

TO: John Arnquist, John Hodgson, Ron Devitt,
Ron Pine & Files

FROM: Darrel Anderson

SUBJECT: Richland STP

DATE: October 10, 1973

State of
Washington
Department of
Ecology



On September 12, 1973, I conducted an efficiency survey at the City of Richland STP. Since there are two plants at the site, I chose to do II because the bulk of the sewage flows through it.

A definite odor problem exists and numerous complaints have been made.

Total solids reduction was 35%, total non-volatile solids was 20%, with COD at 75% and 5-day BOD at 74%. Fecal coliform did not reach past 1000/100ml.

DA:jmh

STP SURVEY REPORT FORM

(EFFICIENCY STUDY)

City Richland, Plant Plant Type Secondary Population 27,000 Design Unk.
 #2 Served Capacity
 Receiving Water Yakima River via ditch Engineer City Engineer of Richland
 Date Sept. 12, 1973 Survey Period 0830-1600 hours Survey Personnel D.L. Anderson
 Comp. Sampling Frequency 1/2 hour Weather Conditions Clear-hot
 (last 48 hours)
 Sampling Alequot 1000 ml.

PLANT OPERATION

Total Flow 288,000 MGD How Measured flow meter at STP
 Max. (Flow) 2.5 GPM Time of Max. 1100-1400 hrs. Min. 1.5 Time of Min. 0830
 Pre Cl₂ None #/day Post Cl₂ 180 #/day

FIELD RESULTS

Determinations	Influent				Effluent			
	Max.	Min.	Mean	Median	Max.	Min.	Mean	Median
Temp. °C	25.2	22.2	22.6	24.0	25.6	22.7	23.9	23.9
pH	7.8	7.0	7.3	7.4	7.4	7.2	7.3	7.4
Conductivity (umhos/cm)	Undetermined				Undetermined			
Settleable Solids	10.0	1.0	6.3	8.0	Trace			

LABORATORY RESULTS ON COMPOSITE IN PPM

Laboratory Number	Influent	Effluent	% Reduction
73-3353		3354	
5-Day BOD	110	<40	70.64
COD	287	61	79
T.S.	477	311	35
T.N.V.S.	242	194	20
T.S.S.	181	26	86
N.V.S.S.	28	0	100
pH	7.4	7.6	
Conductivity	680	610	
Turbidity	60	13	

Richland STP Plant #2

BACTERIOLOGICAL RESULTS

Na₂S₂O₃ added to sample Before _____ sample was taken _____ min.

LAB #	SAMPLING TIME	COLONIES/100 MLS (MF)	Cl Residual 3 Min.	
			ppm	
73-55	1000	1000	1.0	+2.0
56	1100	1000	1.0	+2.0
57	1515	1000	1.0	+2.0

Operator's Name Don Dean

Phone # 943-9161

Comments: _____

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
 WATER QUALITY LABORATORY

ORIGINAL TO:
D. B. ANDERSON
 COPIES TO:

 LAB FILES

DATA SUMMARY

Source Richland STP
 Date Collected 9-12-73

Collected By D.A.
 Geol. Pro./Obj. _____

Log Number:	<u>73-3855 54 55 56 52</u>					STORET
Station:	<u>1NF</u>	<u>EFF</u>	<u>EFF</u>	<u>EFF</u>	<u>EFF</u>	
			<u>1000</u>	<u>1100</u>	<u>1515</u>	
pH	<u>7.4</u>	<u>7.6</u>				<u>03403</u>
Turbidity (JTU)	<u>60</u>	<u>13</u>				<u>05070</u>
Conductivity (umhos/cm) ^{25°C}	<u>680</u>	<u>610</u>				<u>00095</u>
COD	<u>287</u>	<u>61</u>				<u>00340</u>
BOD (5 day)	<u>110</u>	<u>40</u>				<u>00310</u>
Total Coliform (Col./100ml)	-	-	<u><1000</u>	<u><1000</u>	<u><1000</u>	<u>31504</u>
Fecal Coliform (Col./100ml)	-	-	<u><1000</u>	<u><1000</u>	<u><1000</u>	<u>31616</u>
NO3-N (Filtered)						<u>00620</u>
NO2-N (Filtered)						<u>00615</u>
NH3-N (Unfiltered)						<u>00610</u>
N. Kjeldahl-N (Unfiltered)						<u>00625</u>
O-PO4-P (Filtered)						<u>00671</u>
Total Phos.-P (Unfiltered)						<u>00665</u>
Total Solids	<u>477</u>	<u>311</u>				<u>00500</u>
Total Non Vol. Solids	<u>242</u>	<u>194</u>				
Total Suspended Solids	<u>181</u>	<u>26</u>				<u>00530</u>
Total Sus. Non Vol. Solids	<u>28</u>	<u>0</u>				

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 9-24-73

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

FORM APPROVED
BUDGET BUREAU NO. 42-11527

1-2-1973

CHECK ONE: 1ST AUDIT RE-AUDIT DATE OF AUDIT: **9-12-73** PLANT DESCRIPTION CODE (For Official Use Only)

A. GENERAL INFORMATION

1. PROJECT (State, Number) _____ SCOPE OF PROJECT (new plant, additions, etc.) _____
 2. PLANT LOCATION (City, county) **RICHLAND, BENTON** IDENTIFICATION OF AREAS SERVED **CITY OF RICHLAND**

3. POPULATION

3A. FRACTION OF AREA POPULATION SERVED (%) **whole area** 3B. PLANT DESIGN (population equivalent) **11 MGD** 3C. SERVED BY PLANT (domestic) **27,000 Approx**

4. TYPE OF COLLECTION SYSTEM

4A. COMBINED SEPARATE BOTH 4B. ESTIMATE FLOW CONTRIBUTED BY SURFACE OR GROUND WATER (infiltration, m³/d) **None**

6. YEAR PRESENT SYSTEM PLACED IN OPERATION

5. YEAR COMMUNITY BEGAN SEWAGE TREATMENT **#1 1943** 6A. SEWER **1948** 6B. PLANT **1948** 6C. ANCILLARY WORKS **1948**
(-1948)

7A. SIZE OF PLANT SITE (acres) **10** 7B. APPROXIMATE AREA LEFT FOR EXPANSION (acres) **2**

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 SLUDGE DISPOSAL. SHOW APPROPRIATE SURFACE AREA OF STABILIZATION PONDS AND NUMBER OF CELLS. INDICATE WHETHER FLOW TO AND FROM PLANT IS BY PUMPING OR GRAVITY.
PLANT #2
SEE ATTACHED pamphlet

8B. NOTE ANY SIGNIFICANT OR UNIQUE PROCESSING CONDITIONS.

9. RECEIVING STREAM

9A. NAME OF STREAM **COLUMBIA RIVER - VIA YAKIMA**
 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) **2.5 - 3.0 mgd** 1B. PEAK FLOW RATE (mgd) 1C. MINIMUM FLOW RATE (mgd)
 DRY WEATHER WET WEATHER
 2. AVERAGE BOD OF RAW SEWAGE (3 DAY 20°C) (mg/l) **178 Post 3 weeks** 3. AVERAGE SETTLEABLE SOLIDS OF RAW SEWAGE (mg/l) **10 Post 3 weeks**
 4. AVERAGE SUSPENDED SOLIDS OF RAW SEWAGE (mg/l) **N/A** 5. AVERAGE COLIFORM DENSITY OF RAW SEWAGE (mpn/100 ml) **N/A**

5. ANNUAL AVERAGE PLANT PERFORMANCE

6A. BOD (%) _____ 6B. SETTLEABLE SOLIDS (%) _____ 6C. SUSPENDED SOLIDS (%) _____ 6D. COLIFORM (%) _____

7A. DOES PLANT HAVE STANDBY POWER GENERATOR FOR MAJOR PUMPING FACILITIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	7B. ADEQUATE ALARM SYSTEM FOR PUMP OR EQUIPMENT FAILURES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
8. ALL CHLORINATION FACILITIES PROVIDED? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, ANSWER 8A THRU G	IF YES, IS CHLORINATION CONTINUOUS? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF NO, EXPLAIN REASON FOR INTERMITTENT CHLORINATION

8A. PURPOSE OF CHLORINATION
DISINFECTION

8B. TYPE OF CHLORINATOR
WALLACE F. TIERNAN - "V" NOTCH

8C. POINT OF APPLICATION OF CHLORINE <i>Chamber</i>	8D. CAN BYPASSED SEWAGE BE CHLORINATED? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
8E. AVERAGE FEED RATE OF CHLORINE (lb/day) <i>180</i>	8F. CHLORINE RESIDUAL IN EFFLUENT <i>20 ppm AT END OF 3 MINUTES</i>

8G. MINIMUM SUPPLY OF CHLORINE STORED ON PREMISES (lb)
3 cylinders

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) <i>None</i>	9B. AVERAGE DURATION (hours) <i>None</i>	9C. REASON FOR BYPASSING <i>None</i>
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9D. ESTIMATED FLOW RATE DURING BYPASS IS <input type="checkbox"/> WITHIN HYDRAULIC CAPACITY OF PLANT <i>under</i> <input type="checkbox"/> BEYOND HYDRAULIC CAPACITY OF PLANT BY	9E. DOES SEWAGE OVERFLOW IN DRY WEATHER? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
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9F. TYPE OF DIVERSION STRUCTURE
VALVE

9H. DO OPERATORS HAVE OPTION TO BYPASS INDIVIDUAL PLANT UNIT? (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 *one - digester.*

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

11. USES OF TREATMENT PLANT EFFLUENT
NONE

12. USES OF RECEIVING STREAM WITHIN 10 MILES OF OUTFALL
SPORT fishing - Irrigation - water skiing - swimming

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

13. STABILIZATION PONDS

A. WEEDS CUT AND VEGETATIVE GROWTH IN PONDS ELIMINATED? <input type="checkbox"/> YES <input type="checkbox"/> NO		D. DIRT AND DIRLS MAINTAINED (erosion etc.)? <input type="checkbox"/> YES <input type="checkbox"/> NO	
C. FENCING AND "FACILITY = POLLUTED WATER" SIGNS PRESENT AND IN GOOD REPAIR? <input type="checkbox"/> YES <input type="checkbox"/> NO		E. FREQUENCY OF INSPECTION BY OPERATOR	
E. WATER DEPTH (feet) _____ HIGH _____ LOW _____ MEDIUM			
F. ADEQUATE CONTROL OF DEPTH? <input type="checkbox"/> YES <input type="checkbox"/> NO		G. SEEPAGE REPORTED? <input type="checkbox"/> YES <input type="checkbox"/> NO	
H. ANY REPORTS OF LIQUID WATER CONTAMINATION FROM POND? (If yes, give details?) <input type="checkbox"/> YES <input type="checkbox"/> NO			
I. MOSQUITO BREEDING PROBLEM? <input type="checkbox"/> YES <input type="checkbox"/> NO	H. YES, NAME OF SPECIES IF KNOWN		J. CAN SURFACE RUN-OFF ENTER POND? <input type="checkbox"/> YES <input type="checkbox"/> 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?

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
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)

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)

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?
REPLACEMENT OF FILTER media via Bio-Filter

5. ARE OPERATING RECORDS MAINTAINED? (If not maintained, check general items included) YES NO REPORTED TO WHOM? YES NO
HEALTH DEPT.

FREQUENCY	WEATHER	FLOW	SLUDGE HANDLED	CHEMICALS USED	DIGESTER	GRIT HANDLED	ELEC. USED	COST DATA	AIR USED	MAINTENANCE	OTHER
DAILY		✓	✓	✓	✓						
WEEKLY					✓						
MONTHLY					✓						
ANNUALLY											

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

7. IS LABORATORY TESTING ADEQUATE FOR THE CONTROL REQUIRED FOR THIS SIZE AND TYPE OF PLANT?
 YES NO (If no, explain) BECAUSE OF OLD EQUIPMENT - NEW EQUIPMENT ON ORDER

6. INDUSTRIAL WASTES DISCHARGED TO MUNICIPAL SYSTEM:	A. NUMBER AND TYPES OF INDUSTRIES DISCHARGING TO SYSTEMS
B. POPULATION EQUIVALENT (PDE) OF INDUSTRIAL WASTES (pe)	C. POPULATION EQUIVALENT (PE) OF INDUSTRIAL WASTES (pe)
D. VOLUME OF INDUSTRIAL WASTES (mgd)	E. COMPOSITION AND CHARACTERISTICS OF INDUSTRIAL WASTES
F. MAIN DIFFICULTY EXPERIENCED WITH INDUSTRIAL WASTE (explain)	

NONE NONE NONE NONE
N/A

8. HAVE INDUSTRIAL EFFLUENT PROBLEMS BEEN SOLVED? YES NO (If yes, how?)
N/A

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.)
N/A

9B. IS INDUSTRIAL WASTE ORDINANCE IN EFFECT AND ENFORCED? YES NO
 10. WHO PROVIDED INITIAL INSTRUCTION IN THE OPERATION OF THE PLANT?

11. IS A MANUAL OF PRACTICE OR INSTRUCTIONS AVAILABLE? YES NO PROCESS OF COMPLETION IF YES, WHO WROTE AND PROVIDED IT? STEVENS THOMPSON & COMPANY, INC
 12. ESTIMATE OF MAN-HOURS PER WEEK DEVOTED TO LABORATORY WORK AND MAINTENANCE OF RECORDS AND REPORTS

32 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	1				
2. OPERATORS					
3. LABORATORY TECHNICIANS					
4. LABORERS					
5. PART-TIME LABORERS					
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	3	3		3				
2. SUSPENDED SOLIDS	3	3		3				
3. SETTLEABLE SOLIDS	2	2		3				
4. SUSPENDED VOLATILE	6	6		6				
5. DISSOLVED OXYGEN	2	2		2				
6. TOTAL SOLIDS					5	6	5	
7. VOLATILE SOLIDS					5	6	5	
8. pH	2	2		2	3	2	2	
9. TEMPERATURE	2				3	2	1	
10. COLIFORM DENSITY								
11. RESIDUAL CHLORINE				1				3
12. VOLATILE ACIDS						5	5	
13. M. D. STABILITY								
14. ALKALINITY						5	5	
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
DARREL L. ANDERSON	ENVIRO TECH II	DOE

INFORMATION FURNISHED BY	TITLE	ORGANIZATION	DATE
Pete REILAND	LABORATORY OPER	City of Richland	9-12-73
DON DEAN	SUPERVISOR - STP	" " "	9-12-73

G. NOTATIONS BY EVALUATOR

1. ADDITIONAL COMMENTS (If remarks refer to a particular item, identify by number)

Security - very poor

2. GENERAL COMMENTS ON HOUSEKEEPING AND MAINTENANCE

very good

3. REQUIREMENTS OF HIGHER AUTHORITY

3A. DOES THE PLANT PROVIDE THE DEGREE OF TREATMENT PRESENTLY REQUIRED BY THE STATE? (If no, explain)

YES NO

3B. ARE THERE ANY PENDING ACTIONS (enforcement conferences, change in water quality standards, etc.) THAT WOULD REQUIRE UPGRADING OF TREATMENT BY THIS PLANT?

YES NO (If yes, explain)

3C. NUMBER OF STATE INSPECTIONS OF PRESENT PLANT TO DATE.

4. IS ANY FOLLOW-THRU ACTION REQUIRED TO (1) CORRECT DEFICIENCIES IN THE PLANT OR ITS OPERATION OR (2) RESOLVE INDUSTRIAL WASTE PROBLEMS? (If yes, describe required corrective action) YES NO