Section B

Water Quality Data
and
Information by Subbasin

Chapter 1 -
Chowan River Subbasin 03-01-01
Includes the Upper Chowan River, Wiccacon River and Ahoskie Creek Watershed

1.1 Water Quality Overview

Subbasin 03-01-01 at a Glance

Land and Water

Total area:	579 mi^2
Land area:	569 mi^2
Water area:	10 mi^2

Population Statistics

1990 Est. pop.:	24,884 people
Pop. density:	44 persons / mi^2

Land Cover (%)

Forest / Wetland:	73%
Surface Water:	2%
Urban:	<1%
Cultivated Crop:	24%
Pasture / Managed Herbaceous:	1%

The upper Chowan River subbasin is located in the northeastern coastal plain of North Carolina. The Chowan River originates in Virginia and flows southeastward toward Albemarle Sound. The Chowan River is formed at the border of Virginia and North Carolina by the confluence of the Nottoway and Blackwater Rivers. The Chowan River basin includes 1,315 square miles in North Carolina, but the largest part of the drainage basin (3,575 mi^2) drain from Virginia. Major tributaries to the Chowan River in this subbasin include the Wiccacon River and Ahoskie Creek. A map of this subbasin including water quality sampling locations is presented as Figure B-1.

DWQ conducted ambient, benthic macroinvertebrate, fish tissue and fish community sampling in this subbasin. Bioclassifications for these sample locations are presented in Table B-1. The current sampling resulted in impaired ratings for one stream in this subbasin - Wiccacon River. Use support ratings are summarized in Table B-2. Refer to Appendix III for a complete listing of monitored waters and use support ratings. The entire subbasin is designated as Nutrient Sensitive Waters.

Portions of Merchants Millpond State Park and Chowan Swamp State Natural Area are also located in this subbasin. The Chowan Swamp State Natural Area, administered by the Department of Parks and Recreation, protects more than 6,000 acres. Merchants Millpond supports a diverse assemblage of aquatic herbs including several rare species.

The largest municipalities in this subbasin include Ahoskie, Aulander and Winton. Ahoskie and Aulander experienced a net decrease in population ranging from 0.3 percent to 26.6 percent between 1990 and 2000. Winton experienced a 20.1 percent increase over the same ten-year period. This is the most populated subbasin in the Chowan River basin with a population of 24,884.

Currently, five facilities hold NPDES permits in the subbasin, all of which are minor permits. There are no individual stormwater permits issued in the subbasin; however, there are 15 general permits. The Indalex facility, discharging into Ahoskie Creek, is the only facility required to

Figure B-1 Chowan River Subbasin 03-01-01

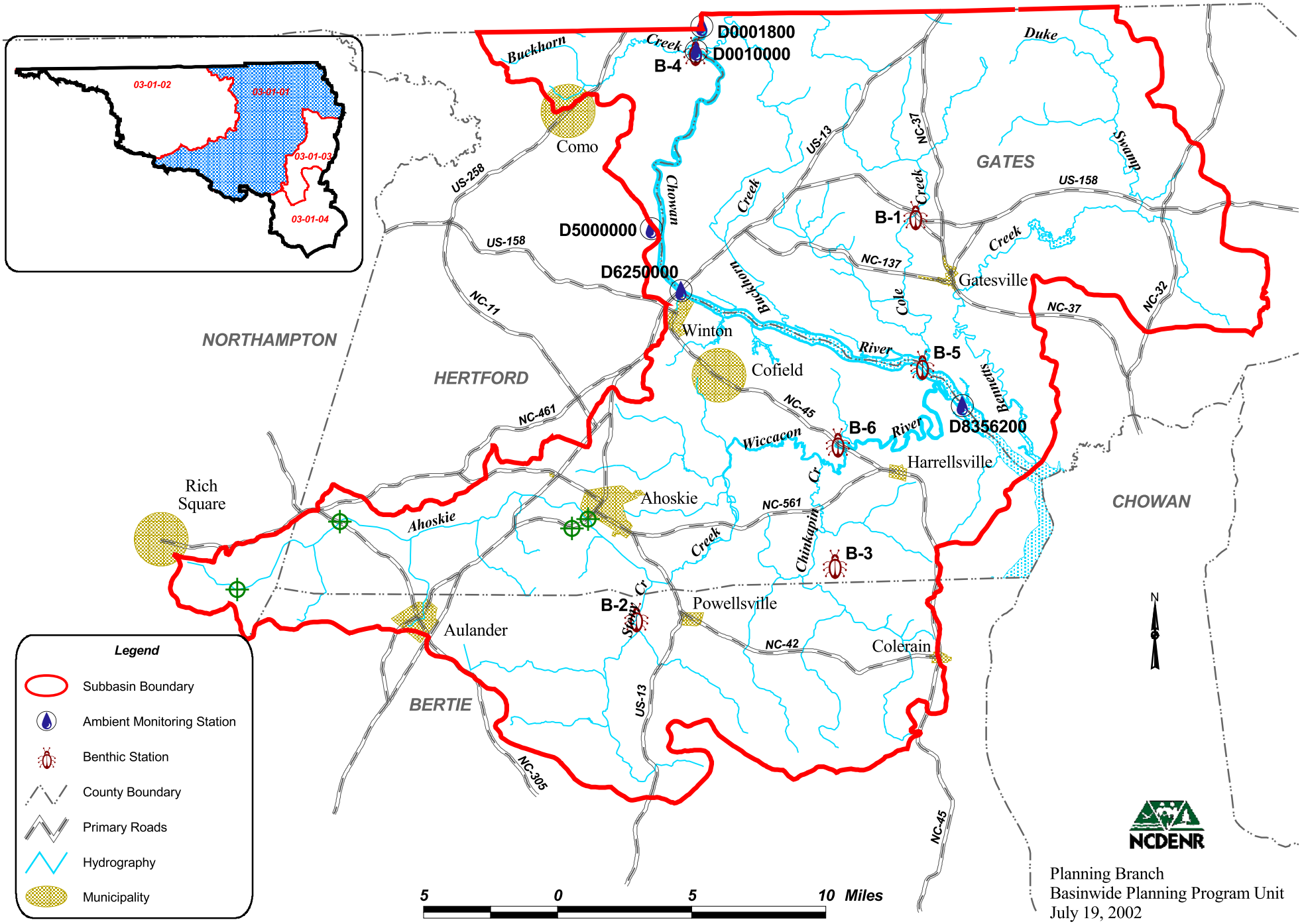

Table B-1 DWQ Monitoring Locations and Benthic Macroinvertebrate Bioclassifications (2000) for Chowan River Subbasin 03-01-01

Site(s)	Stream	County	Location	Bioclassification
Benthic Macroinvertebrates (B)				
B-1	Cole Creek	Gates	NC 58	Not Rated
B-2	Stony Creek	Bertie	SR 1235	Not Rated
B-3	Chinkapin Creek	Hertford	SR 1432	Not Rated
B-4	Chowan River	Hertford	Near Riddicksville	Good-Fair
B-5	Chowan River	Gates	Near Gatesville	Good
B-6	Wiccacon River	Hertford	SR 1433	Fair
Fish Community (F)*				
F-1	Ahoskie Creek	Hertford	NC 42	Not Rated
F-2	Chinkapin Creek	Hertford	SR 1432	Not Rated
Ambient Monitoring				***Problem Parameters***
D0000050	Nottaway River	Riverdale, VA	US 258 near Riverdale, VA	DO
D0001200	Blackwater River	Southampton, VA	Horseshoe Bend at Cherry Grove, VA	DO
D0001800	Blackwater River	Gates	150 yards upstream from mouth near Wyanoke	DO
D0010000	Chowan River	Hertford	near Riddicksville	DO
D6250000	Chowan River	Hertford	US 13 at Winton	DO
D8356200	Chowan River	Hertford	CM 16 near Gatesville	None observed

* Refer to Section A, Part 3.3 for more information on fish community and benthic macroinvertebrate bioclassifications.

Table B-2 Use Support Ratings Summary (2000) for Monitored and Evaluated[2] Freshwater Streams (Miles) in Chowan River Subbasin 03-01-01

Use Support Category	FS	PS	NS	NR	Total[1]
Aquatic Life/ Secondary Recreation	39.8	22.5	0	347.0	409.3
Fish Consumption[2, 3]	0	39.8	0	0	39.8
Primary Recreation	39.8	0	0	0	39.8

[1] Total stream miles/acres assigned to each use support category in this subbasin. Column is not additive because some stream miles are assigned to more than one category.

[2] For the fish consumption use support category, only monitored stream miles are presented.

[3] These waters are impaired because of a regional fish consumption advisory. Refer to Section A, Part 4.3 for further information.

perform whole effluent toxicity testing in the subbasin. The Indalex facility has met permit limits or target values prior to and during 2000.

Benthic macroinvertebrate data indicate water quality in the upper Chowan River is Good to Good-Fair. The recent benthic macroinvertebrate sampling indicate a slight decline in water quality since 1995, although the uppermost site remains Good-Fair. All of the sampling areas receive large amounts of agricultural runoff, and water quality problems are likely related to the low dissolved oxygen concentrations that occurred during the summer.

The Chowan River near the Gatesville site was sampled for the first time during the summer of 2000. There were very low dissolved oxygen concentrations in the bottom waters; however, scientists did not attribute this to either natural or anthropogenic conditions.

Three of the six benthic macroinvertebrate stations exhibit swamp-like characteristics, and they were sampled for the first time through the addition of a winter sampling period in 2000. Field assessments at Cole Creek, Stony Creek and Chinkapin Creek did not indicate any serious water quality problems.

Nutrient enrichment and low dissolved oxygen may cause water quality problems in the Wiccacon River, and the river is considered to be impaired. There has been no significant change over time in the benthic community of the Wiccacon River. The Wiccacon River benthic site may have anoxic bottom water at times; however, low dissolved oxygen concentrations also occurred throughout the water column. Data did not indicate any change in water quality from 1983 to 2000, and the benthic data resulted in a Fair bioclassification. The rating reflected upstream agricultural land use and many channelized tributaries.

Fish community structure was evaluated on Ahoskie Creek and Chinkapin Creek in 2000. However, NCIBI metrics are currently being revised; therefore, a biological rating was not assigned (see Section A, Chapter 3, Part 3.3.2 and Appendix II).

Twenty-six fish tissue samples were collected from the Chowan River near Tunis during August 2000 and analyzed for metal contaminants in order to obtain baseline data prior to the operation of the Nucor steel mill in Hertford County. Metals concentrations, except mercury, were non-detectable or at levels below current USEPA, USFDA and North Carolina criteria (Draft Basinwide Assessment Report 2001).

For more detailed information on sampling and assessment of streams in this subbasin, refer to the *Basinwide Assessment Report-Chowan River Basin* (NCDENR-DWQ, January 2002), available from DWQ Environmental Sciences Branch at http://www.esb.enr.state.ncu.us/bar.html or by calling (919) 733-9960.

1.2 Status and Recommendations for Previously Impaired Waters

The 1997 Chowan River Basinwide Plan identified three impaired stream segments in this subbasin. These streams are discussed below. This section reviews use support and recommendations detailed in the 1997 basinwide plan, reports status of progress, gives

recommendations for the next five-year cycle, and outlines current projects aimed at improving water quality for each stream.

1.2.1 **Ahoskie Creek** (27.8 miles from source to Wiccacon River)

1997 Recommendations

Ahoskie Creek also known as Ahoskie Swamp or Bear Swamp (from source to Wiccacon River) was previously considered impaired. Its impairment was based on benthic macroinvertebrate and fish data. Nonpoint source pollution from agriculture and channelization were considered to be the probable cause of impairment. The 1997 basin plan recommended that the Nonpoint Source Team help clarify and characterize agricultural activities in the area and consider them for targeting of the team's remediation efforts.

Status of Progress

The Nonpoint Source Team chose against focusing on Ahoskie Creek and instead focused on broader issues that could impact the entire basin.

It has been determined that criteria for assigning a bioclassification to Ahoskie Creek were inappropriate. Currently the creek is not rated. Ahoskie Creek and its tributaries west of NC 13, as well as other streams have been channelized. In addition, some tributaries of Merchant's Millpond also have been channelized.

Benthic samples from Stony Creek and Chinkapin Creek, tributaries to Ahoskie Creek, did not indicate a problem with either enrichment or low dissolved oxygen.

2002 Recommendations

2000 biological sampling indicates that Ahoskie Creek and its tributaries west of NC 13, as well as other streams have been channelized. At the Ahoskie Creek benthic sampling site, the location had an impacted riparian zone on one side and poor instream habitat. Therefore, Ahoskie Creek remains a concern for the state. DWQ will work with the Division of Soil and Water Conservation to address the likely agricultural impacts to the creek. DWQ will also notify local agencies of water quality concerns regarding these waters and work with them to conduct further monitoring and to locate sources of water quality protection funding. Additionally, education on local water quality issues is always a useful tool to prevent water quality problems and to promote restoration efforts. Nonpoint source program agency contacts are listed in Appendix VI.

1.2.2 **Wiccacon River (Hoggard Swamp)** (22.5 miles from source to Chowan River)

1997 Recommendations

Channelization, nonpoint source pollution from agricultural activities, and increasing number of animal operations are suspected to have contributed to impairment in the Wiccacon River. The 1997 basin plan recommended that the Nonpoint Source Team help clarify and characterize agricultural activities in the area and consider them for targeting of the team's remediation efforts.

Status of Progress
The Nonpoint Source Team chose against focusing on the Wiccacon River and instead focused on broader issues that could impact the entire basin.

Currently, the Wiccacon River is partially supporting aquatic life based on a Fair bioclassification at SR1433. The watershed is in agricultural land use and many of the tributary streams to the river are channelized.

2002 Recommendations
A progressive program to implement nonpoint source pollution controls is recommended to reduce the nutrient and sediment loading. Such a program will need to be developed and implemented at the local level. DWQ will provide technical assistance and funding information to local communities to assist in this effort. In addition, DWQ will notify local agencies of water quality concerns regarding these waters and work with them to conduct further monitoring and to locate sources of water quality protection funding.

1.2.3 Merchants Millpond (Bennetts Creek)

1997 Recommendations
Due to an over abundance of aquatic weeds, the 1997 basin plan noted threats to the Millpond's designated uses (mostly canoeing and fishing). In an effort to combat the loss of use in the Millpond, it was recommended that the Nonpoint Source Team consider this area as a target for some of its future efforts in order to prevent any further degradation.

Status of Progress
The Nonpoint Source Team did not choose the Millpond as an area of focus; instead, the team focused on broader issues that could impact the entire basin. Merchants Millpond is currently not rated.

2002 Recommendations
A progressive program to implement nonpoint source pollution controls is recommended to reduce the nutrient and sediment loading. Such a program will need to be developed and implemented at the local level. DWQ will provide technical assistance and funding information to local communities to assist in this effort. In addition, DWQ will notify local agencies of water quality concerns regarding these waters and work with them to conduct further monitoring and to locate sources of water quality protection funding.

1.3 Status and Recommendations for Newly Impaired Waters

There are 39.8 freshwater miles which are partially supporting that were monitored for fish consumption. All waters in this subbasin are currently partially supporting (PS) on an evaluated basis in the fish consumption use support category because of a regional fish consumption advisory for shark, swordfish, king mackerel, tilefish, largemouth bass, bowfin (or blackfish), and chain pickerel (or jack). Refer to page 55 for more information on this issue.

1.4 Other Water Quality Impacts and Recommendations

The surface waters discussed in this section are fully supporting designated uses based on DWQ's use support assessment and are not considered to be impaired. However, notable water quality problems and concerns have been documented for some waters based on this assessment. While these waters are not considered impaired, attention and resources should be focused on these waters over the next basinwide planning cycle to prevent additional degradation or facilitate water quality improvement. A discussion of how impairment is determined can be found in Section A, Part 3.5.

Water quality problems in the Chowan River basin are varied and complex. Inevitably, many of the water quality impacts noted are associated with human activities within the watershed. Solving these problems and protecting the surface water quality of the basin in the face of continued growth and development will be a major challenge. Voluntary implementation of BMPs is encouraged and continued monitoring is recommended. DWQ will notify local agencies and others of water quality concerns for the waters discussed below and work with them to conduct further monitoring and to locate sources of water quality protection funding. Additionally, education on local water quality issues is always a useful tool to prevent water quality problems and to promote restoration efforts. Nonpoint source program agency contacts are listed in Appendix VI.

1.4.1 **Upper Chowan River** (1.8 miles from Virginia state line to Near Riddicksville)

The upper Chowan River was considered support threatened in the 1997 plan due to a stressed aquatic system that experienced threats of algal blooms.

1997 Recommendations

Because the upper Chowan bridges both Virginia and North Carolina, the recommendation was for North Carolina to improve communication with Virginia to promote actions to reduce nutrient levels entering the state from the headwaters.

The abandoned CF Industries fertilizer plant has been associated with contaminated groundwater due to the plant's operation. The state has been concerned about potential groundwater seepage into the Chowan River which is susceptible to algal blooms under certain conditions. Groundwater chromium levels were found in sufficient quantities to trigger the Resource Conservation and Recovery Act (RCRA), but with respect to water quality, the nutrients contained in the waste presented a continued concern. DWQ was working to finalize the non-discharge permit with CF Industries to allow for groundwater remediation.

Status of Progress

DWQ recommended improving communication with the State of Virginia in order to promote actions to reduce nutrient levels crossing over the state border. North Carolina has actively pursued interstate collaboration through working towards a Memorandum of Agreement (MOA) between the two states. Instituted through the Albemarle-Pamlico National Estuary Program, North Carolina signed a MOA with Virginia's Department of Conservation and Recreation in October 2001. In addition, both states have jointly funded a Watershed Field Coordinator

position to facilitate discussions regarding the Albemarle, Chowan and Coastal Watersheds (see Section C for more information).

Since the 1997 plan, DWQ has finalized and issued a non-discharge permit to CF Industries for groundwater remediation by extraction and land application. The facility, characterized as a Superfund site, has a clay wall built around the site to minimize further groundwater seepage. During the last ten years, there have been flows above the level of the dyke; however, recent efforts have reduced the water overflow challenges and the groundwater has stabilized below the dyke. The DWQ Washington Regional Office remains in communication with the Division of Solid and Hazardous Waste to ensure permit limits are adhered to.

2002 Recommendations

In an effort to solidify the interstate efforts currently underway, the two states will begin to implement the MOA. In addition, Virginia and North Carolina should continue to fund the Watershed Field Coordinator position through the NC Albemarle-Pamlico National Estuary Program to ensure the continuity and stabilization of this effort.

DWQ should remain abreast of activities in Virginia towards developing a watershed-based forum for water quality in the upper Chowan, part of Virginia's Watershed Conservation Roundtable effort. Once this effort is underway, DWQ should participate in the discussions, share data and management strategies, and foster interstate basin management as much as feasible.

The Chowan River had 1.8 miles listed on the state's Section 303(d) list as having low dissolved oxygen potentially due to agriculture, intensive animal feeding operations, or natural swamp conditions. DWQ will determine whether the low DO is due to natural conditions. The upper Chowan River is one of two stream segments selected in the Chowan River basin to undergo the Swamp Waters Study Plan. If the study indicates that the low pH values and DO concentrations in the upper Chowan River are due to natural conditions, DWQ staff will pursue removing the river from the Section 303(d) List and submit a request for reclassification of the river from C NSW to C NSW Sw.

For more information on the Swamp Waters Study Plan, contact the DWQ Planning Branch Modeling/TMDL Unit at (919) 733-5083 or visit the program's website at http://h2o.enr.state.nc.us/tmdl/.

1.5 Additional Issues of Concern within the Subbasin

The previous section discussed water quality concerns for specific stream segments. This section discusses water quality issues that relate to multiple watersheds in the Chowan River basin. Permitted wastewater dischargers, non-permitted wastewater dischargers, priority areas for conservation and priority areas for restoration were all identified by participants at the public workshop as significant issues in the Chowan River basin.

1.5.1 NPDES Facilities

DWQ reviews NPDES effluent data by analyzing monthly averages of water quality parameters over a two-year period, screening for criterion in excess of state standards for conventional and toxic pollutants. Three NPDES permit holders in the subbasin violated their monthly discharge limitations during this period.

The Gates County School located at Buckland exceeded its fecal coliform limits by greater than 40 percent in the fourth quarter of 1998 and the first quarter of 1999. In addition, the facility exceeded its limitations by 20 percent in four months over the two quarters. The T.S. Cooper Elementary School operated by the Gates County School System exceed its ammonia limits by greater than 40 percent over the first and second quarters of 1999. In addition, the facility exceeded its limits by 20 percent in five months over the same two quarters. The facilities are operational; however, they have maintenance challenges. DWQ has levied fines and has established a record of chronic noncompliance, but DWQ does not recommend issuing a Special Order by Consent (SOC) to remedy the noncompliance issues. Instead, DWQ's Washington Regional Office will continue to provide technical assistance to the schools.

Indalex, Incorporated exceeded its total suspended solid limits by greater than 40 percent in the third and fourth quarters of 1999.

1.5.2 Non-Discharge Facilities

There have been both public and governmental concerns about the construction and maintenance of wastewater and industrial waste infrastructure. The sanitary waste that is going to the Winton Wastewater Treatment Plant from Nucor is within tolerance. Apparently, the water quality concerns associated with Nucor are more focused on the industrial waste for which a lagoon must be constructed. DWQ also has concerns about the planned construction of the lagoon.

DWQ's Washington Regional Office will continue to work with Nucor on their lagoon site plans, construction and operation. Nucor should aim to provide more information to the public about its facility to address some of the public's concern about the plant's operation.