ANDREA BEATTY RINIKER
Director

Segment No. 14-30-01

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

7272 Cleanwater Lane, LU-11 • Olympia, Washington 98504-6811 • (206) 753-2353

MEMORANDUM
October 30, 1986

To: Jim Milton

From: Marc Heffner

Subject: Goldendale Sewage Treatment Plant Class II Inspection, August 27–28, 1985, and March 11–12, 1986.

ABSTRACT

A Class II inspection was conducted at the Goldendale Sewage Treatment Plant (STP) on August 27–28, 1985, and March 11–12, 1986. The inspection was conducted during two field visits so that dry- and wet-weather conditions could be observed. The STP is a two-stage lagoon system followed by chlorination/-dechlorination. Effluent is discharged to the Little Klickitat River during wet weather and is used for irrigation during dry weather. Typical lagoon behavior was observed during both field visits. Concurrent field work in the receiving water is presented in a separate report (Joy, 1986).

INTRODUCTION

At Al Newman's request, a Class II inspection was conducted at the Goldendale Sewage Treatment Plant (STP) to evaluate the system during both wet- and dry-weather flows. The dry-weather field work was done on August 27–28, 1985, and the wet-weather field work was done on March 11–12, 1986. The inspection was conducted by Marc Heffner of the Ecology Water Quality Investigations Section (WQIS), with help from Pete Ham, the Goldendale STP operator. Concurrent receiving water work in the Little Klickatat River was conducted by Joe Joy, Ecology WQIS, and Al Newman, Ecology Central Regional Office. The receiving water work is presented in a separate report (Joy, 1986).

The Goldendale STP is a two-stage lagoon system (Figure 1). Treatment units include two primary cells, one secondary cell, and a chlorination/dechlorination basin. A recycle option is built into the system allowing primary

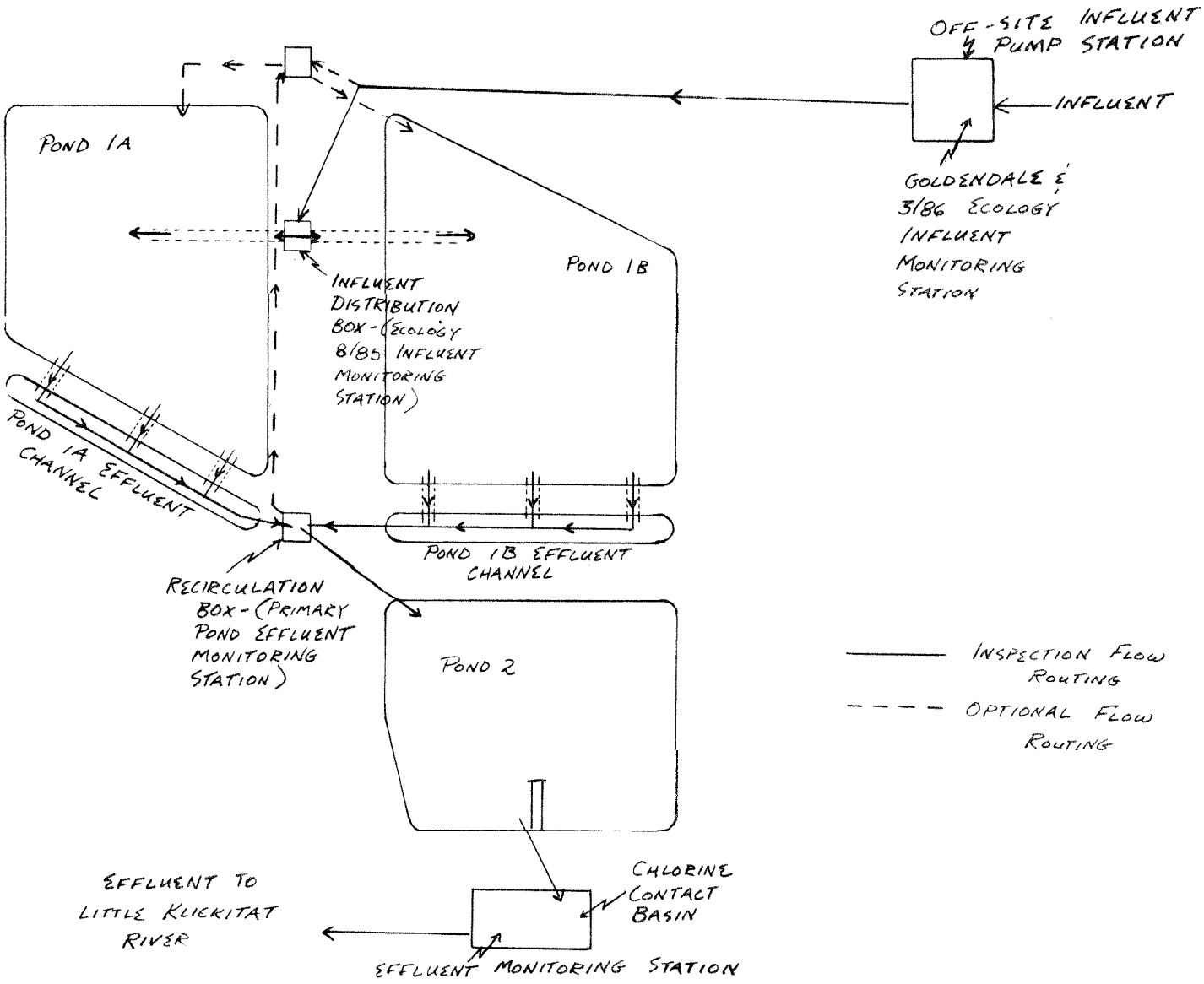

Figure 1. STP flow scheme during inspection - Goldendale, 8/85 and 3/86.

cell effluent to be sent back into the primary cells. The recycle option is used in the winter when algal productivity in the system is low and low dissolved oxygen (D.O.) concentrations occur in the primary cells. Recycle was not taking place during any of the inspection field work.

Effluent flow is limited by National Pollutant Discharge Elfmination System (NPDES) permit #WA-002112-1. The permit allows effluent discharge to the Little Klickitat River at a rate less than 1/20th of the river flow rate upstream of the discharge. During the growing season, all plant effluent is routinely used to spray-irrigate an adjacent hay field so the permit requirement is met. During the dry-weather inspection, the discharge pattern was altered at our request and effluent was discharged to the river at a rate of approximately 1/20th of the river flow. Wet-weather corresponds with the non-growing season, at which time discharge is to the river.

Objeetives of the inspection included:

1. Sample collection and flow measurement to estimate plant efficiency and NPDES permit eompliance.

2, Review laboratory procedures (including sample splits with the operator) to estimate accuracy of results and conformance with approved analytical techniques.

3. Provide support data for the receiving water study.

PROCEDURES

Composite samples were collected during both the August and March visits. Ecology compositors were stationed to collect influent, primary pond effluent, and final effluent samples. The compositors collected approximately 200 mLs of sample every 30 minutes for 24 hours. Goldendale STP compositors also collected influent and final effluent samples. The Goldendale compositors collected approximately 400 mLs of sample every 60 minutes for 24 hours. Influent and final effluent samples were split for analysis by both the Goldendale STP and Ecology laboratories.

Grab samples and field measurements were collected during both field visits. Water depth, sludge depth, and D.O. concentrations (just below the water surface) at several stations on each lagoon were measured from an Ecology boat. Effluent samples were collected for selected laboratory analyses.

Grab and composite samples collected, sampling times, and parameters analyzed are included in Table 1.

Table 1. Sampling schedule - Goldendale, 8/85 and 3/86.

Station	Sampler	Date	Time	Aliquot Collection Frequency (min)	Aliquot Collection Volume (mL)	Laboratory	Parameters Analyzed: Laboratory Analyses: BOD5	COD	Cond.	Turb.	Solids: TS	TNVS	TSS	TNVSS	Nutrients: NH3-N	NO2-N	NO3-N	O-PO4-P	Total-P	Chl. a	Na	Ca	g	F. Coli.	T. Coli.	Oil & Gr	Field Analyses: Temp.	pH	Cond.	Chl. Rest.	D.O.	Sludge depth
COMPOSITE SAWLES:																																
Dry-Weather Sampling																																
influent	Ecology	8/27-28	1020-1020	30	200	Ecology G'dale	X X	X	X	X	X	X	X X	X	X	X	X	X	X	X	X	X	X									
	Galdendale	8/27-28	1020-1020	55	400	Ecology G'dale	X X	X	X	X	X	X	X X	X	X	X	X	X	X	X	X	X	X									
Primary Pond Effluent	Ecology	8/27-28	1010-1010	30	200	Ecology	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X									
Plant Effluent	Ecology	8/27-28	0950-0950	30	200	Ecology G'dale	X X	X	X	X	X	X	X X	X	X X	X	X	X X	X	X	X	X	X									
	Goldendale	8/27-28	0950-0950	55	400	Ecology G'dale	X X	X	X	X	X	X	X X	X	X X	X	X	X X	X	X	X	X	X									
Wet-Weather Sampling																																
Influent	Ecology	3/11-12	0945-0945	30	200	Ecology G'dale	X X	X	X	X	X	X	X X	X	X	X	X	X	X	X	X						X	X	X			
	Goldendale	3/11-12	0945-0945	55	400	Ecology G'dale	X X	X	X	X	X	X	X X	X	X	X	X	X	X	X	X											
Primary Pond Effluent	Ecology	3/11-12	0945-0945	30	200	Ecology	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						X	X	X			
Plant Effluent	Ecology	3/11-12	0945-0945	30	200	Ecology G'dale	X X	X	X	X	X	X	X X	X	X	X	X	X	X	X	X						X	X	X			
	Goldendale	3/11-12	0945-0945	55	400		Sample spilled; no analyses *performed*																									
ECOLOGY GRAB SAMPLES:																																
Dry-Weather Sampling																																
Influent		8/27	1020																								X	X	X			
			1730																								X	X	X			
		8/28	1020																							X	X	X	X			
Primary Ponds		8/27	1130-1300																												X	X
		8/28	0630-0700																												X	
Primary Pond Effluent		8/27	1010																								X	X	X			
			1740																								X	X	X			
		8/28	1005																								X	X	X			
Secondary Pond		8/27	1130-1300																												X	X
		8/28	0630-0700																												X	
Plant Effluent		8/27	0855																					X	X							
			0950																								X	X	X			
			1315																					X	X							
			1430																											X		
			1750																								X	X	X			
		8/28	0830																					X	X							
			0945																							X	X	X	X			
			1000																					X	X					X		
Wet-Weather Sampling																																
Influent		3/11	1010																							X	X	X	X			
			1310																							X						
			1645																								X	X	X			
		3/12	0930																								X		X			
Primary Ponds		3/11	1400-1600																												X	X
Primary Pond Effluent		3/11	1020																								X	X	X			
			1650																								X	X	X			
		3/12	0910																								X	X	X			
Secondary Pond		3/11	1400-1600																												X	X
Plant Effluent		3/11	0830					X	X	X			X		X	X	X	X	X	X				X	X	X				X		
			1030																								X	X	X			
			1300					X	X	X			X		X	X	X	X	X	X				X	X	X						
			1700																								X	X	X	X		
		3/12	0840					X	X	X			X		X	X	X	X	X	X				X	X		X	X	X			
			1035																											X		

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Flow measurement at the plant is done on both the influent and final effluent. Influent flows are monitored in conjunction with the influent pump station. The accuracy of the influent flow measurements could not be confirmed. Effluent flows are measured at a Cipoletti weir at the end of the chlorination/dechlorination basin. Instantaneous Ecology flow measurements were made to check the accuracy of the effluent flow meter.

RESULTS AND DISCUSSION

Inspection data are summarized in Table 2 (composite sample results), Table 3 (grab sample results), and Table 4 (flow measurements). Instantaneous Ecology effluent measurements agreed well with the STP effluent flow meter.

Data collected during the inspection were typical for a lagoon treatment system (Table 2). August effluent BOD_5 concentrations are slightly below 30 mg/L with TSS concentrations higher. Also, ammonia and nitrate concentrations were substantially reduced in the treatment process along with a moderate reduction of phosphorus. March effluent BOD_5 concentrations were approximately 1/2 of the August concentration; presumably due to the weak influent strength. Ammonia, nitrate, and phosphorus reduction was occurring to a much smaller extent in March.

Table 5 compares inspection data to NPDES permit limits. During the August sampling period, BOD_5 and TSS concentrations and loads were less than permit limits, but the BOD_5 percent removal (81 to 84 percent) was slightly less than the required 85 percent minimum. One of the effluent pH measurements exceeded the upper limit of 8.5. High pH values are common in lagoons and generally are accepted per 40CFR #133.102(c) when, as was the case at Goldendale, they appear to be associated with algal activity (GSA, 1984). Chlorine residual in excess of the <0.2 mg/L limit (0.3 mg/L) was detected in one of the effluent samples. The measurement system for dechlorination probably contributed to this. Checking the application rate indicated on the sulfinator is difficult because the SO_2 is stored in a bulk tank (approximately 5 tons) with a scale that measures in 20-pound increments while typical application rates are 15 to 20 lbs/D. Averaging application rates over several consecutive days and comparing that information to the measured amount used may help monitor the accuracy of the sulfinator. Careful operator attention to effluent chlorine residual concentrations is necessary to use the available dechlorination system.

Results of the March field visit are also included in Table 5. Again BOD_5 and TSS concentrations and loads were within permit values, but the BOD_5 percent removal (68 percent) was less than the 85 percent minimum. One of the pH measurements (8.9) exceeded the 8.5 maximum. The operator reported that the lagoons had gotten green due to increased algal activity approximately one week before the inspection; likely explaining the high pH.

Table 2. Ecology laboratory analytical results of composite samples - Goldendale, 8/85 and 3/86.

Sample	Sampler	COD (mg/L)	BOD_5 (mg/L)	Cond. (umhos/cm)	Turb. (NTU)	Solids (mg/L)				Nutrients (mg/L)					Chloride (mg/L as Cl)	Alk. (mg/L as $CaCO_3$)	Cations (mg/L)			Field Measurements		
						TS	TNVS	TSS	TNVSS	NH_3-N	NO_2-N	NO_3-N	O-PO_4-P	Total P			Na	Ca	Mg	pH (S.U.)	Cond. (umhos/cm)	Temp. (°C)
Dry-Weather Sampling (8/85)																						
Influent	Ecology	240	140	285	16	230*	170*	72*	12*	14	0.02	0.02	3.5	5.1	20**	150**	34.0	11.1	4.8			
	Goldendale	350	160	275	27	330*	160*	130*	23*	13	<0.01	<0.01	3.4	5.1	18**	150**	29.3	9.9	5.5			
Primary Pond Effluent	Ecology	180	44	224	18	320*	180*	80*	9*	0.01	0.01	0.03	3.1	4.1	24**	120**	38.8	12.8	5.0			
Final Effluent	Ecology	120	26	234	8	280*	130*	48*	4*	0.41	0.23	0.29	1.9	2.0	30**	100**	41.0	12.1	4.5			
	Goldendale	100	26	232	6	280*	82*	24*	4*	0.11	0.01	0.33		2.3	30**	120**	38.9	9.3	4.2			
Wet-Weather Sampling (3/86)																						
Influent	Ecology	110	44	334	12	270	160	63	18	3.7	0.01	2.5	1.2	2.1	15	110				7.6	310	5.0
	Goldendale	200	74	337	26	330	180	140	34	5.3	0.05	1.8	1.6	3.3	13	120						
Primary Pond Effluent	Ecology	91	16	276	7	230	130	38	1	2.6	0.04	1.1	1.4	1.8	14	93				9.0	280	4.3
Final Effluent	Ecology	91	14	273	8	220	130	40	4	2.8	<0.01	0.73	1.4	1.8	16	89				8.5	285	3.9

*Estimated concentration. Samples sen: to the Ecology laboratory were analyzed after the allowable holding time (7 days) had been exceeded. Estimated concentrations are likely underestimates of the actual concentration.

**Estimated concentration. Samples sen. to the Ecology laboratory were analyzed after the allowable holding time had been exceeded.

Table 3. Ecology grab sample results - Goldendale, 8/85 and 3/86.

Sample	Date	Time	Field Analyses: Temp. (°C)	pH (S.U.)	Cond. (umhos/cm)	Chl. Res. (free) (mg/L)	Chl. Res. (total) (mg/L)	F. Coli. (#/100 mL)	T. Coli (#/100 mL)	Laboratory Analyses: Oil & Grease (mg/L)	COD (mg/L)	Cond. (umhos/cm)	Turb. (NTU)	TSS (mg/L)	Nutrients (mg/L): NH_3-N	NO_2-N	NO_3-N	O-PO_4-P	Total-P	Chloride (mg/L as Cl)
Dry-Weather Sampling																				
Influent	8/27	1020	18.2	9.0	330															
		1730	18.9	6.9	415															
	8/28	1020	17.8	8.3	365					6										
Primary Pond Effluent	8/27	1010	18.6	9.6	287															
		1740	22.2	7.9	280															
	8/28	1005	16.9	9.1	300															
Final Effluent	8/27	0855						**	**											
		0950	19.2	8.0*	280															
		1315						**	**											
		1430				<0.1† 0.5††	0.1† 1.0††													
		1750	21.0	9.7	270															
	8/28	0830						<4	***											
		0945	17.9	7.8	295					<1										
		1000				<0.1† 0.5††	0.3† 1.0††	<4	***											
Wet-Weather Sampling																				
Influent	3/11	1010	9.7	7.2	320					31										
		1310								14										
		1645	9.4	7.3	340															
	3/12	0930	9.7		330															
		Comp	5.0	7.6	310															
Primary Pond Effluent	3/11	1020	9.5	8.6	280															
		1650	10.3	9.0	270															
	3/12	0910	9.6	8.8	270															
		Comp	4.3	9.0	280															
Final Effluent	3/11	0830				<0.1† 1.2††	<0.1† 1.7††	<4	49a 100b	1	83	275	7	36	2.8	<0.01	0.69	1.5	1.8	16
		1030	9.5	8.4	265															
		1300						<4	49a 180b	1	23	275	8	38	2.9	<0.01	0.72	1.4	1.4	14
		1700	10.2	8.9	265	<0.1† 1.5††	<0.1† 1.7††													
	3/12	0840	9.5	7.4	270			<1	11a 410b		60	272	8	36	3.4	<0.01	0.96	1.3	1.8	20
		1035				<0.1† 1.7††	0.1† 2.0††													
		Comp	3.9	8.5	285															

*pH was approximately 10 after 25 minutes.
†Sample taken after dechlorination.
††Sample taken prior to dechlorination.
**No sample analysis due to sample shipment problems resulting in holding time being exceeded.
***Heavy background growth, atypical colonies noted.
[a]MPN technique.
[b]MF technique.

Table 4. Flow measurements - Goldendale, 8/85 and 3/86.

Date	Time	Plant Meters: Instantaneous MGD	Plant Meters: Totalizer	Flow for Time Increment (MGD)
Dry-Weather Samplins				
Influent Meter				
8/27	1020		570392	
				0.63
	1805		570595	
				0.52
8/28	0730		570884	
				0.68
	1155		571010	
Average flow for sampling period: 0.58 MGD*				
Effluent Meter				
8/27	0845	0.3	4399527	
				0.23
	1700		4400321	
				0.25
8/28	0740		4401878	
				0.20
	0900	0.3	4401991	
				0.25
	1145		4402272	
Average flow for sampling period: 0.24 MGD*				
Wet-Weather Sampling				
Influent Meter				
3/11	0800			
				1.29
3/12	0800			
Effluent Meter				
3/11	1050	1.3	5766544	
				1.20
	1345	1.25	5768006	
				1.19
	1720	1.25	5769776	
				1.27
3/12	0905	1.3	5778110	
Average flow for sampling period: 1.25 MGD				

*Dry-weather influent and effluent flows were not equal because effluent was released at a controlled rate of approximately 1/20th of the receiving water flow. The remainder of the influent flow was held in the lagoons.

Table 5. Comparison of inspection effluent to NPDES permit limits - Goldendale, 8/85 and 3/86

			Inspection Measurementst								
	NPDES Permit Limits		Dry-Weather Sampling (8/85)					Wet-Weather Sampling (3/86)			
Parameter	Monthly Average	Weekly Average	Ecology Composite	Goldendale Composite	Grab	Influent	Effluent	Ecology Composite	Grab	Influent	Effluent
Flow (MGD)	1.5††					0.55	0.24			1.29	1.25
BOD_5 (mg/L)	30	45	26	26				14			
(lbs/D)	375	563	52	52				146			
(% Removal)	85		81	84				68			
TSS (mg/L)	75	112	48*	24*				40			
(lbs/D)	938	1407	96*	48*				417			
Total coliforms (#/100 mL)	230	400			**				49; 100; 49; 180; 11; 410		
pH (S.U.)	6.5 ≤ pH 18.5				7.8; 8.0; 9.7				7.4; 8.4; 8.9		
Total Residual Chlorine (mg/L)	<0.2 mg/L when discharging to river				0.1; 0.3				<0.1; <0.1; 0.1		

†Ecology laboratory analysis.

††Flow to the receiving water is not to exceed 1/20th of flow in the receiving water upstream of the discharge.

*Estimated concentration. Samples sent to the Ecology laboratory were analyzed after the allowable holding time (7 days) had been exceeded. Estimated concentrations are likely underestimates of the actual concentration.

**Heavy background growth, atypical colonies.

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Results of lagoon D.O., sludge depth, and water depth measurements are presented in Figure 2. Pond depth was greater during the March survey. The operator maintains a shallow pond level in the fall to allow for some storage capacity in the late fall; accounting for the shallow depth during the August survey. The ponds were operating at approximately maximum depth in March. Sludge depths were slightly greater in ponds 1A and 1B in March. The decomposition of sludge should increase as lagoon temperatures increase resulting in a decrease in sludge depth during the summer. Routine spring and fall checks of sludge depth by the operator should be made. The sludge depth data analyzed along with plant influent/effluent data can be used to estimate when lagoon volume reduction due to sludge accumulation is becoming a problem.

The dissolved oxygen measurements in the lagoons illustrate typical lagoon behavior (Figure 2). D.O. concentrations in the 8/28/85 samples collected before the lagoons had full exposure to sunlight (0630-0700 hours) were fairly low, ranging from 0.7 to 2.5 mg/L. The 8/27/85 samples collected between 1130 and 1300 hours under somewhat overcast conditions ranged from 4.8 to 7.2 mg/L D.O.. The 3/11/86 samples ranged in D.O. concentrations from 16.8 to 18.4 mg/L, suggesting a period of high algal activity.

Vegetation growing on the interior slopes of the lagoon dikes appeared excessive. During the August visit the operator reported that the vegetation was to be killed and burned in the fall. The dead vegetation was still standing during the March field visit. The operator reported that although they tried, they were unable to successfully burn the dead vegetation. The vegetation should be removed to help prevent damage to the lagoon dikes.

LABORATORY REVIEW

Laboratory procedures at the Goldendale STP laboratory appeared appropriate. Results of the split samples are presented in Table 6. Ecology and Goldendale laboratory BOD_5 and TSS analytical results compared reasonably well. The NH_3-N and O-PO_4-P results did not compare well.

Comparison of the Ecology and Goldendale STP influent composite samples is of some concern. The influent TSS concentration of the 8/27-28/85 Goldendale sample (130 mg/L) was considerably greater than the corresponding Ecology sample (72 mg/L). The COD (Ecology sample 240 mg/L, Goldendale sample 350 mg/L) and BOD_5 (Ecology sample 140 mg/L, Goldendale sample 160 mg/L) data followed a similar pattern to a lesser extent. The Ecology influent sampler was stationed at the plant distribution box for the 8/85 sampling in comparison to the Goldendale sampler which was stationed in the influent wet well.

For the 3/86 sampling, both the Ecology and Goldendale samplers were stationed in the wet well to assure that different sampler positioning would not

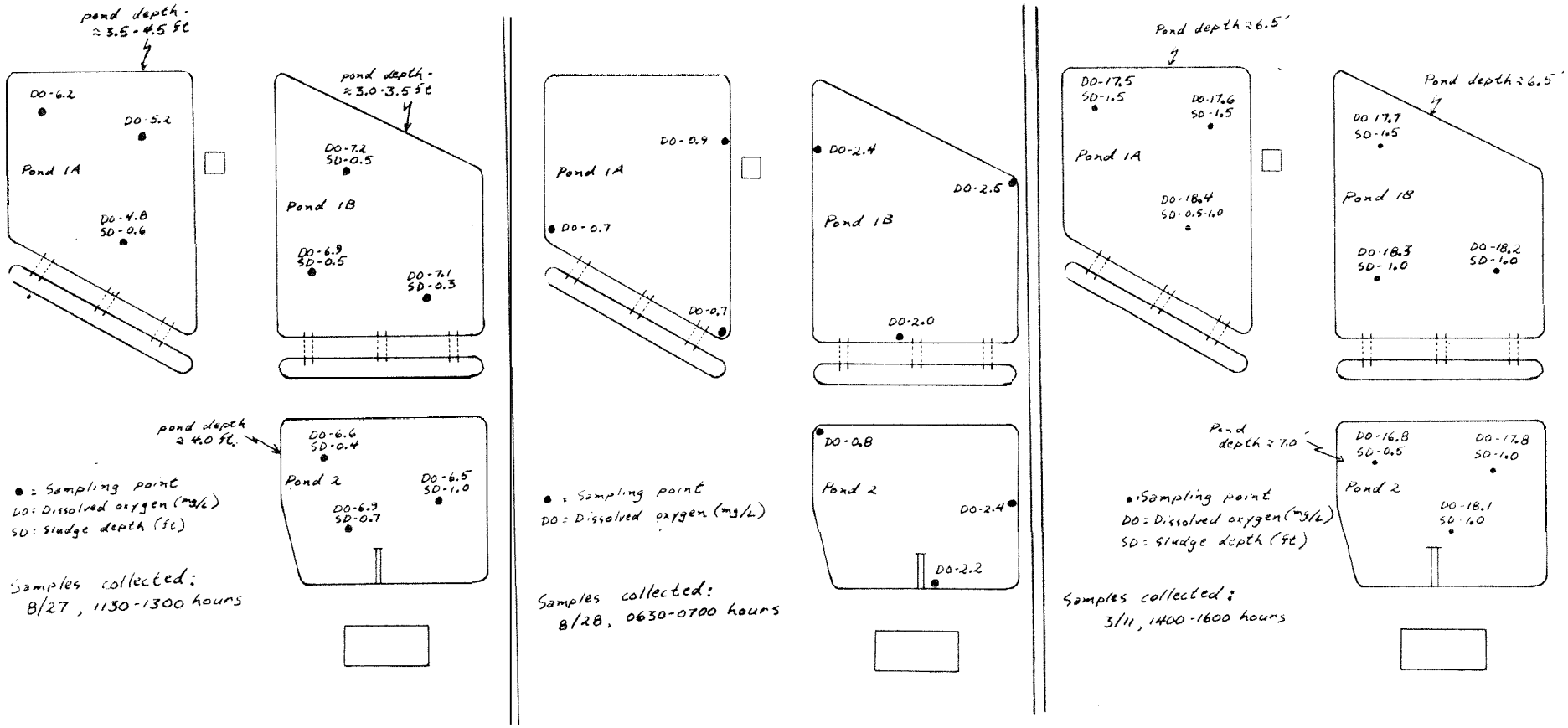

Figure 2. Dissolved oxygen and sludge depth measurements - Goldendale, 8/85 and 3/86.

Table 6. Comparison of split sample results - Goldendale, 8/85 and 3/86.

Parameter	Laboratory	Influent		Effluent		
		Ecology Composite	Goldendale Composite	Ecology Composite	Goldendale Composite	Effluent Grab
Dry-Weather Sampling (8/85)						
BOD_5 (mg/L)	Ecology	140	160	26	26	
	Goldendale	133	170	26	26	
TSS (mg/L)	Ecology	72*	130*	48*	24*	
	Goldendale	94	176	45	30	
Total Coliform (#/100 mL)	Ecology					†
	Goldendale					†
NH3-N (mg/L)	Ecology			0.41	0.11	
	Goldendale			0.7	1.2	
$O\text{-}PO_4\text{-}P$ (mg/L)	Ecology			1.9		
	Goldendale			1.1		
Total Chlorine Residual (mg/L)	Ecology					0.3
	Goldendale					<0.2
Wet-Weather Sampling (3/86)						
BOD_5 (mg/L)	Ecology	44	74	14		
	Goldendale	51	90	10		
TSS (mg/L)	Ecology	63	140	40		
	Goldendale	48	114	44		
Total Coliform (#/100 mL)	Ecology					11
	Goldendale					7 Est.

†Heavy background growth, atypical colonies.

*Estimated concentration. Samples sent to the Ecology laboratory were analyzed after the allowable holding time (7 days) had been exceeded. Estimated concentrations are likely underestimates of the actual concentration.

Est. = Estimated.

contribute to differences in sample composition. Again results indicated that a stronger sample had been collected by the Goldendale compositor (Table 6). The positioning of the Goldendale sampler inlet should be checked to assure that a representative sample is being collected. The data suggest that the Goldendale compositor may be collecting sample from a zone of sedimentation within the wet well. Calculated percent removals that are greater than actual removals would result from the suspected influent sampling problem.

Review of procedures with the operator resulted in the following recommendations being made to improve techniques:

Sampling and Sample Handling

1. Composite sample storage temperature should be checked monthly to assure that it is approximately 4 degrees C.

2. Samples should be stored at 4 degrees C until one to two hours before analysis, at which time they should be set out to gradually warm to room temperature. The operator was following this recommendation during the 3/86 sampling.

3. Septage dumping into the lagoons takes place at the influent distribution box (Figure 1) downstream from the influent sampling station. The amount of septage dumped should be included as a footnote on monthly DMR reports.

BOD_5

1. New dilution water nutrient solutions should be made every six months or when solutions become discolored, whichever is more frequent.

2. The seed control should be set up so that a valid BOD_5 test (D.O. depletion >2.0 mg/L and D.O. remaining >1.0 mg/L) is conducted to establish the seed correction factor. For the 3/85 sample splits the Goldendale seed control D.O. depletions were in the 1.4 to 1.8 mg/L range.

3. Dilutions should be adjusted so valid BOD_5 D.O. depletions are obtained for the weaker wet-weather sewage strength.

4. The pH of samples should be checked before the test is set up. pH adjustment of samples outside the range of 6.5 to 8.0 is necessary (Ecology, 1983, page 11, item 5). This practice had been instituted since the 8/85 sampling.

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TSS

1. Sufficient sample should be retained until filtering is complete so a new test filter can be used if the filter becomes plugged during filtering. This practice had been instituted since the 8/85 inspection.

2. As a quality assurance check, after the initial test drying and weighing are complete, samples should be redried and reweighed to assure a constant weight has been attained (less than 4 percent or 0.5 mg weight loss, whichever is less; APHA, 1985). If drying is adequate, quarterly quality assurance checks are suggested.

Total Coliforms

1. Sodium thiosulfate for sample dechlorination should be added to the sample bottle prior to bottle sterilization.

2. Due to the high algal concentration in the effluent, the operator sometimes has difficulty filtering an adequate sample volume. This problem is difficult to overcome with the membrane filter technique. The MPN technfque should be considered if filtering becomes too difficult.

3. Use of the total coliform test to monitor the discharge is related to the land application guidelines. The total coliform tests run by the Ecology laboratory during the August visit resulted in excessive growth of abnormal colonies on the growth plate. The low fecal coliform counts suggest that the total coliform counts should have been relatively low (Table 3). The operator also commented that excessive background growth on his culture plates occurs sporadically. A log of excessive background growth should be maintained by the operator. Use of either a fecal coliform test (which did not seem to encourage the heavy background growth, presumably because of the higher incubation temperature and/or different culture media) or use of the more time consumptive MPN test for total coliforms should be considered if excessive background growth occurs too frequently.

Although Goldendale NH_3-N and O-PO_4-P results did not correspond well with Ecology results, no obvious variance from test procedures were observed. The Goldendale lab uses Hach test kits for these parameters. Another set of sample splits is suggested. Alternate test methods should be considered if results to not compare more favorably.

Memo to Jim Milton
Goldendale Sewage Treatment Plant Class II Inspection, August 27-28, 1985, and March 11-12, 1986

SUMMARY AND CONCLUSIONS

The STP seemed to be operating well during both field visits. The effluent was within permit limits with the exception of BOD_5 percent removal, one chlorine residual concentration, and two pH measurements. The relative insensitivity of the SO_2 monitoring system requires that the operator closely monitor the chlorine residual to avoid high chlorine residual concentrations. The high effluent pH measurements, usually associated with algal activity, are common in lagoon systems and are generally accepted as part of the treatment process.

Excessive vegetative growth was noted on the inner dike walls of the lagoons. The operator's first effort to burn the vegetation was unsuccessful. An adequate method of weed control should be developed and used.

Sludge depth and D.O. measurements from the lagoons caused no concerns. Spring and fall sludge depth measurements by the operator are recommended to help estimate the lagoon volume available for treatment.

The samples collected by the Goldendale influent compositor were stronger than the corresponding Ecology composites during both field visits. The Goldendale compositor intake location should be inspected to assure that the location is not in an area of solids deposition. The location should be altered as necessary to assure that a representative sample is collected. Also, the amount of septage received at the plant should be included as a footnote on monthly permit monitoring reports.

Laboratory procedures were generally good, with correlation of Ecology and Goldendale BOD_5 and TSS results acceptable. Several suggestions are made for laboratory procedural improvements in the Laboratory Discussion section. Results of the samples split for both labs to analyze for NH_3-N and O-PO_4-P concentrations did not compare well. Additional splits are suggested and alternative methods may need to be considered if more comparable results are not attained. Results of the total coliform tests were sometimes difficult to interpret due to excessive background growth. The operator should keep a log to determine the frequency of the problem; if too frequent, the MPN procedure may be necessary.

MH:cp

Attachments

REFERENCES

APHA, AWWA, WPCF, 1985. Standard Methods for the Examination of Water and Wastewater, 16th Ed.

Ecology, 1983. Laboratory Test Procedure for Biochemical Oxygen Demand of Water and Wastewater, DOE 77-24, August 1977, revised February, 1983.

GSA, 1984. Code of Federal Regulations, Protection of Environment, 40, Parts 100 to 149, revised July 1, 1984.

Joy, J., 1986. "Goldendale wastewater treatment plant/Little Klickitat River receiving water studies and total maximum daily load evaluation," memo to Jim Milton, October 21, 1986.