

TO Ron Robinson, Mike Price

FROM Jim Armstrong

SUBJECT Orting Sewage Lagoon Survey

DATE August 7, 1973



On Wednesday, July 25, 1973, a survey was done on the Orting Sewage Lagoon. The survey lasted from 0930 hours to 1730 hours with samples taken every half hour.

The plant was well fenced and the grounds were in good shape.

The BOD reduction was 94% and total solids reduction was 50%. D.O.'s at the influent were 0 and .1 ppm. The effluent D.O.'s ranged from 22.6 ppm up to 38.2 ppm. These D.O.'s along with the green color of the water indicated large amounts of algae were present.

The pH of 8.6 at the effluent was probably due to the algae, too.

At 1930 hours the pH went from 6.6 to 7.6 and the conductivity went from 600 to 1500. At 1500 hours the conductivity increased to 1750 by 1530 hours it had dropped down to 850.

A large contributor to the sewage received by this plant is a cheese factory located in Orting.

JA:bjj

STP SURVEY REPORT FORM
(EFFICIENCY STUDY)

City Orting Plant Type Lagoon Population 1632 Design 3955
 Served Capacity
 Receiving Water Carbon River Engineer Slaeven and Kors
 Date 7/25/73 Survey Period 0930-1730 Survey Personnel Jim Armstrong
 Comp. Sampling Frequency 1/2 hour Weather Conditions Clear, Hot
 (last 48 hours)
 Sampling Alequot 600 mls.

PLANT OPERATION

Total Flow Not recorded How Measured _____
 Max. (Flow) NA Time of Max. NA Min. NA Time of Min. NA
 Pre Cl₂ NA #/day Post Cl₂ 10.9 #/day

FIELD RESULTS

Influent

Effluent

Determinations	Influent				Effluent			
	Max.	Min.	Mean	Median	Max.	Min.	Mean	Median
Temp. °C	24	12	17.8	18	28	16	21.8	24
pH	7.6	6.6		6.8	8.8	7.2		8.3
Conductivity (umhos/cm)	1750	450	785	650	1000	700	823.5	900
Settleable Solids	14	7	10.7	7	<.1	<.1	<.1	<.1

LABORATORY RESULTS ON COMPOSITE IN PPM

Laboratory Number	Influent	Effluent	% Reduction
5-Day BOD	>600	37	94
COD	1160	187	84
T.S.	1157	576	50
T.N.V.S.	480	403	16
T.S.S.	351	75	79
N.V.S.S.	45	9	80
pH	7.2	8.6	
Conductivity	1080	1000	
Turbidity	100	30	70

Orting

BACTERIOLOGICAL RESULTS

Na₂S₂O₃ added to sample previous to 1000 sampling min.

LAB #	SAMPLING TIME	COLONIES/100 MLS (NF)	Cl Residual	
			ppm	(after secs)
44	1110	<100		
45	1417	<100	.4	3 min.
46	1618	<100	.4	3 min.
47	1800	<500	.2	3 min.

Operator's Name Oscar Engfer Phone # 206-893-2219

Comments: _____

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

WATER QUALITY LABORATORY

ORIGINAL TO:
J. ARMSTRONG
COPIES TO:
R. DEVLIN
.....
LAB FILES

DATA SUMMARY

Source ORTING STP

Collected By J.A.

Date Collected 7-25

Goal, Pro./Obj. _____

Log Number:	73-	2742	43	44	45	46	47					STORET
Station:	INF	EFF	1110	1417	1618	1800						
pH	7.2	8.6										00403
Turbidity (JTU)	100	30										00070
Conductivity (umhos/cm)@25°C	1080	1000										00095
COD	1160	187										00340
BOD (5 day)	>600	37										00310
Total Coliform (Col./100ml)	-	-	EST 600	EST 400	1800	2500						31504
Fecal Coliform (Col./100ml)	-	-	<100	<100	<100	<500						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	1157	576										00500
Total Non Vol. Solids	480	403										
Total Suspended Solids	351	75										00530
Total Sus. Non Vol. Solids	45	9										

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 P. Roll Date 8-2-73

U.S. DEPARTMENT OF THE INTERIOR
 FEDERAL WATER POLLUTION CONTROL ADMINISTRATION
 SEWAGE TREATMENT PLANT OPERATION AND MAINTENANCE
 PRACTICES QUESTIONNAIRE

FORM APPROVED
 BUDGET BUREAU NO. 42-R15

CHECK ONE: 1ST AUDIT RE-AUDIT
 DATE OF AUDIT: 7/25
 PLANT DESCRIPTION CODE (For Official Use Only): Lagoon

A. GENERAL INFORMATION

1. PROJECT (State, Number): _____ SCOPE OF PROJECT (new plant, additions, etc.): New Plant
 2. PLANT LOCATION (City, county): Oxford, Tenn IDENTIFICATION OF AREAS SERVED: City

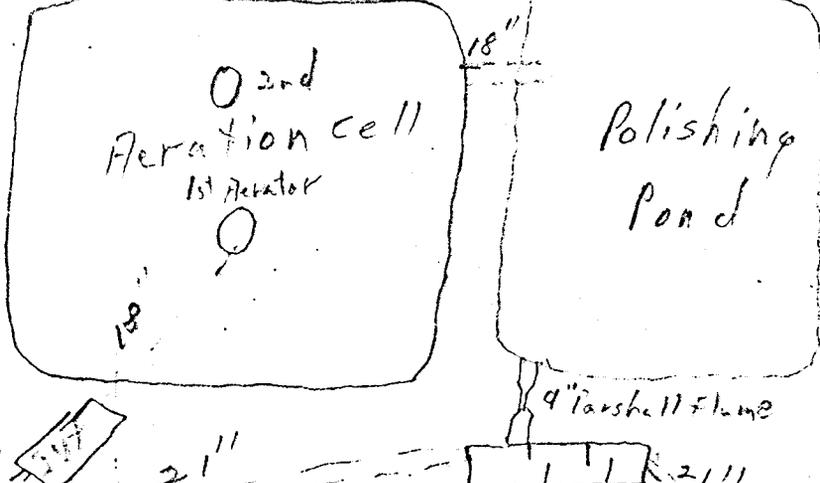
3. POPULATION
 3A. FRACTION OF AREA POPULATION SERVED (%): 99%
 3B. PLANT DESIGN (population equivalent): 2000 (see 10/20)
 3C. SERVED BY PLANT (domestic): 1632

4. TYPE OF COLLECTION SYSTEM
 4A. COMBINED SEPARATE BOTH
 4B. ESTIMATED FLOW CONTRIBUTED BY SURFACE OR GROUND WATER (infiltration, mgd): _____

5. YEAR COMMUNITY BEGAN SEWAGE TREATMENT: 1930s
 6. YEAR PRESENT SYSTEM PLACED IN OPERATION
 6A. SEWER: 305 6B. PLANT: 1942 6C. ANCILLARY WORKS: _____

7A. SIZE OF PLANT SITE (acres): 7 7B. APPROXIMATE AREA LEFT FOR EXPANSION (acres): None

8A. IN THE SPACE PROVIDED BELOW FURNISH A SIMPLIFIED FLOW DIAGRAM OR A WRITTEN DESCRIPTION OF THE PLANT UNITS IN FLOW SEQUENCE. INCLUDE THE METHOD OF ULTIMATE SEWAGE DISPOSAL. SHOW APPROXIMATE SURFACE AREA OF STABILIZATION PONDS AND NUMBER OF CELLS. INDICATE WHETHER FLOW TO AND FROM PLANT IS BY PUMPING OR GRAVITY.



8B. NOTE ANY SIGNIFICANT OR UNIQUE PROCESSING CONDITIONS:
O₂

9. RECEIVING STREAM

9A. NAME OF STREAM: Carbon River

9B. STREAM FLOW IS: PERENNIAL INTERMITTENT NATURAL REGULATED
 INTERSTATE INTRASTATE
 COASTAL

B. CURRENT PERFORMANCE AND PLANT LOADING INFORMATION

1A. ANNUAL AVERAGE DAILY FLOW RATE (mgd): _____
 1B. PEAK FLOW RATE (mgd)
 DRY WEATHER: _____ WET WEATHER: _____
 1C. MINIMUM FLOW RATE (mgd): _____

2. AVERAGE BOD OF RAW SEWAGE (5 DAY 20°C) (ppm): 1 sample 21.6 fil 31.3 in fil water
 3. AVERAGE SUSPENDED SOLIDS OF RAW SEWAGE (mg/l): INF 5.36 EFF. 68 Nov. 22 3

4. AVERAGE SUSPENDED SOLIDS OF RAW SEWAGE (mg/l): _____
 5. AVERAGE COLIFORM DENSITY OF RAW SEWAGE (ppm): _____

5. ANNUAL AVERAGE PLANT REDUCTION

6A. BOD (%) 96.5 6B. SETTLABLE SOLIDS (%) 1/2 in 6C. SUSPENDED SOLIDS (%) _____ 6D. COLIFORM DENSITY (%) _____

7A. DOES PLANT HAVE STANDBY POWER GENERATOR FOR MAJOR PUMPING FACILITIES? YES NO

7B. ADEQUATE ALARM SYSTEM FOR POWER OR EQUIPMENT FAILURES? YES NO

8. ARE CHLORINATION FACILITIES PROVIDED? YES NO
IF YES, ANSWER 8A THRU G

IF YES, IS CHLORINATION CONTINUOUS? YES NO
IF NO, EXPLAIN REASON FOR INTERMITTENT CHLORINATION

8A. PURPOSE OF CHLORINATION

Kill Bacteria

8B. TYPE OF CHLORINATOR
Fisher + 1 year Vacuum type

8C. POINT OF APPLICATION OF CHLORINE
In 5' or less of pipe

8D. CAN BYPASSED SEWAGE BE CHLORINATED?
 YES NO

8E. AVERAGE FEED RATE OF CHLORINE (lb/day)
10.9

8F. CHLORINE RESIDUAL IN EFFLUENT
.578 PPM AT END OF 2-5 MINUTES

8G. MINIMUM SUPPLY OF CHLORINE STORED ON PREMISES (lb)
2 tanks 150 lb each 300 lb

9. ARE FACILITIES PROVIDED FOR COMPLETE BYPASS OF RAW SEWAGE?
 YES NO IF YES, ANSWER A THRU G BELOW, ANSWER H IN EITHER CASE.

9A. FREQUENCY (times monthly)

9B. AVERAGE DURATION (hours)

9C. REASON FOR BYPASSING

9D. ESTIMATED FLOW RATE DURING BYPASS IS
 WITHIN HYDRAULIC CAPACITY OF PLANT
 BEYOND HYDRAULIC CAPACITY OF PLANT BY

9E. DOES SEWAGE OVERFLOW IN DRY WEATHER?
 YES NO

9F. TYPE OF DIVERSION STRUCTURE

9G. AGENCIES NOTIFIED OF BYPASS ACTION

9H. DO OPERATORS HAVE OPTION TO BYPASS INDIVIDUAL PLANT UNITS? (If no, has this caused any operational problems?)
 YES NO

10A. ARE BACK FLOW DEVICES PROVIDED AT ALL CONNECTIONS TO CITY WATER SUPPLY? (If no, explain)
 YES NO

10B. CHECK TYPE OF BACK FLOW PREVENTION DEVICE
 DOUBLE CHECK VALVE PRESSURE OPERATED PHYSICAL DISCONNECT OTHER(specify)

11. USES OF TREATMENT PLANT EFFLUENT

12. USES OF RECEIVING STREAM WITHIN 10 MILES OF OUTFALL

Recreation, Irrigation

13. HAVE THERE BEEN ANY ODOR COMPLAINTS BEYOND THE PLANT PROPERTY? (If yes, explain)
 YES NO

14. OBSERVED APPEARANCE AND CONDITION OF EFFLUENT, RECEIVING STREAM, OR DRAINAGE WAY
Greenish color from algae, carbon colored from glacial flow

15. STABILIZATION PONDS

A. WEEDS CUT AND VEGETATIVE GROWTH IN PONDS ELIMINATED?
 YES NO

D. BANKS AND CURBS MAINTAINED (erosion etc.)?
 YES NO

C. FENCING AND MARKING - POLLUTED WATER? SIGNS PRESENT AND IN GOOD REPAIR?
 YES NO

D. FREQUENCY OF INSPECTION BY OPERATOR
1-2 mo.

E. WATER DEPTH (feet)
Lagoon 8 FT
POL. ponds 9 FT
HIGH LOW MEDIUM

F. ADEQUATE CONTROL OF DEPTH?
gravity
 YES NO

G. SEEPAGE REPORTED?
 YES NO

H. ANY REPORTS OF GROUND WATER CONTAMINATION FROM POND (If yes, give details)?
 YES NO

I. MOSQUITO BREEDING PROBLEM? (If yes, name of species if known)
Site 2-100
 YES NO

J. CAN SURFACE RUN-OFF ENTER POND?
 YES NO

C. SUPERVISORY SERVICES

1. IS A CONSULTING ENGINEER RETAINED OR AVAILABLE FOR CONSULTATION ON OPERATING AND MAINTENANCE PROBLEMS?
 YES NO IF YES IS IT ON: CONTINUING BASIS OR UPON REQUEST BASIS
IF CONTINUING BASIS, WHAT IS THE FREQUENCY OF VISITS: 1 mo.

2. DO OPERATORS AND OTHER PERSONNEL ROUTINELY ATTEND SHORT COURSES, SCHOOLS OR OTHER TRAINING ACTIVITIES?
 YES NO
IF YES, CITE COURSE SPONSOR AND DATE OF LAST COURSE ATTENDED
Dept of Ecology 6/9 June
IF NO, DO YOU KNOW OF ANY COURSES AVAILABLE TO SERVE THIS AREA?

3A. ARE ALL EQUIPMENT AND PARTS OF THE PRESENT PLANT STILL IN OPERATION? YES NO (If no, explain)

B. ARE PROCESSING UNITS OPERATING AT DESIGN EFFICIENCY? YES NO (If no, explain)

Aerators kick out in hot weather

4. HAVE THERE BEEN ANY DIFFICULTIES WITH THE SEWAGE TREATMENT PLANT?

A. STRUCTURAL YES NO (If yes explain)

B. MECHANICAL YES NO (If yes, explain)

Aerators

C. OPERATIONAL YES NO (If yes, explain)

D. BASED ON OPERATING EXPERIENCE TO DATE WHAT IF ANY CHANGES WOULD YOU RECOMMEND TO IMPROVE OPERATION OF THE PLANT?

Large control room
Improve Grit chamber

5. ARE OPERATING RECORDS MAINTAINED? YES NO
 (If maintained, check general items included)

REPORTED? YES NO
 TO WHOM? *Dept. of Health, Fire*

FREQUENCY	WEATHER	FLOW	SLUDGE HANDLED	CHEMICALS USED	DIGESTER	GPIT HANDLED	ELEC. USED	COST DATA	AIR USED	MAIN-TENANCE	OTHER
DAILY	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>									
WEEKLY						<input checked="" type="checkbox"/>					
MONTHLY											
ANNUALLY											

6. ARE LABORATORY RECORDS MAINTAINED? (check appropriate box)

NOT AT ALL DAILY WEEKLY MONTHLY ANNUALLY

IF MAINTAINED CHECK FORM OF RECORD BELOW:

LOG BOOK TABULAR SHEET SEPARATE BY OPERATION CONTROL CHARTS GRAPHS

WHAT PLANT AND/OR LABORATORY EQUIPMENT, GAGES AND METERS ARE CALIBRATED PERIODICALLY?
Flow meter

7. IS LABORATORY TESTING ADEQUATE FOR THE CONTROL REQUIRED FOR THIS SIZE AND TYPE OF PLANT?

YES NO (If no, explain) *No BOD, coliform*

8. INDUSTRIAL WASTES DISCHARGED TO MUNICIPAL SYSTEM

A. NUMBER AND TYPES OF INDUSTRIES DISCHARGING TO SYSTEMS
Cheese Factory

B. POPULATION EQUIVALENT (BOD) OF INDUSTRIAL WASTES (pe)
271 lbs per day 1355

C. POPULATION EQUIVALENT (SS) OF INDUSTRIAL WASTES (pe)

D. VOLUME OF INDUSTRIAL WASTES (mgd)

E. COMPOSITION AND CHARACTERISTICS OF INDUSTRIAL WASTES
Cheese processing

F. MAIN DIFFICULTY EXPERIENCED WITH INDUSTRIAL WASTE (explain)

Color

9. HAVE INDUSTRIAL EFFLUENT PROBLEMS BEEN SOLVED? YES NO (If yes, how?)

9A. METHOD OR METHODS USED TO ASSESS INDUSTRIAL WASTE TREATMENT COST (check appropriate box)

NO CHARGE BY CITY PROPERTY TAX WATER USE ASSESSMENT CHARGE BASED ON FLOW
 CHARGED BASED ON BOD CHARGE BASED ON SS OTHER METHODS (describe)

COMMENT ON HOW CHARGE IS COLLECTED (fixed charge, sliding scale, etc.)

9B. IS INDUSTRIAL WASTE ORDINANCE IN EFFECT AND ENFORCED? YES NO

10. WHO PROVIDED INITIAL INSTRUCTION IN THE OPERATION OF THE PLANT?

Consulting Engineers

11. IS A MANUAL OF PRACTICE OR INSTRUCTIONS AVAILABLE? YES NO

IF YES, WHO WROTE AND PROVIDED IT?
State Dept. of Health

12. ESTIMATE OF MAN-HOURS PER WEEK DEVOTED TO LABORATORY WORK AND MAINTENANCE OF RECORDS AND REPORTS
15 Hrs.

D. PLANT PERSONNEL - Annual Average Staff for Most Recent Year Reported in Section "F"

JOB CATEGORY	NUMBER	TOTAL MAN-HOURS PER WEEK	TOTAL NUMBER CERTIFIED OR LICENSED	RANGE IN YEARS EMPLOYED AT PRESENT PLANT	RANGE IN YEARS OF EXPERIENCE IN TREATMENT
1. SUPERINTENDENT					
2. OPERATORS	<i>1</i>	<i>15</i>	<i>1</i>	<i>9 MOS.</i>	<i>9 MOS.</i>
3. LABORATORY TECHNICIANS					
4. LABORERS					
5. PART-TIME LABORERS	<i>2</i>	<i>2+</i>	<i>0</i>	<i>4 MOS</i>	
6. TOTAL					

E. LABORATORY CONTROL

Enter test codes opposite appropriate items. If any of the below tests are used to monitor industrial wastes place an "X" in addition to the test code.

CODES

1 - 7 or more per week 3 - 1, 2, or 3 per week 5 - 2 or 3 per month 7 - Quarterly 9 - Annually
 2 - 4, 5 or 6 per week 4 - as required 6 - 1 per month 8 - Semi-Annually

ITEM	RAW	PRIMARY EFFLUENT	MIXED LIQUOR	FINAL	SLUDGE		DIGESTOR	RECEIVING STREAM
					RAW	SUPER-NATANT		
1. BOD								
2. SUSPENDED SOLIDS								
3. SETTLEABLE SOLIDS	3			3				
4. SUSPENDED VOLATILE								
5. DISSOLVED OXYGEN	3	lagoon		3				3
6. TOTAL SOLIDS								
7. VOLATILE SOLIDS								
8. pH	1			1				
9. TEMPERATURE	3			3				
10. COLIFORM DENSITY								
11. RESIDUAL CHLORINE				1				
12. VOLATILE ACIDS								
13. M. B. STABILITY	5	lagoon		5				
14. ALKALINITY								
15.								
16.								
17.								
18.								
19.								

F. OPERATION AND MAINTENANCE COST FOR PLANT

YEAR OF OPERATION	SALARIES/WAGES	ELECTRICITY	CHEMICALS	MAINTENANCE	OTHER ITEMS	TOTAL
MOST CURRENT YEAR 19						
PRIOR YEAR 19						
PRIOR YEAR 19						
PRIOR YEAR 19						

EVALUATION PERFORMED BY	TITLE	ORGANIZATION
J.C. Armstrong	Environmental Tech. II	DOE

INFORMATION FURNISHED BY	TITLE	ORGANIZATION	DATE
Oscar Eng Fer	Plant Operator	City of Olathe	7/25