

TO: John Hodgson

FROM: Ron Devitt

SUBJECT: Terrace Heights STP

DATE: February 28, 1973

State of
Washington
Department
of Ecology



On February 1, 1973, I conducted a standard efficiency survey at Terrace Heights sewage treatment plant near Yakima.

Bob Anderson, the operator, also maintains the books for the sewer district. Considerable time is spent just keeping financial records. Waste Water Plant Operators Manual recommends daily sampling of a plant of this size, but he does not have enough time.

An engineering report is in progress for expansion of the facilities. Tentative modifications proposed are a grit channel, expansion of clarifier, a second digester, a chlorine contact chamber and larger outfall.

Presently about once a year a large amount of precipitation falling in a short time causes the clarifier to flood and bypassing occurs.

Housekeeping was good. The portable Stevens level flow recorder was not working properly.

The disinfection was inadequate. With no contact chamber, the effluent was very high in coliform. It is a long way to the receiving water; it is not known how much disinfection takes place in the outfall, but a potential health problem exists.

RD:bj

(EFFICIENCY STUDY)

Terrace Heights SD
 City near Yakima Plant Type T. Filter Population 2400 Design ?
 Served Capacity
 Receiving Water Yakima River Engineer John Hodgson
 Date February 1, 1973 Survey Period 0900 - 1700 hr. Survey Personnel Ron Devitt
 Comp. Sampling Frequency 1/2 hour Weather Conditions cold, clear
 (last 48 hours)
 Sampling Alequot 1000 ml/sample

PLANT OPERATION

Average
 Total Flow 110,000 gpd How Measured 3" Parshall Flume
 Max. (Flow) .15 mgd Time of Max. 1530 Min. .1 MGD Time of Min. ---
 Pre Cl₂ --- #/day Post Cl₂ ~12 #/day
 Flow recorder inaccurate

FIELD RESULTS

Determinations	Influent				Effluent			
	Max.	Min.	Mean	Median	Max.	Min.	Mean	Median
Temp. °C 7	11	10	11	11	10	9	9	9
16	8.0	7.5	7.7	7.7	7.8	7.1	7.6	7.7
Conductivity 7 (umhos/cm)	780	590	670	710	780	720	750	750
Settleable 3 Solids	22	9	13	9	.4	.1	.2	.3

LABORATORY RESULTS ON COMPOSITE IN PPM

Laboratory Number	Influent	Effluent	% Reduction
	73-616	73-615	
5-Day BOD	188	51 X	72
COD	460	170	63
T.S.	704	550	21
T.N.V.S.	441	480	NONE
T.S.S.	263	83 X	68
N.V.S.S.	23	19	17
pH	7.5	7.4	--
Conductivity	890	1000	--
Turbidity	85	45	--

Terrace Heights SD

BACTERIOLOGICAL RESULTS

Na₂S₂O₃ added to sample _____ After _____ in bottle _____ min.

LAB #	SAMPLING TIME	COLONIES/100 MLS (MF)		15 Sec.	3 min.
		Total	Fecal	Cl Residual ppm	(after seen)
73-617	1130	>80,000	>12,000	.15	.75
73-618	1300	>60,000	>6,000	.15	.75
73-619	1400	>80,000	600	---	---

Operator's Name Bob Anderson Phone # _____

Comments: _____

Exhibit F

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-F1527

CHECK ONE 1ST AUDIT RE-AUDIT DATE OF AUDIT 2-1-73 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) TONGUE Pt., YAKIMA Co IDENTIFICATION OF AREAS SERVED DISTRICT - 2400

3. POPULATION

3A. FRACTION OF AREA POPULATION SERVED (%) 3B. PLANT DESIGN (population equivalent) 3C. SERVED BY PLANT (domestic) 2400

4. TYPE OF COLLECTION SYSTEM

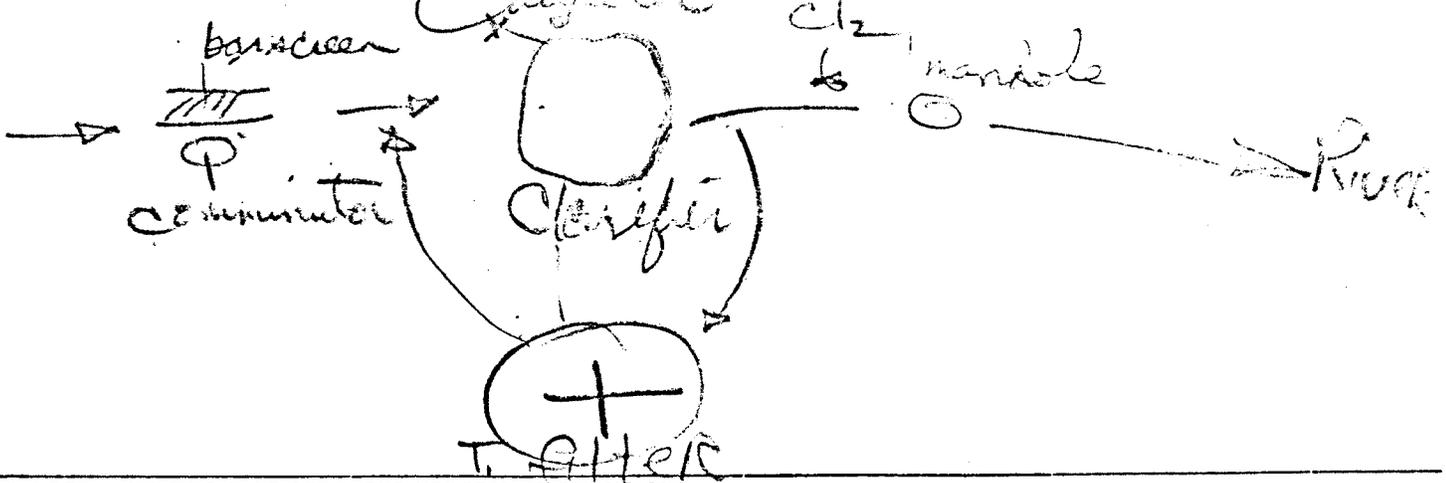
4A. COMBINED SEPARATE BOTH 4B. ESTIMATED FLOW CONTRIBUTED BY SURFACE OR GROUND WATER (infiltration, etc.) 2.5 to 4.0 m³/day

5. YEAR COMMUNITY BEGAN SEWAGE TREATMENT 1954 6. YEAR PRESENT SYSTEM PLACED IN OPERATION 1954

6A. SEWER 1954 6B. PLANT 1954 6C. ANCILLARY WORKS 1954

7A. SIZE OF PLANT SITE (acres) 2 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 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.
No grit channel or Cl₂ contact Chamber

9. RECEIVING STREAM

9A. NAME OF STREAM 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) 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) 3. AVERAGE SETTLEABLE SOLIDS OF RAW SEWAGE (5th DFP Com.) (ml/l)

4. AVERAGE SUSPENDED SOLIDS OF RAW SEWAGE (mg/l) 5. AVERAGE COLIFORM DENSITY OF RAW SEWAGE (mpn/100 ml)

6. ANNUAL AVERAGE PLANT REJECTION

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

6. DOES PLANT HAVE STANDBY POWER GENERATOR OR MAJOR PUMPING FACILITIES? YES NO

7. ARE CHLORINATION FACILITIES PROVIDED? YES NO IF YES, ANSWER BA THRU G

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

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

6A. PURPOSE OF CHLORINATION
disinfection

6B. TYPE OF CHLORINATOR
Wetpack + Tank

6C. POINT OF APPLICATION OF CHLORINE
at chlorine tank

8D. CAN BYPASSED SEWAGE BE CHLORINATED?
 YES NO

6E. AVERAGE FEED RATE OF CHLORINE (lb/day)
12

8F. CHLORINE RESIDUAL IN EFFLUENT
_____ PPM AT END OF _____ MINUTES

6G. MINIMUM SUPPLY OF CHLORINE STORED ON PREMISES (lb)
150

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)
1 X / 4 W

9B. AVERAGE DURATION (hours)
1

9C. REASON FOR BYPASSING
Clarifier loading

8D. 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
GATE

9G. AGENCIES NOTIFIED OF BYPASS ACTION

10. 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 *- use well*

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
FISHING - 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

STABILIZATION PONDS

WEEDS CUT AND VEGETATIVE GROWTH IN PONDS ELIMINATED?

YES NO

D. BANKS AND DIKES MAINTAINED (erosion etc.)?

YES NO

C. FENCING AND "WARNING - POLLUTED WATER" SIGNS PRESENT AND IN GOOD REPAIR?

YES NO

D. FREQUENCY OF INSPECTION BY OPERATOR

E. WATER DEPTH (feet)

_____ HIGH _____ LOW _____ MEDIUM

F. ADEQUATE CONTROL OF DEPTH?

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?

YES NO

IF YES, NAME OF SPECIES IF KNOWN

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:

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

YAKIMA JC - '69

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?

Flow meter way off

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)

Routine maintenance

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?

ENTERING Dept - in progress

now larger in diameter - and larger outfall
Ch contact chamber just toward

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								
6. TOTAL SOLIDS								
7. VOLATILE SOLIDS								
8. pH	3			3				
9. TEMPERATURE	3			3			3	
10. COLIFORM DENSITY								
11. RESIDUAL CHLORINE				3				
12. VOLATILE ACIDS								
13. M. B. STABILITY								
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
Row Druitt	Environmentalist	WPC

INFORMATION FURNISHED BY	TITLE	ORGANIZATION	DATE
Bob Anderson	SWA Supt.	Sanjour Dist	2-1-75

OPERATING RECORDS MAINTAINED? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <i>(maintained, check general items included)</i>						REPORTED? <input type="checkbox"/> YES <input type="checkbox"/> NO TO WHOM? <i>Health Dept</i>					
FREQUENCY	WEATHER	FLOW	SLUDGE HANDLED	CHEMICALS USED	DIGESTER	GRIT HANDLED	ELEC. USED	COST DATA	AIR USED	MAIN-TENANCE	OTHER
DAILY		X		X							
WEEKLY											
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?

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

YES NO (If no, explain)

Not enough time to properly test

8. INDUSTRIAL WASTES DISCHARGED TO MUNICIPAL SYSTEM:

A. NUMBER AND TYPES OF INDUSTRIES DISCHARGING TO SYSTEMS

NONE

B. POPULATION EQUIVALENT (BOD) OF INDUSTRIAL WASTES (pe)

C. POPULATION EQUIVALENT (SS) 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)

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?

PREVIOUS OPERATOR

11. IS A MANUAL OF PRACTICE OR INSTRUCTIONS AVAILABLE?

YES NO

IF YES, WHO WROTE AND PROVIDED IT?

DOE

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

8

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	40	1-1	2-10	-
2. OPERATORS					
3. LABORATORY TECHNICIANS					
4. LABORERS					
5. PART-TIME LABORERS	1	5			
6. TOTAL					

ADDITIONAL REMARKS (If remarks refer to a particular item, identify by number)

2. GENERAL COMMENTS ON HOUSEKEEPING AND MAINTENANCE

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

additional manpower is necessary to adequately monitor plant performance & sewage characteristics