



Comox Valley Water Pollution Control Centre

Capacity Assessment

November 2016

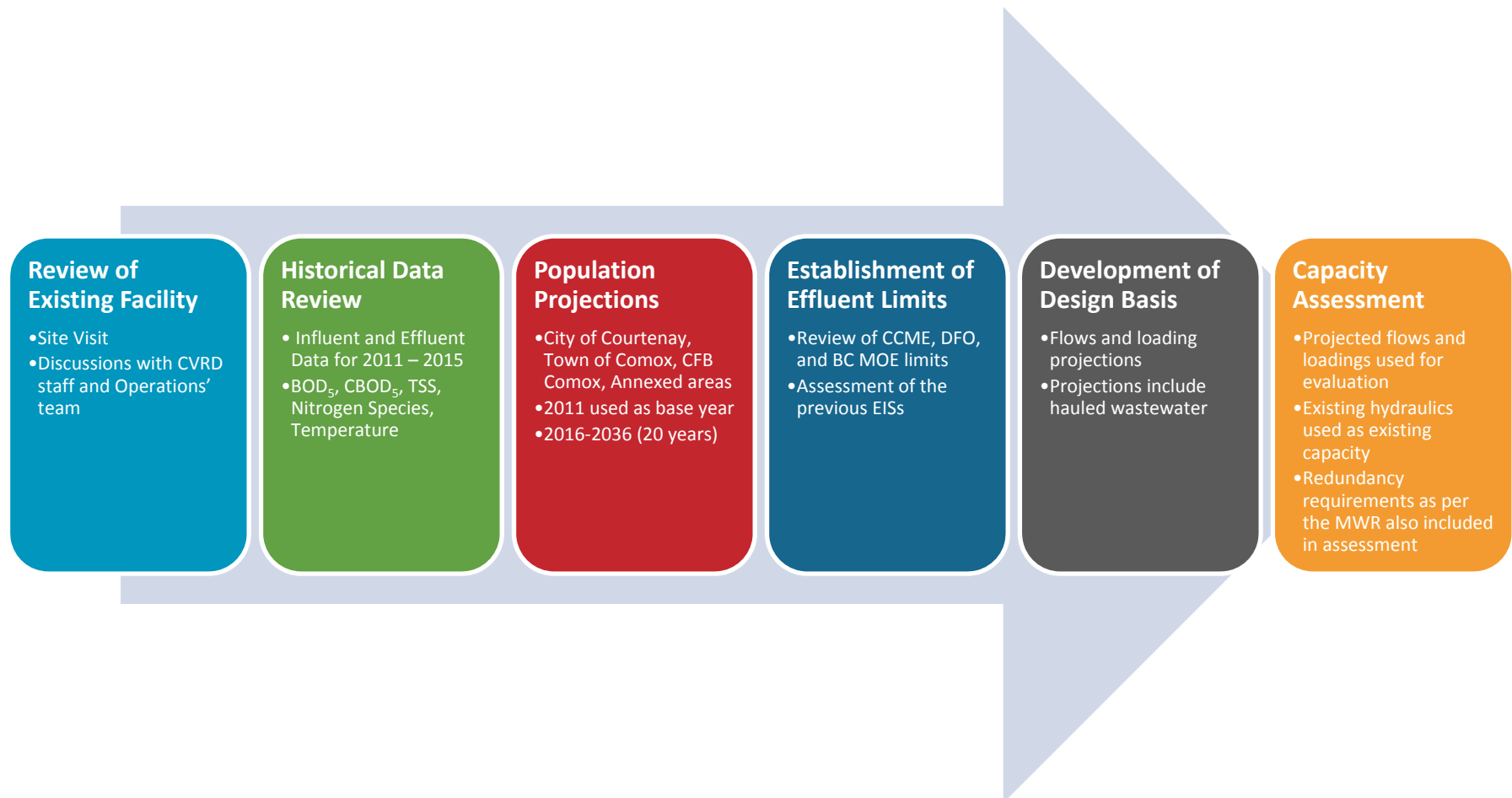


Project Objectives

- 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

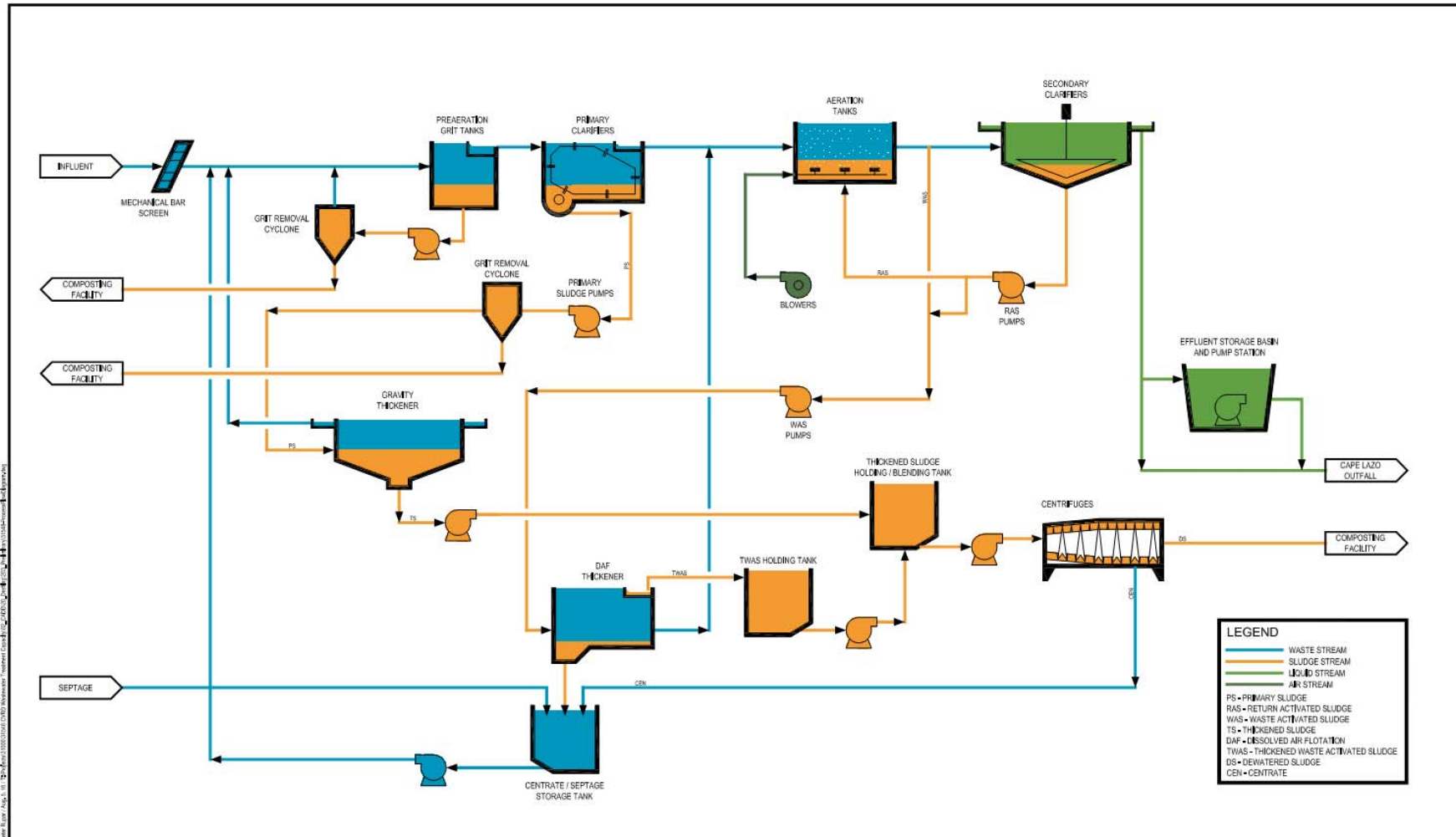


Capacity Assessment Methodology



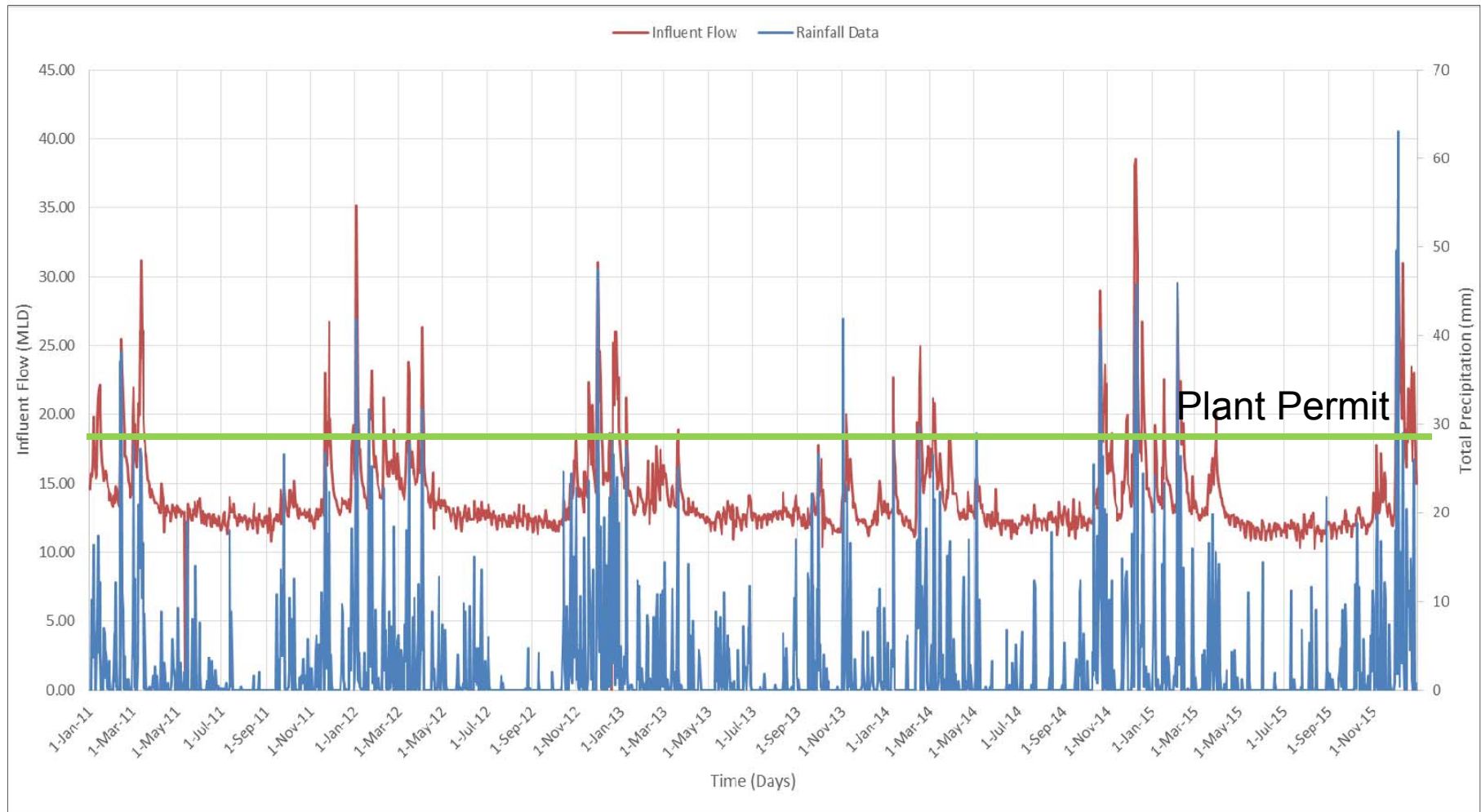


Process Flow Diagram



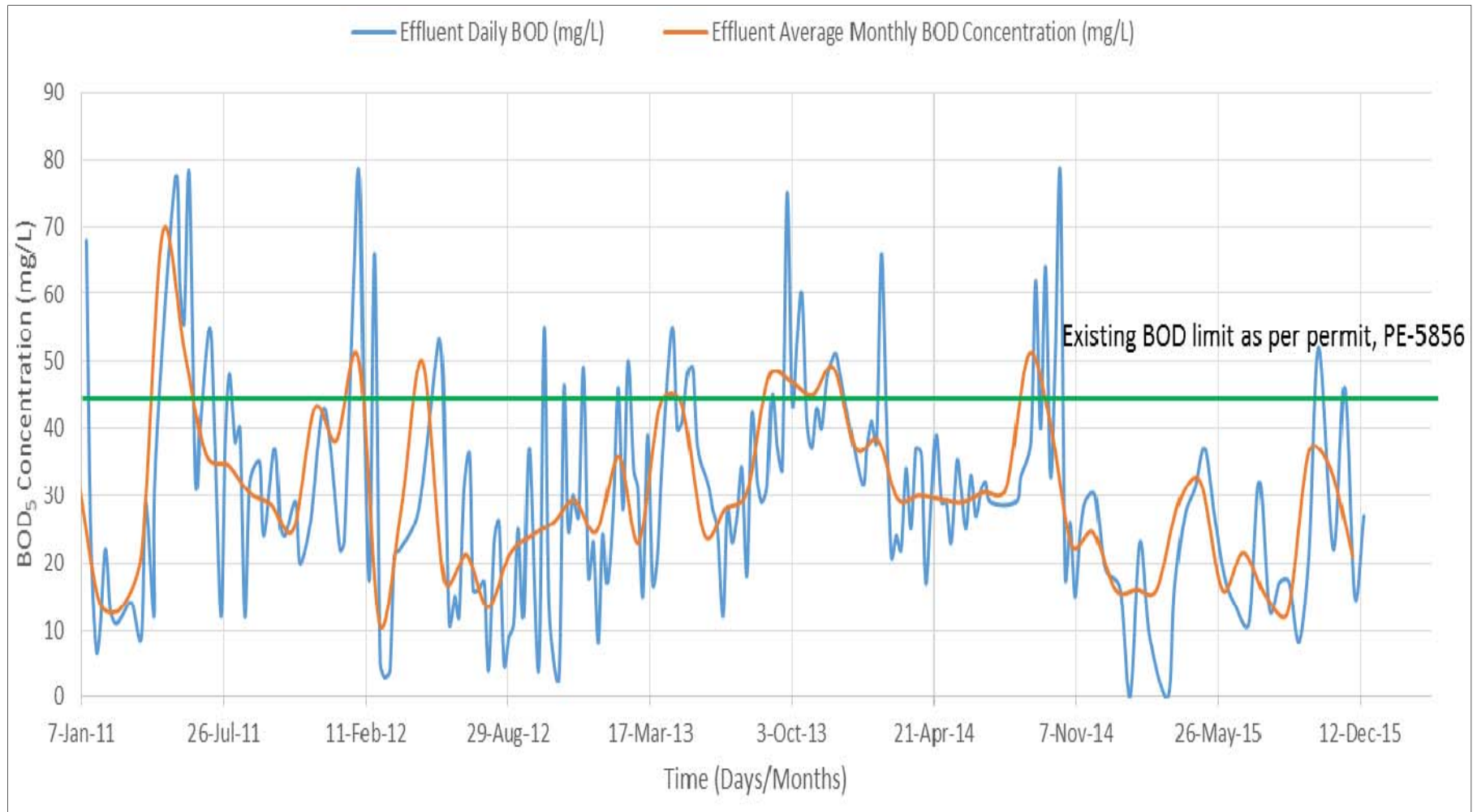


Historical Flows Review



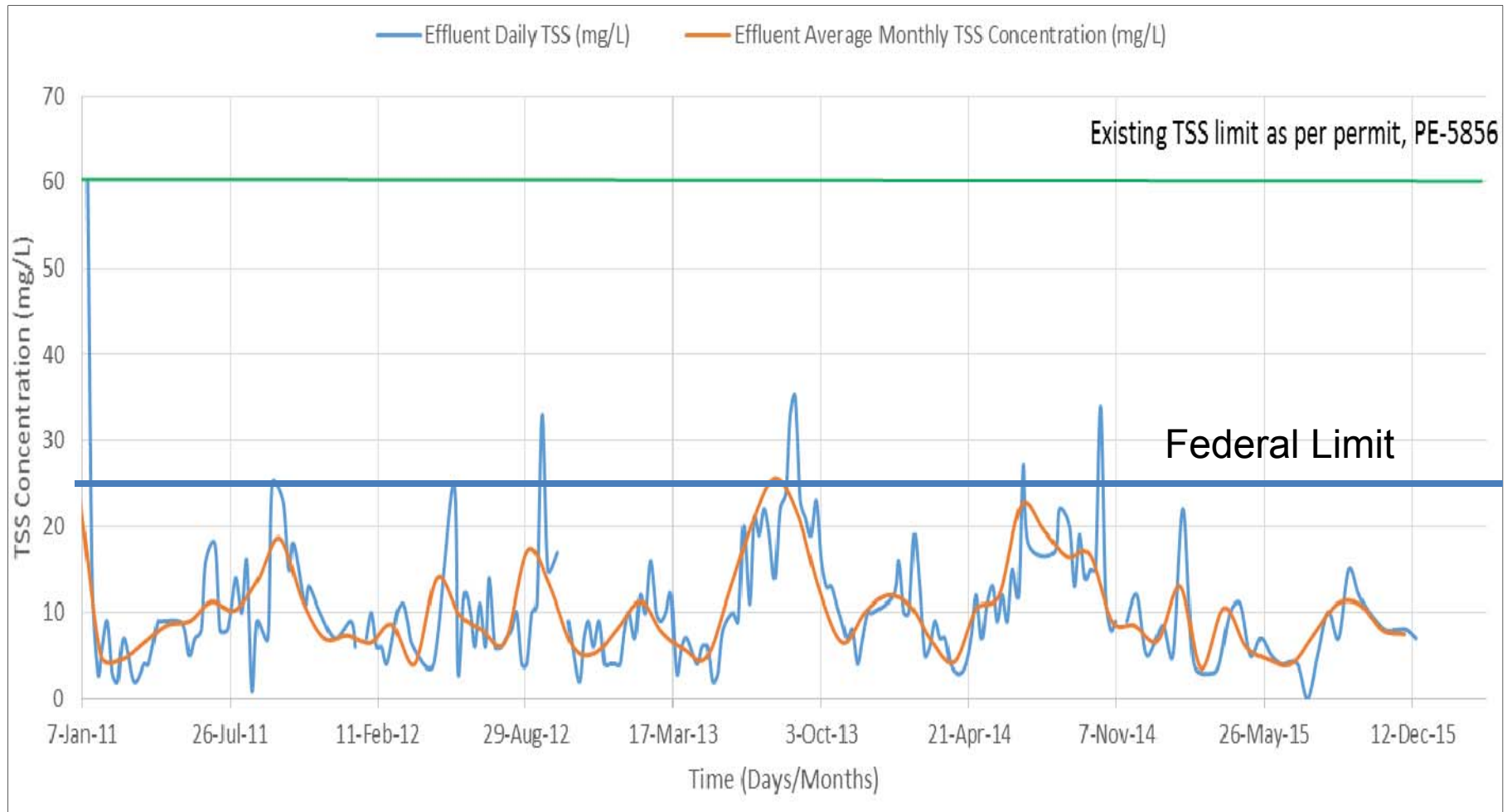


Historical Effluent BOD₅



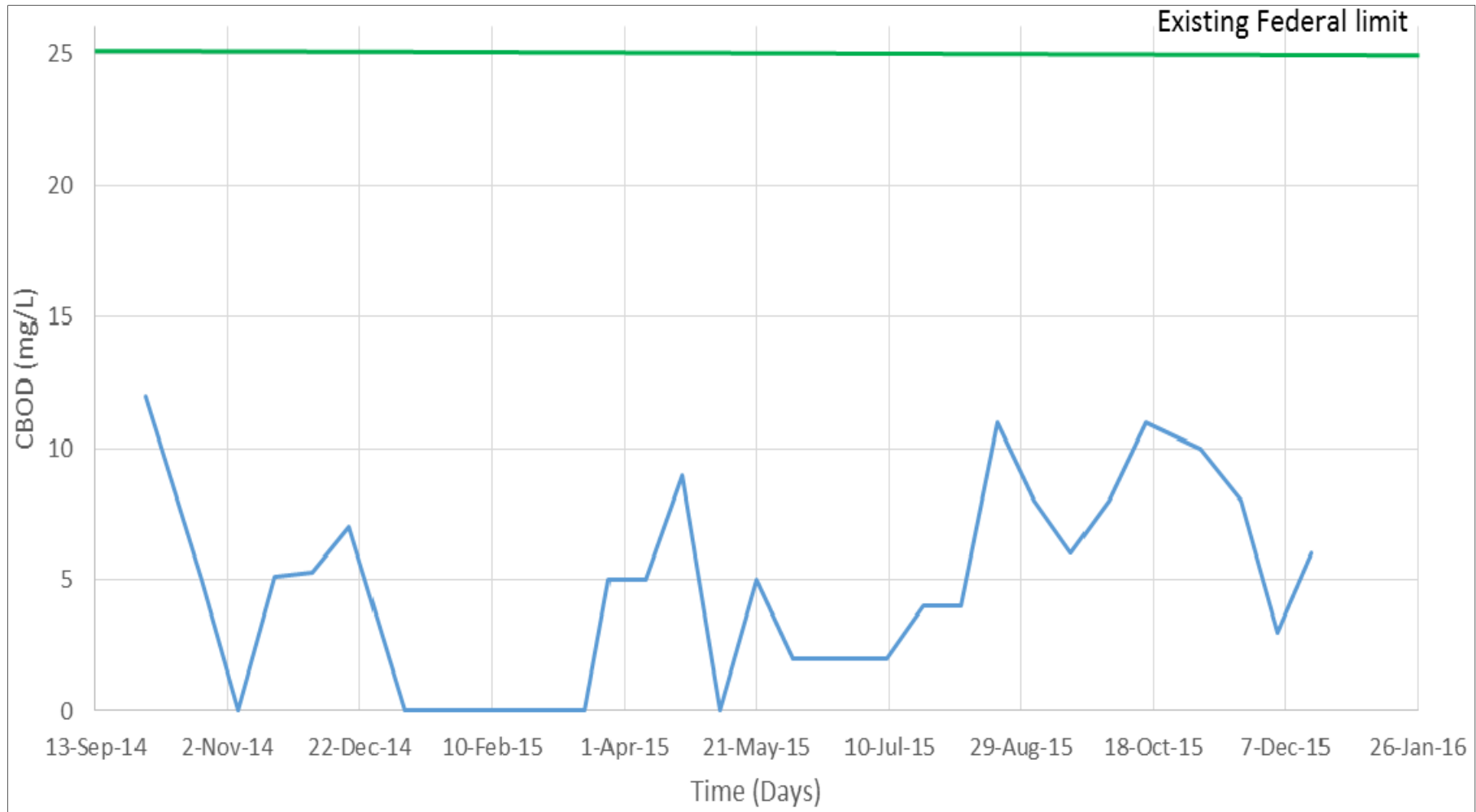


Historical Effluent TSS



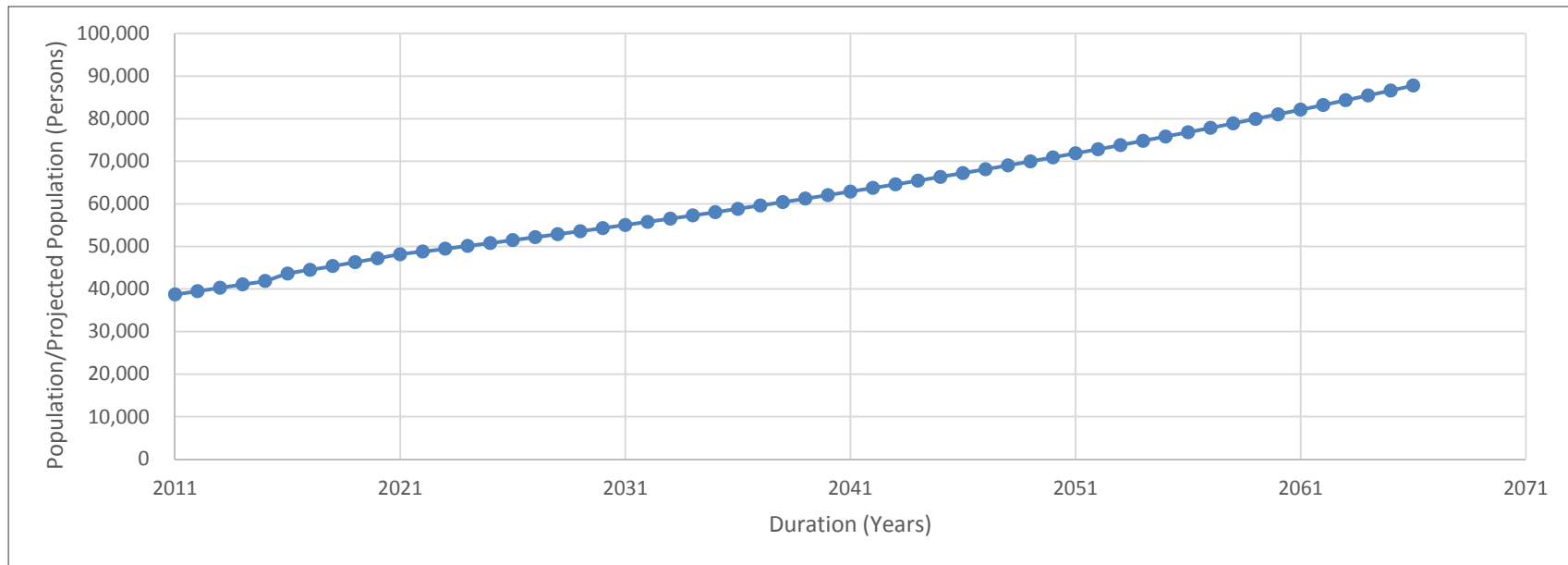


Historical Effluent CBOD₅





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
pH	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



Options

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



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