APPENDIX II

CONTENTS:

DEM Water Quality Monitoring Programs:

- **Benthic Macroinvertebrate Sampling**
- **Fisheries Studies**
- **Lakes Assessment**
- **Whole Effluent Toxicity Testing**

A-II.1 BENTHIC MACROINVERTEBRATES

Benthic macroinvertebrates, or benthos, are organisms, mostly aquatic insect larvae, that live in and on the bottom substrates of rivers and streams. The use of benthos data has proven to be a reliable monitoring tool as benthic macroinvertebrates are sensitive to subtle changes in water quality. Since many taxa in a community have life cycles of six months to one year, the effects of short term pollution (such as a spill) will generally not be overcome until the following generation appears. The benthic community also integrates the effects of a wide array of potential pollutant mixtures.

Criteria have been developed to assign bioclassifications ranging from Poor to Excellent to each benthic sample based on the number of taxa present in the intolerant groups Ephemeroptera, Plecoptera and Trichoptera (EPT S). Likewise, ratings can be assigned with a "biotic index". This index summarizes tolerance data for all taxa in each collection. The two rankings are given equal weight in final site classification. Higher taxa richness values are associated with better water quality. These bioclassifications primarily reflect the influence of chemical pollutants. The major physical pollutant, sediment, is poorly assessed by a taxa richness analysis. Different criteria have been developed for different ecoregions (mountains, piedmont and coastal) within North Carolina.

Classification Criteria by Ecoregion*

A. EPT taxa richness values

	10-sample Qualitative Samples			4-sample EPT samples		
	Mountains	Piedmont	Coastal	Mountains	Piedmont	Coastal
Excellent	>41	>31	>27	>35	>27	>23
Good	32-41	24-31	21-27	28-35	21-27	18-23
Good-Fair	22-31	16-23	14-20	19-27	14-20	12-17
Fair	12-21	8-15	7-13	11-18	7-13	6-11
Poor	0-11	0-7	0-6	0-10	0-6	0-5

B. Biotic Index Values (Range = 0-10)

	Mountains	Piedmont/Coastal
Excellent	<4.18	<5.24
Good	4.17-5.09	5.25-5.95
Good-Fair	5.10-5.91	5.96-6.67
~~Fair~~	~~5.92-7.05~~	~~6.68-7.70~~
Poor	>7.05	>7.71

*These criteria apply to flowing water systems only. Biotic index criteria are only used for full-scale (10-sample) qualitative samples

All the benthic macroinvertebrate collections in the Cape Fear River basin between 1983 and 1993 are presented in Chapter 4. They include site location, DEM classification schedule Index Number, collection date, taxa richness and biotic index values, and bioclassifications. Final bioclassifications assigned may take into account seasonal correction of both EPT taxa richness and Biotic Index value if the sample is collected outside of summer. Bioclassifications listed in this report may differ from older reports because evaluation criteria have changed since 1983. Originally, total taxa richness and EPT taxa richness criteria were used, then just EPT taxa richness, and now BI as well as EPT taxa richness criteria are used. Refinements of the criteria continue to occur as more data are gathered.

A-II.2 FISHERIES

To the public, the condition of the fishery is one of the most meaningful indicators of water quality. Fish occupy the upper levels of the aquatic food web and are both directly and indirectly affected by chemical and physical changes in the environment. Water quality conditions that significantly affect lower levels of the food web will affect the abundance, species composition, and condition of the fish population.

A-II.2.1 Fish Community Structure Methods

The North Carolina Index of Biotic Integrity (NCIBI) is a modification of Karr's IBI (1981) which was developed as a method for assessing a streams biological integrity by examining the structure and health of its fish community. The index incorporates information about species richness and composition, trophic composition, fish abundance and fish condition. The NCIBI summarizes the effects of all classes of factors influencing aquatic faunal communities (water quality, energy source, habitat quality, flow regime, and biotic interactions). While any change in a fish community can be caused by many factors, certain aspects of the community are generally more responsive to specific influences. Species composition measurements reflect habitat quality effects. Information on trophic composition reflects the effect of biotic interactions and energy supply. Fish abundance and condition information indicates additional water quality effects. It should be noted, however, that these responses may overlap. For example, a change in fish abundance may be due to decreased energy supply or a decline in habitat quality, not necessarily a change in water quality.

The assessment of biological integrity using IBI is provided by the cumulative assessment of 12 parameters, or metrics. The values provided by the metrics are converted into scores on a 1, 3, 5 scale. A score of 5 represents conditions expected for undisturbed streams in the area, while a score of 1 indicates that the conditions vary greatly from those expected in undisturbed streams of the region. The scores for each metric are summed to attain the overall IBI score.

Each metric is designed to contribute unique information to the overall assessment. A discussion of each metric is presented below; some metrics have been grouped together.

1. The total number of species and individuals supported by streams of a given size in a given region decrease with environmental degradation.
2. Darters are sensitive to environmental degradation particularly as a result of their specific reproductive and habitat requirements. Darter habitats are degraded as a result of channelization, siltation, and reduced oxygen levels. Collection of fewer than expected darter species can indicates that some habitat degradation is occurring.
3. Sunfish species are used because they are particularly responsive to degradation of pool habitats and to other aspects of habitat degradation like quality of instream cover.
4. Sucker species are intolerant of habitat and chemical degradation and, because they are long lived, provide a multiyear integrated perspective.
5. Intolerant species are those which are most effected by environmental perturbations and therefore should have disappeared, at least as viable populations, by the time a stream is degraded to a fair rating.
6. Tolerant species are those which are often present in a stream in moderate numbers, but as the stream degrades they tend to dominate.
7. The three trophic composition metrics, proportion of omnivores, insectivores, and piscivores, are used to measure the divergence from expected production and consumption patterns in the fish community that can result from environmental degradation. The main cause for a shift in the trophic composition of the fish community (a greater proportion of omnivores and few insectivores) is nutrient enrichment.

8. The proportion of fish with disease, tumors, fin damage, and skeletal anomalies increases as a stream is degraded. The length distribution metric measures the amount of reproduction which is occurring in the community by looking at the number of age groups, determined by length range, present for each species.

A field methodology for fish collections to be used for NC IBI is included in the standard operating procedures of the NC Division of Environmental Management (NCDEM, 1989). A representative section of stream, 600 feet in length, is selected, measured, and blocked at the upstream and downstream ends with small mesh nets. The stream is then sampled with one or two backpack electrofishing units depending upon stream width. After collection, the fish are examined for sores, lesions, fin damage, and skeletal anomalies and preserved in 10% formalin. Once preserved the fish are identified to species, length recorded, and batch weighed by species.

Streams with larger watersheds or drainage areas can be expected to support more fish species and a larger number of fish. Figures 1 and 2 represent the relative number of species and number of fish that can be expected in the North Carolina river basins. Table 2 presents a summary of fish community assessment data from 1980 to 1993 for each sampling location in the basin.

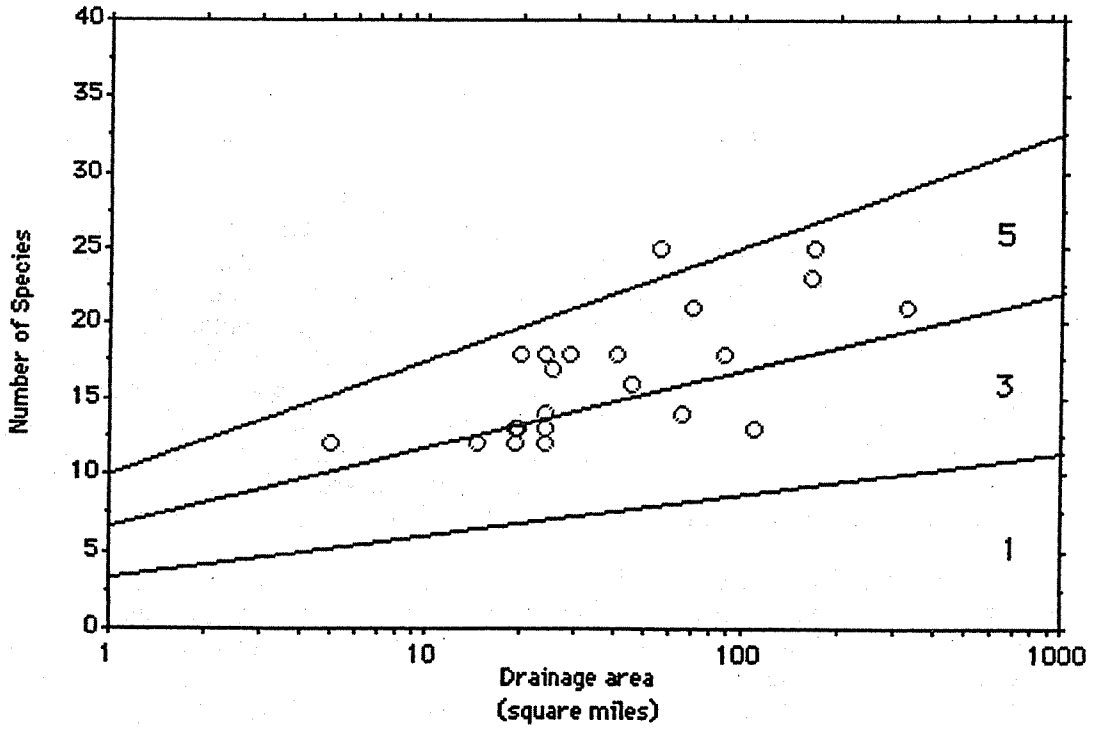

Figure 1. Expectations of the Number of Species based upon Drainage Area Size

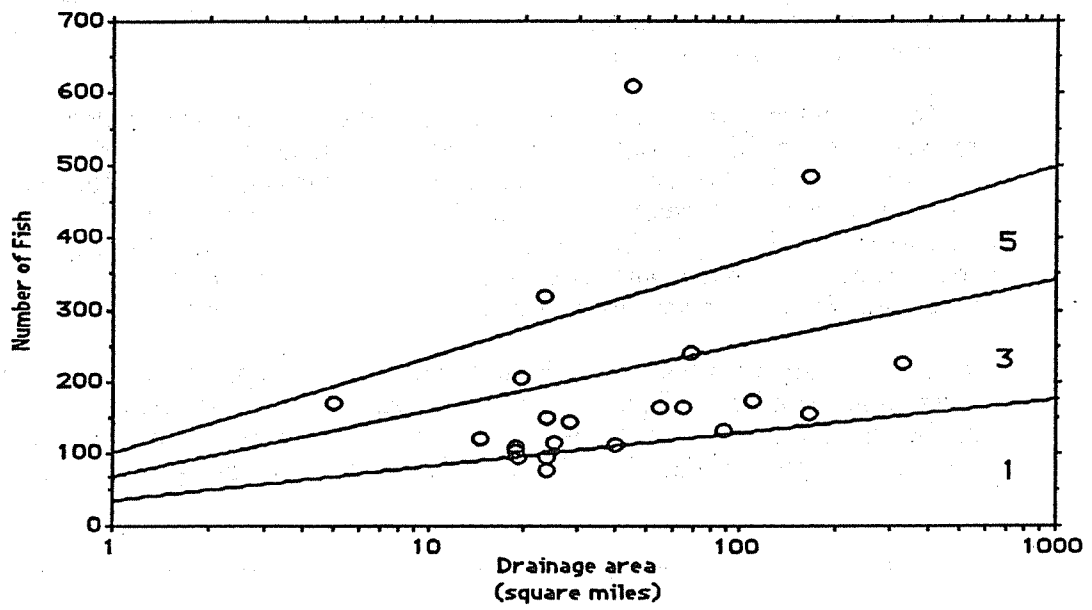

Figure 2. Expectations of the Number of Fish based upon Drainage Area Size

FISH TISSUE ANALYSES

Since fish spend their entire lives in the aquatic environment, they incorporate chemicals from this environment into their body tissues. Therefore, by analyzing fish tissue, determinations about what chemicals are in the water can be made. Once contaminants reach surface waters, they may be available for bioaccumulation either directly or through aquatic food webs and may accumulate in fish and shellfish tissues. Thus results from fish tissue monitoring can serve as an important indicator of further contamination of sediments and surface water. Fish tissue analysis results are also used as indicators for human health concerns and fish and wildlife health concerns, and the presence and concentrations of various chemicals in the ecosystem. Contamination of aquatic resources, including freshwater, estuarine, and marine fish and shellfish species have been documented for heavy metals, pesticides, and other complex organic compounds.

In evaluating fish tissue analysis results, several different types of criteria are used. Currently human health concerns related to fish consumption are screened by comparing results with Federal Food and Drug Administration (FDA) action levels. The FDA levels were developed to protect humans from the chronic effects of toxic substances consumed in foodstuffs and thus employ a "safe level" approach to fish tissue consumption. A list of fish tissue parameters accompanied by their FDA criteria are presented below. Individual parameters which appear to be of potential human health concern are evaluated by the N.C. Division of Epidemiology by request of the Water Quality Section.

Metals

	FDA		FDA
Cadmium	None	Chromium	None
Nickel	None	Lead	None
Copper	None	Arsenic	None
Mercury	1.0 mg/kg	Selenium	None

Synthetic Organics

	FDA		FDA
Aldrin	0.3 mg/kg	o,p DDD	5.0 mg/kg
Dieldrin	0.3 mg/kg	p,p DDD	5.0 mg/kg
Endrin	0.3 mg/kg	o,p DDE	5.0 mg/kg
Methoxychlor	None	p,p DDE	5.0 mg/kg
Alpha BHC	None	o,p DDT	5.0 mg/kg
Gamma BHC	None	p,p DDT	5.0 mg/kg
PCB-1254	2.0 mg/kg	cis-chlordane	3.0 mg/kg
Endosulfan I	None	trans-chlordane	3.0 mg/kg
Endosulfan II	None	Hexachlorobenzene	None

The USEPA is currently developing screening values for target analytes which are formulated from a risk assessment procedure. The EPA screening value for a particular analyte is the concentration of that analyte in edible fish tissue that is associated with a maximum limit of acceptable health risk to the general population or subpopulation of concern.

A-II.3 LAKES ASSESSMENT PROGRAM

Lakes are valued for the multiple benefits they provide to the public, including recreational boating, fishing, drinking water, and aesthetic enjoyment. The North Carolina Lake Assessment Program seeks to protect these waters through monitoring, pollution prevention and control, and restoration activities. Assessments have been made at all publicly accessible lakes, at lakes which supply domestic drinking water, and lakes (public or private) where water quality problems have been observed. Data are used to determine each lake's trophic status-a relative measure of nutrient enrichment and productivity, and whether the lake's uses have been threatened or impaired by pollution.

Tables presented in each subbasin summarize data used to determine the trophic status and use support status of each lake. These determinations are based on information from the most recent summertime sampling (date listed). The most recent North Carolina Trophic State Index (NCTSI) value is shown, followed by the descriptive trophic state classification (O=oligotrophic, M=mesotrophic, E=eutrophic, H=hypereutrophic, D=dystrophic).

Numerical indices are often used to evaluate the trophic status of lakes. An index was developed specifically for North Carolina lakes as part of the state's original Clean Lakes Classification Survey (NRCD 1982). The North Carolina Trophic State Index (NCTSI) is based on total phosphorus (TP in mg/l), total organic nitrogen (TON in mg/l), Secchi depth (SD in inches), and chlorophyll-a (CHL in µg/l). Lakewide means for these parameters are integrated to produce a NCTSI score for each lake, using the following equations:

$$\text{TON score} = \frac{\text{Log(TON)} + (0.45)}{0.24} \times 0.90$$

$$\text{TP score} = \frac{\text{Log(TP)} + (1.55)}{0.35} \times 0.92$$

$$\text{SD score} = \frac{\text{Log(SD)} - (1.73)}{0.35} \times -0.82$$

$$\text{CHL score} = \frac{\text{Log(CHL)} - (1.00)}{0.43} \times 0.83$$

$$\text{NCTSI} = \text{TON score} + \text{TP score} + \text{SD score} + \text{CHL score}$$

In general, NCTSI scores relate to trophic classifications as follows: less than -2.0 is oligotrophic; -2.0 to 0.0 is mesotrophic; 0.0 to 5.0 is eutrophic; and greater than 5.0 is hypereutrophic. When scores border between classes, best professional judgment is used to assign an appropriate classification. NCTSI scores are also skewed by the highly colored water typical of dystrophic lakes. These acidic, "black-water" lakes are scattered throughout the coastal plain, often located in swampy areas or overlying peat deposits.

A-II.4 WHOLE EFFLUENT TOXICITY TESTING

Table A-II.1 NPDES Facilities in the Cape Fear River Basin Required to Conduct Whole Effluent Toxicity Testing

Sub-Basin	Facility	NPDES #	Receiving Stream	County	Permitted Flow	% IWC
CPF01	Episcopal Diocese Camp	NC0046019/001	UT To Haw River	Rockingham	0.015	100.0
	Glen Raven Mills	NC0003913/001	Haw River	Alamance	0.09	1.6
	Pentecostal Holiness Ch.	NC0046809/001	UT Benaja Creek	Guilford	0.02	30.6
	Reidsville WWTP	NC0024881/001	Little Troublesome Crk	Rockingham	5.0	97.0
CPF02	Amoco Oil Co.	NC0003671/001	UT Horsepen Crk	Guilford	NA	100.0
	Brin-Mont Corporation	NC0084778/001	UT N. Buffalo Creek	Guilford	0.110	100
	Burlington East WWTP	NC0023868/001	Haw River	Alamance	12.0	35.63
	Burlington-South WWTP	NC0023876/001	Big Alamance Creek	Alamance	12.0	86
	Cone Mills Greensb.-001	NC0000876/001	N. Buffalo Creek	Guilford	1.25	79
	Graham WWTP	NC0021211/001	Haw River	Alamance	3.50	14
oro - N Buffalo						Greensb
325/001 Buffalo Creek						NC0024 N. Guilford 16.0 96.50
	Greensboro Osborne	NC0047384/001	S. Buffalo Crk	Guilford	20.0	93.08
	Lawrence Industries	NC0084328/001	UT Haw Creek	Alamance	0.120	100
	Mebane WWTP	NC0021474/001	Moadams Crk	Alamance	1.20	100
	Monarch Hosiery	NC0001210/001	Reedy Fork Crk	Alamance	0.05	0.16
	Petroleum Fuel Co.	NC0071463/001	UT Horsepen Creek	Guilford	NA	100.00
	Worth Chemical Corp.	NC0078000/001	UT S. Buffalo Creek	Guilford	0.216	21.8
CPF05	Durham Co.-Triangle	NC0026051/001	Northeast Crk	Durham	3.0	100.00
	Durham-Farrington Rd.	NC0047597/001	New Hope Creek	Durham	20.00	99.52
CPF06	OWASA/Mason Farm	NC0025241/001	Morgan Crk	Orange	8.0	92.54
	UNC-CH Power Plant	NC0025305/001	UT Morgan Crk	Orange	—	100.00
CPF07	Allied Chem. Corp./002	NC0001899/002	UT To Shaddox Creek	Chatham	N/A	100.0
	Allied Signal Fibers	NC0001899/001	Haw River	Chatham	0.244	0.94
	Broadway WWTP	NC0059242/001	Daniels Creek	Lee	0.16	83
	Buies Creek WWTP	NC0030091/001	Cape Fear River	Harnett	0.50	0.13
	CP&L-Cape Fr S.E./007	NC0003433/007	UT Cape Fear River	Chatham	180.7	100.0
	CP&L-Sh. Harris Env.Ct	NC0026735/001	Harris Lake	Wake	0.014	NA
	CP&L-Sh. Harris/006	NC0039586/006	Harris Reservoir	Chatham	17.05	NA
	Fuquay-Varina/ Kenn. Br	NC0028118/001	Kenneth Creek	Wake	1.20	100.00
	Lillington WWTP	NC0021636/001	Cape Fear River	Harnett	0.6	0.17
	Neste Resins Corp.	NC0000892/001	Haw River	Chatham	0.1000	0.39
CPF08	Amerada Hess (Greensb.)	NC0069256/001	UT E Fork Deep River	Guilford	NA	NA
	Colonial Pipeline/001	NC0031046/001	UT E Fork Deep River	Guilford	NA	100.0
	Colonial Pipeline/002	NC0031046/002	UT E. Fork Deep River	Guilford	NA	100.0
	Colonial Pipeline/003	NC0031046/003	UT E. Fork Deep River	Guilford	NA	100.0
	Colonial Pipeline/004	NC0031046/004	UT E. Fork Deep River	Guilford	NA	100.0
	Colonial Pipeline/005	NC0031046/005	UT E. Fork Deep River	Guilford	NA	100.0
	Colonial Pipeline/006	NC0031046/006	UT E. Fork Deep River	Guilford	NA	100.0
	Conoco, Inc. Greensb.	NC0074578/001	UT Long Branch	Guilford	.0067	100.00

	Exxon /Tank Farm-Gree.	NC0000795/001	UT East Fork Deep River	Guilford	NA	100.0
	GNC Energy Corp/ 001	NC0074241/001	UT E. Fork Deep River	Guilford	VAR	100.00
	Hidden Forrest Est. MHP	NC0065358/001	UT Deep River	Randolph	0.027	NA
	High Point Eastside	NC0024210/001	Richland Crk	Guilford	16.00	96.11
	LCP Plastics	NC0036366/001	UT W Fk Deep River	Guilford	NA	100.0
	Louis Dreyfus Energy	NC0026247/001	UT East Fork Deep River	Guilford		NA
	Plantation Pipeline (001)	NC0051161/001	UT E Fork Deep River	Guilford		NA
	Plantation Pipeline (002)	NC0051161/002	UT E Fork Deep River	Guilford		NA
	Randleman WWTP	NC0025445/001	Deep River	Randolph	1.745	35.0
	Texaco Refining/Star En.	NC0022209/001	UT Long Branch	Guilford		100.00
	Triad Terminal Co.	NC0042501/001	UT E Fork Deep River	Guilford	VAR	100.00
CPF09	Asheboro WWTP	NC0026123/001	Haskett's Creek	Randolph	6.0	100.00
	Ramseur WWTP	NC0026565/001	Deep River	Randolph	0.48	6.34
	Thomasville Furniture	NC0084816/001	UT Polecat Cr.	Guilford	0.0288	100
CPF10	Robbins WWTP	NC0062855/001	Deep River	Moore	1.0	8.9
	Star WWTP	NC0058548/001	Cotton Creek	Montgomery	0.60	100.00
CPF11	Golden Poultry	NC0072575/001	Deep River	Lee	1.0	9.1
	Sanford-Big Buffalo	NC0024147/001	Deep River	Lee	6.8	39
CPF12	Siler City WWTP	NC0026441/001	Loves Creek	Chatham	4.0	92
CPF13	Dunn/Blackriver WWTP	NC0043176/001	Cape Fear River	Harnett	3.75	0.79
	Erwin WWTP	NC0064521/001	Cape Fear River	Harnett	1.2	0.2
	Swift Textiles	NC0001406/001	Cape Fear River	Harnett	2.50	0.66
CPF14	Fort Bragg WWTP/001	NC0003964/001	Little River	Cumberland	8.0	25.69
	Spring Lake WWTP	NC0030970/001	Lower Little River	Cumberland	1.5	5.5
CPF15	Fayetteville-Cross Creek	NC0023957/001	Cape Fear River	Cumberland	22.00	4.93
	Fayetteville-Rockfish	NC0050105/001	Cape Fear River	Cumberland	12.0	2.7
	Monsanto/001,002	NC0003719/002	Cape Fear R.	Cumberland	0.73	0.14
	Raeford WWTP	NC0026514/001	Rockfish Creek	Hoke	3.0	8.67
CPF16	Carolina Food Proc., Inc.	NC0078344/001	Cape Fear River	Bladen	3.0	0.4
	Cogentrix Leasing /003	NC0058297/003	Cape Fear River	Bladen	0.10	0.02
	Dupont .001&002	NC0003573/001	Cape Fear River	Bladen	17	3.3
	Elizabethtown WWTP	NC0026671/001	Cape Fear River	Bladen	0.70	0.22
	Veeder Root /004	NC0001121/004	Cape Fear River	Bladen	0.152	0.03
	West Point Pepp.-Eliz.	NC0003522/001	Cape Fear River	Bladen	2.50	0.47
CPF17	AAF/McQuay, Inc.	NC0083658/001	UT To Barnards Crk	New Hanover	0.288	100
	Amerada Hess Corp.	NC0066711/001	Cape Fear River	New Hanover		NA
	Arcadian Corporation	NC0003727/001	Ne Cape Fear River	New Hanover	0.28	1.6
	Archer Daniels Midl./001	NC0027065/001	Cape Fear River(tidal)	Brunswick	3.502	0.03
	Campbell Oil Co.	NC0072681/001	UT Burnt Mill Creek	New Hanover	0.005	100.00
	Carolina Beach WWTP	NC0023256/001	Cape Fear River	New Hanover	1.85	NA
	Carter Pharmacy	NC0074179/001	Burnt Mill Creek	New Hanover	0.0014	2.89
	CP&L-Sutton/001	NC0001422/001	Cape Fear River	New Hanover	250.0	25.35
	CTI Of North Carolina	NC0082970/001	Cape Fear River	New Hanover	VAR	NA
	E.I. Dupont Dene./001	NC0000663/001	Cape Fear River	Brunswick	2.3	0.38
	Exxon Wilm. Term.	NC0073181/001	Cape Fear River	New Hanover	VARIES/NA	
	Federal Paper Board .	NC0081507/001	Burnt Mill Creek	New Hanover	10.0	37
	Federal Paperboard Co.	NC0003298/001	Cape Fear River	Columbus	50.00	8.30
	Fortron Industries/001	NC0082295/001	Cape Fear River (tidal)	New Hanover	0.245	1.16
	General Electric Co-001	NC0001228/001	Ne Cape Fear River	New Hanover	1.80	9.37

	Hoechst Celanese-Wilm	NC0001112/001	Northeast Cape Fear R	New Hanover	1.4	7.4
	Hoechst Celanese-Wilm	NC0001112/002	Cape Fear River	New Hanover	0.80	0.13
	JLM Terminals/CFR Ter	NC0028568/001	Cape Fear River	New Hanover	-	NA
	Koch Refining Co, L.P.	NC0076732/001	Cape Fear River	New Hanover	0.100	NA
	Leland Industrial Park	NC0065676/001	Cape Fear River	Brunswick	0.25	0.065
	M.I. Utilities-Clairmont	NC0058599/001	Brunswick River	Brunswick	.10	NA
	New Hanover Landfill	NC0049743/001	Ne Cape Fear River	New Hanover	VAR	NA
	North Side WWTP	NC0081736/001	Cape Fear River	New Hanover	4.0	NA
	Paktank Corp-Wilm. Ter.	NC0073172/001	Cape Fear River	New Hanover	NA	NA
	River Run Utilities	NC0060291/001	Jump And Run Creek	Brunswick	0.025	30.06
	Southport WWTP	NC0021334/001	Intracoastal Waterway	Brunswick	0.80	NA
	Takeda Chemical Prod.	NC0059234/001	Cape Fear River	New Hanover	0.444	0.07
	Wilm. Corp. Ind WWTP	NC0000817/001	Smith Creek	New Hanover	0.10	34.07
	Wilmington Northside	NC0023965/001	Cape Fear River	New Hanover	8.00	1.73
	Wilmington Shipyard,	NC0068004/001	Ne Cape Fear River	New Hanover	VARIED/NA	
	Wilmington Southside	NC0023973/001	Cape Fear River	New Hanover	12.00	1.59
	Wright Chem.Corp/002	NC0003395/002	Livingston Creek	Columbus	0.135	25.8
CPF18	Chevron USA	NC0084646/001	UT To Black River	Harnett	0.0144	100
	National Elec. C Corp.	NC0060747/001	Juniper Creek	Harnett	0.026	100.00
CPF19	Clinton-Larkins WPCF	NC0020117/001	Williams Old Mill Br.	Sampson	3.0	100.00
	Roseboro WWTP	NC0026816/001	Little Coharie Creek	Sampson	0.3	32
CPF21	Mt. Olive Pickle	NC0001074/001	Barlow Branch	Wayne	0.40	100.00
	Mt. Olive WWTP	NC0020575/001	Ne Cape Fear River	Wayne	1.0	100.00
CPF22	Charles F. Cates & Sons	NC0001970/001	UT Panther Branch	Duplin	0.50	100
	Cogentrix Corp.-003	NC0058271/003	Ne Cape Fear River	Duplin	VAR	100.0
	Guilford Mills East	NC0002305/001	Ne Cape Fear River	Duplin	0.965	18.68
	Rose Hill WWTP	NC0056863/001	Island Creek	Duplin	0.45	100.00
	Stevcoknit	NC0003450/002	Little Rockfish Creek	Duplin	5.0	99
	Swift-Eckrich, Inc.	NC0003344/001	Rockfish Crk.	Duplin	1.5	57
	Wallace WWTP	NC0020702/001	Rockfish Creek	Duplin	1.0	20.53
CPF23	Burgaw WWTP	NC0021113/001	Osgood Can. To Burg.Cr	Pender	0.50	100.00
	Occidental Chem./001	NC0003875/001	Ne Cape Fear River	New Hanover	1.04	6
	Thorn Apple Val. Of Car	NC0007757/001	UT To Juniper Swamp	Onslow	0.65	100.0
CPF24	Holly Ridge WWTP	NC0025895/001	UT Kings Creek	Onslow	0.1	100.0

NOTE: IWC Equals instream waste concentration. This is the percent of streamflow in the receiving waters that is composed of WWTP effluent during 7Q10 flow conditions. 7Q10 equals the lowest 7-day average flow expected to occur in a ten-year period.