Bureau of Water

Watershed Water Quality Management Strategy

Broad Basin

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Technical Report No. 001-98

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Table of Contents

Introduction

The South Carolina Department of Health and Environmental Control (SCDHEC or the Department) initiated its first watershed planning activities as a result of a U.S. Environmental Protection Agency (USEPA) grant in June of 1972. These activities were soon extended by §303(e), "Federal Water Pollution Control Act Amendments of 1972", U.S. Public Law 92-500. In 1975, the SCDHEC published basin planning reports for the four major basins in South Carolina. The next major planning activity resulted from §208 of the Federal Water Pollution Control Act, which required states to prepare planning documents on an areawide basis. Areawide plans were completed in the late 1970's for the five designated areas of the State and for the nondesignated remainder of the State. To date, these plans or their updated versions have served as information sources and guides for water quality management.

During the past decade, special water quality initiatives and Congressional mandates have diverted attention and resources from comprehensive water quality assessment and protection. The Bureau of Water now emphasizes watershed planning to better coordinate river basin planning and water quality management. Watershed-based management allows the Department to address Congressional and Legislative mandates in a coordinated manner and to better utilize current resources. The watershed approach also improves communication between the Department, the regulated community, and the public on existing and future water quality issues (SCDHEC 1991a).

Purpose of the Watershed Water Quality Management Strategy

By definition, a watershed is a geographic area into which the surrounding waters, sediments, and dissolved materials drain, and whose boundaries extend along surrounding topographic ridges. Watershed-based water quality management recognizes the interdependence of water quality related activities associated with a drainage basin including: monitoring, problem identification and prioritization, water quality modeling, planning, permitting, and other activities. The Bureau of Water's Watershed Water Quality Management Program integrates these activities by watershed, resulting in watershed management plans and implementation strategies that appropriately focus water quality protection efforts. While an important aspect of the strategy is water quality problem identification and solution, the emphasis is on problem prevention.

Five major drainage basins divide the State along hydrologic lines and serve as management units. A Watershed Water Quality Management Strategy (WWQMS) will be created for each of the five basins and will be updated on a five-year rotational basis. This will allow for effective allocation and coordination of water quality activities and efficient use of available resources. The Broad Basin is divided into two watershed management units (WMU) and 32 watersheds or hydrologic units. The hydrologic units used are the USDA Natural Resource Conservation Service (1990) 11-digit codes for South Carolina. All water quality related evaluations will be made at the watershed level. The stream names used are derived from USGS topo maps.

The watershed-based strategy fulfills a number of USEPA reporting requirements including various activities under §305(b), §314, and §319 of the Clean Water Act (CWA). Section 305(b) requires that the State biennially submit a report that includes a water quality description and analysis of all navigable waters to estimate environmental impacts. Section (§314) requires that the State submit a biennial report that identifies, classifies, describes, and assesses the status and trends in water quality of publicly owned lakes. The watershed plan is also a logical evaluation, prioritization, and implementation tool for nonpoint source (§319) requirements. Nonpoint source best management practices (BMPs) can be selected by identifying water quality impairments and necessary controls, while considering all the activities occurring in the drainage basin.

The Strategy also allows for more efficient issuance of National Pollutant Discharge Elimination System (NPDES) and State wastewater discharge permits. Proposed permit issuances within a watershed will be consolidated and presented to the public in groups, rather than one at a time, allowing the Department to realize a resource savings, and the public to realize an information advantage.

The Watershed Water Quality Management Strategy is a geographically-based document that describes, at the watershed level, all water quality related activities that may potentially have a negative impact on water quality. Each watershed in the Broad Basin is evaluated and a strategy described to address impaired streams.

The Watershed Implementation Staff investigates the impaired and threatened streams mentioned in the WWQMS to determine, where possible, the source of the impairment and recommends solutions to correct the problems. As part of this effort, the watershed staff is forging partnerships with various federal and state agencies, local governments, and community groups. In particular, the Watershed Program and the Natural Resource Conservation Service (NRCS) district offices are working together to address some of the nonpoint source (NPS) concerns in the basin. By combining NRCS's local knowledge of land use and the Department's knowledge of water quality, we are able to build upon NRCS's close relationships with landowners and determine where NPS projects are needed. These projects may include educational campaigns or special water quality studies.

Factors Assessed in Watershed Evaluations

Water Quality

Monitoring Overview

In an effort to evaluate the State's water quality, the Department operates a permanent Statewide network of primary ambient monitoring stations and flexible, rotating secondary and watershed monitoring stations (SCDHEC 1996a). The ambient monitoring network is directed towards determining long-term water quality trends, assessing attainment of water quality standards, identifying locations in need of additional attention, and providing background data for planning and evaluating stream classifications and standards.

The monitoring data are also used in the process of formulating permit limits for wastewater discharges with the goal of maintaining state and federal water quality standards and criteria in the receiving streams in accordance with the goals of the Clean Water Act. These standards and criteria define the instream chemical concentrations which provide for protection and reproduction of aquatic flora and fauna, determine support of the classified uses of each waterbody, and serve as instream limits for the regulation of wastewater discharges or other activities. In addition, these data are used in the preparation of the biennial §305(b) report to Congress (SCDHEC 1996b), which summarizes the State's water quality with respect to attainment of classified uses by comparing the ambient monitoring network data to the state water quality standards.

The SCDHEC Water Quality Monitoring Network is comprised of three station types: primary, secondary, and watershed stations. Primary stations are sampled on a monthly basis year round, and are located in high water-use areas or as background stations upstream of high water-use areas. The static primary station network is operated statewide, and receives the most extensive parameter coverage, thus making it best suited for detecting long term trends. Data for the Broad Basin are analyzed from 1980-1995 for trends in water quality and from 1991-1995 for standards compliance.

Secondary stations are sampled monthly from May through October, a period critical to aquatic life, characterized by higher water temperatures and lower flows. Secondary stations are located in areas where specific monitoring is warranted due to point source discharges, or areas with a history of water quality problems. Secondary station parameter coverage is less extensive and more flexible than primary or watershed station coverages. The number and locations of secondary stations have greater annual variability than do those in the primary station network, and during a basin's target year may have parameter coverage and sampling frequency duplicating that of primary or watershed stations.

Watershed stations are sampled on a monthly basis, year round, during a basin's target year; additional watershed stations may be sampled monthly from May through October to augment the secondary station network. Watershed stations are located to provide more complete and representative coverage within the larger drainage basin, and to identify additional monitoring needs. The parameter coverage of watershed stations includes the same basic parameters as primary stations.

The ambient monitoring network, as a program, has the capability of sampling a wide range of media and analyzing them for the presence or effects of contaminants. Ambient monitoring data from 25 primary stations, 72 secondary stations (16 with increased coverage during the basin monitoring year), 33 watershed stations, and 2 inactive stations were reviewed for the Broad Basin, along with 37 biological sites and 3 consultant sites to assess macroinvertebrate communities.

Monthly, quarterly, or annual water column grab samples (0.3m) are used to establish representative physical conditions and chemical concentrations in the waterbodies sampled. This information is considered to represent "average" conditions, as opposed to extremes, because of the inability to target individual high or low flow events on a statewide basis. The more extreme instream chemical concentrations resulting from nonpoint source inputs from rain events or from point source inputs of a variable nature are frequently missed because routine monthly sampling rarely coincides with the time of release.

Many pollutants may be components of point source discharges, but may be discharged in a discontinuous manner, or at such low concentrations that water column sampling for them is impractical. Some pollutants are also common in nonpoint source runoff, reaching waterways only after a heavy rainfall; therefore, in these situations, the best media for the detection of these chemicals are sediment and fish tissue where they may accumulate over time. Their impact may also affect the macroinvertebrate community.

Regional ambient trend monitoring is conducted to collect data to indicate general biological conditions of state waters which may be subject to a variety of point and nonpoint source impacts. In 1991, the Department began using ambient macroinvertebrate data to support the development of Watershed Water Quality Management Strategies. Ambient sampling is also used to establish regional reference or "least impacted" sites from which to make comparisons in future monitoring. Additionally, special macroinvertebrate studies, in which stream specific comparisons among stations located upstream and downstream from a known discharge or nonpoint source area, are used to assess impact.

Qualitative sampling of macroinvertebrate communities are the primary bioassessment techniques used in ambient trend monitoring. A habitat assessment of general stream habitat availability and a substrate characterization is conducted at each site. Annual trend monitoring is conducted during low flow "worst case" conditions in July - September. This technique may also be used in special studies for the purpose of determining if, and to what extent, a wastewater discharge or nonpoint source runoff is impacting the receiving stream. A minimum of two sample locations, one upstream and one downstream from a discharge or runoff area, is collected. At least one downstream recovery station is also established when appropriate. Sampling methodology essentially follows procedures described in Standard Operating Procedures, Biological Monitoring (NCDEHNR 1995).

Aquatic sediments represent a historical record of chronic conditions existing in the water column. Pollutants bind to particulate organic matter in the water column and settle to the bottom where they become part of the sediment "record". This process of sedimentation not only reflects the impact of point source discharges, but also incorporates nonpoint source pollution washed into the

stream during rain events. As a result, contaminant concentrations originating from irregular and highly variable sources are recorded in the sediment. The sediment concentrations at a particular location do not vary as rapidly with time as do the water column concentrations. Thus, the sediment record may be read at a later time, unrelated to the actual release time. Lakes act as settling basins for materials entering the lake system directly from a discharge or indirectly from the land surface washed into streams. Therefore, it is not unusual for lake sediment concentrations to be higher than sediment concentrations found in streams. This is especially true for chromium, copper, and zinc.

Classified Waters, Standards, and Natural Conditions

The waters of the State have been classified in regulation based on the desired uses of each waterbody. State standards for various parameters have been established to protect all uses within each classification. The water-use classifications (SCDHEC 1993) that apply to this basin are as follows.

Class ORW, or "outstanding resource waters", are freshwaters which constitute an outstanding recreational or ecological resource, or those freshwaters suitable as a source for drinking water supply purposes, with treatment levels specified by the Department. Streams that are not currently classified as ORW, but meet certain criteria (ie. absence of dischargers, endangered species, federal lands) will be noted as potential ORW candidates in the watershed evaluations.

Class A were freshwaters which were suitable for primary contact recreation. This class was also suitable for uses listed as Class B. As of April, 1992, Class A and Class B waters were reclassified as Class FW which protects for primary contact recreation.

Class B were freshwaters which were suitable for secondary contact recreation and as a source for drinking water supply, after conventional treatment, in accordance with the requirements of the Department. These waters were suitable for fishing, and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. This class was also suitable for industrial and agricultural uses. The main difference between the Class A and B freshwater was the fecal coliform standard. Class A waters were not to exceed a geometric mean of 200/100ml, based on 5 consecutive samples during any 30 day period; nor were more than 10% of the total samples during any 30 day period to exceed 400/100ml. Class B waters were not to exceed a geometric mean of 1000/100ml, based on 5 consecutive samples during any 30 day period; nor were more than 20% of the total samples during any 30 day period to exceed 2000/100ml. As of April, 1992, Class A and Class B waters were reclassified as Class FW, which protects for primary contact recreation.

Class FW, or "freshwaters", are freshwaters which are suitable for primary and secondary contact recreation and as a source for drinking water supply, after conventional treatment, in accordance with the requirements of the Department. These waters are suitable for fishing, and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. This class is also suitable for industrial and agricultural uses.

The standards are used as instream water quality goals to maintain and improve water quality and also serve as the foundation of the Bureau of Water's program. They are used to determine permit limits for treated wastewater dischargers and any other activities that may impact water quality. Using mathematical Wasteload Allocation Models, the impact of a wastewater discharge on a receiving stream, where flow is unregulated by dams, is predicted using 7Q10 streamflows. These predictions are then used to set limits for different pollutants on the National Pollutant Discharge

Elimination System (NPDES) permits issued by the Department. The NPDES permit limits are set so that, as long as a permittee (wastewater discharger) meets the established permit limits, the discharge should not cause a standards violation in the receiving stream. All discharges to the waters of the State are required to have an NPDES permit and must abide by those limits, under penalty of law.

Classifications are based on desired uses, not on natural or existing water quality, and are a legal means to obtain the necessary treatment of discharged wastewater to protect designated uses. Actual water quality may not have a bearing on a waterbody's classification. A waterbody may be reclassified if desired or existing public uses justify the reclassification and the water quality necessary to protect these uses is attainable. A classification change is an amendment to a State regulation and requires public participation, SCDHEC Board approval, and General Assembly approval.

Natural conditions may prevent a waterbody from meeting the water quality goals as set forth in the standards. The fact a waterbody does not meet the standards for a particular classification does not mean the waterbody is polluted or of poor quality. Certain types of waterbodies (ie. swamps, lakes, tidal creeks) naturally have water quality lower than the numeric standards. A waterbody can have water quality conditions below standards due to natural causes and still meet its use classification. A site specific numeric standard may be established by the Department and subjected to public participation and administrative procedures for adopting regulations. Site specific numeric standards apply only to the stream segment described in the water classification listing (SCDHEC 1993, Regulation 61-69), not to tributaries or downstream unspecified waters.

Wetlands

In the Section 401 water quality certification process, applications for wetland alterations may be denied or modified due to the special nature of a wetland or the functions that a wetland provides. Wetland impacts must be compensated through restoration, enhancement, preservation, or creation and protected in perpetuity. Future development would be prohibited in these mitigated and legally protected areas. Knowledge of areas that are restricted from development due to mitigation or special water classification is useful in planning future development in a watershed. In cooperation with the S.C. Department of Natural Resources's Division of Land Resources and Conservation Districts, Landsat Thematic Mapper (TM) satellite image data will provide an inventory of wetlands in the basin and an image-based geographical information system (GIS) for subsequent monitoring and tracking efforts.

Lake Eutrophication Assessment

The trophic condition of South Carolina lakes is monitored through SCDHEC's network of routine sampling stations and through periodic sampling of additional lakes. All lakes of at least 40 acres in area that offer public access are monitored. Large (major) lakes are those greater than 850 acres in surface area. Minor lakes are those less than 850 acres in surface area.

Beginning with the 1989 statewide lake water quality assessment, a multi-parameter percentile index has been used to quantify overall lake trophic state. The index includes the following trophic condition indicators: water clarity, total phosphorus, total inorganic nitrogen, chlorophyll *a*, and

dissolved oxygen. The baseline data for this relative index are collected during the 1980-81 statewide lake water quality assessment. Use of a baseline data set permits trend detection in subsequent assessments. Percentiles for major and minor lakes are derived separately. All data, as well as the programs for deriving index values, are maintained in USEPA's STORET database. A high index value indicates a desirable trophic condition, while low values indicate the need for further study or restoration (SCDHEC 1991b).

Recreational Swimming Areas

Although all waters of the State are protected for swimming, some areas are more popular than others and may require closer monitoring. With input from agencies such as the Councils of Government the Department is identifying swimming areas (regularly used beaches and river banks with public access) where water quality monitoring may be needed. Currently monitored and suggested areas are located and discussed in the appropriate watershed evaluations.

Water Quality Indicators

MACROINVERTEBRATE COMMUNITY

Macroinvertebrates are aquatic insects and other aquatic invertebrates associated with the substrates of streams, rivers, and lakes. Macroinvertebrates can be useful indicators of water quality because these communities respond to integrated stresses over time which reflect fluctuating environmental conditions. Community responses to various pollutants (e.g. organic, toxic, and sediment) may be assessed through interpretation of diversity, known organism tolerances, and in some cases, relative abundances and feeding types.

FISH TISSUE

Many pollutants occur in such low concentrations in the water column that they are usually below analytical detection limits. Over time many of these chemicals may accumulate in fish tissue to levels that are easily measured. By analyzing fish tissue it is possible to see what pollutants may be present in waterbodies at very low levels. This information can also be used to determine if consumption of the fish pose any undue human health concerns and to calculate consumption rates that are safe.

DISSOLVED OXYGEN

Oxygen is essential for the survival and propagation of aquatic organisms. If the amount of oxygen dissolved in water falls below the minimum requirements for survival, aquatic organisms or their eggs and larvae may die. A severe example is a fish kill. Dissolved oxygen (DO) varies greatly due to natural phenomena, resulting in daily and seasonal cycles. Different forms of pollution also can cause declines in DO.

Changes in DO levels can result from temperature changes or the activity of microscopic plants (algae or phytoplankton) present in a waterbody. The natural diurnal (daily) cycle of DO concentration is well documented. Dissolved oxygen concentrations are generally lowest in the

morning, climbing throughout the day and peaking near dusk, then steadily declining during the hours of darkness. Photosynthesis by phytoplankton releases oxygen during the day, which results in a rise in DO. In the dark, respiration consumes DO and lowers the concentration.

There is also a seasonal DO cycle in which concentrations are greater in the colder, winter months and lower in the warmer, summer months. Secondary stations are only sampled during summer months when water temperatures are elevated and DO concentrations are depressed. Streamflow is lower during the summer and greatly affects flushing and reaeration, which affect dissolved oxygen values.

When comparing the SCDHEC data to DO standards, it is necessary to consider several extenuating circumstances that contribute to apparent noncompliance, such as sampling bias due to season. Samples are collected as a single instantaneous grab sample, which is not truly representative of the daily average used as the criterion for most classifications. Secondary stations are sampled only during summer months and generally result in a higher rate of DO excursions as a result. It is essential to examine the data to ascertain such patterns of excursions before summarily concluding that the indicated violations constitute poor water quality. The impact of biased sampling protocols must also be weighed as a factor in instances of nonsupport of classified uses.

Biochemical Oxygen Demand

Five-day biochemical oxygen demand (BOD_5) is a measure of the amount of dissolved oxygen consumed by the decomposition of carbonaceous and nitrogenous matter in water over a five-day period. The BOD_5 test indicates the amount of biologically oxidizable carbon and nitrogen that is present in wastewater or in natural water. Matter containing carbon or nitrogen uses dissolved oxygen from the water as it decomposes, which can result in a dissolved oxygen decline. The quantity of BOD_5 discharged by point sources is limited through the National Pollutant Discharge Elimination System (NPDES) permits issued by the Department so as to maintain the applicable dissolved oxygen standard.

pH

The hydrogen ion concentration in a water sample is defined as "pH", and is used as a measure of the acidity of the water. The pH scale ranges from 0 to 14 standard units (SU). A pH of 7 is considered neutral, with values less than 7 being acidic, and values greater than 7 being basic. pH may vary from the ranges specified in the standards due to a variety of natural causes. Low pH values are found in natural waters rich in dissolved organic matter, especially in Coastal Plain swamps and black water rivers. The tannic acid released from the decomposition of vegetation causes the tea coloration of the water and low pHs.

High pH values in lakes during warmer months may be due to high phytoplankton (algae) levels. Continuous flushing in streams prevents the development of significant phytoplankton populations. Most phytoplankton are dormant during the cold winter months, and populations begin to increase as the water warms in the spring. The relationship between phytoplankton and pH is well established. Daily cycles in pH are common in waters with significant phytoplankton populations.

Photosynthesis by phytoplankton consumes carbon dioxide during the day releasing carbonate, which results in a rise in pH. In the dark, respiration releases carbon dioxide and lowers pH. Soft water lakes and ponds may reach a pH of 9-10 SU during periods of intense photosynthesis when large phytoplankton populations are present.

FECAL COLIFORM BACTERIA

Coliform bacteria are present in the digestive tract and feces of all warm-blooded animals, including humans, poultry, livestock, and wild game species. Fecal coliform bacteria are themselves generally not harmful, but their presence in surface waters may be serious due to their association with sewage or animal waste which may contain pathogenic microbes. At present, it is difficult to distinguish between waters contaminated by animal waste and those contaminated by human waste.

Diseases that can be transmitted to humans through water contaminated by improperly treated human or animal waste are the primary concern. Fecal coliform bacteria are able to survive in water and are usually more numerous than waterborne disease producing organisms (pathogens). Therefore, it is best to test for fecal coliform bacteria as an indicator of possible fecal contamination rather than to try to isolate the relatively few pathogens which may be present in water.

Public health studies have established a correlation between fecal coliform numbers in recreational and drinking waters, and the risk of adverse health effects. Based on these relationships, the USEPA and SCDHEC have developed enforceable standards for surface waters to protect against adverse health effects from various recreational or drinking water uses. Proper waste disposal or sewage treatment prior to discharge to surface waters minimizes this type of pollution.

NUTRIENTS

'Nutrients', in terms of environmental water quality, usually refer to phosphorus and nitrogen, which are primary requirements for the growth and reproduction of aquatic plants. Oxygen demanding materials and nutrients are the most common constituents discharged to the environment by man's activities, through wastewater facilities and by agricultural, residential, and stormwater runoff. In general, increasing nutrient concentrations are undesirable due to the potential for accelerated growth of aquatic vegetation and algal blooms which may, in turn, deplete dissolved oxygen and result in fish kills.

The forms of nitrogen routinely analyzed at SCDHEC stations are ammonia (NH_3+NH_4/N), total Kjeldahl nitrogen (TKN), and nitrite-nitrate nitrogen (NO_2/NO_3). TKN assays the amount of organic nitrogen and ammonia in a sample. Nitrate is the product of aerobic decomposition of ammonia, and is a primary aquatic plant nutrient. Total phosphorus (TP) is measured to determine the phosphorus concentration of surface waters. This test includes all of the various forms of phosphorus (organic, inorganic, dissolved, and particulate) present in a sample.

There are no official standards or criteria for nutrients in water. However, the USEPA has issued recommendations for total phosphate phosphorus concentrations in order to limit eutrophication. High densities of phytoplankton can cause fluctuations of pH and dissolved oxygen beyond standards. Since these are only recommendations, and not a true criterion for use in

evaluating water quality, it is difficult to determine the significance of elevated TP values. Because TP includes all forms of phosphorus, including that incorporated into algal biomass, it would be necessary to consider biological data to properly assess the implications of observed concentrations.

TURBIDITY

Turbidity is an expression of the scattering and absorption of light through water. The presence of clay, silt, fine organic and inorganic matter, soluble colored organic compounds, and plankton and other microscopic organisms increases turbidity. Increasing turbidity can be an indication of increased runoff from land. It is an important consideration for drinking water as finished water has turbidity limits. State water quality standards address turbidity in waters classified for Trout.

TOTAL SUSPENDED SOLIDS

Total Suspended Solids (TSS) are the suspended organic and inorganic particulate matter in water. Although increasing TSS can also be an indication of increased runoff from land, TSS differs from turbidity in that it is a measure of the mass of material in, rather than light transmittance through, a water sample. High TSS can adversely impact fish and fish food populations and damage invertebrate populations. There are no explicit state standards for TSS.

HEAVY METALS

The analytical procedures used by the Department measure total metal concentration, which is a relatively conservative approach, since the total metal concentration is always greater than the acid-soluble or dissolved fraction. Most heavy metal criteria for freshwater are calculated from formulas using water hardness. The formulas used to calculate criteria values are constructed to apply to the entire United States, including Alaska and Hawaii. As with all the USEPA criteria, there is also a large margin of safety built into the calculations. The applicability of the hardness based criteria derived from the USEPA formulas to South Carolina waters has been a subject of much discussion. Hardness values vary greatly nationwide (from zero into the hundreds), with South Carolina representing the lower end of the range (statewide average value is approximately 20 mg/l).

Representatives of the USEPA Region IV standards group have stated that no toxicity data for hardness values less than 50 mg/l were used in the development of the formulas. They have expressed reservations about the validity of the formulas when applied to hardness values below 50 mg/l. Based on this opinion, South Carolina's state standards for metals are based on a hardness of 50 mg/l for waters where hardness is 50 mg/l or less, resulting in several criteria values below the Department's current analytical detection limits. Therefore, any detectable concentration of cadmium, copper, or lead is an excursion beyond recommended criteria.

The SCDHEC monitoring data have historically indicated that zinc and copper levels in South Carolina waters are elevated relative to USEPA criteria, apparently a statewide phenomenon in both fresh and salt waters, and possibly resulting from natural conditions or nonpoint sources. These levels do not appear to adversely affect state fisheries, which suggests that the levels are the result of

long-term local conditions to which the fauna have adapted, as opposed to point source pollution events. It is difficult to assess the significance of heavy metal excursions due to the questionable applicability of the formulas at low hardness values and the occurrence of calculated criteria below present detection limits. Atmospheric inputs are recognized as important sources of metals to aquatic systems. Metals are released to the atmosphere from the burning of fossil fuels (coal, oil, gasoline), wastes (medical, industrial, municipal), and organic materials. The metals are then deposited on land and in waterways from the atmosphere via rainfall.

Assessment Methodology

USE SUPPORT DETERMINATION

At the majority of SCDHEC's monitoring stations, water samples for analysis are collected as surface grab samples once per month, quarter, or year, depending on the parameter. Grab samples collected at a depth of 0.3 meters are considered a surface measurement. At most stations sampled by boat, dissolved oxygen and temperature are sampled as a water column profile, with measurements being made at a depth of 0.3 meters below the water surface and at one-meter intervals to the bottom. At stations sampled from bridges, these parameters are measured only at a depth of 0.3 meters. For the purpose of assessment, only surface samples are used in standards comparisons and trend assessments. All water and sediment samples are collected and analyzed according to standard procedures (SCDHEC 1981, 1994). Macroinvertebrate community structure is analyzed routinely at selected stations as a means of detecting adverse biological impacts on the aquatic fauna due to water quality conditions which may not be readily detectable in the water column chemistry.

Results from water quality samples can be compared to state standards and USEPA criteria, with some restrictions due to time of collection and sampling frequency. The monthly sampling frequency employed in the ambient monitoring network may be insufficient for strict interpretation of the standards. The USEPA does not define the sampling method or frequency other than indicating that it should be "representative". The grab sample method is considered to be representative for the purpose of indicating excursions relative to standards, within certain considerations. A single grab sample is more representative of a one-hour average than a four-day average, more representative of a one-day average than a one-month average, and so on (see also Screening & Additional Considerations for Water Column Metals below); thus, when inferences are drawn from grab samples relative to standards, sampling frequency and the intent of the standards must be weighed. When the sampling method or frequency does not agree with the intent of the particular standard, conclusions about water quality should be considered as only an indication of conditions, not as a proven circumstance.

The time period used to assess standards compliance is the last complete five years of data, in the Broad Basin it is 1991 through 1995. This time period was chosen in light of subsequent basin assessments that will evaluate data collected within the five years prior to the last assessment.

AQUATIC LIFE USE SUPPORT

One important goal of the Clean Water Act and state standards is to maintain the quality of surface waters in order to provide for the survival and propagation of a balanced indigenous aquatic community of fauna and flora. The degree to which aquatic life is protected (aquatic life use support) is assessed by comparing important water quality characteristics and the concentrations of potentially toxic pollutants with numeric standards.

Support of aquatic life uses is based on the percentage of standards excursions and, where data are available, the composition and functional integrity of the biological community. A dissolved oxygen (DO) criterion of 4 mg/l is used for Class SB, 6 mg/l for TN and TPGT, and 5 mg/l for all other Classes. An excursion is an occurrence of a DO concentration less than the stated criterion. For pH, there are several acceptable ranges applied depending on the Class of water: 6-8 SU for TPGT; 6-8.5 SU for FW; 5-8.5 SU for FW*; and 6.5-8.5 for SFH, SA, and SB. For DO and pH, if 10 percent or less of the samples contravene the appropriate standard, then the standards are said to be fully supported. A percentage of standards excursions between 11-25 is considered partial support of the standard, and a percentage greater than 25 is considered to represent nonsupport of the standard, unless excursions are due to natural conditions.

Care must be taken in interpretation of dissolved oxygen data as they relate to aquatic life support. A station for which there are 12 samples could have 3 excursions and be considered to partially meet the standard. This could translate into 3 continuous months where the criteria were not met. Depending on the extent of the excursions, this could be a minor stress for the community or a significant stress that would preclude attainment of the goal of maintaining a balanced indigenous population of native flora and fauna. A single month with extremely low dissolved oxygen concentrations could represent a significant stress, while the criteria would indicate the aquatic life use was fully supported.

If the acute aquatic life standard is exceeded for any individual toxicant (heavy metals, priority pollutants, chlorine, ammonia) in more than 10 percent of the samples, the standard is not supported. If the acute aquatic life standard is exceeded more than once, but in less than or equal to 10 percent of the samples, the standard is partially supported. If the conclusion for any single parameter is that the standard is not supported, then it is concluded that aquatic life uses are not supported. If the conclusion for any single parameter is that the standard is partially supported, then it is concluded that aquatic life uses are partially supported. Biological data are the ultimate deciding factor for aquatic life uses, regardless of chemical conditions. The goal of the standards is the protection of a balanced indigenous aquatic community.

Since most toxicants are collected with less frequency than the physical parameters, some judgement must be used in applying this guidance (see also Screening & Additional Considerations for Water Column Metals below). If the sample size is small, as in the case of something sampled only annually, a single sample above the acute standard constitutes more than 10 percent of the samples. In this instance, it is possible for a single sample to result in a conclusion that aquatic life uses are not supported, despite what other data suggest. In such a circumstance it is noted that aquatic life uses

may not be fully supported and the site is prioritized for the collection of biological data, or additional monitoring and investigation, to verify the true situation.

MACROINVERTEBRATE DATA INTERPRETATION

Macroinvertebrate community assessments are used, where available, to supplement or verify Aquatic Life Use Support determinations based on water chemistry data and to evaluate potential impacts from the presence of sediment contaminants. Aquatic and semi-aquatic macroinvertebrates are identified to the lowest practical taxonomic level depending on the condition and maturity of specimens collected. The EPT Index and the North Carolina Biotic Index are the main indices used in analyzing macroinvertebrate data (NCDEHNR 1995). To a lesser extent taxa richness and sometimes total abundance may be used to help interpret data.

The EPT Index is a tabulation of taxa richness within the generally pollution-sensitive groups. EPT values are used in a relative way (usually compared with least impacted regional sites) for station comparisons (Plafkin *et al.* 1989). A database is currently being developed to establish significant EPT index levels to be used in conjunction with the biotic index to address aquatic life use support. The biotic index for a sample is the average pollution tolerance of all organisms collected, based on assigned taxonomic tolerance values (NCDEHNR 1995).

One method of qualitative data analysis is taxa richness. This is the number of distinct taxa collected and is the simplest measure of diversity. High taxa richness is generally associated with high water quality. Increasing levels of pollution progressively eliminate the more sensitive taxa, resulting in lower taxa richness. Total abundance is the enumeration of all macroinvertebrates collected at a sampling location. This is generally not regarded as a qualitative metric; however, when gross differences in abundance occur between stations this metric may be considered as a potential indicator.

RECREATIONAL USE SUPPORT

The degree to which the swimmable goal of the Clean Water Act is attained (recreational use support) is based on the frequency of fecal coliform bacteria excursions and the occurrence of swimming area closures. For fecal coliform bacteria, an excursion is an occurrence of a bacteria concentration greater than 400/100 ml for all Classes. Comparisons to the bacteria geometric mean standard are not considered appropriate based on sampling frequency and the intent of the standard. If 10 percent or less of the samples are greater than 400/100 ml then recreational uses are said to be fully supported. A percentage of standards excursions between 11-25% is considered partial support of recreational uses, and greater than 25% is considered to represent nonsupport of recreational uses.

FISH CONSUMPTION USE SUPPORT

Fish consumption use support is determined by the occurrence of advisories or bans on consumption for a waterbody. For the support of fish consumption uses, a fish consumption advisory indicates partial use support, a consumption ban indicates nonsupport of uses.

The Department uses a risk-based approach to evaluate mercury concentrations in fish tissue and to issue consumption advisories in affected waterbodies. This approach contrasts the average daily exposure dose to the reference dose (RfD) (ATSDR 1992). Using these relationships, fish tissue data are interpreted by determining the consumption rates that would not be likely to pose a health threat to adult males and nonpregnant adult females. Because an acceptable RfD for developmental neurotoxicity has not been developed, pregnant women, infants, and children were advised to avoid consumption of fish from any waterbody where an advisory was issued.

HUMAN HEALTH STANDARDS

State standards for human health are also evaluated in the preparation of the Watershed Water Quality Management Strategy assessments (SCDHEC 1993). For contaminants with human health standards (ie. heavy metals, pesticides), a potential human health threat is indicated if the median concentration exceeds the standard.

Additional Screening and Prioritization Tools

LONG-TERM TREND ASSESSMENT

As part of the watershed assessments, surface data from each station are analyzed for statistically significant long-term trends using a modification of Kendall's tau, which is a nonparametric test removing seasonal effects (Bauer *et al.* 1984, Hirsch *et al.* 1982, Smith *et al.* 1982, Smith *et al.* 1987). Flows are not available for most stations, and the parametric concentrations are not flow-corrected. Seasonal Kendall's tau analysis is used to test for the presence of a statistically significant trend of a parameter, either increasing or decreasing, usually over a twelve to fifteen year period. It indicates whether the concentration of a given parameter is exhibiting consistent change in one direction over the specified time period. A two sided test at $p=0.1$ is used to determine statistically significant trends, and the direction of trend. An estimate of the magnitude of any statistically significant trend is calculated as in Smith *et al.* (1982).

A rigorous evaluation for trends in time-series data usually includes a test for autocorrelation. The data are not tested for autocorrelation prior to the trend analysis. It is felt that autocorrelation would not seriously compromise a general characterization of water quality trends based on such a long series of deseasonalized monthly samples.

One of the advantages of the seasonal Kendall test is that values reported as being below detection limits (DL) are valid data points in this nonparametric procedure, since they are all considered to be tied at the DL value. When the DL changed during the period of interest, all values are considered to be tied at the highest DL occurring during that period (Hirsch *et al.* 1982). Since it is possible to measure concentrations equal to the value of the DL, values less than DL are reduced by subtraction of a constant so that they remain tied with each other, but are less than the values equal to the DL. Since fecal coliform bacteria detection limits vary with sample dilution, there is no set DL; therefore, for values reported as less than some number, the value of the number is used.

Sediment Screening

There are no sediment standards; therefore, in order to identify sediments with elevated metals concentrations, percentiles are constructed using five years of statewide sediment data (SCDHEC 1995a). Only values greater than the detection limit were used for chromium, copper, nickel, lead, and zinc. Because so few concentrations of cadmium and mercury are measured above the detection limit, all samples were pooled for these metals. A sediment metal concentration is considered to be high if it is in the top 10% of the pooled results, and very high if it is in the top 5%. Any analytical result above detection limits is flagged for pesticides, PCBs, and other priority pollutants. Sites with noted high metals concentrations or the occurrence of other contaminants above detection limits are prioritized for the collection of biological data, or additional monitoring and investigation, to verify the true situation.

Screening & Additional Considerations for Water Column Metals

The USEPA criteria for heavy metals to protect aquatic life are specified as a four-day average and a one-hour average (USEPA 1986), and have been adopted as State Standards (SCDHEC 1993). Because of the quarterly sampling frequency for heavy metals, the USEPA advises against comparisons to chronic toxicity standards (four-day average concentration); therefore, only the acute standard (one-hour average) for the protection of aquatic life is used in the water quality assessment (Table 1).

Table 1. Metal Standards in Water (μg/l)

Metal	Present Detection Level	Freshwater 1Hr. Acute Ave.	Saltwater 1Hr. Acute Ave.	Human Health
*Cadmium	10.0	1.79	43.0	5.000
Chromium (VI)	10.0	16.00	1100.0	50.000
*Copper	10.0	9.22	2.9	
*Lead	50.0	33.78	140.0	50.000
Mercury	0.2	2.40	2.1	0.153
*Nickel	20.0	789.00	75.0	4584.000
*Zinc	10.0	65.00	95.0	

* Freshwater Standards based on a hardness of 50 mg/l as $CaCO_3$.

Zinc and copper are elevated statewide and concentrations are frequently measured in excess of the calculated acute aquatic life standards. To identify areas where zinc, copper, and other metals

are elevated in the water column above normal background concentrations, concentrations greater than the detection limit from all SCDHEC monitoring sites statewide for a five year period are pooled and the 90th and 95th percentiles are computed (SCDHEC 1995a). This is done separately for each metal for both fresh and saltwaters. The individual measurements from each monitoring station are then compared to these percentiles. As in sediments, a metal concentration is referred to as "high" if it is in the top 10% of the pooled results, and "very high" if it is in the top 5%. All water column values referred to as "high" or "very high" are also in excess of the acute aquatic life standard listed in Table 1. For chromium, because so few concentrations are above the detection limit, all samples collected are used to generate the percentiles. Sites with noted high metals concentrations are prioritized for the collection of biological data, or additional monitoring and investigation, to verify the true situation.

Point Source Contributions

Wasteload Allocation Process

A wasteload allocation (WLA) is the portion of a stream's assimilative capacity for a particular pollutant which is allocated to an existing or proposed point source discharge. Existing WLAs are updated during the basin review process and included in permits during the normal permit expiration and reissuance process. New WLAs are developed for proposed projects seeking a discharge permit or for existing discharges proposing to increase their effluent loading at the time of application. Wasteload allocations for oxygen demanding parameters are developed by the Water Quality Modeling Section, and WLAs for toxic pollutants and metals are developed by the appropriate permitting division.

The ability of a stream to assimilate a particular pollutant is directly related to its physical and chemical characteristics. Various techniques are used to estimate this capacity. Simple mass balance/dilution calculations may be used for a particular conservative (nondecaying) pollutant while complex models may be used to determine the fate of nonconservative pollutants that degrade in the environment. Waste characteristics, available dilution and the number of discharges in an area may, along with existing water quality, dictate the use of a simple or complex method of analysis. Projects which generally do not require complex modeling include: groundwater remediation, noncontact cooling water, mine dewatering, air washers, and filter backwash.

Streams are designated either effluent limited or water quality limited based on the level of treatment required of the dischargers to that particular portion of the stream. In cases where the USEPA published effluent guidelines, the minimum treatment levels required by law are sufficient to maintain instream water quality standards, and the stream is said to be effluent limited. Streams lacking the assimilative capacity for a discharge at minimum treatment levels are said to be water quality limited. In cases where better than technology limits are required, water quality, not minimum requirements, controls the permit limits. The Department's Water Quality Modeling Section recommends limits for numerous parameters including ammonia nitrogen (NH3-N), dissolved oxygen (DO), total residual chlorine (TRC), and five-day biochemical oxygen demand (BOD5). Limits for other parameters, including metals, toxics, and nutrients are developed by the Water

Facilities Permitting Division or the Industrial, Agricultural, and Stormwater Permitting Division in conjunction with support groups within the Department.

Permitting Strategy

The Water Facilities Permitting Division and the Industrial, Agricultural, and Stormwater Permitting Division are responsible for drafting and issuing NPDES permits. All NPDES permits in the Broad Basin are to be drafted and issued, or revoked and reissued by September 30, 1997 and will all be reissued together in 2002. Broad Basin permits that remain unissued after September 30, 1997 will be issued during the first quarter of Fiscal Year 98. These permits will also be reissued in 2002 to coincide with the basin permitting year. Major NPDES reissued permits will be individually public noticed in a newspaper of general circulation and minor NPDES reissued permits will be individually public noticed by posting in accordance with Regulation 61-9. New NPDES permits and modifications of existing NPDES permits will be issued as the need arises. New permits and modifications of existing permits will be public noticed by newspaper advertisement and site posting. The permitting Divisions will coordinate drafting of permits for reissue and public notices in the Broad Basin by watershed management units in 2002.

The permitting Divisions use general permits with statewide coverage for certain categories of minor NPDES permits. Discharges covered under general permits include utility water, potable surface water treatment plants, potable groundwater treatment plants with iron removal, petroleum contaminated groundwater, and mine dewatering activities. Additional activities proposed for general permits include bulk oil terminals, aquacultural facilities, and ready-mix concrete/concrete products. Land application systems for land disposal and lagoons are also permitted, and the municipal, community (private), and industrial land application systems will be included in this document as well as NPDES point source dischargers.

A completed draft permit is sent to the permittee, the SCDHEC District office, and if it is a major permit, to the USEPA for review. When the permit draft is finalized, a public notice is issued. Comments from the public are considered and, if requested, a public hearing may be arranged. Both oral and written comments are collected at the hearing, and after considering all information, the Department staff makes the decision whether to issue the permit as drafted, issue a modified permit, or to deny the permit. Everyone who participated in the process receives a copy of the final staff decision. It is anticipated that minor permits will be grouped by watershed and publicly noticed together; major permits will individually stand public review. Staff decisions may be appealed according to the procedures in Regulation 61-72.

Nonpoint Source Contributions

Nonpoint source pollutants are generally introduced to a waterbody during a storm event and enter the system from diverse sources. Nonpoint source contributions originate from a variety of sources that include agriculture, silviculture, construction, urban stormwater runoff, hydrologic modification, landfills, mining, and residual wastes.

Section 319 of the 1987 Amendments to the Clean Water Act required states to assess the nonpoint source water pollution associated with surface and groundwater within their borders and then develop and implement a management strategy to control and abate the pollution. The first Assessment of Nonpoint Source Pollution in South Carolina (SCDHEC 1989) accomplished this purpose. The NPS Management Program developed strategies and targeted waterbodies for priority implementation of management projects. The priority list has been updated several times since then. The current list appears in the State Nonpoint Source Pollution Management Program (SCDHEC 1995b). Comprehensive projects are currently being implemented in a number of these watersheds. Components of the projects vary depending on the particular NPS impacts in the watershed, but all include BMP demonstrations, education, and monitoring.

The conventional §319 NPS Management Program has typically involved SCDHEC program areas or large institutional cooperators such as The Clemson Extension Service and the Department of Natural Resources undertaking large scale projects. In an effort to diversify the participation in the program, the Department allocated a portion of §319 funds to institute a new grants program known as Minigrants. In keeping with the Department's vision statement "Local Solutions to Local Problems", this program sought to gain the involvement of smaller organizations like local governments, nonprofit organizations, and schools in NPS projects that are locally focused and generally smaller in scale.

The purpose of South Carolina's Nonpoint Source Pollution Management Program is to insure the protection and restoration of the state's waters from nonpoint source water pollution impacts. The Plan document describes programs (both regulatory and voluntary) for NPS abatement, targets watersheds for NPS project implementation, and describes the state's strategy under each of the eight categories of NPS sources identified in South Carolina. In each of the categorical sections, management measures are described. Management measures are defined as "economically achievable measures for the control of the addition of pollutants from existing and new categories and classes of nonpoint sources of pollution". The management measures address the following major categories: agriculture, forestry, urban areas, marinas/recreational boating, hydromodification, mining, land application of wastes, and wetlands. The Nonpoint Source Management Program initiates NPS projects during the implementation phase of a targeted basin.

Landfill Activities

All landfill activities within the State are permitted and regulated by the Department's Bureau of Land and Waste Management. All active and closed industrial and municipal solid waste landfills are identified in the appropriate watershed evaluations.

Mining Activities

Mining activities within the State are permitted by the Mining and Reclamation Division of the Department's Bureau of Land and Waste Management. Resource extraction activities and locations are identified in the appropriate watershed evaluations.

Recreational Camps

The two types of camping facilities permitted by the Department through Regulation 61-39 are Resident Camps and Family Camps. Resident camps are organized camps where one or more buildings are provided for sleeping quarters. These camps are typically operated for educational, recreational, religious, or health purposes. Family camps are organized camps where camp sites are provided for use by the general public or certain groups. The camp sewage is discharged into a public collection, treatment and disposal system if available, or an onsite wastewater treatment and disposal system (septic tank) is used. Camp locations are identified in the appropriate watershed evaluations.

Groundwater Concerns

Groundwater is an important resource for drinking water use, together with agricultural, industrial and commercial usages. Based on USEPA drinking water standards, the overall quality of South Carolina's groundwater is excellent. Contaminated groundwater is expensive and difficult to restore; therefore, groundwater protection for present and future usage is the management emphasis.

Localized sources of groundwater contamination can include: septic tanks, landfills (municipal and industrial), surface impoundments, underground storage tanks, above ground storage tanks, hazardous waste sites (abandoned and regulated), salt water intrusion, land application or treatment, agricultural activities, road salting, spills and leaks. For the purposes of this assessment, only groundwater contamination affecting surface waters will be identified. A more detailed accounting of groundwater contamination will be addressed in the Broad Basin update in 2001. The groundwater contamination inventory (SCDHEC 1997a) was used to identify groundwater-related problem areas in the basin. Sites in the inventory are referenced by name and county, and are updated annually.

Water Supply

Water treatment facilities are permitted by the Department for municipal and industrial potable water production. As per the 1983 Water Use Reporting and Coordination Act (Act 282), all water uses over 100,000 gallons per day must report their usage. This includes industrial, agricultural, mining, golf courses, public supply, commercial, recreational, hydro power, thermo power, and nuclear power activities. Intake location and the volume removed from a stream are identified in the watershed evaluations for both municipal (potable) and industrial uses.

Growth Potential and Planning

Land use and management can define the impacts to water quality in relation to point and nonpoint sources. Assessing the potential for an area to expand and grow allows for water quality planning to occur and, if appropriate, increased monitoring for potential impairment of water quality. Indicators used to predict growth potential include water and sewer service, road and highway accessibility, and population trends. These indicators and others were used as tools to determine

areas within the Broad Basin having the greatest potential for impacts to water quality as a result of development.

Many counties in the Broad Basin lack county wide zoning ordinances; therefore, there is little local regulatory power to influence the direction or magnitude of regional growth. The majority of municipalities have zoning ordinances in place; however, much of the growth takes place just outside the municipal boundaries, where infrastructure is inadequate. Section 208 of the Clean Water Act serves to encourage and facilitate the development and implementation of areawide waste treatment management plans. The §208 Areawide Water Quality Management Plans were completed in great detail during the 1970's and have recently been updated (SCDHEC 1997b, Appalachian Council of Governments 1997, Central Midlands Council of Governments 1997). Information from the updated reports are used in the individual watershed evaluations.

Watershed boundaries extend along topographic ridges and drain surrounding surface waters. Roads are commonly built along ridge tops, with the best drainage conditions. Cities often develop in proximity to ridges as a result of their plateau terrain. It is not uncommon, then, to find cities or road corridors located along watershed boundaries, and thus influencing or impacting several watersheds.

Implementation Process for Impaired Waters

A Total Maximum Daily Load (TMDL) is the calculated maximum allowable pollutant loading to a waterbody at which water quality standards are maintained. A TMDL is made up of two main components, a load allocation and a wasteload allocation. A load allocation is the portion of the receiving water's loading capacity attributed to existing or future nonpoint sources or to natural background sources. The waste load allocation is the portion of a receiving water's loading capacity allocated to an existing or future point source. A TMDL may also include an unallocated portion of the capacity reserved as a margin of safety or for future development.

A TMDL is a means for recommending controls needed to meet water quality standards in a particular water or watershed. Historically, the typical TMDL has been developed as a wasteload allocation, considering a particular waterbody segment, for a particular point source, to support setting effluent limitations. In order to address the combined cumulative impacts of all sources, broad watershed-based TMDLs will now be developed.

The TMDL process is linked to all other State water quality activities, and water quality impairments are identified through monitoring and assessment. Watershed-based investigations result in source identification and TMDL development. TMDLs form links between water quality standards and point and nonpoint source controls. Where TMDLs are established, they constitute the basis for NPDES permits, and for strategies to reduce nonpoint source pollution. The effectiveness and adequacy of applied controls are evaluated through continued monitoring and assessment.

Broad Basin Description

The ***Broad Basin*** incorporates 32 watersheds within 2 Watershed Management Units (WMU) and some 2.5 million acres within the State of South Carolina (a portion of the basin resides in North Carolina). There are a total of 4,719 stream miles in the Broad Basin. Within the Department's Broad Basin are the Enoree River Basin, the Tyger River Basin, the Pacolet River Basin, and the Broad River Basin.

The ***Enoree River Basin*** encompasses 761.6 square miles extending over the Piedmont region. The Enoree River Basin is described in WMU-0501 and encompasses 5 watersheds, some 487,405 acres of which 9.71% is urban land, 12.25% is agricultural land, 10.64% is scrub/shrub land, 0.73% is barren land, 66.39% is forested land, 0.04% is forested wetland, and 0.24% is water (SCLRCC 1990). The urban land percentage is comprised chiefly of the Greenville Metropolitan area. The Enoree River originates near the City of Travelers Rest and accepts drainage from Beaverdam Creek, Warrior Creek, and Duncan Creek before draining into the Broad River. There are 895.5 stream miles in the Enoree River Basin.

The ***Tyger River Basin*** encompasses 841.6 square miles extending over the Piedmont region. The Tyger River Basin is described in WMU-0501 and encompasses 6 watersheds, some 538,617 acres of which 9.94% is urban land, 13.65% is agricultural land, 8.23% is scrub/shrub land, 0.53% is barren land, 66.98% is forested land, and 0.67% is water (SCLRCC 1990). The urban land percentage is comprised chiefly of the City of Greer and portions of the Cities of Spartanburg and Union. There are a total of 977.1 stream miles in the Tyger River Basin. The Tyger River is formed by the confluence of the South Tyger River, the Middle Tyger River, and the North Tyger River near the City of Woodruff and accepts drainage from Fairforest Creek before flowing into the Broad River.

The ***Pacolet River Basin*** encompasses 489.4 square miles extending over the Piedmont region. The Pacolet River Basin is described in WMU-0502 and encompasses 7 watersheds, some 313,221 acres of which 4.52% is urban land, 18.78% is agricultural land, 5.70% is scrub/shrub land, 0.88% is barren land, 69.06% is forested land, and 1.06% is water (SCLRCC 1990). The urban land percentage is comprised chiefly of a portion of the City of Spartanburg. There are a total of 580.1 stream miles in the Pacolet River Basin. The South Pacolet River flows through Lake William C. Bowen and joins the North Pacolet River, which originates in North Carolina, to form Lake Blalock and the Pacolet river. The Pacolet River accepts drainage from Lawsons Fork Creek before flowing into the Broad River.

The ***Broad River Basin*** is described in Watershed Management Unit 0502 and encompasses 14 watersheds and 1,844.8 square miles excluding the Enoree River, the Tyger River, and the Pacolet River Basins which all drain into the Broad River. The Broad River originates in North Carolina and flows across the Piedmont region of South Carolina. Of the 1,180,693 acres, 8.23% is urban land, 11.93% is agricultural land, 5.28% is scrub/shrub land, 0.40% is barren land, 72.24% is forested land, 0.02% is forested wetland, and 1.90% is water (SCLRCC 1990). The urban land percentage is

comprised chiefly of the Cities of Gaffney and Chester, and portions of the Cities of York, Union, and Columbia. There are a total of 2,266.3 stream miles in the Broad River Basin. The portion of the Broad River within South Carolina accepts drainage from Buffalo Creek, Cherokee Creek, Kings Creek, Thicketty Creek, Bullock Creek, the Pacolet River, Turkey Creek, Browns Creek, the Sandy River, the Tyger River, the Enoree River, the Little River, and Cedar Creek.

Physiographic Regions

The State of South Carolina has been divided into six Major Land Resource Areas (MLRAs) by the USDA Soil Conservation Service (USDA 1982): the Blue Ridge, Piedmont, Sand Hills, Upper Coastal Plain, Lower Coastal Plain, and the Coastal Zone. The MLRAs are physiographic regions that have soils, climate, water resources, and land uses in common. The Broad Basin is entirely within the Piedmont region, which is defined as an area of gently rolling to hilly slopes with narrow stream valleys dominated by forests, farms, and orchards; elevations range from 375 to 1,000 feet.

Land Use/Land Cover

General land use/land cover data for South Carolina was derived from SPOT multispectral satellite images using image mapping software to inventory the State's land classifications (SCLRCC 1990). The classifications describing the Broad Basin are as follows.

Urban land is characterized by man-made structures and artificial surfaces related to industrial, commercial and residential uses, as well as vegetated portions of urban areas.

Agricultural/Grass land is characterized by cropland, pasture and orchards, and may include some grass cover in Urban, Scrub/Shrub and Forest areas.

Scrub/Shrub land is adapted from the western Rangeland classification to represent the "fallow" condition of the land (currently unused, yet vegetated), and is most commonly found in the dry Sandhills region including areas of farmland, sparse pines, regenerating forest lands and recently harvested timber lands.

Forest land is characterized by deciduous and evergreen trees not including forests in wetland settings.

Forested Wetland (swampland) is the saturated bottomland, mostly hardwood forests that are primarily composed of wooded swamps occupying river floodplains and isolated low-lying wet areas, primarily located in the Coastal Plain.

Barren land is characterized by an unvegetated condition of the land, both natural (rock, beaches and unvegetated flats) and man-induced (rock quarries, mines and areas cleared for construction in urban areas or clearcut forest areas).

Water (non-land) is characterized by freshwaters only in this basin.

Soil Types

The dominant soil associations, or those soil series comprising, together, over 40% of the land area, were recorded for each watershed in percent descending order. The individual soil series for the Broad Basin are described as follows (USDA 1963-1990).

Alpin soils are well drained and excessively drained, sandy soils with a loamy or sandy subsoil.

Badin soils are moderately deep, well drained, moderately permeable, clayey soils that formed in material weathered from Carolina Slate or other fine grained rock, on ridgetops and side slopes.

Cataula soils are deep, gently sloping to strongly sloping, well drained soils with a loamy surface layer and a clayey subsoil.

Cecil soils are deep, well drained, gently sloping to sloping soils that have red subsoil.

Davidson soils are deep, gently sloping to strongly sloping, well drained to somewhat poorly drained soils with a loamy surface layer and a clayey subsoil.

Enon soils are well drained to somewhat poorly drained, shallow to deep soils, mainly brownish, firm to extremely firm clay loam to clay in the subsoil, on narrow and medium ridges.

Georgeville soils are gently sloping to sloping, well drained and moderately well drained soils.

Goldston soils are dominantly sloping to steep, well drained to excessively drained soils.

Helena soils are gently sloping to sloping, moderately well drained to well drained soils.

Herndon soils are gently sloping to sloping, well drained and moderately well drained soils.

Hiwassee soils are well drained, moderately sloping soils with clayey subsoil, moderately deep.

Madison soils are well drained, moderately sloping soils, with clayey subsoil, moderately deep.

Pacolet soils are well drained, moderately steep soils with clayey subsoil, moderately deep.

Tatum soils are dominantly sloping to steep, well drained to excessively drained soils, with a loamy subsoil, moderately deep or shallow to weathered rock.

Wilkes soils are dominantly strongly sloping to steep, well drained soils.

Winnsboro soils are well drained, gently sloping to steep, moderately deep to deep clayey soils.

Slope and Erodibility

The slope values used in this strategy are approximate slopes derived by NRCS field personnel conducting soil surveys (USDA 1963-1990). The definition of soil erodibility differs from that of soil erosion. Soil erosion may be more influenced by slope, rainstorm characteristics, cover, and land management than by soil properties. Soil erodibility refers to the properties of the soil itself, which cause it to erode more or less easily than others when all other factors are constant. The

soil erodibility factor, K, is the rate of soil loss per erosion index unit as measured on a unit plot (USDA 1978), and represents an average value for a given soil reflecting the combined effects of all the soil properties that significantly influence the ease of soil erosion by rainfall and runoff if not protected. The K values in this assessment were derived from the Nonpoint Source Pollution Assessment (SCLRCC 1988), where values closer to 1.0 represent higher soil erodibility and a greater need for best management practices to minimize erosion and contain those sediments which do erode. The range of K-factor values in the Broad Basin is from 0.15 to 0.39, among the 32 hydrologic units or watersheds.

Watershed Evaluations and Implementation Strategies Within WMU-0501

Watershed Management Unit (WMU) 0501 consists primarily of the ***Enoree River Basin*** and the ***Tyger River Basin***. WMU-0501 encompasses the Piedmont region of the State. There are a total of 11 watersheds in WMU-0501, some one million acres of which 9.83% is urban land, 12.98% is agricultural land, 9.38% is scrub/shrub land, 0.63% is barren land, 66.70% is forested land, 0.02% is forested wetland, and 0.46% is water (SCLRCC 1990). There are a total of 1,872.6 stream miles in WMU-0501.

The Enoree River originates near the City of Travelers Rest and accepts drainage from Beaverdam Creek, Warrior Creek, and Duncan Creek before draining into the Broad River. The Tyger River is formed by the confluence of the South Tyger River, the Middle Tyger River, and the North Tyger River near the City of Woodruff and accepts drainage from Fairforest Creek before flowing into the Broad River.

Climate

Normal yearly rainfall in the WMU-0501 area is 48.83 inches, according to the S.C. historic climatological record (SCWRC 1990). Data compiled from National Weather Service stations in Greenville-Spartanburg, Spartanburg, Woodruff, Union, Laurens, Whitmire, and Newberry were used to determine the general climate information for this portion of the State. The highest level of rainfall occurs in the spring with 13.55 inches; 12.41, 10.37, and 12.50 inches of rain falling in the summer, fall, and winter, respectively. The average annual daily temperature is 60.6°F. Spring temperatures average 60.5°F and summer, fall, and winter temperatures are 77.4°F, 61.4°F, and 43.1°F, respectively.

03050108-010

(Enoree River)

General Description

Watershed 03050108-010 is located in Greenville, Spartanburg, and Laurens Counties and consists primarily of the ***Enoree River*** and its tributaries from its origin to Beaverdam Creek. The watershed occupies 169,597 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Madison series. The erodibility of the soil (K) averages 0.27; the slope of the terrain averages 10%, with a range of 2-25%. Land use/land cover in the watershed includes: 21.64% urban land, 20.52% agricultural land, 5.76% scrub/shrub land, 1.18% barren land, 50.81% forested land, and 0.08% water.

The Enoree River originates near the City of Travelers Rest and accepts drainage from the North Enoree River, Long Branch, Beaverdam Creek, Buckhorn Creek (Buckhorn Lake), Mountain Creek (Mountain Lake), Cane Creek, and Princess Creek. Brushy Creek flows through the City of Greenville to enter the river next followed by Rocky Creek (Oak Grove Lake, Shannon Lake, Little Rocky Creek), Dillard Creek, Abner Creek (Vine Creek, Padgett Creek), another Little Rocky Creek, and Peters Creek. Gilder Creek (Earls Lake) originates near the City of Mauldin and is joined by Bridge Fork Creek, Little Gilder Creek, Graze Branch, Horsepen Creek, and Long Branch before flowing into the river downstream of Peters Creek. Hunter Branch enters the river next followed by Buzzard Spring Branch and Lick Creek. Durbin Creek originates near the City of Simpsonville and accepts drainage from Howard Branch, Wilson Branch, Little Durbin Creek, and South Durbin Creek (Reedy Creek) before draining into the Enoree River. Dildane Creek flows into the river downstream of Durbin Creek and is followed by Brock Page Creek and Boggy Creek. Due to the absence of point source dischargers and the presence of endangered species and other special characteristics, portions of Buckhorn Creek may qualify as a potential ORW (outstanding resource water) candidate. There are several ponds and lakes (12-52 acres) in this watershed used for recreational purposes, and a total of 366.2 stream miles, all classified FW. Paris Mountain State Park is located to the north of the City of Greenville; portions of Buckhorn Creek and Mountain Creek are located within the park. There is a Heritage Trust Preserve along the Enoree River just upstream of its confluence with the North Enoree River.

Water Quality

Enoree River - There are seven monitoring sites along this portion of the Enoree River. Aquatic life uses are not supported at the furthest upstream site **(BE-001)** due to chronic occurrences of zinc in excess of the aquatic life acute standard. Every sample collected during the assessment period fell into either the very high or high concentration range, including 17 very high concentrations and 3 high concentrations. In addition, there is a significantly increasing trend in turbidity. The 1995 sediment sample revealed the pesticides P,P'DDT, P,P'DDD, and P,P'DDE (metabolites of DDT). Although the use of DDT was banned in 1973, it is very persistent in the environment. Significantly

decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are partially supported due to fecal coliform bacteria excursions.

Aquatic life uses are fully supported at the next site downstream (BE-015), but may be threatened by a significantly increasing trend in pH. A significantly increasing trend in dissolved oxygen concentration and significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. At the next site downstream **(BE-017)**, aquatic life uses are partially supported due to occurrences of copper in excess of the aquatic life acute standard. Recreational uses are not supported at either BE-015 or BE-017 due to fecal coliform bacteria excursions.

Further downstream **(BE-018)**, aquatic life uses are partially supported based on macroinvertebrate community data. A significantly increasing trend in dissolved oxygen concentration and significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions. Aquatic life uses are also partially supported at the next site downstream **(BE-019)** based on macroinvertebrate community data.

At the next site downstream **(B-037)**, aquatic life uses are fully supported, but may be threatened by a significantly increasing trend in turbidity. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are partially supported due to fecal coliform bacteria excursions. Aquatic life uses are also fully supported at the furthest downstream site (B-040), but recreational uses are partially supported due to fecal coliform bacteria excursions. This river was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Beaverdam Creek (BE-039) - Aquatic life uses are fully supported, and significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

Mountain Creek (B-186) - Aquatic life uses are fully supported, but may be threatened by a significantly increasing trend in turbidity. A significantly decreasing trend in total phosphorus concentration suggests improving conditions for this parameter. Recreational uses are not supported due to fecal coliform bacteria excursions. In addition, there is a significantly increasing trend in fecal coliform bacteria concentration. This creek was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Princess Creek (B-192) - Aquatic life uses are not supported due to pH excursions and occurrences of zinc in excess of the aquatic life acute standard, including a very high concentration measured in 1995. In addition, there are increasing trends in pH and total nitrogen concentrations. A

significantly decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Pesticides (dieldrin and phosdrin) were detected in the 1994 sediment sample. Recreational uses are partially supported due to fecal coliform bacteria excursions, compounded by a significantly increasing trend in fecal coliform bacteria concentration.

Brushy Creek - There are two monitoring sites along Brushy Creek. Aquatic life uses are fully supported at both the upstream site **(BE-035)** and the downstream site **(BE-009)**, and significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration at the downstream site suggest improving conditions for these parameters. Recreational uses are not supported at either site due to fecal coliform bacteria excursions.

Rocky Creek (BE-007) - Aquatic life uses are fully supported, and a significantly increasing trend in dissolved oxygen concentration and significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus concentration, and turbidity suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions. In addition, there is a significantly increasing trend in fecal coliform bacteria concentration.

Gilder Creek - There are three monitoring sites along Gilder Creek **(BE-040, B-241, BE-020)**. Aquatic life uses are fully supported at all sites, but may be threatened at the midstream and downstream sites due to a significantly increasing trend in pH. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters at all sites. In addition, a significantly increasing trend in dissolved oxygen concentration at B-241 and BE-020 and decreasing turbidity at BE-040 and B-241 suggest improving conditions. Recreational uses are not supported at any site due to fecal coliform bacteria excursions, and there is a significantly increasing trend in fecal coliform bacteria concentration at all sites.

Lick Creek (B-038) - Aquatic life uses are fully supported, and a significantly increasing trend in dissolved oxygen concentration and significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

Durbin Creek - There are three monitoring sites along Durbin Creek. Aquatic life uses are fully supported at the upstream site **(B-035)** and the midstream site **(B-097)**, but recreational uses are not supported at these sites due to fecal coliform bacteria excursions. In addition, there is a significantly increasing trend in fecal coliform bacteria concentration at the midstream site. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions at both the upstream and midstream sites for these parameters. Aquatic life uses are fully supported at the downstream site **(B-022)** based on macroinvertebrate community data. This creek was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Buckhorn Lake - In an effort to provide access for swimming and fishing, aquatic herbicides were applied in 1994 by the South Carolina Department of Natural Resources.

Recreational Swimming Areas

RECEIVING STREAM	*SWIMMING LOCATION*
BEAVERDAM CREEK TRIBUTARY	PARIS MOUNTAIN

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
ENOREE RIVER CITY OF WOODRUFF PIPE #: 001 FLOW: 1.8	SC0045802 MAJOR MUNICIPAL EFFLUENT
ENOREE RIVER POLYTECH INC. PIPE #: 001 FLOW: M/R	SCG250062 MINOR INDUSTRIAL EFFLUENT
ENOREE RIVER NATIONAL STARCH & CHEMICAL CO. PIPE #: 002 FLOW: 0.12 WQL FOR BOD5,DO,TRC,NH3N	SC0038229 MAJOR INDUSTRIAL WATER QUALITY
ENOREE RIVER JPS AUTOMOTIVE PRODUCTS/TAYLORS PIPE #: 001 FLOW: 0.0707 WQL FOR BOD5	SCG641015; SCG250149 MINOR INDUSTRIAL WATER QUALITY
ENOREE RIVER INMAN MILLS/RAMEY PLANT PIPE #: 001 FLOW: 0.05 WQL FOR BOD5,DO,TRC,NH3N	SC0002496 MINOR INDUSTRIAL WATER QUALITY
ENOREE RIVER WCRSA/TAYLORS AREA PLANT PIPE #: 001 FLOW: 7.5 WQL FOR BOD5,DO,TRC,NH3N	SC0024309 MAJOR MUNICIPAL WATER QUALITY
ENOREE RIVER WCRSA/PELHAM PLANT PIPE #: 001 FLOW: 7.5 WQL FOR BOD5,DO,TRC,NH3N	SC0033804 MAJOR MUNICIPAL WATER QUALITY
ENOREE RIVER WCRSA/GILDER CREEK PIPE #: 001 FLOW: 4.0 WQL FOR BOD5,DO,TRC,NH3N	SC0040525 MAJOR MUNICIPAL WATER QUALITY

ENOREE RIVER GREENWOOD HOLDING CORP./GREER PIPE #: 001 FLOW: 0.03 WQL FOR BOD5,DO	SC0042056 MINOR INDUSTRIAL WATER QUALITY
ENOREE RIVER ENOREE LANDFILL PIPE #: 001 FLOW: 0.0033	PROPOSED MINOR INDUSTRIAL EFFLUENT
PRINCESS CREEK CAROLINA PRODUCTS WWTP PIPE #: 001 FLOW: M/R	SCG250047 MINOR INDUSTRIAL EFFLUENT
BEAVERDAM CREEK WCRSA/COACHMAN ESTATES PIPE #: 001 FLOW: 0.025 WQL FOR BOD5,DO,TRC,NH3N	SC0024040 MINOR MUNICIPAL WATER QUALITY
MOUNTAIN CREEK ALTAMONT FOREST PIPE #: 001 FLOW: 0.0124 WQL FOR TRC,NH3N	SC0034398 MINOR COMMUNITY WATER QUALITY
MOUNTAIN CREEK MORTON INTERNATIONAL, INC. PIPE #: 001 FLOW: M/R	SCG250097 MINOR INDUSTRIAL EFFLUENT
PRINCESS CREEK EXIDE/GENERAL BATTERY CORP. PIPE #: 001 FLOW: M/R	SC0042633 MINOR INDUSTRIAL EFFLUENT
BRUSHY CREEK LIBERTY LIFE INSURANCE PIPE #: 001 FLOW: 0.03	SCG250166 MINOR INDUSTRIAL EFFLUENT
ROCKY CREEK NYCOIL COMPANY/DM DIV. PIPE #: 001 FLOW: M/R	SCG250061 MINOR INDUSTRIAL EFFLUENT
ROCKY CREEK METROMONT MATERIALS/ROPER MTN PIPE #: 001 FLOW: M/R	SC0044636 MINOR INDUSTRIAL EFFLUENT
ROCKY CREEK TRIBUTARIES GE/GREENVILLE GAS TURBINE PLT PIPE #: 001 FLOW: 0.45 PIPE #: 010 FLOW: MR PIPE #: 011 FLOW: MR	SC0003484 MINOR INDUSTRIAL EFFLUENT EFFLUENT EFFLUENT
VINE CREEK BECKLEY STONE CO./PELHAM QUARRY PIPE #: 001 FLOW: M/R	SCG730042 MINOR INDUSTRIAL EFFLUENT
BROCK PAGE CREEK PIEDMONT DIELECTRICS PIPE #: 001 FLOW: M/R	SCG250056 MINOR INDUSTRIAL EFFLUENT

PADGETT CREEK SSSD/HIGHWAY 101 BUSINESS PARK PIPE #: 001 FLOW: 0.03-0.04 WQL FOR BOD5,DO,TRC; NH3N IN SUMMER & WINTER	SC0047350 MINOR MUNICIPAL WATER QUALITY
DILLARD CREEK CHEVRON USA, INC. PIPE #: 001 FLOW: M/R	SCG830001 MINOR INDUSTRIAL EFFLUENT
GILDER CREEK RENOSOL CORPORATION PIPE #: 001 FLOW: 0.0002	SC0037966 MINOR INDUSTRIAL EFFLUENT
GILDER CREEK BI-LO INC./MAULDIN WAREHOUSE PIPE #: 001 FLOW: M/R	SCG250063 MINOR INDUSTRIAL EFFLUENT
BRIDGE FORK CREEK METROMONT MATERIALS/MAULDIN PIPE #: 001 FLOW: 0.002	SC0038016 MINOR INDUSTRIAL EFFLUENT
DURBIN CREEK WCRSA/DURBIN CREEK PLT PIPE #: 001 FLOW: 3.3 PIPE #: 001 FLOW: VARIABLE (PROPOSED) WQL FOR BOD5,DO,TRC,NH3N	SC0040002 MAJOR MUNICIPAL WATER QUALITY WATER QUALITY
DURBIN CREEK PARA-CHEM SOUTHERN, INC. PIPE #: 001 FLOW: M/R	SCG250117 MINOR INDUSTRIAL EFFLUENT
LITTLE ROCKY CREEK BROCKMAN CATFISH FARM PIPE #: 001 FLOW: 0.1 WQL FOR BOD5,DO	SC0042030 MINOR INDUSTRIAL WATER QUALITY
ENOREE RIVER TRIBUTARY BUCK-A-ROO RANCH INC. PIPE #: 001 FLOW: 0.0101 WQL FOR TRC,NH3N	SC0026662 MINOR COMMUNITY WATER QUALITY
LAND APPLICATION **FACILITY NAME**	**PERMIT#** **TYPE**
SPRAYFIELD 3R, INC. GREER SITE 2-BROCKMAN RD	ND0077399 INDUSTRIAL

Camp Facilities

FACILITY NAME/TYPE ***RECEIVING STREAM***	***PERMIT #*** ***STATUS***
CAMP BUCKHORN/RESIDENT BUCKHORN CREEK	23-305-0127 ACTIVE

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
CRYOVAC DUMP INDUSTRIAL	CERCLA SCD980844021 BEING CLOSED
ENOREE LANDFILL MUNICIPAL	231001-1102 ACTIVE

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
ASHMOORE BROTHERS, INC. 418 SAND PIT	0883-30 SAND

Water Supply

WATER USER (TYPE) *STREAM*	*RATED PUMP. CAPACITY (GPM)* *AMT. TRT./DIV. (MGD)*
JPS AUTOMOTIVE PRODUCTS/TAYLORS PLT 2 (I) ENOREE RIVER	1389.O 2.O

Groundwater Concerns

The groundwater in the vicinity of the property owned by Colonial Pipeline (Site #14828) is contaminated with petroleum products (home fuel oil) due to spills and leaks. The surface water affected by the contamination is Durbin Creek and the area is being monitored. The groundwater in the vicinity of the property owned by Buddy's Inc. (Site #04167) is also contaminated with petroleum products. In this case the contamination is due to underground storage tanks and is considered a risk-based corrective action priority classification 1 (SCDHEC 1997). The contaminated plume is discharging to Brushy Creek.

The groundwater in the vicinity of the property owned by Para-chem Southern, Inc. is contaminated with volatile organic compounds (VOC) resulting from several sources including landfills, pits, ponds, lagoons, and unpermitted disposal. This is an EPA NPL site and is currently in the assessment and remediation phase. The surface water affected by the VOCs is an unnamed tributary of Durbin Creek. Another area with contaminated groundwater is in the vicinity of the property owned by GE Gas Turbine, and it is contaminated with VOCs, petroleum products, and phenol resulting from several sources including spills and leaks, pits, ponds, lagoons, septic tank/tile fields and unknown sources. The facility is currently in the assessment, monitoring, and remediation phases. The groundwater extraction system in the WWTP area has been effective in bringing the stream into compliance. The surface water affected by the contamination is Little Rocky Creek.

Growth Potential

There is a high potential for residential, commercial, and industrial growth in this watershed, which contains the eastern portion of the greater Greenville area. The expansion of the Greenville-Spartanburg Airport and highway improvements around the airport and connecting Greenville to the City of Greer and on to the City of Spartanburg will stimulate continued industrial growth between SC 101, SC 417, the Enoree River, and SC 14. Future industrial development will be prevalent along I-385. The City of Woodruff should also experience industrial, commercial, and residential growth.

Implementation Strategy

This section of the Enoree River is impaired by elevated levels of copper from unknown sources. Biological community data are needed to determine the ecological significance of the metal excursions and should be acquired where feasible. Biological samples were collected at sites further downstream and will be evaluated to determine the cause of their impairment. The Enoree River, Beaverdam Creek, and Mountain Creek are impaired from elevated levels of fecal coliform bacteria resulting from both point and nonpoint sources. Permit revisions have been initiated and bacterial improvements are expected in the next basin rotation.

03050108-020

(Enoree River)

General Description

Watershed 03050108-020 is located in Spartanburg, Laurens, and Union Counties and consists primarily of the ***Enoree River*** and its tributaries from Beaverdam Creek to Duncan Creek. The watershed occupies 71,546 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Wilkes series. The erodibility of the soil (K) averages 0.25; the slope of the terrain averages 18%, with a range of 2-45%. Land use/land cover in the watershed includes: 0.85% urban land, 6.20% agricultural land, 5.13% scrub/shrub land, 0.44% barren land, 87.34% forested land, and 0.04% water.

This segment of the Enoree River accepts drainage from the upstream reach (03050108-010) together with the Beaverdam Creek Watershed, Twomile Creek (Hannah Creek), Buckhead Creek, the Warrior Creek Watershed, Enoree Creek, and Cedar Shoals Creek. Elishas Creek enters the river next followed by Frenchman Creek, Johns Creek (Wildcat Branch), Sispring Branch, and Hills Creek. There are a few recreational lakes (10-35 acres) in this watershed and a total of 126.5 stream miles, all classified FW. The lower portion of the watershed resides within the Sumter National Forest.

Water Quality

Enoree River - There are three monitoring sites along this section of the Enoree River. Aquatic life uses are fully supported at the upstream site **(BE-024)**, and a significantly decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are partially supported due to fecal coliform bacteria excursions. Aquatic life uses are also fully supported at the midstream **(B-041)** and downstream **(B-053)** sites, but may be threatened by a significantly decreasing trend in pH, a significantly increasing trend in turbidity, and a high concentration of zinc measured in 1991. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported at either B-041 or B-053 due to fecal coliform bacteria excursions. This river was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM	*NPDES#*
FACILITY NAME	*TYPE*
PERMITTED FLOW @ PIPE (MGD)	*LIMITATION*
COMMENT	
ENOREE RIVER	SC0041602
TOWN OF WHITMIRE WTP	MINOR DOMESTIC
PIPE #: 001 FLOW: M/R	EFFLUENT

ENOREE CREEK CAROLINA VERMICULITE PIPE #: 001 FLOW: M/R	SCG730013 MINOR INDUSTRIAL EFFLUENT
ENOREE RIVER RIVERDALE MILLS W&S DISTRICT PIPE #: 001 FLOW: 0.09 WQL FOR BOD5,DO,TRC,NH3N	SC0035734 MINOR MUNICIPAL WATER QUALITY
ENOREE RIVER WR GRACE/SUMMER MINE PIPE #: 001 FLOW: M/R	SCG730001 MINOR INDUSTRIAL EFFLUENT
TWOMILE CREEK PIEDMONT DIELECTRICS CORP., INC. PIPE #: 001 FLOW: M/R	SCG250056 MINOR INDUSTRIAL EFFLUENT
BUCKHEAD CREEK WR GRACE/ROPER MINE PIPE #: 001 FLOW: M/R	SCG730089 MINOR INDUSTRIAL EFFLUENT
BUCKHEAD CREEK TRIBUTARY WR GRACE/KEARNEY MILL PIPE #: 001 FLOW: M/R	SC0045811 MINOR INDUSTRIAL EFFLUENT

Landfill Activities

SOLID WASTE LANDFILL NAME ***FACILITY TYPE***	***PERMIT #*** ***STATUS***
TOWN OF WHITMIRE MUNICIPAL	SCD980558084 CLOSED
NATIONAL STARCH INDUSTRIAL	422433-1601 CLOSED

Mining Activities

MINING COMPANY ***MINE NAME***	***PERMIT #*** ***MINERAL***
PATTERSON VERMICULITE CO. NUMBER 8 MINE	1034-30 VERMICULITE
WR GRACE & CO. SCHUMACHER MINE	0907-42 VERMICULITE
WR GRACE & CO. BELK MINE	0693-42 VERMICULITE
WR GRACE & CO. WATSON MINE	1023-42 VERMICULITE
WR GRACE & CO. GIDEON MINE	0833-42 VERMICULITE

WR GRACE & CO. SUMMER MINE	0714-30 VERMICULITE
WR GRACE & CO. ROPER MINE	1119-30 VERMICULITE ORE
WR GRACE & CO. DESHIELDS #1 & #2 MINE	1019-42 VERMICULITE ORE
WR GRACE & CO. BOYD-WHITMORE MINE	1118-30 VERMICULITE ORE
RAY BROWN ENTERPRISES BROWN SAND MINE #2	0861-42 SAND
CAROLINA VERMICULITE SUMNER #1 MINE	0754-42 VERMICULITE
CAROLINA VERMICULITE LAURENCE MINE	1048-44 VERMICULITE ORE

Water Supply

WATER USER (TYPE) *STREAM*	*PUMPING CAPACITY (MGD)* *REG. PUMPING CAPACITY (MGD)*
CITY OF CLINTON (M) ENOREE RIVER	3.5 1.7
TOWN OF WHITMIRE (M) ENOREE RIVER	2.2 1.0

Growth Potential

There is a low potential for growth in the upper portion of this watershed associated with industrial development along US 221. The watershed is bisected by I-26 and some growth may be expected around the interstate interchanges. A commercial corridor has developed along US 176 and SC 72 serving the Whitmire community. Public water is available, but little growth is expected.

Implementation Strategy

The Enoree River is impaired by elevated levels of fecal coliform bacteria resulting from both point and nonpoint sources. Permit revisions have been initiated and bacterial improvements are expected in the next basin rotation.

03050108-030

(Beaverdam Creek/Warrior Creek)

General Description

Watershed 03050108-030 is located in Laurens County and consists primarily of ***Beaverdam Creek and Warrior Creek*** and their tributaries. The watershed occupies 34,834 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Madison-Davidson-Pacolet series. The erodibility of the soil (K) averages 0.26; the slope of the terrain averages 14%, with a range of 2-40%. Land use/land cover in the watershed includes: 0.78% urban land, 21.91% agricultural land, 13.72% scrub/shrub land, 1.78% barren land, 61.04% forested land, and 0.77% water.

Beaverdam Creek flows into the Enoree River near the Town of Enoree and further downstream Warrior Creek enters the river. Beaverdam Creek accepts drainage from Wallace Branch and Warrior Creek accepts drainage from Double Branch and Strouds Branch. There are several ponds and lakes (11-183 acres) in this watershed used for recreation, industry, mining, flood control, water supply, and aquaculture. There are a total of 85.3 stream miles, all classified FW.

Water Quality

Beaverdam Creek (B-246) - Aquatic life uses are fully supported based on physical, chemical, and macroinvertebrate community data. Recreational uses are not supported due to fecal coliform bacteria excursions.

Warrior Creek - There are two monitoring sites along Warrior Creek. Aquatic life uses are fully supported at the upstream site **(B-150)**, but may be threatened by the occurrence of chromium in excess of the acute aquatic life standard. Recreational uses are not supported due to fecal coliform bacteria excursions. At the downstream site **(B-742)**, aquatic life uses are fully supported based on macroinvertebrate community data.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
BEAVERDAM CREEK VULCAN MATERIALS CO./GRAY COURT PIPE #: 001 FLOW: M/R	SCG730055 MINOR INDUSTRIAL EFFLUENT
WARRIOR CREEK WR GRACE/KEARNEY MILL PIPE #: 002 FLOW: 0.025 PROPOSED; WQL FOR BOD5,DO,TRC,NH3N	SC0045811 MINOR INDUSTRIAL WATER QUALITY

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
CAROLINA VERMICULITE CHARLES WALDREP	0970-30 VERMICULITE
VULCAN MATERIALS CO. GRAY COURT QUARRY	0061-30 GRANITE
WR GRACE & CO. F. WALDREP MINE	1022-30 VERMICULITE ORE
WR GRACE & CO. WRIGHT NO. 1 & 2	0278-30 VERMICULITE
WR GRACE & CO. DAVIS-DEWITT MINE	1018-30 VERMICULITE ORE

Growth Potential

There is a low to moderate potential for growth in this watershed. I-385 crosses the watershed and some industrial growth may be expected around interstate interchanges.

03050108-040

(Duncan Creek)

General Description

Watershed 03050108-040 is located in Laurens and Newberry Counties and consists primarily of ***Duncan Creek*** and its tributaries. The watershed occupies 92,409 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Wilkes-Madison-Pacolet series. The erodibility of the soil (K) averages 0.26; the slope of the terrain averages 16%, with a range of 2-45%. Land use/land cover in the watershed includes: 4.57% urban land, 7.62% agricultural land, 5.90% scrub/shrub land, 0.63% barren land, 81.02% forested land, and 0.26% water.

Duncan Creek originates near the Town of Ora and accepts drainage from Duncan Creek Reservoir 6B (73 acres), Long Branch, Saxton Branch, Beards Fork Creek, Millers Fork (Sand Creek), and Allisons Branch. Beards Fork Creek and Millers Fork enter Duncan Creek near the City of Clinton. Further downstream near the Town of Whitmire, South Fork Duncan Creek (Ned Wesson Branch) enters Duncan Creek followed by Mulberry Branch and Sandy Branch. There are several ponds and lakes (11-73 acres) in this watershed used for recreational, municipal, and flood control purposes and a total of 142.5 stream miles, all classified FW. The lower portion of the watershed resides within the Sumter National Forest.

Water Quality

Duncan Creek (B-072) - Aquatic life uses are fully supported based on macroinvertebrate community data, but may be threatened by a significantly decreasing trend in dissolved oxygen concentration and by occurrences of zinc in excess of the aquatic life acute standard, including a very high concentration measured in 1995. Significantly decreasing trends in total phosphorus and total nitrogen concentrations suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

Duncan Creek Reservoir 6B (B-735) - Aquatic life uses are fully supported. Although a pH excursion occurred, high pH levels are not uncommon in lakes with significant aquatic plant communities and are considered natural, not standards violations. Duncan Creek Reservoir 6B is a 73-acre impoundment at the headwaters of an unnamed tributary to Duncan Creek at the top of the watershed in Laurens County. The maximum depth is approximately 15 feet (4.5 m) and the average depth is 5.4 feet (1.7 m). The reservoir's watershed comprises approximately 0.8 square miles (2 km2). It is currently one of the least eutrophic small lakes in South Carolina, characterized by low nutrient concentrations. Preservation of this lake's desirable trophic condition is recommended.

Beards Fork Creek (B-231) - Aquatic life uses are partially supported due to dissolved oxygen excursions. In addition, there is a significantly decreasing trend in pH. A significantly increasing

trend in dissolved oxygen concentration and significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are partially supported due to fecal coliform bacteria excursions, compounded by a significantly increasing trend in fecal coliform bacteria concentration.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
DUNCAN CREEK TOWN OF WHITMIRE PIPE #: 001 FLOW: 0.6 PIPE #: 001 FLOW: 1.0 (PROPOSED) WQL FOR TRC	SC0022390 MINOR MUNICIPAL WATER QUALITY WATER QUALITY
BEARDS FORK CREEK JOHNSON'S CHEVRON PIPE #: 001 FLOW: M/R WQL FOR BOD5	SC0041629 MINOR INDUSTRIAL WATER QUALITY
BEARDS FORK CREEK CLINTON MILLS/BAILEY PIPE #: 001 FLOW: 0.101 PIPE #: 002 FLOW: M/R	SCG250146 MINOR INDUSTRIAL EFFLUENT EFFLUENT
MILLERS FORK CITY OF CLINTON/GARY ST. WTP PIPE #: 001 FLOW: 0.101	SCG645004 MINOR MUNICIPAL EFFLUENT

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
CLINTON MILLS MUNICIPAL	DWP-019 CLOSED
CITY OF CLINTON MUNICIPAL	DWP-026; DWP-914 CLOSED MSW; PROPOSED C&D

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
WR GRACE & CO. GOODWIN MINE	0692-30 VERMICULITE
WR GRACE & CO. COOPER #1 & #2	1064-30 VERMICULITE ORE

Water Supply

WATER USER (TYPE) *STREAM*	*PUMPING CAPACITY (MGD)* *REG. PUMPING CAPACITY (MGD)*
CITY OF CLINTON (M)	3.5
DUNCAN CREEK	1.7
TOWN OF WHITMIRE (M)	1.0
DUNCAN CREEK	1.0

Growth Potential

There is a high potential for industrial growth in this watershed, which contains the City of Clinton and the intersection of I-26 and I-385. Future industrial development will be prevalent along I-385 to the area south of Clinton. US 221 crosses the watershed connecting the Cities of Laurens and Spartanburg, and US 276 connects the Cities of Clinton and Greenville.

Implementation Strategy

Duncan Creek is impaired from elevated levels of fecal coliform bacteria resulting from both point and nonpoint sources. Permit revisions have been initiated and bacterial improvements are expected in the next basin rotation.

03050108-050

(Enoree River)

General Description

Watershed 03050108-050 is located in Newberry and Laurens Counties and consists primarily of the ***Enoree River*** and its tributaries from Duncan Creek to its confluence with the Broad River. The watershed occupies 119,020 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Pacolet-Wilkes series. The erodibility of the soil (K) averages 0.25; the slope of the terrain averages 13%, with a range of 2-40%. Land use/land cover in the watershed includes: 1.03% urban land, 5.87% agricultural land, 2.42% scrub/shrub land, 0.18% barren land, 90.44% forested land, and 0.07% water.

This segment of the Enoree River accepts drainage from the upstream reaches (03050108-010, 03050108-030) together with Sulphur Spring Branch, Collins Branch, and Indian Creek. Indian Creek originates near the Town of Joanna and accepts drainage from Fort Branch, Loftons Branch, Locust Branch, Long Branch (Buncombe Branch), Headleys Creek (Peges Creek), Pattersons Creek, Asias Branch, Gilders Creek (Johns Mountain Branch, Joshuas Branch), and Hunting Creek. South Fork Kings Creek (Little Kings Creek, Means Branch) enters the river near the City of Newberry followed by Fosters Branch, Quarters Branch, and Subers Creek. There are 175.0 stream miles in this watershed, all classified FW. The entire watershed resides within the Sumter National Forest and the Enoree River Waterfowl Area is located near the confluence with the Broad River.

Water Quality

Enoree River (B-054) - Aquatic life uses are fully supported, but may be threatened by a significantly decreasing trend in dissolved oxygen concentration and a significantly increasing trend in total suspended solids. Sediment samples revealed di-n-butylphthalate in 1995. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

Indian Creek (B-071) - Aquatic life uses are fully supported based on macroinvertebrate community data.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM
FACILITY NAME
PERMITTED FLOW @ PIPE (MGD)
COMMENT

NPDES#
TYPE
LIMITATION

HEADLEYS CREEK
JOANNA KOA
PIPE #: 001 FLOW: 0.010
WQL FOR BOD5,DO,TRC,NH3N

SC0024732
MINOR COMMUNITY
WATER QUALITY

Growth Potential

There is a low potential for growth in this watershed, with the exception of the City of Woodruff. Woodruff is expected to experience industrial, commercial, and residential growth. The remainder of the watershed is effectively excluded from development by residing in the Sumter National Forest.

03050107-010

(South Tyger River)

General Description

Watershed 03050107-010 is located in Greenville and Spartanburg Counties and consists primarily of the ***South Tyger River*** and its tributaries. The watershed occupies 114,241 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Cataula series. The erodibility of the soil (K) averages 0.29; the slope of the terrain averages 8%, with a range of 2-25%. Land use/land cover in the watershed includes: 9.14% urban land, 22.16% agricultural land, 4.32% scrub/shrub land, 1.21% barren land, 62.09% forested land, and 1.09% water.

Mush Creek (Johnson Creek, Dysort Lake, Meadow Fork), Barton Creek (McKinney Creek also known as Burban Fork Creek, Noe Creek), and Pax Creek join to form the South Tyger River near Pax Mountain. Just downstream of the confluence the South Tyger River is impounded to form Lake Robinson. Downstream of Lake Robinson, the South Tyger River is joined by Beaverdam Creek and forms Lake Cunningham (Clear Creek). Downstream from Lake Cunningham near the City of Greer, the river accepts drainage from Frohawk Creek, Wards Creek, and Maple Creek. The river then flows through Berrys Pond (60 acres) and accepts drainage from 58 acre-Silver Lake (Williams Creek), Brushy Creek (Powder Branch), Bens Creek, Chickenfoot Creek, and Ferguson Creek (Quarter Creek, Big Ferguson Creek, Little Ferguson Creek). There are several ponds and lakes (10-250 acres) in this watershed used for recreation, industry, water supply, and irrigation. There are a total of 248.5 stream miles, all classified FW.

Water Quality

South Tyger River - There are six monitoring sites along the South Tyger River. Aquatic life uses are fully supported at the furthest upstream site **(B-741)** based on macroinvertebrate community data. Aquatic life uses are also fully supported further downstream **(B-149)**, and significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus concentration, and turbidity suggest improving conditions for these parameters. Recreational uses are fully supported at this site, but may be threatened by a significantly increasing trend in fecal coliform bacteria concentration. Continuing downstream **(B-263)**, aquatic life uses are again fully supported, but may be threatened by a significantly increasing trend in turbidity. A significantly increasing trend in dissolved oxygen concentration and significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentrations suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions, but a significantly decreasing trend in fecal coliform bacteria concentrations suggests improving conditions.

Aquatic life uses are partially supported at the next site downstream **(B-005A)** based on macroinvertebrate community data. Further downstream **(B-005)**, aquatic life uses are fully supported, but may be threatened by a significantly increasing trend in turbidity. Significantly

decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are partially supported due to fecal coliform bacteria excursions. Aquatic life and recreational uses are fully supported at the furthest downstream site **(B-332)**, but aquatic life uses may be threatened by a high concentration of zinc measured in 1995. This river was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Mush Creek (B-317) - Aquatic life uses are fully supported, but may be threatened by a significantly increasing trend in turbidity and a high concentration of zinc measured in a 1994 sediment sample. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus and total nitrogen concentrations suggest improving conditions for these parameters. Recreational uses are partially supported due to fecal coliform bacteria excursions.

Lake John Robinson (CL-100) - Lake Robinson is an 802-acre impoundment on the South Tyger River in Greenville County, with a maximum depth of approximately 40 feet (12.3 m) and an average depth of approximately 18 feet (5.4 m). Lake Robinson's watershed comprises 47 square miles (123 km2). The lake is currently one of the least eutrophic small lakes in South Carolina, characterized by low nutrient concentrations. Preservation of Lake Robinson's desirable trophic condition is recommended.

Lake Cunningham (B-341) - Lake Cunningham is a 250-acre impoundment on the South Tyger River in Greenville County, with a maximum depth of approximately 19 feet (5.8 m) and an average depth of 8.9 feet (2.7 m). Lake Cunningham's watershed comprises approximately 48 square miles (124 km2), and includes Lake John Robinson. Historical eutrophication studies indicate that Lake Cunningham's trophic condition is improving. It is currently one of the least eutrophic small lakes in South Carolina, characterized by low nutrient concentrations. Preservation of this lake's desirable trophic condition is recommended. Aquatic life and recreational uses are fully supported.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
SOUTH TYGER RIVER SSSD/S.TYGER REGIONAL WWTP PIPE #:001 FLOW: 1.0-2.0 WQL FOR TRC	PROPOSED MAJOR MUNICIPAL WATER QUALITY
SOUTH TYGER RIVER LAKEVIEW STEAK HOUSE PIPE #: 001 FLOW: 0.0158	SC0030465 MINOR COMMUNITY EFFLUENT

SOUTH TYGER RIVER WR GRACE/CRYOVAC/DUNCAN PLT PIPE #: 001 FLOW: 0.05025 WQL FOR DO,NH3N	SC0002313 MINOR INDUSTRIAL WATER QUALITY
SOUTH TYGER RIVER CITY OF GREER/S.TYGER RIVER WWTP PIPE #: 001 FLOW: 1.75 WQL FOR DO,TRC,NH3N	SC0020770 MAJOR MUNICIPAL WATER QUALITY
SOUTH TYGER RIVER TOWN OF DUNCAN WWTP PIPE #: 001 FLOW: 0.275 WQL FOR DO,TRC,NH3N	SC0021008 MINOR MUNICIPAL WATER QUALITY
SOUTH TYGER RIVER MEMC ELECTRONIC MATERIALS PIPE #: 001 FLOW: 0.9 PIPE #: 001 FLOW: 1.2 (PROPOSED) WQL FOR TRC	SC0036145 MAJOR INDUSTRIAL WATER QUALITY WATER QUALITY
SOUTH TYGER RIVER CITY OF GREER CPW WTP PIPE #: 001 FLOW: M/R WQL FOR TRC	SCG645020 MINOR DOMESTIC WATER QUALITY
SOUTH TYGER RIVER SSSD/RIVER FALLS PLANTATION PIPE #: 001 FLOW: 0.07 (PROPOSED) PIPE #: 001 FLOW: 0.14 (PROPOSED) NOT CONSTRUCTED	SC0043524 MINOR MUNICIPAL EFFLUENT EFFLUENT
SOUTH TYGER RIVER CITY OF GREER/MAPLE CREEK PLT PIPE #: 001 FLOW: 4.5 WQL FOR DO,TRC,NH3N	SC0046345 MAJOR MUNICIPAL WATER QUALITY
BEAVERDAM CREEK DAVIDSON MINERAL/SANDY FLATS PIPE #: 001 FLOW: M/R	SCG730079 MINOR INDUSTRIAL EFFLUENT
BURBAN FORK CREEK LOOKUP LODGE/PM UTILITIES INC. PIPE #: 001 FLOW: 0.03 WQL FOR TRC,NH3N	SC0026379 MINOR COMMUNITY WATER QUALITY
MEADOW FORK NORTH GREENVILLE COLLEGE PIPE #: 001 FLOW: 0.04 WQL FOR TRC,NH3N	SC0026565 MINOR COMMUNITY WATER QUALITY
MEADOW FORK LAUREL VALLEY INC. PIPE #: 001 FLOW: 0.2 WQL FOR TRC,NH3N; NOT CONSTRUCTED	SC0045331 MINOR MUNICIPAL WATER QUALITY

WILLIAMS CREEK CARMET COMPANY PIPE #: 001 FLOW: 0.009 WQL FOR DO,TRC,NH3N	SC0038083 MINOR INDUSTRIAL WATER QUALITY
WILLIAMS CREEK MILLIKEN/ARMITAGE PLT PIPE #: 001 FLOW: 0.36 WQL FOR TRC,NH3N	SC0023451 MINOR INDUSTRIAL WATER QUALITY
WILLIAMS CREEK TRIBUTARY US ALUMOWELD CO., INC. PIPE #: 001 FLOW: 0.003 WQL FOR NH3N,TRC	SC0043982 MINOR INDUSTRIAL WATER QUALITY

LAND APPLICATION FACILITY NAME	**PERMIT# TYPE**
SPRAYFIELD RD ANDERSON APPLIED TECH. CTR.	ND0067351 MUNICIPAL
SPRAYFIELD 3R, INC./GREER SITE 1-WOFFORD RD	ND0077399 INDUSTRIAL

Landfill Activities

SOLID WASTE LANDFILL NAME FACILITY TYPE	***PERMIT # STATUS***
CITY OF GREER-SOUTH TYGER WWTP SLUDGE MONOFIL	421003-1501 ACTIVE

Mining Activities

MINING COMPANY MINE NAME	***PERMIT # MINERAL***
DAVIDSON MINERAL PROPERTIES, INC. SANDY FLAT QUARRY	0502-23 GRANITE
KING ASPHALT, INC. THEO	0809-42 SAND
CAROLINA VERMICULITE NUKKER-THOMPSON MINE	0893-42 VERMICULITE

Camp Facilities

FACILITY NAME/TYPE RECEIVING STREAM	***PERMIT # STATUS***
LOOKUP LODGE/RESIDENT BURBAN FORK CREEK	23-305-0116 ACTIVE

Water Supply

WATER USER (TYPE) *STREAM*	*PUMPING CAPACITY (MGD)* *REG. PUMPING CAPACITY (MGD)*
CITY OF GREER CPW (M)	18.0
LAKE CUNNINGHAM	8.0

Groundwater Concerns

The groundwater in the vicinity of the property owned by Elmore Waste Disposal is contaminated with volatile organic compounds (VOC) resulting from unpermitted disposal. The facility is currently in the remediation phase. The surface water affected by the VOCs is Wards Creek.

Growth Potential

There is a high potential for growth in this watershed, which contains the City of Greer. The Greenville-Spartanburg Airport expansion, the development of the BMW automotive plant, and highway improvements in the area surrounding the BMW plant will stimulate continued growth. Growth is also expected around the I-85 and US 29 corridors, which connect the Cities of Greenville, Greer, and Spartanburg. The Town of Duncan is expected to serve as a bedroom community for the Greer-Spartanburg area.

Implementation Strategy

The South Tyger River has an impaired macroinvertebrate community from point sources. A facility is currently under enforcement action for acute toxicity. The river is also impacted by elevated levels of fecal coliform bacteria due to point and nonpoint sources. Permit revisions have been initiated and bacterial improvements are expected in the next basin rotation.

03050107-020

(North Tyger River)

General Description

Watershed 03050107-020 is located in Spartanburg County and consists primarily of the upper ***North Tyger River*** and its tributaries. The watershed occupies 22,376 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Cataula series. The erodibility of the soil (K) averages 0.27; the slope of the terrain averages 12%, with a range of 2-40%. Land use/land cover in the watershed includes: 10.74% urban land, 32.45% agricultural land, 0.57% scrub/shrub land, 0.37% barren land, 54.14% forested land, and 1.73% water.

Jordan Creek, which was impounded to create Lake Cooley, drains into the North Tyger River along with several unnamed tributaries. There are several ponds and lakes (10-330 acres) in this watershed used for recreational purposes and 44.9 stream miles, all classified FW.

Water Quality

North Tyger River (B-219) - Aquatic life uses are partially supported due to occurrences of zinc, including a high concentration that was in excess of the aquatic life acute standard. In addition, there are significantly decreasing trends in dissolved oxygen concentration and pH, and a significantly increasing trend in turbidity. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions, compounded by a significantly increasing trend in fecal coliform bacteria concentration.

Lake Cooley (B-348) - Lake Cooley is a 330-acre impoundment on Jordan Creek in Spartanburg County, with a maximum depth of approximately 39 feet (12.0 m) and a mean depth of 4.0 feet (1.2 m). Lake Cooley's watershed comprises approximately 10 square miles (27 km2). The lake is currently one of the least eutrophic small lakes in South Carolina, characterized by low nutrient concentrations. Preservation of Lake Cooley's desirable trophic condition is recommended. Aquatic life and recreational uses are fully supported.

Unnamed Tributary to the North Tyger River (B-315) - Aquatic life uses are fully supported, but may be threatened by a significantly decreasing trend in pH. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)*	*NPDES#* *TYPE* *LIMITATION*
NORTH TYGER RIVER SSSD/BUCKEYE FOREST PIPE #: 001 FLOW: 0.06	SC0000957 MINOR MUNICIPAL EFFLUENT
NORTH TYGER RIVER STEVECOKNIT/MICKEL PLT PIPE #: 001 FLOW: M/R	SCG250147 MINOR INDUSTRIAL EFFLUENT
NORTH TYGER RIVER LEIGH FIBERS, INC. PIPE #: 001 FLOW: M/R	SCG250170 MINOR INDUSTRIAL EFFLUENT
LAKE COOLEY VULCAN MATERIALS CO. PIPE #: 001 FLOW: M/R	SCG730056 MINOR INDUSTRIAL EFFLUENT
NORTH TYGER TRIBUTARY JACKSON MILLS/WELLFORD PLT PIPE #: 001 FLOW: 0.05 WQL FOR DO,TRC,NH3N	SC0001716 MINOR MUNICIPAL WATER QUALITY

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
WELLFORD LANDFILL MUNICIPAL	421001-1101 ACTIVE
WELLFORD LANDFILL C&D LANDFILL	421001-1201 ACTIVE
OLD WELLFORD LANDFILL MUNICIPAL	DWP-012 CLOSED
MESSER MIRROR INDUSTRIAL	IWP-196 ACTIVE
PALMETTO LANDFILL MUNICIPAL	422401-1101 ACTIVE

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
VULCAN MATERIAL CO. LYMAN QUARRY	0587-42 GRANITE
GROUND IMPROVEMENT TECHNIQUES, INC. WELLFORD CLAY MINE	1125-42 CLAY

Growth Potential

There is a high potential for growth in this watershed, which connects the Cities of Greer and Spartanburg via the I-85 corridor and major roads with I-85 interchanges. There are also industrial developmental pressures along US 29. The City of Spartanburg is building regional treatment facilities, which should provide for future growth. The City of Wellford is expected to serve as a bedroom community for the Greer-Spartanburg area.

Implementation Strategy

The North Tyger River is impaired by elevated levels of zinc from unknown sources. Biological community data are needed to determine the ecological significance of the metal excursions and should be acquired where feasible. The North Tyger River is also impaired from elevated levels of fecal coliform bacteria resulting from both point and nonpoint sources. Permit revisions have been initiated and bacterial improvements are expected in the next basin rotation.

03050107-030

(North Tyger River)

General Description

Watershed 03050107-030 is located in Spartanburg County and consists primarily of the lower ***North Tyger River*** and its tributaries. The watershed occupies 33,797 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Davidson-Pacolet-Enon-Cecil series. The erodibility of the soil (K) averages 0.29; the slope of the terrain averages 8%, with a range of 2-15%. Land use/land cover in the watershed includes: 18.00% urban land, 16.55% agricultural land, 2.52% scrub/shrub land, 0.08% barren land, 62.77% forested land, and 0.08% water.

Frey Creek (Grays Creek) drains into the North Tyger RIver followed by Jimmies Creek, Cub Branch, Ranson Creek, Tim Creek (Montgomery Pond), and Stillhouse Branch. Further downstream the river flows through Ott Shoals and accepts drainage from Wards Creek (Tanyard Branch), Tin Roof Branch, Johnson Branch (Big Branch), and Thomas Branch. There are several ponds and lakes (10-137 acres) in this watershed used for recreational purposes and 75.2 stream miles, all classified FW.

Water Quality

North Tyger River - There are three monitoring sites along this portion of the North Tyger River. Aquatic life uses are fully supported at the upstream site **(B-017)** based on macroinvertebrate community data. Further downstream **(B-162)**, aquatic life uses are also fully supported, but may be threatened by a significantly decreasing trend in pH and a significantly increasing trend in turbidity. A significantly increasing trend in dissolved oxygen concentration and a significantly decreasing trend in five-day biochemical oxygen demand suggests improving conditions for these parameters. Aquatic life uses are again fully supported at the downstream site **(B-018A)**, but recreational uses are not supported at either downstream location due to fecal coliform bacteria excursions. This river was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)*	*NPDES#* *TYPE* *LIMITATION*
NORTH TYGER RIVER ABCO INDUSTRIES LTD. PIPE #: 001 FLOW: 0.036	SC0002321 MAJOR INDUSTRIAL EFFLUENT

NORTH TYGER RIVER LAIDLAW ENV. SERVICES PIPE #: 001 FLOW: 0.234	SC0040517 MAJOR INDUSTRIAL EFFLUENT
NORTH TYGER RIVER SSSD/NORTH TYGER RIVER PIPE #: 001 FLOW: 2.0 WQL FOR TRC,NH3N	SC0043532 MAJOR MUNICIPAL WATER QUALITY
NORTH TYGER RIVER SSSD/NORTH TYGER RIVER PIPE #: 001 FLOW: 5.5 (PROPOSED) WQL FOR BOD5,DO,TRC,NH3N	SC0043532 MAJOR MUNICIPAL WATER QUALITY
NORTH TYGER RIVER SSSD/REEVES BROS. WWTP PIPE #: 001 FLOW: 0.085 PIPE #: 001 FLOW: 0.1013 (PROPOSED)	SC0047139 MINOR MUNICIPAL EFFLUENT EFFLUENT
CUB BRANCH HARMON'S TRAILER PARK PIPE #: 001 FLOW: 0.03 WQL FOR DO,TRC,NH3N	SC0033308 MINOR MUNICIPAL WATER QUALITY
CUB BRANCH SSSD/FOREST PARK ESTATES PIPE #: 001 FLOW: 0.05 WQL FOR TRC,NH3N	SC0034321 MINOR MUNICIPAL WATER QUALITY
CUB BRANCH SSSD/SHORESBROOK SD PIPE #: 001 FLOW: 0.2 WQL FOR TRC,NH3N	SC0035891 MINOR MUNICIPAL WATER QUALITY
TIM CREEK SSSD/ROEBUCK MIDDLE SCHOOL PIPE #: 001 FLOW: 0.02 WQL FOR DO,TRC,NH3N	SC0037532 MINOR MUNICIPAL WATER QUALITY
TIM CREEK SSSD/TIM CREEK WWTP PIPE #: 001 FLOW: 0.05 WQL FOR TRC,NH3N	SC0041491 MINOR MUNICIPAL WATER QUALITY
JIMMIES CREEK SYBRON CHEMICALS WWTP PIPE #: 001 FLOW: 0.36 WQL FOR DO	SC0003492 MINOR INDUSTRIAL WATER QUALITY
RANSON CREEK MADERA SD PIPE #: 001 FLOW: 0.076 WQL FOR DO,TRC,NH3N	SC0021687 MINOR COMMUNITY WATER QUALITY

RANSON CREEK TRIBUTARY LINVILLE HILLS SD PIPE #: 001 FLOW: 0.12 WQL FOR DO,TRC,NH3N	SC0034169 MINOR MUNICIPAL WATER QUALITY
FREY CREEK MIDWAY PARK INC. PIPE #: 001 FLOW: 0.015 WQL FOR TRC	SC0030571 MINOR COMMUNITY WATER QUALITY

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
PALMETTO LANDFILL MUNICIPAL	422401-1101 ACTIVE
BATCHILDER BLASIUS SMELTING SLAG LANDFILL	—— CLOSED
SPRINGS INDUSTRIES/SPARTANBURG COUNTY INDUSTRIAL/MUNICIPAL	—— CLOSED
TINDAL CONCRETE SPECIAL WASTE LANDFILL INDUSTRIAL	423340-1601 ACTIVE

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
WR GRACE & CO. JOHNSON MINE	0834-42 VERMICULITE

Growth Potential

There is a moderate potential for growth in this watershed. I-26 bisects the watershed and growth is expected around the major highway interchanges, along with industrial developmental pressures along US 29 and US 221. The City of Spartanburg is building regional treatment facilities, which should provide for future growth.

Implementation Strategy

The North Tyger River is impaired by elevated levels of zinc from unknown sources. Biological community data are needed to determine the ecological significance of the metal excursions and should be acquired where feasible. The North Tyger River is also impaired from elevated levels of fecal coliform bacteria resulting from both point and nonpoint sources. Permit revisions have been initiated and bacterial improvements are expected in the next basin rotation.

03050107-040

(Middle Tyger River)

General Description

Watershed 03050107-040 is located in Greenville and Spartanburg Counties and consists primarily of the ***Middle Tyger River*** and its tributaries. The watershed occupies 64,948 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil series. The erodibility of the soil (K) averages 0.28; the slope of the terrain averages 8%, with a range of 2-15%. Land use/land cover in the watershed includes: 9.02% urban land, 23.85% agricultural land, 0.77% scrub/shrub land, 1.08% barren land, 64.32% forested land, and 0.95% water.

The Middle Tyger River accepts drainage from Campbell Creek, Beaverdam Creek (Barnes Creek), and Spencer Creek before flowing into Lyman Lake (Meadow Creek). Downstream of Lyman Lake, another Beaverdam Creek (Foyster Creek, Thompson Branch, Berrys Millpond, Silver Lake) flows into the river followed by Twin Lakes much further downstream. There are several ponds and lakes (16-500 acres) in this watershed used for recreational, industrial, municipal, and irrigational purposes. There are a total of 120.3 stream miles, all classified FW.

Water Quality

Middle Tyger River - There are three monitoring sites along the Middle Tyger River. Aquatic life uses are fully supported at the upstream site **(B-148)** based on macroinvertebrate community, but may be threatened by a significantly increasing trend in turbidity, occurrences of zinc (including a very high concentration) in excess of the aquatic life acute standard, and a very high concentration of cadmium measured in sediment. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Aquatic life uses are fully supported at the midstream site **(B-012)**, but may be threatened by a significantly decreasing trend in pH. A significantly decreasing trend in five-day biochemical oxygen demand concentration suggests improving conditions for this parameter. Aquatic life uses are again fully supported at the downstream site **(B-014)** based on physical, chemical, and macroinvertebrate community data. Recreational uses are not supported at any site due to fecal coliform bacteria excursions and there is a significantly increasing trend in fecal coliform bacteria concentration. This river was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM
FACILITY NAME
PERMITTED FLOW @ PIPE (MGD)
COMMENT

NPDES#
TYPE
LIMITATION

MIDDLE TYGER RIVER SPARTAN MILLS/STARTEX MILL PIPE #: 001 FLOW: 0.9 WQL FOR BOD5,DO,TRC	SC0002453 MAJOR INDUSTRIAL WATER QUALITY
MIDDLE TYGER RIVER TOWN OF LYMAN WWTP PIPE #: 001 FLOW: 6.0 WQL FOR BOD5,DO,TRC,NH3N	SC0021300 MAJOR MUNICIPAL WATER QUALITY
MIDDLE TYGER RIVER SJWD/WTP PIPE #: 001 FLOW: M/R	SCG643003 MINOR MUNICIPAL EFFLUENT
MIDDLE TYGER RIVER SSSD/BROOKSIDE VILLAGE PIPE #: 001 FLOW: 0.08	SC0023698 MINOR MUNICIPAL EFFLUENT
MIDDLE TYGER RIVER SSSD/TWIN LAKES SD PIPE #: 001 FLOW: 0.12	SC0035696 MINOR MUNICIPAL EFFLUENT

LAND APPLICATION **FACILITY NAME**	**PERMIT#** **TYPE**
SPRAYFIELD BLUE RIDGE HIGH SCHOOL	ND0064629 MUNICIPAL

Landfill Activities

SOLID WASTE LANDFILL NAME ***FACILITY TYPE***	***PERMIT #*** ***STATUS***
SPRINGS INDUSTRIES INDUSTRIAL	—— CLOSED

Mining Activities

MINING COMPANY ***MINE NAME***	***PERMIT #*** ***MINERAL***
CLARK CONSTRUCTION CO. CLARK-TYGER SAND MINE	0886-23 SAND
PANEX-EC RESTER MINE	0880-23 SAND & GRAVEL

Water Supply

WATER USER (TYPE) ***STREAM***	***PUMPING CAPACITY (MGD)*** ***REG. PUMPING CAPACITY (MGD)***
SJWD (M) MIDDLE TYGER RIVER	32.8 14.0

Growth Potential

There is a high potential for growth in this watershed, which connects the Cities of Greer and Spartanburg via the I-85 corridor and major roads with I-85 interchanges. There are also industrial developmental pressures along US 29. The Towns of Lyman and Startex are expected to serve as a bedroom community for the Greer-Spartanburg area.

Implementation Strategy

The Middle Tyger River is impaired by elevated levels of fecal coliform bacteria resulting from both point and nonpoint sources. Permit revisions have been initiated and bacterial improvements are expected in the next basin rotation.

03050107-050

(Tyger River)

General Description

Watershed 03050107-050 is located in Spartanburg and Union Counties and consists primarily of the ***Tyger River*** and its tributaries from its confluence with the South and North Tyger Rivers to its confluence with the Broad River. The watershed occupies 152,393 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Wilkes-Madison series. The erodibility of the soil (K) averages 0.24; the slope of the terrain averages 20%, with a range of 6-45%. Land use/land cover in the watershed includes: 0.70% urban land, 6.74% agricultural land, 5.28% scrub/shrub land, 0.34% barren land, 86.90% forested land, and 0.05% water.

The Tyger River is formed by the confluence of the South Tyger River Watershed and the North Tyger River Watershed. The Tyger River then accepts drainage from Nichol Branch (Kelly Branch), Vise Branch, Harrelson Branch (Wofford Branch, Aiken Branch), Jimmies Creek, Cane Creek (Martha Shands Branch, Williams Branch, Trail Branch), Motley Branch, Hackers Creek, and Dutchman Creek. Dutchman Creek accepts drainage from Harrison Branch, Newman Branch, Smith Creek (Jennings Branch), Powder Spring Branch, Shands Branch (Pennywinkle Branch), Paint Bearden Branch, Bearden Branch, another Wofford Branch, Wiley Fork Creek (Carson Branch), and Dry Branch. Cowdens Creek enters the river next followed by Mill Creek, another Wofford Branch, Holcombe Branch, Isaacs Creek, and Sparks Creek. Further downstream, the Tyger River accepts drainage from the Fairforest Creek Watershed, the Tinker Creek Watershed, Hawkins Creek, Johnsons Creek, Padgetts Creek, Evans Branch, Rennicks Branch, Duffs Branch, Peters Creek, and Cane Creek (Brocks Creek). Due to the absence of point source dischargers and the presence of endangered species and other special characteristics, portions of the Tyger River within the Sumter National Forest may qualify as potential ORW candidates. There are a few ponds and lakes (10-25 acres) in this watershed used for recreational purposes and 234.5 stream miles, all classified FW. The lower half of the watershed resides within the Sumter National Forest. Rose Hill State Park is located near the confluence of the Tyger River and Fairforest Creek.

Water Quality

Tyger River - There are two monitoring sites along the Tyger River. Aquatic life uses are fully supported at the upstream site **(B-008)**, but may be threatened by significantly decreasing trends in dissolved oxygen concentration and pH, and a significantly increasing trend in turbidity. Sediment samples revealed a very high concentration of chromium in 1992 and a high concentration in 1993. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus and total nitrogen concentrations suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions. In addition, there is a significantly increasing trend in fecal coliform bacteria concentration.

At the downstream site **(B-051)**, aquatic life uses are not supported due to occurrences of zinc in excess of the aquatic life acute standard, including a high concentration in 1993. In addition, there are significantly increasing trends in pH and turbidity. Significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus and total nitrogen concentrations suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions. This river was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Jimmies Creek (B-019) - Aquatic life uses are fully supported. A significantly increasing trend in dissolved oxygen concentration and significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

Dutchman Creek (B-733) - Aquatic life uses are fully supported based on macroinvertebrate community data.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
TYGER RIVER SC DEPT. CORR./CROSS ANCHOR CORR. INST. PIPE #: 001 FLOW: 0.35	SC0036773 MINOR COMMUNITY EFFLUENT
TYGER RIVER SYNTHETIC IND./SPARTANBURG PLT PIPE #: 001 FLOW: M/R	SCG250074 MINOR INDUSTRIAL EFFLUENT

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
WR GRACE & CO. FOSTER MINE	0460-42 VERMICULITE
WR GRACE & CO. PROVIDENCE MINE	0706-42 VERMICULITE
WR GRACE & CO. C. CASEY MINE	1017-42 VERMICULITE ORE
WR GRACE & CO. MYERS MINE	1021-42 VERMICULITE ORE

KING ASPHALT, INC. JOSEPH W. THEO MINE	1124-42 SAND
PATTERSON VERMICULITE CO. FANNIE YOUNG MINE	0585-42 VERMICULITE

Growth Potential

There is an overall low potential for growth in this watershed. An exception would be the City of Woodruff, which is expected to experience residential, commercial, and industrial growth. The lower portion of the watershed is effectively excluded from development by the Sumter National Forest. The western section of the Town of Carlisle is in this watershed, and two projects have been proposed which could influence its growth. One is to impound the Tyger River to create a public access lake to promote development, and the other is to develop a regional solid waste landfill. Union County is currently developing a feasibility study for a multi-county landfill.

Implementation Strategy

The Tyger River is impaired by elevated levels of zinc from unknown sources. Biological community data are needed to determine the ecological significance of the metal excursions and should be acquired where feasible. The Tyger River is also impaired from elevated levels of fecal coliform bacteria resulting from both point and nonpoint sources. Permit revisions have been initiated and bacterial improvements are expected in the next basin rotation.

03050107-060

(Fairforest Creek/Tinker Creek)

General Description

Watershed 03050107-060 is located in Spartanburg and Union Counties and consists primarily of ***Fairforest Creek and Tinker Creek*** and their tributaries. Both Fairforest Creek and Tinker Creek flow into the Broad River. The watershed occupies 155,396 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Madison-Wilkes series. The erodibility of the soil (K) averages 0.26; the slope of the terrain averages 13% with a range of 2-40%. Land use/land cover in the watershed includes: 14.57% urban land, 11.42% agricultural land, 3.14% scrub/shrub land, 0.34% barren land, 70.22% forested land, and 0.31% water.

Fairforest Creek originates near the City of Spartanburg and accepts drainage from Goat Pond Creek, Holston Creek, Beaverdam Creek (Reedy Creek), Foster Creek (Underwood Branch), Reedy Branch, Buffalo Creek (Zimmerman Pond), Fleming Branch, Goose Branch, Stillhouse Branch (Smith Branch), and Lancaster Branch (James Branch, Pauline Creek, Dugan Creek). Kelsey Creek flows through Lake Craig (Lake Johnson, Thompson Creek) before entering Fairforest Creek. Black Branch (Whitestone Spring Branch) flows into Fairforest Creek next followed by McElwain Creek (Story Branch, Mineral Spring Branch, Sulphur Spring Branch), Kennedy Creek (Iscons Creek, Cunningham Creek), McClure Creek, Sugar Creek (another Beaverdam Creek, Whitlock Lakes, White Pine Lake), Swink Creek (Bishop Branch), and Rocky Creek. Swink Creek is also known as Mitchell Creek and Bishop Branch is also known as Mill Creek. Further downstream, Fairforest Creek accepts drainage from Mitchell Creek, another Sugar Creek (West Springs Branch), another Buffalo Creek, Dining Creek, Shoal Creek (Toschs Creek), Sand Creek, and Morris Branch.

Tinker Creek flows into the Broad River downstream of Fairforest Creek. Tinker Creek accepts drainage from Henry Creek (Reno Lake), Brushy Creek, and Swift Run. There are several ponds and lakes (11-105 acres) in this watershed used for recreational purposes, and 253.7 stream miles, all classified FW. The lower portion of the watershed resides within the Sumter National Forest, and Croft State Park is located next to Fairforest Creek, just south of the City of Spartanburg.

Water Quality

Fairforest Creek - There are five monitoring sites along Fairforest Creek. Aquatic life uses are fully supported at the upstream sites **(B-020, B-164)**, but may be threatened by a significantly increasing trend in turbidity at both sites and a significantly decreasing trend in pH at B-020. A significantly decreasing trend in total phosphorus concentration at both upstream sites suggests improving conditions for this parameter. Recreational uses are not supported at either site due to fecal coliform bacteria excursions. This is compounded at B-164 by a significantly increasing trend in fecal coliform bacteria concentration.

Further downstream **(B-021)**, aquatic life uses are partially supported based on macroinvertebrate community data. In addition, there is a significantly increasing trend in turbidity,

and occurrences of chromium and zinc in excess of the aquatic life acute standard, including two high concentrations of zinc. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus and total nitrogen concentrations suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions, compounded by a significantly increasing trend in fecal coliform bacteria concentration.

Aquatic life uses are also partially supported at the next site downstream **(BF-007)** due to dissolved oxygen excursions. In addition, there is a significantly decreasing trend in dissolved oxygen concentration. This is a secondary monitoring station and sampling is purposely biased towards periods with potentially low dissolved oxygen concentrations. Significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus concentration, and turbidity suggest improving conditions for these parameters. Recreational uses are partially supported due to fecal coliform bacteria excursions; however, a significantly decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter. At the furthest downstream site **(BF-008)**, aquatic life uses are fully supported based on physical, chemical, and macroinvertebrate community data. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are partially supported due to fecal coliform bacteria excursions.

This creek was Class B until April, 1992. Because of chronically high concentrations of fecal coliform bacteria in the upper portions of this creek, samples were collected from additional sites on upper Fairforest Creek in August of 1995. No obvious point source was identified as concentrations were extremely high at all sampling sites, with the exception of the most upstream site. Even at the upstream site Class FW standards were exceeded. The most likely sources of the elevated fecal coliform bacteria concentrations are stormwater runoff and sewage collection system failures.

Unnamed Tributary to Fairforest Creek (B-321) - Aquatic life uses are not supported due to occurrences of chromium, copper, lead, and zinc in excess of the aquatic life acute standard, including a very high concentration of zinc in 1994, a high concentration of copper in 1994, and a high concentration of zinc in 1995. In addition, there is a significantly decreasing trend in pH and a significantly increasing trend in turbidity. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus and total nitrogen concentrations suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions, compounded by a significantly increasing trend in fecal coliform bacteria concentration.

Kelsey Creek (B-235) - Aquatic life uses are fully supported, but may be threatened by significantly decreasing trends in dissolved oxygen concentration and pH, and a significantly increasing trend in turbidity. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentrations suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

Lake Johnson (CL-035) - Aquatic life uses are fully supported. Although pH excursions occurred, higher pH levels are not uncommon in lakes with significant aquatic plant communities and are considered natural, not standards violations. Lake Edwin Johnson, in Croft State Park in Spartanburg County, is a 40-acre impoundment on Thompson Creek. Lake Johnson's maximum depth is approximately 28 feet (8.5 m); average depth is approximately 14 feet (4.4 m). The lake's watershed comprises approximately 9.3 square miles (24 km2) and includes Lake Craig. Lake Johnson currently maintains an intermediate trophic condition among small lakes in South Carolina; the lake is managed for fishing and supports high algal biomass.

Lake Craig (CL-033) - Aquatic life uses are fully supported. Lake Tom Moore Craig, in Croft State Park in Spartanburg County, is a 105-acre impoundment on Kelsey Creek. The average depth of Lake Craig is approximately 17 feet (5.2 m); the maximum depth is approximately 20 feet (6.1 m). The lake's watershed comprises approximately 8.1 square miles (21 km2). Historical eutrophication studies indicate that Lake Craig's trophic condition is improving; the impoundment has been reconstructed after being destroyed in 1990 floods. The lake is currently one of the least eutrophic small lakes in South Carolina, characterized by low nutrient concentrations. Preservation of Lake Craig's desirable trophic condition is recommended.

Swink Creek or Mitchell Creek (B-199) - Aquatic life uses are fully supported. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentrations suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

Toschs Creek - There are two monitoring sites along Toschs Creek. Aquatic life uses are fully supported at the upstream site **(B-067A)**, and significantly decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. Aquatic life uses are also fully supported at the downstream site **(B-067B)**, but may be threatened by a significantly increasing trend in pH. Significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus concentrations, and turbidity suggest improving conditions for these parameters. Recreational uses are not supported at either site due to fecal coliform bacteria excursions, and is compounded at the downstream site by a significantly increasing trend in fecal coliform bacteria concentration. This creek was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Tinker Creek - There are three monitoring sites along Tinker Creek. Aquatic life uses are fully supported at the upstream site **(B-286)**. Aquatic life uses are also fully supported at the midstream site **(B-287)**, but may be threatened by a significantly increasing trend in pH. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration at both the upstream and midstream sites suggest improving conditions for these parameters. Aquatic life uses are again fully supported at the downstream site **(B-336)** based on macroinvertebrate community data,

but may be threatened by occurrences of copper and zinc in excess of the aquatic life acute standard. Recreational uses are not supported at any site due to fecal coliform bacteria excursions. This creek was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
FAIRFOREST CREEK SSSD/FAIRFOREST PLANT PIPE #: 001 FLOW: 14.1 WQL FOR TRC,NH3N	SC0020435 MAJOR MUNICIPAL WATER QUALITY
FAIRFOREST CREEK FAIRWOODS SD/UNITED UTILITIES PIPE #: 001 FLOW: 0.065	SC0035041 MINOR COMMUNITY EFFLUENT
FAIRFOREST CREEK SSSD/CAROLINA COUNTRY CLUB PIPE #: 001 FLOW: 0.25 WQL FOR DO,TRC	SC0039560 MINOR MUNICIPAL WATER QUALITY
FAIRFOREST CREEK CITY OF UNION/TOSCHS CREEK WWTP PIPE #: 001 FLOW: 6.0 PROPOSED; WQL FOR BOD5,DO,TRC,NH3N	SC0047244 MAJOR MUNICIPAL WATER QUALITY
FAIRFOREST CREEK MAYFAIR MILLS/MAYFAIR & BAILEY PIPE #: 001 FLOW: M/R	SCG250015 MINOR INDUSTRIAL EFFLUENT
FAIRFOREST CREEK DITCH ADO CORP. WWTP PIPE #: 001 FLOW: M/R	SCG250071 MINOR INDUSTRIAL EFFLUENT
FAIRFOREST CREEK TRIBUTARY POWDERCRAFT CORP. PIPE #: 001 FLOW: M/R	SCG250159 MINOR INDUSTRIAL EFFLUENT
FAIRFOREST CREEK TRIBUTARY SPARTAN MILLS/SPARTAN DIV. PIPE #: 001 FLOW: M/R	SC0002445 MINOR INDUSTRIAL EFFLUENT
FAIRFOREST CREEK TRIBUTARY STONEHAVEN MHP PIPE #: 001 FLOW: .0225 WQL FOR DO,TRC,NH3N	SC0032409 MINOR COMMUNITY WATER QUALITY

REEDY CREEK SSSD/MARILYNDALE SD PIPE #: 001 FLOW: 0.0415 WQL FOR TRC	SC0030121 MINOR MUNICIPAL WATER QUALITY
GOAT POND CREEK AMOCO FABRICS & FIBERS PIPE #: 001 FLOW: M/R	SC0003107 MINOR INDUSTRIAL EFFLUENT
GOAT POND CREEK SYNTHETIC IND./SPARTANBURG PLT PIPE #: 001 FLOW: M/R	SCG250074 MINOR INDUSTRIAL EFFLUENT
HOLSTON CREEK EVANS MHP PIPE #: 001 FLOW: 0.0038 WQL FOR TRC,NH3N	SC0029521 MINOR COMMUNITY WATER QUALITY
HOLSTON CREEK MINI MART/SPARTANBURG PIPE #: 001 FLOW: M/R	SCG830017 MINOR INDUSTRIAL EFFLUENT
BEAVERDAM CREEK DAVIDSON MINERAL/SANDY FLATS PIPE #: 001 FLOW: M/R	SCG730079 MINOR INDUSTRIAL EFFLUENT
BEAVERDAM CREEK TRIBUTARY S&S MANUFACTURING PIPE #: 001 FLOW: 0.01 WQL FOR TRC,NH3N	SC0022616 MINOR INDUSTRIAL WATER QUALITY
KELSEY CREEK CITCO PETROLEUM PIPE #: 001 FLOW: M/R	SCG340008 MINOR INDUSTRIAL EFFLUENT
KELSEY CREEK TRIBUTARY COLONIAL PIPELINE/SPARTANBURG PIPE #: 001 FLOW: M/R	SC0040665 MINOR INDUSTRIAL EFFLUENT
MILL CREEK TOWN OF JONESVILLE PIPE #: 001 FLOW: 0.15 PIPE #: 001 FLOW: 0.25 (PROPOSED) WQL FOR DO,TRC,NH3N	SC0024988 MINOR MUNICIPAL WATER QUALITY WATER QUALITY
MINERAL SPRING BRANCH SPARTANBURG BOYS HOME PIPE #: 001 FLOW: 0.0035 WQL FOR TRC	SC0024449 MINOR COMMUNITY WATER QUALITY
ROCKY CREEK MILLIKEN & CO./CEDAR HILL PLT PIPE #: 001 FLOW: 0.0163 PIPE #: 001 FLOW: 0.0170 (PHASE I) PIPE #: 001 FLOW: 0.0198 (PHASE II) WQL FOR TRC,NH3N	SC0000809 MINOR INDUSTRIAL WATER QUALITY WATER QUALITY WATER QUALITY

TOSCHS CREEK TRIBUTARY	SC0038636
TORRINGTON CO./UNION BEARINGS	MINOR INDUSTRIAL
PIPE #: 001 FLOW: M/R	WATER QUALITY
PIPE #: 002 FLOW: M/R	WATER QUALITY
WQL FOR BOD5	
ISCONS CREEK TRIBUTARY	SC0023370
MILLIKEN & CO./WHITESTONE	MINOR INDUSTRIAL
PIPE #: 001 FLOW: M/R	EFFLUENT
SUGAR CREEK TRIBUTARY	SCG830023
UNION AMOCO STATION	MINOR INDUSTRIAL
PIPE #: 001 FLOW: M/R	EFFLUENT
TINKER CREEK	SC0021202
CITY OF UNION/BELTLINE PLANT	MINOR MUNICIPAL
PIPE #: 001 FLOW: 0.35	WATER QUALITY
WQL FOR BOD5,DO,TRC,NH3N	

Landfill Activities

SOLID WASTE LANDFILL NAME	*PERMIT #*
FACILITY TYPE	*STATUS*
RED HILL LANDFILL	422444-1601
INDUSTRIAL	ACTIVE
CROFT LANDFILL	421001-1102
MUNICIPAL	ACTIVE
OLD CITY/COUNTY DUMP	——
MUNICIPAL	CLOSED
MAXIE COPELAND LANDFILL	442329-1201
LONGTERM C&D LANDFILL	ACTIVE

Mining Activities

MINING COMPANY	*PERMIT #*
MINE NAME	*MINERAL*
FAIRFOREST CREEK SAND CO.	1059-42
FAIRFOREST CREEK SAND MINE	SAND

Water Supply

WATER USER (TYPE)	*RATED PUMP. CAPACITY (GPM)*
STREAM	*AMT. TRT./DIV. (MGD)*
MAYFAIR MILLS-BAILY PLT	1000
FAIRFOREST CREEK	1.44
AMOCO FABRICS & FIBERS CO.	1000
FAIRFOREST CREEK TRIBUTARY	3.00

Groundwater Concerns

The groundwater in the vicinity of the properties owned by Ina Bearing - Holly Mobile Home Park (Site #13493) and Spartanburg Steel Products (Site #00403) is contaminated with volatile organic compounds (VOCs) due to unknown sources. The surface water affected by the contamination from Ina Bearing is Fairforest Creek and the facility is currently in the remediation phase (air sparging system initiated). The surface water affected by the contamination from Spartanburg Steel Products is Goat Pond Creek which drains into Fairforest Creek. The facility is currently in the assessment and monitoring phases.

The groundwater in the vicinity of the property owned by Blackman Uhler Chemical is contaminated with volatile organic compounds (VOC) resulting from pits, ponds, and lagoons. This is a RCRA facility and is currently in the remediation phase. The surface water affected by the VOCs is an unnamed tributary of Kelsey Creek. Another area with groundwater contaminated by VOCs is the I-85 Site, also resulting from pits, ponds, and lagoons. The area is currently in the assessment phase and the affected surface water is Fairforest Creek.

Growth Potential

There is a high potential for growth in this watershed, which contains portions of the Cities of Spartanburg and Union. Industrial growth in particular is expected along the I-85 corridor and major roads with I-85 interchanges. There are also industrial developmental pressures along I-26, US 29, and US 221. Urban development is evident in the City of Union and in the unincorporated Buffalo Mill Village in the form of residential, commercial, and industrial uses. Growth is most evident along the US 176 Bypass. US 176 north from Union to Spartanburg has recently been widened to four lanes and has generated the development of an industrial park. The lower portion of the watershed is effectively excluded from development by the Sumter National Forest.

Implementation Strategy

Fairforest Creek has an impaired macroinvertebrate community, low dissolved oxygen concentrations, and elevated fecal coliform bacteria concentrations due to point and nonpoint sources. The macroinvertebrate samples will be evaluated to determine the cause of their impairment. Toschs Creek and Tinker Creek are also impaired from elevated levels of fecal coliform from point and nonpoint sources. Permit revisions have been initiated and oxygen and bacterial improvements are expected in the next basin rotation. An enforcement action is also underway for fecal coliform bacteria.

A Fairforest Creek tributary is impaired by elevated levels of zinc, chromium, lead, and copper related to unknown and point sources. Biological community data are needed to determine the ecological significance of the metal excursions and should be acquired where feasible.

Watershed Evaluations and Implementation Strategies Within WMU-0502

Watershed Management Unit (WMU) 0502 consists of the ***Pacolet River Basin*** and the ***Broad River Basin***. WMU-0502 extends across the Piedmont region of the State and contains 21 watersheds, some 1.5 million acres of which 7.41% is urban land, 13.44% is agricultural land, 5.37% is scrub/shrub land, 0.50% is barren land, 71.54% is forested land, 0.02% is forested wetland, and 1.72% is water (SCLRCC 1990). There are a total of 2,846.4 stream miles in WMU-0502.

The Broad River flows across the North Carolina/South Carolina state line and accepts drainage from Buffalo Creek, Cherokee Creek, Kings Creek, Thicketty Creek, Bullock Creek, the Pacolet River, Turkey Creek, Browns Creek, the Sandy River, the Little River, and Cedar Creek in WMU-0502 and the Enoree River and the Tyger River from WMU-0501.

Fish Consumption Advisory

A fish consumption advisory has been issued by SCDHEC for portions of the Broad River advising people to limit the amount of some types of fish consumed from this river due to mercury contamination. Pregnant women, infants, children, and people with neurologic diseases face the greatest risk of mercury related health problems and should not eat any fish from these waters. The consumption of Largemouth Bass from the Broad River south of Neal Shoals in Union County to the confluence with the Saluda River in Columbia should be restricted to no more than 3.25 pounds per month.

The source of mercury contamination in fish tested by the Department is uncertain. Mercury occurs naturally and may account for a portion of the levels found in fish tissue. Another source is deposition from the air, a result of the combustion of fossil fuels. The Department continues to monitor for mercury in ambient air and precipitation. A precipitation sampler is located at the Congaree Swamp National Monument as part of the National Air Deposition Program, Mercury Deposition Network. Weekly composite samples are collected for mercury analysis to provide background concentrations for application across the State. The continuous monitoring of mercury concentrations in air is also conducted at the site.

There is no data available linking mercury in wastewater discharges as a major source of mercury in fish, nor can mercury levels be traced to any industries. South Carolina is one of 40 states that are seeing high mercury levels in fish and have issued advisories. These states are working together and with the U.S. Environmental Protection Agency to try and identify the cause or causes of mercury in fish.

Climate

Normal yearly rainfall in the WMU-0502 area is 48.25 inches, according to the S.C. historic climatological record (SCWRC 1990). Data compiled from National Weather Service stations in Rainbow Lake, Gaston Shoals, Gaffney, Ninety Nine Islands, Spartanburg, Santuck, Chester, Blair, Winnsboro, Parr, Little Mountain, Columbia at USC, and Columbia Metropolitan Airport were used

to determine the general climate information for this portion of the State. The highest level of rainfall occurs in the summer with 13.55 inches; 12.41, 10.37, and 12.50 inches of rain falling in the fall, winter, and spring, respectively. The average annual daily temperature is 62.1°F. Summer temperatures average 78.4°F and fall, winter, and spring temperatures are 63.0°F, 45.0°F, and 62.1°F, respectively.

03050105-050

(Broad River)

General Description

Watershed 03050105-050 is located in Cherokee and Spartanburg Counties and consists primarily of tributaries of the ***Broad River***. This watershed occupies 16,454 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Pacolet series. The erodibility of the soil (K) averages 0.28; the slope of the terrain averages 10%, with a range of 2-45%. Land use/land cover in the watershed includes: 8.95% urban land, 37.39% agricultural land, 1.36% scrub/shrub land, 0.32% barren land, 51.79% forested land, and 0.19% water.

Before the Broad River flows across the South Carolina/North Carolina border it accepts drainage from several streams originating in South Carolina that flow into North Carolina including Arrowood Branch, Big Horse Creek (Little Horse Creek, Jolleys Lake), Suck Creek, and Ashworth Creek. There are several small ponds and lakes in this watershed used for recreational purposes and 26.8 stream miles, all classified FW.

Water Quality

There are no water quality monitoring stations in this watershed.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM	*NPDES#*
FACILITY NAME	*TYPE*
PERMITTED FLOW @ PIPE (MGD)	*LIMITATION*
COMMENT	
LITTLE HORSE CREEK	SC0002429
SPARTAN MILLS/MONTGOMERY DIV.	MAJOR INDUSTRIAL
PIPE #: 001 FLOW: M/R	WATER QUALITY
WQL FOR TRC	

Growth Potential

There is a low potential for growth in this watershed.

03050105-090

(Broad River)

General Description

Watershed 03050105-090 is located in Cherokee and York Counties and consists primarily of the ***Broad River*** and its tributaries from the North Carolina border to the Pacolet River. The watershed occupies 82,652 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Wilkes-Goldston-Badin series. The erodibility of the soil (K) averages 0.28; the slope of the terrain averages 12%, with a range of 2-45%. Land use/land cover in the watershed includes: 4.54% urban land, 18.42% agricultural land, 0.84% scrub/shrub land, 1.04% barren land, 73.37% forested land, and 1.79% water.

After the river crosses the state line, it accepts drainage from Ross Creek (Sarratt Creek), Mikes Creek, the Bowens River (Wylies Creek), the Buffalo Creek Watershed, and the Cherokee Creek Watershed. Further downstream, Peoples Creek (Furnace Creek, Toms Branch) drains into the river near the City of Gaffney. Doolittle Creek enters the river next, near the Town of Blacksburg, followed by London Creek (Lake Cherokee, Little London Creek), Bear Creek, McKowns Creek, Dry Branch, the Kings Creek Watershed, and Quinton Branch. Mud Creek enters the river next, downstream of Mud Island, followed by Guyonmbore Creek, Mountain Branch, Abingdon Creek (Wolf Branch, Service Branch, Jenkins Branch), the Thicketty Creek Watershed, Beaverdam Creek (McDaniel Branch), the Bullock Creek Watershed, and Dry Creek (Nelson Creek).

There are several ponds and lakes (10-45 acres) in this watershed used for recreation and water supply and 229.3 stream miles, all classified FW. A fifteen mile segment of the Broad River, extending from Ninety Nine Islands Dam to the river's confluence with the Pacolet River is designated as a South Carolina State Scenic River in recognition of it's outstanding natural resources.

Water Quality

Broad River - There are two monitoring sites along this section of the Broad River. Aquatic life uses are fully supported at the upstream site **(B-042)**, but may be threatened by a significantly increasing trend in pH and a high concentration of zinc measured in 1991. Sediment samples revealed P,P'DDT and P,P'DDE (metabolites of DDT) in 1993, together with high concentrations of chromium and nickel. Although the use of DDT was banned in 1973, it is very persistent in the environment. Significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus and total nitrogen concentrations suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions; however, a significantly decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter.

At the downstream site **(B-044)**, aquatic life uses are not supported due to occurrences of cadmium, chromium, copper, lead, and zinc in excess of the aquatic life acute standards, including a high concentration of zinc in 1992 and a very high concentration in 1995. In addition, there is a significantly increasing trend in pH. Sediment samples revealed P,P'DDT in 1993. A significantly

increasing trend in dissolved oxygen concentration and significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus and total nitrogen concentrations suggest improving conditions for these parameters. Recreational uses are partially supported at this site due to fecal coliform bacteria excursions.

Canoe Creek - Aquatic life uses are partially supported at the site immediately upstream of the Town of Blacksburg wastewater treatment plant discharge (B-755), and not supported at the site immediately downstream of the discharge (B-756) or further downstream (B-088) based on macroinvertebrate community data (Shealy Environmental Services, Inc., 1996). Department data at B-088 indicates dissolved oxygen excursions, a significantly decreasing trend in dissolved oxygen concentration and a significantly increasing trend in five-day biochemical oxygen demand. A significantly decreasing trend in total phosphorus concentration suggests improving conditions for this parameter. Recreational uses are not supported due to fecal coliform bacteria excursions. This creek was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed. In addition, the main discharge to this stream is being relocated to the Broad River, thus improving bacterial conditions.

Peoples Creek (B-211) - Aquatic life uses are fully supported, and significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus concentration, and turbidity suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions; however, a significantly decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter. This creek was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Furnace Creek (B-100) - Aquatic life uses are fully supported, but may be threatened by a significantly decreasing trend in dissolved oxygen concentration and a significantly increasing trend in pH. Sediment samples revealed a high concentration of zinc in 1991, P,P'DDT and O,P'DDT in 1993 and P,P'DDT again in 1994. Although the use of DDT was banned in 1973, it is very persistent in the environment. Significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus concentration, and turbidity suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

Doolittle Creek (B-323) - Aquatic life uses are fully supported, and significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

Lake Cherokee (B-343) - Lake Cherokee is a 45-acre impoundment at the headwaters of London Creek in Cherokee County, with a maximum depth of approximately 32 feet (9.8 meters) and an average depth of 11 feet (3.4 meters). Lake Cherokee's watershed comprises approximately 0.2 square miles (0.4 km2). Historical eutrophication studies indicate that Lake Cherokee's trophic

condition is improving. It is currently one of the least eutrophic small lakes in South Carolina, characterized by low nutrient concentrations. Preservation of this lake's desirable trophic condition is recommended. Aquatic life and recreational uses are fully supported. In an effort to provide access for boating and fishing, 300 triploid grass carp (20/vegetated acre) were stocked in 1991 and aquatic herbicides were applied in 1989, 1991, and 1995.

Guyonmoore Creek (B-330) - Aquatic life uses are fully supported, and recreational uses are partially supported due to fecal coliform bacteria excursions.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
BROAD RIVER SC DISTRIBUTORS INC. PIPE #: 001 FLOW: 0.04	SC0002755 MINOR MUNICIPAL EFFLUENT
BROAD RIVER MILLIKEN & CO./MAGNOLIA PLT PIPE #: 001 FLOW: 3.45 PIPE #: 001 FLOW: 4.879 (PROPOSED)	SC0003182 MAJOR INDUSTRIAL EFFLUENT EFFLUENT
BROAD RIVER CHAMPION PRODUCTS PIPE #: 001 FLOW: 2.0	SC0035947 MAJOR INDUSTRIAL EFFLUENT
BROAD RIVER CITY OF GAFFNEY/PEOPLES CREEK PLT PIPE #: 001 FLOW: 3.5 WQL FOR DO	SC0047091 MAJOR MUNICIPAL WATER QUALITY
BROAD RIVER TOWN OF BLACKSBURG/CANOE CREEK PLT PIPE #: 001 FLOW: 0.68 (PROPOSED) WQL FOR DO,TRC,NH3N	SC0047457 MINOR MUNICIPAL WATER QUALITY
CANOE CREEK TOWN OF BLACKSBURG/CANOE CREEK PLT PIPE #: 001 FLOW: 0.34 WQL FOR DO,TRC,NH3N	SC0026042 MINOR MUNICIPAL WATER QUALITY
BEAVERDAM CREEK G & W INC. PIPE #: 001 FLOW: 0.005 WQL FOR BOD5,DO,TRC,NH3N	SC0027561 MINOR INDUSTRIAL WATER QUALITY

PEOPLES CREEK HAMRICK MILLS PIPE #: 001 FLOW: M/R	SCG250167 MINOR INDUSTRIAL EFFLUENT
PEOPLES CREEK CHEROKEE CO. COGEN PARTNERS PIPE #: 001 FLOW: M/R	SCG250110 MINOR INDUSTRIAL EFFLUENT

LAND APPLICATION FACILITY NAME	**PERMIT# TYPE**
SPRAYFIELD PEELER RUG COMPANY	ND0070980 INDUSTRIAL
SPRAYFIELD SCREEN PRINTERS	ND0003417 INDUSTRIAL

Landfill Activities

SOLID WASTE LANDFILL NAME FACILITY TYPE	***PERMIT # STATUS***
CITY OF GAFFNEY CWP INDUSTRIAL/C&D	APPLYING FOR PERMIT ACTIVE

Mining Activities

MINING COMPANY MINE NAME	***PERMIT # MINERAL***
SQUAW VALLEY SAND CO. BROAD RIVER PLANT	0042-09 SAND
THOMAS SAND CO. BLACKSBURG PLANT	0869-09 SAND
RAY BROWN ENTERPRISES HIDDEN VALLEY MINE	0123-09 SAND
RAY BROWN ENTERPRISES BROWN #3 SAND MINE	1070-09 SAND

Water Supply

WATER USER (TYPE) STREAM	***PUMPING CAPACITY (MGD) REG. PUMPING CAPACITY (MGD)***
CITY OF GAFFNEY BPW (M) BROAD RIVER	18.0 12.0

Growth Potential

There is a moderate potential for growth in this watershed, which contains the Town of Blacksburg and a portion of the City of Gaffney. The City of Gaffney is planning for new subdivision growth by considering new regional treatment facilities near the Cherokee Creek-Broad

River area. Major growth is expected along the I-85 corridor, particularly in the area north of Gaffney. The potential for industrial growth exists along SC 329 east of Gaffney due to the existing industrial park and the proposal of another park.

Implementation Strategy

The Broad River is impaired by elevated levels of copper, cadmium, lead, and zinc from unknown or possibly point sources. Biological community data are needed to determine the ecological significance of the metal excursions and should be acquired where feasible. Peoples Creek is impaired from elevated levels of fecal coliform resulting from point sources, and bacteria conditions are expected to improve now that permit revisions have been initiated. Canoe Creek has an impaired macroinvertebrate community and elevated fecal coliform levels due to point sources. The facility is being upgraded and relocated, and conditions should improve.

03050105-100

(Buffalo Creek)

General Description

Watershed 03050105-100 is located in Cherokee County and consists primarily of ***Buffalo Creek*** and its tributaries. The watershed occupies 9,917 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Herndon-Helena-Goldston-Georgeville series. The erodibility of the soil (K) averages 0.34; the slope of the terrain averages 10%, with a range of 2-45%. Land use/land cover in the watershed includes: 7.22% urban land, 21.20% agricultural land, 0.51% scrub/shrub land, 0.84% barren land, 70.23% forested land, and 0.01% water.

Bee Branch flows across the North Carolina border and drains into Buffalo Creek, which flows into the Broad River. There are 19.5 stream miles in this watershed, all classified FW.

Water Quality

Buffalo Creek - There are three monitoring sites along Buffalo Creek. Aquatic life uses are fully supported at the upstream site **(B-740)** based on macroinvertebrate community data. Aquatic life uses are also fully supported at the midstream site **(B-119)**, but may be threatened by a significantly increasing trend in total phosphorus concentration, a high concentration of zinc measured in 1992, and PCB 1260 in 1991. Aquatic life uses are partially supported at the downstream site **(B-057)** due to occurrences of cadmium, chromium, and copper in excess of the aquatic life acute standards, including a very high concentration of copper measured in 1992. In addition, there is a significantly increasing trend in pH and total phosphorus concentration, and the PAH indeno(1,2,3-cd)pyrene was detected in 1995. A significantly increasing trend in dissolved oxygen concentration and significantly decreasing trends in five-day biochemical oxygen demand and total nitrogen concentrations at both the midstream and downstream sites suggest improving conditions for these parameters. Recreational uses are not supported at any site due to fecal coliform bacteria excursions, and there is a significantly increasing trend in bacteria concentrations at the midstream site.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
BUFFALO CREEK EMRO MARKETING SPEEDWAY #66 PIPE #: 002 FLOW: 0.0075 WQL FOR BOD5,DO,TRC,NH3N	SC0042196 MINOR INDUSTRIAL WATER QUALITY

BUFFALO CREEK TNS MILLS INC./BLACKSBURG PLT PIPE #: 001 FLOW: M/R	SCG250043 MINOR INDUSTRIAL EFFLUENT
BUFFALO CREEK TRIBUTARY BROAD RIVER TRUCK STOP PIPE #: 001 FLOW: 0.01 WQL FOR TRC,NH3N	SC0032433 MINOR COMMUNITY WATER QUALITY
BEE BRANCH TRIBUTARY JM BROWN VEND/MR. WAFFLE PIPE #: 001 FLOW: 0.0092 WQL FOR TRC,NH3N	SC0031968 MINOR MUNICIPAL WATER QUALITY

Water Supply

WATER USER (TYPE) *STREAM*	*RATED PUMP.CAP.(GPM)* *AMT. TRT./DIV. (MGD)*
MILLIKEN & CO.-MAGNOLIA FINISHING (I) BUFFALO CREEK	3400.0 4.896

Growth Potential

There is a moderate potential for growth in this watershed, which contains a portion of the Town of Blacksburg. Major growth is expected along the I-85 corridor, which stretches across the watershed. Commercial growth is also associated with the I-85 corridor near the Town of Blacksburg.

Implementation Strategy

Buffalo Creek is impaired by elevated levels of copper, cadmium, and lead. Biological community data are needed to determine the ecological significance of the metal excursions and should be acquired where feasible.

03050105-110

(Cherokee Creek)

General Description

Watershed 03050105-110 is located in Cherokee County and consists primarily of ***Cherokee Creek*** and its tributaries. The watershed occupies 14,911 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Goldston-Badin series. The erodibility of the soil (K) averages 0.22; the slope of the terrain averages 10%, with a range of 2-45%. Land use/land cover in the watershed includes: 20.87% urban land, 33.65% agricultural land, 0.56% scrub/shrub land, 0.74% barren land, 42.79% forested land, and 1.38% water.

Cherokee Creek flows through Lake Whelchel (180 acres) near the City of Gaffney and accepts drainage from Allison Creek in the lake and Providence Creek downstream of the lake before flowing into the Broad River. There are several ponds and lakes (10-180 acres) in this watershed used for recreational and municipal purposes. There are 34.5 stream miles, all classified FW.

Water Quality

Cherokee Creek (B-056) - Aquatic life uses are fully supported, and significantly decreasing trends in five-day biochemical oxygen demand and turbidity suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions. This creek was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
CHEROKEE CREEK CITY OF GAFFNEY/PROVIDENCE CREEK PLT PIPE #: 001 FLOW: 1.80 WQL FOR DO,TRC,NH3N	SC0020508 MAJOR MUNICIPAL WATER QUALITY
PROVIDENCE CREEK CITY OF GAFFNEY/WTP PIPE #: 001 FLOW: 1.02 WQL FOR TRC	SC0021121 MINOR DOMESTIC WATER QUALITY

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
CHEROKEE COUNTY LANDFILL MUNICIPAL	111001-1101 ACTIVE

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
BOREN BRICK HIGGINS RED CLAY PIT	0113-09 CLAY
BOREN BRICK SHALE PIT	0114-09 SHALE

Water Supply

WATER USER (TYPE) *STREAM*	*PUMPING CAPACITY (MGD)* *REG. PUMPING CAPACITY (MGD)*
CITY OF GAFFNEY BPW (M) LAKE WHELCHEL	— 18.0

Groundwater Concerns

The groundwater in the vicinity of the property owned by SKF Tools (Site #13699) is contaminated with volatile organic compounds (VOCs). The source of the contamination is spills and leaks. The facility is currently in the remediation phase. The surface water affected by the contamination is Providence Creek.

Growth Potential

There is a moderate potential for growth in this watershed, which contains a portion of the City of Gaffney. The City of Gaffney is planning for new subdivision growth by considering new regional treatment facilities near the Cherokee Creek-Broad River area. Major growth is expected along the I-85 corridor, particularly in the area north of Gaffney. Commercial growth is also associated with the I-85 corridor near the SC 11 interchange north of Gaffney and at the SC 105 interchange with the new outlet center. The potential for industrial growth exists along SC 329 east of Gaffney due to the existing industrial park and the proposal of another park.

Implementation Strategy

Cherokee Creek is impaired from elevated levels of fecal coliform resulting from point sources, and bacteria conditions are expected to improve now that permit revisions have been initiated. An enforcement action is currently underway for fecal coliform bacteria.

03050105-120

(Kings Creek)

General Description

Watershed 03050105-120 is located in Cherokee and York Counties and consists primarily of ***Kings Creek*** and its tributaries. The watershed occupies 33,018 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Goldston-Badin series. The erodibility of the soil (K) averages 0.15; the slope of the terrain averages 13%, with a range of 2-45%. Land use/land cover in the watershed includes: 1.10% urban land, 14.48% agricultural land, 0.30% scrub/shrub land, 0.48% barren land, 83.41% forested land, and 0.23% water.

Kings Creek originates in North Carolina and flows across the state line to accept drainage from Modlin Branch, Dixon Branch, Ponders Branch, Stonehouse Branch, Dellingham Branch, Mill Creek, and Jumping Branch. Further downstream, Garner Branch flows into Kings Creek followed by Manning Branch, Bells Branch, Beech Branch, Wolf Creek, and Nells Branch before draining into the Broad River. There are several recreational ponds and lakes in this watershed and 77.1 stream miles, all classified FW. Kings Mountain National Military Park and Kings Mountain State Park are additional natural resources in the watershed.

Water Quality

Kings Creek (B-333) - Although there were occurrences of copper in excess of the aquatic life acute standard, based on macroinvertebrate community data, aquatic life uses are fully supported. Recreational uses are partially supported due to fecal coliform bacteria excursions.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
KINGS CREEK DITCH COMPRESSOR STATION/GROVER PIPE #: 001 FLOW: 0.22	SC0047783 MINOR INDUSTRIAL EFFLUENT
MILL CREEK TRIBUTARY VULCAN MATERIALS CO. PIPE #: 001 FLOW: M/R	SCG730068 MINOR INDUSTRIAL EFFLUENT

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
BOREN BRICK SERICITE PIT	0115-09 SERICITE

VULCAN MATERIALS CO. BLACKSBURG QUARRY	0354-09 LIMESTONE
BORAL BRICKS, INC.-ASHE DIV. ROBERTS MINE	0221-09 SHALE
TAYLOR CLAY PRODUCTS CO. GROVER MINE	0199-09 MANGANESE SCHIST
INDUSTRIAL MINERALS, INC. KINGS CREEK MINE	0162-09 SERICITE

Growth Potential

There is a low potential for growth in this watershed due to the absence of public utilities.

03050105-130

(Thicketty Creek)

General Description

Watershed 03050105-130 is located in Cherokee County and consists primarily of ***Thicketty Creek*** and its tributaries. The watershed occupies 98,730 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Pacolet-Wilkes-Herndon-Madison series. The erodibility of the soil (K) averages 0.30; the slope of the terrain averages 16%, with a range of 2-45%. Land use/land cover in the watershed includes: 5.04% urban land, 19.53% agricultural land, 0.59% scrub/shrub land, 0.92% barren land, 73.51% forested land, and 0.41% water.

Thicketty Creek joins with Macedonia Creek to form Lake Thicketty at the top of the watershed. Thicketty Creek then accepts drainage from Thicketty Mountain Creek (Linder Creek), Clary Creek, Allgood Branch, and Irene Creek (Cole Creek) near the City of Gaffney. Little Thicketty Creek (Rocky Ford Creek, Cowpens Creek) enters Thicketty Creek next followed by Limestone Creek (Mill Creek, Skelton Creek) and Big Blue Branch (Blue Branch). North Goucher Creek and South Goucher Creek join in Hammett Lake to form Goucher Creek (Gum Root Creek), which flows into Thicketty Creek, downstream of Big Blue Creek. Jones Creek (Martin Lake) enters Thicketty Creek next followed by Timber Ridge Branch, Minkum Creek (Polecat Creek), Crocker Branch, Lusts Mill Creek, and Gilkey Creek. Gilkey Creek accepts drainage from Gaffney Country Club Lake, Blanton Creek, Peeler Branch, Spencer Branch (also known as Cartum Branch), Dry Fork Creek, Martin Branch, and Rocky Branch. Thicketty Creek drains into the Broad River. There are several ponds and lakes (10-100 acres) in this watershed used for recreation, irrigation, and flood control. There are a total of 213.9 stream miles, all classified FW.

Water Quality

Thicketty Creek - There are three monitoring sites along Thicketty Creek. Aquatic life uses are fully supported at the upstream site **(B-095)**, the midstream site **(B-133)** based on macroinvertebrate community data, and the downstream site **(B-062)**. A significantly decreasing trend in five-day biochemical oxygen demand at the midstream and downstream sites suggest improving conditions for this parameter. Recreational uses are not supported at any site due to fecal coliform bacteria excursions, which is compounded at the downstream site by a significantly increasing trend in fecal coliform bacteria concentrations. This creek was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Lake Thicketty (B-342) - Lake Thicketty is a 100-acre impoundment on Thicketty and Macedonia Creeks in Cherokee County, with a maximum depth of approximately 20 feet (6.1 m), and an average depth of 10 feet (3.1 m). Lake Thicketty's watershed comprises 6.9 square miles (18 km2). Historical eutrophication studies indicate that Lake Thicketty's trophic condition is improving. It is

currently one of the least eutrophic small lakes in South Carolina, characterized by low nutrient concentrations. Preservation of this lake's desirable trophic condition is recommended. Aquatic life and recreational uses are fully supported.

Irene Creek (B-059) - Aquatic life uses are fully supported, and a significantly increasing trend in dissolved oxygen concentration and significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus concentrations, and turbidity suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

Limestone Creek (B-128) - Aquatic life uses are fully supported, and significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

Gilkey Creek (B-334) - Aquatic life uses are fully supported based on physical, chemical, and macroinvertebrate community data. Recreational uses are not supported due to fecal coliform bacteria excursions.

Recreational Swimming Areas

RECEIVING STREAM	*SWIMMING LOCATION*
LAKE RUFUS	CAMP LEA

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
THICKETTY CREEK CITY OF GAFFNEY/CLARY WWTP PIPE #: 001 FLOW: 3.6 WQL FOR BOD5,DO,TRC,NH3N	SC0031551 MAJOR MUNICIPAL WATER QUALITY
LITTLE THICKETTY CREEK JIM'S TRAILER PARK PIPE #: 001 FLOW: 0.01 WQL FOR TRC,NH3N	SC0030503 MINOR COMMUNITY WATER QUALITY
ALLGOOD BRANCH PINECONE CAMPGROUND PIPE #: 001 FLOW: 0.018 WQL FOR TRC,NH3N	SC0034002 MINOR COMMUNITY WATER QUALITY

IRENE CREEK NESTLE FROZEN FOODS CORP. PIPE #: 001 FLOW: 0.066 WQL FOR TRC	SC0037664 MINOR INDUSTRIAL WATER QUALITY
IRENE CREEK TIMKEN CO./GAFFNEY BEARING PIPE #: 001 FLOW: 0.013	SC0000949 MINOR INDUSTRIAL EFFLUENT
MILL CREEK HAMRICK MILLS/MUSGROVE MILLS PIPE #: 001 FLOW: M/R	SCG250168 MINOR INDUSTRIAL EFFLUENT
SPENCERS BRANCH TRIBUTARY BRIARCREEK SD I/UNITED UTILITIES PIPE #: 001 FLOW: 0.0228 WQL FOR TRC,NH3N	SC0023736 MINOR COMMUNITY WATER QUALITY
SPENCERS BRANCH BRIARCREEK SD II/UNITED UTILITIES PIPE #: 001 FLOW: 0.020 WQL FOR TRC,NH3N	SC0026409 MINOR COMMUNITY WATER QUALITY
JONES CREEK MEDLEY FARMS NPL SITE PIPE #: 001 FLOW: 0.041	SC0046469 MINOR INDUSTRIAL EFFLUENT

Growth Potential

There is a moderate potential for growth in this watershed associated with I-85 and the City of Gaffney. Major growth is expected along the I-85 corridor, which stretches across the watershed, particularly in the area north of Gaffney. US 29 and a rail line also stretches across the watershed from Spartanburg to Gaffney.

Implementation Strategy

Thicketty Creek is impaired by elevated levels of fecal coliform bacteria resulting from point and nonpoint sources. Permit revisions have been initiated and conditions are expected to improve.

03050105-140

(Bullock Creek)

General Description

Watershed 03050105-140 extends through York County and consists primarily of ***Bullock Creek*** and its tributaries. The watershed occupies 76,376 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Wilkes-Cecil-Goldston-Badin series. The erodibility of the soil (K) averages 0.22; the slope of the terrain averages 13%, with a range of 2-45%. Land use/land cover in the watershed includes: 0.22% urban land, 15.88% agricultural land, 0.36% scrub/shrub land, 0.68% barren land, 82.74% forested land, and 0.12% water.

Bullock Creek originates near the South Carolina/North Carolina border and accepts drainage from Gin Branch, Rocky Branch, Buckhorn Creek (Silver Creek), and Clark Fork. Clark Fork also originates near the state line and flows through Lake Crawford to join Jennings Branch and forms Lake York before accepting drainage from Biggers Branch and Saltlick Branch. Downstream of Clark Fork, Bullock Creek accepts drainage from Thompson Branch, Berry Branch, Purgatory Branch, Mitchell Branch, Plexico Branch, Loves Creek, and Bells Creek (Prater Branch, Dowdle Branch). There are a few ponds and lakes (10-50 acres) in this watershed used for recreation and irrigation and 138.8 stream miles, all classified FW. Kings Mountain State Park extends over the upper portion of the watershed along with Kings Mountain National Military Park.

Water Quality

Bullock Creek - There are two monitoring sites along Bullock Creek. Aquatic life uses are fully supported at the upstream site **(B-739)** based on macroinvertebrate community data. Aquatic life uses are also fully supported at the downstream site **(B-159)**, and significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported at this site due to fecal coliform bacteria excursions.

Lake York (B-737) - Aquatic life uses are fully supported. Lake York, located in Kings Mountain State Park in York County, is a 50-acre impoundment on Clark Fork. Lake York's maximum depth is approximately 13 feet (4.0 m); average depth is 9 feet (2.7 m). The lake's watershed comprises approximately 0.8 square miles (2 km2) in North and South Carolina. Lake York is currently one of the least eutrophic small lakes in South Carolina, characterized by low nutrient concentrations. Preservation of this lake's desirable trophic condition is recommended. In an effort to provide access for swimming and boating, 600 triploid grass carp (20/vegetated acre) were stocked in 1993 and aquatic herbicides were applied in 1995.

Long Branch (B-326) - Aquatic life uses are fully supported, and significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus concentrations, and turbidity suggest improving conditions for these parameters. Recreational uses are partially supported at this site due to fecal coliform bacteria excursions.

Clark Fork - There are two monitoring sites along Clark Fork. Aquatic life uses are fully supported at the site upstream of Crawford Lake **(B-325)**, but may be threatened by a significantly decreasing trend in pH. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are partially supported at this site due to fecal coliform bacteria excursions. Aquatic life uses are also fully supported at the site downstream of Crawford Lake **(B-157)** based on macroinvertebrate community data. In an effort to provide access for swimming and boating in Crawford Lake, 200 triploid grass carp (20/vegetated acre) were stocked in 1992 and aquatic herbicides were applied in 1990-1996.

Recreational Swimming Areas

RECEIVING STREAM	*SWIMMING LOCATION*
LAKE CRAWFORD	KINGS MTN STATE PARK

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM	*NPDES#*
FACILITY NAME	*TYPE*
PERMITTED FLOW @ PIPE (MGD)	*LIMITATION*
COMMENT	
LONG BRANCH	SC0025275
US PARK SERVICE/KINGS MTN NATL MIL PARK	MINOR INDUSTRIAL
PIPE #: 001 FLOW: 0.023	WATER QUALITY
WQL FOR DO,TRC,NH3N	

Growth Potential

There is a low potential for growth in this watershed, which contains the Towns of Hickory Grove and Sharon, and public water service is limited to these towns. Although the area is largely rural, residential activity is increasing as a result of the close proximity to the Town of Clover, the City of York, and the Greater Charlotte Metropolitan Area.

03050105-150

(North Pacolet River)

General Description

Watershed 03050105-150 is located in Spartanburg County and consists primarily of the ***North Pacolet River*** and its tributaries. The watershed occupies 30,145 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Hiwassee series. The erodibility of the soil (K) averages 0.28; the slope of the terrain averages 10%, with a range of 2-25%. Land use/land cover in the watershed includes: 8.57% urban land, 22.87% agricultural land, 0.97% scrub/shrub land, 0.13% barren land, 66.92% forested land, and 0.54% water.

The North Pacolet River originates in North Carolina and accepts drainage from Vaughn Creek (Lake Lanier) and Wolfe Creek, which originate in South Carolina. After flowing across the state line, the river accepts drainage from Page Creek. Hooper Creek, Collinsville Creek, and Bear Creek enter the river next; all originating in North Carolina. Obed Creek drains into the river at the base of the watershed. There are a few recreational ponds and lakes (10-90 acres) in this watershed and a total of 71.6 stream miles, all classified FW with the exception of Vaughn Creek which is classified ORW. Due to the absence of point source dischargers and the presence of endangered species and other special characteristics, portions of a Vaughn Creek tributary may qualify as a potential ORW candidate.

Water Quality

North Pacolet River - There are three monitoring sites along the North Pacolet River. Aquatic life uses are fully supported at the upstream site **(B-719)** based on macroinvertebrate community data. Aquatic life uses are also fully supported at the midstream site **(B-026)**, but may be threatened by a significantly decreasing trend in pH and a significantly increasing trend in turbidity. Significantly decreasing trends in five-day biochemical oxygen demand and total nitrogen concentration suggest improving conditions for these parameters. At the downstream site **(B-126)**, aquatic life uses are again fully supported, but may be threatened by an occurrence of lead in excess of the aquatic life acute standard. Recreational uses are not supported at any site due to fecal coliform bacteria excursions.

Vaughn Creek (B-099-7) - Aquatic life uses are fully supported based on macroinvertebrate community data.

Lake Lanier - There are two monitoring sites along Lake Lanier. Aquatic life uses are fully supported at the uplake site **(B-099A)**, but may be threatened by significantly decreasing trends in dissolved oxygen concentration and pH, and a significantly increasing trend in turbidity. Recreational uses are partially supported at this site due to fecal coliform bacteria excursions. Aquatic life uses are also fully supported at the downlake site **(B-099B)**, but may be threatened by a significantly

decreasing trend in pH and a significantly increasing trend in turbidity. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are fully supported.

Page Creek (B-301) - Aquatic life uses are fully supported, and significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions. This creek was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
NORTH PACOLET RIVER ONEITA INDUSTRIES/FINGERVILLE PIPE #: 001 FLOW: 0.50	SC0035157 MINOR INDUSTRIAL EFFLUENT
NORTH PACOLET RIVER SSSD/FINGERVILLE PIPE #: 001 FLOW: 0.020	SC0047759 MINOR MUNICIPAL EFFLUENT
NORTH PACOLET RIVER MILLIKEN/NEW PROSPECT MILL PIPE #: 001 FLOW: 0.47 WQL FOR DO,TRC,NH3N	SC0023540 MINOR INDUSTRIAL WATER QUALITY
OBED CREEK HB SWOFFORD VOCATIONAL CENTER PIPE #: 001 FLOW: 0.0045 WQL FOR NH3N	SC0028037 MINOR MUNICIPAL WATER QUALITY
PAGE CREEK CITY OF LANDRUM/PAGE CREEK PLT PIPE #: 001 FLOW: 0.3 WQL FOR BOD5,TRC,NH3N	SC0026875 MINOR MUNICIPAL WATER QUALITY
WOLFE CREEK CITY OF LANDRUM/PLANT #1 PIPE #: 001 FLOW: 0.1 WQL FOR TRC,NH3N	SC0021636 MINOR MUNICIPAL WATER QUALITY

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
LITTLE ACRES SAND CO. NORTH PACOLET RIVER MINE	1037-42 SAND

Water Supply

WATER USER (TYPE) *STREAM*	*PUMPING CAPACITY (MGD)* *REG. PUMPING CAPACITY (MGD)*
CITY OF LANDRUM (M) VAUGHN CREEK TRIBUTARY	0.0 0.0
CITY OF LANDRUM (M) LAKE LANIER - VAUGHN CREEK	2.0 1.0

Growth Potential

There is a low potential for growth in this watershed, which contains the Town of Fingerville.

03050105-160

(South Pacolet River)

General Description

Watershed 03050105-160 is located in Spartanburg County and consists primarily of the ***South Pacolet River*** and its tributaries. The watershed occupies 59,585 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil series. The erodibility of the soil (K) averages 0.28; the slope of the terrain averages 9%, with a range of 2-25%. Land use/land cover in the watershed includes: 8.00% urban land, 25.85% agricultural land, 0.71% scrub/shrub land, 0.44% barren land, 61.90% forested land, and 3.11% water.

The South Pacolet River originates near Glassy Mountain and accepts drainage from Green Creek, Belue Creek, Jamison Mill Creek, Spivey Creek (Clear Branch), and Motlow Creek (Easley Creek, Holston Creek) before forming Lake Bowen (Alexander Creek, Turkey Creek). The South Pacolet River flows out of Lake Bowen to then form the South Pacolet River Reservoir #1 (Mud Creek) which is also known as Spartanburg Reservoir #1 (301 acres). There are 146.4 stream miles in this watershed, all classified FW. Due to the absence of point source dischargers and the presence of endangered species and other special characteristics, portions of a Green Creek tributary, Belue Creek, and Jamison Mill Creek may qualify as potential ORW candidates.

Water Quality

South Pacolet River - There are two monitoring sites along the South Pacolet River. Aquatic life uses are fully supported at the upstream site **(B-720)** based on macroinvertebrate community data. Aquatic life uses are also fully supported at the downstream site **(B-302)**, but may be threatened by an occurrence of lead in excess of the aquatic life acute standard. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

Spivey Creek (B-103) - Aquatic life uses are fully supported, and a significantly decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are partially supported at this site due to fecal coliform bacteria excursions.

Lake Bowen - Lake William C. Bowen is a 1600-acre impoundment on the South Pacolet River in Spartanburg County, with a maximum depth of approximately 41 feet (12.5 m) and an average depth of 15 feet (4.7 m). Lake Bowen's watershed comprises 82 square miles (212.6 km2). In 1991, NRCS, in cooperation with SCDHEC, began an educational project to reduce watershed pollutant loads. Historical eutrophication assessments indicate that Lake Bowen's trophic condition is improving. It is currently one of the least eutrophic large lakes in South Carolina, characterized by low nutrient concentrations. Preservation of this lake's desirable trophic condition is recommended.

There are two monitoring sites along Lake Bowen. Aquatic life uses are fully supported at the uplake site **(B-340)**. Sediment samples revealed P,P'DDT and O,P'DDT, and P,P'DDD, O,P'DDD, P,P'DDE (metabolites of DDT) in 1991. Although the use of DDT was banned in 1973, it is very persistent in the environment. Aquatic life uses are also fully supported at the downlake site **(B-339)**, but may be threatened by a very high concentration of cadmium detected in the 1992 sediment sample. Recreational uses are fully supported at both sites.

Spartanburg Reservoir #1 (B-113) - Aquatic life uses are fully supported, but may be threatened by a significantly decreasing trend in dissolved oxygen concentration and a significantly increasing trend in turbidity. A significantly decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are fully supported, but may be threatened by a significantly increasing trend in fecal coliform bacteria concentrations.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
MOTLOW CREEK LINKS O TRYON PIPE #: 001 FLOW: 0.024 WQL FOR DO,TRC,NH3N	SC0042684 MINOR COMMUNITY WATER QUALITY
SOUTH PACOLET RIVER SPARTANBURG WATER SYSTEM WWTP/SIMMS PLT PIPE #: 001 FLOW: 0.004 PIPE #: 001 FLOW: 0.012 (PROPOSED)	SC0030279 MINOR MUNICIPAL EFFLUENT EFFLUENT
SOUTH PACOLET RIVER SPARTANBURG WATER SYSTEM/SIMMS PLT PIPE #: 001 FLOW: 1.17 WQL FOR TRC	SCG643002 MINOR DOMESTIC WATER QUALITY
SPIVEY CREEK CITY OF LANDRUM/WTP PIPE #: 001 FLOW: 0.032 WQL FOR TRC	SCG645029 MINOR DOMESTIC WATER QUALITY
LAND APPLICATION **FACILITY NAME**	**PERMIT#** **TYPE**
SPRAYFIELD CAMPOBELLO-GRAMBLING SCHOOL	ND0067342 MUNICIPAL

Landfill Activities

SOLID WASTE LANDFILL NAME	*PERMIT #*
FACILITY TYPE	*STATUS*
BILLY JACKSON C&D LANDFILL	—
C&D LANDFILL	CLOSED

Mining Activities

MINING COMPANY	*PERMIT #*
MINE NAME	*MINERAL*
LITTLE ACRES SAND CO.	0805-42
SOUTH PACOLET RIVER MINE	SAND

Water Supply

WATER USER (TYPE)	*PUMPING CAPACITY (MGD)*
STREAM	*REG. PUMPING CAPACITY (MGD)*
SPARTANBURG WATER SYSTEM (M)	—
SOUTH PACOLET RIVER RES.#1	64.0

Growth Potential

There is a low to moderate potential for growth in this watershed, which contains the City of Landrum and the Town of Campobello.

03050105-170

(Pacolet River)

General Description

Watershed 03050105-170 is located in Spartanburg and Cherokee Counties and consists primarily of the ***Pacolet River*** and its tributaries from its origin at the confluence of the North and South Pacolet Rivers to Lawsons Fork Creek. The watershed occupies 84,046 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Pacolet series. The erodibility of the soil (K) averages 0.28; the slope of the terrain averages 11%, with a range of 2-45%. Land use/land cover in the watershed includes: 11.15% urban land, 33.26% agricultural land, 0.92% scrub/shrub land, 0.29% barren land, 53.08% forested land, and 1.31% water.

The Pacolet River is formed by the confluence of the North Pacolet River Watershed and the South Pacolet River Watershed. Downstream from the confluence, the Pacolet River accepts drainage from Thompson Creek and forms Lake Blalock (760 acres). Streams draining into Lake Blalock include Buck Creek, Little Buck Creek (Ezell Branch, Cudds Creek, Greenes Lake), and Casey Creek (Carlisle Branch). Downstream from the lake, the Pacolet River accepts drainage from Cherokee Creek (Little Cherokee Creek), Island Creek (Zekial Creek, Double Branch), Pole Bridge Branch, Peters Creek, Cinder Branch, Turkey Hen Branch, Quinn Branch, and Mill Branch. There are several ponds and lakes (10-760 acres) in this watershed used for recreational, municipal, and water supply purposes. There are a total of 156.7 stream miles, all classified FW. Cowpens National Battlefield Site is located between Island Creek and Zekial Creek.

Water Quality

Pacolet River - There are three monitoring sites along the Pacolet River. Aquatic life uses are fully supported at the upstream site **(B-028)**, but may be threatened by significantly increasing trends in total phosphorus concentration and turbidity. A significantly decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Aquatic life uses are also fully supported at the midstream site **(B-163A)**, but may be threatened by decreasing trends in dissolved oxygen concentration and pH. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. At the downstream site **(B-331)**, aquatic life uses are again fully supported. Recreational uses are not supported at the upstream and downstream sites and are partially supported at the midstream site due to fecal coliform bacteria excursions.

Little Buck Creek (B-259) - Aquatic life uses are fully supported, but may be threatened by a significantly increasing trend in turbidity. A significantly decreasing trend in total phosphorus concentrations suggests improving conditions for this parameter. Recreational uses are not supported

due to fecal coliform bacteria excursions. This creek was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Lake Taylor Blalock (B-347) - Lake Blalock in Spartanburg County is a 760-acre impoundment on the Pacolet River, with a maximum depth of approximately 49.5 feet (15 m) and an average depth of 5.6 feet (1.7 m). Lake Blalock's watershed comprises 273 square miles (707 km2), which includes Spartanburg Reservoir #1 and Lake Bowen, and extends into North Carolina. Eutrophication assessments indicate that Lake Blalock is one of the least eutrophic small lakes in South Carolina, characterized by low nutrient concentrations. Preservation of this lake's desirable trophic condition is recommended. Aquatic life and recreational uses are fully supported.

Potter Branch (B-191) - Aquatic life uses are fully supported, but may be threatened by a significantly increasing trend in turbidity. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
PACOLET RIVER SSSD/CLIFTON WWTP PIPE #: 001 FLOW: 0.29	SC0042668 MINOR MUNICIPAL EFFLUENT
PACOLET RIVER HOECHST CELANESE CORP. PIPE #: 002 FLOW: 0.800 PIPE #: 004 FLOW: 0.061 PIPE #: 010 FLOW: 0.216 WQL FOR DO,TRC	SC0002798 MAJOR INDUSTRIAL EFFLUENT EFFLUENT WATER QUALITY
PACOLET RIVER SSSD/TOWN OF COWPENS-WASH. RD PIPE #: 001 FLOW: 1.5 WQL FOR TRC	SC0045624 MAJOR MUNICIPAL WATER QUALITY
PACOLET RIVER CITY OF SPARTANBURG/LAKE BLALOCK/CHESNEE WTP PIPE #: 001 FLOW: 1.12 NOT CONSTRUCTED	SCG641006 MINOR DOMESTIC EFFLUENT
PACOLET RIVER TRIBUTARY OMEGA CHEMICALS, INC. PIPE #: 001 FLOW: 1.12	SCG250055 MINOR INDUSTRIAL EFFLUENT

CHEROKEE CREEK SAXONIA-FRANKE OF AMERICA, INC. PIPE #: 001 FLOW: 0.003	SC0046353 MINOR INDUSTRIAL EFFLUENT
LITTLE BUCK CREEK CITY OF CHESNEE/MAIN PLANT WWTP PIPE #: 001 FLOW: 0.500 WQL FOR NH3N	SC0025763 MINOR MUNICIPAL WATER QUALITY
PETERS CREEK RR DONNELLEY & SONS CO. PIPE #: 001 FLOW: 0.1202 WQL FOR TRC; NH3N IN SUMMER & WINTER	SC0036102 MINOR INDUSTRIAL WATER QUALITY
PETERS CREEK SPECIALTY INDUSTRIAL PRODUCTS PIPE #: 001 FLOW: 0.0097 WQL FOR TRC	SC0037826 MINOR INDUSTRIAL WATER QUALITY
PETERS CREEK SSSD IDLEWOOD SD PIPE #: 001 FLOW: 0.08 WQL FOR TRC,NH3N	SC0030554 MINOR MUNICIPAL WATER QUALITY
PETERS CREEK TRIBUTARY LIQUID AIR CORP. PIPE #: 001 FLOW: M/R	SCG250046 MINOR INDUSTRIAL EFFLUENT
ISLAND CREEK TALL TALES FISH CAMP PIPE #: 001 FLOW: 0.0136	SC0031577 MINOR COMMUNITY EFFLUENT
CINDER BRANCH SSSD/CINDER BRANCH PLT PIPE #: 001 FLOW: 0.03 WQL FOR DO,TRC; NH3N IN SUMMER & WINTER	SC0035424 MINOR MUNICIPAL WATER QUALITY
CINDER BRANCH SSSD/HILLBROOK FOREST SD PIPE #: 001 FLOW: 0.15	SC0029718 MINOR MUNICIPAL WQL FOR DO,TRC,NH3N
LAND APPLICATION SYSTEM **FACILITY NAME**	**PERMIT #** **TYPE**
SPRAYFIELD SPARTANBURG WATER SYSTEM/SIMMS WTP	ND0074101 DOMESTIC
SPRAYFIELD SPARTANBURG WATER SYSTEM/LAKE BLALOCK WTP	ND0077135 DOMESTIC

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
IRENE BISHOP SHORT TERM C&D LANDFILL	422904-1301 ACTIVE
DAVID STOLTZ SHORT TERM C&D LANDFILL	422422-1301 ACTIVE
JAMES LANCASTER LAND CLEARING DEBRIS LANDFILL	422460-1701 ACTIVE
HASKELL SEXTON SHORT TERM C&D LANDFILL	422484-7301 ACTIVE
HOECHST CELANESE CORP. INDUSTRIAL C&D LANDFILL	423312-1201 ACTIVE

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
CHAPMAN GRADING & CONCRETE CO., INC. CHAPMAN SAND PLANT #6	1081-42 SAND

Groundwater Concerns

The groundwater in the vicinity of the property owned by Freedom Chemical is contaminated with volatile organic compounds (VOC) resulting from spills and leaks. The facility is currently in the assessment phase. The surface water affected by the VOCs is an unnamed tributary of the Pacolet River.

Growth Potential

There is a low to moderate potential for growth in this watershed associated primarily with the City of Chesnee and the Town of Cowpens, both having sewer infrastructure. Industrial growth in particular is expected along the I-85 corridor and major roads with I-85 interchanges.

Implementation Strategy

Little Buck Creek is impaired from elevated levels of fecal coliform bacteria due to point and nonpoint sources. Permit revisions have been initiated and conditions are expected to improve.

03050105-180

(Lawsons Fork Creek)

General Description

Watershed 03050105-180 is located in Spartanburg County and consists primarily of ***Lawsons Fork Creek*** and its tributaries. The watershed occupies 59,348 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil series. The erodibility of the soil (K) averages 0.28; the slope of the terrain averages 8%, with a range of 2-15%. Land use/land cover in the watershed includes: 43.80% urban land, 20.47% agricultural land, 0.35% scrub/shrub land, 0.26% barren land, 35.02% forested land, and 0.10% water.

Lawsons Fork Creek originates near and flows past the City of Spartanburg before draining into the Pacolet River. Lawsons Fork Creek accepts drainage from Greene Creek (Meadow Creek), Camp Creek, Fawn Branch, Big Shoally Creek (Little Shoally Creek, Flatwood Lake, Fairview Lake), Betty Green Creek (Waldrops Lake), Chinquapin Creek, and Fourmile Branch. There are several ponds and lakes (10-20 acres) in this watershed used for recreation, irrigation, and power supply. There are a total of 103.6 stream miles, all classified FW.

Water Quality

Lawsons Fork Creek - There are five monitoring sites along Lawsons Fork Creek. Aquatic life uses are partially supported at the upstream site **(B-221)** based on macroinvertebrate community data, and fully supported at the next site downstream **(B-277)**. A significantly increasing trend in dissolved oxygen concentration and significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration at these upstream sites suggest improving conditions for these parameters. Further downstream **(B-278)**, aquatic life uses are also fully supported, but may be threatened by a significantly increasing trend in turbidity. A significantly increasing trend in dissolved oxygen concentration and a significantly decreasing trend in five-day biochemical oxygen demand suggest improving conditions for these parameters.

Aquatic life uses are again fully supported at the next site downstream **(BL-005)**, but may be threatened by a significantly decreasing trend in pH. At the furthest downstream site **(BL-001)**, aquatic life uses are partially supported based on macroinvertebrate community data. In addition, there is a significantly decreasing trend in pH and a significantly increasing trend in turbidity. Sediment samples revealed a very high concentration of zinc in 1992, and high concentrations of PAHs anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, benzo(ghi)perylene, and benzo(a)anthracene in 1994. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration at the downstream sites suggest improving conditions for these parameters. Recreational uses are not supported at any site due to fecal coliform bacteria excursions. This creek was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
LAWSONS FORK CREEK MILLIKEN & CO./DEWEY PLT PIPE #: 001 FLOW: 0.374 WQL FOR DO,TRC,NH3N	SC0003581 MAJOR INDUSTRIAL WATER QUALITY
LAWSONS FORK CREEK AMOCO OIL/SPARTANBURG TERMINAL PIPE #: 001 FLOW: M/R PIPE #: 002 FLOW: M/R	SC0003549 MINOR INDUSTRIAL EFFLUENT EFFLUENT
LAWSONS FORK CREEK SSSD/LAWSONS FORK PLANT PIPE #: 001 FLOW: 9.0-15.5 WQL FOR DO,TRC,NH3N	SC0020427 MAJOR MUNICIPAL WATER QUALITY
LAWSONS FORK CREEK SPARTAN MILLS/WHITNEY PIPE #: 001 FLOW: M/R	SCG250115 MINOR INDUSTRIAL EFFLUENT
LAWSONS FORK CREEK CITY OF INMAN PIPE #: 001 FLOW: 0.477 PIPE #: 001 FLOW: 1.000 (PROPOSED) WQL FOR DO,TRC,NH3N	SC0021601 MINOR MUNICIPAL WATER QUALITY WATER QUALITY
LAWSONS FORK CREEK CITGO PETROLEUM CORP. PIPE #: 001 FLOW: M/R	SCG340005 MINOR INDUSTRIAL EFFLUENT
LAWSONS FORK CREEK INMAN MILLS WATER DISTRICT PIPE #: 001 FLOW: 0.175 WQL FOR DO,TRC,NH3N	SC0024414 MINOR MUNICIPAL WATER QUALITY
LAWSONS FORK CREEK SOUTHEAST TERMINAL/SPARTANBURG PIPE #: 001 FLOW: M/R	SCG340002 MINOR INDUSTRIAL EFFLUENT
LAWSONS FORK CREEK BORDEN INC. PIPE #: 001 FLOW: M/R	SCG250113 MINOR INDUSTRIAL EFFLUENT
LAWSONS FORK CREEK TRIBUTARY DRAPER CORPORATION PIPE #: 001 FLOW: M/R PIPE #: 002 FLOW: M/R	SCR001582 MINOR INDUSTRIAL EFFLUENT EFFLUENT

GREENE CREEK HUDSON INTERNATIONAL CONDUCTORS PIPE #: 001 FLOW: M/R	SCG250039 MINOR INDUSTRIAL EFFLUENT
CAMP CREEK STONECREEK SD/UNITED UTILITIES PIPE #: 001 FLOW: 0.084 WQL FOR DO,TRC,NH3N	SC0031763 MINOR COMMUNITY WATER QUALITY
MEADOW CREEK INMAN STONE COMPANY, INC. PIPE #: 001 FLOW: M/R	SCG730084 MINOR INDUSTRIAL EFFLUENT
CHINQUAPIN CREEK SPARTAN MILLS/BEAUMONT PLT PIPE #: 001 FLOW: M/R	SC0002437 MINOR INDUSTRIAL EFFLUENT
CHINQUAPIN CREEK SPARTAN IRON & METAL PIPE #: 001 FLOW: 0.002	SC0046515 MINOR INDUSTRIAL EFFLUENT
CHINQUAPIN CREEK NORTHSIDE ROBO CAR WASH PIPE #: 001 FLOW: M/R	SCG750002 MINOR INDUSTRIAL EFFLUENT
FOURMILE BRANCH CROWN CENTRAL PETROLEUM CORP. PIPE #: 001 FLOW: M/R	SCG340007 MINOR INDUSTRIAL EFFLUENT
FOURMILE BRANCH CONOCO INC./SPARTANBURG TERMINAL PIPE #: 001 FLOW: M/R PIPE #: 002 FLOW: M/R PIPE #: 003 FLOW: M/R	SCG340006 MINOR INDUSTRIAL EFFLUENT EFFLUENT EFFLUENT

LAND APPLICATION SYSTEM **FACILITY NAME**	**PERMIT #** **TYPE**
SPRAYFIELD KOHLER CO.	ND0000892 INDUSTRIAL

Landfill Activities

SOLID WASTE LANDFILL NAME ***FACILITY TYPE***	***PERMIT #*** ***STATUS***
MILLIKEN & CO. INDUSTRIAL	—— CLOSED
PAR GRADING SHORT TERM C&D LANDFILL	422421-1301 ACTIVE
DRAPER LANDFILL INDUSTRIAL	IWP-103 ACTIVE

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
INMAN STONE COMPANY., INC. INMAN QUARRY	0630-42 GRANITE

Groundwater Concerns

The groundwater in the vicinity of the properties owned by Conoco Inc. (Site #13389), Plantation Pipeline (Site #13652), Exxon Inc. (Site #13432), Fina Oil & Chemical Company (Site #13438), Texaco-Star Enterprises (Site #13726), and Shell Oil Company (Site #13694) are contaminated with petroleum products. Sources of contamination include above ground storage tanks and spills and leaks. The facilities are currently in the assessment and remediation phases, and are participating in a 'community plume agreement'. The surface water affected by the contamination is Fourmile Branch.

The groundwater in the vicinity of the property owned by Milliken & Co. is contaminated with volatile organic compounds (VOC) resulting from pits, ponds, and lagoons. This is a RCRA facility and remedial action has been initiated. The surface water affected by the VOCs is Lawsons Fork Creek.

Growth Potential

There is a high potential for growth in this watershed, which contains a portion of the City of Spartanburg. Industrial growth in particular is expected along the I-85 corridor and major roads with I-85 interchanges. There are also industrial developmental pressures along I-26, US 29, and US 221.

Implementation Strategy

Lawsons Fork Creek has an impaired macroinvertebrate community and elevated levels of fecal coliform bacteria due to both point and nonpoint sources. The biological samples will be evaluated to determine the cause of their impairment. Permit revisions have been initiated and bacterial improvements are expected in the next basin rotation.

03050105-190

(Pacolet River)

General Description

Watershed 03050105-190 is located in Union, Cherokee, and Spartanburg Counties and consists primarily of the ***Pacolet River*** and its tributaries from Lawsons Fork Creek to the Broad River. The watershed occupies 80,098 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Madison-Cecil-Pacolet series. The erodibility of the soil (K) averages 0.27; the slope of the terrain averages 10%, with a range of 2-25%. Land use/land cover in the watershed includes: 2.12% urban land, 11.77% agricultural land, 3.49% scrub/shrub land, 0.88% barren land, 81.57% forested land, and 0.18% water.

This section of the Pacolet River accepts drainage from its upper reach (03050105-170), together with Richland Creek, Harvey Branch, Browns Branch, Plum Branch, and Mill Branch. Further downstream, Mill Creek (Jumping Run Creek, Eison Branch) enters the river followed by Sandy Run Creek, Peter Hawks Creek, Gault Creek, another Mill Creek, another Gault Creek, Big Creek, Kendrick Branch, and Reedy Branch. The Pacolet River drains into the Broad River. There are a few ponds and lakes (25-40 acres) in this watershed used for recreational, municipal, and industrial purposes. There are a total of 101.8 stream miles in this watershed, all classified FW.

Water Quality

Pacolet River - There are two monitoring sites along this section of the Pacolet River. Aquatic life uses are fully supported at both the upstream **(BP-001)** and the downstream **(B-048)** sites, but may be threatened by a significantly decreasing trend in pH at both sites and a very high concentration of cadmium measured in sediment in 1993 at the downstream site. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentrations at both sites and total nitrogen concentrations at the downstream site suggest improving conditions for these parameters. Recreational uses are not supported at either site due to fecal coliform bacteria excursions, but a significantly decreasing trend in fecal coliform bacteria concentrations suggests improving conditions for this parameter at the downstream site.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
PACOLET RIVER SSSD/PACOLET MILLS WWTP PIPE #: 001 FLOW: 0.3	SC0044717 MINOR MUNICIPAL EFFLUENT

PACOLET RIVER TRIBUTARY SSSD/PACOLET ELEM. SCHOOL PIPE #: 001 FLOW: 0.035 WQL FOR TRC; NH3N IN SUMMER & WINTER	SC0038326 MINOR MUNICIPAL WATER QUALITY
PACOLET RIVER TRIBUTARY FMC CORP/SPARTAN MINERALS PIPE #: 001 FLOW: 0.018 PIPE #: 002 FLOW: 0.257 PIPE #: 02a FLOW: 0.120 PIPE #: 003 FLOW: 0.159 WQL FOR METALS	SC0002411 MINOR INDUSTRIAL WATER QUALITY WATER QUALITY WATER QUALITY WATER QUALITY
PACOLET RIVER TRIBUTARY VULCAN MATERIALS CO. PIPE #: 001 FLOW: M/R	SC0002941 MINOR INDUSTRIAL EFFLUENT
MILL CREEK SPARTAN MILLS/ROSEMONT MILL PIPE #: 001 FLOW: 0.0122	SC0037371 MINOR INDUSTRIAL EFFLUENT

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
KOHLER LANDFILL INDUSTRIAL	422442-1601 ACTIVE

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
DEATON SAND COMPANY DEATON SAND PIT	1016-42 SAND
VULCAN MATERIALS CO. PACOLET QUARRY	0062-42 GRANITE

Growth Potential

There is a low to moderate potential for growth in this watershed, which contains a portion of the Town of Jonesville. Public water and sewer services are available in Jonesville, and residential and commercial uses center around the town and along SC 9.

03050106-010

(Broad River)

General Description

Watershed 03050106-010 is located in Union, Chester, and Fairfield Counties and consists primarily of the ***Broad River*** and its tributaries from the Pacolet River to the Tyger River. The watershed occupies 79,889 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Wilkes-Pacolet-Winnsboro series. The erodibility of the soil (K) averages 0.24; the slope of the terrain averages 21%, with a range of 6-40%. Land use/land cover in the watershed includes: 0.49% urban land, 10.74% agricultural land, 3.70% scrub/shrub land, 0.51% barren land, 82.93% forested land, and 1.63% water.

This section of the Broad River accepts drainage from its upper reach (03050105-094), together with Robertson Branch, Fanning Creek (Sharps Creek), George Branch, Osborn Branch, and the Turkey Creek Watershed. Hughes Creek (Lake John D. Long, Vanderford Branch) enters the river next followed by the Browns Creek Watershed, McCluney Creek, Little Turkey Creek, Clarks Creek, Neals Creek (Hobsons Creek), Mineral Creek, Coxs Creek, and the Sandy River Watershed. There are 156.1 stream miles in this watershed, all classified FW. The lower three-quarters of the watershed, below Turkey Creek, resides within the Sumter National Forest.

Water Quality

A fish consumption advisory has been issued by the Department for mercury and includes portions of the Broad River in this watershed (see Watershed Evaluations and Implementation Strategies Within WMU-0502).

Broad River (B-046) - Aquatic life uses are fully supported, but may be threatened by a significantly increasing trend in pH, a very high concentration of zinc measured in 1993, and di-n-butylphthalate detected in 1991. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus and total nitrogen concentrations suggest improving conditions for these parameters. Recreational uses are partially supported due to fecal coliform bacteria excursions.

Lake John D. Long (B-344) - Lake John D. Long is a 78-acre impoundment on Hughes Creek in Union County, with a maximum depth of approximately 31 feet (9.4 m) and an average depth of 16 feet (4.9 m). Lake Long's watershed comprises approximately 1.9 square miles (5.0 km). The lake is currently one of the least eutrophic small lakes in South Carolina, characterized by low nutrient concentrations. Preservation of Lake Long's desirable trophic condition is recommended.

Aquatic life and recreational uses are fully supported. Although pH excursions occurred, higher pH levels are not uncommon in lakes with significant aquatic plant communities and are considered natural, not standards violations. In an effort to provide access for boating and fishing,

300 triploid grass carp (30/vegetated acre) were stocked in 1991 and aquatic herbicides were applied in 1991 and 1994-1996.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
BROAD RIVER CONE MILLS/CARLISLE PLT PIPE #: 001 FLOW: 2.0 PIPE #: 002 FLOW: 0.04 PIPE #: 003 FLOW: 0.12 WQL FOR TRC	SC0001368 MAJOR INDUSTRIAL EFFLUENT WATER QUALITY EFFLUENT
BROAD RIVER SCE&G/NEAL SHOALS HYDRO PIPE #: 001 FLOW:M/R	SC0002186 MINOR INDUSTRIAL EFFLUENT
BROAD RIVER LOCKHART UTIL. CO. PIPE #: 001 FLOW: 0.169 WQL FOR BOD5,DO,TRC,NH3N	SC0003051 MINOR COMMUNITY WATER QUALITY
BROAD RIVER LOCKHART UTIL. CO. PIPE #: 001 FLOW: 0.169 PROPOSED; DISCHARGE BELOW POWER PLANT	SC0003051 MINOR COMMUNITY EFFLUENT
BROAD RIVER CLARIANT CORP./LEEDS PLT PIPE #: 001 FLOW: M/R	SC0022756 MINOR INDUSTRIAL EFFLUENT
LAND APPLICATION **FACILITY NAME**	**PERMIT#** **TYPE**
SPRAYFIELD HOECHST CELANESE CORP.	ND0000091 INDUSTRIAL

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
MCINTYRE SAND CO., INC. MULLINS MINE	0825-44 SAND
MCINTYRE SAND CO., INC. CUDD SAND MINE	0909-44 SAND
SLOAN CONSTRUCTION CO., INC. LOCKHART MINE	0471-44 SAND

UNION COUNTY	0311-10
CARLISLE PIT	SAND

Camp Facilities

FACILITY NAME/TYPE *RECEIVING STREAM*	*PERMIT #* *STATUS*
LEEDS HUNT CAMP/FAMILY BROAD RIVER TRIBUTARY	12-307-0008 ACTIVE
WOODS FERRY/FAMILY BROAD RIVER	12-307-0005 ACTIVE

Water Supply

WATER USER (TYPE) *STREAM*	*PUMPING CAPACITY (MGD)* *REG. PUMPING CAPACITY (MGD)*
CITY OF UNION (M) BROAD RIVER	28.5 8.0
CARLISLE CONE MILLS (M) BROAD RIVER	8.1 5.7
LOCKHART MILLS (M) BROAD RIVER	2.0 1.0

WATER USER (TYPE) *STREAM*	*RATED PUMP. CAP. (GPM)* *AMT. TRT./DIV. (MGD)*
HOECHST CELANESE CORP. (I) BROAD RIVER	200 0.288
HOECHST CELANESE CORP. (I) MINERAL CREEK	694.4 0.576

Growth Potential

There is a low potential for future growth in this watershed. A large portion of the watershed is effectively excluded from development by the Sumter National Forest. Public water service is available in the Towns of Santuck, Lockhart, and Carlisle, and sewer service is available in Lockhart and Carlisle.

03050106-020

(Turkey Creek)

General Description

Watershed 03050106-020 is located in York and Chester Counties and consists primarily of ***Turkey Creek*** and its tributaries. The watershed occupies 96,488 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Wilkes-Cecil-Madison series. The erodibility of the soil (K) averages 0.26; the slope of the terrain averages 12%, with a range of 2-40%. Land use/land cover in the watershed includes: 1.09% urban land, 11.31% agricultural land, 1.48% scrub/shrub land, 0.54% barren land, 85.47% forested land, and 0.11% water.

Turkey Creek originates near the City of York, flowing out of Caldwell Lake (37 acres) and accepting drainage from Ross Branch (Lake Carolyn), Dry Fork, Little Turkey Creek (McClures Branch, Lindsey Creek), and Bryson Creek. Further downstream, Blue Branch enters Turkey Creek followed by Rainey Branch (Palmer Branch), Susybole Creek (Little Susybole Creek), Mill Creek (Rodens Creek), and McKelvy Creek. There are a few ponds and lakes (10-37 acres) in this watershed used for recreational, municipal, and irrigational purposes. There are a total of 142.3 stream miles in this watershed, all classified FW. The lower tip of the watershed resides within the Sumter National Forest.

Water Quality

Turkey Creek (B-136) - Aquatic life uses are fully supported based on physical, chemical, and macroinvertebrate community data. Recreational uses are fully supported.

Ross Branch (B-086) - Aquatic life uses are fully supported, and a significantly decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are not supported due to fecal coliform bacteria excursions.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
LITTLE SUSYBOLE CREEK BECKER MINERALS/LOWRY QUARRY PIPE #: 001 FLOW: M/R	SCG730085 MINOR INDUSTRIAL EFFLUENT
SUSYBOLE CREEK TRIBUTARY MACK ESTATES PIPE #: 001 FLOW: 0.02 WQL FOR DO,TRC,NH3N; NOT CONSTRUCTED	SC0043095 MINOR MUNICIPAL WATER QUALITY

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
REA CONSTRUCTION CO. SAND PIT #123 - TURKEY CREEK MINE	0177-46 SAND
REA CONSTRUCTION CO. SAND PIT #124 - SUSYBOLE CREEK MINE	0180-10 SAND

Water Supply

WATER USER (TYPE) *STREAM*	*PUMPING CAPACITY (MGD)* *REG. PUMPING CAPACITY (MGD)*
CITY OF YORK (M) CALDWELL LAKE	4.1 2.2
CITY OF YORK (M) ROSS BRANCH TRIBUTARY - LAKE CAROLYN	4.0 2.2

Growth Potential

There is a low to moderate potential for growth in this watershed, which contains the Town of Lowrys and portions of the City of York, and the Towns of Sharon and McConnells. The City of York is located at the top of the watershed, and extends water and sewer service in and around the city. Residential and commercial development are expected to grow in these areas.

03050106-030

(Browns Creek)

General Description

Watershed 03050106-030 is located in Union County and consists primarily of ***Browns Creek*** and its tributaries. The watershed occupies 34,729 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Madison-Cecil-Wilkes series. The erodibility of the soil (K) averages 0.26; the slope of the terrain averages 13%, with a range of 2-40%. Land use/land cover in the watershed includes: 5.67% urban land, 18.59% agricultural land, 3.09% scrub/shrub land, 0.32% barren land, 72.20% forested land, and 0.13% water.

Big Browns Creek (Knox Creek, Bethlehem Creek, Meng Creek) originates near the City of Union and merges with Little Browns Creek to form Browns Creek. Gregorys Creek flows into Browns Creek just prior to its confluence with the Broad River. There are 59.6 stream miles in this watershed, all classified FW. The lower portion of the watershed resides within the Sumter National Forest.

Water Quality

Browns Creek (B-155) - Aquatic life uses are fully supported based on macroinvertebrate community data, but may be threatened by a very high concentration of zinc measured in 1995 and occurrences of copper in excess of the aquatic life acute standard. Recreational uses are partially supported due to fecal coliform bacteria excursions.

Meng Creek (B-064) - Aquatic life uses are fully supported, and significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions. This creek was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Unnamed tributary to Meng Creek (B-243) - Aquatic life uses are fully supported, but may be threatened by a significantly increasing trend in pH. Significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus concentration, and turbidity suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions. This creek was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Gregorys Creek (B-335) - Aquatic life uses are fully supported, but may be threatened by a very high concentration of zinc measured in 1995. Recreational uses are fully supported.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
BIG BROWNS CREEK CITY OF UNION/MENG CREEK PLANT PIPE #: 001 FLOW: 1.0 WQL FOR DO,TRC,NH3N	SC0047236 MAJOR MUNICIPAL WATER QUALITY
BIG BROWNS CREEK TRIBUTARY SONOCO PRODUCTS/PINCKNEY PLT PIPE #: 001 FLOW: 0.001 WQL FOR BOD5,DO,TRC,NH3N	SC0028789 MINOR INDUSTRIAL WATER QUALITY
MENG CREEK CITY OF UNION/WTP PIPE #: 001 FLOW: 0.062 WQL FOR TRC	SCG645028 MINOR DOMESTIC WATER QUALITY

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
UNION COUNTY LANDFILL MUNICIPAL	441001-1101 ACTIVE

Growth Potential

There is a low to moderate potential for growth in this watershed, which contains a portion of the City of Union and the unincorporated Monarch Mill Village. Water service is available in most of the watershed, and the area should continue to experience scattered residential development.

Implementation Strategy

Meng Creek and a tributary to Meng Creek are impaired by elevated levels of fecal coliform bacteria due to both point and nonpoint sources. Permit revisions have been initiated and bacterial improvements are expected in the next basin rotation.

03050106-040

(Sandy River)

General Description

Watershed 03050106-040 is located in Chester County and consists primarily of the ***Sandy River*** and its tributaries. The watershed occupies 102,351 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Wilkes-Madison series. The erodibility of the soil (K) averages 0.26; the slope of the terrain averages 14%, with a range of 2-40%. Land use/land cover in the watershed includes: 3.41% urban land, 9.12% agricultural land, 3.28% scrub/shrub land, 0.22% barren land, 83.58% forested land, and 0.40% water.

The Sandy River accepts drainage from Chapel Branch and flows through Chester Reservoir (80 acres) near the City of Chester. Downstream from the reservoir, Dry Fork enters the river followed by Caney Fork Creek (Chester State Park Lake, Twomile Branch, Threemile Branch), Carter Branch, Bear Branch (Mountain Lakes), and Seely Creek (Julies Fork, Walkers Mill Branch, Rock Branch, Bond Branch, Long Branch, Gum Spring Branch). Further downstream, the river accepts drainage from Rocky Branch, Brushy Fork Creek (Smith Creek, Starne Branch), the Little Sandy River (Mobley Creek, Coon Creek), and Johns Creek. Chester State Park is located in this watershed and extends over Twomile Branch and Threemile Branch near the City of Chester. There are several ponds and lakes (10-138 acres) in this watershed used for recreational and municipal purposes, and a total of 156.2 stream miles all classified FW. The lower tip of the watershed resides within the Sumter National Forest.

Water Quality

Sandy River (B-075) - Aquatic life uses are fully supported based on physical, chemical, and macroinvertebrate community data. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

Chester State Park Lake (CL-023) - Aquatic life uses are fully supported. Chester State Park Lake is a 138-acre impoundment on Twomile Branch and Threemile Branch located within Chester State Park in Chester County. The maximum depth is approximately 17 feet (5.2 m) and the average depth is 8.9 feet (2.7 m). The lake's watershed comprises approximately 9.2 square miles (23.8 km2). Eutrophication assessments indicate that Chester State Park Lake maintains an intermediate trophic condition among small lakes in South Carolina. Valued for fishing, although not intensively managed, the lake can support high algal biomass.

Dry Fork (B-074) - Aquatic life uses may not be supported due to the occurrence of a high concentration of copper and both high and very high concentrations of chromium and nickel in sediments. Significantly decreasing trends in five-day biochemical oxygen demand and total

phosphorus concentrations suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
SANDY RIVER HILLTOP MOBILE HOME PARK PIPE #: 001 FLOW: 0.01125 WQL FOR DO,TRC,NH3N	SC0031224 MINOR COMMUNITY WATER QUALITY
SANDY RIVER CITY OF CHESTER/SANDY RIVER WWTP PIPE #: 001 FLOW: 2.133 WQL FOR BOD5,DO,TRC,NH3N	SC0036081 MAJOR MUNICIPAL WATER QUALITY
LAND APPLICATION **FACILITY NAME**	**PERMIT#** **TYPE**
SPRAYFIELD OWENS LAUNDROMAT	ND0001023 INDUSTRIAL
SPRAYFIELD ESSEX INTER INC.	ND0001015 INDUSTRIAL

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
CITY OF CHESTER MUNICIPAL	DWP-069 CLOSED

Camp Facilities

FACILITY NAME/TYPE *RECEIVING STREAM*	*PERMIT #* *STATUS*
CHESTER STATE PARK/FAMILY CHESTER STATE PARK LAKE	12-307-0001 ACTIVE
B&S FAMILY CAMPGROUND/FAMILY SEELY CREEK	12-307-0007 ACTIVE

Growth Potential

There is a low to moderate potential for growth in this watershed, which contains the City of Chester. Water and sewer services are provided in and around Chester and will promote modest residential, commercial, and industrial growth. The majority of the watershed is rural in nature with a high degree of forestry activities.

Implementation Strategy

Dry Fork is impaired by elevated levels of chromium, copper, and nickel from nonpoint sources. Biological community data are needed to determine the ecological significance of the metal excursions and should be acquired where feasible.

03050106-050

(Broad River)

General Description

Watershed 03050106-050 is located in Newberry and Fairfield Counties and consists primarily of the ***Broad River*** and its tributaries from the Tyger River to the Parr Shoals dam. The watershed occupies 156,544 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Cecil-Pacolet-Wilkes series. The erodibility of the soil (K) averages 0.24; the slope of the terrain averages 15%, with a range of 2-40%. Land use/land cover in the watershed includes: 0.73% urban land, 11.17% agricultural land, 3.86% scrub/shrub land, 0.34% barren land, 76.86% forested land, and 7.03% water.

This section of the Broad River accepts drainage from its upper reaches (03050105-094, 03050106-010) together with the Tyger River Watershed, the Enoree River Watershed, Beaver Creek (McClures Creek, Chicken Creek, Storm Branch, Reedy Branch, Sandy Fork), Rocky Creek, and Terrible Creek. The Parr Shoals dam impounds the Broad River to form Parr Reservoir, which accepts drainage from Hellers Creek (Second Creek, Buck Branch) and Cannons Creek (Rocky Branch, Kerr Creek, Charles Creek, Mud Creek). Monticello Reservoir (7100 acres) is connected to Parr Reservoir by Frees Creek. There are a few ponds and lakes (10-7100 acres) in this watershed used for recreation, industry, and power supply. There are a total of 294.9 stream miles, all classified FW. The Sumter National Forest and the Broad River Waterfowl Area are natural resources in the watershed.

Water Quality

A fish consumption advisory has been issued by the Department for mercury and includes portions of the Broad River in this watershed (see Watershed Evaluations and Implementation Strategies Within WMU-0502).

Broad River (B-047) - Aquatic life uses are fully supported, but may be threatened by a significantly increasing trend in total phosphorus concentration. A significantly decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are partially supported due to fecal coliform bacteria excursions. This river was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Beaver Creek (B-143) - Aquatic life uses are fully supported based on macroinvertebrate community data.

Cannons Creek (B-751) - Aquatic life uses are fully supported based on macroinvertebrate community data.

Monticello Reservoir - Monticello Reservoir is a 7100-acre divided impoundment flooding most of the Frees Creek watershed in Fairfield County. The upper impoundment is a small recreational lake. The lower impoundment is linked with Parr Reservoir on the Broad River via a pumped storage hydroelectric facility. Overall, the average depth of Monticello Reservoir is 59 feet (17.9 m) and the maximum depth in the lower impoundment is approximately 126 feet (38.4 m). The lake's watershed comprises approximately 17 square miles (44 km2). Historical eutrophication studies indicate that Monticello Reservoir's trophic condition is improving. It is currently one of the least eutrophic large lakes in South Carolina, characterized by low nutrient concentrations. Preservation of Monticello Reservoir's desirable trophic condition is recommended.

There are two monitoring sites along Monticello Reservoir. Aquatic life uses are fully supported at the upper impoundment site **(B-328)**. Recreational uses are fully supported, but may be threatened by a significantly increasing trend in fecal coliform bacteria concentration. Aquatic life uses are also fully supported at the lower impoundment site **(B-327)**, but may be threatened by a significantly increasing trend in pH and a very high concentration of copper measured in the 1992 sediment sample. Although pH excursions occurred, higher pH levels are not uncommon in lakes with significant aquatic plant communities and are considered natural, not standards violations. Significantly decreasing trends in total phosphorus and total nitrogen concentration, and turbidity at both lake sites suggest improving conditions for these parameters. Recreational uses are fully supported, but may be threatened by a significantly increasing trend in fecal coliform bacteria concentration.

Parr Reservoir - Parr Reservoir is a 4400-acre impoundment on the Broad River in Fairfield and Newberry Counties, linked with Monticello Reservoir via a pumped storage hydroelectric facility. Parr Reservoir's maximum depth is approximately 25 feet (7.6 m) and the average depth is 15 feet (4.6 m). The reservoir's watershed comprises approximately 4750 square miles (12,302 km2) in North and South Carolina. Currently, Parr Reservoir maintains an intermediate trophic condition among large lakes in South Carolina; a short retention time (average approximately four days) results in both high dissolved oxygen concentrations and high turbidity.

There are two monitoring sites along Parr Reservoir. Aquatic life and recreational uses are fully supported at both the uplake site **(B-346)** and the downlake site **(B-345)**. Although a pH excursion occurred at the downlake site, aquatic life uses are considered to be fully supported due to the small number of samples collected.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM
FACILITY NAME
PERMITTED FLOW @ PIPE (MGD)
COMMENT

NPDES#
TYPE
LIMITATION

BROAD RIVER SCE&G/PARR HYDRO STA. PIPE #: 001 FLOW: M/R	SC0001864 MINOR INDUSTRIAL EFFLUENT
MONTICELLO RESERVOIR SCE&G/SUMMER NUCLEAR STA. PIPE #: 014 FLOW: 0.12 WQL DO,TRC; NH3N IN SUMMER & WINTER	SC0030856 MAJOR INDUSTRIAL WATER QUALITY
PARR RESERVOIR SCE&G/FAIRFIELD PUMPED STORAGE PIPE #: 001 FLOW: M/R	SC0035904 MINOR INDUSTRIAL EFFLUENT
CANNONS CREEK NEWBERRY INN/BEST WESTERN PIPE #: 001 FLOW: 0.0255 WQL FOR TRC,NH3N	SC0026921 MINOR COMMUNITY WATER QUALITY
CHARLES CREEK FOREST HILLS SD/ELBO INC. PIPE #: 001 FLOW: 0.02 WQL FOR DO,TRC,NH3N	SC0024571 MINOR MUNICIPAL WATER QUALITY
KERR CREEK TOWN OF PROSPERITY PIPE #: 001 FLOW: 0.17 WQL FOR DO,TRC,NH3N	PROPOSED MINOR MUNICIPAL WATER QUALITY
ROCKY CREEK TARMAC MID-ATLANTIC, INC. PIPE #: 001 FLOW: M/R	SCG730053 MINOR INDUSTRIAL EFFLUENT

Landfill Activities

SOLID WASTE LANDFILL NAME ***FACILITY TYPE***	***PERMIT #*** ***STATUS***
NEWBERRY COUNTY LANDFILL MUNICIPAL	DWP-117 CLOSED
NEWBERRY COUNTY COMPOSTING MUNICIPAL	361001-3001 ACTIVE
NEWBERRY COUNTY TRANSFER STATION MUNICIPAL	361001-6007 ACTIVE
SHAKESPEARE CO. LANDFILL INDUSTRIAL	IWP-159 CLOSED

Mining Activities

MINING COMPANY ***MINE NAME***	***PERMIT #*** ***MINERAL***
TARMAC MID-ATLANTIC, INC. BLAIR QUARRY	0130-20 GRANITE

NEWBERRY COUNTY	0299-36
WICKER ESTATE PIT	SAND/CLAY

Water Supply

WATER USER (TYPE) / *STREAM*	*PUMPING CAPACITY (MGD)* / *REG. PUMPING CAPACITY (MGD)*
VC SUMMER NUCLEAR STATION WTP (M)	3.1
MONTICELLO RESERVOIR	1.5

Growth Potential

There is a low to moderate potential for growth in this watershed, primarily associated with residential development around the reservoirs, the Town of Jenkinsville, and the City of Newberry. The upper portion of the watershed is effectively excluded from development by the Sumter National Forest, and the overall lack of adequate utilities to serve the remaining area will limit growth.

Implementation Strategy

The Broad River is impaired by elevated levels of fecal coliform bacteria due to point and nonpoint sources. Permit revisions have been initiated and bacterial improvements are expected in the next basin rotation.

03050106-060

(Broad River)

General Description

Watershed 03050106-060 is located in Richland, Newberry, and Fairfield Counties and consists primarily of the ***Broad River*** and its tributaries from the Parr Shoals dam to its confluence with the Saluda River. The watershed occupies 160,922 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Tatum-Alpin-Herndon-Pacolet series. The erodibility of the soil (K) averages 0.29; the slope of the terrain averages 13%, with a range of 2-25%. Land use/land cover in the watershed includes: 15.47% urban land, 5.62% agricultural land, 1.89% scrub/shrub land, 0.46% barren land, 74.96% forested land, and 1.57% water.

This section of the Broad River accepts drainage from its upper reaches (03050105-094, 03050106-010, 03050106-050) together with Mayo Creek, Crims Creek (Rocky Creek, Summers Branch), Wateree Creek (Risters Creek), Boone Creek, Freshley Branch, Mussel Creek, and the Little River Watershed. Hollingshead Creek (Boyd Branch, Wildhorse Branch, Metz Branch, Hope Creek, Bookman Creek) enters the river next followed by the Cedar Creek Watershed, Nipper Creek, Nicholas Creek (Swygert Branch, Moccasin Branch), Slatestone Creek, and Burgess Creek. Crane Creek and Smith Branch enter the river at the base of the watershed near the City of Columbia. Sorghum Branch, Dry Branch (Crescent Lake, Stevensons Lake), Elizabeth Lake (60 acres), and Cumbess Creek drain into Crane Creek followed by North Crane Creek. North Cane Creek accepts drainage from Beasley Creek (Robertson Branch, Lot Branch, Hawkins Branch), Swygert Creek, Dry Fork Creek, and Long Branch. There are several ponds and lakes (10-60 acres) in this watershed used for recreational and irrigational purposes, and a total of 311.6 stream miles, all classified FW. The Harbison State Forest is located next to the Broad River just downstream of Nicholas Creek and a Heritage Trust Preserve is located along Nipper Creek.

Water Quality

A fish consumption advisory has been issued by the Department for mercury and includes portions of the Broad River in this watershed (see Watershed Evaluations and Implementation Strategies Within WMU-0502).

Broad River - There are three monitoring sites along this section of the Broad River. Aquatic life uses may not be supported at the upstream site **(B-236)** due to the occurrence of pesticides (P,P'DDT, P,P'DDE, endrin) and high concentrations of the PAHs benzo(k)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene in sediment samples. Recreational uses are partially supported due to fecal coliform bacteria excursions. Aquatic life and recreational uses are fully supported at the midstream site **(B-337)**. At the downstream site **(B-080)**, aquatic life uses are not supported due to occurrences of copper and zinc in excess of the aquatic life acute standard. In addition, there is a significantly

decreasing trend in dissolved oxygen concentration. Significantly decreasing trends in five-day biochemical oxygen demand, total phosphorus and total nitrogen concentration at both the upstream and downstream sites suggest improving conditions for these parameters. Recreational uses are partially supported due to fecal coliform bacteria excursions. This river was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Elizabeth Lake (B-110) - Aquatic life uses are fully supported. Although pH excursions occurred, they were typical of values seen in blackwater, sandhills systems and were considered natural, not standards violations. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are partially supported due to fecal coliform bacteria excursions. In addition, there is a significantly increasing trend in fecal coliform bacteria concentration.

Crane Creek - There are two monitoring sites along Crane Creek. Aquatic life uses are partially supported at the upstream site **(B-081)** based on macroinvertebrate community data. Aquatic life uses are not supported at the downstream site **(B-316)** due to occurrences of copper and zinc in excess of the aquatic life acute standard. In addition, there is a significantly increasing trend in turbidity. A significantly decreasing trend in total phosphorus concentration suggests improving conditions for this parameter. Recreational uses are not supported due to fecal coliform bacteria excursions, and there is a significantly increasing trend in fecal coliform bacteria concentration. This creek was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Smith Branch (B-280) - Aquatic life uses are not supported based on macroinvertebrate community data. A significantly increasing trend in dissolved oxygen concentration and significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentrations suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM	*NPDES#*
FACILITY NAME	*TYPE*
PERMITTED FLOW @ PIPE (MGD)	*LIMITATION*
COMMENT	
BROAD RIVER	SCG730066
MARTIN MARIETTA/N. COLUMBIA	MINOR INDUSTRIAL
PIPE #: 001 FLOW: M/R	EFFLUENT

BROAD RIVER RAINTREE ACRES SD/MIDLANDS UTILITIES PIPE #: 001 FLOW: 0.14	SC0039055 MINOR COMMUNITY EFFLUENT
BROAD RIVER TOWN OF CHAPIN PIPE #: 001 FLOW: 1.2 PIPE #: 001 FLOW: 2.4 (PROPOSED)	SC0040631 MAJOR MUNICIPAL EFFLUENT EFFLUENT
BROAD RIVER RICHLAND COUNTY REGIONAL WWTP PIPE #: 001 FLOW: 2.5	SC0046621 MAJOR MUNICIPAL EFFLUENT
BROAD RIVER AMERADA HESS #40231 PIPE #: 001 FLOW: MR NOT CONSTRUCTED	SC0045187 MINOR INDUSTRIAL EFFLUENT
MAYO CREEK SCE&G/SUMMER NUCLEAR TRAINING CTR PIPE #: 001 FLOW: 0.004 WQL FOR TRC	SC0038407 MINOR INDUSTRIAL WATER QUALITY
CRANE CREEK ATLANTIC SOFT DRINK PIPE #: 001 FLOW: M/R	SCG250021 MINOR INDUSTRIAL EFFLUENT
CRANE CREEK RICHTEX BRICK CORP. PIPE #: 001 FLOW: 0.008 WQL FOR DO,TRC,NH3N	SC0031640 MINOR INDUSTRIAL WATER QUALITY
CRANE CREEK DITCH COLUMBIA I-20 AUTO TRUCK CTR PIPE #: 001 FLOW:M/R	SC0035416 MINOR INDUSTRIAL EFFLUENT
CRANE CREEK TRIBUTARY PRESCOTT TERRACE WWTP PIPE #: 001 FLOW: —	SC0030899 MINOR MUNICIPAL EFFLUENT
RISTERS CREEK MUNN OIL CO/MUNN-E-S PIPE #: 001 FLOW: M/R NEVER CONSTRUCTED	SCG830006 MINOR INDUSTRIAL EFFLUENT
SMITH BRANCH CROWN SC 17 PIPE #: 001 FLOW: M/R	SC0043681 MINOR INDUSTRIAL EFFLUENT
SMITH BRANCH CHEVRON USA/COLUMBIA PIPE #: 001 FLOW: M/R	SCG830003 MINOR INDUSTRIAL EFFLUENT
NIPPER CREEK TARMAC AMERICA/DREYFUS QUARRY PIPE #: 001 FLOW: M/R	SCG730052 MINOR INDUSTRIAL EFFLUENT

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
GIST BACKHOE & GRINDING SERVICE MUNICIPAL	402445-3001 ACTIVE
WHALES TAIL INERT	— CLOSED
RICHLAND COUNTY MSW MUNICIPAL	DWP-065 CLOSED
RICHLAND COUNTY C&D LANDFILL	401002-1201 ACTIVE
RICHARDSON CONSTRUCTION CO., INC. C&D LANDFILL	— CLOSED
RICHTEX BRICK CORP. INDUSTRIAL	IWP-147 ACTIVE
CITY OF COLUMBIA-NORTH LANDFILL MUNICIPAL	SCD981-028-699 CLOSED
CAROLINA WRECKING C&D LANDFILL	402451-1301 CLOSED
CAROLINA WRECKING C&D LANDFILL	APPLYING FOR PERMIT ACTIVE
RICHLAND WRECKING CO., INC. C&D LANDFILL (3 SITES)	—— CLOSED
NORTH COLUMBIA DEVELOPMENT C&D LANDFILL	—— CLOSED
OSS METALS C&D LANDFILL	—— CLOSED

Mining Activities

MINING COMPANY *MINE NAME*	*PERMIT #* *MINERAL*
MARTIN MARIETTA MATERIALS NORTH COLUMBIA QUARRY	0099-40 GRANITE
TRIP CONSTRUCTION CO. TRIP CONSTRUCTION MINE	0081-40 SAND
RICHTEX CORP. BROAD RIVER MINE	0187-40 SHALE
TARMAC MID-ATLANTIC, INC. DREYFUS QUARRY	0129-40 GRANITE

Camp Facilities

FACILITY NAME/TYPE *RECEIVING STREAM*	*PERMIT #* *STATUS*
WOODSMOKE CAMPGROUND/FAMILY WILDHORSE BRANCH	40-307-0011 ACTIVE
CAPITAL CITY CAMPGROUND/FAMILY CRANE CREEK TRIBUTARY	40-307-0003 ACTIVE

Water Supply

WATER USER (TYPE) *STREAM*	*PUMPING CAPACITY (MGD)* *REG. PUMPING CAPACITY (MGD)*
CITY OF COLUMBIA (M) BROAD RIVER CANAL	90.0 72.0

Groundwater Concerns

The groundwater in the vicinity of the property owned by Southern Bell is contaminated with petroleum products due to underground storage tanks. The contamination is considered a risk-based corrective action priority classification 1 (SCDHEC 1997). The contaminated plume is discharging to Smith Branch.

Growth Potential

There is a high potential for growth in this watershed, which contains the northwest portion of the City of Columbia and ample water and sewer service. The I-26 and I-77 corridors, which cross the watershed, together with the US 321, US 21, and US 176 corridors will serve to increase residential, commercial, and industrial growth in the Greater Columbia Area. The northwest portion of the city (St. Andrews, Irmo, and Harbison) will continue to develop as a regional commercial hub for the area. Industrial development along the I-77 corridor is expected to remain strong due to the aggressive economic development policy by the City of Columbia and Richland County. The Killian and Blythwood areas in particular are expected to see increased construction activity.

Implementation Strategy

The Broad River is impaired by elevated levels of pesticides, PAHs, zinc, copper, and fecal coliform bacteria from point and nonpoint sources. Biological community data are needed to determine the ecological significance of the metal excursions and should be acquired where feasible. Permit revisions have been initiated and bacterial improvements are expected in the next basin rotation. Crane Creek has an impaired macroinvertebrate community and elevated levels of zinc, copper, and fecal coliform bacteria from point and nonpoint sources. Smith Branch also has an impaired macroinvertebrate community and elevated levels of fecal coliform. The biological data will be evaluated to determine the cause of their impairment. Permit revisions have been initiated in Crane Creek and bacterial improvements are expected in the next basin rotation.

03050106-070

(Little River)

General Description

Watershed 03050106-070 is located in Fairfield, Chester, and Richland Counties and consists primarily of the ***Little River*** and its tributaries. The watershed occupies 117,685 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Wilkes-Cecil series. The erodibility of the soil (K) averages 0.26; the slope of the terrain averages 14%, with a range of 2-40%. Land use/land cover in the watershed includes: 0.39% urban land, 3.92% agricultural land, 4.54% scrub/shrub land, 0.19% barren land, 90.87% forested land, and 0.10% water.

Big Creek and Little Creek join to form the headwaters of the Little River near the Town of Blackstock. Downstream of the confluence, the Little River accepts drainage from Camp Branch, Brushy Fork Creek (Dumpers Creek), the West Fork Little River (Weir Creek, Spring Branch, Williams Creek, Opossum Branch), Lick Branch, and Harden Branch. The Jackson Creek Watershed drain into the river next followed by Crumpton Creek, the Mill Creek Watershed, Morris Creek, Gibson Branch (Manns Branch, Russell Creek), and Home Branch. The Little River drains into the Broad River. There are a few ponds and lakes (10-16 acres) in this watershed used for recreational and industrial purposes. There are a total of 186.4 stream miles in this watershed, all classified FW.

Water Quality

Little River (B-145) - Although a very high concentration of zinc was measured in 1995, based on macroinvertebrate community data, aquatic life uses are fully supported. Significantly decreasing trends in five-day biochemical oxygen demand and total phosphorus concentration suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions, compounded by a significantly increasing trend in fecal coliform bacteria concentration.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
MORRIS CREEK MARTIN MARIETTA/RION QUARRY PIPE #: 001 FLOW: M/R	SCG730060 MINOR INDUSTRIAL EFFLUENT

Camp Facilities

FACILITY NAME/TYPE	*PERMIT #*
RECEIVING STREAM	*STATUS*
GLENN'S 6-10 CAMPGROUND/FAMILY	20-307-0012
LITTLE RIVER TRIBUTARY	ACTIVE

Growth Potential

There is a low potential for growth in this watershed due to the absence of public utilities.

03050106-080

(Jackson Creek/Mill Creek)

General Description

Watershed 03050106-080 is located in Fairfield County and consists primarily of ***Jackson Creek and Mill Creek*** and their tributaries. The watershed occupies 37,523 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Madison-Cecil-Wilkes series. The erodibility of the soil (K) averages 0.26; the slope of the terrain averages 12%, with a range of 2-40%. Land use/land cover in the watershed includes: 9.33% urban land, 8.62% agricultural land, 2.57% scrub/shrub land, 0.37% barren land, 78.41% forested land, and 0.70% water.

Jackson Creek is created by the confluence of Winnsboro Branch and Moore Creek near the Town of Winnsboro. Jackson Creek accepts drainage from Jordan Branch, Kennedy Creek, Sand Creek, Stitt Branch, and Gladney Branch before flowing into the Little River. Mill Creek drains into the Little River downstream of Jackson Creek. There are a few ponds and lakes (10-192 acres) in this watershed used for recreational, municipal, and flood control purposes. There are a total of 69.3 stream miles in this watershed, all classified FW.

Water Quality

Jackson Creek (B-102) - Aquatic life uses are partially supported based on macroinvertebrate community data. In addition, there is an occurrence of chromium and copper in excess of the aquatic life acute standard. Recreational uses are not supported due to fecal coliform bacteria excursions.

Winnsboro Branch - There are two monitoring sites along Winnsboro Branch. Aquatic life uses are fully supported at the upstream site **(B-123)**, but may be threatened by a significantly increasing trend in turbidity. A significantly decreasing trend in five-day biochemical oxygen demand suggests improving conditions for this parameter. Recreational uses are not supported due to fecal coliform bacteria excursions.

Aquatic life uses are also fully supported at the downstream site **(B-077)**, but may be threatened by a significantly decreasing trend in dissolved oxygen concentration and the occurrence of chromium, copper, and zinc in the water column in excess of the aquatic life acute standard, and the detection of PCB-1242 and PCB-1254 in the 1993 sediment sample. A significantly decreasing trend in total phosphorus concentration suggests improving conditions for this parameter. Recreational uses are not supported due to fecal coliform bacteria excursions. This is compounded by a significantly increasing trend in fecal coliform bacteria concentration.

Mill Creek (B-338) - Although pH excursions occurred, aquatic life uses are considered to be fully supported due to the small number of samples collected. Recreational uses are not supported due to fecal coliform bacteria excursions.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
JACKSON CREEK TOWN OF WINNSBORO PIPE #: 001 FLOW: 1.6 WQL FOR BOD5,DO,TRC,NH3N	SC0020125 MAJOR MUNICIPAL WATER QUALITY
JACKSON CREEK TRIBUTARY UNIROYAL GOODRICH TIRE MFG. PIPE #: 001 FLOW: M/R	SCG250148 MINOR INDUSTRIAL EFFLUENT
JORDAN BRANCH ROYAL HILL SD/MIDLAND UTILITIES PIPE #: 001 FLOW: 0.04 PROPOSED; WQL FOR BOD5,DO,TRC,NH3N	SC0031046 MINOR COMMUNITY WATER QUALITY

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
CHAMBERS FAIRFIELD COUNTY SW TRANSFER STA. MUNICIPAL	---- ACTIVE
FAIRFIELD COUNTY LANDFILL MUNICIPAL	DWP-090 CLOSED

Water Supply

WATER USER (TYPE) *STREAM*	*PUMPING CAPACITY (MGD)* *REG. PUMPING CAPACITY (MGD)*
TOWN OF WINNSBORO (M) SAND CREEK	0.7 0.5
TOWN OF WINNSBORO (M) MILL CREEK - 192 ACRE LAKE	— ---

Growth Potential

There is a low potential for growth in this watershed except for in and around the City of Winnsboro, where water and sewer services exist.

Implementation Strategy

Jackson Creek has an impaired macroinvertebrate community from unknown sources. The biological data will be evaluated to determine the cause of their impairment.

03050106-090

(Cedar Creek)

General Description

Watershed 03050106-090 is located in Fairfield and Richland Counties and consists primarily of ***Cedar Creek*** and its tributaries. The watershed occupies 61,189 acres of the Piedmont region of South Carolina. The predominant soil types consist of an association of the Herndon-Helena-Georgeville series. The erodibility of the soil (K) averages 0.39; the slope of the terrain averages 11%, with a range of 2-25%. Land use/land cover in the watershed includes: 0.66% urban land, 7.17% agricultural land, 1.40% scrub/shrub land, 0.05% barren land, 0.02% forested wetland, 90.35% forested land, and 0.34% water.

Big Cedar Creek originates near the Town of Ridgeway and accepts drainage from Center Creek (Rock Dam Creek), Persimmon Fork, Horse Creek, Williams Branch (Big Branch), and Little Cedar Creek (Crooked Run Creek, Bethel Pond, Smith Branch, Chappel Branch). Big Cedar Creek merges with Harmon Creek (Little Horse Branch, Elkins Creek) to form Cedar Creek which flows into the Broad River. There are a few recreational ponds and lakes (10-20 acres) in this watershed and a total of 150.0 stream miles, all classified FW.

Water Quality

Big Cedar Creek (B-320) - Aquatic life uses are fully supported based on physical, chemical, and macroinvertebrate community data. Recreational uses are partially supported due to fecal coliform bacteria excursions. This creek was Class B until April, 1992 and bacterial conditions may show improvement as the NPDES permits are reissued in the watershed.

Activities Potentially Affecting Water Quality

Point Source Contributions

RECEIVING STREAM *FACILITY NAME* *PERMITTED FLOW @ PIPE (MGD)* *COMMENT*	*NPDES#* *TYPE* *LIMITATION*
CEDAR CREEK TRIBUTARY TOWN OF RIDGEWAY WWTP PIPE #: 001 FLOW: 0.12 WQL FOR BOD5,DO,TRC,NH3N	SC0022900 MINOR MUNICIPAL WATER QUALITY
CENTER CREEK KINGS LABORATORY PIPE #: 001 FLOW: M/R	SC0038474 MINOR INDUSTRIAL EFFLUENT

Growth Potential

There is a low to moderate potential for growth in this watershed. Water and sewer services are available in the Blythewood area.

Implementation Strategy

Big Cedar Creek is impaired from elevated levels of fecal coliform bacteria resulting from both point and nonpoint sources. Permit revisions have been initiated and bacterial improvements are expected in the next basin rotation.

Summary of Water Quality and Implementation Strategies

This summary details both impaired and unimpaired waters. Waters are considered impaired if they are unable to fully meet classified uses for aquatic life, recreation or fish consumption based on the corresponding standards (see Methodology section for interpretation). Noteworthy long-term trends are identified for unimpaired waters. The actions indicated should occur prior to updating this assessment in 2001. (* See text for additional information.)

PS = Partially Supported; NS = Not Supported

WATERSHED WATERBODY	IMPAIRED USE	CAUSE	POSSIBLE SOURCE	RECOMMENDED ACTION
03050108-010 Enoree River* (7 Sites)	Aquatic Life	NS-Zinc (Site 1); PS-Copper (Site 3); PS-Macroinvertebrate Community (Sites 4,5)	Unknown	Monitor the Area for Groundwater; Further Evaluate the Macroinvertebrate Data
	Recreation	PS-Fecal Coliform (Sites 1,6,7); NS-Fecal Coliform (Sites 2,3,4)	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation.
			Nonpoint Source	Further Evaluation
Beaverdam Creek	Recreation	NS-Fecal Coliform	Point Source	Facility May Be Eliminated
			Nonpoint Source	Further Evaluation
Mountain Creek*	Recreation	NS-Fecal Coliform	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation.
			Nonpoint Source	Further Evaluation
Princess Creek*	Aquatic Life	NS-pH, Zinc	Point Source	Evaluate Macroinvertebrate Community
	Recreation	PS-Fecal Coliform	Nonpoint Source	Further Evaluation
Brushy Creek (2 Sites)	Recreation	NS-Fecal Coliform (Both Sites)	Nonpoint Source	Further Evaluation
	-----	Groundwater - Petroleum Products	Nonpoint Source	Facility in Monitoring Phase
Rocky Creek*	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
Little Rocky Creek	-----	Groundwater - Petroleum Products, Phenol, Volatile Organic Compounds	Nonpoint Source	Currently in Assessment, Monitoring, & Remediation Phases.
Gilder Creek* (3 Sites)	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
Lick Creek	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation

PS=Partially Supported; NS=Not Supported

WATERSHED WATERBODY	IMPAIRED USE	CAUSE	POSSIBLE SOURCE	RECOMMENDED ACTION
Durbin Creek* (3 Sites)	Recreation	NS-Fecal Coliform (Upstream & Midstream Sites)	Point and/or Nonpoint Sources	Further Evaluation
	-----	Groundwater - Petroleum Products	Nonpoint Source	A Risk-Based Corrective Action Priority Classification I Underway
Durbin Creek Tributary	-----	Groundwater - Volatile Organic Compounds	Nonpoint Source	Facility Currently in Assessment & Remediation Phase
03050108-020 Enoree River* (3 Sites)	Recreation	PS-Fecal Coliform (Upstream Site); NS-Fecal Coliform (Midstream & Downstream Sites)	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation.
			Nonpoint Source	Further Evaluation
03050108-030 Beaverdam Creek	Recreation	NS-Fecal Coliform	Nonpoint Sources	Further Evaluation
Warrior Creek* (2 Sites)	Recreation	NS-Fecal Coliform (Upstream Site)	Nonpoint Source	Further Evaluation
03050108-040 Duncan Creek*	Recreation	NS-Fecal Coliform	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation.
			Nonpoint Source	Further Evaluation
Beards Fork Creek*	Aquatic Life	PS-Dissolved Oxygen	Nonpoint Source	Further Evaluation
	Recreation	PS-Fecal Coliform		
03050108-050 Enoree River*	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050107-010 South Tyger River* (6 Sites)	Aquatic Life	PS-Macroinvertebrate Community (Site 4)	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation. An Enforcement Action is also Underway. (Proposal to Eliminate and Tie in Point Source)
	Recreation	NS,PS-Fecal Coliform (Sites 3,5)		
Wards Creek	-----	Groundwater - Volatile Organic Compounds	Nonpoint Source	Facility Currently in Remediation Phase
Mush Creek*	Recreation	PS-Fecal Coliform	Nonpoint Source	Further Evaluation

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WATERSHED WATERBODY	IMPAIRED USE	CAUSE	POSSIBLE SOURCE	RECOMMENDED ACTION
03050107-020 North Tyger River*	Aquatic Life	PS-Zinc	Unknown	Evaluate Macroinvertebrate Community
	Recreation	NS-Fecal Coliform	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation.
			Nonpoint Source	Further Evaluation
North Tyger River Tributary	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050107-030 North Tyger River* (3 Sites)	Recreation	NS-Fecal Coliform	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation.
			Nonpoint Source	Further Evaluation
03050107-040 Middle Tyger River* (3 Sites)	Recreation	NS-Fecal Coliform (All Sites)	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation.
			Nonpoint Source	Further Evaluation
03050107-050 Tyger River* (2 Sites)	Aquatic Life	NS-Zinc (Upstream Site)	Unknown	Evaluate Macroinvertebrate Community
	Recreation	NS-Fecal Coliform (Both Sites)	Point Sources	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation.
			Nonpoint Source	Further Evaluation
Jimmies Creek	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050107-060 Fairforest Creek* (5 Sites)	Aquatic Life	PS-Metals & Macroinvertebrate Community (Site 3); PS-Dissolved Oxygen (Site 4)	Point and Nonpoint Sources	Permit Actions Initiated & Improvements Expected in Next Basin Rotation.
	Recreation	NS,PS-Fecal Coliform (Sites 1,2,3; Sites 4,5)	Point Source	Permit Actions Initiated & Improvements Expected in Next Basin Rotation. An Enforcement Action is also Underway.
			Nonpoint Source	Further Evaluation
	-----	Groundwater - Volatile Organic Compounds	Nonpoint Sources	Facilities Currently in Assessment & Remediation Phases
Fairforest Creek Tributary*	Aquatic Life	NS-Chromium, Copper, Lead, Zinc	Unknown/Point Source	Evaluate Macroinvertebrate Community & Groundwater
	Recreation	NS-Fecal Coliform	Unknown/Nonpoint Source	Further Evaluation

PS = Partially Supported; NS = Not Supported

WATERSHED WATERBODY	IMPAIRED USE	CAUSE	POSSIBLE SOURCE	RECOMMENDED ACTION
Goat Pond Creek	------	Groundwater - Volatile Organic Compounds	Nonpoint Sources	Facility Currently in Assessment & Monitoring Phase
Kelsey Creek*	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
Kelsey Creek Tributary	-----	Groundwater - Volatile Organic Compounds	Nonpoint Source	RCRA Facility in Remediation Phase
Mitchell Creek	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
Toschs Creek* (2 Sites)	Recreation	NS-Fecal Coliform (Both Sites)	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation. An Enforcement Action is also Underway.
Tinker Creek* (3 Sites)	Recreation	NS-Fecal Coliform (All Sites)	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation.
03050105-090 Broad River* (2 Sites)	Aquatic Life	NS-Cadmium, Lead, Copper, Zinc (Downstream Site)	Point Source/Unknown (Possibly from N.C.)	Evaluate Macroinvertebrate Community
	Recreation	NS,PS-Fecal Coliform (Both Sites)	Nonpoint Source	Further Evaluation
Canoe Creek* (3 Sites)	Aquatic Life	PS,NS-Macroinvertebrate Community	Point Source	Facility to be Upgraded
	Recreation	NS-Fecal Coliform (Downstream Site)	Point Source	Facility to be Upgraded
Peoples Creek	Recreation	NS-Fecal Coliform	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation.
			Nonpoint Source	Further Evaluation
Doolittle Creek	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
Guyonmoore Creek	Recreation	PS-Fecal Coliform	Nonpoint Source	Further Evaluation
Furnace Creek*	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050105-100 Buffalo Creek* (3 Sites)	Aquatic Life	PS-Cadmium, Copper, Chromium (Downstream Site)	Point Source/Unknown (Possibly from N.C.)	Evaluate Macroinvertebrate Community & Groundwater
	Recreation	NS-Fecal Coliform (All Sites)	Nonpoint Source	Further Evaluation

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WATERSHED WATERBODY	IMPAIRED USE	CAUSE	POSSIBLE SOURCE	RECOMMENDED ACTION
03050105-110 Cherokee Creek	Recreation	NS-Fecal Coliform	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation; An Enforcement Action is also Underway
Providence Creek	-----	Groundwater - Volatile Organic Compounds	Nonpoint Source	Facility Currently in Remediation Phase
03050105-120 Kings Creek*	Recreation	PS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050105-130 Thicketty Creek* (3 Sites)	Recreation	NS-Fecal Coliform (All Sites)	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation.
			Nonpoint Source	Further Evaluation
Irene Creek	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
Limestone Creek	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
Gilkey Creek	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050105-140 Bullock Creek	Recreation	PS-Fecal Coliform	Nonpoint Source	Further Evaluation
Long Branch	Recreation	PS-Fecal Coliform	Nonpoint Source	Further Evaluation
Clark Fork* (2 Sites)	Recreation	PS-Fecal Coliform (Upstream Site)	Nonpoint Source	Further Evaluation
03050105-150 North Pacolet River* (3 Sites)	Recreation	NS-Fecal Coliform (2 Downstream Sites)	Nonpoint Source	Further Evaluation
Lake Lanier* (2 Sites)	Recreation	PS-Fecal Coliform (Upstream Site)	Nonpoint Source	Further Evaluation
Page Creek	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050105-160 South Pacolet River (2 Sites)	Recreation	NS-Fecal Coliform (Downstream Site)	Nonpoint Source	Further Evaluation
Spivey Creek	Recreation	PS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050105-170 Pacolet River* (3 Sites)	Recreation	NS-Fecal Coliform (All Sites)	Nonpoint Source	Further Evaluation
	-----	Groundwater - Volatile Organic Compounds	Nonpoint Source	Facility in Assessment Phase

PS = Partially Supported; NS = Not Supported

WATERSHED WATERBODY	IMPAIRED USE	CAUSE	POSSIBLE SOURCE	RECOMMENDED ACTION
Little Buck Creek*	Recreation	NS-Fecal Coliform	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation.
			Nonpoint Source	Further Evaluation
Potter Branch*	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050105-180 Lawsons Fork Creek* (5 Sites)	Aquatic Life	PS-Macroinvertebrate Community (Sites 1,5)	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation.
			Nonpoint Source (Urban Runoff from Spartanburg)	Further Evaluation
	Recreation	NS-Fecal Coliform (All Sites)	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation.
			Nonpoint Source (Urban Runoff from Spartanburg)	Further Evaluation
	-----	Groundwater - VOCs	Nonpoint Source	Remedial Action has been Initiated for RCRA Facility
Fourmile Branch	----	Groundwater - Petroleum Products	Nonpoint Source	Facilities Currently in Assessment & Remediation Phase, & are Participating in a Community Plume Agreement
03050105-190 Pacolet River* (2 Sites)	Recreation	NS-Fecal Coliform (Both Sites)	Nonpoint Source	Further Evaluation
03050106-010 Broad River*	Recreation	PS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050106-020 Ross Branch	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050106-030 Meng Creek	Recreation	NS-Fecal Coliform	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation.
			Nonpoint Source	Further Evaluation
Meng Creek Tributary*	Recreation	NS-Fecal Coliform	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation.
			Nonpoint Source	Further Evaluation
Browns Creek*	Recreation	PS-Fecal Coliform	Nonpoint Source	Further Evaluation

PS = Partially Supported; NS = Not Supported

WATERSHED WATERBODY	IMPAIRED USE	CAUSE	POSSIBLE SOURCE	RECOMMENDED ACTION
03050106-040 Sandy River	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
Dry Fork*	Aquatic Life	NS-Copper, Chromium, Nickel	Nonpoint Source (Urban Runoff from Chester)	Evaluate Macroinvertebrate Community & Possibly Groundwater
	Recreation	NS-Fecal Coliform	Nonpoint Source (Urban Runoff from Chester)	Further Evaluation
03050106-050 Broad River*	Recreation	PS-Fecal Coliform Upstream Site (Enoree & Tyger Rivers)	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation.
			Nonpoint Source	Further Evaluation
03050106-060 Broad River* (3 Sites)	Aquatic Life	NS-Pesticides, PAHs (Upstream Site); Copper, Zinc (Downstream Site)	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation.
			Nonpoint Source (Urban Runoff from Columbia)	Further Evaluation
	Recreation	PS-Fecal Coliform (Upstream & Downstream Site)	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation.
			Nonpoint Source (Urban Runoff from Columbia)	Further Evaluation
Crane Creek* (2 Sites)	Aquatic Life	PS-Macroinvertebrate Community (Upstream Site); NS-Copper, Zinc (Downstream Site)	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation.
			Nonpoint Source (Urban Runoff from Columbia)	Further Evaluation
	Recreation	NS-Fecal Coliform	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation.
			Nonpoint Source (Urban Runoff from Columbia)	Further Evaluation

PS = Partially Supported; NS = Not Supported

WATERSHED WATERBODY	IMPAIRED USE	CAUSE	POSSIBLE SOURCE	RECOMMENDED ACTION
Smith Branch	Aquatic Life	NS-Macroinvertebrate Community	Nonpoint Source (Urban Runoff from Columbia)	Further Evaluation
	Recreation	NS-Fecal Coliform	Nonpoint Source (Urban Runoff From Columbia)	Further Evaluation
	------	Groundwater - Petroleum Products	Nonpoint Source (Underground Storage Tank Leakage)	Risk-Based Corrective Action Priority Class I is Underway
Elizabeth Lake*	Recreation	PS-Fecal Coliform	Nonpoint Source (Urban Runoff from Columbia)	Further Evaluation
03050106-070 Little River*	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050106-080 Jackson Creek*	Aquatic Life	PS-Macroinvertebrate Community	Unknown	Evaluate Macroinvertebrate data
	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
Winnsboro Branch* (2 Sites)	Recreation	NS-Fecal Coliform (Both Sites)	Nonpoint Source	Further Evaluation
Mill Creek	Recreation	NS-Fecal Coliform	Nonpoint Source	Further Evaluation
03050106-090 Big Cedar Creek	Recreation	PS-Fecal Coliform	Point Source	Permit Actions Initiated & Improvements are Expected in Next Basin Rotation.
			Nonpoint Source	Further Evaluation

UNIMPAIRED WATERS WITH NOTABLE TRENDS

The waters listed in this table are not impaired, but rather display long-term trends that bear following, primarily with continued monitoring.

WATERSHED WATERBODY	CONCERN	POSSIBLE SOURCE	RECOMMENDED ACTION
03050105-160 Lake Bowen	Very High Levels of Cadmium	Unknown	Continue Evaluation
Spartanburg Reservoir #1	Declining Trends in Dissolved Oxygen; Increasing Trend in Turbidity and Fecal Coliform Bacteria	Unknown	Continue Evaluation
03050106-030 Gregorys Creek	Very High Levels of Zinc	Unknown	Continue Evaluation
03050106-050 Monticello Reservoir	Increasing Trends in Fecal Coliform, pH; Very High Levels of Copper	High Geese Population	Continue Evaluation

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APPENDIX A. WMU-0501

Monitoring Station Descriptions

STATION TYPES (P=PRIMARY, S=SECONDARY, W=WATERSHED, BIO=BIOLOGICAL, I=INACTIVE)
CLASS (FW=FRESHWATER, SA=SALTWATER)

03050108-010

BE-001	P	FW	ENOREE RIVER AT UNNUMBERED ROAD W OF US 25, N OF TRAVELERS REST
BE-039	S	FW	BEAVERDAM CREEK AT ROAD 1967
B-186	S	FW	MOUNTAIN CREEK AT S-23-335
B-192	P	FW	PRINCESS CREEK AT SUBER MILL RD, SECOND ROAD S OF US 29 OFF S-23-540
BE-015	S	FW	ENOREE RIVER AT COUNTY ROAD 164
BE-035	S	FW	BRUSHY CREEK AT HOWELL ROAD, APPROXIMATELY 5 MI NE OF GREENVILLE
BE-009	S	FW	BRUSHY CREEK AT S-23-164
BE-007	S	FW	ROCKY CREEK AT BATESVILLE BRIDGE, 1 MI ABOVE CONFLUENCE WITH ENOREE R.
BE-017	P	FW	ENOREE RIVER AT SC 296, 7.5 MI NE OF MAULDIN
BE-040	S	FW	GILDER CREEK AT SC 14, ABOVE GILDERS CREEK PLANT
B-241	S	FW	GILDER CREEK AT S-23-142, 2.75 MI ENE OF MAULDIN
BE-020	S	FW	GILDER CREEK AT S-23-143, 1/4 MI ABOVE CONFLUENCE WITH ENOREE RIVER
BE-018	S/BIO	FW	ENOREE RIVER AT S-30-75
BE-019	BIO	FW	ENOREE RIVER AT SC 418
B-037	S	FW	ENOREE RIVER AT S-42-118, SW OF WOODRUFF
B-038	S	FW	LICK CREEK AT S-42-118, 1 1/4 MI SW WOODRUFF
B-035	S	FW	DURBIN CREEK ON S-23-160, 3 MI E OF SIMPSONVILLE
B-097	P	FW	DURBIN CREEK AT SC 418
BE-022	BIO	FW	DURBIN CREEK AT SC 101
B-040	W	FW	ENOREE RIVER AT S-30-112

03050108-020

BE-024	I	FW	ENOREE RIVER AT US 221
B-041	P	FW	ENOREE RIVER AT SC 49, SE OF WOODRUFF
B-053	W	FW	ENOREE RIVER AT SC 72, 121, & US 176, 1 MI NE WHITMIRE

03050108-030

B-246	W/BIO	FW	BEAVERDAM CREEK AT S-30-97, 7 MI NE OF GRAY COURT
B-150	W	FW	WARRIOR CREEK AT US 221, 8 MI NNE OF LAURENS
B-742	BIO	FW	WARRIOR CREEK AT SC 49

03050108-040

B-735	W	FW	DUNCAN CREEK RESERVOIR 6B
B-231	S	FW	BEARDS FORK CREEK AT US 276 (I-385), 3.7 MI NNE OF CLINTON
B-072	P/BIO	FW	DUNCAN CREEK AT US 176, 1.5 MI SE OF WHITMIRE

03050108-050

B-071	BIO	FW	INDIAN CREEK AT US 176
B-054	P	FW	ENOREE RIVER AT S-36-45, 3.5 MI ABOVE CONFLUENCE WITH BROAD R.

03050107-010

B-317	P	FW	MUSH CREEK AT SC 253, BELOW TIGERVILLE
B-741	BIO	FW	SOUTH TYGER RIVER AT UNNUMBERED ROAD, S OF S-23-569

CL-100	W	FW	LAKE ROBINSON IN FOREBAY NEAR DAM
B-341	W	FW	LAKE CUNNINGHAM IN FOREBAY NEAR DAM
B-149	S	FW	SOUTH TYGER RIVER AT SC 14, 2.9 MI NNW OF GREER
B-263	S	FW	SOUTH TYGER RIVER AT SC 290, 3.7 MI E OF GREER
B-005A	BIO	FW	SOUTH TYGER RIVER AT S-42-242
B-005	S	FW	SOUTH TYGER RIVER AT S-42-63
B-332	W	FW	SOUTH TYGER RIVER AT S-42-86, 5 MI NE OF WOODRUFF
03050107-020			
B-348	W	FW	LAKE COOLEY IN FOREBAY NEAR DAM
B-315	S	FW	TRIBUTARY TO N.TYGER RIVER AT UNNUMBERED ROAD BELOW JACKSON #2 EFFLUENT
B-219	S	FW	NORTH TYGER RIVER AT US 29, 7.2 MI W OF SPARTANBURG
03050107-030			
B-017	BIO	FW	NORTH TYGER RIVER AT SC 296
B-162	I	FW	NORTH TYGER RIVER AT US 221, 7.6 MI NNE OF WOODRUFF
B-018A	S	FW	NORTH TYGER RIVER AT S-42-231, 11 MI S OF SPARTANBURG
03050107-040			
B-148	P/BIO	FW	MIDDLE TYGER RIVER AT SC 14, 2 MI SSW GOWANSVILLE
B-012	S	FW	MIDDLE TYGER RIVER AT S-42-63
B-014	W/BIO	FW	MIDDLE TYGER RIVER AT S-42-64
03050107-050			
B-008	P	FW	TYGER RIVER AT S-42-50, E OF WOODRUFF
B-019	S	FW	JIMMIES CREEK AT S-42-201, 2 MI E OF WOODRUFF
B-733	BIO	FW	DUTCHMAN CREEK AT S-42-511
B-051	P	FW	TYGER RIVER AT SC 72, 5.5 MI SW OF CARLISLE
03050107-060			
B-321	P	FW	TRIBUTARY TO FAIRFOREST CREEK, 200 FEET BELOW S-42-65
B-020	S	FW	FAIRFOREST CREEK AT US 221, S OF SPARTANBURG
B-164	S	FW	FAIRFOREST CREEK AT S-42-651, 3.5 MI SSE OF SPARTANBURG
B-021	P/BIO	FW	FAIRFOREST CREEK AT SC 56
B-235	S	FW	KELSEY CREEK AT S-42-321
CL-035	W	FW	LAKE JOHNSON AT SPILLWAY AT S-42-359
CL-033	W	FW	LAKE CRAIG 45 METERS NW OF DAM
BF-007	S	FW	FAIRFOREST CREEK ON COUNTY ROAD 12, SW OF JONESVILLE
B-199	S	FW	MITCHELL CREEK AT COUNTY ROAD 233, 2.3 MI SSW OF JONESVILLE
B-067A	S	FW	TOSCHS CREEK AT US 176, 2 MI SW OF UNION
B-067B	S	FW	TOSCHS CREEK AT ROAD TO TREATMENT PLANT OFF S-44-92, SW OF UNION
BF-008	S/BIO	FW	FAIRFOREST CREEK AT S-44-16, SW OF UNION
B-286	S	FW	TINKER CREEK AT ROAD TO TREATMENT PLANT, 1.3 MI SSE OF UNION
B-287	S	FW	TINKER CREEK AT UNNUMBERED COUNTY ROAD, 1.7 MI SSE OF UNION
B-336	W/BIO	FW	TINKER CREEK AT S-44-278, 9 MI SSE OF UNION

Water Quality Trends and Status by Station

Spreadsheet Legend

Station Information:

STATION NUMBER	Station ID
TYPE	SCDHEC station type code
	P = Primary station, sampled monthly all year round
	S = Secondary station, sampled monthly May - October
	P* = Secondary station upgraded to primary station parameter coverage and sampling frequency for basin study
	BD = Special station added for the Broad basin study
	I* = Currently inactive station which had some data within the period reviewed
	BIO= Indicates macroinvertebrate community data assessed
WATERBODY NAME	Stream or Lake Name
CLASS	Stream classification at the point where monitoring station is located

Parameter Abbreviations and Parameter Measurement Units:

DO	Dissolved Oxygen (mg/l)	NH3	Ammonia (mg/l)
BOD	Five-Day Biochemical Oxygen Demand (mg/l)	CD	Cadmium (ug/l)
pH	pH (SU)	CR	Chromium (ug/l)
TP	Total Phosphorus (mg/l)	CU	Copper (ug/l)
TN	Total Nitrogen (mg/l)	PB	Lead (ug/l)
TURB	Turbidity (NTU)	HG	Mercury (ug/l)
TSS	Total Suspended Solids (mg/l)	NI	Nickel (ug/l)
BACT	Fecal Coliform Bacteria (#/100 ml)	ZN	Zinc (ug/l)

Statistical Abbreviations:

N	For standards compliance, number of surface samples collected between January, 1991 and December, 1995 For trends, number of surface samples collected between January, 1980 and December, 1995
EXC.	Number of samples contravening the appropriate standard
%	Percentage of samples contravening the appropriate standard
MEAN EXC.	Mean of samples which contravened the applied standard
MED	For heavy metals with a human health criterion, this is the median of all surface samples between January, 1991 and December, 1995. DL indicates that the median was the detection limit.
MAG	Magnitude of any statistically significant trend, average change per year, expressed in parameter measurement units
GEO MEAN	Geometric mean of fecal coliform bacteria samples collected between January, 1991 and December, 1995

Key to Trends:

D	Statistically significant decreasing trend in parameter concentration
I	Statistically significant increasing trend in parameter concentration
*	No statistically significant trend
Blank	Insufficient data to test for long term trends

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0501

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	DO N	DO EXC.	DO %	MEAN EXC.	TRENDS DO	TRENDS N	TRENDS MAG	TRENDS BOD	TRENDS N	TRENDS MAG	pH N	pH EXC.	pH %	MEAN EXC.	TRENDS PH	TRENDS N	TRENDS MAG
03050108010																				
BE-001	P	ENOREE RVR	FW	58	0	0		*	143		D	187	-0.0667	57	2	4	5.8	*	174	
BE-039	S	BEAVERDAM CK	FW	21	0	0		*	62		D	69	-0.15	23	1	4	5.8	*	74	
B-186	S	MOUNTAIN CK	FW	23	0	0		*	63		*	68		22	0	0		*	63	
B-192	P	PRINCESS CK	FW	48	0	0		*	86		D	96	-0.05	46	14	30	5.679	I	92	0.1
BE-015	S	ENOREE RVR	FW	23	0	0		I	63	0.14	D	67	-0.1667	23	0	0		I	71	0.0182
BE-035	S	BRUSHY CK	FW	22	0	0		*	62		*	65		21	0	0		*	62	
BE-009	S	BRUSHY CK	FW	23	0	0		*	63		D	68	-0.05	23	0	0		*	65	
BE-007	S	ROCKY CK	FW	23	0	0		I	63	0.0778	D	68	-0.1817	23	0	0		*	71	
BE-017	P	ENOREE RVR	FW	13	0	0								13	0	0				
BE-040	S	GILDER CK	FW	23	0	0		*	63		D	69	-0.0612	23	0	0		*	65	
B-241	S	GILDER CK	FW	23	0	0		I	63	0.1227	D	69	-0.6492	23	0	0		I	65	0.02
BE-020	S	GILDER CK	FW	23	0	0		I	63	0.1528	D	68	-0.2	23	0	0		I	71	0.0333
BE-018	S/BIO	ENOREE RVR	FW	23	0	0		I	63	0.0414	D	67	-0.075	23	0	0		*	65	
BE-019	BIO	ENOREE RVR	FW																	
B-037	S	ENOREE RVR	FW	22	0	0		*	64		D	67	-0.1	22	0	0		*	71	
B-038	S	LICK CK	FW	22	0	0		I	63	0.1268	D	68	-0.2	22	0	0		*	65	
B-035	S	DURBIN CK	FW	23	0	0		I	64	0.12	D	70	-0.3683	23	0	0		*	65	
B-097	P	DURBIN CK	FW	49	0	0		*	82		D	81	-0.15	49	0	0		*	81	
BE-022	BIO	DURBIN CK	FW																	
B-040	BD	ENOREE RVR	FW	12	0	0								12	0	0				
03050108020																				
BE-024	I*	ENOREE RVR	FW	17	0	0		*	59		D	63	-0.0633	17	0	0		*	61	
B-041	P	ENOREE RVR	FW	59	0	0		*	138		D	181	-0.0818	58	0	0		D	170	0
B-053	BD	ENOREE RVR	FW	12	0	0								12	0	0				
03050108030																				
B-246	BD/BIO	BEAVERDAM CK	FW	12	0	0								12	0	0				
B-150	BD	WARRIOR CK	FW	12	0	0								12	0	0				
B-742	BIO	WARRIOR CK	FW																	
03050108040																				
B-735	BD	DUNCAN CK RES. 6B	FW	4	0	0								4	1	25	9.1			
B-231	S	BEARDS FORK CK	FW	24	6	25	4.1	I	64	0.1562	D	68	-0.269	24	0	0		D	65	-0.0167
B-072	P/BIO	DUNCAN CK	FW	49	0	0		D	89	-0.0586	*	100		49	0	0		*	100	
03050108050																				
B-071	BIO	INDIAN CK	FW																	
B-054	P	ENOREE RVR	FW	56	0	0		D	158	-0.0679	D	190	-0.08	56	0	0		*	204	

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0501

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	TRENDS											
				TP	N	MAG	TN	N	MAG	TURB	N	MAG	TSS	N	MAG
03050108010															
BE-001	P	ENOREE RVR	FW	D	186	-0.0022	*	133		I	185	0.1818			
BE-039	S	BEAVERDAM CK	FW	D	75	-0.0661				*	68				
B-186	S	MOUNTAIN CK	FW	D	67	0				I	67	0.3889			
B-192	P	PRINCESS CK	FW	*	92		I	30	0.085	*	96				
BE-015	S	ENOREE RVR	FW	D	70	-0.0233				*	67				
BE-035	S	BRUSHY CK	FW	*	65					*	64				
BE-009	S	BRUSHY CK	FW	D	67	-0.0011				*	67				
BE-007	S	ROCKY CK	FW	D	73	-0.0102				D	67	-0.3			
BE-017	P	ENOREE RVR	FW												
BE-040	S	GILDER CK	FW	D	68	-0.0033				D	68	-0.4			
B-241	S	GILDER CK	FW	D	68	-0.0732				D	68	-0.5657			
BE-020	S	GILDER CK	FW	D	74	-0.045				*	68				
BE-018	S/BIO	ENOREE RVR	FW	D	69	-0.015				*	66				
BE-019	BIO	ENOREE RVR	FW												
B-037	S	ENOREE RVR	FW	D	72	-0.0133				I	65	0.75			
B-038	S	LICK CK	FW	D	67	-0.01				*	66				
B-035	S	DURBIN CK	FW	D	70	-0.0419				*	69				
B-097	P	DURBIN CK	FW	D	81	-0.02	*	36		*	81				
BE-022	BIO	DURBIN CK	FW												
B-040	BD	ENOREE RVR	FW												
03050108020															
BE-024	I*	ENOREE RVR	FW	*	63					*	61				
B-041	P	ENOREE RVR	FW	D	181	-0.008	*	130		I	179	0.5			
B-053	BD	ENOREE RVR	FW												
03050108030															
B-246	BD/BIO	BEAVERDAM CK	FW												
B-150	BD	WARRIOR CK	FW												
B-742	BIO	WARRIOR CK	FW												
03050108040															
B-735	BD	DUNCAN CK RES. 6B	FW												
B-231	S	BEARDS FORK CK	FW	D	68	-0.01				*	67				
B-072	P/BIO	DUNCAN CK	FW	D	95	-0.0042	D	36	-0.07	*	100				
03050108050															
B-071	BIO	INDIAN CK	FW												
B-054	P	ENOREE RVR	FW	D	185	-0.0022	*	136		*	185		I	171	0.5833

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0501

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	GEO MEAN	BACT N	BACT EXC.	BACT %	MEAN EXC.	TRENDS BACT	TRENDS N	TRENDS MAG	NH3 N	NH3 EXC.	CD N	CD EXC.	CD MED.	CD %
03050108010																	
BE-001	P	ENOREE RVR	FW	208	60	14	23	3035	*	187		58	0	19	0	DL	0
BE-039	S	BEAVERDAM CK	FW	401	23	11	48	1176	*	74							
B-186	S	MOUNTAIN CK	FW	839	23	15	65	3962	I	68	31.2698						
B-192	P	PRINCESS CK	FW	20	49	11	22	2009	I	97	1.55	41	0	15	0	DL	0
BE-015	S	ENOREE RVR	FW	431	23	10	43	1447	*	74							
BE-035	S	BRUSHY CK	FW	1640	22	21	95	8646	*	67		1	0	1	0	DL	0
BE-009	S	BRUSHY CK	FW	582	23	16	70	1897	*	68							
BE-007	S	ROCKY CK	FW	502	23	11	48	2628	I	74	22.9286						
BE-017	P	ENOREE RVR	FW	704	13	7	54	6440				13	0	4	0	DL	0
BE-040	S	GILDER CK	FW	2084	23	19	83	29890	I	68	74.1428						
B-241	S	GILDER CK	FW	944	23	20	87	1849	I	68	33.3333						
BE-020	S	GILDER CK	FW	663	23	19	83	902	I	74	30						
BE-018	S/BIO	ENOREE RVR	FW	635	22	13	59	2349	*	67		1	0				
BE-019	BIO	ENOREE RVR	FW														
B-037	S	ENOREE RVR	FW	259	22	5	23	980	*	72							
B-038	S	LICK CK	FW	1615	22	13	59	27119	*	67							
B-035	S	DURBIN CK	FW	928	23	21	91	1520	*	69							
B-097	P	DURBIN CK	FW	581	49	35	71	1297	I	81	42	42	0	13	0	DL	0
BE-022	BIO	DURBIN CK	FW														
B-040	BD	ENOREE RVR	FW	241	12	2	17	780				12	0	4	0	DL	0
03050108020																	
BE-024	I*	ENOREE RVR	FW	270	17	4	24	1055	*	63							
B-041	P	ENOREE RVR	FW	298	59	18	31	1685	*	181		57	0	20	0	DL	0
B-053	BD	ENOREE RVR	FW	196	12	4	33	740				10	0	4	0	DL	0
03050108030																	
B-246	BD/BIO	BEAVERDAM CK	FW	479	12	7	58	904				12	0	4	0	DL	0
B-150	BD	WARRIOR CK	FW	395	12	4	33	1390				10	0	3	0	DL	0
B-742	BIO	WARRIOR CK	FW														
03050108040																	
B-735	BD	DUNCAN CK RES. 6B	FW														
B-231	S	BEARDS FORK CK	FW	140	24	5	21	916	I	66	5.4545	1	0				
B-072	P/BIO	DUNCAN CK	FW	416	45	21	47	1418	*	99		37	0	14	0	DL	0
03050108050																	
B-071	BIO	INDIAN CK	FW														
B-054	P	ENOREE RVR	FW	279	55	16	29	1276	*	191		53	0	18	0	DL	0

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0501

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR MED.	CR %	CU N	CU EXC.	CU %	PB N	PB EXC.	PB MED.	PB %	HG N	HG EXC.	HG MED.	HG %	NI N	NI EXC.	NI %	ZN N	ZN EXC.	ZN %
03050108010																								
BE-001	P	ENOREE RVR	FW	19	0	DL	0	19	0	0	19	0	DL	0	19	0	DL	0	19	0	0	19	19	100
BE-039	S	BEAVERDAM CK	FW																					
B-186	S	MOUNTAIN CK	FW																					
B-192	P	PRINCESS CK	FW	15	0	DL	0	15	0	0	15	0	DL	0	15	0	DL	0	15	0	0	15	3	20
BE-015	S	ENOREE RVR	FW																					
BE-035	S	BRUSHY CK	FW	1	0	DL	0	1	0	0	1	0	DL	0	1	0	DL	0	1	0	0	1	0	0
BE-009	S	BRUSHY CK	FW																					
BE-007	S	ROCKY CK	FW																					
BE-017	P	ENOREE RVR	FW	4	0	DL	0	4	2	50	4	0	DL	0	4	0	DL	0	4	0	0	4	0	0
BE-040	S	GILDER CK	FW																					
B-241	S	GILDER CK	FW																					
BE-020	S	GILDER CK	FW																					
BE-018	S/BIO	ENOREE RVR	FW																					
BE-019	BIO	ENOREE RVR	FW																					
B-037	S	ENOREE RVR	FW																					
B-038	S	LICK CK	FW																					
B-035	S	DURBIN CK	FW																					
B-097	P	DURBIN CK	FW	13	0	DL	0	13	0	0	13	0	DL	0	13	0	DL	0	13	0	0	13	0	0
BE-022	BIO	DURBIN CK	FW																					
B-040	BD	ENOREE RVR	FW	4	0	DL	0	4	1	25	4	0	DL	0	4	0	DL	0	4	0	0	4	0	0
03050108020																								
BE-024	I*	ENOREE RVR	FW																					
B-041	P	ENOREE RVR	FW	20	0	DL	0	20	0	0	20	0	DL	0	20	0	DL	0	20	0	0	20	1	5
B-053	BD	ENOREE RVR	FW	4	0	DL	0	4	0	0	4	0	DL	0	4	0	DL	0	4	0	0	4	0	0
03050108030																								
B-246	BD/BIO	BEAVERDAM CK	FW	4	0	DL	0	4	0	0	4	0	DL	0	4	0	DL	0	4	0	0	4	0	0
B-150	BD	WARRIOR CK	FW	3	1	DL	33	3	0	0	3	0	DL	0	3	0	DL	0	3	0	0	3	0	0
B-742	BIO	WARRIOR CK	FW																					
03050108040																								
B-735	BD	DUNCAN CK RES. 6B	FW																					
B-231	S	BEARDS FORK CK	FW																					
B-072	P/BIO	DUNCAN CK	FW	14	1	DL	7	14	1	7	14	0	DL	0	14	0	DL	0	14	0	0	14	3	21
03050108050																								
B-071	BIO	INDIAN CK	FW																					
B-054	P	ENOREE RVR	FW	18	1	DL	6	18	0	0	18	0	DL	0	18	0	DL	0	18	0	0	18	1	6

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0501

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	DO N	DO EXC.	DO %	MEAN EXC.	TRENDS DO	TRENDS N	TRENDS MAG	TRENDS BOD	TRENDS N	TRENDS MAG	pH N	pH EXC.	pH %	MEAN EXC.	TRENDS PH	TRENDS N	TRENDS MAG
03050107010																				
B-317	P	MUSH CK	FW	58	0	0		*	145		D	186	-0.05	57	0	0		*	176	
B-741	BIO	S TYGER RVR	FW																	
B-341	BD	LAKE CUNNINGHAM	FW	17	0	0								16	0	0				
B-149	S	S TYGER RVR	FW	22	0	0		*	63		D	68	-0.05	22	0	0		*	66	
B-263	S	S TYGER RVR	FW	24	0	0		I	66	0.0342	D	70	-0.04	24	0	0		*	69	
B-005A	BIO	S TYGER RVR	FW																	
B-005	S	S TYGER RVR	FW	24	0	0		*	65		D	69	-0.05	24	0	0		*	68	
B-332	BD	S TYGER RVR	FW	12	0	0								12	0	0				
03050107020																				
B-348	BD	LAKE COOLEY	FW	6	0	0								6	0	0				
B-315	S	N TYGER RVR TRIB	FW	24	0	0		*	65		D	70	-0.1667	24	0	0		D	68	-0.0423
B-219	P*	N TYGER RVR	FW	30	0	0		D	71	-0.0182	D	75	-0.0345	30	1	3	5.95	D	74	-0.02
03050107030																				
B-017	BIO	N TYGER RVR	FW																	
B-162	I*	N TYGER RVR	FW	17	0	0		I	58	0.1	D	63	-0.125	17	0	0		D	60	-0.0528
B-018A	P*	N TYGER RVR	FW	12	0	0								12	0	0				
03050107040																				
B-148	P/BIO	MIDDLE TYGER RVR	FW	60	0	0		*	144		D	186	-0.0444	57	1	2	5.85	*	174	
B-012	S	MIDDLE TYGER RVR	FW	24	0	0		*	64		D	69	-0.225	24	0	0		D	68	-0.0875
B-014	BD/BIO	MIDDLE TYGER RVR	FW	12	0	0								12	0	0				
03050107050																				
B-008	P	TYGER RVR	FW	59	0	0		D	144	-0.025	D	187	-0.075	58	0	0		D	173	-0.025
B-019	S	JIMMIES CK	FW	23	0	0		I	64	0.05	D	68	-0.2056	23	1	4	5.05	*	65	
B-733	BIO	DUTCHMAN CK	FW																	
B-051	P	TYGER RVR	FW	58	0	0		*	149		D	182	-0.1207	58	2	3	7.34	I	191	0.0167

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0501

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	TRENDS											
				TP	N	MAG	TN	N	MAG	TURB	N	MAG	TSS	N	MAG
03050107010															
B-317	P	MUSH CK	FW	D	183	-0.0022	D	130	-0.0186	I	185	0.7464			
B-741	BIO	S TYGER RVR	FW												
B-341	BD	LAKE CUNNINGHAM	FW												
B-149	S	S TYGER RVR	FW	D	67	0				D	67	-0.2			
B-263	S	S TYGER RVR	FW	D	66	-0.0042				I	68	0.355			
B-005A	BIO	S TYGER RVR	FW												
B-005	S	S TYGER RVR	FW	D	69	-0.0067				I	67	0.445			
B-332	BD	S TYGER RVR	FW												
03050107020															
B-348	BD	LAKE COOLEY	FW												
B-315	S	N TYGER RVR TRIB	FW	D	69	-0.028				*	68				
B-219	P*	N TYGER RVR	FW	D	74	0				I	73	0.845			
03050107030															
B-017	BIO	N TYGER RVR	FW												
B-162	I*	N TYGER RVR	FW	*	63					I	61	0.475			
B-018A	P*	N TYGER RVR	FW												
03050107040															
B-148	P/BIO	MIDDLE TYGER RVR	FW	D	186	0	*	130		I	184	1.125			
B-012	S	MIDDLE TYGER RVR	FW	*	70					*	67				
B-014	BD/BIO	MIDDLE TYGER RVR	FW												
03050107050															
B-008	P	TYGER RVR	FW	D	186	-0.005	D	134	-0.03	I	184	0.5			
B-019	S	JIMMIES CK	FW	D	68	-0.0102				*	66				
B-733	BIO	DUTCHMAN CK	FW												
B-051	P	TYGER RVR	FW	D	184	-0.005	D	129	-0.0265	I	183	0.075			

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0501

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	GEO MEAN	BACT N	BACT EXC.	BACT %	MEAN EXC.	TRENDS BACT	TRENDS N	TRENDS MAG	NH3 N	NH3 EXC.	CD N	CD EXC.	CD MED.	CD %
03050107010																	
B-317	P	MUSH CK	FW	228	58	14	24	1224	*	187		54	0	19	0	DL	0
B-741	BIO	S TYGER RVR	FW														
B-341	BD	LAKE CUNNINGHAM	FW	25	6	0	0					5	0				
B-149	S	S TYGER RVR	FW	82	23	2	9	995	I	66	5.4286						
B-263	S	S TYGER RVR	FW	261	24	8	33	930	D	69	-25.2778						
B-005A	BIO	S TYGER RVR	FW														
B-005	S	S TYGER RVR	FW	318	24	6	25	1543	*	68							
B-332	BD	S TYGER RVR	FW	189	12	1	8	490				12	0	4	0	DL	0
03050107020																	
B-348	BD	LAKE COOLEY	FW	9	6	0	0					6	0				
B-315	S	N TYGER RVR TRIB	FW	346	24	12	50	962	*	69							
B-219	P*	N TYGER RVR	FW	445	30	15	50	1777	I	74	23.5417	11	0	4	0	DL	0
03050107030																	
B-017	BIO	N TYGER RVR	FW														
B-162	I*	N TYGER RVR	FW	983	17	15	88	1972	*	62							
B-018A	P*	N TYGER RVR	FW	577	12	8	67	1099				12	0	4	0	DL	0
03050107040																	
B-148	P/BIO	MIDDLE TYGER RVR	FW	333	60	23	38	1544	*	185		58	0	20	0	DL	0
B-012	S	MIDDLE TYGER RVR	FW	398	23	9	39	1797	I	67	11.4286						
B-014	BD/BIO	MIDDLE TYGER RVR	FW	578	12	8	67	1288				12	0	4	0	DL	0
03050107050																	
B-008	P	TYGER RVR	FW	355	59	23	39	1369	I	186	6.6667	55	0	20	0	DL	0
B-019	S	JIMMIES CK	FW	695	23	12	52	3427	*	67							
B-733	BIO	DUTCHMAN CK	FW														
B-051	P	TYGER RVR	FW	280	58	18	31	1240	*	183		55	0	17	0	DL	0

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0501

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR MED.	CR %	CU N	CU EXC.	CU %	PB N	PB EXC.	PB MED.	PB %	HG N	HG EXC.	HG MED.	HG %	NI N	NI EXC.	NI %	ZN N	ZN EXC.	ZN %
03050107010																								
B-317	P	MUSH CK	FW	19	0	DL	0	19	1	5	19	0	DL	0	19	0	DL	0	19	0	0	19	0	0
B-741	BIO	S TYGER RVR	FW																					
B-341	BD	LAKE CUNNINGHAM	FW																					
B-149	S	S TYGER RVR	FW																					
B-263	S	S TYGER RVR	FW																					
B-005A	BIO	S TYGER RVR	FW																					
B-005	S	S TYGER RVR	FW																					
B-332	BD	S TYGER RVR	FW	4	0	DL	0	4	0	0	4	0	DL	0	4	0	DL	0	4	0	0	4	1	25
03050107020																								
B-348	BD	LAKE COOLEY	FW																					
B-315	S	N TYGER RVR TRIB	FW																					
B-219	P*	N TYGER RVR	FW	4	0	DL	0	4	0	0	4	0	DL	0	4	0	DL	0	4	0	0	4	2	50
03050107030																								
B-017	BIO	N TYGER RVR	FW																					
B-162	I*	N TYGER RVR	FW																					
B-018A	P*	N TYGER RVR	FW	4	0	DL	0	4	1	25	4	0	DL	0	4	0	DL	0	4	0	0	4	0	0
03050107040																								
B-148	P/BIO	MIDDLE TYGER RVR	FW	20	0	DL	0	20	0	0	20	0	DL	0	20	0	DL	0	20	0	0	21	2	10
B-012	S	MIDDLE TYGER RVR	FW																					
B-014	BD/BIO	MIDDLE TYGER RVR	FW	4	0	DL	0	4	1	25	4	0	DL	0	4	0	DL	0	4	0	0	4	0	0
03050107050																								
B-008	P	TYGER RVR	FW	20	0	DL	0	20	0	0	20	0	DL	0	20	0	DL	0	20	0	0	20	0	0
B-019	S	JIMMIES CK	FW																					
B-733	BIO	DUTCHMAN CK	FW																					
B-051	P	TYGER RVR	FW	17	0	DL	0	17	1	6	17	0	DL	0	16	0	DL	0	17	0	0	17	2	12

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0501

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	DO N	DO EXC.	DO %	MEAN EXC.	TRENDS DO	TRENDS N	TRENDS MAG	TRENDS BOD	TRENDS N	TRENDS MAG	pH N	pH EXC.	pH %	MEAN EXC.	TRENDS PH	TRENDS N	TRENDS MAG
03050107060																				
B-321	P	FAIRFOREST CK TRIB	FW	59	3	5	4.117	*	144		D	186	-0.25	58	2	3	5.9	D	173	-0.05
B-020	S	FAIRFOREST CK	FW	24	0	0		*	65		*	69		23	0	0		D	65	-0.0167
B-164	S	FAIRFOREST CK	FW	24	0	0		*	65		*	69		23	0	0		*	65	
B-021	P/BIO	FAIRFOREST CK	FW	59	0	0		*	144		D	187	-0.16548	58	0	0		*	172	
B-235	S	KELSEY CK	FW	24	0	0		D	65	-0.0782	D	69	-0.05	24	0	0		D	66	-0.05
CL-035	BD	LAKE JOHNSON	FW	4	0	0								4	3	75	9.233			
CL-033	BD	LAKE CRAIG	FW	4	0	0								3	1	33	5.6			
BF-007	S	FAIRFOREST CK	FW	30	7	23	3.843	D	67	-0.125	D	72	-0.0896	30	0	0		*	74	
B-199	S	MITCHELL CK	FW	30	0	0		*	69		D	74	-0.09	30	0	0		*	75	
B-067A	S	TOSCHS CK	FW	29	0	0		*	65		D	71	-0.0882	29	1	3	5.95	*	72	
B-067B	S	TOSCHS CK	FW	29	0	0		*	66		D	72	-0.1125	29	0	0		I	74	0.0143
BF-008	P*/BIO	FAIRFOREST CK	FW	36	0	0		*	74		D	79	-0.1	36	0	0		*	81	
B-286	S	TINKER CK	FW	30	0	0		*	67		D	73	-0.09	30	0	0		*	74	
B-287	S	TINKER CK	FW	29	0	0		*	69		D	74	-0.1286	29	0	0		I	76	0.025
B-336	BD/BIO	TINKER CK	FW	12	0	0								12	0	0				

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0501

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	TRENDS											
				TP	N	MAG	TN	N	MAG	TURB	N	MAG	TSS	N	MAG
03050107060															
B-321	P	FAIRFOREST CK TRIB	FW	D	184	-0.0476	D	128	-3	I	184	0.5817			
B-020	S	FAIRFOREST CK	FW	D	68	-0.0079				I	68	0.7321			
B-164	S	FAIRFOREST CK	FW	D	68	-0.089				I	68	0.6775			
B-021	P/BIO	FAIRFOREST CK	FW	D	187	-0.0167	D	136	-0.0508	I	184	0.6292			
B-235	S	KELSEY CK	FW	D	68	-0.0002				I	67	0.2381			
CL-035	BD	LAKE JOHNSON	FW												
CL-033	BD	LAKE CRAIG	FW												
BF-007	S	FAIRFOREST CK	FW	D	64	-0.0122				D	74	-0.7062			
B-199	S	MITCHELL CK	FW	D	69	-0.01				*	74				
B-067A	S	TOSCHS CK	FW	*	67					D	71	-1.0467			
B-067B	S	TOSCHS CK	FW	D	70	-0.0019				D	73	-0.36			
BF-008	P*/BIO	FAIRFOREST CK	FW	D	76	-0.01				*	81				
B-286	S	TINKER CK	FW	D	68	-0.002				*	75				
B-287	S	TINKER CK	FW	D	71	-0.03				*	75				
B-336	BD/BIO	TINKER CK	FW												

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0501

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	GEO MEAN	BACT N	BACT EXC.	BACT %	MEAN EXC.	TRENDS BACT	TRENDS N	TRENDS MAG	NH3 N	NH3 EXC.	CD N	CD EXC.	CD MED.	CD %
03050107060																	
B-321	P	FAIRFOREST CK TRIB	FW	414	59	30	51	2738	I	186	4	58	0	21	0	DL	0
B-020	S	FAIRFOREST CK	FW	11978	24	24	100	191275	*	69							
B-164	S	FAIRFOREST CK	FW	1175	24	15	63	7810	I	69	46.6667						
B-021	P/BIO	FAIRFOREST CK	FW	709	59	38	64	13647	I	187	8.8167	58	0	20	0	DL	0
B-235	S	KELSEY CK	FW	565	24	10	42	2970	*	68							
CL-035	BD	LAKE JOHNSON	FW														
CL-033	BD	LAKE CRAIG	FW														
BF-007	S	FAIRFOREST CK	FW	252	30	7	23	1430	D	74	-21.25						
B-199	S	MITCHELL CK	FW	444	30	13	43	1253	*	74							
B-067A	S	TOSCHS CK	FW	452	29	10	34	2561	*	72							
B-067B	S	TOSCHS CK	FW	697	29	20	69	1666	I	74	31.4286						
BF-008	P*/BIO	FAIRFOREST CK	FW	320	36	9	25	1673	*	81		11	0	4	0	DL	0
B-286	S	TINKER CK	FW	430	30	17	57	829	*	74							
B-287	S	TINKER CK	FW	500	29	15	52	967	*	77							
B-336	BD/BIO	TINKER CK	FW	399	12	8	67	636				10	0	4	0	DL	0

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0501

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR MED.	CR %	CU N	CU EXC.	CU %	PB N	PB EXC.	PB MED.	PB %	HG N	HG EXC.	HG MED.	HG %	NI N	NI EXC.	NI %	ZN N	ZN EXC.	ZN %
03050107060																								
B-321	P	FAIRFOREST CK TRIB	FW	21	2	DL	10	21	2	10	21	1	DL	5	20	0	DL	0	21	0	0	21	5	24
B-020	S	FAIRFOREST CK	FW																					
B-164	S	FAIRFOREST CK	FW																					
B-021	P/BIO	FAIRFOREST CK	FW	20	1	DL	5	20	1	5	20	0	DL	0	20	0	DL	0	20	0	0	20	3	15
B-235	S	KELSEY CK	FW																					
CL-035	BD	LAKE JOHNSON	FW																					
CL-033	BD	LAKE CRAIG	FW																					
BF-007	S	FAIRFOREST CK	FW																					
B-199	S	MITCHELL CK	FW																					
B-067A	S	TOSCHS CK	FW																					
B-067B	S	TOSCHS CK	FW																					
BF-008	P*/BIO	FAIRFOREST CK	FW	4	0	DL	0	4	1	25	4	0	DL	0	4	0	DL	0	4	0	0	4	0	0
B-286	S	TINKER CK	FW																					
B-287	S	TINKER CK	FW																					
B-336	BD/BIO	TINKER CK	FW	4	0	DL	0	4	2	50	4	0	DL	0	4	0	DL	0	4	0	0	4	1	25

Mean Seasonal Water Quality Values

BROAD BASIN WMU-0501

PARAMETER	STAT	SPRING (Mar-May)	SUMMER (Jun-Sep)	FALL (Oct-Nov)	WINTER (Dec-Feb)
TEMPERATURE (°C)	Mean	16.6	22.5	15.2	8.3
	Max	27.5	32.0	22.0	18.0
	Min	7.0	15.5	7.5	1.0
	Med	17.0	22.0	15.5	8.0
	95%	21.5	27.0	20.0	13.5
	N	338	832	267	202
DISSOLVED OXYGEN (mg/l)	Mean	8.6	7.6	8.8	10.5
	Max	10.8	11.0	11.2	14.1
	Min	4.0	1.5	4.7	4.8
	Med	8.6	7.6	8.8	10.4
	5%	6.8	5.9	7.3	8.7
	N	338	828	267	202
pH (SU)	Mean	6.7	6.8	6.8	6.7
	Max	9.1	9.6	8.1	8.9
	Min	5.1	5.0	5.8	5.1
	Med	6.7	6.7	6.8	6.7
	95%	7.4	7.4	7.4	7.4
	N	334	824	267	195
BOD_5 (mg/l)	Mean	1.7	1.2	1.3	1.5
	Max	29.0	7.4	7.8	11.0
	Min	0.1	0.1	0.1	0.0
	Med	1.2	1.0	1.0	1.1
	95%	4.2	2.8	3.3	4.0
	N	330	805	263	198
TURBIDITY (NTU)	Mean	26.5	22.5	30.4	31.9
	Max	310.0	400.0	600.0	320.0
	Min	1.0	0.5	0.7	1.0
	Med	17.0	14.0	10.0	18.0
	95%	76.0	66.0	150.0	100.0
	N	330	807	265	202

BROAD BASIN WMU-0501

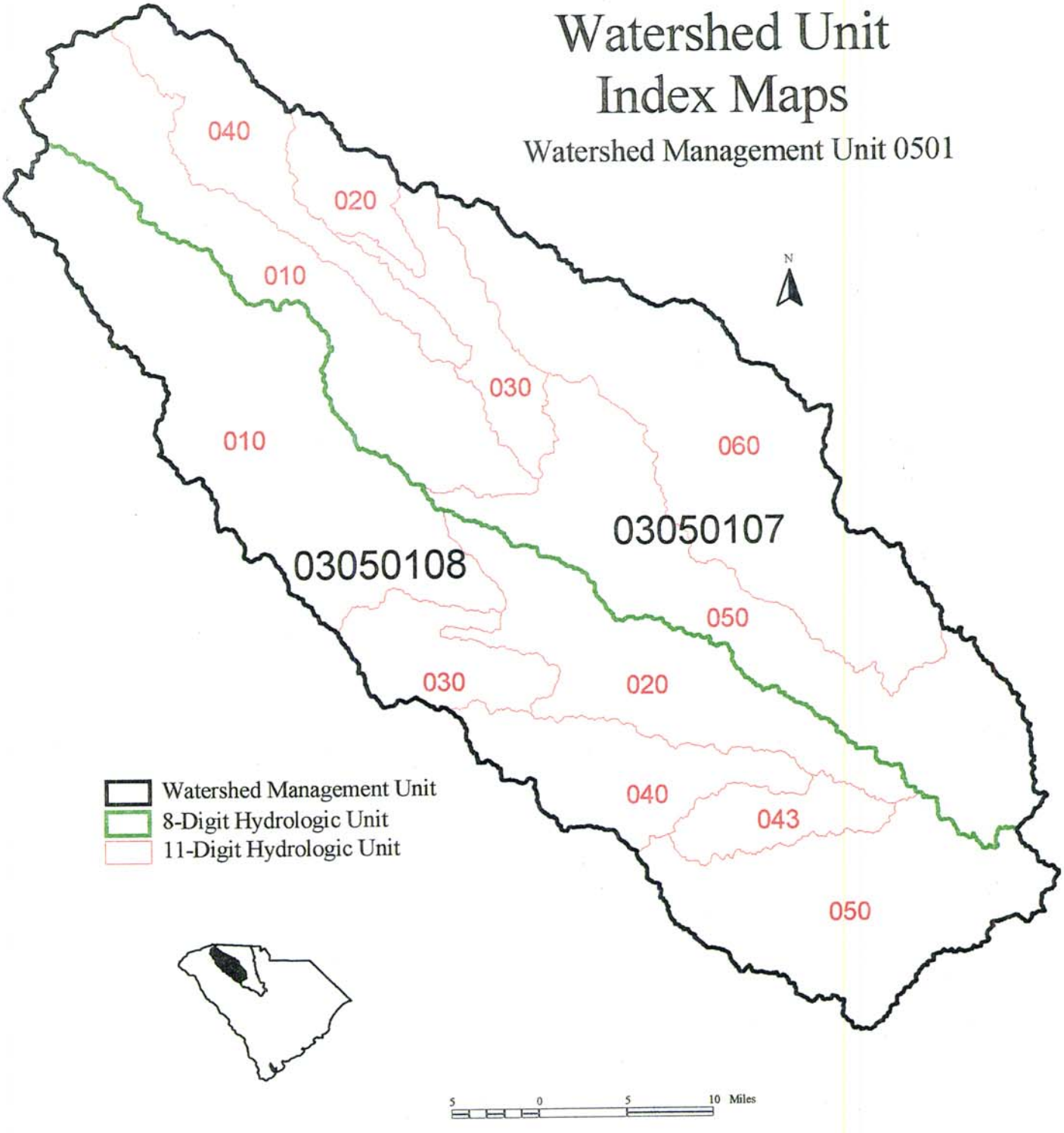
PARAMETER	STAT	SPRING (Mar-May)	SUMMER (Jun-Sep)	FALL (Oct-Nov)	WINTER (Dec-Feb)
AMMONIA (mg/l)	Mean	0.19	0.17	0.26	0.18
	Max	0.83	1.13	1.30	0.85
	Min	0.05	0.05	0.05	0.05
	Med	0.13	0.08	0.10	0.11
	95%	0.49	0.74	1.30	0.44
	N	25	32	12	30
TKN (mg/l)	Mean	0.43	0.44	0.49	0.47
	Max	2.02	3.50	3.95	3.60
	Min	0.10	0.07	0.09	0.10
	Med	0.33	0.36	0.33	0.34
	95%	1.04	0.95	1.26	1.15
	N	171	248	127	190
NITRITE-NITRATE (mg/l)	Mean	0.79	0.91	0.88	0.78
	Max	10.00	9.40	9.80	6.10
	Min	0.02	0.02	0.02	0.07
	Med	0.55	0.55	0.49	0.57
	95%	2.70	3.20	3.00	3.00
	N	318	762	242	198
TOTAL PHOSPHORUS (mg/l)	Mean	0.16	0.18	0.26	0.13
	Max	4.80	1.72	6.80	0.92
	Min	0.02	0.02	0.02	0.02
	Med	0.07	0.08	0.10	0.08
	95%	0.55	0.75	0.90	0.46
	N	284	657	192	177
TOTAL ORGANIC CARBON (mg/l)	Mean	5.3	4.7	3.9	7.7
	Max	64.0	20.0	13.8	185.0
	Min	0.9	1.2	1.1	1.0
	Med	4.0	4.0	3.4	4.1
	95%	9.7	8.5	8.9	15.3
	N	71	83	62	73

BROAD BASIN WMU-0501

PARAMETER	STAT	SPRING (Mar-May)	SUMMER (Jun-Sep)	FALL (Oct-Nov)	WINTER (Dec-Feb)
FECAL COLIFORM BACTERIA (#/100ml)	Mean	309	550	326	184
	Max	160,000	4,000,000	100,000	8,000
	Min	2	1	2	2
	Med	290	460	310	220
	95%	4,000	8,700	3,500	2,000
	N	332	811	266	202

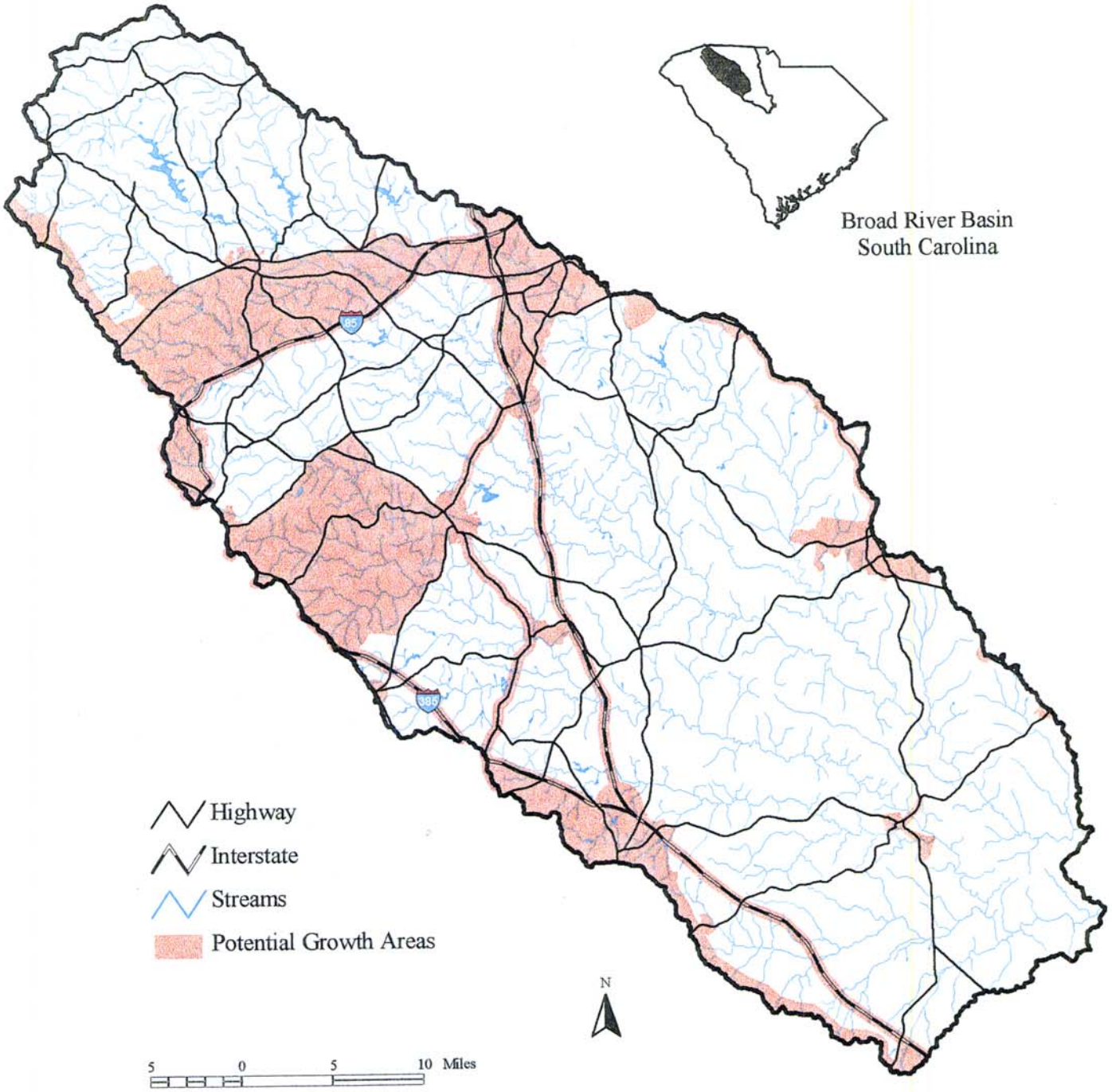
Watershed Unit Index Maps

Watershed Management Unit 0501



Potential Growth Areas

Watershed Management Unit 0501

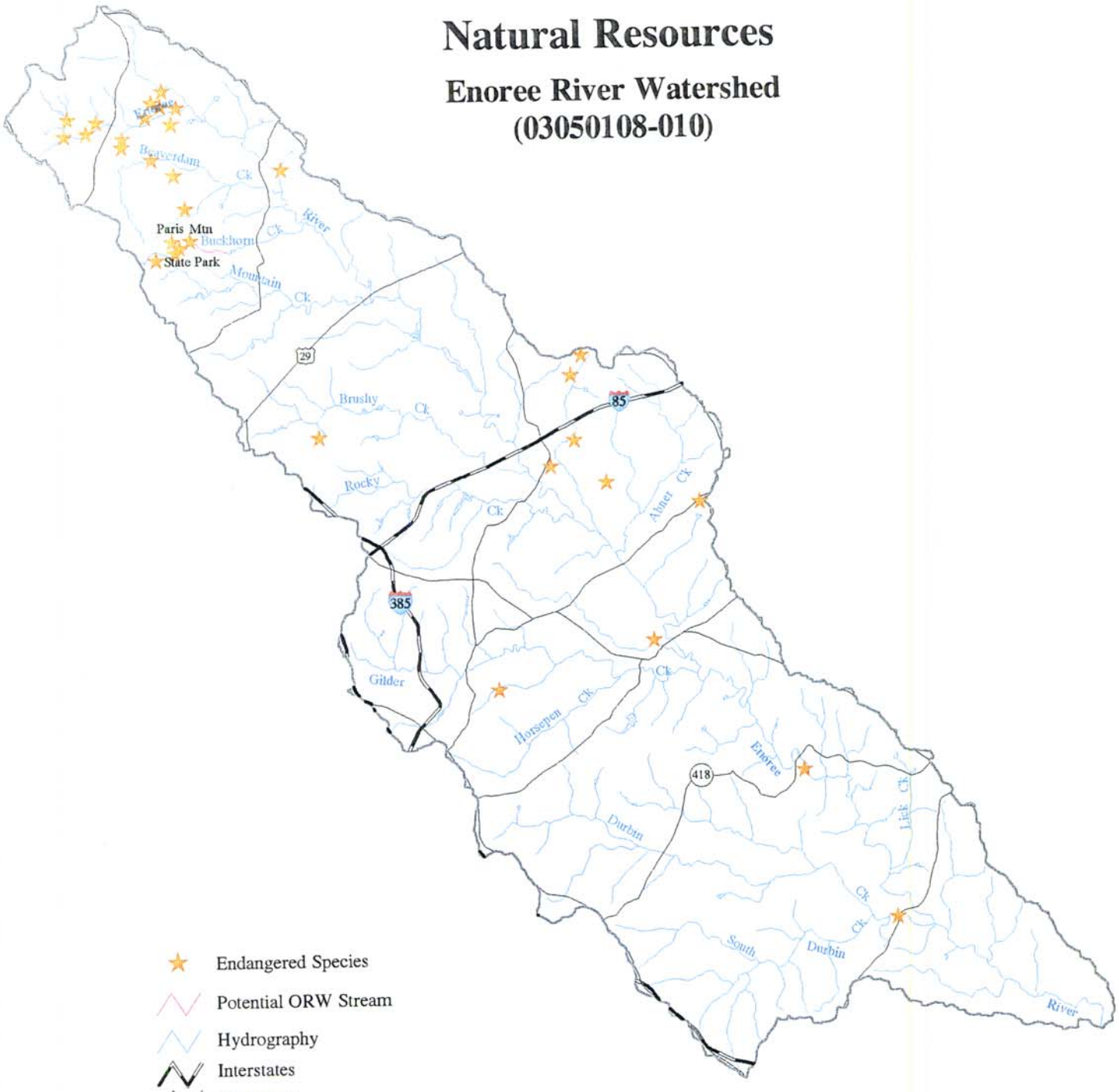


Land Use/Land Cover
Watershed Management Unit 0501

Broad River Basin
South Carolina

Natural Resources

Enoree River Watershed
(03050108-010)



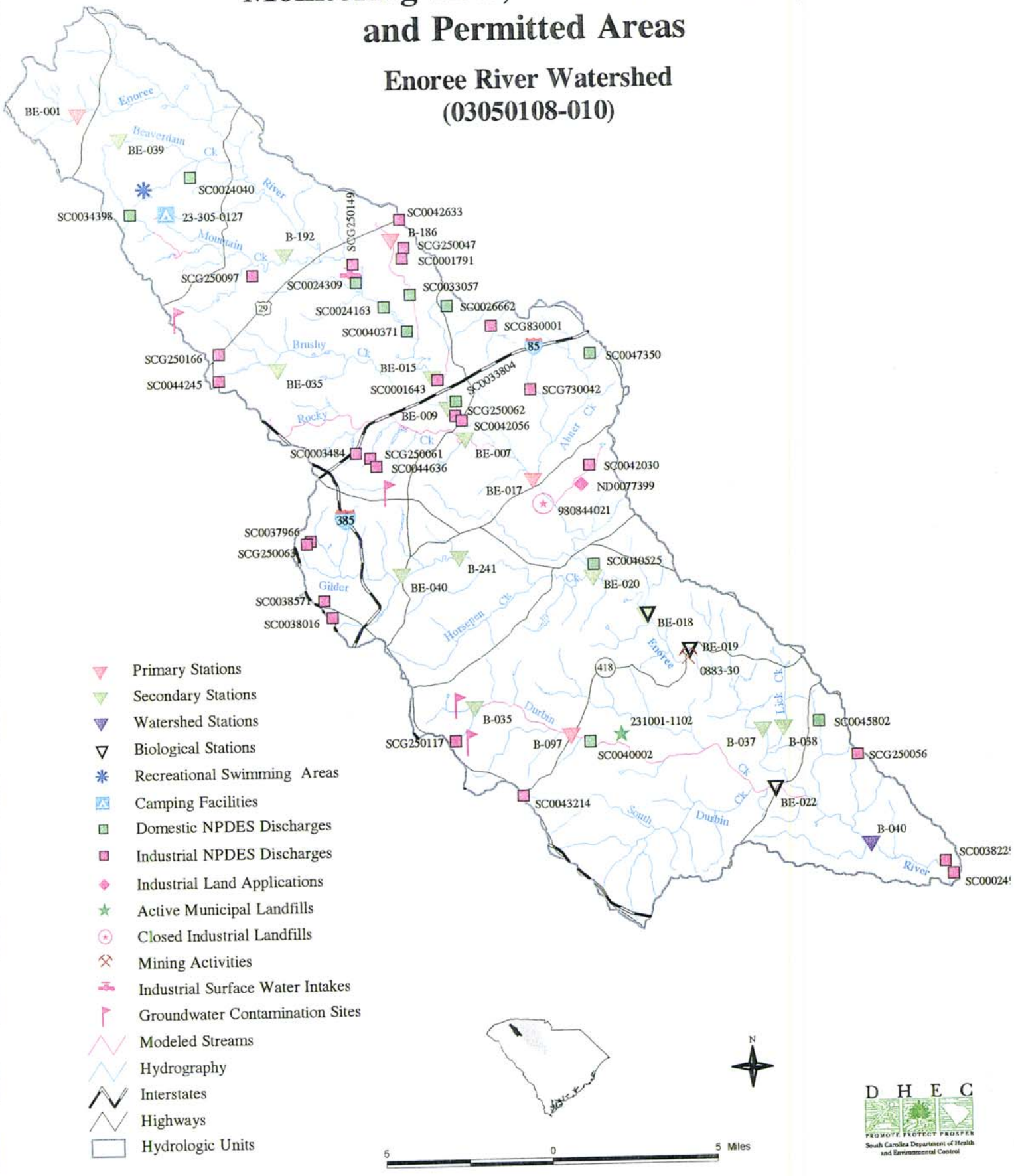
DHEC

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

Monitoring Sites, Modeled Streams, and Permitted Areas

Enoree River Watershed (03050108-010)



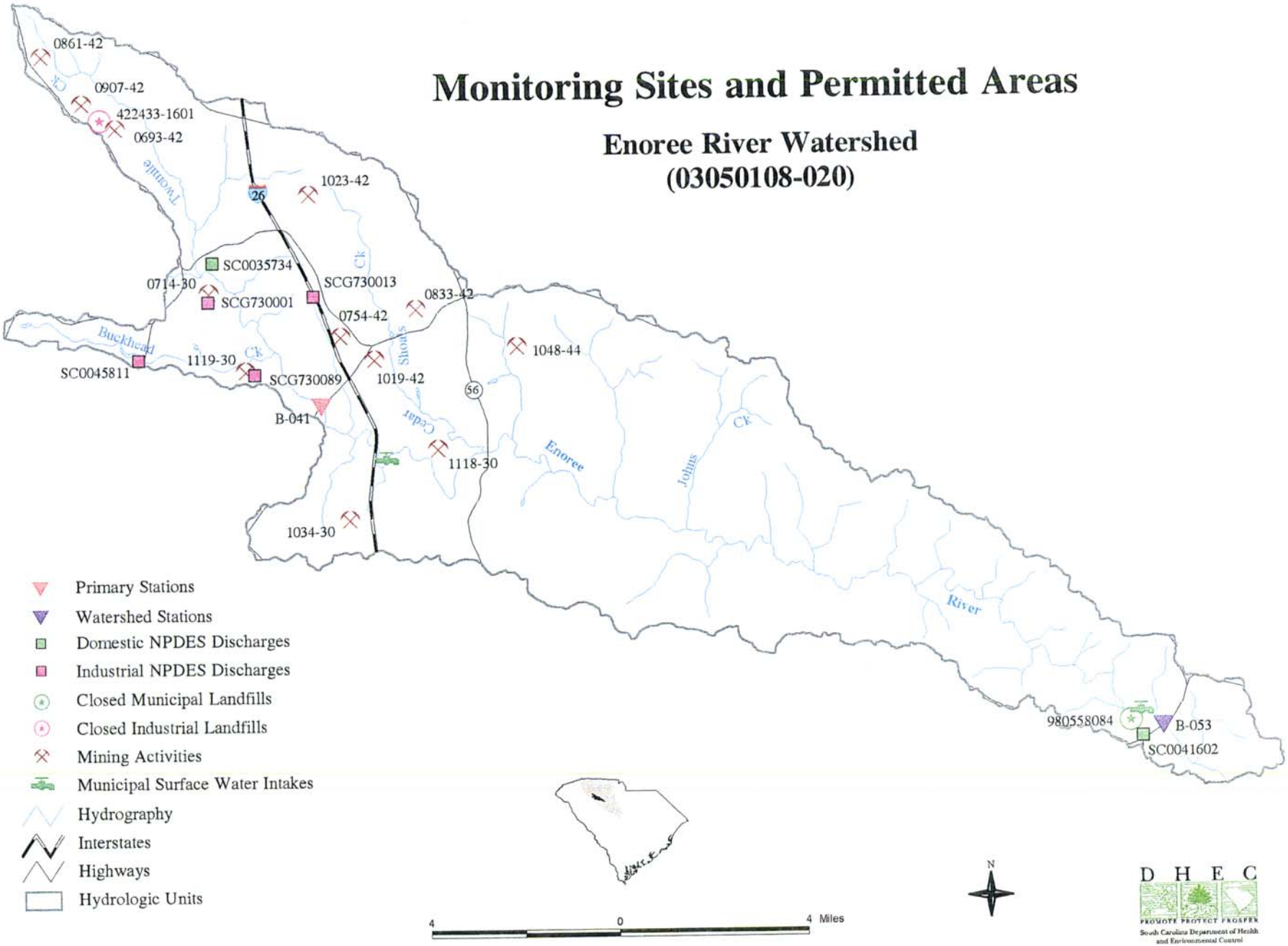
D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

Monitoring Sites and Permitted Areas

Enoree River Watershed
(03050108-020)



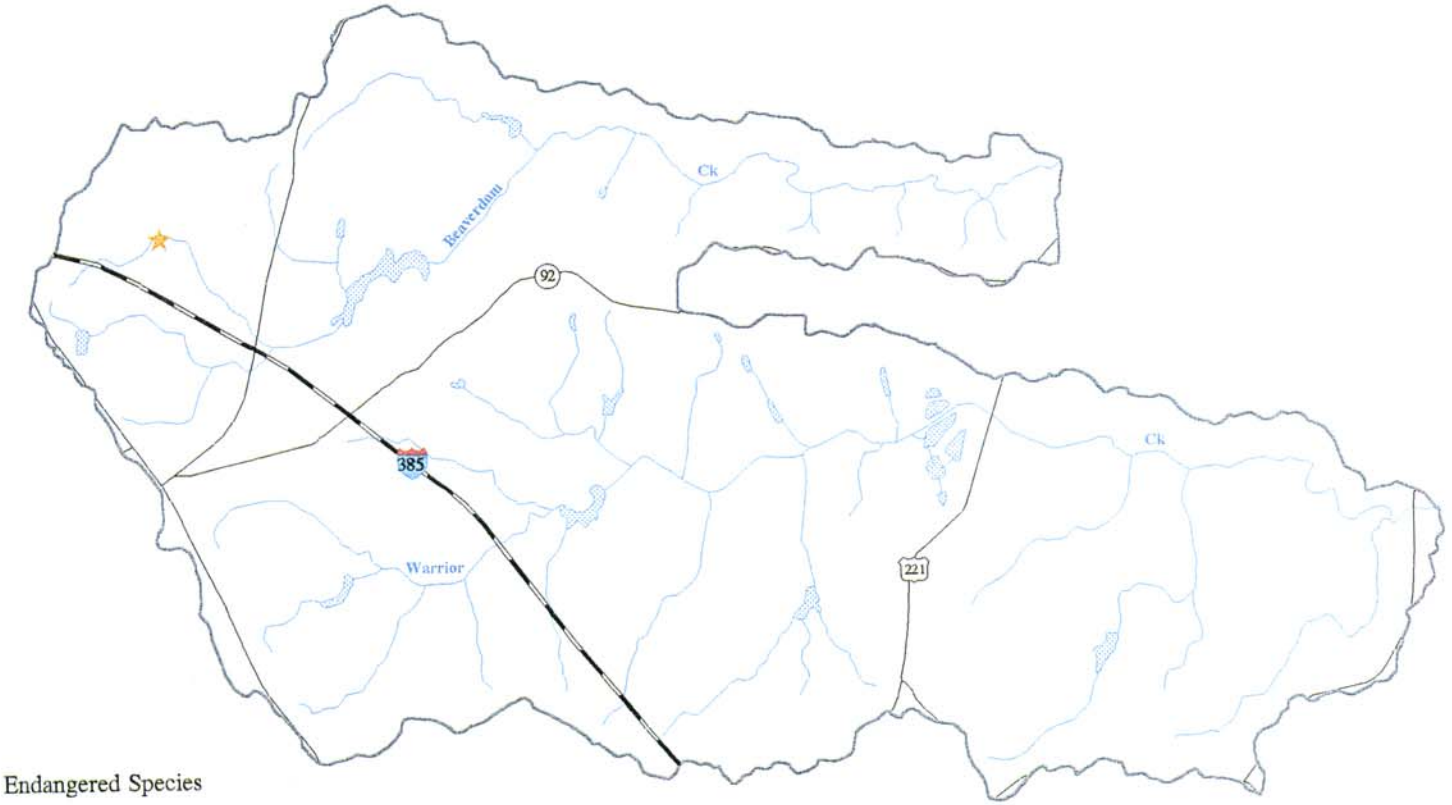
D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

Natural Resources

Beaverdam Creek/Warrior Creek Watershed
(03050108-030)



- Endangered Species
- Hydrography
- Interstates
- Highways
- Hydrologic Units

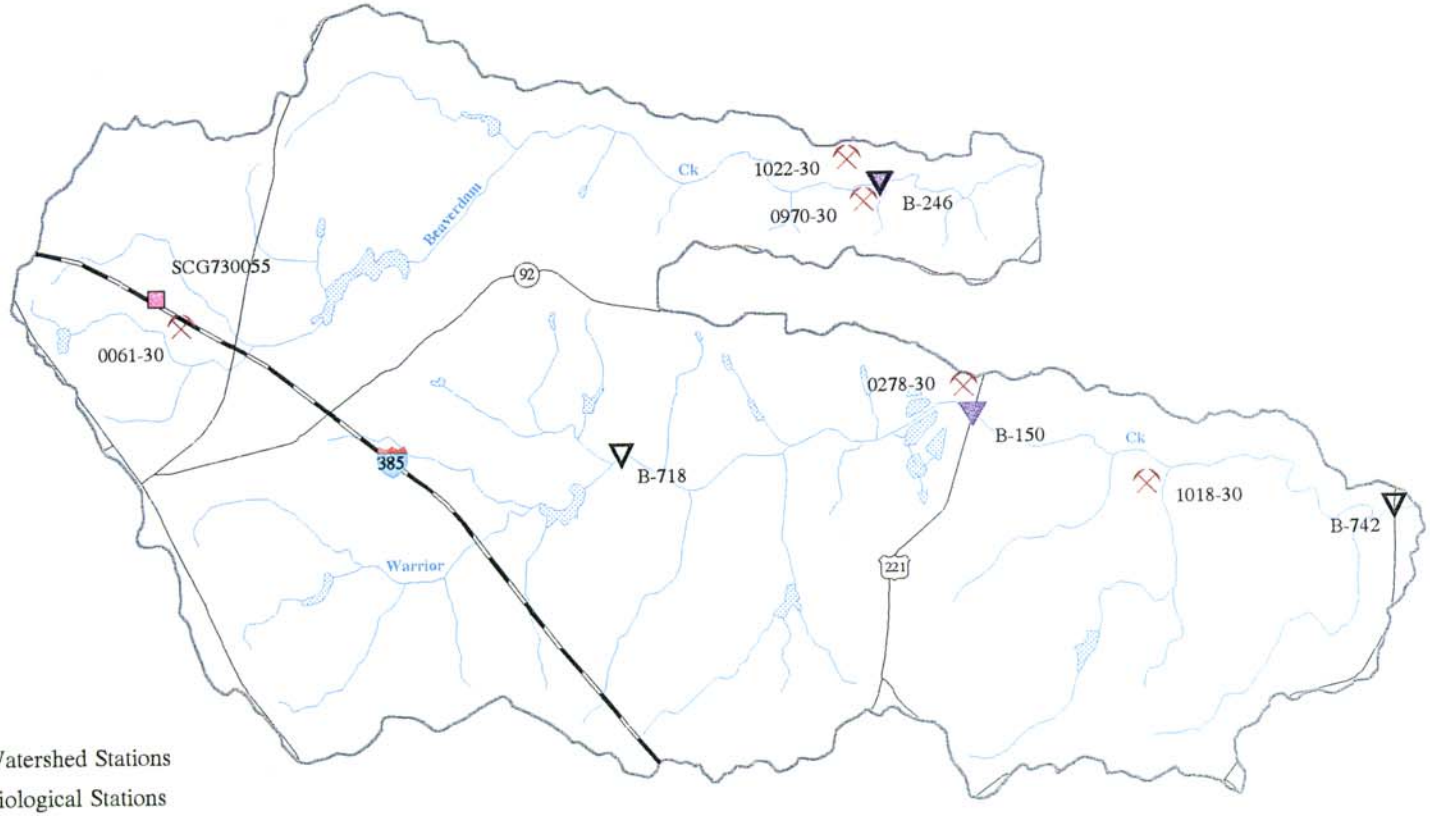
N

2 0 2 Miles

D H E C
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

Monitoring Sites and Permitted Areas

Beaverdam Creek/Warrior Creek Watershed
(03050108-030)



- Watershed Stations
- Biological Stations
- Industrial NPDES Discharges
- Mining Activities
- Hydrography
- Interstates
- Highways
- Hydrologic Units

2 0 2 Miles

N

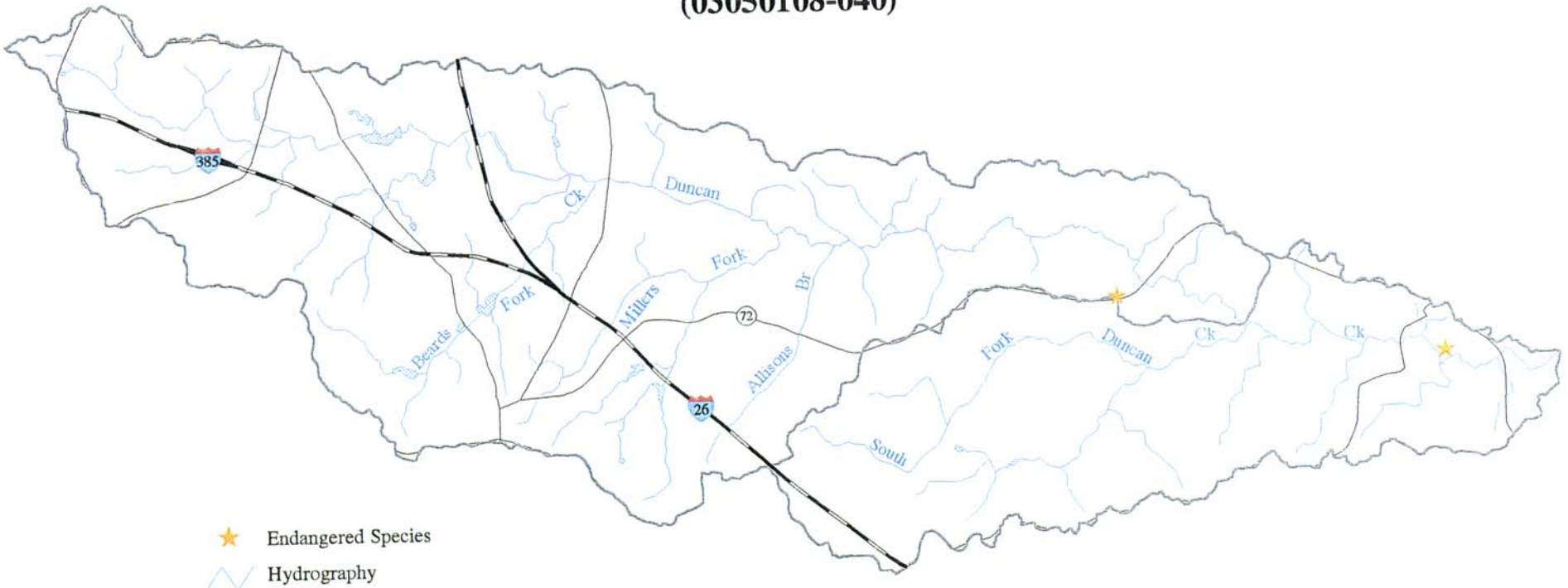
D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

Natural Resources

Duncan Ceek Watershed
(03050108-040)



- Endangered Species
- Hydrography
- Interstates
- Highways
- Hydrologic Units

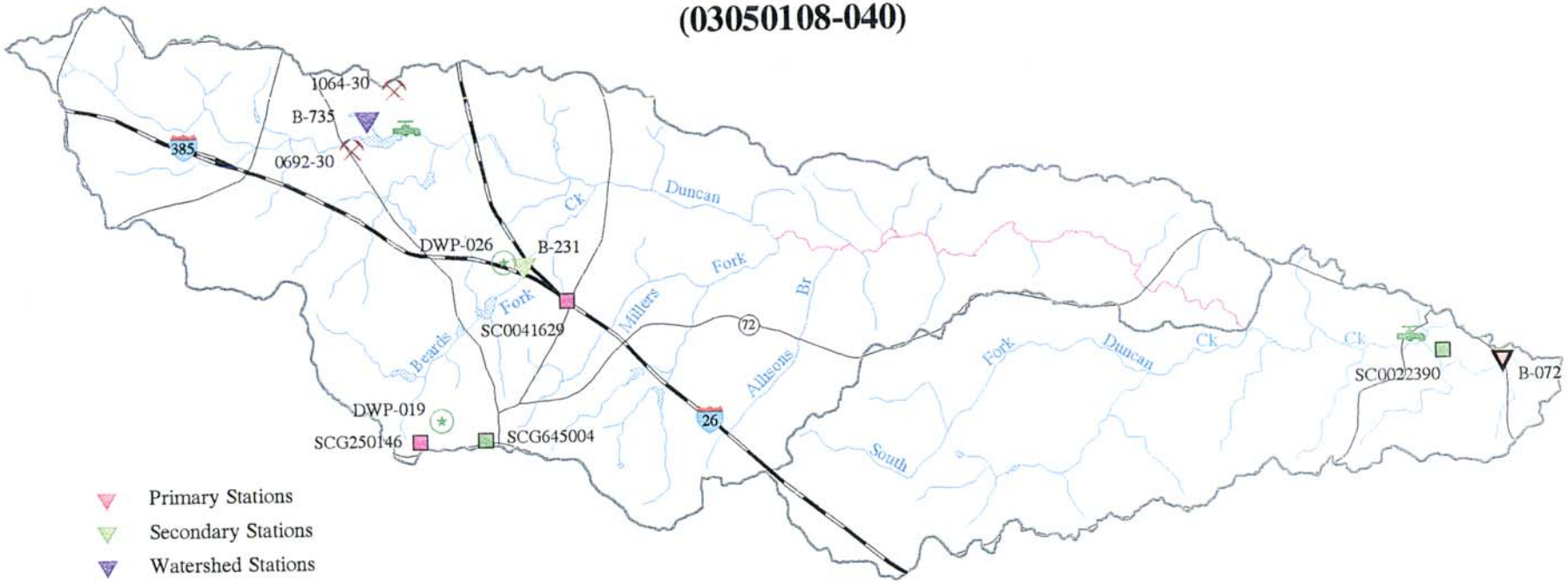
N

3 0 3 Miles

D H E C
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

Monitoring Sites, Modeled Streams, and Permitted Areas

Duncan Ceek Watershed (03050108-040)



- Primary Stations
- Secondary Stations
- Watershed Stations
- Biological Stations
- Domestic NPDES Discharges
- Industrial NPDES Discharges
- Closed Municipal Landfills
- Mining Activities
- Municipal Surface Water Intakes
- Modeled Streams
- Hydrography
- Interstates
- Highways
- Hydrologic Units

N

3 0 3 Miles

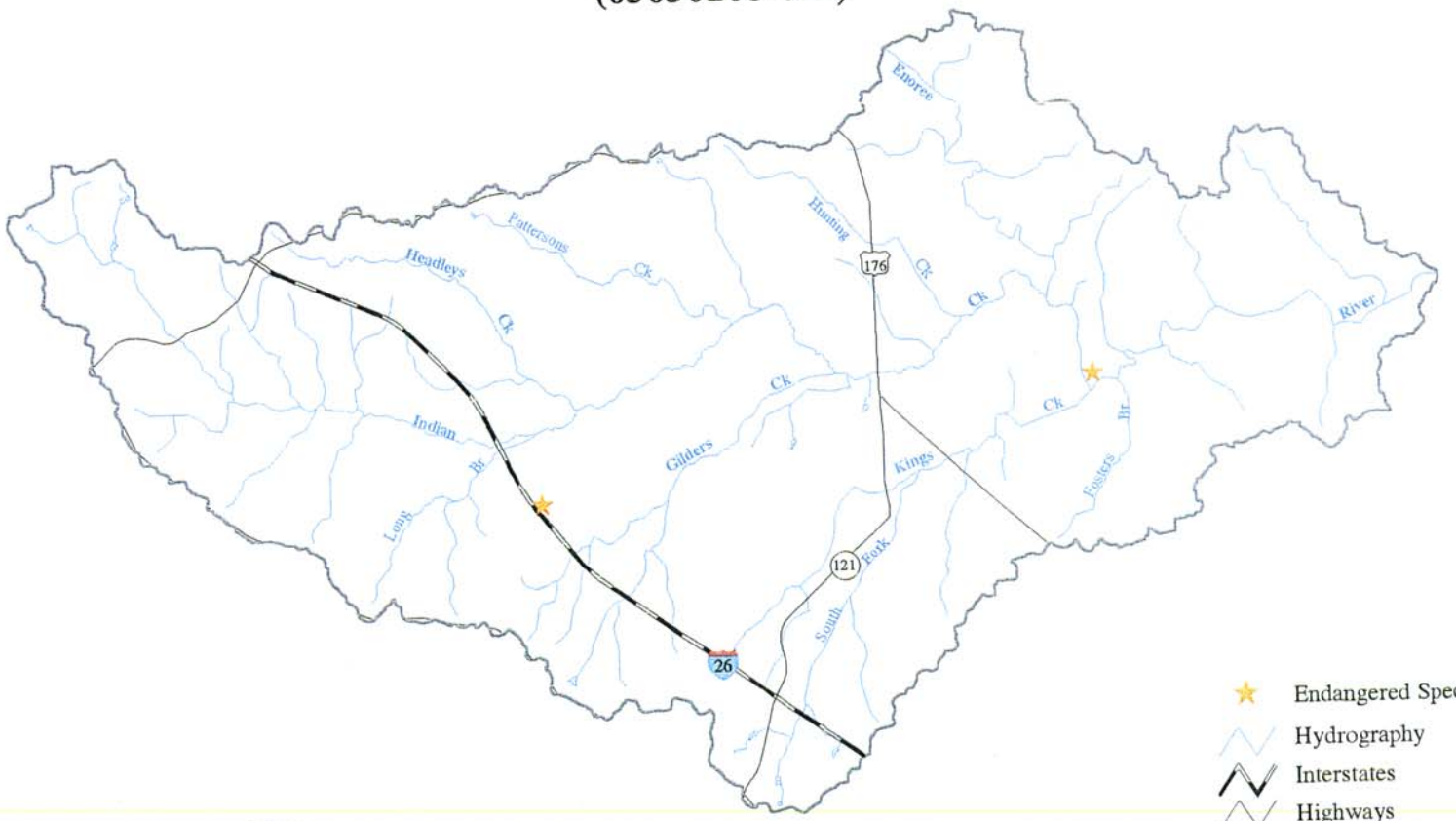
D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

Natural Resources

Enoree River Watershed
(03050108-050)



Endangered Species
Hydrography
Interstates
Highways
Hydrologic Units

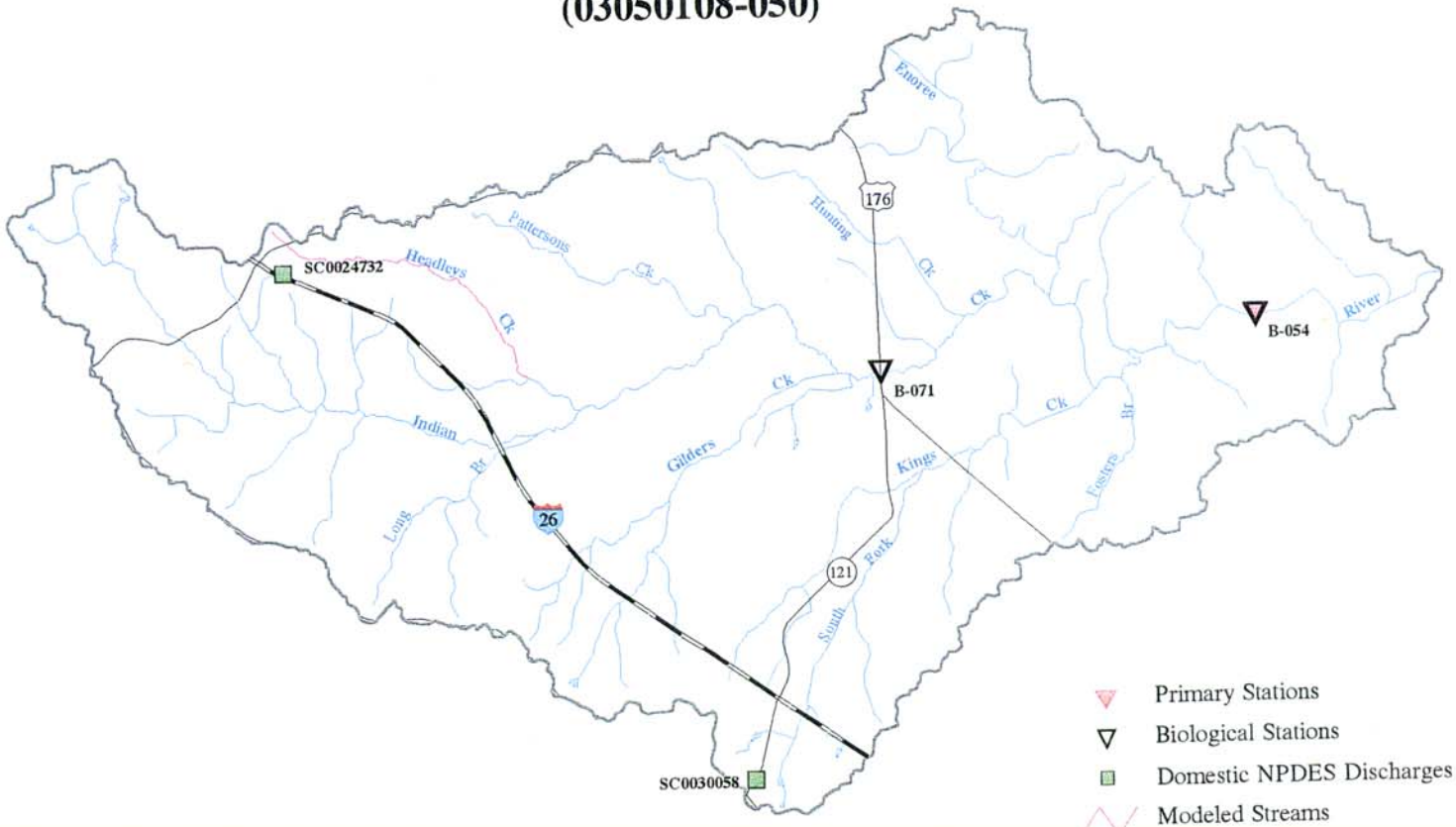
N

5 0 5 Miles

D H E C
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

Monitoring Sites, Modeled Streams, and Permitted Areas

Enoree River Watershed (03050108-050)



Natural Resources

South Tyger River Watershed
(03050107-010)

D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

5 0 5 Miles

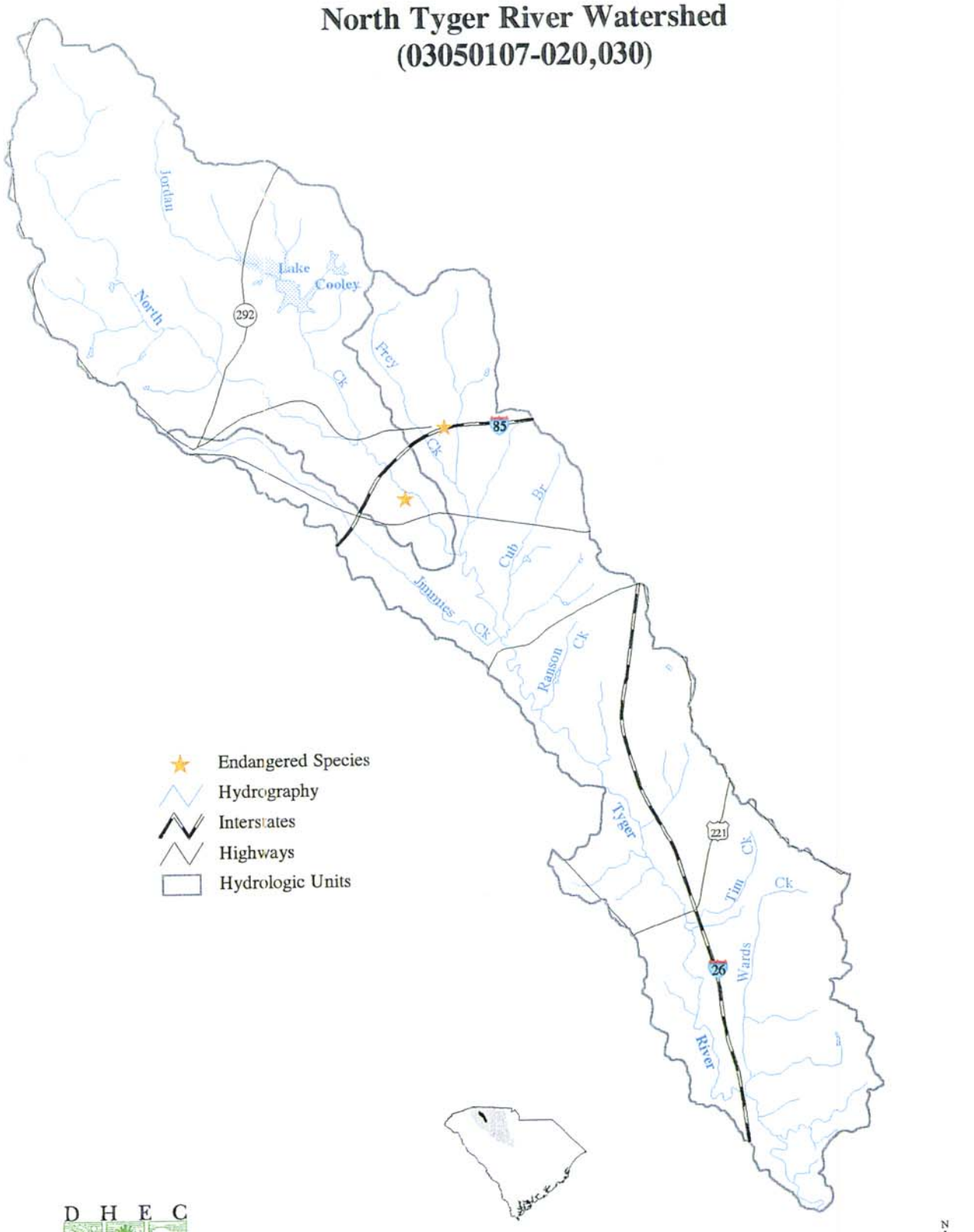
Monitoring Sites, Modeled Streams, and Permitted Areas

South Tyger River Watershed (03050107-010)

D H E C
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

Natural Resources

North Tyger River Watershed
(03050107-020,030)



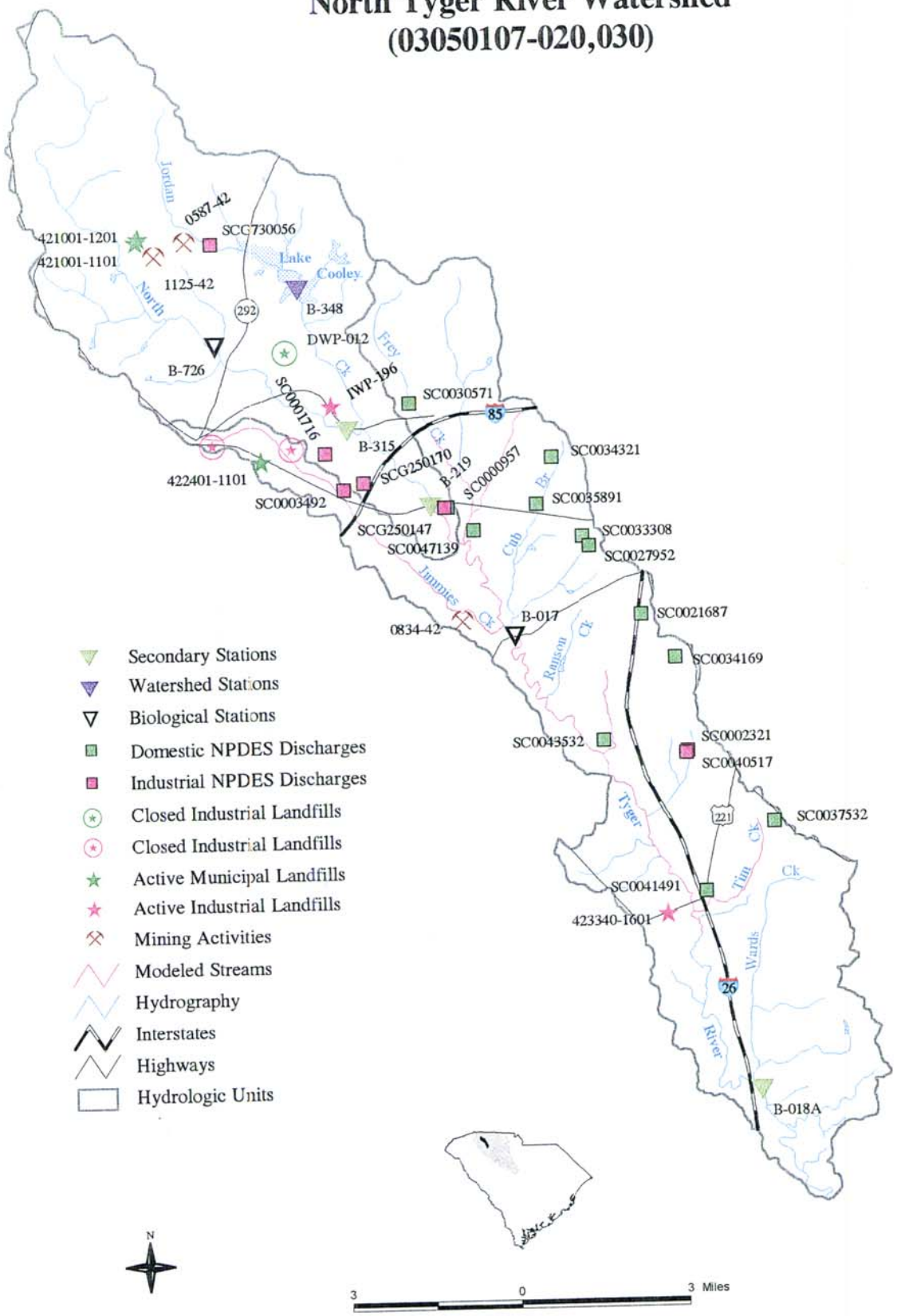
D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

Monitoring Sites, Modeled Streams, and Permitted Areas

North Tyger River Watershed (03050107-020,030)



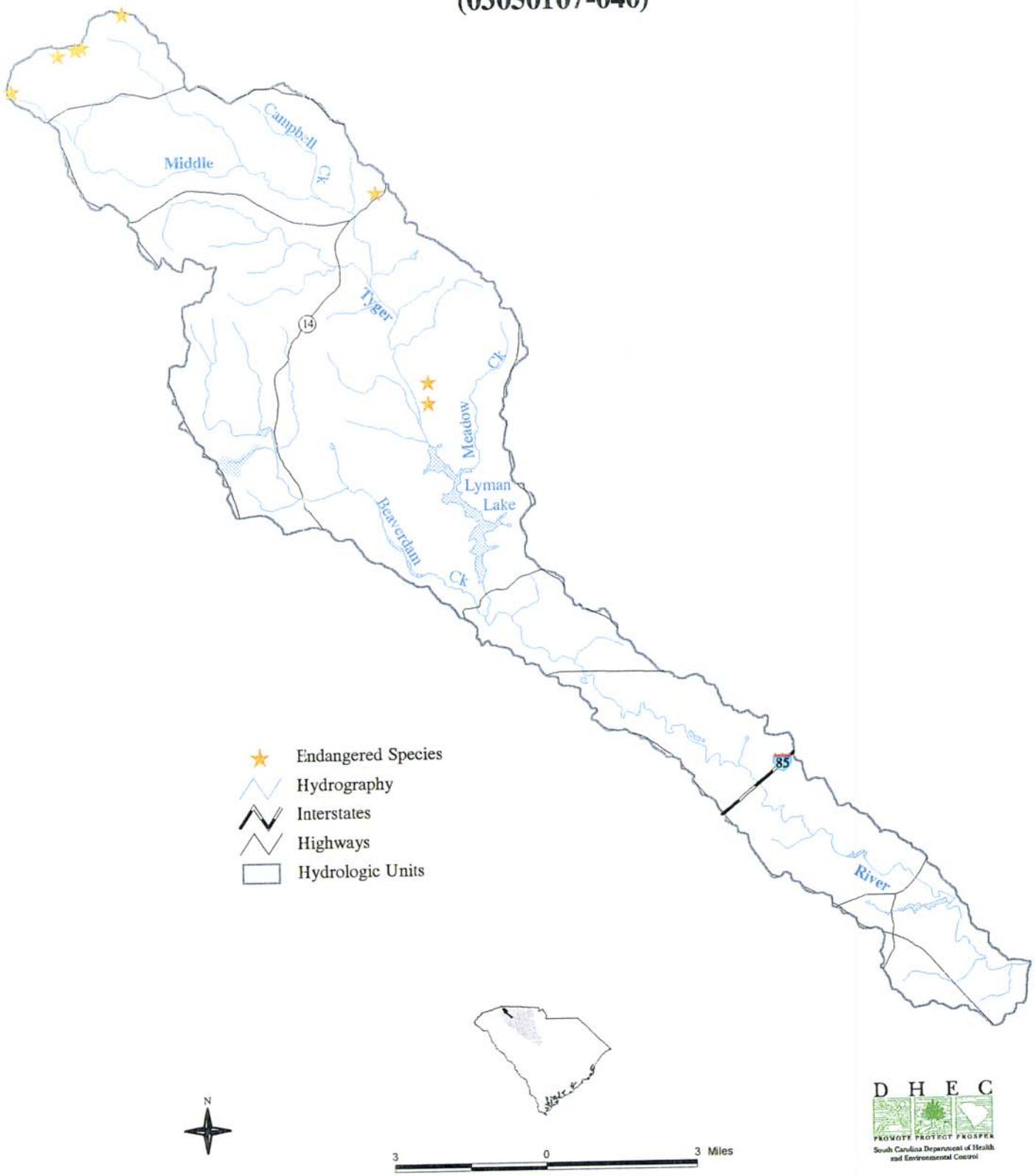
DHEC

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

Natural Resources

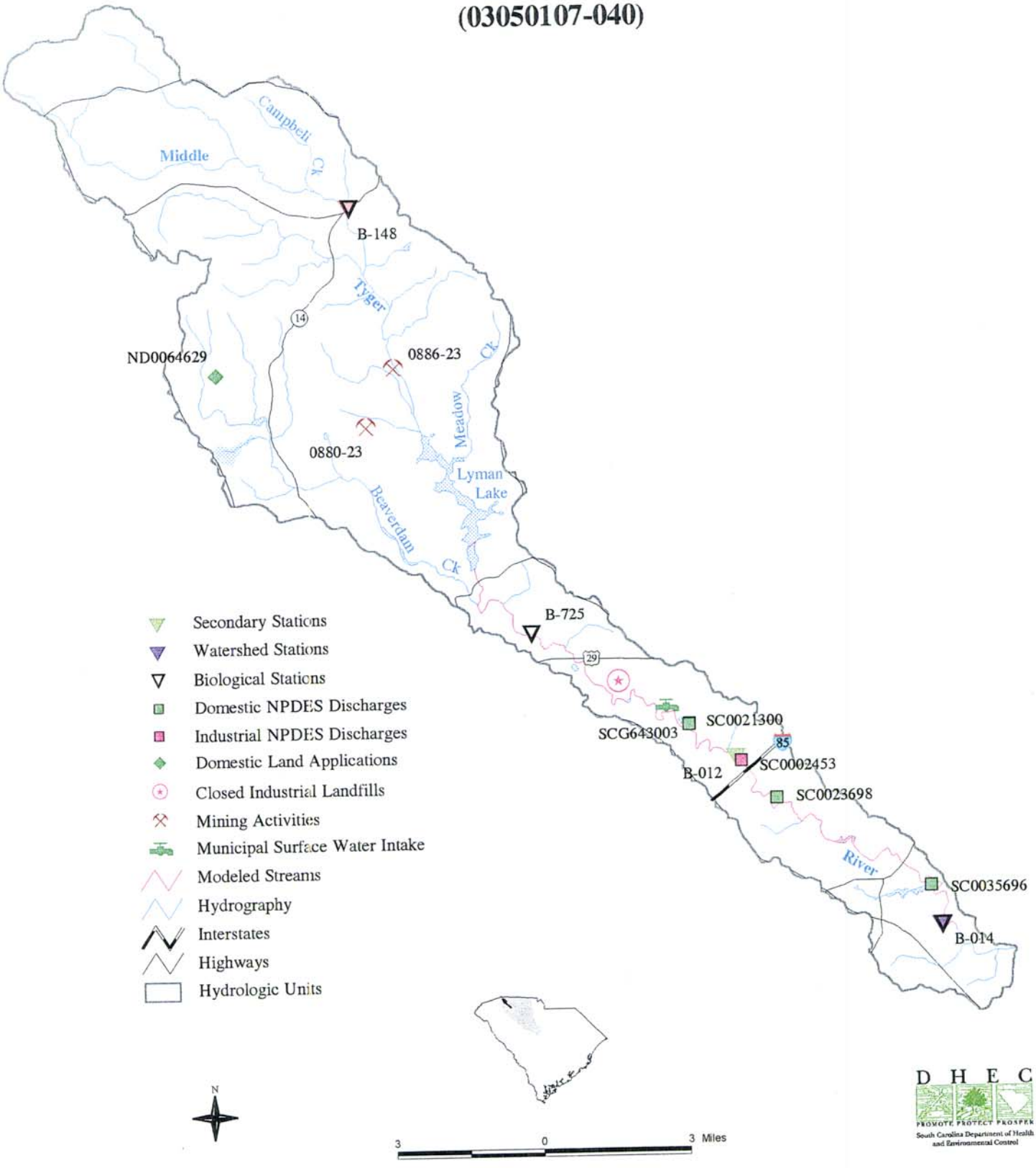
Middle Tyger River Watershed
(03050107-040)



D H E C
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

Monitoring Sites, Modeled Streams, and Permitted Areas

Middle Tyger River Watershed (03050107-040)



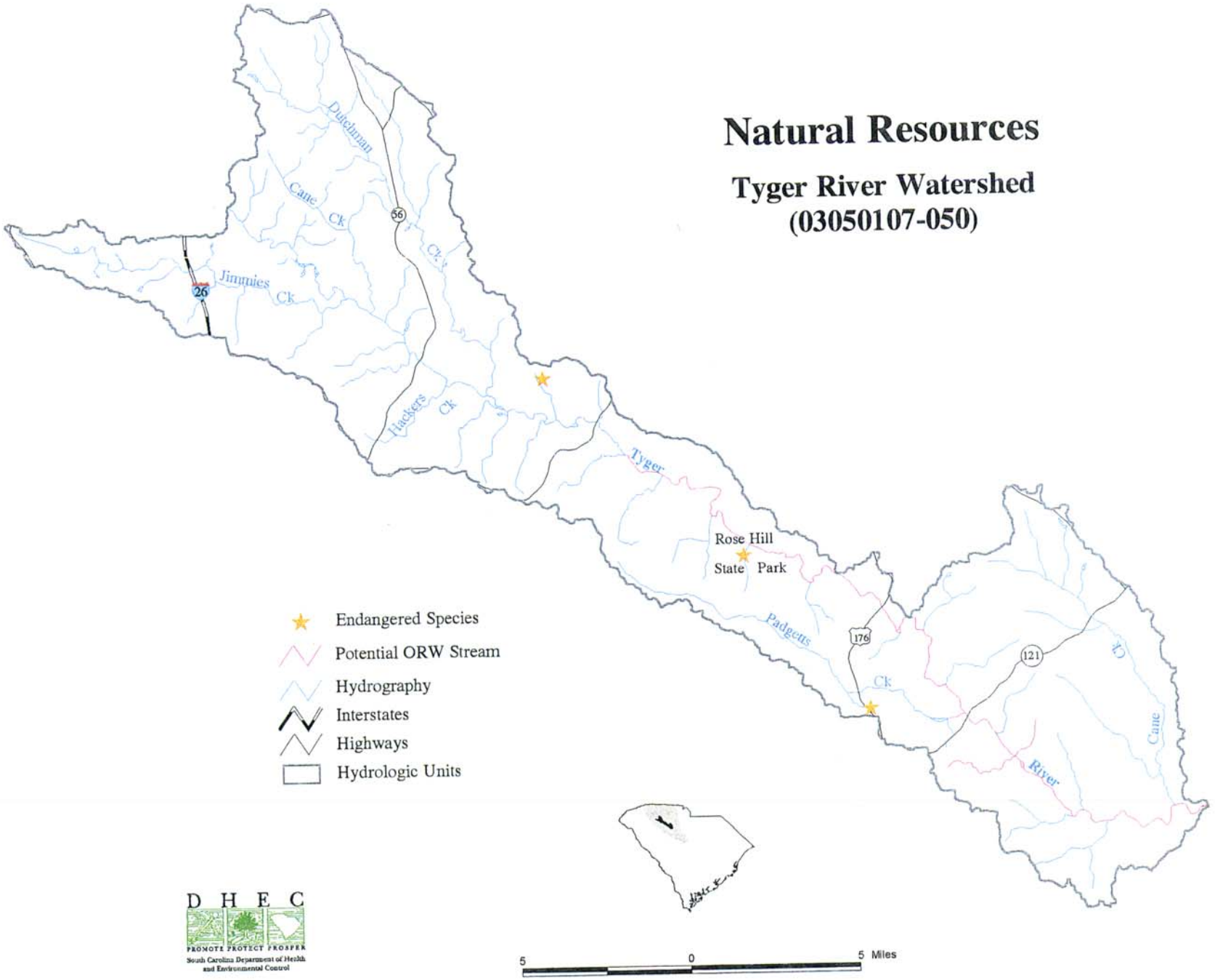
D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

Natural Resources

Tyger River Watershed
(03050107-050)



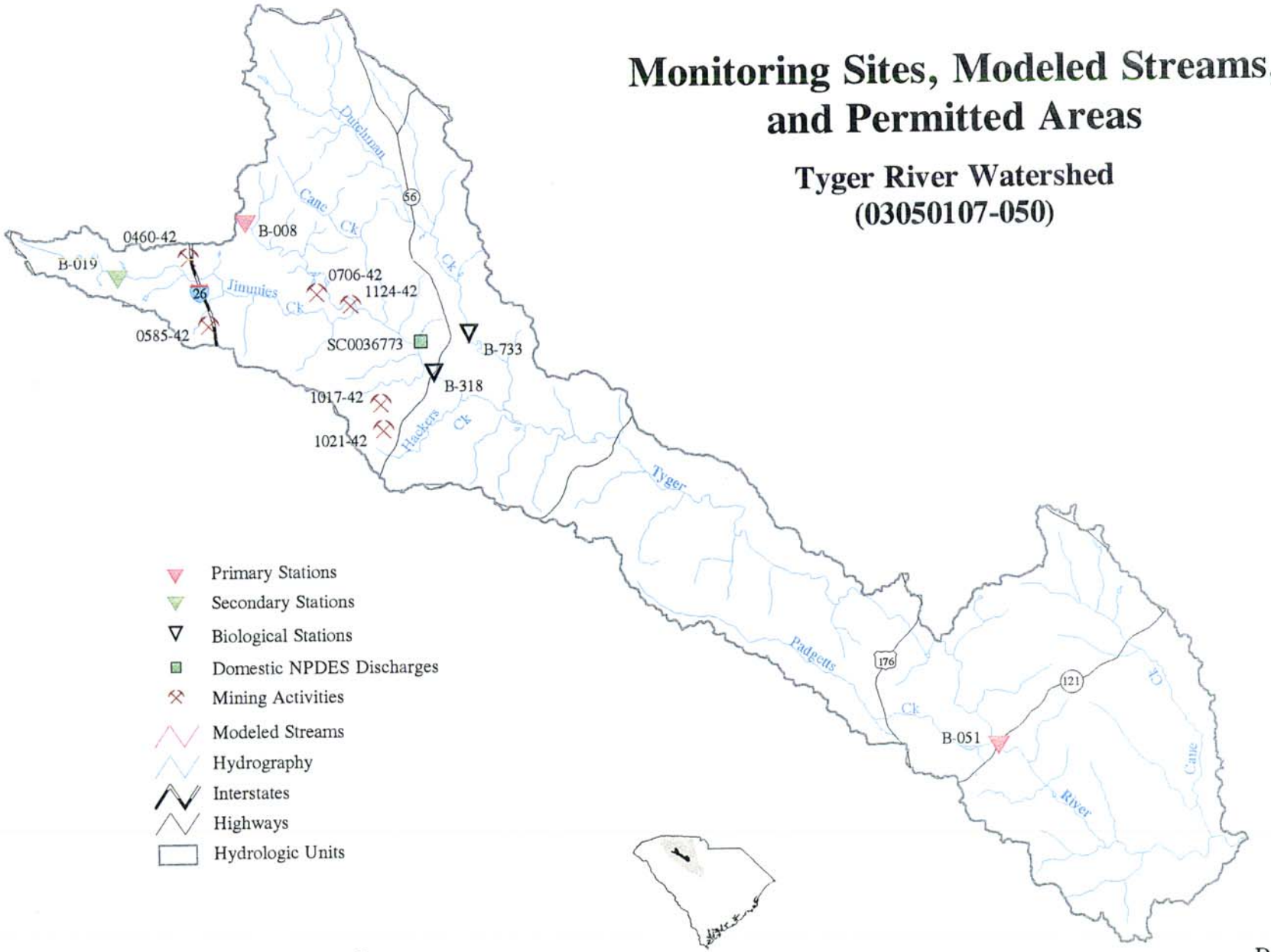
D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

Monitoring Sites, Modeled Streams, and Permitted Areas

Tyger River Watershed (03050107-050)



D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

Natural Resources

Fairforest Creek Watershed
(03050107-060)

D H E C
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control

5 0 5 Miles

N

Monitoring Sites, Modeled Streams, and Permitted Areas

Fairforest Creek Watershed (03050107-060)

DHEC

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

APPENDIX B. WMU-0502

Monitoring Station Descriptions

STATION TYPES (P=PRIMARY, S=SECONDARY, W=WATERSHED, BIO=BIOLOGICAL, I=INACTIVE)
CLASS (FW=FRESHWATER, ORW=OUTSTANDING RESOURCE WATERS)

03050105-090

B-042	P	FW	BROAD RIVER AT SC 18, 4 MI NE GAFFNEY
B-088	S	FW	CANOE CREEK AT S-11-245, 1/2 MI W OF BLACKSBURG
B-211	S	FW	PEOPLES CREEK AT UNIMPROVED ROAD, 2.3 MI E OF GAFFNEY
B-100	S	FW	FURNACE CREEK AT S-11-50, 6 MI E OF GAFFNEY
B-323	S	FW	DOOLITTLE CREEK AT S-11-100, 1.25 MI SE OF BLACKSBURG
B-343	W	FW	LAKE CHEROKEE IN FOREBAY NEAR DAM
B-330	S	FW	GUYONMOORE CREEK AT S-46-233
B-044	P	FW	BROAD RIVER AT SC 211, 12 MI SE OF GAFFNEY

03050105-100

B-740	BIO	FW	BUFFALO CREEK AT SC 198
B-119	S	FW	BUFFALO CREEK AT S-11-213, 2.2 MI NNW OF BLACKSBURG
B-057	S	FW	BUFFALO CREEK AT SC 5, 1 MI W OF BLACKSBURG

03050105-110

B-056	S	FW	CHEROKEE CREEK AT US 29, 3 MI E OF GAFFNEY

03050105-120

B-333	W/BIO	FW	KINGS CREEK AT S-11-209, 3 MI W OF SMYRNA

03050105-130

B-342	W	FW	LAKE THICKETTY IN FOREBAY NEAR DAM
B-059	S	FW	IRENE CREEK AT S-11-307, 2.5 MI W OF GAFFNEY
B-095	S	FW	THICKETTY CREEK AT S-11-164
B-128	S	FW	LIMESTONE CREEK AT S-11-301
B-133	S/BIO	FW	THICKETTY CREEK AT SC 18, 8.3 MI S OF GAFFNEY
B-334	W/BIO	FW	GILKEY CREEK AT S-11-231, 9 MI SE OF GAFFNEY
B-062	S	FW	THICKETTY CREEK AT SC 211, 2 MI ABOVE JUNCTION WITH BROAD RIVER

03050105-140

B-739	BIO	FW	BULLOCK CREEK AT S-46-40
B-325	S	FW	CLARK FORK INTO CRAWFORD LAKE ON UNNUMBERED ROAD NEAR SC 161 & 705
B-737	W	FW	LAKE YORK IN KINGS MOUNTAIN STATE PARK
B-326	S	FW	LONG BRANCH ON SC 216, BELOW KINGS MOUNTAIN PARK RECREATION AREA
B-157	BIO	FW	CLARK FORK AT S-46-63
B-159	S	FW	BULLOCK CREEK AT SC 97, 4.8 MI S OF HICKORY GROVE

03050105-150

B-099-7	BIO	ORW	VAUGHN CREEK AT UNNUMBERED ROAD, 0.4 MI S OF S-23-319
B-099A	S	FW	LAKE LANIER ON # 1 INLET IN GREENVILLE COUNTY
B-099B	S	FW	LAKE LANIER AT DAM IN GREENVILLE COUNTY
B-719	BIO	FW	NORTH PACOLET RIVER AT S-42-128
B-301	S	FW	PAGE CREEK AT S-42-1258, 1.7 MI SE LANDRUM
B-026	P	FW	NORTH PACOLET RIVER AT S-42-956, 6.5 MI E LANDRUM

B-126	W	FW	North Pacolet River at S-42-978, 1 mi SE of Fingerville
03050105-160			
B-720	BIO	FW	South Pacolet River at S-42-183
B-103	S	FW	Spivey Creek at S-42-208, 2.5 mi SSE of Landrum
B-302	S	FW	South Pacolet River at S-42-866, 1 mi SE Campobello
B-340	W	FW	Lake Bowen near headwaters, 0.4 km W of S-42-37
B-339	W	FW	Lake Bowen in forebay near dam
B-113	S	FW	Spartanburg Reservoir #1 on S-42-213 NE of Inman
03050105-170			
B-028	S	FW	Pacolet River at S-42-55, below confluence of North & South Pacolet Rivers
B-259	S	FW	Little Buck Creek at unnumbered county road, 2.3 mi SW of Chesnee
B-347	W	FW	Lake Blalock in forebay near dam
B-163A	S	FW	Pacolet River at bridge on S-42-737, 2.9 mi NW of Cowpens
B-191	S	FW	Potter Branch on road 30, below outfall from housing project, Cowpens
B-331	W	FW	Pacolet River at S-42-59, Beacon Light Road in Clifton
03050105-180			
B-221	S/BIO	FW	Lawsons Fork Creek at S-42-40, below Inman Mill effluent
B-277	S	FW	Lawsons Fork Creek at S-42-218, 2.7 mi SSE of Inman
B-278	S	FW	Lawsons Fork Creek at unnumbered road below Milliken Chemical
BL-005	S	FW	Lawsons Fork Creek at S-42-79 at Valley Falls
BL-001	P/BIO	FW	Lawsons Fork Creek at S-42-108
03050105-190			
BP-001	S	FW	Pacolet River above dam at Pacolet Mills
B-048	P	FW	Pacolet River at SC 105, 6 mi above confluence with Broad River
03050106-010			
B-344	W	FW	Lake John D. Long in forebay near dam
B-046	P	FW	Broad River at SC 72/215/121, 3 mi E of Carlisle
03050106-020			
B-086	S	FW	Ross Branch at SC 49, SW of York
B-136	W/BIO	FW	Turkey Creek at SC 9, 14 mi NW of Chester
03050106-030			
B-064	S	FW	Meng Creek at SC 49, 2.5 mi E of Union
B-243	S	FW	Tributary to Meng Creek at culvert on S-44-384, 3 mi E of Union
B-155	W/BIO	FW	Browns Creek at S-44-86, 8 mi E of Union
B-335	W	FW	Gregorys Creek at S-44-86, 8 mi E of Union
03050106-040			
CL-023	W	FW	Chester State Park Lake, 100 m E of Spillway
B-074	S	FW	Dry Fork at S-12-304, 2 mi SW of Chester
B-075	S/BIO	FW	Sandy River at SC 215, 2.5 mi above confluence with Broad River

03050106-050

B-143	BIO	FW	Beaver Creek at S-20-99
B-047	S	FW	Broad River at SC 34, 14 mi NE of Newberry
B-346	W	FW	Parr Reservoir 4.8 km N of Dam, upstream of Monticello Reservoir
B-751	BIO	FW	Cannons Creek at US 176
B-328	P	FW	Monticello Reservoir, upper impoundment at Buoy in middle of lake
B-327	P	FW	Monticello Reservoir, lower impoundment between large islands
B-345	W	FW	Parr Reservoir in forebay near dam

03050106-060

B-236	P	FW	Broad River at SC 213, 2.5 mi SW of Jenkinsville
B-110	S	FW	Elizabeth Lake at Spillway on US 21
B-081	BIO	FW	Crane Creek at US 321
B-316	P	FW	Crane Creek at S-40-43 under I-20, North Columbia
B-280	P/BIO	FW	Smith Branch at N Main St (US 21) in Columbia
B-337	W	FW	Broad River at US 176 (Broad River Road) in Columbia
B-080	P	FW	Broad River Diversion Canal at Columbia Water Plant

03050106-070

B-145	S/BIO	FW	Little River at S-20-60, 3.1 mi SW of Jenkinsville

03050106-080

B-123	S	FW	Winnsboro Branch at US 321, above Winnsboro Mills outfall
B-077	S	FW	Winnsboro Branch below plant outfall
B-102	W/BIO	FW	Jackson Creek at S-20-54, 5 mi W of Winnsboro
B-338	W	FW	Mill Creek at S-20-48, 10 mi SW of Winnsboro

03050106-090

B-320	W/BIO	FW	Big Cedar Creek at SC 215

Water Quality Trends and Status by Station

Spreadsheet Legend

Station Information:

STATION NUMBER	Station ID
TYPE	SCDHEC station type code
	P = Primary station, sampled monthly all year round
	S = Secondary station, sampled monthly May - October
	P* = Secondary station upgraded to primary station parameter coverage and sampling frequency for basin study
	BD = Special station added for the Broad basin study
	I* = Currently inactive station which had some data within the period reviewed
	BIO= Indicates macroinvertebrate community data assessed
WATERBODY NAME	Stream or Lake Name
CLASS	Stream classification at the point where monitoring station is located

Parameter Abbreviations and Parameter Measurement Units:

DO	Dissolved Oxygen (mg/l)	NH3	Ammonia (mg/l)
BOD	Five-Day Biochemical Oxygen Demand (mg/l)	CD	Cadmium (ug/l)
pH	pH (SU)	CR	Chromium (ug/l)
TP	Total Phosphorus (mg/l)	CU	Copper (ug/l)
TN	Total Nitrogen (mg/l)	PB	Lead (ug/l)
TURB	Turbidity (NTU)	HG	Mercury (ug/l)
TSS	Total Suspended Solids (mg/l)	NI	Nickel (ug/l)
BACT	Fecal Coliform Bacteria (#/100 ml)	ZN	Zinc (ug/l)

Statistical Abbreviations:

N	For standards compliance, number of surface samples collected between January, 1991 and December, 1995 For trends, number of surface samples collected between January, 1980 and December, 1995
EXC.	Number of samples contravening the appropriate standard
%	Percentage of samples contravening the appropriate standard
MEAN EXC.	Mean of samples which contravened the applied standard
MED	For heavy metals with a human health criterion, this is the median of all surface samples between January, 1991 and December, 1995. DL indicates that the median was the detection limit.
MAG	Magnitude of any statistically significant trend, average change per year, expressed in parameter measurement units
GEO MEAN	Geometric mean of fecal coliform bacteria samples collected between January, 1991 and December, 1995

Key to Trends:

D	Statistically significant decreasing trend in parameter concentration
I	Statistically significant increasing trend in parameter concentration
*	No statistically significant trend
Blank	Insufficient data to test for long term trends

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0502

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	DO N	DO EXC.	DO %	MEAN EXC.	TRENDS DO	TRENDS N	TRENDS MAG	TRENDS BOD	TRENDS N	TRENDS MAG	pH N	pH EXC.	pH %	MEAN EXC.	TRENDS PH	TRENDS N	TRENDS MAG
03050105094																				
B-042	P	BROAD RVR	FW	60	0	0		*	144		D	184	-0.1333	60	1	2	8.6	I	186	0.0333
B-088	S	CANOE CK	FW	30	12	40	4.046	D	69	-0.22	I	74	0.15	30	0	0		*	75	
B-211	S	PEOPLES CK	FW	30	0	0		*	69		D	74	-0.1	30	0	0		*	75	
B-100	P*	FURNACE CK	FW	36	1	3	4.5	D	75	-0.0333	D	80	-0.2	36	0	0		I	82	0.0167
B-323	S	DOOLITTLE CK	FW	30	0	0		*	69		D	74	-0.15	30	0	0		*	75	
B-343	BD	LAKE CHEROKEE	FW	6	0	0								6	0	0				
B-330	S	GUYONMOORE CK	FW	30	0	0		*	35		*	34		30	0	0		*	35	
B-044	P	BROAD RVR	FW	59	0	0		I	142	0.025	D	184	-0.1545	59	0	0		I	184	0.02
03050105109																				
B-740	BIO	BUFFALO CK	FW																	
B-119	S	BUFFALO CK	FW	30	0	0		I	79	0.075	D	80	-0.169	30	0	0		*	81	
B-057	P*	BUFFALO CK	FW	36	0	0		I	86	0.05	D	93	-0.1191	36	0	0		I	94	0.0143
03050105110																				
B-056	P*	CHEROKEE CK	FW	36	0	0		*	74		D	80	-0.1333	36	0	0		*	81	
03050105122																				
B-333	BD/BIO	KINGS CK	FW	12	1	8	2.8							12	0	0				
03050105130																				
B-342	BD	LAKE THICKETTY	FW	6	0	0								6	0	0				
B-059	S	IRENE CK	FW	30	0	0		I	69	0.0333	D	73	-0.1	30	0	0		*	75	
B-095	S	THICKETTY CK	FW	30	0	0		*	35		*	35		30	0	0		*	35	
B-128	S	LIMESTONE CK	FW	30	0	0		*	68		D	73	-0.12	30	0	0		*	74	
B-133	S/BIO	THICKETTY CK	FW	30	0	0		*	69		D	74	-0.1317	30	0	0		*	75	
B-334	BD/BIO	GILKEY CK	FW	12	0	0								12	0	0				
B-062	P*	THICKETTY CK	FW	36	0	0		*	73		D	78	-0.1	36	0	0		*	79	
03050105142																				
B-739	BIO	BULLOCK CK	FW																	
B-325	S	CLARK FORK	FW	29	2	7	3.2	*	67		D	72	-0.1	28	0	0		D	72	-0.0214
B-737	BD	LAKE YORK	FW	4	0	0								4	0	0				
B-326	S	LONG BRANCH	FW	29	0	0		*	71		D	74	-0.0899	29	0	0		*	77	
B-157	BIO	CLARK FORK	FW																	
B-159	P*	BULLOCK CK	FW	36	0	0		*	75		D	80	-0.075	36	2	6	5.825	*	81	

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0502

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	TRENDS											
				TP	N	MAG	TN	N	MAG	TURB	N	MAG	TSS	N	MAG
03050105094															
B-042	P	BROAD RVR	FW	D	177	-0.0067	D	133	-0.0183	*	182				
B-088	S	CANOE CK	FW	D	68	-0.1192				*	73				
B-211	S	PEOPLES CK	FW	D	66	-0.0016				D	73	-0.1429			
B-100	P*	FURNACE CK	FW	D	74	-0.045				D	80	-0.625			
B-323	S	DOOLITTLE CK	FW	D	66	-0.005				*	73				
B-343	BD	LAKE CHEROKEE	FW												
B-330	S	GUYONMOORE CK	FW	*	36					*	35				
B-044	P	BROAD RVR	FW	D	183	-0.004	D	132	-0.0188	*	183				
03050105109															
B-740	BIO	BUFFALO CK	FW												
B-119	S	BUFFALO CK	FW	I	79	0.03	D	50	-0.0394	*	80		*	30	
B-057	P*	BUFFALO CK	FW	I	85	0.0275	D	57	-0.0411	*	91		*	32	
03050105110															
B-056	P*	CHEROKEE CK	FW	*	72					D	78	-1			
03050105122															
B-333	BD/BIO	KINGS CK	FW												
03050105130															
B-342	BD	LAKE THICKETTY	FW												
B-059	S	IRENE CK	FW	D	69	-0.0006				D	73	-0.4062			
B-095	S	THICKETTY CK	FW	*	36					*	35				
B-128	S	LIMESTONE CK	FW	D	69	-0.0017				*	72				
B-133	S/BIO	THICKETTY CK	FW	*	70					*	73				
B-334	BD/BIO	GILKEY CK	FW												
B-062	P*	THICKETTY CK	FW	*	73					*	76				
03050105142															
B-739	BIO	BULLOCK CK	FW												
B-325	S	CLARK FORK	FW	D	67	-0.0013				*	72				
B-737	BD	LAKE YORK	FW												
B-326	S	LONG BRANCH	FW	D	68	-0.0013				D	73	-0.1333			
B-157	BIO	CLARK FORK	FW												
B-159	P*	BULLOCK CK	FW	D	76	-0.001				*	79				

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0502

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	GEO MEAN	BACT N	BACT EXC.	BACT %	MEAN EXC.	TRENDS BACT	TRENDS N	TRENDS MAG	NH3 N	NH3 EXC.	CD N	CD EXC.	CD MED.	CD %
03050105094																	
B-042	P	BROAD RVR	FW	351	59	26	44	1770	D	185	-32.55	57	0	18	0	DL	0
B-088	S	CANOE CK	FW	305	30	9	30	1408	*	75							
B-211	S	PEOPLES CK	FW	1695	30	26	87	4327	D	75	-115.625	2	0	1	0	DL	0
B-100	P*	FURNACE CK	FW	513	35	21	60	1392	*	82		9	0	2	0	DL	0
B-323	S	DOOLITTLE CK	FW	629	30	22	73	1358	*	75		1	0				
B-343	BD	LAKE CHEROKEE	FW	18	6	0	0					6	0				
B-330	S	GUYONMOORE CK	FW	189	30	7	23	963	*	35							
B-044	P	BROAD RVR	FW	194	59	15	25	1810	*	185		58	0	19	1	DL	5
03050105109																	
B-740	BIO	BUFFALO CK	FW														
B-119	S	BUFFALO CK	FW	599	30	15	50	2773	I	81	23	25	0	27	0	DL	0
B-057	P*	BUFFALO CK	FW	477	36	20	56	2026	*	94		32	0	33	1	DL	3
03050105110																	
B-056	P*	CHEROKEE CK	FW	807	36	29	81	1626	*	81		11	0	3	0	DL	0
03050105122																	
B-333	BD/BIO	KINGS CK	FW	225	12	2	17	810				10	0	3	0	DL	0
03050105130																	
B-342	BD	LAKE THICKETTY	FW	22	6	0	0					6	0				
B-059	S	IRENE CK	FW	782	30	24	80	1690	*	75							
B-095	S	THICKETTY CK	FW	925	30	20	67	3320	*	35							
B-128	S	LIMESTONE CK	FW	760	30	21	70	1886	*	74							
B-133	S/BIO	THICKETTY CK	FW	718	30	21	70	2153	*	75							
B-334	BD/BIO	GILKEY CK	FW	199	12	4	33	710				11	0	4	0	DL	0
B-062	P*	THICKETTY CK	FW	330	36	12	33	1279	I	79	14.0833	12	0	4	0	DL	0
03050105142																	
B-739	BIO	BULLOCK CK	FW														
B-325	S	CLARK FORK	FW	205	29	7	24	1009	*	72							
B-737	BD	LAKE YORK	FW														
B-326	S	LONG BRANCH	FW	141	29	5	17	1814	*	74							
B-157	BIO	CLARK FORK	FW														
B-159	P*	BULLOCK CK	FW	421	36	16	44	1589	*	81		10	0	3	0	DL	0

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0502

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR MED.	CR %	CU N	CU EXC.	CU %	PB N	PB EXC.	PB MED.	PB %	HG N	HG EXC.	HG MED.	HG %	NI N	NI EXC.	NI %	ZN N	ZN EXC.	ZN %
03050105094																								
B-042	P	BROAD RVR	FW	18	0	DL	0	18	1	6	18	0	DL	0	18	0	DL	0	18	0	0	18	1	6
B-088	S	CANOE CK	FW																					
B-211	S	PEOPLES CK	FW	1	0	DL	0	1	0	0	1	0	DL	0	1	0	DL	0	1	0	0	1	0	0
B-100	P*	FURNACE CK	FW	2	0	DL	0	2	0	0	2	0	DL	0	2	0	DL	0	2	0	0	2	0	0
B-323	S	DOOLITTLE CK	FW																					
B-343	BD	LAKE CHEROKEE	FW																					
B-330	S	GUYONMOORE CK	FW																					
B-044	P	BROAD RVR	FW	19	3	DL	16	19	2	11	19	1	DL	5	19	0	DL	0	19	0	0	19	2	11
03050105109																								
B-740	BIO	BUFFALO CK	FW																					
B-119	S	BUFFALO CK	FW	27	0	DL	0	27	0	0	27	0	DL	0	25	0	DL	0	27	0	0	27	2	7
B-057	P*	BUFFALO CK	FW	33	1	DL	3	33	2	6	33	0	DL	0	32	0	DL	0	33	0	0	33	0	0
03050105110																								
B-056	P*	CHEROKEE CK	FW	3	0	DL	0	3	0	0	3	0	DL	0	3	0	DL	0	3	0	0	3	0	0
03050105122																								
B-333	BD/BIO	KINGS CK	FW	3	0	DL	0	3	2	67	3	0	DL	0	3	0	DL	0	3	0	0	3	0	0
03050105130																								
B-342	BD	LAKE THICKETTY	FW																					
B-059	S	IRENE CK	FW																					
B-095	S	THICKETTY CK	FW																					
B-128	S	LIMESTONE CK	FW																					
B-133	S/BIO	THICKETTY CK	FW																					
B-334	BD/BIO	GILKEY CK	FW	4	0	DL	0	4	0	0	4	0	DL	0	4	0	DL	0	4	0	0	4	0	0
B-062	P*	THICKETTY CK	FW	4	0	DL	0	4	0	0	4	0	DL	0	4	0	DL	0	4	0	0	4	0	0
03050105142																								
B-739	BIO	BULLOCK CK	FW																					
B-325	S	CLARK FORK	FW																					
B-737	BD	LAKE YORK	FW																					
B-326	S	LONG BRANCH	FW																					
B-157	BIO	CLARK FORK	FW																					
B-159	P*	BULLOCK CK	FW	3	0	DL	0	3	0	0	3	0	DL	0	3	0	DL	0	3	0	0	3	1	33

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0502

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	DO N	DO EXC.	DO %	MEAN EXC.	TRENDS DO	TRENDS N	TRENDS MAG	TRENDS BOD	TRENDS N	TRENDS MAG	pH N	pH EXC.	pH %	MEAN EXC.	TRENDS PH	TRENDS N	TRENDS MAG
03050105155																				
B-099-7	BIO	VAUGHN CK	ORW																	
B-099A	S	LAKE LANIER	FW	22	0	0		D	63	-0.04	*	67		22	0	0		D	66	-0.025
B-099B	S	LAKE LANIER	FW	22	0	0		*	63		D	68	-0.05	22	0	0		D	66	-0.0333
B-719	BIO	N PACOLET RVR	FW																	
B-301	S	PAGE CK	FW	23	0	0		*	63		D	67	-0.0667	23	0	0		*	66	
B-026	P	N PACOLET RVR	FW	59	0	0		*	143		D	185	-0.0769	58	0	0		D	173	-0.0111
B-126	BD	N PACOLET RVR	FW	12	0	0								12	0	0				
03050105160																				
B-720	BIO	S PACOLET RVR	FW																	
B-103	P*	SPIVEY CK	FW	29	0	0		*	69		D	73	-0.0818	29	0	0		*	72	
B-302	P*	S PACOLET RVR	FW	48	1	2	4.9	*	85		D	73	-0.0571	48	0	0		*	88	
B-340	BD	LAKE BOWEN	FW	24	0	0								24	1	4	9.07			
B-339	BD	LAKE BOWEN	FW	25	0	0								25	1	4	8.54			
B-113	S	SPARTANBURG RES. #1	FW	23	0	0		D	63	-0.0472	*	67		23	1	4	5.9	*	66	
03050105170																				
B-028	P*	PACOLET RVR	FW	29	0	0		*	69		D	74	-0.075	29	0	0		*	72	
B-259	S	LITTLE BUCK CK	FW	23	1	4	4.95	*	63		*	67		23	0	0		*	66	
B-347	BD	LAKE BLALOCK	FW	6	0	0								6	0	0				
B-163A	P*	PACOLET RVR	FW	30	0	0		D	71	-0.0694	D	75	-0.08	30	0	0		D	73	-0.0375
B-191	S	POTTER BRANCH	FW	24	0	0		*	65		D	68	-0.1	24	0	0		*	66	
B-331	BD	PACOLET RVR	FW	12	0	0								12	0	0				
03050105180																				
B-221	S/BIO	LAWSONS FORK CK	FW	23	0	0		I	64	0.1	D	68	-0.2402	23	0	0		*	66	
B-277	S	LAWSONS FORK CK	FW	23	0	0		I	65	0.1232	D	69	-0.1	23	0	0		*	67	
B-278	S	LAWSONS FORK CK	FW	23	0	0		I	71	0.1146	D	69	-0.1118	23	0	0		*	73	
BL-005	P*	LAWSONS FORK CK	FW	30	0	0		*	72		D	76	-0.075	30	0	0		D	74	-0.0222
BL-001	P/BIO	LAWSONS FORK CK	FW	59	0	0		*	154		D	184	-0.11	58	0	0		D	185	-0.0083
03050105190																				
BP-001	S	PACOLET RVR	FW	24	0	0		*	65		D	68	-0.06	24	0	0		D	66	-0.0222
B-048	P	PACOLET RVR	FW	59	0	0		*	144		D	187	-0.15	59	0	0		I	187	0.0143
03050106010																				
B-344	BD	LAKE LONG	FW	7	0	0								7	4	57	9.2			
B-046	P	BROAD RVR	FW	58	0	0		*	155		D	182	-0.1707	58	0	0		I	195	0.0333
03050106020																				
B-086	S	ROSS BRANCH	FW	29	1	3	4.5	*	67		D	72	-0.1	29	0	0		*	73	
B-136	BD/BIO	TURKEY CK	FW	12	0	0								12	0	0				

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0502

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	TRENDS											
				TP	N	MAG	TN	N	MAG	TURB	N	MAG	TSS	N	MAG
03050105155															
B-099-7	BIO	VAUGHN CK	ORW												
B-099A	S	LAKE LANIER	FW	*	67					I	66	0.5802			
B-099B	S	LAKE LANIER	FW	D	65	0				I	67	0.1167			
B-719	BIO	N PACOLET RVR	FW												
B-301	S	PAGE CK	FW	D	67	0				*	66				
B-026	P	N PACOLET RVR	FW	*	186		D	128	-0.02	I	184	0.5042			
B-126	BD	N PACOLET RVR	FW												
03050105160															
B-720	BIO	S PACOLET RVR	FW												
B-103	P*	SPIVEY CK	FW	*	74					*	72				
B-302	P*	S PACOLET RVR	FW	D	89	-0.0009				*	88				
B-340	BD	LAKE BOWEN	FW												
B-339	BD	LAKE BOWEN	FW												
B-113	S	SPARTANBURG RES. #1	FW	D	67	0				I	66	0.1667			
03050105170															
B-028	P*	PACOLET RVR	FW	I	76	0.005				I	73	0.8688			
B-259	S	LITTLE BUCK CK	FW	D	68	-0.0008				I	66	0.2667			
B-347	BD	LAKE BLALOCK	FW												
B-163A	P*	PACOLET RVR	FW	D	75	-0.0017				*	75				
B-191	S	POTTER BRANCH	FW	D	68	-0.1017				I	66	0.475			
B-331	BD	PACOLET RVR	FW												
03050105180															
B-221	S/BIO	LAWSONS FORK CK	FW	D	69	-0.0157				*	66				
B-277	S	LAWSONS FORK CK	FW	D	68	-0.0057				*	67				
B-278	S	LAWSONS FORK CK	FW	*	74					I	67	0.6			
BL-005	P*	LAWSONS FORK CK	FW	D	75	-0.0083				*	74				
BL-001	P/BIO	LAWSONS FORK CK	FW	D	178	-0.02	*	129		I	179	0.4167	*	158	
03050105190															
BP-001	S	PACOLET RVR	FW	D	70	-0.006				*	65				
B-048	P	PACOLET RVR	FW	D	184	-0.0064	D	131	-0.0129	*	186				
03050106010															
B-344	BD	LAKE LONG	FW												
B-046	P	BROAD RVR	FW	D	182	-0.0044	D	131	-0.0362	*	183		*	33	
03050106020															
B-086	S	ROSS BRANCH	FW	*	68					*	71				
B-136	BD/BIO	TURKEY CK	FW												

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0502

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	GEO MEAN	BACT N	BACT EXC.	BACT %	MEAN EXC.	TRENDS BACT	TRENDS N	TRENDS MAG	NH3 N	NH3 EXC.	CD N	CD EXC.	CD MED.	CD %
03050105155																	
B-099-7	BIO	VAUGHN CK	ORW														
B-099A	S	LAKE LANIER	FW	118	22	3	14	1677	*	65							
B-099B	S	LAKE LANIER	FW	11	23	1	4	1100	*	66							
B-719	BIO	N PACOLET RVR	FW														
B-301	S	PAGE CK	FW	455	23	11	48	1260	*	66							
B-026	P	N PACOLET RVR	FW	445	59	28	47	1395	*	185		55	0	19	0	DL	0
B-126	BD	N PACOLET RVR	FW	986	12	7	58	5354				12	0	4	0	DL	0
03050105160																	
B-720	BIO	S PACOLET RVR	FW														
B-103	P*	SPIVEY CK	FW	155	29	6	21	1070	*	72		12	0	4	0	DL	0
B-302	P*	S PACOLET RVR	FW	320	32	12	38	648	*	74		31	0	4	0	DL	0
B-340	BD	LAKE BOWEN	FW	66	7	0	0					24	0				
B-339	BD	LAKE BOWEN	FW	12	8	0	0					25	0				
B-113	S	SPARTANBURG RES. #1	FW	67	23	0	0		I	66	5.75						
03050105170																	
B-028	P*	PACOLET RVR	FW	360	29	8	28	2381	*	73		12	0	4	0	DL	0
B-259	S	LITTLE BUCK CK	FW	587	23	12	52	5881	*	66							
B-347	BD	LAKE BLALOCK	FW	10	6	1	17	1000				6	0				
B-163A	P*	PACOLET RVR	FW	80	30	4	13	1920	*	76		12	0	4	0	DL	0
B-191	S	POTTER BRANCH	FW	437	24	10	42	2140	*	69							
B-331	BD	PACOLET RVR	FW	194	12	5	42	2612				12	0	4	0	DL	0
03050105180																	
B-221	S/BIO	LAWSONS FORK CK	FW	2251	23	22	96	10032	*	67							
B-277	S	LAWSONS FORK CK	FW	1923	23	23	100	20377	*	68							
B-278	S	LAWSONS FORK CK	FW	3127	23	23	100	9007	*	73							
BL-005	P*	LAWSONS FORK CK	FW	1007	30	22	73	3963	*	76		12	0	5	0	DL	0
BL-001	P/BIO	LAWSONS FORK CK	FW	509	58	24	41	10402	*	183		55	0	19	0	DL	0
03050105190																	
BP-001	S	PACOLET RVR	FW	268	24	9	38	3309	*	68		2	0	1	0	DL	0
B-048	P	PACOLET RVR	FW	335	59	23	39	1145	D	188	-26.9091	58	0	19	0	DL	0
03050106010																	
B-344	BD	LAKE LONG	FW	5	6	0	0					5	0				
B-046	P	BROAD RVR	FW	115	58	10	17	1710	*	183		57	0	18	0	DL	0
03050106020																	
B-086	S	ROSS BRANCH	FW	2324	29	26	90	5336	*	73				2	0	DL	0
B-136	BD/BIO	TURKEY CK	FW	190	12	1	8	640				12	0	4	0	DL	0

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0502

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR MED.	CR %	CU N	CU EXC.	CU %	PB N	PB EXC.	PB MED.	PB %	HG N	HG EXC.	HG MED.	HG %	NI N	NI EXC.	NI %	ZN N	ZN EXC.	ZN %
03050105155																								
B-099-7	BIO	VAUGHN CK	ORW																					
B-099A	S	LAKE LANIER	FW																					
B-099B	S	LAKE LANIER	FW																					
B-719	BIO	N PACOLET RVR	FW																					
B-301	S	PAGE CK	FW																					
B-026	P	N PACOLET RVR	FW	19	0	DL	0	19	1	5	19	0	DL	0	19	0	DL	0	19	0	0	19	0	0
B-126	BD	N PACOLET RVR	FW	4	0	DL	0	4	0	0	4	1	DL	25	4	0	DL	0	4	0	0	4	0	0
03050105160																								
B-720	BIO	S PACOLET RVR	FW																					
B-103	P*	SPIVEY CK	FW	4	0	DL	0	4	0	0	4	0	DL	0	4	0	DL	0	4	0	0	4	0	0
B-302	P*	S PACOLET RVR	FW	4	0	DL	0	4	0	0	4	1	DL	25	4	0	DL	0	4	0	0	4	0	0
B-340	BD	LAKE BOWEN	FW																					
B-339	BD	LAKE BOWEN	FW																					
B-113	S	SPARTANBURG RES. #1	FW																					
03050105170																								
B-028	P*	PACOLET RVR	FW	4	0	DL	0	4	0	0	4	0	DL	0	4	0	DL	0	4	0	0	4	0	0
B-259	S	LITTLE BUCK CK	FW																					
B-347	BD	LAKE BLALOCK	FW																					
B-163A	P*	PACOLET RVR	FW	4	0	DL	0	4	1	25	4	0	DL	0	4	0	DL	0	4	0	0	4	0	0
B-191	S	POTTER BRANCH	FW																					
B-331	BD	PACOLET RVR	FW	4	0	DL	0	4	0	0	4	0	DL	0	4	0	DL	0	4	0	0	4	0	0
03050105180																								
B-221	S/BIO	LAWSONS FORK CK	FW																					
B-277	S	LAWSONS FORK CK	FW																					
B-278	S	LAWSONS FORK CK	FW																					
BL-005	P*	LAWSONS FORK CK	FW	5	0	DL	0	5	0	0	5	0	DL	0	5	0	DL	0	5	0	0	5	0	0
BL-001	P/BIO	LAWSONS FORK CK	FW	19	0	DL	0	19	0	0	19	0	DL	0	19	0	DL	0	19	0	0	19	0	0
03050105190																								
BP-001	S	PACOLET RVR	FW	1	0	DL	0	1	0	0	1	0	DL	0	1	0	DL	0	1	0	0	1	0	0
B-048	P	PACOLET RVR	FW	19	1	DL	5	19	1	5	19	0	DL	0	19	0	DL	0	19	0	0	19	0	0
03050106010																								
B-344	BD	LAKE LONG	FW																					
B-046	P	BROAD RVR	FW	18	0	DL	0	18	1	6	18	0	DL	0	17	0	DL	0	18	0	0	18	1	6
03050106020																								
B-086	S	ROSS BRANCH	FW	2	0	DL	0	2	0	0	2	0	DL	0	2	0	DL	0	2	0	0	2	0	0
B-136	BD/BIO	TURKEY CK	FW	4	0	DL	0	4	0	0	4	0	DL	0	4	0	DL	0	4	0	0	4	1	25

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0502

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	DO N	DO EXC.	DO %	MEAN EXC.	TRENDS DO	TRENDS N	TRENDS MAG	TRENDS BOD	TRENDS N	TRENDS MAG	pH N	pH EXC.	pH %	MEAN EXC.	TRENDS PH	TRENDS N	TRENDS MAG
03050106030																				
B-064	S	MENG CK	FW	30	0	0		*	69		D	73	-0.18	30	0	0		*	75	
B-243	S	MENG CK TRIB	FW	30	0	0		*	67		D	73	-0.2174	30	0	0		I	74	0.0138
B-155	BD/BIO	BROWNS CK	FW	12	0	0								12	0	0				
B-335	BD	GREGORYS CK	FW	12	0	0								12	0	0				
03050106040																				
CL-023	BD	CHESTER ST PARK LAKE	FW	4	0	0								4	0	0				
B-074	S	DRY FORK	FW	30	0	0		*	69		D	73	-0.1143	30	0	0		*	74	
B-075	P*/BIO	SANDY RVR	FW	36	0	0		*	74		D	79	-0.15	36	0	0		*	81	
03050106050																				
B-143	BIO	BEAVER CK	FW																	
B-047	P*	BROAD RVR	FW	28	0	0		*	70		D	85	-0.0612	28	1	4	5.6	*	83	
B-346	BD	LAKE, PARR RESERVOIR	FW	7	0	0								7	0	0				
B-751	BIO	CANNONS CK	FW																	
B-328	P	LAKE, MONTICELLO	FW	60	0	0		*	198		*	185		61	2	3	8.825	*	222	
B-327	P	LAKE, MONTICELLO	FW	69	0	0		*	208		*	187		69	10	14	8.372	I	226	0.0333
B-345	BD	LAKE, PARR RESERVOIR	FW	7	0	0								7	1	14	5.9			
03050106060																				
B-236	P	BROAD RVR	FW	59	0	0		*	169		D	185	-0.05	59	2	3	5.8	*	200	
B-110	S	ELIZABETH LAKE	FW	23	1	4	3.65	*	65		D	76	-0.0764	23	7	30	5.66	*	76	
B-081	BIO	CRANE CK	FW																	
B-316	P	CRANE CK	FW	48	2	4	2.8	*	89		*	102		48	0	0		*	100	
B-280	P/BIO	SMITH BRANCH	FW	58	0	0		I	140	0.05	D	174	-0.08	58	0	0		*	178	
B-337	BD	BROAD RVR	FW	12	0	0								12	0	0				
B-080	P	BROAD RVR	FW	59	0	0		D	148	-0.0667	D	191	-0.06	59	1	2	8.63	*	190	
03050106070																				
B-145	P*/BIO	LITTLE RVR	FW	29	0	0		*	70		D	82	-0.1	29	1	3	5.9	*	81	
03050106080																				
B-123	S	WINNSBORO BRANCH	FW	24	0	0		*	64		D	75	-0.1	24	1	4	5.25	*	74	
B-077	S	WINNSBORO BRANCH	FW	24	0	0		D	64	-0.0667	*	75		24	1	4	5.3	*	74	
B-102	BD/BIO	JACKSON CK	FW	12	0	0								12	0	0				
B-338	BD	MILL CK	FW	12	0	0								12	2	17	5.9			
03050106090																				
B-320	BD/BIO	BIG CEDAR CK	FW	11	0	0								11	0	0				

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0502

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	TRENDS											
				TP	N	MAG	TN	N	MAG	TURB	N	MAG	TSS	N	MAG
03050106030															
B-064	S	MENG CK	FW	D	69	-0.0143				*	75				
B-243	S	MENG CK TRIB	FW	D	68	-0.0312				D	74	-0.6667			
B-155	BD/BIO	BROWNS CK	FW												
B-335	BD	GREGORYS CK	FW												
03050106040															
CL-023	BD	CHESTER ST PARK LAKE	FW												
B-074	S	DRY FORK	FW	D	69	-0.0048				*	71				
B-075	P*/BIO	SANDY RVR	FW	D	75	-0.0071				*	81				
03050106050															
B-143	BIO	BEAVER CK	FW												
B-047	P*	BROAD RVR	FW	I	83	0.0033				*	83				
B-346	BD	LAKE, PARR RESERVOIR	FW												
B-751	BIO	CANNONS CK	FW												
B-328	P	LAKE, MONTICELLO	FW	D	185	-0.0016	D	164	-0.0387	D	181	-0.1087			
B-327	P	LAKE, MONTICELLO	FW	D	186	-0.0025	D	159	-0.0152	D	182	-0.1556			
B-345	BD	LAKE, PARR RESERVOIR	FW												
03050106060															
B-236	P	BROAD RVR	FW	D	186	-0.0027	D	145	-0.0256	*	181		*	164	
B-110	S	ELIZABETH LAKE	FW	D	73	-0.0014				*	74				
B-081	BIO	CRANE CK	FW												
B-316	P	CRANE CK	FW	D	99	-0.0155	*	39		I	101	0.3636			
B-280	P/BIO	SMITH BRANCH	FW	D	175	-0.01	*	128		*	174				
B-337	BD	BROAD RVR	FW												
B-080	P	BROAD RVR	FW	D	187	-0.0029	D	133	-0.012	*	188				
03050106070															
B-145	P*/BIO	LITTLE RVR	FW	D	79	-0.0028				*	82				
03050106080															
B-123	S	WINNSBORO BRANCH	FW	*	72					I	72	0.425			
B-077	S	WINNSBORO BRANCH	FW	D	73	-0.1769				*	73				
B-102	BD/BIO	JACKSON CK	FW												
B-338	BD	MILL CK	FW												
03050106090															
B-320	BD/BIO	BIG CEDAR CK	FW												

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0502

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	GEO MEAN	BACT N	BACT EXC.	BACT %	MEAN EXC.	TRENDS BACT	TRENDS N	TRENDS MAG	NH3 N	NH3 EXC.	CD N	CD EXC.	CD MED.	CD %
03050106030																	
B-064	S	MENG CK	FW	607	30	24	80	1314	*	75							
B-243	S	MENG CK TRIB	FW	939	30	22	73	2490	*	74							
B-155	BD/BIO	BROWNS CK	FW	202	12	2	17	420				12	0	4	0	DL	0
B-335	BD	GREGORYS CK	FW	166	12	1	8	1000				10	0	4	0	DL	0
03050106040																	
CL-023	BD	CHESTER ST PARK LAKE	FW														
B-074	S	DRY FORK	FW	1106	30	26	87	1945	*	75		1	0				
B-075	P*/BIO	SANDY RVR	FW	467	36	17	47	1123	*	80		12	0	4	0	DL	0
03050106050																	
B-143	BIO	BEAVER CK	FW														
B-047	P*	BROAD RVR	FW	129	27	3	11	5233	*	85		11	0	4	0	DL	0
B-346	BD	LAKE, PARR RESERVOIR	FW	76	5	0	0					5	0				
B-751	BIO	CANNONS CK	FW														
B-328	P	LAKE, MONTICELLO	FW	2	56	0	0		I	187	0	56	0	18	0	DL	0
B-327	P	LAKE, MONTICELLO	FW	2	57	0	0		I	188	0	55	0	18	0	DL	0
B-345	BD	LAKE, PARR RESERVOIR	FW	20	6	0	0					6	0				
03050106060																	
B-236	P	BROAD RVR	FW	33	58	7	12	1984	*	187		58	0	19	0	DL	0
B-110	S	ELIZABETH LAKE	FW	151	22	4	18	982	I	76	4.5727						
B-081	BIO	CRANE CK	FW														
B-316	P	CRANE CK	FW	679	46	25	54	6093	I	102	20	41	0	15	0	DL	0
B-280	P/BIO	SMITH BRANCH	FW	3248	56	51	91	14130	*	182		55	0	19	0	DL	0
B-337	BD	BROAD RVR	FW	79	12	1	8	940				12	0	4	0	DL	0
B-080	P	BROAD RVR	FW	82	57	8	14	1066	*	192		56	0	20	0	DL	0
03050106070																	
B-145	P*/BIO	LITTLE RVR	FW	356	27	11	41	566	I	82	10	9	0	3	0	DL	0
03050106080																	
B-123	S	WINNSBORO BRANCH	FW	1612	24	22	92	12806	*	75							
B-077	S	WINNSBORO BRANCH	FW	953	22	17	77	2979	I	74	37.5			4	0	DL	0
B-102	BD/BIO	JACKSON CK	FW	365	11	3	27	2770				11	0	4	0	DL	0
B-338	BD	MILL CK	FW	389	10	5	50	1004				10	0	3	0	DL	0
03050106090																	
B-320	BD/BIO	BIG CEDAR CK	FW	299	9	2	22	1000				9	0	3	0	DL	0

WATER QUALITY SUMMARY - MANAGEMENT UNIT 0502

STATION NUMBER	TYPE	WATERBODY NAME	CLASS	CR N	CR EXC.	CR MED.	CR %	CU N	CU EXC.	CU %	PB N	PB EXC.	PB MED.	PB %	HG N	HG EXC.	HG MED.	HG %	NI N	NI EXC.	NI %	ZN N	ZN EXC.	ZN %
03050106030																								
B-064	S	MENG CK	FW																					
B-243	S	MENG CK TRIB	FW																					
B-155	BD/BIO	BROWNS CK	FW	4	0	DL	0	4	2	50	4	0	DL	0	4	0	DL	0	4	0	0	4	1	25
B-335	BD	GREGORYS CK	FW	4	0	DL	0	4	0	0	4	0	DL	0	4	0	DL	0	4	0	0	4	1	25
03050106040																								
CL-023	BD	CHESTER ST PARK LAKE	FW																					
B-074	S	DRY FORK	FW																					
B-075	P*/BIO	SANDY RVR	FW	4	0	DL	0	4	0	0	4	0	DL	0	4	0	DL	0	4	0	0	4	0	0
03050106050																								
B-143	BIO	BEAVER CK	FW																					
B-047	P*	BROAD RVR	FW	4	0	DL	0	4	0	0	4	0	DL	0	4	0	DL	0	4	0	0	4	0	0
B-346	BD	LAKE, PARR RESERVOIR	FW																					
B-751	BIO	CANNONS CK	FW																					
B-328	P	LAKE, MONTICELLO	FW	18	0	DL	0	17	0	0	18	0	DL	0	18	0	DL	0	18	0	0	18	1	6
B-327	P	LAKE, MONTICELLO	FW	18	0	DL	0	18	0	0	18	0	DL	0	18	0	DL	0	18	0	0	18	1	6
B-345	BD	LAKE, PARR RESERVOIR	FW																					
03050106060																								
B-236	P	BROAD RVR	FW	19	1	DL	5	19	0	0	19	0	DL	0	19	0	DL	0	19	0	0	19	1	5
B-110	S	ELIZABETH LAKE	FW																					
B-081	BIO	CRANE CK	FW																					
B-316	P	CRANE CK	FW	15	0	DL	0	15	3	20	15	0	DL	0	15	0	DL	0	15	0	0	15	2	13
B-280	P/BIO	SMITH BRANCH	FW	19	1	DL	5	19	1	5	19	0	DL	0	19	0	DL	0	19	0	0	19	1	5
B-337	BD	BROAD RVR	FW	4	0	DL	0	4	0	0	4	0	DL	0	4	0	DL	0	4	0	0	4	0	0
B-080	P	BROAD RVR	FW	20	1	DL	5	20	6	30	20	0	DL	0	20	0	DL	0	20	0	0	20	2	10
03050106070																								
B-145	P*/BIO	LITTLE RVR	FW	3	0	DL	0	3	1	33	3	0	DL	0	2	0	DL	0	3	0	0	3	1	33
03050106080																								
B-123	S	WINNSBORO BRANCH	FW																					
B-077	S	WINNSBORO BRANCH	FW	4	1	DL	25	4	1	25	4	0	DL	0	4	0	DL	0	4	0	0	4	1	25
B-102	BD/BIO	JACKSON CK	FW	4	1	DL	25	4	1	25	4	0	DL	0	4	0	DL	0	4	0	0	4	0	0
B-338	BD	MILL CK	FW	3	0	DL	0	3	1	33	3	0	DL	0	3	0	DL	0	3	0	0	3	0	0
03050106090																								
B-320	BD/BIO	BIG CEDAR CK	FW	3	0	DL	0	3	1	33	3	0	DL	0	3	0	DL	0	3	0	0	3	0	0

Mean Seasonal Water Quality Values

BROAD BASIN WMU-0502

PARAMETER	STAT	SPRING (Mar-May)	SUMMER (Jun-Sep)	FALL (Oct-Nov)	WINTER (Dec-Feb)
TEMPERATURE (°C)	Mean	17.2	23.0	15.4	8.6
	Max	29.5	33.0	24.0	18.0
	Min	7.5	6.9	7.0	1.0
	Med	18.0	23.0	15.0	9.0
	95%	23.0	29.0	21.0	13.0
	N	448	1077	350	260
DISSOLVED OXYGEN (mg/l)	Mean	8.7	7.5	8.7	10.5
	Max	12.0	17.0	11.6	14.6
	Min	2.3	1.4	1.7	2.8
	Med	8.6	7.5	8.8	10.5
	5%	6.8	6.0	6.8	8.3
	N	448	1079	350	258
pH (SU)	Mean	6.9	6.9	6.9	7.0
	Max	9.5	9.5	7.9	9.1
	Min	5.7	5.2	5.5	4.6
	Med	6.9	6.9	6.9	7.0
	95%	7.8	7.7	7.6	8.0
	N	445	1078	350	260
BOD_5 (mg/l)	Mean	1.6	1.5	1.5	1.4
	Max	8.9	11.0	15.0	7.9
	Min	0.3	0.1	0.1	0.1
	Med	1.3	1.1	1.1	1.1
	95%	3.7	4.0	4.0	3.5
	N	414	1021	335	244
TURBIDITY (NTU)	Mean	24.1	21.1	14.1	23.6
	Max	288.0	500.0	260.0	180.0
	Min	0.5	1.1	0.7	1.6
	Med	13.0	12.0	7.8	14.0
	95%	80.0	64.0	43.0	81.0
	N	430	1046	344	254

BROAD BASIN WMU-0502

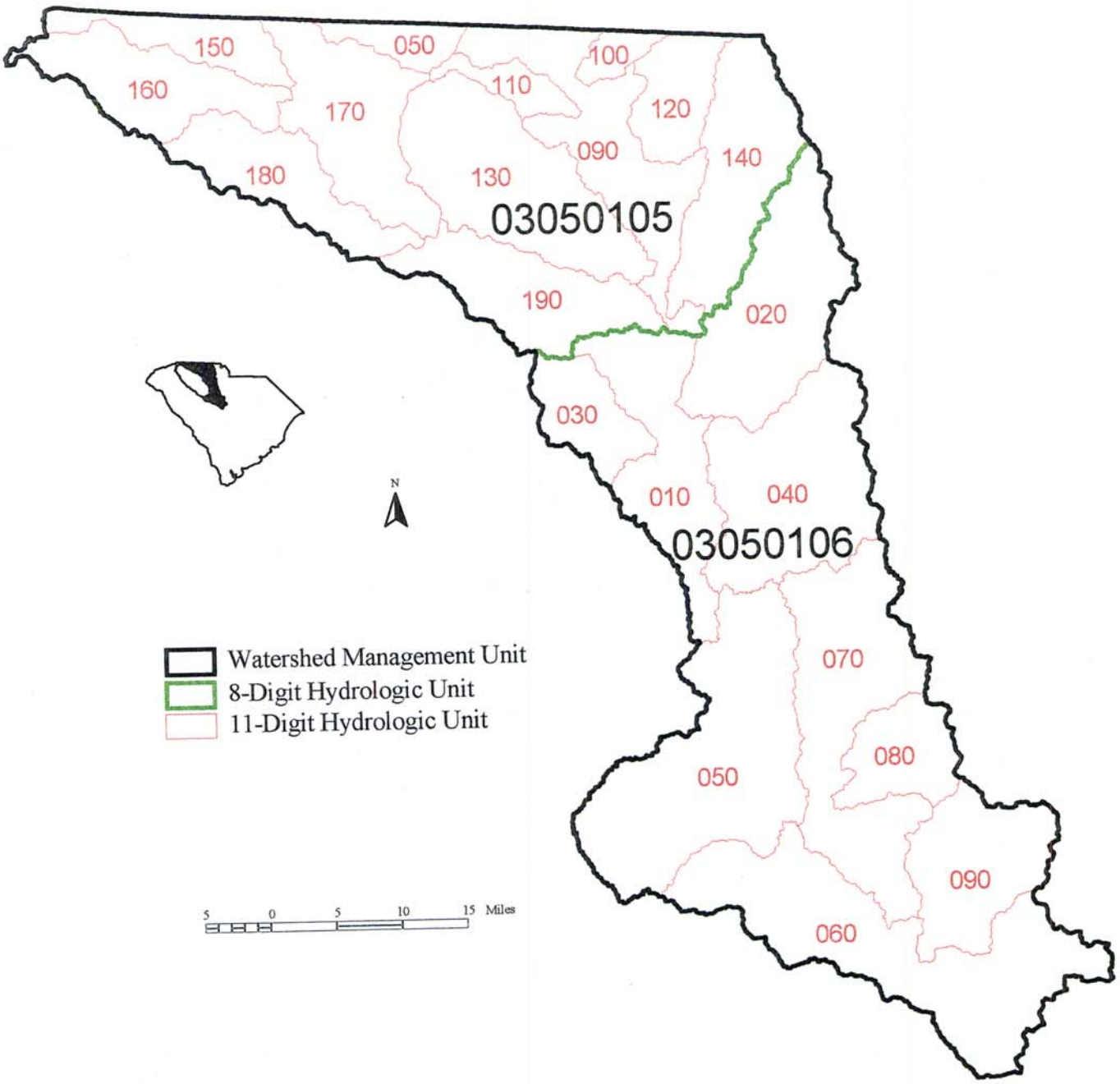
PARAMETER	STAT	SPRING (Mar-May)	SUMMER (Jun-Sep)	FALL (Oct-Nov)	WINTER (Dec-Feb)
AMMONIA (mg/l)	Mean	0.13	0.33	0.37	0.17
	Max	0.52	6.70	2.64	1.20
	Min	0.05	0.05	0.05	0.05
	Med	0.10	0.07	0.18	0.08
	95%	0.35	1.12	2.64	0.50
	N	45	36	15	40
TKN (mg/l)	Mean	0.41	0.45	0.41	0.40
	Max	1.72	8.60	3.43	1.76
	Min	0.09	0.10	0.06	0.11
	Med	0.32	0.37	0.31	0.33
	95%	1.00	1.00	1.08	0.93
	N	241	372	177	244
NITRITE-NITRATE (mg/l)	Mean	0.66	0.85	0.76	0.49
	Max	13.30	14.00	10.80	2.90
	Min	0.02	0.02	0.02	0.02
	Med	0.38	0.41	0.33	0.37
	95%	1.85	3.30	2.50	1.56
	N	404	941	303	251
TOTAL PHOSPHORUS (mg/l)	Mean	0.14	0.20	0.18	0.08
	Max	3.30	3.00	1.65	0.84
	Min	0.02	0.02	0.02	0.02
	Med	0.07	0.07	0.08	0.06
	95%	0.47	0.94	0.81	0.19
	N	388	857	259	233
TOTAL ORGANIC CARBON (mg/l)	Mean	4.9	4.9	4.9	4.4
	Max	15.3	18.9	28.0	22.0
	Min	1.0	0.9	1.3	1.4
	Med	4.0	3.7	4.2	3.5
	95%	11.2	12.9	11.0	10.9
	N	118	170	70	112

BROAD BASIN WMU-0502

PARAMETER	STAT	SPRING (Mar-May)	SUMMER (Jun-Sep)	FALL (Oct-Nov)	WINTER (Dec-Feb)
FECAL COLIFORM BACTERIA (#/100ml)	Mean	224	357	219	119
	Max	90,000	200,000	420,000	170,000
	Min	1	1	1	1
	Med	280	420	250	170
	95%	5,100	6,600	4,000	2,500
	N	417	1032	340	246

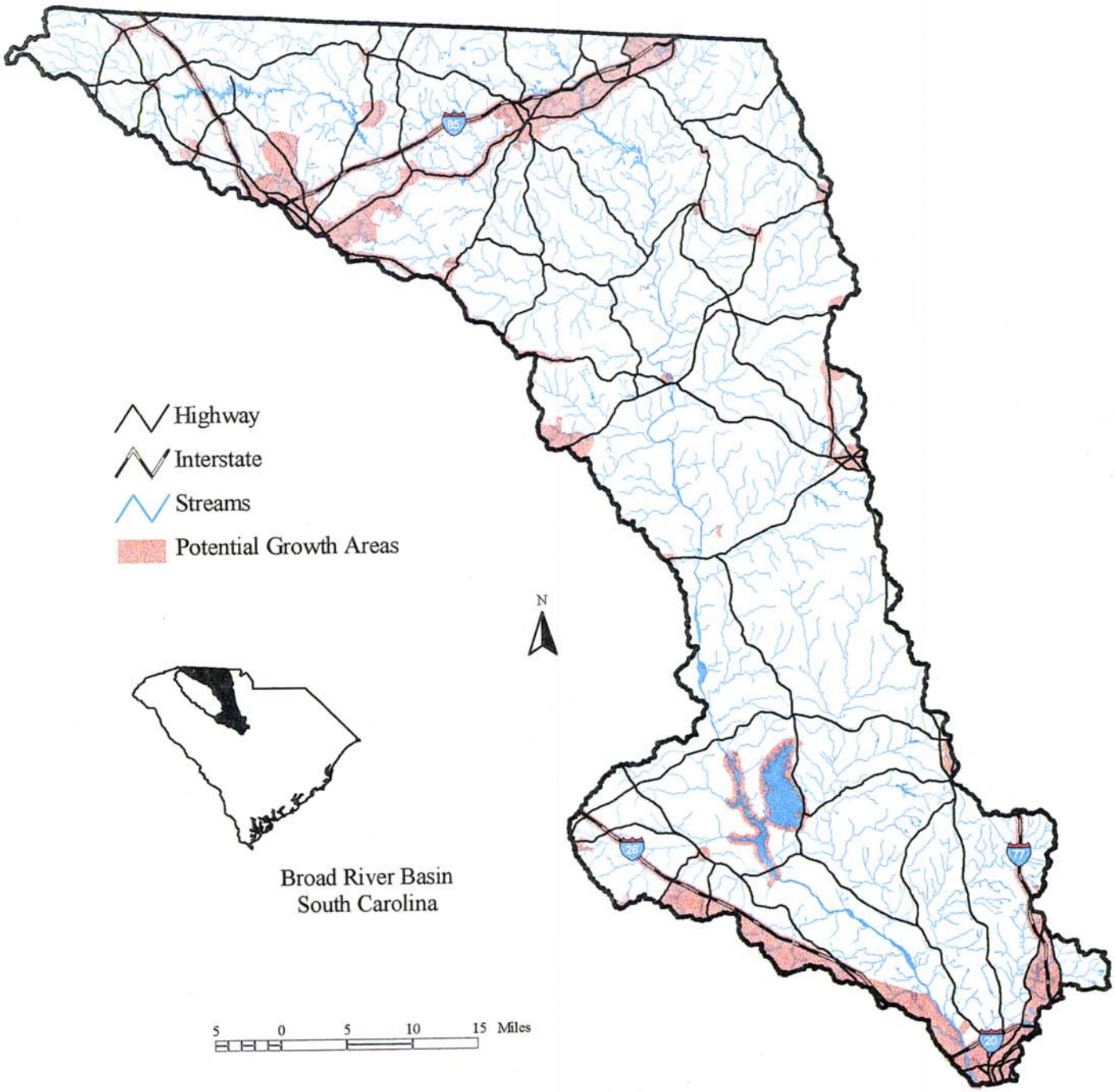
Watershed Unit Index Map

Watershed Management Unit 0502

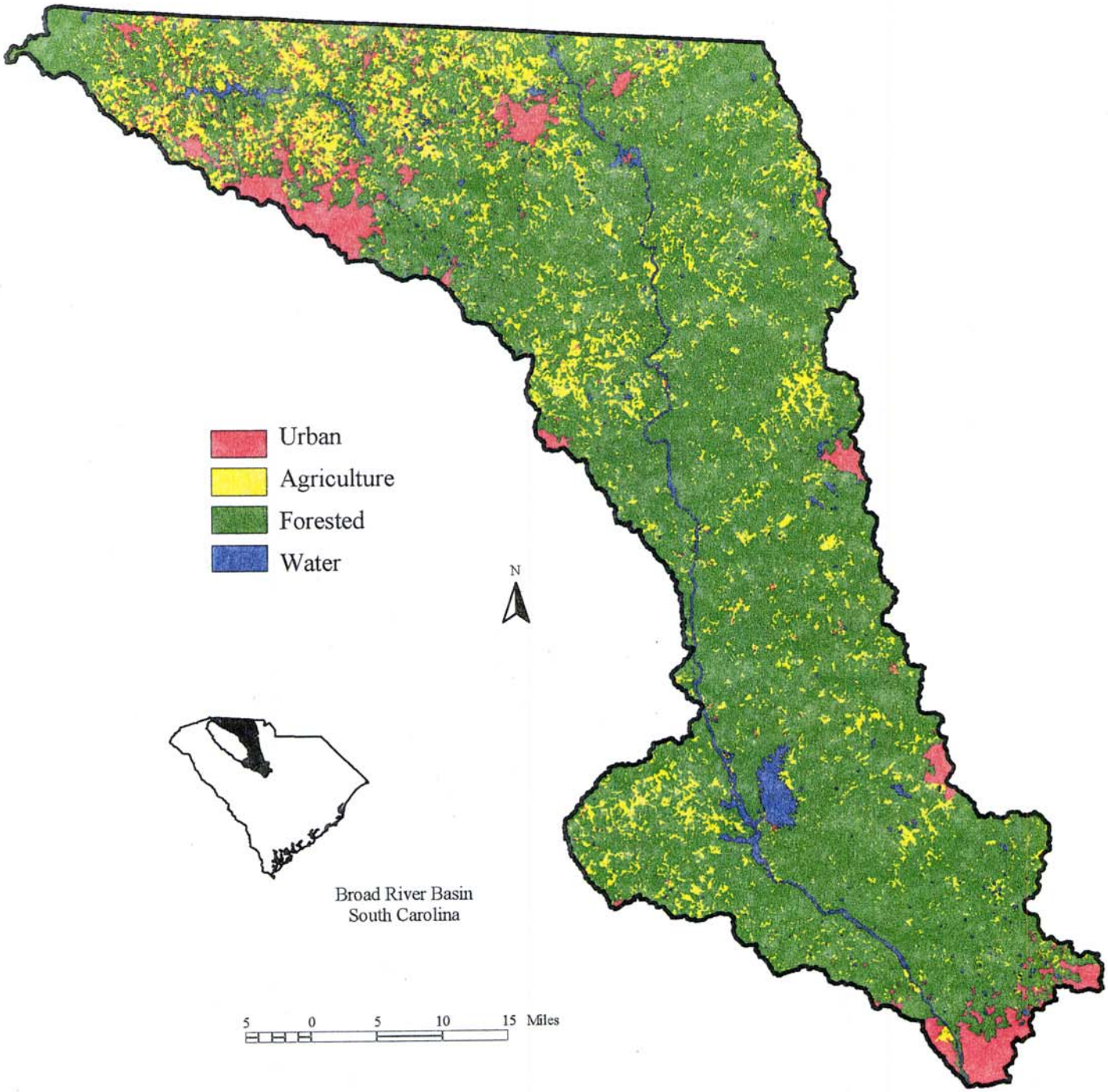


Potential Growth Areas

Watershed Management Unit 0502

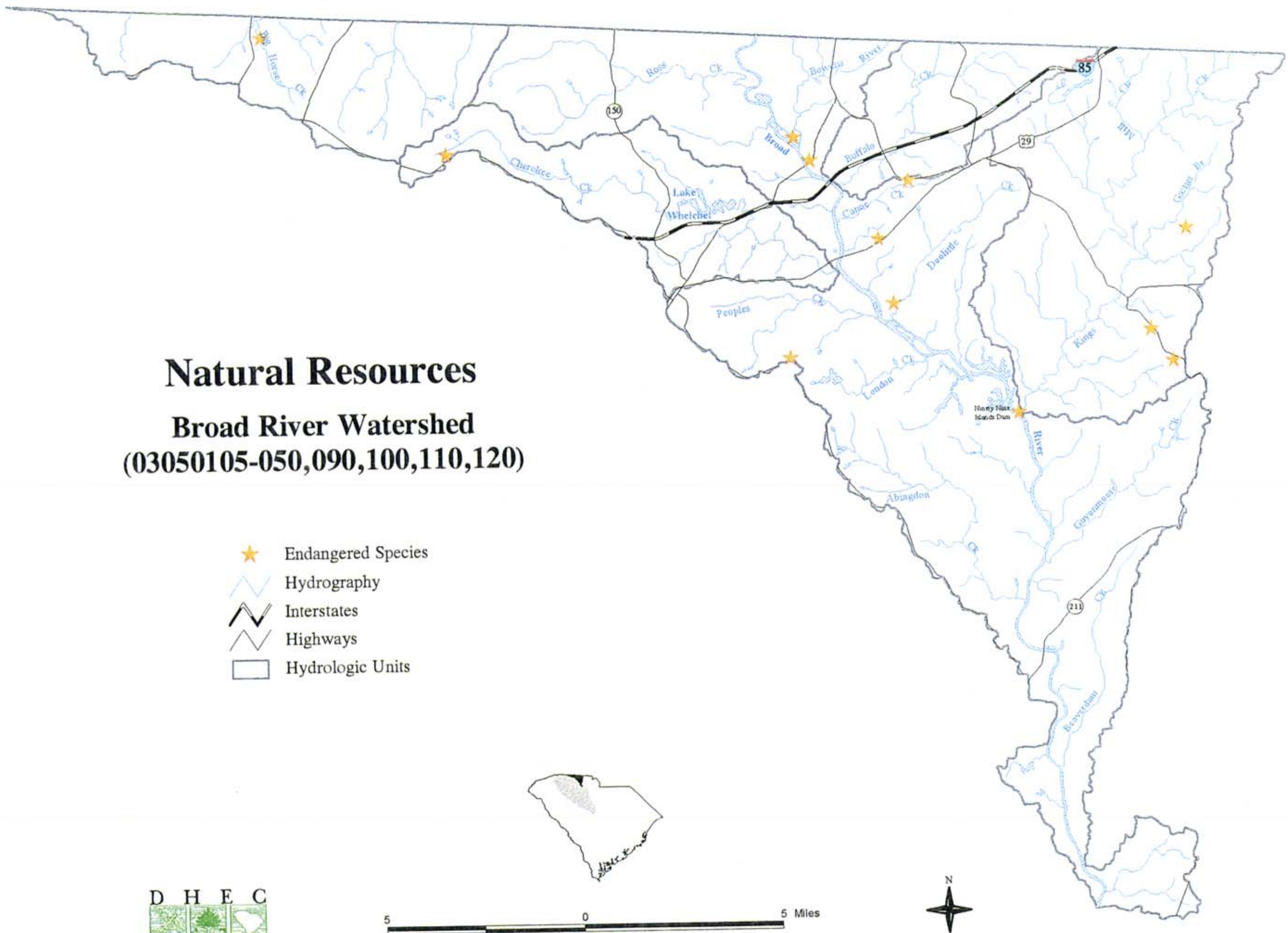


Land Use/Land Cover
Watershed Management Unit 0502



Natural Resources

Broad River Watershed
(03050105-050,090,100,110,120)



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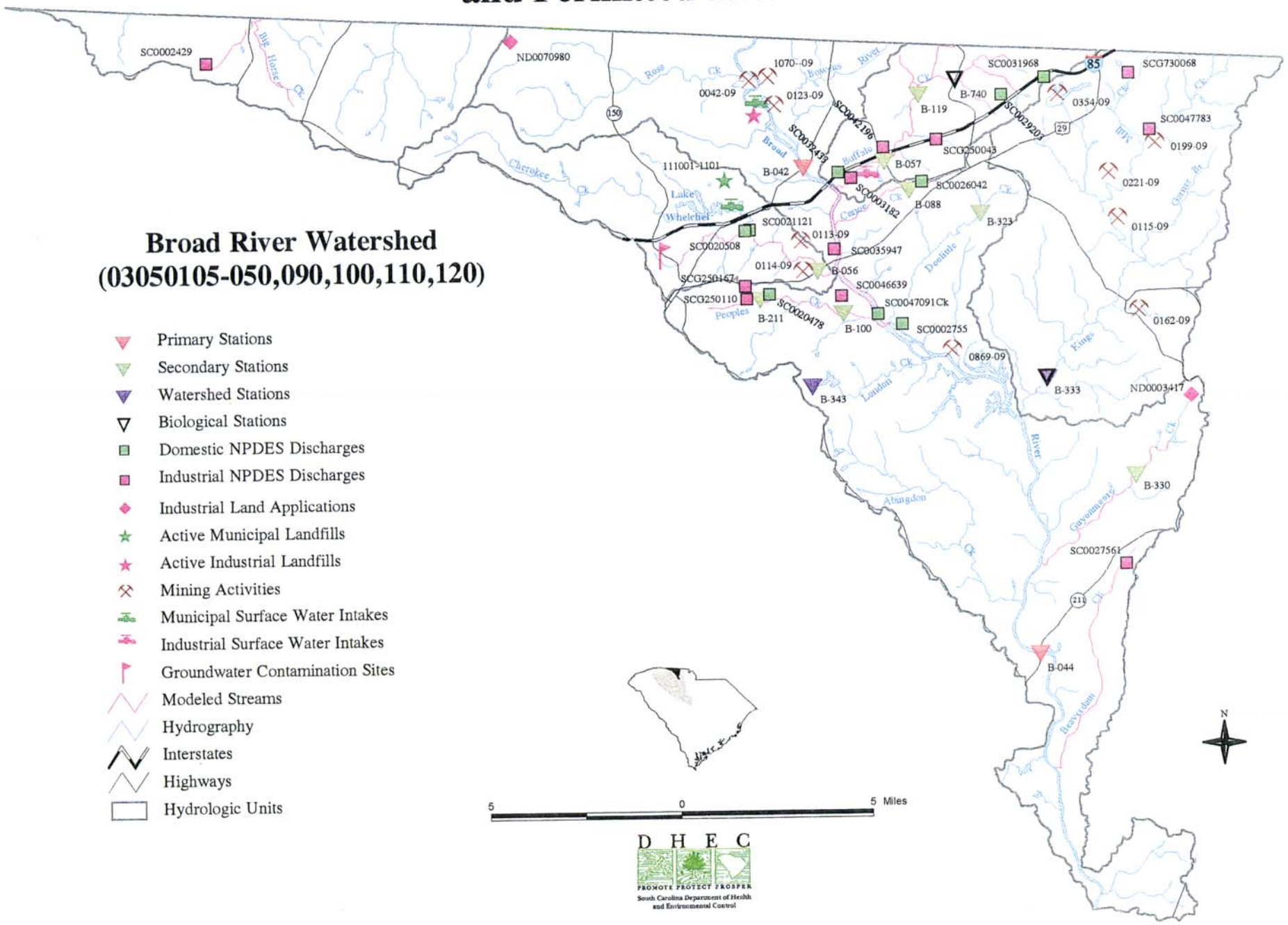
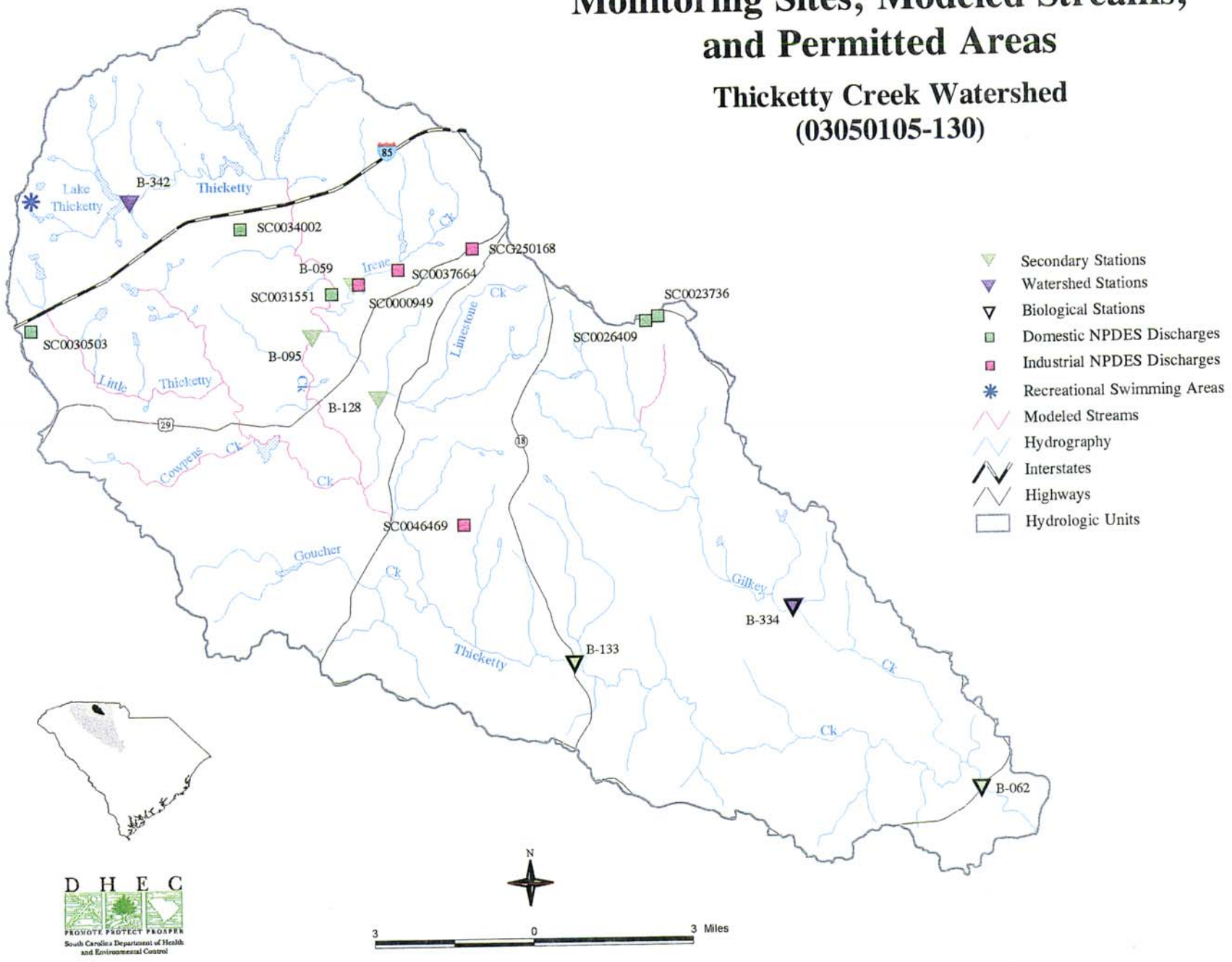
Monitoring Sites, Modeled Streams, and Permitted Areas



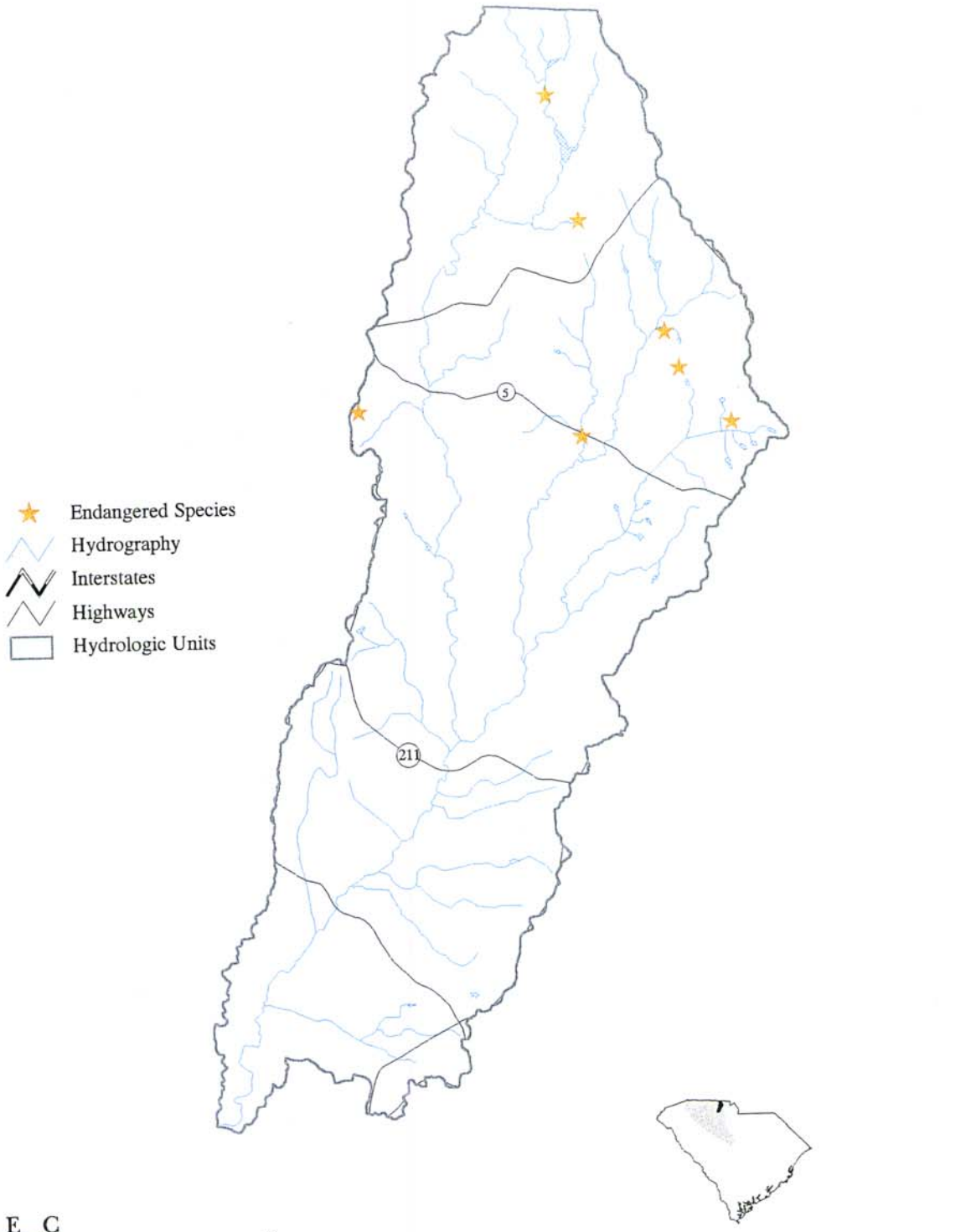
Monitoring Sites, Modeled Streams, and Permitted Areas

Thicketty Creek Watershed (03050105-130)



Natural Resources

Bullock Creek Watershed
(03050105-140)



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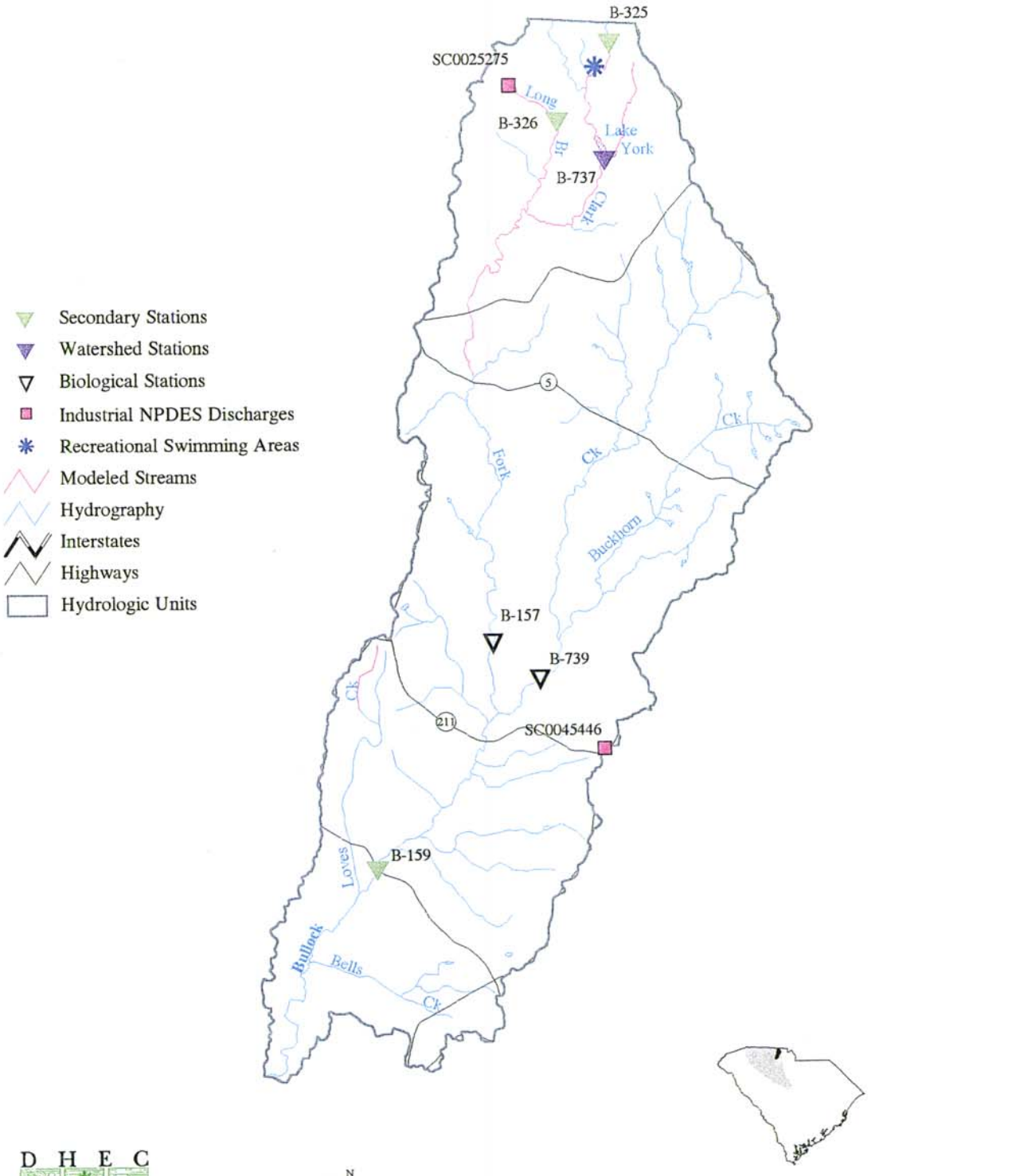
Monitoring Sites, Modeled Streams, and Permitted Areas

Bullock Creek Watershed (03050105-140)



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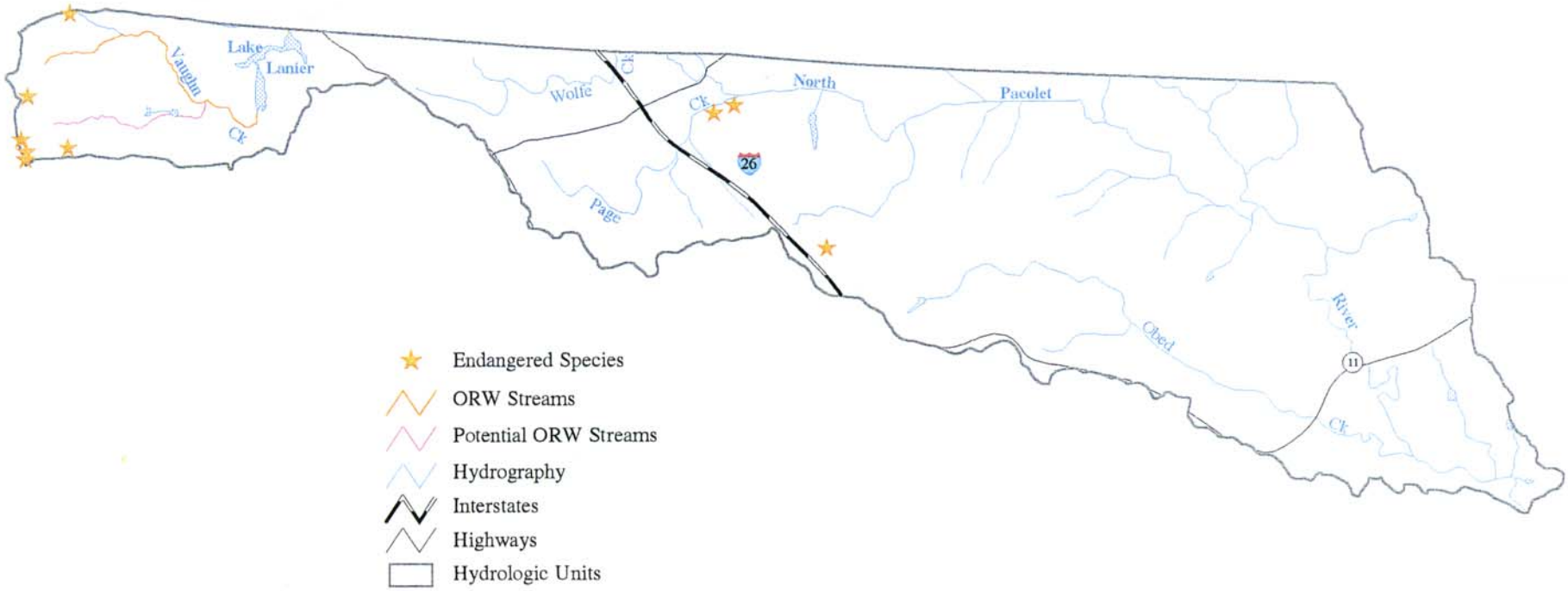
Natural Resources

North Pacolet River Watershed
(03050105-150)



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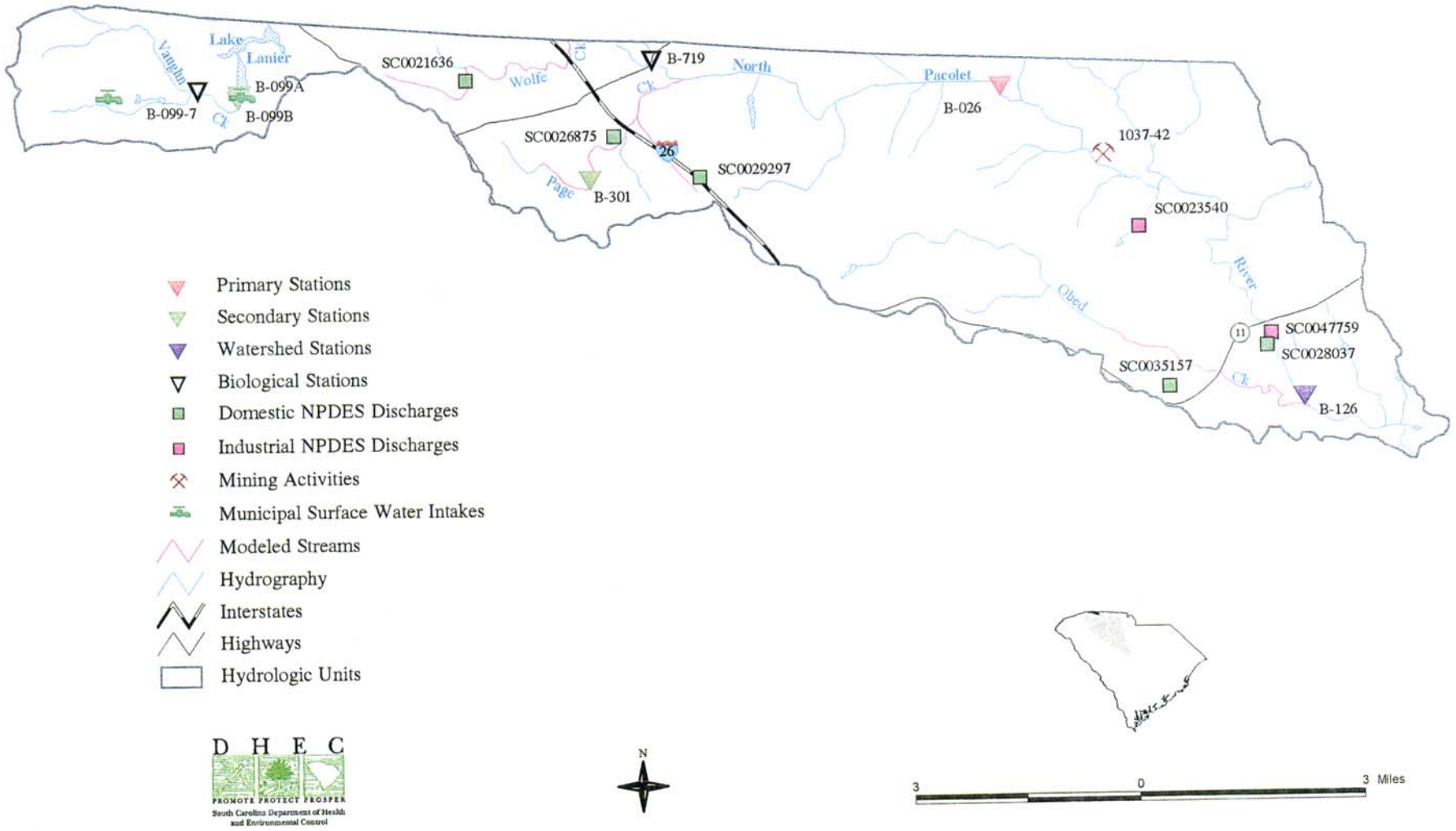
N

3 0 3 Miles

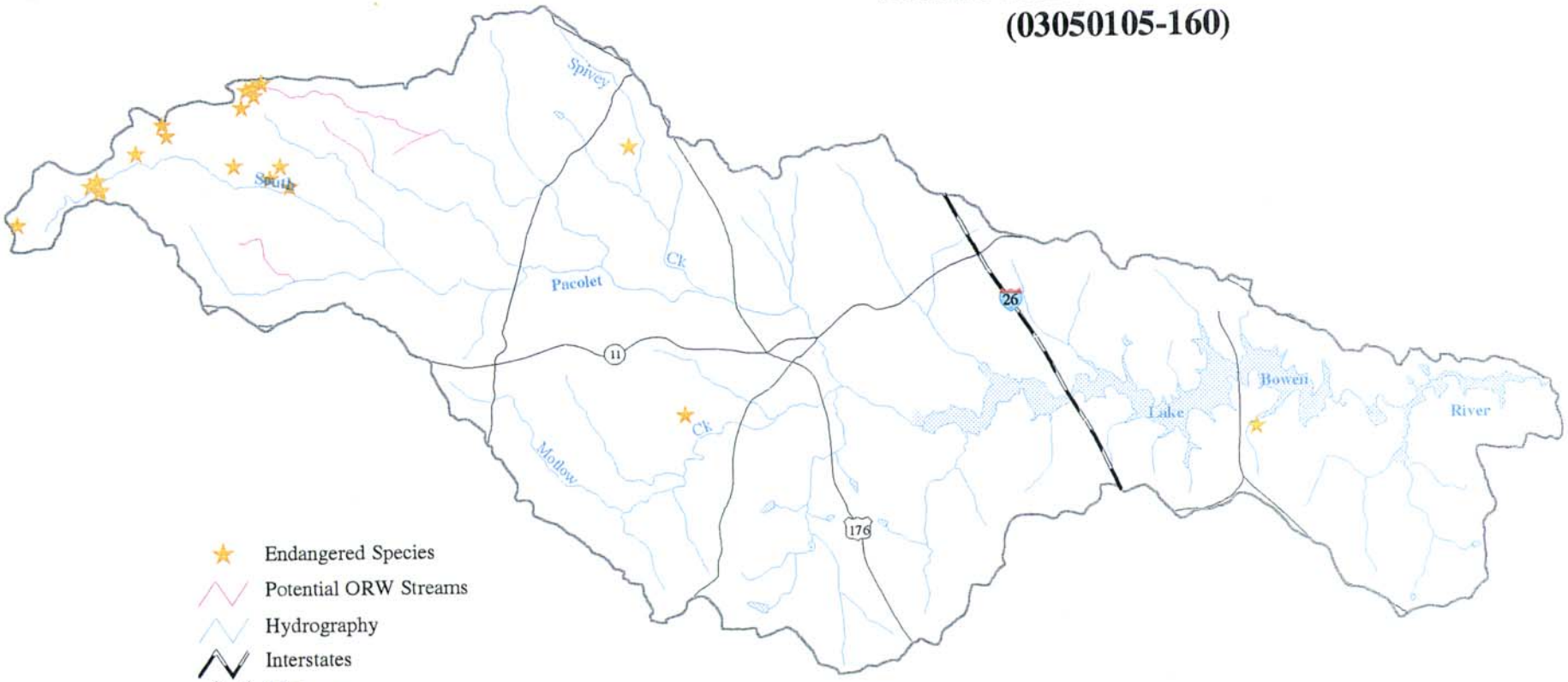
Monitoring Sites, Modeled Streams, and Permitted Areas

North Pacolet River Watershed (03050105-150)



Natural Resources

South Pacolet River Watershed
(03050105-160)



- Endangered Species
- Potential ORW Streams
- Hydrography
- Interstates
- Highways
- Hydrologic Units

D H E C

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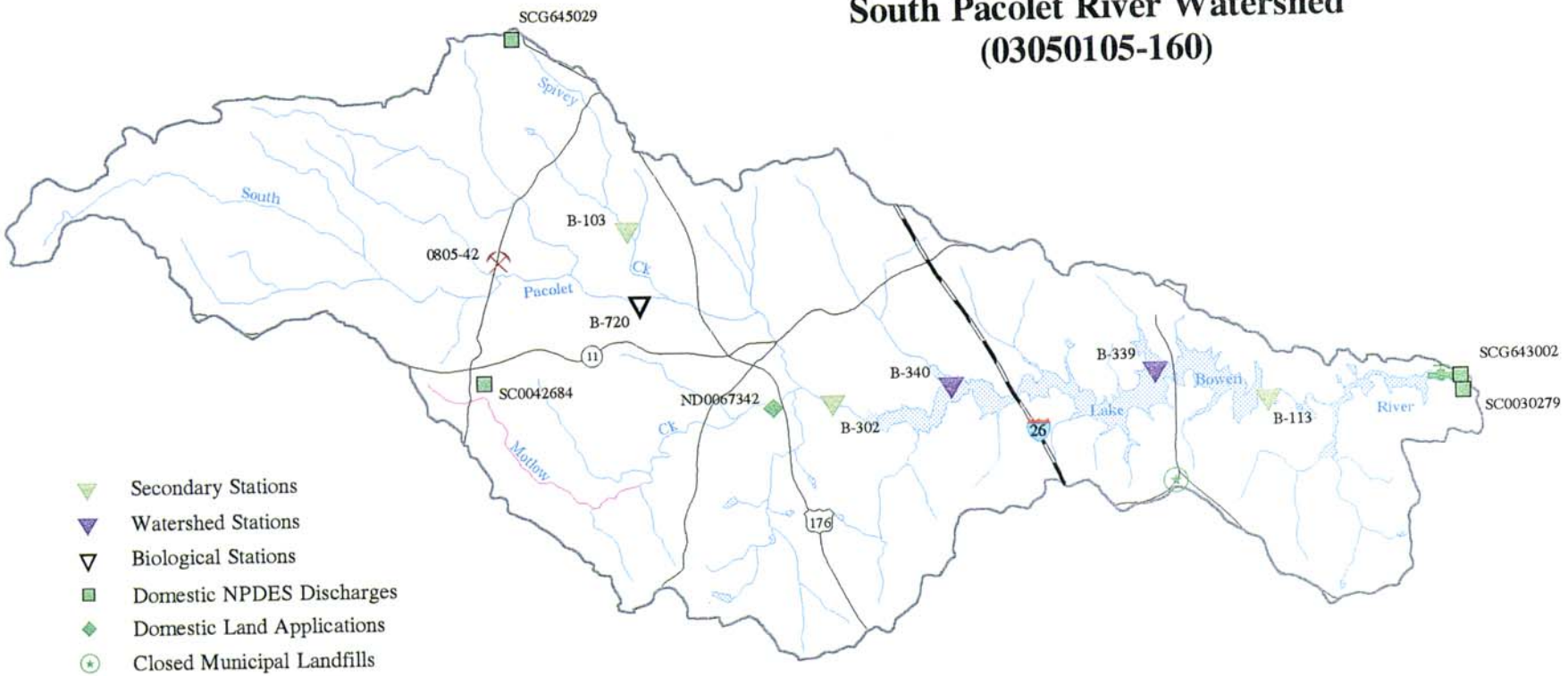
N

4 0 4 Miles

Monitoring Sites, Modeled Streams, and Permitted Areas

South Pacolet River Watershed (03050105-160)



- Secondary Stations
- Watershed Stations
- Biological Stations
- Domestic NPDES Discharges
- Domestic Land Applications
- Closed Municipal Landfills
- Mining Activities
- Municipal Surface Water Intakes
- Modeled Streams
- Hydrography
- Interstates
- Highways
- Hydrologic Units

D H E C
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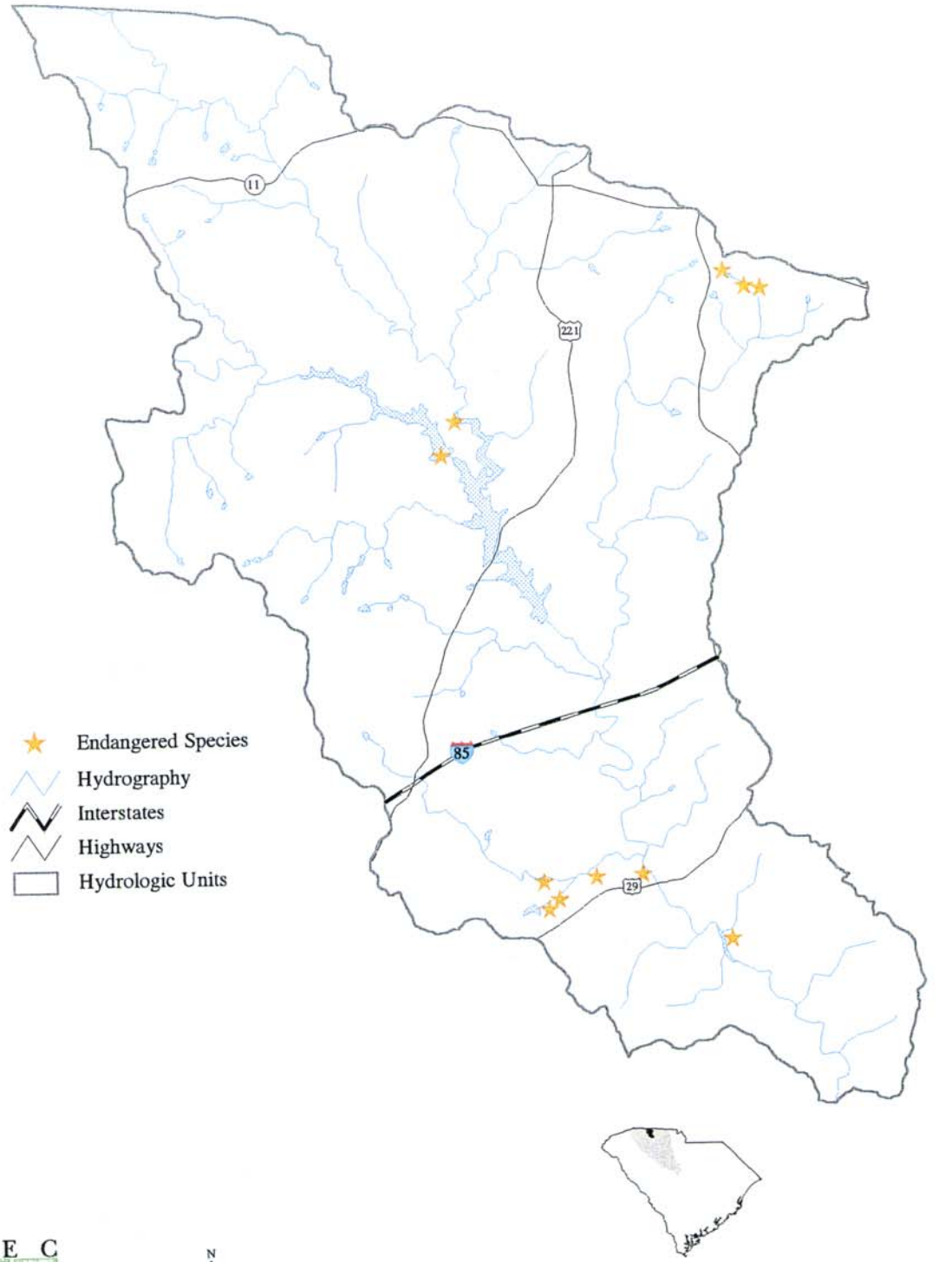
N

4 0 4 Miles

Natural Resources

Pacolet River Watershed
(03050105-170)



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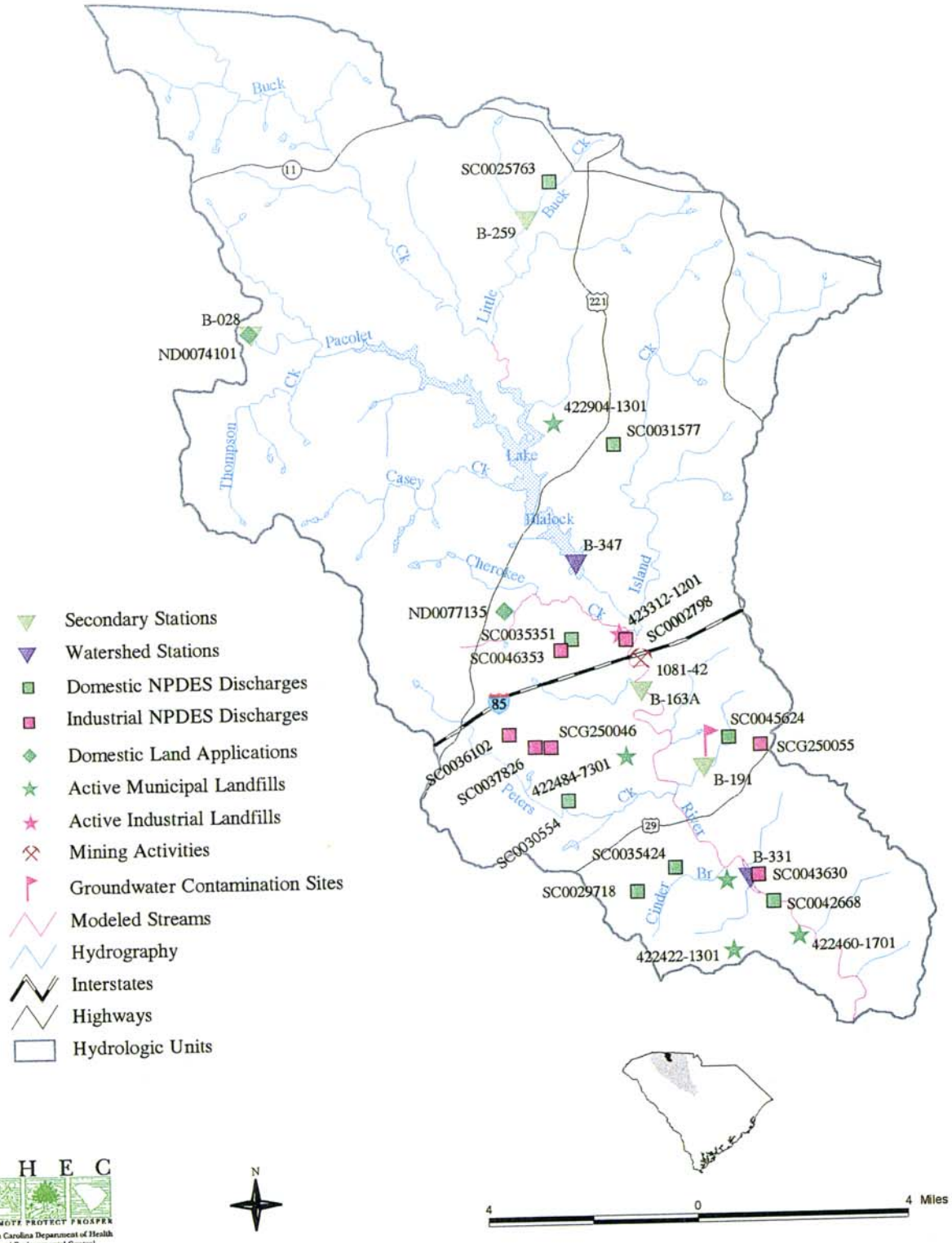
Monitoring Sites, Modeled Streams, and Permitted Areas

Pacolet River Watershed (03050105-170)



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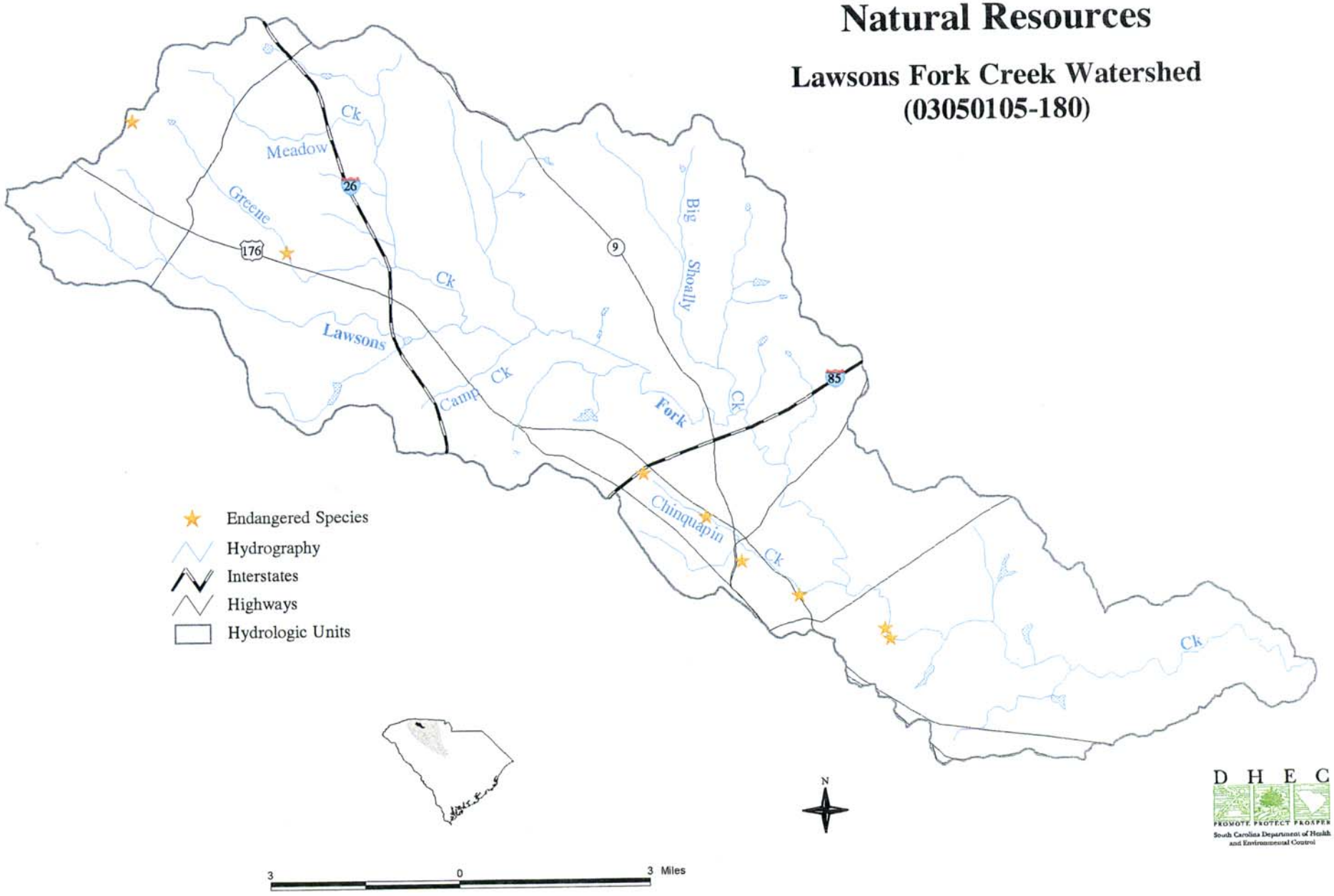
Natural Resources

Lawsons Fork Creek Watershed
(03050105-180)



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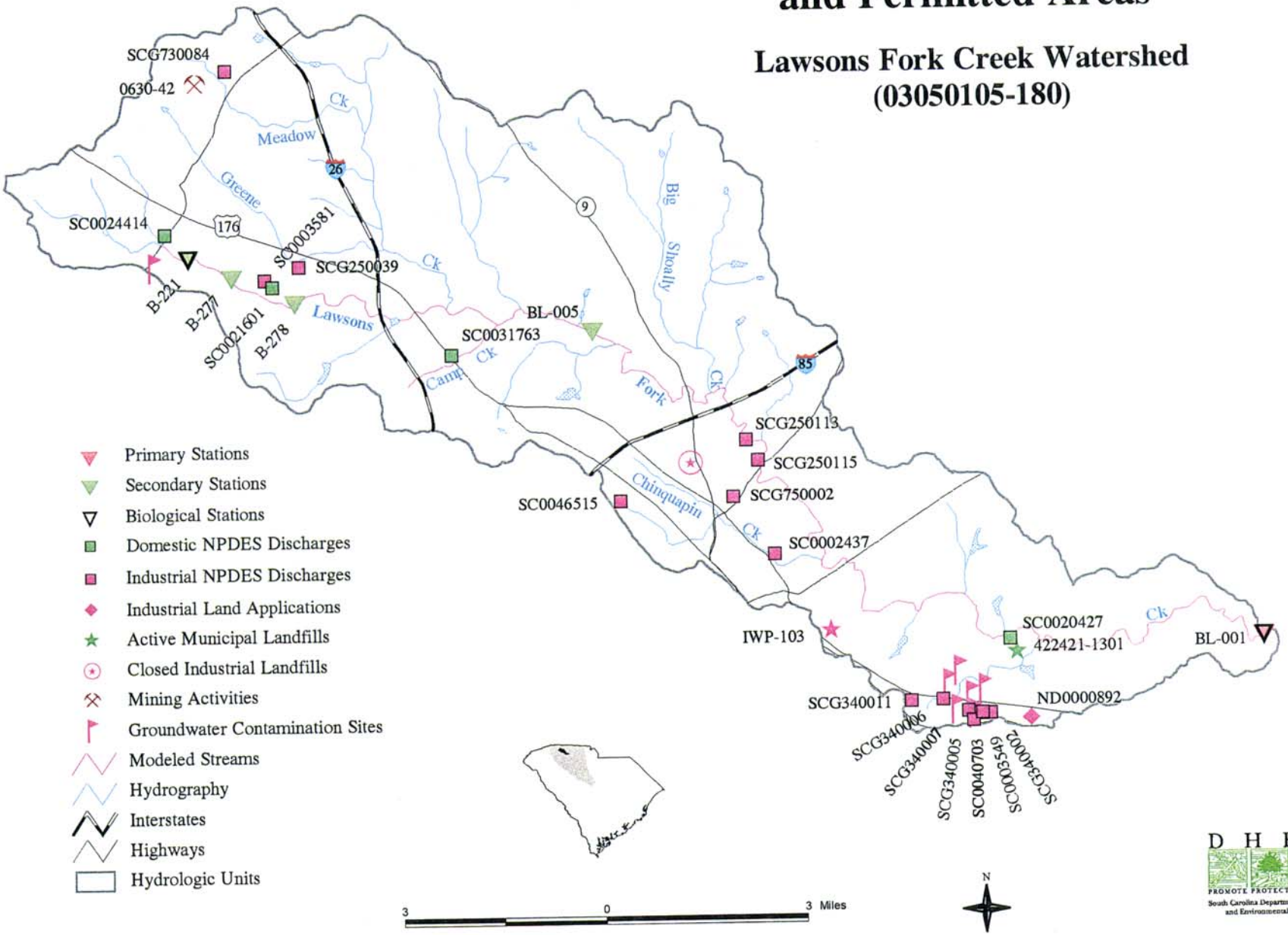
Monitoring Sites, Modeled Streams, and Permitted Areas

Lawsons Fork Creek Watershed (03050105-180)



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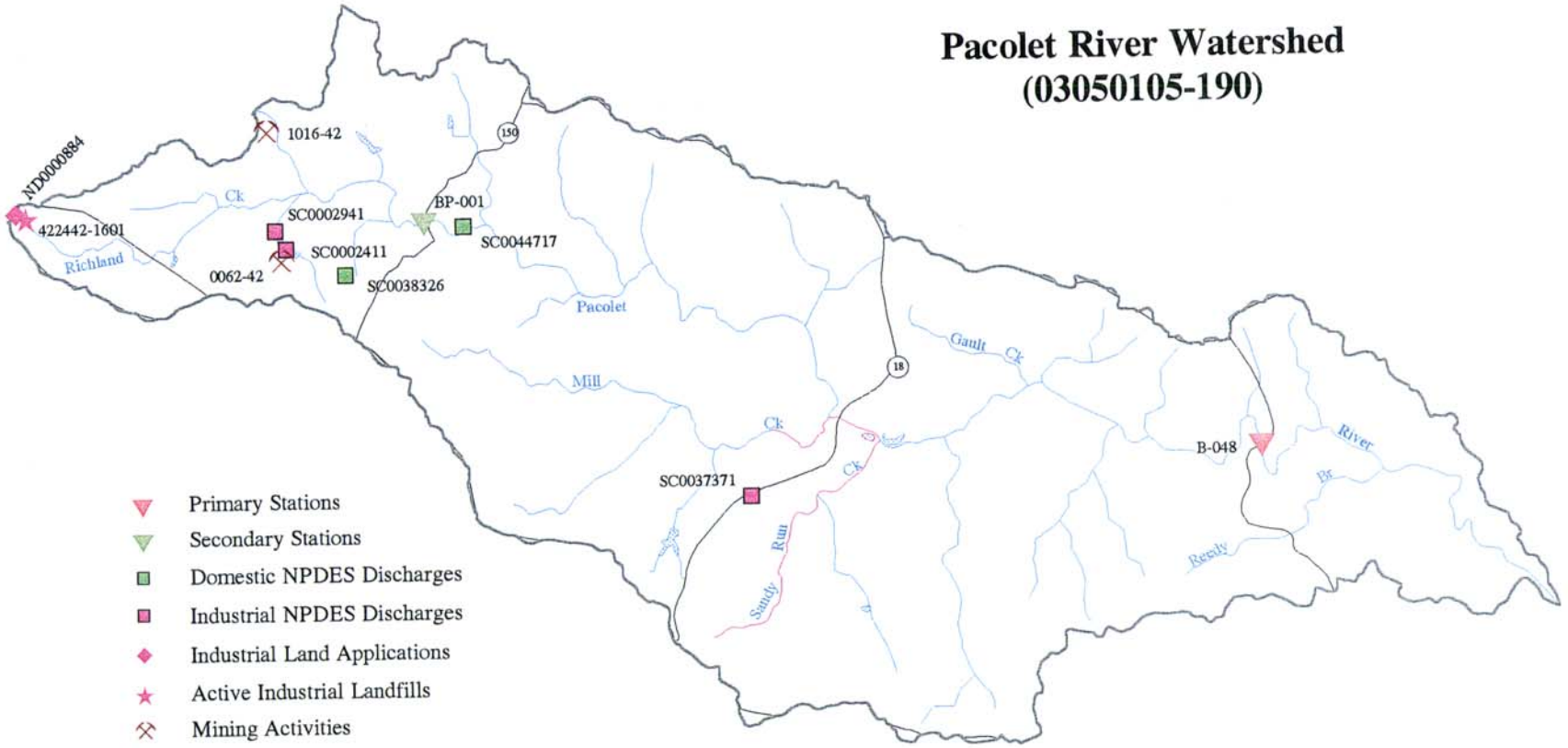
Monitoring Sites, Modeled Streams, and Permitted Areas

Pacolet River Watershed (03050105-190)



- Primary Stations
- Secondary Stations
- Domestic NPDES Discharges
- Industrial NPDES Discharges
- Industrial Land Applications
- Active Industrial Landfills
- Mining Activities
- Modeled Streams
- Hydrography
- Interstates
- Highways
- Hydrologic Units

D H E C
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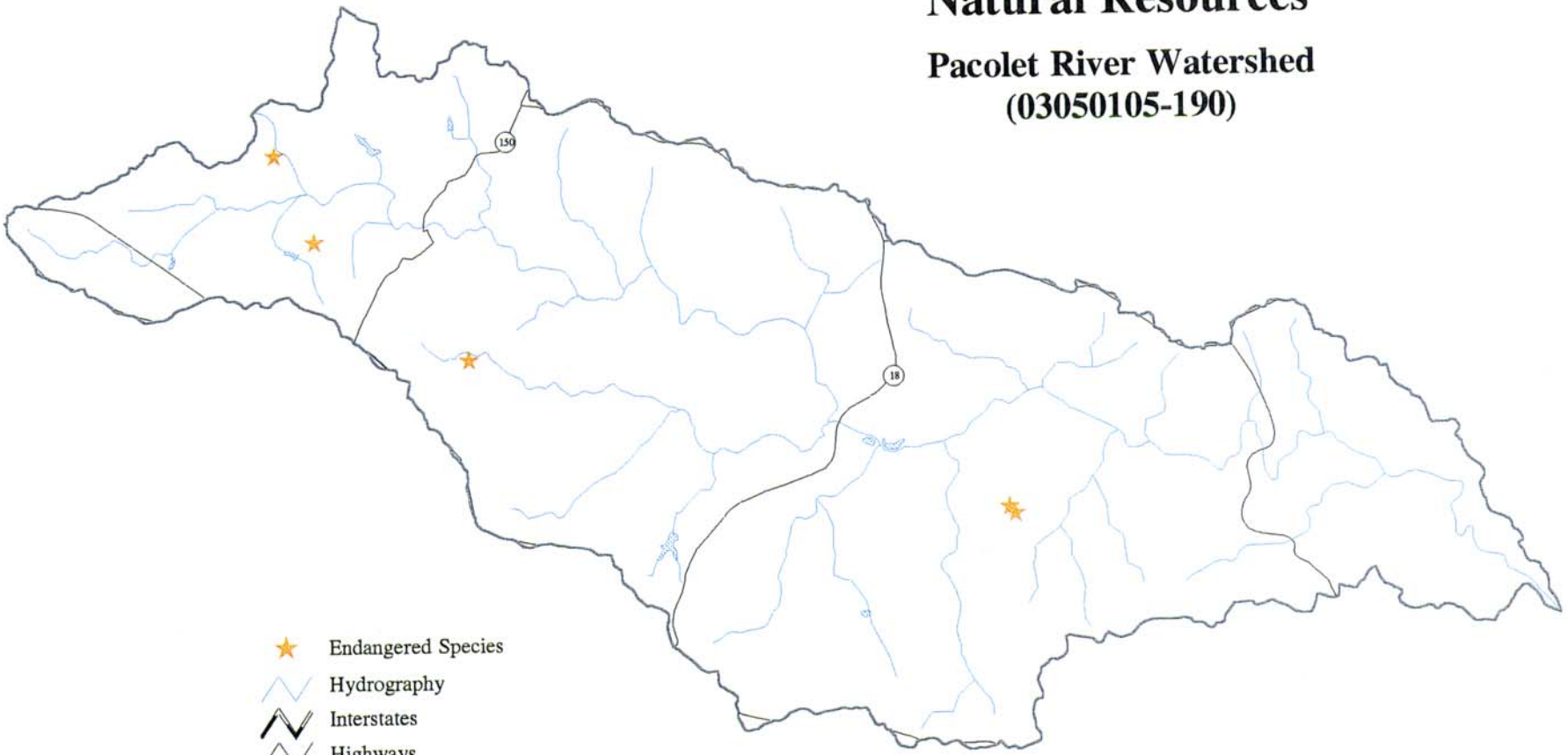
4 0 4 Miles

N

Natural Resources

Pacolet River Watershed
(03050105-190)



Endangered Species
Hydrography
Interstates
Highways
Hydrologic Units

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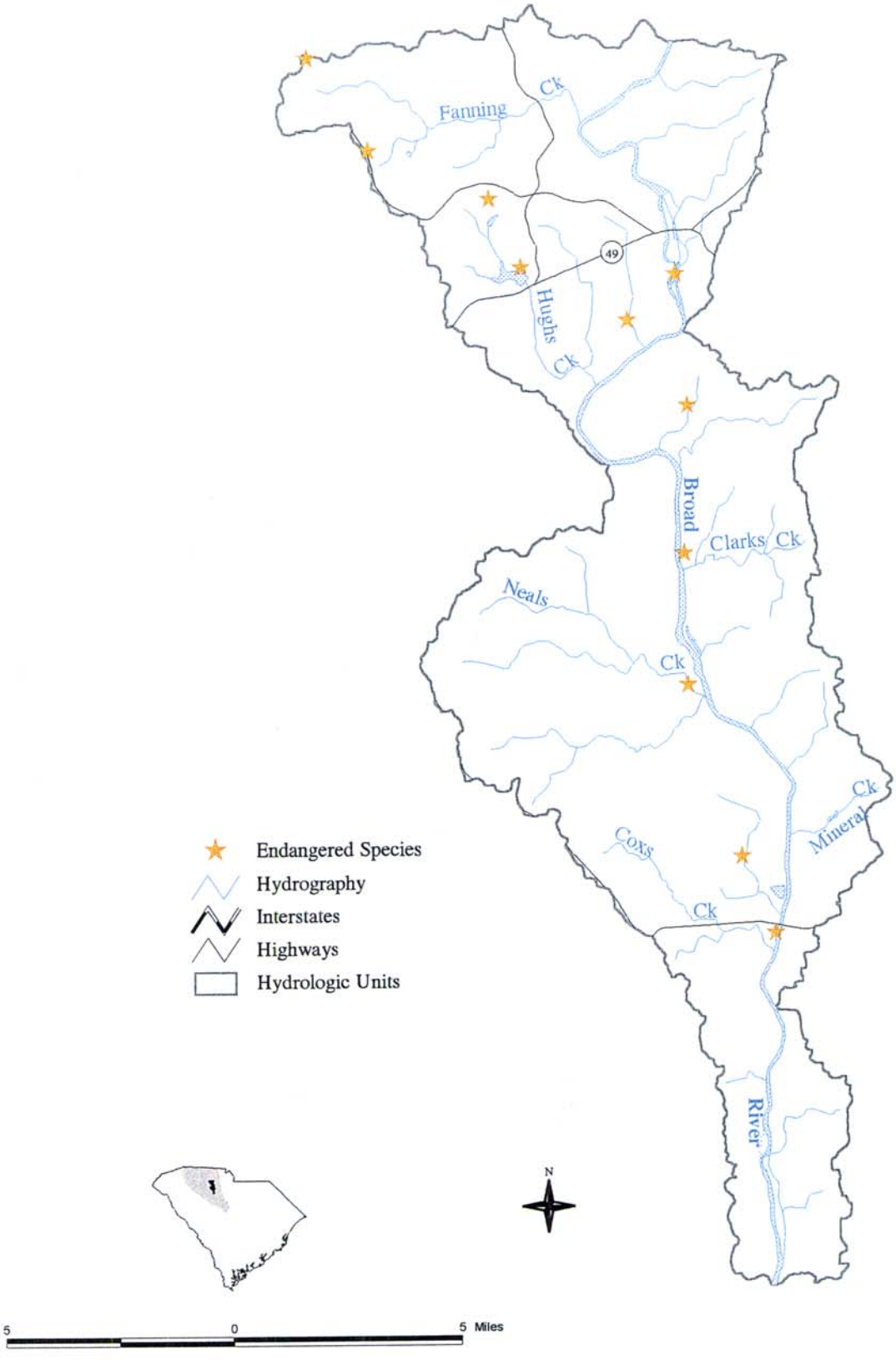
N

4 0 4 Miles

Natural Resources

Broad River Watershed
(03050106-010)



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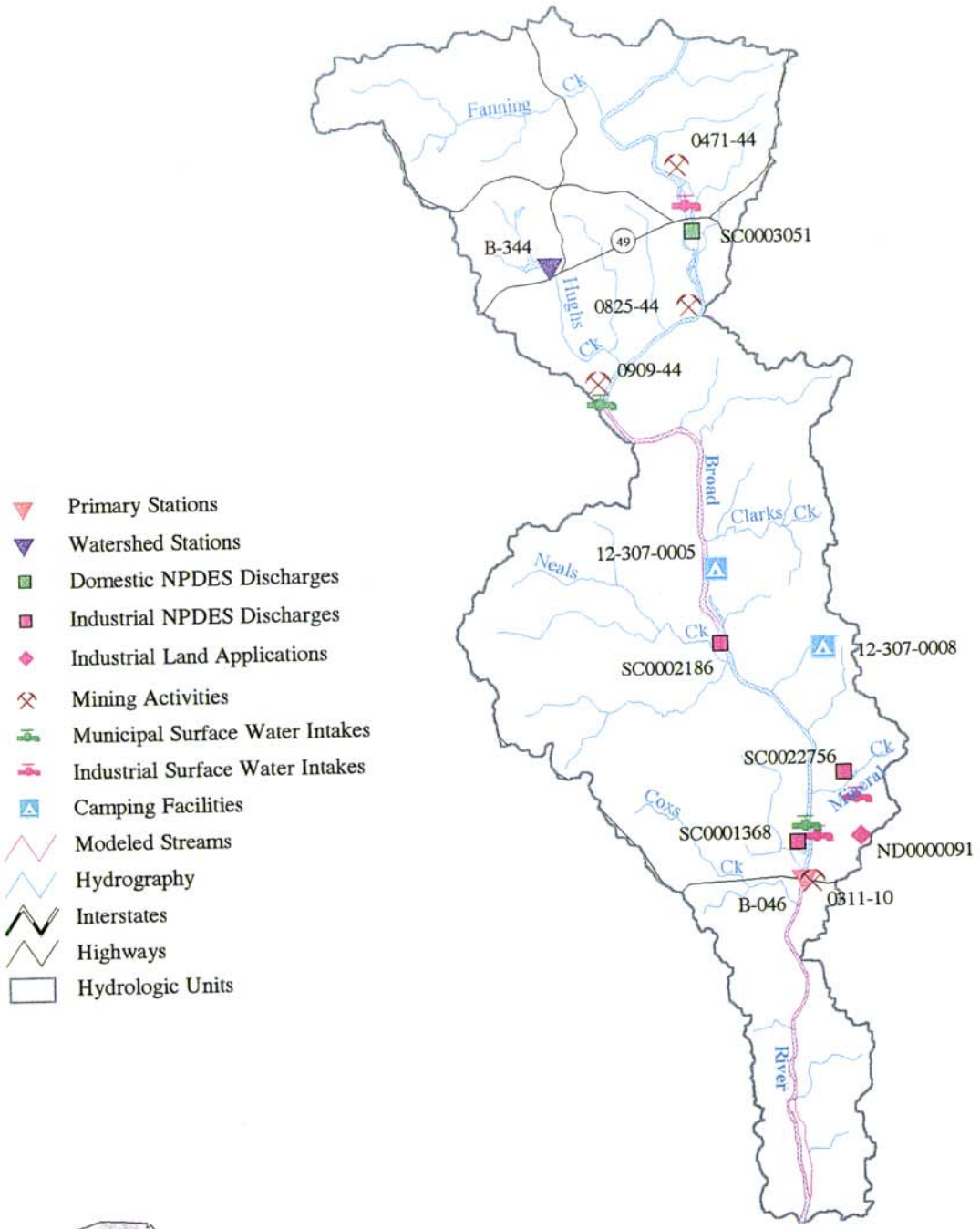
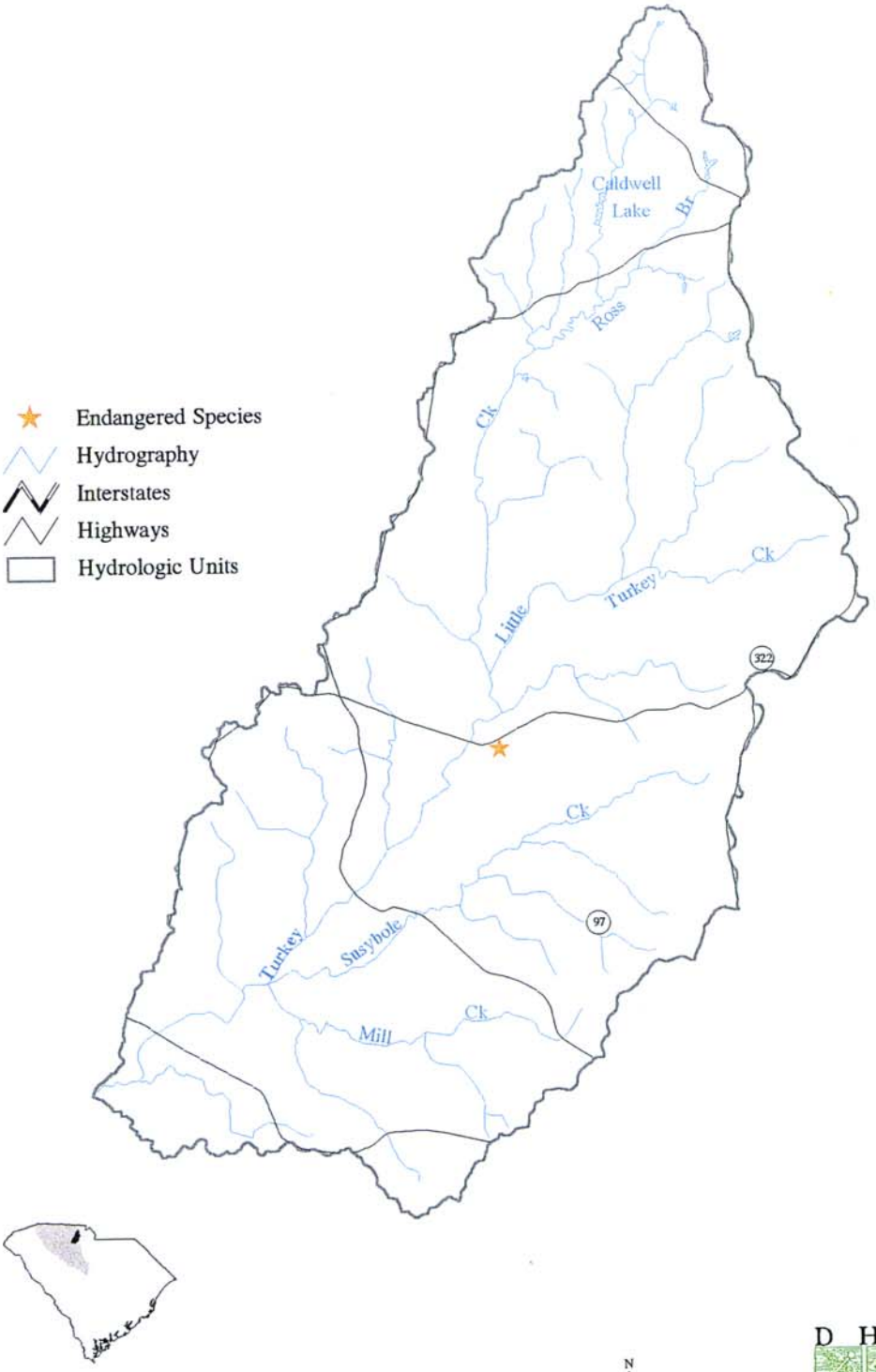
Monitoring Sites, Modeled Streams, and Permitted Areas

Broad River Watershed (03050106-010)



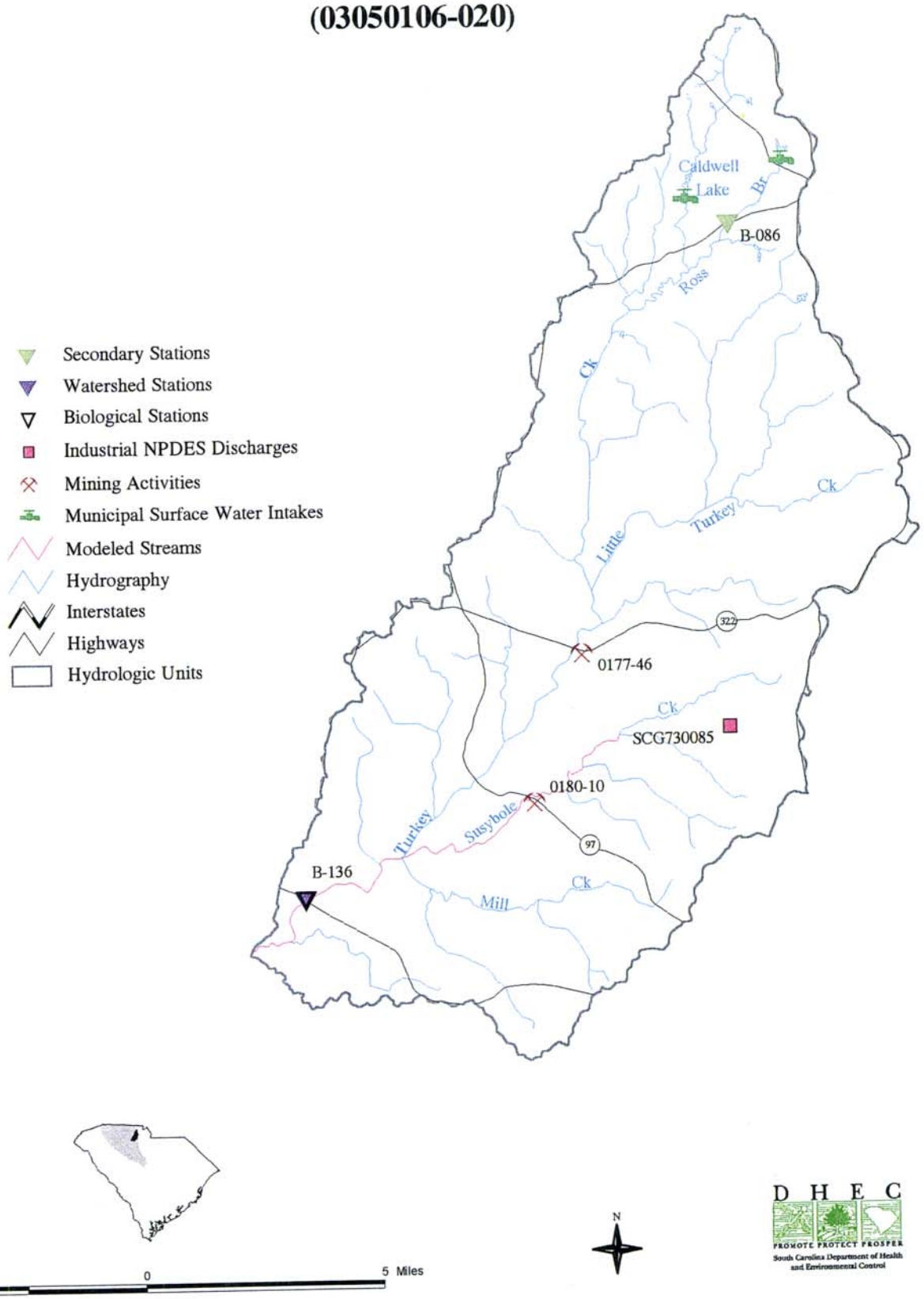
Natural Resources

Turkey Creek Watershed
(03050106-020)



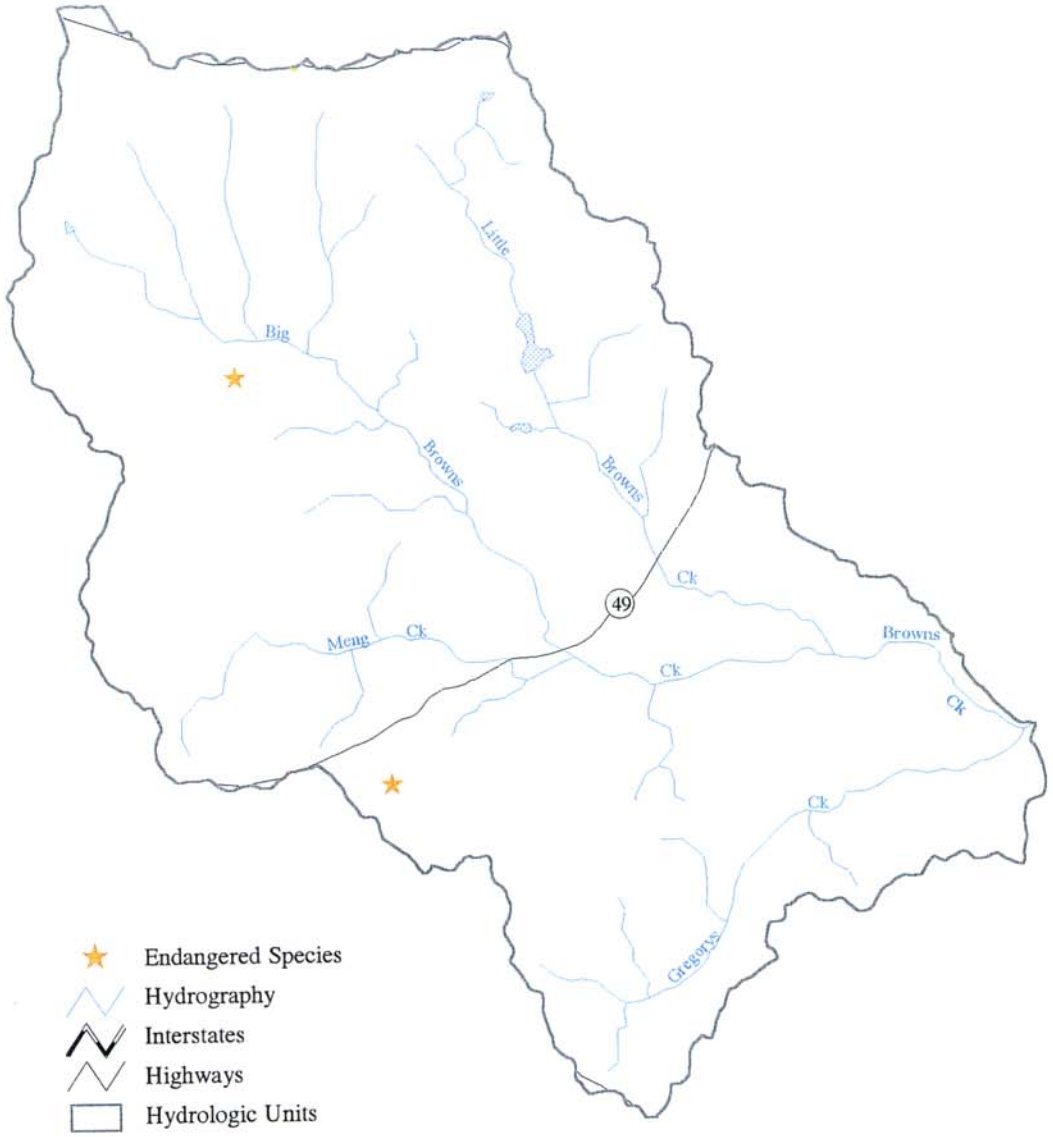
Monitoring Sites, Modeled Streams, and Permitted Areas

Turkey Creek Watershed (03050106-020)



Natural Resources

Browns Creek Watershed
(03050106-030)



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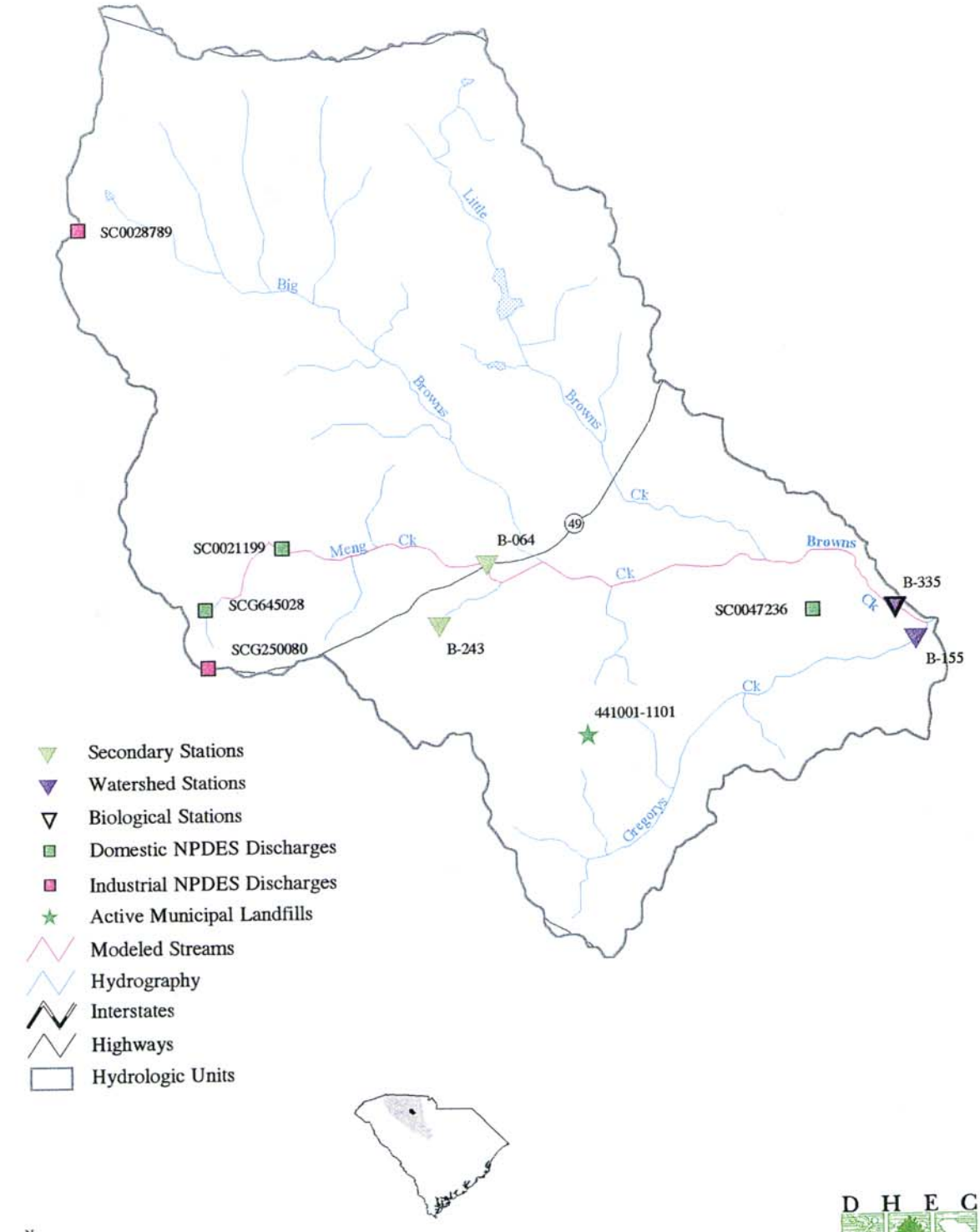
South Carolina Department of Health and Environmental Control

Monitoring Sites, Modeled Streams, and Permitted Areas

Browns Creek Watershed (03050106-030)



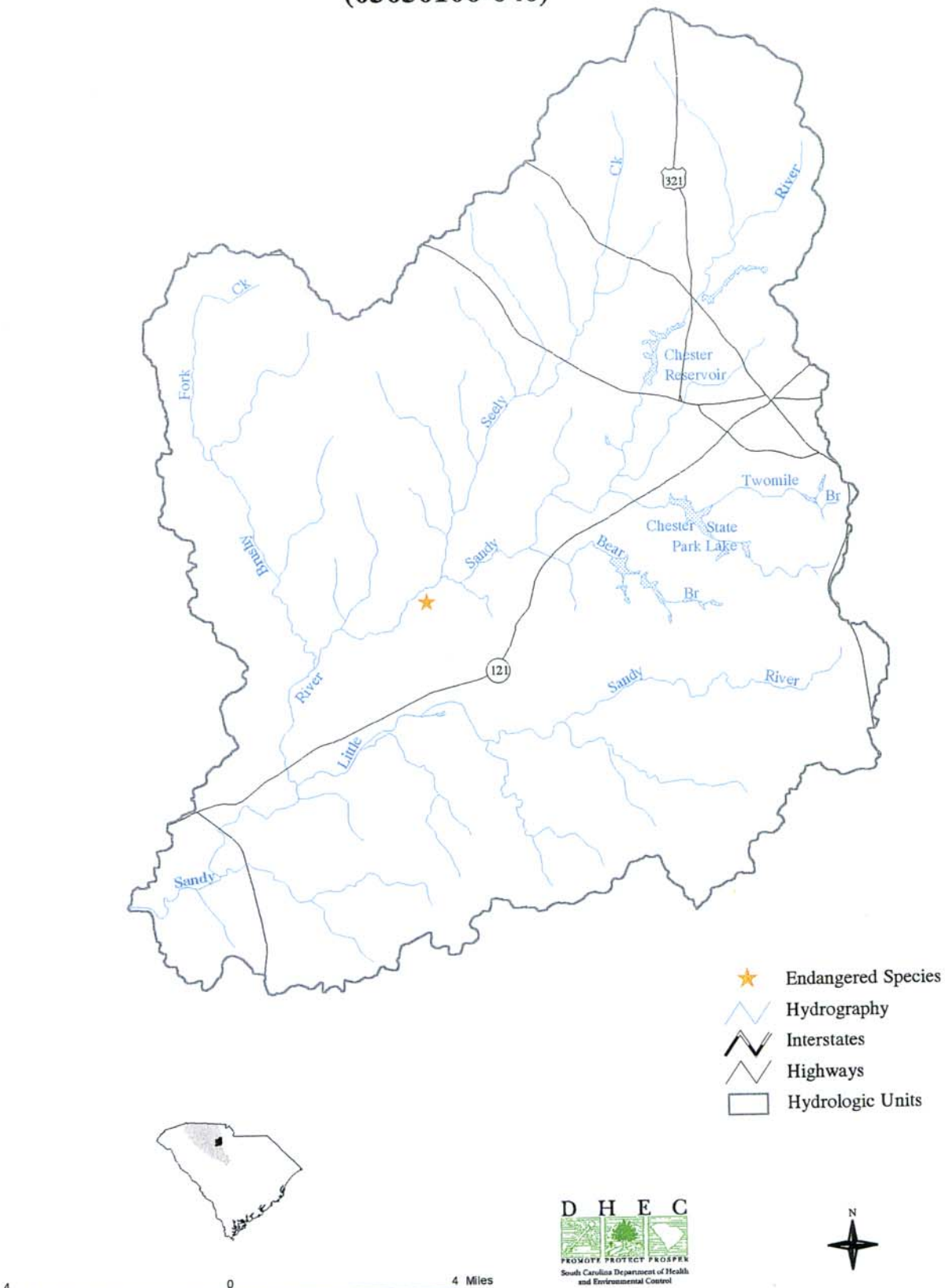
D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

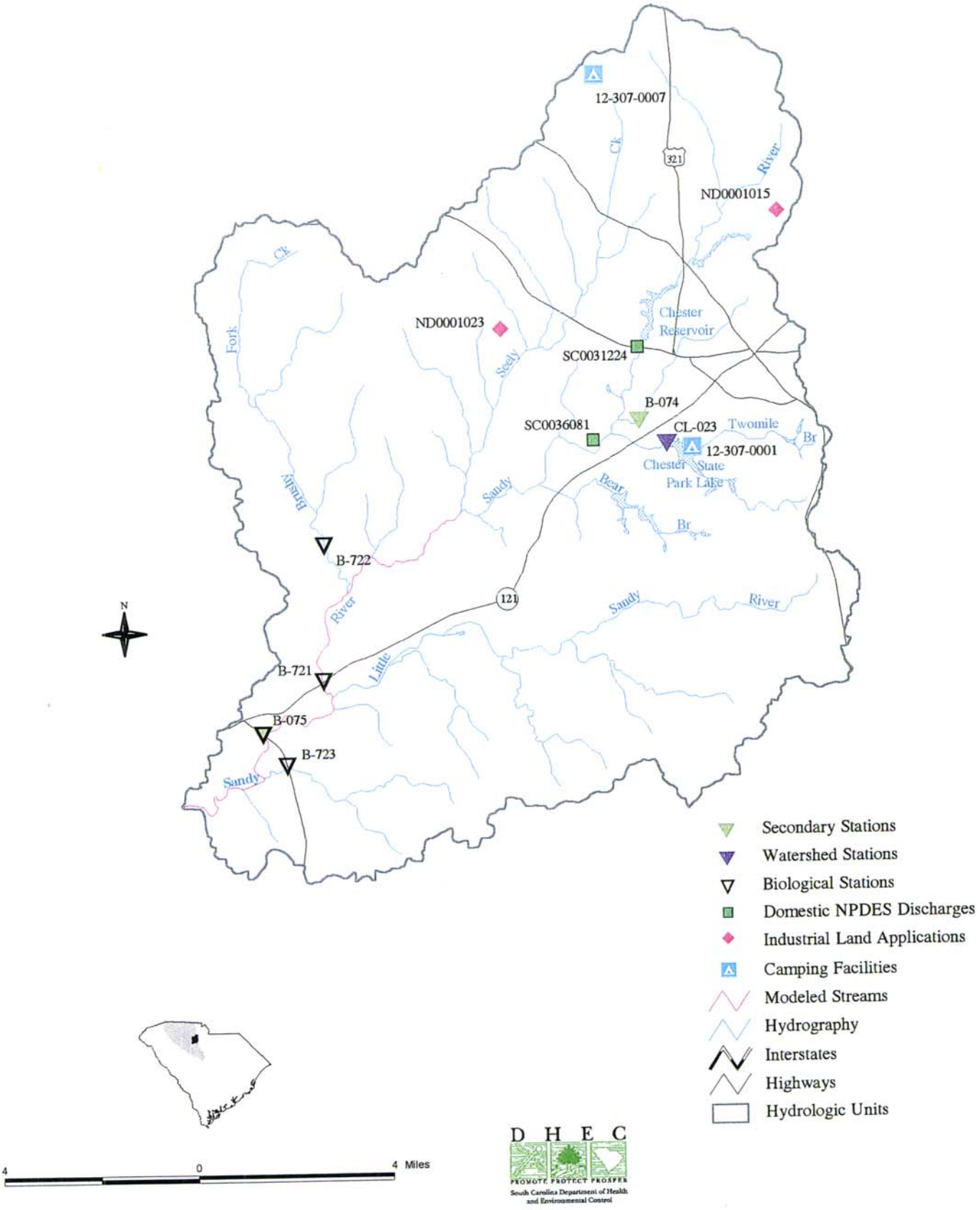
Natural Resources

Sandy River Watershed
(03050106-040)



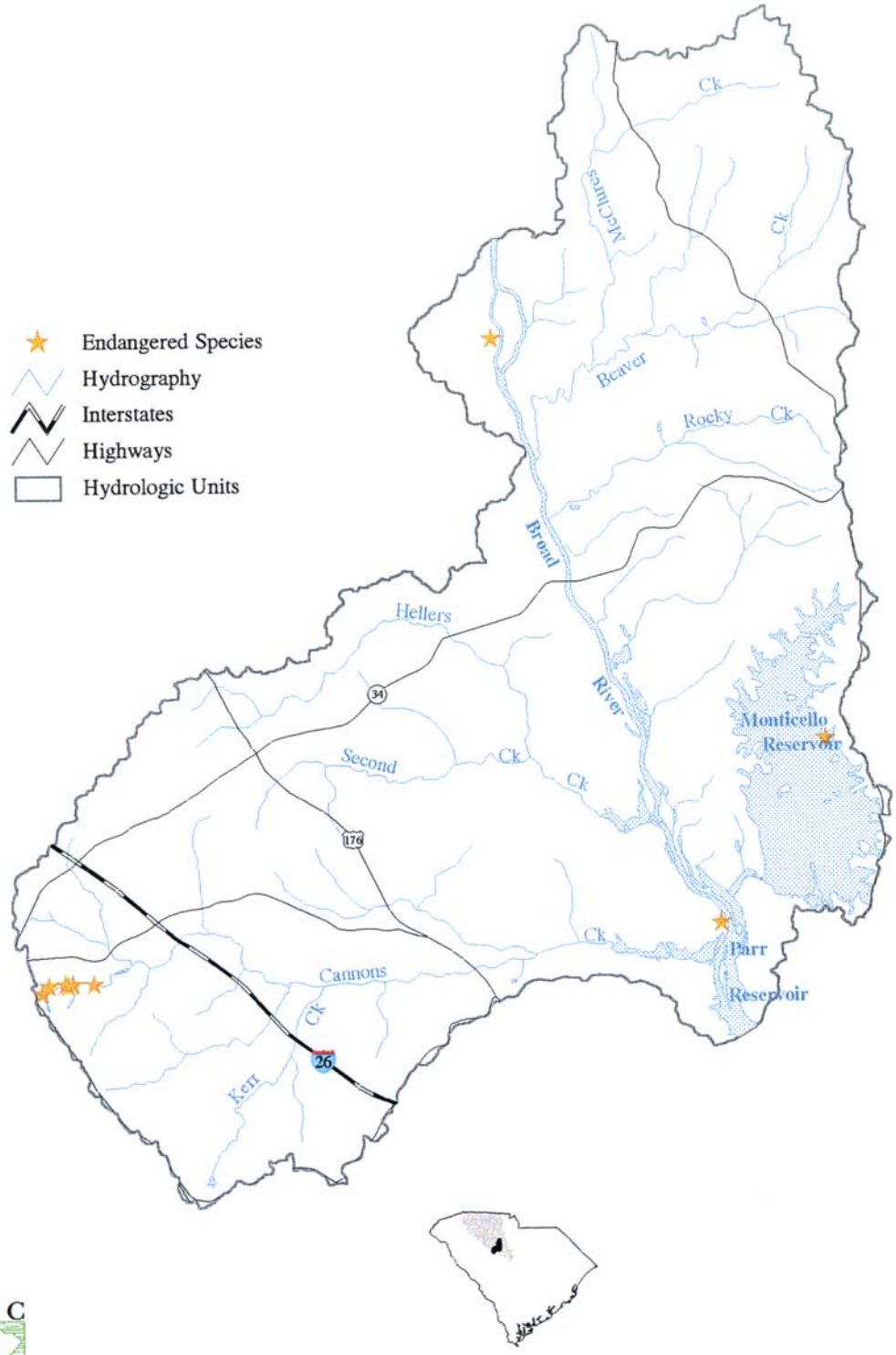
Monitoring Sites, Modeled Streams, and Permitted Areas

Sandy River Watershed (03050106-040)



Natural Resources

Broad River Watershed
(03050106-050)



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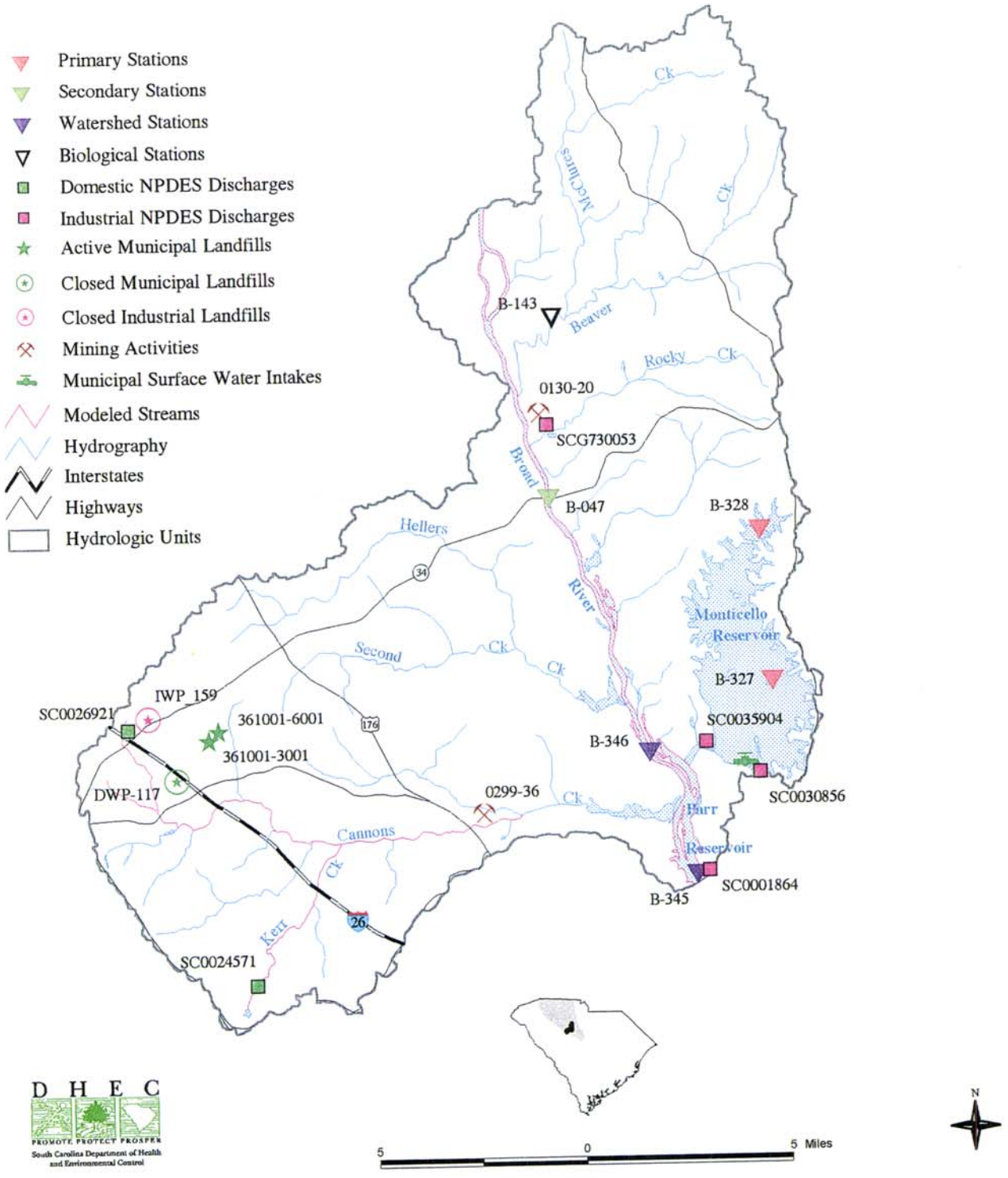
Monitoring Sites, Modeled Streams, and Permitted Areas

Broad River Watershed (03050106-050)



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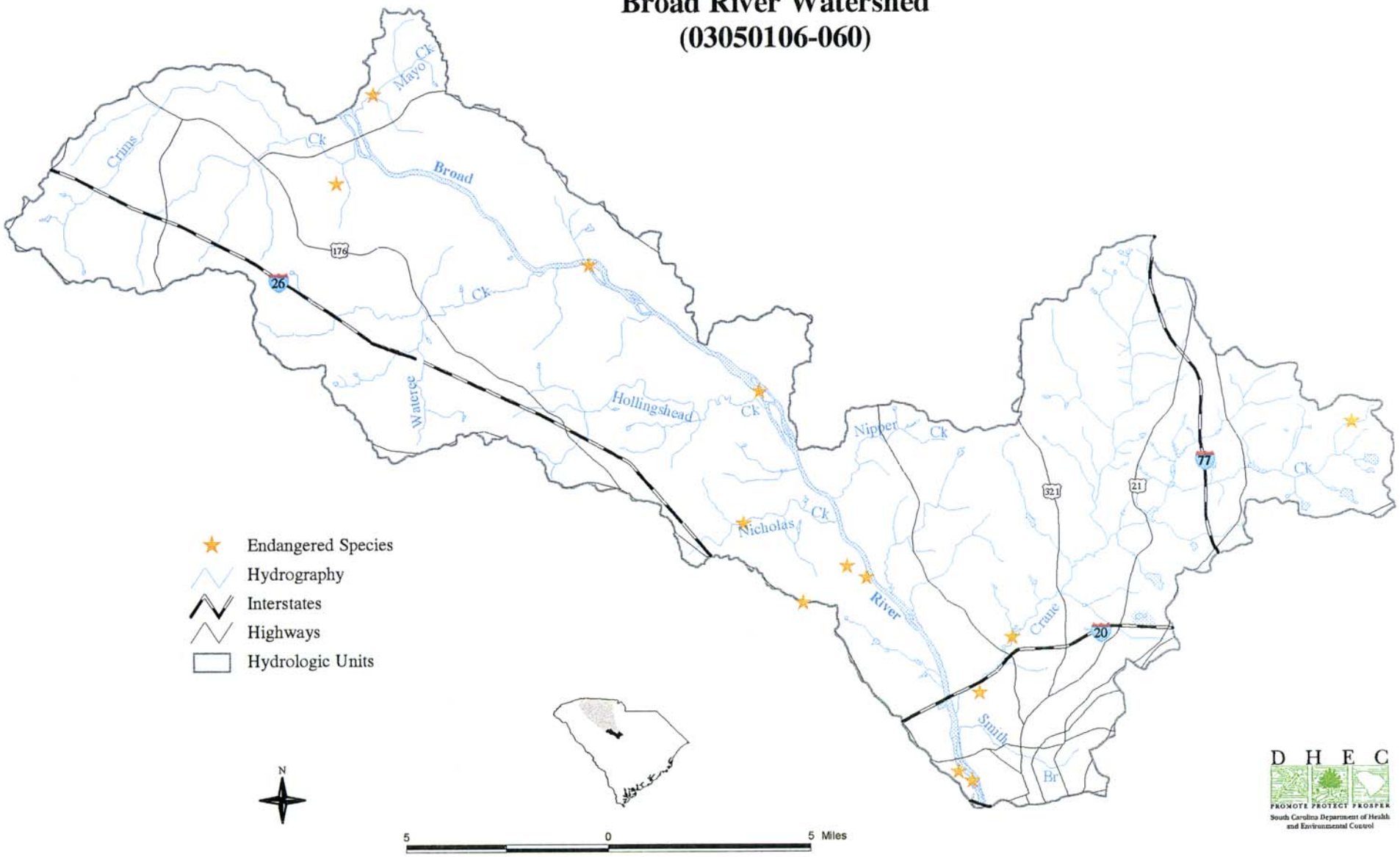
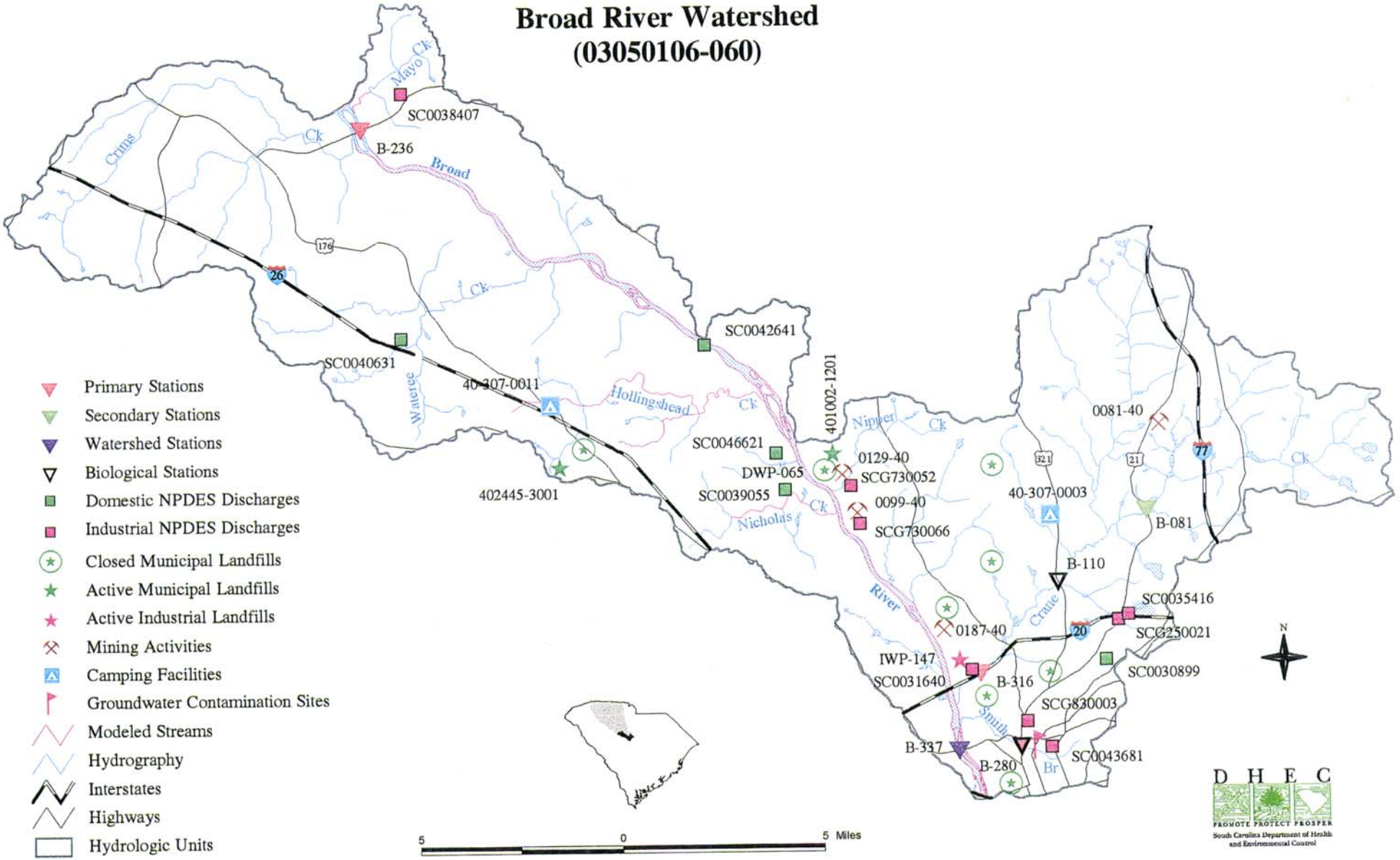
Natural Resources

Broad River Watershed
(03050106-060)



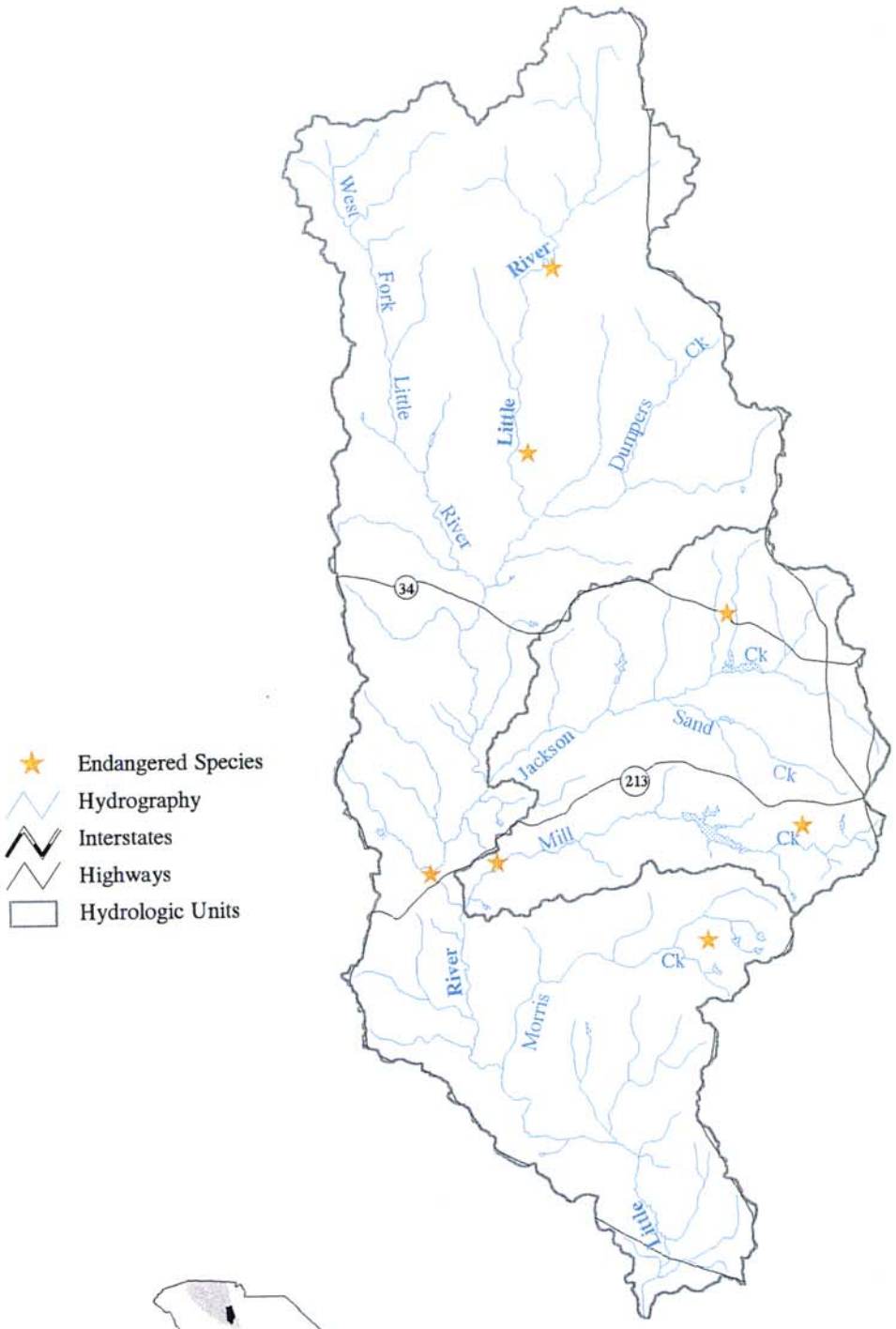
Monitoring Sites, Modeled Streams, and Permitted Areas

Broad River Watershed (03050106-060)



Natural Resources

Little River Watershed
(03050106-070,080)



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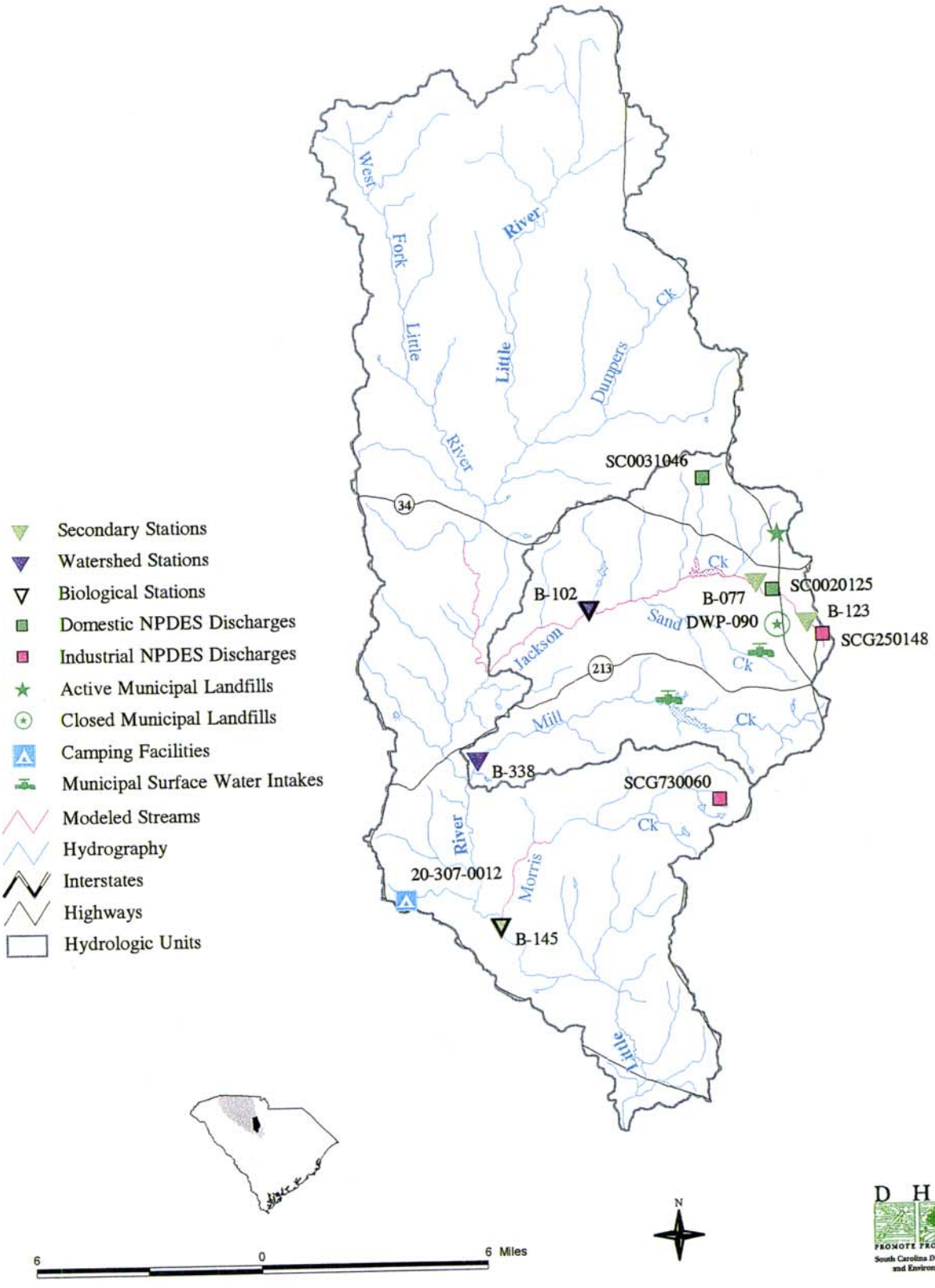
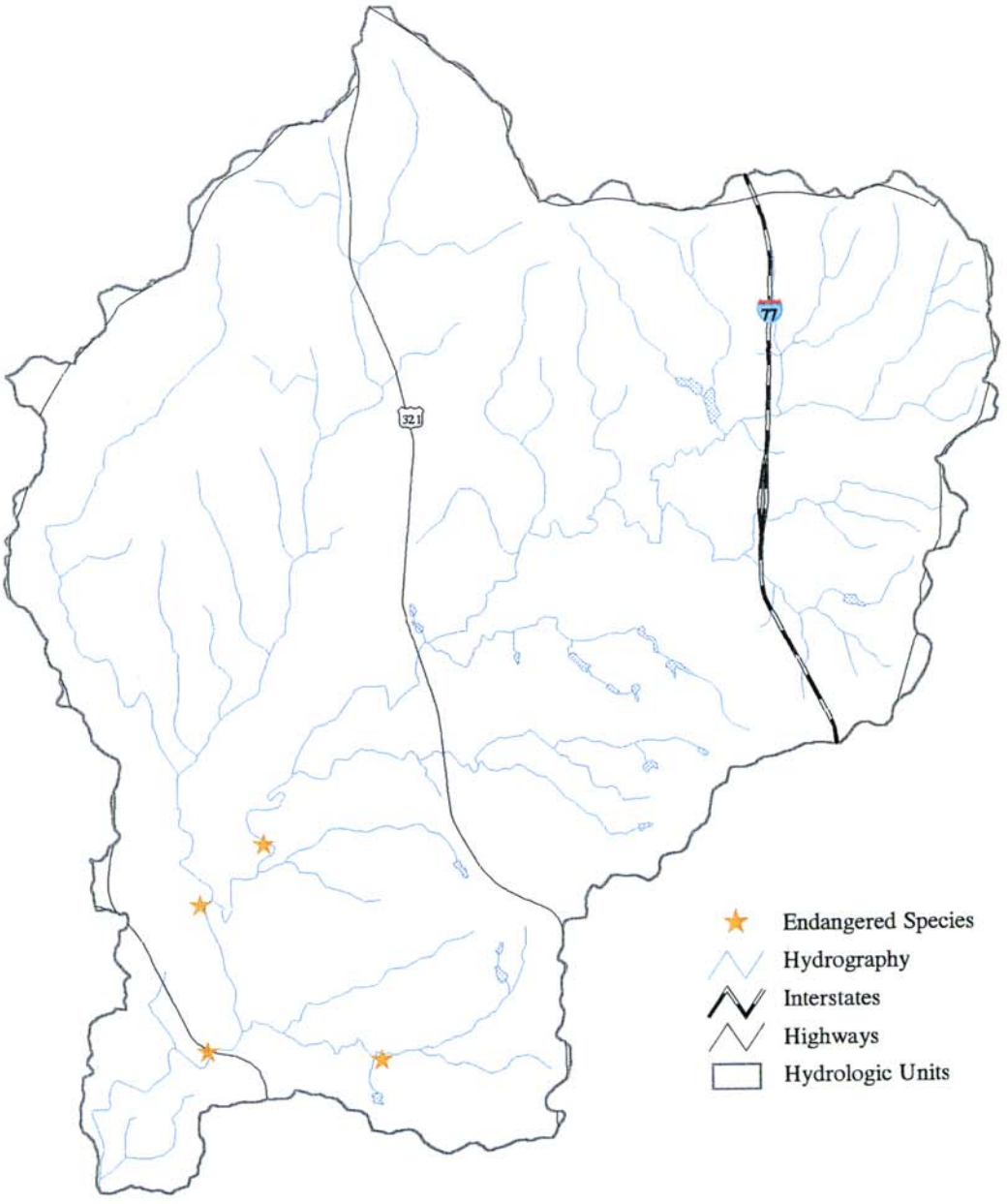
Monitoring Sites, Modeled Streams, and Permitted Areas

Little River Watershed (03050106-070,080)



Natural Resources

Cedar Creek Watershed
(03050106-090)



3 0 3 Miles

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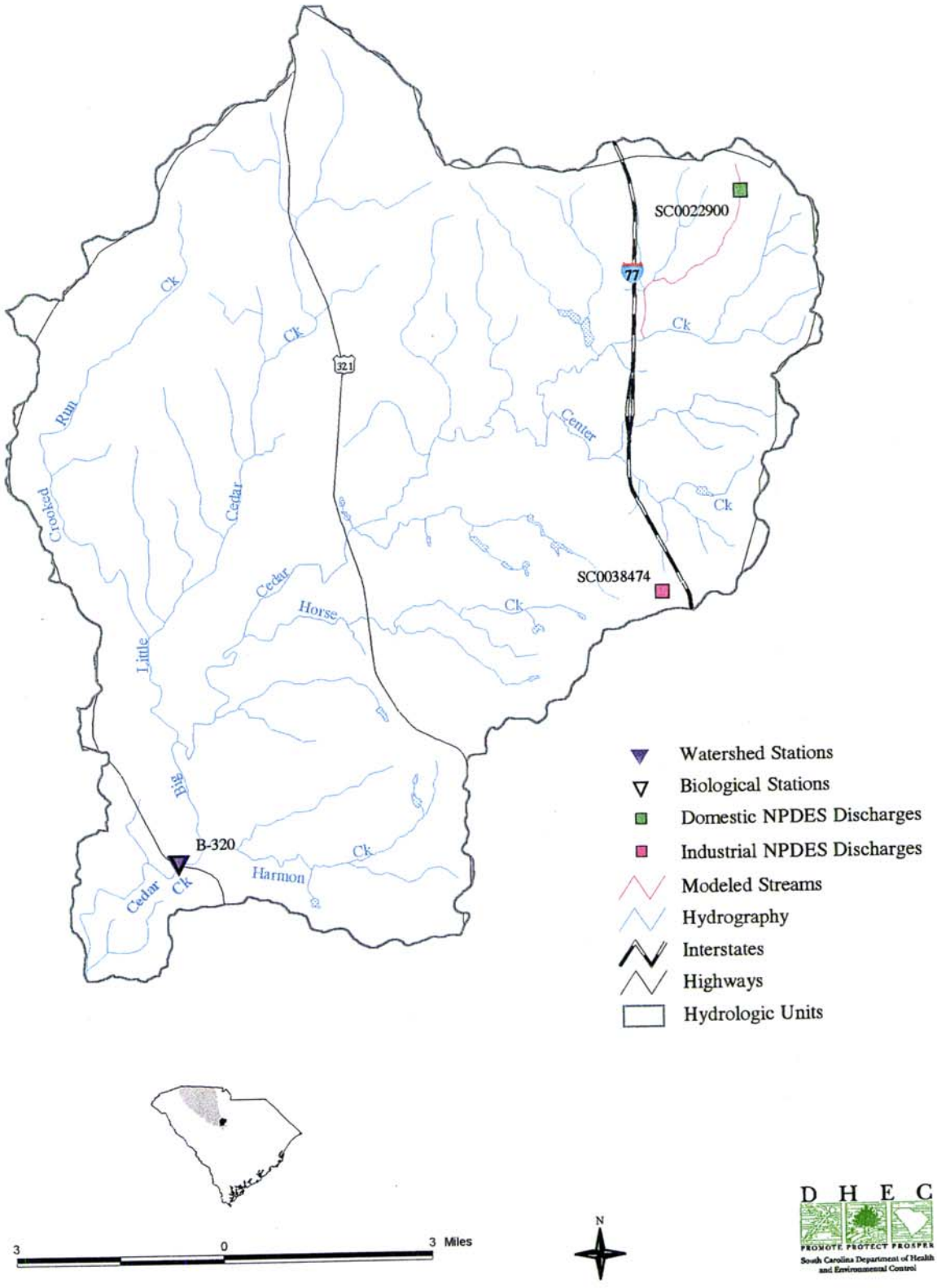
Monitoring Sites, Modeled Streams, and Permitted Areas

Cedar Creek Watershed (03050106-090)



Waterbody Index

Facility Index