Publication No. 72-e09

Memo to: Bill Burwell

From: Ronald C. Devitt

Subject: Seattle Rendering

Date: November 24, 1972

OBJECTIVE: The survey was conducted to determine:

1. Changes in water characteristics caused by industrial usage of river water.
2. Changes of river water quality due to industrial influence.
3. Effectiveness of the septic tank drainfield.
4. Which waters pass through the wastewater treatment system.

INTRODUCTION: On 11-8-72, I dyed drainages at Seattle Rendering. On 11-9, Bill Burwell and I dyed the remaining drains and took water samples of the river, storm runoff, and process waters.

The following is a list of sampling sites and/or discharges to the river proceeding from upstream to downstream: (refer to the attached map)

A. Duwamish River Upstream: A grab sample was taken at the edge of the riprap near the office. This sample was above any known influence from the rendering plan.

B. Storm Drain #1: This drain is located in the shop and fueling area. There is no curbing around the three fuel pumps. This is a potentially dangerous area for fuel spillage. The use of dye to locate the discharge point was unnecessary because the water used to flush the dye produced an iridiscent sheen at the river. On 11-9, with sprinkles and light rain, the runoff from this area flushed enough gas and/or diesel fuel from the line to be visible throughout the survey period. Corrective measures are necessary to prevent any additional petroleum products from entering State waters.

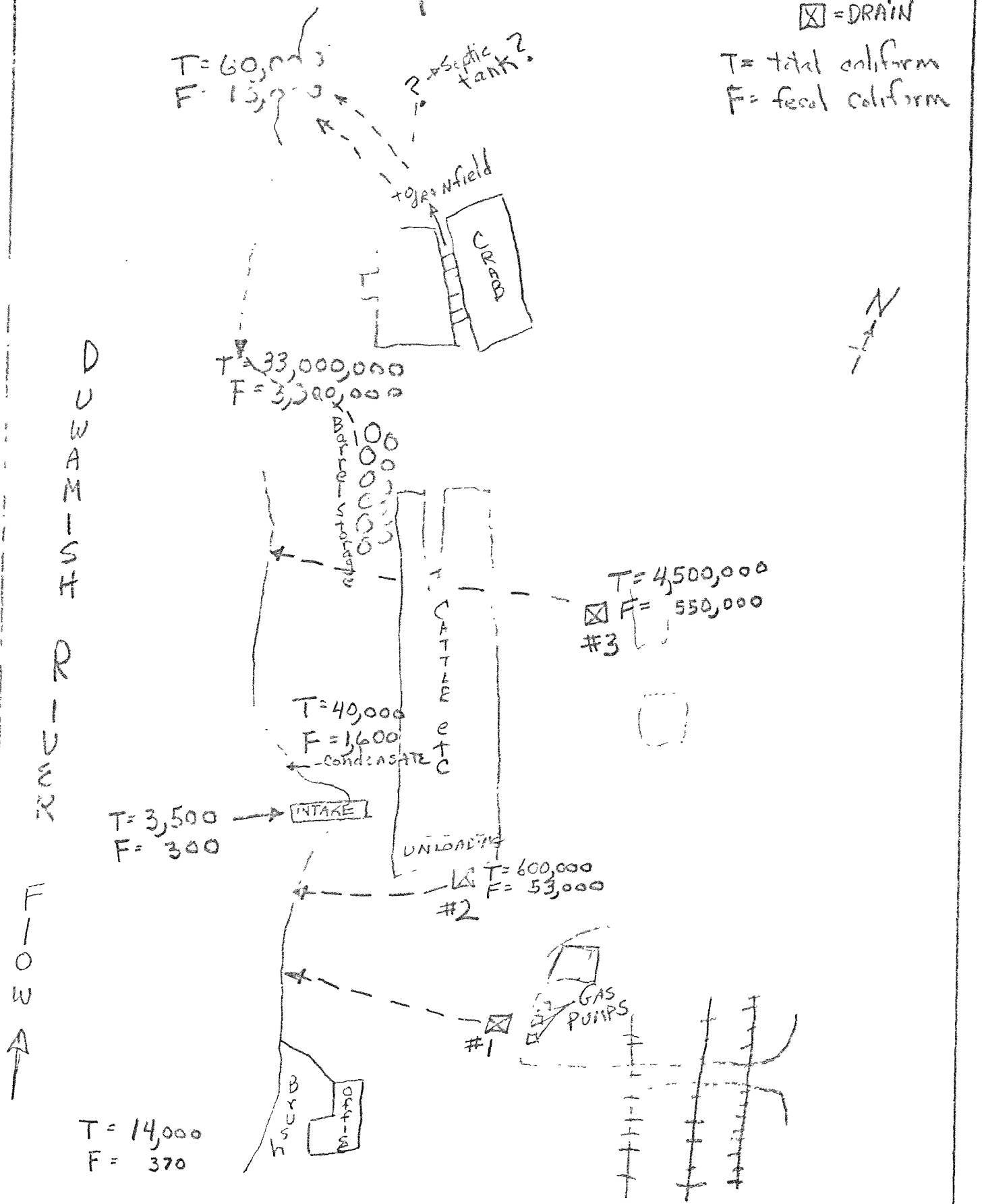
   The discharge is about 7 yards downstream of the tree stump in the riprap near the office.

C. Drain #2: This drain is located near the dead animal unloading dock at the southeast end of the main building. Discharge point was about midway between Drain #1 and the pump house intake. Samples were taken for coliform.

Seattle [illegible] 11-9-72

☒ = DRAIN

T = total coliform
F = fecal coliform



D. Raw Water Intake: A composite sample was taken to determine the effects of industrial usage by comparing to E below.

E. Cooling Water Condensate: A composite was taken to compare to the above sample. This is the water obtained at D, used, passed through a series of grease traps and returned to the river downstream. Flow was estimated at 200 gpm.

F. Storm Drain #3: This drain collects surface water from the newly asphalted area between the old and new buildings in the central plant area. Chicken feathers were observed in and around this drain. The discharge point is about 8 yards downstream of the last telephone pole. Samples were taken for COD and coliform.

G. Runoff From Barrel Storage Area: Washing of, and overflow from the stored barrels, northwest of the main processing plant, were observed to reach the river on 11-8 and 11-9. Samples were taken for COD and coliform.

H. Discharge to Septic Tank: A composite sample was taken at the end of the grease traps near the crab processing plant. This sample represents the loading to the septic tank system. Flow was estimated to be 3,000 gpd.

Assumedly, all water used by the industry, except from the aforementioned locations, passes through this final grease trap and to the septic tank system. Rhodamine dye added to the last cell in the grease trap was obvious in the river within an hour. The points of entry were perpendicular to the grease trap and at two other locations within 10 yards downstream. Evidently there is a large fracture in the septic tank and/or drainfield. There is said to be no provisions for pumping out the septic tank.

DATA

Surface Runoff

	Colonies/100mls		ppm
	Total Coliform	Fecal Coliform	COD
Drain #2	600,000	53,000	---
Drain #3	4,500,000	550,000	710
Barrel runoff	33,000,000	3,300,000	7,200

To Septic System

BOD	4160
COD	7100
pH	6.5
Conductivity	3700
Turbidity	750
NH_3-N	218
T.Kjeldahl-N	530
T.S.	3990
TNVS	1020
TSS	2200
TSNVS	120
Grease	1030

Cooling Water

	(Before) RAW H_2O	(After) Condensate
BOD	2	38
COD	18	44
pH	7.2	8.4
Conductivity	79	165
Turbidity	6	7
NH_3-N	.28	9.1
T.Kjeldahl-N	.56	12.4
T.S.	77	110
TNVS	33	68
TSS	6	10
TSNVS	2	1
Grease	.7	1.1

	#1	#2	#1	#2
T. Coliform	3,500	5,000	40,000	50,000
F. Coliform	300	600	1,600	200

Values in ppm except pH, turbidity, and conductivity

Conductivity μmhos/cm @25C
Turbidity in JTU
Coliform Colonies/100mls

Discussion of Data

The coliform quality of the Duwamish River is substandard upstream, but all the discharges from Seattle Rendering that were sampled are gross. The high volume flow from the cooling water condensate and the excessive coliform indicate that this discharge should be disinfected. The high coliform values in Drains 2 and 3 and the barrel runoff, the high COD in Drain 3 and the barrel runoff, and the low flows would indicate that these three discharges should be routed through the treatment system.

Conclusions

1. There should be curbing around the fueling area.

2. Cooling water condensate should be disinfected before discharge.

3. Drains #2 and 3 and the barrel runoff should be treated and disinfected.

4. The whole septic tank treatment system should either be repaired or replaced.

MEMORANDUM
Department of Ecology

	Check
Information	
For Action	
Permit	
Other	

TO: Pete Hildebrant, Ron Pine
Bob McCormick and Files

DATE: October 2, 1972

FROM: Bill Burwell WWB

SUBJECT: SURVEY SCOPING - SEATTLE RENDERING WORKS

REFERENCE: Letter from this office, subject the same, dated January 11, 1972.

OBJECTIVE

To determine the strength and characteristics of waste-streams from the subject plant, to better evaluate proposed treatment system and to insure compliance with a permit renewal.

BACKGROUND

Seattle Rendering Works produces protein meal for use in animal feed supplements and in fertilizers. These materials being obtained by the rendering of dead stock, butcher meat scraps, blood and fish scraps. In addition, large quantities of high value tallow are produced. The plant is in the process of enlarging to handle 400,000 lbs. per day from its 200,000 lbs. per day present capacity.

Four waste streams are involved in the operation:

1. Condensate and spray water from the cooker condensers exits the rear of the plant, passes through a grease trap and enters the Green River just downstream of their pump station.

2. Wash down water from the operation travel through a series of grease traps and is treated by septic tank and drainfield.

3. A chitin pilot plant, operated by Food Chemical Research, contributes small amounts of wash down wastes to the septic tank.

4. Surface drains carry truck wash water to the septic tank and parking lot drains go to the river via a pipe 50 ft. upstream from the water intake.

Investigation of the effluent from the condenser should be made and compared to upstream river water. Check characteristics such as BOD_5, COD, flow rate, oils and grease, ammonia, organic nitrogen, suspended solids and total coliform.

To insure connection of the storm drains, make dye checks of the loading, unloading, and wash down areas. Also check the parking lot storm drain discharge for flow rate, BOD_5, Coliform and suspended solids.

The floor washdown discharge from the main operation and chitin plant (if operating) should be sampled for the same parameters as the condensate flow.

WHAT HE WANTS TO DO IS COMPARE UPSTREAM W/DOWNSTREAM.
NO 1 intake to output

EXPECTED RESULTS

1. Information as to the characteristics of river water as compared to the spray condenser effluent.

2. Data concerning potential contribution from loading and unloading area runoff. Sample only if raining.

3. Characteristics of influent to septic tanks to be used for design purposes in upgrading treatment.

STUDY COMPLETED BY

According to your schedule.

BB:mk
10-2-72 dd

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

WATER QUALITY LABORATORY

ORIGINAL TO: R. Quinn

COPIES TO:

LAB FILES

DATA SUMMARY

Source Seattle Rendering (page 1 of 2) Collected By RCD

Date Collected 11-9-72 Goal, Pro./Obj. 3.2.23

Log Number: 7244-	67	68	69	70	71	72	73	74	75	76	STORET
Station:	DUWAMISH UPSTREAM	→ DOWN-STREAM	INTAKE 1030	→ 1230	CONDENSATE 1030	→ 1200	COW UNLOADING 1247	CENTRAL STORM 1212	BARREL RUNOFF 1210	COMP TO SEPTIC	
pH	7.2									6.5	00403
Turbidity (JTU)	5.									750.	00070
Conductivity (umhos/cm)@25°C	110.									3700	00095
COD	11.							710	7200	7100.	00340
BOD (5 day)	2									4160	00310
Total Coliform (Col./100ml)	14,000	60000	3500	5000	40000	50000	600,000	4.5×10^6	$33. \times 10^6$		31504
Fecal Coliform (Col./100ml)	370.	15,000	300	600	1600	200	53,000	550,000	3.3×10^6		31616
NO3-N (Filtered)											00620
NO2-N (Filtered)											00615
NH3-N (Unfiltered)										218.	00610
T. Kjeldahl-N (Unfiltered)										530.	00625
O-PO4-P (Filtered)											00671
Total Phos.-P (Unfiltered)											00665
Total Solids	91									3790	00500
Total Non Vol. Solids	36.									1020.	
Total Suspended Solids	4									2200.	00530
Total Sus. Non Vol. Solids	1.									120.	

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. Roll Date 11-21-72

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

WATER QUALITY LABORATORY

ORIGINAL TO:

COPIES TO:

LAB FILES

DATA SUMMARY

Source SEATTLE RENDERING (PAGE 2 of 2) Collected By

Date Collected Goal, Pro./Obj.

Log Number: 7244-	77	78	79	80	81						STORET
Station:	SEPTIC TANK GRAB, 1246	RAW INTAKE GRAB	→ COMP	COND. COMP. EFF.	→ GRAB						
pH			7.2	8.4							00403
Turbidity (JTU)			6.	7.							00070
Conductivity (umhos/cm)@25°C			74.	165.							00095
COD			18.	44							00340
BOD (5 day)			2	38.							00310
Total Coliform (Col./100ml)											31504
Fecal Coliform (Col./100ml)											31616
NO3-N (Filtered)											00620
NO2-N (Filtered)											00615
NH3-N (Unfiltered)			.28	9.1							00610
T. Kjeldahl-N (Unfiltered)			.56	12.4							00625
O-PO4-P (Filtered)											00671
Total Phos.-P (Unfiltered)											00665
Total Solids			77.	110.							00500
Total Non Vol. Solids			33.	68.							
Total Suspended Solids			6	10.							00530
Total Sus. Non Vol. Solids			2.	2.							
GREASES	1030	0.7			1.1						

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. Roll Date 11-21-72