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State of Washington
Department of Ecology

Memo to: Gerry Calkins

From: Ron Devitt

Subject: Longview Sewage Lagoons Survey.

On October 25, 1973, an efficiency survey was conducted on Longview Lagoons. Since there were flow recorders on both the influent and the effluent, composites were portioned based on each respective flow rate.

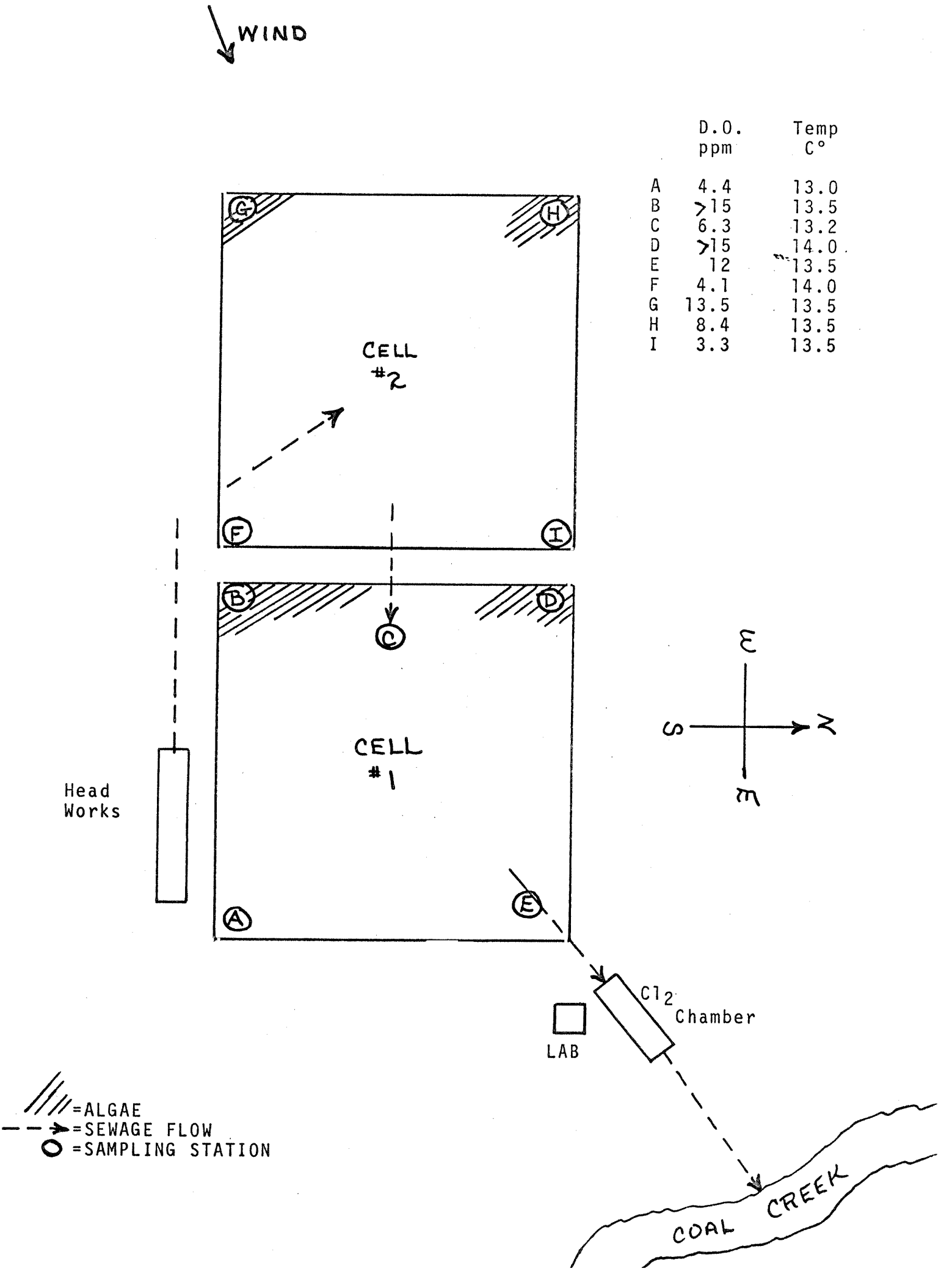
The system was not working very well based on BOD_5 reduction. Also the BOD_5 of 129 ppm in the effluent is rather high. The prevailing overcast weather, combined with rain, was less than optimal for lagoon performance.

Serious hydraulic overloading occurred at the headworks from 1200-1300 hours (see pictures). Jim Thom said that one of their lift stations had probably plugged and that the excessive flow was caused by continuous pumping. The flow was 28 inches head height through a six inch Parshall flume; this exceeded the capacity of the flow meter. The influent channel flooded out and splashed over. The color of the influent was extremely dark, but no offensive odor or acidic condition was present to indicate septicity.

The lagoons were being operated in series with the influent entering the #2 cell first. Dissolved oxygen determinations were made using the YSI probe at various locations in the system. Highest concentrations of oxygen correlated with the obvious abundant concentrations of algae.

Excepting station #E, all oxygen values were taken about 3 feet from shore. At #E, measurements were taken from the cat walk. The data are for near the surface of the lagoon and should be considered maximum values. The wind was blowing in a North-easterly direction. The height of the dikes permitted algae to be in a quiescent state at stations B,D, G and H. It is also at these stations where high oxygen values were recorded.

RD:jmh


WIND
D.O. ppm
Temp C°
A 4.4 13.0
B >15 13.5
C 6.3 13.2
D >15 14.0
E 12 13.5
F 4.1 14.0
G 13.5 13.5
H 8.4 13.5
I 3.3 13.5
G
H
CELL #2
F
I
B
D
C
CELL #1
Head Works
A
E
E
S
N
W
Cl2 Chamber
LAB
=ALGAE
=SEWAGE FLOW
=SAMPLING STATION
COAL CREEK

STP SURVEY REPORT FORM

(EFFICIENCY STUDY)

City Longview Plant Type Lagoons Population Served 4,000 Design Capacity

Receiving Water Coal Creek Engineer H. Steeley

Date 10-25-73 Survey Period 0930-1730 hour Survey Personnel R.C. Devitt

Comp. Sampling Frequency 1/2 hour Weather Conditions (last 48 hours) Sprinkles, rain, overcast.

Sampling Alequot Maximum influent flow on cycle ÷ 2 mls.

Influent = 251900 MG in 8 PLANT OPERATION

Total Flow Effluent = .103300 MG in 8 hrs. How Measured Parshall flume recorders

*Max. (Flow) >2.3 MGD Time of Max. 1200-1300 hrs Min. 1.4 MGD Time of Min. 1700 hrs.

Pre Cl_2 NA #/day Post Cl_2 28 #/day

* Head height of 6" Parshall Flume = 28"

FIELD RESULTS

17 Determinations	Influent Max.	Influent Min.	Influent Mean	Influent Median	Effluent Max.	Effluent Min.	Effluent Mean	Effluent Median
Temp. °C	16.9	15.9	16.5	16.5	13.5	11.8	12.5	12.6
pH	7.3	7.0	7.1	7.1	7.8	7.0	7.2	7.2
Conductivity (umhos/cm)	550	350	450	450	350	350	350	350
Settleable Solids	25	2.0	---	---	Nil	Nil	----	----

LABORATORY RESULTS ON COMPOSITE IN PPM

Laboratory Number	Influent 73-3957	Effluent 73-3958	% Reduction
5-Day BOD	212	129	39%
COD	350	140	60%
T.S.	651	376	42%
T.N.V.S.	287	191	33%
T.S.S.	352	71	79%
N.V.S.S.	134	9	93%
pH	7.2	7.4	
Conductivity	550	450	
Turbidity	70	20	
Color	258	183	

Longview Lagoons

BACTERIOLOGICAL RESULTS

$Na_2S_2O_3$ added to sample in Bottle After _____ min.

LAB #	SAMPLING TIME	COLONIES/100 MLS (MF)		15 Sec. 3 Min. Cl Residual	
		Total	Fecal	ppm	(~~after~~ ~~secs~~)
73-3959	1030	<400	<200	.35	.5
3960	1130	<400	<200	.2	.35
3961	1230	<400	<200	.35	.5
3962	1330	<400	<200	.30	.35
3963	1600	<400	<200	.30	.5

erator's Name Jim Thom Phone # _____

mments:

Nutrient	Effluent - ppm
NO_2-N (Filtered)	1.02
NO_3-N (Filtered)	1.88
NH_3-N	5.2
T. Kjeldahl-N	7.8
O-PO_4-P (Filtered)	7.00
Total Phos.-P	28.0

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: ☐ 1ST AUDIT ☐ RE-AUDIT

DATE OF AUDIT: 10-24

PLANT DESCRIPTION CODE (For Official Use Only)

A. GENERAL INFORMATION

1. PROJECT (State, Number): LONGVIEW LAGOONS

SCOPE OF PROJECT (new plant, additions, etc.):

2. PLANT LOCATION (City, county): LONGVIEW - COWLITZ

IDENTIFICATION OF AREAS SERVED: West Longview

3. POPULATION

3A. FRACTION OF AREA POPULATION SERVED (%):

3B. PLANT DESIGN (population equivalent):

3C. SERVED BY PLANT (domestic): 4,000

4. TYPE OF COLLECTION SYSTEM

4A. ☐ COMBINED ☒ SEPARATE ☐ BOTH

4B. ESTIMATED FLOW CONTRIBUTED BY SURFACE OR GROUND WATER (infiltration, mgd): .5

5. YEAR COMMUNITY BEGAN SEWAGE TREATMENT:

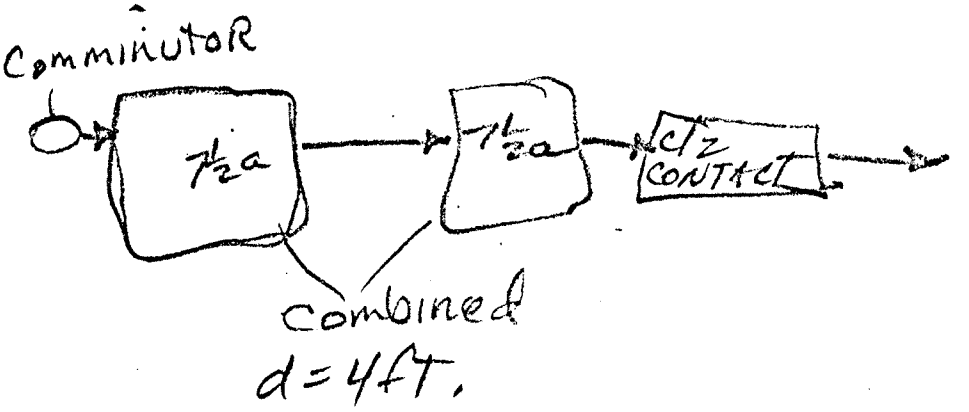
6. YEAR PRESENT SYSTEM PLACED IN OPERATION

6A. SEWER	6B. PLANT	6C. ANCILLARY WORKS
1966	1966	

7A. SIZE OF PLANT SITE (acres): 20

7B. APPROXIMATE AREA LEFT FOR EXPANSION (acres): 40

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: COAL CR.

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

B. CURRENT PERFORMANCE AND PLANT LOADING INFORMATION

10A. ANNUAL AVERAGE DAILY FLOW RATE (mgd)	10B. PEAK FLOW RATE (mgd)		10C. MINIMUM FLOW RATE (mgd)
	DRY WEATHER	WET WEATHER	
.500 MGD	.120	1.5	.112

11. AVERAGE BOD OF RAW SEWAGE (5 DAY 20°C) (ppm)	12. AVERAGE SETTLEABLE SOLIDS OF RAW SEWAGE (ml/l)
104	4.5
13. AVERAGE SUSPENDED SOLIDS OF RAW SEWAGE (mg/l)	**14. AVERAGE COLIFORM DENSITY OF RAW SEWAGE (coli/100 ml)**
130	

15. ANNUAL AVERAGE PLANT REDUCTION

15A. BOD (%)	15B. SETTLEABLE SOLIDS (%)	15C. SUSPENDED SOLIDS (%)	15D. COLIFORMS (%)
61		24	

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

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
disinfection

8B. TYPE OF CHLORINATOR
MANUAL - GAS

8C. POINT OF APPLICATION OF CHLORINE
after 2nd lagoon

8D. CAN BYPASSED SEWAGE BE CHLORINATED?
☐ YES ☐ NO

8E. AVERAGE FEED RATE OF CHLORINE (lb/day)
40.

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

8G. MINIMUM SUPPLY OF CHLORINE STORED ON PREMISES (lb)
2,000

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) Vacuum breaker

11. USES OF TREATMENT PLANT EFFLUENT
NONE

12. USES OF RECEIVING STREAM WITHIN 10 MILES OF OUTFALL
to Columbia - SAME

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

15. STABILIZATION PONDS

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

B. BANKS AND DIKES MAINTAINED (erosion etc.)? ☒ YES ☐ NO

C. FENCING AND POSTING – POLLUTED WATER SIGNS PRESENT AND IN GOOD REPAIR? No fencing ☐ YES ☐ NO

D. FREQUENCY OF INSPECTION BY OPERATOR 2-3 / week

E. WATER DEPTH (feet) 4 HIGH 4' LOW 4 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 presently

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) high water floods into channel

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?

influent structure, bypass to cells
eliminate communitor

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

REPORTED? ☒ YES ☐ NO

TO WHOM? DES

FREQUENCY	WEATHER	FLOW	SLUDGE HANDLED	CHEMICALS USED	DIGESTER	GRIT HANDLED	ELEC. USED	COST DATA	AIR USED	MAINTENANCE	OTHER
DAILY		X									
WEEKLY				X							
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:

A. NUMBER AND TYPES OF INDUSTRIES DISCHARGING TO SYSTEMS: NA

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?

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

IF YES, WHO WROTE AND PROVIDED IT?

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

2 Ma

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	Same as		Same	Same	
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		DIGESTOR	RECEIVING STREAM
					RAW	SUPER-NATANT		
1. BOD	6			6				
2. SUSPENDED SOLIDS	6			6				
3. SETTLEABLE SOLIDS	2			2				
4. SUSPENDED VOLATILE	—			—				
5. DISSOLVED OXYGEN	2			2				
6. TOTAL SOLIDS	—							
7. VOLATILE SOLIDS								
8. pH	2			2				
9. TEMPERATURE	2			2				
10. COLIFORM DENSITY	—			3				
11. RESIDUAL CHLORINE	2			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						
PRIOR YEAR 19						

EVALUATION PERFORMED BY	TITLE	ORGANIZATION
Ron DeWitt		DOE

INFORMATION FURNISHED BY	TITLE	ORGANIZATION	DATE
Jim Tom		City	10-24

G. NOTATIONS BY EVALUATOR

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

2. GENERAL COMMENTS ON HOUSEKEEPING AND MAINTENANCE

good - clean - small lab in Cl_2 hou...

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