Publication No. 75-e15

MEMORANDUM WA-14-1600

April 16, 1975

To: Ron Robinson

From: Dan Glantz

Subject: Washington Corrections Center (Shelton)
STP Efficiency Study

This study was conducted on March 31, 1975. Sampling and testing was made on the one-half hour commencing at 0915 and ending at 1530. The staff personnel working with me had to clear the premises by 1600 so I was unable to do later sampling.

There is a large amount of laundry water entering the plant. Influent temperature is high and pH varies considerably during the day. At 1100 pH reached 9.3 and conductivity raised to 625. Later in the day a dark blue coloration appeared. This too was attributed to the laundry, resulting from dungaree washing.

When I arrived, shortly after 0800, the clarifier effluent was quite clear. Settleable solids were at "trace". By 1100 the sludge blanket was rising and at 1200 the settleable solids read 450. It continued in this very high range through the rest of the day. The flow chart shows an abrupt drop to around 30 GPM at midnight, when activity nearly ceases in the institution. The flow continues at this low rate until 0600 when activity again commences and the flow rapidly reaches and holds a range of 100-120 GPM throughout the day. Apparently, the low flow during the night allows the sludge blanket to settle and it rises again with the flow increase. This excess discharge of solids is undoubtedly doing just what the operators are worried about, clogging the drain field. It was learned from the operator that they are not wasting any sludge. This could be creating the excessive buildup.

The aeration ditch was sampled at four locations; two below the first aerator and two below the second aerator. Four times during the day, temperature and D.O. readings were taken at these same stations. D.O. was very low, ranging from .075 PPM to .8 PPM. Settleable solids ranged from 96% to 99%. Readings were taken twice on the clarifier where the D.O. read 1.1 PPM and 3 PPM. Coliform samples were taken on the creek above and below the plant location and from a small pond beside the plant area. It is suspected this pond may receive seepage from the drain field area and it shows a high fecal count. The FC/FS ratio strongly indicates human source. It is questionable whether the creek is near enough to the drain field to be affected.

DG:ee
Attachment

STP Survey Report Form

Efficiency Study

Wash. Correction Center
City Shelton Plant Type Secondary Pop. Served 1200 Design Capacity

Receiving Water Ground via drainfield Perennial X Intermittent

Date 3/31/75 Survey Period 0830 - 1530 Survey Personnel Dan Glantz

Comp. Sampling Frequency 1/2 hr. Sampling Alequot 1000 M/L (Proportioned)

Weather Conditions (24 hr) Fair-Dry Are facilities provided for complete by-pass of raw sewage? ____ Yes X No/Frequency of bypass

Reason for bypass ____ Is bypass chlorinated? ____ Yes ____ No

Was DOE Notified? ____ Discharge - Intermittent ____ Continuous ____

Plant Operation

Total flow 85,500 GPD How measured Recorder

Maximum flow 120 GPM Time of Max. 1100 & 1200

Minimum flow 30 GPM Time of Min. After midnight

Pre Cl_2 None #/day Post Cl_2 None #/day

Field Results

11 Determinations	Influent Max.	Influent Min.	Influent Mean	Influent Median	Effluent Max.	Effluent Min.	Effluent Mean	Effluent Median
Temp °C	20°	17°		18°	12°	11°		11°
pH (Units)	9.3	6.2		7.0	7.0	6.9		7.0
Conductivity (µmhos/cm²)	625	375		460	410	375		400
Settleable Solids (mls/l)	25.0	4.0	17.4	20	450	TR	230	325

Laboratory Results on Composites

	Influent	Effluent	% Reduction
Laboratory No.	75-1117	75-1118	
5-Day BOD ppm	270	385	Gain
COD ppm	455	1030	Gain
T.S. ppm	462	923	Gain
T.N.V.S. ppm	202	213	Gain
T.S.S. ppm	129	810	Gain
N.V.S.S. ppm	ND	112	Gain
pH (Units)			
Conductivity (µmhos/cm²)	490	340	
Turbidity (JTU's)	--	--	

Laboratory Bacteriological Results

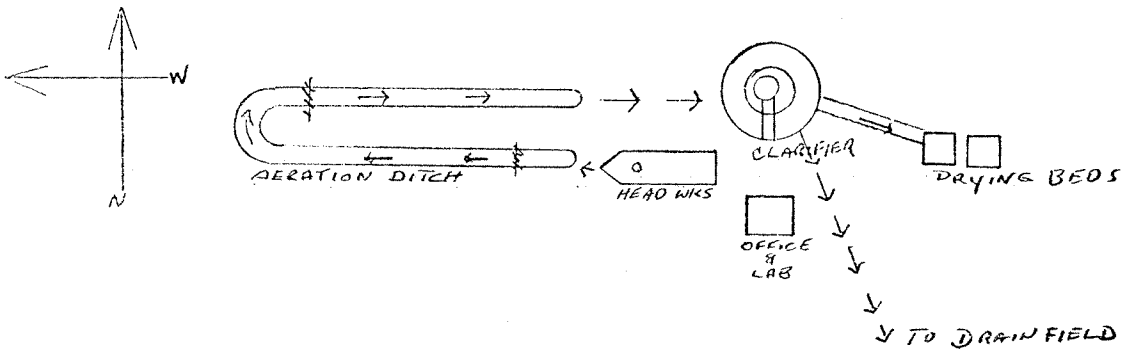
Lab No.	Sampling Time	Colonies/100 ml (MF) Total Coliform	Fecal Coliform	Fecal Strep	Cl_2 Residual
75-1124	1030	> 40,000	> 4,000		None
75-1125	1215	> 40,000	> 4,000		None
75-1126	1330	> 40,000	> 4,000		None
75-1127	1500	< 40,000	< 4,000		None
75-1128	1200	5,000	> 8,000	Est. 10	
75-1129	1200	31,000	Est 75	Est 20	
75-1130	1200	> 8,000	Est 12	Est 12	

Additional Laboratory Results

NO_3-N ppm -	
NO_2-N ppm -	
NH_3-N ppm -	
T. Kjeldahl-N ppm -	
O-PO_4-P ppm -	
T-PO_4-P ppm -	

Operator's Name Clarence Fordmeyer Phone No. 8-276-1011 Ext. 255

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



Type of Collection System

__ Combined X Separate __ Both

Estimate flow contributed by surface or ground water (infiltration)

_____ MGD

Plant Loading Information

Annual average daily flow rate(mgd)

Dry _____

Wet _____

Peak flow rate(mgd)

Dry _____

Wet _____

COMMENTS: _____

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

WATER QUALITY LABORATORY

ORIGINAL TO: R. Robinson
COPIES TO: D. Glantz
LAB FILES

DATA SUMMARY

Source Wash. Correction Ctr. @ Shelton — Collected By D. Glantz

Date Collected 3-31-75 (Page 1 of 2) — Goal, Pro./Obj.

Log Number: 75-	1117	18	19	20	21	22	23	24	25	26	STORET
Station:	INF	EFF	BELOW 1ST AER.	AER. STA. 2	AER. STA. 3	AER. DITCH	AER. STA. 4	EFF 1030	→ 1215	1320	
pH	7.5	7.2									00403
Turbidity (JTU)											00070
Conductivity (umhos/cm)@25°C	490	340									00095
COD	455	1030									00340
BOD (5 day) *	270	385									00310
Total Coliform (Col./100ml)								>40,000	>40,000	>40,000	31504
Fecal Coliform (Col./100ml)								>4,000	>4,000	>4,000	31616
NO3-N (Filtered)											00620
NO2-N (Filtered)											00615
NH3-N (Unfiltered)											00610
T. Kjeldahl-N (Unfiltered)											00625
O-PO4-P (Filtered)											00671
Total Phos.-P (Unfiltered)											00665
Total Solids	462	923	3511	3086	3277	3613	3512				00500
Total Non Vol. Solids	202	213	563	505	535	575	569				
Total Suspended Solids *	129	810	3285	2785	3045	3240	3145				00530
Total Sus. Non Vol. Solids	ND	112	445	325	385	440	370				
Vol S.S	129	698	2840	2460	2660	2800	2775				

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

Summary By Stephen P. Hall Date 4-7-75

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

WATER QUALITY LABORATORY

ORIGINAL TO: .....

COPIES TO: .....

.....

LAB FILES .....

DATA SUMMARY

Source WASH. CORR. CTR. (PAGE 2 of 2) Collected By _____

Date Collected _____ Goal, Pro./Obj. _____

Log Number: 75-1127 28 29 30

Station:	EFF 1500	GROUND WATER SEEPAGE	CREEK ABOVE STP	CREEK BELOW STP	STORET
pH					00403
Turbidity (JTU)					00070
Conductivity (umhos/cm)@25°C					00095
COD					00340
BOD (5 day)					00310
Total Coliform (Col./100ml)	<40,000	5,000	31,000	>8000	31504
Fecal Coliform (Col./100ml)	<4,000	>800	EST 75	EST 12	31616
NO3-N (Filtered)					00620
NO2-N (Filtered)					00615
NH3-N (Unfiltered)					00610
T. Kjeldahl-N (Unfiltered)					00625
O-PO4-P (Filtered)					00671
Total Phos.-P (Unfiltered)					00665
Total Solids					00500
Total Non Vol. Solids					
Total Suspended Solids					00530
Total Sus. Non Vol. Solids					
FECAL STREP		EST 10	EST 20	EST 12	(COLONIES/100 ml)

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

Summary By Stephen D. Bell Date 9-2-75