

M E M O R A N D U M

January 14, 1976

To: Ron Robinson

From: Allen Moore

Subject: Port Townsend STP Efficiency Study

An efficiency study was done at the Port Townsend primary STP on July 22, 1975. The plant is very well maintained by plant operator, Pete Sophie. Reduction in BOD was only 56% and T.S.S. reduction was only 57%. A very high chlorine rate of 59 pounds per day was being applied with no residual found in the effluent. Bacteria counts were, therefore, very high. According to our conversation about this problem, the conclusion was that retention time was too long in the clarifiers allowing the sewage to go septic. This was using up all the chlorine allowing no disinfection as shown by the bacteria counts on the STP Survey Report Form and Data Summary sheet. A high spike in conductivity of 3500 was recorded at 0855 and gradually tailed off during the day to 650 in the effluent. Pete thought a possible source was the Coast Guard pumping their salt water sewage system from one of their ships to the city municipal system.

AWM:ee

cc: Pete Sophie

STP Survey Report Form

Efficiency Study

City Port Townsend Plant Type Primary Pop. Served 5400 Design 7,500 pop.  
 Capacity  
 Receiving Water Straits of Juan de Fuca Perennial X Intermittent \_\_\_\_\_  
 Date 22 July 75 Survey Period 0830 - 1600 Survey Personnel Allen Moore, Darrel  
 Anderson  
 Comp. Sampling Frequency 1/2 hour Sampling Alequot Flow x 1000 = ml  
Max. Flow  
 Weather Conditions (24 hr) sunny, warm Are facilities provided for complete by-  
 pass of raw sewage? X Yes \_\_\_\_\_ No/Frequency of bypass \_\_\_\_\_  
 Reason for bypass breakdown Is bypass chlorinated? X Yes \_\_\_\_\_ No  
 Was DOE Notified? \_\_\_\_\_ Discharge - Intermittent \_\_\_\_\_ Continuous \_\_\_\_\_

Plant Operation

Total flow 157,500 gal. or .54 MGD How measured Flow meter  
 Maximum flow 157 MGD Time of Max. 1600  
 Minimum flow .36 MGD Time of Min. 0855  
 Pre Cl<sub>2</sub> \_\_\_\_\_ #/day Post Cl<sub>2</sub> 59 #/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	19.0	17.0		18.5	19.0	17.0		18.5
pH (Units)	7.8	7.2		7.4	7.2	6.8		7.0
Conductivity (µmhos/cm <sup>2</sup> )	3500	650		850	2000	1225		1650
Settleable Solids (mls/l)	13.0	7.5	10.1	10.0	T	T	T	T

Laboratory Results on Composites

	<u>Influent</u>	<u>Effluent</u>	<u>% Reduction</u>	<u>lbs/day</u>
Laboratory No.	<u>75-3158</u>	<u>75-3159</u>		
5-Day BOD ppm	<u>170</u>	<u>110</u>	<u>36</u>	<u>495.4</u>
COD ppm	<u>340</u>	<u>200</u>		
T.S. ppm	<u>835</u>	<u>710</u>		
T.N.V.S. ppm	<u>595</u>	<u>575</u>		
T.S.S. ppm	<u>148</u>	<u>65</u>	<u>57</u>	<u>299.2</u>
N.V.S.S. ppm	<u>31</u>	<u>14</u>		
pH (Units)	<u>7.5</u>	<u>7.3</u>		
Conductivity (µmhos/cm <sup>2</sup> )	<u>1500</u>	<u>1500</u>		
Turbidity (JTU's)	<u>65</u>	<u>25</u>		

Laboratory Bacteriological Results

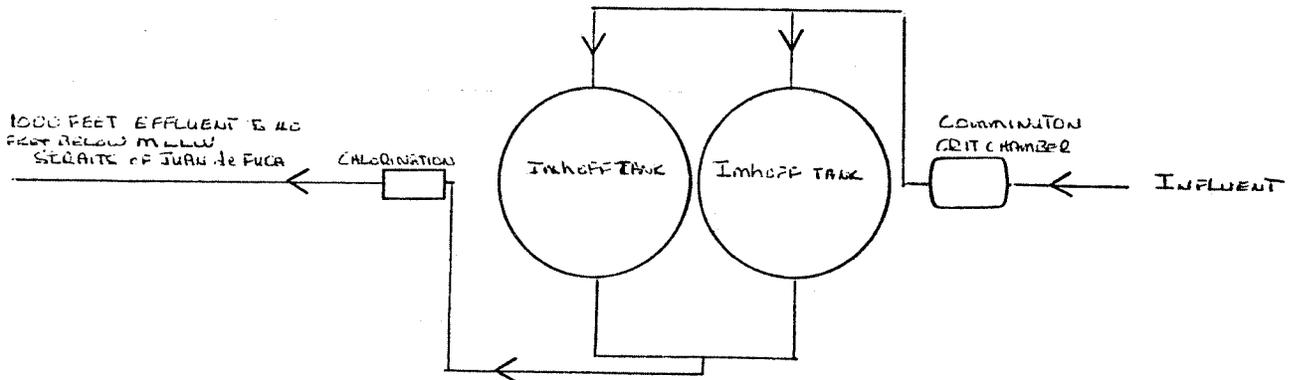
Lab No.	Sampling Time	Colonies/100 ml (MF)			Cl <sub>2</sub> Residual
		Total Coliform	Fecal Coliform	Fecal Strep	
75-3160	0845	> 4 x 10	> 4000		0.0
3161	1100	> 4 x 10	> 4000		0.0
3162	1300	> 4 x 10	> 4000		0.0
3163	1500	> 4 x 10	> 4000		0.0

Additional Laboratory Results

NO <sub>3</sub> -N ppm -	0.04	
NO <sub>2</sub> -N ppm -	ND	
NH <sub>3</sub> -N ppm -	22	= 25.024 x MGD x 8.34 = 112.70 lbs NH <sub>3</sub> /day
T. Kjeldahl-N ppm -	26	
O-PO <sub>4</sub> -P ppm -	4.6	
T-PO <sub>4</sub> -P ppm -	7.8	

Operator's Name Pete Sofie Phone No. 385-3193

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)

1.0 MGD

Plant Loading Information

Annual average daily flow rate (mgd)

Peak flow rate (mgd)

Dry .6 MGD

Dry \_\_\_\_\_

Wet \_\_\_\_\_

Wet \_\_\_\_\_

COMMENTS: \_\_\_\_\_

STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

WATER QUALITY LABORATORY

DATA SUMMARY

ORIGINAL TO: ...A.W.M. ....  
COPIES TO: .....  
.....  
.....  
LAB FILES .....

Source PORT TOWNSEND STP

Collected By B. Moore

Date Collected 8-22-75

Goal, Pro./Obj. \_\_\_\_\_

Log Number:	25	3158	59	60	61	62	63					STORET
Station:	INF	EFF	0845	1100	1300	1500						
pH	7.5	7.3										00403
Turbidity (JTU)	65.	25.										00070
Conductivity (umhos/cm)@25°C	1500.	1500.										00095
COD	340.	200.										00340
BOD (5 day)	170.	110.										00310
Total Coliform (Col./100ml)	-	-	>4x10 <sup>4</sup>	>4x10 <sup>4</sup>	>4x10 <sup>4</sup>	>4x10 <sup>4</sup>						31504
Fecal Coliform (Col./100ml)	-	-	>4000	>4000	>4000	>4000						31616
NO3-N (Filtered)	-	0.04										00620
NO2-N (Filtered)	-	N.D.										00615
NH3-N (Unfiltered)	-	22.										00610
T. Kjeldahl-N (Unfiltered)	-	26.										00625
O-PO4-P (Filtered)	-	4.6										00671
Total Phos.-P (Unfiltered)	-	7.8										00665
Total Solids	835	710										00500
Total Non Vol. Solids	595	575										
Total Suspended Solids	148	65										00530
Total Sus. Non Vol. Solids	31	14										

Note: All results are in PPM unless otherwise specified. ND is "None Detected"  
Convert those marked with a \* to PPB (PPM X 10<sup>3</sup>) prior to entry into STORET

Summary By Stephen P. Rod Date 8-12-75