WATER QUALITY STATUS REPORT ● REPORT NO. 59

COTTONWOOD CREEK
Idaho County, Idaho
1986

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February 1986

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Introduction

Cottonwood Creek is located in the Camas Prairie of northwest Idaho County and flows generally due east until its confluence with the South Fork of the Clearwater River, approximately 4 miles south of Kooskia.

Cottonwood Creek is identified in Idaho Water Quality Standards and Wastewater Treatment Requirements as stream segment CB1322. Its designated uses are for agricultural water supply, cold water biota, salmonid spawning, and secondary contact recreation. General water quality standards also apply. They stipulate concentrations of hazardous, deleterious, and radioactive materials; floating, suspended, and submerged matter; excess nutrient; BOD or COD; and suspended sediment.

Designation for cold water biota usage requires dissolved oxygen concentrations to exceed 6 mg/l; pH to range within 6.5 - 9.0 S.U.; water temperatures not to exceed 22° C, with daily average not to exceed 19° C. Salmonid spawning uses require the same or higher quality of water, except that water temperatures are not to exceed 13° C, with daily average less than 9° C.

The City of Cottonwood discharges its municipal wastewater to Cottonwood Creek. An NPDES permit was issued on March 20, 1974; it expired on January 30, 1977. The City applied for a new permit on February 10, 1984.

The discharge permit under which the City is operating stipulates limitations for BOD and suspended solids only (Table 1). Compliance inspections conducted by the Division in 1982, 1983, and 1984, and by E.P.A. Idaho Operations Office in 1985 indicated that the facility has been operated fairly well, and that effluent was within specified limitations. (Cover letters attached as Appendix A). Excess flows and high pH have been noted, but sources are undetermined.

Discharge Monitoring Reports (DMR) for 1983, 1984, and 1985 noted continued violations of limitations on suspended solids loading and concentrations (Appendix B). It should be noted, however, that the DMR record is extremely scant. The permittee has only submitted one-third of the required reports to E.P.A.

Methods

The historically low-flow period of June through August was selected for a limited study of Cottonwood Creek. The study was designed only to ascertain the effect of the City of Cottonwood wastewater effluent on instream water quality. The potential for any significant impact was considered to be greatest during such low flows.

Samples were collected approximately every two weeks between June 13 and August 28, 1985, for a total of six sample sets. Four sample sites were selected (Table 2). Stream stations immediately above and below the outfall were selected, as was the outfall itself. A station was also selected approximately one-half mile below the outfall in order to determine impacts following mixing with creek water (Fig. 1).

On-site analysis included flow, water temperature, dissolved oxygen, pH, and electrical conductivity. Laboratory analyses included fecal coliform, biochemical oxygen demand (BOD), suspended solids/sediments, total phosphorus, and total Kjeldahl nitrogen (TKN).

All collection procedures conformed to Standard Methods, or EPA Methods for Chemical Analysis of Water and Wastes (EPA, 1979). Dissolved oxygen was determined with a YSI Model 54 meter; electrical conductivity with a YSI Model 33 S.C.T. meter; pH with a Corning Model M-103 meter; flow with a Marsh McBirney Model 201 meter.

Results and Discussion

Cottonwood Creek exhibited a flow regime which is typical of intermittent streams in central Idaho (Fig. 2). Stations 1 (above the effluent on Cottonwood Creek), 3 (immediately below the effluent), and 4 (1/2 mile below the effluent) all showed less than 0.1 cfs discharge on each of the last 5 sample dates. Flow on June 13 was substantially greater, as a result of very heavy precipitation events which occurred during late May and early June. It should be noted that due to inherent inaccuracies in determination of very small open-channel flows, all flows equal to or less than 0.1 cfs were recorded as 0.1 cfs, and all loadings were based upon that estimate.

The only significant variation in effluent discharge also occurred on June 13. Apparently, infiltration and inflow to the wastewater facility were substantial; this is substantiated by numerous inspection reports and file notes.

The massive influence of the June 13 samples made it desirable to analyze the entire data set by both including and excluding it. Interestingly, mean concentrations of only two parameters differed substantially between those two data sets (Table 3). Mean suspended sediments concentrations at Stations 1 and 4 differed by 48% and 26% respectively depending upon whether June 13 data were included or excluded. Fecal coliform concentrations were greater at Sections 2, 3, and 4, and lower at Station 1 when high flow data were included.

The best reflection of the effect of the City's wastewater on Cottonwood Creek is through comparison of Stations 1 and 4. Station 4 is approximately 1/2 mile downstream of the outfall, and differences from Station 1 in water quality can be almost totally attributed to effects of the wastewater, since no other significant sources of organic materials have been identifed.

Relatively small differences in pH were seen above and one-half mile below the discharge point (Table 4). However, the geometric mean effluent pH of 9.1 which was found during this study was consistent with previous inspections and file notes. The effluent raised mean in-stream pH by 1.3 S.U. and maximum pH directly below the outfall was 9.1. Cottonwood effluent pH continued to be abnormally high, for unexplained reasons, although high-pH wastewaters are not necessarily unusual.

Mean concentrations of suspended solids and BOD for the municipal effluent were well within limits of the current NPDES permit (Fig. 3A). There was a noticeable effect on instream water quality, as determined by comparison of Stations 1 and 4. However, mean SS and BOD concentrations at Station 4 were only 23 and 7.7 mg/l, and therefore comparable to high quality surface water. Effluent loadings of both BOD and SS were extremely low, accounting for less than 25 pounds per day into Cottonwood Creek (Fig. 3B). Suspended solids loadings were particularly affected by high stream flows of June 13. Most of those solids were not the direct

result of municipal outfall. Loadings at Stations 1 and 3 were equivalent, and the effluent loading (Station 2) accounted for only 6% of instream suspended sediment. Loadings of suspended solids at Station 4 were substantially higher than those upstream, indicating additional entrainment by the high flows. It is unlikely that the municipal contributions of BOD and SS significantly affected instream water quality.

Dissolved oxygen (D.O.) decreased by only 17% between Stations 1 and 3, and by 34% between Stations 1 and 4 (Fig. 3). Thus, during the 1985 low flow period of this study, in-stream D.O. was apparently slightly impaired by municipal effluent, with no sign of recovery at Station 4. It should be noted that mean D.O. concentration in Cottonwood Creek above the outfall is only slightly above minimum standards for cold water biota. The mean was impacted by a very low 3.9 mg/l D.O. concentration on July 25, 1985 which was the result of minimal or no-flow conditions.

High stream temperatures were the primary reason for low D.O. (Table 4). Saturated D.O. at the mean temperature of 15.6°C is only 8.6 mg/l in Cottonwood Creek. Thus, municipal effluent undoubtedly contributed to a D.O. sag in Cottonwood Creek, but its effect is probably secondary to existing conditions caused by low flows and high temperatures.

Phosphorus is an important nutrient of water quality concern. It is essential to organism growth, and may be of particular concern where phosphate is a growth-limiting nutrient. The ortho-phosphate form is essentially equivalent to dissolved phosphate. For this study, it was decided that little additional information would be gained by breaking total phosphorus down into its various components. Total phosphorus concentration of the effluent was 2.8 mg/l resulting in a 365% increase between Stations 1 and 4 (Fig. 4A).

The mean concentration of 1.21 mg/l total phosphorus at Station 4 is twelve times higher than the recommended concentration of 0.1 mg/l for waters not directly entering reservoirs and lakes (Mackenthun, 1973). Similarly, mean total phosphorus loading at the lower-most station was up 287% over those above the outfall (Fig. 4B). Based only upon low flow conditions of this study, an extremely conservative estimate of 1340 pounds of total phosphorus are annually exported to the South Fork of the Clearwater River.

Nitrogen is another important nutrient which is present in large concentrations in the Cottonwood wastewater. All forms of nitrogen are biochemically interconvertible, and therefore, may be of interest in effluent limitation studies.

Nitrite and nitrate are oxidized forms of nitrogen which are available for uptake by aquatic and terrestrial plants. Concentrations of these inorganic forms of nitrogen in excess of 0.3 mg/l are considered likely to contribute to acceleration of lake eutrophication. Organic forms of nitrogen include proteins, urea, nucleic acids, and numerous synthetic organic materials. Analysis for total Kjeldahl nitrogen (TKN) includes organic forms as well as the ammonia fraction. Since there are no apparent discharges of synthetic organic materials and no feedlots or other animal waste facilities within the study area, it was decided that TKN would best reflect the influences of the municipal wastewater facility on instream water quality.

The mean TKN concentration increase of 333% between Stations 1 and 4 suggests significant effects of municipal effluent (Fig. 4A). However, 4.9 mg/l TKN was determined to be the mean immediately downstream of the outfall, and only 2.9 mg/l remained at Station 4. Apparently, benthic and suspended flora assimilated large amounts of organic and ammonia nitrogen in a relatively short stretch of stream. TKN loadings increased by 160% between Stations 1 and 4, also reflecting the obvious impact of effluent on water quality (Fig. 4B).

Although evident, it should be noted that mean loadings for phosphorus and nitrogen were greatly affected by the high flows observed on June 13. Mean loadings determined by inclusion of all data were, in general, at least 100% greater compared to those means determined upon excluding data obtained on June 13.

One sample date, out of the six, served to emphasize the effect of effluent on instream water quality during a time period when the stream was already severely stressed by low flow and high temperatures. On August 28, 1985 effluent BOD concentration was 22 mg/l, a high, but typical BOD for Cottonwood effluent (Fig. 5A). Instream BOD at Station 3 (immediately below the outfall) was 27 mg/l, compared to 3 mg/l at Station 1; BOD concentration at Station 4 had decreased to 9 mg/l. Dissolved oxygen decreased from 6.7 mg/l at Station 1 to 4.5 mg/l at Station 3, and 2.9 at Station 4(Fig.6). The latter oxygen concentrations were well below the minimum standard of 6.0 mg/l, for cold water biota.

Effluent suspended solids concentrations of 39 mg/l on August 28 resulted in an instream change from 2 mg/l above the outfall to 38 mg/l directly below it, and to 17 mg/l one-half mile downstream (Fig.5B). Similarly suspended sediment loadings increased from one lb/day to 21 lbs/day at Station 3, and 9 lbs/day at Station 4 (Fig. 5C).

Changes in phosphorus and nitrogen concentration on August 28 showed changes more dramatically than those based upon means. TKN concentration (Fig.7A) and loading (Fig.7B) were both higher at Station 3 than can be explained by effluent concentration. Total phosphorus concentration and loading at Station 3, could both be explained by high levels in the effluent.

Cottonwood Creek's classification for secondary contact recreation stipulates that fecal coliform are not to exceed 800/100 ml at any time, nor a geometric mean of 200/100 ml taken from five or more samples collected over a 30 day period. Effluent coliform concentrations were less than 160/100 ml for all sample dates except June 13 (Fig. 8A). However, instream concentrations, both above and directly below the outfall were, in general, greater than those in the effluent. Mean fecal coliform concentrations at Station 4, one-half mile below the outfall, were less than half those at Station 3 (Fig. 8B). The reason for this decrease is unknown since the wastewater is not chlorinated prior to discharge, and grassy overgrowth probably prevents much ultraviolet irradiation.

Conclusions

1) The City of Cottonwood municipal wastewater facility has shown repeated NPDES permit violations. BOD and suspended solids concentrations and loadings have been frequently violated, as has pH.

2) Excessive infiltration and inflow have been documented, and were somewhat evident during this study.

3) The receiving waterway, Cottonwood Creek, carried very low volume during the tenure of this study, and may have been intermittent over part of its length.

4) Instream pH was affected by municipal effluent.

5) An oxygen sag was noted and no indication of recovery was seen at the lower-most station.

6) High temperatures combined with low flows were the primary reasons for low instream dissolved oxygen concentrations.

7) Instream phosphorus concentration as a result of municipal effluent was substantially greater than recommended criteria

8) Instream organic/ammonia nitrogen concentration, as a result of municipal effluent was greater than recommended criteria.

9) Instream phosphorus and nitrogen loadings indicate substantial impact of municipal effluent.

10) In general, municipal effluent was of higher bacterial quality than Cottonwood Creek.

11) Minimal flows, low dissolved oxygen, and high temperatures of Cottonwood Creek preclude additional municipal water treatment which would solely serve to remove nutrients.

12) The designated use for cold water biota throughout the entire length of Cottonwood Creek is likely inappropriate, due to low flows, high temperatures, and low dissovled oxygen.

Recommendations

1) Based upon minimal or zero instream dilution, the Cottonwood wastewater facility should treat equivalent to secondary, in order to prevent aesthetic and public health concerns in Cottonwood Creek.

2) Chlorination should be required.

References

EPA, 1979. Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020

Mackenthun, K. M. 1973. Toward A Cleaner Aquatic Environment, U. S. Environmental Protection Agency, Washington, D. C.

Standard Methods for the Examination of Water & Wastewater, 16th Edition, 1985. APHA.

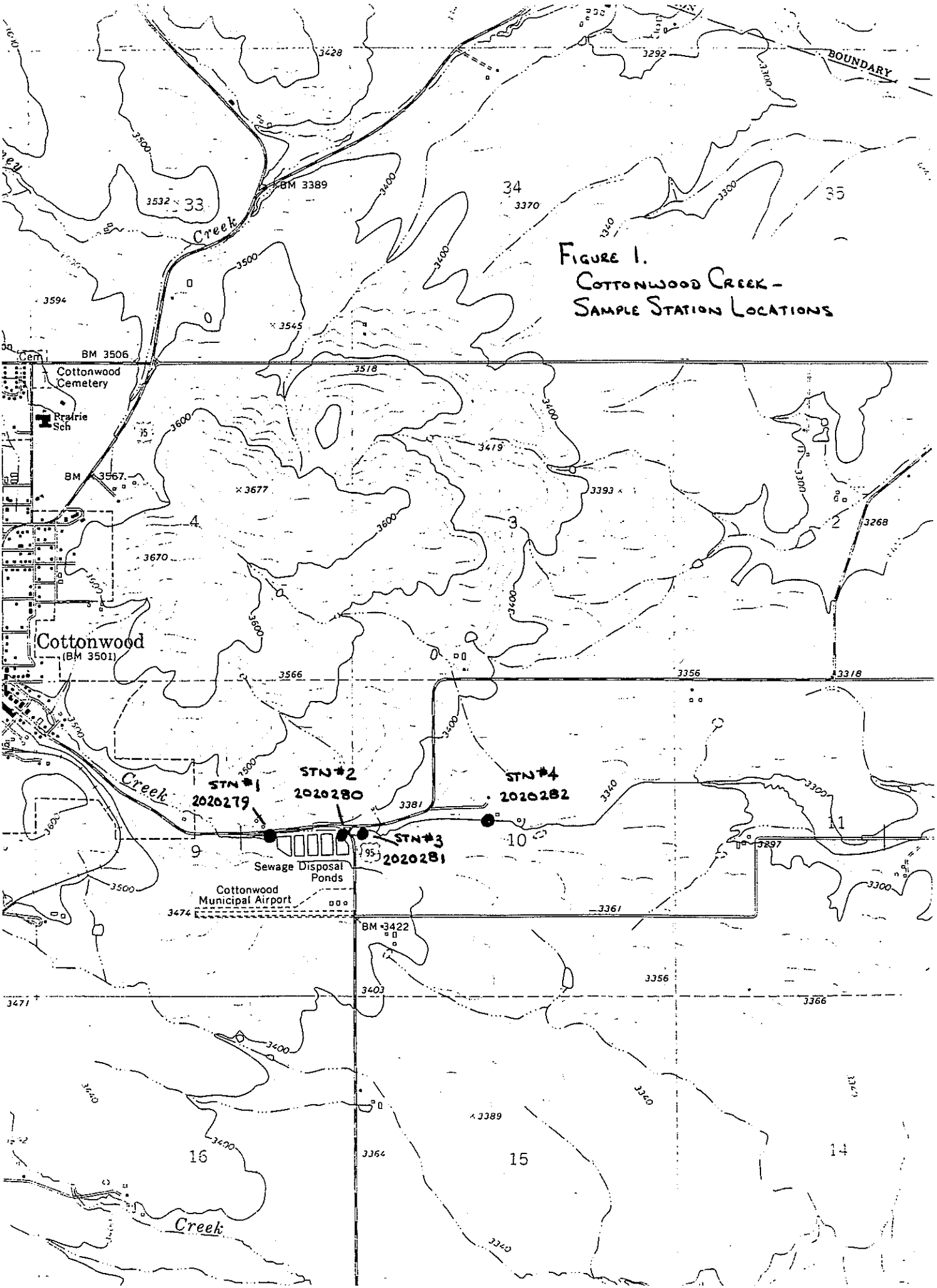
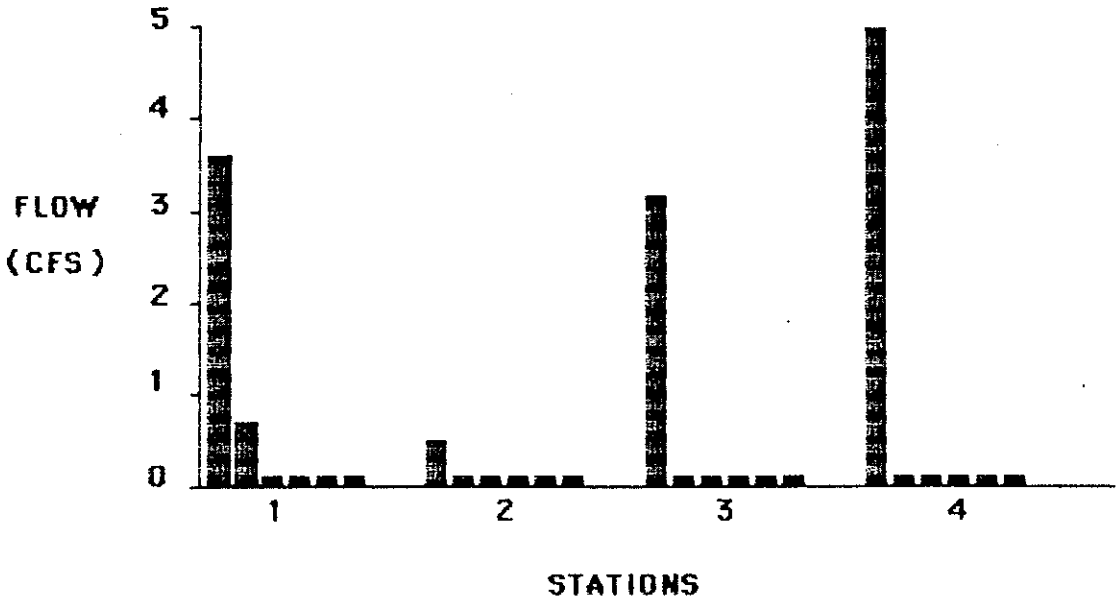


FIGURE 1.
COTTONWOOD CREEK -
SAMPLE STATION LOCATIONS
BOUNDARY
BM 3389
Creek
BM 3506
Cottonwood Cemetery
Prairie Sch
BM 3567
Cottonwood
(BM 3501)
STN #1
2020279
STN #2
2020280
STN #3
2020281
STN #4
2020282
Sewage Disposal Ponds
Cottonwood Municipal Airport
BM 3422
Creek
Creek

Figure 2. Discharge regime for six sample collections in the summer of 1985.



STATION	STORET #	LOCATION
1	2020279	Cottonwood Creek above wastewater lagoons.
2	2020280	City of Cottonwood wastewater lagoons outfall.
3	2020281	Cottonwood Creek 100 ft. downstream from outfall in mixing zone.
4	2020282	Cottonwood Creek 1/2 mile below outfall.

Figure 3A. Mean concentrations of S.S. and BOD for 4 stations on Cottonwood Creek. (Station descriptions are the same as on Fig. 2.)

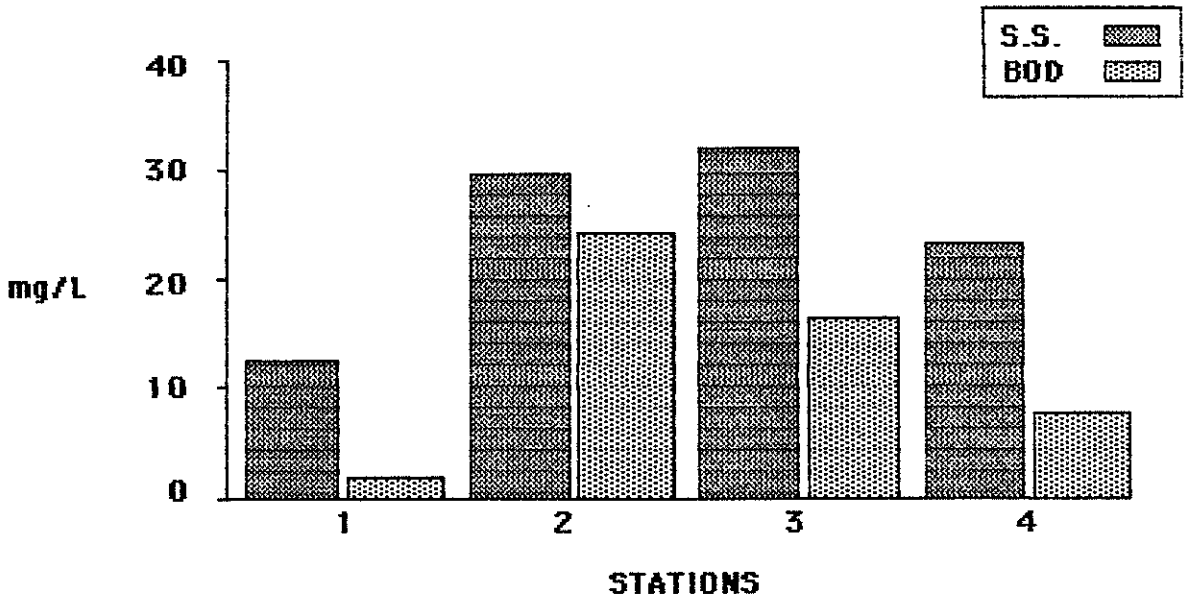


Figure 3B. Mean loadings of BOD and S.S. for Cottonwood Creek.

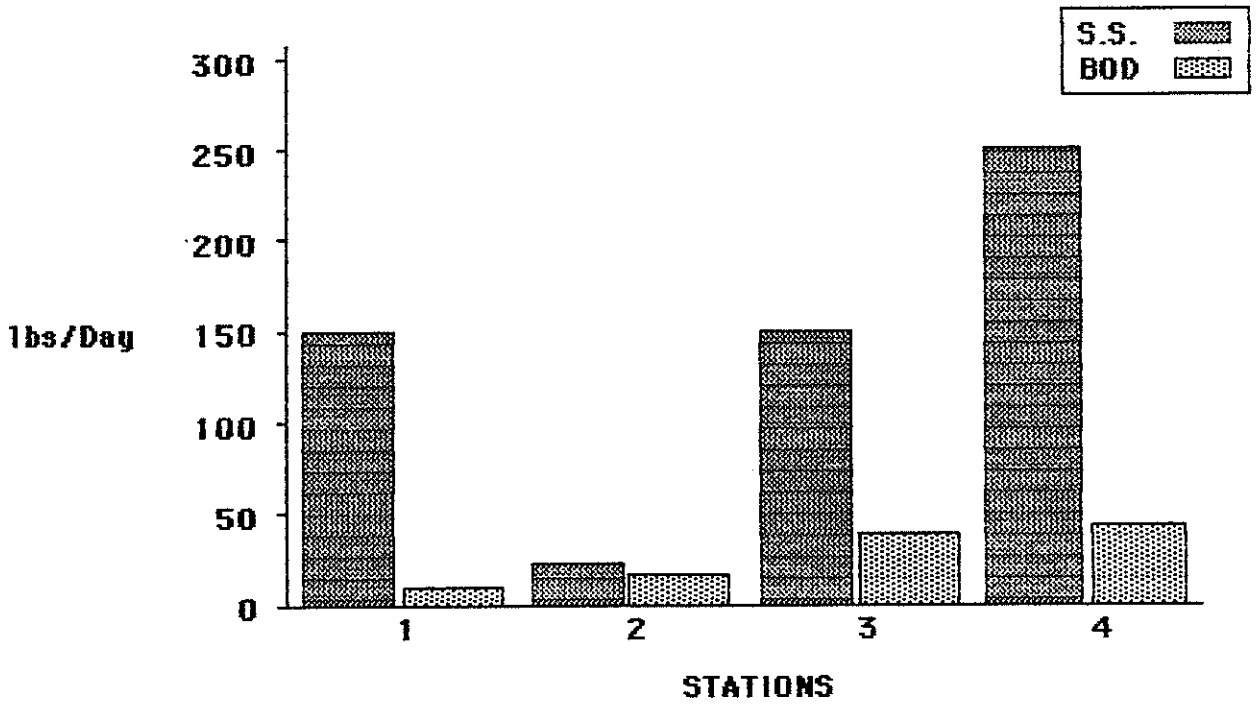


Figure 3C. Mean concentrations of dissolved oxygen for Cottonwood Creek.

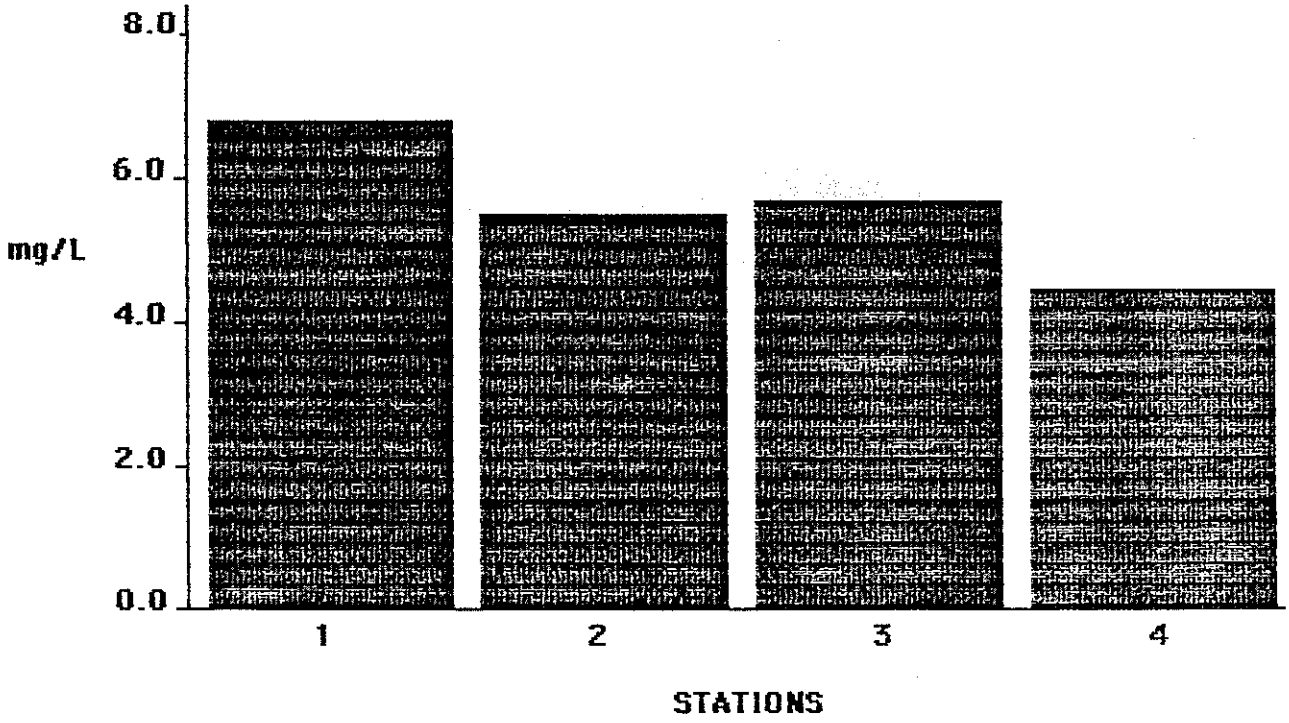


Figure 4A. Mean nutrient concentrations for Cottonwood Creek. (Station descriptions are the same as on Fig. 2.)

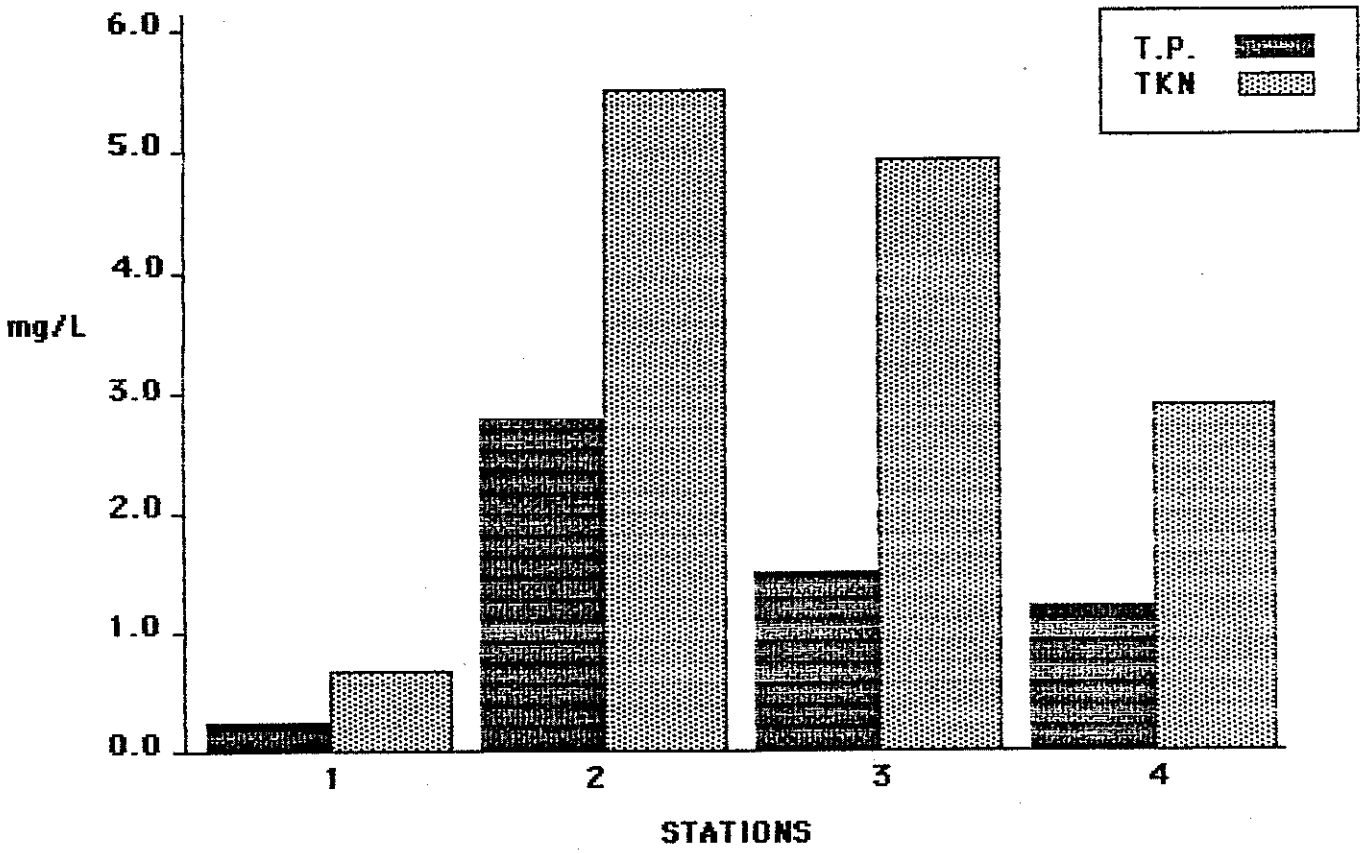


Figure 48. Mean nutrient loadings for Cottonwood Creek.

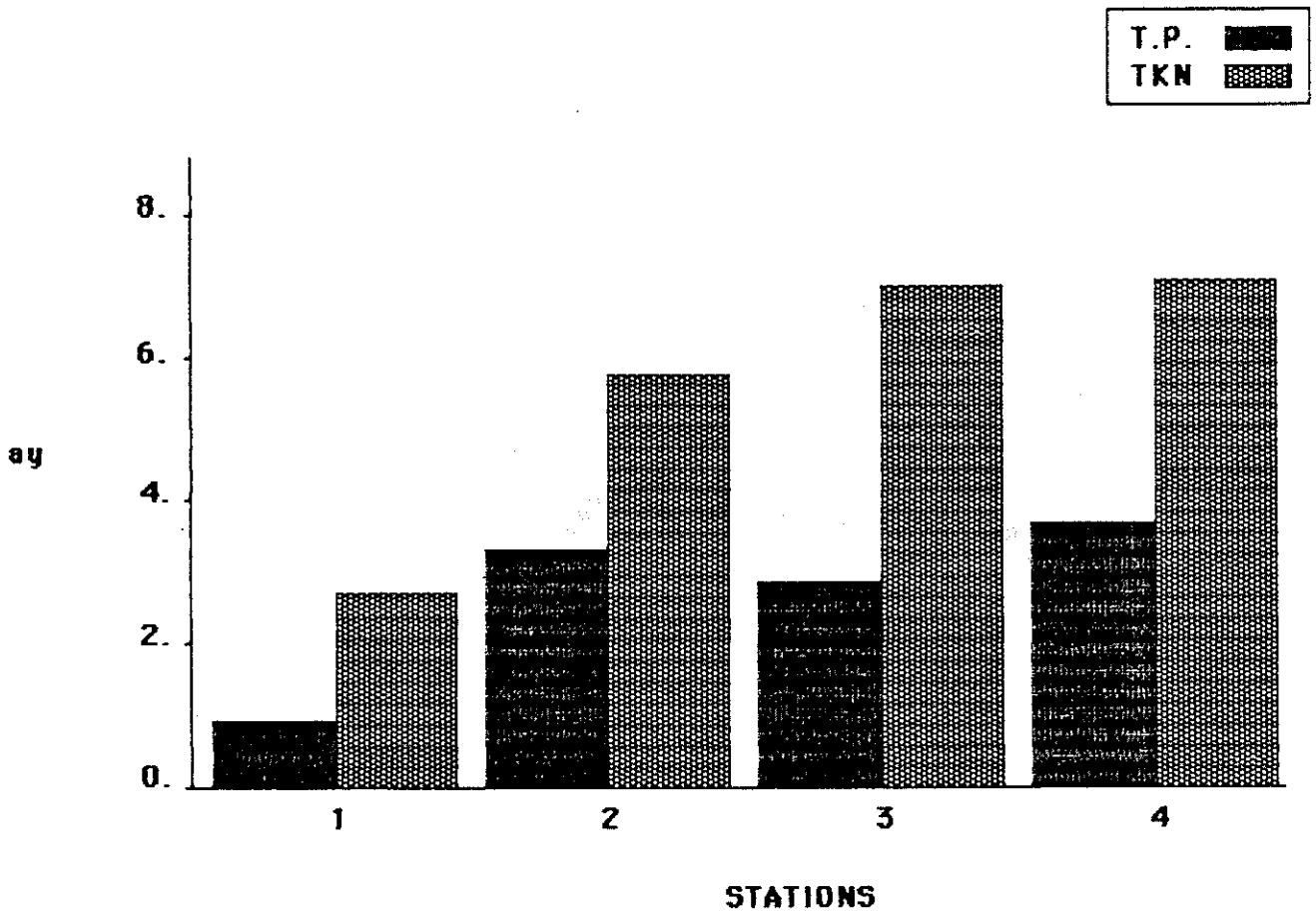


Figure 5A. BOD concentrations for Cottonwood Creek on August 28. 1985. (Station descriptions are the same as on Fig. 2.)

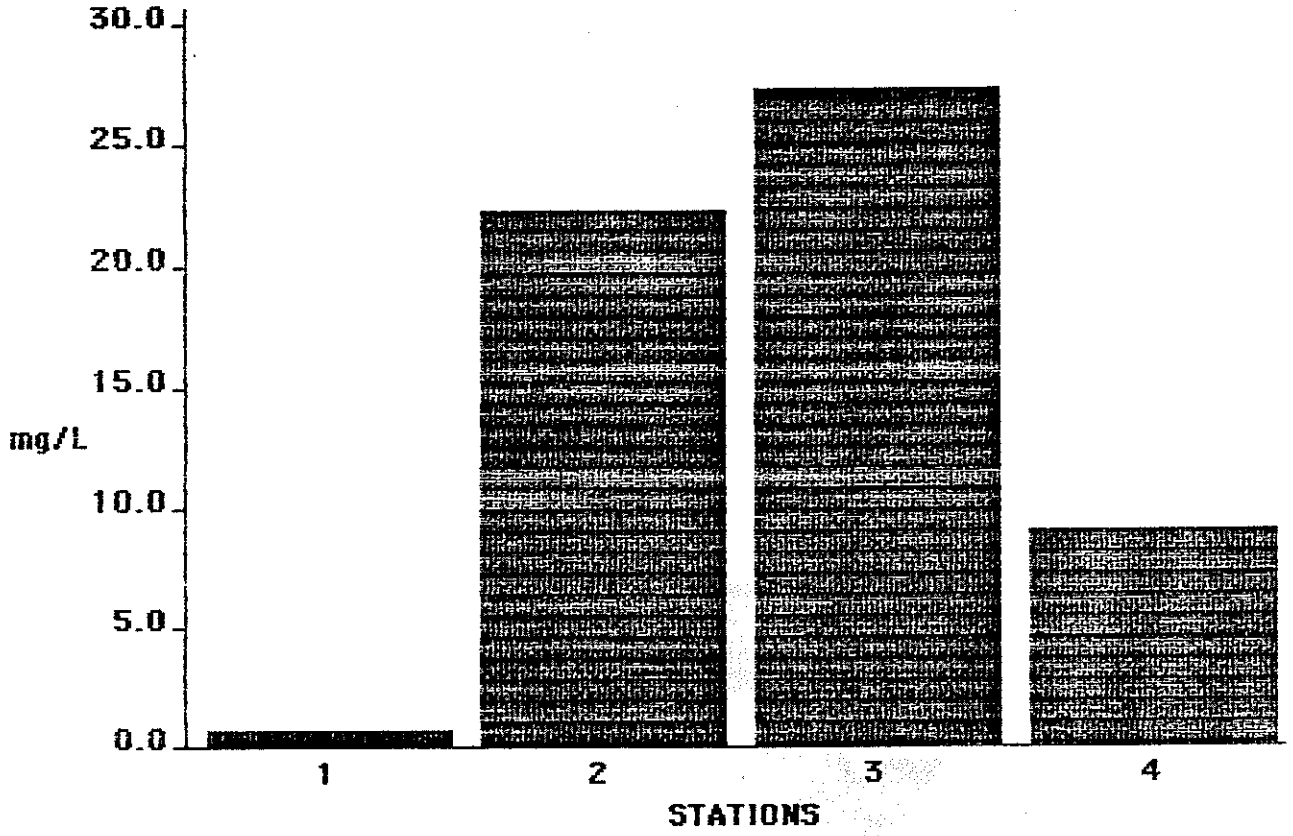
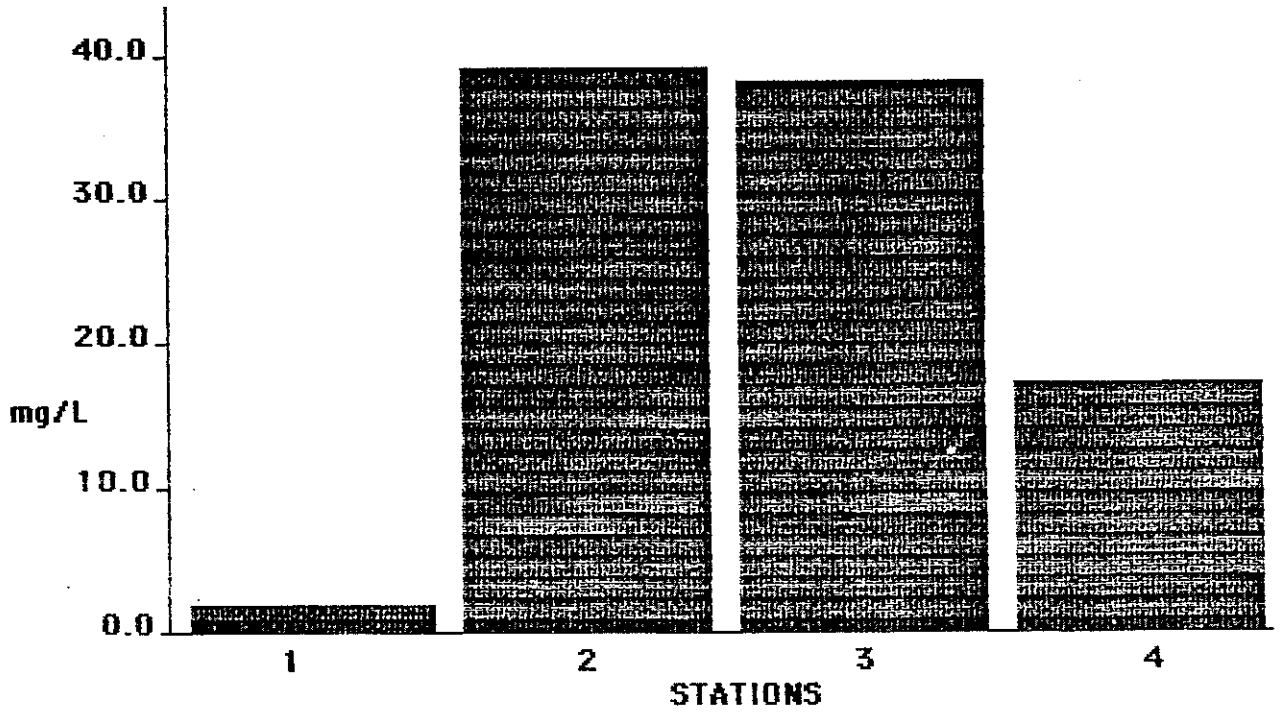


Figure 5B. Suspended solids/sediment concentrations for Cottonwood Creek on August 28, 1985.



gure 5C. BOD and S.S. loadings for Cottonwood Creek on August 28, 1985.

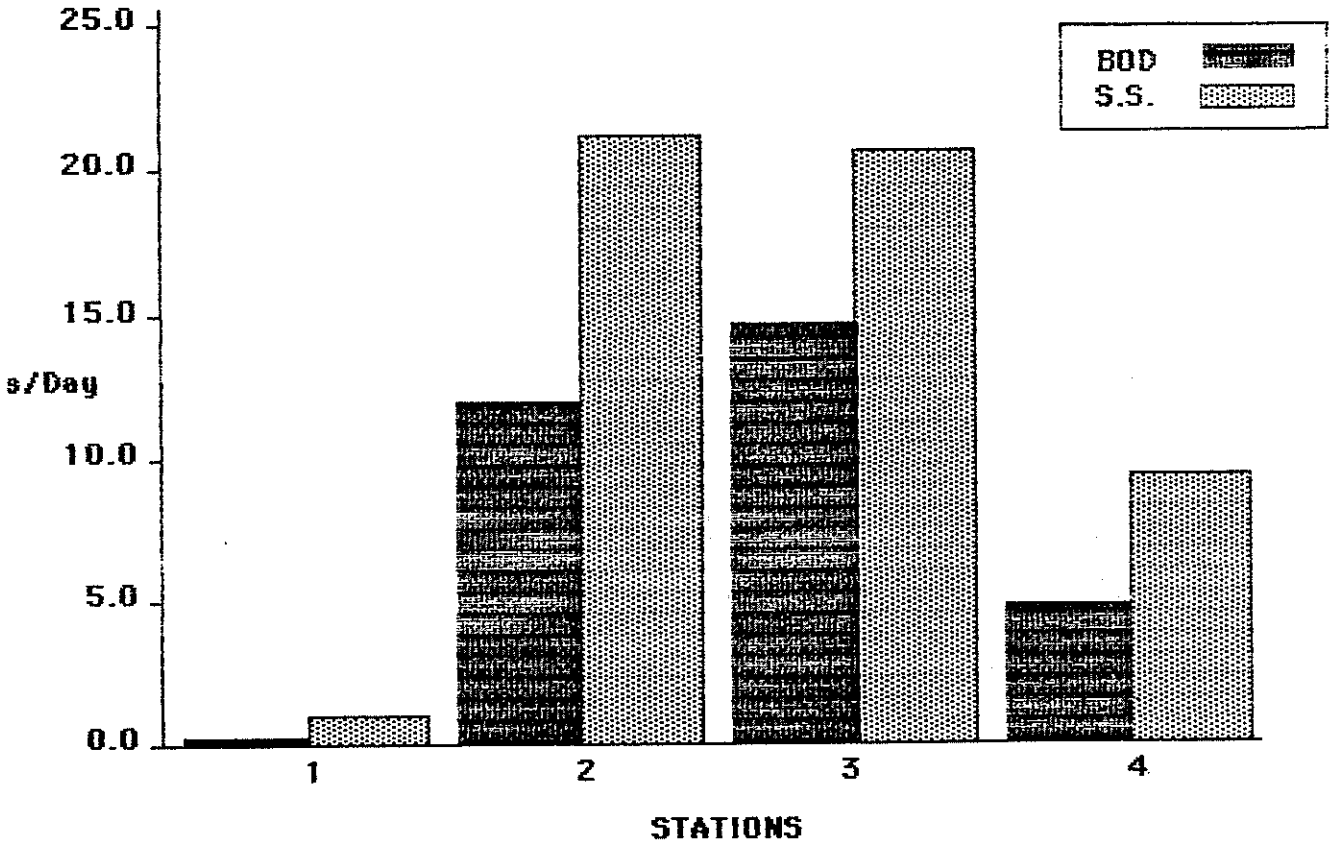


Figure 6. Dissolved oxygen concentrations for Cottonwood Creek on August 28, 1985. (Station descriptions same as Fig. 2.)

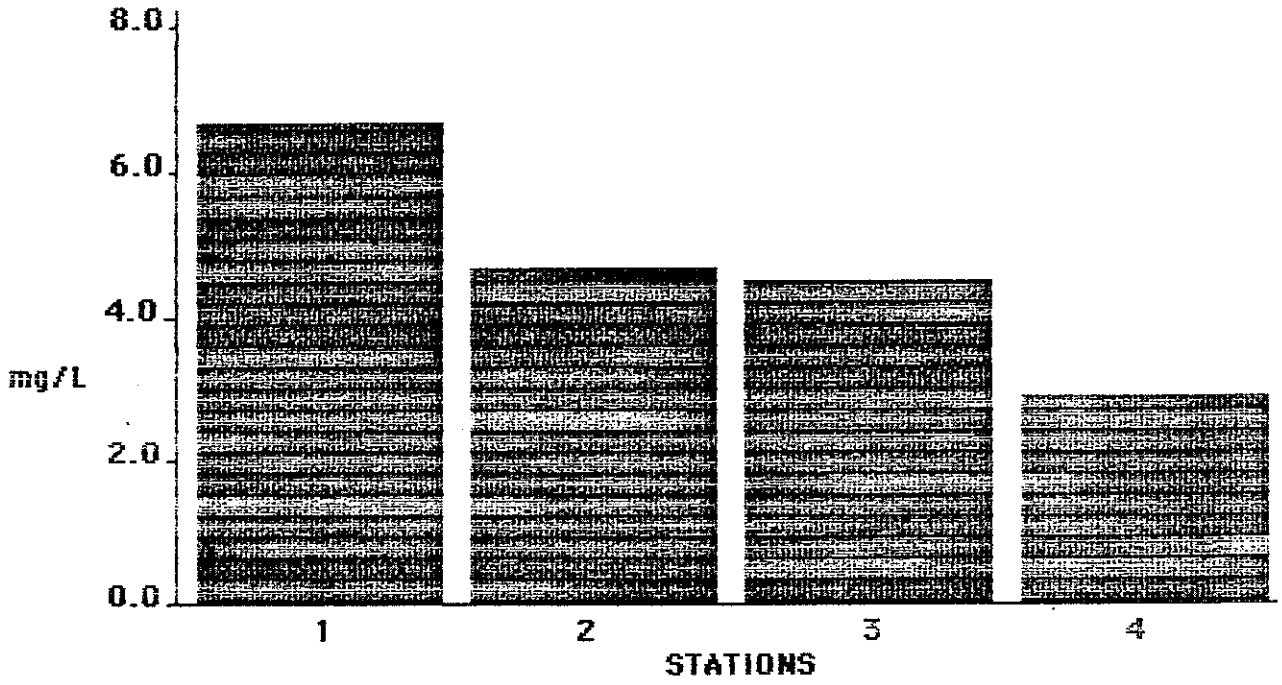


Figure 7A. Nutrient concentrations for Cottonwood Creek on August 28,1985. (Station descriptions same as on Fig. 2,)

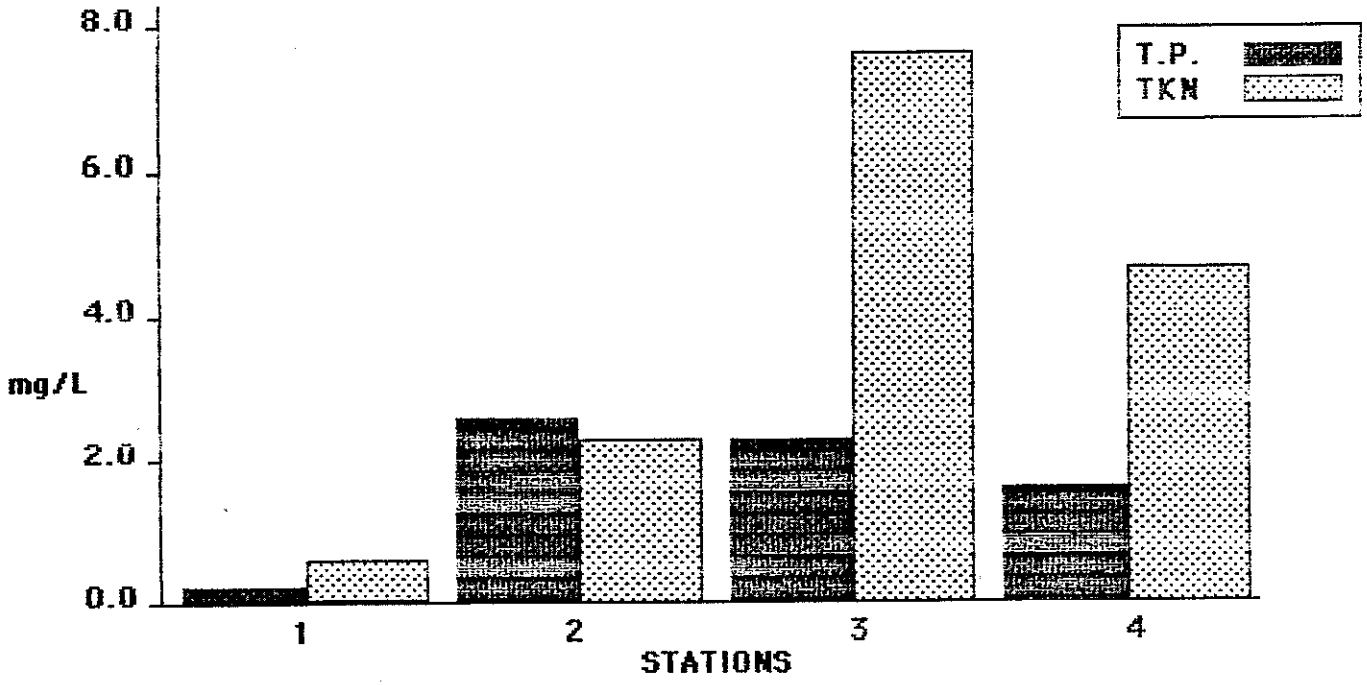


Figure 7B. Nutrient loadings for Cottonwood Creek on August 28,1985.

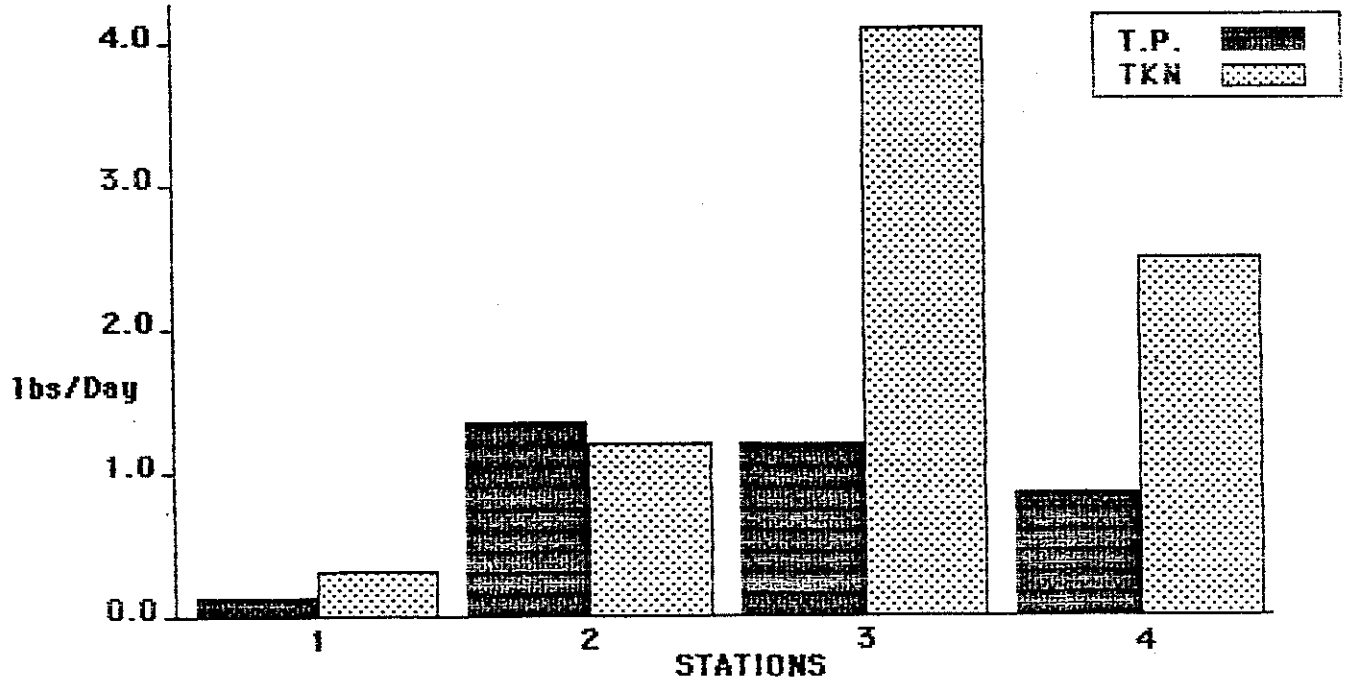


Figure 8A. Fecal coliform density for 4 stations on Cottonwood Creek. (Station descriptions same as for Fig. 2.)

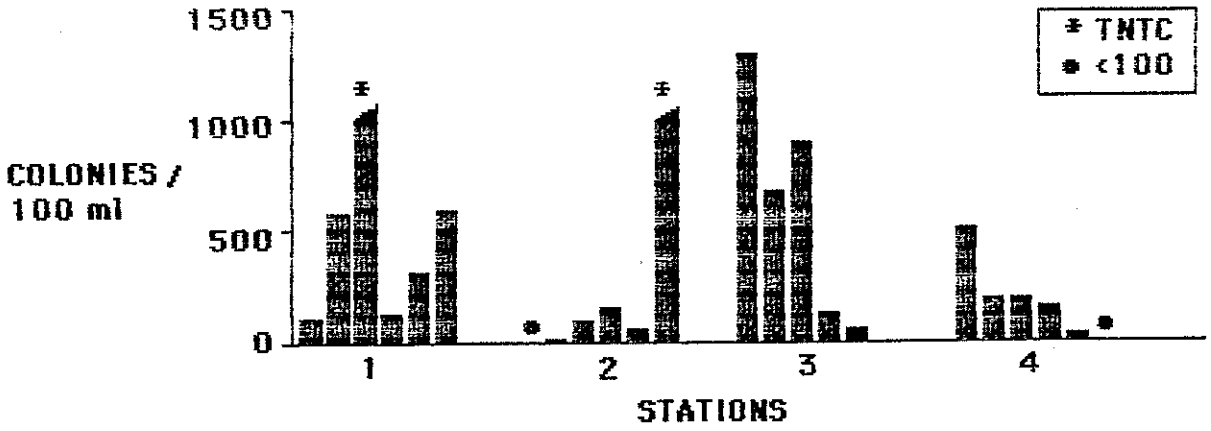


Figure 8B. Geometric mean fecal coliform density for Cottonwood Creek.

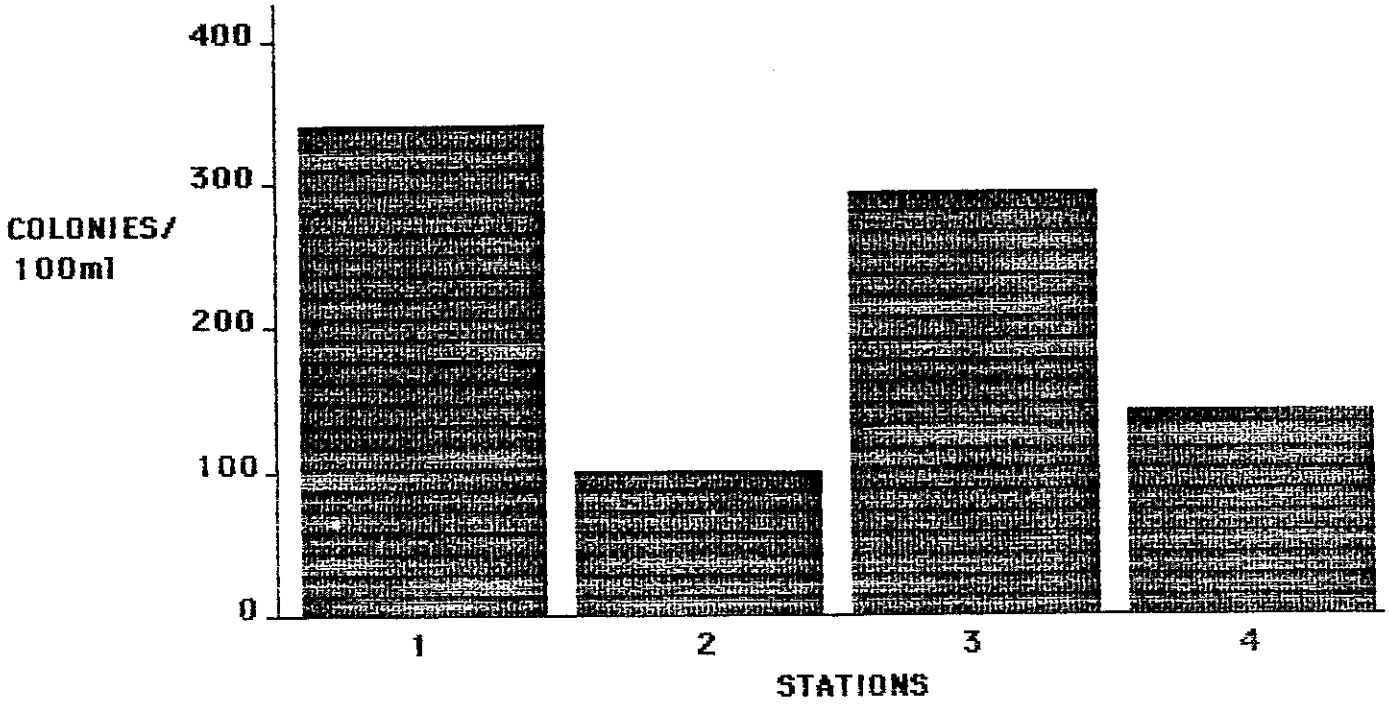


Table 1. City of Cottonwood NPDES Permit Effluent Limitations - (Expired June 30, 1977).

Parameter	Units	Daily Ave.	Daily Max.
BOD5	mg/l	60	90
BOD5	lb/day	75	113
Susp. Solids	mg/l	70	105
Susp. Solids	lb/day	88	131
pH	S.U.	6.0 - 9.0	

Table 2. Sample Stations, Cottonwood Creek, Idaho County, Idaho

COTTONWOOD CREEK

116 = 851614

Station #	Description	Latitude/Longitude	River Mile	Elevation	STORET #
1	Cottonwood Cr ab Lagoon	46°02'30"/116°19'53"	324.3/139.3/74.7/4.7/17.7	3,400'	2020279
2	City of Cottonwood @ Outfall	46°02'30"/116°19'35"	324.3/139.3/74.7/4.7/17.4	3,380'	2020280
3	Cottonwood Cr downstream from outfall-mixing zone	46°02'30"/116°19'33"	324.3/139.3/74.7/4.7/17.3	3,380'	2020281
4	Cottonwood Cr ½ mile bl outfall	46°02'33"/116°19'04"	324.3/139.3/74.7/4.7/16.8	3,340'	2020282

Table 3. Mean Concentrations of Parameters for Cottonwood Creek, Calculated With & Without the High-flow Data of June 13, 1985.

Stn.*	FLOW	DO	BOD	TKN	TP	SS	FECAL
1							
w/Jn.13	0.78	6.8	1.9	0.67	0.26	12.7	458
w/o Jn.13	0.22	6.5	1.8	0.67	0.27	6.6	527
*%Difference	-72	-4.	-5	0	4	-48	15
2							
w/Jn.13	0.17	5.5	24.3	5.5	2.8	29.7	222
w/o Jn.13	0.10	5.5	26.9	5.0	2.3	31.6	66
%Difference	-14	0	10	-9	-18	6	-70
3							
w/Jn.13	0.62	5.7	16.4	4.9	1.5	32.2	512
w/o Jn.13	0.10	5.2	19.4	5.6	1.6	29.1	354
%Difference	-84	-9	18	14	7	-10	-31
4							
w/Jn.13	0.92	4.5	7.7	2.9	1.2	23.4	180
w/o Jn.13	0.10	4.1	7.8	3.2	1.3	17.3	115
%Difference	-89	-9	1	10	8	-26	-36

*% Difference calculated as $\frac{\text{W/June 13 - w/o June 13}}{\text{W/June 13}} \times 100$

Table 4. Cottonwood Creek Water Quality Results.

COTTONWOOD CREEK DATA

ST.#	DATE	TEMP. °C	FLOW CFS	COND. @ 25° µhs/cm	D.O. mg/L	pH S.U.	BOD mg/L	BOD LOAD lbs/D	TKN mg/L	TKN LOAD lbs/D	T.P. mg/L	T.P. LOAD lbs/D	S.S. mg/L	S.S. LOAD lbs/D	FECAL COLI. #/100ml
1	06/13/85	16.0	3.6	152	8.2	7.6	2.4	46.5	0.67	13.0	0.22	4.2	43	834.3	110
1	06/27/85	20.0	0.7	192	8.0	7.8	0.8	3.0	0.48	1.8	0.24	0.9	14	52.8	590
1	07/11/85	16.2	0.1	373	7.2	7.5	0.4	0.2	0.79	0.4	0.34	0.1	1	0.5	*TNTC
1	07/25/85	14.2	0.1	360	3.9	6.8	3.0	1.6	0.87	0.4	0.41	0.2	14	7.5	130
1	08/14/85	12.0	0.1	436	6.8	7.2	4.0	2.1	0.61	0.3	0.12	0.0	2	1.0	316
1	08/28/85	15.2	0.1	379	6.7	7.1	0.7	0.3	0.60	0.3	0.25	0.1	2	1.0	600
1	MEAN	15.6	0.8	315	6.80	7.3	1.9	7.9	0.67	2.7	0.26	0.9	13	149.5	342
1	MAXIMUM	20.0	3.6	436	8.2	7.8	4.0	77.6	0.87	13.0	0.41	4.2	43	834.3	*TNTC
1	MINIMUM	12.0	0.1	152	3.9	6.8	0.4	0.2	0.48	0.3	0.12	0.0	1.0	0.5	110
2	06/13/85	17.8	0.5	478	5.7	8.2	11.0	29.6	7.82	21.0	5.04	13.5	20	53.9	*TNTC
2	06/27/85	17.0	0.1	415	5.1	9.2	30.4	16.3	6.13	3.3	2.65	1.4	27	14.5	10
2	07/11/85	21.6	0.1	385	5.4	9.1	24.0	12.9	6.84	3.6	2.25	1.2	30	16.1	100
2	07/25/85	19.2	0.1	405	5.6	9.4	28.0	15.0	6.42	3.4	2.52	1.3	26	14.0	160
2	08/14/85	15.2	0.1	455	6.5	9.4	30.0	16.1	3.53	1.9	1.78	0.9	36	19.4	62
2	08/28/85	17.0	0.1	460	4.7	9.5	22.3	12.0	2.26	1.2	2.56	1.3	39	21.1	*<100
2	MEAN	18.0	0.2	433	5.50	9.1	24.3	22.2	5.50	5.7	2.80	3.3	30	23.1	100
2	MAXIMUM	21.6	0.5	478	6.5	9.5	30.4	81.9	7.82	21.0	5.04	13.5	39	53.9	*TNTC
2	MINIMUM	15.2	0.1	385	4.7	8.2	11.0	5.9	2.26	1.2	1.78	0.9	20	14.0	10

*TNTC Designation under fecal coliform heading assumed equivelent to 1000 colonies/100 ml for determining means.
*<100 Designation under fecal coliform heading assumed equivelent to 100 colonies/100ml for determining means.
* 999 Designates unreported data.

Table 4. Cottonwood Creek Water Quality Results.

COTTONWOOD CREEK DATA

ST.#	DATE	TEMP. °C	FLOW CFS	COND. @ 25° µhs/cm	D.O. mg/L	pH S.U.	BOD mg/L	BOD LOAD lbs/D	TKN mg/L	TKN LOAD lbs/D	T.P. mg/L	T.P. LOAD lbs/D	S.S. mg/L	S.S. LOAD lbs/D	FECAL COLI. #/100ml
3	06/13/85	17.8	3.2	160	8.1	7.7	7.3	125.9	1.56	26.9	0.74	12.7	48	827.9	1300
3	06/27/85	19.6	0.1	263	6.5	8.3	9.0	4.8	2.24	1.2	0.74	0.3	19	10.2	680
3	07/11/85	20.2	0.1	421	4.7	9.1	999	538.4	5.88	3.1	1.87	1.0	29	15.6	900
3	07/25/85	18.8	0.1	467	4.2	9.0	999	538.4	7.15	3.8	1.90	1.0	33	17.7	130
3	08/14/85	14.2	0.1	466	6.1	9.1	22.0	11.8	5.14	2.7	1.47	0.7	26	14.0	62
3	08/28/85	16.6	0.1	465	4.5	8.9	27.3	14.7	7.61	4.1	2.27	1.2	38	20.5	*<100
3	MEAN	17.9	0.6	374	5.68	8.7	16.4	54.8	4.93	6.9	1.49	2.8	32	151.0	294
3	MAXIMUM	20.2	3.2	467	8.1	9.1	27.3	470.8	7.61	26.9	2.27	12.7	48	827.9	1300
3	MINIMUM	14.2	0.1	160	4.2	7.7	7.3	3.9	1.56	1.2	0.74	0.3	19	10.2	<100
4	06/13/85	17.8	5.0	176	6.6	7.2	7.5	202.1	1.25	33.6	0.69	18.5	54	1455.3	500
4	06/27/85	20.8	0.1	259	5.3	7.6	8.0	4.3	1.57	0.8	0.68	0.3	12	6.4	200
4	07/11/85	21.4	0.1	436	4.4	8.3	999	538.4	3.77	2.0	1.55	0.8	20	10.7	200
4	07/25/85	20.4	0.1	489	4.6	7.8	7.0	3.7	3.26	1.7	1.58	0.8	23	12.3	150
4	08/14/85	15.4	0.1	480	3.1	7.5	7.0	3.7	2.93	1.5	1.20	0.6	14	7.5	28
4	08/28/85	19.4	0.1	484	2.9	7.6	9.0	4.8	4.63	2.4	1.61	0.8	17	9.3	*<100
4	MEAN	19.2	0.9	387	4.48	7.7	7.7	38.1	2.90	7.0	1.21	3.6	23	250.3	142
4	MAXIMUM	21.4	5.0	489	6.6	8.3	9.0	242.5	4.63	33.6	1.61	18.5	54	1455.3	500
4	MINIMUM	15.4	0.1	176	2.9	7.2	7.0	3.7	1.25	0.8	0.68	0.3	12	6.4	28

*TNTC Designation under fecal coliform heading assumed equivelent to 1000 colonies/100 ml for determining means.
*<100 Designation under fecal coliform heading assumed equivelent to 100 colonies/100ml for determining means.
* 999 Designates unreported data.

STATE OF IDAHO

DEPARTMENT OF HEALTH AND WELFARE
DIVISION OF ENVIRONMENT - 1118 F. Street - P O Drawer B - Lewiston, Idaho 83501

(208) 746-2651, Ext. 430

March 31, 1982

Honorable Ladd Arnoti
Mayor, CITY OF COTTONWOOD
P O Box 172
Cottonwood, Idaho 83522

Re: NPDES Compliance Inspection
ID-002184-9

Dear Mayor Arnotti:

Enclosed is a copy of a recent NPDES Inspection Report completed on the City's wastewater treatment facility.

Samples collected on the City's effluent during the inspection indicate the facility was in compliance with effluent limitations for Biochemical Oxygen Demand (BOD) and Suspended Solids (SS) concentration.

We commend the City and David Shears for the excellent appearance and operation and maintenance of the treatment facility.

If you have any questions regarding this inspection please contact me.

Sincerely,

DIVISION OF ENVIRONMENT

Ed Tulloch

Ed Tulloch
Field Office Supervisor

ET/cmd
xc: Larry Koenig - IDHW-DOE, Boise
Grover Partee - EPA-IOO, Boise

Encl.

STATE OF IDAHO

DEPARTMENT OF HEALTH AND WELFARE
DIVISION OF ENVIRONMENT - 1118 F. Street - P O Drawer B - Lewiston, Idaho 83501

NEW PHONE NO: (208) 799-3430

July 18, 1983

Honorable Ladd Arnoti
Mayor, CITY OF COTTONWOOD
P O Box 172
Cottonwood, Idaho 83522

Re: NPDES INSPECTION
ID#002184-9

Dear Mayor Arnoti:

Enclosed is a copy of the recent inspection performed on the City's wastewater treatment facility.

As noted, a review of 1982 monitoring data shows some unusually high pH values and suspended solids concentrations during the period April through September. Typically, wastewater treatment lagoons dont produce effluents with those characteristics. Its possible some chemical additive may be adversely impacting the lagoons. As a result the City should try to locate such a source or sources and exclude it from the sanitary sewer system.

If we can assist you with this problem please contact us.

We wish to thank David Shears for his time on the survey.

Sincerely,

DIVISION OF ENVIRONMENT

Ed Tulloch

Ed Tulloch
Source Control Field Officer

ET/cmd
xc: Larry Koenig-IDHW/DOE, Boise
Grover Partee-EPA/IOO, Boise

Encl.

STATE OF IDAHO

DEPARTMENT OF HEALTH AND WELFARE
DIVISION OF ENVIRONMENT - 1118 F. Street - Lewiston, Idaho 83501

799-3430

August 30, 1984

Honorable Ladd Arnoti
Mayor, CITY OF COTTONWOOD
P O Box 172
Cottonwood, Idaho 83522

Re: NPDES Inspection (ID#002184-9)

Dear Mayor Arnoti:

Recently we inspected Cottonwood's wastewater treatment facility. Enclosed is a copy of our inspection report.

Cottonwood's self-monitoring data shows unusually high water flows and pH levels. This may indicate industrial discharges or storm drains feeding into this system. High biological oxygen demand and high suspended solids may be caused by this additional flow.

Please respond to this office by September 17, 1984 with a written plan of what attempts will be made during the next year to find such sources of excess flows.

We would like to thank operator David Shears for his assistance. He seems to be keeping these lagoons well maintained.

If you have any questions do not hesitate to call this office.

Sincerely,

DIVISION OF ENVIRONMENT

George M. Dekan

George M. Dekan
Sr. Water Quality Specialist

GMD/cmd
xc: John Moeller-IDHW/DOE, Lewiston
Wally Scarburgh-EPA/IOO, Boise
Dave Shears-Cottonwood

Encl.

Lewiston

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION X

Appendix A-4

IDAHO OPERATIONS OFFICE
422 WEST WASHINGTON STREET
BOISE, IDAHO 83702

I00

October 9, 1985

Honorable Ladd C. Arnoti,
Mayor, City of Cottonwood
P. O. Box 172
Cottonwood, Idaho 83522

RE: NPDES Compliance Inspection
Permit No. ID-002184-9

Dear Mayor Arnoti:

Attached for your information are the results of an NPDES compliance inspection conducted at the Cottonwood wastewater treatment facility on August 21, 1985. Although in compliance with permit conditions, sample results verify that the City will need to upgrade existing facilities in order to meet minimum State/EPA requirements for waste stabilization ponds that must be achieved no later than July 1, 1988.

EPA will be reissuing the Cottonwood permit in the near future to include a compliance schedule, based on a Staff Evaluation being prepared by the Idaho Department of Health and Welfare - Division of Environment. This permit will contain interim effluent limitations similar to the previously issued permit. Although the City has demonstrated the ability to comply with these existing permit conditions, milestones identified in the compliance schedule will need to be completed in order to meet the final compliance date.

You will be provided 30 days to comment on the draft permit before final issuance. Please contact me if you should have any questions following review of the permit conditions.

Mr. Shears' assistance during the inspection was appreciated as are his efforts to maintain the wastewater treatment facility.

Sincerely,

Wally Scarburgh,
NPDES Permits Coordinator

Enclosure

cc: David Shears, Operator, City of Cottonwood
Larry Koenig, IDHW-DOE, Boise
Jamie Sikorski, M/S 513

Appendix B-1

NPDES

DISCHARGE MONITORING REPORT SUMMARY

002184-9

Year 1973

mittee Cottonwood

QUANTITY

Permit Condition	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min.												
Av. 75	56			56			33			80		
Max. 115	85			70	"	"	36			122		
Min.												
Av. 88	114			142	"	"	131			114		
Max. 131	111			231	"	"	144			135		
Min.												
Av.	—			—								
Max.	—			—								
Min.												
Av.	.33			.38	"	"	.24			.371		
Max.	.64			.45	"	"	.35			.509		
Min.												
Av.	.40			.41	"	"	.18			.435		
Max.	1.01			.95	"	"	.21			.435		
Min.												
Av.												
Max.												
Min.												
Av.												
Max.												
Min.												
Av.												
Max.												

CONCENTRATION

Permit Condition	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Min.	6			10			10			15		
Av. 6.0	12			19	"	"	19			25		
Max. 7.0	16			24	"	"	31			31		
Min.	4			11	"	"	42			38		
Av. 7.0	33			43	"	"				60		
Max. 10.5	54			61	"	"				68		
Min. 6.0	7.9			8.0	"	"	5.9			7.6		
Av.												
Max. 9.0	9.3			10.3	"	"				7.9		
Min.												
Av.												
Max.												
Min.												
Av.												

NPDES - DISCHARGE MONITORING REPORT SUMMARY

NO. 002184-9 YEAR 1984

PERMITTEE Cottonwood

QUANTITY

Permit Condition	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug	Sept	Oct	Nov	Dec.
75	[illegible]	→	→	54	→	→	15	→	→	56	→	→
115	[illegible]	→	→	98	→	→	25	→	→	79	→	→
88	[illegible]	→	→	417	→	→	.39	→	→	125	→	→
131	[illegible]	→	→	493	→	→	.64	→	→	223	→	→
	—	→	→	—	→	→	→	→	→	→	→	→
	—	→	→	—	→	→	→	→	→	→	→	→
	.645	→	→	.65	→	→	.06	→	→	.16	→	→
	1.08	→	→	.90	→	→	.06	→	→	.207	→	→
	1.13	→	→	1.08	→	→	→	→	→	→	→	→
	1.47	→	→	1.09	→	→	→	→	→	→	→	→

CONCENTRATION

Permit Condition	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug	Sept	Oct	Nov	Dec.
	16	→	→	12	→	→	16	→	→	34	→	→
60	38	→	→	16	→	→	38	→	→	41	→	→
70	67	→	→	23	→	→	49	→	→	46	→	→
	42	→	→	→	→	→	52	→	→	→	→	→
70	45	→	→	[illegible]	→	→	[illegible]	→	→	60	→	→
105	46	→	→	90	→	→	[illegible]	→	→	70	→	→
6.0	7.6	→	→	8.0	→	→	7.9	→	→	7.7	→	→
	→	→	→	→	→	→	→	→	→	→	→	→
9.0	7.8	→	→	[illegible]	→	→	[illegible]	→	→	[illegible]	→	→

Appendix B-3

NI[illegible] - DISCHARGE MONITORING REPORT [illegible]MARY

IT NO. ID-002184-9

YEAR 1985

OF PERMITTEE Cottonwood

QUANTITY

ter	Permit Condition	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug	Sept	Oct	Nov	Dec.
D	75	86	→	→	28	→	→						
	115	114	→	→	53								
	88	114	→	→	140								
	131	151	→	→	281								
W		.20	→	→	.164								
		.315	→	→	.315								

CONCENTRATION

er	Permit Condition	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug	Sept	Oct	Nov	Dec.
		26	→	→	20	→	→						
)	60	[illegible]	→	→	20								
	70	[illegible]	→	→	21								
		48	→	→	70								
	70	[illegible]	→	→	94								
	105	113	→	→	107								
	6.0	7.6	→	→	8.9								
	9.0	7.9	→	→	10.5								

STATE OF IDAHO

DEPARTMENT OF HEALTH
AND WELFARE

DIVISION OF ENVIRONMENT
Statehouse
Boise, Idaho 83720

January 13, 1986

MEMORANDUM

TO: Larry Koenig

THRU: Susan Martin SBM

FROM: Steve Bauer

SUBJECT: Draft Cottonwood Creek Report

I have reviewed the draft report and have a few comments and suggestions. I thought the report was well written regarding the analysis of the water quality data.

As we discussed at our meeting on effluent limitations on January 7, the impact (or potential impact) of the treatment plant on protected uses is an important consideration in developing effluent limits. The ability of Cottonwood Creek to support protected uses as listed in the Water Quality Standards needs to be verified. Should the treatment plant be designed to provide protection for the future uses - cold water biota and salmonid spawning - as shown in the Standards? The intermittent nature of the stream in the vicinity of the treatment plant would indicate that these uses are not attainable due to the physical limitations of the habitat. If this is an accurate conclusion, then the report should recommend a change in use designation in the Water Quality Standards. A new segment, which encompasses the intermittent reach, may need to be designated in the Water Quality Standards to clarify the existing situation.

If the assessment of protected uses discussed above is correct, then the effluent limits would be designed primarily to protect public health. Would the "equivalent" to secondary treatment standards of 45/70 with disinfection being considered by the Division be sufficient to protect public health? This can be addressed in a Recommendations section.

In regard to completion of the report the field office should prepare a final report and send it to the Planning Section. We will make copies and distribute the report.

I apologize for getting these comments in later than requested.

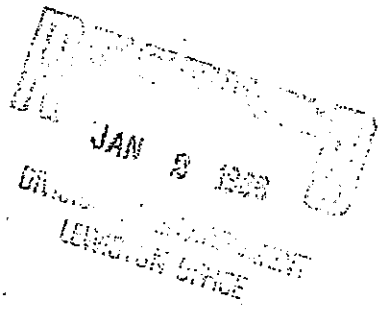
Steve

STATE OF IDAHO

DEPARTMENT OF HEALTH
AND WELFARE

DIVISION OF ENVIRONMENT
Statehouse
Boise, Idaho 83720

December 30, 1985



MEMORANDUM

TO: John Moeller

FROM: Larry L. Koenig

SUBJECT: Comments - Cottonwood Creek Water Quality Status Report

Attached for your review and consideration are comments received from Robert Braun regarding the above-referenced report. To date, no comments have been received from the PATS Section.

After making any necessary changes, resubmit the report for approval and signatures.

Larry

lab
Attachment

cc: Bob Braun, w/o attach.
Susan Martin, w/o attach.

STATE OF IDAHO

DEPARTMENT OF HEALTH
AND WELFARE

DIVISION OF ENVIRONMENT
Statehouse
Boise, Idaho 83720

December 23, 1985

MEMORANDUM

TO: Larry Koenig

FROM: Robert L. Braun

SUBJECT: Cottonwood Creek Water Quality Status Report

Thank you for allowing us the opportunity to review the subject report. The results and conclusions indicate that Cottonwood's wastewater effluent impacts Cottonwood Creek. The information provided should be helpful in establishing effluent limits which may require special consideration during stream low flows. We have several comments on the draft report.

I have noted that both the text and the tabular data summary refer to the term "mean pH." Considering the fact that pH in itself is a logarithmic function, it is inappropriate to calculate an arithmetic mean. The pH effects of the effluent can be presented without referring to mean pH. I recall an article or editorial in the Journal, WPCF, several years ago which expounded several more objections to "mean pH."

Also with regard to pH, have any checks been made on the community water supply to determine if the high pH might be of natural origin?

Figures 3 through 5 all refer to nutrients in the title and description but present data on parameters other than nutrients. Should the titles be modified?

On page 3, second paragraph, last sentence, the word "sections" should be changed to "stations."

RLB

RLB/ph

cc: Steve Bauer