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JOHN SPELLMAN
Governor

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
7272 Cleanwater Lane, MS-11 • Olympia, Washington 98504 •

MEMORANDUM
August 17, 1983

To: Bill Yake

From: Kevin Kiernan

Subject: Battle Ground STP and Weaver Creek Reconnaissance Visit

On August 9, 1983, a preliminary inspection was made at the Battle Ground STP and its receiving water, Weaver Creek. Joe Kurth and Bob Jones were present, representing the City of Battle Ground. The purpose of this visit was to become familiar with the plant layout and to examine the receiving water. At a later date, a Class II inspection may be scheduled, depending upon the perceived need and available manpower.

Figure 1 shows the location of the plant and the sample sites used by Moore and Anderson in their 1978 analysis of Weaver Creek*. This study showed that the STP had a substantial effect on the creek, lowering its dissolved oxygen (D.O.) from 9.0 mg/L at Station 1 to 3.7 mg/L at Station 3. This drop was attributed to the bacterially mediated conversion of NH_3-N to NO_3-N. Subsequent to the completion of this report, the plant was upgraded to provide for nitrification of the wastewater prior to discharge.

The existing plant is a secondary treatment facility with nitrification occurring in the final rotating biological surface (RBS). Figure 2 illustrates the pattern of flow through the plant. During ordinary conditions, the lagoon is used for sludge disposal. There has been an ongoing and well-documented problem with infiltration and inflow in the collection system, and at peak wet-weather flows, influent is diverted into the lagoon for storage. When flows subside, this wastewater is reintroduced into the plant, apparently substantially impacting plant performance and raising effluent BOD and suspended solids. The city has been working several years to correct this problem. During this visit, the operator described the plant flow (0.24 MGD instantaneous flow) as very low due to the dry weather and the school vacation. The plant receives a substantial input from the city's school system when it is in session.

*Moore, A. and D. Anderson, 1978. Weaver Creek-Battle Ground Sewage Treatment Plant Study. Dept. of Ecology Project Report PR-4.

Weaver Creek is a small stream, originating upstream of Battle Ground, which empties into Salmon Creek. In addition to the Battle Ground STP, the creek receives discharges from the Columbia Academy and Roest Dairy. Downstream from the city limits, the creek flows through wooded areas and thick brush. This brush made an exact determination of the location of the outfall impossible.

After a tour of the plant, grab samples were taken at the effluent aerator and Stations 2, 3, and 4. Because of the difficulty involved in determining the exact outfall location, Station 1 was moved upstream to 1A, as shown on Figure 1. Samples were analyzed in the field for temperature, pH, and conductivity. Dissolved oxygen was fixed and later determined via the Winkler method. Samples from all stations were taken to the laboratory for nutrient analyses and samples from Stations 1A, 3, and the effluent were analyzed for fecal coliform. The results are presented in Table 1.

Using conductivity measurements taken at Stations 1, 2, and the effluent aerator, and the effluent flow, the streamflow above the outfall can be estimated at 0.88 cfs. Conductivity increases inexplicably between Stations 2 and 3, but total phosphorus and total inorganic nitrogen measures support this flow estimate. Dissolved oxygen levels show a pronounced drop downstream of the plant. Although the effect is much less than noted in 1978, D.O. at Stations 3 and 4 is still below levels required for Class A status. Fecal coliform counts also violate Class A standards by a substantial amount, although the STP is apparently not the source of the problem. These results agree with data supplied by the Southwest Washington Regional Health Laboratory* which show elevated coliform counts upstream of the plant and in several tributaries.

A review of Battle Ground's DMRs and the data gathered during this visit shows that the plant is nearly always in violation of the unrealistically low effluent flow of 0.126 MGD allowed in its NPDES permit. In addition, while the plant's impact on Weaver Creek has diminished since 1978, it apparently still causes a substantial drop in receiving water D.O. A full Class II inspection and receiving water study may be of use in determining the extent of and possible solutions to the issues raised here.

KK:cp

Attachments

cc: Mike Morhous, S.W. Region

*Addy, Carl, Southwest Washington Regional Health District Laboratory, personal communication.

Table 1. Data from Battle Ground STP and Weaver Creek reconnaissance visit.

Station	Dissolved Oxygen (mg/L)	Conductivity (umhos/cm)	pH (S.U.)	Temperature (°C)	NH_3-N (mg/L)	NO_2-N (mg/L)	NO_3-N (mg/L)	O-PO_4-P (mg/L)	T-PO_4-P (mg/L)	Fecal Coliform (#/100 mL)
1A	8.9	169	7.2	19.4	0.030	<0.005	0.250	0.110	0.110	580
2	9.0	265	7.5	19.4	0.120	<0.05	3.50	2.00	2.30	--
3	7.6	367	7.5	20.3	0.085	<0.05	3.25	1.90	2.10	1,020
4	7.8	354	7.4	19.0	0.070	<0.05	3.30	2.05	2.10	--
Effluent	9.4	493	7.5	20.1	0.350	<0.05	9.30	6.50	6.90	58

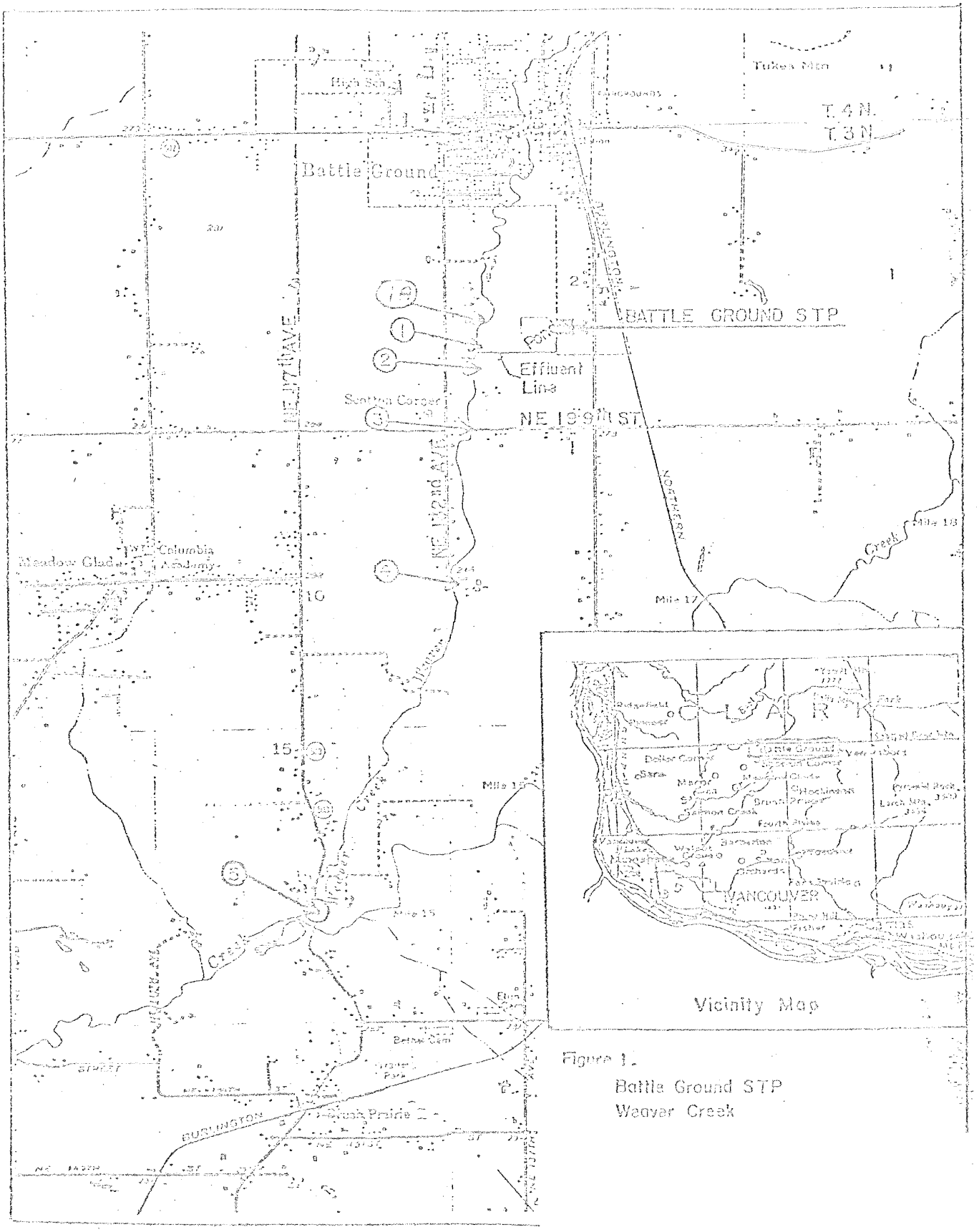

Figure 1.
Battle Ground STP
Weaver Creek
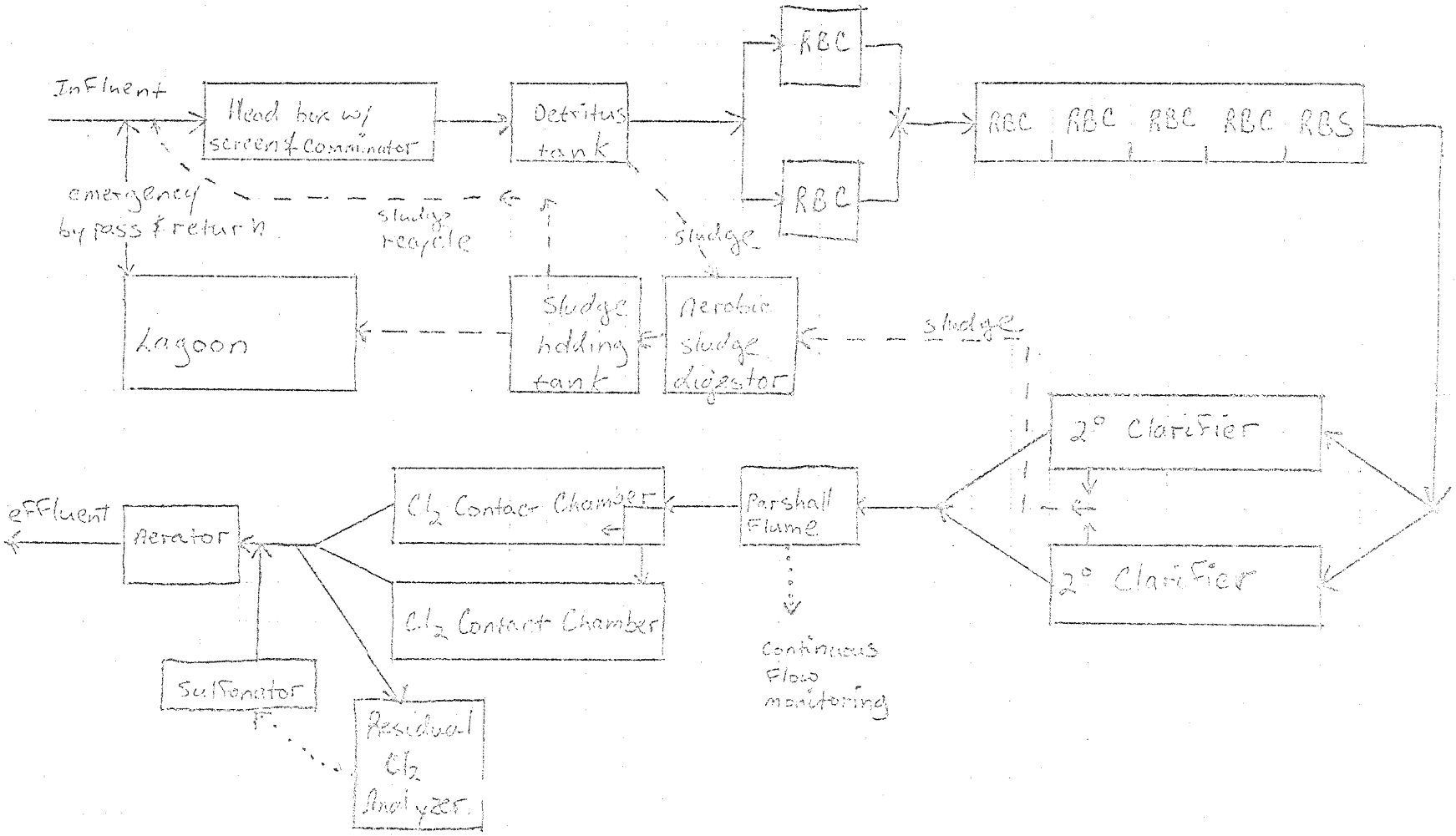
Figure 2: Battle Ground STP Flow Chart