# MEMORANDUM

October 12, 2018

TO: Historical Memo

FM: Peter Carter / Steven Yee

RE: Vashon Wastewater Treatment Plant –September 2018

The Vashon Plant performed well in September 2018. Effluent Biochemical Oxygen Demand ($BOD_5$) averaged 6.0-mg/l and Total Suspended Solids (TSS) averaged 7.7-mg/L. $BOD_5$ and TSS removals were both >98%. All required analytical testing was completed. The influent sampler failed on Sept. 6. It was replaced with a time-paced portable sampler. Flow-paced influent sampling resumed Sept. 19.

Influent flow averaged 0.112 million gallons per day (MGD), with the highest influent flow recorded on September 15 (.206 MGD). A total of 1.37-inches of precipitation fell in September as measured at the North Vashon rain gauge.

The oxidation ditch was operated at an average sludge retention time of 14-days. The MLSS concentration was in the range of 2500-3600 mg/L. The sludge volume index (SVI), which measures the MLSS's settling characteristics, averaged 82 mL/g (a SVI of 80-150 mL/g indicates good settling). An estimated 3500 dry pounds of waste activated sludge were hauled to South Plant for further treatment in September.

One set of samples was collected this month (Sept. 5) for nutrient and alkalinity analysis. Total-N removal was 91%, with an effluent total inorganic nitrogen (N) level of 2.5-mg/L (0.4-mg/L $NH_3$-N and 3.6-mg/L $NO_2$+$NO_3$ as N). Effluent phosphorus was 6.8-mg/L, resulting in a Total-P removal of 36%. No soda ash was added to the ditch in September for pH adjustment; the lowest effluent pH of the month was pH 6.9.

Clarifier-1 was in service. Clarifier-2 has been out of service since June 6 for process reasons and energy savings; it will remain out of service until the wet weather. The UV system operated with both stages in AUTO.

On September 19, an attempt was made to replace the UV lamps with over 12,000-hrs of service; the manufacturer rates the life of these lamps at 14,000-hours. The 12,000-hr lamps total about ½ of all the lamps. Basically, they are the lamps that are always in service; the other lamps only come on at higher flows. Unfortunately, the UV system would not operate with the replacement lamps. In fact, merely replacing one of eight lamps on an 8-lamp rack would not allow any of the eight lamps to work. We are working with the UV manufacturer to determine why the new replacement lamps are creating this problem. In the meantime, we swapped the locations of the hardly-used lamps with the 12,000-hour lamps. This should provide us with more months of operation without the need for lamp replacement. And of course, we'll continue to monitor the run-hours of all the

lamps. (Note: the current UV lamps have a chip that tracks the number of hours that a lamp operates. The replacement UV lamps - which would not allow the rack of bulbs to light - also have a chip. Interestingly, the UV system will work with replacement lamps that do not have the chip.)

The on-site generator operated on Sept. 10 in response to a local power outage. Grease and grit were removed from the influent splitter box and the north influent line with the Vactor truck on September 26 in preparation for higher wet weather flows.

Table 1. Summary of Monthly Flow & Rain

| Total Wastewater Treated, MG | Monthly Average Flow, MGD | Minimum Daily Flow, MGD | Maximum Daily Flow, MGD | Total Rainfall, Inches |
|---|---|---|---|---|
| 3.350 | 0.112 | 0.093 | 0.206 | 1.37 |

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 | 6.0 | 98.8 | 30 | 7.7 | 97.5 | 200 | E1 |

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 | 6.0 | 45 | 8.8 | 400 | E1 |
| Week 2 | 45 | 6.7 | 45 | 9.5 | 400 | E1 |
| Week 3 | 45 | 6.7 | 45 | 6.4 | 400 | <1 |
| Week 4 | 45 | 4.7 | 45 | 5.9 | 400 | <1 |