

MEMORANDUM

October 15, 1975

To: Clar Pratt

From: Grover Scott Jeane II

Subject: Klickitat STP Survey

July 8, 1975, I completed an efficiency study of the Klickitat STP. The study consisted of a 24 hour composite of the chlorinated effluent and an 8 hour composite of the influent and secondary effluent. The plant is owned by St. Regis and operated by their personnel. A recent addition to the plant is the chlorine contact chamber and 22½° V-notch weir. Future improvements are being considered for the laboratory. The more complicated analyses are sent to a private laboratory in Portland.

A review of the sampling locations used by the operator revealed that the influent and effluent samples were being collected at incorrect locations. The influent sample was collected upstream from the comminutor which would bias the solids and organic loading to below actual. The effluent sample was being collected from the chlorine contact chamber and would bias the BOD and suspended solids to lower values than would be expected. Verification of the recording flow meter against actual head height measurement revealed a +25% discrepancy. Plant loading values presented below were computed based on 24 hour totalizer readings corrected by the above factor (The operator is presently evaluating the meter).

	ppm	Effluent lbs/day	Permit Limitations Weekly Average
BOD	26	- 10.1	30 mg/l
T.S.S.	34	- 13.2	70 mg/l
NO ₃	3.4	- 1.32	---
T-PO ₄	10.0	- 3.88	---

The plant was surveyed during hot dry weather. Very high turbidity of the receiving water (Klickitat River) was due to glacier runoff. The normal parameters were measured (see attached Efficiency Study Form) and the median values of the effluent are as follows: temperature 21.5°; pH 6.8; Conductivity 310 µmhos/cm²; settleable solids, trace. The percent reduction for BOD was 82%, while T.S.S. was 84%.

The plant is underloaded and the operator is presently adjusting the aeration and clarifier holding times to prevent flocculation of solids.

Analysis of receiving water samples collected above and below the plant indicate an increase in nutrients and bacteria only. Only total coliform bacteria showed an increase (800 to 1400 col/100 ml). The increase was not significant but nitrate ($\text{NO}_3\text{-N}$), $\text{NH}_3\text{-N}$, and total Kjeldahl-N doubled in concentration while $\text{O-PO}_4\text{-P}$ and $\text{T-PO}_4\text{-P}$ demonstrated lesser increases. The level of all nutrient parameters except $\text{O-PO}_4\text{-P}$ were below algae bloom potential.

The operator has just notified me (10-16-75) that he has changed his sampling locations to conform with Department of Ecology sampling locations. The operator also completed a very thorough evaluation of the flow meter and determined that the meter is reading 32% above actual flow. He is presently in the process of recalibrating the meter.

The pounds per day loading discharged by the plant will be reduced due to the 32% positive error in flow measurement while the change to the new sampling locations will cause an increase in BOD and T.S.S. values. The overall effect should be a reduced loading.

GSJ:ee
Attachment

STP Survey Report Form

Efficiency Study

City Klickitat Plant Type Extended Pop. Served 600 Design 100,000 gp
eration Capacity
 Receiving Water Klickitat River Perennial Intermittent
 Date July 8 Survey Period 24 hours Survey Personnel G. S. Jeane II
 Comp. Sampling Frequency every 30 min. Sampling Alequot 300 ml
 Weather Conditions (24 hr) clear, hot Are facilities provided for complete by-
 pass of raw sewage? Yes No/Frequency of bypass
 Reason for bypass Is bypass chlorinated? X Yes No
 Was DOE Notified? Discharge - Intermittent Continuous

Plant Operation

Total flow 46,470 gal/day How measured Totalizer verified by field measurements
 Maximum flow 0.12 MGD Time of Max. 1500 hr
 Minimum flow Time of Min.
 Pre Cl₂ #/day Post Cl₂ #/day

Field Results

Influent

Effluent

<u>Determinations</u>	<u>Max.</u>	<u>Min.</u>	<u>Mean</u>	<u>Median</u>	<u>Max.</u>	<u>Min.</u>	<u>Mean</u>	<u>Median</u>
Temp °C	20.5	19.5		19.7	22	20		21.5
pH (Units)	7.8	7.4		7.6	6.8	6.7		6.8
Conductivity (µmhos/cm ²)	590	300		440	325	300		310
Settleable Solids (mls/l)	13.5	6	9.83	10.0	Tr	Tr	Tr	Tr

Laboratory Results on Composites

	<u>Influent</u>	<u>Effluent</u>	<u>% Reduction</u>	<u>lbs/day</u>
Laboratory No.	<u>75 -2830</u>	<u>2831</u>		
5-Day BOD ppm	<u>147</u>	<u>26</u>	<u>82%</u>	<u>10.1</u>
COD ppm	<u>300</u>	<u>46</u>		
T.S. ppm	<u>390</u>	<u>250</u>		
T.N.V.S. ppm	<u>198</u>	<u>172</u>		
T.S.S. ppm	<u>216</u>	<u>34</u>	<u>84%</u>	<u>13.2</u>
N.V.S.S. ppm	<u>10</u>	<u>6</u>		
pH (Units)	<u>7.8</u>	<u>7.1</u>		
Conductivity (µmhos/cm ²)	<u>290</u>	<u>290</u>		
Turbidity (JTU's)	<u>93</u>	<u>16</u>		

Laboratory Bacteriological Results

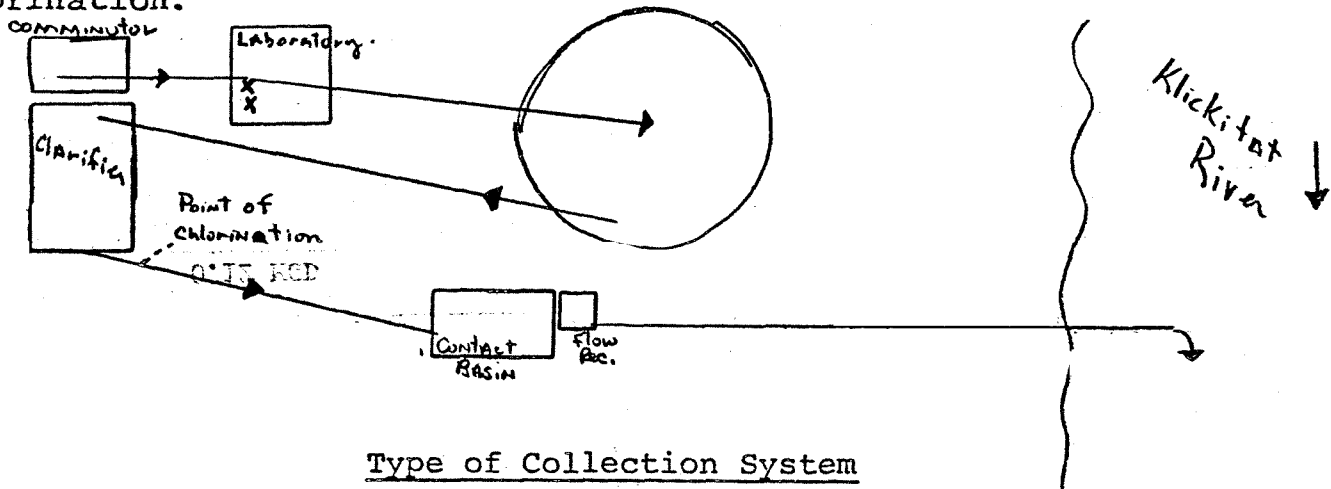
Lab No.	Sampling Time	Colonies/100 ml (MF)			Cl ₂ Residual	
		Total Coliform	Fecal Coliform	Fecal Strep	15 sec.	3 min.
2833	1000	60	<10		0.3	0.4
2834	1200	< 20	<10		0.2	0.5
2835	1430	60	<10		0.3	0.7

Additional Laboratory Results

		lbs. per day
NO ₃ -N ppm	- 3.40	1.32
NO ₂ -N ppm	- N.D.	-
NH ₃ -N ppm	- .38	0.15
T. Kjeldahl-N ppm	- 2.8	1.09
O-PO ₄ -P ppm	- 9.8	3.80
T-PO ₄ -P ppm	- 10.0	3.88

Operator's Name Mike Mahoney Phone No. 509-369-4501

Furnish a flow diagram with sequence and relative size and points of chlorination.



Type of Collection System

Combined Separate Both

Estimate flow contributed by surface or ground water (infiltration)

Unknown MGD

Plant Loading Information

Annual average daily flow rate (mgd)

Peak flow rate (mgd).

Dry _____

Dry _____

Wet _____

Wet _____

COMMENTS: The operator has determined a 7% greater error in flow than the 25% measured during the survey. Therefore the lbs/day loading would be slightly decreased.