

M E M O R A N D U M

April 15, 1976

To: Ron Robinson

From: Douglas Houck

Subject: Olympia STP Class II Inspection

On January 22, 1976 I went to the Olympia sewage treatment plant to install three composite samplers. The influent sampler was located in a wet well just before the comminutor. Another sampler was located at the end of the clarifier, before chlorination. The third composite sampler was located at the end of the chlorine contact chamber. All samplers were adjusted to take a 250 ml aliquot every 30 minutes.

Due to the location of the venturi flume a check on their flow measuring device could not be done.

I returned on the 23rd with Mike Morhous to collect the samplers. The third sampler located at the end of the contact chamber had not taken a sample during the whole 24 hour period. The composite samples were not split with their lab as they were having operational problems at the time. The following table gives DOE's results of the composite sample, Olympia's results from their own samples taken that week and their NPDES weekly average effluent limitations.

	DOE		Olympia		NPDES
	<u>Inf.</u>	<u>Eff.</u>	<u>Inf.</u>	<u>Eff.</u>	<u>Weekly Avg.</u>
BOD ₅ (mg/l)	490	420	568	478	690
T.S.S. (mg/l)	240	170	290	91	400
Fecal Coliform (colonies/100 ml)		Est. 400		270	1500
pH		7.2			6.0 - 9.5

The table shows that although they didn't receive much BOD₅ reduction they are still within their permit limitations. It should be pointed out that the effluent results reported by Olympia were taken at the end of the chlorine contact chamber. This shows that they are getting good BOD₅ and especially total suspended solids reduction within the chlorine contact chamber.

I returned again to their lab the following month to review their laboratory procedures. They were quite adequate and are some of the best in the state.

DH:ee

STP Survey Report Form

Efficiency Study

City Olympia Plant Type Primary Pop. Served 25,000 Design Capacity 9.1 MGD
 Receiving Water Budd Inlet Perennial Intermittent
 Date 1-22/23-76 Survey Period 24 hrs. Survey Personnel Houck
 Comp. Sampling Frequency 30 min. Sampling Alequot 250 ml
 Weather Conditions (24 hr) rainy/clear Are facilities provided for complete by-pass of raw sewage? Yes No/Frequency of bypass _____
 Reason for bypass _____ Is bypass chlorinated? Yes No
 Was DOE Notified? _____ Discharge - Intermittent _____ Continuous _____

Plant Operation

Total flow _____ How measured Venturi Flume
 Maximum flow 11.0 Time of Max. 0900 - 1600
 Minimum flow 3.0 Time of Min. 1200 - 0500
 Pre Cl₂ -- #/day Post Cl₂ 400 - 800 #/day

Field Results

Determinations	Influent				Effluent			
	Max.	Min.	Mean	Median	Max.	Min.	Mean	Median
Temp °C								
pH (Units)				7.2				6.8
Conductivity (µmhos/cm ²)								
Settleable Solids (mls/l)								

Laboratory Results on Composites

	Influent	Effluent	% Reduction
Laboratory No.	<u>76-0299</u>	<u>-0300</u>	
5-Day BOD ppm	<u>490</u>	<u>420</u>	<u>14%</u>
COD ppm	<u>620</u>	<u>520</u>	<u>16%</u>
T.S. ppm	<u>722</u>	<u>610</u>	<u>17%</u>
T.N.V.S. ppm	<u>291</u>	<u>270</u>	<u>7%</u>
T.S.S. ppm	<u>240</u>	<u>170</u>	<u>29%</u>
N.V.S.S. ppm	<u>7.5</u>	<u>7.3</u>	<u>58%</u>
pH (Units)			
Conductivity (µmhos/cm ²)			
Turbidity (JTU's)			

Laboratory Bacteriological Results

Lab No.	Sampling Time	Colonies/100 ml (MF)			Cl ₂ Residual
		Total Coliform	Fecal Coliform	Fecal Strep	

Additional Laboratory Results

NO ₃ -N ppm -	0.37	
NO ₂ -N ppm -	0.01	
NH ₃ -N ppm -	6.3	
T. Kjeldahl-N ppm -		
O-PO ₄ -P ppm -	0.30	
T-PO ₄ -P ppm -	3.7	

Operator's Name Ken Nurmi Phone No. 753-8386

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)

_____ MGD

Plant Loading Information

Annual average daily flow rate(mgd)

Peak flow rate(mgd)

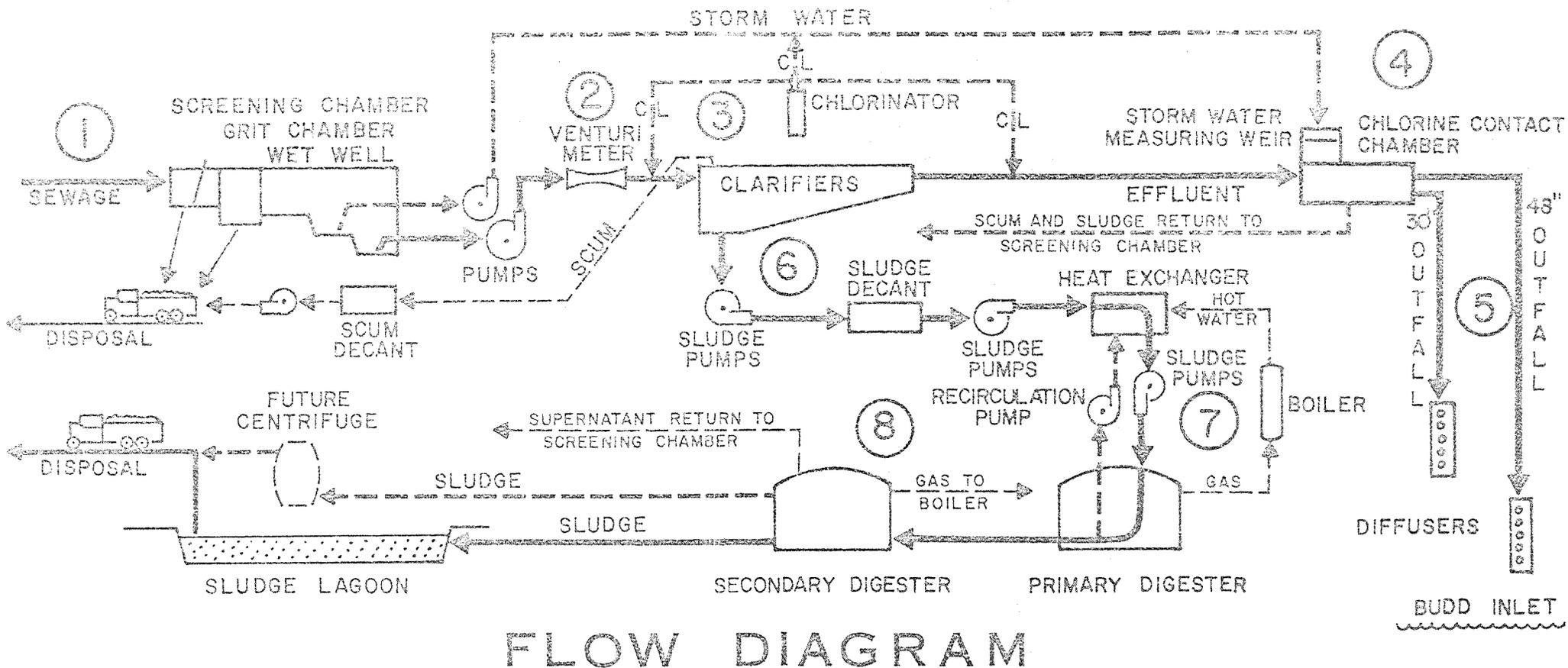
Dry 7.6

Dry 9.1

Wet 10.2

Wet 20.0

COMMENTS: _____



FLOW DIAGRAM

PLANT OPERATION

1. Sewage enters the plant where screenings and grit are removed.
2. The sewage is pumped through a flow measuring Venturi meter and prechlorinated to control odors prior to entering clarifiers. Storm water is chlorinated and pumped to a measuring weir for flow measurement and re-enters the system at the chlorine contact chamber.
3. Sewage enters the clarifiers where solids are allowed to settle for transfer as sludge to the digesters.
4. The clarified effluent (liquid) receives additional chlorination and is discharged to the chlorine contact chamber to allow time for adequate disinfection. Scum and sludge collected is returned to the screening chamber.
5. Treated effluent is discharged into Budd Inlet through two outfalls with diffusers.
6. The sludge from the clarifiers is thickened in a sludge decanting tank, and pumped through a heat exchanger to the primary digester.
7. The sludge is then recirculated to maintain the temperature necessary in this stage of the digestion process. Gas reclaimed from the digester is burned to heat the sludge.
8. In the secondary digester, the digestion process is completed and the digested sludge is transferred to the sludge lagoon for drying. A centrifuge will be added in the future for sludge drying prior to disposal.

