

# Stage 3 Liquid Waste Management Plan (LWMP)

## TACPAC Meeting #14 *November 18, 2025*

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

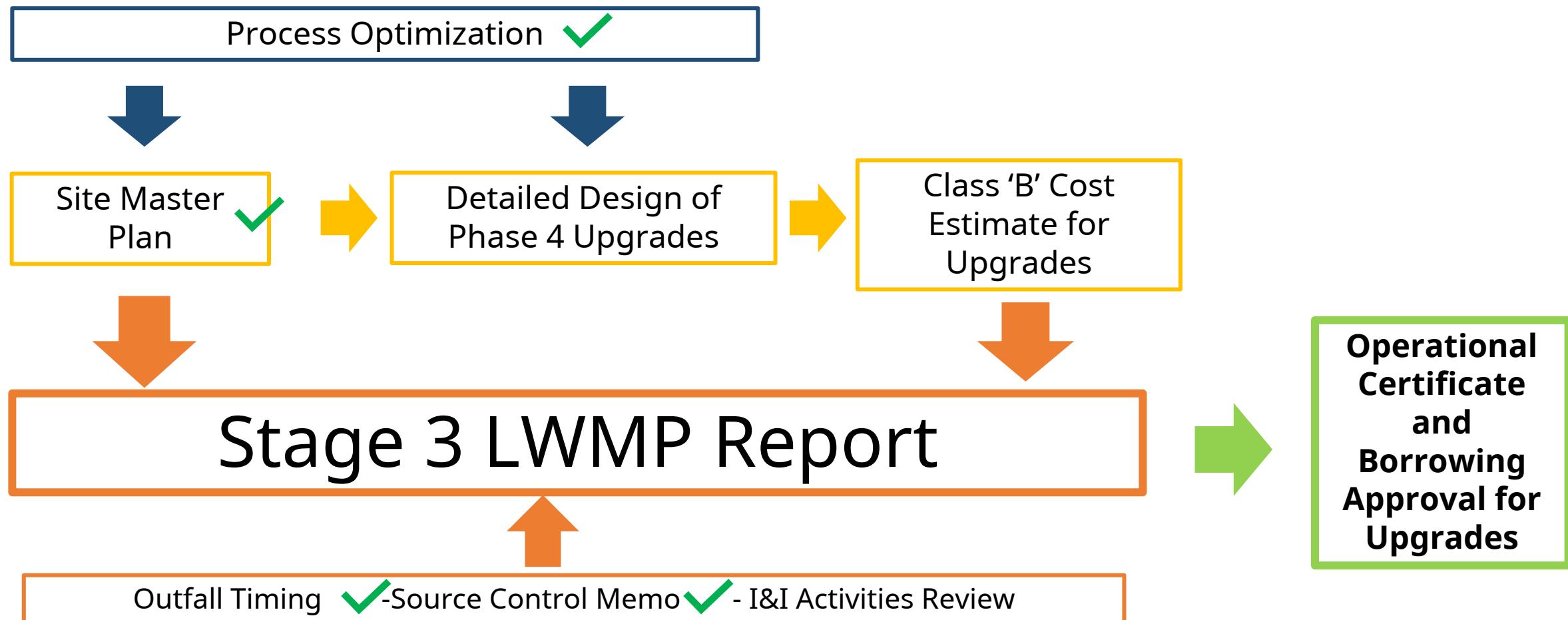


The Comox Valley Regional District respectfully acknowledges the land on which we gather is on the unceded traditional territory of the K'ómoks First Nation, the traditional keepers of this land.

# Agenda

1. Review of Meeting Minutes
2. Overview of Site Master Plan and Cost Estimate
3. Overview and Discussion on Inflow and Infiltration
4. Next Steps and TACPAC Engagement

# Path to Stage 3 LWMP Report Submittal



# Ministry Requirements for Stage 3 Report

- Outfall planning component
- Source control planning

Work presented previously

- Site master plan (full draft)
- Resource recovery recommendations
- Inflow and infiltration planning- update

Work to be discussed today

- Environmental impact study
- I&I commitments
- Phase 4 Upgrade updated cost estimate
- Cost impacts to users

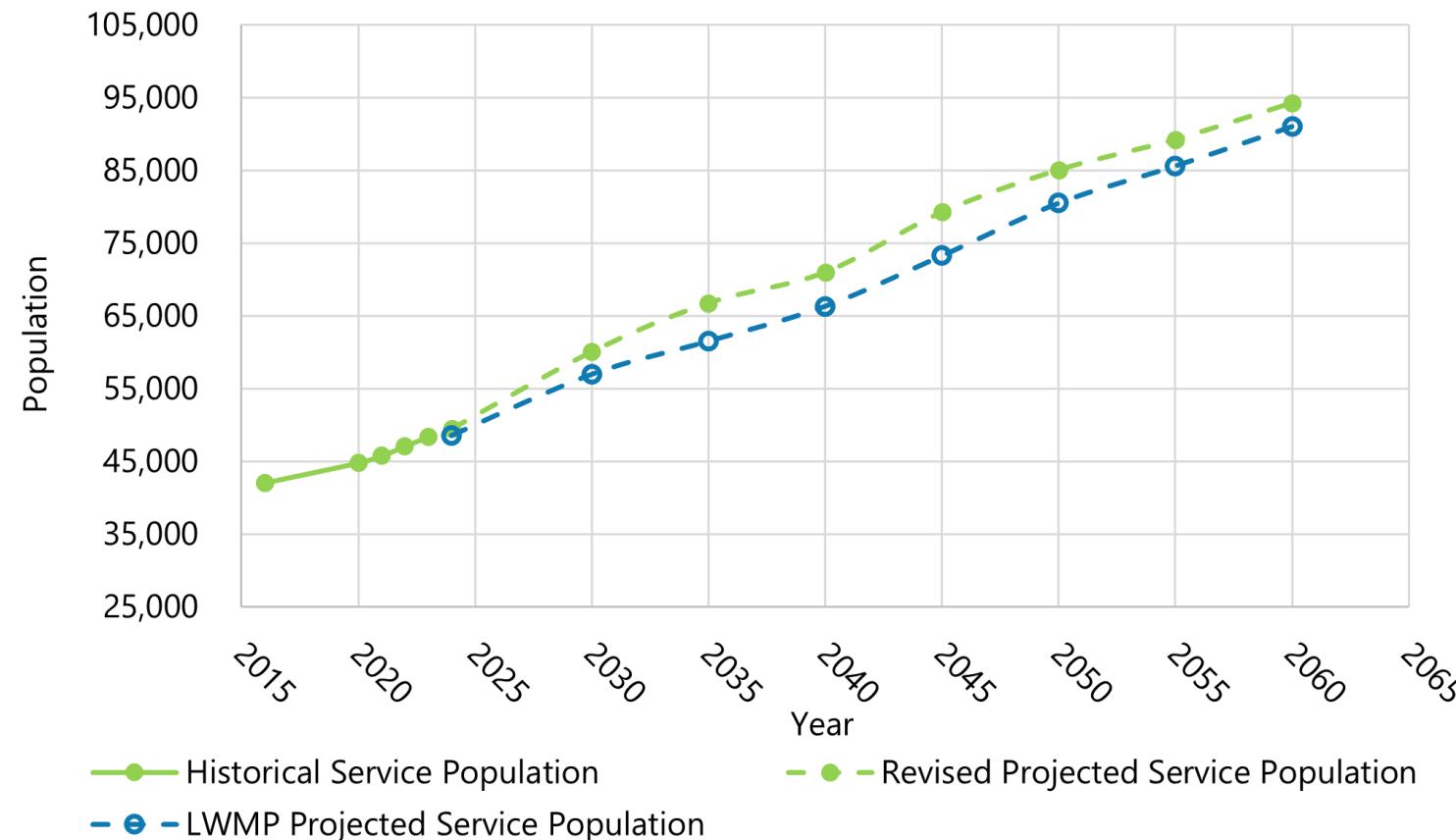
Work to be presented and discussed as part of draft Stage 3 report

# Overview of Site Master Plan and Cost Estimate for Upgrades

# Site Master Plan Objectives

- Revise service population projections and design criteria
- Develop cost-effective, resilient infrastructure strategies and maximize reuse of existing infrastructure
- Identify capacity bottlenecks and end-of-life equipment
- Consider the cost and benefits of resource recovery options
- Establish timing of upgrades based on goals recommended in LWMP & MWR redundancy requirements
- Estimate cost and scope of upgrade phasing

# Revised Service Population Projections



**2060 Service Population of 94,300 ppl**

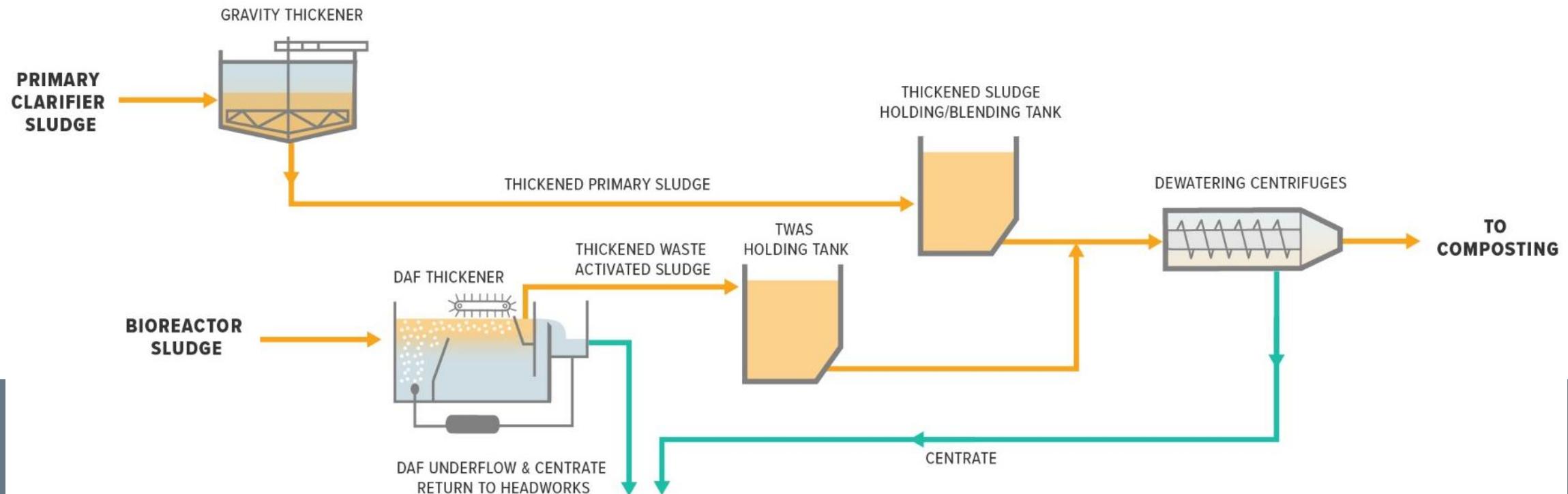
- Organic growth within existing sewer area
- Infill densification motivated by new provincial regs. (Bill 44)
- South sewer extension (Royston, Union Bay, KFN)

# Liquid Stream Future Upgrade Pathway

- Includes a high-rate wet weather treatment process and CEPT
  - » Deferring need for additional Primary Clarifiers until later upgrades
- During wet weather, peak flows greater than 2xADWF are bypassed to filter for treatment and blended with secondary effluent
  - » Reducing upgrade requirements for secondary treatment while still meeting regulatory objectives
  - » Improving effluent quality under dry weather flow conditions
- Addition of UV Disinfection for all flows

# Solids Management

- Sludge production is continuous and management is important
- As part of facility plan, level of redundancy was assessed to address risk
- Regulations do not specifically address redundancy
- Substantial upgrade needed in 2045



# Resource Recovery Options

- Cost-benefit analysis requested by Province as part of Stage 1 and 2 review
- Reviewed 3 options:
  - Heat recovery
  - Reclaimed water
  - Anaerobic digestion
- Heat recovery and anaerobic digestion not being incorporated as part of current upgrades due to:
  - High capital costs associated with options
  - Payback period is greater than expected lifespan of equipment

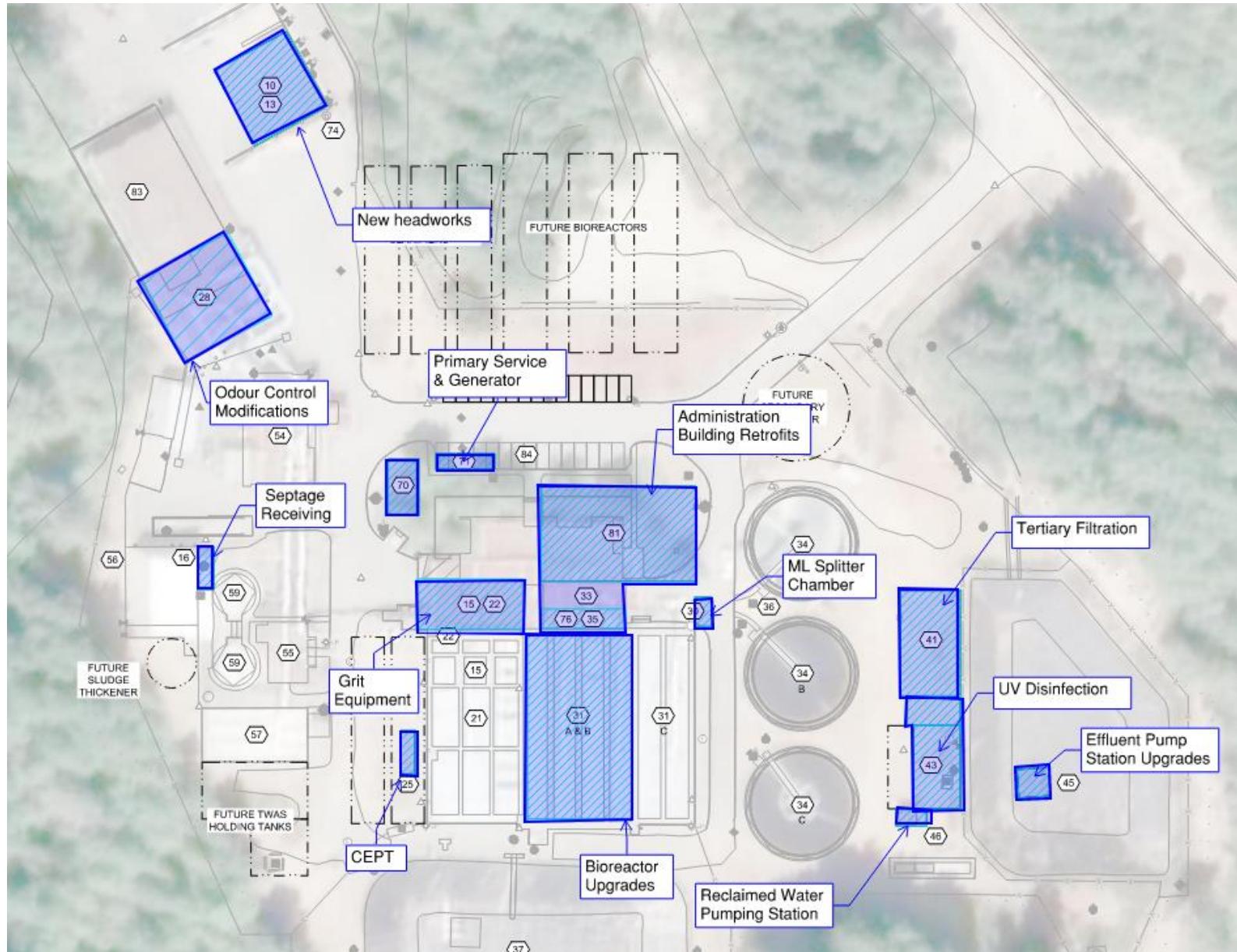


# Resource Recovery Recommendations

- Reclaimed water be incorporated into phase 4 upgrades for low exposure potential areas to offset potable water use
- The CVWPCC should continue the use of composting, as other biosolids management options (anaerobic digestion, thermal drying) have significant capital costs for a facility of this size
- As composting facility approaches capacity or when upgrades to sludge process required in year 2045, reassess anaerobic digestion as a staged upgrade
- Should regulations become more stringent or the market for SkyRocket decreases, the CVWPCC could also consider thermal drying as an outlet

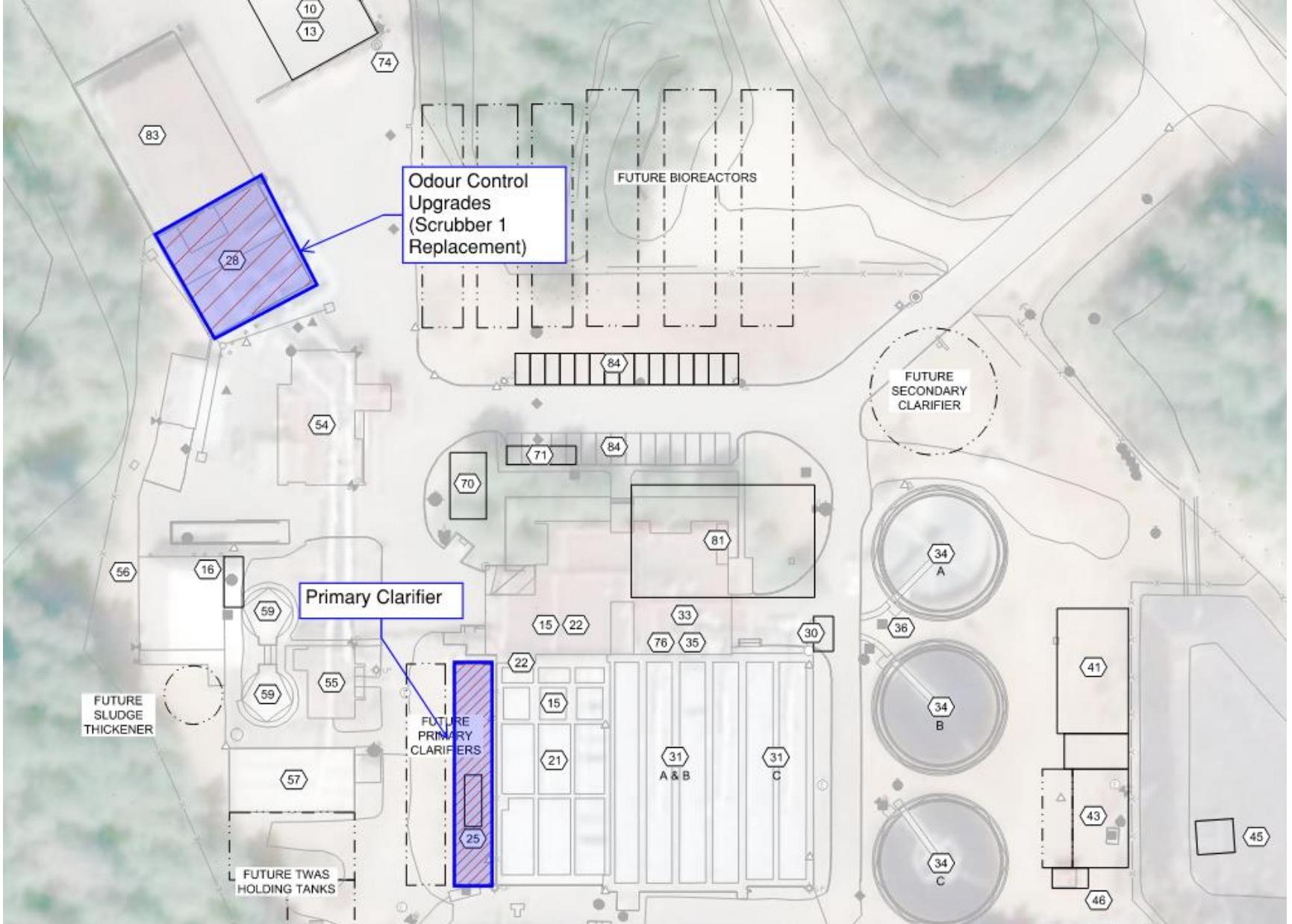
# Phase 4 Upgrade Scope 2030

- New headworks
- Admin building retrofit
- New electrical service
- CEPT
- Bioreactor updates
- MLSS splitter chamber
- Tertiary filtration
- UV disinfection
- Reclaimed water
- Effluent pump upgrade
- Odour control modifications
- Condition assessment equipment replacements



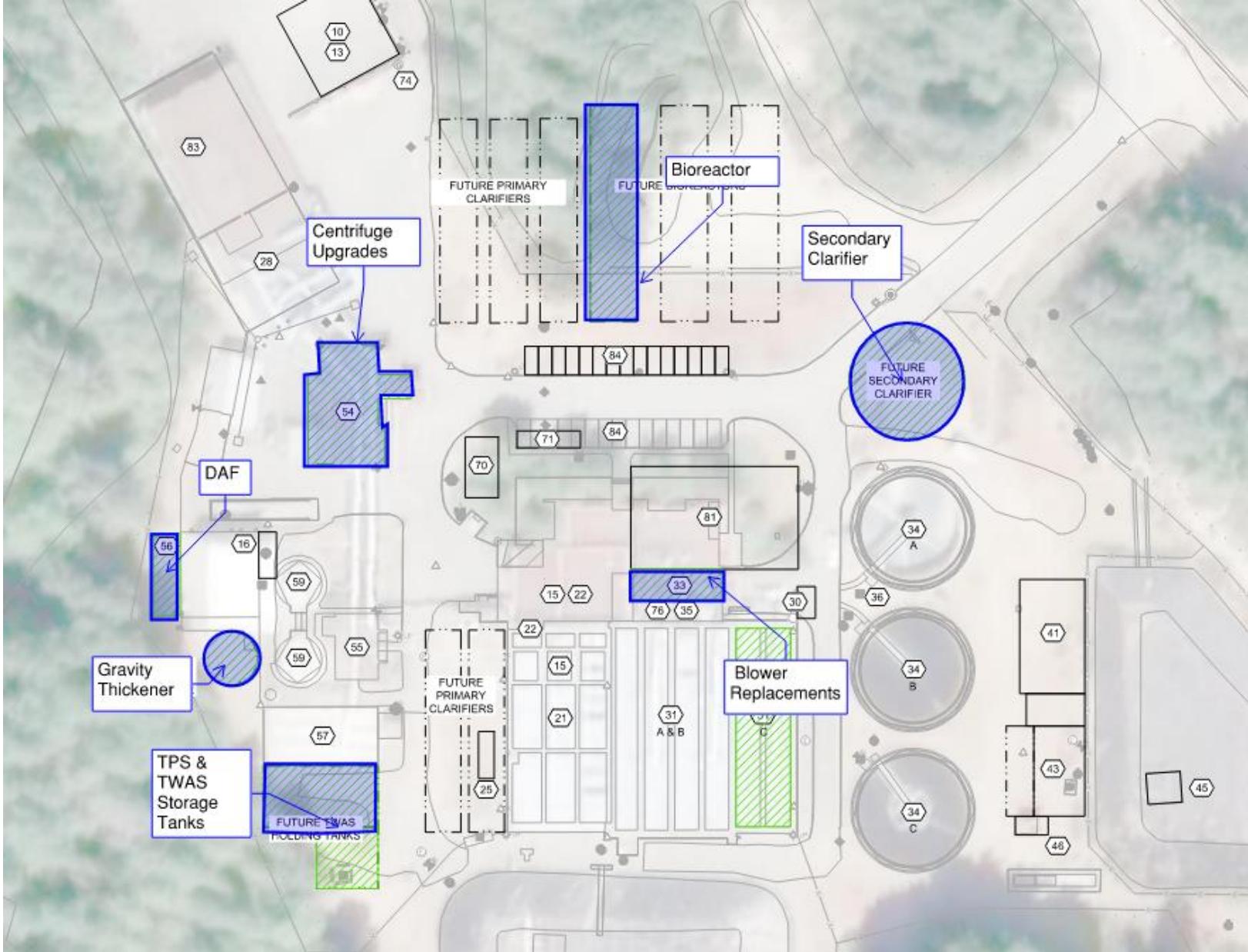
# Phase 5 Upgrade Scope 2040

- New primary clarifier
- Odour control upgrades
- MCC replacements
- *Potential tertiary filtration expansion*



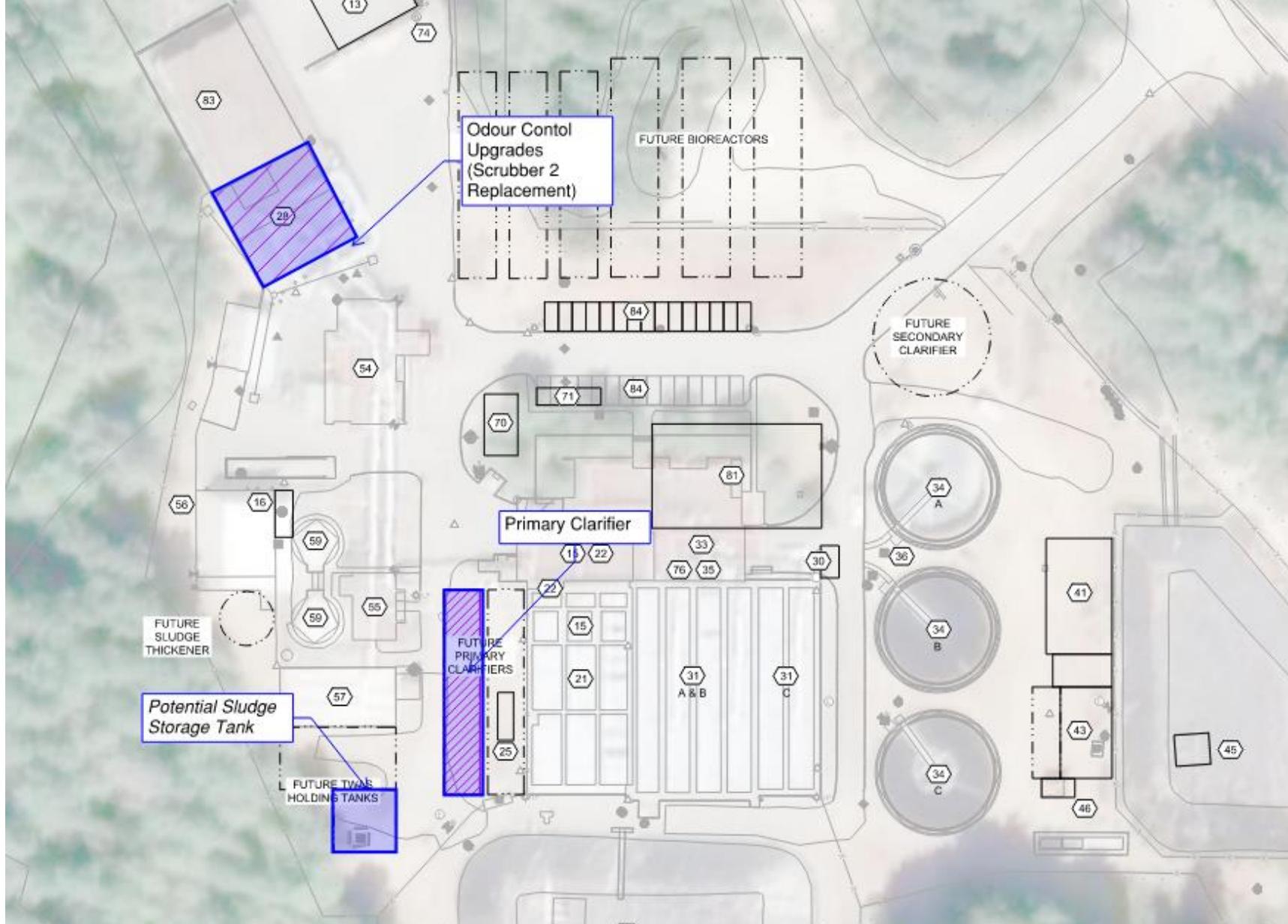
# Phase 6 Upgrade Scope 2045

- New bioreactor
- New secondary clarifier
- Blower replacements
- New gravity thickener
- Third DAF
- Sludge storage
- Increased dewatering centrifuge capacity
- MCC replacements



# Phase 7 Upgrade Scope 2060

- New primary clarifier
- Odour control upgrades
- *Potential additional sludge storage tank*



# Updated Cost Estimate

| Upgrade Phase  | Capital Costs<br>(2025 Dollars) | Escalated Capital Costs to Mid-Point of Construction |
|----------------|---------------------------------|--|
| Phase 4 (2030) | \$100.3M                        | \$113.4M   |
| Phase 5 (2040) | \$21.9M                         | \$31.7M  |
| Phase 6 (2045) | \$56.5M                         | \$92.5M  |
| Phase 7 (2060) | \$22.4M                         | \$53.1M  |

Cost estimate presented is preliminary, used to develop long-term capital plans and provide details on the approximate magnitude of costs for the proposed project as part of planning process

# Cost Estimate and Impacts to Users

- CVRD recognizes the significant financial burden of these projects on the community
  - Majority of the Phase 4 upgrades will be funded by borrowing
  - Impacts split between existing users & developers
- Continuing to look for ways to reduce or limit project costs through design and construction
  - \$7M grant application submitted this fall
  - Value engineering workshop this winter
  - Project will be highly eligible for new grants
- Average impacts to users will be presented as part of Stage 3 LWMP draft report

# TACPAC Action

*Make a recommendation to the Comox Valley Sewage Commission to proceed with the Site Master Plan as proposed*

# Overview and Discussion of Inflow and Infiltration

# CVSS Stage 3 LWMP Update

Michael Desilets, P. Eng., PMP

Principal Engineer

Water and Wastewater Treatment and Facilities

WSP Canada Inc.

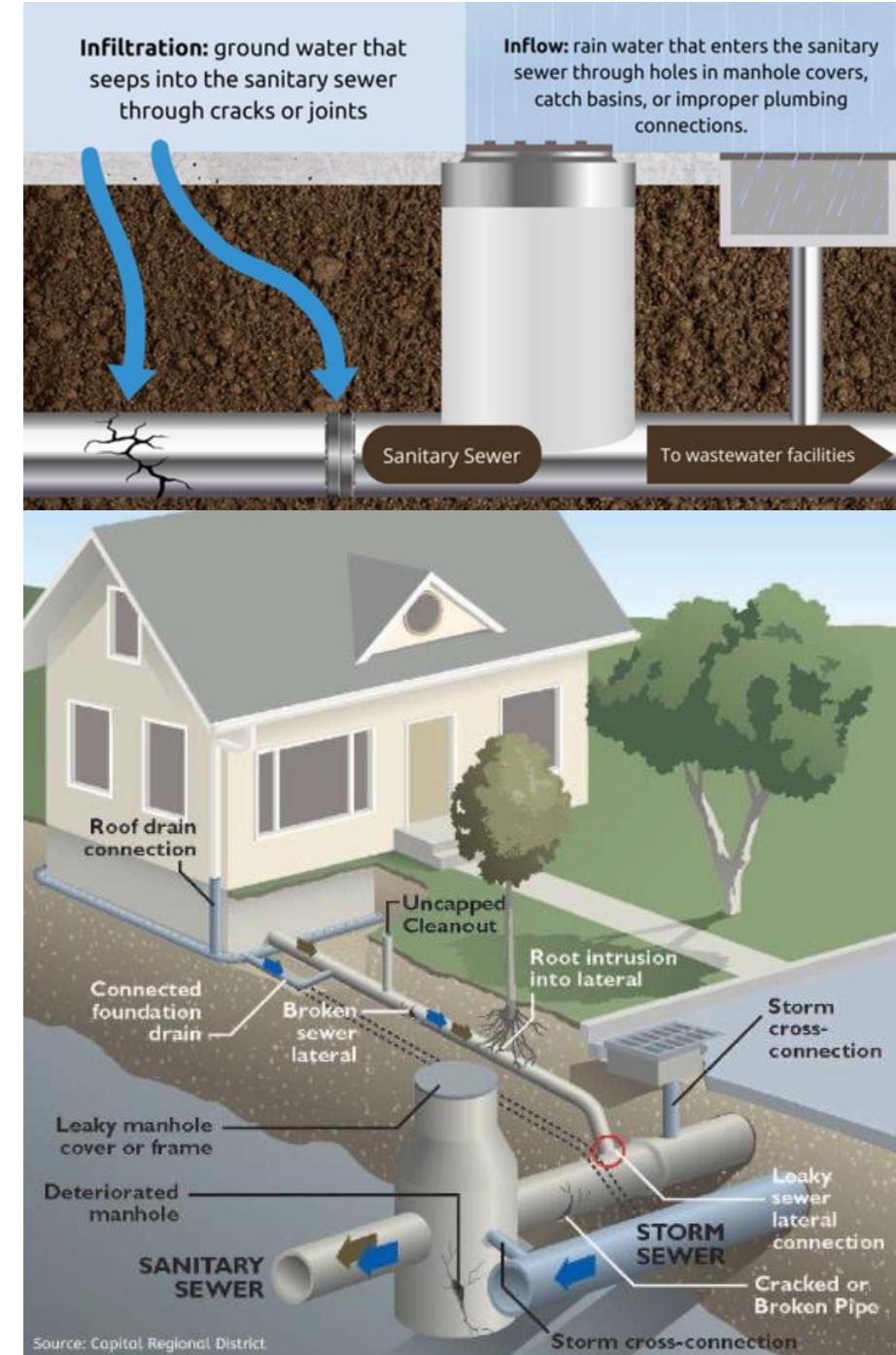


# Inflow and Infiltration Reduction



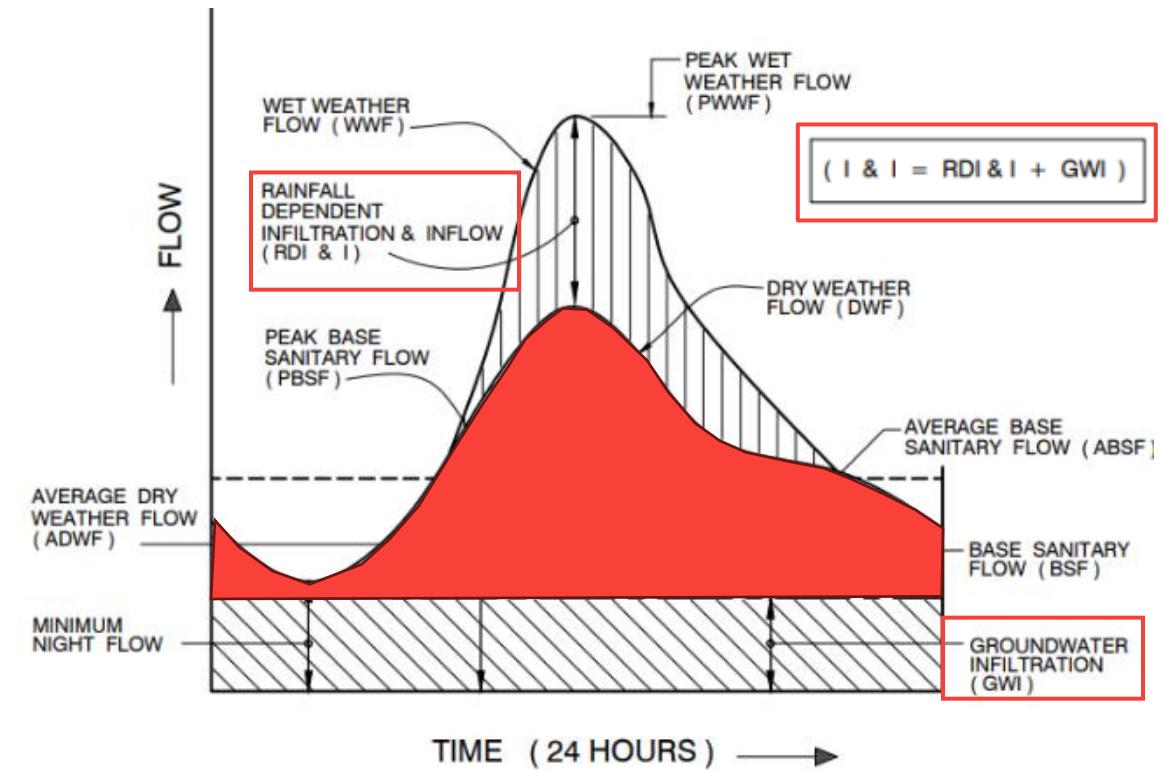
## Inflow and Infiltration (I&I) Overview

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



## Objectives of I&I Reduction

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



# Drivers for I&I Reduction



## Address Ministry Comments Stage 1&2 LWMP

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

## Meet Ministry LWMP Guidelines

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

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



## Meet BC MWR Regulatory Requirement

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



## Meet Public Feedback and Stage 1&2 Commitment

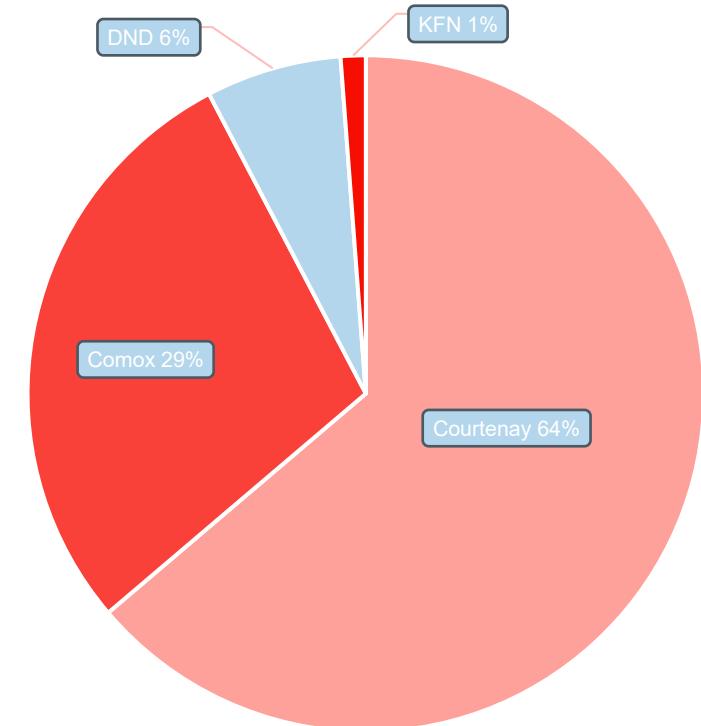
Stage 1&2 LWMP Level of Treatment Commitment

# CVSS I&I Review



| MUNICIPALITY | I&I      |              | CATCHMENT AREA<br>(ha) | COMMENTS                |
|--------------|----------|--------------|------------------------|-------------------------|
|              | (l/s/ha) | (% of Total) |                        |                         |
| Comox        | 0.356    | 80%          | 472                    | Not correlated to storm |
|              | 0.7      | 15%          | 88.5                   | Not Correlated to storm |
| Courtenay    | 0.21     | 48%          | 713.6                  | 5-year 24-hour I&I      |
|              | 0.24     | 52%          | 788.6                  | 5-year 24-hour I&I      |

Acceptable I&I 0.13-0.14 l/s/ha



# CVSS I&I Review

## Pump Stations

|   | 2021      | 2022      | 2023      |
|---|-----------|-----------|-----------|
| <b>Courtenay Pump Station</b>             |           |           |           |
| ADWF (m <sup>3</sup> /day)                | 7,456     | 7,641     | 7,536     |
| MDF (m <sup>3</sup> /day)                 | 21,137    | 20,955    | 18,246    |
| Days MDF:ADWF>2                           | 17        | 10        | 7         |
| Annual Flow >2ADWF (m <sup>3</sup> /year) | 32,910    | 28,109    | 8,462     |
| <b>Jane Place Pump Station</b>            |           |           |           |
| ADWF (m <sup>3</sup> /day)                | 3,121     | 2,863     | 3,014     |
| MDF(m <sup>3</sup> /day)                  | 10,381    | 10,388    | 9,626     |
| Days MDF:ADWF>2                           | 29        | 19        | 19        |
| Annual Flow >2ADWF (m <sup>3</sup> /year) | 41,664    | 38,225    | 20,156    |
| <b>Total Courtenay + Jane Place</b>       |           |           |           |
| Total Annual Flow (m <sup>3</sup> /year)  | 4,973,835 | 4,729,993 | 4,712,974 |
| Courtenay % of Total Flow >2ADWF          | 0.7%      | 0.6%      | 0.2%      |
| Jane Place % of Total Flow >2ADWF         | 0.8%      | 0.8%      | 0.4%      |

## CVWPCC

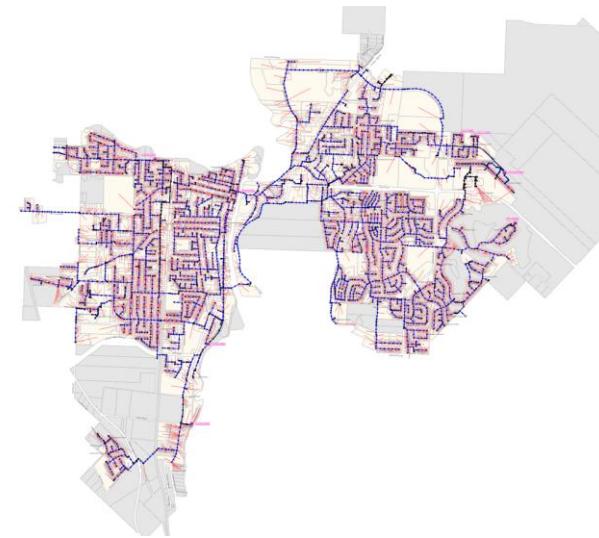
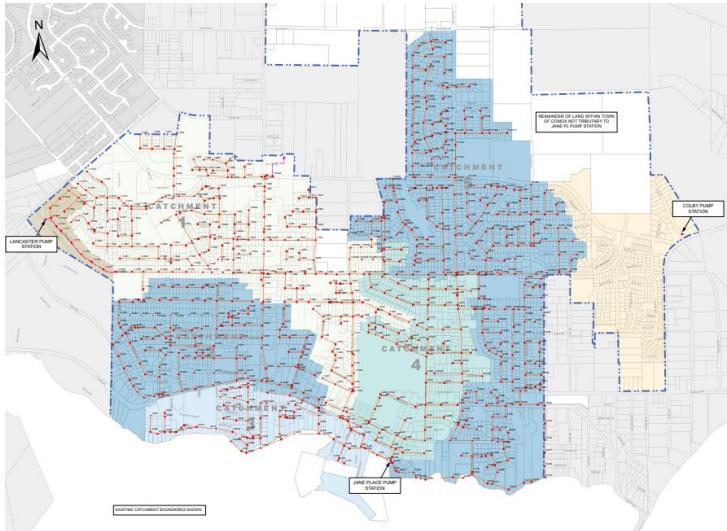
| YEAR <sup>1</sup> | ADWF<br>(M <sup>3</sup> /DAY) | MDF<br>(M <sup>3</sup> /DAY) | RATIO<br>MDF:ADWF | ADAYS<br>WITH 24-HR PRECIP.>2<br>MDF:ADWF | DAYS<br>5-YEAR RAINFALL <sup>2</sup> |
|-------------------|-------------------------------|------------------------------|-------------------|---|--------------------------------------|
| 2013              | 12,113                        | 21,225                       | 1.8               | 0   | N/A                                  |
| 2014              | 11,900                        | 38,462                       | 3.2               | 8   | 0                                    |
| 2015              | 11,503                        | 37,253                       | 3.2               | 11  | 0                                    |
| 2016              | 11,506                        | 39,998                       | 3.5               | 33  | 0                                    |
| 2017              | 11,709                        | 34,965                       | 3.0               | 11  | 0                                    |
| 2018              | 11,877                        | 41,168                       | 3.5               | 22  | 0                                    |
| 2019              | 11,264                        | 34,726                       | 3.1               | 4   | 0                                    |
| 2020              | 11,656                        | 34,851                       | 3                 | 18  | 0                                    |
| 2021              | 11,893                        | 36,792                       | 3.1               | 20  | 0                                    |
| 2022              | 11,788                        | 36,535                       | 3.1               | 14  | 0                                    |
| 2023              | 11,810                        | 32,424                       | 2.7               | 12  | 0                                    |

## Outcomes and Benefits

### Key Commitment: Initiate Staged I&I Reduction Program

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

## Stage 3 LWMP Work on I&I Reduction



Review Flows  
and I&I rates

Review I&I  
Reduction  
Efforts

Master Plan  
Development  
and  
Finalization

Develop  
LWMP  
Recomm.

Collaboration  
and  
Consultation

Finalize LWMP  
Commitments

## **Questions on I&I Reduction Planning Component?**



# Thank you

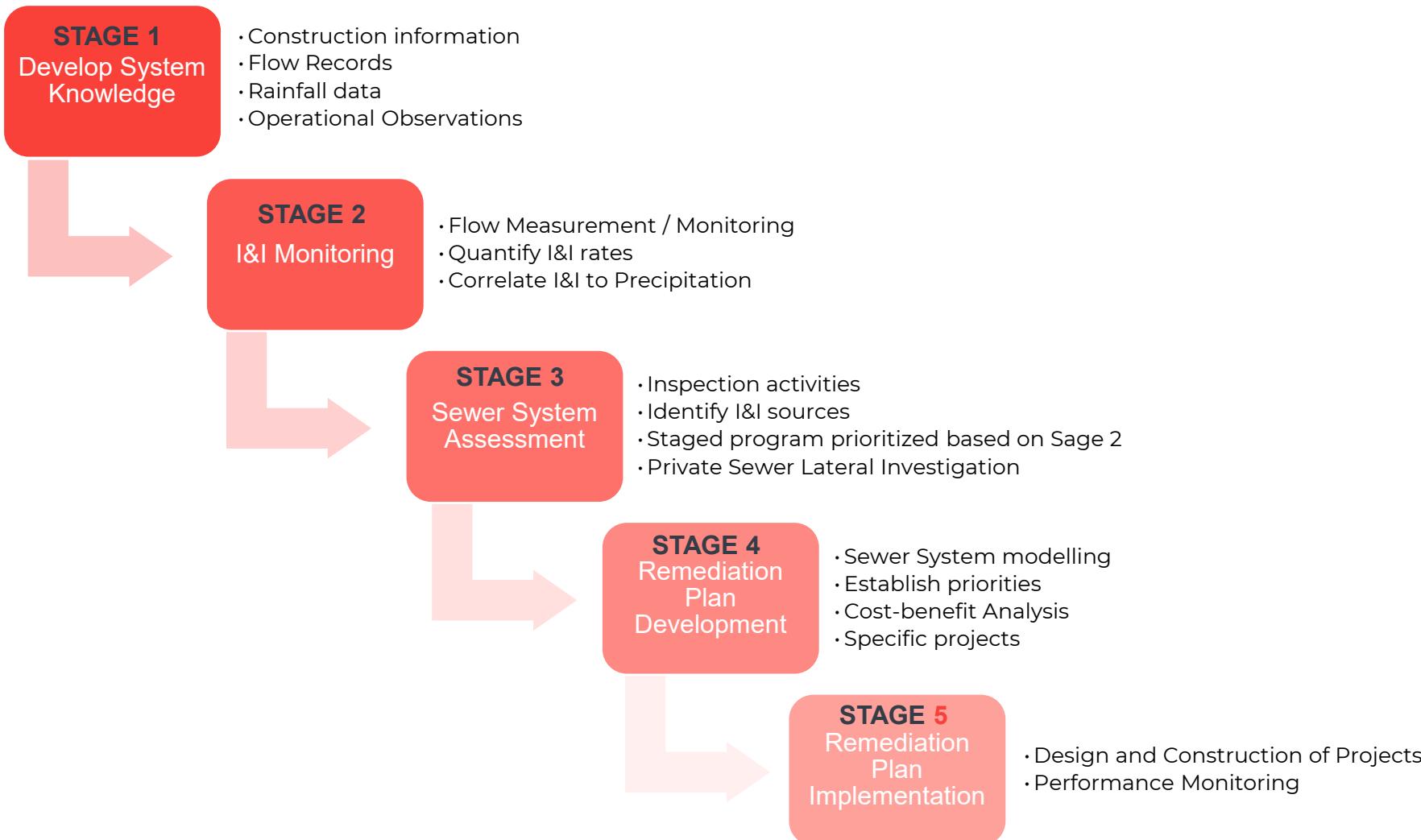


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## LWMP I&I Commitments

1. CVWPCC Phase 4 Upgrade to incorporate the Wet Weather Flow Management Option to achieve the level of treatment selected by the Stage 1&2 LWMP Planning process.
2. Reduce I&I with a goal of limiting the maximum daily flows to less than 2 times ADWF by the year 2045
3. Develop and initiate staged I&I reduction programs
  1. develop a standardized annual reporting template
  2. conduct additional flow monitoring at the sub-catchment level
  3. conduct additional flow monitoring at jurisdictional boundaries.
  4. develop year-by-year inspection plans for full inspection by the year 2030.
  5. conduct cost-benefit analyses of I&I reductions options
  6. develop system remediation plans by the year 2033.
4. Investigate options for private sewer lateral inspection and rehabilitation programs.
5. Review/update bylaws and engineering and development standards to ensure new systems are designed and installed to prevent future I&I problems.

# Components of Staged I&I Reduction Program



# Next Steps & Engagement with TACPAC

# Stage 3 LWMP Timing

- **Now until Spring 2026:**
  - Drafting Stage 3 LWMP Report
  - Engagement with K'ómoks Chief and Council & other First Nations
- **Spring 2026:** Stage 3 report review and engagement
- **Summer 2026:** Stage 3 LWMP report approval & submittal for Ministry Review
- **2027:** Plan approval and begin Phase 4 Upgrades

# Planned TACPAC Meetings

