

MEMORANDUM

May 11, 2020

TO: Historical Memo

FM: Pete Carter / Steven Yee

RE: Vashon Wastewater Treatment Plant –April 2020

The Vashon Plant performed well in April 2020. Effluent Biochemical Oxygen Demand (BOD₅) averaged 2.3-mg/l and Total Suspended Solids (TSS) averaged <2.3-mg/L. BOD₅ and TSS removals were 99.1% and >98.9% respectively. All required analytical testing was completed.

Influent flow averaged 0.124 million gallons per day (MGD). A total of 1.94-inches of precipitation fell in April as measured at the North Vashon rain gauge; the Seatac Airport rain gauge measured 1.60-inches. The max-day precipitation of 0.60-inches occurred on Apr. 23 resulting in an influent flow of 0.124-MGD. The max-day flow of 0.171-MGD occurred on Apr. 2 when the peak hour flow reached 0.378-MGD. No flow equalization was necessary in April. Effluent turbidities remained low (1-2 NTU) during the high flows.

The oxidation ditch was operated at an average sludge retention time of 31-days. The MLSS concentration was in the range of 3,730 to 4,350 mg/L. The sludge volume index (SVI), which measures the MLSS's settling characteristics, averaged 138 mL/g. An estimated 3985 dry pounds of waste activated sludge were hauled to South Plant for further treatment in April.

One set of samples was collected this month (Apr. 14) for nutrient and alkalinity analysis. Total nitrogen (N) removal was 73%, with an effluent total inorganic-N level of 11.3-mg/L (0.1-mg/L NH₃-N and 11.2-mg/L NO₂+NO₃ as N). The oxidation ditch DO was lowered in mid-April to improve denitrification (by improving the effectiveness of the anoxic zone) and thus, return to the higher nitrogen removal that the Vashon Plant has achieved. Effluent phosphorus (P) was 4.0-mg/L, resulting in a Total-P removal of 32%. 100 pounds of soda ash was added to the ditch in April for pH adjustment. The lowest effluent pH of the month was pH 6.75.

Both clarifiers were in service until April 22 when clarifier #1 was taken out of service. Two clarifiers are not needed during the dry season so one is removed from service for maintenance and energy savings. The UV system operated with both stages in AUTO.

There was one call out early in the morning on April 2. The effluent pH reading suddenly dropped from pH 6.7 to 6.1. The pH was checked with the portable pH probe which read 6.8. As a precaution, effluent flow was stopped and influent flow was stored in the oxidation ditch and equalization basin until an instrument technician could re-calibrate the online pH probe.

Vashon – April 2020
Process Summary

Table 1. Summary of Monthly Flow & Rain

Monthly Total Flow Volume, MG	Monthly Average Flow, MGD	Minimum Daily Flow, MGD	Maximum Daily Flow, MGD	Total Rainfall, Inches
3.71	0.124	0.103	0.171	1.94

Table 2. Summary of Monthly Compliance/Exceptions

Biochemical Oxygen Demand 5-day			Total Suspended Solids			Fecal Coliform (no./100 mL)	
Permit mg/L	Actual mg/L	Rem %	Permit mg/L	Actual mg/L	Rem %	Permit	Actual
30	2.3	99.1	30	<2.3	>98.9	200	<1

Table 3. Summary of Weekly Compliance/Exceptions

	Biochemical Oxygen Demand (mg/L)		Total Suspended Solids (mg/L)		Fecal Coliforms (Organisms/100 mL)	
	Permit	Actual	Permit	Actual	Permit	Actual
Week 1	45	1.7	45	<2.0	400	<1
Week 2	45	1.8	45	2.3	400	<1
Week 3	45	2.2	45	<2.0	400	<1
Week 4	45	2.7	45	<2.5	400	E0.8
Week 5	45	2.9	45	2.7	400	<1