

MEMO
Department

Publication No. 72-e18

TO: Dan Neal & John Hodgson

DATE: June 29, 1972

FROM: Ron Devitt

SUBJECT: Wapato STP

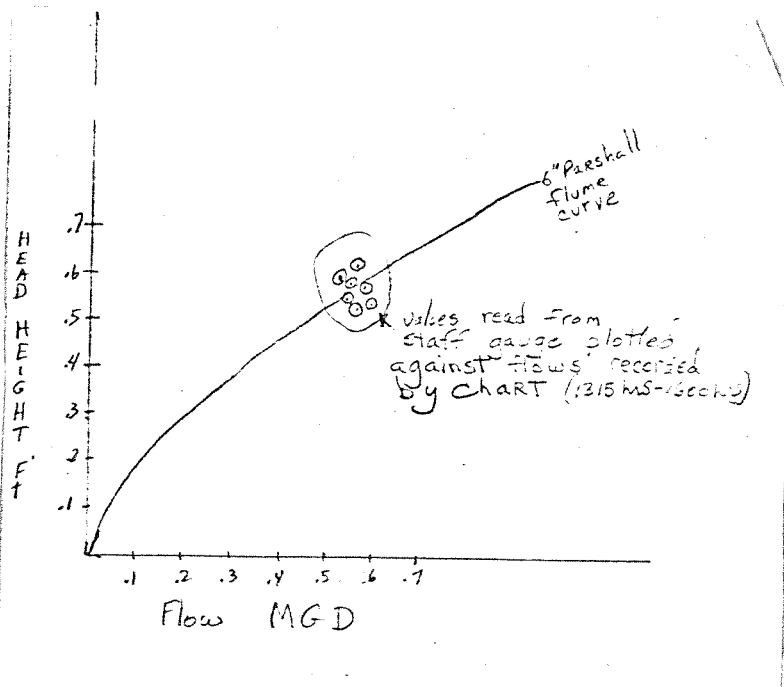
On Tuesday, June 13, 1972, I conducted an efficiency survey on Wapato STP.

Four Composite samples were collected:

1. Influent at Parshall flume
2. Primary clarifier effluent
3. Combined trickling filter effluents
4. Secondary clarifier effluent

These samples were proportioned to flow from the chart inside the lab; but at 1300 it was noticed that there was a discrepancy between Parshall flume head height and the chart reading. The proportional chlorination had been adapted to the influent recorder the previous day by the instrument factory representative, so I assumed that it would be functioning properly.

Comparing high flow to low flow, the chart did increase as the influent visibly increased, but the head height values obtained in the afternoon versus the recorded flow showed variation of $\pm .1$ MGD from actual flow.



The average of sixteen chart readings throughout the day was .677 MGD. The integrator reading was 182,000 for 8 hours of .546 MGD. The average of six head height readings of the Parshall flume from 1300 hours to 1600 hours was .57 feet or .55 MGD. The actual total flow is not known.

It is doubtful that proportioning chlorine to the influent flow is as effective in disinfection as proportioning to effluent flow. The flow through the chlorine chamber is not a direct function of the flow of the influent, because of the time delay caused by detention time throughout the system.

Another disadvantage is, if the comminutor overloads and stops (as it did at 1310 hours) the flow device exceeds actual flow and more chlorine is added than necessary.

At 1615 hours, quantities of crankcase like oil were observed in the clarifier and influent channel. One auto repair shop and the five service stations on the sewer system were visited and questioned, but I was unable to locate the source. Residual amounts of oil were still entering the plant at 1745. Estimated oil to the plant was 5 - 10 gallons.

RCD:bj

cc: Ron Pine
Lloyd Taylor
Glenn Phillips

STP SURVEY REPORT FORM

(EFFICIENCY STUDY)

City Wapato Plant Type T. Filters Population 2300 Design 5,000
 Served Capacity
 Receiving Water Yakima River via Ditch Engineer Dan Neal
 Date 6/13/72 Survey Period 0830-1600 Survey Personnel Ron Devitt
 Comp. Sampling Frequency 1/2 Hour Weather Conditions Sunny
 (last 48 hours)
 Sampling Alequot * Recorded flow x 2 ml/30 min.

PLANT OPERATION

* .546 integrator reading
 Total Flow .677 average chart reading How Measured 6" Parshall flume
 Max. (Flow) _____ Time of Max. 1030-1130 Min. _____ Time of Min. 0830-0900
 Pre Cl₂ ----- #/day Post Cl₂ to flow #/day
 50# @ .75 MGD
 44# @ .65 MGD
 35# @ .53 MGD
 22# @ .425 MGD
 * Flow recorder off.

FIELD RESULTS

| 16 [†] Determinations | Influent | | | | Effluent | | | |
|--------------------------------|----------|------|------|--------|----------|------|------|--------|
| | Max. | Min. | Mean | Median | Max. | Min. | Mean | Median |
| Temp. °C | 23.5 | 20.9 | 21.8 | 21.8 | 21.6 | 19.1 | 20.4 | 20.3 |
| Conductivity (umhos/cm) | 7.7 | 7.3 | 7.4 | 7.4 | 7.3 | 7.0 | 7.1 | 7.0 |
| Settleable Solids | 18.0 | 4.0 | 8.3 | 7.0 | .1 | Nil | Nil | Nil |

† Only 7 settleable solids

SEE ATTACHED

LABORATORY RESULTS ON COMPOSITE IN PPM

| Laboratory Number | Influent | Effluent | % Reduction |
|-------------------|----------|----------|-------------|
| 5-Day BOD | | | |
| COD | | | |
| T.S. | | | |
| T.N.V.S. | | | |
| T.S.S. | | | |
| N.V.S.S. | | | |
| pH | | | |
| Conductivity | | | |
| Turbidity | | | |

ge two

apato STP

BACTERIOLOGICAL RESULTS

Na₂S₂O₃ added to sample in bottle After _____ min.

| LAB # | SAMPLING TIME | COLONIES/100 MLS (MF) | | 15 Sec. | 3 Min. |
|-------|---------------|-----------------------|-------|---------|------------------------------|
| | | Total | fecal | ppm | Cl Residual (after 5 min) |
| | 0845 | 22,500 | < 20 | .4 | > 1.0 |
| | 0945 | 400 | | .5 | > 1.0 |
| | 1145 | 400 | | .5 | > 1.0 |
| | 1315 | 400 | < 20 | .5 | > 1.0 |
| | | | | | |
| | | | | | |

erator's Name Dennis Moorefield Phone # 879-7697

omments: Lou Stevens on vacation.

| | 16 Samples 0830-1600 6 Settleable Solids North T. Filter Effluent | | | | 16 Samples 0830-1600 6 Settleable Solids South T. Filter Effluent | | | | 5 Samples 1400-1601 1 Settleable Solid Primary Clarifier Effluent | | | |
|-------|--|------|------|--------|--|------|------|--------|--|------|------|--------|
| | Max. | Min. | Mean | Median | Max. | Min. | Mean | Median | Max. | Min. | Mean | Median |
| Temp. | 21.4 | 18.6 | 19.9 | 19.9 | 21.4 | 18.9 | 20.4 | 20.6 | 21.6 | 21.1 | 21.3 | 21.4 |
| pH | 7.3 | 7.1 | 7.2 | 7.2 | 7.5 | 7.3 | 7.3 | 7.3 | 7.3 | 7.1 | 7.3 | 7.3 |
| SS | .9 | .3 | .5 | .4 | 1.0 | .2 | .5 | .3 | ---- | ---- | <.1 | ---- |

Temp. = °C
SS = ml/l (Settleable)

| Wapato STP | | Primary Clarifier | Primary Clarifier | Trickling | Trickling. | Secondary | Secondary | Overall |
|------------|-----|-------------------|-------------------|-----------|------------|-----------|-----------|------------|
| Influent | | Effluent | Reduction | Filters | Filters | Clarifier | Clarifier | Efficiency |
| | | | | Effluent | Reduction | Effluent | Reduction | |
| BOD | 151 | 68 | 55 % | 38 | 44 % | 3 | 92 % | 98 % |
| COD | 438 | 253 | 42 % | 146 | 42 % | 84 | 42 % | 80 % |
| T.S. | 516 | 374 | 28 % | 370 | 1 % | 329 | 11 % | 36 % |
| T.N.V.S. | 260 | 155 | 40 % | 204 | None | 186 | 9 % | 28 % |
| T.S.S. | 227 | 96 | 58 % | 95 | 1 % | 36 | 62 % | 84 % |
| N.V.S.S. | 50 | 23 | 54 % | 23 | None | 7 | 70 % | 86 % |
| pH | 7.2 | 7.2 | --- | 7.1 | --- | 7.2 | -- | -- |
| Cond. | 499 | 428 | --- | 380 | --- | 387 | -- | -- |
| Turb. | 65 | 45 | --- | 30 | --- | 20 | -- | -- |

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
 WATER QUALITY LABORATORY

ORIGINAL TO: C. R. DeWitt
 COPIES TO:

 LAB FILES

DATA SUMMARY

Source WAPATO STP

Collected By R. DeWitt

Date Collected 6-13

Goal, Pro./Obj. 3.2.21

| Log Number: | 72- | 2124 | 2125 | 2126 | 2127 | 2128 | 2129 | 2130 | 2131 | STORET |
|------------------------------|------|----------------|----------------|---------------------|------|-------|------|------|------|--------|
| Station: | INF | 1ST CLAR. EFF. | 2ND CLAR. EFF. | COMP. EFF. T. FULT. | | 0845 | 0945 | 1145 | 1345 | |
| pH | 7.2 | 7.2 | 7.2 | 7.1 | | | | | | 00403 |
| Turbidity (JTU) | 65. | 45. | 20. | 30. | | | | | | 00070 |
| Conductivity (umhos/cm)@25°C | 499. | 429. | 387. | 380. | | | | | | 00095 |
| COD | 438. | 253. | 84. | 146. | | | | | | 00340 |
| BOD (5 day) | 151. | 68. | 3. | 38. | | | | | | 00310 |
| Total Coliform (Col./100ml) | | | | | | 22500 | <400 | <400 | <400 | 31504 |
| Fecal Coliform (Col./100ml) | | | | | | <20. | - | - | <20. | 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 | 516 | 374. | 329. | 370. | | | | | | 00500 |
| Total Non Vol. Solids | 260 | 155. | 186. | 204. | | | | | | |
| Total Suspended Solids | 227 | 96 | 30. | 95 | | | | | | 00530 |
| Total Sus. Non Vol. Solids | 50 | 23. | 7. | 23. | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Note: All results are in PPM unless otherwise specified. ND is "None Detected"
 Convert those marked with a * to PPB (PPM X 10³) prior to entry into STORET

Summary By Stephen D. Roll Date 6-28-72