



STATE OF
WASHINGTON

Dixy Lee Ray
Governor

DEPARTMENT OF ECOLOGY

7272 Cleanwater Lane, Olympia, Washington 98504

206/753-2353

M E M O R A N D U M

Publication No. 77-e18

WA-22-4040

To: Ron Robinson

From: Mike Morhous

Re: Elma STP
Class II Inspection

Date: September 19, 1977

Findings and Conclusions:

With the exception of fecal coliforms, the Elma STP was within the limitations of their NPDES permit. The excessive coliform count was due to the chlorine tank running dry sometime during the night of March 15th. A full chlorine tank was connected the following morning. It is recommended that the City of Elma initiate appropriate action to prevent this situation from occurring in the future. An alarm system which activates when the chlorine tank nears empty would be one alternative.

The STP's effluent flow was recorded for 24 hours for comparison with the STP's flow recorders. The resultant flow when compared with the STP's effluent totalizer showed the STP recording 53 percent of DOE's 24 hour effluent flow value. The STP's influent totalizer recorded a 24 hour flow which was 211 percent of DOE effluent flow value. In view of the above flow data it would appear the STP's influent and effluent flow recorders were, at the time of this inspection, in definite need of calibration. A subsequent check of the STP's recorders could be scheduled upon request from your office.

MM:ee

cc: Central Files
Doug Houck
Dick Cunningham

Class II Field Review and Sample Collection
24 Hour Composite Sampler Installations

Sampler	Date and Time Installed	Location
1. Chl. eff.	3/15/77 at 1000 aliquot - 250 mls/30 minutes	End of chlorine contact chamber
2. Inf.	Grab composite 3/15-16 aliquot - 3/15 500 mls at 1020, 1500 mls at 1340 3/16 1000 mls at 1000, 1000 mls at 1015	Influent wet well lift station
3.	aliquot -	

Grab Samples

	Date and Time	Analysis	Sample Location
1.	3/16 at 1000	Fecal coliform	End of chlorine contact chamber
2.	3/16 at 1015	"	"
3.			
4.			
5.			
6.			

Flow Measuring Device

1. Type 90° v-notch weir
2. Dimensions

a. Meets standard criteria Yes
 No Explain:

b. Accuracy check

	Actual Instan. Flow	Recorder Reading	Recorder Accuracy (% of inst. flow)
1.	See page 3		
2.			
3.			

is within accepted 15% error limitations

is in need of calibration

Field Data

Parameter	Date and Time	Sample Location	Result
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Review of Laboratory Procedures and Techniques

Laboratory procedures were not reviewed during this inspection. The City of Elma was in the process of ordering additional laboratory equipment.

STP weir/recorder

On March 15, a Manning "dipper" flow meter was installed at the chlorine contact chamber approximately 3'-4' upstream from the 90° v-notch weir. The purpose was to monitor the STP's effluent flow for a 24 hour total flow figure and comparison with the STP's influent and effluent script charts and totalizers.

The results are as follows:

	DOE	Elma STP	
Total Plant	Eff	Inf.	Eff.
Flow (mgd)	.351	.742	.185

The STP's influent flow totalizer recorded 211 percent of DOE's flow meter (effluent) value. The STP's effluent flow totalizer recorded 53 percent of DOE's flow meter.

	DOE	Chl. Eff.	NPDES (Monthly Average)
	Inf.		
BOD mg/l lbs/day	115	24 70	30 88
TSS mg/l lbs/day	68	24 70	30 88
Fecal Coli. (col/100 mls) at 1000 at 1015		Est. 80 Est. 700	200
* Chlorine Residual ppm at 1000 at 1015		.15 .25	
Total Plant Flow mgd (DOE)		.351	.35

* Field analysis

"<" is "less than" and ">" is "greater than"

M E M O R A N D U M

October 19, 1976

State of
Washington
Department
of Ecology



TO: Ron Robinson
FROM: Mike Morhous
SUBJECT: Elma STP Class II Inspection

On August 12, 1976 Ward Andrews and myself arrived at the Elma STP to conduct the above referenced inspection. Quinton Boyer, plant operator, was on vacation and Bob Boyer, city employee, met with us at the STP.

Composite samplers were installed at the influent, pre-chlorinated effluent and chlorinated effluent. The influent sampler was located in the wet well. The pre-chlorinated effluent sampler was located in the clarifier. The chlorinated effluent sampler was located immediately above the chlorine contact chamber outfall. All three samplers were adjusted to take a 250 ml aliquot every 30 minutes.

The STP was in the process of setting up the new laboratory equipment manufactured primarily by Hach including a Hach manometer for BOD analysis. Millipore equipment was being set up for coliform analysis.

The effluent flow measuring device is a 90° V-notch weir located at the chlorine contact chamber outfall. An accuracy check of the weir-recorder was conducted noting two separate instantaneous head measurements and the respective recorder readings. The results showed the script chart was recording 121% and 107% of the actual instantaneous flow. It was noticed the following day that although the effluent script chart ink pen appeared to be functioning properly, the circular script chart was not revolving. The STP also has an influent script recorder which was out of order during this inspection. The total flow from the STP was determined from the effluent totalizer reading for the 24 hour period.

The following data were obtained in the field from a grab sample taken at each of the composite sampler locations.

	<u>Inf.</u>	<u>Pre-Chl. Eff.</u>	<u>Chl. Eff.</u>
pH	7.2	6.5	6.5
temperature	19°C	19°C	19°C
conductivity (umhos/cm)	390	315	310

Simultaneous fecal coliform grab samples and total chlorine residuals were also taken.

On August 13, Ward and I returned to collect the composite samplers. The composite samples were not split with the STP. The following table lists the results of DOE analyses together with NPDES permit limitations.

	<u>Inf.</u>	<u>Chl. Eff.</u>	<u>NPDES</u> (weekly average)
BOD ₅ (mg/L) (lbs/day)	162	37 67.9	45 132
TSS (mg/L) (lbs/day)	184	32 58.7	45 132
Fecal Colif. (colonies/100 mls)			400
@ 1105		430	
@ 1220		550	
*Chlorine Residual (ppm)			
@ 1105	less than 0.1		
@ 1220	less than 0.1		
Total Flow (mgd)		.22	

* field analysis (LaMotte DPD Test Kit)

As shown in the previous table low chlorine residuals were present in conjunction with the respective coliform results.

In summary the influent and effluent script chart recorders should be checked and repaired as necessary. In conjunction with the high fecal coliform results, the chlorine residual should probably be monitored more closely. It is also advisable to check out the chlorination system for possible malfunctioning.

Consideration should be given to a subsequent class II inspection after the STP lab has been put in order and BOD₅ and fecal coliform analyses initiated. This would provide an opportunity to review laboratory techniques and compare analytical results from split composite samples.

MM:dg

cc: Doug Houck
Dick Cunningham
 Central Files

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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OLYMPIA LABORATORY

DATA SUMMARY

Source Chehalis & Elma STPs

Collected By M. Housh & Andrews

Date Collected 8/12-13/76 Elma STP

Chehalis STP

Sample Number: 76-3177 78 79 80 81 92 93 84 85 86

Parameter:	ELMA INF. COMP	UNION EFF. COMP	CHLOR. EFF. COMP	1105	1220	CHEHALIS CANDIDATE COL. 14, 10E	COMP	WAR. FRUIT COMP	DILUTION H ₂ O	DISTIN H ₂ O
Turbidity (NTU)										
Conductivity (umhos/cm)										
BOD COD	310	125	125			1800	1780	5250		
BOD (5 day) BOD	162.	47.	37.			<2000	<2000	3100	1.2	2.3
Total Coliform (Col./100ml)										
Fecal Coliform (Col./100ml)				430	550					
NO ₃ -N (Filtered)	<.02	17.0	13.4							
NO ₂ -N (Filtered)	<.02	<.02	<.02							
NO ₃ -N (Unfiltered)	14.8	1.4	1.3							
Kjeldahl-N (Unfiltered)										
PO ₄ -P (Filtered)	4.8	6.2	6.3							
Total Phos.-P (Unfiltered)	6.5	7.6	7.4							
Total Solids	296	295	282							
Total Non Vol. Solids	190	201	200							
Total Suspended Solids	184	38	32							
Total Sus. Non Vol. Solids	32	6	2							
Total Chlor. 22mgd										

NOTE: All results are in PPM (mg/L) unless otherwise specified. ND is "None Detected"
 "<" is "Less Than" and ">" is "Greater Than"