

Comox Valley Water Pollution Control Centre Capacity Assessment

November 2016





Project Objectives

- Capacity assessment of the existing components of the CVWPCC
- Consisted of
 - Identifying components and timelines for replacement or upgrade
 - Providing replacement and/or expansion options for components, where applicable





Capacity Assessment Methodology

Review of Existing Facility

- •Site Visit
- •Discussions with CVRD staff and Operations' team

Historical Data Review

- Influent and Effluent Data for 2011 – 2015
- •BOD₅, CBOD₅, TSS, Nitrogen Species, Temperature

Population Projections

- City of Courtenay,
 Town of Comox, CFB
 Comox, Annexed areas
- •2011 used as base year
- •2016-2036 (20 years)

Establishment of Effluent Limits

- •Review of CCME, DFO, and BC MOE limits
- Assessment of the previous EISs

Development of Design Basis

- •Flows and loading projections
- Projections include hauled wastewater

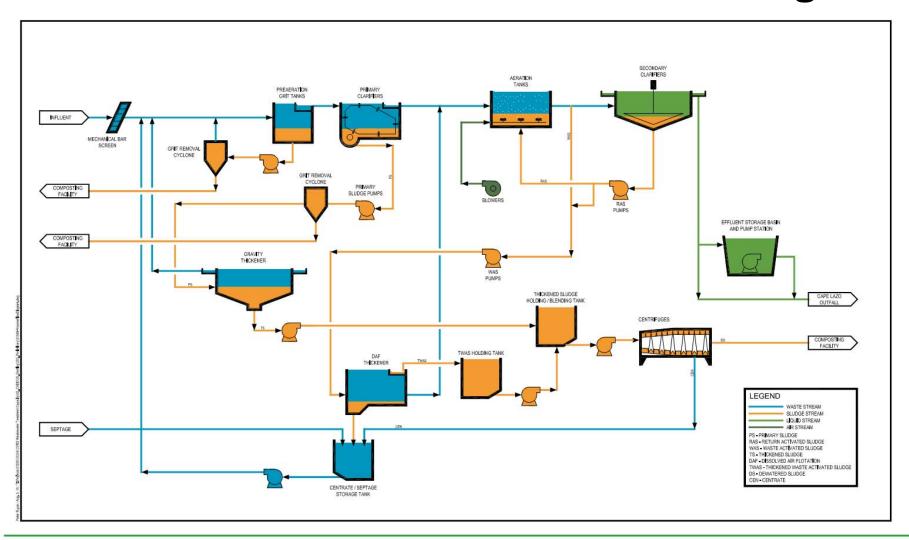
Capacity Assessment

- Projected flows and loadings used for evaluation
- Existing hydraulics used as existing capacity
- Redundancy requirements as per the MWR also included in assessment





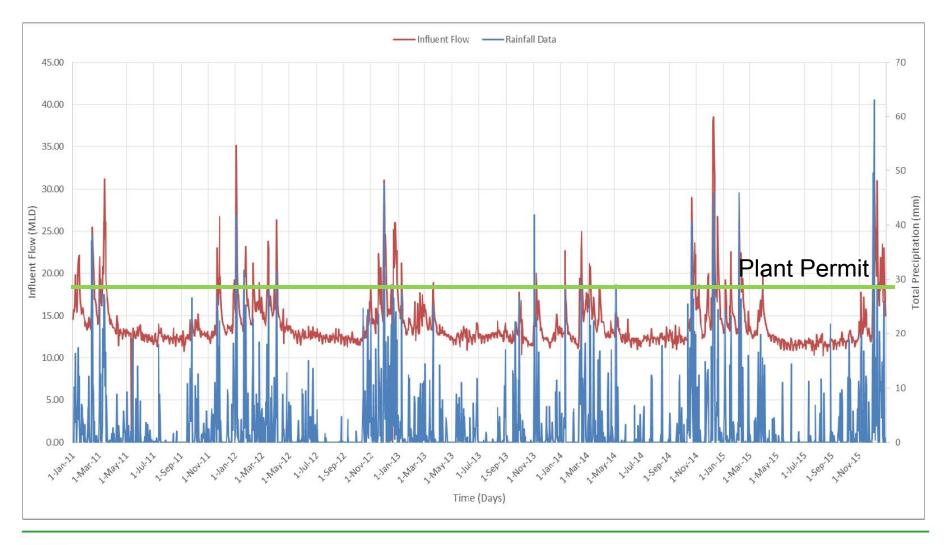
Process Flow Diagram







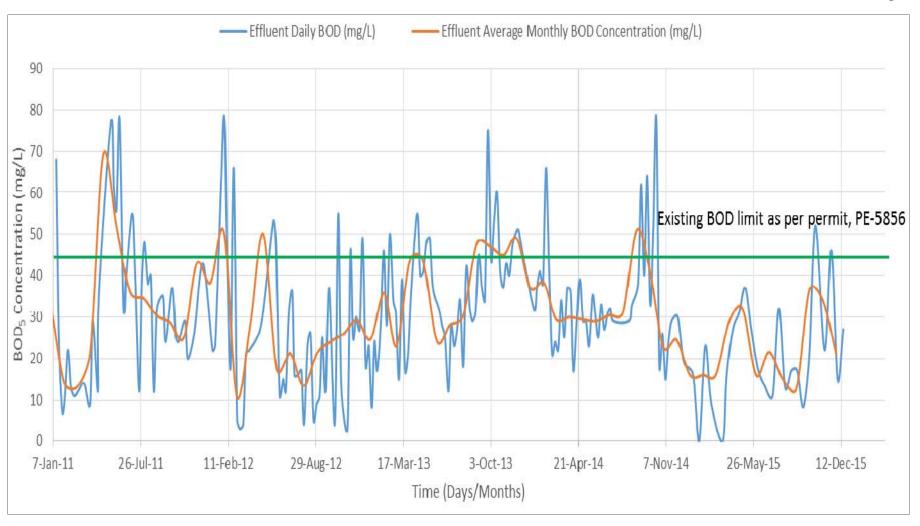
Historical Flows Review







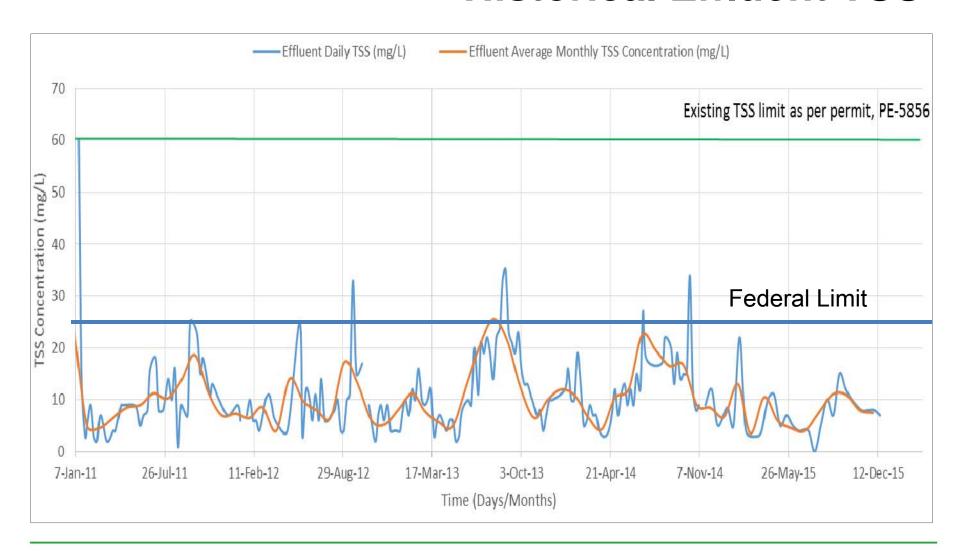
Historical Effluent BOD₅







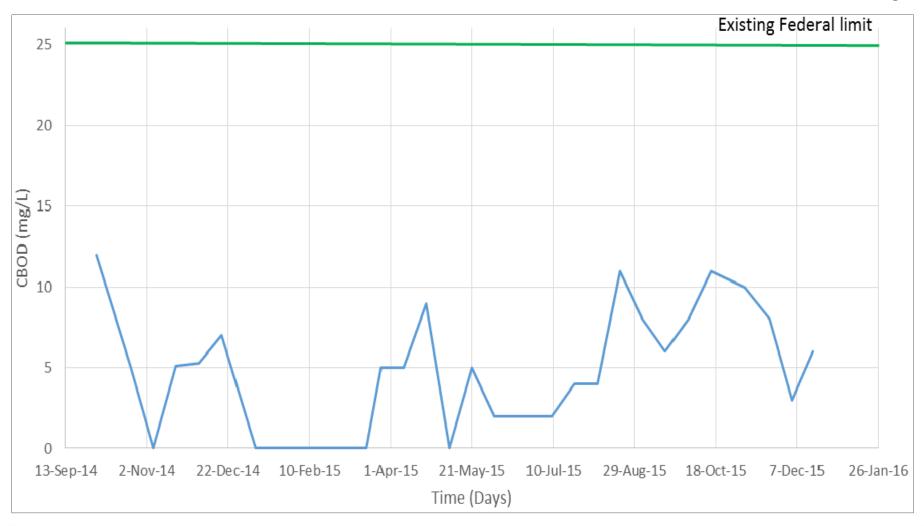
Historical Effluent TSS







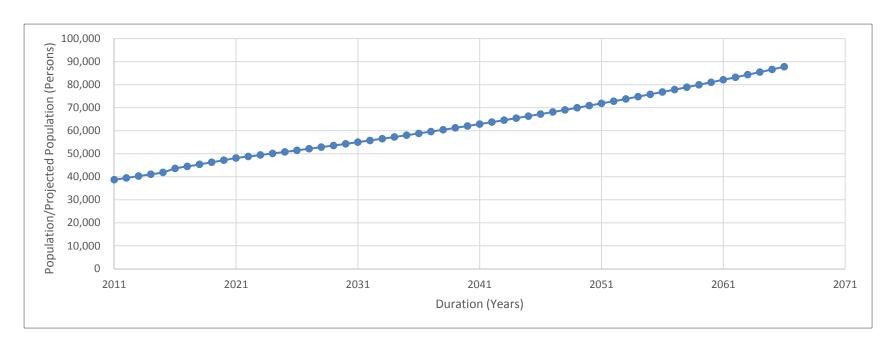
Historical Effluent CBOD₅







Populations Projections



City of Courtenay Town of Comox CFB Comox Annual Population Growth (1.34%)





Target Effluent Limits

Parameters	NPS	Permit	BC Current	Target
Carbonaceous Biochemical Oxygen Demand (mg/L)	≤ 25		≤ 45/130	≤ 25
Biochemical Oxygen Demand (mg/L)		≤ 45		
Total Suspended Solids (mg/L)	≤ 25	≤ 60	≤ 45/130	≤ 25
рН	6-9		6-9	6-9
Un-ionized Ammonia at 15°C (mg/L)	≤ 1.25			≤ 1.25
Toxicity	Non-lethal			Non-lethal
Fecal Coliform (MPN/100 mL)			<14/100 mL for shellfish protection and <200/100mL for recreational use, both measured at the edge of dilution zone	<200/100 mL measured at end of pipe





Summary of Capacity Assessment

Unit Process	Population	Sufficient Up to	
Screens	66,786	~2045	
Grit Removal	16,897	Insufficient Capacity	
Primary Clarifiers	57,189	~2033	
Aeration Tanks	46,241	~2019	
Secondary Clarifiers	57,143	~2033	
UV system	New Installation Recommended		
Gravity thickeners	76,169	~2055	
DAF Units	133,058	>2066	
Centrifuge Units	81,280	~2060	
Effluent Pumps	41,882	At Capacity	



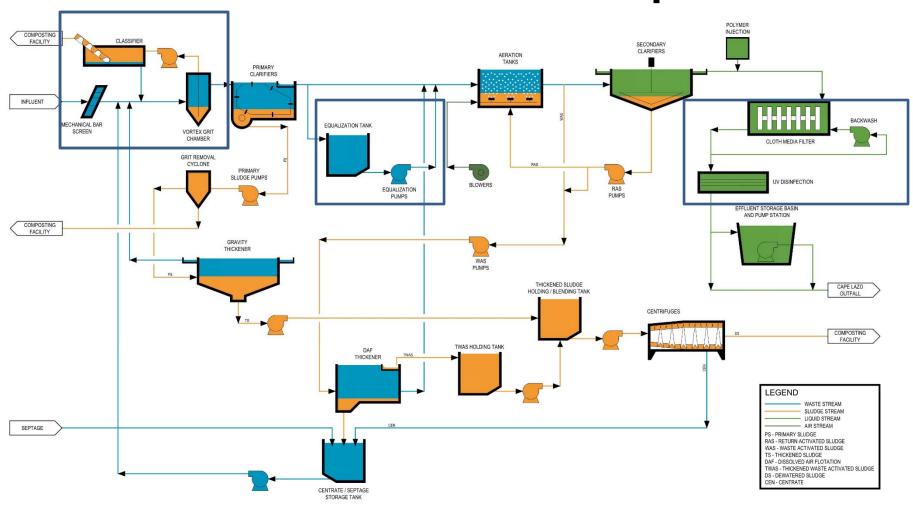


- Eight options investigated.
- Three Options were carried forward for further investigation.
- Option 3 was recommended





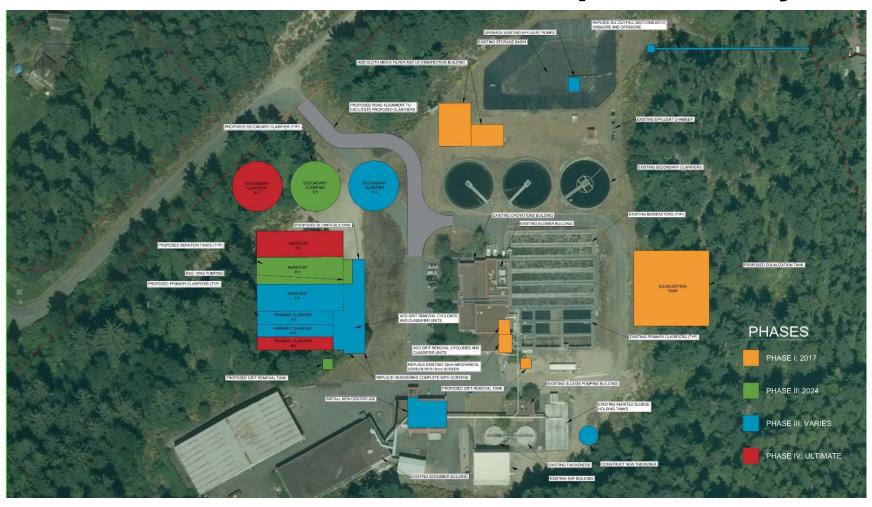
Option 3 PFD







Option 3 Layout







Capital Cost

Description	Option 3	
Phase 1 - 2017 Construction	\$15,489,000	
Phase 2 - 2024 Construction	\$6,610,000	
Phase 3 - (2031 - 2066 construction)	\$46,983,000	
Total Capital Costs (includes 40% engineering and contingencies)	\$69,082,000	





Option 3 Merits

- Less chemicals use compared with other Options
- Delay construction of aeration tank and clarifier to 2024
- Better effluent quality less than 10 mg/L more suitable for effluent reuse
- More sustainable solution (less chemical use and better effluent quality)
- Minimize hydraulic load to the biological treatment
- Delay replacement of the existing effluent pumps to 2043
- Prevent the need to pressurize the existing outfall and to extend the use of the existing effluent pump system.





Questions/Comments

