

March 25, 1974

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WA-22-4010

Memo to: Mike Price and Ron Robinson

From: Hans Cregg

Subject: Efficiency Survey Conducted at Montesano STP.



During the month of November, 1973, an efficiency study was conducted on the Montesano Wastewater Treatment Plant. The plant provides primary treatment and appears to be a well running unit. Lab results, however, indicate a different situation. BOD and COD reduction are only 40 and 55% respectively. Total solids reduction is no better than 10%. This in itself is an unfavorable situation. It is worsened by the coliform count. The lowest total coliform count is $>4 \times 10^4$ and the lowest fecal coliform count is $>4 \times 10^3$. It should be emphasized that chlorination did take place and no malfunctioning of the chlorinator was observed.

In addition, nutrient analysis shows the following results:

NO ₃ -N (filtered)	.26
NO ₂ -N (filtered)	.25
NH ₃ -N (unfiltered)	6.4
T. Kjeldahl-N (unfilt.)	12.
O-PO ₄ -P (filtered)	2.15
Total Phos.-P (unfilt.)	6.75

HC:jmh

STP SURVEY REPORT FORM

(EFFICIENCY STUDY)

City Montesano Plant Type Primary Population 2000 Design Capacity
 Served

Receiving Water Chehalis River Engineer _____

Date _____ Survey Period 8 hour Survey Personnel H. Cregg

Comp. Sampling Frequency 1/2 hour Weather Conditions Fair and cool
 (last 48 hours)

Sampling Alequot 1000 mls.

PLANT OPERATION

Total Flow .500 How Measured Totalizer

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

Pre Cl₂ _____ #/day Post Cl₂ _____ #/day

FIELD RESULTS

Determinations	Influent				Effluent			
	Max.	Min.	Mean	Median	Max.	Min.	Mean	Median
Temp. °C								
pH								
Conductivity (umhos/cm)								
Settleable Solids								

LABORATORY RESULTS ON COMPOSITE IN PPM

Laboratory Number	Influent	Effluent	% Reduction
	73-4112	73-4113	
5-Day BOD	108	65	40
COD	170	77	55
T.S.	307	250	19
T.N.V.S.	142	128	10
T.S.S.	96	50	48
N.V.S.S.	9	7	23
pH	7.1	7.0	
Conductivity	350	330	
Turbidity	33	26	22

Montesano

BACTERIOLOGICAL RESULTS

Na₂S₂O₃ added to sample Before sampling after _____ min.

LAB #	SAMPLING TIME	COLONIES/100 MLS (MF)		Cl Residual	
		Total	Fecal	dpm	(after secs.)
73-4114	0900	>4 x 10 ⁴	>4 x 10 ³		
4115	1100	>1 x 10 ⁵	>4 x 10 ³		
4116	1230	>4 x 10 ⁵	>4 x 10 ³		
4117	1430	>1 x 10 ⁵	>4 x 10 ³		
4118	1530	>1 x 10 ⁵	>4 x 10 ³		

Operator's Name _____ Phone # _____

Comments: _____

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

WATER QUALITY LABORATORY

DATA SUMMARY

ORIGINAL TO: H. CREEL.....
COPIES TO:
.....
.....
LAB FILES.....

Source Montesano STP

Collected By HJC

Date Collected 11-7-73

Goal, Pro./Obj. _____

Log Number:	73-4112	13	14	15	16	17	18				STORET
Station:	INF	EFF	0900	1100	1230	1430	1530				
pH	7.1	7.0									00403
Turbidity (JTU)	33.	26.									00070
Conductivity (umhos/cm)@25°C	350.	330.									00095
COD	170	77.									00340
BOD (5 day)	108	65									00310
Total Coliform (Col./100ml)	-	-	>4x10 ⁴	>1x10 ⁵	>4x10 ⁵	>1x10 ⁵	>1x10 ⁵				31504
Fecal Coliform (Col./100ml)	-	-	>4x10 ³	>4x10 ³	>4x10 ³	>4x10 ³	>4x10 ³				31616
NO3-N (Filtered)	-	.26									00620
NO2-N (Filtered)	-	.25									00615
NH3-N (Unfiltered)	-	6.4									00610
T. Kjeldahl-N (Unfiltered)	-	12.									00625
O-PO4-P (Filtered)	-	2.15									00671
Total Phos.-P (Unfiltered)	-	6.75									00665
Total Solids	307	250									00500
Total Non Vol. Solids	142	128									
Total Suspended Solids	96	50									00530
Total Sus. Non Vol. Solids	9	7									
<u>COLOR</u>	110	100									

Note: All results are in PPM unless otherwise specified. ND is "None Detected"
Convert those marked with a * to PPB (PPM X 10³) prior to entry into STORET

Summary By Stephen D. Roll Date 12-5-73

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

FORM APPROVED
BUDGET BUREAU NO. 42-111527

CHECK ONE: 1ST AUDIT RE-AUDIT DATE OF AUDIT: November 7, 1973 PLANT DESCRIPTION CODE (For Official Use Only):

A. GENERAL INFORMATION
1. PROJECT (State, Number): SCOPE OF PROJECT (new plant, additions, etc.):

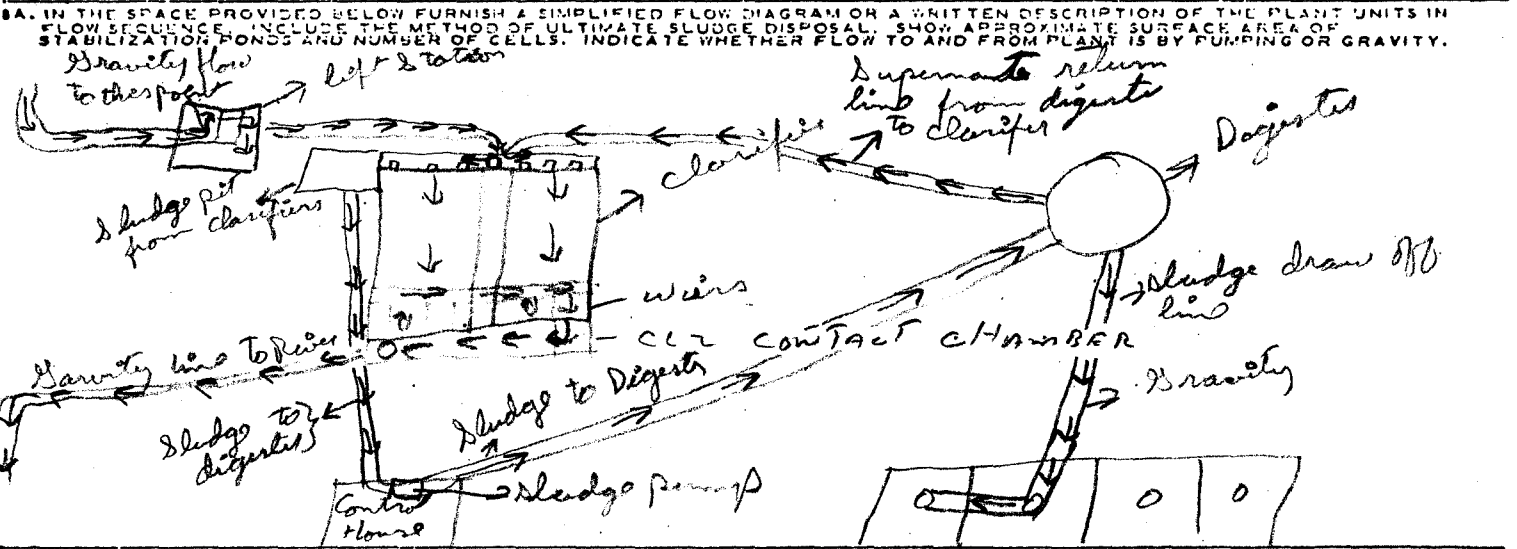
2. PLANT LOCATION (City, county): Montezuma Grays Harbor IDENTIFICATION OF AREAS SERVED:

3A. FRACTION OF AREA POPULATION SERVED (%): 90% 3B. PLANT DESIGN (population equivalent): 3C. SERVED BY PLANT (domestic): 2,600

4. TYPE OF COLLECTION SYSTEM
4A. COMBINED SEPARATE BOTH 4B. ESTIMATED FLOW CONTRIBUTED BY SURFACE OR GROUND WATER (infiltration, mgd):

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

7A. SIZE OF PLANT SITE (acres): 1 Acre 7B. APPROXIMATE AREA LEFT FOR EXPANSION (acres): 5 acres



8B. NOTE ANY SIGNIFICANT OR UNIQUE PROCESSING CONDITIONS.

9. RECEIVING STREAM

9A. NAME OF STREAM: Chehalis
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): 875 1B. PEAK FLOW RATE (mgd):
 DRY WEATHER: .350 WET WEATHER: .950 1C. MINIMUM FLOW RATE (mgd): .250
2. AVERAGE BOD OF RAW SEWAGE (5 DAY 20°C) (ppm): 3. AVERAGE SETTLEABLE SOLIDS OF RAW SEWAGE (mg/l): 4.5
4. AVERAGE SUSPENDED SOLIDS OF RAW SEWAGE (mg/l): 5. AVERAGE COLIFORM DENSITY OF RAW SEWAGE (mpn/100 ml):

5. ANNUAL AVERAGE PLANT PERFORMANCE
6A. BOD (%) 6B. SETTLEABLE SOLIDS (%) 6C. SUSPENDED SOLIDS (%) 6D. COLIFORM DENSITY (%)

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

8A. PURPOSE OF CHLORINATION
DISINFECT WATER BEFORE ENTERING RIVER

8D. TYPE OF CHLORINATOR
Wallace & Tiernan (Ball jar)

8C. POINT OF APPLICATION OF CHLORINE
Effluent end of clarifiers

8D. CAN BYPASSED SEWAGE BE CHLORINATED?
 YES NO

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

8F. CHLORINE RESIDUAL IN EFFLUENT
1.0 PPM AT END OF 5 MINUTES

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

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)
on an average 4 times a year

9B. AVERAGE DURATION (hours)
8 hrs

9C. REASON FOR BYPASSING
SHUT Down Plant for repairs

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
State Health Dept., Olympia

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 In the process of putting in check valves on all new water service.

10B. CHECK TYPE OF BACK FLOW PREVENTION DEVICE
 DOUBLE CHECK VALVE PRESSURE OPERATED PHYSICAL DISCONNECT OTHER (specify)
3/4" Check Valve

11. USES OF TREATMENT PLANT EFFLUENT
NONE

12. USES OF RECEIVING STREAM WITHIN 10 MILES OF OUTFALL

13. HAVE THERE BEEN ANY ODOOR 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 *N/A*

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

YES NO *N/A*

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

YES NO *N/A*

D. FREQUENCY OF INSPECTION BY OPERATOR

N/A

E. WATER DEPTH (feet)

_____ HIGH _____ LOW _____ MEDIUM *N/A*

F. ADEQUATE CONTROL OF DEPTH?

YES NO *N/A*

G. SEEPAGE REPORTED?

YES NO *N/A*

H. ANY REPORTS OF GROUND WATER CONTAMINATION FROM POND (If yes, give details)?

YES NO

N/A

I. MOSQUITO BREEDING PROBLEM?

YES NO

IF YES, NAME OF SPECIES IF KNOWN

N/A

J. CAN SURFACE RUN-OFF ENTER POND?

YES NO *N/A*

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

Sacramento State College (Correspondence course) Feb. 72 to Sept.

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?

5. ARE OPERATING RECORDS MAINTAINED? (If maintained, check general items included) <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO						REPORTED? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO					
						TO WHOM? <i>Department of Social & Health</i>					
FREQUENCY	WEATHER	FLOW	SLUDGE HANDLED	CHEMICALS USED	DIGESTER	GRIT HANDLED	ELEC. USED	COST DATA	AIR USED	MAINTENANCE	OTHER
DAILY	X	X	X	X	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?

HAZARD WATER TESTER

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

YES NO (If no, explain)

B. INDUSTRIAL WASTES DISCHARGED TO MUNICIPAL SYSTEM:

A. NUMBER AND TYPES OF INDUSTRIES DISCHARGING TO SYSTEMS

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

C. POPULATION EQUIVALENT (SS) OF INDUSTRIAL WASTES (pc)

D. VOLUME OF INDUSTRIAL WASTES (mgd)

E. COMPOSITION AND CHARACTERISTICS OF INDUSTRIAL WASTES

F. MAIN DIFFICULTY EXPERIENCED WITH INDUSTRIAL WASTE (explain)

8. 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 hrs lab 2 1/2 hrs Reports

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	4	30	2	2-14	2-14
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			RECEIVING STREAM
					RAW	SUPER-NATANT	DIGESTOR	
1. BOD								
2. SUSPENDED SOLIDS								
3. SETTLEABLE SOLIDS	1	1						
4. SUSPENDED VOLATILE								
5. DISSOLVED OXYGEN	1	1						
6. TOTAL SOLIDS								
7. VOLATILE SOLIDS								
8. pH	1	1						
9. TEMPERATURE	1							
10. COLIFORM DENSITY								
11. RESIDUAL CHLORINE		1						
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
through October, MOST CURRENT YEAR 1972	8481.94	879.51	1,200.00	1,528.48	3,562.79	
PRIOR YEAR 19 72	16,812.37	717.31	1,200.00	1,322.24	4,384.87	
PRIOR YEAR 19 71	9,062.52	755.98	1,200.00	182.14	3,416.99	
PRIOR YEAR 19 70	9,524.81	552.73	1,347.14	600.00	4,665.81	

EVALUATION PERFORMED BY	TITLE	ORGANIZATION

INFORMATION FURNISHED BY	TITLE	ORGANIZATION	DATE
Sandy Patterson	Water & Waste treatment super.	City of Montezuma	11-2-72