TO: TOM. HAGGARTY

Publication No. 71-e10

WA-41-1110, -1120, -3000

WA-41-1110 Winchester Wasteway
41-1120 Frenchman Hills
41-3000 West Canal

On 12-21-71, an efficiency survey was conducted on Quincy industrial treatment facilities. The components are a clarifier, an aerated lagoon and five stabilizing ponds.

The clarifier does exceptionally well in removing the settleable solids. The sludge is pumped through a vacuum filter and the filtrate is recirculated through the clarifier.

The aerated cell is equipped with four stationary aerators. One of them was not working at 0730 hours; but after it was reset, functioned throughout the survey. This cell has two dissolved oxygen analyzers with a recording chart, but have never operated to satisfaction.

The polishing ponds were all frozen over, except at the outfall and the immediate area where the effluent from the aerated cell entered the system. Capacities and depths of the lagoons are attached.

Although the pH of the influent was high (mean 10.4), the pH of the sludge being pumped was less than 5, due to an anaerobic condition created by week-end mechanical difficulties with the filter belt. The odor was quite noticeable. Operators said the efficiency of the filter was greatly reduced by the low pH.

The headworks had been constructed without any grinding or screening device, but large pieces and whole potatoes entering the clarifier caused difficulties in sludge removal and septic conditions. A bar screen (one inch on centers) was installed to retain these large solids. The influent was by-passing to the aerated cell at 0730 and after cleaning, again from 1130 to 1200 hours, due to restriction of flow by the bar screen.

This unnecessary loading could be curtailed by installation of a grinding device or more frequent hand cleaning. It was said that this was an unusual condition caused by a hole in an industrial floor screen, causing excessive loss of larger potato pieces.

Samples were composited on the influent, the effluent from the clarifier, the effluent from the aerated cell, and the final effluent. Coliform samples were taken at the effluent weir. Although coliform numbers were low, it would be interesting to take additional samples in the late summer.

STP SURVEY REPORT FORM

(EFFICIENCY STUDY)

City Quincy - Industrial Plant Type Secondary Population Served --- Design Capacity 2.0 MGD

Receiving Water Bureau of Rec. ditch Engineer Tom Haggarty

Date December 21, 1971 Survey Period 0830-1630 Survey Personnel Ron C. Devitt

Comp. Sampling Frequency varied Weather Conditions (last 48 hours) Cold, Snow

Sampling Alequot Clarifier: (MGD) /2 X 1000 mls

Lagoons: 1000 mls

PLANT OPERATION

Total Flow 509,000 in 8 hours How Measured Recorder on Clarifier effluent

Max. (Flow) 1.8 MGD Time of Max. 0830 hrs. Min. 1.4 MGD Time of Min. 0930 hrs.

Pre Cl_2 None #/day Post Cl_2 None #/day

FIELD RESULTS

Determinations	Influent Max.	Influent Min.	Influent Mean	Influent Median	Final Effluent Max.	Final Effluent Min.	Final Effluent Mean	Final Effluent Median
Temp. °C	25.8	21.5	24.2	24.2	1.8	.3	1.3	1.2
pH	11.2	9.0	10.4	10.3	8.6	8.4	8.5	8.5
Conductivity (umhos/cm)	3000	1100	1980	1800	3500	2500	3100	3300
Settleable Solids	70	60	65	65	--	--	--	Nil

LABORATORY RESULTS ON COMPOSITE IN PPM

Laboratory Number	Influent 71-4076	Final Effluent 71-4079	% Reduction ----
5-Day BOD	2640	20	99
COD	5750	180	97
T.S.	5886	1671	72
T.N.V.S.	1122	1372	--
T.S.S.	3274	87	97
N.V.S.S.	228	7	97
pH	10.1	8.6	--
Conductivity	1800	2200	--
Turbidity	240	10	--
S	3046	80	97

Quincy - Industrial

BACTERIOLOGICAL RESULTS

$Na_2S_2O_3$ added to sample _____ After _____ min.

LAB #	SAMPLING TIME	Total COLONIES/100 MLS (MF)	Fecal COLONIES/100 MLS (MF)	Cl Residual ppm	Cl Residual (after secs)
71-4080	920	400	< 100		
71-4081	1010	230	< 100		
71-4082	1100	500	< 200		
71-4083	1300	370	< 200		
71-4084	1440	380	< 200		

Operator's Name Phil Bell, Sam Taylor Phone # 509-SU 7-2423

Comments: _____

DATA REPORT FORM

Location:

Station and Log number

Field Results	Clarifier Effluent				Aerated Cell Effluent			
	MAX.	MIN.	MEAN	MEDIAN	MAX.	MIN.	MEAN	MEDIAN
T	25.4	23.8	24.4	24.3	7.7	6.9	7.3	7.4
pH	10.2	8.1	9.3	9.3	8.0	7.7	7.8	7.9
Cond.	3500	1650	2050	1900	3500	2600	3070	3000
SS	.5	.5	.5	.5	--	--	--	650

Lab. Results		
BOD	1480	390
COD	2700	1350
TS	3574	2384
TNVS	1476	1090
TSS	479	974
NVSS	41	88
SCS	438	886
pH	6.2	7.7
Cond.	2150	2300
Turbidity	150	150

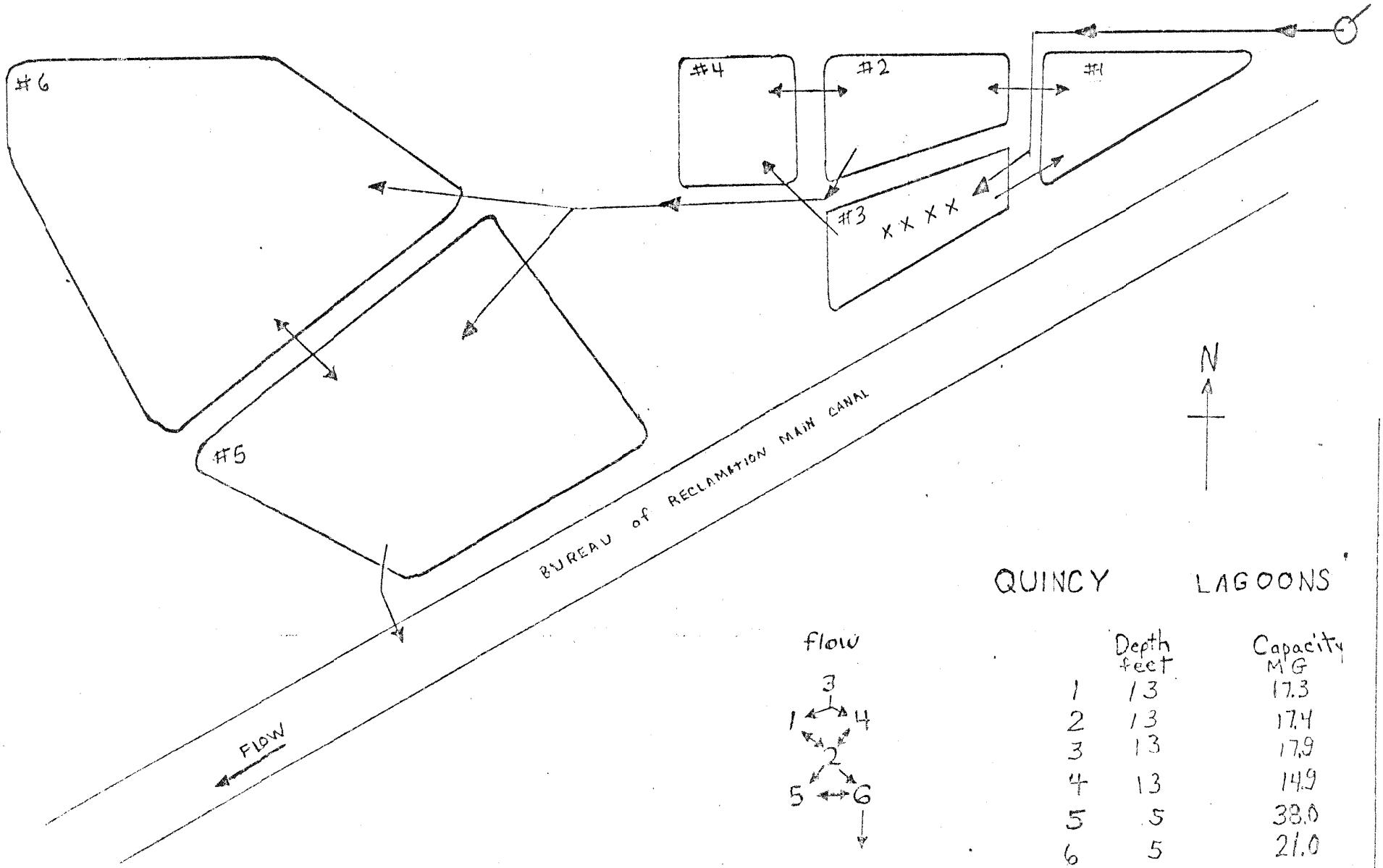
Quincy

*PERCENT REDUCTION BY COMPONENT

	Clarifier	Aeration Cell	Lagoons	Overall
BOD	44	73	95	99
COD	53	50	50	97
TS	39	33	30	72
TNVS	--	26	--	--
TSS	85	--	92	97
NVSS	82	--	92	97
SCS	86	--	91	97

* Comparing the influent and effluent for each unit.

-- Indicates an increase (negative reduction)



flow

QUINCY LAGOONS

	Depth feet	Capacity M G
1	13	17.3
2	13	17.4
3	13	17.9
4	13	14.9
5	5	38.0
6	5	21.0

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-R1527

CHECK ONE	DATE OF AUDIT	PLANT DESCRIPTION CODE (For Official Use Only)
☐ 1ST AUDIT ☐ RE-AUDIT		

A. GENERAL INFORMATION

1. PROJECT (State, Number)	SCOPE OF PROJECT (new plant, additions, etc.)
QUINCY INDUSTRIAL	
2. PLANT LOCATION (City, county)	**IDENTIFICATION OF AREAS SERVED**
QUINCY COMPANY	

3. POPULATION

3A. FRACTION OF AREA POPULATION SERVED (%)	3B. PLANT DESIGN (population equivalent)	3C. SERVED BY PLANT (Domestic)
	2 MGD	

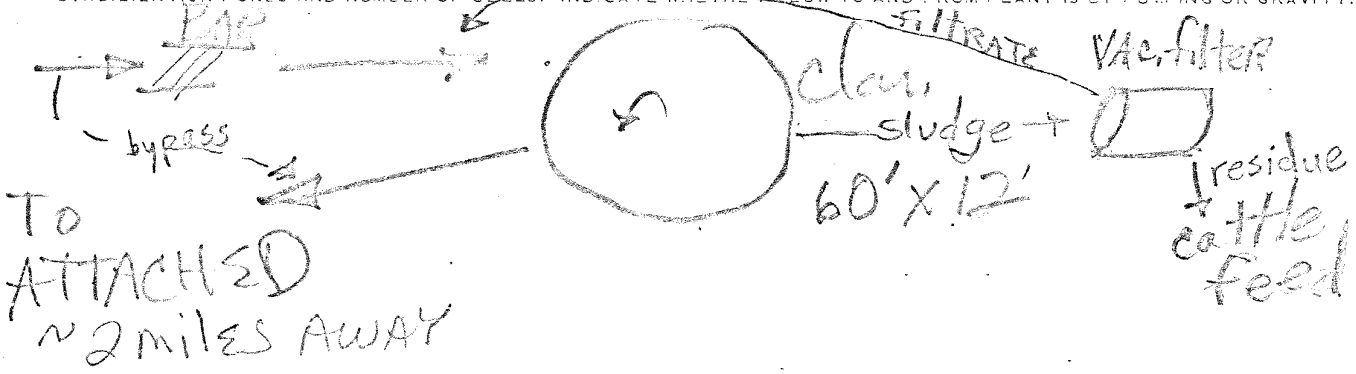
4. TYPE OF COLLECTION SYSTEM

4A.	4B. ESTIMATED FLOW CONTRIBUTED BY SURFACE OR GROUND WATER (infiltration, mgd)
☐ COMBINED ☒ SEPARATE ☐ BOTH	0

5. YEAR COMMUNITY BEGAN SEWAGE TREATMENT	6. YEAR PRESENT SYSTEM PLACED IN OPERATION		
	6A. SEWER	6B. PLANT	6C. ANCILLARY WORKS
	1965	1965	ADDITIONS '70

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

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 [illegible] 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	
BUREAU of Rec. drain ?	

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 (Imhoff Cone) (ml/l)
3000	

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

6. ANNUAL AVERAGE PLANT REDUCTION %

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

ES PLANT HAVE STANDBY POWER GENERATOR FOR MAJOR PUMPING FACILITIES? ☐ YES ☒ NO

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

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

1

8A. PURPOSE OF CHLORINATION

NA

8B. TYPE OF CHLORINATOR NA

8C. POINT OF APPLICATION OF CHLORINE NA

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

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

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

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

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) NA

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 NA

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

IRRIGATION after ~40 min

12. USES OF RECEIVING STREAM WITHIN 10 MILES OF OUTFALL

NONE

13. HAVE THERE BEEN ANY ODOR COMPLAINTS BEYOND THE PLANT PROPERTY? *(If yes, explain)*

☐ YES ☒ NO

not since aerators

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

iced over

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
daily

E. WATER DEPTH (feet)
____ HIGH ____ LOW ____ MEDIUM See attached

F. ADEQUATE CONTROL OF DEPTH?
[X] YES [ ] NO

G. SEEPAGE REPORTED?
[ ] YES [X] 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: 3 weeks

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 Dec 71

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)
SPARE PARTS available

B. ~~ARE PROCESSING UNITS OPERATING AT DESIGN EFFICIENCY?~~
[ ] YES [ ] NO (If no, explain)
DO probes in aeration cell – NOT working

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

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?
Head works too small; bar screen area too small, Replace with Barminutor

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

FREQUENCY	WEATHER	FLOW	SLUDGE HANDLED	CHEMICALS USED	DIGESTER	GRIT HANDLED	ELEC. USED	COST DATA	AIR USED	MAIN-TENANCE	OTHER
DAILY	—	X	X	X	—	—				X	
WEEKLY											
MONTHLY							X	X	NA		
ANNUALLY											

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

[ ] NOT AT ALL [X] DAILY [ ] WEEKLY [ ] MONTHLY [ ] ANNUALLY

IF MAINTAINED CHECK FORM OF RECORD BELOW:

[ ] LOG BOOK [X] 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
2 MAJOR – POTATOES, 2 MINOR

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

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

D. VOLUME OF INDUSTRIAL WASTES *(mgd)*
TOTAL

E. COMPOSITION AND CHARACTERISTICS OF INDUSTRIAL WASTES
pH varies, Hi BOD

F. MAIN DIFFICULTY EXPERIENCED WITH INDUSTRIAL WASTE *(explain)*
PRIOR TO 69 – ODOR.

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 [X] 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? [X] YES [ ] NO

10. WHO PROVIDED INITIAL INSTRUCTION IN THE OPERATION OF THE PLANT?
G. ASSELSTINE & GRAY & McFARLAND Dan Neal

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

IF YES, WHO WROTE AND PROVIDED IT?
WPCC ; NEW YORK

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

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	2	80	2	5 YRS	5
3. LABORATORY TECHNICIANS				4 YRS	4
4. LABORERS			--	2	
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	5	5		5				5
2. SUSPENDED SOLIDS								
3. SETTLEABLE SOLIDS	3	3		6				
4. SUSPENDED VOLATILE	5	6						
5. DISSOLVED OXYGEN	3	3		3				3
6. TOTAL SOLIDS	1	3						
7. VOLATILE SOLIDS								
8. pH	1	1						
9. TEMPERATURE	1	1						
10. COLIFORM DENSITY	–							
11. RESIDUAL CHLORINE	–							
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 DeVitt		Dot E

INFORMATION FURNISHED BY	TITLE	ORGANIZATION	DATE
Phil [illegible]	Operator	City	[illegible]
Sam Taylor			

G. NOTATIONS BY EVALUATOR

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

2. GENERAL COMMENTS ON HOUSEKEEPING AND MAINTENANCE

Clean

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