December 19, 1973

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WA-24-0010

of
Washington
Department
of Ecology

Memo to: Howard Steeley and Gerry Calkins

From: Jim Armstrong

Subject: Long Beach Sewage Treatment Plant Efficiency Survey.

On November 20, 1973, an efficiency study was conducted at the Long Beach Sewage Treatment Plant. The survey lasted from 0830 hours to 1630 hours with samples taken every one half hour.

The area was well fenced and well taken care of. There has been some trouble with damage caused by muskrats burrowing in the dikes. There had been 31 muskrats trapped up to the date of the survey.

The reductions for BOD and suspended solids were a minimum of 87% for BOD and 96% for suspended solids. The 30 minute settleability test gives no results, but does not seem to affect the efficiency of the plant.

The results for the coliform samples were <400 total coliform and <200 for fecal coliform in colonies per 100 mls.

JA:jmh

STP SURVEY REPORT FORM

(EFFICIENCY STUDY)

City Long Beach Plant Type Lagoon Population Served 1,000 Design Capacity

Receiving Water Ditch to Tinker Lake Engineer Howard Steeley

Date 11-20-73 Survey Period 0830-1630 hours Survey Personnel J. Armstrong

Comp. Sampling Frequency Every 1/2 hour Weather Conditions (Last 48 hours) Rain

Sampling Alequot

PLANT OPERATION

Total Flow .093 MGD during survey How Measured Totalizer

Max. (Flow) Time of Max. Min. Time of Min.

Pre Cl_2 #/day Post Cl_2 5 #/day

FIELD RESULTS

Determinations	Influent Max.	Influent Min.	Influent Mean	Influent Median	Effluent Max.	Effluent Min.	Effluent Mean	Effluent Median
Temp. °C	14.0	13.0	13.3	13.2	8.2	7.6	7.9	8.0
pH	7.4	7.0	--	7.0	7.0	6.8	--	7.0
Conductivity (umhos/cm)	--	--	--	--	--	--	--	--
Settleable Solids	12	4	8.3	9	<.1	<.1	<.1	<.1

LABORATORY RESULTS ON COMPOSITE IN PPM

Laboratory Number	Influent 73-4303	Effluent 73-4304	% Reduction
5-Day BOD	126	<16	Minimum 87%
COD	340	81	76%
T.S.	365	165	55%
T.N.V.S.	157	129	18%
T.S.S.	186	8	96%
N.V.S.S.	58	7	88%
pH	7.7	7.5	--
Conductivity	510	410	--
Turbidity	60	8	87%

Long Beach

BACTERIOLOGICAL RESULTS

$Na_2S_2O_3$ added to sample previous to sampling after _____ min.

LAB #	SAMPLING TIME	COLONIES/100 MLS (MF) Total	Fecal	Cl Residual	(after secs.)
73-4305	0915	≤400	< 200	.75	3 min.
4306	1140	≤400	< 200	1.0	"
4307	1445	≤400	< 200	1.0	"
4308	1615	≤400	< 200	.75	"

Operator's Name _____ Phone # _____

Comments: _____

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

WATER QUALITY LABORATORY

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

DATA SUMMARY

Source Long Beach STP Collected By J. A.

Date Collected 11-20-73 Goal, Pro./Obj.

Log Number:	73-4303	04	05	06	07	08					STORET
Station:	INF	EFF	0913	1140	1445	1615					
pH	7.7	7.5									00403
Turbidity (JTU)	60.	8.									00070
Conductivity (umhos/cm)@25°C	510.	410.									00095
COD	340	81									00340
BOD (5 day)	126.	<16.									00310
Total Coliform (Col./100ml)	-	-	<400	<400	<400	<400					31504
Fecal Coliform (Col./100ml)	-	-	<200	<200	<200	<200					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	365.	165.									00500
Total Non Vol. Solids	157.	129.									
Total Suspended Solids	186.	8.									00530
Total Sus. Non Vol. Solids	58.	7.									

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

* NO NUTRIENT BOTTLES

Summary By Stephen D. Roll Date 12-17-73

Exhibit E

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-R1527

CHECK ONE	DATE OF AUDIT	PLANT DESCRIPTION CODE (For Official Use Only)
☐ 1ST AUDIT ☐ RE-AUDIT	11/20/[illegible]	Secondary Treatment [illegible]

A. GENERAL INFORMATION

1. PROJECT (State, Number)	SCOPE OF PROJECT (new plant, additions, etc.)

2. PLANT LOCATION (City, county)	IDENTIFICATION OF AREAS SERVED
Long Beach Pacific CO	[illegible]

3. POPULATION

3A. FRACTION OF AREA POPULATION SERVED (%)	3B. PLANT DESIGN (population equivalent)	3C. SERVED BY PLANT (domestic)
1,000		1,000 plus [illegible]

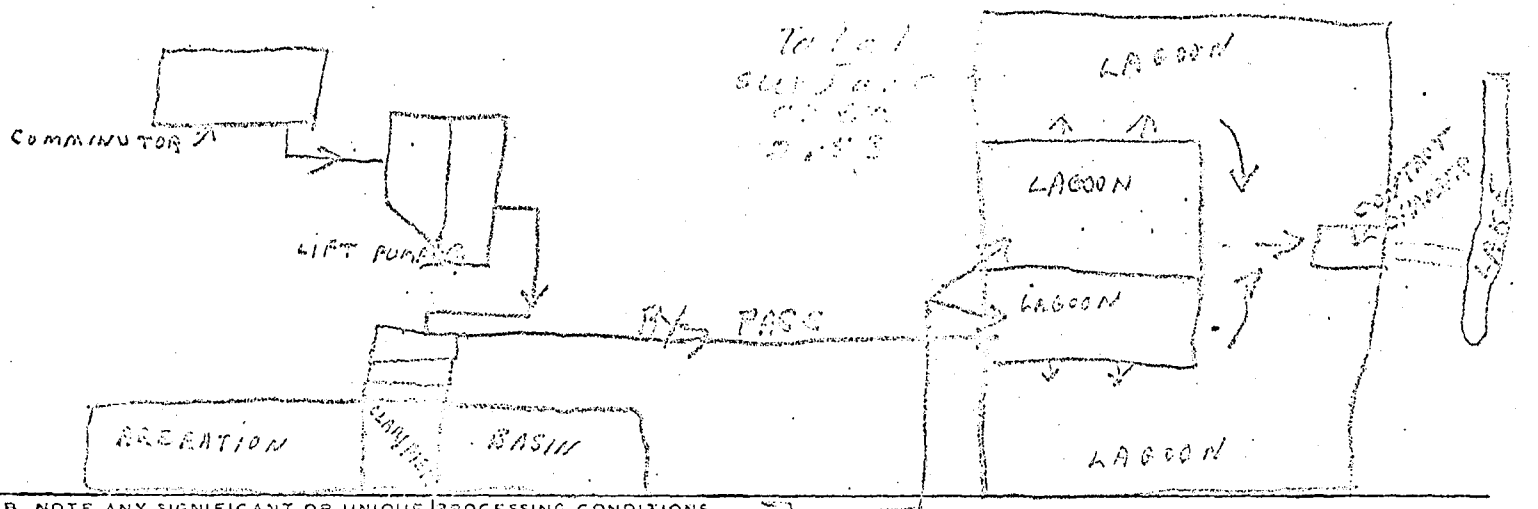
4. TYPE OF COLLECTION SYSTEM

4A.	4B. ESTIMATED FLOW CONTRIBUTED BY SURFACE OR GROUND WATER (infiltration, mgd)
☐ COMBINED ☑ SEPARATE ☐ BOTH	

5. YEAR COMMUNITY BEGAN SEWAGE TREATMENT	6. YEAR PRESENT SYSTEM PLACED IN OPERATION		
	6A. SEWER	6B. PLANT	6C. ANCILLARY WORKS
1956		1972	

7A. SIZE OF PLANT SITE (acres)	7B. APPROXIMATE AREA LEFT FOR EXPANSION (acres)
3	16

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.

9. RECEIVING STREAM

9A. NAME OF STREAM
Ditch to Tinker Lake

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)		1C. MINIMUM FLOW RATE (mgd)
	DRY WEATHER	WET WEATHER	

2. AVERAGE BOD OF RAW SEWAGE (5 DAY 20°C) (ppm)	3. AVERAGE SETTLEABLE SOLIDS OF RAW SEWAGE [illegible] (ml/l)
	9

4. AVERAGE SUSPENDED SOLIDS OF RAW SEWAGE (mg/l)	5. AVERAGE COLIFORM DENSITY OF RAW SEWAGE (ppm [illegible])
[illegible]	

6. ANNUAL AVERAGE PLANT REDUCTION

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

FWPCA-12 (Rev. 4-68)

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

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

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

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

8A. PURPOSE OF CHLORINATION

Disinfection

8B. TYPE OF CHLORINATOR

[illegible]

8C. POINT OF APPLICATION OF CHLORINE

[illegible]

8D. CAN BYPASSED SEWAGE BE CHLORINATED?
[X] YES [ ] NO

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

5

8F. CHLORINE RESIDUAL IN EFFLUENT
1.5 PPM AT END OF 15 MINUTES

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

1,000

9. ARE FACILITIES PROVIDED FOR COMPLETE BYPASS OF RAW SEWAGE?
[ ] YES [X] 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

None

12. USES OF RECEIVING STREAM WITHIN 10 MILES OF OUTFALL

Drainage

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

Make [illegible] look out of [illegible]

14. OBSERVED APPEARANCE AND CONDITION OF EFFLUENT, RECEIVING STREAM, OR DRAINAGE WAY

Effluent is clear

15. STABILIZATION PONDS

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

B. BANKS AND DIKES MAINTAINED (erosion etc.)? [X] YES [ ] NO

C. FENCING AND "WARNING – POLLUTED WATER" SIGNS PRESENT AND IN GOOD REPAIR? [X] 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? [X] YES [ ] NO

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

I. MOSQUITO BREEDING PROBLEM? [ ] YES [X] NO IF YES, NAME OF SPECIES IF KNOWN

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

C. SUPERVISORY SERVICES

1. IS A CONSULTING ENGINEER RETAINED OR AVAILABLE FOR CONSULTATION ON OPERATING AND MAINTENANCE PROBLEMS?

[X] YES [ ] NO IF YES IS IT ON: [X] CONTINUING BASIS OR [ ] UPON REQUEST BASIS

IF CONTINUING BASIS, WHAT IS THE FREQUENCY OF VISITS: 1 m a

2. DO OPERATORS AND OTHER PERSONNEL ROUTINELY ATTEND SHORT COURSES, SCHOOLS OR OTHER TRAINING ACTIVITIES?

[X] YES [ ] NO

IF YES, CITE COURSE SPONSOR AND DATE OF LAST COURSE ATTENDED

More Two weeks ago

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? [X] YES [ ] NO (If no, explain)

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

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

A. STRUCTURAL [ ] YES [X] NO (If yes explain)

B. MECHANICAL [X] YES [ ] NO (If yes, explain)

Power to aerators burned out (repaired immediately)

C. OPERATIONAL [X] YES [ ] NO (If yes, explain)

Trouble with settleability in aerator tank

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

None so far

5. ARE OPERATING RECORDS MAINTAINED? [✓] YES [ ] NO (If maintained, check general items included) REPORTED? [✓] YES [ ] NO TO WHOM? State

FREQUENCY	WEATHER	FLOW	SLUDGE HANDLED	CHEMICALS USED	DIGESTER	GRIT HANDLED	ELEC. USED	COST DATA	AIR USED	MAIN-TENANCE	OTHER
DAILY	✓	✓		✓		✓					
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)

8. INDUSTRIAL WASTES DISCHARGED TO MUNICIPAL SYSTEM: None

A. NUMBER AND TYPES OF INDUSTRIES DISCHARGING TO SYSTEMS

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)

G. 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?

Hanson, Ross, Sanderson

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

IF YES, WHO WROTE AND PROVIDED IT? Engineers, State Manual

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

15

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	8	8
2. OPERATORS	1	40		8	
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
2 — 4, 5 or 6 per week
3 — 1, 2, or 3 per week
4 — as required
5 — 2 or 3 per month
6 — 1 per month
7 — Quarterly
8 — Semi-Annually
9 — Annually

ITEM	RAW	PRIMARY EFFLUENT	MIXED LIQUOR	FINAL	SLUDGE RAW	SLUDGE SUPER-NATANT	DIGESTOR	RECEIVING STREAM
1. BOD	3			3				
2. SUSPENDED SOLIDS	3	3		3				
3. SETTLEABLE SOLIDS	3			3				
4. SUSPENDED VOLATILE								
5. DISSOLVED OXYGEN	3			3				
6. TOTAL SOLIDS								
7. VOLATILE SOLIDS								
8. pH	2	2		2				
9. TEMPERATURE	2	2						
10. COLIFORM DENSITY				2				
11. RESIDUAL CHLORINE				2				
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			5.			
PRIOR YEAR 19						

EVALUATION PERFORMED BY	TITLE	ORGANIZATION
[illegible]	[illegible]	[illegible]

INFORMATION FURNISHED BY	TITLE	ORGANIZATION	DATE
[illegible]	[illegible]	[illegible]	[illegible]