

Cape Fear River Basin  
Basinwide Assessment Report  
Whole Effluent Toxicity Program  
2004-2008



## The Division of Water Quality's Whole Effluent Toxicity Monitoring Program

Acute and/or chronic toxicity tests are used to determine toxicity of discharges to sensitive aquatic species (usually fathead minnows or the water flea, *Ceriodaphnia dubia*). Results of these tests have been shown by researchers to be predictive of discharge effects to receiving stream populations. Many facilities are required to monitor whole effluent toxicity (WET) by their NPDES permit. Facilities without monitoring requirements may have their effluents evaluated for toxicity by DWQ's Aquatic Toxicology Laboratory. If toxicity is detected, DWQ may include aquatic toxicity testing upon permit renewal.

DWQ's Aquatic Toxicology Unit maintains a compliance summary for all facilities required to perform tests and provides a monthly update of this information to regional offices and WQ administration. Ambient toxicity tests can be used to evaluate stream water quality relative to other stream sites and/or a point source discharge.

### WET Monitoring in the Cape Fear River Basin – 2004-2008

One hundred seventeen NPDES permits in the Cape Fear River basin currently require whole effluent toxicity (WET) monitoring (Figure 1A and Table 1B). Eighty-seven NPDES permits have a WET limit; the other 30 permits specify monitoring with no limit.

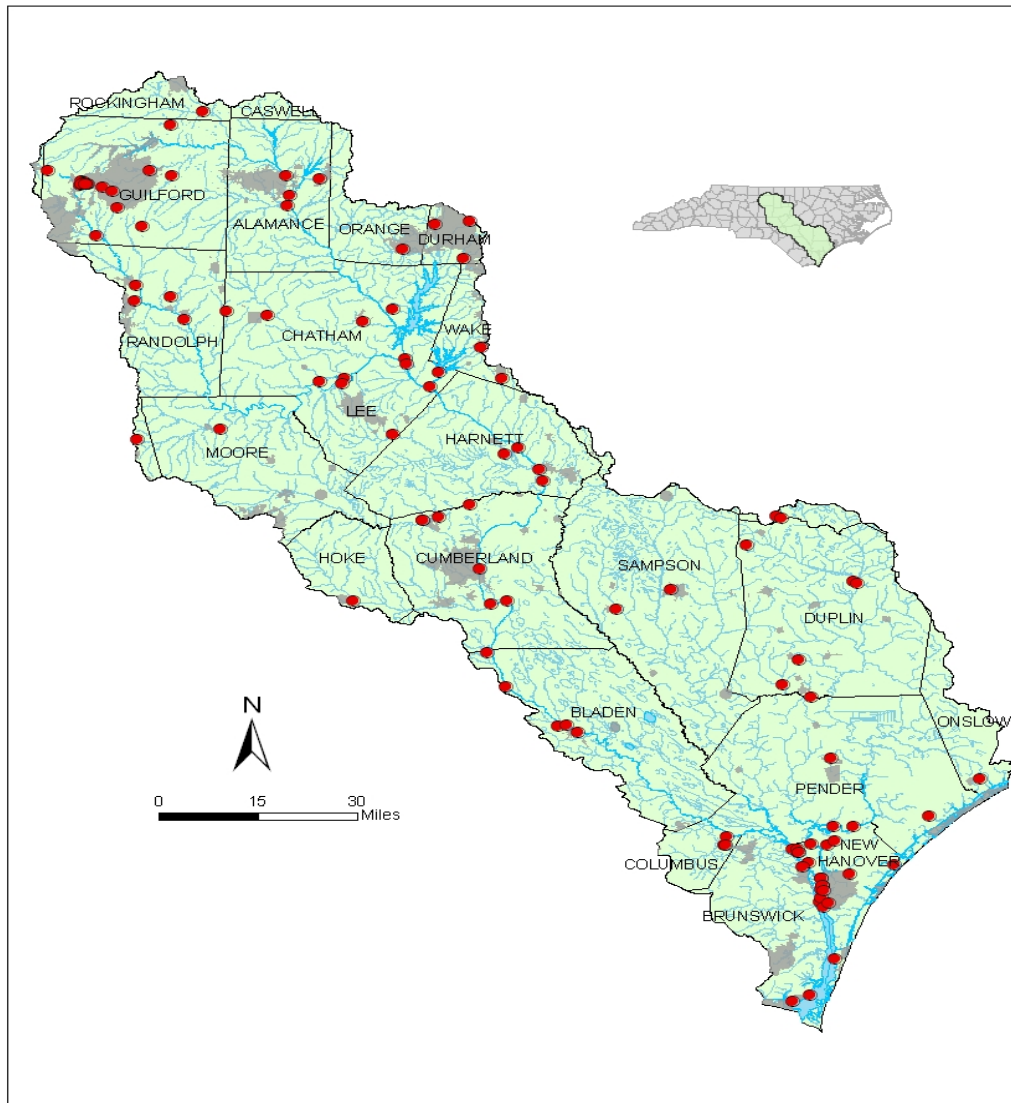


Figure 1A. Facilities required to perform toxicity testing in the Cape Fear River basin.

**Table1B. Facilities in the Cape Fear River basin required to perform whole effluent toxicity testing.**

8 digit HUC /Facility	NPDES Permit No.	Receiving Stream	County	Flow (MGD)	IWC (%)	7Q10 (cfs)
<b>03030002</b>						
Pentecostal Holiness Church	NC0046809/001	UT Benaja Cr.	Guilford	0.02	30.6	0.07
Reidsville WWTP	NC0024881/001	Haw R.	Rockingham	7.5	61	7.4
Apex Oil Company	NC0071463/001	UT Horsepen Cr.	Guilford	NA	100	0.0
Brenntag Southeast, Inc.	NC0078000/001	UT S. Buffalo Cr.	Guilford	0.216	21.8	1.2
Burlington East WWTP	NC0023868/001	Haw R.	Alamance	12.0	36	33.6
Burlington-South WWTP	NC0023876/001	Big Alamance Cr.	Alamance	12.0	86	3.0
Graham WWTP	NC0021211/001	Haw R.	Alamance	3.5	14	34
Greensboro N Buffalo Cr WWTP	NC0024325/001	N. Buffalo Cr.	Guilford	16.0	96.5	0.90
Greensboro Osborne WWTP	NC0047384/001	S. Buffalo Cr.	Guilford	30.0	95.7	2.1
Mebane WWTP	NC0021474/001	Moadams Cr.	Alamance	2.5	100	0.0
Magellan Holdings- G'Boro	NC0003671/001	UT Horsepen Cr.	Guilford	NA	100	0.0
NC DOT- asphalt Test Site #6	NC0087629/001	UT Haw River	Guilford	0.0144	90.0	0
Pittsboro WWTP	NC0020354/001	Roberson Cr.	Chatham	0.75	100	0.000
Brenntag Southeast, Inc.	NC0086827/001	UT Third Fork Cr.	Durham	0.0144	100	0.0
Durham Co.-Triangle WWTP	NC0026051/001	Northeast Cr.	Durham	6.0	100	0.0
South Durham WRF	NC0047597/001	New Hope Cr.	Durham	20.0	99.5	0.15
OWASA/Mason Farm	NC0025241/001	Morgan Cr.	Orange	12	90	1.0
UNC-Chapel Hill Power Plant	NC0025305/001	UT Morgan Cr.	Orange	0.048	100	0.0
<b>03030003</b>						
Kinder Morgan-Southeast Terminals	NC0042501/001	UT E Fork Deep R.	Guilford	VAR	100	0.0
Kinder Morgan-G'boro Terminals	NC0000795/001	UT E Fork Deep R.	Guilford	VAR	100	0.0
Colonial Pipeline/001-005	NC0031046/001	UT E Fork Deep R.	Guilford	NA	100	0.0
Exxon/Greensboro Marketing Term	NC0000795/001	UT E Fork Deep R.	Guilford	NA	100	0.0
High Point Eastside WWTP	NC0024210/001	Richland Cr.	Guilford	16.0	96	1.0
Associated Asphalt Greensboro (HRS)	NC0074241/001	UT E. Fork Deep R.	Guilford	VAR	100	0.0
LCP Plastics, Inc.	NC0036366/001	UT W Fork Deep R.	Guilford	NA	100	0.00
Motiva Enterprises LLC-Greensboro	NC0022209/001	UT Long Br.	Guilford	VAR	100	0.0
Plantation Pipeline Co. (001-002)	NC0051161/001,002	UT E Fork Deep R.	Guilford	NA	100	0.0
Randleman WWTP	NC0025445/001	Deep R.	Randolph	1.745	35	5.0
TransMontaigne-Piedmont Terminal	NC0069256/001	UT E Fork Deep R.	Guilford	NA	100	0.0
TransMontaigne-Southeast Terminal	NC0026247/001	UT E Fork Deep R.	Guilford	NA	100	0.0
Magellan Holdings- G'Boro	NC0074578/002	UT Long Br.	Guilford	0.0067	100	0.0
Asheboro WWTP	NC0026123/001	Haskett's Cr.	Randolph	9.0	100	0.0
Hancock Country Hams	NC0084077/001	UT Sandy Cr.	Randolph	0.10	100	0.0
Ramseur WWTP	NC0026565/001	Deep R.	Randolph	0.48	6.3	11.0
S.S. Mobile Home Park	NC0038300/001	UT Brush Cr.	Chatham	0.01	100	0.0
Thomasville Furniture	NC0084816/001	UT Polecat Cr.	Guilford	0.0288	100	0.0
Robbins WWTP	NC0062855/001	Deep R.	Moore	1.3	10	15.9
Star WWTP	NC0058548/001	Cotton Cr.	Montgomery	0.60	100	0.0
Gold Kist WWTP	NC0072575/001	Deep R.	Lee	1.0	9.1	17.0
Siler City WWTP	NC0026441/001	Loves Cr.	Chatham	4.0	96.1	0.25
Sanford-Big Buffalo WWTP	NC0024147/001	Deep R.	Lee	6.8	39	16.8
<b>03030004</b>						
Buies Creek WWTP	NC0030091/001	Cape Fear R.	Harnett	0.50	0.13	600
CP&L-Cape Fear S.E./007	NC0003433/007	UT Cape Fear R.	Chatham	NA	100	0.0
CP&L-Shearon Harris E&E Center	NC0039586/007	Harris L.	Wake	0.02	NA	LAKE
CP&L-Shearon Harris/006	NC0039586/006	Harris Reservoir	Chatham	18.6	NA	LAKE
DYNEA USA Inc.	NC0000892/001	Haw R.	Chatham	0.10	0.39	40.0
Fuquay-Varina/ Kenneth Cr WWTP	NC0028118/001	Kenneth Cr.	Wake	1.2	100	0.0
Holly Springs WWTP	NC0063096/001	Utleigh Cr.	Wake	1.5	95	0.11
Performance Fibers	NC0001899/002	UT Shaddox Cr.	Chatham	NA	100	0.0
Performance Fibers	NC0001899/001	Haw R.	Chatham	0.244	0.94	40
North Harnett Regional WWTP	NC0021636/001	Cape Fear R.	Harnett	0.6	0.17	550.0
Carolina Trace Subdivision WWTP	NC0038831/001	Upper Little R.	Lee	1.0	76.0	0.49
Dunn/Blackriver WWTP	NC0043176/001	Cape Fear R.	Harnett	3.75	1.0	586.6
Erwin WWTP	NC0064521/001	Cape Fear R.	Harnett	1.2	0.32	586

8 digit HUC /Facility	NPDES Permit No.	Receiving Stream	County	Flow (MGD)	IWC (%)	7Q10 (cfs)
Fort Bragg WWTP/001	NC0003964/001	Little R.	Cumberland	8.0	26	35.8
South Harnett County Regional WWTP	NC0088366/001	Little River	Harnett	5.0	14	45.46
Spring Lake WWTP	NC0030970/001	Lower Little R.	Cumberland	1.5	5.5	40.0
<b>03030005</b>						
Fayetteville-Cross Creek WWTP	NC0023957/001	Cape Fear R.	Cumberland	25.0	6.0	657.0
Fayetteville-Rockfish WWTP	NC0050105/001	Cape Fear R.	Cumberland	16.0	3.5	675.0
DAK America	NC0003719/002	Cape Fear R.	Cumberland	1.3	0.25	791.0
Raeford WWTP	NC0026514/001	Rockfish Cr.	Hoke	3.0	8.67	49.0
Elizabethtown Power, LLC	NC0058297/003	Cape Fear R.	Bladen	NA	0.03	740.0
Dupont De Nemours /Fayetteville	NC0003573/001	Cape Fear R.	Bladen	17	3.3	791.0
Elizabethtown WWTP	NC0026671/001	Cape Fear R.	Bladen	1.225	4.6	815
Smithfield Packing Co., Tarheel Div.	NC0078344/001	Cape Fear R.	Bladen	3.0	0.58	795
Dynapar	NC0001121/004	Cape Fear R.	Bladen	NA	NA	812.5
AAF/McQuay, Inc.-001,002	NC0083658/001,002	UT Barnards Cr.	New Hanover	0.288	100	0.0
Acme Facility-Wright Chemical	NC0003395/002	Livingston Crk	Columbus	0.2	4.7	0.6
Amerada Hess Corp.	NC0066711/001	UT Cape Fear R.	New Hanover	NA	100	0
Archer Daniels Midland Co./001	NC0027065/001	Cape Fear R.	Brunswick	3.502	NA	Tidal
Invista-SARL-Wilmington-001	NC0001112/001	NE Cape Fear R.	New Hanover	1.4	7.4	Tidal
Invista SARL-Wilmington-002	NC0001112/002	Cape Fear R.	New Hanover	1.25	NA	Tidal
BASF	NC0059234/001	Cape Fear R.	New Hanover	.33	1.0	Tidal
Columbus County	NC0087947/001	Livingston Creek	Columbus	0.125	24	0
Carolina Beach WWTP	NC0023256/001	Cape Fear R.	New Hanover	3.0	NA	Tidal
CP&L-Sutton/001 Progress Energy	NC0001422/001	Cape Fear R.	New Hanover	NA	NA	Tidal
CTI of North Carolina	NC0082970/001	Cape Fear R.	New Hanover	VAR	NA	Tidal
CTI of North Carolina	NC0082970/003	Cape Fear R.	New Hanover	VAR	NA	Tidal
DAK Americas, LL	NC0000663/001	Cape Fear R.	Brunswick	2.3	0.38	918
Exxon USA Wilmington Terminal	NC0073181/001	Cape Fear R.	New Hanover	VAR	NA	Tidal
Flint Hills Resources, LLP	NC0076732/001	Cape Fear R.	New Hanover	0.1	NA	Tidal
Fortron Industries/001	NC0082295/001	Cape Fear R.	New Hanover	0.245	1.16	910
International Paper Co.- Riegelwood	NC0003298/001	Cape Fear R.	Columbus	50	8.3	856
International Paper Co.	NC0081507/001	Burnt Mill Cr.	New Hanover	0.05	37	0.13
NE Brunswick County WWTP	NC0086819/001	Cape Fear R.	Brunswick	1.65	NA	Tidal
New Hanover County Airport WWTP	NC0081736/001	Cape Fear R.	New Hanover	4.0	NA	Tidal
Southport WWTP	NC0021334/001	Intracoastal W-way	Brunswick	0.80	NA	Tidal
Vopak Terminal Wilmington	NC0073172/001	Cape Fear R.	New Hanover	NA	NA	Tidal
Wilmington Northside WWTP	NC0023965/001	Cape Fear R.	New Hanover	8.0	NA	Tidal
Wilmington Southside WWTP	NC0023973/001	Cape Fear R.	New Hanover	12.0	1.59	1149
<b>03030006</b>						
Clinton-Larkins WPCF	NC0020117/001	Williams Old Mill Br.	Sampson	5.0	100	0.0
Roseboro WWTP	NC0026816/001	Little Coharie Cr.	Sampson	0.49	52	1.0
<b>03030007</b>						
Mt. Olive Pickle	NC0001074/001	Barlow Branch	Wayne	0.40	100	0.0
Mt. Olive WWTP	NC0020575/001	NE Cape Fear R.	Wayne	1.0	100	0.0
Charles F. Cates & Sons	NC0001970/001	UT Panther Br.	Duplin	0.50	100	0.0
Carolina Gleen Power WWTP	NC0058271/003	UT NE Cape Fear R.	Duplin	NA	90	0.0
Guilford Mills East	NC0002305/001	NE Cape Fear R.	Duplin	1.5	27	6.5
Rose Hill WWTP	NC0056863/001	Reedy Branch	Duplin	0.45	100	0.0
House of Raeford- Walker Division	NC0003344/001	Rockfish Cr.	Duplin	1.5	57	1.77
Wallace-L. Rockfish WWTP	NC0003450/001	Little Rockfish Cr.	Duplin	4.42	98.70	0.09
Wallace-Rockfish WWTP	NC0020702/001	Rockfish Cr.	Duplin	1.0	20.53	4.20
Burgaw WWTP	NC0021113/001	Osgood Canal	Pender	0.75	100	0.0
Castle Hayne WWTP-Elementis	NC0003875/001	NE Cape Fear R.	New Hanover	0.785	4.6	25
Del Laboratories	NC0088277/001	NE Cape Fear R.	New Hanover	0.785	100	Tidal
Global Nuclear Fuel Americas, LLC.	NC0001228//001	NE Cape Fear R.	New Hanover	1.8	9.37	27.0
Hermitage House Rest Home WWTP	NC0051969/001	UT Prince George Crk	New Hanover	0.012	90	NA
New Hanover County Landfill	NC0049743/001	NE Cape Fear R.	New Hanover	NA	NA	Tidal
Belvedere WTP-CWS	NC0032221/01	UT Intercoastal WWY	Pender	NA	NA	Tidal
Holly Ridge WWTP	NC0025895/001	UT King Cr.	Onslow	0.1	100	0.0
New Hanover County WTP	NC0088307/001	Intercoastal WWY	New Hanover	1.38	NA	

The number of facilities in this basin monitoring whole effluent toxicity (WET) has decreased in 2008 with 73 facilities from a high in 2003 with 86 facilities (Figure 2). Some of these facilities have multiple permits. We attribute the decrease in the number of facilities to the fact that some facilities are no longer in business or they have joined onto another treatment facility and asked for their permit to be rescinded. Whole effluent toxicity limits were written into permits in North Carolina beginning in 1987. The compliance rate of those facilities has generally risen since the inception of the program. Since 2003 the compliance rate has stabilized at approximately 95-99% (Figure 2 and Table 2).

The Town of Star (HUC 0303003) had ongoing effluent toxicity problems since it began monitoring in 1987. The facility's effluent had been dominated by textile waste and thus the source of toxicity was total dissolved solids (salts). Since August 2004, the facility has been compliant for WET testing all but one month.

The Environmental Management Commission granted Mt. Olive Pickle Co. (HUC 0303003) and Charles F. Cates & Sons (HUC 0303003) variances from the State's action level standard for chloride and water quality standard for WET. These variances were granted effective 1996 based on material presented by the facility describing the technical and economic impracticability of treating the waste and the subsequent adverse economic impact on the region should these two facilities relocate. These two facilities are required to monitor for toxicity but have no regulated limit with which to comply.

The Columbus WWTP operated by Wright Chemical (Hexion) (HUC 0303005) combined their effluent stream into one and are discharging under NC0087947. The new permit came into effect February, 2007. WET testing started in August 2007 and there were numerous failures during 2007 thru August 2008. Since September 2008, the facility has been compliant for WET testing.

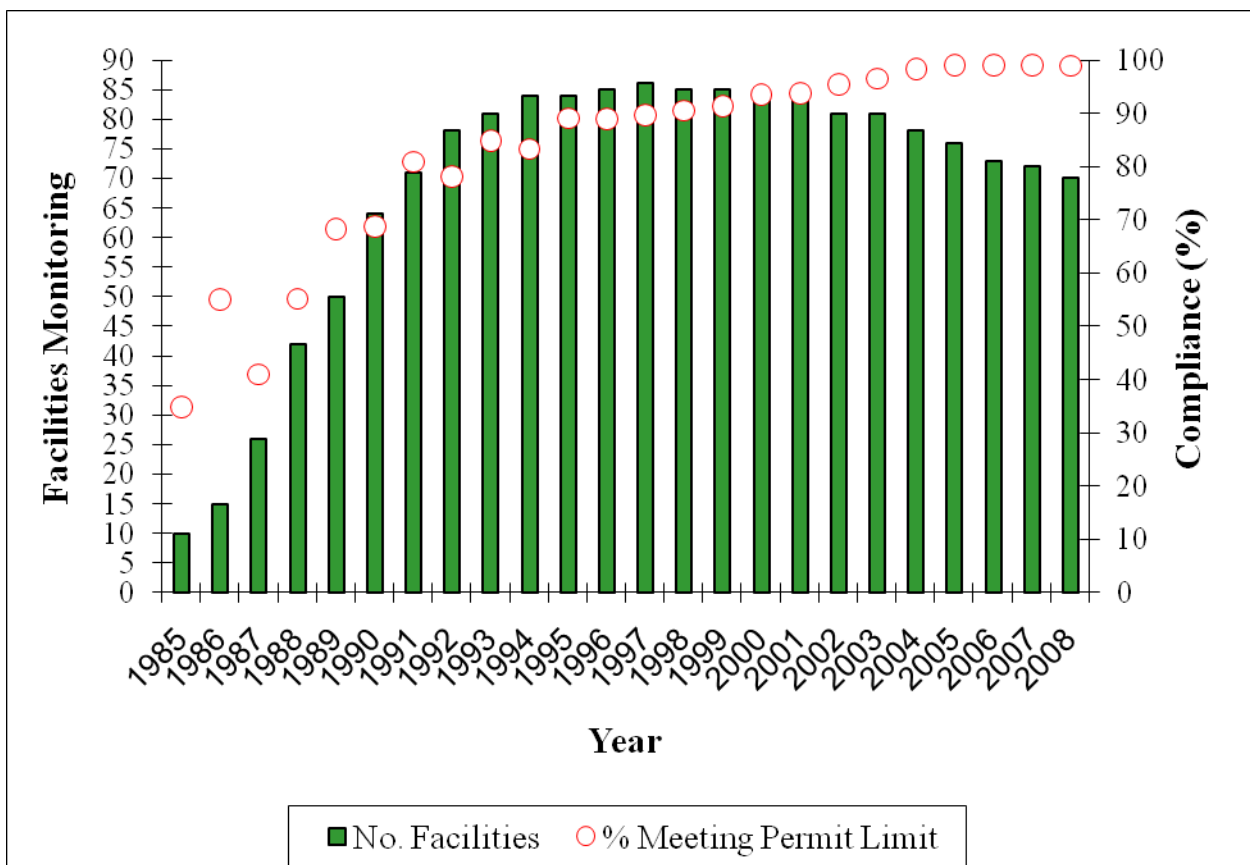


Figure 2. NPDES facility whole effluent toxicity compliance in the Cape Fear River basin, 1985-2008. The compliance values were calculated by determining whether facilities with WET limits were meeting their ultimate permit limits during the given time period, regardless of any SOCs in force.

**Table 2. Compliance record of facilities performing whole effluent toxicity testing in the Cape Fear River basin.**

Subbasin/Facility	NPDES Permit No.	2004-008 Passes <sup>1</sup>	2004-2008 Fails	2008 Passes	2008 Fails
<b>03030002</b>					
Pentecostal Holiness Church	NC0046809/001	19	6	5	1
Reidsville WWTP	NC0024881/001	16	0	4	0
Apex Oil Company	NC0071463/001	4	0	0	1
Brenntag Southeast, Inc.	NC0078000/001	16	0	4	0
Burlington East WWTP	NC0023868/001	16	0	4	0
Burlington-South WWTP	NC0023876/001	16	0	3	4
Graham WWTP	NC0021211/001	16	0	4	0
Greensboro N Buffalo Cr WWTP	NC0024325/001	16	0	4	0
Greensboro Osborne WWTP	NC0047384/001	16	0	5	1
Mebane WWTP	NC0021474/001	16	3	4	0
Magellan Holdings- G'Boro	NC0003671/001	4	0	1	0
NC DOT- asphalt Test Site #6	NC0087629/001	0	0	5	1
Pittsboro WWTP	NC0020354/001	16	0	4	0
Brenntag Southeast, Inc.	NC0086827/001	16	0	4	0
Durham Co.-Triangle WWTP	NC0026051/001	16	1	4	0
South Durham WRF	NC0047597/001	16	0	4	0
OWASA/Mason Farm	NC0025241/001	16	0	4	0
<b>03030003</b>					
Kinder Morgan-Southeast Terminals	NC0042501/001	4	0	1	0
Kinder Morgan-G'boro Terminals	NC0000795/001	4	0	1	0
Colonial Pipeline/001	NC0031046/001	4	0	1	0
Colonial Pipeline/002	NC0031046/002	4	0	2	0
Colonial Pipeline/003	NC0031046/003	4	0	2	0
Colonial Pipeline/004	NC0031046/004	4	0	2	0
Colonial Pipeline/005	NC0031046/005	4	0	2	0
High Point Eastside WWTP	NC0024210/001	18	2	4	0
Associated Asphalt Greensboro (HRS)	NC0074241/001	4	0	1	0
LCP Plastics, Inc.	NC0036366/001	0	0	0	0
Motiva Enterprises LLC-Greensboro	NC0022209/001	2	0	0	0
Plantation Pipeline Co. (001)	NC0051161/001	3	0	0	0
Plantation Pipeline Co. (002)	NC0051161/002	3	0	0	0
Randleman WWTP	NC0025445/001	16	0	4	0
TransMontaigne-Piedmont Terminal	NC0069256/001	4	0	1	0
Transmontaigne-Southeast Terminal	NC0026247/001	4	0	2	0
Magellan Holdings- G'Boro	NC0074578/002	4	0	1	0
Asheboro WWTP	NC0026123/001	18	2	4	0
Hancock Country Hams	NC0084077/001	0	0	0	0
Ramseur WWTP	NC0026565/001	18	0	4	0
S.S. Mobile Home Park	NC0038300/001	15	2	4	1
Robbins WWTP	NC0062855/001	16	0	4	0
Star WWTP	NC0058548/001	21	8	4	0
Gold Kist WWTP	NC0072575/001	16	0	4	0
Thomasville Furniture	NC0084816/001	0	0	0	0
<b>03030004</b>					
Buies Creek WWTP	NC0030091/001	15	1	0	0
CP&L-Cape Fear S.E./007	NC0003433/007	16	0	4	0
CP&L-Shearon Harris E&E Center	NC0039586/007	16	0	4	0
CP&L-Shearon Harris/006	NC0039586/006	16	0	4	0
DYNEA USA Inc.	NC0000892/001	15	9	4	0
Fuquay-Varina/ Kenneth Cr WWTP	NC0028118/001	16	2	0	0
Holly Springs WWTP	NC0063096/001	16	0	4	0
Performance Fibers	NC0001899/001	16	0	4	0
Performance Fibers	NC0001899/002	4	0	0	0
North Harnett Regional WWTP	NC0021636/001	16	0	4	0
Sanford-Big Buffalo WWTP	NC0024147/001	16	0	4	0
Siler City WWTP	NC0026441/001	17	1	4	0
Carolina Trace Subdivision WWTP	NC0038831/001	0	0	2	0
Dunn/Blackriver WWTP	NC0043176/001	18	0	4	0
Erwin WWTP	NC0064521/001	16	0	4	0
Spring Lake WWTP	NC0030970/001	16	0	4	0
South Harnett County Regional WWTP	NC0088366/001	0	0	0	0
Fort Bragg WWTP/001	NC0003964/001	17	1	4	0

**Table 2 (continued)**

<b>8 digit HUC/Facility</b>	<b>NPDES Permit No.</b>	<b>2004-008 Passes<sup>1</sup></b>	<b>2004-2008 Fails</b>	<b>2008 Passes</b>	<b>2008 Fails</b>
<b>3030005</b>					
Fayetteville-Cross Creek WWTP	NC0023957/001	17	0	4	0
Fayetteville-Rockfish WWTP	NC0050105/001	19	0	5	1
DAK America	NC0003719/002	16	0	4	0
Raeford WWTP	NC0026514/001	19	0	4	0
Elizabethtown Power, LLC	NC0058297/003	11	2	4	0
Dupont - Fayetteville Works	NC0003573/001	16	0	4	0
Elizabethtown WWTP	NC0026671/001	15	1	4	0
Smithfield Packing Co., Tarheel Div.	NC0078344/001	16	0	4	0
Dynapar	NC0001121/004	16	3	4	1
AAF/McQuay, Inc.-001	NC0083658/001	16	0	4	0
Acme Facility-Wright Chemical	NC0003395/002	2	0	4	0
Amerada Hess Corp.	NC0066711/001	3	0	1	0
Archer Daniels Midland Co./001	NC0027065/001	17	0	4	0
Invista-SARL-Wilmington-001	NC0001112/001	16	1	4	0
Invista SARL-Wilmington-002	NC0001112/002	16	0	4	0
BASF (formerly Takeda)	NC0059234/001	16	0	4	0
Carolina Beach WWTP	NC0023256/001	16	0	4	0
Columbus County	NC0087947/001	2	2	3	4
CP&L-Sutton/001 Progress Energy	NC0001422/001	25	0	4	0
CTI Of North Carolina	NC0082970/001	3	0	1	0
CTI of North Carolina	NC0082970/003	4	0	1	0
DAK Americas, LLC (DuPont)	NC0000663/001	16	0	4	0
Exxon USA Wilmington Terminal	NC0073181/001	2	0	0	0
Flint Hills Resources, LLP	NC0076732/001	17	0	4	0
Fortron Industries/001	NC0082295/001	9	0	0	0
International Paper Co.- Riegelwood	NC0003298/001	16	2	4	0
International Paper Co.	NC0003298/001	0	0	0	0
NE Brunswick County WWTP	NC0086819/001	16	0	4	0
New Hanover County Airport WWTP	NC0081736/001	0	0	0	0
Southport WWTP	NC0021334/001	16	1	4	1
Vopak Terminal Wilmington	NC0073172/001	2	0	0	0
Wilmington Northside WWTP	NC0023965/001	16	0	4	0
Wilmington Southside WWTP	NC0023973/001	16	0	4	0
<b>3030006</b>					
Clinton-Larkins WPCF	NC0020117/001	18	0	4	0
Roseboro WWTP	NC0026816/001	17	0	4	0
<b>3030007</b>					
Mt. Olive Pickle	NC0001074/001	0	16	0	4
Mt. Olive WWTP	NC0020575/001	18	0	4	0
Charles F. Cates & Sons	NC0001970/001	0	16	0	4
Carolina Gleen Power WWTP	NC0058271/003	16	0	2	0
Rose Hill WWTP	NC0056863/001	17	1	5	1
House of Raeford- Walker Division	NC0003344/001	15	0	5	0
Wallace-L. Rockfish WWTP	NC0003450/001	0	0	0	0
Wallace-Rockfish WWTP	NC0020702/001	16	0	4	0
Burgaw WWTP	NC0021113/001	20	2	4	0
Castle Hayne WWTP-Elementis	NC0003875/001	17	1	4	0
Del Laboratories	NC0088277/001	0	0	4	0
Global Nuclear Fuel-Americas, LLC	NC0001228/001	16	0	4	0
Hermitage House Rest Home WWTP	NC0051969/001	0	0	0	4
New Hanover County Landfill	NC0049743/001	14	0	3	0
Belvedere WTP-CWS	NC0032221/01	0	0	0	0
Holly Ridge WWTP	NC0025895/001	3	0	0	0
New Hanover County WTP	NC0088307/001	0	0	0	0
Guilford Mills East	NC0002305/001	18	2	4	0

Note that "pass" denotes meeting a permit limit or, for those facilities with a monitoring requirement, meeting a target value. The actual test result may be a "pass" (from a pass/fail acute or chronic test), LC<sub>50</sub>, or chronic value. Conversely, "fail" means failing to meet a permit limit or target value.