Publication No. 76-e31

WA-24-2020

MEMORANDUM

January 27, 1976

To: Howard Steeley

From: Scott Jeane

Subject: East Point Seafoods Effluent and Receiving Water Study

Shirley Prescott and I composite sampled the effluent from East Point Seafoods during shrimp processing. The processing lines operated from 7 A.M. to 12 P.M. on September 16, 1975. The composite sampling took place between 1100 hr and 1530 hr. A receiving water survey was completed in conjunction with the effluent sampling (See Figure 1). Water use for the plant during sampling was monitored on the two city meters and extrapolated to obtain the 0.456 MGD flow.

Effluent Evaluation

The shrimp waste is characterized by high particulate matter (shrimp shells and flesh) and floating oils mainly from herring captured during trawling and crushed by unloading activities. The waste treatment process consists only of screening but large amounts of solids are removed. Comparison of influent and effluent loading values revealed percent reductions of 17% for BOD, 6% for Total Solids and minus 4% for Total Suspended Solids (TSS). The minus value for TSS is due to the inability to obtain accurate samples and sub-samples of waste with extremely high solids. The effluent loading values are (See Table 1) for BOD (14,000 lbs/day), TSS 6,000 lbs/day, NH_3-N (114 lbs/day) and T-PO_4-P (76 lbs/day).

The composite effluent pH was within permit limitations. Flow and TSS exceeded the daily average limitations but not the daily maximum. The effluent was characterized by total coliforms of >80,000 and fecal coliforms of 32,000 colonies/100 ml.

Table 1

	Influent		Effluent		Reduction
	mg/l	lbs/day	mg/l	lbs/day	%
COD	4400	16,720	4390	16,682	
BOD	4400	16,720	3652	13,870	17
NO_3-N			0.05	0.2	
NH_3-N			30.0	114.00	
T.S	4010	15,238	3760	14.288	6
TSS	1480	5,624	1540	5,852	4
T-PO_4-P			20.0	76.00	

Memo to Howard Steeley
Re: East Point Seafoods Effluent
and Receiving Water

Receiving Water Evaluation

The tidal current during the survey was from Station 4 toward Station 6 (See Figure 1). Stations 4 and 5 can be considered as background control stations. Station 1 was within 50 feet of the effluent discharged onto the beach. Stations 2 and 7 were within the waste plume as the waste plume didn't rapidly dilute and continued directly down current; Station 7 was degraded more than Station 2. Station 6 was the downstream most station.

The East Point Seafoods effluent discharges to Segment 11-24-02 of the Willapa Basin. This segment is Class A water with a total coliform (in colonies/100 ml) special condition of 240 with less than 20% of samples exceeding 1,000. Stations 5 and 6 were the only stations below 1,000 total coliform (See Table 1). Station 1 exceeded 1 million total coliform, with Stations 7 and 2 also very high. The Fecal Coliform for the above three stations ranged from >16,000 to 8,000.

The interpretation of the nutrient results are complicated but revealing. The NO_3-N and O-PO_4-P values are low compared to NH_3-N and T-PO_4-P. The high T-PO_4-P values of the effluent indicate shrimp particulate matter as the main source (Liquid detergents would also give this type of difference). Total Kjeldahl Nitrogen was not analyzed due to laboratory load level, but should also have been high.

Receiving water levels of NH_3-N and T-PO_4-P indicate a variety of factors at work. The major factors in reduction of NH_3-N are oxidation and dilution. The large numbers of bait fish feeding within the waste plume are adding to the NH_3-N level of the water. The T-PO_4-P levels are the result of reduced particulate matter by settling and fish consumption and dilution. The O-PO_4-P and NH_3-N values at Stations 1, 2 and 7 are high enough to stimulate plankton blooms. The plankton bloom stimulation should not be detrimental to the local ecology, but the NH_3-N values are approaching toxic levels.

Background DO levels at Stations 4, 5 and 6 were only slightly below water quality standards. Stations 3, 2, 1 and 7 demonstrated very depressed DO levels ranging from 5.0 to 3.3 mg/l.

Conclusions:

The receiving water and effluent parameter levels measured during this survey supported those observed by Pat Lee during his more extensive survey in August 1974.

Waste discharge permit violations were noted for flow and TSS.

Violations of the Class A receiving water standards were noted for DO and bacteria. Recommended nutrient levels were exceeded and approached toxic levels.

Water quality would be improved with repair of the broken waste discharge line and installation of a well designed diffuser.

The present receiving water conditions, with low DO and nutrient levels approaching toxic conditions, represent a potential fish kill situation if natural phenomena (wind, tide, and temperature) combine to create a stressful situation.

GSJ:ee

Figure 1

EAST POINT SEAFOODS

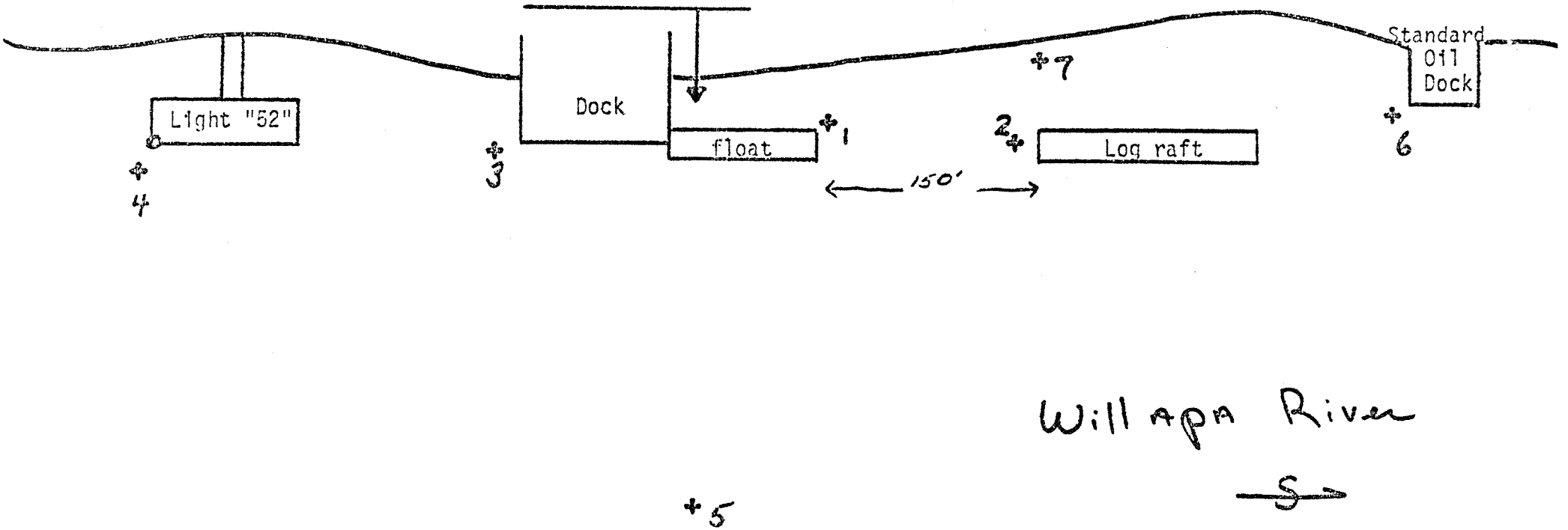

Table 2

Station No.	T. Col. Colonies/100 ml	F. Coli. Colonies/100 ml	NO_3-N	NH_3-N	O-PO_4-P	T.PO_4-P	Salinity (0/00)	DO	Temp (°C)
6	<100	40.	.10	.06	<.02	.05	26.1	5.8	17
2	38,000	8,000.	.11	.19	<.02	.09	26.2	4.7	17
7	84,000	28,000	.09	.57	.03	.22	26.1	3.8	16
1	1,300,000	<16,000	.12	.82	.04	.24	26.0	3.3	16
3	2,600	350	.10	.10	<.02	.07	26.1	5.0	17
4	1,200	150.	.10	.07	<.02	.06	26.0	5.7	17
5	300	100.	.10	.07	<.02	.05	26.1	5.9	16.5