WATER QUALITY DEMONSTRATION STUDY

ALDRIDGE CREEK
HUNTSVILLE, ALABAMA
1987 AND 1990

SPECIAL STUDIES SECTION
FIELD OPERATIONS DIVISION
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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INTRODUCTION

The City of Huntsville in Madison County, Alabama utilized Aldridge Creek as a receiving stream for the treated effluent from its municipal wastewater treatment facility. During the period of May 1987 to September 1990 the old disposal plant for the City of Huntsville was under construction to upgrade its treatment facilities. Staff members of the Special Studies Section of the Field Operations Division of the Alabama Department of Environmental Management (ADEM), at the request of the Municipal Branch of the Water Division of ADEM, conducted a water quality demonstration study to assess the effects of the new treatment facility on Aldridge Creek.

EPA CONSTRUCTION GRANTS PROGRAM

Since 1972, approximately $545 million dollars in EPA grant funds have been expended toward construction of municipal wastewater treatment works in Alabama. The City of Huntsville received an EPA Construction Grant for the improvements to Aldridge Creek WWTP.

The upgrade of the existing Aldridge Creek WWTP was completed in November 1988 by the addition of three 2.0 MGD oxidation ditches and additional clarifiers to the existing trickling filter plant. The upgraded facility has a 8.4 MGD average daily flow capacity. The total construction of the Aldridge Creek facility was approximately $6.6 Million. Of this total, the EPA grant funding was approximately $2.9 million. The project engineer was Proctor, Davis, Ray Engineers of Huntsville, and the construction company was CFW Contruction of Fayetteville, Georgia. The new construction included 3 - 2.0 MGD oxidation ditches operating in parallel, upgraded plant headworks, upgraded plant control systems, final clarifiers, standby generators, additional sludge drying beds, sludge thickeners and upgraded chlorination facilities. Also associated with this (as separate construction contract) was the construction of a new plant outfall to convey the treated wastewater to the Tennessee River, thereby eliminating the discharge to Aldridge Creek.

The upgrade of the Aldridge Creek WWTP augmented an existing trickling filter treatment system originally designed to provide 2.4 MGD of secondary treatment. The upgraded treatment plant was designed to meet a secondary treatment level at a flow of 8.4 MGD.

The oxidation ditch is a type of activated sludge treatment system in which wastewater is treated by flowing through an oval ("racetrack") shaped basin where aeration and mixing take place. The Aldridge Creek facility utilized "brush" aerators manufactured by the Lakeside Company. This type of aerator was selected for its ability to provide efficient mixing and oxygen transfer.

In the Huntsville Aldridge Creek WWTP treatment system, wastewater first flows by gravity to the bar screens and grit removal system for preliminary treatment, then to a splitter box where the raw wastewater is apportioned between the original trickling filter treatment train and the new oxidation ditch process train. The maintenance of the constant flow of approximately 2.4 MGD to the trickling filters is designed to enhance their operation. After the treated waste passed

through the treatment trains it is chlorinated prior to discharge to the Tennessee River.

NPDES permit limits for the 8.40 MGD Aldridge Creek treatment system are as follows:

$cBOD_5$	25 mg/l
TSS	30 mg/l

Average monthly performance by the treatment facility for the period from May 1990 to December 1990 is as follows:

FLOW	4.297	MGD
BOD	9.9	mg/l
TSS	9.5	mg/l

FIELD OPERATIONS

During May through September, 1987, staff members of the Special Studies Section collected data to establish conditions, and provide a comparative base of information, on Aldridge Creek. This sampling was accomplished prior to construction and implementation of the new plant. During May through September, 1990, data were collected to demonstrate the improvement, if any, of water quality in the receiving stream attributable to the new plant.

SAMPLING LOCATIONS AND METHODOLOGIES

Physical, chemical, and biological water quality data were collected at the following locations:

AC-1 (Control) - Aldridge Creek approximately 1.0 mile upstream of treatment plant at road crossing.
Latitude 034° 35' 42.0" Longitude 086° 32' 45.0"
T5S, R1E, S17, SE1/4, SW1/4, SE1/4.

AC-2 - Aldridge Creek approximately 10 feet downstream of treatment plant discharge at Hobbs Island Road crossing.
Latitude 034° 35' 02.3" Longitude 086° 33'21.6"
T5S, R1E, S20, SW1/4, NW1/4, SE1/4.

All physical data, chemical and biological sample collection and handling, and field parameter analyses, for this water quality demonstration study were in accordance with the ADEM Field Operations Division Standard Operating Procedures and Quality Assurance Manual, Volumes 1 and 2, as amended. Chain-of-Custody was maintained by locking the samples in a Departmental vehicle when not in the sight of Field Operations personnel. The samples requiring laboratory analysis were transported to the ADEM Environmental Laboratory in Montgomery, Alabama. Analysis methodologies were as specified in the Federal Register, 40 CFR Part 136, October 1984, as amended. Analysis of the samples yielded the data which are reported in Tables 1 and 2.

DISCUSSION AND RESULTS

A. Physical

Aldridge Creek, at AC-1 and AC-2, is a third order stream located in the Interior Plateau Ecoregion. It drains a predominantly residential, industrial and agricultural area. The stream banks are dominated by grasses and small shrubs at AC-1, and shrubs and trees at AC-2. Both stations have an open canopy.

At the time of the study, the average stream width and depth at AC-1 was approximately 65 feet and 1.0 foot, respectively. Stream flow averaged 4.13 cubic feet per second (cfs) prior to the upgrade and 9.89 cfs after the upgrade of the wastewater treatment plant (WWTP). Sand and silt deposition was noted during both the before and after portions of the study, indicating local watershed erosion and nonpoint source (NPS) pollution. At the time the August/September, 1987 samples were collected, a dragline was seen working upstream channelizing the creek bed. The substrate at this station consisted primarily of boulder, small gravel and sand. The bank stability during the pre-upgrade portion of the study was poor, compounding the erosion problem. The stability improved during the post-upgrade portion , with the banks mostly covered by grasses and small shrubs. Cows have been observed in the creek just downstream of AC-1. Filamentous algae and rooted aquatic macrophytes were commonly found in the creek bed during both phases of the study.

Aldridge Creek, at AC-2, had an estimated stream width of approximately 100 feet. This station was influenced by, and located in the backwaters of, the Tennessee River. Prior to upgrade it received an estimated average of 9.71 cfs from the combined flow from AC-1 (4.13 cfs) and the WWTP discharge (5.58 cfs). Flow received during the 1990 sampling season, as measured at AC-1 averaged 9.89 cfs. During the upgrade of the WWTP, the discharge point was relocated to the Tennessee River.

B. Chemical

Aldridge Creek has a Water Use Classification of Fish and Wildlife (F&W). This assigns the best usage of the waters for fishing, propagation of fish, aquatic life, and wildlife, and any other usage except for swimming and water-contact sports or as a source of water supply for drinking or food processing purposes.

As seen in Table 1, 2 and Figure 1, the early morning concentration of Dissolved Oxygen (D.O.) at AC-1, prior to upgrade, ranged from 3.0 to 6.5 milligrams per liter (mg/l) with an average of 5.8 mg/l. After the upgrade, the D.O. concentration ranged from 3.7 to 6.3 mg/l, and averaged 4.7 mg/l. Two of three a.m. measurements of D.O. concentration fell below the 5.0 mg/l standard for F&W. The excessively high afternoon D.O. concentrations, elevated nutrients, and Total Suspended Solids (TSS) (Figures 3 and 4), indicate there was a source of enrichment to the study reach in addition to the WWTP effluent. Biochemical Oxygen Demand (BODs) and Specific Conductivity values (Figure 2) were also elevated during the entire study. The pH determinations were meeting the F&W standards.

Aldridge Creek below the discharge point (AC-2) had pre- and post-upgrade afternoon Dissolved Oxygen concentrations which met the F&W standard, with the exception of one preupgrade measurement (Tables 1, 2 and Figure 1). Early morning D.O. samples taken prior to the upgrade of

the WWTP ranged from 0.1 to 2.4 mg/l with an average of 0.9 mg/l. The post-upgrade, early morning D.O. concentration dataset averaged 5.3 mg/l and included one value lower than 5.0 mg/l. Prior to upgrade, average BOD_5 ,TSS and nutrient parameters, with the exception of NO_3, were elevated above the control (Figures 3 and 4). These factors may have contributed to the low early morning D.O. concentrations. Average pH determinations shown in Figure 2 were meeting the F&W standards , with the exception of one measurement above the acceptable range (pH 8.6.) at AC-2 prior to upgrade. After the upgrade of the facility and subsequent removal of the discharge from Aldridge Creek, there were significant improvements in all pre-upgrade elevated chemical parameters.

C. Biological

An assessment of Aldridge Creek water quality would be incomplete without considering impacts to its biological community. The aquatic macroinvertebrate community was surveyed using Modified Hester-Dendy Multiplate Samplers to substantiate the physical and chemical data and to provide an aspect that reflects pollution response over time.

Biological metrics were used to analyze the raw benthic data. Table 4 provides simplified interpretations of these metrics and should be referred to in the following discussion.

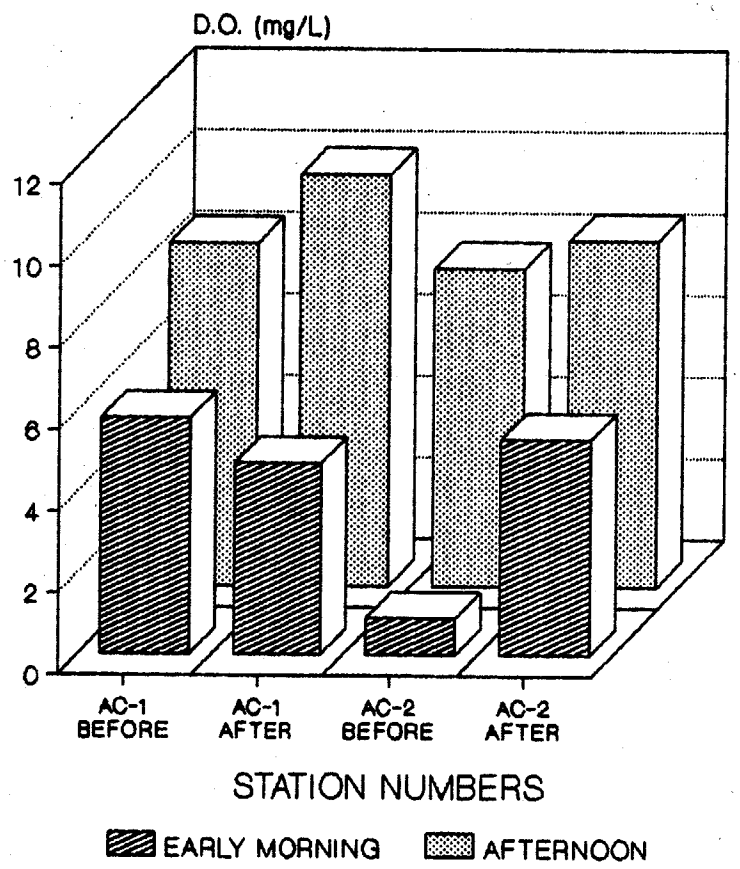
The macroinvertebrate community, indicated a definite adverse impact at AC-2 as compared to the control (Tables 3A - 4 and Figures 6, 7). This impact was reflected by the loss in the number of taxa collected at AC-2 as compared to the control. The EPT Index (Ephemeroptera, Plecoptera, and Trichoptera taxa) also showed an adverse impact. The EPT Index dropped from an EPT of 1 at AC-1 to 0 at AC-2, a complete loss of these generally pollution intolerant organisms. A general deterioration of the macroinvertebrate community was also noted in the Biotic Index, which increased from 6.96 at station AC-1 to 9.37 at AC-2, indicating a shift from moderately tolerant organisms to organisms very tolerant of organic pollution.

The post-upgrade community, as seen in Figures 5 and 6, indicated an improvement. The number of taxa collected at both the control and downstream stations increased. This may be due to a temporary detrimental effect of siltation on the pre-upgrade biota of both stations resulting from the channelization that took place during the 1987 portion of this study. The post-upgrade improvement was also illustrated by the Shannon-Weaver Diversity Index. The diversity of the organisms inhabiting both stations increased, indicating a much healthier community was collected in 1990. The Equitability index indicated the post-upgrade, upstream community's organisms were more evenly distributed within the taxa collected, while the post-upgrade AC-2 community is slightly less evenly distributed than were the respective pre-upgrade communities. An evenly distributed community is a generally healthy community. A slight improvement, if any, in the overall pollution tolerance of the community is indicated by the small decrease in the biotic index as compared to the pre-upgrade community at both AC-1 and AC-2. As seen in Figure 7, the post-upgrade communities at AC-1 and AC-2 were more similar and had a better balance of pollution indicator organisms than their pre-upgrade counterparts. Figure 8 illustrates the functional feeding group structure of the community at each station before and after upgrade of the WWTP. There was an improvement in the balance of these groups after the upgrade with the additional groups collected at AC-2 during 1990. Table 5 summarizes the

relative changes in the pre- and post-upgrade biological indices. Data indicate an improvement in the community after removal of the WWTP discharge from Aldridge Creek.

CONCLUSIONS

Physical, chemical, and biological data indicate that after the upgrade of the wastewater treatment facility and relocation of the discharge to the Tennessee River there has been an improvement in the overall water quality of Aldridge Creek. Factors other than removal of the discharge may have affected, or masked, the improvement in the overall condition of this study reach. The water quality of Aldridge Creek may have been negatively affected prior to pre-upgrade sampling by channelization dredging upstream. It may have also temporarily impaired the macroinvertebrate population during the 1987 study. Therefore any improvement indicated after upgrade may be the natural recovery from this temporary stress. The average flow measured at AC-1 after the upgrade was over twice that of the earlier study. The dilution effect may have also been the cause of any improvement in the chemical parameters. However, at the time of this final study, our data indicate that the entire study reach was not meeting its' Fish and Wildlife Water Use Classification. Further work may be required to document recovery of Aldridge Creek.



THE ABOVE NUMBERS ARE AVERAGES REPRESENTING MULTIPLE SAMPLING EVENTS.

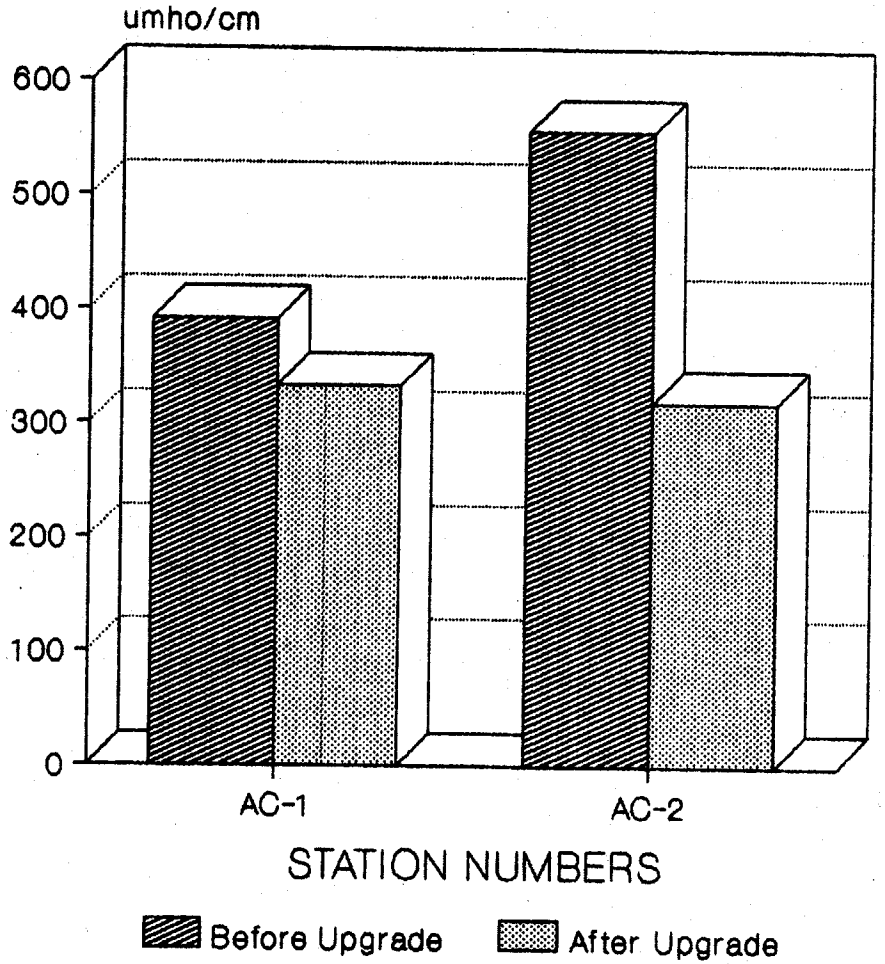
FIGURE 1

ALDRIDGE CREEK

DISSOLVED OXYGEN DATA

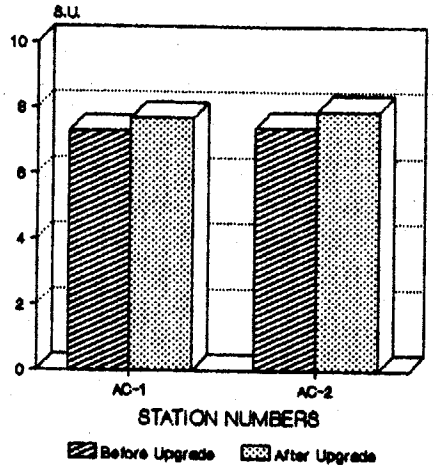
BEFORE AND AFTER UPGRADE OF WWTP

FIGURE 2
ALDRIDGE CREEK
CONDUCTIVITY DATA



THE ABOVE NUMBERS ARE AVERAGES REPRESENTING MULTIPLE SAMPLING EVENTS.

pH DATA



FLOW DATA

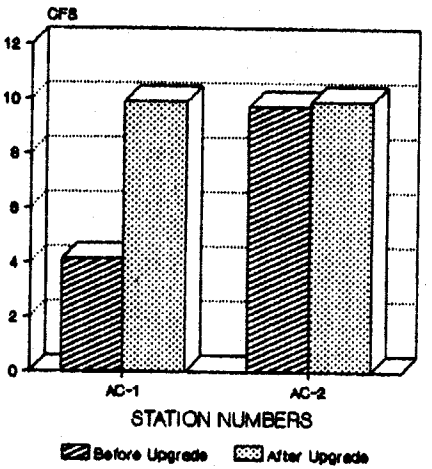
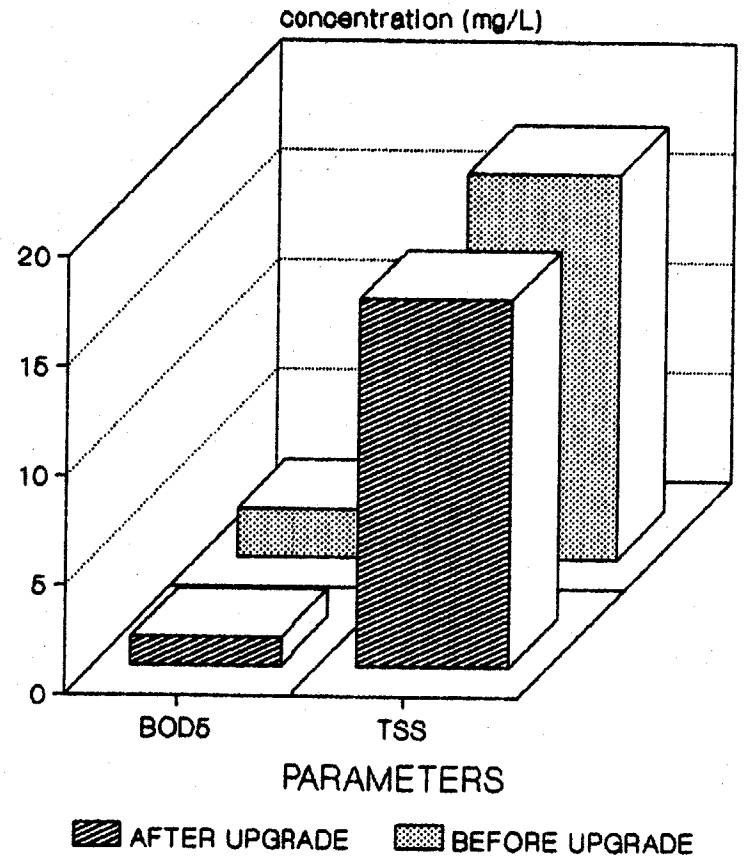
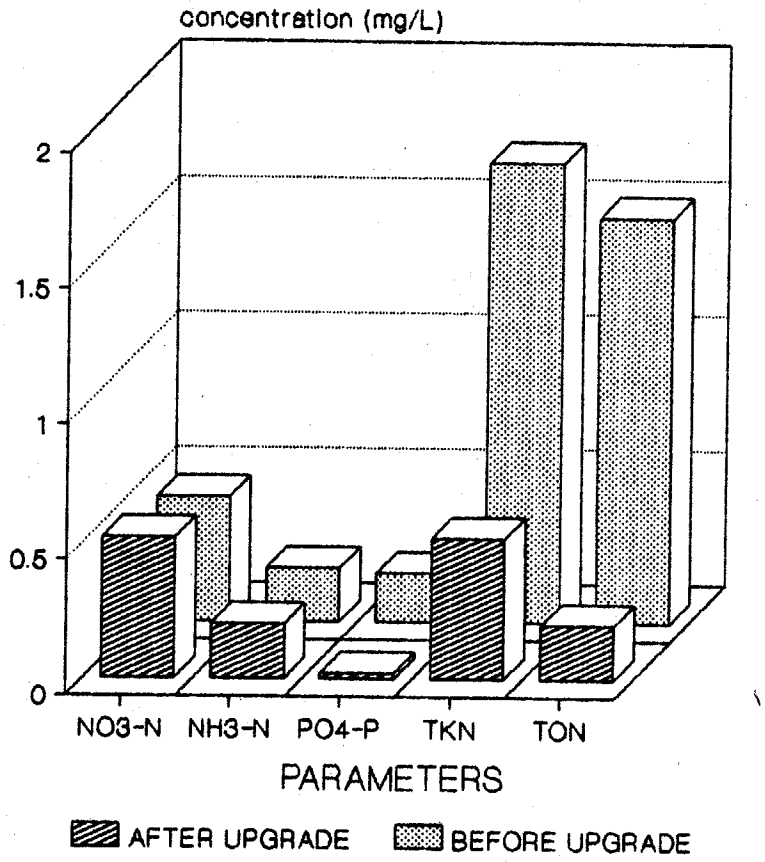


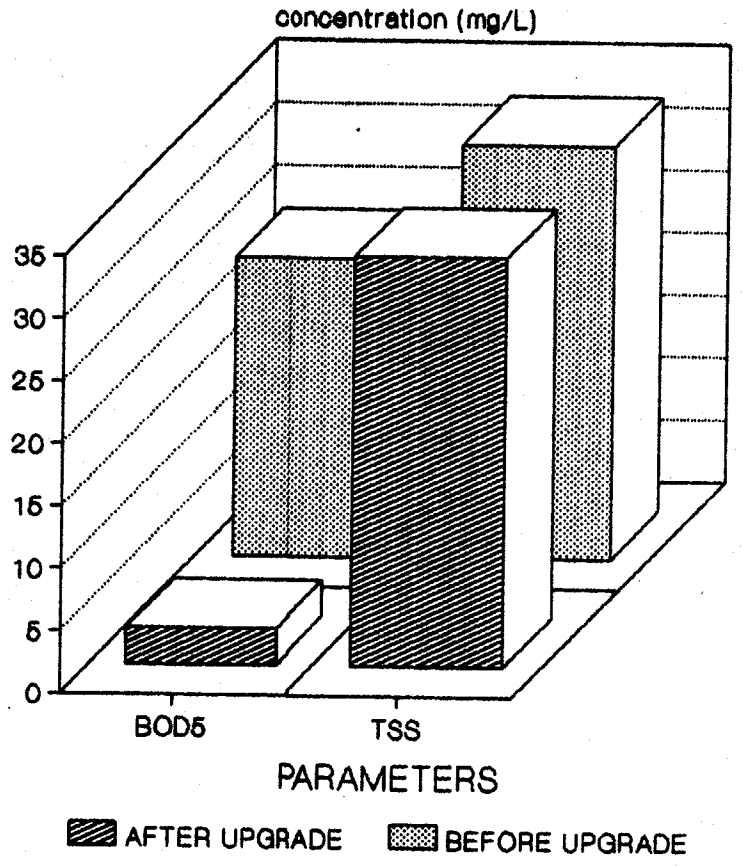
FIGURE 3
ALDRIDGE CREEK (AC-1)
CHEMICAL ANALYSIS DATA

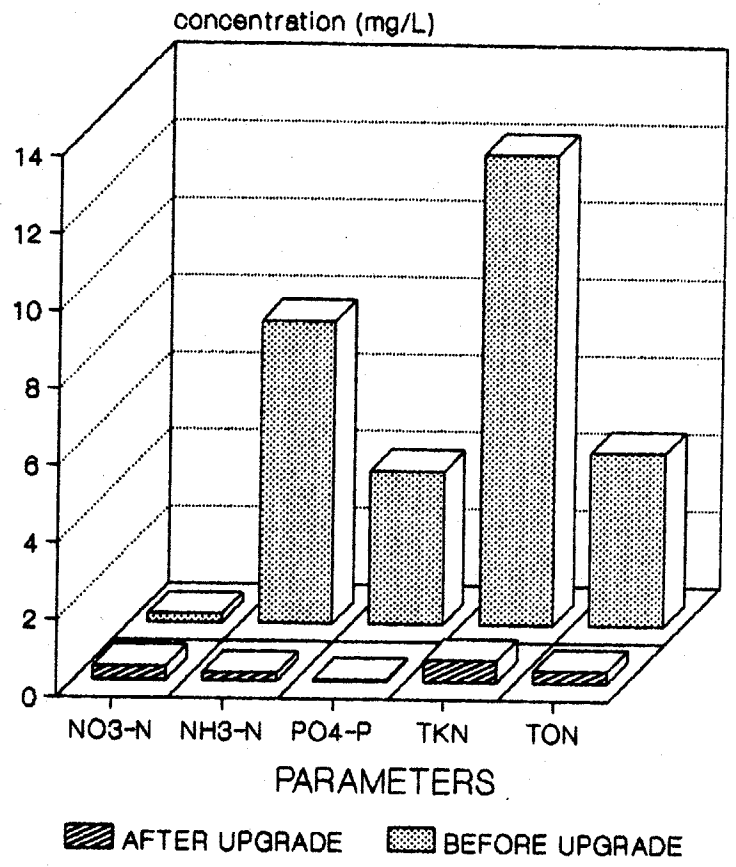




THE ABOVE NUMBERS ARE AVERAGES REPRESENTING MULTIPLE SAMPLING EVENTS

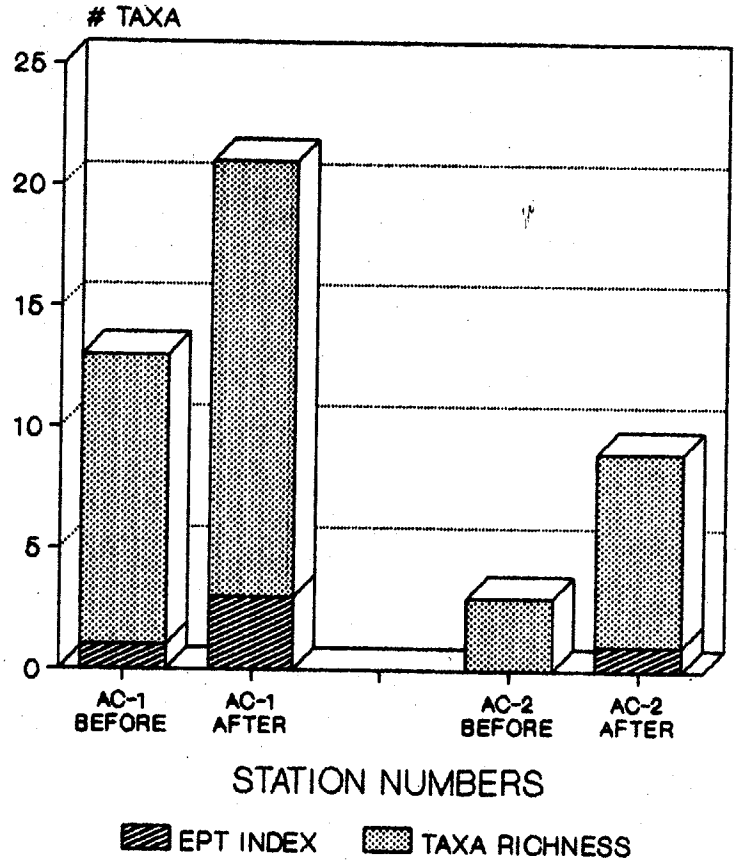
FIGURE 4
ALDRIDGE CREEK (AC-2)
CHEMICAL ANALYSIS DATA





THE ABOVE NUMBERS ARE AVERAGES REPRESENTING MULTIPLE SAMPLING EVENTS

FIGURE 5
ALDRIDGE CREEK
BIOMETRIC INDICES



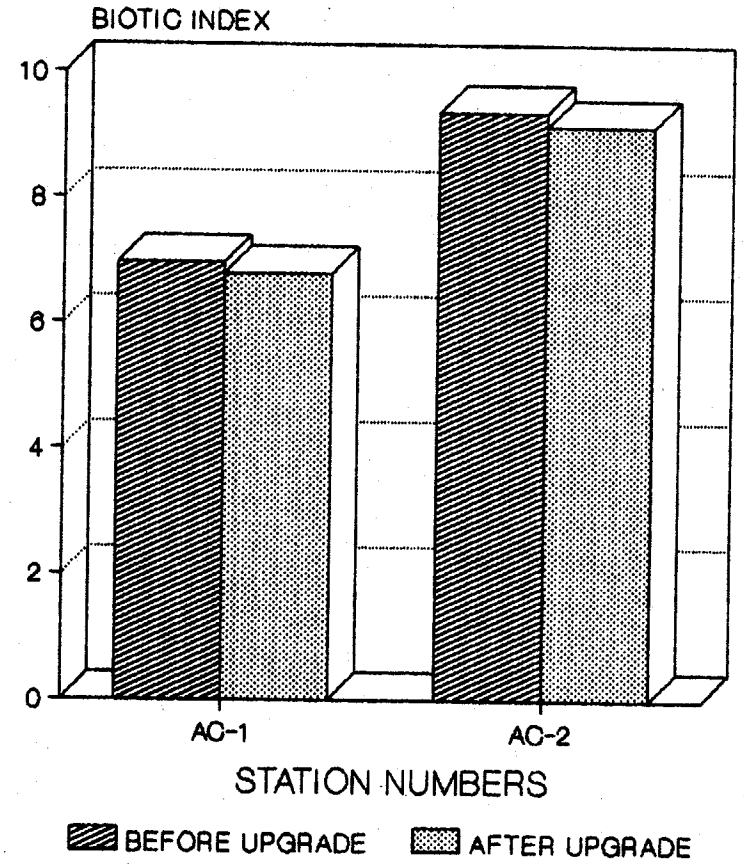
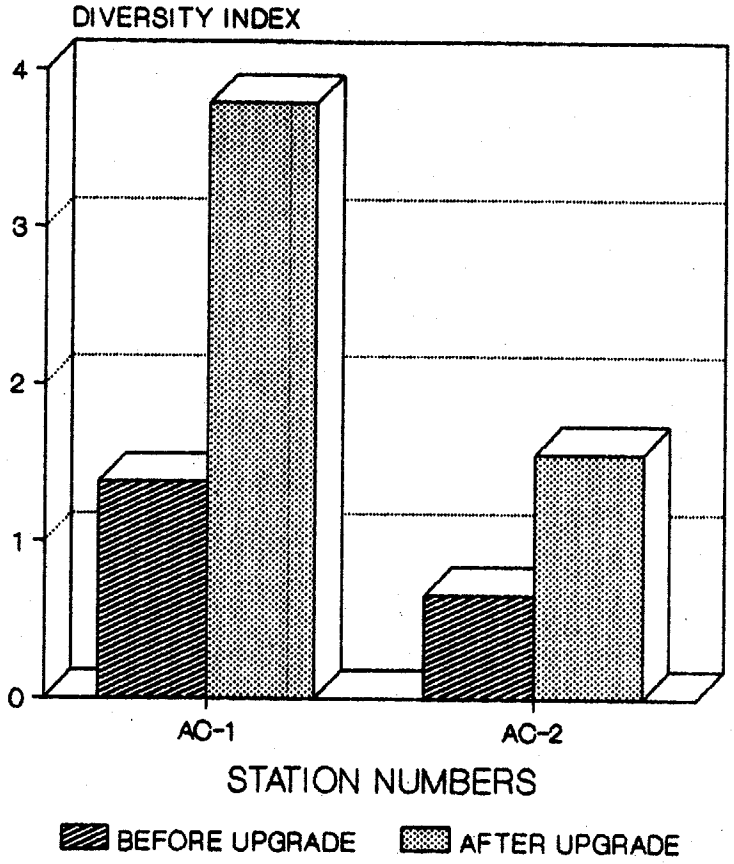


FIGURE 6
ALDRIDGE CREEK
BIOMETRIC INDICES



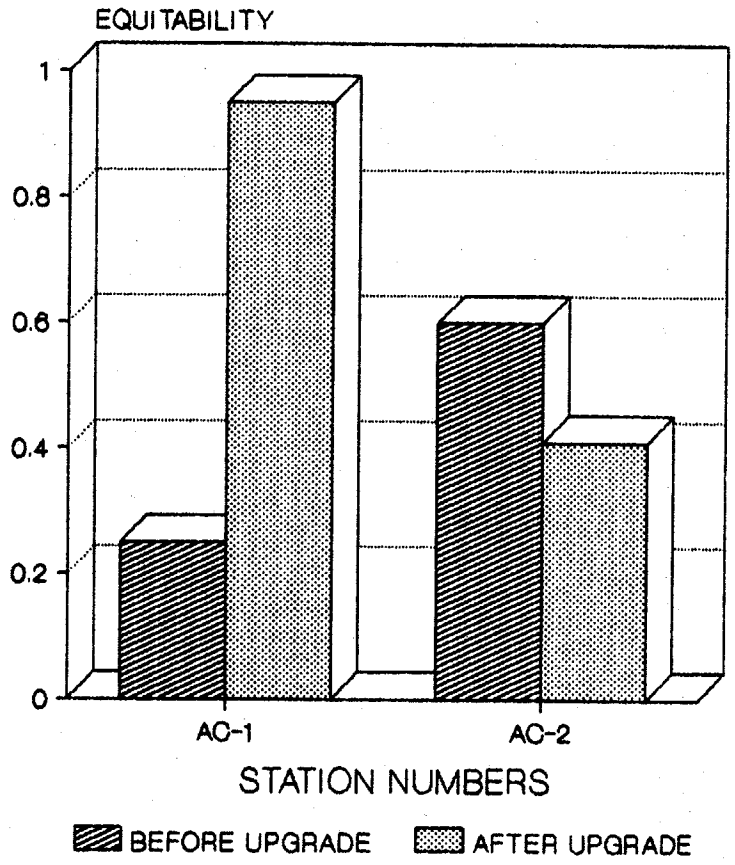
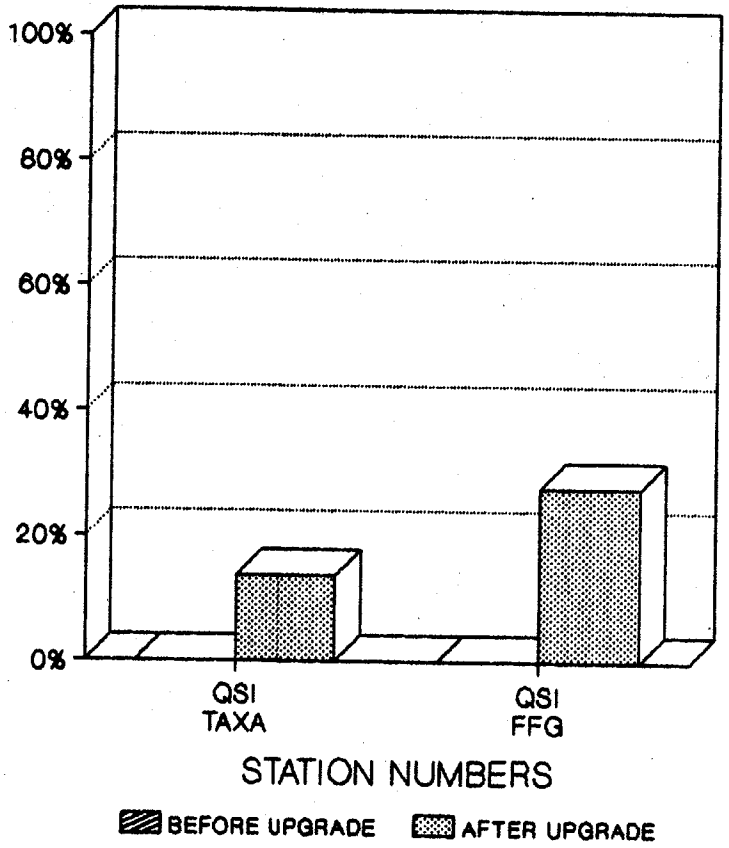
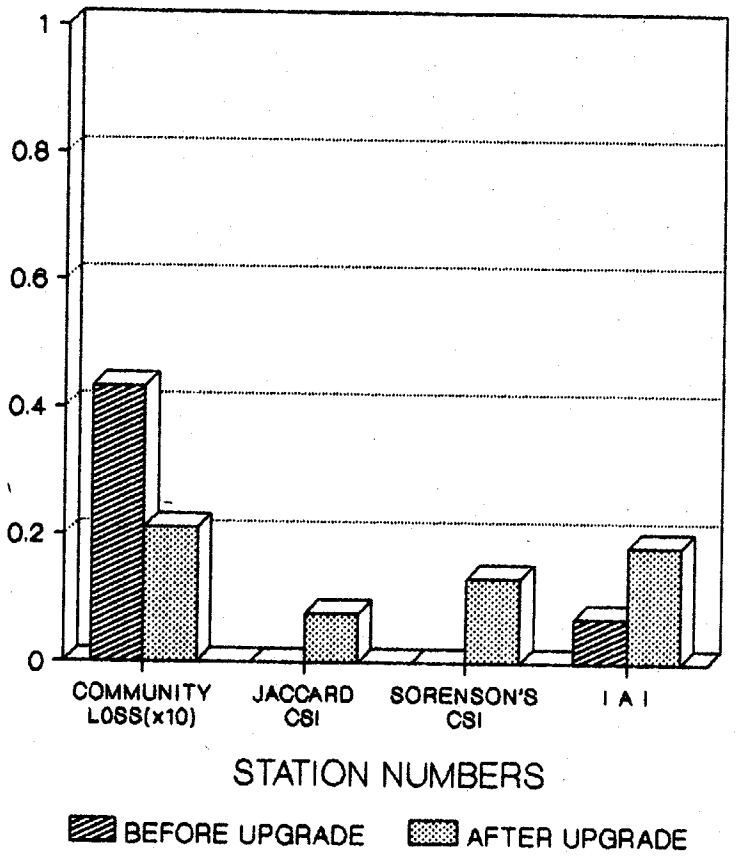
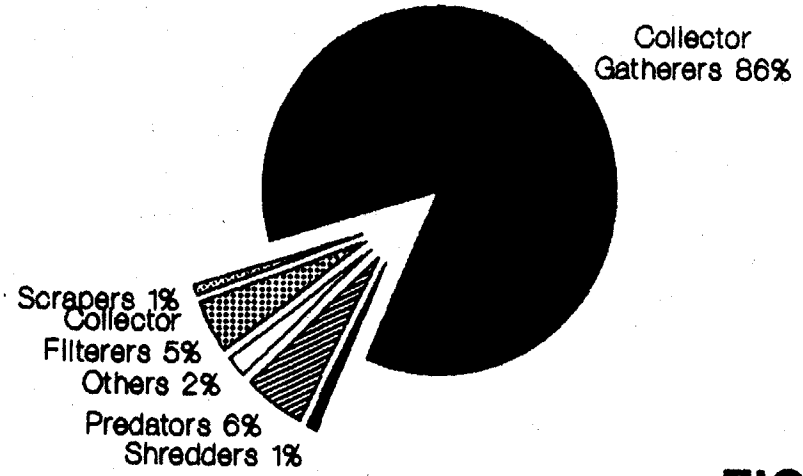


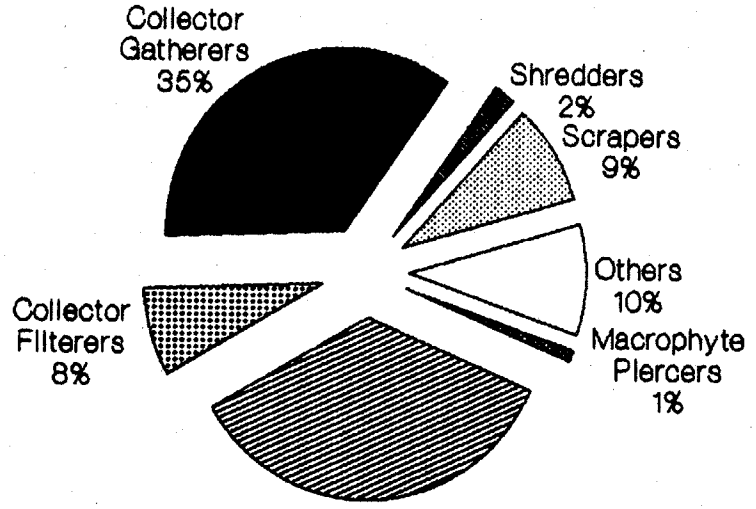
FIGURE 7
ALDRIDGE CREEK
BIOMETRIC INDICES





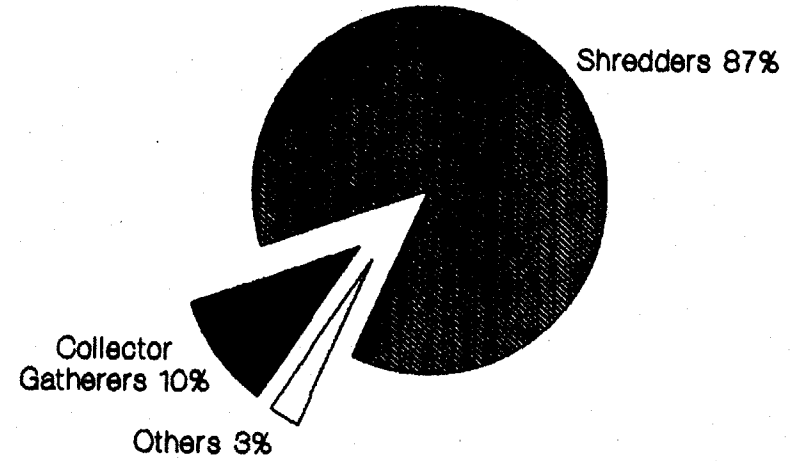


AC-1 BEFORE

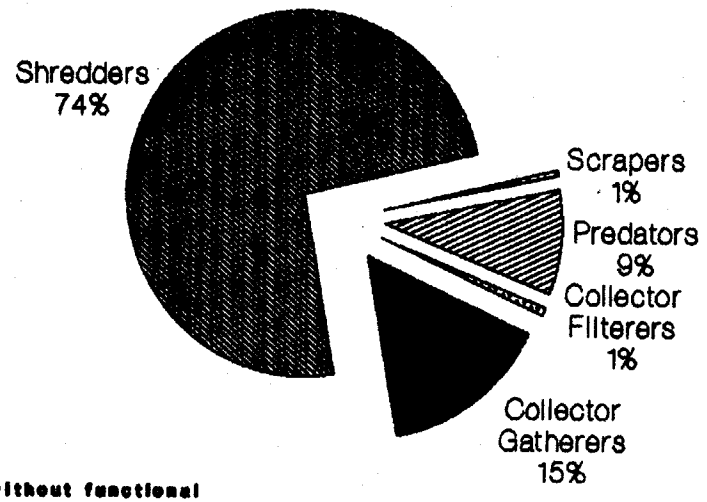


AC-1 AFTER

FIGURE 8
ALDRIDGE CREEK
COMMUNITY STRUCTURE



AC-2 BEFORE



AC-2 AFTER

% Others are organisms without functional feeding group designation.

TABLE 1

WATER QUALITY DEMONSTRATION STUDY
ALDRIDGE CREEK AT HUNTSVILLE, ALABAMA
DATA COLLECTED PRIOR TO UPGRADE OF WWTP

DATE	LOCATION	TIME	AIR TEMP	WATER TEMP	A.M. DO	P.M. DO	pH	SPECIFIC COND	BOD 5	TSS	NO -N 3	NH -N 3	TKN	TON	PO -P 4	FLOW **	BACTERIA
04/30/87	AC-1	09:25	22	18.5	6.5		7	---	2	4	0.78	0.4	2	1.6	0.12	8.75	
05/20/87		16:26	30.5	28.5		6.5	7.3	---	0.6	10	0.4	0.3	1.4	1.1	0.02	3.09	<1
05/21/87		08:15	24.5	23.5	3.5		6.9	---									
06/24/87		15:45	34	29.5		6.3	7.4	---	0.7	10	0.48	0.2	1.4	1.2	<0.02	5.31	
07/22/87		16:20	30.5	26.5		6.4	7.1	490	1	8	0.42	0.1	2.2	2.1	0.8	1.66	
07/23/87		06:55	27.5	23.5	3		7.1	380	7.2	12	0.6	0.1	1.6	1.5	0.15		26
08/31/87	*	13:05	32	26		14.4	7.8	350	1.9	52	0.19	0.2	1.8	1.6	0.06	1.85	
09/01/87	*	09:15	24	22	10.3		7.5	345	2	27	0.36	0.2	1.6	1.4	0.06		5
AVERAGE			28.1	24.8	5.8	8.4	7.3	391	2.2	17.6	0.46	0.2	1.7	1.5	-----	4.13	----
04/30/87	AC-2	08:26	18.5	18.5	2.4		7	----	10.5	11	0.31	7.2	9.2	2	3.24	15.1	
05/20/87		17:15	29	29		10.2	7.9	----	17	33	0.25	3.9	6	2.1	1.75	8.2	210
05/21/87		08:05	24	24.5	0.7		7.2	----									
06/24/87		15:00	30	32		14.9	8.6	----	>7.5	30	0.31	4.5	12	7.5	1.96	10.88	
07/22/87		13:50	31	28.5		5.8	7.4	590	>43	80	0.28	6.9	15.6	8.7	5.6	6.77	
07/23/87		06:45	27.5	26	0.1		7	440	19.2	34	0.26	6	10.3	4.3	4.4		>6000
08/31/87		12:40	28	26		0.1	7.1	700	37	23	0.24	16.4	18	2.6	6.4	7.58	
09/01/87		09:30	25	24	0.2		7	495	33	21	0.06	9.6	14	4.4	4.5		>60000
AVERAGE			26.6 C	26.1 C	0.9 mg/L	7.8 mg/L	7.4 SU	556 umho/cm	----- mg/L	33.1 mg/L	0.24 mg/L	7.8 mg/L	12.2 mg/L	4.5 mg/L	3.98 mg/L	9.71 cfs	---- org/100 mL

* - Dragline working upstream - channelizing.
** Flow at AC-2 is equal to Flow at AC-1 + WWTP discharge

TABLE 2

WATER QUALITY DEMONSTRATION STUDY
ALDRIDGE CREEK AT HUNTSVILLE, ALABAMA
DATA COLLECTED AFTER UPGRADE OF WWTP

DATE	LOCATION	TIME	AIR TEMP	WATER TEMP	A.M. DO	P.M. DO	pH	SPECIFIC COND	BOD 5	TSS	NO -N 3	NH -N 3	TKN	TON	PO -P 4	FLOW **	BACTERIA
05-15-90	AC-1	14:00	28	26		10.3	8	390	1	14	0.78	<0.20	0.8	0.6	<0.02	14.65	
05-16-90		07:20	24	20	6.3		7.5	335	1	14	0.82	<0.20	<0.4	0	<0.02		87
07/24/90		06:34	20	23	3.7		7.5	285	1.2	12	0.39	<0.20	<0.4	0	<0.02	8.4	
07/25/90		06:30	18	22	4		7.5	305	0.7	18	0.43	<0.20	<0.4	0	<0.02		190
09/12/90		16:50	30	28.5		9.9	7.9	350	2.4	26	0.2	<0.20	0.6	0.6	<0.02	6.61	
AVERAGE			24.0	23.9	4.7	10.1	7.7	333	1.3	16.8	0.52	----	----	0.2	----	9.89	139
05-15-90	AC-2	13:25	28	23		6.5	8	370	2.9	30	0.62	<0.20	0.6	0.4	0.03	14.65	
05-16-90		07:45	22	23	5.2		7.7	330	1.6	38	0.6	<0.20	0.6	0.4	0.03		590
07/24/90		06:50	20	25	4		7.6	275	1.6	24	0.28	<0.20	<0.4	0	0.05	8.4	
07/25/90		06:48	18	24	6.6		7.8	280	1.4	40	0.22	<0.20	<0.4	0	0.03		12
09/12/90		15:35	28.5	28.5		10.4	8.4	340	7	32	0.08	<0.20	0.8	0.8	0.06	6.61	
AVERAGE			23.3 C	24.7 C	5.3 mg/L	8.5 mg/L	7.9 SU	319 umho/cm	2.9 mg/L	32.8 mg/L	0.36 mg/L	---- mg/L	---- mg/L	0.3 mg/L	0.04 mg/L	9.89 cfs	301 org/100 mL

** Flow at AC-2 is equal to Flow at AC-1 + WWTP discharge

TABLE 3A
MACROINVERTEBRATE
DATA SUMMARY SHEET

Waterbody Name: Aldridge Creek — Aquatic Ecoregion: 71
Location/ City: Huntsville — County: Madison — State: AL
Investigators: Diggs, Bertolotti — Date: 10-08-87 (Before Upgrade)

Habitat Assess.	---	---
Station Number	AC-1	AC-2
Total No. Org.	321	1899
Taxa Richness	13	3
EPT Index	1	0
Biotic Index	6.96	9.37
% Dom. Taxa	80.4%	86.9%
Dominant Taxa	Caenis	Glyptotendipes
Dom. Taxa. Tol. Val.	7	10
% Shredders	0.9%	86.9%
% Scrapers	0.9%	0%
% Predators	5.6%	0%
% Collect-Gath.	86%	10.3%
% Collect-Fil.	4.7%	0%
% Macro-Piercer	0%	0%
% Other	1.9%	2.8%
EPT/EPT+Chiro.	0.84	0
Hydrop/Trichop	0	0
S.W. Diversity	1.38	0.66
Equitability	0.25	0.60

Station Comparison	AC-1 vs AC-2
IAI	0.07
DIC (>5%)	0
QSI-Taxa	0
QSI-FFG	13.10
Comm. Loss Index	4.33
Jaccard Comm. Sim.	0
Sorenson's CSI	0

--- Habitat Assessment Matrix not applicable to non-wadeable stream

TABLE 3B
MACROINVERTEBRATE
DATA SUMMARY SHEET

Waterbody Name: Aldridge Creek — Aquatic Ecoregion: 71
Location/ City: Huntsville — County: Madison — State: AL
Investigators: Bauer, Leslie — Date: 09-12-90 (After Upgrade)

Habitat Assess.	---	---
Station Number	AC-1	AC-2
Total No. Org.	102	461
Taxa Richness	21	9
EPT Index	3	1
Biotic Index	6.79	9.14
% Dom. Taxa	17.7%	70.9%
Dominant Taxa	Caenis	Glyptotendipes
Dom. Taxa. Tol. Val.	7	10
% Shredders	2.0%	74.2%
% Scrapers	8.8%	0.4%
% Predators	35.3%	5.6%
% Collect-Gath.	35.3%	19.1%
% Collect-Fil.	7.8%	0.7%
% Macro-Piercer	1.0%	0%
% Other	9.8%	0%
EPT/EPT+Chiro.	0.37	0.05
Hydrop/Trichop	0	0
S.W. Diversity	3.79	1.56
Equitability	0.95	0.41

Station Comparison	AC-1 vs AC-2
IAI	0.18
DIC (>5%)	1
QSI-Taxa	0.14
QSI-FFG	0.28
Comm. Loss Index	2.11
Jaccard Comm. Sim.	0.08
Sorenson's CSI	0.13

--- Habitat Assessment Matrix not applicable to non-wadeable stream

TABLE 4
BIOMETRIC INTERPRETATION

METRIC	RANGE	INTERPRETATION
HABITAT ASSESSMENT	104-135	EXCELLENT
	71-103	GOOD
	35-70	FAIR
	0-34	POOR
a). TAXA RICHNESS b). EPT INDEX c). SHANNON-WEAVER SPECIES DIVERSITY d). EQUITABILITY		GENERALLY INCREASES WITH INCREASING WATER QUALITY.
a). BIOTIC INDEX b). % DOMINANT TAXA c). TOLERANCE VALUE OF DOM TAXA		GENERALLY INCREASES WITH DECREASING WATER QUALITY.
a). % SHREDDERS b). % SCRAPERS c). % PREDATORS d). % COLLECTOR-GATHERERS e). % COLLECTOR-FILTERERS f). % MACROPHYTE PIERCERS g). % OTHERS		PERCENTAGES AND COMPOSITION SHOULD BE SIMILAR TO BACKGROUND STATION FOR SIMILAR STREAM SIZES AND HABITAT COMPOSITION.
a). SCRAPERS/SCRAPERS+C-F b). SHREDDERS/TOTAL c). HYDROPTILIDAE/TRICHOPTERA		NO SIGNIFICANT CHANGE AS COMPARED TO BACKGROUND.
a). EPT/EPT+CHIRONOMIDAE		GENERALLY INCREASING WATER QUALITY AS APPROACHES 1.0.
SIMILARITY INDICES		
a). INDICATOR ASSEMBLAGE INDEX (IAI) b). JACCARD COMMUNITY SIMILARITY c). SORENSON'S CSI		INCREASING SIMILARITY AS APPROACHES 1.0.
a). DOMINANTS IN COMMON b). QUANTITATIVE SIMILARITY INDEX (QSI)-TAXA c). QSI-FUNCTIONAL FEEDING GROUP (FFG)		GENERALLY INCREASING WITH INCREASING SIMILARITY.
a). COMMUNITY LOSS INDEX		GENERALLY INCREASING WITH INCREASING DISSIMILARITY

TABLE 5
MACROINVERTEBRATE
METRIC SUMMARY SHEET

Waterbody Name: Aldridge Creek
Location/ City: Huntsville
Investigators: Diggs, Bertolotti
Bauer, Leslie

Aquatic Ecoregion: 71
County: Madison State: AL
Dates: Before 10-08-87
After 09-12-90

+....improvement
0....no change
-....deterioration
*....see comments below

Habitat Assess.	*		*
Station Number	AC-1		AC-2
Taxa Richness	+		+
EPT Index	+		+
Biotic Index	+		+
% Dom. Taxa	+		+
Dom. Taxa Tol. Val.	0		0
EPT/EPT+Chiro.	-		+
Hydrop/Trichop	0		0
S.W. Diversity	+		+
Equitability	+		-
Station Comparisons		AC-1 vs AC-2	
IAI		+	
DIC		+	
QSI-Taxa		+	
QSI-FFG		+	
Comm. Loss Index		+	
Jaccard Comm. Sim.		+	
Sorenson's CSI		+	

* Habitat Assessment Matrix is not valid for non-wadeable streams.

TAXA LIST
MACROINVERTEBRATE DATA
ALDRIDGE CREEK - HUNTSVILLE, AL

TAXA	AC-1 BEFORE	AC-2 BEFORE	AC-1 AFTER	AC-2 AFTER
ANNELIDA				
OLIGOCHAETA	-	54	6	-
INSECTA				
COLEOPTERA				
Berosus	-	-	1	-
Stenelmis	-	-	1	-
Tanysphyrus	3	-	-	-
DIPTERA				
Bezzia	-	-	3	-
Pericoma	-	195	-	-
CHIRONOMIDAE				
Ablabesmyia	3	-	5	-
Chironomus	9	-	-	-
Cryptotendipes	-	-	1	-
Dicrotendipes	9	-	12	59
Glyptotendipes	-	1650	-	327
Nilothauma	-	-	2	-
Paratanytarsus	3	-	-	-
Phaenopsectra	3	-	-	-
Polypedilum	-	-	2	15
Pseudochironomus	-	-	-	12
Rheotanytarsus	3	-	-	-
Tanypus	-	-	1	-
Tanytarsus	9	-	8	-
Thienemannimyia Grp	9	-	10	-
Tribelos	-	-	-	17
UNID-CHIRONOMINI	-	-	1	-
UNID-TANYPODINAE	-	-	1	-
UNID-CHIRONOMIDAE	-	-	1	-
EPHEMEROPTERA				
Caenis	258	-	18	-
Stenacron	-	-	6	-
Tricorythodes	-	-	2	-
ODONATA				
Amphiagrion	-	-	3	-
Argia	3	-	10	-
Chromagrion	3	-	-	-
Erythemis	-	-	1	-
Perithemis	-	-	-	5
UNID-COENAGRIONIDAE	-	-	3	-
TRICHOPTERA				
Cyrnellus	-	-	-	21

TAXA LIST
ALDRIDGE CREEK - HUNTSVILLE, AL

TAXA	AC-1 BEFORE	AC-2 BEFORE	AC-1 AFTER	AC-2 AFTER
MOLLUSCA				
Corbicula	-	-	-	3
Elimia	-	-	2	-
Physella	-	-	-	2
MISCELLANEOUS				
Nematoda	-	-	1	-
Planaria	6	-	1	-