

M E M O R A N D U M

May 7, 1975

To: Howard Steeley

From: Allen Moore

Subject: Mossyrock Lagoons Efficiency Study and
Receiving Water Survey

On January 28, 1975, grab samples were taken from the Mossyrock lagoons. Except for some microscopic algae which settle out after standing a short time, the effluent is virtually crystal clear. The lab data shows a BOD reduction of 80%. Other reductions are listed below:

COD	25%
T.S.	42%
T.N.V.S.	45%
T.S.S.	25%
N.V.S.S.	22%

Percent reductions in BOD, COD, T.S. and T.S.S. would probably all be higher if a larger contact chamber was present to allow settling out of the algae after chlorination.

During the winter, rainy period, effluent is discharged to Mayfield Reservoir 4 or 5 days a month with a 24 hour average flow of .25 MGD. During the rest of the year there is no effluent discharge.

The plant is neatly run and maintained by operator George Bryant.

Following the grab sampling from the lagoons a boat survey of the receiving waters was conducted around the outfall. Samples were collected at 5 locations as shown on the diagram. Stations C, D, and E were sampled at one foot below the surface. Station B was sampled at one foot and 25 feet. Station A was sampled at one foot, 25 feet and one foot above the diffuser at 50 feet. Parameters tested were coliform bacteria and nutrients. All stations had very low counts of bacteria and low nutrient levels with only slightly higher values directly over the outfall. The higher coliform values at station E (which was used as a control sample) are probably due to a upstream pollution source and is not characteristic of the reservoir water.

The survey shows the STP outfall has negligible effects on the ambient water quality of the reservoir.

Further studies (see memo to Howard Steeley, Feb. 18, 1975) shows that the reservoir retains the Class A designation of the Cowlitz Rivdr because the retention time of the reservoir is not long enough for it to qualify as Lake Class.

AM:ee

Attachment

cc: Ron Pine

STP Survey Report Form

Efficiency Study

City Mossyrock Plant Type lagoon Pop. Served 500 Design 1,000
 Capacity
 Receiving Water Mayfield reservoir Perennial X Intermittent _____
 Date 28 Jan. 1975 Survey Period 1000 - 1200 Survey Personnel Allen Moore, Darrel
 Anderson
 Comp. Sampling Frequency grab Sampling Alequot _____
 Weather Conditions (24 hr) light rain Are facilities provided for complete by-
 pass of raw sewage? _____ Yes X No/Frequency of bypass none
 Reason for bypass _____ Is bypass chlorinated? _____ Yes _____ No
 Was DOE Notified? _____ Discharge - Intermittent _____ Continuous _____

Plant Operation

Total flow average .25 MGD (effluent) How measured totalizer
 Maximum flow constant rate during Time of Max. _____
pumping
 Minimum flow _____ Time of Min. _____
 Pre Cl₂ _____ #/day Post Cl₂ 15 #/day

Field Results

Influent

Effluent

Determinations	Max.	Min.	Mean	Median	Max.	Min.	Mean	Median
Temp °C								
pH (Units)								
Conductivity (µmhos/cm ²)								
Settleable Solids (mls/l)								

Laboratory Results on Composites

	Influent	Effluent	% Reduction
Laboratory No.	<u>75-419</u>	<u>75-420</u>	
5-Day BOD ppm	<u>112</u>	<u>22</u>	<u>80%</u>
COD ppm	<u>160</u>	<u>120</u>	<u>25%</u>
T.S. ppm	<u>281</u>	<u>164</u>	<u>42%</u>
T.N.V.S. ppm	<u>142</u>	<u>78</u>	<u>45%</u>
T.S.S. ppm	<u>83</u>	<u>62</u>	<u>25%</u>
N.V.S.S. ppm	<u>9</u>	<u>7</u>	<u>22%</u>
pH (Units)	<u>7.4</u>	<u>8.2</u>	
Conductivity (µmhos/cm ²)	<u>380</u>	<u>160</u>	
Turbidity (JTU's)	<u>64</u>	<u>8</u>	

Laboratory Bacteriological Results

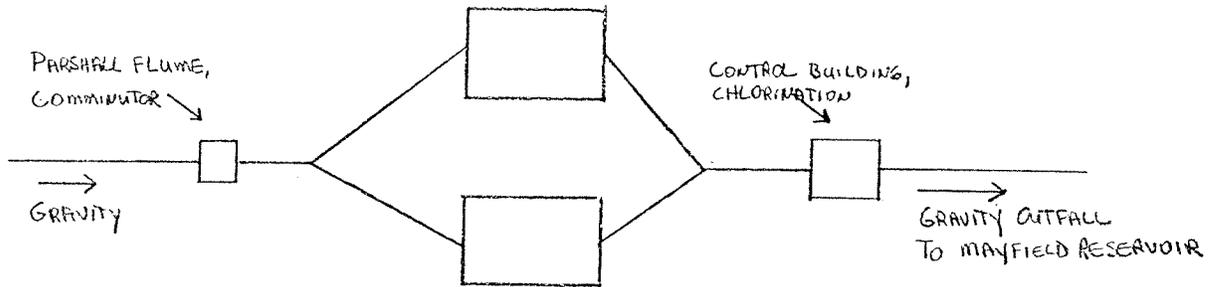
Lab No.	Sampling Time	Colonies/100 ml (MF)			Cl ₂ Residual
		Total Coliform	Fecal Coliform	Fecal Strep	
75-439		17 est	<10		2.0
75-440		<20	<10		2.0

Additional Laboratory Results

NO ₃ -N ppm -	.29
NO ₂ -N ppm -	.01
NH ₃ -N ppm -	1.85
T. Kjeldahl-N ppm -	5.32
O-PO ₄ -P ppm -	0.70
T-PO ₄ -P ppm -	5.8

Operator's Name George Bryant Phone No. 943-2041

Furnish a flow diagram with sequence and relative size and points of chlorination.



Type of Collection System

Combined Separate Both

Estimate flow contributed by surface or ground water (infiltration)

_____ MGD

Plant Loading Information

Annual average daily flow rate (mgd)

Peak flow rate (mgd)

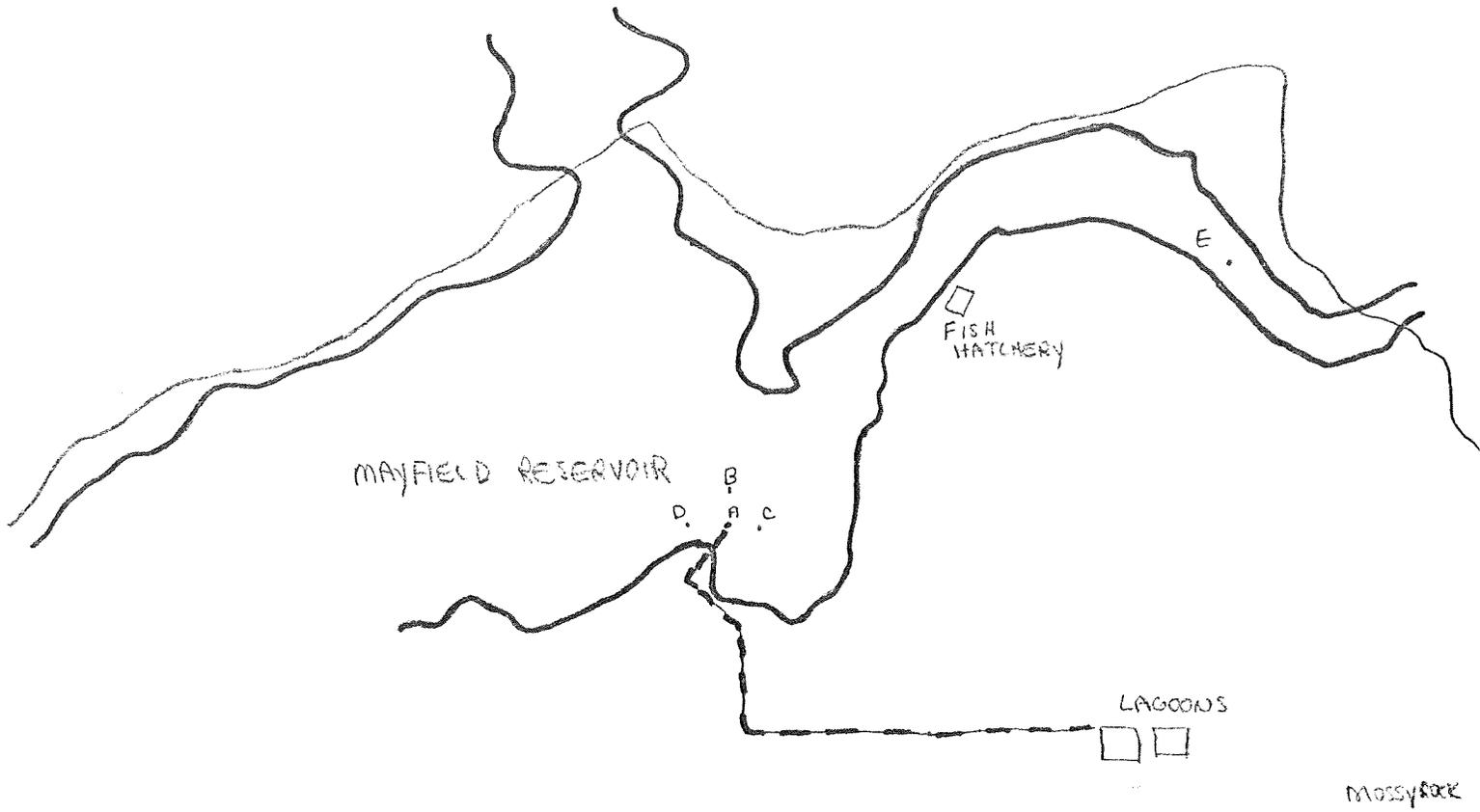
Dry .042 MGD

Dry .051 MGD

Wet .073 MGD

Wet .542 MGD

COMMENTS: _____



MOSSYROCK STP LAGOONS
RECEIVING WATER SURVEY STATIONS

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

WATER QUALITY LABORATORY

DATA SUMMARY

ORIGINAL TO: .A. Moore
COPIES TO:
.....
.....
LAB FILES

Source Mossyrock Lagoons

Collected By A. W. Moore

Date Collected 1-28-75

Log Number:	75-419	420	421	422	423	424	425	426	427	428	439	440
Station:	INF GRAB	EFF GRAB	#2 SUR. A	#2 Med. depth	#2 depths A	B SURFACE	B 25'	C SURF.	D SURF.	E SURF.	EFF	MLL
pH	7.4	8.2										
Turbidity (JTU)	64.	8.										
Conductivity (umhos/cm)@25°C	380.	160.										
COD	160	120										
BOD (5 day)	112	22										
Total Coliform (Col./100ml)	-	-	180	160	EST 5	<5	EST 5	<5	EST 40	760	EST 17	<20
Fecal Coliform (Col./100ml)	-	-	EST 4	EST 22	<2	EST 2	<2	EST 2	EST 2	EST 30	<10	<10
NO3-N (Filtered)		.29	.13	-	.07	.07	.07	.07	.07	.06		.50
NO2-N (Filtered)		.01	ND	-	ND	ND	ND	ND	ND	ND		ND
NH3-N (Unfiltered)		1.85	.02	.03	.04	ND	ND	ND	ND	ND		1.75
T. Kjeldahl-N (Unfiltered)		5.32	.10	.04	.04	ND	ND	ND	ND	ND		5.08
O-PO4-P (Filtered)		0.70	ND	-	ND	ND	ND	ND	ND	ND		2.30
Total Phos.-P (Unfiltered)		5.8	.03	-	.02	.01	.02	.01	.01	.01		3.15
Total Solids	281	164										
Total Non Vol. Solids	142	78										
Total Suspended Solids	83	62										
Total Sus. Non Vol. Solids	9	7										

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 _____ Date _____