP. Work to be conducted under Stage 3 process is to address how decisions made during Stage 1&2 are implemented. A. Habkirk confirmed with the committee that the members have seen the committee's terms of reference. Decisions will be made by consensus. Opened the meeting to questions about each person's roles, the committee's role and the process going forward.

	Q: When we make a decision, is it to put a seal of approval on the quality of the decision and advise the final decision makers? Are we making recommendations as detailed as needed, rather than providing blanket approval? A: Yes. Major decisions were already made on level of treatment, conveyance route, capacity of treatment plant, etc. Now looking at how to implement those decisions and the associated costs. The TACPAC will provide feedback to the Sewage Commission, but not revisiting previous decisions. Comment: Current TACPAC seems to be focused on how-to decisions rather than what-to decisions and addressing the impacts to residents in the service area. Q: Will the focus at the next meeting be on the draft Site Master Plan? A: Some technical components will be brought back for consideration. TACPAC will look at upgrades at plant for next 50 years. Goal for spring meeting is to share Site Master Plan and seek comments and questions on 50-year phasing plan. Will give additional information to review beforehand. Comment: Glad to see staff are addressing Bill 44. Q: Do we have any updates on the schedule and budget of the Sewer Conveyance Project? A: Regular updates are provided to the Sewage Commission. Project overall is on schedule and on budget.
1.8 **1:02**	**Adjournment** The committee adjourned at 1:02 pm.

GENERAL:
The next LWMP Joint TACPAC meeting will be scheduled for spring 2025 and will be hosted in the CVRD Civic Room at 770 Harmston Avenue, Courtenay, and via Zoom.

TERMINATION:
The meeting terminated at 1:02 pm.

Comox Valley
REGIONAL DISTRICT

Master Plan Finalization and Detailed Design Phase 4 Upgrades

Site Master Plan - Executive Summary

June 2025 / DRAFT

carollo

Comox Valley REGIONAL DISTRICT

Master Plan Finalization and Detailed Design Phase 4 Upgrades

Site Master Plan - Executive Summary

June 2025 / DRAFT

This document is released for the purpose of information exchange review and planning only.

EXECUTIVE SUMMARY

ES.1 Introduction

The Comox Valley Regional District (CVRD) owns and operates the regional conveyance and treatment system for domestic wastewater, serving the City of Courtenay, Town of Comox, K'ómoks First Nation (KFN), and the Department of National Defense facilities, along with providing septage receiving for the rural Comox Valley Regional District electoral areas. Wastewater from these communities is conveyed to the Comox Valley Water Pollution Control Centre (CVWPCC) where it undergoes secondary treatment before discharge into the Salish Sea. The submerged outfall pipe extends a distance of 2,825 meters (m) from the shore near Cape Lazo and terminates at a depth of 60 m below the water surface at low tide in the Strait of Georgia.

In June 2018, CVRD initiated a Liquid Waste Management Plan (LWMP) which functions as a regulatory document under the Environmental Management Act and the Municipal Wastewater Regulation (MWR) 87 in three stages:

- Stage 1 - Identification of baseline and alternative options.
- Stage 2 - Develops preferred strategy and solution.
- Stage 3 - Details costs and implementation plan.

This collaborative process is guided by Technical and Public Advisory Committees and through public engagement, allows the community to balance strategies for environmental protection and fiscal management of the service. To date, the Stage 2 reporting is complete and the Final Site Master Plan supplements and supports the Stage 3 LWMP reporting. The Final Site Master Plan establishes future upgrade requirements and associated costs for the CVWPCC.

The CVWPCC was originally constructed in the early 1980s, with several expansions to present. Many of the processes and equipment at the plant are either at, or approaching the end of their service life, and require additional study or replacement to address aging infrastructure and provide environmental resilience through the 2060 planning horizon.

This Site Master Plan builds on previous LWMP stages and incorporates recent studies, updated population and load forecasts, condition assessments, and regulatory requirements to define a roadmap for modernization and expansion of the CVWPCC. It aims to maximize the useful life of existing infrastructure while future-proofing the CVWPCC through scalable, sustainable, and cost-effective infrastructure improvements, in a phased approach, to support community needs.

ES.2 Projected Flows and Loads

The CVWPCC currently services multiple areas and jurisdictions, including:

- City of Courtenay.
- Town of Comox.
- Department of National Defence (Canadian Forces Base [CFB] Comox and His Majesty's Canadian Ship [HMCS] Quadra).
- KFN.

Wastewater from each of these jurisdictions is conveyed to the CVWPCC by way of gravity pipes, pump stations, and force mains. The CVRD-owned infrastructure for transmission of wastewater from service areas to the CVWPCC and effluent to the outfall is shown in Figure ES.1.

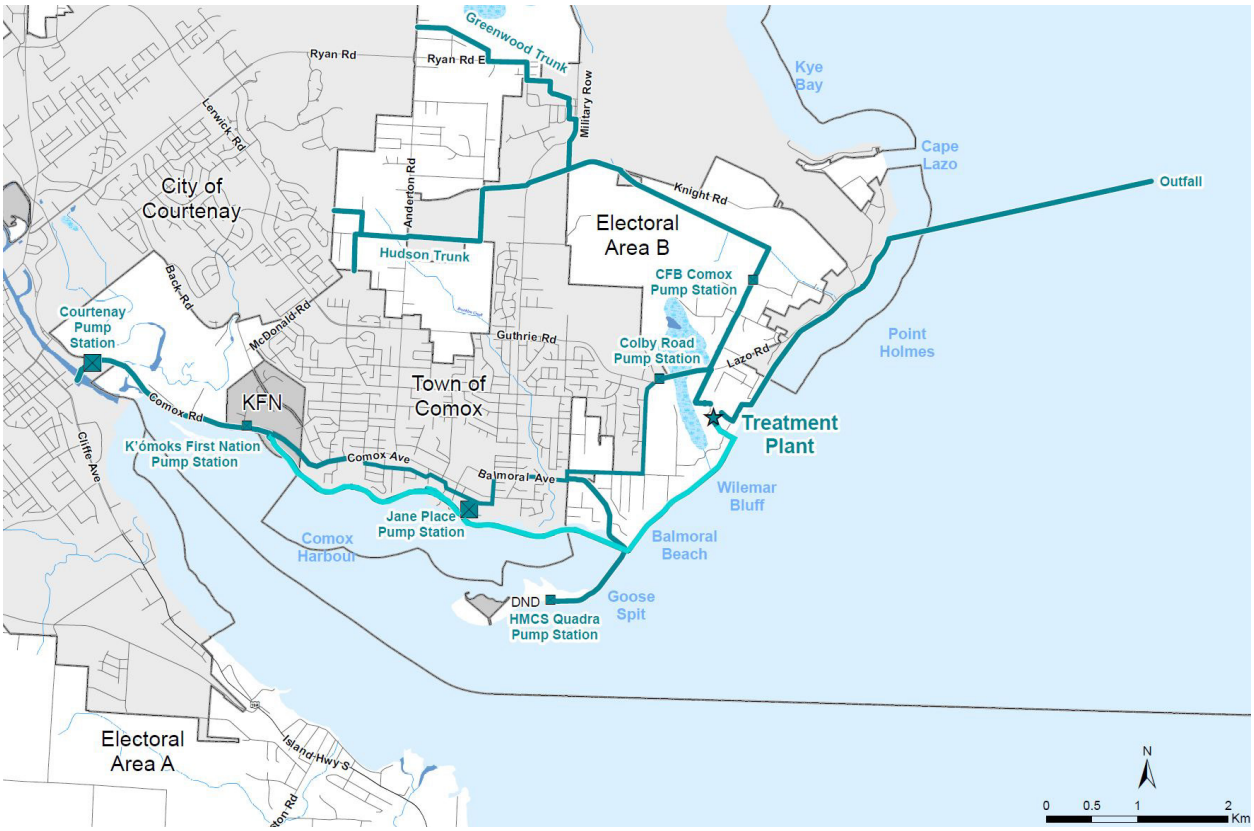

Figure ES.1 Comox Valley Sewerage System

A review and analysis of service population projections considered the following:

- Bill 44 (Housing Statutes [Residential Development] Amendment Act).
- CVRD Housing Needs Assessment.
- Planned expansion to include the South Sewer Service area.

The average growth rate to year 2060 for the revised population projections is 1.85 percent compared to 1.77 percent for the LWMP population projections. Driven by the above noted considerations, the revised population projections are used to project future flows and loads.

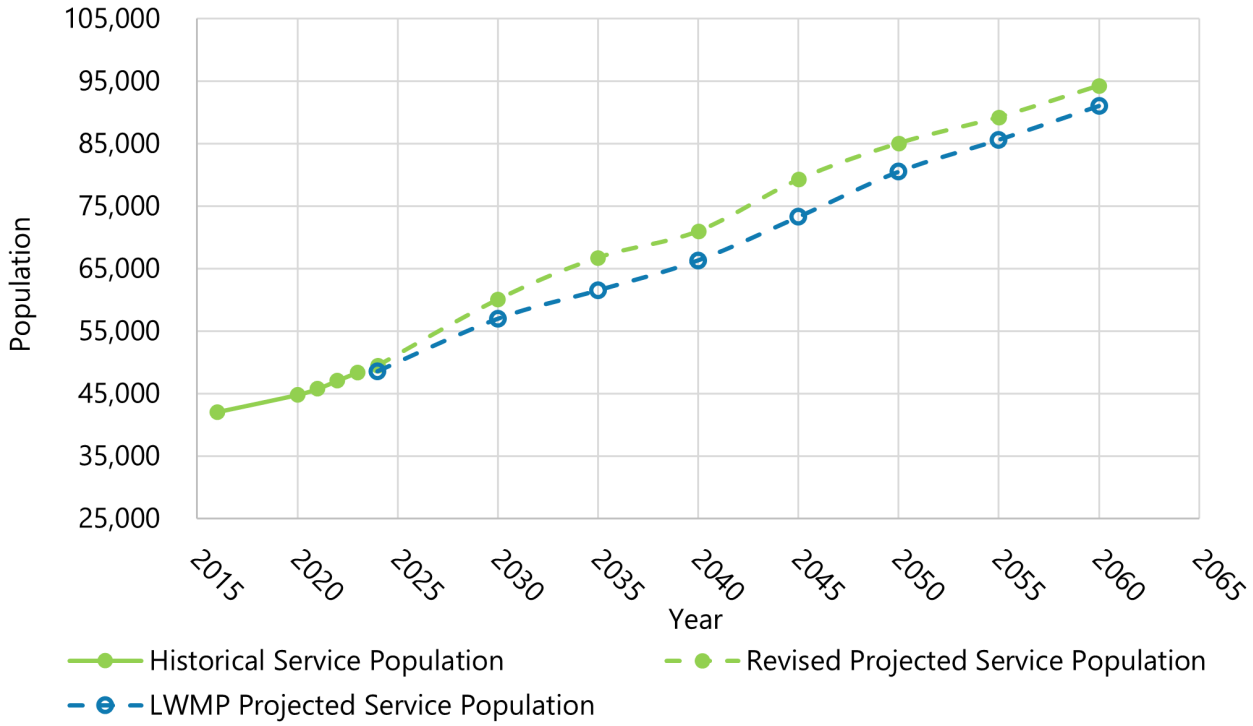

Figure ES.2 Comparison of Revised Total CVWPCC Service Population Projections with LWMP Estimates

The design per capita wastewater generation rates, wet weather peaking factors and projected influent flows were established based on the updated record. Since 2020, the CVWPCC has been recording flow measurements at five-minute intervals. This data was used to revise the wet weather peaking factors.

The influent flow is characterized by high peak flows through the autumn-to-spring period when rainfall events are common. During the dry summer periods, influent wastewater flows are lower and more constant in comparison, reflecting the lower inflow and infiltration. At the CVWPCC, peak hourly flow (PHF) can increase more than four-fold compared to the average dry weather flow (ADWF).

With assessment of population growth and historical data, the wastewater influent flow projections to the CVWPCC to year 2060 are summarized in Table ES.1 and reflect the historical peak flow characteristics developed in this section and service population projection estimates. Table ES.2 presents projected raw wastewater BOD_5, TSS, and TKN loading to the CVWPCC.

Table ES.1 Flow Projections from 2024 to 2060

	2024	2030	2035	2040	2045	2050	2055	2060
Projected Service Population	49,471	60,070	66,788	71,017	79,279	85,084	89,274	94,308
ADWF (m^3/d)	12,368	15,017	16,697	17,754	19,820	21,271	22,319	23,577
ADF (m^3/d)	16,184	19,651	21,849	23,233	25,935	27,835	29,205	30,852
MMF (m^3/d)	24,735	30,034	33,392	35,507	39,638	42,540	44,635	47,152
MDF (m^3/d)	40,048	48,628	54,066	57,490	64,178	68,878	72,270	76,344
PHF(1) (m^3/d)	50,724	61,591	68,479	72,815	81,286	87,239	91,535	96,696
Maximum Instantaneous Flow((m^3/d)	55,888	67,862	75,451	80,229	89,562	96,120	100,854	106,540
Maximum Instantaneous Flow (L/s)	647	785	873	929	1,037	1,113	1,167	1,233

Notes:
ADF - average daily flow; L/s - litres per second; m^3/d - cubic metres per day; MDF - maximum day flow; MMF - maximum month flow.

Table ES.2 Projected Influent Wastewater Flow and Organic Loading for the CVWPCC

	2024	2030	2035	2040	2045	2050	2055	2060
Service Population Projection	49,471	60,070	66,788	71,017	79,279	85,084	89,274	94,308
BOD_5 Loading (kg/day)								
Average Annual	3,859	4,685	5,209	5,539	6,184	6,637	6,963	7,356
Maximum Month	5,016	6,091	6,772	7,201	8,039	8,628	9,052	9,563
TSS Loading (kg/day)								
Average Annual	4,007	4,866	5,410	5,752	6,422	6,892	7,231	7,639
Maximum Month	6,131	7,444	8,277	8,801	9,825	10,544	11,064	11,688

Notes;
kg/day - kilograms per day.

ES.3 Future Upgrade Pathway Weather Treatment Evaluation

Several options were reviewed to determine the future upgrade pathway for the CVWPCC. During wet weather events, inflow and infiltration (I/I) to the wastewater collection system dilutes the raw wastewater. The volume of wet weather, in excess of biological treatment capacity, currently, is relatively small at the CVWPCC. Based on measured hourly data from 2020 to 2024, the total volume of influent flow greater than two-times the ADWF (i.e., the assumed maximum biological treatment capacity) has been less than 2.4 percent of the total influent volume.

To address I/I challenges, high-rate systems that treat the dilute wastewater, in excess of the biological capacity can be used, as they require less infrastructure, and thus can be cost efficient compared to treating the entire wet weather flow through the secondary process. In addition, a coagulant and/or polymer can be added to screened raw wastewater entering the primary clarifiers to improve settling and thereby increasing hydraulic capacity. An assessment of three options was completed with an associated projected capital expenditure.

- **Baseline:** Conventional treatment upgrade based on primary clarifiers, bioreactors and secondary clarifiers.

- **Option 1:** Conventional treatment upgrade with chemically enhanced primary treatment (CEPT) in primary clarification.
- **Option 2:** Wet weather treatment upgrade with year-round tertiary filtration and CEPT in primary clarification.

The wet weather treatment (Option 2) was selected which includes the installation of a tertiary filter for year-round use and use of CEPT for the primary clarifiers during wet weather events which allow these units to meet the same performance criteria as conventional primary clarifiers. This option also provides other improvements including:

- **UV Disinfection Performance:** The addition of a tertiary filter to support the wet weather treatment auxiliary train improves the performance of the new UV disinfection system, currently planned for the Phase 4 Upgrades.
- **Plant Effluent Reuse:** Filtration also provides the opportunity for expanded effluent reuse under the Greater Exposure Potential category defined in the MWR which could include irrigation of landscaping and greywater (i.e. toilets), and potentially off-site use in the future, if demand materializes.
- **Improved Effluent Quality and Operational Resiliency:** Since tertiary filtration provides a physical barrier, the process can reduce any solids carry-over and provide enhanced effluent quality.
- **Extension of Useful Life of Facility:** The wet weather flow options, when compared to the baseline option, requires less concrete tanks (two fewer secondary clarifiers and one less primary clarifier) while maintaining regulatory requirements to the 2060 planning horizon. By reserving the limited space available at the current site, the facility can continue to accommodate population growth within the existing property lines well beyond the 2060 planning horizon.

ES.4 Future Pathway Upgrades

The future pathway upgrade provides a strategic foundation to meet the CVWPPC's needs for the 2060 planning horizon. The Site Master Plan considers condition assessment of existing assets, evaluation of resource recovery options, and major liquids and solids treatment train requirements required with the wet weather treatment pathway.

ES.4.1 Condition Assessment

A detailed condition assessment was conducted to review process mechanical, structural (concrete), and electrical assets:

- Several process mechanical systems, including clarifier mechanisms and pumps, are approaching end-of-life or require upgrades.
- Electrical, instrumentation, and supervisory control and data acquisition systems show vulnerabilities and need modernization.
- The Administration Building requires functional and safety enhancements, and seismic retrofit to provide resiliency.

- Greenhouse gas (GHG) emissions inventory indicates opportunities for energy efficiency and emissions reduction through resource recovery options to meet CVRD's commitment for carbon neutrality as a signatory to the British Columbia (BC) Climate Action Charter.
- Treatment performance has generally met existing permit requirements, but improvements are needed to meet projected loads and regulatory changes.

ES.4.2 Resource Recovery Options

Resource recovery options were identified as part of the Stage 1 and 2 LWMP and as part of this Site Mater Plan. A cost-benefit analysis was completed to inform specific commitments within the Stage 3 LWMP and the Site Master Plan. Three resource recovery options were reviewed:

- **Reclaimed Water:** The use of reclaimed water (treated plant effluent water) was evaluated for on-site water demands that are currently met with potable water purchased from the Regional District, with standards set out in MWR 87. Several reclaimed water uses for tank filling, cleaning process equipment or pump seal water make up a significant portion of the water demand at the CVWPCC. Installation of an effluent water system with pumps to these process areas would provide this beneficial reuse of effluent water and off-set the costs of potable water purchase, decrease stress on local water supply, and could facilitate a pilot project for sale of reclaimed water for off-site users.
- **Heat Recovery:** Effluent water can also be used as a renewable source of energy and its thermal limits are suitable for heat recovery. This approach has become increasingly more common at wastewater treatment facilities. The current facility utilizes natural gas fired boilers to supply hot water loops to several buildings on-site. A heat pump could be installed on-site and integrated into the existing system, with the existing boiler system maintained as a back-up system.
- **Biosolids Management:** Currently, the thickened and dewatered waste sludge is hauled to a composting facility, and it is sold to the local community as Class A compost called SkyRocket, which is used as composting feedstock. The compost market is a sustainable strategy and helps offset the operating cost of the composting facility, but is highly dependent on the availability of the local market to purchase compost. Several biosolids management options were reviewed such as anaerobic digestion, thermal drying, and pyrolysis. These options provide opportunities for resource recovery with potential to generate biogas for energy and heat recovery; however, the smaller sizer of the CVWPCC facility does not provide a strong economic basis for implementation. The current method of composting is an excellent resource recovery option and should be continued. If, in the foreseeable future, regulations require discontinuation of the composting process due to stringent per- and polyfluoroalkyl substances (PFAS) limits, at such time, alternatives such as thermal drying followed by pyrolysis may need to be evaluated in more detail.

ES.4.3 Phased Implementation Plan

The Site Master Plan outlines a comprehensive, phased strategy for infrastructure investment and includes the following.

ES.4.3.1 Liquids Treatment Train

The liquids treatment train consists of influent screening and grit removal, primary clarification, bioreactors, secondary clarification, and is discharged to the ocean via the effluent chamber and outfall.

The capacity evaluation of the existing liquids treatment train considered the rated and effective capacity of each unit, informed by stress testing performed in 2024 and 2025 at the CVWPCC, the projected flows through 2060, and design criteria informed by literature. Phased increased capacity needs were informed by MWR criteria requirements.

- **Headworks:** The existing headworks equipment (screening and grit removal) has reached the end-of-useful-life and new infrastructure is required. It was identified that the existing process of degritting influent and primary sludge is performing well, and need for a new grit facility at the new headworks is not necessary. However, the existing grit equipment still requires replacement and upgrades for the future buildout. The new headworks facility considers flow projections, operational flexibility, and consideration for future buildout tie-ins and is recommended in the Phase 4 (2030) upgrades.
- **Primary Clarifiers:** Primary clarifier needs were based on CEPT use for flows above two times ADWF as part of the wet weather flow (WWF) treatment upgrade pathway. The addition of CEPT increases the performance of a conventional primary clarifier. With CEPT operation, a fourth Primary Clarifier D will be required by year 2040 and a fifth Primary Clarifier E will be required by 2060.
- **Bioreactors:** As the service population grows, the associated organic loading on the bioreactor also increases. The current complement of three bioreactor trains is projected to reach capacity by 2045 when a fourth bioreactor is required. The new, fourth bioreactor, will need to be constructed on the north side of the administration building. The available hydraulic grade may not be sufficient to convey primary effluent to the new bioreactor and a low-head pump may be required.
- **Secondary Clarifiers:** Secondary clarifier upgrade requirements under this option are driven by both hydraulic and solids loading. With the WWF treatment upgrade, the need for secondary clarifier capacity is deferred. A fourth secondary clarifier is required by year 2045. A fifth secondary clarifier is not required within the 2060 planning horizon.
- **Outfall and Effluent Pumping Station:** The existing effluent outfall was part of the 1982 original construction and is now over 40 years old. The outfall capacity has been identified as a concern during high tide and peak influent flow scenarios. It is recommended to provide additional capacity by 2030. A condition assessment was performed of the existing outfall confirming its useful lifespan can be extended by approximately 10 years with a modest pressure increase using pumps to convey effluent from the CVWPCC under high tide flows. This option necessitates a retrofit of the existing effluent pumping station located within the existing effluent storage basin.

ES.4.3.2 Hydraulic Grade Line

A hydraulic grade line (HGL) was prepared for peak hourly flow and average dry weather flow based on the proposed implementation plan. Several conservative assumptions were included to provide additional flexibility for the CVWPCC expansion in the future, such as considering the potential of a new grit facility to be co-located near the new screening Headworks Building. The HGL identified several hydraulic constraints based on the future 2060 buildout and projected flows. It is recommended that the following modifications be addressed within the Phase 4 scope:

- Removal of Parshall flume in the existing effluent chamber and provide effluent flow metering elsewhere.
- Increase influent line diameter into the CVWPCC to 900 millimetres.

ES.4.3.3 Solids Processing and Handling

CVWPCC generates two types of sludge through its conventional activated sludge treatment process: primary sludge from primary clarification and waste activated sludge from secondary biological treatment. These solids are thickened, blended, and dewatered onsite prior to being hauled to a composting facility. The capacity evaluation of the existing solids processing and handling infrastructure considered the rated and effective capacity of each unit, projected sludge loads through 2060 based on population growth projections, and redundancy and system resilience. In lieu of specific MWR redundancy criteria, industry-standard redundancy requirements were applied and considered alongside operational considerations and performance.

Table ES.3 Solids Processing and Handling Upgrades

Process Unit	Process	Recommendation
Gravity Thickener	TPS.	▪ Provide third gravity thickener in 2045.
DAF	TWAS.	▪ Provide third additional DAF in 2045.
TPS Tank	Storage of TPS prior to dewatering.	▪ Provide second TPS storage tank in 2045. ▪ Provide third TPS storage tank in 2060.
TWAS Tank	Storage to TWAS prior to dewatering.	▪ Provide second TWAS storage tank in 2045
Dewatering Centrifuges	Dewatering of TPS and TWAS prior to transfer to composting facility.	▪ Provide higher capacity centrifuges by 2040.

Notes:
DAF - dissolved air flotation, TPS - thickened primary sludge; TWAS - thickened waste activated sludge.

ES.4.3.4 Odour Control

The odour control system was initially installed in phases: Scrubber No. 1 was installed in 1997, an activated carbon unit for polishing installed in 2018, and Scrubber No. 2 installed in 2021. Identification of new additional odour air sources that require treatment informed the necessary upgrades. The additional odour air sources within the Phase 4 (2030) upgrades does not exceed the existing capacity and minor modifications are required to integrate the new sources. Both Scrubber No. 1 and Scrubber No. 2 will reach end-of-useful-life in 2040 and 2060 respectively, and at that time should be replaced with a higher capacity scrubber to accommodate future build-out. On-going maintenance requirements and media replacements will maintain performance of the system.

ES.4.3.5 Site-Wide Electrical Modernization

Much of the main distribution and electrical infrastructure has been identified as end-of-useful life with minimal spare parts and equipment support, and require a complete overhaul to address health, safety and regulatory concerns. The site-wide electrical infrastructure upgrades are included in Phase 4 (2030) and will address the following and future 2060 horizon needs:

- Outdoor service entrance upgrade to a primary service, with a new generator and automatic transfer switch.
- Upgrade and expansion of main electrical room (in the Operations, Grit, and Blower Building) distribution and motor control centre (MCC) equipment. Diversification of distribution (i.e. splitting

loads among various electrical equipment) will be included for new equipment to allow operational flexibility for maintenance activities.

- Replacement, relocation and capacity increase of MCC equipment located in the Grit Room, Sludge Pumping Building, and DAF Building.

ES.4.3.6 Existing Facility Assessment

A site condition review was conducted for major process mechanical systems and associated concrete condition. With the original facility constructed in 1982, several medium and high-priority items were identified that require near-term intervention due to their function within the treatment train, advanced age, or non-compliance with safety or process standards. Many of these items were previously identified within the LWMP process and are included within the Phase 4 upgrades (2030) including:

- Aging headworks and grit removal equipment.
- Electrical main distribution, MCCs, and electrical distribution in pipe gallery.
- Structural retrofits to the Operations, Grit and Blower Building.

Low-priority improvements and retrofits are recommended to be phased together with the associated main treatment upgrades.

ES.4.3.7 Operations, Grit and Blower Building

The Operations, Grit and Blower building was originally constructed in 1982 and consists of an underground pipe gallery housing significant process mechanical equipment, main electrical distribution, blower room, mechanical rooms, workshop space, Grit Room adjacent to the existing screening room, a laboratory, and office space for staff and visitors.

- **Seismic Resiliency:** A seismic assessment was completed to identify modifications to this structure to confirm the existing building can continue to be used for critical infrastructure. Seismic retrofits were identified and recommended to meet British Columbia Building Code-24 post-disaster objectives. The existing building requires updates to support current and future operations and to improve resiliency.
- **Staff Facility Retrofits:** An operational needs assessment was completed based on the 2060 buildout and defined a proposed configuration of additional washrooms, showers, locker rooms, lunchrooms and office spaces to suit the recommended future staffing requirements. The retrofit includes an expansion of space in addition to renovation of existing, and an outdoor covered storage space.

ES.4.3.8 Greenhouse Gas Inventory Mitigation

CVRD is a signatory to the BC Climate Action Charter, which included a commitment to achieve carbon neutrality in corporate operations, which includes the CVWPCC facility. CVRD's target is to reduce corporate GHG emissions by 50 percent below 2019 corporate emissions by 2030, and achieving carbon neutral operations by 2050. At the CVWPCC, GHG emissions are monitored annually by the CVRD through its Energy and Emissions Departmental Work Plan. As the facility continues to expand and modernize, quantifying current GHG performance provides a baseline for assessing future improvements, identifying reduction opportunities, and supporting broader climate action goals. Opportunities for resource recovery can be implemented to mitigate GHGs. These opportunities can be implemented at any phase; however, provisions for future elements can be included in the Phase 4 upgrades.

ES.4.3.9 Phased Implementation Plan

A summary of the major components categorized in liquids, solids odour control, and site-wide electrical upgrades is provided in Table ES.4.

Table ES.4 Phased Implementation Plan

Upgrades	Liquids	Solids	Odourous Air	Site Electrical
Phase 4 (2030)	▪ Bioreactor Improvements. ▪ Tertiary Filtration. ▪ UV Disinfection. ▪ New Headworks. ▪ Operations, Grit and Blower Building Retrofit. ▪ CEPT. ▪ Mixed Liquor Suspended Solids Splitter Chamber. ▪ Effluent Pumping Station Retrofit.		▪ Minor modifications to existing odour control system.	▪ Main distribution retrofit. ▪ Pipe gallery retrofits (distribution, voltage and MCCs). ▪ Site-wide MCC upgrades. ▪ Service entrance equipment upgrade. ▪ Generator replacement.
Phase 5 (2040)	▪ Fourth Primary Clarifier D. ▪ *Potential* Tertiary Filtration Expansion.	▪ Centrifuge upgrades.	▪ Replace Scrubber No. 1 at end-of-life.	
Phase 6 (2045)	▪ Fourth Bioreactor D. ▪ Fourth Secondary Clarifier D.	▪ Gravity Thickener 3. ▪ Second TPS Storage Tank. ▪ Second TWAS Storage Tank.		
Phase 7 (2060)	▪ Fifth Primary Clarifier E.	▪ *Potential* Third TPS Storage Tank.	▪ Replace Scrubber No. 2 at end-of-life.	

ES.5 Recommendations

The Site Master Plan forms the basis of design for plant expansion and to develop an efficient site layout for long-term phased upgrades to optimize existing assets and space, considering regulatory frameworks and emerging concerns, and opportunities for resource recovery. The revised population growth projection is the major driver of liquids and solids treatment trains which informs the supporting odour control treatment upgrades, new process units and trains, and opportunities to prepare for emerging concerns and regulatory changes and GHG mitigation strategies.

The following recommendations are based on the completion of the updated Site Master Plan, providing a phased implementation plan for CVRD:

- Proceed with Stage 3 of the LWMP process which focuses on implementing the phased implementation plan provided, including continuation of the public and stakeholder engagement process.
- Continue monitoring of actual population growth, flows and loads against projections, including developing and evaluation measures for volume reduction and source control programs.
- Perform recommended and necessary site-specific assessments and studies ahead of phased upgrades to further evaluate options; including drafting of proposed Operational Certificate updates, based on the phased implementation plan.
- Identify and secure funding sources through grants, utility revenues and infrastructure programs where possible.

APPENDIX A

SITE PLAN

SITE PLANS

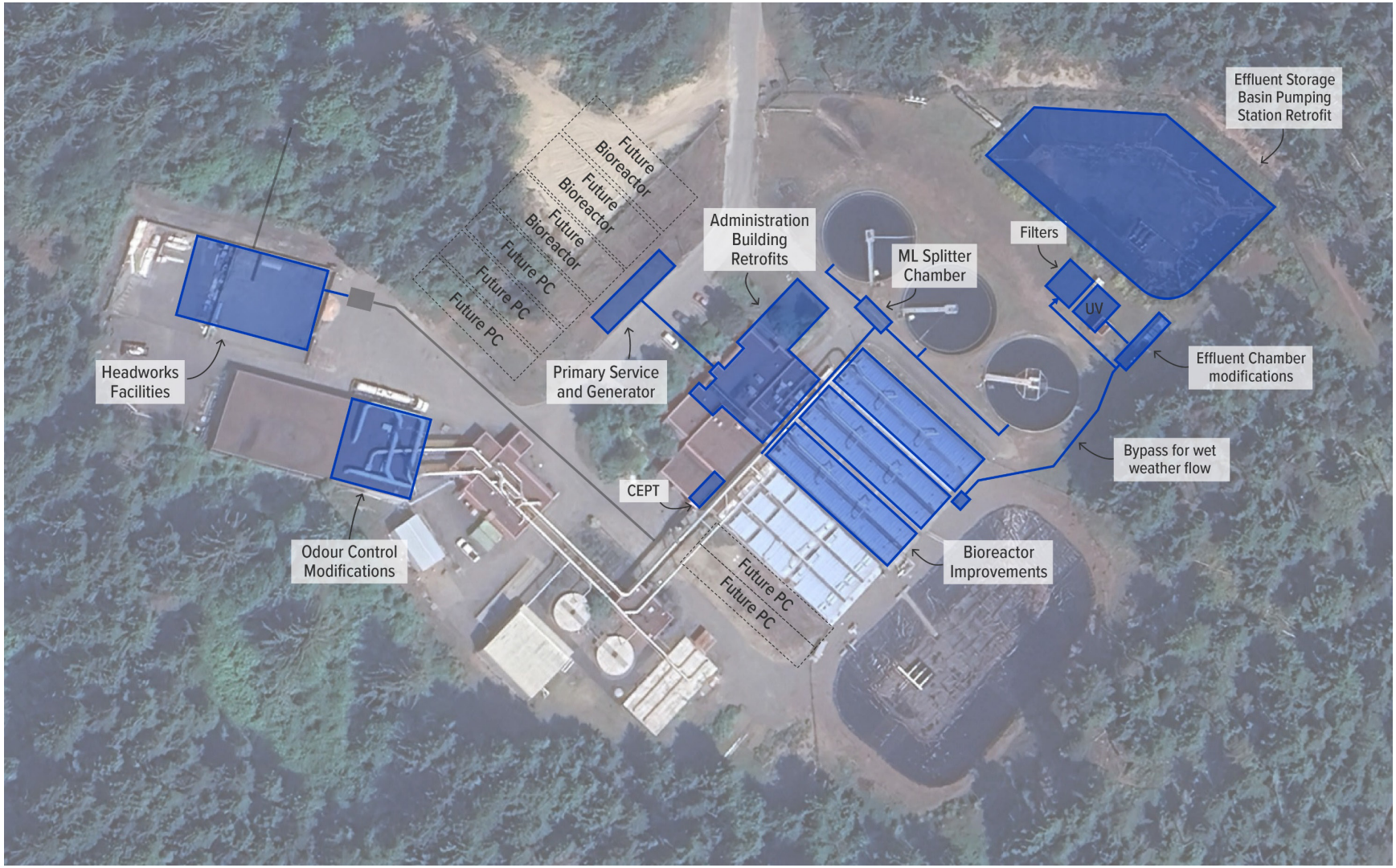

Figure A.1 Phase 4 (2030) Site Plan

Figure A.2 Phase 5 (2040) Site Plan

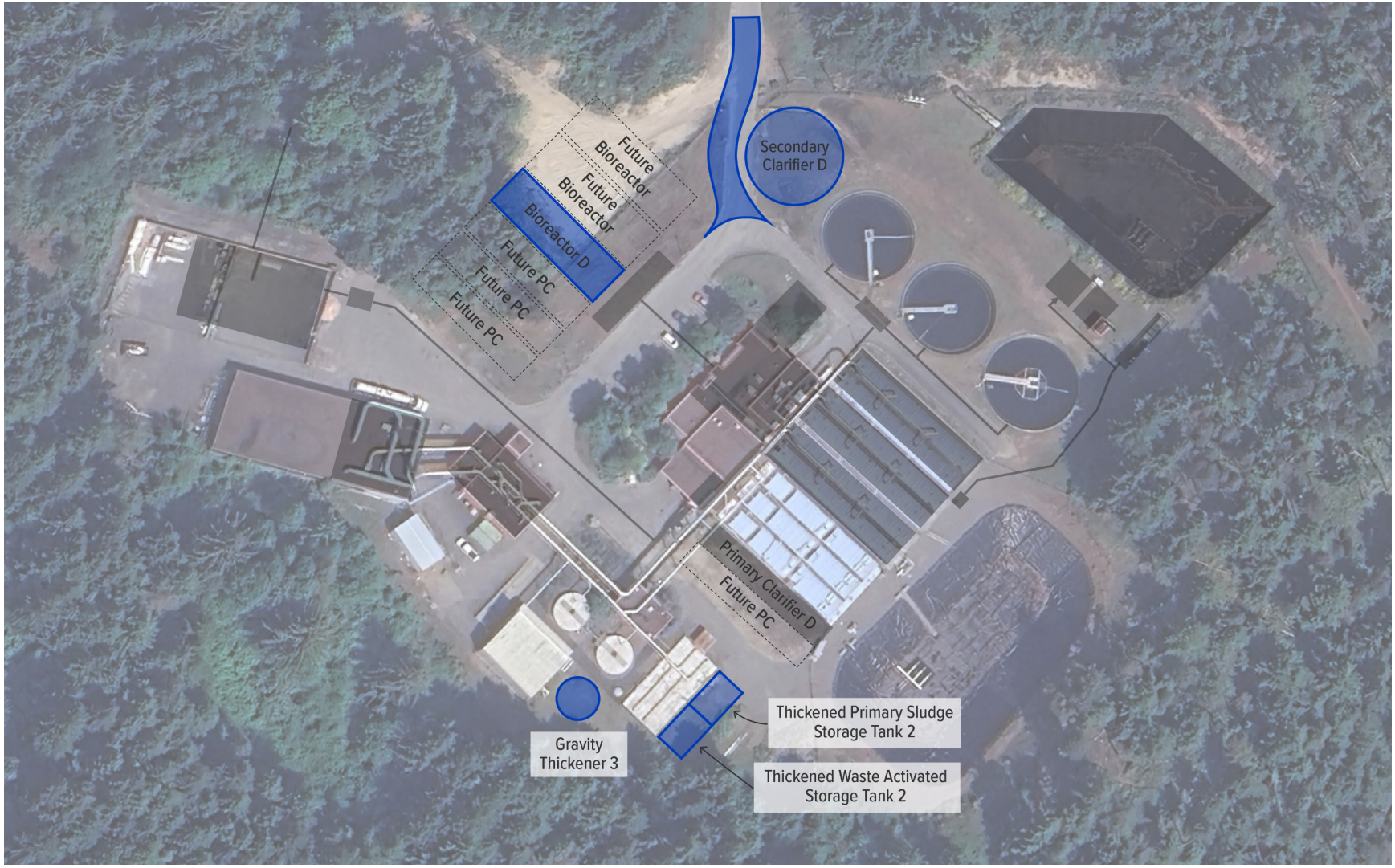

Figure A.3 Phase 6 (2045) Site Plan

Figure A.4 Phase 7 (2060) Site Plan

MEMO
FOR DISCUSSION

TO: Zoe Berkey, Kris La Rose

FROM: WSP Canada Inc.

SUBJECT: **Source Control Review and Recommendations**

DATE: **June 3, 2025**

1.0 INTRODUCTION

The Comox Valley Regional District (CVRD) has completed Stages 1 and 2 of it's Liquid Waste Management Plan (LWMP) and submitted to the BC Ministry of Environment and Climate Change Strategy (Ministry) for review and comment. Comments on the combined Stage 1 and 2 report were received from Ministry in May 2023 which included considerations for the CVRD to address in preparation of the Final Stage 3 LWMP. With respect to source control, the Ministry commented that the Stage 1 and 2 LWMP did not address source control and requested that the Stage 3 LWMP include commitments to develop a source control program for the plan area.

The purpose of this memorandum is to provide an overview of source control within the plan area and outline potential commitments to include in the Stage 3 LWMP for review and selection by the CVRD and Joint Technical and Public Advisory Committees (TACPAC).

2.0 SOURCE CONTROL OVERVIEW

2.1 GENERAL

The BC Ministry of Environment *Interim Guidelines for the Preparation of Liquid Waste Management Plans* (the Guidelines) identify that an important component of a LWMP is a commitment to develop an effective source control program. Source controls implemented through a source control program are used to discourage the discharge of waste to the sanitary sewer system that may pose a risk to workers and the public, damage infrastructure, hinder the efficiency of treatment facilities, degrade the quality of receiving waters or affect the quality of biosolids.

The efficiency of wastewater treatment and its costs are closely related to the quantity and quality of the wastewater to be treated. Source control is also therefore widely recognized as a best practice for managing wastewater treatment through reduction of pollution loads at the source.

The key objectives of a source control program as described in the Federation of Canadian Municipalities and National Research Council - *Wastewater Source Control Best Practice by the National Guide to Sustainable Municipal Infrastructure* include the following:

1. Manage the Demand for Service
2. Protect Sewer Workers and the Public
3. Protect the Sewer Infrastructure
4. Protect the Wastewater Treatment Process
5. Protect the Environment

6 Protect and Improve the Quality of Biosolids

These objectives are applicable within the context of the CVRD sewage system as they support the sustainable management of the associated infrastructure, support management of infrastructure upgrade costs/ capital investment, and address public consultation feedback for protection of the environment.

2.2 REGULATORY CONTEXT

The Guidelines identify that an important component of a LWMP is a commitment to develop an effective source control program and as appropriate, improved or added source control measures such as bylaws, codes of practice and education programs should be identified and evaluated. While the development of a source control program does not need to be completed within the LWMP, a framework and commitments for developing and implementing such a program should be established.

The relevant guidelines and regulations applicable to the development of a source control program are summarized below:

— **BC Ministry of Environment Interim Guidelines for the Preparation of Liquid Waste Management Plans:** Include evaluation of existing source control programs (Stage 1), and the development and evaluation of additional measures for source control (Stage 3). Source control is a well-established component of the LWMP, and the Ministry evaluates how a local government addresses this component in their LWMP through the review and approval process. The Ministry's comments on the Stage 1 and 2 LWMP highlight that the CVRD should ensure the Stage 3 LWMP includes a commitment to develop a source control program. These comments outline the importance of this component for approval of the LWMP.

— **BC Municipal Wastewater Regulation (MWR):** Section 7 (3), states that municipalities that accept non-domestic waste are required to either regulate the discharge via a source control bylaw that provides for the pre-treatment of non-domestic discharges to the system or demonstrate by a study that a source control bylaw is not required to protect the wastewater facility or receiving environment. A source control bylaw must include provisions for pre-treatment of industrial, commercial and institutional discharges into the sewer system. The Comox Valley Wastewater Pollution Control Center (CVWPCC) currently operates under a discharge permit but will apply for an Operational Certificate under the LWMP which generally follows the MWR. Since there are various industrial, commercial, and institutional zoning connected to the CVRD sewer service, these sections of the MWR are applicable to the CVRD.

— **FCM/NRC Wastewater Source Control Best Practice by the National Guide to Sustainable Municipal Infrastructure:** This Guideline provides guidance for the development of the content, and implementation of a wastewater source control program.

— **CCME Model Sewer Use Bylaw Guidance Document:** Model bylaw tool to assist Canadian municipalities and communities in developing and implementing sewer use bylaws for source controls of contaminants discharged to community sewer systems.

3.0 LWMP STAGE 1 AND 2 SOURCE CONTROL REVIEW AND CONSULTATION

Source control was not included as a component of the Stage 1 and 2 LWMP. Although not specifically addressed, consultation and review of treatment options touched on aspects of source control. During the Stage 1 and 2 public consultation process, public concern deemed the environment and environmental protection as a high value consideration in decision making. Concerns expressed by the public were largely focused on marine pollution.

Public feedback also highlighted concerns around contaminants of emerging concern (CECs), microplastics and a need for education around what not to flush. Public feedback was considered by the TACPAC in setting the goals and objectives for the treatment component of the LWMP and an overview of microplastics, viruses and CECs in wastewater was completed as part of the Stage 1 and 2 LWMP. Options for treatment of these pollutants were also evaluated as part of the development of the preferred treatment option. It was determined that treatment at the CVWPCC to eliminate these would require significant technological advancements and a more economical approach would be to eliminate these pollutants at the source.

While typically upwards of 90% of organic contaminants and microplastics are removed in wastewater treatment processes, they are only separated into the solid portion and not destroyed, posing risk to biosolids quality and the environment through land application. Viruses are removed through disinfection; however, the amount of reduction depends on the strain of virus and monitoring and analysis of efficacy is difficult. Overall, a more economical and robust approach is reducing these pollutants at the source. Based on public consultation, implementation of a source control program is expected to be well received by the public and educational approaches to source control may be well suited to address concerns and reduce these pollutants.

4.0 EXISTING CVRD SOURCE CONTROL MEASURES

Although the CVRD does not currently have an official source control program or associated sewer use by-law, components of source control are included in the current CVRD liquid waste bylaws and educational outreach programs. These are summarized in the following sections.

4.1 CVRD BYLAWS

CVRD BYLAW NO. 650

The Sewage Commission Bylaw No. 650 was adopted in December 1982 and established a sewage commission to be comprised of members of municipal councils of Courtenay, Comox and Department of National Defense. This commission was created to oversee the operation and maintenance of the sewage interception, treatment and disposal facilities and charged with the administration of the "Sewer Regulation Bylaw", including penalties and offences and other administrative powers.

CVRD BYLAW NO. 71

The CVRD has implemented fees and tipping charges for the acceptance of septage at the CVWPCC. Comox Valley Sewerage Service Regulation, Fees and Charges Bylaw No. 71 came into effect in February 2023. This bylaw imposes a fee structure for the service to accept and process septage generated in Electoral Areas A, B and C at the CVWPCC. The fee structure

includes septage, biosolids, holding tank effluent and grey water disposal. The by-law also includes an application process for acceptance of septage/biosolids and a septage and biosolids code of practice setting prohibitions and procedures which haulers must agree and adhere to.

CVRD BYLAWS NO. 3008, 2541, 572

Bylaw No. 2541 (2003) converts the function of sewage interception, treatment and disposal facilities to a service known as the Comox Valley Sewerage Service (CVSS) and includes septage disposal and biosolids composting facilities as part of the service. The bylaw defines the boundaries of the service area, participating areas, and makes provisions to allow for cost recovery and of cost of service.

The Comox Valley Sewerage System Capital Improvement Cost Charge Bylaw No. 3008 came into effect in 2007, and the Comox Valley Sewerage Service Development Cost Charges Bylaw No. 572 came into effect in 2019. These bylaws regulate costs associated with development and impose a development and capital improvement cost charges for the purpose of providing funds to assist the Regional District to pay the capital costs of providing, constructing, altering or expanding facilities required to service, directly or indirectly, the development for which the charge is being imposed including subdivision or any expansion of the service area including single parcels.

4.2 MEMBER MUNICIPALITY BYLAWS

The Town of Comox and City of Courtenay both have sanitary sewer bylaws that cover many of the components related to source control or sewer use bylaws but also contain components typically found in sewer bylaws that are generally used to regulate the way sewer connections can be made. A brief overview of these is provided below. While there are many commonalities between the Town and City sewer-use bylaws, there are however differences between the two and certain recommended components such as standard forms/permit applications, codes of practice for specific commercial/institution discharges and pollution prevention programs plans are not included. While the bylaws establish the powers of the City and Town for inspection, monitoring and enforcement, the enforcement policies and levels of enforcement are not clearly communicated. As the sewage from the member municipalities is treated at the CVWPCC under the CVSS, it is recommended that sewer-use bylaws and enforcement policy be consistently applied to all system users and regional harmonization considered.

TOWN OF COMOX BYLAW NO. 713

The Town of Comox Sanitary Sewer Use, Extension & Connection Bylaw No. 713 covers many of the major components of a source control bylaw including description and listing of prohibited discharges / substances, standards for waste discharges including, particle size limits, concentration limits for oil/grease, suspended solids, BOD/COD and toxic substances, as well as limits on temperature and pH. The general and more specific requirements for connecting to the sewerage system, including pre-treatment requirements for industrial and high strength wastewaters, volume control, requirements for control manholes and monitoring are also described. The bylaw further outlines procedures and policies for connection of sewers, sewer system extension, abandonment, connection fees, and inspection requirements. The bylaw also defines offenses and penalties for violation of the bylaw.

CITY OF COURTENAY BY-LAW NO. 1327

The City of Courtney Sanitary Sewer Use, Extension and Connection Bylaw No. 1327 is similar in nature to the Town of Comox Bylaw No. 713, but has some additional instructions and requirements related to swimming pool discharges and grease interceptors and has differences in terms of prohibited discharges and associated limits. In addition to connection fees this bylaw also imposes sewer-use charges and associated policies.

4.3 EDUCATION AND AWARENESS

There are presently two fact pages on the CVRD website regarding liquid waste. An informational webpage titled “What Are You Putting Down Your Pipes” is targeted at educating residential users on damaging discharges, with an emphasis on obstructive waste (i.e. that may result in blockages or damage to infrastructure). Other topics such as proper disposal of pharmaceuticals as well as keeping toxic compounds out of storm sewers are also featured on this page.

The other educational page “Septic System Education” has both written information on septic systems as well as an hour-long online webinar discussing regulatory components, maintenance, and recommendations for controlling compounds that may negatively affect septic systems. A PDF fact sheet is also linked to this page.

5.0 CVRD USER CHARACTERISTICS

The CVSS currently collects sewage from the City of Courtney, Town of Comox, Canadian Forces Base (CFB) Comox, and K’ómoks First Nation Lands. The majority of sewage received at the CVWPCC comes from residential domestic sewage. Based on population, 35% of the CVRD in electoral areas A, B and C are not connected to the CVSS. The septage contribution from these areas to the CVWPCC is roughly 0.2% of the total CVSS flows according to the Apportionment of 2024 Sewer Municipal Levy (CVRD, 2024). Overall, industrial, institutional, and commercial (IIC) contributions to the CVWPCC are a small component, however, there is potential for elevated pollutant levels produced by specific operations.

Contaminants of concern identified in the LWMP Stage 1 and 2 include persistent organic pollutants, pharmaceuticals, nanomaterials and microplastics. The following commercial user categories should be assessed as potential contributors of non-domestic pollutant loads that may warrant source control measures:

- **Medical/Dental/Veterinary Offices:** Potential for pharmaceuticals, endocrine disrupting compounds.
- **Laundromats**: Potential for solvents and microplastics.

Based on typical industrial, institutional, and commercial facilities operating in municipalities, other user categories /operations and associated pollutants that should be considered for source control measures include but are not limited to:

- **Restaurants:** Potential for sewer clogging from fats, oil and grease.
- **Automotive shops:** Potential for flammable, explosive or toxic compounds (fuel, oil) as well as sewer clogging properties from grease.
- **Photographic imaging:** Potential for toxic volatile organic compounds in ink which could be released into the air at the CVWPCC.

— **Laboratories:** Potential for toxic compounds (PCBs) and compounds that are pervasive in the environment (halogenated compounds).

— **Fermentation operations (i.e. Breweries):** Potential for increased strain on the CVWPCC due to high organic loading.

— **Dental Offices:** Potential for metals which end up in biosolids and risk to compost quality under BC organic matter recycling regulation (OMRR).

— **Fish/shellfish processing or aquaculture facilities:** Potential for increased strain on the CVWPCC due to high organic loading. In the case of salmon could also be sources of Piscine orthoreovirus (PRV).

— **Sawmills:** Potential for toxic properties in wood preservatives which may upset the biological process at the CVWPCC.

When comparing the potential non-domestic discharges and associated pollutants listed above, with known characteristics of the wastewater within the CVRD two observations can be made:

1 The average organic loads at the CVWPCC are regularly tested as BOD5 (biochemical oxygen demand) and are in typical ranges for domestic sewage. This suggests that there are not consistent major contributions of high organic loads produced from IIC sources.
2 The biosolids from the CVWPCC currently produce a Class A Compost, SkyRocket product, after being composted with wood waste. Class A compost needs to meet low metal content per the BC Organic Material Recycling Regulation, and it is likely that metals are not a large issue in the biosolids.

A preliminary review and survey of IIC users within the CVSS was conducted using publicly available zoning maps and business directories for the CVRD and member municipalities. The review was conducted to identify operations with potential discharge of the pollutants discussed above. Figure 1 below shows the number of users identified for each of the associated IIC user categories described above based on business directory search.

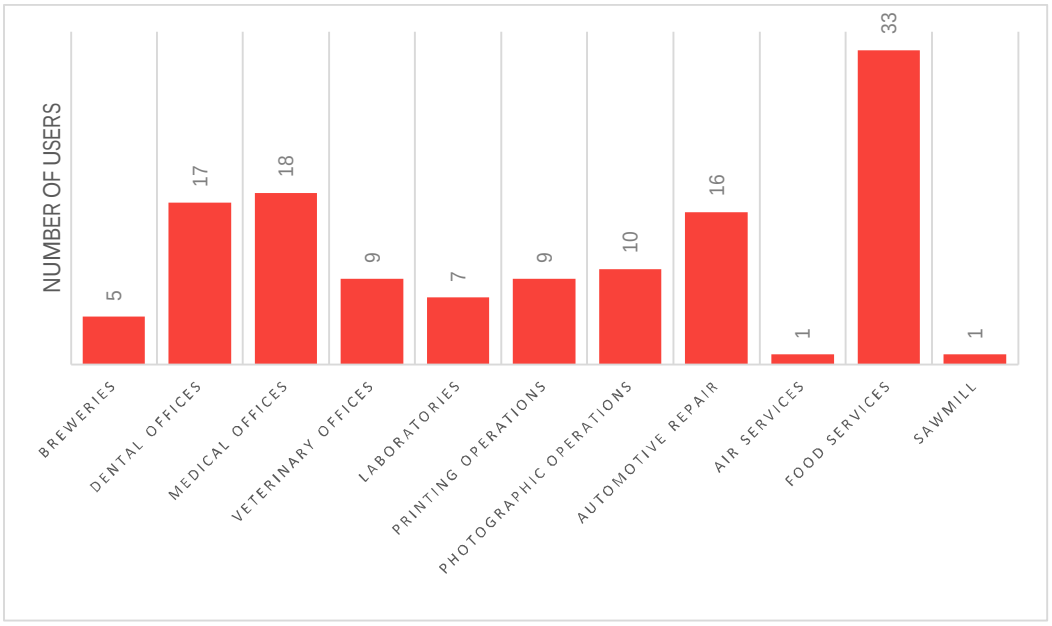

Figure 1: Estimated Number Businesses in IIC User Category with Potential for Polluted Discharges.

Industrial parcels were also counted from zoning maps to assess the number of industrial users that may be contributing non-domestic discharges to the CVSS. The number of industrial parcels was estimated to be 12 in the CVRD, 11 in Comox and 146 in Courtenay. The majority of these parcels are identified as “light industrial”, which have a variety of uses and may not produce non-domestic wastewater. These include properties such as storage facilities or warehouses. Some other examples of light industrial operations noted in this review are automotive repair, RV dealers, welding, building products stores, yoga/ personal training studios, breweries and distilleries, and carpentry operations. One Aquaculture parcel is shown to be within the CVSS however, it is unknown what is being discharged from this connection. Based on the preliminary review of users, it is possible that many of the current industrial parcels in the CVSS may not produce non-domestic wastewater, however, the CVRD would highly benefit from a more comprehensive user outreach and survey program to identify all potential non-domestic IIC discharges to the CVSS, evaluate compliance with existing Courtenay and Comox sewer use bylaws, and inform the development of a regional source control program.

6.0 CVRD SOURCE CONTROL PROGRAM OPTIONS

Implementation of a source control program within the CVSS will discourage/regulate the discharge of waste to the sanitary sewer system that may pose a risk to workers and the public, damage infrastructure, degrade the quality of receiving waters, hinder the efficiency of treatment facilities, or affect the quality of biosolids. In addition, an effective source control plan may contribute over time to reduced capital costs associated with future major upgrades the CVWPCC, sewage interception infrastructure and the collection systems owned and operated by member municipalities.

Implementation of a source control program will also demonstrate further action to address public and stakeholder feedback around enhanced protection of the environment and meet the Ministry’s expectation to include commitments to develop a source control program for the plan area in the Stage 3 LWMP. Also, because of the presence of IIC users connected to the CVSS potentially contributing non-domestic wastewater, regulation of these discharges through a source control bylaw that provides for pre-treatment is required under section 7 (3) of the MWR.

Source control programs are generally implemented through a combination of both regulatory and educational approaches. The regulatory approach is typically focused on non-domestic discharges and implemented through development of a sewer use bylaw. Educational approaches to source control for both domestic and non-domestic discharges can also be undertaken through education focused at raising awareness to reduce the use and disposal of problematic, hazardous, and toxic substances. The objective of the regulatory and educational programs should be to provide a consistent and comprehensive approach to source control in the CVSS. A combination of both regulatory and educational approaches will contribute to the overall effectiveness of a source control program and the prevention of unauthorized or problematic discharges. The following section outlines the measures to be considered by the CVRD in the development and implementation of a source control program.

6.1 BYLAWS

While the City of Courtney and Town of Comox both have adopted sanitary sewer bylaws that contain aspects related to source control focused on protective measures for the sewers and sewer workers within the member municipalities themselves, a large aim of source control is treatment

based. As such, these sewer-use bylaws should consider any operability or treatment concerns at the CVWPCC and provide for consistent application and enforcement to all system users, and in particular current and future non-domestic discharges.

A sewer-use bylaw serves as a regulatory tool that sets parameters around sewer use and penalties for misuse. The Canadian Council of Ministers of the Environment has prepared *Model Sewer Use Bylaw Guidance Document* (CCME, 2009*)* which can be used as a template tool for development /updating of source control bylaws. The following provides a summary of the main components to consider for inclusion within a sewer use bylaw.

— **Restricted and prohibited compounds:** Bylaws should specify prohibited and restricted compounds in sewer discharges and provides the basis for monitoring and enforcement.

— **Permits and Authorizations:** Bylaws should specify instances where discharges into the municipal sewer system requires a permit or authorization. Waste discharge permits are generally used for non-domestic discharges containing restricted wastes, high-volume, or high-load discharges and are typically applicable to IIC users. The bylaw requirements for permits also specify the conditions for these discharges including construction of pre-treatment works, monitoring, sampling and reporting. Bylaws should contain a standard form that requests user, processes and liquid waste information for each operation and outline the procedures to apply for a permit.

— **Monitoring:** Bylaws normally specify that an authorized person may at any reasonable time enter a property or premises to sample discharges to the sewer and more specific user sampling and monitoring requirements for discharge permits. Other requirements include installation of a monitoring point onsite for certain users, requirements for self-monitoring and reporting, and monitoring frequencies. For onsite testing, wastewater characteristics may vary widely throughout the day during specific activities. As such, it is recommended that bylaws allow for composite testing to be requested in which many individual samples are taken throughout a day to determine the average concentration of the discharge. Annual inspections and audits can also be implemented to monitor compliance. To assess performance of the source control program the CVWPCC can be tested for specific pollutants in the influent stream as well as biosolids. Another useful sampling point may be specific manholes in the collection / conveyance systems, especially within large commercial or industrial zoning areas.

— **Enforcement:** Fines and surcharges are two common means of enforcing the source control bylaw. Fines should be priced based on the cost burden of compliance. For example, if pre-treatment would be required, the fines for non-compliance should be larger to motivate the business or industry to install such work. Surcharges would be a result of the sampling or inspection program and should be priced based on the downstream cost to manage high loading or toxic pollutants.

— **Codes of Practice:** Codes of practice (COP) set forth standards and restrictions for specific commercial, institutional or industrial operations. COP typically contain detailed requirements regrading pre-treatment, waste segregation, waste collection and disposal, waste reduction techniques, inspection and servicing frequency, reporting and record keeping. Good examples of COP can be found in the Capital Regional District (CRD) Source Control Program, Bylaw No. 2922 Capital Regional District Sewer Use Bylaw, 2001. The CRD source control program has been established as one of the most comprehensive regional scale programs in

BC, and this is an advantageous model for adopting COP into a source control program that can be drawn on by the CVRD. Codes of Practice provide highly informative and structured means of targeting commercial and industrial discharges.

6.2 EDUCATION AND AWARENESS

The purpose of educational campaigns is to bring awareness to harmful substances, best practices, and sustainable alternatives regarding sewer use. Education can help promote compliance with the source control bylaw, by highlighting the importance of reducing pollution and the benefits it has for the community. The most effective means of education depend on the community. The most common methods are listed below.

- Municipality fact sheet web pages
- Printed brochures, which can be distributed to each residence.
- Community social media channels/online campaigns.
- In person events, such as public workshops.

As IIC users have issues specific to each industry, a workshop can be an effective means of discussing standard practices, reducing waste streams, recycling, and promote collaboration and resource sharing amongst local businesses.

To prioritize the selection of topics for educational campaigns, the following are suggested based on established issues in municipal wastewater, and priorities highlighted during the Stage 1 and 2 LWMP public consultation phase:

- **Microplastics:** As noted in LWMP 1 & 2, washing polyester (i.e. fleece) textiles produces 50-70% of microplastics at wastewater treatment facilities based on recent research. One simple solution that can be realized through an educational program is promoting the use of fine mesh washing bags which capture fibres released from clothing. Given the priority seen during public engagement for protection of the marine environment and shellfish industry, bringing awareness to this issue could result in a high level of user participation.
- **Persistent Organics Compounds:** In recent years Per- and Polyfluoroalkyl Substances (PFAS) have been a topic or heavy research and regulation by the US EPA. These contaminants of emerging concern are pervasive in the environment. An educational program around common products that are major sources, and that typically make their way into sewer systems could bring public awareness to this environmental issue. The educational program should focus around reducing the use of such products, identifying alternatives, and preventing discharges of products containing these substances into the sewer system.
- **Pharmaceuticals and personal care products:** It is recommended to increase awareness surrounding pharmaceuticals in wastewater, and locations where un-used or expired medication can be safely returned/disposed to prevent flushing of these into the sewer system. In addition, some compounds in personal care products can interfere with the normal function of hormone systems in animals (endocrine disrupting compounds). Further educational programs around personal care products with these compounds identified on the label (parabens, triclosan, benzophenones, bisphenols, and phthalates) focused on discouraging their use should be considered.

— **Non-flushables and hazardous household products:** These compounds can be damaging to sewer systems. Disposable wipes, cotton pads, and kitchen grease can clog the sewer. Any local hazardous household chemical recycling options should be promoted, such as paints. Simple ongoing educational programs around these products have been successful in other jurisdictions as part of effective source control programs.

6.3 COLLABORATION

Like most efforts, collaboration can significantly increase effectiveness. The CVRD can seek recommendations of areas of concern and effective source control efforts from other local governments that have executed successful source control programs. There are several local governments in the Vancouver Island region that have implemented comprehensive regional source control programs such as the Regional District of Nanaimo (RDN) and the Capital Regional District. Engagement and collaboration with the RDN and CRD can provide the CVRD with lessons learned, assist in selection of restricted/prohibited wastes, COPs and successful educational programs.

On a local scale, collaboration between the CVRD liquid and solid waste departments is necessary to ensure pollutants are not simply transferring from the liquid stream into solid waste. Collaboration with CVSS member municipalities to harmonize sewer and sewer-use bylaws, and with other distinct parts of the service area operated by other authorities will also be critical to successful implementation and ensure consistency of efforts across the region. Lastly, collaboration between businesses should be promoted to discuss methods of reducing or recycling waste streams, including recycling between different industries.

7.0 RECOMMENDED SOURCE CONTROL PROGRAM LWMP COMMITMENTS

The key benefits of implementing a source control program within the CVRD are protection of the local marine environment, protection of liquid waste management infrastructure and workers, protection of quality of biosolids, as well as promoting equity amongst the district's sewer users. The following commitments are recommended for consideration to be included in the Stage 3 LWMP.

1. Work with the Town of Comox and City of Courtenay to strengthen and harmonize their respective sanitary sewer bylaws based on community specific issues and priorities. With this, also develop a strategy and policy for consistent application and enforcement to all system users, and in particular current and future non-domestic discharges. Updated bylaws can be modelled based on the CCME Model Sewer Use Bylaw Guidance Document and other regional sewer use bylaws developped by the CRD and RDN.
2. Complete an outreach program and comprehensive survey of IIC sewer users to identify any IIC users in the CVSS discharging non-domestic liquid waste, and assess current level of compliance with existing Courtenay and Comox Sewer use bylaws. Use the survey to develop an inventory of IIC users and inform updates to municipal sewer use bylaws and educational programs for businesses/industry.
3. Hold a workshop for commercial and industrial businesses to engage and collaborate utilizing examples of business specific practices (COPs) for minimizing pollution. Use this opportunity gain feedback from IIC users to determine whether COPs should be included in updated sewer use bylaws.

4 Complete a sampling and analysis program of the influent and effluent at the CVWPCC based on monitoring parameters recommended by the *Directory of Sources of Contaminants Entering Municipal Systems* (CWWA, 2001). Consider sampling selected IIC wastewater and manholes near large industrial and commercial zones. The sampling program will further assist in the identification of problematic pollutants that should be considered in updates to municipal sewer use bylaws and support monitoring the effectiveness of the source control program.

5 Develop and execute educational campaigns focused at domestic users on one or more of the following topics:

- Microplastics: Awareness and alternatives and use reduction.
- Persistent organic compounds, PFAS: Awareness of sources, alternatives, and use reduction.
- Pharmaceuticals and personal care products: Proper disposal and products to avoid.
- Non-flushables and hazardous household products: Proper disposal options and preventing discharges to sewer system.

8.0 CLOSURE

We trust this provides you with the information required at this time. Please contact the undersigned should you have any questions or require additional information.

Prepared

Sarah Ries, M.ASc. EIT
Junior Designer
Water and Wastewater Treatment

Reviewed and Approved

Michael Desilets, P. Eng., PMP
Principal Engineer, Manager
Water and Wastewater Treatment

9.0 REFERENCES

BC Ministry of Environment and Climate Change Strategy, Environmental Management Act – Municipal Wastewater Regulation, 2016.

Canadian Water and Wastewater Association (CWWA), 2001. Directory of Sources of Contaminants Entering Municipal Sewer Systems, first edition, Ottawa, Ontario.

Capital Regional District (CRD), 2001. Source Control Program, Bylaw No. 2922 Capital Regional District Sewer Use Bylaw NO. 5.

Canadian Council of Ministers of the Environment (CCME), 2009. Model Sewer Use Bylaw Guidance Document. https://www.publications.gc.ca/site/eng/444860/publication.html

Comox Valley Regional District (CVRD), 2024. Apportionment of 2024 Sewer Municipal Levy. 20240202 Warren SR CVSS Municipal Levy Apportionment.pdf (comoxvalleyrd.ca)

Federation of Canadian Municipalities and National Research Council, 2003. Wastewater Source Control - A Best Practice by the National Guide to Sustainable Municipal Infrastructure

WSP, 2019. Technical Memorandum - CVRD LWMP - An Overview of Emerging Contaminants in Wastewater.

WSP, 2019A. Technical Memorandum - CVRD LWMP – An Overview of Microplastics in Wastewater

WSP, 2019B. Technical Memorandum - CVRD LWMP – An Overview of Viruses in Wastewater

WSP, 2022. LWMP Stage 1 and 2.