SURFACE WATER QUALITY SCREENING ASSESSMENT OF THE TENNESSEE RIVER BASIN – 1998

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ENVIRONMENTAL INDICATORS SECTION ✦ FIELD OPERATIONS DIVISION
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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COMMENTS OR QUESTIONS RELATED TO THE CONTENT OF THIS
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EXECUTIVE SUMMARY

The ADEM adopted a watershed management approach to nonpoint source monitoring and management in 1996. This approach has enabled the Nonpoint Source (NPS) Program to improve basic knowledge of each basin, and to identify the sub-watersheds most impaired by nonpoint source pollution. This effort has improved the effectiveness of implemented management practices by concentrating them in relatively small areas.

In 1998, a basin-wide screening assessment of the Tennessee River drainage was initiated by the Environmental Indicators Section (EIS) of ADEM's Field Operations Division. The objectives of this study were to:

1. assess water quality within each of the priority sub-watersheds;
2. identify sub-watersheds most impaired by NPS pollution;
3. identify causes of NPS impairment in those sub-watersheds;
4. prioritize sub-watersheds most impaired by NPS pollution;
5. provide a resource for researchers and regulators documenting the information available regarding each sub-watershed; and,
6. refine basin-wide screening methods that can be used to meet the above objectives in each of Alabama's major drainage basins.

The Tennessee Basin NPS project was divided into two parts. Part I of the project included collection of surface water quality and habitat assessment data on selected CWA §303(d) listed segments in the Tennessee Basin. The data collected will be utilized in development of TMDLs. Part II was the basin-wide NPS screening assessment. The project was further divided into six phases:

I. review of available data (I & II);

II. rank ADEM, TVA and GSA fish assessments (II);

III. reconnaissance (I & II);

IV. chemical/physical and habitat assessments (I & II);

V. rank and prioritize sub-watersheds (II);

VI. analysis of local SWCD Conservation Assessment data.

The majority of the available studies were conducted by three agencies: ADEM, TVA and GSA. All have been monitoring sub-watersheds of the Tennessee Basin since the 1980's. Bioassessment results from fish community assessments conducted by these agencies since 1991 were used to prioritize and rank sub-watersheds for further habitat and physical/chemical data collection.

A total of 290 historical (1991-1997) fish and aquatic macroinvertebrate community assessments from approximately 172 stations were used to rank and prioritize sub-watersheds for further assessment. Of these assessments, four stations (2%), were evaluated as *excellent* or *good/excellent*; forty-one stations (24%) were classified as *good* or *good/fair*; fifty-eight stations (34%) were evaluated as *fair* or *poor/fair*; and sixty-nine stations (40%) were evaluated as *poor* or *very-poor*.

Sixty-six (66) sub-watersheds had available historical bioassessment data. Twenty-five (25) of these were not included in the project due to land-use activities, or the presence of a current watershed project. Of the ninety (90) sub-watersheds from the five main cataloging units (0001, 0002, 0004, 0005, and 0006), fifty (50) sub-watersheds were not included in this project due to status as a current NPS watershed project (16), small drainage size or substantially backwater area (15), urban land-use (12), or lack of available biological data (7).

Forty-one (41) sub-watersheds with historical bioassessment data were ranked by degree of impairment. Generally, those with *poor* or *very-poor* assessments were selected as priority NPS sub-watersheds. Land use patterns, observed habitat conditions, chemical water quality measurements and SWCD Conservation Assessment Worksheet data were used to evaluate the cause(s) of impairment.

Twenty priority sub-watersheds were identified within the Tennessee River Basin. Two (10%) of these were located within the Lower Elk River Cataloging Unit (CU) and four (20%) were located within the Pickwick Lake CU. The most impaired CUs within the Tennessee Basin were the Guntersville Lake and Wheeler lake CUs with five (25%) and nine (45%) priority sub-watersheds, respectively. Sixteen additional sub-watersheds were already part of current NPS watershed projects in the Guntersville Lake (4) and Wheeler Lake (12) CUs. The Wheeler Lake and Guntersville Lake CUs also contained the largest number of CWA§303(d) segments in the Tennessee Basin with twenty-four (59%) and eight (20%), respectively.

In an effort to collect additional water quality data from segments on the CWA § 303(d) list of impaired waters of Alabama, forty-six stations from twenty-two segments were assessed using chemical, physical and habitat assessments. This data will be used in the development of future TMDLs for each segment.

The potential for NPS impairment was estimated for each sub-watershed and major CU in the Tennessee Basin. Data compiled by the Local Soil and Water Conservation Districts, EPA percent land cover estimates, and information on the number of current construction stormwater authorizations were evaluated to determine the final estimate of potential. Results indicated that the Wheeler Lake CU had a *high* potential for NPS impairment, primarily from development and row cropping activities. Guntersville Lake CU also had a *high* potential, primarily from animal husbandry activities. Pickwick Lake and Bear Creek CUs were estimated to have a *moderate* potential and the Lower Elk River CU had a *low* potential for NPS impairment.

An additional objective of this project was to develop and refine methods that could be used within each of the major drainage basins throughout the state to assist the Department in prioritizing sub-watersheds for implementation of nonpoint source controls and application of CWA §319 funds. Because the historical bioassessments used during this study were based on standardized methods and regional criteria, assessment results were comparable from year to year (EPA 1997a). This enabled the EIS of the Field

Operations Division to concentrate the efforts of this study on chemical, physical and habitat assessments. In addition, the incorporation of the Conservation Assessment Worksheet information provided by the local SWCDs provided valuable insight into the activities conducted within each sub-watershed, thereby assisting in determining possible sources for the detected impairment.

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Thank you to Dr. Patrick O'Neil of the Geological Survey of Alabama and to Charlie Saylor of the Tennessee Valley Authority for their cooperative efforts in the sharing of historical bioassessment data, and their review and comments on the final draft. Thank you to Vic Payne, the State Soil and Water Conservation Committee, and the Local Soil and Water Conservation Districts (SWCDs) in the Tennessee Basin for providing the Conservation Assessment Worksheet information for inclusion in this report. Special thanks also to the Water Quality Section of ADEM's Water Division for their review and comments.

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LIST OF ABBREVIATIONS

Abbreviation	Interpretation
§	Section
ADEM	Alabama Department of Environmental Management
AU	Animal Unit as defined by ADEM CAFO Rules
Br	Branch
CAFO	Concentrated Animal Feeding Operation
cfs	Cubic Feet per Second
Chem.	Chemical/Physical Water Quality
Co.	County
Confl.	Confluence
Cr	Creek
CWA	Clean Water Act
CWAP	Clean Water Action Plan
ds	Downstream
EIS	Environmental Indicators Section of ADEM's Field Operations Division
EPA	U.S. Environmental Protection Agency
FOD	Field Operations Division
GSA	Geological Survey of Alabama
IBI	Index of Biotic Integrity (fish community)
Macroinv.	Aquatic Macroinvertebrate
mg/l	Milligrams per Liter
Mod.	Moderate
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
nr	Near
R	River
Rd	Road
RM	River Mile
SSWCC	State Soil and Water Conservation Committee
SWCD	Soil and Water Conservation District
TMDL	Total Maximum Daily Load
TVA	Tennessee Valley Authority
ug/g	Micrograms per Gram
ug/l	Micrograms per Liter
us	Upstream

INTRODUCTION

The Alabama Department of the Environmental Management (ADEM) is charged with monitoring the status of the state's water quality pursuant to the Clean Water Act and the Alabama Water Pollution Control Act. Under the Clean Water Act of 1977, the EPA emphasized programs addressing the chemical contamination of the nation's waters (National Research Council 1992). State and federal programs initiated to meet these water quality guidelines have been largely successful in controlling and reducing certain kinds of chemical pollution from point source discharges (National Research Council 1992, ADEM 1996c). However, the Clean Water Act of 1977 does not directly address impairment from nonpoint sources. Furthermore, programs designed to monitor and control pollutants from point source discharges cannot effectively monitor or control pollution from nonpoint sources (National Research Council 1992).

The detection, assessment, and control of impairment from point sources is fairly well understood because the pollutants, their concentrations, and probable points of impact are known (National Research Council 1992, EPA 1997a). By contrast, nonpoint source pollution is defined as any unconfined or diffuse source of contamination, such as storm water runoff from urban or agricultural areas (EPA 1997a). The pollutants, their concentrations, and/or their source(s) may not be known or well defined. Because pollutants are mobilized primarily during rainstorm events, nonpoint source pollution is generated irregularly and, therefore, may not be detected by periodic chemical water quality measurements (National Research Council 1992). In addition, there may be multiple stressors present within the watershed that have unknown synergistic effects, or may cause indirect effects, such as degradation to the habitat (EPA 1997a). Nonpoint source impairment is associated with land-use within a watershed, such as agriculture, silviculture, and mining. Potential sources can therefore be widespread and severe. Water quality at any point along the stream is influenced by water quality from all upstream tributaries. Therefore, implementing nonpoint source pollution controls or best management practices (BMPs) at a limited number of sites throughout the cataloging unit may have no discernible effect on water quality (ADEM 1996a).

In order to address these issues, the ADEM adopted a watershed assessment strategy in 1996. The watershed-based management approach is a process to synchronize water quality monitoring, assessment, and implementation of control activities on a geographic basis. In Alabama, the major drainage basins are monitored on a 5-year rotation basis (ADEM 1996a). Concentrating monitoring efforts within one basin provides the Department with a framework for more centralized management and implementation of control efforts and provides consistent and integrated decision making for awarding CWA §319 NPS funds.

In 1998, the Environmental Indicators Section (EIS) of the Field Operations Division of ADEM initiated a screening assessment of the Tennessee River Basin. The initial goal of the project was to provide data that will allow ADEM to estimate the current status in ecological conditions throughout the basin using indicators of biological, habitat, and chemical/physical conditions. This information can then be used by the Department to prioritize sub-watersheds most impacted by nonpoint source pollution and to use resources most effectively by directing BMP implementation and demonstration within priority watersheds.

Despite the advantages of implementing a watershed assessment strategy to control nonpoint source pollution, there are some problems associated with monitoring drainage areas as large as the Tennessee Basin. First, streams located within large drainages may drain different physiographic regions and therefore be characterized by different geomorphologies, substrate types, and riparian vegetation, resulting in differences in water chemistry, habitat quality, and biological communities (Omernik 1987). These characteristics will, in turn, influence both predominant surrounding land-use and baseline measurements of ecological indicators used to assess the degree of nonpoint source impairment.

The Tennessee Valley Authority (TVA) and Geological Survey of Alabama (GSA) have developed regional criteria to assess water quality using both aquatic macroinvertebrates and fish. These criteria were based on data collected over multiple years and throughout the state using standard, documented collection and analysis methods. These criteria therefore incorporate natural temporal and spatial variation in biological communities and can be used to prioritize sub-watersheds by degree of impairment.

Limited resources are available to meet the objectives of basin-wide assessment projects. The Tennessee River basin drains 6,826 mi^2 (13.1%) of Alabama's land area and is comprised of 93 sub-watersheds, some of which are several hundred square miles. Attempting to monitor all of these sub-watersheds defeats the purpose of the Watershed Assessment Strategy. In addition, several studies have indicated that monitoring several sites within a sub-watershed once every five years will provide more accurate estimates of status and trends in ecological indicators (ADEM 1994b).

Several studies have documented significant impairment of water quality from nonpoint sources within the Tennessee Basin. These include impairments from sedimentation caused by agricultural practices (ADEM 1996b) and runoff of nutrients and bacteria from animal production (ADEM 1999f). Sixty-seven (67) waterbodies located within five cataloging units were included on Alabama's 1998 §303(d) list due to impacts associated with agriculture, mining and urban runoff (ADEM 1999c).

The majority of the referenced studies were conducted by three agencies: ADEM, GSA, and TVA. All have been monitoring sub-watersheds of the Tennessee Basin since the 1980's. During this time, they have collaborated on several monitoring projects and use similar assessment methods. Because these agencies used standardized collection and analysis methods and regional criteria to assess water quality, the results of these studies were used to identify the priority sub-watersheds for further habitat and physical/chemical data collection. Bioassessment results from independent studies conducted since 1992 were used to prioritize and rank sub-watersheds.

The Tennessee Basin NPS project was conducted in six phases.

I. review of available data;

II. rank TVA and GSA fish assessments;

III. reconnaissance;

IV. chemical/physical and habitat assessments

V. rank and prioritize sub-watersheds

VI. analysis of local SWCD Conservation Assessment data

Although the components or phases of this project resulted in a fully integrated assessment of the Tennessee Basin, biological, habitat, and chemical assessments were utilized differently in ranking and prioritizing sub-watersheds. Biological communities reflect the cumulative effects of different pollutant stressors—excess nutrients, toxic chemicals, increased temperature, excessive sediment loading—and thus provide an overall measure of the aggregate impact of the stressors. Although biological communities respond to changes in water quality more slowly than water quality actually changes, they respond to stresses of various degrees over time. Consequently, monitoring changes in biological communities can detect impairment from nonpoint sources, which can be infrequent or low-level. The results of historical TVA or GSA fish assessments were therefore used to identify priority sub-watersheds. Land use patterns, habitat condition, chemical water quality measurements and Conservation Assessment Worksheet data were used to evaluate the cause(s) of impairment.

The objectives of the 1998 Tennessee basin-wide screening assessment were to:

1. assess water quality within each of the priority sub-watersheds of the Tennessee Basin;
2. identify sub-watersheds most impacted by NPS pollution;
3. identify causes of NPS impairment in sub-watersheds;
4. prioritize sub-watersheds most impacted by nonpoint sources of pollution;
5. provide a resource for researchers and regulators documenting the information available regarding each sub-watershed; and,
6. develop basin-wide screening methods that can be used to meet the above objectives in each of Alabama's major drainage basins.

A second component of the 1998 Tennessee Basin NPS Grant was the assessment of water quality within selected stream reaches listed on the 1997 §303(d) list. The data collected will be utilized in development of TMDLs for the twenty-two (22) segments assessed.

METHODOLOGY

Study Area

The Tennessee River basin drains 6,826 mi^2 (13.1%) of Alabama's land area. It flows through parts of fifteen counties in Alabama, but only ten counties (Lauderdale, Limestone, Madison, Jackson, Dekalb, Marshall, Morgan, Lawrence, Colbert, and Franklin) contain a significant portion of the Basin.

The Alabama portion of the Tennessee River Basin (0603 & 0602) is comprised of seven major divisions or 'cataloging units' (Guntersville lake, Wheeler Lake, Upper Elk River, Lower Elk River, Pickwick Lake, Bear Creek, and Chickamauga) and ninety-three sub-watersheds. Two of these, the Chickamauga and the Upper Elk River cataloging units (CU) are small (52 and 0.4 sq. mi., respectively). Some information is available from the Chickamauga CU and will be included in the section on the Guntersville Lake CU. The Upper Elk River will be combined with the Lower Elk River CU.

Ecoregions

This basin lies above the Fall Line mostly within the *Southwestern Appalachians (68)* and the *Interior Plateau (71)* ecoregions; a small portion of the northwestern Alabama part of the basin is in the *Transition Hills* subregion of the *Southeastern Plains (65)* (Fig. 5)

Stretching from Kentucky to Alabama, the open low mountains of the *Southwestern Appalachians* contain a mosaic of forest and woodland with some cropland and pasture. The eastern boundary of the ecoregion along the more abrupt escarpment where it meets the Ridge and Valley (67), is relatively smooth and only slightly notched by small eastward flowing stream drainages. The western boundary, next to the Interior Plateau's Eastern Highland Rim (71g), is more crenulated with a rougher escarpment that is more deeply incised. The mixed mesophytic forest is restricted mostly to the deeper ravines and escarpment slopes, and the upland forests are dominated by mixed oaks with shortleaf pine. (Griffin pers. Comm.1999)

The *Interior Plateau* is a diverse ecoregion extending from southern Indiana and Ohio to northern Alabama. Rock types are distinctly different from the coastal plain sands of ecoregion 65, and elevations are lower than the Appalachian ecoregions (66, 67, 68) to the east. Mississippian to Ordovician-age limestone, chert, sandstone, siltstone, and shale compose the landforms of open hills, irregular plains, and tablelands. The natural vegetation is primarily oak-hickory forest, with some areas of cedar glades. The springs, lime sinks, and caves contribute to this region's distinctive faunal distribution. (Griffin pers. Comm.1999)

Topography/Soils

The Tennessee Basin contains several distinct soil areas. The predominant type, the *Limestone Valleys*, consists of red clayey soils with silt/loam surface textures. The topography of the valleys is generally level to undulating with elevations of about 600 feet. Most of the land is open and cropped with cotton or soybeans. The uplands are gravelly loam and gravelly clay subsoil with gravelly/silt/loam surface layers. The elevations are about 700 feet and the topography ranges from level to very steep. Cotton and soybeans are the major row crops with much of the area used for pasture or forest. (ACES 1997)

The *Appalachian Plateau* comprises Cumberland, Sand, Lookout, Gunter, Brindlee, Chandler and other smaller mountains. Most of the soils are derived from sandstone or shale. The more level areas are dominated by Nauvoo, Hartsells and Wynville soils that are formed in residuum from sandstone. They have loamy subsoils and fine sandy loam surface layers. Most slopes are less than 10 percent. Elevation is about 1300 feet. Corn soybeans, potatoes and tomatoes are major crops. Poultry production is very important in this area. The more rugged portions of the Appalachian Plateau are dominated by soils such as Montevallo and Townley, which were formed in residuum from shale. These soils have either a very channery loam or a clayey subsoil and silt loam surface layers. Most areas are too steeply sloping for agriculture. Elevations range from 300 to 700 feet. (ACES 1997)

Most of the soils in the *Upper Coastal Plain* (far northwest portion of the Basin) are derived from marine and fluvial sediments eroded from the Appalachian and Piedmont plateaus. Smithdale, Luverne and Savannah soils are extensive with either loamy or clayey subsoils and sandy loam or loam surface layers. Savannah soils have a fragipan. Topography is level to very steep with narrow ridgetops and broad terraces that are cultivated. Most of the area is in forest with elevations ranging from 200 to 1000 feet. (ACES 1997)

The soils of the *Major Flood Plains and Terraces* are not extensive but important where they are found along streams and rivers as in the Bear Creek Cataloging Unit. They are derived from alluvium deposited by the streams. The Cahaba, Annemaine, and Urbo series represent major soils of this area. A typical area consists of cultivated crops on the nearly level terraces and bottomland hardwood forests on the floodplain of streams. (ACES 1997)

Review of Available Data

Tennessee Valley Authority (TVA) and the Geological Survey of Alabama (GSA) have been collecting fish community data within the State since the 1970's, resulting in extensive databases including collections from both impaired and relatively unimpaired areas. Two levels of assessment are included in the data-set, the *IBI* or index of biotic integrity, and the *Level I* fish assessment. The *IBI* was developed by Karr (1981) to directly assess the biological condition of fish communities. This technique measures the conditions of communities based on 12 characteristics of a representative fish sample in the categories of: species richness and composition, trophic composition, and fish abundance and condition. The value of each characteristic is compared to values expected from undisturbed streams of similar size in the same area. The sum of the scores for the 12 characteristics is the total IBI score. The community is assigned to a condition class from *very-poor* to *excellent* based on the IBI score. The *Level I* fish assessment was developed by TVA as a less costly and time-consuming method of quickly deriving information about the condition of fish communities than the IBI. Its rating scheme is based on evaluations of four basic ecological characteristics of the community as well as general observations of qualified biologists (best professional judgement). The Level I fish assessment allows the ecological evaluation of some fish samples and historical collection data which would otherwise be inadequate for the more rigorous IBI analysis.

Existing available data (1991-97) from the TVA biological database (TVA 1998a) and assessments/evaluations available from the GSA were compiled and utilized to estimate the status of ecological conditions throughout the basin. The fish and aquatic macroinvertebrate assessments were ranked by the assessment category (*very-poor* to *excellent*) for the historical sites in each cataloging unit. Those sub-watersheds that were indicated as being the most impaired (*poor* or *very-poor* fish community assessments) were selected for additional physical, chemical, and habitat data collection. Sub-watersheds covered by a previous or ongoing NPS watershed project (Flint Creek, Sand Mountain/Lake Guntersville and Paint Rock River sub-watersheds) or having an urban land-use were not included (Appendix H). Reconnaissance of the selected sub-watersheds was conducted by staff of the EIS in spring 1998 to determine accessibility of the historical sites for additional assessment.

Landuse and Nonpoint Source Impairment

Land use percentages and estimates of animal populations and sedimentation rates were obtained from information provided to ADEM by the Alabama Soil and Water Conservation Committee (ASWCC) and local Soil and Water Conservation Districts (SWCD). This information was provided on Conservation Assessment Worksheets completed in 1998 (FY97 CWA § 319 Workplan Project #4). Additional land-use information was obtained from EPA published estimates of percent land cover for the entire southeastern U.S. (EPA 1997a). These estimates were based on leaves-off Landsat TM data acquired in 1988, 1990, 1991, 1992, and 1993. Although the images used to estimate land cover were slightly dated, they provide generalized and consistent estimates for the entire basin. Therefore, these estimates of percent land-cover were used to supplement information collected by the local SWCD. A comparison of the two data sets for the broad categories of land-uses is found in Tables 2a through 2e, and in Table 12b.

Animal Unit estimates were calculated for each of the animal types based on the current conversion factors found in ADEM Administrative Code Chapter 335-6-7 (CAFO Program Rules). These values considered characteristics such as live weight equivalent waste quantity and constituent composition (limiting nutrients, moisture, additive compounds, etc.). (ADEM 1999b)

Animal Type (CAFO Definition)	*Numbers of Animals*	*Animal Unit (AU) Equivalent*
Cattle (slaughter, feeder, dairy heifers)	*1*	*1.0*
Dairy (mature)	*1*	*1.4*
Swine (>55 lbs)	*1*	*0.4*
Poultry (Broiler & Layer)	*125*	*1.0*

An estimate of the potential for nonpoint source impairment was determined for each sub-watershed and cataloging unit. Information was selected to represent potential categories of impairment sources. The sub-watershed values for each category were ranked and assigned an impairment potential (H=5, M =3, and L=1). The ranges of values for an impairment potential were based on the observed association of the values to sub-watersheds with known impaired segments or "impaired sub-watersheds". The ranges were then estimated so as to include most of the impaired sub-watershed values in the *high* category and the values from sub-watersheds without known impaired segments in the *low* category. The *moderate* category was the transitional area between the *high* and *low* categories. The potentials for each category were summed for each sub-watershed and averaged to determine the final NPS impairment potential. The information source, category name (italics), and range of values used included:

- EPA land-use percentages for:
  - → *Mining* (% Mining),
    (1% or greater =M)
  - → *Urban* (Sum of % Urban land-uses),
    (>15=H; 15-6=M; <6=L)
  - → *Forestry Practices* (% Evergreen Forest),
    (<20=L)
  - → *Pasture Runoff* (% Pasture)
    (>22=H; 22–11=M; <11=L)
  - → *Row Crop* (% Row Crop)
    (>20=H, 20–10=M; <10=L)
- SWCD Conservation Assessment Worksheet Information:
  - → *Animal Husbandry* (Animal Densities converted to the number of animal units (AU) per acre of sub-watershed reported)
    (>0.3=H, 0.3-0.15=M; <0.15=L);
  - → *Sedimentation* (Sediment tons per acre of sub-watershed reported)
    (>4=H, 4–2=M; <2=L)
- ADEM Construction General Permit Database retrieval:
  - → *Development* (Number of current construction/stormwater authorizations in the sub-watershed)
    (>6=H, 6–3=M; <3=L)

It is important to note that the ranges used for the Tennessee Basin may not be applicable to water quality conditions and activities in other basins of the State. These categories and ranges are intended to be descriptive, but are open to differing interpretations considering alternative data analysis techniques and are subject to refinement as data availability and analysis warrants.

The Local SWCDs also evaluated the streams for each of the sub-watersheds located in their respective counties. These evaluations were discussed during public meetings and were used to rank the sub-watersheds as to their perceived priority for conducting water quality improvement projects. The 1st priority was given to the sub-watershed with the greatest need. A single sub-watershed may have more than one priority if two or more of the counties containing the sub-watershed gave it a top-five priority ranking. This information was used to supplement the sub-watershed estimates of NPS impairment potential (Tables 5 and 15).

Habitat Assessment

Aquatic biological condition of the fish and macroinvertebrate communities is generally correlated with the quality of available habitat (without considering influences of water quality). The presence of stable and diverse habitat usually will support a diverse and healthy aquatic fauna (Barbour and Stribling 1991). Habitat quality was therefore assessed at each assessment site in order to evaluate stream condition and to assist in the interpretation of the historical biological data. Three habitat characteristics were evaluated to assess overall habitat quality at each site: primary, secondary, and tertiary parameters. Primary habitat parameters evaluate the availability and quality of substrate and instream cover. They include those characteristics that directly support aquatic communities, such as substrate type and stability, and availability. Secondary habitat parameters evaluate channel morphology, which was determined by flow regime, local geology, land surface form, soil, and human activities. Channel morphology indirectly affects the biological communities by affecting sediment movement through a stream (Barbour and Stribling 1991). Secondary habitat parameters include an evaluation of flow regime, sinuosity/instream geomorphology, and sediment deposition and scouring. Tertiary habitat characteristics evaluate bank structure and riparian vegetation. Bank and riparian vegetation prevent bank erosion and protect the stream from stormwater runoff from impervious surfaces. The presence of overhanging riparian vegetation also determines the primary energy source for aquatic macroinvertebrate communities—the base of the fish food chain (Vannote et al. 1980). Tertiary parameters include bank condition, bank vegetative protection, and riparian zone width.

The EPA published revised habitat assessment forms which evaluate riffle/run (Appendix B-1) and glide/pool (Appendix B-2) streams separately (EPA 1997b). The primary habitat parameters of the glide/pool habitat assessment place more emphasis on habitat characteristics important to this stream-type, primarily pool structure and variability. Because the revised habitat assessment forms more accurately assess habitat quality and degradation to glide/pool streams, the ADEM began using the revised forms in 1996 (ADEM 1999e). In addition, because they measure impairment to habitat quality, the scores (converted into percent maximum) were comparable between stream types and can be used to evaluate streams throughout the basin.

One physical characterization sheet was filled out at each station (Appendix C). Depending upon stream geomorphology, each team member completed a riffle/run or glide/pool habitat assessment.

Chemical Assessment

Water chemistry samples were analyzed for selected parameters used as indicators of impairment from land-uses present within the Tennessee River basin. These include sedimentation (total suspended solids, total dissolved solids), nutrient enrichment (total phosphate, nitrate/nitrite, BOD_5), agricultural impacts (pesticide scan), and mining impacts (iron, manganese).

Stream flow estimates, routine field parameters, and water quality samples were collected at each of stations in July 1998. Additional sampling events were conducted in May and September at each of the sites monitored in support of TMDL development.

Chemical analyses of water samples were conducted by the ADEM's Central Laboratory in Montgomery and the Field Laboratory in Birmingham. Water quality samples for laboratory analysis were collected, preserved, and transported to the ADEM Laboratories as described in ADEM Field Operations Standard Operating Procedures and Quality Control Assurance Manual, Volume I - Physical/Chemical (1994a). Duplicate field parameters and samples were collected during ten percent (10%) of the sampling events.

Water quality samples and routine field parameters were collected in conjunction with several other studies conducted by ADEM, GSA and TVA from 1992-97 (Table 8, Appendix F).

Chain of Custody

Sample handling and chain-of custody procedures were utilized for all chemical samples as outlined in ADEM Field Operations Standard Operating Procedures and Quality Control Assurance Manual, Volumes I and II to ensure the integrity of all samples collected (1994a, 1996e/1999e).

Final Assessment and Ranking of Sub-watersheds

Although the components or phases of this project resulted in a fully integrated assessment of the Tennessee River basin, biological, habitat, and chemical assessments were weighted differently in ranking and prioritizing sub-watersheds. Although biological communities respond to changes in water quality more slowly than water quality changes, they respond to stresses of various degrees over time. Consequently, monitoring changes in biological communities can detect impairment from nonpoint sources, which can be infrequent or low-level. The results of fish and aquatic macroinvertebrate assessments were therefore used to identify priority sub-watersheds. Land use patterns, habitat condition, chemical water quality measurements and Conservation Assessment data were used to evaluate the cause(s) of impairment. Evaluations of chemical measurements were made by comparing data from streams in the same area.

Assessments of *poor* or *very-poor* (fish community) were used to identify priority sub-watersheds. Sub-watersheds meeting these criteria, but suspected to be impaired by point sources or urban runoff were not recommended as priority sub-watersheds for implementation of nonpoint source controls.

RESULTS

The results of the Tennessee Basin Nonpoint Source Assessment project are organized into five sections by cataloging unit. Each section summarizes the monitoring information compiled for each NRCS sub-watershed. Maps, figures, and tables specific to each cataloging unit are included at the end of each section.

Section I: Guntersville Lake Cataloging Unit (0603-0001)

The Guntersville Lake cataloging unit of the Tennessee River Basin contains twenty-three sub-watersheds located primarily within Jackson, Dekalb, Marshall, Etowah and Blount Counties (Fig. 4a). The cataloging unit is located in the Southwestern Appalachians Ecoregion (Subregions 68a – 68d) (Fig. 5) and drains soils in portions of the Limestone Valleys and Uplands, and the Appalachian Plateau soil areas (ACES 1997).

Historical Data/Studies

A review of existing data indicated that bioassessments have been conducted recently within twelve sub-watersheds by TVA and GSA (Appendix G-1). In 1994-95, ADEM conducted an intensive assessment of biological, chemical, physical, and habitat conditions as part of the Sand Mountain/Lake Guntersville NPS Watershed Project (ADEM 1996b). The study was conducted in order to monitor water quality in relation to implementation of BMPs in the sub-watersheds. Eight sub-watersheds contained segments on Alabama's 1998 CWA §303(d) list of priority waterbodies (Table 11). In 1998, five stream segments in two sub-watersheds were monitored as part of the ADEM State Parks Assessment (Appendix F-5) (ADEM 1999d). Four stations (two on the Tennessee River) were assessed as part of the ADEM 1996 Clean Water Strategy (Appendix F-7) (ADEM 1999a).

Study Area

Eight of the twenty-three sub-watersheds in the Guntersville Lake Cataloging Unit were included in this project. Four sub-watersheds were already part of the Sand Mountain/Lake Guntersville NPS watershed project (220, 250, 270, and 280) and are discussed where appropriate. Eleven sub-watersheds were not considered in this study due to relatively small drainage areas (150, 200, 230, and 240), or they were located in backwater areas near reservoirs (210, 260, 290, and 320), or they contained suspected urban runoff (190), or assessments planned by other agencies were not conducted (310 and 080).

Conservation Assessment Worksheets

Based on the conservation assessment worksheets completed (1998) by the local SWCDs, the primary land-uses throughout the Lake Guntersville cataloging unit were forestland (50%), pastureland (22%), cropland (18%), urban land (2%), mined land (1%), open water (5%) and other land (2%) (Table 12b). Approximately 388,000 acres of crop and pastureland (37% of total area) were treated with pesticides and/or herbicides (Table 13). Animal production included poultry, dairy and beef cattle, and swine. Animal Unit

(AU) concentration estimates are presented in Table 13. Ten sub-watersheds were listed as priorities by the local SWCD in public meetings conducted during 1998 (080, 170, 180, 220, 250, 270, 280, 290, 300, and 310). The highest contributions to the sediment loading in the cataloging unit (Table 14) were estimated to be from mined lands and croplands (0.64 and 0.60 tons/acre/year, respectively). The overall potential for nonpoint source impairment in the cataloging unit was *high* based upon estimates of sedimentation rates, animal unit densities and pasture land-use; and, the number of current construction stormwater authorizations (Development) in the CU (Table 15). Erosion and sediment from cropland and roads/road banks, nutrients in surface waters, and access of livestock to streams were indicated as public concerns within the sub-watersheds.

Habitat Quality

Habitat quality (Table 7a) was assessed at five (5) stations during the Tennessee Basin NPS screening project and five (5) additional stations during 1998 in conjunction with the State Parks Assessment Project. In order to compare all assessments, habitat parameters are presented as percent of maximum score. Habitat Quality at seven (7) stations was assessed as *excellent* and three (3) stations were assessed as *good*.

Historical Biological Assessments

Twenty-six (26) historical Fish IBI and three (3) aquatic macroinvertebrate community assessments were available from twelve (12) sub-watersheds (Appendix G-1). Five additional Fish IBI assessments and five aquatic macroinvertebrate assessments were conducted by ADEM during the 1998 State Parks Study (Table 7a). Of the thirty-nine bioassessments conducted at nineteen stations, one station was assessed as *excellent* (5%), three were assessed as *good* (16%), and, three were assessed as having *fair* (16%) biological communities. Twelve stations (63%) were evaluated as having *poor* biological communities. (Table 16, Appendix G-1) Of these twelve stations, eight (67%) are located in sub-watersheds included in the Sand Mountain/Lake Guntersville NPS Watershed project.

Priority Sub-watersheds

Based on these results, five (5) priority sub-watersheds were identified (Appendix J). A summary for each sub-watershed in the cataloging unit is provided below.

Sub-Watershed: Widows Creek

NRCS Sub-Watershed Number 060

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
BENJ-3/ 724-1	Chemistry, Habitat/ Fish	1998/ 1997	Bengis Creek @ Jackson Co. T2S, R8E, S8	14	F&W
TN527	Fish	1991	Widows Creek @ Jackson Co. T2S, R8E, S1		S/F&W

Percent land cover of the Widows Creek sub-watershed was estimated as 36% deciduous forest, 7% evergreen forest, 17% mixed forest, 14% pasture/hay, 13% row crop, 5% wetlands, 1% low intensity residential, 2% high intensity commercial/industrial/transportation, and 5% open water (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs were lower for row crops (8%). Six current construction/stormwater authorizations and two current mining NPDES permits, four municipal/semi-public/private and one industrial NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were *low* (0.07 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4a) indicated a *low* potential for NPS impairment (1.8 tons/acre) mostly from erosion of dirt roads and road banks. The overall potential for impairment from nonpoint sources (Table 5a) was estimated as *moderate*, mainly from pasture, row crops and development in the sub-watershed.

The Widows Creek sub-watershed drains approximately 76 mi^2 in Jackson County. Two streams were evaluated by GSA. Widows Creek was evaluated as having a *good* fish community (1997). The evaluation of the historical fish community at Bengis Creek was *poor*, however, the fish IBI assessment conducted by TVA in 1997 was *fair/good*.

Water quality and habitat assessments were conducted at BENJ-3 during 1998 based upon the GSA historical evaluation (Table 10). The mostly-shaded stream reach was dominated by sand (~65%) with lesser amounts of cobble and gravel substrates (Table 6a). Habitat quality was assessed as *good* using the glide/pool assessment matrix. Instream habitat quality, bank stability and sinuosity were the main areas of slight impairment to the habitat (Table 7a). Water quality data (Appendix D-1) indicated that dissolved oxygen concentrations were low (5.1mg/l) and fecal coliform counts were elevated with 440 colonies/100ml. Nitrate/nitrite concentrations were also elevated (0.914 mg/l) during the July 1998 sampling event. No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling.

Recommended Priority Sub-Watershed

Widows Creek was identified as a low priority sub-watershed due to biological, habitat, and chemical conditions within the watershed (Table 17, Appendix J).

Sub-Watershed: Long Island Creek

NRCS Sub-Watershed Number 080

The Long Island Creek sub-watershed drains approximately 97 mi^2 in Dekalb and Jackson Counties. Percent land cover of the sub-watershed was estimated as 1% transitional forest, 39% deciduous forest, 9% evergreen forest, 22% mixed forest, 13% pasture/hay, 9% row crop, 2% wetlands, and 4% open water (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs indicated higher amounts of pasture (21%) and row crops (13%). Two current mining NPDES permits, one municipal/semi-public/private and one industrial NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were *moderate* (0.28 AU/Acre), with broiler poultry being the dominant animal. Sedimentation estimates (Table 4a) indicated a *moderate* potential for NPS impairment (3.1 tons/acre) mostly from erosion of mined land. The overall potential for impairment from nonpoint sources (Table

5a) was estimated as *moderate*, mainly from pasture, animal husbandry and sedimentation in the sub-watershed. Long Island Creek was a 2nd priority sub-watershed by the local SWCD. However, a water quality assessment was not completed within this sub-watershed during this project and Fish IBI assessments planned by other agencies were not conducted.

Sub-Watershed: Crow Creek

NRCS Sub-Watershed Number 100

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
2824	Fish	1997	Crow Creek @ Jackson Co		F&W

Percent land cover of the Crow Creek sub-watershed was estimated as 58% deciduous forest, 4% evergreen forest, 14% mixed forest, 4% pasture/hay, 14% row crop, 5% wetlands, and 1% open water (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs indicated slightly higher amounts of row crops (20%). No current NPDES permits or construction stormwater authorizations have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were *low* (0.04 AU/Acre), with cattle and swine being the dominant animals (0.03 and 0.01 AU/acre, respectively). Sedimentation estimates (Table 4a) indicated a *low* potential for NPS impairment (0.6 tons/acre) mostly from erosion of cropland. The overall potential for impairment from nonpoint sources (Table 5a) was estimated as *low*.

The Crow Creek sub-watershed drains approximately 41 mi^2 in Jackson County. One stream site was evaluated by GSA in 1997 as having a *fair* fish community. No additional assessments were conducted during this project.

Sub-Watershed: Little Coon Creek

NRCS Sub-Watershed Number 120

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
LCNJ-36	Chemistry, Habitat	1998	Little Coon Creek	20	F&W
LCNJ-2/ 6502-1	Chemistry, Habitat/ Fish	1998/ 1997	Little Coon Creek Near Cave Springs Church off of Jackson Co Rd 54	23	F&W

Percent land cover of the Little Coon Creek sub-watershed was estimated as 76% deciduous forest, 3% evergreen forest, 14% mixed forest, 3% pasture/hay, and 4% row crop (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs were similar to the EPA estimates. No current NPDES permits or construction stormwater authorizations have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were *low* (0.04 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4a) indicated a *low* potential for NPS impairment (0.2 tons/acre) mostly from erosion of stream banks and cropland. The overall potential for impairment from nonpoint sources (Table 5a) was estimated as *low*.

The Little Coon Creek sub-watershed drains approximately 25 mi^2 in Jackson County. One reach was evaluated by GSA in 1997 as having a *poor* fish community. Water quality and habitat assessments were conducted by ADEM at two stations on Little Coon Creek, LCNJ-2 and LCNJ-36, during July 1998 (Table 10).

Little Coon Creek at LCNJ-36 was mostly-shaded and dominated by sand (62%) with lesser amounts of gravel (~20%), cobble and boulder substrates (Table 6a). Habitat quality was assessed as *good* using the riffle/run assessment matrix. Instream habitat quality, bank stability, riparian zone measurements and sinuosity were the general areas of slight impairment to the habitat quality (Table 7a). Cattle were noted to have direct access to the stream at this reach. Stream flow was estimated at 3.3 cubic feet per second (cfs). Water quality data (Appendix D-1) indicated that fecal coliform counts were elevated with 540 colonies/100ml. Nitrite/nitrate and total dissolved solids (TDS) concentrations were also moderately elevated (0.29 and 195 mg/l, respectively). No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling.

Little Coon Creek at LCNJ-2 was not wadeable (Table 6a). Water quality data (Appendix D-1) indicated that dissolved oxygen concentrations were low (2.7mg/l) and fecal coliform counts were elevated with 530 colonies/100ml. Total Kjeldahl nitrogen (TKN) and TDS concentrations were also elevated (0.595 and 169 mg/l, respectively). No stream flow was measured, due to depth of the site, however, no visible flow was apparent. No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling.

Recommended Priority Sub-Watershed

Little Coon Creek was identified as a priority sub-watershed due to biological, habitat, and chemical conditions within the watershed (Table 17, Appendix J).

Sub-Watershed: Big Coon Creek

NRCS Sub-Watershed Number 140

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
TN511	Fish	1997	Big Coon Creek T2S/R7E/S20		F&W

Percent land cover of the Big Coon Creek sub-watershed was estimated as 1% transitional forest, 80% deciduous forest, 2% evergreen forest, 9% mixed forest, 3% pasture/hay, and 5% row crop (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs were slightly higher for row crops (9%). No current NPDES permits or construction stormwater authorizations have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were very *low* (0.01 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4a) indicated a *low* potential for NPS impairment (0.3 tons/acre) mostly from erosion of cropland. The overall potential for impairment from nonpoint sources (Table 5a) was estimated as *low*.

The Big Coon Creek sub-watershed drains approximately 43 mi^2 in Jackson County. One stream segment was evaluated by GSA in 1997 as having a *fair* fish community. No additional assessments were conducted during this project.

Sub-Watershed: Lower Crow Creek

NRCS Sub-Watershed Number 150

Percent land cover of the Lower Crow Creek sub-watershed was estimated as 25% deciduous forest, 7% evergreen forest, 16% mixed forest, 11% pasture/hay, 17% row crop, 13% wetland, 1% high intensity commercial/industrial/residential, and 11% open water (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs were higher for pastureland (28%). No current NPDES permits or construction stormwater authorizations have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were *low* (0.11 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4a) indicated a *low* potential for NPS impairment (0.4 tons/acre) mostly from erosion of cropland. The overall potential for impairment from nonpoint sources (Table 5a) was estimated as *moderate*, mainly from pasture runoff and row crops in the sub-watershed.

The Little Crow Creek sub-watershed drains approximately 22 mi^2 in Jackson County. Due to the small size and the close proximity to the Tennessee River, no additional assessments were conducted during this project.

Sub-Watershed: Coon Creek

NRCS Sub-Watershed Number 160

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
3978-1	Fish	1997	Flat Rock Creek @ Jackson Co.		S/F&W
TN-509/ FLRJ-4	Fish/ Chem., Habitat	1997/ 1998	Flat Rock Creek T3S, R9E, S20	28	S/F&W

Percent land cover of the Coon Creek sub-watershed was estimated as 2% transitional, 33% deciduous forest, 16% evergreen forest, 24% mixed forest, 10% pasture/hay, 8% row crop, 2% wetlands, and 3% open water (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs were higher for pastureland (17%). Two current construction/stormwater authorizations and two current mining NPDES permits, and two municipal/semi-public/private NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were *high* (0.32 AU/Acre), with broiler poultry being the dominant animal (0.16 AU/Acre). Sedimentation estimates (Table 4a) indicated a *high* potential for NPS impairment (5.3 tons/acre) mostly from erosion of mined land. The overall potential for impairment from nonpoint sources (Table 5a) was estimated as *moderate*.

The Coon Creek sub-watershed drains approximately 96 mi^2 in Jackson and Dekalb Counties. Coon /Flat Rock Creek, from the Tennessee River to its source, is included on the 1998 §303(d) list of impaired waters of Alabama (Table 11). Two additional segments, Hogue Creek (nutrients, pH, organic enrichment/DO) and Warren Smith Creek (pH, siltation) were added by EPA to the 1998 §303(d) List in 1999. Two reaches of Flat Rock Creek were assessed and evaluated by GSA in 1997 as having *poor* fish communities (Appendix G-1). Two stations, on Kash Creek and Rock Branch, were assessed by ADEM in 1996 during the Clean Water Strategy (CWS) Project (Appendix F-7) and one station on Burkhalter Creek was assessed during the 1998 ALAMAP project (Appendix F-6). Water quality and habitat assessments were conducted at one station on Flat Rock Creek (FLRJ-4) during 1998 (Table 10).

Flat Rock Creek, at the FLRJ-4 sampling reach, had a mostly-open canopy and was dominated by bedrock (~81%) with lesser amounts of cobble, gravel and sand substrates (Table 6a). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix. The instream habitat category had a lower percentage which is normal for bedrock dominated streams (Table 7a). A historical low head dam was located below this reach, however a hole was located on the left side allowing water to flow. Stream flow was estimated at 0.1 cfs. Water quality data (Appendix D-1) indicated that total phosphate and TKN were slightly elevated (0.101 and 0.484 mg/l, respectively). No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling.

Recommended Priority Sub-Watershed

Coon Creek was identified as a priority sub-watershed due to biological and chemical conditions within the watershed (Table 17, Appendix J).

Sub-Watershed: Mud Creek

NRCS Sub-Watershed Number 170

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
MUDJ-6 TN716	Chemistry, Habitat/ Fish	1998/ 1995	Mud Creek @ Jackson Co. T3S, R6E, S10	74	F&W

Percent land cover of the Mud Creek sub-watershed was estimated as 1% transitional forest, 40% deciduous forest, 6% evergreen forest, 14% mixed forest, 11% pasture/hay, 15% row crop, 7% wetlands, and 6% open water (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs were generally similar. One current construction/stormwater authorization, one current mining NPDES permit, and one municipal NPDES permit have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were *low* (0.06 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4a) indicated a *low* potential for NPS impairment (0.6 tons/acre) mostly from erosion of cropland. The overall potential for impairment from nonpoint sources (Table 5a) was estimated as *moderate*. The Mud Creek sub-watershed was listed as a 3rd priority by the local SWCD.

The Mud Creek sub-watershed drains approximately 105 mi^2 in Jackson County. Mud Creek, from the Tennessee River to its source, is included on the 1998 §303(d) list of impaired waters of Alabama due to organic enrichment/DO from non-irrigated crop production and pasture grazing (Table 11). One stream reach of Mud Creek was evaluated by GSA in 1997 as having a *poor* fish community. Water quality and habitat assessments were also conducted by ADEM at this reach during July 1998 (Table 10).

Mud Creek, at the MUDJ-6 sampling reach, had a mostly-shaded canopy and was dominated by sand (~60%) with lesser amounts of sand (~17%) and clay (~10%) substrates (Table 6a). Habitat quality was assessed as *good* using the glide/pool assessment matrix. Instream habitat quality, bank stability, and sinuosity were the general areas of slight impairment to the habitat quality (Table 7a). Stream flow was estimated at 9.1 cfs. Water quality data (Appendix D-1) indicated that nitrite/nitrate and TKN were slightly elevated (0.894 and 0.314 mg/l, respectively). The herbicide Atrazine (Appendix D-2) was also present (0.159 μg/l).

Recommended Priority Sub-Watershed

Mud Creek was identified as a priority sub-watershed due to biological and chemical conditions within the watershed (Table 17, Appendix J).

Sub-Watershed: Jones Creek

NRCS Sub-Watershed Number 180

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
BYTJ-1/ TN501	Chemistry, Habitat, Macinv. , Fish/ Fish	1998/ 1991	Bryant Creek Upstream of AL Hwy 71 Bridge @ Jackson Co. T4S, R8E, S31	42	F&W
TN532	Fish	1991	Jones Creek @Jackson Co. T1S, R9E, S8		F&W

Percent land cover of the Jones Creek sub-watershed was estimated as 1% transitional forest, 26% deciduous forest, 8% evergreen forest, 19% mixed forest, 21% pasture/hay, 21% row crop, and 3% open water (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs were higher for row crops (31%) and pastureland (28%). One current semi-public/private NPDES permit and one current construction stormwater authorization have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were *high* (0.37 AU/Acre), with broiler poultry, cattle and swine being the dominant animals (0.19, 0.12, and 0.12 AU/Acre, respectively). Sedimentation estimates (Table 4a) indicated a *moderate* potential for NPS impairment (3.4 tons/acre) mostly from erosion of mined land and cropland. The overall potential for impairment from nonpoint sources (Table 5a) was estimated as *high*. The Jones Creek sub-watershed was listed as a 4th priority by the local SWCD.

Two reaches in the Jones Creek sub-watershed (Jones and Bryant Creeks) were assessed by TVA in 1991 and evaluated by GSA in 1997 as having *poor* fish communities. Water quality, aquatic macroinvertebrate, fish IBI, and habitat, assessments were conducted at one station on Bryant Creek (BYTJ-1) during 1998 (Table 7a) as part of the Monitoring of the Alabama State Parks project (ADEM 1999).

Bryant Creek, at the BYTJ-1 sampling reach, had a mostly-shaded canopy and was dominated by bedrock (~80%) with lesser amounts of boulder (~10%) substrates (Table 6a). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix. Stream flow was estimated at 2.1 cfs during the July sampling event (Appendix F-5). Water quality data indicated that nitrite/nitrate and TKN concentrations were slightly elevated (1.060 and 0.48 mg/l, respectively). The aquatic macroinvertebrate community was evaluated to be in *good* condition, while the fish community was *poor/very-poor*. The fish community was similar to other collections near Buck's Pocket State Park 'consisting of few individuals, primarily sunfish species' (ADEM 1999). 'The fish community in Bryant Creek is also probably being impacted by natural low stream flow during the summer and limited habitat with a dominance of bedrock' (ADEM 1999). No additional assessments were conducted during this project.

Sub-Watershed: Roseberry Creek

NRCS Sub-Watershed Number: 190

Percent land cover of the Jones Creek sub-watershed was estimated as 2% low intensity residential, 1% high intensity commercial/industrial, 37% deciduous forest, 9% evergreen forest, 18% mixed forest, 12% pasture/hay, 12% row crop, 1% wetland, and 6% open water (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs were higher for row crops (17%). Three current construction/stormwater authorizations, one current mining NPDES permit, two industrial and one municipal NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were *low* (0.05 AU/Acre), with cattle being the dominant animals. Sedimentation estimates (Table 4a) indicated a *low* potential for NPS impairment (0.7 tons/acre) mostly from erosion of cropland. The overall potential for impairment from nonpoint sources (Table 5a) was estimated as *moderate*. This sub-watershed includes the city of Scottsboro, and therefore, no assessments were conducted during this NPS screening project (Appendix H).

Sub-Watershed: Chisenhall Spring Branch

NRCS Sub-Watershed Number 200

Percent land cover of the Chisenhall Spring Branch sub-watershed was estimated as 30% deciduous forest, 10% evergreen forest, 13% mixed forest, 5% pasture/hay, 2% row crop, and 38% open water (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs were similar to the EPA estimates. No current NPDES permits or construction stormwater authorizations have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were very *low* (0.02 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4a) indicated a *low* potential for NPS impairment (0.1 tons/acre). The overall potential for impairment from nonpoint sources (Table 5a) was estimated as *low*.

The Chisenhall Spring Branch sub-watershed drains approximately 18 mi^2 in Jackson County. Due to the small size and the close proximity to the Tennessee River, no assessments were conducted during this project (Appendix H).

Sub-Watershed: North Sauty Creek

NRCS Sub-Watershed Number 210

The North Sauty Creek sub-watershed drains approximately 84 mi^2 in Marshall and Jackson Counties. Percent land cover of the sub-watershed was estimated as 42% deciduous forest, 6% evergreen forest, 15% mixed forest, 11% pasture/hay, 12% row crop, 3% wetlands, and 10% open water (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs were similar to EPA estimates. One municipal NPDES permit has been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were *low* (0.04 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4a) indicated a *low* potential for NPS impairment (0.5 tons/acre) mostly from erosion of cropland. The overall potential for impairment from nonpoint sources (Table 5a) was estimated as *moderate*, mainly from pasture runoff, and row crops in the sub-watershed. No additional assessments were completed within this sub-watershed during this project and biological assessments planned by other agencies were not conducted.

Sub-Watershed: South Sauty Creek

NRCS Sub-Watershed Number: 220

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
10653-1	Fish	1999, 1996, 1994	South Sauty Creek at RM 16.7 (Dekalb Co Rd 47)	44	S/F&W
SSCD-1/ SCD-3/ SS-3	Fish, Macroinv., Habitat, Chem./ Macroinv. Habitat,/ Chem.	1998/ 1992-1995/ 1988-98	South Sauty Creek @Dekalb Co Rd 47 West of Rainsville	44	S/F&W
STGD-1	Fish, Macroinv., Habitat, Chem.	1998	Straight Creek @unnamed Dekalb Co Rd.	13	F&W
STND-1	Fish, Macroinv., Habitat, Chem.	1998	Stringer Creek @unnamed Dekalb Co Rd	14	F&W
KIRD-1	Fish, Macroinv., Habitat, Chem.	1998	Kirby Creek @unnamed Jackson Co Rd	16	F&W

Percent land cover of the South Sauty Creek sub-watershed was estimated as 17% deciduous forest, 8% evergreen forest, 18% mixed forest, 27% pasture/hay, 26% row crop, and 3% wetland (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs were slightly higher for row crops (31%) and pastureland (32%). Three municipal and four semi-public/private NPDES permits, and three current construction stormwater authorization have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were *high* (0.71 AU/Acre), with broiler poultry being the dominant animal (0.44 AU/Acre). Sedimentation estimates (Table 4a) indicated a *moderate* potential for NPS impairment (2.5 tons/acre) mostly from erosion of cropland. The overall potential for impairment from nonpoint sources (Table 5a) was estimated as *high*. The South Sauty Creek sub-watershed was assigned 1st and 3rd priorities by the local SWCDs.

<u>South Sauty Creek</u>

The South Sauty Creek sub-watershed was included in the Sand Mountain/Lake Guntersville NPS Watershed Project. One site (SCD3) was assessed, by FOD-EIS from 1992-95, using aquatic macroinvertebrate and habitat assessments. The aquatic macroinvertebrate community was assessed as either *good* or *excellent* each year of the project. Water quality samples were collected and analyzed at two sites, SS-3 and SS-5 from 1988 to 1998 (Appendix F-2). Elevated concentrations of nitrite/nitrate and elevated fecal coliform counts were recorded during multiple sampling events from 1996-98.

Water quality, fish and aquatic macroinvertebrate community, and habitat assessments were conducted at SSCD-1 on South Sauty Creek during 1998 (Table 10) as part of the Monitoring of the Alabama State Parks project (ADEM 1999). The sampling reach had a mostly-open canopy and was dominated by bedrock (~55%), with lesser amounts of sand (~15%), gravel, cobble, and boulder substrates (Table 6a). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix. However, the sediment deposition category indicated some impairment. The aquatic macroinvertebrate and fish communities were assessed as *good* and *very-poor*, respectively (Table 7a). Stream flow was estimated at 3.4 cfs during the July sampling event (Appendix F-5). Water quality data indicated that nitrite/nitrate (0.570 mg/l) and Chloride (306 mg/l) concentrations were elevated during the July and September sampling events, respectively. A wastewater treatment facility is located approximately 15 miles upstream of the sampling site.

One reach on South Sauty Creek was assessed by TVA in 1994 and again in 1996 as having a *poor* fish community (Appendix G-1). The aquatic macroinvertebrate community was assessed in 1999 as *poor/fair* (Appendix G-2). No additional assessments were conducted during this project. South Sauty Creek was added by the EPA to Alabama's 1998 §303(d) list of impaired waterbodies due to pH impairment.

<u>Straight Creek</u>

Water quality, biological community, and habitat assessments were conducted at one station on Straight Creek (STGD-1) during 1998 (Appendix E-1) as part of the Monitoring of the Alabama State Parks project (ADEM 1999). Straight Creek, at the STGD-1 sampling reach, had a partly-open/partly-shaded canopy and was dominated by bedrock (~60%) with lesser amounts of sand (~15%), and cobble (~10%) substrates (Table 6a). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix (Table 7e). The aquatic macroinvertebrate community was evaluated to be in *good* condition, while the fish community was *poor* (ADEM 1999). Stream flow was estimated at 0.8 cfs during the July sampling event (Appendix F-5). Water quality data indicated that nitrite/nitrate concentrations (1.19 mg/l) were elevated during the spring sampling event. The State Parks Project Report noted that 'the documentation of filamentous algae' suggested 'nutrient enrichment'. No samples were collected during the State Parks Project's September sampling event due to lack of stream flow.

Stringer Creek

Stringer Creek was assessed during the 1998 State Parks Project (ADEM 1999). Water quality, biological community, and habitat assessments were conducted at one station (Appendix E-1). Stringer Creek, at the STND-1 sampling reach, had a mostly-shaded canopy and was dominated by bedrock (~65%) with lesser amounts of boulder, cobble, and gravel substrates (Table 6a). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix. Stream flow was estimated at 0.2 cfs during the July sampling event (Appendix F-5). Water quality data indicated that nitrite/nitrate (1.4 mg/l) and TKN (0.120 mg/l) concentrations were elevated during the spring and summer sampling event, respectively. The dissolved oxygen concentration during the summer sampling event was 4.9 mg/l, below the Fish and Wildlife water quality standard of 5.0 mg/l. The aquatic macroinvertebrate community condition was assessed as *fair*, while the fish community was *poor* (Table 7a). Inadequate stream flow may have had an adverse impact on the biological communities. Lack of stream flow precluded sample collection during the fall sampling event (ADEM 1999). No additional assessments were conducted during this basin-screening project.

Kirby Creek

Water quality, biological community, and habitat assessments were conducted at one station on Kirby Creek (KIRD-1) (Appendix E-1) as part of the 1998 Monitoring of the Alabama State Parks project (ADEM 1999). Kirby Creek had a mostly-open canopy and was dominated by bedrock (~80%), with a substantial amount of silt (~10%) substrates (Table 6a). However, habitat quality was still evaluated as *excellent* using the riffle/run assessment matrix. The aquatic macroinvertebrate community was assessed in *fair* condition, and the fish community was in *very-poor* condition (Table 7a) (ADEM 1999). The State Parks Report (ADEM 1999) indicated that 'there were a reduced number of fish species and a high percentage of herbivores, omnivores and sunfish present', and that the community is 'probably being impacted by natural low stream flow during the summer' and 'limited habitat with a dominance of bedrock'. Stream flow was estimated at 0.2 cfs during the July sampling event (Appendix F-5). Water quality data indicated that nitrite/nitrate (1.060 mg/l) and TKN (0.43 mg/l) concentrations were elevated during the spring and summer sampling events, respectively. No samples were collected during the State Parks Project's September sampling event due to lack of stream flow.

The South Sauty Creek sub-watershed drains approximately 126 mi^2 in Jackson, Dekalb and Marshall Counties. This sub-watershed is already a part of the Sand Mountain/Lake Guntersville Watershed Project, therefore, despite the impairment detected during recent assessments, this sub-watershed is not recommended as a current priority sub-watershed.

Sub-Watershed: Dry Creek

NRCS Sub-Watershed Number: 230

Percent land cover of the Dry Creek sub-watershed was estimated as 1% transitional, 21% deciduous forest, 13% evergreen forest, 18% mixed forest, 18% pasture/hay, 14% row crop, and 16% open water (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs were higher for row crops (27%). One current construction stormwater authorization has been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were *moderate* (0.30 AU/Acre), with broiler poultry being the dominant animal. Sedimentation estimates (Table 4a) indicated a *moderate* potential for NPS impairment (2.2 tons/acre), mainly from erosion of mined land and cropland. The overall potential for impairment from nonpoint sources (Table 5a) was estimated as *moderate*.

The Dry Creek sub-watershed drains approximately 26 mi^2 in Jackson County. Due to the generally small size and the close proximity to the Tennessee River, no assessments were conducted during this project (Appendix H). Dry Creek was added by the EPA to Alabama's §303(d) list due to impairment from metals, pH and siltation (Table 11).

Sub-Watershed: Boshart Creek

NRCS Sub-Watershed Number 240

Percent land cover of the Boshart Creek sub-watershed was estimated as 34% deciduous forest, 14% evergreen forest, 16% mixed forest, 7% pasture/hay, 5% row crop, and 22% open water (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs indicated a higher pasture land-use (13%) than did EPA data. Two semi-public/private NPDES permits, and four current construction stormwater authorizations have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were *low* (0.09 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4a) indicated a *low* potential for NPS impairment (0.9 tons/acre). The overall potential for impairment from nonpoint sources (Table 5a) was also estimated as *low*.

The Boshart Creek sub-watershed drains approximately 38 mi^2 in Jackson and Marshall Counties. Due to the generally small size, the close proximity to the Tennessee River and the point source discharges present, no assessments were conducted during this project.

Sub-Watershed: Town Creek

NRCS Sub-Watershed Number 250

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
11504-1	Fish	1999, 1996, 1994	Town Creek @ Lakeview RM 22.8	129	F&W
TCD-3 / T-3	Macroinv., Habitat/ Chem.	1992-1995/ 1988-98	Town Creek @ Dekalb Co. Rd 50 East of Fyffe (Guest Bridge)		F&W
T-5	Chem.	1988-98	Town Creek @ AL Hwy 227 N of Geraldine		F&W

Percent land cover of the Town Creek sub-watershed was estimated as 20% deciduous forest, 10% evergreen forest, 21% mixed forest, 29% pasture/hay, 19% row crop, and 1% wetland (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs were very similar to EPA estimates. One current construction stormwater authorization and one municipal NPDES permit have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were *high* (0.77 AU/Acre), with broiler poultry being the dominant animal (0.52 AU/Acre). Sedimentation estimates (Table 4a) indicated a *moderate* potential for NPS impairment (3.8 tons/acre), mainly from mined land, cropland, and other critical areas. The overall potential for impairment from nonpoint sources (Table 5a) was estimated as *high*. The local SWCD also assigned a 1st priority to the Town Creek sub-watershed. A four mile section of Rocky Branch is on the 1998 §303(d) list due to historical mining impacts and EPA added a segment of Town Creek to the list due to pH impairment.

The Town Creek sub-watershed was included in the Sand Mountain/Lake Guntersville NPS Watershed Project. One site (TCD3) was assessed using aquatic macroinvertebrates and habitat assessments by FOD-EIS from 1992-95. The aquatic macroinvertebrate community was assessed as either *good* or *excellent* each year of the project. Water quality samples were collected and analyzed at two sites, T-3 and T-5 from 1988 to 1998 (Appendix F-2). Elevated concentrations of nitrite/nitrate, TKN and total phosphate, and elevated fecal coliform counts were recorded during multiple sampling events from 1996-98. One reach in the Town Creek sub-watershed was assessed by TVA in 1994, 1996 and again in 1999 as having *poor* a fish community. The unnamed tributary to Traylor Branch was visited in 1998 during the ALAMAP project and was found to be dry. No additional assessments were conducted during this project.

The Town Creek sub-watershed drains approximately 203 mi^2 in Marshall and Dekalb Counties. This sub-watershed is already a part of the Sand Mountain/Lake Guntersville Watershed Project, therefore, despite the impairment detected during historical assessments this sub-watershed is not recommended as a current priority sub-watershed.

Sub-Watershed: Lower Town Creek

NRCS Sub-Watershed Number 260

Percent land cover of the Lower Town Creek sub-watershed was estimated as 25% deciduous forest, 12% evergreen forest, 17% mixed forest, 8% pasture/hay, 5% row crop, and 32% open water (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs were higher for row crops (19%) and pasture land-uses (23%). No current construction stormwater authorization or NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were *high* (0.30 AU/Acre), with broiler poultry being the dominant animal. Sedimentation estimates (Table 4a) indicated a *low* potential for NPS impairment (1.7 tons/acre), mainly from erosion of cropland. The overall potential for impairment from nonpoint sources (Table 5a) was estimated as *low*.

The Lower Town Creek sub-watershed drains approximately 47 mi^2 in Jackson and Marshall Counties. Due to the generally small size and the close proximity to the Tennessee River, no assessments were conducted during this project (Appendix H).

Sub-Watershed: Scarham Creek

NRCS Sub-Watershed Number: 270

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
10068-2	Fish	1999, 1996, 1994	Scarham Creek @ Colvin Bridge (RM5.8)	89	F&W
SC-3/ SCD-3	Chem./ Macroinv., Habitat	1988-98/ 1992-1995	Scarham Creek @Dekalb Co Rd. 1 NW of Kilpatrick		F&W
SC-4	Chem.	1988-98	Scarham Creek @Marshall Co. Rd 89 NE of Albertville (Double Bridges)		F&W
LSHOAL/ LSLM-1	Chem./ Macroinv., Habitat	1988-98/ 1992-1995	Little Shoal Creek @ Secondary Road		F&W
SHOAL/ SLM-1	Chem./ Macroinv., Habitat	1988-98/ 1992-1995	Shoal Creek @ Secondary Road		F&W
W-1	Chem.	1988-98	Whippoorwill Creek @ Marshall Co. Rd 89 NE of Albertville (Double Bridges)		F&W

Percent land cover of the Scarham Creek sub-watershed was estimated as 14% deciduous forest, 11% evergreen forest, 20% mixed forest, 33% pasture/hay, and 21% row crop (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs were very similar to EPA data. Two current construction stormwater authorizations and three semi-public/private NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were *high* (0.79 AU/Acre), with broiler poultry being the dominant animal. Sedimentation estimates (Table 4a) indicated a *moderate* potential for NPS impairment (3.5 tons/acre), mainly from erosion of dirt roads. The overall potential for impairment from nonpoint sources (Table 5a) was estimated as *high*. The Scarham Creek sub-watershed was assigned a 2nd priority rating by the local SWCDs. A twelve mile segment of Scarham Creek is on Alabama's 1998 §303(d) list.

The Scarham Creek sub-watershed was included in the Sand Mountain/Lake Guntersville NPS Watershed Project. Three sites (SCD-3, LSLM-1, SLM-1) were assessed using aquatic macroinvertebrates and habitat assessments by FOD-EIS from 1992-95. The aquatic macroinvertebrate community was assessed as either *good* or *excellent* each year of the project. Water quality samples were collected and analyzed at five sites, SHOAL, L SHOAL, SC-3, SC-4 and W-1 from 1988 to 1998 (Appendix F-2). Elevated concentrations of nitrite/nitrate, TKN and total phosphate, and elevated fecal coliform counts were recorded during multiple sampling events from 1996-98. One reach in the Scarham Creek sub-watershed was assessed by TVA in 1994 and again in 1996 as having a *poor/very-poor* fish community (Appendix G-1) assessment in 1999 indicated the fish community was in *poor/fair* condition. No additional assessments were conducted during this NPS basin-screening project.

The Scarham Creek sub-watershed drains approximately 91 mi^2 in Marshall and Dekalb Counties. This sub-watershed is already a part of the Sand Mountain/Lake Guntersville Watershed Project, therefore, despite the impairment detected during historical assessments, this sub-watershed is not recommended as a current priority sub-watershed.

Sub-Watershed: Short Creek

NRCS Sub-Watershed Number: 280

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
10336-1 SH-3/ SHM-3a	Fish/ Chem. Macroinv., Habitat	1994/ 1988-98/ 1992-95	Short Creek @ Myrtle Tree Bridge Marshall Co Rd 543	74	F&W
10336-2	Fish	1999, 1996	Short Creek @Blessing Road	72	F&W
SH-4	Chem.	1988- 1998	Short Creek @ Marshall Co Rd 50 North of Albertville		F&W

Percent land cover of the Short Creek sub-watershed was estimated as 13% deciduous forest, 11% evergreen forest, 18% mixed forest, 37% pasture/hay, 17% row crop, 1% other grasses, 2% low intensity residential, and 1% high intensity commercial/industrial/transportation (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs were very similar to EPA data. Eleven current construction stormwater authorizations and two municipal NPDES permits have been issued in the sub-watershed

(Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were *high* (0.58 AU/Acre), with broiler poultry being the dominant animal. Sedimentation estimates (Table 4a) indicated a *moderate* potential for NPS impairment (2.4 tons/acre) from a number of sources. The overall potential for impairment from nonpoint sources (Table 5a) was estimated as *high*. Short creek was assigned a 1st and 5th priority rating by the local SWCDs. Short Creek was added by the EPA to Alabama's 1998 §303(d) list due to impairment from fecal coliform contamination.

The Short Creek sub-watershed was included in the Sand Mountain/Lake Guntersville NPS Watershed Project. One site (SHM-3a) was assessed using aquatic macroinvertebrates and habitat assessments by FOD-EIS from 1992-95. The aquatic macroinvertebrate community was assessed as either *good* or *excellent* each year of the project. Water quality samples were collected and analyzed at two sites, SH-3 and SH-4 from 1988 to 1998 (Appendix F-2). Elevated concentrations of nitrite/nitrate, TKN, and total phosphate, and elevated fecal coliform counts, were recorded during multiple sampling events from 1996-98.

Two reaches in the Short Creek sub-watershed were assessed by TVA, 10336-1 (1994), and 10336-2 (1996) as having a *poor* and *poor/very-poor* fish community, respectively (Appendix G-1). Station 10336-2 was assessed by TVA again in 1999 as having a *poor* fish community, and a *fair* aquatic macroinvertebrate community (Appendices G-1 and G-2). A site on Coal Creek was visited in August during the 1998 ALAMAP project; the stream was not flowing. ADEM conducted an intensive water quality survey in the Short Creek sub-watershed in 1998. This site included sites on Drum Creek, Short Creek, Shoal Creek and Turkey Creek (Appendices E-1 and F-1). No additional assessments were conducted during this NPS basin-screening project.

The Short Creek sub-watershed drains approximately 113 mi^2 in Marshall, Etowah, and Dekalb Counties. This sub-watershed is already a part of the Sand Mountain/Lake Guntersville Watershed Project, therefore, despite the impairment detected during recent historical assessments, this sub-watershed is not recommended as a current priority sub-watershed.

Sub-Watershed: Lower Short Creek

NRCS Sub-Watershed Number: 290

Percent land cover of the Lower Short Creek sub-watershed was estimated as 22% deciduous forest, 15% evergreen forest, 19% mixed forest, 19% pasture/hay, 16% row crop, and 8% open water (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs were higher for row crops (23%) and pasture land-uses (30%). One semi-public/private NPDES permit has been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were *high* (0.56 AU/Acre), with broiler poultry being the dominant animal. Sedimentation estimates (Table 4a) indicated a *moderate* potential for NPS impairment (3.8 tons/acre). The overall potential for impairment from nonpoint sources (Table 5a) was estimated as *moderate*. The Lower Short Creek sub-watershed was assigned a 5th priority rating by the local SWCD.

The Lower Short Creek sub-watershed drains approximately 21 mi^2 in Marshall County. Due to the generally small size and the close proximity to the Tennessee River, no assessments were conducted during this project (Appendix H).

Sub-Watershed: Big Spring Creek

NRCS Sub-Watershed Number: 300

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
GSA2/ BGSM-22	Fish/ Chem., Habitat	1997/ 1998	Big Spring Creek @ Marshall Co. T8S, R3E, S32	45	F&W

Percent land cover of the Big Spring Creek sub-watershed was estimated as 1% transitional forest, 28% deciduous forest, 11% evergreen forest, 19% mixed forest, 20% pasture/hay, 12% row crop, 1% low intensity residential, 1% high intensity commercial/industrial/transportation, and 6% open water (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs were somewhat higher for urban (7%), row crops (19%), and pasture (25%) land-uses. Ten current construction/stormwater authorizations, one current mining, and one industrial NPDES permit have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were *low* (0.13 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4a) indicated a *moderate* potential for NPS impairment (2.5 tons/acre), mainly from cropland erosion. The overall potential for impairment from nonpoint sources (Table 5a) was estimated as *high*. Big Spring Creek was also given a 1st priority sub-watershed rating by the local SWCD.

The Big Spring Creek sub-watershed drains approximately 72 mi^2 in Blount and Marshall Counties. One stream reach of Big Spring Creek was evaluated by GSA in 1997 as having a *poor* fish community. Water quality and habitat assessments were also conducted by ADEM at this reach during 1998 (Table 10).

Big Spring Creek, at the BGSM-22 sampling reach, had a shaded canopy and was dominated by sand (~50%) with lesser amounts of cobble (~20%) and gravel (~20%) substrates (Table 6a). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix. Sediment deposition and bank stability were the categories of slight impairment to the habitat quality (Table 7a). Stream flow was estimated at 9.2 cfs. Water quality data (Appendix D-1) indicated that nitrite/nitrate, total phosphate and TKN were slightly elevated (0.508, 0.077 and 0.272 mg/l, respectively). No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling.

Recommended Priority Sub-Watershed

Big Spring Creek was identified as a priority sub-watershed due to biological and chemical conditions within the watershed (Table 17, Appendix J).

Sub-Watershed: Browns Creek

NRCS Sub-Watershed Number: 310

Percent land cover of the Browns Creek sub-watershed was estimated as 29% deciduous forest, 10% evergreen forest, 17% mixed forest, 16% pasture/hay, 9% row crop, 1% wetland, and 18% open water (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs were higher for row crops (17%) and pasture land-uses (24%). Eight current construction/stormwater authorizations and three current mining NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were *low* (0.13 AU/Acre), with cattle being the dominant animal (0.09 AU/acre). Sedimentation estimates (Table 4a) indicated a *moderate* potential for NPS impairment (2.1 tons/acre), mainly from erosion of sand and gravel pits, and cropland. The overall potential for impairment from nonpoint sources (Table 5a) was estimated as *moderate*.

The Browns Creek sub-watershed drains approximately 73 mi^2 in Blount and Marshall Counties. This sub-watershed was assigned a 2^{nd} priority by the local SWCD. However, water quality and habitat evaluations were not completed during this project and bioassessments planned by other agencies were not conducted.

Sub-Watershed: Honey Comb Creek

NRCS Sub-Watershed Number: 320

Percent land cover of the Honey Comb Creek sub-watershed was estimated as 35% deciduous forest, 11% evergreen forest, 17% mixed forest, 8% pasture/hay, 6% row crop, and 21% open water (Table 1a). Estimates of land-use (Table 2a) by the local SWCDs indicated a 9% urban land-use not included in the EPA estimates. Two current construction/stormwater authorizations, one municipal and two semi-public/private NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3a) were *low* (0.06 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4a) indicated a *low* potential for NPS impairment (0.9 tons/acre). The overall potential for impairment from nonpoint sources (Table 5a) was estimated as *low*.

The Honey Comb Creek sub-watershed drains approximately 40 mi^2 in Marshall County. Due to the generally small size and the close proximity to the Tennessee River, no assessments were conducted during this project (Appendix H).

Table 1a. Land use percentages for the Middle Tennessee-Chicamauga (0602-0001) Guntersville Lake cataloging unit (0603-0001) from EPA landuse subcategory data (EPA 1997) and broader categories used in comparison with local SWCD Conservation Assessment Worksheet landuse estimates (ASWCC 1998).

	Percent Total Landuse (Category and Subcategory)													
	Open Water	Urban			Mining	Forest				Pasture/ Hay	Row Crops	Other		
Subwatershed	Open Water	Low Intensity Residential	High Intensity Residential	High Intensity Commercial/ Industrial/ Transportation	Quarries/ Strip Mines/ Gravel Pits	Transitional Forest	Deciduous Forest	Evergreen Forest	Mixed Forest	Pasture/ Hay	Row Crops	Other Grasses	Woody Wetlands	Herbaceous Wetlands
Middle Tennessee/Chicamauga (0602-0001)														
290				1		1	52	12	21	8	4			
350							55	8	20	9	8			
Guntersville Lake (0603-0001)														
60	5	1		2			36	7	17	14	13		4	1
80	4					1	39	9	22	13	9		2	
100	1						58	4	14	4	14		5	
120							76	3	14	3	4			
140						1	80	2	9	3	5			
150	11			1			25	7	16	11	17		11	2
160	3					2	33	16	24	10	8		2	
170	6					1	40	6	14	11	15		6	1
180	3					1	26	8	19	21	21			
190	6	2		1			37	9	18	12	12		1	
200	38						30	10	13	5	2			
210	10						42	6	15	11	12		3	
220							17	8	18	27	26		3	
230	16					1	21	13	18	18	14			
240	22						34	14	16	7	5			

Table 1a, cont. Land Use Percentages for Guntersville Lake Cataloging Unit (0603-0001) from EPA landuse subcategory data (EPA 1997) and broader categories used in comparison with local SWCD Conservation Assessment Worksheet landuse estimates (ASWCC 1998).

	Percent Total Landuse (Category and Subcategory)													
	Open Water	Urban			Mining	Forest				Pasture/ Hay	Row Crops	Other		
Subwatershed	Open Water	Low Intensity Residential	High Intensity Residential	High Intensity Commercial/ Industrial/ Transportation	Quarries/ Strip Mines/ Gravel Pits	Transitional Forest	Deciduous Forest	Evergreen Forest	Mixed Forest	Pasture/ Hay	Row Crops	Other Grasses	Woody Wetlands	Herbaceous Wetlands
Guntersville Lake (0603-000, Cont.														
250							20	10	21	29	19		1	
260	32						25	12	17	8	5			
270							14	11	20	33	21			
280		2		1			13	11	18	37	17	1		
290	8						22	15	19	19	16			
300	6	1		1		1	28	11	19	20	12			
310	18						29	10	17	16	9		1	
320	21						35	11	17	8	6			

Table 2a. Land use percentages for the Middle Tennessee-Chicamauga (0602-0001) Guntersville Lake cataloging unit (0603-0001) from EPA landuse categories (EPA 1997) and local SWCD Conservation Assessment Worksheet landuse estimates (ASWCC 1998).

Subwatershed	Percent Total Landuse													
	Open Water		Urban		Mines		Forest		Pasture		Row Crops		Other	
	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA
Middle Tennessee/Chicamauga (0602-0001)														
290			1	1			77	86	18	8	2	4	2	
350	1						81	83	6	9	9	8	3	
Guntersville Lake (0603-0001)														
060	7	5	2	3			63	64	17	14	8	13	3	1
080	2	4			2		58	73	21	13	13	9	2	
100		1					70	81	8	4	20	14	2	
120							85	93	9	3	3	4	2	
140							85	92	4	3	9	5	2	
150	18	11					38	59	28	11	14	17	3	2
160	2	3	1		5		63	77	17	10	10	8	2	
170	9	6					53	67	16	11	19	15	3	1
180	5	3	2		2		30	54	28	21	31	21	3	
190	8	6	4	3			57	65	13	12	17	12		
200	26	38					67	53	5	5	1	2	1	
210	14	10	2				58	66	10	11	14	12	2	
220	1		1				31	46	32	27	31	26	3	
230	16	16			1		38	53	15	18	27	14	3	
240	7	22	3				73	64	13	7	4	5		
250			1		1		43	52	33	29	18	19	4	
260	12	32	11				35	54	23	8	19	5		
270	2		3				37	45	34	33	21	21	3	
280	2		1	3			41	42	35	37	19	17	2	1
290	15	8	8				24	56	30	19	23	16		

Table 2a, cont. Land use percentages for the Middle Tennessee-Chicamauga (0602-0001) Guntersville Lake cataloging unit (0603-0001) from EPA landuse categories (EPA 1997) and local SWCD Conservation Assessment Worksheet landuse estimates (ASWCC 1998).

Subwatershed	Percent Total Landuse													
	Open Water		Urban		Mines		Forest		Pasture		Row Crops		Other	
	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA
Guntersville Lake (0603-0001), cont.														
300	4	6	7	2			44	59	25	20	19	12	1	
310	9	18	5				43	57	24	16	17	9	2	
320	12	21	9				64	63	9	8	6	6		

Table 3a. Estimations of animal concentrations, animal units (AU), and percent of acres where pesticides/herbicides applied in the Middle Tennessee/Chicamauga Cataloging Unit (0602-0001) and Guntersville Lake Cataloging Unit (0603-0001). Numbers of animals and pesicides/herbicides listed by acreage and subwatershed were provided by the local SWCDs on Conservation Assessment Worksheets completed in 1998.

		CU and Subwatershed (0602-0001)			CU and Subwatershed (0603-0001)						
		290	350	Total	060	080	100	120	140	150	160
County (s)		Dekalb	Jackson	----	Jackson	Jackson Dekalb	Jackson	Jackson	Jackson	Jackson	Jackson Dekalb
Acres Reported		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Pesticides Applied	Est. % Total Acres	20	17	20	18	27	26	10	12	35	26
Cattle	# / Acre	0.05	0.03	0.05	0.07	0.08	0.03	0.04	0.01	0.11	0.08
	A.U./Acre	**0.05**	**0.03**	**0.05**	**0.07**	**0.08**	**0.03**	**0.04**	**0.01**	**0.11**	**0.08**
Dairy	# / Acre	---	---	---	---	0.00	---	---	---	---	0.00
	A.U./Acre	---	---	---	---	**0.01**	---	---	---	---	**0.00**
Swine	# / Acre	---	---	---	0.01	0.01	0.03	---	---	---	0.18
	A.U./Acre	---	---	---	**0.00**	**0.00**	**0.01**	---	---	---	**0.07**
Poultry - Broilers	# / Acre	5.64	4.42	5.44	---	20.84	---	---	---	---	19.82
	A.U./Acre	**0.05**	**0.04**	**0.04**	---	**0.17**	---	---	---	---	**0.16**
Poultry - Layers	# / Acre	0.70	---	0.59	---	2.57	---	---	---	---	1.15
	A.U./Acre	**0.01**	---	**0.00**	---	**0.02**	---	---	---	---	**0.01**
Catfish	# Acres/ Acre	---	---	---	---	---	---	---	---	---	---
	A.U./Acre	---	---	---	---	---	---	---	---	---	---
Total	A.U./Acre	**0.11**	**0.07**	**0.09**	**0.07**	**0.28**	**0.04**	**0.04**	**0.01**	**0.11**	**0.32**
Potential for NPS Impairment		Low	Low	Low	Low	Mod.	Low	Low	Low	Low	High

* No data reported for this portion of the subwatershed

Table 3a, cont. Estimations of animal concentrations, animal units (AU), and percent of acres where pesticides/herbicides applied in the Guntersville Lake Cataloging Unit (0603-0001). Numbers of animals and pesicides/herbicides listed by acreage and subwatershed were provided by the local SWCDs on Conservation Assessment Worksheets completed in 1998.

		Subwatershed									
		170	180	190	200	210	220	230	240	250	260
County (s)		Jackson	Jackson Dekalb	Jackson	Jackson	Jackson Marshall	Jackson Dekalb Marshall	Jackson	Marshall, Jackson*	Dekalb Marshall	Marshall Jackson*
Acres Reported		100%	100%	100%	100%	100%	100%	100%	100%	100%	99%
Pesticides Applied	Est. % Total Acres	29	51	26	4	9	60	37	24	51	42
Cattle	# / Acre	0.06	0.12	0.05	0.02	0.04	0.14	0.06	0.09	0.14	0.08
	A.U./Acre	**0.06**	**0.12**	**0.05**	**0.02**	**0.04**	**0.14**	**0.06**	**0.09**	**0.14**	**0.08**
Dairy	# / Acre	---	0.01	---	---	---	---	---	---	0.00	---
	A.U./Acre	---	**0.01**	---	---	---	---	---	---	**0.00**	---
Swine	# / Acre	---	0.12	---	---	---	0.25	0.04	---	0.19	---
	A.U./Acre	---	**0.05**	---	---	---	**0.10**	**0.02**	---	**0.08**	---
Poultry - Broilers	# / Acre	---	22.97	---	---	---	55.09	25.31	0.16	65.50	25.39
	A.U./Acre	---	**0.18**	---	---	---	**0.44**	**0.20**	**0.00**	**0.52**	**0.20**
Poultry - Layers	# / Acre	0.09	1.87	---	---	---	3.34	2.24	0.00	3.37	2.79
	A.U./Acre	**0.00**	**0.01**	---	---	---	**0.03**	**0.02**	**0.00**	**0.03**	**0.02**
Catfish	# Acres/ Acre	0.00	---	---	---	---	---	---	---	---	---
	A.U./Acre	---	---	---	---	---	---	---	---	---	---
Total	A.U./Acre	**0.06**	**0.37**	**0.05**	**0.02**	**0.04**	**0.71**	**0.30**	**0.09**	**0.77**	**0.30**
Potential for NPS Impairment		Low	High	Low	Low	Low	High	Mod.	Low	High	Mod.

* No data reported for this portion of the subwatershed

Table 3a, cont. Estimations of animal concentrations, animal units (AU), and percent of acres where pesticides/herbicides applied in the Guntersville Lake Cataloging Unit (0603-0001). Numbers of animals and pesicides/herbicides listed by acreage and subwatershed were provided by the local SWCDs on Conservation Assessment Worksheets completed in 1998.

		Subwatershed						
		270	280	290	300	310	320	Total
County (s)		Dekalb Marshall	Dekalb Marshall Etowah	Marshall	Blount Marshall	Blount Marshall	Marshall	----
Acres Reported		100%	100%	100%	100%	100%	100%	100%
Pesticides Applied	Est. % Total Acres	56	58	53	41	36	15	37
Cattle	# / Acre	0.17	0.11	0.14	0.10	0.09	0.06	0.09
	A.U./Acre	**0.17**	**0.11**	**0.14**	**0.10**	**0.09**	**0.06**	**0.09**
Dairy	# / Acre	0.01	---	---	---	---	---	0.00
	A.U./Acre	**0.01**	---	---	---	---	---	**0.00**
Swine	# / Acre	0.12	0.06	---	---	---	---	0.07
	A.U./Acre	**0.05**	**0.03**	---	---	---	---	**0.03**
Poultry - Broilers	# / Acre	66.52	52.26	47.67	3.68	4.83	0.10	25.25
	A.U./Acre	**0.53**	**0.42**	**0.38**	**0.03**	**0.04**	**0.00**	**0.20**
Poultry - Layers	# / Acre	3.97	3.06	5.22	0.31	0.30	0.00	1.63
	A.U./Acre	**0.03**	**0.02**	**0.04**	**0.00**	**0.00**	**0.00**	**0.01**
Catfish	# Acres/ Acre	---	---	---	---	---	---	0.00
	A.U./Acre	---	---	---	---	---	---	---
Total	A.U./Acre	**0.79**	**0.58**	**0.56**	**0.13**	**0.13**	**0.06**	**0.33**
Potential for NPS Impairment		High	High	High	Low	Low	Low	High

* No data reported for this portion of the subwatershed

Table 4a. Sedimentation estimates by source, forest condition, septic tank information and resource concerns by subwatershed in the Middle Tennessee (0602-0001) and Guntersville Lake (0603-0001) cataloging units as provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets (ASWCC 1998). (* Indicates not reported)

Basin Code- Cataloging Unit	0602-0001		0603-0001						
Subwatershed	**290**	**350**	**060**	**080**	**100**	**120**	**140**	**150**	**160**
Forest Condition									
% of Subwatershed Needing Forest Improvement	60	40	19	29	35	43	42	19	33
Sediment Contributions (Tons/Acre)									
Cropland	0.1	0.4	0.2	0.5	0.4	0.1	0.2	0.3	0.3
Sand & Gravel Pits	0.3			0.0					
Mined Land			0.1	2.2					4.5
Developing Urban Land	0.0		0.3	0.0					0.0
Critical Areas	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Gullies	0.0			0.0					0.0
Stream Banks	0.0		0.0	0.0	0.1	0.1	0.0	0.0	0.0
Dirt Roads and Roadbanks	1.3	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.4
Woodlands	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Total Sediment	1.8	0.5	0.7	**3.1**	0.6	0.2	0.3	0.4	**5.3**
Potential for Sediment NPS	Low	Low	Low	**Mod.**	Low	Low	Low	Low	**High**
Current NPS Project	----	----	----	----	----	----	----	----	----
Septic Tanks									
# Septic Tanks per acre*	0.01	0.03	0.04	0.02	0.01	0.00	0.00	0.02	0.02
# Septic Tanks Failing per acre*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
# of Alternative Septic Systems	0	0	0	0	0	0	0	0	0
Resource Concerns in the Subwatershed									
Excessive Erosion on Cropland	X	X	X	X	X	X	X	X	X
Gully Erosion on Agricultural Land	X								X
Road and Roadbank Erosion	X			X		X			X
Poor Soil Condition (cropland)	X			X					X
Excessive Animal Waste Applied to Land	X			X					X
Excessive Pesticides Applied to Land									
Excessive Sediment from Cropland	X	X	X	X	X	X	X	X	X
Excessive Sediment From Roads/Roadbanks	X			X	X	X	X		X
Excessive Sediment from Urban Development									
Inadequate Management of Animal Wastes	X			X					X
Nutrients in Surface Waters	X			X		X	X		X
Pesticides in Surface Waters									
Livestock Commonly have Access to Streams	X	X	X	X	X	X	X	X	X

Table 4a, cont. Sedimentation estimates by source, forest condition, septic tank information and resource concerns by subwatershed in the Guntersville Lake (0603-0001) cataloging units as provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets (1998).

Basin Code- Cataloging Unit	0603-0001								
Subwatershed	**170**	**180**	**190**	**200**	**210**	**220**	**230**	**240**	**250**
Forest Condition									
% of Subwatershed Needing Forest Improvement	26	16	29	29	27	20	19	25	32
Sediment Contributions (Tons/Acre)									
Cropland	0.6	0.8	0.6		0.3	1.1	0.8	0.2	0.8
Sand & Gravel Pits			0.1						
Mined Land		1.9			0.0	0.0	1.2		1.0
Developing Urban Land		0.0	0.0		0.1	0.0	0.0	0.2	0.0
Critical Areas	0.0	0.0	0.0		0.0	0.7	0.0	0.2	0.7
Gullies		0.1				0.0		0.1	0.2
Stream Banks	0.0	0.0	0.0		0.0	0.0	0.0	0.1	0.1
Dirt Roads and Roadbanks	0.0	0.3	0.0	0.0	0.0	0.5	0.0	0.0	0.9
Woodlands	0.0	0.2	0.0	0.0	0.0	0.0	0.1	0.2	0.2
Total Sediment	0.6	**3.4**	0.7	0.1	0.5	**2.5**	**2.2**	0.9	**3.8**
Potential for Sediment NPS	Low	**Mod.**	Low	Low	Low	**Mod**	**Mod.**	Low	**Mod.**
Current NPS Project	----	----	----	----	----	Sand Mtn	----	----	Sand Mtn
Septic Tanks									
# Septic Tanks per acre*	0.02	0.03	0.05	0.00	0.01	0.04	0.02	0.09	0.04
# Septic Tanks Failing per acre*	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.06	0.01
# of Alternative Septic Systems	0	0	0	0	0	300	0	0	400
Resource Concerns in the Subwatershed									
Excessive Erosion on Cropland	X	X	X	X	X	X	X		X
Gully Erosion on Agricultural Land		X							
Road and Roadbank Erosion	X	X			X	X		X	X
Poor Soil Condition (cropland)		X				X			X
Excessive Animal Waste Applied to Land		X				X			X
Excessive Pesticides Applied to Land									
Excessive Sediment from Cropland	X	X	X	X	X	X			X
Excessive Sediment From Roads/Roadbanks	X	X			X	X		X	X
Excessive Sediment from Urban Development							X	X	
Inadequate Management of Animal Wastes		X				X		X	X
Nutrients in Surface Waters	X	X			X	X		X	X
Pesticides in Surface Waters					X				
Livestock Commonly have Access to Streams	X	X	X	X	X	X	X		X

Table 4a, cont. Sedimentation estimates by source, forest condition, septic tank information and resource concerns by subwatershed in the Guntersville Lake (0603-0001) cataloging units as provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets (1998).

Basin Code- Cataloging Unit	0603-0001						
Subwatershed	**260**	**270**	**280**	**290**	**300**	**310**	**320**
Forest Condition							
% of Subwatershed Needing Forest Improvement	22	26	19	8	16	6	20
Sediment Contributions (Tons/Acre)							
Cropland	0.7	0.7	0.7	0.8	1.0	0.5	0.2
Sand & Gravel Pits						0.6	
Mined Land						0.1	
Developing Urban Land	0.1	0.1	0.1	0.3	0.2	0.0	0.1
Critical Areas	0.2	0.7	0.6	0.8	0.4	0.2	0.1
Gullies	0.2	0.3	0.2	0.5	0.2	0.2	0.1
Stream Banks	0.3	0.2	0.4	0.9	0.5	0.3	0.1
Dirt Roads and Roadbanks	0.2	1.4	0.5	0.5	0.2	0.1	0.1
Woodlands		0.0	0.0		0.1	0.1	0.2
Total Sediment	1.7	**3.5**	**2.4**	**3.8**	**2.5**	**2.1**	0.9
Potential for Sediment NPS	Low	**Mod**	**Mod**	**Mod.**	**Mod.**	**Mod.**	Low
Current NPS Project	----	Sand Mtn	Sand Mtn	----	----	----	----
Septic Tanks							
# Septic Tanks per acre	0.03	0.05	0.05	0.08	0.02	0.05	0.05
# Septic Tanks Failing per acre	0.03	0.02	0.02	0.06	0.02	0.04	0.04
# of Alternative Septic Systems	0	0	76	0	0	0	0
Resource Concerns in the Subwatershed							
Excessive Erosion on Cropland		X	X				
Gully Erosion on Agricultural Land			X				
Road and Roadbank Erosion		X	X		X		X
Poor Soil Condition (cropland)		X	X				
Excessive Animal Waste Applied to Land	X	X	X		X		
Excessive Pesticides Applied to Land							
Excessive Sediment from Cropland		X	X				
Excessive Sediment From Roads/Roadbanks		X	X				X
Excessive Sediment from Urban Development					X		
Inadequate Management of Animal Wastes	X	X	X	X	X		
Nutrients in Surface Waters	X	X	X	X	X	X	X
Pesticides in Surface Waters							
Livestock Commonly have Access to Streams	X	X	X	X			

Table 5a. Estimation of Potential Sources of NPS Impairment for subwatersheds in the Guntersville Lake Cataloging Unit (0603-0001). Source categories are based upon information provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets completed in 1998, and from Construction Stormwater Authorization information provided by the Mining and NPS Unit of ADEM.

Subwatershed	Potential NPS Impairment	Final Project Priority+	Potential Sources of Impairment							
			Urban	Mining	Forestry Practices	Development	Sedimentation	Animal Husbandry	Pasture Runoff	Row Crops
060	M	M	L		L	M	L	L	M	M
080	M				L		M	M	M	L
100	L				L		L	L	L	M
120	L	L			L		L	L	L	L
140	L				L		L	L	L	L
150	M		L		L		L	L	M	M
160	M	M			L	L	H	H	L	L
170	M	M			L	L	L	L	M	M
180	H				L	L	M	H	M	H
190	M		L		L	M	L	L	M	M
200	L				L		L	L	L	L
210	M				L		L	L	M	M
220	H				L	M	M	H	H	H
230	M				L	L	M	H	M	M
240	L				L	M	L	L	L	L
250	H				L	L	M	H	H	M
260	L				L		L	H	L	L
270	H				L	L	M	H	H	H
280	H		L		L	H	M	H	H	M
290	M				L		M	H	M	M
300	H	H	L		L	H	M	L	M	M
310	M				L	H	M	L	M	L
320	L				L	L	L	L	L	L

+ Final Priority may not coincide with estimated impairment potential; aquatic life use impairment determined the priority. SWCD information was not received until after final priority was assigned.

Table 6a Physical characteristic estimates for sites assessed in the Guntersville Lake cataloging unit (0603-0001).

		Station										
		BENJ-003	LCNJ-002	LCNJ-36	FLRJ-004	MUDJ-006	BYTJ-001	BYTJ-001	STND-001	STND-001	SSCD-001	KIRD-001
Subwatershed #		060	120	120	160	170	180	180	220	220	220	220
Date (YYMMDD)		980728	980728	980728	980728	980728	980519	980706	980519	980706	980519	980519
Width (ft)		12	---	30	20	30	50	50	30	30	35	50
Canopy Cover*		MS		MS	MO	MS	MS	MS	MS	MS	MO	MO
Depth (ft)	Riffle	0.3		0.3	0.2	---	0.5	0.5	0.5	0.5	0.8	1.0
	Run	1.0		1.0	0.5	1.5	1.0	1.0	1.5	1.5	1.0	1.5
	Pool	1.5		>2.5	2.5	2.5	1.5	1.5	>2.5	>2.5	1.5	2.0
Substrate (%)	Bedrock	0		0	81	0	80	80	65	65	55	80
	Boulder	0		2	1	1	10	10	10	10	5	2
	Cobble	10		3	5	1	2	2	8	8	9	2
	Gravel	10		20	5	17	2	2	6	6	9	1
	Sand	65	Not Wadeable	62	5	60	3	3	5	5	15	4
	Silt	5		3	1	3	1	1	3	3	2	10
	Detritus	10		10	2	8	2	2	2	2	5	1
	Clay	0		0	0	10	0	0	1	1	0	0
	Org. Silt	0		0	0	0	0	0	0	0	0	0

		Station	
		STGD-001	BGSM-022
Subwatershed #		220	300
Date (YYMMDD)		980519	980728
Width (ft)		30	25
Canopy Cover*		50/50	S
Depth (ft)	Riffle	1.0	0.5
	Run	1.5	1.0
	Pool	2.0	2.0
Substrate (%)	Bedrock	60	0
	Boulder	5	0
	Cobble	10	20
	Gravel	5	20
	Sand	15	50
	Silt	2	3
	Detritus	3	7
	Clay	0	0
	Org. Silt	0	0

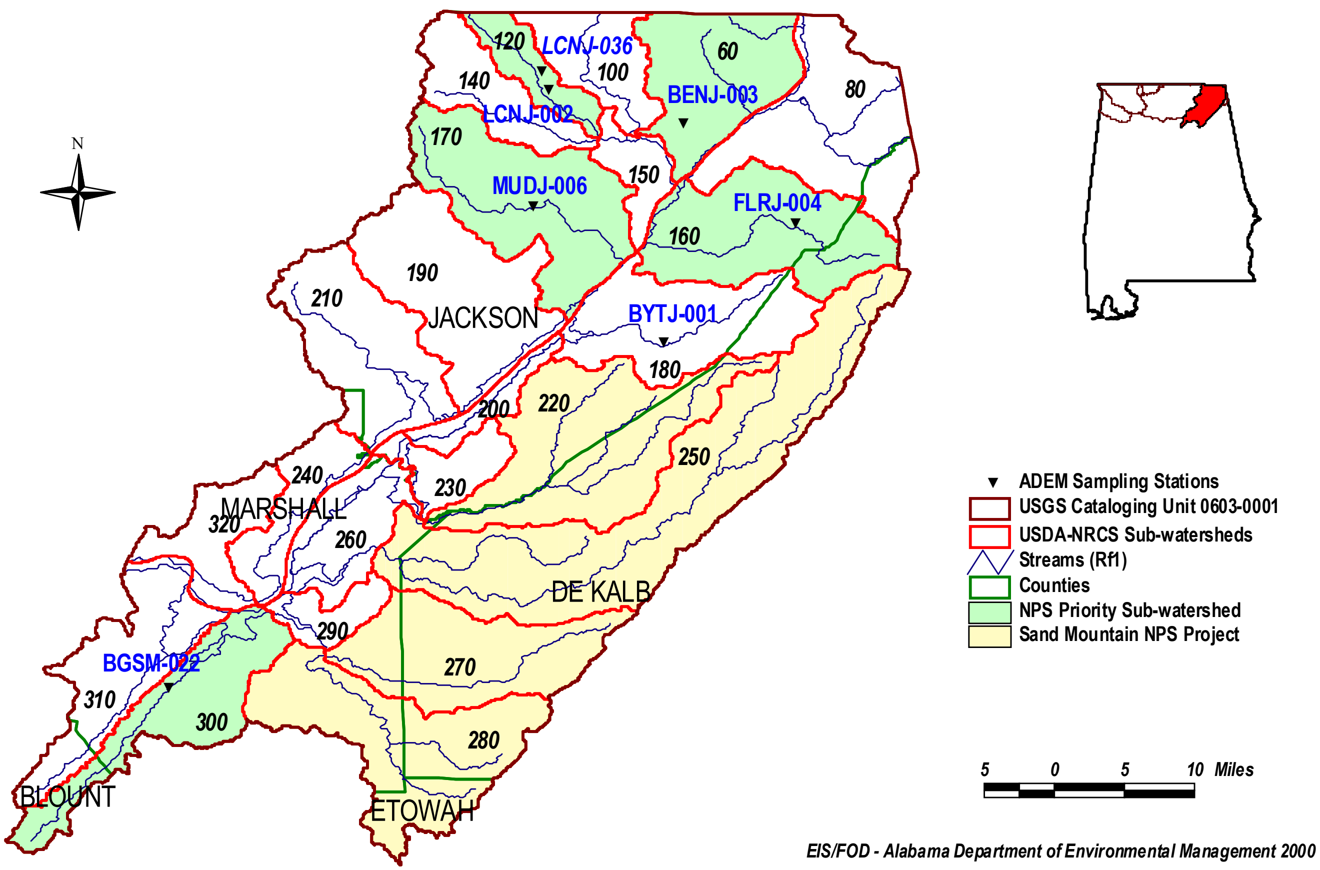
* S = Shaded, MS = Mostly Shaded, 50/50 = est. half shaded, MO = Mostly Open, O = Open

Table 7a. Habitat quality from the Guntersville Lake cataloging unit (0603-0001). In order to compare levels of habitat degradation between stations, values given for each of three major habitat parameter categories are presented as percent of maximum score. (* Stations part of the ADEM Monitoring of State Parks Project)

	Station									
Parameter	BENJ-003	LCNJ-036	FLRJ-004	MUDJ-006	BYTJ-001	STND-001*	SSCD-001*	KIRD-001*	STGD-001*	BGSM-22
Subwatershed #	060	120	160	170	180	220	220	220	220	300
Habitat Assessment Form^	GP	RR	RR	GP	RR	RR	RR	RR	RR	RR
Date (YYMMDD)	980728	980728	980728	980728	980519	980519	980519	980519	980519	980728
Instream Habitat Quality	52	53	54	56	81	79	83	76	79	79
Sediment Deposition	81	70	74	81	88	85	63	78	70	61
% Sand	*65*	*62*	*5*	*60*	*3*	*5*	*15*	*4*	*15*	*50*
% Silt	*5*	*3*	*1*	*3*	*1*	*3*	*2*	*10*	*2*	*3*
Sinuosity	38	55	70	55	88	93	78	93	90	80
Bank and Vegetative Stability	54	58	89	41	90	79	85	86	90	53
Riparian Zone Measurements	68	49	88	71	90	50	90	83	90	80
% Canopy Cover+	MS	MS	MO	MS	MS	MS	MO	MO	50/50	S
% Maximum Score	59	61	71	63	87	78	82	83	84	72
Ecoregion /Subregion	68b	68c	68d	68b	68d	68d	68d	68d	68d	71g
Habitat Quality Category	Good	Good	Excellent	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
EPT Taxa Collected	---	---	---	---	16	11	14	11	12	---
Aq. Macroinvertebrate Assess.*	---	---	---	---	Good	Fair	Good	Fair	Good	---
Fish IBI	---	---	---	---	24	28	20	22	28	---
Fish Assessment*	---	---	---	---	Very Poor/ Poor	Poor	Very Poor	Very Poor	Poor	---

* Conducted as part of the "Monitoring of Watersheds Associated with Alabama State Parks" (1999)
+S = Shaded; MS = Mostly Shaded; 50/50 = Approx. Half Shaded; MO = Mostly Open; O = Open
^ RR = Riffle Run; GP = Glide Pool (ADEM 1999)

Figure 4a. ADEM Water Quality Sampling Stations and NPS Priority Subwatersheds in the Lake Guntersville Cataloging Unit (0603-0001) of the Tennessee River Basin



Section II: Wheeler Lake Cataloging Unit (0603-0002)

The Wheeler Lake Cataloging Unit drains thirty-six (36) sub-watersheds located within Jackson, Madison, Marshall, Morgan, Limestone, Cullman, Lawrence and Lauderdale Counties (Fig. 4b). The cataloging unit mostly drains portions of the Interior Plateau (71f, g) and Southwestern Appalachians (68a, c, d, e) Ecoregions (Fig. 5) (Griffith et al. 1999 Draft) that consist primarily of the Limestone Valleys and Uplands, and smaller amounts of the Appalachian Plateau soil areas (NRCS 1997).

Historical Data/Studies

A review of existing data indicated that bioassessments have been conducted recently within twenty-nine (29) of the thirty-six (36) sub-watersheds in the cataloging unit (Table 9b and Appendices G-1, G-2). Two nonpoint source projects are ongoing in the Flint Creek and Paint Rock River sub-watersheds. In 1998-99, ADEM assessed biological, chemical physical and habitat conditions as part of the Paint Rock River NPS Watershed Project. Assessments were also conducted in 1992, and again in 1995, to monitor water quality in relation to implementation of BMPs in the sub-watersheds of Flint Creek (ADEM 1996). Two (2) locations were monitored as part of the ADEM State Parks Assessment (Appendix F-5) (ADEM 1999d). Six (6) sites (four on the Tennessee River) were assessed as part of the ADEM 1996 Clean Water Strategy (Appendix F-7) (ADEM 1999a). Ten (10) sites were visited and assessed using water quality parameters as part of the ADEM ALAMAP (Alabama Monitoring and Assessment Program) program (ADEM, unpublished data) (Appendix F-6). TVA conducted water quality assessments during 1997 at forty-seven (47) sites in nineteen (19) sub-watersheds under contract with ADEM (Appendix F-8) (TVA 1998b). Approximately 24 sub-watersheds contain segments on Alabama's 1998 §303(d) list of impaired waterbodies (Table 11). The majority of those are listed due to impairment from nonpoint sources (ADEM 1999c).

Study Area

Twelve (12) of the thirty-six (36) sub-watersheds in the Wheeler Lake Cataloging Unit were included in this project (Appendix H). Eight (8) sub-watersheds were already part of the Paint Rock Creek NPS watershed project (020, 040, 050, 060, 070, 080, 090, 100) and are discussed where appropriate (ADEM 1999f). The Flint Creek NPS watershed project (ADEM 1996g) included four (4) sub-watersheds (330, 340, 350, 360). Twelve sub-watersheds were not considered in this study due to relatively small drainage area and location in a backwater area near the reservoir (420), or contained suspected urban runoff (210, 230, 240, 250, 260, 370, 380, 390), or lacked available biological data (110, 200, 280) (Appendix H).

Conservation Assessment Worksheets

Based on the conservation assessment worksheets completed by the local SWCDs in 1998, the primary land-uses throughout the Wheeler Lake cataloging unit were forestland (43%), pastureland (28%), cropland (18%), urban land (7%), and open water (4%) (Table 12b). Approximately 310,000 acres of crop and pastureland (~18% of total land area) were treated with pesticides and/or herbicides (Table 13). Animal production (Table 13) was dominated by poultry (0.06 AU/Acre) and cattle (0.10 AU/Acre). The highest estimated contributions to the sediment loading in the CU (Table 14) were from developing urban land, cropland and critical areas (0.72, 0.49, 0.44 tons/acre/yr., respectively). Seventeen (17) sub-watersheds were listed as priorities by the local SWCD in public meetings conducted during 1998 (070, 100, 160, 200, 210, 220, 270, 300, 320, 330, 340, 350, 360, 390, 400, 410, 420). The overall potential for nonpoint source impairment in the cataloging unit was estimated as *high* based upon estimates of potential from the selected source categories. Indicators of development and estimates of row crop land-use in addition to sedimentation rates, animal unit densities and pasture land-use in the CU contributed to the *high* estimation of potential (Table 15). Erosion and sediment from croplands, nutrients and pesticides in surface waters, and animals commonly having access to streams, were indicated as the most common concerns within the sub-watersheds (ASWCC 1998).

Habitat Quality

Habitat quality (Table 7b) was assessed at nine (9) stations during the Tennessee Basin NPS screening project. Forty-four (44) stations were assessed for habitat quality as part of the assessment of §303(d) streams conducted in conjunction with the screening project. Additional sites were assessed in 1998 in conjunction with the State Parks Assessment Project (NLYW-1, FIRW-1) (Table 7b) and the Paint Rock NPS Project (10) (Appendix 4c). In order to compare all assessments, habitat parameters are presented as the percent of maximum score. Habitat Quality at thirty-nine (39) stations was assessed as *excellent*. Fifteen (15) stations were assessed as having *good* habitat quality; while nine (9) and two (2) stations were assessed as having *fair* and *poor* habitat quality, respectively.

Historical Biological Assessments

Ninety-five (95) historical Fish IBI assessments (1991-97) and thirty-four (34) aquatic macroinvertebrate assessments were available from twenty-nine (29) sub-watersheds (Table 7b, Appendix G-1) (TVA 1998, GSA 1998). In addition, two (2) aquatic macroinvertebrate bioassessments were conducted by ADEM during the 1998 State Parks Study. Of the one-hundred-thirty-eight (138) bioassessments conducted at approximately ninety-one (91) stations, two (2%) stations were assessed as having an *excellent* biological community. Thirteen (14%) and twenty-four (26%) stations were assessed as having *good* and *fair* biological communities, respectively. Fifty-two (57%) stations were assessed as having *poor* biological communities (Appendix G-1). Of these fifty-two (52) stations, two (2) are located in sub-watersheds included in the Paint Rock River NPS Watershed project, and nineteen (19) are located in the Flint Creek NPS Project sub-watersheds. In an addition, seven (7) stations were included in sub-watersheds containing urbanized areas. Twenty (20) sub-watersheds contained stations having *poor* biological communities. Of these, nine (9) sub-watersheds were not already included in a NPS project or part of an 'urban' sub-watershed.

Priority Sub-watersheds

Based on these results, nine (9) priority sub-watersheds were identified (Appendix J). A summary for each sub-watershed in the cataloging unit is provided below.

Sub-Watershed: Estill Fork

NRCS Sub-Watershed Number 020

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
HURR-1	Macroinv., Chem., Habitat	1998, 1999	Hurricane Creek @Jackson Co Rd 141	45	F&W
5394-1	Fish, Habitat/ Chem.	1994 1997	Hurricane Creek @Private Property (RM 2.7)	45	F&W
ESTL-1	Macroinv., Chem., Habitat	1998	Estill Fork @Jackson Co Rd 141		F&W
3734-1	Fish, Habitat	1994	Estill Fork @ Private Land (RM 1.8)	47	F&W
3734-2	Fish, Macroinv., habitat	1995	Estill Fork @ end of Jackson Co. Rd 175 (RM 7.3	23	F&W

Percent land cover of the Estill Fork sub-watershed was estimated as 1% transitional forest, 81% deciduous forest, 2% evergreen forest, 9% mixed forest, 4% pasture/hay, and 3% row crop (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were very similar to EPA data. No current construction/stormwater authorizations or NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *low* (0.01 AU/Acre). Sedimentation estimates (Table 4b) indicated a *low* potential for NPS impairment (0.1 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *low*.

The Estill Fork sub-watershed drains approximately 59 mi^2 in Jackson County. Five stream reaches have been evaluated by TVA and ADEM from 1994-98. This sub-watershed is included in the Paint Rock River NPS watershed Assessment Project; therefore, no additional assessments were conducted during this project.

<u>Estill Fork</u>

Three assessments on the Estill Fork have been conducted. The fish communities were evaluated by TVA as being in *fair/good* (3734-2) and *good*/*excellent* (3734-1) condition and an aquatic macroinvertebrate assessment rated station 3734-2 as *good* (Appendices G-1 and G-2). Water quality, habitat, and aquatic macroinvertebrate assessments were also conducted by ADEM at ESTL-1 in 1998 during the Paint Rock River NPS Watershed Project (Appendix F-4c). Estill Fork, at the ESTL-1 sampling reach, had a partly-open/partly-shaded canopy and was dominated by cobble (~40%) and gravel (~40%) with lesser amounts of sand (~10%) substrates. Habitat quality was assessed as *excellent* using the riffle/run assessment matrix with the 'riparian zone measurement' category indicating slight impairment. Eighteen EPT genera were collected indicating an *excellent* aquatic macroinvertebrate community. Water quality data collected from 1997-99 (Appendices F-4a and F-4b) 'did not show impairment but indicated periodic nutrient enrichment. Seasonal pasture use upstream of the sampling point could contribute to the elevated nutrients' (ADEM 1999f).

Hurricane Creek

Two biological assessments were conducted on Hurricane Creek. TVA assessed the fish community as *good/excellent* at station 5394-1 (Appendix G-1). TVA collected monthly water quality data from June to October of 1997 that indicated no causes for impairment. Assessments of the aquatic macroinvertebrate community, habitat, and water quality were conducted by ADEM at HURR-1 in 1998 during the Paint Rock River NPS Watershed Project (Appendix F-4c).

Hurricane Creek, at the HURR-1 sampling reach, had a partly-open/partly-shaded canopy and was dominated by sand (~70%), with lesser amounts of gravel (~10%), cobble (~5%) and boulder (~7%) substrates. Habitat quality was assessed as *good* using the riffle/run assessment matrix. 'Sediment deposition' and the 'riparian zone measurement' categories indicated slight impairment, with all categories having a generally lower score than ESTL-1. Twenty-three EPT genera were collected indicating an *excellent* aquatic macroinvertebrate community. ADEM water quality data collected from 1997-99 (Appendices F-4a and F-4b) 'did not show impairment but does indicate recurrent nutrient enrichment' (ADEM 1999f).

Sub-Watershed: Larkin Fork

NRCS Sub-Watershed Number 040

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
LARK-1	Macroinv., Chem., Habitat	1998	Larkin Fork Off Hwy 65 nr Halls Chapel in Jackson Co.		F&W
6087-1	Fish, Habitat/ Macroinv.	1994, 1999/ 1999	Larkin Fork @Private land along Hwy 27 before 1st T (RM2.6)	40	F&W

Percent land cover of the Larkin Fork sub-watershed was estimated as 85% deciduous forest, 3% evergreen forest, 8% mixed forest, 3% pasture/hay, and 2% row crop (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were similar to EPA data. No current construction/stormwater authorizations or NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *low* (0.02 AU/Acre). Sedimentation estimates (Table 4b) indicated a *low* potential for NPS impairment (0.1 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *low*.

The Larkin Fork sub-watershed drains approximately 33 mi^2 in Jackson County. Two reaches in this sub-watershed, both on Larkin Fork, were assessed from 1994-1999. This sub-watershed is included in the Paint Rock River NPS watershed Assessment Project; therefore, no additional assessments were conducted during this project.

Larkin Fork

The fish community was evaluated by TVA as being in *good/excellent* (1994) and *good* (1999) condition (Appendix G-1). The aquatic macroinvertebrate assessment also conducted in 1999 found the community to be excellent. Water quality, habitat, and aquatic macroinvertebrate assessments were conducted by ADEM at LARK-1 in 1998 during the Paint Rock River NPS Watershed Project (Appendix F-4c).

Larkin Fork, at the LARK-1 sampling reach, had a partly-open/partly-shaded canopy and was dominated by gravel (~50%) with lesser amounts of sand (~25%) and cobble (~15%) substrates. Habitat quality was assessed as *excellent* using the riffle/run assessment matrix. Fifteen EPT genera were collected indicating an *excellent* aquatic macroinvertebrate community. Water quality data collected from 1997-99 (Appendices F-4a and F-4b) indicated some nutrient enrichment and intermittent elevated fecal coliform counts (ADEM 1999f).

Sub-Watershed: Lick Fork

NRCS Sub-Watershed Number 050

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
DRYJ-1	Macroinv., Chem., Habitat	1998	Dry Creek @Hwy 65 Crossing In Jackson Co.		F&W
3368-1	Fish, Habitat,/ Chem.	1994/ 1997	Dry Creek @County Rd 504 (RM 1)	14	F&W
LICK-1	Macroinv., Chem. Habitat	1998	Lick Fork @Jackson Co Rd 3		F&W
6384-1	Fish, Habitat/ Chem.	1994/ 1997	Lick Fork @Hwy 65 Bridge Crossing (RM1)	18	F&W

Percent land cover of the Lick Fork sub-watershed was estimated as 81% deciduous forest, 2% evergreen forest, 8% mixed forest, 4% pasture/hay, 5% row crop, and 1% wetland (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were very similar to EPA data. No current construction/stormwater authorizations or NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *low* (0.01 AU/Acre). Sedimentation estimates (Table 4b) indicated a *low* potential for NPS impairment (0.1 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *low*.

The Lick Fork sub-watershed drains approximately 70 mi^2 in Jackson County. Four stream reaches have been evaluated by TVA and ADEM from 1994-99. This sub-watershed is included in the Paint Rock River NPS watershed Assessment Project; therefore, no additional assessments were conducted during this project.

<u>Dry Creek</u>

Two biological assessments were conducted on Dry Creek. TVA used a fish IBI method to assess the fish community as *fair* at station 3368-1 (Appendix G-1). Assessments of the aquatic macroinvertebrate community, habitat, and water quality were conducted by ADEM at DRYJ-1 in 1998 during the Paint Rock River NPS Watershed Project (Appendix F-4c).

Dry Creek, at the DRYJ-1 sampling reach, had a mostly-shaded canopy and was dominated by sand (~41%) and gravel (~41%) substrates. Habitat quality was assessed as *excellent* using the riffle/run assessment matrix. The bank and vegetative stability category indicated slight impairment. Twenty EPT genera were collected indicating an *excellent* aquatic macroinvertebrate community. ADEM Water quality data collected from 1997-99 (Appendices F-4a and F-4b) 'indicated recurrent nutrient enrichment' (ADEM 1999f). The herbicides atrazine, and metolachlor were detected in water quality samples collected in May and June of 1998, respectively. TVA water quality data collected during 1997 (Appendix F-8a) also indicated slightly elevated NO2/NO3 and TKN concentrations and elevated fecal coliform counts (range 290 to 1,360 col/100 ml).

Lick Fork

Two biological assessments have been conducted on the Lick Fork. The fish community was evaluated by TVA as being in *good* condition using a fish IBI assessment (Appendix G-1). Water quality data, collected by TVA in 1997, indicated slightly elevated nutrient concentrations (Appendix F-8a). Water quality, habitat, and aquatic macroinvertebrate assessments were also conducted by ADEM at LICK-1 in 1998 during the Paint Rock River NPS Watershed Project (Appendix F-4c).

Lick Fork, at the LICK-1 sampling reach, had a mostly-open canopy and was dominated by sand (~50%) and gravel (~43%) substrates. Habitat quality was assessed as *excellent* using the riffle/run assessment matrix. Nineteen EPT genera were collected indicating an *excellent* aquatic macroinvertebrate community. Water quality data collected from 1997-99 (Appendices F-4a and F-4b) 'indicated nutrient enrichment but did not indicate impairment. Pasture activities in the watershed may be the source of elevated nutrient' concentrations (ADEM 1999f). The pesticides atrazine, metolachlor, and pendimethalin were detected in samples collected during the June 1998 site visit.

Sub-Watershed: Guess Creek

NRCS Sub-Watershed Number 060

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
GUES-1	Macroinv., Chem., Habitat	1998	Guess Creek nr Jackson Co Rd 20	28	F&W
4641-1/ TN442	Fish/ Chem.	1991, 1994/ 1997	Guess Creek @ Private Land (RM 3.6)	28	F&W
4641-2	Macroinv., Habitat/ Chem.	1996/ 1997	Guess Creek @Little Nashville	5	F&W

Percent land cover of the Guess Creek sub-watershed was estimated as 77% deciduous forest, 2% evergreen forest, 6% mixed forest, 7% pasture/hay, and 8% row crop (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were somewhat higher for pasture land-use (14%). No current construction/stormwater authorizations or NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *low* (0.02 AU/Acre). Sedimentation estimates (Table 4b) indicated a *low* potential for NPS impairment (0.2 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *low*.

The Guess Creek sub-watershed drains approximately 34 mi^2 in Jackson County. A segment of Guess Creek was added by EPA to Alabama's 1998 §303(d) list due to pathogens, unknown toxicity and organic enrichment/dissolved oxygen impairments (Table 11). Since this sub-watershed is included in the NPS Assessment Project. No additional assessments were conducted during this project.

Guess Creek

Two stream reaches of Guess Creek (4641-1, 4641-2) were assessed by TVA as having *good* fish (1994) and *fair* aquatic macroinvertebrate communities (1996), respectively (Appendices G-1 and G-2). Water quality data, collected at both stations by TVA in 1997 (Appendix F-8a), indicated low dissolved oxygen concentrations at station 4641-1 in September and October; and at 4641-2 in August and September. Nutrients were elevated (NH3-N - 0.36 mg/l and NO2/NO3 – 0.49 mg/l) in June at station 4641-2 during high stream flow (133 cfs). Fecal coliform counts were elevated in September (660 col/100ml) at station 4641-1 and in October at stations 4641-1 and 4641-2 (3080 and 400 col/100 ml, respectively).

Water quality, habitat, and aquatic macroinvertebrate assessments were also conducted by ADEM at GUES-1 in 1998 during the Paint Rock River NPS Watershed Project (Appendix F-4c). Guess Creek, at the GUES-1 sampling reach, had a mostly-shaded canopy and was dominated by sand (~58%) with lesser amounts of detritus (~30%) and gravel (~10%) substrates (Appendix F-4c). Habitat quality was assessed as *good* using the riffle/run assessment matrix. 'Instream habitat quality' and 'bank vegetative stability' were the categories contributing to slight impairment of the habitat quality (Appendix F-4c). Fifteen EPT genera were collected indicating an *excellent* aquatic macroinvertebrate community. Water quality data collected from 1997-99 (Appendices F-4a and F4b) 'did not indicate impairment, but did indicate periodic nutrient enrichment. Possible sources of nutrients and fecal coliform include a stable and row crops in the watershed' (ADEM 1999f).

Sub-Watershed: Upper Paint Rock River

NRCS Sub-Watershed Number 070

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
CSPR-1 (CSPJ-070)	Macroinv., Habitat, Chem.	1998	Cole Spring Branch @Al Hwy 65 Bridge	10	F&W
2466-1	Fish, Habitat	1994	Cole Spring Branch @ Bridge on Private land, (RM1)	9	F&W
CSPJ-072	Habitat	1998	Shanty Branch		F&W

Percent land cover of the Upper Paint Rock River sub-watershed was estimated as 1% transitional forest, 54% deciduous forest, 3% evergreen forest, 10% mixed forest, 13% pasture/hay, 16% row crop, 2% wetlands and 1% high intensity commercial/

industrial/transportation (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were somewhat lower for row crops (10%) and pasture land-uses (5%). One current construction/stormwater authorization has been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *low* (0.05 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4b) indicated a *moderate* potential for NPS impairment (2.1 tons/acre), mostly from 'critical areas'. The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *moderate*. The Upper Paint Rock River was also given a 5th priority sub-watershed rating by the local SWCD.

The Upper Paint Rock River sub-watershed drains approximately 52 mi^2 in Jackson, Madison and Marshall Counties. A 2.1 mile reach of Cole Spring Creek is on the 1998 §303(d) list of impaired waters for Alabama. One stream reach of Cole Spring Branch was assessed by TVA in 1994 as having a *poor* fish community. Water quality, habitat, and aquatic macroinvertebrate assessments were also conducted by ADEM at CSPR-1 in 1998 during the Paint Rock River NPS Watershed Project (Appendix F-4c). Since this sub-watershed is included in the NPS Assessment Project, no additional assessments were conducted during the screening part of this project. However, an additional site on Shanty Branch was selected for assessment related to the §303(d) status of Cole Spring Creek. It was not flowing during any of the three sampling visits to the area during May-September, 1998.

Cole Spring Branch, at the CSPR-1 (~CSPJ-070) sampling reach, had an open canopy and was dominated by sand (~65%) with lesser amounts of organic silt (~15%) and clay (~10%) (Appendix F-4c). Habitat quality was assessed as *fair* using the glide/pool assessment matrix. Four EPT genera were collected indicating a *poor* aquatic macroinvertebrate community. Water quality data collected from 1997-99 (Appendices F-4a and F-4b) indicates impairment. Elevated nutrient concentrations and fecal coliform counts, detectable pesticide concentrations, and dissolved oxygen concentrations (2.5 mg/l), below the Fish and Wildlife Use classification criteria of 5.0 mg/l, have been recorded.

Sub-Watershed: Clear Creek

NRCS Sub-Watershed Number 080

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
CLER-1/ 2305-1/ TN439	Macroinv., Chem. Habitat/ Fish, Habitat/ Fish/ Chem.	1998/ 1994/ 1991/ 1997	Clear Creek @HWY 65	17	F&W

Percent land cover of the Clear Creek sub-watershed was estimated as 83% deciduous forest, 1% evergreen forest, 6% mixed forest, 8% pasture/hay, and 2% row crop (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were similar to EPA data. No current construction/stormwater authorizations or NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *low* (0.05 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4b) indicated a *low* potential for NPS impairment (0.2 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *low*.

The Clear Creek sub-watershed drains approximately 18 mi^2 in Jackson County. Since this sub-watershed is included in the NPS Assessment Project, no additional assessments were conducted during the screening part of this project.

Clear Creek

One stream reach of Clear Creek has been assessed from 1991-98. GSA evaluated this reach in 1991 (TN439) as having a *good* fish community. The fish community was determined to be in *fair* condition (2305-1) when it was assessed again in 1994 by TVA. Water Quality data collected by TVA in 1997 indicated slightly elevated nutrients (NO2/NO3, TKN) and elevated fecal coliform counts (range 330 to 1140 col/100ml) (Appendix F-8).

Water quality, aquatic macroinvertebrate, and habitat assessments were conducted by ADEM at station CLER-1 during the Paint Rock River NPS Watershed Project (1998) (Appendices F-4a, F-4b, F-4c). Clear Creek, at the CLER-1 sampling reach, had a partly-open/partly-shaded canopy and was dominated by sand (~45%) and gravel (~45%). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix. Sinuosity and riparian zone measurements were the categories of slight impairment to the habitat quality. The aquatic macroinvertebrate community was also assessed as *excellent*. Water quality data collected from 1997-99 did not indicate impairment but did indicate elevated fecal coliform and nutrient enrichment.

Sub-Watershed: Little Paint Creek

NRCS Sub-Watershed Number 090

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
6675-1	Fish, Habitat	1994	Little Paint Creek @ Jackson Co rd 108 Bridge to AL Hwy 63	37	F&W
LPNT-1/ 6675-2	Macroinv., Habitat, Chem. / Fish, Habitat	1998/ 1996	Little Paint Creek @AL Hwy 63	51	F&W
12460-1	Fish, Habitat/ Chem.	1994/ 1997	Yellow Branch @ 1st bridge on Hwy 8 (RM1.9)	14	F&W
12460-2	Fish/ Chem.	1996/ 1997	Yellow Branch @ AL Hwy 63 Bridge	15	F&W

Percent land cover of the Little Paint Creek sub-watershed was estimated as 55% deciduous forest, 5% evergreen forest, 17% mixed forest, 11% pasture/hay, and 9% row crop (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were somewhat higher for row crops (14%) and pasture land-uses (19%). One municipal NPDES permit and two current construction/stormwater authorizations have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed

(Table 3b) were *moderate* (0.15 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4b) indicated a *low* potential for NPS impairment (1.5 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *low*.

The Little Paint Creek sub-watershed drains approximately 57 mi^2 in Jackson and Marshall Counties. Four reaches on two streams, Little Paint Creek and Yellow Branch, have been assessed from 1994-98. A 2.0-mile segment of Little Paint Rock Creek is included on Alabama's 1998 §303(d) list (Table 11). This sub-watershed is included in the Paint Rock River NPS Assessment; therefore, no additional assessments were conducted during this project.

Little Paint Creek

Two stream reaches of Little Paint Creek (6675-1, 6675-2) were assessed by TVA as having *good* (1994), and *fair/good* (1996) fish communities, respectively. Water quality, habitat, and aquatic macroinvertebrate assessments were also conducted by ADEM at LPNT-1 in 1998 during the Paint Rock River NPS Watershed Project (Appendix F-4c).

Little Paint Creek, at the LPNT-1 sampling reach, had an open canopy and was dominated by bedrock (~58%) with lesser amounts of sand (~20%) and gravel (~10%) (Appendix F-4c). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix. Twelve EPT genera were collected indicating a *good* aquatic macroinvertebrate community. Water quality data collected from 1997-99 (Appendices F-4a and F-4b) 'indicate nutrient enrichment but do not indicate impairment. Seasonal pastures are located adjacent to both sides of the stream. Cattle have direct access to the stream and the elevated nutrient concentrations may correspond to the times of the year that the cattle are grazed in the pasture (ADEM 1999f).

Yellow Branch

Two stream reaches of Yellow Branch (12460-1, 12460-2) were assessed by TVA as having *fair* (1994), and *good* (1996) fish communities, respectively. Water quality assessments were also conducted by TVA at both Yellow Branch locations in 1997 (Appendix F-8a). Water quality data indicated some nutrient enrichment (NO2/NO3, TKN) and elevated fecal coliform counts at stations 12460-1 and 12460-2 of 1,880 and 2,140 col/100ml, respectively.

Sub-Watershed: Lower Paint Rock River

NRCS Sub-Watershed Number 100

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
6676-1	Fish, Habitat/ Macroinv.	1999, 1994/ 1999	Little Paint Rock Creek @Merrill Road Bridge	9	F&W
LPRK-1 (LPRM-090)	Habitat, Chem./ Macroinv., Chem., Habitat	1998	Little Paint Rock Creek @ unnamed Marshall Co. Rd, S of Hwy 431 nr Hebron	9	F&W
LPRM-091	Habitat, Chem.	1998	Little Paint Rock Creek @ unnamed Marshall Co. Rd nr Robertson	7	F&W
PTRK-1	Chem.	1998	Paint Rock River @unnamed Marshall Co. Rd north of Hwy 431 nr New Hope		F&W
8421-1	Fish, Habitat, Macroinv. / Chem.	1995/ 1997	Paint Rock River @Butler Mill Road Bridge	387	F&W
TN486	Fish	1993	Paint Rock River @Marshall Co. T5S, R3E, S27		F&W

Percent land cover of the Lower Paint Rock River sub-watershed was estimated as 39% deciduous forest, 6% evergreen forest, 16% mixed forest, 15% pasture/hay, 18% row crop, 2% wetland, and 2% open water (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were higher for pasture land-uses (24%). One current construction/stormwater authorization, one current mining and one municipal NPDES permit have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *moderate* (0.23 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4b) indicated a *moderate* potential for NPS impairment (2.8 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *moderate*. The Lower Paint Rock River was also given a 4th priority sub-watershed rating by the local SWCD.

The Lower Paint Rock River sub-watershed drains approximately 94 mi^2 in Jackson, Madison, and Marshall Counties. Approximately five reaches of the Little Paint Rock Creek and the Paint Rock River have been assessed from 1993-99. A site visit was made to an unnamed tributary to the Paint Rock River as part of the 1998 ALAMAP project; it was not flowing (Appendices E-1 and F-6). This sub-watershed is included in the Paint Rock River NPS watershed Assessment Project; therefore, no additional assessments were conducted during this project.

Little Paint Rock Creek

Three assessments on the Little Paint Rock Creek have been conducted. The fish community was evaluated by TVA as being in *poor* (1994) and *poor/fair* (1999) condition (Appendix G-1). Water quality, habitat, and aquatic macroinvertebrate assessments were also conducted by ADEM at LPRK-1 in 1998 during the Paint Rock River NPS Watershed Project (Appendix F-4c).

Little Paint Rock Creek, at the LPRK-1 (~LPRM-090) sampling reach, had a mostly-shaded canopy and was dominated by clay (~60%) and gravel (~20%) substrates (Appendix F-4c). Habitat quality was assessed as *good* using the riffle/run assessment matrix with the riparian zone quality category indicating *moderate* impairment. Eleven EPT genera were collected indicating a *good* aquatic macroinvertebrate community. Water quality data collected from 1997-99 (Appendices D-1 F-4a, F-4b) 'indicate impairment. Cattle have direct access to the creek both upstream and downstream of the sampled reach indicating a possible source of nutrient enrichment' (ADEM 1999f). Water samples collected in May through August of 1998 indicated intermittent elevated concentrations of NO2/NO3, TKN and TPO4.

Water quality and habitat data were collected at LPRM-091 in 1998 (Appendix D-1). Assessment of habitat indicated *fair* overall habitat quality with the channel substrate estimated at about ~93% sand with an open canopy. Elevated fecal coliform counts (>1200 & >6000 col./100ml), TKN, NO2/NO3 and TPO4 concentrations indicated potential nutrient impairment.

Paint Rock River

Three assessments were conducted on the Paint Rock River. GSA (1993) assessed the fish community from a reach on the Paint Rock River (TN486) as being in *good* condition. In 1995, TVA assessed the fish community at station 5394-1 as *fair/good* and the aquatic macroinvertebrate community as *fair* (Appendix G-1). Water quality data were collected by TVA in June through October 1997 from station 8421-1. The nitrite/nitrate concentrations were slightly elevated during all sampling events (Appendix F-8a). Fecal coliform concentrations ranged from 80 to 2,120 colonies per 100 ml. No pesticides or herbicides were detected in the July 1997 sample (Appendix F-8b).

Water quality assessments were conducted by ADEM at PTRK-1 (1997-99) during the Paint Rock River NPS Watershed Project (Appendices F-4a and F-4b). No biological assessments were conducted since the reach was not wadeable. ADEM water quality data indicated nutrient enrichment and included a dissolved oxygen concentration (4.5 mg/l) below the Fish and Wildlife Criteria of 5.0 mg/l during low-flow conditions (ADEM 1999f). The herbicide atrazine was detected in both the May 1998 (3.170 ug/l) and May 1999 (1.01 ug/l) water quality samples.

Sub-Watershed: Shoal Creek

NRCS Sub-Watershed Number 110

Percent land cover of the Shoal Creek sub-watershed was estimated as 34% deciduous forest, 8% evergreen forest, 18% mixed forest, 19% pasture/hay, 16% row crop, 2% wetland and 1% open water (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs indicated an urban land-use (5%); the remaining land-uses were similar. Two current construction/stormwater authorizations, one current mining, one semi-public/private and two industrial NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *moderate* (0.24 AU/Acre), with broiler poultry being the dominant animal. Sedimentation estimates (Table 4b) indicated a *low* potential for NPS impairment (1.2 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *moderate*. The Shoal Creek sub-watershed drains approximately 59 mi^2 in Marshall County. Neither TVA nor GSA have conducted any assessments in this sub-watershed, therefore this sub-watershed could not be ranked and no assessments were conducted during this screening project.

Sub-Watershed: West Fork Flint River

NRCS Sub-Watershed Number 130

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
11778-1	Fish, Habitat, Macroinv.	1999, 1995	West Fork of Flint River @ Walker Creek at Fish	37	F&W

Percent land cover of the West Fork of the Flint River sub-watershed was estimated as 12% deciduous forest, 1% evergreen forest, 6% mixed forest, 23% pasture/hay, 45% row crop, and 12% wetland (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were higher for urban (5%) and pasture (53%) land-uses and lower for row crops (23%). This may be do to rotation of pastureland to cropland during the time of the satellite over flight. One current construction/stormwater authorization has been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *low* (0.05 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4b) indicated a *low* potential for NPS impairment (1.3 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *moderate*.

The West Fork of the Flint River sub-watershed drains approximately 16 mi^2 in Madison County. One stream reach of West Fork was assessed by TVA as having a *fair* (1994-1995) and *good* (1999) fish community (Appendix G-1). The aquatic macroinvertebrate community was determined to be *good* in 1995 and *poor/fair* in 1999 (Appendix G-2). No additional assessments were conducted during this screening project.

Sub-Watershed: Upper Flint River

NRCS Sub-Watershed Number 140

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
4015-3	Fish, Habitat/ Chem.	1994/ 1997	Flint River @Patterson Rd Bridge (Walela Canoe)	130	F&W
4015-4	Fish	1999	Flint River		

Percent land cover of the Upper Flint River sub-watershed was estimated as 16% deciduous forest, 3% evergreen forest, 9% mixed forest, 17% pasture/hay, 46% row crop, and 7% wetland (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were lower for row crops (31%) and higher for pasture land-uses (34%). Three current construction/stormwater authorizations and two semi-public/private NPDES permit have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *low* (0.13 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4b) indicated a *moderate* potential for NPS impairment (2.4 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *moderate*.

The Upper Flint River sub-watershed drains approximately 35 mi^2 in Madison County. Two stream reaches of the Flint River have been assessed by TVA as having *fair* fish communities (4015-3, 4015-4) (Appendix G-1).

Water chemistry samples were collected at station 4015-3 by TVA in 1997. Nutrient (NO2/NO3) concentrations were slightly elevated (range 0.79-0.95 mg/l) during all sampling events; fecal coliform counts were elevated during the September and October site visits (2720, 1100 col/100 ml, respectively). A site visit was made to the Flint River as part of the 1998 ALAMAP project (Appendix E-1). Water Quality data collected in August indicated elevated nitrite/nitrate concentrations (1.641 mg/l) and fecal coliform counts (440 col/100ml) (Appendix F-6). No additional assessments were conducted during this screening project.

Sub-Watershed: Mountain Fork of the Flint River

NRCS Sub-Watershed Number 160

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
MTNM-162/ 5005-1	Habitat, Chem./ Fish, Habitat, Macroinv./ Chem.	1998/ 1995/ 1997	Hester Creek above Confl with Mtn Fk @ New Market Bridge	40	F&W
MTNM-160/ 7891-1	Habitat, Chem./ Fish, Habitat, Macroinv.	1998/ 1994	Mountain Fork @ Subdivision (Landfill) (RM1.8)	83	F&W
MTNM-161/ 7891-2	Habitat, Chem./ Fish, Habitat/ Chem.	1998/ 1995/ 1997	Mountain Fork above confl. with Hester Ck @New Market Bridge	32	F&W
MTNM-163	Habitat, Chem.	1998	Mountain Fork @ unnamed Madison Co rd nr New Market/Jones Cemetery	22	F&W

Percent land cover of the Mountain Fork of the Flint River sub-watershed was estimated as 43% deciduous forest, 1% evergreen forest, 7% mixed forest, 16% pasture/hay, 31% row crop, and 1% wetland (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were lower for row crops (19%) and higher for pasture land-uses (28%). One current construction/stormwater authorization and one semi-public/private NPDES permit have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *moderate* (0.25 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4b) indicated a *high* potential for NPS impairment (5.5 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *high*. Mountain Fork of the Flint River was also given a 1st priority sub-watershed rating by the local SWCD.

The Mountain Fork of the Flint River sub-watershed drains approximately 66 mi^2 in Madison County. The entire reach of Mountain Fork, from the Flint River confluence to its source, is included on the 1998 §303(d) list for Alabama with a non-attainment status due to siltation, pathogens, and organic enrichment/DO from pasture grazing (Table 11). In 1999, EPA added a segment of Hester Creek to the 1998 §303(d) list due to nutrients, siltation and organic enrichment/dissolved oxygen impairment. Four reaches in the watershed were assessed during this project. In addition, a site visit was made to Dry Creek as part of the 1998 ALAMAP project; it was not flowing (Appendices E-1 and F-6).

<u>Hester Creek</u>

One stream reach of Hester Creek was assessed by TVA in 1995 (5005-1) and had a fish community that was in *very-poor/poor* condition and an aquatic macroinvertebrate community that was in *fair* condition (Appendices G-1 and G-2). Hester Creek, at the MTNM-162 sampling reach had a mostly-shaded canopy and was dominated by bedrock (~58%) with lesser amounts of boulder (~10%) and cobble (~15%) substrates (Table 6b). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix. Water quality data was collected at this site by TVA in 1997 and by ADEM in 1998. This data

(Appendices D-1, F-8a) indicated that nitrite/nitrate, total phosphate and TKN were elevated to varying degrees. Detectable concentrations of the herbicide atrazine (0.127 ug/l) were found in a July 1998 water sample (Appendix D-2).

Mountain Fork

Two reaches of Mountain Fork were assessed by TVA from 1994-99. The fish community of station 7891-1 was determined to be *poor* and the aquatic macroinvertebrate community was assessed to be in *fair* condition (Appendix G-2). Mountain Fork, at the MTNM-160 sampling reach, had an open canopy and was dominated by bedrock (~40%) substrates (Table 6b). The habitat quality was assessed as *excellent* using the riffle/run assessment matrix (Table 7b).

The fish community of station 7891-2 was determined to be *very-poor/poor (1995)* and *poor* (1999). The aquatic macroinvertebrate community was assessed to be in *poor* condition (Appendix G-2). Mountain Fork, at the MTNM-161 sampling reach, had mostly-shaded canopies and was dominated by bedrock (~60%) substrates (Table 6b). The habitat quality was assessed as *excellent* using the riffle/run assessment matrix (Table 7b).

Mountain Fork at MTNM-163 had an estimated stream width of 10-15 feet with an open canopy and was dominated by cobble (~40%), with lesser amounts of gravel (~30%), sand (~15%), and boulder (~10%) substrates (Table 6b). Habitat quality was assessed as excellent (Table 7b).

Water quality data were collected by TVA at station 7891-2 in 1997 (Appendix F-8a) and by ADEM (MTNM-161) in 1998 (Appendix G-1). Additional data were collected at MTNM-160 and MTNM-163 in 1998 (Appendix G-1). All three stations had elevated nutrient concentrations (NO2/NO3, TKN, TPO4). Station 7891-2 had elevated NH3 concentrations (0.38 –1.4 mg/l) and fecal coliform counts (3,840 -5,200 col/100ml) (Appendix F-8a). No pesticides or herbicides (Appendices D-2 and F-8b) were detected at the time of water quality sampling.

Recommended Priority Sub-Watershed

Mountain Fork of the Flint River was identified as a priority sub-watershed due to biological and chemical conditions within the watershed (Table 17, Appendix J).

Sub-Watershed: Brier Fork of the Flint River

NRCS Sub-Watershed Number 180

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
BVDM-017/ 580-1	Habitat, Chem./ Fish, Habitat, Macroinv./ Chem.	1998/ 1999, 1995/ 1997	Beaverdam Creek @ Hwy 431 Bridge (RM2.7)	34	F&W
BFFM-182	Habitat, Chem.	1998	Brier Fork @unnamed Madison Co Rd nr Hazel Green and Shiloh Church	22	F&W
1370-1	Fish, Habitat, Macroinv./ Chem.	1999, 1995/ 1997	Brier Fork @Brier Fork road Bridge (RM1.4)	28	F&W
BFFM-181/ 1370-2	Habitat, Chem./ Fish, Habitat, Macroinv./Chem.	1998/ 1995/ 1997	Brier Fork @Meridianville Bottom Rd Bridge (RM4.8)	54	F&W
BFFM-180	Habitat, Chem.	1998	Brier Fork @unnamed Madison Co Rd just us of Flint R. confl.	106	F&W
1370-3	Fish, Habitat/ Chem.	1994/ 1997	Brier Fork @ Private Property (RM13.5)	109	F&W

Percent land cover of the Brier Fork of the Flint River sub-watershed was estimated as 10% deciduous forest, 3% evergreen forest, 6% mixed forest, 22% pasture/hay, 48% row crop, 9% wetland, and 1% low intensity residential (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were lower for row crops (35%) and higher for pasture land-uses (45%). Seven current construction/stormwater authorizations and one semi-public/private NPDES permit have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *low* (0.05 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4b) indicated a *high* potential for NPS impairment (4.2 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *high*. A 3.9 mile segment of Brier Fork is included on the 1998 §303(d) list for Alabama due to unknown toxicity and siltation from non irrigated crop production (Table 11).

The Brier Fork of the Flint River sub-watershed drains approximately 104 mi^2 in Madison County. Four stream reaches were assessed by TVA in 1994-95 as having *poor* or *poor/fair* fish communities. Water samples were collected for analysis from these stations in 1997. Water quality and habitat assessments were also conducted by ADEM at two of these and two additional reaches during 1998 (Table 10).

<u>Beaverdam Creek</u>

Beaverdam Creek, at the BVDM-017 sampling reach, had a shaded canopy and was dominated by sand (~30%) and cobble (~26%) with slightly lesser amounts of gravel

(~20%) and silt (~15%) substrates (Table 6b). Habitat quality was assessed as *excellent* using the glide/pool assessment matrix (Table 7b). Fish and aquatic macroinvertebrate assessments conducted by TVA in 1995 evaluated the communities to be in *poor* and *poor/fair* condition, respectively. TVA collected water quality samples in 1997 at station 580-1. Data indicated elevated nitrite/nitrite concentrations ranging from 1.2 to 2.0 mg/l (Appendices F-8a and F-8b). ADEM (1998) water quality data (Appendix D-1) indicated that nitrite/nitrate (2.171 mg/l), total dissolved solids (160 mg/l) and TPO4 (0.109 mg/l) were elevated. No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling. A segment of Beaverdam Creek was added to the 1998 §303(d) list due to siltation impacts.

<u>Brier Fork</u>

Three reaches of Brier Fork were assessed by TVA in 1994-95. The fish communities of the Brier Fork sites were determined to be in *poor* (1370-1, 2) and *poor/fair* (1370-3) condition (Appendices G-1 and G-2). The fish community of station 1370-1 was reassessed in 1999 as *fair*. The aquatic macroinvertebrate communities of stations 1370-1 and 1370-2 were assessed to be in *fair* and *good* condition, respectively.

Brier Fork, at the BFFM-180 had *excellent* habitat quality (Table 7b). The channel was dominated by bedrock (~50%) with lesser amounts of gravel (~15%), boulder (~10%), and sand (~10%) substrates (Table 6b). The canopy was open over the stream channel with approximately 1-foot riffle depths and a 75ft channel width.

Brier Fork at BFFM-181 had a shaded canopy over a 20ft wide stream dominated by cobble (~35%) and gravel (~30%) substrates and had *excellent* habitat quality using the glide/pool assessment matrix (Tables 6b and 7b).

The stream channel at station BFFM-182 was approximately 30 feet wide with a mostly-shaded canopy. The habitat quality was assessed as *excellent* using the glide/pool assessment matrix (Table 7b). The bottom substrate was estimated to consist of cobble (~20%), gravel (~25%), sand (~15%), detritus (~15%), boulder (~10%), and silt (~10%) substrates (Table 6b).

Water quality data were collected by TVA at station 1370-1, -2 and -3 in 1997 (Appendix F-8a). All three stations had elevated nutrient concentrations (NO2/NO3, TKN). Elevated fecal coliform counts were recorded from 1370-2 (1780, 2900 col/100ml) and 1370-3 (720 col/100ml (Appendix F-8a).

Water quality data were collected by ADEM at stations BFFM-180, -181, -182 in 1998 (Appendix D-1). All three stations had elevated nutrient concentrations (NO2/NO3, TKN). Elevated fecal coliform counts were recorded BFFM-182 (630 col/100ml) (Appendix D-1). The herbicides Atrazine and Metolachlor were detected at each station sampled by ADEM during 1998 (Appendix D-2). Atrazine concentrations as high as 2.48 ug/l were measured in water column samples collected from BFFM-182 during the May sampling event. Detectable concentrations (MDL = 0.005mg/l) of Lead, Cadmium, Zinc, Mercury, and Copper were found in water column samples at all three locations (Appendix D-2).

Recommended Priority Sub-Watershed

Brier Fork of the Flint River was identified as a priority sub-watershed due to biological and chemical conditions within the watershed (Table 17, Appendix J).

Sub-Watershed: Middle Flint River

NRCS Sub-Watershed Number 190

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
2157-1	Fish, Habitat, Macroinv.	1995	Chase Creek @Private Property (RM0.9)	8	F&W
CHSM-190	Habitat, Chem.	1998	Chase Creek @unnamed Madison Co. Rd just us of Flint R Confl.	8	F&W

Percent land cover of the Middle Flint River sub-watershed was estimated as 30% deciduous forest, 4% evergreen forest, 10% mixed forest, 18% pasture/hay, 35% row crop, 2% wetland, 1% open water, 1% other grasses, 1% low intensity residential, and 1% high intensity commercial/industrial/ transportation (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were lower for row crops (17%) and higher for pasture land-uses (41%). Eight current construction/stormwater authorizations, one municipal and one semi-public/private NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *low* (0.05 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4b) indicated a *moderate* potential for NPS impairment (3.2 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *high*. A 2.7 mile segment of Chase Creek is on the 1998 §303(d) list for Alabama.

The Middle Flint River sub-watershed drains approximately 51 mi^2 in Madison County. One stream reach of Chase Creek was assessed by TVA in 1995 as having a *poor* fish community, and a *poor/fair* aquatic macroinvertebrate community. Water quality and habitat assessments were also conducted by ADEM at or near the same reach during 1998 (Table 10).

Chase Creek, at the CHSM-190 sampling reach, had a shaded canopy and was dominated by gravel (~58%) with lesser amounts of cobble (~20%) and sand (~10%) substrates (Table 6b). Habitat quality was assessed as *excellent* in May using the glide/pool assessment matrix (Table 7b). Subsequent visits to this site (July, September) found a reach dominated by intermittent pools. Water quality data collected in May (Appendix D-1) indicated that nitrite/nitrate and TDS concentrations, and fecal coliform counts were elevated (0.877 and 197 mg/l; 350 col/100ml, respectively). No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling.

Recommended Priority Sub-Watershed

Middle Flint River was identified as a priority sub-watershed due to biological and chemical conditions within the watershed (Table 17, Appendix J).

Sub-Watershed: Hurricane Creek

NRCS Sub-Watershed Number 200

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
5392-1	Chem.	1997	Hurricane Creek		F&W
5392-2	Chem.	1997	Hurricane Creek		F&W

Percent land cover of the Hurricane Creek sub-watershed was estimated as 54% deciduous forest, 3% evergreen forest, 10% mixed forest, 14% pasture/hay, and 17% row crop (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were lower for row crops (8%) and higher for pasture land-uses (32%). Six current construction/stormwater authorizations and one municipal NPDES permit have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *low* (0.09 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4b) indicated a *low* potential for NPS impairment (1.3 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *moderate*. Hurricane Creek was also given a 5th priority sub-watershed rating by the local SWCD.

The Hurricane Creek sub-watershed drains approximately 74 mi^2 in Jackson and Madison Counties. A segment of Hurricane Creek was added by EPA to the 1998 § 303(d) list due to impairment by pathogens. No quantitative TVA fish IBI assessments were available for analysis. In 1997, TVA conducted water quality assessments of two reaches (5392-1, -2) on Hurricane Creek (Appendices E-1 and F-8). Water samples at 5392-1 and 5392-2 had elevated nutrients during the July, and September/October sampling event, respectively. Elevated fecal coliform counts were made in August through October (1240, 3520, 900 col./100ml) during low-flow sampling events. No additional assessments were conducted during this project.

Sub-Watershed: Lower Flint River

NRCS Sub-Watershed Number 210

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
872-1	Fish, Habitat, Macroinv. Chem.	1995/ 1997	Big Cove Creek @ Old Hwy 431 Bridge RM1.4	9	F&W
TN609	Fish	1993	Flint River @T5S, R1E, S13		F&W
4015-2	Fish, Habitat, Macroinv./ Chem.	1995/ 1997	Flint River @Owens Crossroad (Chickasaw Canoe) (RM12.1)	513	F&W
4402-1	Fish, Habitat, Macroinv./ Chem.	1995/ 1997	Goose Creek @old Hwy 431 Bridge (RM1.3)	13	F&W
12457-2	Fish, Habitat, Macroinv./ Chem.	1995/ 1997	Yellow Bank Creek @Hobbs Island Road Bridge (RM1.2)	8	F&W

Percent land cover of the Lower Flint River sub-watershed was estimated as 1% transitional forest, 38% deciduous forest, 5% evergreen forest, 13% mixed forest, 13% pasture/hay, and 21% row crop, 7% wetland, and 1% open water (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were higher for urban (5%) and pasture land-uses (31%). Seven current construction/stormwater authorizations and two municipal NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *low* (0.12 AU/Acre), with cattle and broiler poultry being the dominant animals. Sedimentation estimates (Table 4b) indicated a *high* potential for NPS impairment (4.8 tons/acre), predominately from developing urban land. The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *high*. Lower Flint River was also given a 2nd priority sub-watershed rating by the local SWCD.

The Lower Flint River sub-watershed drains approximately 94 mi^2 in Jackson and Madison Counties. A segment of the Lower Flint River was added by EPA to the 1998 §303(d) list due to organic enrichment/dissolved oxygen impairments (Table 11). The fish communities of five stream reaches were assessed from 1993-1995 by TVA and GSA. Water quality data were collected and aquatic macroinvertebrate assessments were conducted at four of the reaches by TVA in 1997 and 1995, respectively. No additional assessments were conducted during this project due to the location of the city of Huntsville in the upper watershed.

<u>Big Cove Creek</u>

The fish community at Big Cove Creek (872-1) was assessed as *poor/fair* while the aquatic macroinvertebrate community was in *fair* condition. Water quality data (Appendix F-8a) indicated only slight nutrient enrichment and elevated fecal coliform counts (range

130 to 1600 col/100ml) during low stream flow. No pesticides or herbicides were detected at the time of water quality sampling by TVA in 1997 (Appendix F-8b).

Flint River

Two fish IBI assessments, conducted on the Flint River, indicated the communities of TN609 (1993) and 4015-2 (1995) were in *good* and *poor* condition, respectively. The aquatic macroinvertebrate community was assessed by TVA to be in *fair* condition with eight EPT families collected (Appendix G-2). Water quality data were collected at station 4015-2 during 1997; elevated nitrite/nitrate concentrations (range 0.68 to 1.8 mg/l) were detected at each of the five sampling events from June to October (Appendices F-8a and F-8b).

Goose Creek

A mile segment of Goose Creek is included on the 1998 §303(d) list in non-attainment status, due to unknown toxicity, and organic enrichment/D.O. from agriculture sources (Table 11). Goose Creek was assessed by TVA in 1995, using fish IBI (*poor*) and aquatic macroinvertebrate assessments (*fair*). Water quality data collected by TVA in 1997 (Appendix F-8a) indicated no-flow conditions during the September and October sampling events. Dissolved oxygen concentrations of 3.3 mg/l were measured during low-flow conditions in August. Nitrite/nitrate concentrations were slightly elevated (range 0.47 – 0.89 mg/l) during the June through August assessments.

Yellow Bank Creek

TVA assessed Yellow Bank Creek during 1995 and 1997. The Fish and aquatic macroinvertebrate communities (1995) were in *poor* and *fair* condition, respectively. TVA collected water quality data during 1997. Low-flow (0.1 cfs) conditions were present during the July and August visits. Dissolved oxygen concentrations of 4.8 mg/l were measured during August. Total Kjeldahl nitrogen concentrations were slightly elevated during the June and August sampling events (0.92 and 0.46 mg/l, respectively). Station visits during September and October indicated no-flow conditions. In 1999, EPA added a segment of Yellow Bank Creek to Alabama’s 1998 §303(d) list due to organic enrichment/dissolved oxygen impairment.

Sub-Watershed: Dry Creek

NRCS Sub-Watershed Number 220

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
CANM-220/ 1873-1	Habitat, Chem./ Fish, Macroinv.	1998/ 1995	Cane Creek @Greenbrier Road Bridge	13	F&W

Percent land cover of the Dry Creek sub-watershed was estimated as 1% transitional forest, 40% deciduous forest, 10% evergreen forest, 17% mixed forest, 9% pasture/hay, 13% row crop, 4% wetland, and 4% open water (Table 1b). Estimates (Table 2b) by the local SWCDs were higher for the pasture land-use (26%). Four current construction/stormwater authorizations and one semi-public/private NPDES permit has been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *low* (0.13 AU/Acre), with cattle and broiler poultry being the dominant animals. Sedimentation estimates (Table 4b) indicated a *low* potential for NPS impairment (0.6 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *moderate*.

The Dry Creek sub-watershed drains approximately 47 mi^2 in Morgan and Marshall Counties. One stream reach of Cane Creek was assessed by TVA as having a *very-poor/poor* fish community and a *poor* aquatic macroinvertebrate community. Only three EPT families were collected. Water quality assessments were also conducted by ADEM at this reach during 1998 (Table 10). A 5.1 mile segment of Cane Creek is on the 1998 §303(d) list for non-attainment due to siltation and organic enrichment/D.O. from agriculture sources.

Cane Creek

Cane Creek, at the CANM-220 sampling reach, had a mostly-open canopy (Table 6b). During the May sampling event, the stream was out of its banks. In July, there was insufficient stream flow to conduct a measurement – a logjam was present at the upstream end of the sampling reach. In September, there was also no measurable flow. Habitat quality in July was assessed as *fair* using the glide/pool assessment matrix (Table 7b). Water quality data (Appendix D-1) collected during no-measurable flow (July, September), indicated low dissolved oxygen concentrations (4.0 - 4.8 mg/l) and elevated TPO4, TKN, TDS, and TSS concentrations. No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling.

Recommended Priority Sub-Watershed

Dry Creek was identified as a *moderate* priority sub-watershed due to biological, habitat, and chemical conditions within the watershed (Table 17, Appendix J).

Sub-Watershed: Aldridge Creek

NRCS Sub-Watershed Number 230

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
ALDM-230/ 43-1	Habitat, Chem./ Fish, Habitat, Macroinv.	1998/ 1995	Aldridge Creek @Green Cove Road	19	F&W
ALDM-231	Habitat, Chem.	1998	Aldridge Creek @Green Mtn Rd.	14	F&W
ALDM-232	Habitat, Chem.	1998	Aldridge Creek @Four Mile Post Road	7	F&W

Percent land cover of the Aldridge Creek sub-watershed was estimated as 1% transitional forest, 29% deciduous forest, 7% evergreen forest, 11% mixed forest, 7% pasture/hay, 10% row crop, 2% other grasses, 13% wetlands, 8% low intensity residential, 3% high intensity residential, 2% high intensity commercial/ industrial/transportation, and 6% open water (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were higher for pasture land-uses (29%). Seven current construction/stormwater authorizations and one current mining NPDES permit have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *moderate* (0.19 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4b) indicated a *moderate* potential for NPS impairment (4.0 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *high*.

The Aldridge Creek sub-watershed drains approximately 54 mi^2 in Madison County. One stream reach of Aldridge Creek was assessed by TVA in 1995 as having *poor* fish and aquatic macroinvertebrate communities. Water quality and habitat assessments were also conducted by ADEM at this and two additional upstream reaches during 1998 relative to its §303(d) status (Table 10). The entire reach of Aldridge Creek is included on the 1998 §303(d) list with partial attainment status due to siltation and organic enrichment/D.O. impairment from rural and urban sources.

Aldridge Creek, at the ALDM-230 sampling reach, had an open canopy and was dominated by bedrock (~78%) with lesser amounts of sand (~10%) substrates (Table 6b). Habitat quality in May was assessed as *good* using the riffle/run assessment matrix. Instream habitat quality, sinuosity, and riparian zone measurements were the categories of slight to moderate impairment to the habitat quality (Table 7b). Stream flow in May was estimated at 23.5 cfs; no measurable flow was found during the July and September station visits. Water quality data collected in May (Appendix D-1) indicated that nitrite/nitrate and TDS concentrations were elevated (0.1141, and 242 mg/l, respectively). Fecal coliform counts were also elevated (540 col/100 ml). High dissolved oxygen (11.5, 12.7) concentrations during mid-day (May and July) may indicate excessive algal activity.

The ALDM-231 sampling reach, had an open canopy and was dominated by bedrock (~58%) with lesser amounts of sand (~10%), gravel (~10%), and clay (~10%) substrates (Table 6b). Habitat quality was assessed as *excellent* in May using the Riffle/run assessment matrix. Riparian Zone measurements had the greatest adverse influence on the total score (Table 7b). Field notes taken during the July site visit indicated that recent ‘channelization’ had taken place, with bulldozer tracks apparent in one-half of the reach. Gravel (~30%), silt (~30%), and cobble (~25%) were estimated to be the dominant substrates. Assessed habitat quality was only *fair* with the greatest influence coming from the sediment deposition, instream habitat quality and sinuosity categories. Stream flow was estimated at 15.8 cfs. Water quality data (Appendix D-1) indicated that nitrite/nitrate and TDS were slightly elevated (1.051 and 232 mg/l), respectively.

The ALDM-232 sampling reach, had an open canopy and was dominated by sand (~60%) and gravel (~29%) substrates (Table 6b). Habitat quality was assessed as *good* in May using the riffle/run assessment matrix. Riparian zone measurements had the greatest adverse influence on the total score (Table 7b). Stream flow was estimated at 3.4 cfs. Water quality data, also collected in May (Appendix D-1) indicated that NO2/NO2 (1.078 mg/l), TKN (0.536 mg/l), TDS (260 mg/l), and TSS (13 mg/l) concentrations and fecal coliform counts (1360 col/100ml) were elevated. Field notes taken during the July site visit indicated that no flow was measurable at the sampling reach (flow estimated at 0 cfs). The September sampling event noted recent dredging in the stream channel and very low stream flow (0.1 cfs). Water quality data collected indicted low dissolved oxygen (3.6

mg/l), and elevated TKN (1.716 mg/l) concentrations. Fecal coliform counts were also elevated at greater than 1200 col/100 ml.

Sub-Watershed: Huntsville Spring Branch

NRCS Sub-Watershed Number 240

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
5358-1	Fish, Habitat, Macroinv.	1999, 1995	Huntsville Spring Branch @Johnson Road Bridge	46	F&W
HSBM-240	Habitat, Chem.	1998	Huntsville Spring Branch @Martin Road (Redstone Arsenal)	47	F&W
HSBM-241	Habitat, Chem.	1998	Fagen Creek ds Of spring nr Von Braun Civic Center	4	F&W
HSBM-242	Habitat Chem.	1998	Pinhook Creek @Pratt Avenue	21	F&W

Percent land cover of the Huntsville Spring Branch sub-watershed was estimated as 1% transitional forest, 14% deciduous forest, 8% evergreen forest, 9% mixed forest, 5% pasture/hay, 11% row crop, 5% other grasses, 10% wetlands, 18% low intensity residential, 8% high intensity residential, 9% high intensity commercial/ industrial/transportation, 1% mining, and 2% open water (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were somewhat higher for urban (48%), and pasture land-uses (17%). Twenty-five current construction/stormwater authorizations, two current mining and three industrial NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *low* (0.03 AU/Acre). Sedimentation estimates (Table 4b) indicated a *high* potential for NPS impairment (5.9 tons/acre), mainly from developing urban land. The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *high*.

The Huntsville Spring Branch sub-watershed drains approximately 91 mi^2 in Madison County. One stream reach of Huntsville Spring Branch was assessed by TVA in 1995 as having a *poor* fish and aquatic macroinvertebrate community. Water quality and habitat assessments were conducted by ADEM at three additional reaches (Table 10).

<u>Huntsville Spring Branch</u>

Huntsville Spring Branch, at the HSBM-240 sampling reach, had an open canopy and was dominated by sand (~46%) and gravel (~30%) substrates in May (Table 6b). Habitat quality was assessed as *good* using the glide/pool assessment matrix (Table 7b). Stream flows were estimated at 56.7 cfs in May, and 9.0 and 7.0 cfs in July and September, respectively. Water quality data (Appendix D-1) indicated that nitrite/nitrate concentrations were elevated (ranged 0.444 – 1.552 mg/l) during all sampling events. Two segments of Huntsville Spring Branch are included on Alabama's 1998 §303(d) list due to urban/industrial impacts.

<u>Fagen Creek</u>

Fagen Creek, at HSBM-241 is a concrete drain with an open canopy near Von Braun Civic Center. Stream Flow estimates were 19.3, 20.6 and 2.5 cfs in May, July, and September, respectively. Water samples collected indicated elevated NO2/NO3 concentrations (1.731 to 2.041 mg/l) and elevated TPO4 concentrations in September (0.416 mg/l). Habitat quality was assessed as *poor*, as is expected for a concrete channel substrate.

Pinhook Creek

Pinhook Creek, at HSBM-242 in Huntsville, is a riffle/run dominated stream with the substrate dominated by sand (~64%) and gravel (~30%) during the May sampling event and by cobble (~50%), gravel (~25%), and sand (~15%) in July. Stream width in May was approximately four feet. Habitat quality improved from a category of *fair* in May to *good* in July. An increase in the instream habitat quality category was a large factor in the apparent improvement of the habitat assessment. Stream Flow estimates were 0.2, 4.6, and 0.3 cfs in May, July, and September, respectively. Water samples collected indicated generally elevated NO2/NO3 concentrations (0.542 to 2.294 mg/l), and elevated TPO4 and TKN concentrations during the September sampling event. One elevated pH measurement was recorded at 10.4 standard units, however no apparent cause for this value was determined.

Sub-Watershed: Indian Creek

NRCS Sub-Watershed Number 250

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
INDM-250/ 5471-1	Habitat, Chem./ Fish, Habitat, Macroinv.	1998/ 1999, 1995	Indian Creek @ Hwy 72 Bridge	42	F&W
INDM-251	Habitat, Chem.	1998	Indian Creek @unnamed Madison Co Rd nr Monrovia	12	F&W

Percent land cover of the Indian Creek sub-watershed was estimated as 17% deciduous forest, 7% evergreen forest, 11% mixed forest, 16% pasture/hay, 36% row crop, 2% other grasses, 7% wetland, 1% low intensity residential, 2% high intensity commercial/ industrial/transportation, and 1% open water (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were higher for urban (12%) and pasture (37%) and lower for row crop (22%) land-uses. Eighteen current construction/stormwater authorizations and three semi-public/private NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *low* (0.06 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4b) indicated a *high* potential for NPS impairment (5.9 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *high*.

The Indian Creek sub-watershed drains approximately 64 mi^2 in Madison County. One stream reach of Indian Creek was assessed by TVA in 1995 as having *poor* fish, and *poor/fair* aquatic macroinvertebrate communities. This reach was assessed again in 1999 and the fish community was determined to be in *poor/fair* condition (Appendix G-1).

Water quality and habitat assessments were also conducted during 1998 by ADEM at this site and an upstream reach (Table 10). One 6.9 mile segment of Indian Creek is on the 1998 Alabama §303(d) list of impaired waters due to nonpoint sources (Table 11).

Indian Creek

Indian Creek, at the INDM-250 sampling reach, had a partly-shaded/partly-open canopy and was dominated by cobble (~59%) with lesser amounts of gravel (~20%) and sand (~10%) substrates (Table 6b). Habitat quality was assessed as *excellent* in May, using the riffle/run assessment matrix (Table 7b). Stream flow was estimated at 39.9, 7.0, and 3.2 cfs in May, July and September, respectively. Water quality data (Appendix D-1) indicated that nitrite/nitrate concentrations were elevated (ranged 1.066 to 1.242 mg/l).

Station INDM-251 on Indian Creek, is a riffle/run dominated stream with excellent habitat quality. The channel was shaded and dominated by cobble (~50%) and gravel (~27%) substrates during the May sampling event. Water samples collected indicated elevated NO2/NO3 concentrations in May and July (1.048 and 0.71 mg/l, respectively), and elevated TPO4 concentrations during the July and September sampling events (0.277 and 0.181 mg/l respectively) (Table D-1).

Sub-Watershed: Barren Fork Creek

NRCS Sub-Watershed Number 260

Percent land cover of the Barren Fork Creek sub-watershed was estimated as 7% deciduous forest, 3% evergreen forest, 4% mixed forest, 7% pasture/hay, 40% row crop, 5% other grasses, 23% wetland, 3% low intensity residential, 2% high intensity residential, 3% high intensity commercial/ industrial/transportation, and 4% open water (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs higher for urban (16%) and pasture (23%) and lower for row crop (30%) land-uses. Twenty-seven current construction/stormwater authorizations, one current mining and one industrial NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were very *low* (0.00 AU/Acre). Sedimentation estimates (Table 4b) indicated a *moderate* potential for NPS impairment (4.0 tons/acre), mainly from developing urban land. The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *high*.

The Barren Fork Creek sub-watershed drains approximately 43 mi^2 in Limestone and Madison Counties. No recent biological assessments were available by TVA or GSA. Due to the relatively small size and high number of construction/stormwater authorizations issued, no additional assessments were conducted during this screening project.

Sub-Watershed: Cotaco Creek

NRCS Sub-Watershed Number 270

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
CTCM-26/ 2647-2	Habitat, Chem./ Fish, Macroinv./ Chem.	1998/ 1995/ 1997	Cotaco Creek NE of Lynntown	158	S/F&W
CTCM-37	Habitat, Chem.	1998	Cotaco Creek @Morgan Co. Rd 505	136	S/F&W
HGSM-27/ 5328-1	Habitat, Chem./ Fish, Habitat, Macroinv./ Chem.	1998/ 1995/ 1997	Hughes Creek @Pines Ridge Road	12	F&W
6505-1	Fish, Habitat, Macroinv./ Chem.	1995/ 1997	Little Cotaco Ck @Saylor's Gap Rd Bridge	4	F&W
7628-1	Fish, Habitat, Macroinv./ Chem.	1995 1997	Mill Pond Creek @Matt Morrow Bridge	11	F&W
RCKM-23/ TN368	Habitat, Chem./ Fish	1998/ 1991	Rock Creek @Morgan Co. T8S, R2W, S1	6	F&W
SXMM-36	Habitat, Chem.	1998	Sixmile Creek @Morgan Co Rd 73	14	F&W
TWNM-24/ 11503-1	Habitat, Chem./ Fish, Habitat, Macroinv./ Chem.	1998/ 1995/ 1997	Town Creek @Antioch Road	36	F&W
WFCM-28/ 11770-2	Habitat, Chem./ Fish, Habitat/ Chem.	1998/ 1996/ 1997	West Fork Cotaco Creek @Ryan Bridge	25	F&W
WFCM-25	Chem.	1998/	West Fork Cotaco Creek @ Bridge ds of Confl. with Mud Creek	46	F&W
11770-1	Fish, Habitat, Macroinv./ Chem.	1995/ 1997	West Fork Cotaco Creek @ds. of Hwy 67 Bridge	51	F&W

Percent land cover of the Cotaco Creek sub-watershed was estimated as 31% deciduous forest, 11% evergreen forest, 19% mixed forest, 19% pasture/hay, 13% row crop, 4% wetland, and 2% open water (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were higher for pasture (30%) and lower for row crop (3%) land-uses. Seven current construction/stormwater authorizations, three municipal and three semi-public/private NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *moderate* (0.19 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4b) indicated a *low* potential for NPS impairment (0.6 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *moderate*. Cotaco Creek was also given a 4th priority sub-watershed rating by the local SWCD.

The Cotaco Creek sub-watershed drains approximately 276 mi^2 in Cullman, Marshall and Morgan Counties. Eight stream reaches have been evaluated using fish community assessments by either GSA or TVA from 1991 to 1995. All but one reach was determined to have a *poor* quality fish community (6505-1 – *good*). Water quality and habitat assessments were also conducted by ADEM at five of these and at two addition reaches during July of 1998 (Table 10).

Cotaco Creek

The aquatic macroinvertebrate community of 2647-2 was assessed by TVA in 1995 as having *poor/fair* quality. TVA conducted monthly water quality assessments from June to October 1997 (Appendix F-8a). These data indicated nutrient (NO2/NO3, TKN, and TPO4) concentrations were elevated to varying degrees. Ammonia nitrogen concentrations were elevated (0.44 mg/l) during the October sampling event, indicating a probable animal waste source for the elevated nutrients. Fecal coliform counts were 680 and 4100 col/100ml during widely varying stream flow conditions in September (0.0cfs) and October (121 cfs), respectively. No pesticides or herbicides were detected during water quality sampling events (Appendix F-8b).

Two sites on Cotaco Creek were assessed by ADEM in July 1998; both reaches drained large watersheds (136-158 mi^2). Cotaco Creek, at the CTCM-26 sampling reach, had an open canopy and no stream flow was detectable with a flow meter (Table 6b). Habitat quality was assessed as *fair* using the glide/pool assessment matrix (Table 7b). Water quality data (Appendix D-1) indicated that TKN and TSS concentrations were slightly elevated (0.567, 17 mg/l, respectively). No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling. An 11.8 mile segment of Cotaco Creek is on Alabama's 1998 §303(d) list with non-attainment status due to pathogens from agriculture sources (Table 11).

Cotaco Creek at station CTCM-37, is a glide/pool dominated stream with the mostly shaded canopy over a channel dominated by clay (~50%), sand (~20%), and boulder (~30%) substrates (Table 6b). Stream width in July was approximately twenty feet and habitat quality was assessed as *fair* (Table 7b). Stream Flow was estimated as 3.8 cfs. Water samples collected indicated elevated TPO4 (0.125 mg/l) and TKN (0.679 mg/l) concentrations (Appendix D-1).

Hughes Creek

One site on Hughes Creek was assessed by TVA in 1995 using aquatic macroinvertebrate and fish communities. The aquatic macroinvertebrate community was assessed to be in *fair* condition. TVA conducted monthly water quality assessments from June to October 1997 (Appendix F-8a). These data indicated nitrite/nitrate and TKN (September only) concentrations were slightly elevated. Fecal coliform counts were 600 and 460 col/100ml during September and October, respectively.

Hughes Creek was assessed by ADEM in July 1998. The station HSGM-027 sampling reach, had a mostly-shaded canopy and was dominated by sand (~85%) with lesser amounts of detritus (~13%) substrates (Table 6b). Habitat quality was assessed as *good* using the glide/pool assessment matrix (Table 7b) and stream flow was estimated at 0.5 cfs. Water quality samples revealed slightly elevated concentrations of nitrite/nitrate and TKN, and fecal coliform counts (Appendix D-1). No pesticides or herbicides

(Appendix D-2) were detected at the time of water quality sampling. EPA added a segment of Hughes Creek to the 1998 §303(d) list due to siltation impairments.

Little Cotaco Creek

One site on Little Cotaco Creek was assessed by TVA in 1995. The fish and aquatic macroinvertebrate communities were determined to be in *good* and *fair* condition, respectively. TVA conducted monthly water quality assessments from June to October 1997 (Appendix F-8a). These data indicated nitrite/nitrate, Ammonia, and TKN concentrations were slightly elevated. Fecal coliform counts could not be conducted due to interference from other bacteria. No additional assessments were conducted during this project.

Mill Pond Creek

A reach of Mill Pond Creek was assessed by TVA in 1995. The fish and aquatic macroinvertebrate communities were determined to be in *poor* and *poor/fair* condition, respectively. TVA conducted monthly water quality assessments from June to October 1997 (Appendix F-8a). These data indicated nutrient (NH3-N, NO2/NO3, TKN, TPO4, and Ortho-P) concentrations were elevated to vary degrees. Ammonia nitrogen concentrations were elevated during the June (0.13 mg/l) and July (0.08 mg/l) sampling events. Fecal coliform counts were 500, 300 and 6000 col/100ml July, September and October, respectively. A semi/public private wastewater discharge is located further upstream from this sampling reach. During the spring reconnaissance of station 7628-1, it was noted that the entire flow of the stream went underground within view from the downstream side of the bridge. No additional assessments were conducted during this project. In 1999, EPA added a segment of Mill Pond Creek to the 1998 §303(d) list due to impairment by pathogens and siltation (Table 11).

Rock Creek

One site on Rock Creek was assessed by ADEM during 1998. The fish community was found to be in *poor* condition by TVA in 1991. The shaded reach of RCKM-23 was approximately 15 feet wide and was dominated by bedrock (~74%) and sand (~10%) substrates (Table 6b). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix (Table 7b) despite the low stream flow estimated at 0.1 cfs. Water quality data (Appendix D-1) indicated that NO2/NO3 and TKN concentrations were slightly elevated (0.372, 0.424 mg/l, respectively). The herbicide Atrazine was detected (1.03 ug/l) at the time of water quality sampling (Appendix D-2).

Sixmile Creek

Water quality data were collected in July 1998 by ADEM at one site on Sixmile Creek. The stream reach was sand dominated (~81%) with a shaded canopy over an eight-foot wide channel. Habitat quality was evaluated as *poor* using the glide/pool assessment matrix. Bank stability and riparian zone measurements were categories having an adverse impact on the final assessment. Field measurements indicated low dissolved oxygen concentrations (3.9 mg/l) and low stream flow (0.2 cfs) during the sampling event. Lab analysis of water quality samples revealed elevated concentrations of total phosphate (0.117mg/l) and TKN (0.563 mg/l), and fecal coliform counts of 1620 col/100ml

(Appendix D-1). No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling.

Town Creek

One site on Town Creek was assessed by TVA in 1995 using aquatic macroinvertebrate and fish communities. The aquatic macroinvertebrate community was assessed to be in *poor/fair* condition. TVA conducted monthly water quality assessments from June to October 1997 (Appendix F-8a). These data indicated that low dissolved oxygen concentrations and low stream flows were present during assessments in August (3.9 mg/l at 1.6 cfs) and September (3.2 mg/l at 0 cfs). Nitrite/Nitrate concentrations were slightly elevated and fecal coliform counts were 1940 and 6200 col/100ml during August and October, respectively.

ADEM also conducted a water quality assessment of this reach in July 1998. The shaded reach of TWNM-24 was approximately 10 feet wide and was dominated by sand (~80%) substrates (Table 6b). Habitat quality was assessed as *good* using the glide/pool assessment matrix (Table 7b). Field measurements and water quality samples revealed a low dissolved oxygen concentration (3.5 mg/l) and low stream flow (0.6 cfs) (Appendix D-1). No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling. Town Creek, from the confluence with Cotaco Creek to its source is on Alabama's 1998 §303(d) list with non-attainment status due to Organic enrichment/DO from agriculture sources (Table 11).

West Fork Cotaco Creek

TVA conducted monthly water quality assessments from June to October 1997 at two stream reaches on the West Fork of Cotaco Creek (Appendix F-8a). The data from 11770-1, the downstream station, indicated elevated nutrient (NO2/NO3, TKN) concentrations and elevated fecal coliform counts, ranging from 590 to 6900 col/100 ml. A low dissolved oxygen concentration of 3.4 mg/l was recorded during an assessment with a 0.0 cfs stream flow. Station 11770-2, upstream of the previous station, had slightly elevated NO2/NO3 concentrations during the 1997 sampling events.

West Fork Cotaco Creek, at the WFCM-28 sampling reach, had a mostly-shaded canopy over the 15-foot wide channel dominated by sand (~78%) substrate (Table 6b). Habitat quality in July 1998 was assessed by ADEM as *fair* using the glide/pool assessment matrix. Instream habitat quality, sinuosity, and bank vegetative stability were the categories adversely affecting the habitat quality (Table 7b). Stream flow was estimated at 2.9 cfs. Water quality data (Appendix D-1) indicated that nitrite/nitrate and TKN were slightly elevated (0.52, 0.368 mg/l, respectively) and fecal coliform counts were greater than 1200 colonies per 100ml. No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling. A 7.8 mile segment of West Fork Cotaco Creek is on Alabama's 1998 §303(d) list with partial-attainment status due to pathogens from agriculture sources (Table 11).

Recommended Priority Sub-Watershed

Cotaco Creek was identified as a priority sub-watershed due to biological and chemical, and habitat quality conditions within the watershed (Table 17, Appendix J).

Sub-Watershed: Beaver Dam Creek

NRCS Sub-Watershed Number 280

Percent land cover of the Beaver Dam Creek sub-watershed was estimated as 5% deciduous forest, 2% evergreen forest, 4% mixed forest, 7% pasture/hay, 53% row crop, 1% other grasses, 19% wetland, and 10% open water (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were similar to EPA data. Six current construction/stormwater authorizations have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *low* (0.08 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4b) indicated a *moderate* potential for NPS impairment (2.4 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *moderate*.

The Beaver Dam Creek sub-watershed drains approximately 60 mi^2 in Limestone and Madison Counties. No recent assessments biological were available by TVA or GSA. No additional assessments were conducted during this NPS Screening project.

Sub-Watershed: Limestone Creek

NRCS Sub-Watershed Number 300

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
LIML-300/ 6409-3	Habitat, Chem./ Fish, Habitat, Macroinv./ Chem./ Macroinv.	1998/ 1995/ 1997/ 1999	Limestone Creek @Hwy 72 Bridge	119	F&W
6409-4	Fish, Habitat, Macroinv.	1995	Limestone Creek @Browns Ferry Road	111	F&W
LIML-301	Habitat, Chem.	1998	Limestone Creek @Nick Daus Rd nr *fair*view	96	F&W
LIML-302	Habitat, Chem.	1998	Limestone Creek @unnamed Limestone Co Rd. nr Copeland	89	F&W
6409-5	Fish, Habitat, Macroinv./ Chem.	1999, 1995/ 1997	Limestone Creek @Hwy 53 Bridge	29	F&W
6640-1	Fish, Habitat/ Chem.	1999, 1994/ 1997	Little Limestone Creek @Informal Vehicle Crossing	23	F&W

Percent land cover of the Limestone Creek sub-watershed was estimated as 13% deciduous forest, 3% evergreen forest, 6% mixed forest, 23% pasture/hay, 47% row crop, 6% wetland, and 1% open water (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were somewhat higher for pasture (34%) and lower for row crop (27%) land-uses. Twenty-four current construction/stormwater authorizations, one current mining, one municipal and five semi-public/private NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *low* (0.08 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4b) indicated a *high* potential for NPS impairment (5.6 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *high*. Limestone Creek was also given 2nd and 3rd priority sub-watershed ratings by the local SWCDs.

The Limestone Creek sub-watershed drains approximately 126 mi^2 in Limestone and Madison Counties. Four stream reaches have been assessed by TVA during 1994-95 and one additional reach (Davis Branch) was assessed as part of the ADEM ALAMAP program. Three reaches of Limestone Creek (two additional) were included in this project (Table 10, Appendices E-3 and F-6).

Limestone Creek

Limestone Creek, at the downstream station (6409-3) was assessed by TVA in 1995 as having a *very-poor/poor* fish community and a *fair* aquatic macroinvertebrate community. TVA conducted monthly water quality assessments from June to October 1997 at two stream reaches on Limestone Creek (Appendix F-8a). No pesticides or herbicides were detected during monthly sampling events in July and August. The data from 6409-3 indicated elevated nutrient (NO2/NO3, TKN), fecal coliform, and suspended solids (TSS) concentrations. Station 6409-5, upstream of the previous station, had somewhat lower NO2/NO3 concentrations during the 1997 sampling events. Fecal coliform counts ranged from 110 to 600 col/100ml. Limestone Creek, at 6409-4 was assessed by TVA in 1995 as having a *very-poor* fish community and a *poor* aquatic macroinvertebrate community.

Limestone Creek, at the LIML-300 sampling reach, had a shaded canopy over the 65-foot wide channel dominated by cobble (~30%), sand (~30%), gravel (~20%) and boulder (~10%) substrates (Table 6b). Habitat quality in May 1998 was assessed by ADEM as *excellent* using the riffle/run assessment matrix (Table 7b). Stream flows estimated in May, July and September ranged from 111 to 22 cfs. Water quality data during the three sampling events (Appendix D-1) indicated that nitrite/nitrate (0.857-0.922 mg/l) and TKN (0.264 – 0.403 mg/l) concentrations were elevated. The May and July samples contained a TPO4 concentration of 0.099 and 0.121 mg/l, respectively. No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling. A segment of Limestone Creek (including the area between LIML-300 and LIML-302) is on Alabama's 1998 §303(d) list with non-attainment status due to siltation, organic enrichment/DO from pasture grazing and non-irrigated crop production sources (Table 11).

The canopy at the LIML-301 sampling reach was partly-shaded/partly-open. The substrate was dominated by cobble (~40%), gravel (~30%), and sand (~20%) substrates (Table 6b). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix. Riparian zone measurements, and bank and vegetative stability, were the categories of slight impairment to the habitat quality (Table 7b). Stream flow estimates ranged from 97 cfs in May to 14 cfs in September. Water quality data (Appendix D-1) indicated that nitrite/nitrate (0.823–0.859 mg/l), TPO4 (0.089–0.131 mg/l) and TKN (0.249–0.814 mg/l) were elevated.

Limestone Creek, at LIML-302, was not wadeable. Water quality data during the three sampling events (Appendix D-1) indicated that nitrite/nitrate (0.808-0.851 mg/l) and TKN (0.178–0.388 mg/l) concentrations were elevated. The concentration of total Suspended solids (27 mg/l) was elevated during the May sampling event.

Little Limestone Creek

TVA conducted monthly water quality assessments from June to October 1997 at one stream reach on Little Limestone Creek (Appendix F-8a). The data from station 6640-1 indicated elevated NO2/NO3 (0.42 – 0.96 mg/l), and TKN (0.16 – 0.37 mg/l) concentrations, and fecal coliform counts ranging from 160 to 1360 col/100ml. The fish community was in *poor/fair* condition during the assessment conducted by TVA in 1994.

Recommended Priority Sub-Watershed

Limestone Creek was identified as a priority sub-watershed due to biological and chemical conditions within the watershed (Table 17, Appendix J).

Sub-Watershed: Piney Creek

NRCS Sub-Watershed Number 320

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
4124-1	Fish, Habitat, Macroinv./ Chem.	1996/ 1997	French Mill Creek @Bridge Site	7	F&W
PINL-320/ 8773-1	Habitat, Chem./ Fish, Habitat/ Macroinv.	1998/ 1994, 1999/ 1999	Piney Creek @Church Site	84	F&W
PINL-321	Habitat, Chem.	1998	Piney Creek @Limestone Co Rd 24	77	F&W
PINL-322/ 8773-2	Habitat, Chem./ Fish, Habitat, Macroinv./ Chem.	1998/ 1996, 1999/ 1997	Piney Creek @Pepper Road Bridge	60	F&W
8773-3	Fish, Habitat, Macroinv. / Chem.	1996, 1999/ 1997	Piney Creek @Limestone Co Rd 86 (Black Road)	35	F&W

Percent land cover of the Piney Creek sub-watershed was estimated as 17% deciduous forest, 2% evergreen forest, 5% mixed forest, 30% pasture/hay, 32% row crop, 11% wetland, 1% high intensity commercial/ industrial/transportation, and 1% open water (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were somewhat higher for row crops (39%). Three current construction/stormwater authorizations and two municipal NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *moderate* (0.16 AU/Acre), with cattle and broiler poultry being the dominant animals. Sedimentation estimates (Table 4b) indicated a *moderate* potential for NPS impairment (2.0 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *high*. Piney Creek was also given a 1st priority sub-watershed rating by the local SWCD.

The Piney Creek sub-watershed drains approximately 92 mi^2 in Limestone County. Five stream reaches have been evaluated by TVA and ADEM from 1994-1999. An 11.5 mile segment of Piney Creek is on the Alabama 1998 §303(d) list with partial support status due to pesticides, siltation, and organic enrichment/DO from non-irrigated crop production and pasture grazing (Table 11).

French Mill Creek

One stream reach of French Mill Creek was assessed by TVA in 1996 as having a *fair* fish community and a *poor/fair* aquatic macroinvertebrate community (Appendices G-1 and G-2). Water quality assessments were also conducted by TVA in 1997 (Appendix F-8a). Data indicated some nutrient enrichment (NO2/NO3 range 0.59 – 1.2 mg/l; TKN range 0.08 – 0.31 mg/l) and one fecal coliform sample had colony counts of 3,360 col/100ml. A segment of French Mill Creek was added to the 1998 §303(d) list due to impairment by pathogens (Table 11).

Piney Creek

Three stream reaches of Piney Creek were assessed by TVA as having *poor* (8773-1), *good* (8773-2), and *poor/fair* (8773-3) fish communities. Aquatic macroinvertebrate assessments were also conducted by TVA. Stations 8773–1 and 8773–3 had *fair* and 8773–2 had *fair/good* aquatic macroinvertebrate communities. Water quality data collected by TVA at 8773–2 and 8773-3 indicated intermittent elevated nutrient concentrations (NO2/NO3, TKN) (Appendix F-8a). Fecal Coliform counts were slightly elevated at both stations. No pesticides or herbicides were detected at station 8773-2 (Appendix F-8b).

Piney Creek, at the PINL-320 to PINL-322 sampling reaches, had mostly-open to open canopies over channels that were dominated by cobble, gravel, and sand substrates (Table 6b). Habitat quality was assessed as *excellent* at all three locations (Table 7b). Water quality data collected by ADEM in 1998 (Appendices D-1 and D-2) indicate moderate nutrient enrichment at all locations (NO2/NO3 ranged 0.504 – 0.916mg/l; TKN ranged 0.179 – 0.485). Fecal coliform counts were elevated during July at station PINL-321 (580 col/100ml) and in July and September at station PINL-322 (>1,200 and 320 col/100ml, respectively). Copper and Zinc were detected in the two downstream stations (PINL-320, PINL-321) and Zinc was detected at the upstream station (PINL-322). The plastisizer *Di(2-Ethhylhexyl)phthalate* was detected in the pesticide/herbicide sample collected at the downstream station (PINL-320) in May 1998.

Piney Creek was also sampled during the 1996 ADEM Clean Water Strategy (TN06, TN07). Water quality data indicated nutrient enrichment at both locations (Appendices E-1 and F-7).

Recommended Priority Sub-Watershed

Piney Creek was identified as a priority sub-watershed due to biological and chemical conditions within the watershed (Table 17, Appendix J).

Sub-Watershed: Upper Flint Creek

NRCS Sub-Watershed Number 330

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
2087-1	Habitat, Chem.	1997	Cedar Creek @Cedar Road Bridge		F&W
3544-1	Fish, Habitat/ Chem.	1999, 1994/ 1997	East Fork of Flint Creek @Bridge NE of Providence	9	F&W
4011-2	Fish, Habitat	1994	Flint Creek @Huckaby Bridge	134	
4011-3	Fish, Habitat	1994	Flint Creek @RM32.3	111	
5470-1	Fish, Habitat/ Chem.	1994/ 1997	Indian Creek @Hwy 31 Bridge	4	F&W
MACM-330/ 7109-1	Habitat, Chem./ Fish, Habitat	1998/ 1994	Mack Creek @Hwy 55 Bridge	6	F&W
7577-1	Fish, Habitat	1994	Mill Creek @RR Bridge (Marker 329)	20	F&W
ROBM-331	Habitat, Chem.	1998	Robinson Creek @unnamed Morgan Co Rd T8S, R4W, S11	9	F&W
9531-1	Fish, Habitat/ Chem.	1994/ 1997	Robinson Creek us of Bridge @Falkville Lagoon	9	F&W
9557-1	Fish, Habitat/ Chem.	1994/ 1997	Rock Creek @Hurricane Creek Park off HWY 31	6	F&W
9957-1	Fish, Habitat/ Chem.	1994/ 1997	Sally Mike Creek us of Lacon Rd off gravel	6	F&W
10282-1	Fish, Habitat	1998	Shoal Creek ds of Hartselle STP	14	F&W
10282-2	Fish, Habitat	1994	Shoal Creek us of Hartselle STP	12	F&W
SHLM-333	Habitat, Chem.	1998	Shoal Creek @Morgan Co. Rd 45 us. of Town Br confl.	12	F&W
SHLM-334	Habitat, Chem.	1998	Shoal Creek @unnamed Morgan Co Rd	7	F&W
SHLM-332	Habitat, Chem.	1998	Shoal Creek just us. of Flint Ck confl.	14	F&W
TWNM-335	Habitat, Chem.	1998	Town Branch @AL 36 Bridge	1	F&W

Percent land cover of the Upper Flint Creek sub-watershed was estimated as 28% deciduous forest, 9% evergreen forest, 19% mixed forest, 25% pasture/hay, 13% row crop, 3% wetland, 1% low intensity residential, and, 1% high intensity commercial/ industrial/transportation (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were somewhat higher for pasture (48%) and lower for row crop (5%) land-uses. Four current construction/stormwater authorizations, three current mining, two municipal, and two industrial NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *high* (0.86 AU/Acre), with broiler poultry being the dominant animal. Sedimentation estimates (Table 4b) indicated a *low* potential for NPS impairment (0.8 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *high*. Upper Flint Creek was also given a 1st priority sub-watershed rating by the local SWCD.

The Upper Flint Creek sub-watershed drains approximately 153 mi^2 in Cullman and Morgan Counties. Eleven streams have been assessed by TVA, GSA and ADEM from 1994-99 using fish IBI, habitat, and/or water quality assessments (Appendices G-1, G-2, F-8, F-3, F-6). Portions of nine streams are included on the Alabama 1998 §303(d) list of impaired waters due to nonpoint sources (Table 11). This sub-watershed is part of the larger Flint Creek NPS watershed project. No additional assessments were conducted for the NPS screening part of this project (Appendix H). However, four streams were assessed to determine their status with regard to water use classification and §303(d) listing purposes.

<u>Mack Creek</u>

Mack Creek was assessed by TVA in 1994 as having a *poor* fish community using a fish IBI assessment. Mack Creek, at the MACM-330 sampling reach, had a mostly-shaded canopy over the 15-foot wide channel dominated by sand (~45%), silt (~30%) and detritus (~15%) substrates (Table 6b). Habitat quality in May 1998 was assessed by ADEM as *good* using the glide/pool assessment matrix. Lack of sinuosity adversely affected the habitat quality (Table 7b). Stream flow was estimated at 1.9 cfs during the May sampling event. No flow was detected at the July or September site visit. Water quality data (Appendix D-1) indicated slightly elevated nitrite/nitrate and TKN concentrations and fecal coliform counts during the May sampling event (0.369 and 0.333 mg/l; 1960 col/100ml, respectively).

<u>Robinson Creek</u>

In 1994, TVA assessed Robinson Creek station 9531-1 as having a *poor* fish community using a fish IBI assessment. Water quality data collected by TVA in 1997 (Appendix F-8a) indicated that the same station had dissolved oxygen concentrations below the 5.0 mg/l Fish & Wildlife water quality standard in August and September (4.1 and 0.7 mg/l respectively). Nitrite/nitrite and/or TKN concentrations over the June to October sampling effort were somewhat elevated. One fecal coliform sample collected in July had a count of 2,500 col/100 ml.

Robinson Creek, at the ROBM-331 sampling reach, had a mostly-shaded canopy over the 21-foot wide channel dominated by sand (~45%), silt (~25%) and detritus (~20%) substrates (Table 6b). Habitat quality in May 1998 was assessed by ADEM as *good* using the glide/pool assessment matrix (Table 7b). Stream flows were estimated at 3.6 and 0.5 cfs during the May and July sampling events, respectively. No flow was detected at the September site visit. Water quality data (Appendix D-1) indicated elevated nitrite/nitrate (0.711 and 0.659 mg/l), TKN (0.824 and 0.531 mg/l) and TDS (189 and 196 mg/l) concentrations, and elevated fecal coliform counts (320 and 370 col/100ml) during the May and July sampling events, respectively.

Shoal Creek

In 1994 two reaches of Shoal Creek (10282-1 and 10282-2) were assessed by TVA using Fish IBI assessments; both stations were assessed as having *poor* fish communities. Three stations on Shoal Creek were assessed by ADEM in 1998. The upstream station (SHLM-334) sampling reach had a mostly-shaded canopy over an 8 foot wide channel dominated by clay (~45%), sand (~23%), and detritus (~20%) substrates (Table 6b). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix (Table 7b). Stream flow was estimated at 2.9 cfs during the May sampling event and was not detectable during the July and September site visits (Appendix D-1). Water quality data indicated slightly elevated nitrite/nitrate and TKN concentrations (0.277 and 0.375 mg/l, respectively) during the May site visit.

The SHLM-333 reach had a partly-shaded/partly-open canopy, and a boulder (~40%), sand (~25%) and cobble (~20%) dominated substrate (Table 6b). The habitat quality was *excellent* as assessed using the riffle/run habitat assessment matrix (Table 7b). Stream flow was estimated at 6.3 cfs during the May sampling event and was not detectable during the July and September site visits (Appendix D-1). Lab analysis results indicated a slightly elevated TKN concentration at the time of sampling (0.412 mg/l).

Shoal Creek, at the SHLM-332 sampling reach (downstream station), had a mostly-shaded canopy over the 28-foot wide channel dominated by sand (~40%) and bedrock (~28%) substrates (Table 6b). Habitat quality in May 1998 was assessed by ADEM as *excellent* using the riffle/run assessment matrix (Table 7b). Stream flows were from 7.7, 3.9 and 1.6 cfs during the May, July, and September sampling events, respectively. Water quality data (Appendix D-1) indicated highly elevated TKN concentrations in May (1.844 mg/l) and July (6.209 mg/l); and highly elevated NO2/NO3 (8.709 mg/l) and TPO4 (1.433 mg/l) concentrations during the September sampling event. Fecal coliform counts were >1,200 col/100ml during the July site visit. This location is downstream of the Hartselle wastewater treatment facility discharge.

Town Branch

Town Branch, at the TOWM-335 sampling reach, had a mostly-open canopy over the 1-foot wide channel (Table 6b). Habitat quality in May 1998 was assessed by ADEM as *good* using the glide/pool assessment matrix (Table 7b). The very low percentage in the sinuosity category combined with the high percentages in the bank stability and riparian zone measurement categories indicates possible historic channelization. No stream flow was detected at the May, July, or September site visits. Water quality data collected in May and July (Appendix D-1) were consistent with no-flow conditions.

Cedar Creek

Cedar Creek was assessed by TVA in 1994 at station 2087-1 as having a *fair* fish community with a fish IBI assessment score of 40 (Appendix G-1). TVA measured dissolved oxygen concentrations (Appendix F-8a) below the 5.0 mg/l Fish & Wildlife water quality standard in August and September, 1997 (4.8 and 2.0 mg/l respectively) (Appendix F-8a).

East Fork of Flint Creek

In 1994 and 1999, TVA assessed the East Fork of Flint Creek at station 3544-1 as *very/poor* and *poor*, respectively, using a fish IBI assessment (Appendix G-1). Water quality data collected monthly from June through October of 1997 indicated slightly elevated NO2/NO3 concentrations (Appendix F-8a).

Indian Creek

The fish community of Indian Creek at station 5470-1 was assessed by TVA in 1994 as being in *fair* condition (Appendix G-1). Water quality data collected monthly from June through October of 1997 indicated slightly elevated NO2/NO3 concentrations, and elevated fecal coliform counts during the September and October sampling events (Appendix F-8a).

Rock Creek

Rock Creek at station 9557-1 was assessed by TVA using a Fish IBI assessment. The fish community was determined to be in *poor* condition (Appendix G-1). Elevated NO2/NO3 concentrations were detected during sampling events conducted in June and July of 1997 (Appendix F-8a).

Sally Mike Creek

The fish community of Sally Mike Creek at station 9957-1 was assessed by TVA in 1994 as being in *fair/good* condition (Appendix G-1). Stream flows measured during monthly site visits were 22.1 cfs and 0.1 cfs in June and July. Subsequent visits detected no stream flow. The ammonia nitrogen concentration (0.11 mg/l) was elevated during the July sampling event.

Mill Creek

Mill Creek at station 7577-1 was assessed by TVA using a Fish IBI assessment. The fish community was determined to be in *poor* condition (Appendix G-1).

Flint Creek

The fish communities of Flint Creek stations 4011-2 and 4011-3 were assessed by TVA in 1994 as being in *poor/fair*, and *poor* condition, respectively (Appendix G-1).

Sub-Watershed: Crowdabout Creek

NRCS Sub-Watershed Number 340

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
2827-3	Fish, Habitat	1996	Crowdabout Creek @Private Property	7	F&W
2827-2	Fish, Habitat	1996	Crowdabout Creek @Private Property	17	F&W
2827-1	Fish, Habitat	1994	Crowdabout Creek @Hopewell Road	38	F&W
2827-4	Fish, Habitat	1996	Crowdabout Creek @New Cut Road	39	F&W

Percent land cover of the Crowdabout Creek sub-watershed was estimated 25% deciduous forest, 5% evergreen forest, 12% mixed forest, 34% pasture/hay, 13% row crop, and 10% wetland (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were higher for pasture land (61%) and lower for row crop (7%) land-uses. No current construction/stormwater authorizations or NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *high* (0.41 AU/Acre), with cattle and broiler poultry being the dominant animals. Sedimentation estimates (Table 4b) indicated a *low* potential for NPS impairment (0.7 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *moderate*. Crowdabout Creek was also given a 3rd priority sub-watershed rating by the local SWCD.

The Crowdabout Creek sub-watershed drains approximately 49 mi^2 in Cullman, Lawrence and Morgan Counties. Four stream reaches have been assessed by TVA from 1994-96 using fish IBI and habitat assessments (Appendices G-1 and G-2). All but station 2827-1 (*poor/fair*) had *poor* fish communities. Water quality assessments have been conducted by ADEM and GSA at several reaches associated with the ADEM ALAMAP program and the Flint Creek Nonpoint Source Project (Appendices F-3 and F-6). Portions of five streams are included on the Alabama 1998 §303(d) list of impaired waters due to impairment from nonpoint sources (Table 11). Since this sub-watershed is part of the larger Flint Creek NPS watershed project, no additional assessments were conducted as part of this project (Appendix H).

Sub-Watershed: Lower Flint Creek

NRCS Sub-Watershed Number 350

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
TN612	Fish	1993	Flint Creek @T6S, R4W, S31		
4011-1	Fish, Habitat	1994	Flint Creek Above Public Boat Ramp @ Confluence	246	
7943-1	Fish, Habitat	1994	Mud Tavern Creek @Mud Tavern Rd Bridge	15	F&W
NOBM-350/ 8231-1	Habitat, Chem./ Fish, Habitat	1998/ 1994	No Business Creek @Ironman Rd Bridge	31	F&W
NOBM-351	Habitat, Chem.	1998	No Business Creek @AL Hwy 36	9	F&W
90004-1	Fish, Macroinv.	1995	UT to Nasty Branch @Hartselle Stormwater Park	1	F&W
VILM-350/ 11739-1	Habitat, Chem./ Fish, Habitat	1998/ 1994	Village Branch @unnamed Morgan Co Rd.	8	F&W
12045-1	Fish, Habitat	1999, 1994	West Flint Creek @Private Property	112	F&W
12045-1	Fish, Habitat	1999, 1994	West Flint Creek @Private Property	112	F&W
12045-2	Fish	1999	West Flint Creek		F&W

Percent land cover of the Lower Flint Creek sub-watershed was estimated 23% deciduous forest, 7% evergreen forest, 13% mixed forest, 24% pasture/hay, 13% row crop, 1% other grasses, 10% wetland, 3% low intensity residential, 1% high intensity residential, 2% high intensity commercial/ industrial/transportation, and 4% open water (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were higher for pasture (39%) and lower for row crop (6%) land-uses. Eight current construction/stormwater authorizations, one current mining, three semi-public/private and one industrial NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *moderate* (0.22 AU/Acre), with cattle and broiler poultry being the dominant animals. Sedimentation estimates (Table 4b) indicated a *low* potential for NPS impairment (0.9 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *high*. Lower Flint Creek was also given a 2nd priority sub-watershed rating by the local SWCD.

The Lower Flint Creek sub-watershed drains approximately 145 mi^2 in Lawrence and Morgan Counties. Seven streams have been assessed by TVA, GSA and ADEM from 1994-99 using fish IBI, habitat, and/or water quality assessments (Appendices E-1,G-1, G-2, F-3). Portions of three streams are included on the Alabama 1998 §303(d) list of impaired waters due to nonpoint sources (Table 11). This sub-watershed is part of the larger Flint Creek NPS watershed project. No additional assessments were conducted for the NPS screening part of this project (Appendix H). However, three stream reaches were assessed to determine their status with regard to water use classification and §303(d) listing purposes.

No Business Creek

Station 8231-1 was assessed by TVA in 1994 as having a *poor* fish community using a fish IBI assessment. ADEM assessed two reaches on No Business Creek during 1998. The NOBM-350 sampling reach had a mostly-shaded canopy over a channel dominated by clay (~88%) substrate (Table 6b). Habitat quality was assessed as *fair* using the glide/pool assessment matrix. Sinuosity and bank stability were the categories of impairment to the habitat quality (Table 7b). Streams with clay dominated substrates generally have lower percentages in the instream habitat category. Stream flow was estimated at 5.8 cfs during the May sampling event and was not detectable during the July and September site visits (Appendix D-1). Water quality data indicated elevated nitrite/nitrate, TKN, and TDS concentrations during the May site visit (0.74, 0.438 and 205 mg/l, respectively). Fecal coliform counts were also elevated in the May sample (370 col/100ml).

The NOBM-351 reach had an open canopy with a sand (~70%) and gravel (~15%) dominated substrate (Table 6b). The habitat quality was *good* as assessed using the riffle/run habitat assessment matrix. Low percentages in the sinuosity category may indicate historic channelization (Table 7b). Water quality sampling was conducted in May and July (no flow was detected in September). Lab analysis results indicated elevated NO2/NO3 (0.868 mg/l in May), TKN (0.653 mg/l in July), and TDS (204 and 168 mg/l) concentrations. Fecal coliform counts were also elevated during both sampling events (470 and 1200 col/100ml) (Appendix D-1).

Village Branch

Village Branch was assessed by TVA in 1994 as having a *poor* fish community using a fish IBI assessment. Village Branch, at the VILM-350 sampling reach, had a partly-shaded/partly-open canopy over the 10-foot wide channel dominated by sand (~49%), detritus (~22%), silt (~15%) and Clay (~12%) substrates (Table 6b). Habitat quality in May 1998 was assessed by ADEM as *excellent* using the riffle/run assessment matrix. Instream habitat quality and sinuosity were the categories adversely affecting the overall habitat quality (Table 7b). The very low percentage in the sinuosity category combined with the high percentages in the bank stability and riparian zone measurement categories may indicate historic channelization. Stream flows were estimated at 4.4 and 0.7 cfs during the May and July sampling events, respectively. No flow was detected at the September site visit. Water quality data (Appendix D-1) indicated elevated TPO4 concentrations (0.14 mg/l) in July, and TKN (0.423 and 0.674 mg/l) concentrations during the May and July sampling events. Fecal coliform counts were elevated in the July sample (450 col/100ml).

Flint Creek

The fish community of Sally Mike Creek at stations 4011-1 (TVA-1994) and TN612-(GSA-1993) were assessed as being in *poor* condition (Appendix G-1).

Mud Tavern Creek

Mud Tavern Creek at station 7943-1 was assessed by TVA using a Fish IBI assessment. The fish community was determined to be in *poor/fair* condition (Appendix G-1).

UT to Nasty Branch

The fish community of the unnamed tributary to Nasty Branch at station 90004-1 was assessed by TVA in 1994 as being in *poor* condition (Appendix G-1). An assessment of the aquatic macroinvertebrate community in 1995 was *poor* with no EPT collected (Appendix G-2).

West Flint Creek

The fish communities of the West Flint Creek stations 12045-1 and 12045-2 were assessed by TVA in 1999 as being in *poor* condition. An assessment conducted in 1994 at station 12045-1 determined the fish community to be in *poor/fair* condition (Appendix G-1). The aquatic macroinvertebrate community was assessed in 1999 at station 12045-1 as *fair* (Appendix G-2).

Sub-Watershed: West Flint Creek

NRCS Sub-Watershed Number 360

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
950-1	Fish, Habitat	1994	Big Shoal Creek @Old Molton Rd Bridge	19	F&W
3658-1	Fish, Habitat/ Chem./ Macroinv.	1999, 1994/ 1999/ 1997	Elam Creek @Lawrence Co Rd 86	29	F&W
3957-1	Fish, Habitat/ Chem.	1994/ 1997	Flat Creek @Old Molton Rd Bridge (Lawrence Co Rd 61)	9	F&W
MCDL-361	Habitat, Chem.	1998	McDaniel Creek @unnamed Lawrence Co Rd nr Lindsey Cemetery	3	F&W
MCDL-360/ 7342-1	Habitat, Chem./ Fish, Habitat	1998/ 1994	McDaniel Creek @ unnamed Lawrence Co. Road bridge	13	F&W

Percent land cover of the West Flint Creek sub-watershed was estimated as 1% transitional forest, 24% deciduous forest, 7% evergreen forest, 12% mixed forest, 31% pasture/hay, 16% row crop, and 8% wetland (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were somewhat higher for pasture land-use (49%). One current construction/stormwater authorization and two semi-public/private NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *low* (0.10 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4b) indicated a *low* potential for

NPS impairment (0.8 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *moderate*. West Flint Creek was also given a 2nd priority sub-watershed rating by the local SWCD.

The West Flint Creek sub-watershed drains approximately 118 mi^2 in Lawrence and Morgan Counties. This sub-watershed is part of the larger Flint Creek NPS watershed project (Appendix F-3). Sites on Elam and Flat Creeks were assessed by TVA in 1997 (Appendix F-8a) and one site on McDaniel Creek was assessed during the 1997 ALAMAP project (Appendix F-6). No additional assessments were conducted for the NPS screening part of this project (Appendix H). However, two stream reaches of McDaniel Creek were assessed to determine their status with regard to water use classification and §303(d) listing purposes. Segments of McDaniel Creek (3.9 mi.) and Big Shoal Creek (9.3 mi.) are included on the Alabama 1998 §303(d) list of impaired waters (Table 11) with partial attainment status due to impairments from agricultural and pasture grazing sources, respectively. Segments of Elam and Flat Creeks were added by EPA to the 1998 §303(d) list due to organic enrichment/DO (Elam and Flat Creeks), and ammonia, nutrients, and siltation impairments (Flat Creek).

McDaniel Creek

McDaniel Creek, at the MCDL-361 sampling reach, had a mostly-shaded canopy and was dominated by sand (~40%), gravel (~30%), and clay (~16%) substrates (Table 6b). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix (Table 7b). Stream flow was estimated at 0.8 cfs and 14.6 cfs during the May and July site visits, respectively. The stream was dry at the time of the September visit. Field notes taken at the July visit indicate that there had been a recent rain event; 'the stream was high and turbid'. May water quality samples (Appendix D-1) had high fecal coliform counts (2220 col/100ml). Data collected during the July high flow conditions had elevated concentrations of total phosphate (0.626 mg/l) and TKN (1.371 mg/l) indicating a possible source of nutrients in the stormwater runoff (Appendix D-1).

McDaniel Creek at station 7342-1 was assessed by TVA in 1994 as having a *poor* fish community using a fish IBI assessment. This same site was visited by ADEM in 1998 for collection of water chemistry and habitat assessment. MCDL-360 had a mostly-shaded canopy over the 18-foot wide channel dominated by sand (~70%) and Clay (~15%) substrates (Table 6b). Habitat quality in May 1998 was assessed by ADEM as *excellent* using the glide/pool assessment matrix. Instream habitat quality and sinuosity were the categories having a slight adverse affect on the overall habitat quality (Table 7b). Stream flows were estimated at 3.3 and 11.5 cfs during the May and July sampling events, respectively. No flow was detected at the September site visit. The July sampling event was conducted shortly after a rain event. Water quality data (Appendix D-1) indicated elevated nitrite/nitrate concentrations during the May (1.47 mg/l) and July (0.836 mg/l) sampling events. Total phosphate and TKN concentrations were elevated in the July sample (0.24 and 0.984 mg/l, respectively).

Big Shoal Creek

The fish community of Big Shoal Creek at station 950-1 was assessed by TVA in 1994 as being in *very-poor* condition (Appendix G-1).

Elam Creek

Assessments of the instream biological communities of Elam Creek station 3658-1 were conducted by TVA in 1999 (Appendices G-1 and G-2). The aquatic macroinvertebrate community was in *fair* condition, while the fish community was in *poor* condition. The fish community had been previously assessed in 1994 as being in *very-poor* condition. TVA conducted monthly water quality sampling at this station in 1997. Stream flows ranged from 61.9 in June to 0.0 in September and October. Water quality data from June and July indicated elevated NO2/NO3 concentrations (Appendix F-8a).

Flat Creek

The fish community of Flat Creek at station 3957-1 was assessed by TVA in 1994 as being in *poor/fair* condition (Appendix G-1). Water quality data were collected monthly by TVA from June through October 1997. Data indicated elevated fecal coliform counts during the September (920 col/100ml) and October (1,400 col/100ml) sampling events (Appendix F-8a).

Sub-Watershed: Prior Branch

NRCS Sub-Watershed Number 370

Percent land cover of the Prior Branch sub-watershed was estimated as 6% deciduous forest, 1% evergreen forest, 2% mixed forest, 5% pasture/hay, 23% row crop, 1% other grasses, 21% wetland, 1% high intensity commercial/ industrial/transportation, and 39% open water (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were lower for forest (12%) and row crop (9%) land-uses. One current construction/stormwater authorization and one municipal NPDES permit have been issued in the sub-watershed (Table 9). The SWCD worksheets did not indicate animal concentration estimates for the sub-watershed (Table 3b). Sedimentation estimates (Table 4b) indicated a *low* potential for NPS impairment (0.3 tons/acre) mainly from erosion of cropland. The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *moderate*.

The Prior Branch sub-watershed drains approximately 32 mi^2 in Limestone County. Due to the relatively small size of the drainage and the proximity to Decatur, this sub-watershed was not included in the screening project (Appendix H).

Sub-Watershed: Baker Creek

NRCS Sub-Watershed Number 380

Percent land cover of the Baker Creek sub-watershed was estimated as 16% deciduous forest, 1% evergreen forest, 4% mixed forest, 17% pasture/hay, 16% row crop, 5% other grasses, 7% wetland, 12% low intensity residential, 5% high intensity residential, 7% high intensity commercial/ industrial/transportation, 1% mining, and 7% open water (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were somewhat lower for the row crop (4%) land-uses. Twenty current construction/stormwater authorizations, one current mining and eight industrial NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *low* (0.13 AU/Acre), with cattle and broiler poultry being the dominant animals. Sedimentation estimates (Table 4b) indicated a *moderate* potential for NPS impairment (2.5 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *high*.

The Baker Creek sub-watershed drains approximately 29 mi^2 in Limestone and Morgan Counties. Due to the relatively small size of the drainage and the proximity to Decatur, this sub-watershed was not included in the screening project (Appendix H).

Sub-Watershed: Swan Creek

NRCS Sub-Watershed Number 390

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
TN301	Fish	1992	Swan Creek @T3S, R4W, S9		F&W
SWNL-390/ 11146-1	Habitat, Chem./ Fish, Habitat/ Macroinv.	1998/ 1999, 1994/ 1999	Swan Creek @Hwy 31 Bridge	53	F&W
SWNL-391	Habitat, Chem.	1998	Swan Creek @Limestone Co Rd 24 nr Tanner Crossroads	44	A&I
SWNL-392	Habitat, Chem.	1998	Swan Creek @Hwy 72 nr Athens	29	F&W
11146-3	Fish, Habitat/ Chem.	1996/ 1997	Swan Creek @Hwy 251 Bridge (Strain Rd)	25	F&W
11146-2	Fish, Macroinv./ Chem.	1995/ 1997	Swan Creek Between Elkton Rd Bridge & Muddy Cr Confl.	20	F&W

Percent land cover of the Swan Creek sub-watershed was estimated as 22% deciduous forest, 4% evergreen forest, 9% mixed forest, 24% pasture/hay, 27% row crop, 2% other grasses, 4% wetland, 4% low intensity residential, 1% high intensity residential, and 2% high intensity commercial/industrial/ transportation, (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were higher for pasture (38%) and lower for row crop (17%) land-uses. Thirteen current construction/stormwater authorizations, one municipal, two semi-public/private and two industrial NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *low* (0.04 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4b) indicated a *low* potential for NPS impairment (1.5 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *high*. Swan Creek was also given a 3rd priority sub-watershed rating by the local SWCD.

The Swan Creek sub-watershed drains approximately 56 mi^2 in Limestone County. Swan Creek was assessed in Part I of this project. An 8.4 mile segment of Swan Creek is included on the Alabama 1998 §303(d) list of impaired waters with non-attainment status due to siltation and organic enrichment/DO from urban and rural nonpoint sources.

Swan Creek

Three stream reaches on Swan Creek were visited by ADEM in May, July and September to document water quality in varying flow conditions. One of these reaches (11146-1) was assessed by TVA in 1994 as having a *very-poor/poor* fish community. Water quality data were collected by TVA at two stream reaches during 1997 (Appendices F-8a and F-8b). Station 11146-2 had generally low nutrient concentrations, however the nutrient concentrations for station 11146-3 were moderately-to-highly elevated as compared to surrounding stations. Fecal coliform counts were elevated at station 11146-2 in the June, July and September samples. Interference from other bacteria precluded any counts from the 11146-3 samples. No pesticides or herbicides were detected during the July/August 1997 sampling events.

Swan Creek, at the upstream (SWNL-392) sampling reach, had a mostly-shaded canopy and was dominated by bedrock (~70%) with lesser amounts of cobble (~10%) substrates (Table 6b). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix (Table 7b). Stream flow was estimated at 19.2, 7.3 and 2.1 cfs in May, July and September, respectively. Water quality data (Appendix D-1) indicated that nitrite/nitrate and TKN were elevated during all three sampling events. Total phosphate concentrations and fecal coliform counts (390 col/100 ml) were elevated during the July site visit.

The SWNL-391 reach had an open canopy, and was also dominated by bedrock (~65%) and cobble (~15%) substrates (Table 6b). The habitat quality was *excellent* as assessed using the riffle/run habitat assessment matrix, however, the riparian zone measurement category percentage was lower than the upstream station (80% vs. 45%) (Table 7b). Stream flow estimates ranged from 37.9 cfs in May to 6.3 cfs in September (Appendix D-1). Lab analysis results indicated nutrient enrichment during all three sampling events. NO2/NO3 concentrations ranged from 2.091 to 7.608 mg/l. Total phosphate concentrations were also high (0.551, 1.506, and 1.66 mg/l) in May, July and September, respectively. This station is downstream of the confluence with Town Creek. The city of Athens wastewater treatment facility discharges to Town Creek near the confluence with Swan Creek.

Swan Creek, at the SWNL-390 sampling reach (downstream station), had an open canopy over the approx. 80-foot wide channel dominated by bedrock (~70%) with lesser amounts of cobble (~10%) substrates (Table 6b). Habitat quality in May 1998 was assessed by ADEM as *good* using the glide/pool assessment matrix (Table 7b). Stream flow estimates ranged from 36.9 to 5.1 cfs during the May, July, and September sampling events. Water quality data (Appendix D-1) indicated elevated nitrite/nitrate (range 1.899 – 6.81 mg/l) and TPO4 (range 0.353 – 10.285 mg/l) concentrations during the all three sampling events. TKN concentrations were also elevated (range 0.057 – 0.545 mg/l). Fecal coliform counts were >1200 col/100ml in the July sample. Data indicated the possibility of the existence of an additional nutrient source between SWNL-390 and –391. Simazine was detected in the May pesticide/herbicide sample at a concentration of 0.181 mg/l.

Sub-Watershed: Round Island Creek

NRCS Sub-Watershed Number 400

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
9782-1	Fish, Habitat/ Macroinv.	1999, 1994/ 1999	Round Island Creek @Browns Ferry-Huntsville Rd Bridge	36	F&W
RNIL-400	Habitat, Chem.	1998	Round Island Creek @Browns Ferry-Athens Rd Bridge	27	F&W
RNIL-401	Habitat, Chem.	1998	Round Island Creek @Limestone Co Rd 43 nr Blackburn	7	F&W

Percent land cover of the Round Island Creek sub-watershed was estimated as 20% deciduous forest, 1% evergreen forest, 4% mixed forest, 20% pasture/hay, 33% row crop, 4% wetland, and 16% open water (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were somewhat higher for row crops (53%) and lower for pasture land-uses (3%). Three current construction/stormwater authorizations, two semi-public/private, and one industrial NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *low* (0.06 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4b) indicated a *low* potential for NPS impairment (1.7 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *moderate*. Round Island Creek was also given a 4th priority sub-watershed rating by the local SWCD.

The Round Island Creek sub-watershed drains approximately 116 mi^2 in Limestone County. A 3.8 mile segment of Round Island Creek is included on the Alabama 1998 §303(d) list of impaired waters with partial attainment status due to siltation and organic enrichment/DO from agricultural sources. Station 9782-1 was assessed by TVA in 1994 and 1999 as having a *poor* and *poor/fair* fish community, respectively (Appendix G-1). Water quality and habitat assessments were conducted by ADEM at two upstream reaches of Round Island Creek during 1998. These sites were included in both Part I & II of this project (Table 10).

Round Island Creek

Round Island Creek, at the RNIL-401 sampling reach, had a mostly-shaded canopy over 30 foot wide channel with a substrate dominated by bedrock (~48%) with lesser amounts of cobble (~23%), gravel (~10%) and sand (~10%) substrates (Table 6b). Habitat quality in May was assessed as *excellent* using the riffle/run assessment matrix (Table 7b). Stream flow estimates ranged from 4.5 cfs in May to 1.4 cfs in September. Water quality data (Appendix D-1) indicated that nitrite/nitrate were moderately elevated (range 0.889 - 1.064 mg/l) during each sampling event. The concentration of TKN was also slightly elevated during the September site visit (0.597 mg/l).

The RNIL-400 sampling reach, had an open canopy and was dominated by gravel (~39%) with lesser amounts of bedrock (~20%), cobble (~15%) and sand (~15%)

substrates (Table 6b). Habitat quality in May was assessed as *excellent* using the riffle/run assessment matrix (Table 7b). Water quality data (Appendix D-1) indicated that nitrite/nitrate concentrations (0.889, 0.763, and 1.713 mg/l) were elevated during all three sampling events. TKN concentrations and fecal coliform counts were also elevated during the July site visit (0.916 mg/l, >1200 col/100ml, respectively).

Recommended Priority Sub-Watershed

Round Island Creek was identified as a priority sub-watershed due to biological and chemical conditions within the watershed (Table 17, Appendix J).

Sub-Watershed: Mallard Creek

NRCS Sub-Watershed Number 410

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
MALL-410/ 7139-1	Habitat, Chem./ Fish, Habitat	1998/ 1994	Mallard Creek @Bridge by Smith Cemetery	19	F&W
MALL-411	Habitat, Chem.	1998	Mallard Creek @Browns Ferry Rd nr Smith Cemetery	6	F&W

Percent land cover of the Mallard Creek sub-watershed was estimated as 19% deciduous forest, 2% evergreen forest, 4% mixed forest, 11% pasture/hay, 29% row crop, 19% wetland, 1% mining, and 15% open water (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were higher for row crop (51%) and pasture (17%) land-uses. Thirteen current construction/stormwater authorizations, one current mining and three industrial NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *low* (0.08 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4b) indicated a *moderate* potential for NPS impairment (2.0 tons/acre), mostly from cropland. The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *high*. Mallard Creek was also given a 3rd priority sub-watershed rating by the local SWCD.

The Mallard Creek sub-watershed drains approximately 72 mi^2 in Blount and Marshall Counties. An 11.5 mile segment of Mallard Creek is included on the Alabama 1998 §303(d) list of impaired waters with partial attainment status due to siltation and organic enrichment/DO from agricultural sources. One stream reach of Mallard Creek was assessed by TVA in 1994 as having a *poor/fair* fish community. Water quality and habitat assessments were also conducted by ADEM (Project Part I) at this reach during 1998 (Table 10).

Mallard Creek

Mallard Creek, at the MALL-411 sampling reach, had a mostly-shaded canopy and was dominated by clay (~65%) with lesser amounts of detritus (~17%) and sand (~10%) substrates (Table 6b). Habitat quality was assessed as *good* using the glide/pool assessment matrix. Sinuosity and Riparian Zone measurements were the categories of slight impairment to the habitat quality (Table 7b). Streams with clay dominated substrates generally have lower percentages in the instream habitat quality category. Stream flow was estimated at only 0.2 cfs during the May sampling event and 0.0 cfs at the July and September site visits. Field parameter measurements, conducted in May, found high turbidity (1000 ntu) that may have indicated a recent rain event. Analysis of water quality samples collected in May (Appendix D-1) indicated that total phosphate and TKN were very elevated (1.529 and 2.258 mg/l, respectively). Fecal coliform counts were also high (>1200 col/100ml).

The approximately 22-foot wide MALL-410 sampling reach had a mostly-shaded canopy, and was dominated by sand (~65%), detritus (~20%) and silt (~10%) substrates (Table 6b). The habitat quality was assessed as *excellent* using the glide/pool habitat assessment matrix (Table 7b). Stream flow was estimated at 7.6 cfs in May and 0.0 cfs in July and September (Appendix D-1). Lab analysis of the May sampling event indicated high nitrite/nitrate concentrations (1.846 mg/l).

Sub-Watershed: Spring Creek

NRCS Sub-Watershed Number 420

Percent land cover of the Spring Creek sub-watershed was estimated as 12% deciduous forest, 6% evergreen forest, 4% mixed forest, 7% pasture/hay, 36% row crop, 4% wetland, 1% high intensity commercial/ industrial/transportation, 1% mining, and 28% open water (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were higher for the row crop land-use (77%). Two current construction/ stormwater authorizations and one industrial NPDES permit have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *high* (0.36 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4b) indicated a *moderate* potential for NPS impairment (2.7 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *high*. Spring Creek was also given a 4th priority sub-watershed rating by the local SWCD.

The Spring Creek sub-watershed drains approximately 31 mi^2 in Lawrence County. Due to the relatively small size and the close proximity to the Tennessee River, this sub-watershed was not included in the screening project.

Sub-Watershed: Second Creek

NRCS Sub-Watershed Number 440

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
FIRW-001/ 3910-1	Macroinv. Chem. Habitat/ Fish, Habitat/Chem.	1998/ 1994/ 1997	First Creek @Ford on Turner Lane Lauderdale Co.	16	S/F&W
SCDL-011/ 10118-1	Habitat, Chem./ Fish, Habitat/ Chem.	1998/ 1999, 1994/ 1997	Second Creek @Lauderdale Co Rd 76	39	F&W
NLYW-1	Habitat, Chem., Macroinv.	1998	Neely Branch us of backwater of TN River and ds of WWTP		F&W

Percent land cover of the Second Creek sub-watershed was estimated 29% deciduous forest, 3% evergreen forest, 8% mixed forest, 28% pasture/hay, 22% row crop, and 9% open water (Table 1b). Estimates of land-use (Table 2b) by the local SWCDs were somewhat higher for pasture (30%) and lower for row crops (12%) land-uses. Five current construction/stormwater authorizations have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3b) were *moderate* (0.22 AU/Acre), with cattle and broiler poultry being the dominant animals. Sedimentation estimates (Table 4b) indicated a *low* potential for NPS impairment (1.6 tons/acre). The overall potential for impairment from nonpoint sources (Table 5b) was estimated as *high*.

The Second Creek sub-watershed drains approximately 80 mi^2 in Lauderdale County. An 11.6 mile segment of Second Creek is included on the Alabama 1998 §303(d) list of impaired waters with partial attainment status due to pathogens from agricultural sources. Two streams, First Creek and Second Creek, were assessed by TVA in 1994 as having *very-poor/poor* and *poor* fish communities, respectively. A re-assessment of the Second Creek site in 1999 determined the fish community to be in *fair* condition. Water quality and habitat assessments were also conducted at these reaches by TVA in 1997 (Appendix E-1) and by ADEM during 1998 for this project (Table 10) and for the Alabama State Parks Project (ADEM 1999d). A site on Whites Branch was assessed using physical/chemical parameters as part of the 1998 ADEM ALAMAP program.

<u>First Creek</u>

The FIRW-001 sampling reach, had a partly-open/partly-shaded canopy and was dominated by bedrock (~65%) and gravel (~20%) substrates (Table 6b). Habitat quality in June was assessed as *excellent* using the riffle/run assessment matrix (Table 7b). An aquatic macroinvertebrate assessment conducted as part of the State Parks Project indicated that the aquatic macroinvertebrate community was in *fair* condition with 10 EPT genera collected. Water quality data (Appendices D-1, F-5 and F-8a) indicated that nitrite/nitrate concentrations were moderately elevated (1998 range 0.772 – 0.849 mg/l; 1997 range 0.09 – 0.86 mg/l). No herbicides or pesticides were detected in the sample collected by ADEM in July 1998 (Appendix D-2). Fecal coliform counts were elevated during several of the 1997 sampling events (range 100 to 2020 col/100 ml). A segment of First Creek was added by EPA to the 1998 §303(d) list due to impairment by pathogens.

Second Creek

Second Creek, at the SCDL-011 sampling reach, had a partly-shaded/partly-open canopy with a diverse substrate composed of gravel (~25%), cobble (~25%), boulder (~20%) and bedrock (~15%) substrates (Table 6b). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix (Table 7b). Stream flow was estimated at 28.5 cfs during the July sampling event. Water quality data (Appendices D-1 and F-8a) indicated that nitrite/nitrate concentrations and fecal coliform counts were elevated during 1998 sampling events (0.701 mg/l and 350 col/100ml, respectively). Fecal coliform counts were elevated during most of the 1997 sampling events (range 55 to 3200 col/100 ml) (Appendix F-8a). No pesticides or herbicides (Appendices D-2 and F-8b) were detected at the time of water quality sampling.

Neely Branch

A reach of Neely Branch was assessed as part of the ADEM State Parks Project. The station NLYW-1 sampling reach had a shaded canopy over an approximately 15 foot wide channel dominated by bedrock (~70%) and boulder (~20%) substrates (Table 6b). Habitat quality was assessed by ADEM as *excellent* using the riffle/run assessment matrix (Table 7b). Six EPT genera were collected indicated that the aquatic macroinvertebrate community was in *poor* condition. Stream flows ranged from 0.4 to 0.9 cfs during the June, July, and September sampling events. Water quality data (Appendix F-5) indicated elevated nitrite/nitrate (range 1.148 – 2.030 mg/l) and BOD_5 (June – 3.0 mg/l) concentrations.

Recommended Priority Sub-Watershed

Second Creek was identified as a priority sub-watershed due to biological and chemical conditions within the watershed (Table 17, Appendix J).

Table 1b. Land use percentages for Wheeler Lake cataloging unit (0603-0002) from EPA landuse subcategory data (EPA 1997) and broader categories used in comparison with local SWCD Conservation Assessment Worksheet landuse estimates (ASWCC 1998).

	Percent Total Landuse (Category and Subcategory)													
	Open Water	Urban			Mining	Forest				Pasture/ Hay	Row Crops	Other		
Subwatershed	Open Water	Low Intensity Residential	High Intensity Residential	High Intensity Commercial/ Industrial/ Transportation	Quarries/ Strip Mines/ Gravel Pits	Transitional Forest	Deciduous Forest	Evergreen Forest	Mixed Forest	Pasture/ Hay	Row Crops	Other Grasses	Woody Wetlands	Herbaceous Wetlands
Wheeler Lake (0603-0002)														
20						1	81	2	9	4	3			
40							85	3	8	3	2			
50							81	2	8	4	5		1	
60							77	2	6	7	8			
70				1		1	54	3	10	13	16		2	
80							83	1	6	8	2			
90							55	5	17	11	9			
100	2						39	6	16	15	18		2	
110	1						34	8	18	19	16		2	
130							12	1	6	23	45		12	
140							16	3	9	17	46		7	
160							43	1	7	16	31		1	
180		1					10	3	6	22	48		9	
190	1			1			30	4	10	18	35	1	2	
200							54	3	10	14	17			
210	1					1	38	5	13	13	21		6	1
220	4					1	40	10	17	9	13		4	
230	6	8	3	2		1	29	7	11	7	10	2	12	1
240	2	18	8	9	1	1	14	8	9	5	11	5	9	1

Table 1b, cont. Land use percentages for Wheeler Lake cataloging unit (0603-0002) from EPA landuse subcategory data (EPA 1997) and broader categories used in comparison with local SWCD Conservation Assessment Worksheet landuse estimates (ASWCC 1998).

	Percent Total Landuse (Category and Subcategory)													
	Open Water	Urban			Mining	Forest				Pasture/ Hay	Row Crops	Other		
Subwatershed	Open Water	Low Intensity Residential	High Intensity Residential	High Intensity Commercial/ Industrial/ Transportation	Quarries/ Strip Mines/ Gravel Pits	Transitional Forest	Deciduous Forest	Evergreen Forest	Mixed Forest	Pasture/ Hay	Row Crops	Other Grasses	Woody Wetlands	Herbaceous Wetlands
Wheeler Lake (0603-0002), cont.														
250	1	1		2			17	7	11	16	36	2	7	
260	4	3	2	3			7	3	4	7	40	5	22	1
270	2						31	11	19	19	13		4	
280	10						5	2	4	7	53	1	18	1
300	1						13	3	6	23	47		6	
320	1			1			17	2	5	30	32		10	1
330		1		1			28	9	19	25	13		2	1
340							25	5	12	34	13		9	1
350	4	3	1	2			23	7	13	24	13	1	9	1
360						1	24	7	12	31	16		8	
370	39			1			6	1	2	5	23	1	19	2
380	7	12	5	7	1		16	1	4	17	16	5	7	
390		4	1	2			22	4	9	24	27	2	4	
400	16						20	1	4	20	33		4	
410	15				1		19	2	4	11	29		18	1
420	28			1	1		12	6	4	7	36		4	
440	9						29	3	8	28	22			

Table 2b. Land use percentages for the Wheeler Lake cataloging unit (0603-0002) from EPA landuse categories (EPA 1997) and local SWCD Conservation Assessment Worksheet landuse estimates (ASWCC 1998).

Subwatershed	Percent Total Landuse													
	Open Water		Urban		Mines		Forest		Pasture		Row Crops		Other	
	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA
Wheeler Lake (0603-0002)														
020							92	93	6	4	1	3	1	
040							93	96	6	3		2	1	
050							91	92	3	4	5	5	1	
060							83	85	14	7	2	8	1	
070			1	1			83	70	5	13	10	16	1	
080							85	90	12	8		2	2	
090	3		2				61	77	19	11	14	9	1	
100	4	2	2				52	63	24	15	17	18		
110	3	1	5				56	62	21	19	15	16		
130			5				18	31	53	23	23	45		
140			1				33	35	34	17	31	46		
160			2				51	52	28	16	19	31		
180			6	1			13	28	45	22	35	48	1	
190		1	4	1			38	46	41	18	17	35		1
200							60	67	32	14	8	17		
210		1	5				41	63	31	13	22	21		1
220	3	4	4				60	72	26	9	6	13	1	
230	4	6	13	13			46	60	29	7	8	10		3
240	2	2	48	35	1	1	28	41	17	5	5	11		6
250		1	12	3			29	42	37	16	22	36		2
260	1	4	16	8			30	36	23	7	30	40		6
270		2	1				65	65	30	19	3	13		
280	26	10	2				13	29	5	7	55	53		2
300		1	12				27	28	34	23	27	47		
320		1	4	1			27	34	28	30	39	32	1	1

Table 2b, cont. Land use percentages for the Wheeler Lake cataloging unit (0603-0002) from EPA landuse categories (EPA 1997) and local SWCD Conservation Assessment Worksheet landuse estimates (ASWCC 1998).

Subwatershed	Percent Total Landuse													
	Open Water		Urban		Mines		Forest		Pasture		Row Crops		Other	
	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA
Wheeler Lake (0603-0002), cont.														
330			4	2			42	58	48	25	5	13	1	1
340							30	51	61	34	7	13	1	1
350	3	4	9	6			42	52	39	24	6	13		2
360			1				37	52	49	31	13	16		
370	75	39	3	1			12	28		5	9	23		3
380	3	7	53	24		1	25	28	14	17	4	16	1	5
390	2		33	7			10	39	38	24	17	27		2
400	34	16	5				5	29	3	20	53	33		
410		15	1			1	27	43	17	11	51	29	3	1
420		28		1		1	15	26	8	7	77	36	1	
440		9	4				53	40	30	28	12	22	1	

Table 3b. Estimations of animal concentrations, animal units (AU), and percent of acres where pesticides/herbicides applied in the Wheeler Lake Cataloging Unit (0603-0002). Numbers of animals and pesicides/herbicides listed by acreage and subwatershed were provided by the local SWCDs on Conservation Assessment Worksheets completed in 1998.

		Subwatershed									
		020	040	050	060	070	080	90	100	110	130
County (s)		Jackson	Jackson	Jackson	Jackson	Jackson Madison* Marshall*	Jackson	Jackson Marshall	Jackson* Madison Marshall	Marshall	Madison
Acres Reported		100%	100%	100%	100%	90%	100%	100%	99%	100%	100%
Pesticides Applied	Est. % Total Acres	6	5	7	16	13	11	31	23	36	13
Cattle	# / Acre	0.01	0.02	0.01	0.02	0.05	0.05	0.13	0.21	0.06	0.05
	A.U./Acre	**0.01**	**0.02**	**0.01**	**0.02**	**0.05**	**0.05**	**0.13**	**0.21**	**0.06**	**0.05**
Dairy	# / Acre	---	---	---	---	---	---	---	0.00	---	---
	A.U./Acre	---	---	---	---	---	---	---	**0.00**	---	---
Swine	# / Acre	---	---	---	---	---	---	---	0.04	---	---
	A.U./Acre	---	---	---	---	---	---	---	**0.01**	---	---
Poultry - Broilers	# / Acre	---	---	---	---	---	---	---	---	20.13	---
	A.U./Acre	---	---	---	---	---	---	---	---	**0.16**	---
Poultry - Layers	# / Acre	---	---	---	---	---	---	2.65	1.63	2.21	---
	A.U./Acre	---	---	---	---	---	---	**0.02**	**0.01**	**0.02**	---
Catfish	# Acres/ Acre	---	---	---	0.00	---	---	---	---	---	---
	A.U./Acre	---	---	---	---	---	---	---	---	---	---
Total	A.U./Acre	**0.01**	**0.02**	**0.01**	**0.02**	**0.05**	**0.05**	**0.15**	**0.23**	**0.24**	**0.05**
Potential for NPS Impairment		Low	Low	Low	Low	Low	Low	Mod.	Mod.	Mod.	Low

* No data reported for this portion of the subwatershed

Table 3b, cont. Estimations of animal concentrations, animal units (AU), and percent of acres where pesticides/herbicides applied in the Wheeler Lake Cataloging Unit (0603-0002). Numbers of animals and pesicides/herbicides listed by acreage and subwatershed were provided by the local SWCDs on Conservation Assessment Worksheets completed in 1998.

		Subwatershed									
		140	160	180	190	200	210	220	230	240	250
County (s)		Madison	Madison	Madison	Madison	Jackson* Madison	Jackson* Madison	Marshall Morgan	Madison	Madison	Madison
Acres Reported		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Pesticides Applied	Est. % Total Acres	22	15	30	17	10	24	8	8	4	22
Cattle	# / Acre	0.13	0.24	0.05	0.05	0.08	0.12	0.08	0.19	0.03	0.06
	A.U./Acre	**0.13**	**0.24**	**0.05**	**0.05**	**0.08**	**0.12**	**0.08**	**0.19**	**0.03**	**0.06**
Dairy	# / Acre	---	0.00	0.00	---	---	---	---	---	---	---
	A.U./Acre	---	**0.00**	**0.00**	---	---	---	---	---	---	---
Swine	# / Acre	---	0.01	---	---	0.01	0.01	0.00	---	---	0.00
	A.U./Acre	---	**0.00**	---	---	**0.01**	**0.01**	**0.00**	---	---	**0.00**
Poultry - Broilers	# / Acre	---	0.88	---	---	---	---	6.57	---	---	---
	A.U./Acre	---	**0.01**	---	---	---	---	**0.05**	---	---	---
Poultry - Layers	# / Acre	---	---	---	---	---	---	0.05	---	---	---
	A.U./Acre	---	---	---	---	---	---	**0.00**	---	---	---
Catfish	# Acres/ Acre	---	---	---	---	---	---	---	---	---	---
	A.U./Acre	---	---	---	---	---	---	---	---	---	---
Total	A.U./Acre	**0.13**	**0.25**	**0.05**	**0.05**	**0.09**	**0.12**	**0.13**	**0.19**	**0.03**	**0.06**
Potential for NPS Impairment		Low	Mod.	Low	Low	Low	Low	Low	Mod.	Low	Low

* No data reported for this portion of the subwatershed

Table 3b, cont. Estimations of animal concentrations, animal units (AU), and percent of acres where pesticides/herbicides applied in the Wheeler Lake Cataloging Unit (0603-0002). Numbers of animals and pesicides/herbicides listed by acreage and subwatershed were provided by the local SWCDs on Conservation Assessment Worksheets completed in 1998.

		Subwatershed									
		260	270	280	300	320	330	340	350	360	370
County (s)		Madison Limestone*	Marshall Morgan Cullman*	Limestone Madison	Limestone Madison	Limestone	Cullman Morgan	Lawrence Morgan Cullman*	Lawrence Morgan	Lawrence Morgan	Limestone
Acres Reported		97%	98%	100%	100%	100%	100%	95%	100%	100%	100%
Pesticides Applied	Est. % Total Acres	30	6	54	25	39	5	20	8	9	9
Cattle	# / Acre	---	0.13	0.08	0.07	0.10	0.19	0.21	0.12	0.09	---
	A.U./Acre	---	**0.13**	**0.08**	**0.07**	**0.10**	**0.19**	**0.21**	**0.12**	**0.09**	---
Dairy	# / Acre	---	0.01	---	---	0.00	0.01	0.03	0.01	0.00	---
	A.U./Acre	---	**0.01**	---	---	**0.01**	**0.01**	**0.05**	**0.02**	**0.00**	---
Swine	# / Acre	---	0.00	0.00	---	---	0.01	0.01	0.01	0.01	---
	A.U./Acre	---	**0.00**	**0.00**	---	---	**0.00**	**0.00**	**0.00**	**0.00**	---
Poultry - Broilers	# / Acre	---	5.81	---	---	6.69	80.93	18.62	9.68	0.13	---
	A.U./Acre	---	**0.05**	---	---	**0.05**	**0.65**	**0.15**	**0.08**	**0.00**	---
Poultry - Layers	# / Acre	---	0.14	---	1.24	0.39	0.90	0.47	0.05	0.00	---
	A.U./Acre	---	**0.00**	---	**0.01**	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	---
Catfish	# Acres/ Acre	---	---	---	---	---	---	---	---	---	---
	A.U./Acre	---	---	---	---	---	---	---	---	---	---
Total	A.U./Acre	**0.00**	**0.19**	**0.08**	**0.08**	**0.16**	**0.86**	**0.41**	**0.22**	**0.10**	**0.00**
Potential for NPS Impairment		Low	Mod.	Low	Low	Mod.	High	High	Mod.	Low	Low

* No data reported for this portion of the subwatershed

Table 3b, cont. Estimations of animal concentrations, animal units (AU), and percent of acres where pesticides/herbicides applied in the Wheeler Lake Cataloging Unit (0603-0002). Numbers of animals and pesicides/herbicides listed by acreage and subwatershed were provided by the local SWCDs on Conservation Assessment Worksheets completed in 1998.

		Subwatershed						
		380	390	400	410	420	440	Total
County (s)		Morgan Limestone*	Limestone	Limestone	Lawrence Morgan	Lawrence	Lauderdale	----
Acres Reported		80%	100%	100%	100%	100%	100%	99%
Pesticides Applied	Est. % Total Acres	---	18	53	17	55	13	18
Cattle	# / Acre	0.07	0.04	0.04	0.07	0.36	0.12	0.10
	A.U./Acre	**0.07**	**0.04**	**0.04**	**0.07**	**0.36**	**0.12**	**0.10**
Dairy	# / Acre	---	---	0.00	---	---	---	0.00
	A.U./Acre	---	---	**0.00**	---	---	---	**0.00**
Swine	# / Acre	0.01	---	---	0.00	0.00	0.02	**0.00**
	A.U./Acre	**0.00**	---	---	**0.00**	**0.00**	**0.01**	**0.00**
Poultry - Broilers	# / Acre	6.77	---	1.38	1.68	---	10.67	**7.59**
	A.U./Acre	**0.05**	---	**0.01**	**0.01**	---	**0.09**	**0.06**
Poultry - Layers	# / Acre	---	---	0.93	0.00	---	1.06	**0.40**
	A.U./Acre	---	---	**0.01**	**0.00**	---	**0.01**	**0.00**
Catfish	# Acres/ Acre	---	---	---	---	---	---	---
	A.U./Acre	---	---	---	---	---	---	---
Total	A.U./Acre	**0.13**	**0.04**	**0.06**	**0.08**	**0.36**	**0.22**	**0.16**
Potential for NPS Impairment		Low	Low	Low	Low	High	Mod.	Mod.

* No data reported for this portion of the subwatershed

Table 4b. Sedimentation estimates by source, forest condition, septic tank information and resource concerns by subwatershed in the Wheeler Lake cataloging unit (0603-0002) as provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets (ASWCC 1998).

Basin Code- Cataloging Unit	0603-0002								
Subwatershed	**020**	**040**	**050**	**060**	**070**	**080**	**090**	**100**	**110**
Forest Condition									
% of Subwatershed Needing Forest Improvement	46	47	46	41	42	43	31	25	27
Sediment Contributions (Tons/Acre)									
Cropland	0.0	0.0	0.1	0.0	0.2	0.0	0.4	0.4	0.5
Sand & Gravel Pits									
Mined Land							0.0		
Developing Urban Land							0.1	0.2	
Critical Areas	0.0	0.0	0.0	0.0	1.3	0.0	0.1	1.1	0.1
Gullies	0.0						0.2	0.1	0.1
Stream Banks	0.0	0.0	0.0	0.0	0.5	0.1	0.6	0.6	0.3
Dirt Roads and Roadbanks	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.2
Woodlands	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	
Total Sediment	0.1	0.1	0.1	0.2	**2.1**	0.2	1.5	**2.8**	1.2
Potential for Sediment NPS	Low	Low	Low	Low	**Mod.**	Low	Low	**Mod.**	Low
Current NPS Project	Paint Rk	Paint Rk	Paint Rk	Paint Rk	Paint Rk	Paint Rk	Paint Rk	Paint Rk	----
Septic Tanks									
# Septic Tanks per acre	0.00	0.00	0.00	0.01	0.00	0.00	0.06	0.06	0.03
# Septic Tanks Failing per acre	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.01
# of Alternative Septic Systems	0	0	0	0	0	0	0	0	0
Resource Concerns in the Subwatershed									
Excessive Erosion on Cropland			X	X	X			X	
Gully Erosion on Agricultural Land									
Road and Roadbank Erosion	X	X	X						
Poor Soil Condition (cropland)								X	
Excessive Animal Waste Applied to Land								X	X
Excessive Pesticides Applied to Land								X	
Excessive Sediment from Cropland	X		X		X			X	
Excessive Sediment From Roads/Roadbanks	X		X	X	X	X	X	X	
Excessive Sediment from Urban Development									
Inadequate Management of Animal Wastes					X		X	X	X
Nutrients in Surface Waters			X		X			X	X
Pesticides in Surface Waters								X	
Livestock Commonly have Access to Streams	X	X	X	X	X	X	X	X	

Table 4b, cont. Sedimentation estimates by source, forest condition, septic tank information and resource concerns by subwatershed in the Wheeler Lake cataloging unit (0603-0002) as provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets (ASWCC 1998). (* indicates information not reported)

Basin Code- Cataloging Unit	0603-0002								
Subwatershed	**130**	**140**	**160**	**180**	**190**	**200**	**210**	**220**	**230**
Forest Condition									
% of Subwatershed Needing Forest Improvement	*	*	*	*	*	*	*	5	*
Sediment Contributions (Tons/Acre)									
Cropland	0.5	0.7	0.5	0.6	0.3	0.2	0.3	0.3	0.1
Sand & Gravel Pits									0.1
Mined Land									
Developing Urban Land	0.2	0.8	0.3	1.2	0.9	0.2	3.3		3.5
Critical Areas	0.3	0.8	0.7	2.2	1.9	0.5	0.6	0.1	0.1
Gullies								0.1	
Stream Banks	0.1	0.1	3.8	0.1	0.1	0.3	0.4	0.1	0.1
Dirt Roads and Roadbanks	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0
Woodlands	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
Total Sediment	1.3	**2.4**	**5.5**	**4.2**	**3.2**	1.3	**4.8**	0.6	**4.0**
Potential for Sediment NPS	Low	**Mod.**	**High**	**High**	**Mod.**	Low	**High**	Low	**Mod.**
Current NPS Project	----	----	----	----	----	----	----	----	----
Septic Tanks									
# Septic Tanks per acre	0.20	0.04	0.08	0.07	0.03	0.05	0.04	0.03	0.09
# Septic Tanks Failing per acre	0.04	0.01	0.02	0.01	0.01	0.02	0.01	0.01	0.03
# of Alternative Septic Systems	0	0	0	0	0	0	0	40	0
Resource Concerns in the Subwatershed									
Excessive Erosion on Cropland		X	X	X		X	X	X	
Gully Erosion on Agricultural Land		X				X	X	X	
Road and Roadbank Erosion									
Poor Soil Condition (cropland)		X		X					
Excessive Animal Waste Applied to Land								X	
Excessive Pesticides Applied to Land		X	X	X		X	X		
Excessive Sediment from Cropland		X	X	X		X	X	X	
Excessive Sediment From Roads/Roadbanks									
Excessive Sediment from Urban Development		X	X	X		X	X		
Inadequate Management of Animal Wastes			X						
Nutrients in Surface Waters		X	X	X		X	X	X	
Pesticides in Surface Waters		X	X	X		X	X		
Livestock Commonly have Access to Streams		X	X	X		X	X	X	

Table 4b, cont. Sedimentation estimates by source, forest condition, septic tank information and resource concerns by subwatershed in the Wheeler Lake cataloging unit (0603-0002) as provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets (ASWCC 1998). * indicates not reported.

Basin Code- Cataloging Unit	0603-0002								
Subwatershed	**240**	**250**	**260**	**270**	**280**	**300**	**320**	**330**	**340**
Forest Condition									
% of Subwatershed Needing Forest Improvement	*	*	*	6	0	6	14	8	2
Sediment Contributions (Tons/Acre)									
Cropland	0.1	0.5	0.4	0.1	1.8	0.7	0.9	0.2	0.3
Sand & Gravel Pits								0.1	
Mined Land	1.2	0.1	0.5						
Developing Urban Land	4.1	1.5	1.8	0.0	0.2	2.6	0.2	0.1	
Critical Areas	0.4	3.7	0.8	0.1	0.0	1.0	0.1	0.0	0.0
Gullies				0.0	0.0			0.0	0.0
Stream Banks	0.0	0.2	0.3	0.1	0.2	0.6	0.3	0.0	0.1
Dirt Roads and Roadbanks			0.0	0.3	0.2	0.4	0.3	0.2	0.2
Woodlands	0.0	0.0	0.1	0.0	0.0	0.3	0.1	0.0	0.1
Total Sediment	**5.9**	**5.9**	**4.0**	0.6	**2.4**	**5.6**	**2.0**	0.8	0.8
Potential for Sediment NPS	**High**	**High**	**Mod.**	Low	**Mod.**	**High**	**Mod.**	Low	Low
Current NPS Project	----	----	----	----	----	----	----	Flint Ck	Flint Ck
Septic Tanks									
# Septic Tanks per acre	0.17	0.12	0.11	0.10	0.02	0.07	0.02	0.06	0.32
# Septic Tanks Failing per acre	0.05	0.02	0.02	0.01	0.00	0.01	0.00	0.00	0.03
# of Alternative Septic Systems	0	0	0	300	0	0	200	100	100
Resource Concerns in the Subwatershed									
Excessive Erosion on Cropland	X	X		X	X	X	X	X	X
Gully Erosion on Agricultural Land				X				X	X
Road and Roadbank Erosion				X				X	
Poor Soil Condition (cropland)		X			X	X	X		X
Excessive Animal Waste Applied to Land								X	X
Excessive Pesticides Applied to Land	X	X				X			
Excessive Sediment from Cropland		X		X	X	X	X	X	X
Excessive Sediment From Roads/Roadbanks				X					
Excessive Sediment from Urban Development	X	X				X			
Inadequate Management of Animal Wastes				X				X	X
Nutrients in Surface Waters	X	X		X		X		X	X
Pesticides in Surface Waters	X	X			X	X	X		
Livestock Commonly have Access to Streams	X	X		X	X	X	X	X	X

Table 4b, cont. Sedimentation estimates by source, forest condition, septic tank information and resource concerns by subwatershed in the Wheeler Lake cataloging unit (0603-0002) as provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets (ASWCC 1998). * indicates not reported

Basin Code- Cataloging Unit	0603-0002								
Subwatershed	**350**	**360**	**370**	**380**	**390**	**400**	**410**	**420**	**440**
Forest Condition									
% of Subwatershed Needing Forest Improvement	2	50	10	0	6	1	10	26	*
Sediment Contributions (Tons/Acre)									
Cropland	0.3	0.4	0.3	0.2	0.4	1.6	1.6	2.6	0.4
Sand & Gravel Pits	0.0								0.1
Mined Land							0.2		
Developing Urban Land	0.4	0.2		2.0	1.0	0.0	0.2		0.1
Critical Areas	0.0	0.0		0.0	0.0	0.0	0.0	0.1	0.0
Gullies	0.0	0.0		0.0			0.0	0.0	0.1
Stream Banks	0.1			0.0	0.0	0.1	0.0	0.0	0.1
Dirt Roads and Roadbanks	0.1	0.1		0.2		0.1	0.1	0.0	0.8
Woodlands	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.1
Total Sediment	0.9	0.8	0.3	**2.5**	1.5	1.7	**2.0**	**2.7**	1.6
Potential for Sediment NPS	Low	Low	Low	**Mod.**	Low	Low	**Mod.**	**Mod**	Low
Current NPS Project	Flint Ck	Flint Ck	----	----	----	----	----	----	----
Septic Tanks									
# Septic Tanks per acre	0.10	0.03	0.00	0.10	0.30	0.01	0.03	0.00	0.03
# Septic Tanks Failing per acre	0.01	0.03	0.00	0.01	0.09	0.00	0.01	0.00	0.00
# of Alternative Septic Systems	201	3	0	200	5000	0	103	0	5
Resource Concerns in the Subwatershed									
Excessive Erosion on Cropland	X	X		X	X	X	X	X	X
Gully Erosion on Agricultural Land	X			X			X		
Road and Roadbank Erosion		X					X	X	
Poor Soil Condition (cropland)	X	X			X	X	X	X	X
Excessive Animal Waste Applied to Land	X	X					X		
Excessive Pesticides Applied to Land		X					X	X	
Excessive Sediment from Cropland	X	X		X	X	X	X	X	X
Excessive Sediment From Roads/Roadbanks	X	X						X	
Excessive Sediment from Urban Development	X			X			X		
Inadequate Management of Animal Wastes	X	X					X		
Nutrients in Surface Waters	X	X		X			X		
Pesticides in Surface Waters		X	X		X	X	X	X	
Livestock Commonly have Access to Streams	X	X		X	X	X	X		X

Table 5b. Estimation of Potential Sources of NPS Impairment for subwatersheds in the Wheeler Lake Cataloging Unit (0603-0002). Source categories are based upon information provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets completed in 1998, and from Construction Stormwater Authorization information provided by the Mining and NPS Unit of ADEM.

Subwatershed	Potential NPS Impairment	Final Project Priority+	Potential Sources of Impairment							
			Urban	Mining	Forestry Practices	Development	Sedimentation	Animal Husbandry	Pasture Runoff	Row Crops
020	L				L		L	L	L	L
040	L				L		L	L	L	L
050	L				L		L	L	L	L
060	L				L		L	L	L	L
070	M		L		L	L	M	L	M	M
080	L				L		L	L	L	L
090	L				L	L	L	L	M	L
100	M				L	L	M	M	M	M
110	M				L	L	L	M	M	M
130	M				L	L	L	L	M	H
140	M				L	M	M	L	M	H
160	H	H			L	L	H	M	M	H
180	H	H	L		L	H	H	L	M	H
190	H	H	L		L	H	M	L	M	H
200	M				L	M	L	L	M	M
210	H				L	H	H	L	M	H
220	M				L	M	L	L	L	M
230	H		M		L	H	H	M	L	L
240	H		H	M	L	H	H	L	L	M
250	H		L		L	H	H	L	M	H
260	H		M		L	H	H		L	H
270	M	M			L	H	L	M	M	M
280	M				L	M	M	L	L	H

Table 5b, cont. Estimation of Potential Sources of NPS Impairment for subwatersheds in the Wheeler Lake Cataloging Unit (0603-0002). Source categories are based upon information provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets completed in 1998, and from Construction Stormwater Authorization information provided by the Mining and NPS Unit of ADEM.

Subwatershed	Potential NPS Impairment	Final Project Priority+	Potential Sources of Impairment							
			Urban	Mining	Forestry Practices	Development	Sedimentation	Animal Husbandry	Pasture Runoff	Row Crops
300	H	H			L	H	H	L	M	H
320	H	H	L		L	M	M	M	H	H
330	H		L		L	M	L	H	H	M
340	M				L		L	H	H	M
350	H		M		L	H	L	M	H	M
360	M				L	L	L	L	H	M
370	M		L		L	L	L		L	H
380	H		H	M	L	H	M	L	M	M
390	H		M		L	H	L	L	H	H
400	M	M			L	M	L	L	M	H
410	H			M	L	H	M	L	M	H
420	H		L	M	L	L	M	H	L	H
440	H	H			L	M	L	M	H	H

+ Final Priority may not coincide with estimated impairment potential; aquatic life use impairment determined the priority. SWCD information was not received until after final priority was assigne

Table 6b Physical characteristic estimates for sites assessed in the Wheeler Lake cataloging unit (0603-0002).

		Station										
		CSPJ-070	LPRM-090	LPRM-091	MTNM-160	MTNM-161	MTNM-162	MTNM-163	BFFM-180	BFFM-181	BFFM-182	BVDM-017
Subwatershed #		070	100	100	160	160	160	160	180	180	180	180
Date (YYMMDD)		980526	980527	980527	980513	980513	980513	980513	980513	980513	980513	980722
Width (ft)		25	12	16	5	40	30	15	75	20	---	25
Canopy Cover*		MO	S	O	O	MS	MS	O	O	S	MS	S
Depth (ft)	Riffle	---	1.5	1.5	1	0.75	0.5	1	1	---	---	---
	Run	2	1.5	1.5	1.5	1	1.5	1.5	2	2	4	1
	Pool	2.5	1.5	1.5	2.5	1	2.5	1.5	3.0	3.0	4.5	>3.0
Substrate (%)	Bedrock	0	0	0	40	60	58	0	50	0	0	0
	Boulder	1	0	0	20	10	10	10	10	5	10	0
	Cobble	0	0	0	10	5	15	40	5	35	20	26
	Gravel	1	15	1	10	5	5	30	15	30	25	20
	Sand	75	40	93	10	10	5	15	10	15	15	30
	Silt	15	2	2	3	5	5	3	5	10	10	15
	Detritus	8	7	2	5	2	2	2	5	15	15	4
	Clay	0	36	2	2	0	0	0	0	0	0	0
	Org. Silt	0	0	0	0	3	0	0	0	0	5	0

		Station										
		CHSM-190	CANM-220	ALDM-230	ALDM-231	ALDM-231	ALDM-232	HSBM-240	HSBM-241	HSBM-242	INDM-250	INDM-251
Subwatershed #		190	220	240	240	240	240	240	240	240	250	250
Date (YYMMDD)		980513	980706	980511	980511	980706	980511	980511	980511	980511	980512	980512
Width (ft)		15	10	80	40	60	15	90	30	4	25	22
Canopy Cover*		S	MO	O	O	O	O	O	O	50/50	50/50	S
Depth (ft)	Riffle	---	---	---	---	---	0.5	---	---	0.2	0.5	0.5
	Run	1.5	1	1.5	1.5	0.5	1	2.5	0.25	0.5	1.5	1
	Pool	2.5	1.5	2	2	0.5	1.5	3	---	---	2	1.5
Substrate (%)	Bedrock	0	No Measurable Flow	78	58	3	0	0	81	0	1	2
	Boulder	0		1	3	0	2	0	0	0	2	5
	Cobble	20		2	5	25	5	2	5	0	59	50
	Gravel	58		5	10	30	29	30	10	30	20	27
	Sand	10		10	10	10	60	46	2	64	10	10
	Silt	2		2	2	30	2	5	2	3	3	2
	Detritus	5		2	2	0	2	5	0	3	5	4
	Clay	5		0	10	2	0	2	0	0	0	0
	Org. Silt	0		0	0	0	0	10	0	0	0	0

* S = Shaded, MS = Mostly Shaded, 50/50 = est. half shaded, MO = Mostly Open, O = Open

Table 6b, cont. Physical characteristic estimates for sites assessed in the Wheeler Lake cataloging unit (0603-0002).

		Station										
		CTCM-026	CTCM-037	HGSM-027	RCKM-023	SXMM-036	TWNM-024	WFCM-028	LIML-300	LIML-301	PINL-320	PINL-321
Subwatershed #		270	270	270	270	270	270	270	300	300	320	320
Date (YYMMDD)		980723	980723	980723	980729	980723	980723	980729	980512	980512	980512	980512
Width (ft)		45	20	12	15	8	10	15	65	40	55	50
Canopy Cover*		O	MS	MS	S	S	S	MS	S	50/50	MO	O
Depth (ft)	Riffle	---	---	---	0.2	---	---	---	1.0	0.5	---	1
	Run	1.5	1.5	1.0	0.5	0.5	0.5	0.5	2.0	2.0	3	2.5
	Pool	2.5	2.5	1.5	1.5	2.0	2.0	2.5	3.0	---	4	3
Substrate (%)	Bedrock	No Measurable Flow	0	0	74	0	0	0	2	0	0	0
	Boulder		10	0	2	0	2	0	10	5	5	3
	Cobble		0	0	5	0	0	0	30	40	40	60
	Gravel		0	0	5	0	3	0	20	30	30	20
	Sand		20	85	10	81	80	78	30	20	20	10
	Silt		5	2	2	5	2	3	3	2	1	2
	Detritus		12	13	2	4	13	7	5	3	4	5
	Clay		50	0	0	0	0	0	0	0	0	0
	Org. Silt		0	0	0	15	0	2	0	0	0	0

		Station										
		PINL-322	MACM-330	ROBM-331	SHLM-332	SHLM-333	SHLM-334	TWNM-335	NOBM-350	NOBM-351	VILM-350	MCDL-360
Subwatershed #		320	330	330	330	330	330	330	350	350	350	360
Date (YYMMDD)		980512	980505	980505	980505	980505	980506	980506	980506	980506	980506	980506
Width (ft)		60	15	21	28	16	8	1	16	9	10	18
Canopy Cover*		MO	MS	MS	MS	50/50	MS	MO	MS	O	50/50	MS
Depth (ft)	Riffle	0.5	---	---	---	0.2	0.2	---	---	0.2	0.5	---
	Run	1	1.8	1.5	1.5	1.2	1.0	0.5	1.4	0.7	1.0	2.0
	Pool	3	2.5	3	3.0	2.0	3.0	1.0	2.5	1.2	1.4	3.0
Substrate (%)	Bedrock	0	0	0	28	0	0	No Measurable Flow	0	0	0	0
	Boulder	3	0	0	0	40	0		0	0	0	0
	Cobble	30	0	0	5	20	0		0	0	0	0
	Gravel	40	5	0	0	5	0		0	15	0	5
	Sand	20	45	45	40	25	23		0	70	49	70
	Silt	2	30	25	10	5	10		5	9	15	4
	Detritus	5	15	20	12	2	20		5	1	22	5
	Clay	0	3	0	0	3	45		88	5	12	15
	Org. Silt	0	2	10	5	0	2		2	0	2	1

* S = Shaded, MS = Mostly Shaded, 50/50 = est. half shaded, MO = Mostly Open, O = Open

Table 6b, cont. Physical characteristic estimates for sites assessed in the Wheeler Lake cataloging unit (0603-0002).

		Station										
		MCDL-361	SWNL-390	SWNL-391	SWNL-392	RNIL-400	RNIL-401	MALL-410	MALL-411	SCDL-011	FIRW-001	NLYW-001
Subwatershed #		360	390	390	390	400	400	410	410	440	440	440
Date (YYMMDD)		980506	980512	980512	980512	980512	980512	980506	980506	980722	980603	980603
Width (ft)		10	80	40	35	30	30	22	7	48	30	15
Canopy Cover*		MS	O	O	MS	O	MS	MS	MS	50/50	50/50	S
Depth (ft)	Riffle	0.2	---	0.5	0.5	0.25	0.5	---	---	0.3	0.25	---
	Run	1.0	1.0	0.8	1.5	0.5	1	2	0.6	1.75	1	---
	Pool	3.0	2.0	1.5	2.5	1	1.5	3.5	---	2.5	2	---
Substrate (%)	Bedrock	0	70	65	70	20	48	0	0	15	65	70
	Boulder	0	5	5	5	0	2	0	0	20	5	20
	Cobble	0	10	15	10	15	23	0	0	25	5	3
	Gravel	30	5	5	5	39	10	0	5	25	20	2
	Sand	40	5	5	5	15	10	65	10	8	1	0
	Silt	11	3	2	3	5	3	10	3	3	2	3
	Detritus	2	2	3	2	6	4	20	17	4	2	2
	Clay	16	0	0	0	0	0	5	65	0	0	0
	Org. Silt	1	0	0	0	0	0	0	0	0	0	0

		Station
		NLYW-001
Subwatershed #		440
Date (YYMMDD)		980722
Width (ft)		15
Canopy Cover*		S
Depth (ft)	Riffle	0.3
	Run	1
	Pool	1.5
Substrate (%)	Bedrock	70
	Boulder	2
	Cobble	5
	Gravel	5
	Sand	5
	Silt	10
	Detritus	3
	Clay	0
	Org. Silt	0

* S = Shaded, MS = Mostly Shaded, 50/50 = est. half shaded, MO = Mostly Open, O = Open

Table 7b. Habitat quality from the Wheeler Lake cataloging unit (0603-0002). In order to compare levels of habitat degradation between stations, values given for each of three major habitat parameter categories are presented as percent of maximum score.

Parameter	Station										
	CSPJ-070	LPRM-090	LPRM-091	MTNM-160	MTNM-161	MTNM-162	MTNM-163	BFFM-180	BFFM-181	BFFM-182	BVDM-017
Subwatershed #	070	100	100	160	160	160	160	180	180	180	180
Habitat Assessment Form	GP	GP	GP	RR	RR	RR	RR	RR	GP	GP	GP
Date (YYMMDD)	980526	980527	980527	980513	980513	980513	980513	980513	980513	980513	980722
Instream Habitat Quality	43	48	30	80	68	70	90	87	87	82	70
Sediment Deposition	63	63	45	65	73	80	73	63	73	65	78
% Sand	*75*	*40*	*93*	*10*	*10*	*5*	*15*	*10*	*15*	*15*	*30*
% Silt	*15*	*2*	*2*	*3*	*8*	*5*	*3*	*5*	*10*	*15*	*15*
Sinuosity	30	20	30	85	85	65	55	90	60	60	48
Bank and Vegetative Stability	50	63	78	35	78	68	68	78	63	68	40
Riparian Zone Measurements	43	35	25	55	75	80	40	80	90	90	70
% Canopy cover	MO	S	O	O	MS	MS	O	O	S	MS	S
% Maximum Score	49	51	45	67	74	74	72	78	77	76	66
Ecoregion /Subregion	71g	68c	68d	71g	71g	71g	71g	71g	71g	71g	71g
Habitat Quality Category	Fair	Good	Fair	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent

Parameter	Station										
	CHSM-190	CANM-220	ALDM-230	ALDM-231	ALDM-231	ALDM-232	HSBM-240	HSBM-241	HSBM-242	INDM-250	INDM-251
Subwatershed #	190	220	240	240	240	240	240	240	240	250	250
Habitat Assessment Form	GP	GP	RR	RR	GP	RR	GP	RR		RR	RR
Date (YYMMDD)	980513	980706	980511	980511	980706	980511	980511	980511	980511	980512	980512
Instream Habitat Quality	85	42	48	68	48	65	55	15	34	87	75
Sediment Deposition	83	68	83	80	30	60	49	75	69	73	83
% Sand	*10*	*45*	*10*	*10*	*10*	*60*	*45*	*2*	*64*	*10*	*10*
% Silt	*2*	*16*	*2*	*2*	*30*	*2*	*5*	*2*	*3*	*3*	*2*
Sinuosity	60	25	25	75	10	75	15	0	73	75	95
Bank and Vegetative Stability	75	25	83	80	60	75	64	48	63	73	85
Riparian Zone Measurements	55	23	40	30	50	33	83	0	19	65	70
% Canopy cover	S	MS	O	O	O	O	O	O	O	50/50	S
% Maximum Score	75	41	58	65	46	58	54	24	46	77	80
Ecoregion /Subregion	71g	71g	71g	71g	71g	71g	71g	71g	71g	71g	71g
Habitat Quality Category	Excellent	Fair	Good	Excellent	Fair	Good	Good	Poor	Fair	Excellent	Excellent

+S = Shaded; MS = Mostly Shaded; 50/50 = Approx. Half Shaded; MO = Mostly Open; O = Open
^ RR = Riffle Run; GP = Glide Pool (ADEM 1999)

Table 7b, cont. Habitat quality from the Wheeler Lake cataloging unit (0603-0002). In order to compare levels of habitat degradation between stations, values given for each of three major habitat parameter categories are presented as percent of maximum score.

Parameter	Station										
	CTCM-026	CTCM-037	HGSM-027	RCKM-023	SXMM-036	TWNM-024	WFCM-028	LIML-300	LIML-301	PINL-320	PINL-321
Subwatershed #	270	270	270	270	270	270	270	300	300	320	320
Habitat Assessment Form	GP	GP	GP	RR	GP	GP	GP	RR	RR	GP	RR
Date (YYMMDD)	980723	980723	980723	980729	980723	980723	980729	980512	980512	980512	980512
Instream Habitat Quality	44	48	43	52	37	54	42	83	83	83	73
Sediment Deposition	53	66	73	89	58	71	70	78	78	80	73
% Sand	*83*	*20*	*85*	*10*	*81*	*80*	*78*	*30*	*20*	*20*	*10*
% Silt	*5*	*5*	*2*	*2*	*20*	*2*	*5*	*3*	*2*	*1*	*2*
Sinuosity	33	40	50	80	45	60	35	70	85	25	95
Bank and Vegetative Stability	40	24	40	86	19	29	30	80	55	60	80
Riparian Zone Measurements	35	34	85	66	10	70	54	90	35	75	40
% Canopy cover	O	MS	MS	S	S	S	MO	S	50/50	MO	O
% Maximum Score	46	46	56	72	34	55	47	83	69	72	71
Ecoregion /Subregion	71g	71g	68c	68c	71g	71g	68c	71g	71g	71g	71g
Habitat Quality Category	Fair	Fair	Good	Excellent	Poor	Good	Fair	Excellent	Excellent	Excellent	Excellent

Parameter	Station										
	PINL-322	MACM-330	ROBM-331	SHLM-332	SHLM-333	SHLM-334	TWNM-335	NOBM-350	NOBM-351	VILM-350	VILM-350
Subwatershed #	320	330	330	330	330	330	330	350	350	350	350
Habitat Assessment Form	RR	GP	GP	RR	RR	RR	GP	GP	RR	RR	GP
Date (YYMMDD)	980512	980505	980505	980505	980505	980506	980506	980506	980506	980506	980714
Instream Habitat Quality	73	47	45	72	73	57	37	25	48	47	47
Sediment Deposition	70	58	58	65	78	60	55	73	50	65	53
% Sand	*20*	*45*	*45*	*40*	*25*	*23*	*30*	*0*	*70*	*49*	*50*
% Silt	*2*	*32*	*35*	*15*	*5*	*12*	*15*	*7*	*9*	*17*	*17*
Sinuosity	65	10	30	0	5	5	0	25	15	5	30
Bank and Vegetative Stability	53	70	68	65	88	83	100	18	63	90	75
Riparian Zone Measurements	53	40	85	100	100	100	40	85	45	100	75
% Canopy cover	MO	MS	MS	MS	50/50	MS	MO	MS	O	50/50	50/50
% Maximum Score	67	52	62	73	80	70	53	47	54	71	58
Ecoregion /Subregion	71g	71g	71g	71g	71j	71j	71j	71j	71g	71j	71j
Habitat Quality Category	Excellent	Good	Good	Excellent	Excellent	Excellent	Good	Fair	Good	Excellent	Good

+S = Shaded; MS = Mostly Shaded; 50/50 = Approx. Half Shaded; MO = Mostly Open; O = Open
^ RR = Riffle Run; GP = Glide Pool (ADEM 1999)

Table 7b, cont. Habitat quality from the Wheeler Lake cataloging unit (0603-0002). In order to compare levels of habitat degradation between stations, values given for each of three major habitat parameter categories are presented as percent of maximum score. (* Stations part of the ADEM Monitoring of State Parks Project)

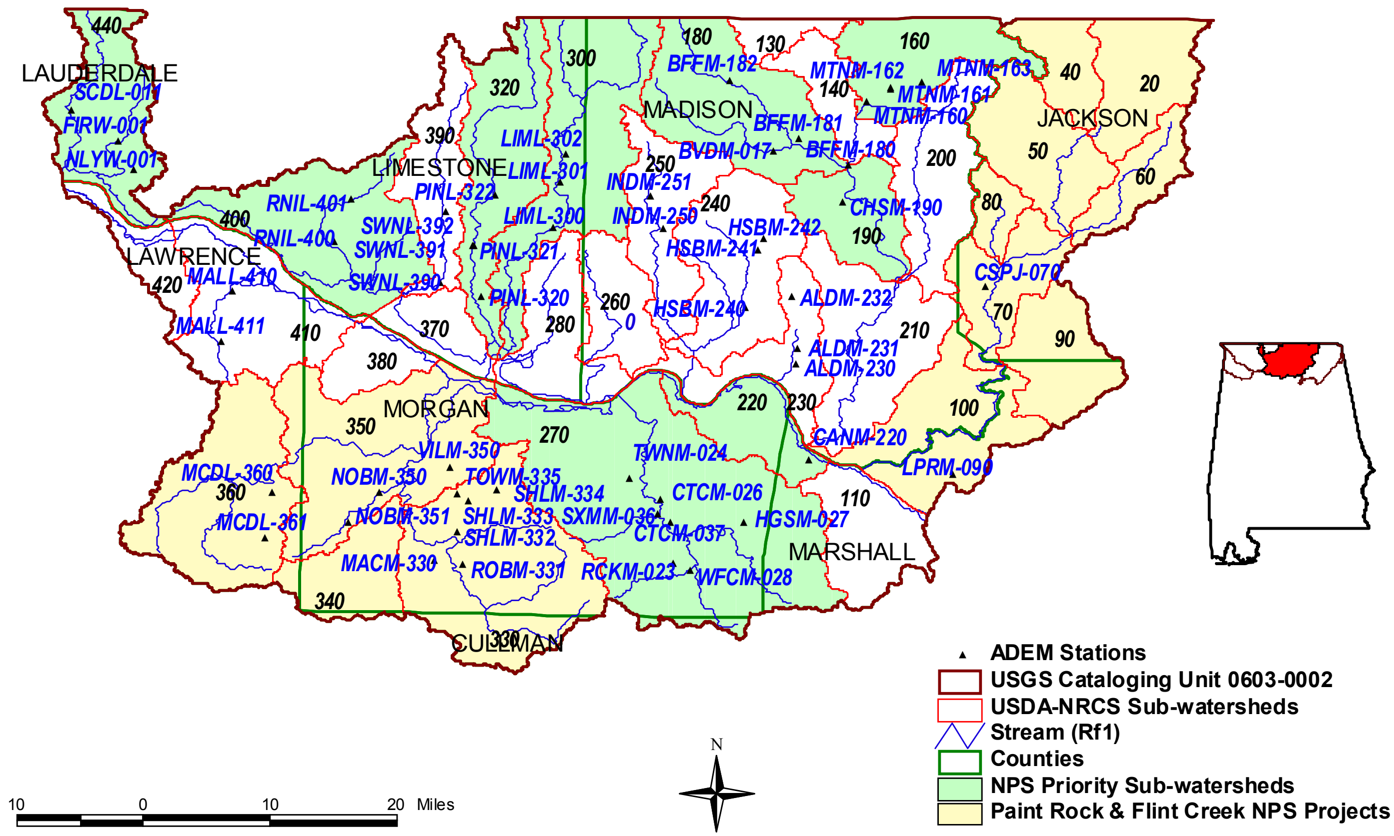
Parameter	Station										
	BGSM-022	MCDL-360	MCDL-361	SWNL-390	SWNL-391	SWNL-392	RNIL-400	RNIL-401	MALL-410	MALL-411	SCDL-011
Subwatershed #	360	360	360	390	390	390	400	400	410	410	440
Habitat Assessment Form	RR	GP	RR	GP	RR	RR	RR	RR	GP	GP	RR
Date (YYMMDD)	980728	980506	980506	980512	980512	980512	980512	980512	980506	980506	980722
Instream Habitat Quality	79	40	63	45	73	73	70	68	45	42	88
Sediment Deposition	61	73	68	30	78	73	65	73	78	90	88
% Sand	*50*	*70*	*40*	*5*	*5*	*5*	*15*	*10*	*65*	*10*	*8*
% Silt	*3*	*5*	*12*	*3*	*2*	*3*	*5*	*3*	*10*	*3*	*3*
Sinuosity	80	50	5	25	90	80	85	70	35	45	98
Bank and Vegetative Stability	53	90	95	73	83	80	65	63	83	83	60
Riparian Zone Measurements	80	100	75	90	45	80	63	75	93	50	44
% Canopy cover	S	MS	MS	O	O	MS	O	MS	MS	MS	50/50
% Maximum Score	72	72	68	58	69	74	67	71	70	63	76
Ecoregion /Subregion	71g	71g	71g	71g	71g	71g	71g	71g	71g	71g	71f
Habitat Quality Category	Excellent	Excellent	Excellent	Good	Excellent	Excellent	Excellent	Excellent	Excellent	Good	Excellent

Parameter	Station	
	FIRW-001*	NLYW-001*
Subwatershed #	440	440
Habitat Assessment Form	RR	RR
Date (YYMMDD)	980603	980603
Instream Habitat Quality	59	53
Sediment Deposition	81	84
% Sand	*1*	*0*
% Silt	*2*	*3*
Sinuosity	93	95
Bank and Vegetative Stability	70	49
Riparian Zone Measurements	90	86
% Canopy cover	50/50	S
% Maximum Score	78	71
Ecoregion /Subregion	71f	71g
Habitat Quality Category	Excellent	Excellent
EPT Taxa Collected	10	6
Aq. Macroinvertebrate Assess.*	Fair	Poor

+S = Shaded; MS = Mostly Shaded; 50/50 = Approx. Half Shaded; MO = Mostly Open; O = Open

^ RR = Riffle Run; GP = Glide Pool (ADEM 1999)

Fig. 4b. ADEM Water Quality Sampling Stations and NPS Priority Sub-watersheds for the Wheeler Lake Cataloging Unit of the Tennessee River Basin



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Section III: Lower Elk River Cataloging Unit (0603-0004)

The Lower Elk River Cataloging Unit contains eight sub-watersheds located within Limestone and Lauderdale Counties (Fig. 4c). The entire cataloging unit drains approximately 247 square miles of the Limestone Valleys and Uplands soil areas and is primarily located within the Interior Plateau Ecoregion (Fig. 5) (Griffith et al. 1999 Draft).

Historical Data/Studies

A review of existing data indicated that bioassessments have been conducted recently within four (4) of the seven (7) sub-watersheds by TVA and GSA (Appendices G-1 and G-2). Four (4) sub-watersheds contain segments on Alabama's 1998 §303(d) list of priority waterbodies (Table 11). Two (2) stations were assessed as part of the ADEM 1996 Clean Water Strategy (Appendices E-1 and F-7) (ADEM 1999a).

Study Area

Four (4) of the seven (7) sub-watersheds in the Lower Elk River Cataloging Unit were included in this project and two (2) were selected for further assessment (Table 10). Three (3) sub-watersheds were not considered in this study due to relatively small drainage areas (020, 070, 130) (Appendix H).

Conservation Assessment Worksheets

Based on the conservation assessment worksheets completed by the local SWCDs, the primary land-uses throughout the Lower Elk River cataloging unit were forestland (37%), pastureland (35%), cropland (22%), urban land (3%), and open water (3%) (Table 12b). Approximately 37,000 acres of crop and pastureland (24% of total land area) were treated with pesticides and/or herbicides. Animal production included poultry, dairy and beef cattle and swine. Animal Unit (AU) concentration estimates are presented in Table 13. The highest contribution to the sediment loading in the cataloging unit (Table 14) was estimated to be from cropland and dirt roads (0.70, 0.53 tons/acre/yr., respectively). The overall potential for nonpoint source impairment in the cataloging unit was *low* based upon SWCD estimates of sedimentation rates, animal unit densities, pasture and row crop land-uses; and the number of current construction stormwater authorizations (Development) in the CU (Table 15). Excessive erosion and sediment from croplands, poor soil condition of croplands, pesticides in surface waters, and common access of livestock to streams were indicated as concerns within the sub-watersheds by the local watershed committees. Two (2) sub-watersheds were listed as priorities by the local SWCD in public meetings during 1998 (080, 150).

Habitat Quality

Habitat quality (Table 7c) was assessed at three stations during the 1998 Tennessee Basin NPS screening project. In order to compare all assessments, habitat parameters are presented as percent of maximum score. Habitat Quality at all three of the stations was assessed as *excellent*.

<u>Historical Biological Assessments</u>

Eight (8) historical Fish IBI/Level I assessments and six (6) aquatic macroinvertebrate assessments were available from four (4) sub-watersheds (Appendices G-1 and G-2). Of the fourteen (14) bioassessments conducted at five (5) stations, four (4) stations were assessed as having *fair* (80%) biological communities and one (1) station (20%) was evaluated as having *poor* biological communities.

<u>Priority Sub-watersheds</u>

Based on the historical assessment results from 1993 to 1997, two (2) priority sub-watersheds were identified (Table 17, Appendix J). The fish community of one (1) station re-assessed in 1999 indicated improvement to a *fair* category. Therefore, this sub-watershed was given a *low* priority rating. A summary for each sub-watershed in the cataloging unit is provided below.

Sub-Watershed: North Elk River

NRCS Sub-Watershed Number 020

Percent land cover of the North Elk River sub-watershed was estimated as 51% deciduous forest, 2% evergreen forest, 10% mixed forest, 21% pasture/hay, 14% row crop, and 1% open water (Table 1c). Estimates of land-use (Table 2c) by the local SWCDs were higher for pasture land-use (45%). One current construction/stormwater authorization has been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3c) were *moderate* (0.17 AU/Acre), with cattle and poultry being the dominant animals. Sedimentation estimates (Table 4c) indicated a *low* potential for NPS impairment (1.4 tons/acre). The overall potential for impairment from nonpoint sources (Table 5c) was estimated as *moderate*.

The North Elk River sub-watershed drains approximately 38 mi^2 in Limestone County. One stream reach on the Elk River was sampled during the 1996 ADEM CWS project (Appendices E-1 and F-7).

Sub-Watershed: Shoal Creek

NRCS Sub-Watershed Number 060

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
10281-1	Chem./ Fish, Macroinv., Habitat	1997/ 1995	Shoal Creek @ Shoal Creek Bridge	58	F&W

Percent land cover of the Shoal Creek sub-watershed was estimated as 55% deciduous forest, 3% evergreen forest, 11% mixed forest, 20% pasture/hay, 10% row crops, and 1% open water (Table 1c). Estimates of land-use (Table 2c) by the local SWCDs were higher for urban (4%), pastureland (43%) and row crops (16%). No current construction/stormwater authorizations or NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3c) were *moderate* (0.23 AU/Acre), with cattle being the dominant animal.

Sedimentation estimates (Table 4c) indicated a *low* potential for NPS impairment (1.3 tons/acre). The overall potential for impairment from nonpoint sources (Table 5c) was estimated as *moderate.*

The Shoal Creek sub-watershed drains approximately 14 mi^2 in Limestone County. A 5.5 mile segment of Shoal Creek is included on the 1998 §303(d) list of impaired waters of Alabama due to unknown toxicity.

Shoal Creek

One stream reach of Shoal Creek was assessed by TVA in 1995 as having a *fair* fish community and a *fair/good* aquatic macroinvertebrate community (Appendices G-1 and G-2). Water quality and habitat assessments were also conducted by TVA at this reach during 1997 (Appendix F-8a). Stream flows ranged from 106 to 9.3 cfs from June to October. Water quality data indicated that total phosphate concentrations were elevated (range 0.18 to 0.39 mg/l).

Sub-Watershed: Baptizing Branch

NRCS Sub-Watershed Number 070

Percent land cover of the Baptizing Branch sub-watershed was estimated as 1% transitional forest, 50% deciduous forest, 1% evergreen forest, 10% mixed forest, 21% pasture/hay, 9% row crop, 2% wetland, and 5% open water (Table 1c). Estimates of land-use (Table 2c) by the local SWCDs were somewhat higher for pastureland (30%) and urban (6%), and lower for row crops (3%). No current construction/stormwater authorizations or NPDES permit have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3c) were *low* (0.04 AU/Acre), with cattle being the dominant animal. Sedimentation estimates (Table 4c) indicated a *low* potential for NPS impairment (0.7 tons/acre). The overall potential for impairment from nonpoint sources (Table 5c) was estimated as *low*.

The Baptizing Branch sub-watershed drains approximately 10 mi^2 in Limestone County. Due to the relatively small size, and the lack of recent biological assessments from either TVA or GSA for this sub-watershed, no additional assessments were conducted during this project.

Sub-Watershed: Big Creek

NRCS Sub-Watershed Number 080

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
BIGL-14/ 875-1	Chem., Habitat/ Fish, Macroinv., Habitat/Chem.	1998/ 1995, 1999/ 1997	Big Creek @Townsend Ford Rd Bridge	13	F&W
SLRL-15/ 11094-1	Chem., Habitat/ Fish	1998/ 1995	Sulphur Creek @Easter Ferry Rd Bridge	16	F&W

Percent land cover of the Big Creek sub-watershed was estimated as 37% deciduous forest, 3% evergreen forest, 9% mixed forest, 24% pasture/hay, 21% row crop, and 5% open water (Table 1c). Estimates of land-use (Table 2c) by the local SWCDs were higher for row crops (51%). One current construction/stormwater authorization and two semi-public/private NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3c) were *low* (0.08 AU/Acre), with cattle and poultry being the dominant animals. Sedimentation estimates (Table 4c) indicated a *low* potential for NPS impairment (1.9 tons/acre). The overall potential for impairment from nonpoint sources (Table 5c) was estimated as *moderate*. Big Creek was also given a 5th priority sub-watershed rating by the local SWCD.

The Big Creek sub-watershed drains approximately 62 mi^2 in Limestone County. Two stream reaches were evaluated by TVA in 1995 as having *poor* (875-1) and *fair* (11094-1) fish communities. Water quality and habitat assessments were also conducted by TVA and ADEM at these sites during 1997and 1998 respectively. A segment of Big Creek is included on the 1998 §303(d) list of impaired waters of Alabama due to impairment from organic enrichment/ dissolved oxygen.

<u>Big Creek</u>

Big Creek, at the BIGL-14 sampling reach, had a shaded canopy and was dominated by bedrock (~78%) substrates (Table 6c). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix (Table 7c). Stream flow was estimated at 6.2 cfs (Appendix D-1). ADEM water quality data indicated that the nitrite/nitrate concentration was elevated (1.12mg/l) during the July 1998 sampling event. No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling.

TVA collected water quality data monthly from June through October 1997 (Appendix F-8a). Stream flows ranged from 5.6 to 28.5 cfs. Nitrite/nitrate concentrations from June through October samples were elevated ranging from 0.73 to 1.1 mg/l. Fecal coliform counts were 470 and 1400 col/100ml in June and August, respectively.

<u>Sulphur Creek</u>

Sulphur Creek, at the SLRL-115 sampling reach, had a partly-shaded/partly-open canopy and was also dominated by bedrock (~80%) substrates (Table 6c). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix (Table 7c). Stream flow was estimated at 4.4 cfs (Appendix D-1). ADEM water quality data (Appendix D-1) indicated that nitrite/nitrate, and total phosphate were slightly elevated (0.646 and 0.101

mg/l, respectively). No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling.

TVA collected water quality data monthly from June through October 1997 (Appendix F-8a). Stream flows ranged from 3.7 to 42.5 cfs. Nitrite/nitrate concentrations from June through October samples were elevated, ranging from 0.67 to 0.96 mg/l. The total phosphate concentration was 0.19mg/l in the October sample. Fecal coliform counts were 300 and 1440 col/100ml in August and September, respectively.

Recommended Priority Sub-Watershed

Big Creek was identified as a priority sub-watershed due to biological and chemical conditions within the watershed (Table 17, Appendix J).

Sub-Watershed: Sugar Creek

NRCS Sub-Watershed Number 120

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
11053-1	Chem./ Fish, Macroinv., Habitat	1997/ 1995	Sugar Creek @Sugar Ck Rd Bridge	136	F&W

Percent land cover of the Sugar Creek sub-watershed was estimated as 37% deciduous forest, 3% evergreen forest, 9% mixed forest, 24% pasture/hay, 21% row crop, and 5% open water (Table 1c). Estimates of land-use (Table 2c) by the local SWCDs were higher for pastureland (50%). Two current construction/stormwater authorizations and one semi-public/private NPDES permit have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3c) were *moderate* (0.17 AU/Acre), with beef and dairy cattle being the dominant animals. Sedimentation estimates (Table 4c) indicated a *low* potential for NPS impairment (1.5 tons/acre). The overall potential for impairment from nonpoint sources (Table 5c) was estimated as *moderate*. The Sugar sub-watershed drains approximately 43 mi^2 in Lauderdale and Limestone Counties.

Sugar Creek

One stream reach of Sugar Creek was assessed by TVA in 1995 as having a *fair* fish community and a *good* aquatic macroinvertebrate community (Appendices G-1 and G-2). Water quality and habitat assessments were also conducted by TVA at this reach during 1997 (Appendix F-8a). Stream flows were erratic during the sampling events from June to October, ranging from 9.7 to 267 cfs, with the highest flows measured in July and October and the lowest in June (Appendix D-1). Water quality data indicated that nitrite/nitrate concentrations were slightly elevated (range 0.18 to 0.54 mg/l).

Sub-Watershed: Maple Swamp Branch

NRCS Sub-Watershed Number 130

Percent land cover of the Maple Swamp Branch sub-watershed was estimated as 1% transitional, 44% deciduous forest, 4% evergreen forest, 11% mixed forest, 22% pasture/hay, 7% row crop, and 11% open water (Table 1c). Estimates of land-use (Table 2c) by the local SWCDs were somewhat higher for row crops (14%) and pastureland (47%). One current construction/stormwater authorization has been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3c) were *moderate* (0.26 AU/Acre), with swine, cattle and layer poultry being the dominant animals. Sedimentation estimates (Table 4c) indicated a *moderate* potential for NPS impairment (2.6 tons/acre). The overall potential for impairment from nonpoint sources (Table 5c) was estimated as *moderate*.

The Maple Swamp Branch sub-watershed drains approximately 17 mi^2 in Lauderdale and Limestone Counties. Due to the generally small size and the lack of available recent biological assessments for this sub-watershed, no additional assessments were conducted during this project (Appendix H).

Sub-Watershed: Anderson Creek

NRCS Sub-Watershed Number 150

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
ANDL-8/ 122-1	Chem., Habitat/ Fish, Macroinv., Habitat/Chem.	1998/ 1995, 1999/ 1997	Anderson Creek @Snake Road Bridge	49	F&W

Percent land cover of the Anderson Creek sub-watershed was estimated as 30% deciduous forest, 2% evergreen forest, 7% mixed forest, 35% pasture/hay, 22% row crop, and 3% open water (Table 1c). Estimates of land-use (Table 2c) by the local SWCDs were lower for row crops (9%) and pastureland (23%). One current construction/stormwater authorizations and two semi-public/private NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3c) were *low* (0.11 AU/Acre), with cattle and broiler poultry being the dominant animals. Sedimentation estimates (Table 4c) indicated a *low* potential for NPS impairment (1.9 tons/acre). The overall potential for impairment from nonpoint sources (Table 5c) was estimated as *moderate*. Anderson Creek was also given a 4th priority sub-watershed rating by the local SWCD.

The Anderson Creek sub-watershed drains approximately 63 mi^2 in Lauderdale and Limestone Counties. Anderson Creek is included on the 1998 §303(d) list of impaired waters of Alabama due to siltation from an unknown source(s). The Elk River, from Wheeler Reservoir to Anderson Creek, is also included on the list due to pH and Organic enrichment from pasture grazing and non-irrigated crop production (Table 11).

Anderson Creek

One stream reach of Anderson Creek was evaluated by TVA in 1995 as having a *poor* fish community and a *good* aquatic macroinvertebrate community. TVA conducted additional assessments in 1999 and evaluated the communities as *fair* for both the fish and aquatic macroinvertebrates. Water samples collected by TVA in 1997 (Appendix F-8a) also had elevated nitrite/nitrate concentrations (range 0.59 to 0.75 mg/l). Fecal coliform counts were elevated during the August through October sampling events (range 440 to 1200 col/100ml.).

Water quality and habitat assessments were also conducted by ADEM at this reach during 1998 (Table 10). Anderson Creek, at the ANDL-8 sampling reach, had an open canopy and was dominated by bedrock (~75%) substrate (Table 6c). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix (Table 7c). Stream flow was estimated at 21.4 cfs during the July 1998 sampling event. ADEM Water quality data (Appendix D-1) indicated that nitrite/nitrate concentration (0.66 mg/l) was slightly elevated. No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling.

Recommended Priority Sub-Watershed

Anderson Creek was identified as a low priority sub-watershed due to biological and chemical conditions within the watershed (Table 17, Appendix J).

Table 1c. Land use percentages for Lower Elk River cataloging unit (0603-0004) from EPA landuse subcategory data (EPA 1997) and broader categories used in comparison with local SWCD Conservation assessment worksheet landuse estimates (ASWCC 1998).

	Percent Total Landuse (Category and Subcategory)													
	Open Water	Urban			Mining	Forest				Pasture/ Hay	Row Crops	Other		
Subwatershed	Open Water	Low Intensity Residential	High Intensity Residential	High Intensity Commercial/ Industrial/ Transportation	Quarries/ Strip Mines/ Gravel Pits	Transitional Forest	Deciduous Forest	Evergreen Forest	Mixed Forest	Pasture/ Hay	Row Crops	Other Grasses	Woody Wetlands	Herbaceous Wetlands
Lower Elk River (0603-0004)														
20	1						51	2	10	21	14			
60	1						55	3	11	20	10			
70	5					1	50	1	10	21	9		2	
80	5						37	3	9	24	21			
120	1					1	47	1	9	26	13		1	
130	11					1	44	4	11	22	7			
150	3						30	2	7	35	22			

Table 2c. Land use percentages for the Lower Elk River cataloging unit (0603-0004) from EPA landuse categories (EPA 1997) and local SWCD Conservation Assessment Worksheet landuse estimates (ASWCC 1998).

Sub-Watershed	Percent Total Landuse													
	Open Water		Urban		Mines		Forest		Pasture		Row Crops		Other	
	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA
Lower Elk River (0603-0004)														
020	2	1	3				37	63	45	21	13	14		1
060	2	1	4				35	69	43	20	16	10		
070	7	5	6				54	64	30	21	3	9		1
080	2	5	3				20	49	25	24	51	21		
120	6	1	4				29	58	50	26	11	13		1
130	14	11	3				22	59	47	22	14	7		
150		3	2				65	39	23	35	9	22	1	

Table 3c. Estimations of animal concentrations, animal units (AU), and percent of acres where pesticides/herbicides applied in the Lower Elk River Cataloging Unit (0603-0004). Numbers of animals and pesicides/herbicides listed by acreage and subwatershed were provided by the local SWCDs on Conservation Assessment Worksheets completed in 1998.

		Subwatershed							
		020	060	070	080	120	130	150	Total
County (s)		Limestone	Limestone	Limestone	Limestone	Limestone Lauderdale*	Limestone Lauderdale*	Lauderdale Limestone*	----
Acres Reported		100%	100%	100%	100%	95%	96%	90%	96%
Pesticides Applied	Est. % Total Acres	13	16	3	52	11	19	17	24
Cattle	# / Acre	0.11	0.23	0.04	0.06	0.17	0.14	0.08	0.10
	A.U./Acre	**0.11**	**0.23**	**0.04**	**0.06**	**0.17**	**0.14**	**0.08**	**0.10**
Dairy	# / Acre	---	---	---	---	0.00	---	0.01	0.00
	A.U./Acre	---	---	---	---	**0.01**	---	**0.01**	**0.00**
Swine	# / Acre	---	---	---	---	---	0.28	0.03	0.03
	A.U./Acre	---	---	---	---	---	**0.11**	**0.01**	**0.01**
Poultry - Broilers	# / Acre	4.22	---	---	2.05	---	---	---	1.21
	A.U./Acre	**0.03**	---	---	**0.02**	---	---	---	**0.01**
Poultry - Layers	# / Acre	3.23	---	---	0.98	---	1.93	1.00	1.14
	A.U./Acre	**0.03**	---	---	**0.01**	---	**0.02**	**0.01**	**0.01**
Catfish	# Acres/ Acre	---	---	---	---	---	---	---	---
	A.U./Acre	---	---	---	---	---	---	---	---
Total	A.U./Acre	**0.17**	**0.23**	**0.04**	**0.08**	**0.17**	**0.26**	**0.11**	**0.14**
Potential for NPS Impairment		Mod.	Mod.	Low	Low	Mod.	Mod.	Low	Low

* No data reported for this portion of the subwatershed

Table 4c. Sedimentation estimates by source, forest condition, septic tank information and resource concerns by subwatershed in the Lower Elk River (0603-0004) cataloging unit as provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets (ASWCC 1998).

Basin Code- Cataloging Unit	0603-0004						
Subwatershed	**020**	**060**	**070**	**080**	**120**	**130**	**150**
Forest Condition							
% of Subwatershed Needing Forest Improvement	21	17	23	8	11	11	*
Sediment Contributions (Tons/Acre)							
Cropland	0.5	0.5	0.1	1.5	0.4	0.7	0.3
Sand & Gravel Pits							0.1
Mined Land							
Developing Urban Land	0.2	0.0	0.1	0.2	0.0	0.1	0.1
Critical Areas	0.2	0.0	0.1	0.1	0.0	0.1	0.1
Gullies							0.1
Stream Banks	0.2	0.2	0.2	0.1	0.1	0.1	0.1
Dirt Roads and Roadbanks	0.2	0.1		0.0	0.7	1.7	1.0
Woodlands	0.1	0.5	0.1	0.1	0.2		0.2
Total Sediment	1.4	1.3	0.7	1.9	1.5	**2.6**	1.9
Potential for Sediment NPS	Low	Low	Low	Low	Low	**Mod.**	Low
Current NPS Project	----	----	----	----	----	----	----
Septic Tanks							
# Septic Tanks per acre	0.01	0.03	0.02	0.02	0.01	0.02	0.03
# Septic Tanks Failing per acre	0.00	0.00	0.00	0.00	0.00	0.00	0.00
# of Alternative Septic Systems	50	0	0	0	0	0	40
Resource Concerns in the Subwatershed							
Excessive Erosion on Cropland	X	X		X	X	X	
Gully Erosion on Agricultural Land							
Road and Roadbank Erosion							
Poor Soil Condition (cropland)	X	X	X	X	X	X	X
Excessive Animal Waste Applied to Land							
Excessive Pesticides Applied to Land							
Excessive Sediment from Cropland	X			X	X	X	
Excessive Sediment From Roads/Roadbanks							
Excessive Sediment from Urban Development							
Inadequate Management of Animal Wastes							
Nutrients in Surface Waters							
Pesticides in Surface Waters	X			X	X	X	
Livestock Commonly have Access to Streams	X	X	X	X	X	X	X

Table 5c. Estimation of Potential Sources of NPS Impairment for subwatersheds in the Lower Elk River Cataloging Unit (0603-0004). Source categories are based upon information provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets completed in 1998, and from Construction Stormwater Authorization information provided by the Mining and NPS Unit of ADEM.

Subwatershed	Potential NPS Impairment	Final Project Priority+	Potential Sources of Impairment							
			Urban	Mining	Forestry Practices	Development	Sedimentation	Animal Husbandry	Pasture Runoff	Row Crops
020	M				L	L	L	M	M	M
060	M				L		L	M	M	L
070	L				L		L	L	M	L
080	M	M			L	L	L	L	H	H
120	M				L	L	L	M	H	M
130	M				L	L	M	M	M	L
150	M	M			L	L	L	L	H	H

+ Final Priority may not coincide with estimated impairment potential; aquatic life use impairment determined the priority. SWCD information was not received until after final priority was assigned.

Table 6c Physical characteristic estimates for sites assessed in the Lower Elk River cataloging unit (0603-0004).

		Station		
		ANDL-008	BIGL-014	SLRL-015
Subwatershed #		150	080	080
Date (YYMMDD)		980722	980722	980722
Width (ft)		40	40	21
Canopy Cover*		O	S	50/50
Depth (ft)	Riffle	0.5	0.5	0.25
	Run	1.25	0.5	0.75
	Pool	2	1	---
Substrate (%)	Bedrock	75	78	80
	Boulder	2	3	4
	Cobble	7	5	4
	Gravel	7	5	4
	Sand	5	5	3
	Silt	2	2	3
	Detritus	2	2	2
	Clay	0	0	0
	Org. Silt	0	0	0

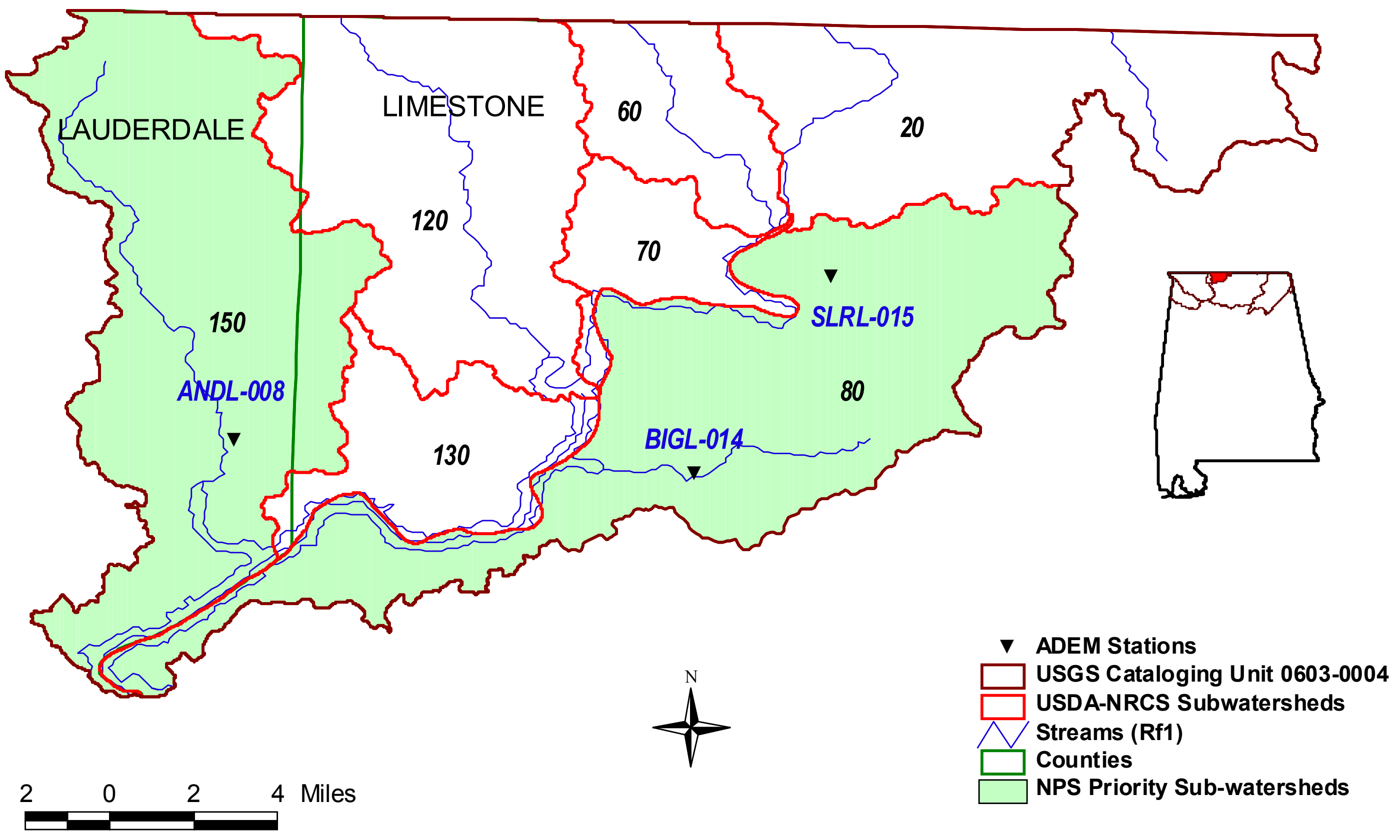
* S = Shaded, MS = Mostly Shaded, 50/50 = est half shaded, MO = Mostly Open, O = Open

Table 7c. Habitat quality from the Lower Elk River cataloging unit (0603-0004). In order to compare levels of habitat degradation between stations, values given for each of three major habitat parameter categories are presented as percent of maximum score.

Parameter	Station SLRL-015	BIGL-014	ANDL-008
Subwatershed #	080	080	150
Habitat Assessment Form	RR	RR	RR
Date (YYMMDD)	980722	980722	980722
Instream Habitat Quality	75	77	90
Sediment Deposition	80	69	83
% Sand	*3*	*5*	*5*
% Silt	*3*	*2*	*2*
Sinuosity	98	93	90
Bank and Vegetative Stability	69	80	70
Riparian Zone Measurements	68	84	80
% Canopy cover	50/50	S	O
% Maximum Score	74	78	82
Ecoregion /Subregion	71h	71h	71f
Habitat Quality Category	Excellent	Excellent	Excellent

+S = Shaded; MS = Mostly Shaded; 50/50 = Approx. Half Shaded; MO = Mostly Open; O = Open
^ RR = Riffle Run; GP = Glide Pool (ADEM 1999)

Fig. 4c. ADEM Water Quality Sampling Stations and NPS Priority Sub-watersheds for the Lower Elk River Cataloging Unit (0603-0004) of the Tennessee River Basin



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Section IV: Pickwick Lake Cataloging Unit (0603-0005)

The Pickwick Lake cataloging unit drains seventeen sub-watersheds located within Lawrence, Lauderdale, Colbert, and Franklin counties. The cataloging unit drains approximately 1,414 square miles of primarily the Limestone Valleys and Uplands, and smaller amounts of the Coastal Plain. It is primarily located within the Interior Plateau Ecoregion with a portion of Northwest Lauderdale County in the Transition Hills Subregion of the Southeastern Plains (Fig. 5) (Griffith et al. 1999 Draft).

Historical Data/Studies

A review of existing data indicated that bioassessments have been conducted recently by TVA and GSA within fifteen (15) of the seventeen (17) sub-watersheds (Appendices G-1 and G-2). Three sub-watersheds contained segment(s) on Alabama's 1998 §303(d) list of impaired waterbodies (Table 11). Eight stations were assessed as part of the ADEM 1996 Clean Water Strategy (Appendix F-7), and six stations were included in the ALAMAP (Appendices E-1 and F-6) sampling project (ADEM 1999a, ADEM 1997a).

Study Area

Eleven of the seventeen sub-watersheds in the Pickwick Lake Cataloging Unit were included in this project with four being selected for additional study. Six Sub-watersheds were not considered in this study due to relatively small drainage areas (140, 240, 320), or the influence of an urban area (150, 160, 200).

Conservation Assessment Worksheet

Based on the conservation assessment worksheets completed by the local SWCDs, the primary land-uses throughout the Pickwick Lake cataloging unit were forestland (48%), pastureland (20%), cropland (23%), urban land (7%), open water (1%), and other land (2%) (Table 12b). Approximately 116,000 acres of crop and pastureland (~13% of total land area) were treated with pesticides and/or herbicides. Animal production included poultry, dairy and beef cattle, swine, and catfish farms. Animal Unit (AU) concentration estimates for each animal type are presented in Table 13. The highest contribution to the sediment loading in the cataloging unit were estimated to be from cropland, developing urban land and dirt roads (0.66, 0.49, and 0.35 tons/acre/yr., respectively). The estimated overall potential for nonpoint source impairment in the cataloging unit was *moderate*; primarily from estimates of sedimentation rates, pasture and row crop land-uses, and the number of current construction stormwater authorizations (Development) in the CU (Table 15). The dominant areas of concern in the sub-watershed as indicated by the local conservation committees were the poor condition of, and excessive erosion/sediment from cropland, and common access of livestock to streams. Eight sub-watersheds were listed as priorities by the local SWCD in public meetings during 1998 (010, 030, 040, 180, 200, 210, 220, 230).

Habitat Quality

Habitat quality (Table 7d) was assessed at nine stations during the 1998 Tennessee Basin NPS project. In order to compare all assessments, habitat parameters are presented as percent of maximum score. Habitat Quality at all stations was assessed as either *excellent* (7) or *good* (2).

Historical Biological Assessments

Sixty-one (61) historical Fish IBI assessments and twenty (20) aquatic macroinvertebrate assessments were available from fifteen (15) sub-watersheds (Appendices G-1 and G-2). Of the Eighty-three (83) bioassessments conducted at approximately forty-two (42) stations, one station was assessed as having a *good/excellent* (2%) biological community, 21 stations (50%) were evaluated as having *good* or *fair/good* biological communities, 16 (38%) were *fair* or *poor/fair*, and 4 (10%) were assessed as *poor*.

Priority Sub-watersheds

Based on these results, four priority sub-watersheds were identified (Table 17, Appendix J). A summary for each sub-watershed in the cataloging unit is provided below.

Sub-Watershed: Big Nance Creek

NRCS Sub-Watershed Number 010

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
TN599	Fish	1992	Big Nance Creek		F&W
930-1	Fish, Macroinv., Habitat	1998, 1999	Big Nance Creek @AL Hwy 70	187	F&W
BNC-A	Chem., Habitat	1997	Big Nance Creek ds of Alt 72 Bridge		F&W
BGNL-32/ TN211	Chem., Habitat/ Fish,	1997/ 1991	Big Nance Creek Next to Lawrence Co Rd 150 nr Courtland	150	F&W
BGNL-33/ BNC-B	Chem., Habitat/	1998/	Big Nance Creek @ Lawrence Co Rd 151	117	F&W
TN662/ 2324-1	Fish/ Fish, Macroinv., Habitat	1993/ 1999	Clear Fk of Big Nance Ck	27	F&W
CLFL-12	Chem., Habitat	1998	Clear Fk of Big Nance Ck ds of AL Hwy 33 Bridge	20	F&W
MBNL-34	Chem., Habitat	1998	Muddy Fk of Big Nance Ck	25	A&I

Percent land cover of the Big Nance Creek sub-watershed was estimated as 27% deciduous forest, 3% evergreen forest, 11% mixed forest, 27% pasture/hay, 21% row crop, 1% other grasses, 6% wetland, 1% high intensity commercial/ industrial/transportation, and 1% open water (Table 1d). Estimates of land-use (Table 2d) by the local SWCDs were somewhat higher for row crops (36%) and lower for pasture (20%). Eleven (11) current construction/stormwater authorizations; two municipal and one each of mining, semi-public/private and industrial NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3d) were *low* (0.09 AU/Acre), with cattle and broiler poultry being the dominant animals. Sedimentation estimates (Table 4d) indicated a *low* potential for NPS impairment (1.2 tons/acre). The overall potential for impairment from nonpoint sources (Table 5d) was estimated as *high*. Big Nance Creek was also given a 1st priority sub-watershed rating by the local SWCD.

The Big Nance Creek sub-watershed drains approximately 200 mi^2 in Lawrence County. Big Nance Creek, from Wilson Lake to the confluence with Clear and Muddy Forks is included on the 1998 §303(d) list of impaired waters of Alabama with non-attainment status due to pesticides, Ammonia, Siltation, Organic enrichment/DO, and Pathogens from intensive animal feeding operations, landfills, pasture grazing and non-irrigated crop production (Table 11). Four stream reaches were evaluated by TVA and GSA using fish IBI or Level I community assessments and aquatic macroinvertebrate community assessments. Water quality data were collected at two additional stations (Appendices E-1 and E-2). Water quality and habitat assessments were also conducted at four sites by ADEM during this project (Table 10).

Big Nance Creek

The fish community of Big Nance Creek was assessed at three locations: *fair/good* at station TN599 in 1992, *fair* at station TN211 in 1991, and *poor/fair* at station 930-1 in 1999. The aquatic macroinvertebrate community of station 930-1 was assessed as *poor* in 1998 and *fair/good* in 1999.

ADEM collected water quality and habitat data at stations BGNL-32 and BGNL–33 in 1998. Big Nance Creek, at the BGNL-32 sampling reach, had a partly-open/partly-shaded canopy and was dominated by cobble (~40% and gravel (~40%) substrates (Table 6d). Station BGNL-33 substrates were dominated by sand (~47%), gravel (~30%) and cobble (~10%). Habitat quality was assessed as *excellent* at both stations using the riffle/run assessment matrix. Sediment deposition, riparian zone measurements, and bank stability were the categories of slight impairment to the BGNL-33 habitat quality (Table 7d). Stream flow was estimated at 22.9 and 11.0 cfs at stations BGNL–32 and BGNL–33, respectively. Water quality data (Appendix D-1) indicated that the dissolved oxygen concentration during the station visits in July 1998 were below the 5.0 mg/l water quality standard at both stations (3.2 and 2.0 mg/l). Constituent concentrations were elevated for nitrite/nitrate (0.822 and 0.314mg/l), total phosphate (0.115, 0.109 mg/l), and TKN (0.781, 0.91 mg/l) at stations BGNL–32 and BGNL–33, respectively. No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling.

Two sites were also assessed during ADEM's 1996 CWS sampling effort (Appendices E-1 and F-7a). Nitrite/nitrate concentrations were consistently elevated at both sites during site visits in June, August and October 1996 (range 0.919 to 1.8 mg/l).

TVA collected monthly water quality data at BNC-B (BGNL-33) and BNC-A from June through October 1997 (Appendix E-1). Both stations had sporadic elevated nutrients, including ammonia, during all sampling events (Appendix F-8a). No pesticides or herbicides were detected at the time of water quality sampling (Appendix F-8b).

Clear Fork of Big Nance Creek

One stream reach of the Clear fork of Big Nance Creek was assessed by GSA (1993) and TVA (1999) as having a *poor* (1993 and 1999) fish community, and a *fair* (1999) aquatic macroinvertebrate community. Water quality and habitat assessments were also conducted by ADEM upstream of this reach during 1998 (Table 10).

Clear Fork, at the CLFL-12 sampling reach, had a mostly-shaded canopy and was dominated by cobble (~50%) with lesser amounts of gravel (~20%) and sand (~18%) substrates (Table 6d). Habitat quality was assessed as *excellent* in July using the riffle/run assessment matrix (Table 7d). Water quality data, collected during a stream flow estimated at 3.9 cfs, indicated that TKN and TPO4 concentrations were slightly elevated (0.666, 0.097 mg/l, respectively) (Appendix D-1). No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling.

Muddy Fork of Big Nance Creek

Water quality samples were collected from the Muddy Fork of Big Nance Creek (MBNL-34) by ADEM in July 1998. Muddy Fork, at the MBNL-34 sampling reach, had an open canopy and was dominated by gravel (~43%) and cobble (~40%) with lesser amounts of sand (~10%) substrates (Table 6d). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix (Table 7d). The stream flow was similar to the station CLFL-12 (3.6 cfs). The dissolved oxygen concentration measured was 5.0 mg/l; however, the water quality standard for an A&I classified stream is 3.0 mg/l. Laboratory derived water quality data indicated that the nutrients concentrations measured were all elevated, when compared to the Clear Fork (Appendix D-1). No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling. One site on Muddy Fork was assessed in 1997 during the ALAMAP monitoring program (Appendix F-6) and Borden Creek, a tributary to the Muddy Fork, upstream of MBNL-34 was also evaluated at two locations in 1996 as part of the 1996 CWS sampling effort (Appendix F-7a).

Recommended Priority Sub-Watershed

Big Nance Creek was identified as a priority sub-watershed due to biological and chemical conditions within the watershed (Table 17, Appendix J).

Sub-Watershed: Bluewater Creek

NRCS Sub-Watershed Number 030

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
TN719	Fish	1996	Bluewater Creek Lauderdale Co. @1S, 9W, S24	49	F&W
1157-1/ GSA12	Fish/ Fish, Macroinv. Habitat	1997/ 1999	Bluewater Creek Lauderdale Co. @ 1S, 9W, S36	110	F&W
1157-2	Fish	1997	Bluewater Creek		F&W
7574-1	Fish/ Fish, Macroinv. Habitat	1997/ 1999	Mill Creek	14	F&W

Percent land cover of the Bluewater Creek sub-watershed was estimated as 36% deciduous forest, 1% evergreen forest, 8% mixed forest, 33% pasture/hay, 18% row crop, and 4% open water (Table 1d). Estimates of land-use (Table 2d) by the local SWCDs were somewhat higher for pasture (44%). Four current construction/stormwater authorizations and one semi-public/private NPDES permit have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3d) were *high* (0.34 AU/Acre), with cattle and poultry being the dominant animals. Sedimentation estimates (Table 4d) indicated a *low* potential for NPS impairment (1.8 tons/acre). The overall potential for impairment from nonpoint sources (Table 5d) was estimated as *high*. Bluewater Creek was also given a 5th priority sub-watershed rating by the local SWCD. The Bluewater Creek sub-watershed drains approximately 89 mi^2 in Lauderdale County.

Bluewater Creek

Three stream reaches of Bluewater Creek were evaluated by GSA and TVA from 1996 to 1999 (Appendix G-1). All assessments indicated the fish communities were in *fair/good* to *fair* condition and the aquatic macroinvertebrate community of station 1157-1 was in *good* condition.

Mill Creek

Mill Creek was also assessed by TVA in 1997 and 1999. The fish community was in *fair* condition in 1997 and in *poor/fair* condition in 1999 (Appendix G-1). The aquatic macroinvertebrate community was in *good* condition in 1999 (Appendix G-2).

Sub-Watershed: Town Creek

NRCS Sub-Watershed Number 040

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
TC-A/ 11500-1/ TN193	Chem., Habitat/ Chem., Habitat, Macroinv./ Fish	1997/ 1998/ 1991	Town Creek @Hwy 184 Bridge	226	F&W
TC-B	Chem., Habitat	1997	Town Creek @Alt Hwy 72 Bridge	201	F&W
TC-C	Chem., Habitat	1997	Town Creek @ Lawrence Co Rd131	126	F&W
TWNL-13/ TN196	Chem., Habitat/ Fish	1998/ 1991	Town Creek @ Harris Bridge	75	F&W
PPLC-1/ TN195	Chem., habitat/ Fish	1998/ 1991	Poplar Creek @Colbert Co Rd 48 nr Zion Hill Church	9	F&W

Percent land cover of the Town Creek sub-watershed was estimated as 1% Transitional, 26% deciduous forest, 4% evergreen forest, 13% mixed forest, 26% pasture/hay, 24% row crop, 4% wetland, and 2% open water (Table 1d). Estimates of land-use (Table 2d) by the local SWCDs were somewhat higher for row crops (37%). Eleven current construction/stormwater authorizations, and two municipal, one mining, and one semi-public private NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3d) were *moderate* (0.18 AU/Acre), with cattle and poultry being the dominant animals. Sedimentation estimates (Table 4d) indicated a *moderate* potential for NPS impairment (2.1 tons/acre). The overall potential for impairment from nonpoint sources (Table 5d) was estimated as *high.* Town Creek was also given a 1st priority sub-watershed rating by the local SWCD.

The Town Creek sub-watershed drains approximately 250 mi^2 in Colbert, Franklin, and Lawrence Counties. Town Creek, from Wheeler Reservoir to its source, is included on the 1998 §303(d) list of impaired waters of Alabama with partial-attainment status due to pH and Organic enrichment/DO from pasture grazing and non-irrigated crop production (Table 11). Harris Creek is also listed with non-attainment status, from the confluence with Mud Creek to its source, for siltation and organic enrichment/DO impairment due to pasture grazing activities. Three stream reaches in the Town Creek sub-watershed have been assessed using fish IBI or aquatic macroinvertebrate assessments. Two additional sites were evaluated by TVA using habitat assessments and water quality samples only. Water quality and habitat assessments were also conducted by ADEM at two sites during this project (Table 10).

Town Creek

Four stations on Town Creek have been assessed by TVA and GSA since 1991. Three of the four Fish IBI assessments conducted at two stations found *poor* fish communities. Station 11500-1 had a *fair* fish community in 1999 and a *fair/good* aquatic macroinvertebrate community in 1998.

Town Creek was assessed by ADEM in July 1998 as part of this screening project. The TWNL-13 sampling reach, had a partly-open/partly-shaded canopy and was dominated by cobble (~30%), sand (~25%), and gravel (~23%) with lesser amounts of boulder (~10%) and silt (~10%) substrates (Table 6d). Habitat quality was assessed as *good* using the glide/pool assessment matrix. Sinuosity, bank stability and riparian zone measurements were the categories of slight impairment to the habitat quality (Table 7d). Stream flow was estimated at 4.2 cfs. Water quality data (Appendix D-1) indicated that TDS, nitrite/nitrate, TPO4, and TKN were elevated (209, 0.644, 0.133, and 0.916 mg/l, respectively). No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling.

Water quality data were collected by TVA at stations TC-A, TC-B and TC-C during 1997. Stations TC-A and TC-B had generally elevated nitrite/nitrate concentrations during site visits from July through October. The upstream station of the three, station TC-C, had much lower nitrite/nitrate concentrations over the same period.

One station on Town Creek was assessed by ADEM during the 1996 CWS effort (Appendix F-7a). Water samples collected in June, August and October indicated sporadic nutrient enrichment.

<u>Poplar Creek</u>

Poplar Creek, at GSA station TN195, was assessed in 1991 as *poor* using a fish community assessment. ADEM conducted a habitat assessment and collected water quality samples and field parameters at the same site in July 1998. Poplar Creek, at the PPLC-1 sampling reach, had a mostly-shaded canopy and was dominated by clay (~40%), and organic silt (~30%) with lesser amounts of sand (~10%) and silt (~10%) substrates (Table 6d). Habitat quality was assessed as *good* using the glide/pool assessment matrix (Table 7d). Sinuosity and riparian zone measurements were the categories of slight impairment to the habitat quality. Stream flow was very low (0.3 cfs) (Appendix D-1) during the July sampling event and the dissolved oxygen concentration was 2.8 mg/l, below the water quality standard of 5.0 mg/l for a Fish and Wildlife Classified stream. Laboratory derived water quality data indicated that the TKN and TPO4 concentrations were elevated (0.676, 0.105 mg/l, respectively). No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling.

<u>Recommended Priority Sub-Watershed</u>

Town Creek was identified as a priority sub-watershed due to biological and chemical conditions within the watershed (Table 17, Appendix J).

Sub-Watershed: Upper Shoal Creek

NRCS Sub-Watershed Number 090

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
INCL-1	Chem., Habitat, Macroinv.	1998	Indiancamp Creek @ Festival Park	10	F&W
5458-1	Fish, Habitat	1994	Indiancamp Creek @ RM 1.3	8	F&W
10280-1/ TN600	Macroinv./ Fish	1997/ 1996	Shoal Creek @ Lauderdale Co Rd 8		F&W
10280-2	Fish	1997	Shoal Creek		F&W
10280-3	Fish	1997	Shoal Creek		F&W

Percent land cover of the Upper Shoal Creek sub-watershed was estimated as 1% transitional forest, 60% deciduous forest, 2% evergreen forest, 12% mixed forest, 17% pasture/hay, 8% row crop, and 1% open water (Table 1d). Estimates of land-use (Table 2d) by the local SWCDs were somewhat higher for pasture (31%). One current construction/stormwater authorization, and one mining and two semi-public/private NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3d) were *moderate* (0.22 AU/Acre), with cattle, broiler poultry and swine being the dominant animals. Sedimentation estimates (Table 4d) indicated a *low* potential for NPS impairment (1.5 tons/acre). The overall potential for impairment from nonpoint sources (Table 5d) was estimated as *moderate*.

The Upper Shoal Creek sub-watershed drains approximately 30 mi^2 in Lauderdale County. Five stream reaches were evaluated using instream bioassessments by TVA, ADEM, or GSA from 1994 through 1998. Water quality and habitat assessments were also conducted by ADEM at one reach during 1998 (Table 10).

Indiancamp Creek

Two reaches on Indiancamp Creek have been assessed, using either fish or aquatic macroinvertebrate community assessments, as *good/excellent* and *excellent*, respectively (Table 7d, Appendix G-1). A water quality assessment of station INCL-1 was conducted in June of 1998 in conjunction with the Alabama State Parks Project (ADEM 1999d). The stream reach was mostly-shaded over a channel dominated with gravel (~65%), cobble (~15%) and bedrock (~10%) substrates (Table 6d). Habitat quality was assessed as excellent using the riffle run assessment matrix. Water quality data (Appendix D-1) indicated that only fecal coliform counts were slightly elevated (330 col/100ml). No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling.

Shoal Creek

Shoal Creek was evaluated by GSA at three sites during 1996-97. The 1997 fish community assessments indicated that sites 10280-1 and 10280-2 were in *fair* condition and site 10280-3 was in *good* condition (Appendix G-1). A 1998 assessment at station

10280-1 found the aquatic macroinvertebrate community was in *good* condition (Appendix G-2).

Sub-Watershed: Butler Creek

NRCS Sub-Watershed Number 140

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
1725-1/ TN186	Fish, Macroinv./ Fish	1998, 1999/ 1993	Butler Creek @ Lauderdale Co Rd 302	55	F&W

Percent land cover of the Butler Creek sub-watershed was estimated as 71% deciduous forest, 3% evergreen forest, 11 mixed forest, 10% pasture/hay, 4% row crop, and 1% high intensity commercial/ industrial/transportation (Table 1d). Estimates of land-use (Table 2d) by the local SWCDs were somewhat higher for pasture (31%). One current construction/stormwater authorization has been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3d) were *low* (0.08AU/Acre), with cattle being the dominant animal type. Sedimentation estimates (Table 4d) indicated a *low* potential for NPS impairment (0.6 tons/acre). The overall potential for impairment from nonpoint sources (Table 5d) was estimated as *low*.

The Butler Creek sub-watershed drains approximately eight square miles (8 mi2) in Lauderdale County, Alabama. The remaining part of the sub-watershed is located in Tennessee. One site was assessed by TVA and GSA from 1993 to 1999. All assessments of fish and aquatic macroinvertebrates indicated that the communities were in *good* condition. Due to the small area located in Alabama, this sub-watershed was not included in the project.

Sub-Watershed: Lower Shoal Creek

NRCS Sub-Watershed Number 150

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
TN138	Fish	1991	Cox Creek @ T2S, R11W, S34		F&W
10448-1	Macroinv.	1998	Sixmile Creek @ Lauderdale Co Rd 37		F&W

Percent land cover of the Lower Shoal Creek sub-watershed was estimated as 34% deciduous forest, 3% evergreen forest, 11% mixed forest, 22% pasture/hay, 9% row crop, 2% other grasses, 1% wetland, 2% high intensity commercial/ industrial/transportation, 1% high intensity residential, 4% low intensity residential and 13% open water (Table 1d). Estimates of land-use (Table 2d) by the local SWCDs were similar. Seventeen current construction/stormwater authorizations and two semi-public/private NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3d) were *low* (0.10 AU/Acre), with cattle being the dominant animal type. Sedimentation estimates (Table 4d) indicated a *low* potential for NPS impairment (1.4 tons/acre). The overall potential for impairment from nonpoint sources (Table 5d) was estimated as *moderate*.

The Lower Shoal Creek sub-watershed drains approximately 80 mi^2 in Lauderdale County. Cox Creek was assessed by GSA in 1991 as having a *fair* fish community. The aquatic macroinvertebrate community of Sixmile Creek was assessed by TVA in 1998 as *fair/good*. Due to the close proximity of the city of Florence, Alabama, no assessments were conducted during this project (Appendix H).

Sub-Watershed: Pond Creek

NRCS Sub-Watershed Number 160

Percent land cover of the Pond Creek sub-watershed was estimated as 20% deciduous forest, 1% evergreen forest, 7% mixed forest, 17% pasture/hay, 29% row crop, 3% other grasses, 3% wetland, 4% high intensity commercial/ industrial/transportation, 1% high intensity residential, 4% low intensity residential, and 12% open water (Table 1d). Estimates of land-use (Table 2d) by the local SWCDs were somewhat higher for row crops (39%) and urban land-use (22%). Seven current construction/stormwater authorizations, and three municipal and five industrial NPDES permit have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3d) were *moderate* (0.16 AU/Acre), with cattle and broiler poultry being the dominant animals. Sedimentation estimates (Table 4d) indicated a *high* potential for NPS impairment (9.3 tons/acre) mostly from developing urban land. The overall potential for impairment from nonpoint sources (Table 5d) was estimated as *high*.

The Pond Creek sub-watershed drains approximately 74 mi^2 in Colbert County. Pond Creek, from the Tennessee River to its source, is included on the 1998 §303(d) list of impaired waters of Alabama with non-attainment status due to metals and organic enrichment/DO from urban runoff/storm sewers, natural sources, and non-irrigated crop production (Table 11). A 15.0 mile segment of Shegog Creek is also included on the list with non-attainment status due to organic enrichment/DO, ammonia, nutrients and siltation from unknown sources. Water chemistry samples were collected at three sites on Pond Creek by TVA in 1997 (Appendices F-8a, F-8b, F-8c). Due to the proximity of the cities of Tuscumbia and Muscle Shoals, Alabama, no assessments were conducted during this project (Appendix H).

Sub-Watershed: Upper Cypress Creek

NRCS Sub-Watershed Number 180

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
BRML-009/ TN148	Chem., Habitat/ Fish	1998/ 1992	Burcham Creek	16	F&W
6417-1/ TN153	Fish, Macroinv.	1998	Lindsey Creek @ Lauderdale Co Rd 278		F&W
TN624	Fish	1992	Middle Cypress Creek		F&W
7508-1	Fish	1997	Middle Cypress Creek		F&W
TN163	Fish	1992	North Fork Cypress Creek		F&W

Percent land cover of the Upper Cypress Creek sub-watershed was estimated as 37% deciduous forest, 2% evergreen forest, 11% mixed forest, 29% pasture/hay, 18% row crop, 1% wetland (Table 1d). Estimates of land-use (Table 2d) by the local SWCDs were similar. One current construction/stormwater authorization and two semi-public/private NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3d) were *low* (0.11 AU/Acre), with cattle and layer poultry being the dominant animals. Sedimentation estimates (Table 4d) indicated a *low* potential for NPS impairment (1.8 tons/acre). The overall potential for impairment from nonpoint sources (Table 5d) was estimated as *moderate*. Upper Cypress Creek was also given a 2nd priority sub-watershed rating by the local SWCD.

The Upper Cypress Creek sub-watershed drains approximately 80 mi^2 in Lauderdale County. Approximately five stream reaches were evaluated by TVA and GSA from 1992 through 1998. Water quality and habitat assessments were also conducted by ADEM at the Burcham Creek station during 1998 (Table 10).

<u>Burcham Creek</u>

Burcham Creek at TN148 was assessed by GSA as having a *poor/fair* fish community. ADEM visited this site in July 1998. Burcham Creek, at the BRML-009 sampling reach, had a mostly-shaded canopy and was dominated by gravel (~60%) with lesser amounts of cobble (~20%) and sand (~11%) substrates (Table 6d). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix (Table 7d). Stream flow was estimated at 0.8 cfs. Water quality data (Appendix D-1) indicated that the nitrite/nitrate and total phosphate concentrations were slightly elevated (0.611, 0.095 mg/l, respectively). No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling.

<u>Lindsey Creek</u>

Biological assessments were conducted at Lindsey Creek by TVA (1998) and GSA (1992). Fish and aquatic macroinvertebrate assessments indicated *good* community condition.

<u>Middle Cypress Creek</u>

Two assessments were conducted on Middle Cypress Creek by GSA. The Fish community assessment in 1992 indicated a *good* community, while the 1997 evaluation rated the community as *fair*.

<u>North Fork Cypress Creek</u>

North Fork of Cypress Creek was evaluated by GSA in 1992. The fish assessment indicated that the community was in *good* condition.

<u>Recommended Priority Sub-Watershed</u>

Upper Cypress Creek was identified as a low priority sub-watershed due to biological and chemical conditions within the Burcham Creek portion of the watershed (Table 17, Appendix J).

Sub-Watershed: Lower Cypress Creek

NRCS Sub-Watershed Number 200

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
2888-1 TN533	Fish, Macroinv./ Fish	1998/ 1996	Cypress Creek @Lauderdale Co Rd 14		PWS/F&W
6547-2	Fish	1997	Little Cypress Creek		F&W
6547-1	Fish	1997	Little Cypress Creek @ Lauderdale Co Rd 41	51	F&W

Percent land cover of the Lower Cypress Creek sub-watershed was estimated as 1% transitional forest, 42% deciduous forest, 2% evergreen forest, 11% mixed forest, 21% pasture/hay, 13% row crop, 2% other grasses, 1% wetland, 1% high intensity commercial/ industrial/transportation, 1% high intensity residential, 5% low intensity residential, and 1% open water (Table 1d). Estimates of land-use (Table 2d) by the local SWCDs were higher for urban land-use (23%) and lower for both pasture (12%) and row crops (3%). Twelve current construction/stormwater authorizations and one industrial NPDES permit have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3d) were *low* (0.12 AU/Acre), with cattle and broiler poultry being the dominant animals. Sedimentation estimates (Table 4d) indicated a *moderate* potential for NPS impairment (2.4 tons/acre), mostly from developing urban land and dirt roads. The overall potential for impairment from nonpoint sources (Table 5d) was estimated as *high*. Lower Cypress Creek was also given a 1st priority sub-watershed rating by the local SWCD.

The Lower Cypress Creek sub-watershed drains approximately 70 mi^2 in Lauderdale County. Three stream reaches in this sub-watershed were assessed by TVA and GSA from 1996 to 1998 using fish or aquatic macroinvertebrate community assessments. All assessments evaluated the communities as *fair* to *good* quality. One site on Cypress Creek was sampled in association with the Department's ALAMAP monitoring project (Appendix F-6). Two additional sites on Cypress Creek were assessed during the 1996 Clean Water Strategy project (Appendix F-7a). Due to the proximity of the city of

Florence, Alabama, no additional assessments were conducted during this project (Appendix H).

Sub-Watershed: Spring Creek

NRCS Sub-Watershed Number 210

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
TN130	Fish	1993	Foxtrap Creek @Colbert Co Rd 37		F&W
TN648	Fish	1993	Spring Creek @Al Hwy 157		F&W
10725-1	Fish, Macroinv./ Fish	1998/ 1999	Spring Creek @Colbert Co Rd 55	100	F&W

Percent land cover of the Spring Creek sub-watershed was estimated as 2% transitional forest, 30% deciduous forest, 5% evergreen forest, 15% mixed forest, 19% pasture/hay, 23% row crop, 1% other grasses, 2% wetland, 1% high intensity commercial/ industrial/transportation, 2% low intensity residential and 1% open water (Table 1d). Estimates of land-use (Table 2d) by the local SWCDs were somewhat higher for urban land (15%). Six current construction/stormwater authorizations, and one industrial and two mining permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3d) were *low* (0.14 AU/Acre), with cattle and poultry being the dominant animals. Sedimentation estimates (Table 4d) indicated a *moderate* potential for NPS impairment (2.6 tons/acre). The overall potential for impairment from nonpoint sources (Table 5d) was estimated as *high*. Spring Creek was also given a 4th priority sub-watershed rating by the local SWCD. The Spring Creek sub-watershed drains approximately 108 mi^2 in Colbert and Franklin Counties.

Foxtrap Creek

Foxtrap Creek was evaluated by GSA in 1993. The fish community assessment indicated that the community was in *fair/good* condition.

Spring Creek

Four assessments were conducted on two reaches of Spring Creek by TVA and GSA. The fish assessment in 1993 at station TN648 indicated a *fair/good* community, while both the 1998 and 1999 assessments rated the station 10725-1 fish community as *fair*. The aquatic macroinvertebrate community of station 10725-1 was also assessed as *fair* by TVA in 1998.

Sub-Watershed: Sinking Creek

NRCS Sub-Watershed Number 220

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
SNKL-010/ 10420-1/ TN120	Chem. Habitat/ Fish, Habitat, Macroinv./ Fish	1998/ 1999/ 1997	Sinking Creek	46	F&W

Percent land cover of the Sinking Creek sub-watershed was estimated as 15% deciduous forest, 1% evergreen forest, 4% mixed forest, 22% pasture/hay, 42% row crop, 7% wetland, and 9% open water (Table 1d). Estimates of land-use (Table 2d) by the local SWCDs were higher for row crops (65%). Two current construction/stormwater authorizations have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3d) were *low* (0.08 AU/Acre), with cattle and swine being the dominant animals. Sedimentation estimates (Table 4d) indicated a *high* potential for NPS impairment (4.7 tons/acre) mostly from cropland and dirt roads. The overall potential for impairment from nonpoint sources (Table 5d) was estimated as *moderate*. Sinking Creek was also given a 3rd priority sub-watershed rating by the local SWCD.

The Sinking Creek sub-watershed drains approximately 74 mi^2 in Lauderdale County. One stream reach of Sinking Creek was evaluated by TVA, GSA and ADEM. In 1997, GSA evaluated the fish community as *poor*. TVA (1999) assessed the fish and aquatic macroinvertebrate communities as *poor/fair* and *poor*, respectively. In July 1998, water quality and habitat assessments were conducted by ADEM (Table 10).

Sinking Creek, at the SNKL-010 sampling reach, had a mostly-shaded canopy over a channel dominated by cobble (~45%) and gravel (~45%) substrates (Table 6d). Habitat quality was assessed as *excellent* using the riffle/run assessment matrix (Table 7d). Stream flow was estimated at 14.7 cfs. Water quality data (Appendix D-1) indicated that the nitrite/nitrate and total phosphate concentrations were elevated (1.498, 0.095 mg/l, respectively). The dissolved oxygen concentration was 5.6 mg/l in the late afternoon. No pesticides or herbicides (Appendix D-2) were detected at the time of water quality sampling.

<u>Recommended Priority Sub-Watershed</u>

Sinking Creek was identified as a priority sub-watershed due to biological and chemical conditions within the watershed (Table 17, Appendix J).

Sub-Watershed: Cane Creek

NRCS Sub-Watershed Number 230

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
1870-1/ TN642	Fish, Macroinv./ Fish	1999/ 1993	Cane Creek @AL Hwy 247, Colbert Co.	42	F&W
TN124	Fish	1993	Little Bear Creek @Colbert Co. T5S,11W,S6		F&W
6442-1	Fish, Macroinv./ Fish	1998/ 1999	Little Bear Creek @ Colbert Co Rd 65	52	F&W

Percent land cover of the Cane Creek sub-watershed was estimated as 5% transitional forest, 47% deciduous forest, 7% evergreen forest, 19% mixed forest, 12% pasture/hay, 6% row crop, and 2% open water (Table 1d). Estimates of land-use (Table 2d) by the local SWCDs were higher for urban land-use (11%). Three current construction/stormwater authorizations and two mining, one industrial, one semi-public/private, and one municipal, NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3d) were *low* (0.11 AU/Acre), with cattle and poultry being the dominant animals. Sedimentation estimates (Table 4d) indicated a *moderate* potential for NPS impairment (2.3 tons/acre). The overall potential for impairment from nonpoint sources (Table 5d) was estimated as *moderate*. Cane Creek was also given a 2nd priority sub-watershed rating by the local SWCD. The Cane Creek sub-watershed drains approximately 142 mi^2 in Colbert and Franklin Counties.

<u>Cane Creek</u>

Cane Creek has been evaluated by GSA (1993) and TVA (1999). The fish assessments indicated that the community was in *fair/good* condition in 1993 and in *good* condition in 1999. The biological assessment by TVA in 1999 also found the aquatic macroinvertebrate community to be in *good* condition.

<u>Little Bear Creek</u>

Four assessments were conducted on two reaches of Little Bear Creek by TVA and GSA. The Fish assessment in 1993 at station TN124 indicated a *good* community, while both the 1998 and 1999 assessments rated station 6442-1 community as *fair*. The aquatic macroinvertebrate community of station 6442-1 was assessed as *good* by TVA in 1998.

Sub-Watershed: Colbert Creek

NRCS Sub-Watershed Number 240

Percent land cover of the Colbert Creek sub-watershed was estimated as 5% transitional forest, 34% deciduous forest, 7% evergreen forest, 14% mixed forest, 10% pasture/hay, 20% row crop, and 10% open water (Table 1d). Estimates of land-use (Table 2d) by the local SWCDs were very similar. Three current construction/stormwater authorizations and one mining, one industrial, and one municipal NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3d) were *low* (0.03 AU/Acre), with cattle being the dominant animal type. Sedimentation estimates (Table 4d) indicated a *moderate* potential for NPS impairment (2.7 tons/acre). The overall potential for impairment from nonpoint sources (Table 5d) was estimated as *moderate*.

The Colbert Creek sub-watershed drains approximately 61 mi^2 in Colbert County. No recent fish or aquatic macroinvertebrate community assessments were available from this sub-watershed. Due to the generally small size of the streams and its overall close proximity to the Tennessee River, no assessments were conducted during this project (Appendix H).

Sub-Watershed: Brush Creek

NRCS Sub-Watershed Number 250

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
1162-1/ TN107	Fish, Macroinv./ Fish	1998/ 1991	Bluff Creek @Lauderdale Co Rd 87		F&W
1460-1/ TN105	Fish, Macroinv./ Fish	1998/ 1991	Brush Creek @Lauderdale Co Rd 133		F&W

Percent land cover of the Brush Creek sub-watershed was estimated as 1% transitional forest, 52% deciduous forest, 4% evergreen forest, 11% mixed forest, 9% pasture/hay, 7% row crop, and 16% open water (Table 1d). Estimates of land-use (Table 2d) by the local SWCDs were similar. Two current construction/stormwater authorizations have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3d) were *low* (0.03 AU/Acre), with cattle being the dominant animals. Sedimentation estimates (Table 4d) indicated a *low* potential for NPS impairment (1.3 tons/acre). The overall potential for impairment from nonpoint sources (Table 5d) was estimated as *low*. The Brush Creek sub-watershed drains approximately 68 mi^2 in Lauderdale County.

Bluff Creek

Three assessments were conducted on one reach of Bluff Creek by TVA and GSA. The Fish community assessments conducted in 1991 and 1998 indicated *good* fish communities. The aquatic macroinvertebrate community was also assessed as *good* by TVA in 1998.

Brush Creek

Brush Creek has been evaluated by GSA (1991) and TVA (1998). All of the fish and aquatic macroinvertebrate assessments indicated that the communities were in *good* condition.

Sub-Watershed: Second Creek

NRCS Sub-Watershed Number 270

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
TN099	Fish	1991	Bumpass Creek @ Lauderdale Co T1s, R15W, S24		F&W
TN003	Fish	1992	Cedar Fork @ Lauderdale Co T1s, R15W, S24		F&W
10117-1/ TN102	Fish, Macroinv. Fish	1998/ 1997	Second Creek @Lauderdale Co Rd 90		F&W

Percent land cover of the Second Creek sub-watershed was estimated as 6% transitional, 58% deciduous forest, 7% evergreen forest, 14% mixed forest, 6% pasture/hay, 2% row crop, 1% wetland, and 5% open water (Table 1d). Estimates of land-use (Table 2d) by the local SWCDs were similar. One current construction/stormwater authorization and one semi-public/private NPDES permit have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3d) were *low* (0.01 AU/Acre), with cattle being the dominant animal type. Sedimentation estimates (Table 4d) indicated a *low* potential for NPS impairment (1.5 tons/acre). The overall potential for impairment from nonpoint sources (Table 5d) was estimated as *low*.

The Second Creek sub-watershed drains approximately 47 mi^2 in Lauderdale County. Three streams in the Second Creek sub-watershed were assessed from 1991 through 1998 by TVA and GSA. Bumpass Creek and Cedar Fork were evaluated by GSA as having *good* fish communities. Community assessments were conducted on a reach of Second Creek by GSA in 1997 (fish) and by TVA in 1998 (fish and aquatic macroinvertebrates). All assessments indicated *good* community condition.

Sub-Watershed: Panther Creek

NRCS Sub-Watershed Number 280

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
TN005	Fish	1991	UT to Tennessee River @Lauderdale Co T1S, R 15W, S33		F&W
8470-1/ TN004	Fish, Macroinv./ Fish	1998/ 1991	Panther Creek @Lauderdale co Rd 105		F&W

Percent land cover of the Panther Creek sub-watershed was estimated as 1% transitional forest, 39% deciduous forest, 14% evergreen forest, 18% mixed forest, 2% pasture/hay, 1% wetland, and 23% open water (Table 1d). Estimates of land-use (Table 2d) by the local SWCDs were similar. One current construction/stormwater authorization has been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3d) were *low* (0.01 AU/Acre), with cattle being the dominant animal type. Sedimentation estimates (Table 4d) indicated a *low* potential for NPS impairment (1.7 tons/acre). The overall potential for impairment from nonpoint sources (Table 5d) was estimated as *low*.

The Panther Creek sub-watershed drains approximately 30 mi^2 in Lauderdale County. Two streams were assessed by TVA and GSA in the Panther Creek sub-watershed. The fish community of an unnamed tributary (UT) to the Tennessee River was assessed as *good* by GSA in 1991. Panther Creek was also assessed by GSA in 1991 and by TVA in 1998 as having a *good* and *fair* fish community condition, respectively. The Panther Creek aquatic macroinvertebrate community evaluated by TVA in 1998 was in *good* condition.

Sub-Watershed: Hitchcock Branch

NRCS Sub-Watershed Number 320

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
TN001	Fish	1991	UT to Tennessee River		F&W

Percent land cover of the Hitchcock Branch sub-watershed was estimated as 23% deciduous forest, 19% evergreen forest, 19% mixed forest, 2% pasture/hay, and 36% open water (Table 1d). No data was submitted by the local SWCDs due to the small size of the sub-watershed. One current construction/stormwater authorization has been issued in the sub-watershed (Table 9). The overall potential for impairment from nonpoint sources (Table 5d) was roughly estimated as *low*.

The Hitchcock Branch sub-watershed drains approximately 4 mi^2 in Lauderdale County. One stream reach of an unnamed tributary to the Tennessee River was evaluated by GSA in 1991 as having a *poor* fish community. However, due to the very small size of the sub-watershed and its location on the Tennessee border, this sub-watershed was not included in the screening project.

Table 1d. Land use percentages for Pickwick Lake cataloging unit (0603-0005) from EPA landuse subcategory data (EPA 1997) and broader categories used in comparison with local SWCD Conservation Assessment Worksheet landuse estimates (ASWCC 1998).

	Percent Total Landuse (Category and Subcategory)													
	Open Water	Urban			Mining	Forest				Pasture/ Hay	Row Crops	Other		
Subwatershed	Open Water	Low Intensity Residential	High Intensity Residential	High Intensity Commercial/ Industrial/ Transportation	Quarries/ Strip Mines/ Gravel Pits	Transitional Forest	Deciduous Forest	Evergreen Forest	Mixed Forest	Pasture/ Hay	Row Crops	Other Grasses	Woody Wetlands	Herbaceous Wetlands
Pickwick Lake (0603-0005)														
10	1			1			27	3	11	27	21	1	6	
30	4						36	1	8	33	18			
40	2					1	26	4	13	26	24		4	
90	1					1	60	1	12	17	8			
140				1			71	3	11	10	4			
150	13	4	1	2			34	3	11	22	9	2	1	
160	12	3	1	4			20	1	7	17	29	3	3	
180							37	2	11	29	18		1	
200	1	5	1	1		1	42	2	11	21	13	2	1	
210	1	2		1		2	30	5	15	19	23	1	2	
220	9						15	1	4	22	42		6	1
230	2					5	47	7	19	12	6			
240	10					5	34	7	14	10	20			
250	16					1	52	4	11	9	7			
270	5					6	58	7	14	6	2		1	
280	23					1	39	14	18	2			1	
320	36						23	19	19	2				

Table 2d. Land use percentages for the Pickwick Lake cataloging unit (0603-0005) from EPA landuse categories (EPA 1997) and local SWCD Conservation Assessment Worksheet landuse estimates (ASWCC 1998).

Sub-Watershed	Percent Total Landuse													
	Open Water		Urban		Mines		Forest		Pasture		Row Crops		Other	
	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA
Pickwick Lake (0603-0005)														
010		1	4	1			39	47	20	27	36	21		1
030		4	3				37	45	44	33	14	18	1	
040		2	1				37	48	23	26	37	24	2	
090		1	3				57	74	31	17	8	8	1	
140			3	1			57	85	31	10	8	4	1	
150		13	13	7			44	49	30	22	10	9	3	2
160		12	22	8			20	31	12	17	39	29	6	3
180			2				57	51	29	29	11	18	1	
200	1	1	23	7			57	57	12	21	3	13	4	2
210	1	1	15	3			43	54	16	19	22	23	2	1
220	1	9	2				12	26	19	22	65	42	1	1
230		2	11				65	78	15	12	5	6	3	
240		10	2				65	60	8	10	23	20	1	
250	1	16	3				81	68	10	9	5	7	1	
270	3	5	2				89	86	4	6	1	2	1	
280		23					95	73	2	2	1		1	
320		36						61		2				

Table 3d. Estimations of animal concentrations, animal units (AU), and percent of acres where pesticides/herbicides applied in the Pickwick Lake Cataloging Unit (0603-0005). Numbers of animals and pesicides/herbicides listed by acreage and subwatershed were provided by the local SWCDs on Conservation Assessment Worksheets completed in 1998.

		Subwatershed									
		010	030	040	090	140	150	160	180	200	210
County (s)		Lawrence	Lauderdale	Colbert Franklin Lawrence	Lauderdale	Lauderdale	Lauderdale	Colbert	Lauderdale	Lauderdale	Colbert Franklin
Acres Reported		100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Pesticides Applied	Est. % Total Acres	21	15	14	12	2	11	2	12	28	1
Cattle	# / Acre	0.08	0.17	0.12	0.17	0.08	0.10	0.07	0.10	0.05	0.06
	A.U./Acre	**0.08**	**0.17**	**0.12**	**0.17**	**0.08**	**0.10**	**0.07**	**0.10**	**0.05**	**0.06**
Dairy	# / Acre	0.00	0.00	0.00	---	---	---	---	---	---	---
	A.U./Acre	**0.00**	**0.01**	**0.00**	---	---	---	---	---	---	---
Swine	# / Acre	0.00	0.03	0.00	0.03	---	0.00	---	0.01	0.00	---
	A.U./Acre	**0.00**	**0.01**	**0.00**	**0.01**	---	**0.00**	---	**0.00**	**0.00**	---
Poultry - Broilers	# / Acre	0.07	18.39	6.31	4.34	---	---	10.17	---	9.40	9.78
	A.U./Acre	**0.00**	**0.15**	**0.05**	**0.03**	---	---	**0.08**	---	**0.08**	**0.08**
Poultry - Layers	# / Acre	0.00	0.95	1.71	---	---	---	1.14	0.70	---	0.17
	A.U./Acre	**0.00**	**0.01**	**0.01**	---	---	---	**0.01**	**0.01**	---	**0.00**
Catfish	# Acres/ Acre	0.00	---	0.00	---	---	---	---	---	0.00	0.00
	A.U./Acre	---	---	---	---	---	---	---	---	---	---
Total	A.U./Acre	**0.09**	**0.34**	**0.18**	**0.22**	**0.08**	**0.10**	**0.16**	**0.11**	**0.12**	**0.14**
Potential for NPS Impairment		Low	High	Mod.	Mod.	Low	Low	Mod.	Low	Low	Low

Table 3d, cont. Estimations of animal concentrations, animal units (AU), and percent of acres where pesticides/herbicides applied in the Pickwick Lake Cataloging Unit (0603-0005). Numbers of animals and pesicides/herbicides listed by acreage and subwatershed were provided by the local SWCDs on Conservation Assessment Worksheets completed in 1998.

		Subwatershed*						
		220	230	240	250	270	280	Total
County (s)		Lauderdale	Colbert Franklin	Colbert	Lauderdale	Lauderdale	Lauderdale	----
Acres Reported		100%	100%	100%	100%	100%	100%	100%
Pesticides Applied	Est. % Total Acres	53	1	6	4	0	0	13
Cattle	# / Acre	0.08	0.07	0.03	0.03	0.01	0.01	0.08
	A.U./Acre	**0.08**	**0.07**	**0.03**	**0.03**	**0.01**	**0.01**	**0.08**
Dairy	# / Acre	---	---	---	---	---	---	0.00
	A.U./Acre	---	---	---	---	---	---	**0.00**
Swine	# / Acre	0.01	---	---	---	---	---	0.01
	A.U./Acre	**0.00**	---	---	---	---	---	**0.00**
Poultry - Broilers	# / Acre	---	4.18	---	---	---	---	4.55
	A.U./Acre	---	**0.03**	---	---	---	---	**0.04**
Poultry - Layers	# / Acre	---	0.05	---	---	---	---	0.48
	A.U./Acre	---	**0.00**	---	---	---	---	**0.00**
Catfish	# Acres/ Acre	---	0.00	---	---	---	---	0.00
	A.U./Acre	---	---	---	---	---	---	---
Total	A.U./Acre	**0.08**	**0.11**	**0.03**	**0.03**	**0.01**	**0.01**	**0.12**
Potential for NPS Impairment		Low	Low	Low	Low	Low	Low	Low

* No data reported for subwatershed 320

Table 4d. Sedimentation estimates by source, forest condition, septic tank information and resource concerns by subwatershed in the Pickwick Lake cataloging unit (0603-0005) as provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets (ASWCC 1998).

Basin Code- Cataloging Unit	0603-0005								
Subwatershed	**010**	**030**	**040**	**090**	**140**	**150**	**160**	**180**	**200**
Forest Condition									
% of Subwatershed Needing Forest Improvement	57	*	6	*	*	*	*	*	*
Sediment Contributions (Tons/Acre)									
Cropland	1.1	0.5	1.0	0.2	0.2	0.3	0.8	0.4	0.1
Sand & Gravel Pits		0.0		0.0		0.1	0.1	0.2	0.1
Mined Land	0.0		0.2						
Developing Urban Land	0.0	0.1	0.0	0.0		0.1	6.6	0.1	1.4
Critical Areas	0.0	0.0	0.1	0.0		0.0	0.4	0.0	0.0
Gullies	0.0	0.0	0.3	0.0		0.0	1.1	0.0	0.0
Stream Banks	0.0	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1
Dirt Roads and Roadbanks	0.0	1.0	0.1	0.8	0.1	0.6	0.0	0.8	0.6
Woodlands	0.0	0.1	0.3	0.2	0.2	0.1	0.2	0.2	0.2
Total Sediment	1.2	1.8	**2.1**	1.5	0.6	1.4	**9.3**	1.8	**2.4**
Potential for Sediment NPS	Low	Low	**Mod.**	Low	Low	Low	**High**	Low	**Mod.**
Current NPS Project	----	----	----	----	----	----	----	----	----
Septic Tanks									
# Septic Tanks per acre*	0.02	0.06	0.02	0.06	0.00	0.07	0.05	0.03	0.11
# Septic Tanks Failing per acre*	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.01
# of Alternative Septic Systems	2	35	33	14	0	56	12	38	25
Resource Concerns in the Subwatershed									
Excessive Erosion on Cropland	X	X	X			X			X
Gully Erosion on Agricultural Land									
Road and Roadbank Erosion	X		X						
Poor Soil Condition (cropland)	X	X	X			X		X	X
Excessive Animal Waste Applied to Land	X		X						
Excessive Pesticides Applied to Land			X						
Excessive Sediment from Cropland	X	X	X					X	X
Excessive Sediment From Roads/Roadbanks	X		X						
Excessive Sediment from Urban Development									X
Inadequate Management of Animal Wastes	X		X						
Nutrients in Surface Waters	X		X						
Pesticides in Surface Waters			X						
Livestock Commonly have Access to Streams	X		X	X	X			X	X

Table 4d, cont. Sedimentation estimates by source, forest condition, septic tank information and resource concerns by subwatershed in the Pickwick Lake cataloging unit (0603-0005) as provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets (ASWCC 1998). (* Indicates not reported)

Basin Code- Cataloging Unit	0603-0005							
Subwatershed	**210**	**220**	**230**	**240**	**250**	**270**	**280**	**320**
Forest Condition								
% of Subwatershed Needing Forest Improvement	*	*	*	*	*	*	*	*
Sediment Contributions (Tons/Acre)								
Cropland	0.4	2.7	0.1	0.4	0.2	0.0	0.0	
Sand & Gravel Pits	0.0	0.0	0.7		0.2	0.0	0.4	
Mined Land	0.4		0.3	0.5		0.1		
Developing Urban Land	0.4	0.0	0.2	0.1	0.0		0.0	
Critical Areas	0.3	0.0	0.1	0.4	0.0	0.0	0.0	
Gullies	0.6	0.1	0.2	0.6	0.0	0.0	0.0	
Stream Banks	0.2	0.8	0.1	0.1	0.1	0.1	0.1	
Dirt Roads and Roadbanks	0.0	1.0	0.0	0.0	0.6	0.9	0.9	
Woodlands	0.3	0.0	0.6	0.6	0.2	0.3	0.3	
Total Sediment	**2.6**	**4.7**	**2.3**	**2.7**	1.3	1.5	1.7	
Potential for Sediment NPS	**Mod.**	**High**	**Mod.**	**Mod.**	Low	Low	Low	
Current NPS Project	----	----	----	----	----	----	----	----
Septic Tanks								
# Septic Tanks per acre	0.04	0.03	0.03	0.01	0.01	0.01	0.01	
# Septic Tanks Failing per acre	0.01	0.00	0.01	0.00	0.00	0.00	0.00	
# of Alternative Septic Systems	64	36	56	15	17	7	7	
Resource Concerns in the Subwatershed								
Excessive Erosion on Cropland		X						
Gully Erosion on Agricultural Land								
Road and Roadbank Erosion								
Poor Soil Condition (cropland)		X						
Excessive Animal Waste Applied to Land	X							
Excessive Pesticides Applied to Land								
Excessive Sediment from Cropland								
Excessive Sediment From Roads/Roadbanks								
Excessive Sediment from Urban Development								
Inadequate Management of Animal Wastes	X							
Nutrients in Surface Waters	X							
Pesticides in Surface Waters								
Livestock Commonly have Access to Streams	X		X		X			

Table 5d. Estimation of Potential Sources of NPS Impairment for subwatersheds in the Pickwick Lake Cataloging Unit (0603-0005). Source categories are based upon information provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets completed in 1998, and from Construction Stormwater Authorization information provided by the Mining and NPS Unit of ADEM.

Subwatershed	Potential NPS Impairment	Final Project Priority+	Potential Sources of Impairment							
			Urban	Mining	Forestry Practices	Development	Sedimentation	Animal Husbandry	Pasture Runoff	Row Crops
010	H	H	L		L	H	L	L	H	H
030	H				L	M	L	H	H	M
040	H	H			L	H	M	M	H	H
090	M				L	L	L	M	M	L
140	L		L		L	L	L	L	L	L
150	M		M		L	H	L	L	M	L
160	H		M		L	H	H	M	M	H
180	M	M			L	L	L	L	H	M
200	H		M		L	H	M	L	M	M
210	H		L		L	M	M	L	M	H
220	M	M			L	L	H	L	M	H
230	M				L	M	M	L	M	L
240	M				L	M	M	L	L	M
250	L				L	L	L	L	L	L
270	L				L	L	L	L	L	L
280	L				L	L	L	L	L	
320	L				L	L			L	

+ Final Priority may not coincide with estimated impairment potential; aquatic life use impairment determined the priority. SWCD information was not received until after final priority was assigned.

Table 6d Physical characteristic estimates for sites assessed in the Pickwick Lake cataloging unit (0603-0005).

		Station								
		BGNL-032	BGNL-033	CLFL-012	MBNL-034	PPLC-001	TWNL-013	INCL-001	BRML-009	SNKL-010
Subwatershed #		010	010	010	010	040	040	090	180	220
Date (YYMMDD)		980721	980721	980721	980721	980721	980721	980722	980722	980721
Width (ft)		35	55	20	25	15	25	25	15	25
Canopy Cover*		50/50	50/50	MS	O	MS	50/50	MS	MS	MS
Depth (ft)	Riffle	0.5	0.3	0.5	0.3	---	---	0.3	0.3	0.3
	Run	1.5	1.25	1	1	1.5	1	0.75	0.75	1
	Pool	>2.5	2	1.5	2	2	2	1.5	1.75	1.5
Substrate (%)	Bedrock	0	0	0	0	0	0	10	0	0
	Boulder	5	1	5	0	0	10	1	0	0
	Cobble	40	10	50	40	0	30	15	20	45
	Gravel	40	30	20	43	0	23	65	60	45
	Sand	5	47	18	10	10	25	5	11	5
	Silt	5	5	5	5	10	10	2	2	3
	Detritus	5	7	2	2	10	2	2	7	2
	Clay	0	0	0	0	40	0	0	0	0
	Org. Silt	0	0	0	0	30	0	0	0	0

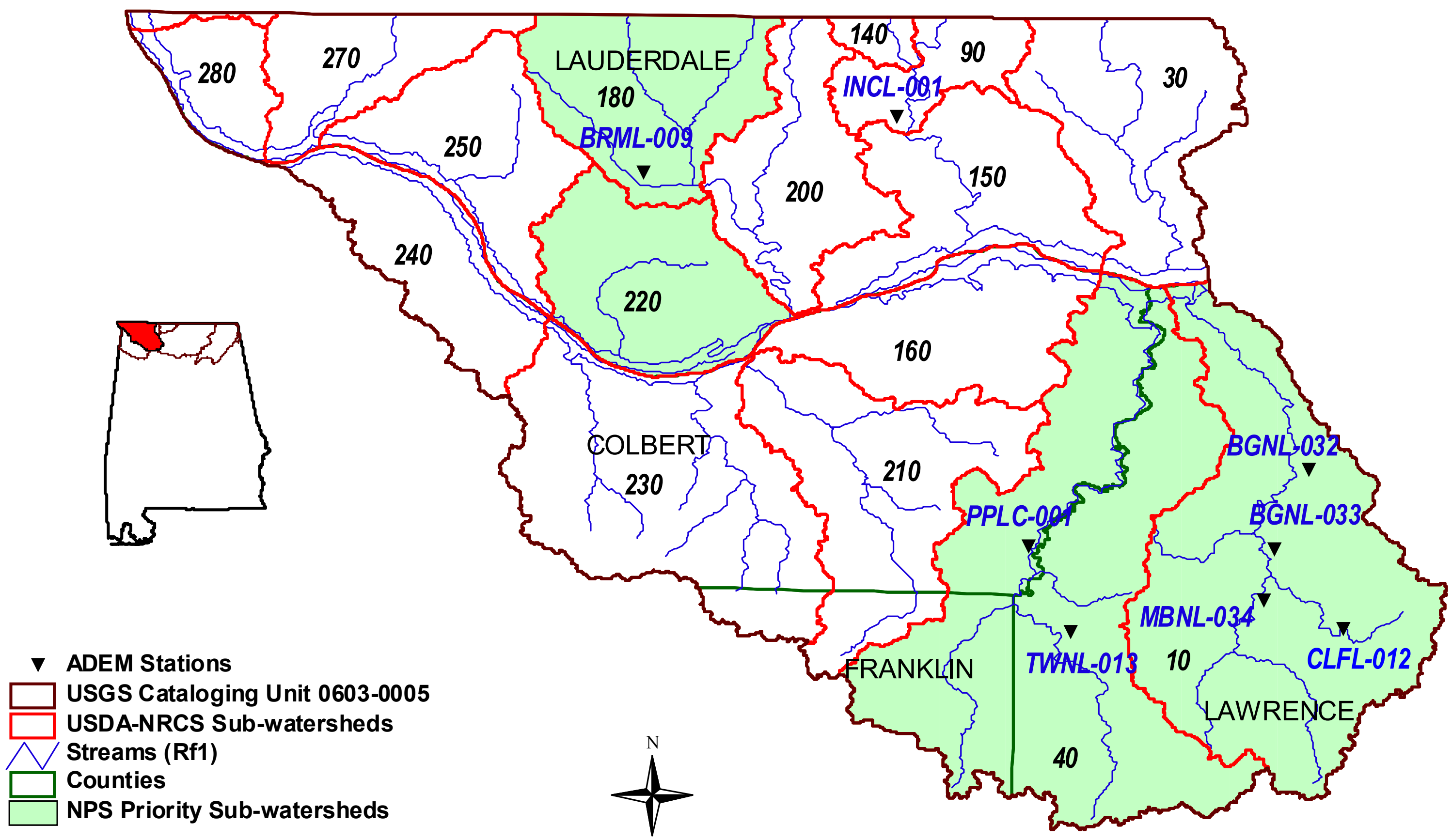
* S = Shaded, MS = Mostly Shaded, 50/50 = est half shaded, MO = Mostly Open, O = Open

Table 7d. Habitat quality from the Pickwick Lake cataloging unit (0603-0005). In order to compare levels of habitat degradation between stations, values given for each of three major habitat parameter categories are presented as percent of maximum score.

Parameter	Station								
	BGNL-033	MBNL-034	BGNL-032	CLFL-012	PPLC-001	TWNL-013	INCL-001	BRML-009	SNKL-010
Subwatershed #	010	010	010	010	040	040	090	180	220
Habitat Assessment Form	RR	RR	RR	RR	GP	GP	RR	RR	RR
Date (YYMMDD)	980721	980721	980721	980721	980721	980721	980722	980722	980721
Instream Habitat Quality	69	73	82	78	42	66	93	76	94
Sediment Deposition	59	70	84	85	69	65	94	86	85
% Sand	*47*	*10*	*5*	*18*	*10*	*25*	*5*	*11*	*5*
% Silt	*5*	*5*	*5*	*5*	*10*	*10*	*2*	*2*	*3*
% Mud-Muck	*0*	*0*	*0*	*0*	*30*	*0*	*0*	*0*	*0*
Sinuosity	80	85	85	90	35	43	98	98	98
Bank and Vegetative Stability	50	79	51	78	60	46	75	61	55
Riparian Zone Measurements	55	75	66	86	38	39	55	84	86
% Canopy cover	50/50	O	50/50	MS	MS	50/50	MS	MS	MS
% Maximum Score	64	73	74	80	52	55	83	77	83
Ecoregion /Subregion	71j	71j	71g	71j	71j	71g	71f	71f	71g
Habitat Quality Category	Excellent	Excellent	Excellent	Excellent	Good	Good	Excellent	Excellent	Excellent
EPT Taxa Collected							23		
Aq. Macroinvertebrate Assess.*							Excellent		

* Conducted as part of the "Monitoring of Watersheds Associated with Alabama State Parks" (1999)
+S = Shaded; MS = Mostly Shaded; 50/50 = Approx. Half Shaded; MO = Mostly Open; O = Open
^ RR = Riffle Run; GP = Glide Pool (ADEM 1999)

Fig. 4d. ADEM Water Quality Sampling Stations and NPS Priority Sub-watersheds for the Pickwick Lake Cataloging Unit (0603-0005) of the Tennessee River Basin



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Section V: Bear Creek Cataloging Unit (0603-0006)

The Bear Creek Cataloging Unit contains seven sub-watersheds located within Franklin, Lawrence, Marion, Winston, and Colbert Counties (Fig. 4e). The entire cataloging unit drains approximately 797 square miles of the Coastal Plain, Major Flood Plains and Terraces, Appalachian Plateau, and Limestone Valleys and Uplands soil areas. It is primarily located within the Southeastern Plains Ecoregion with small areas in the Interior Plateau and Southwestern Appalachians Ecoregions (Fig. 5) (Griffith et al. 1999 Draft).

<u>Historical Data/Studies</u>

A review of existing data indicated that bioassessments have been conducted recently within six (6) of the seven (7) sub-watersheds by TVA and GSA (Appendix G-1). Two sub-watersheds contained segment(s) on Alabama's 1998 §303(d) list of priority waterbodies (Table 11). Eight (8) stations were assessed as part of the ADEM 1996 Clean Water Strategy (ADEM 1999a) and five (5) stations were sampled in conjunction with the Department's ALAMAP monitoring program (Appendices E-1, F-6, and F-7).

<u>Study Area</u>

Five (5) of the seven (7) sub-watersheds in the Bear Creek Cataloging Unit were included in this project. Two sub-watersheds were not included in this study, one due to relatively small drainage area (100) and one without available data (050). However, this sub-watershed was assessed in 1999 by TVA (Appendix H).

<u>Conservation Assessment Worksheets</u>

Based on the conservation assessment worksheets completed by the local SWCDs, the primary land-uses throughout the Bear Creek cataloging unit were forestland (72%), pastureland (12%), cropland (6%), urban land (3%), open water (3%), mining (2%), and other (2%) (Table 12b). Approximately 10,000 acres of crop and pastureland (2% of total land area) were treated with pesticides and/or herbicides. Animal Unit (AU) concentration estimates are presented in Table 13. The major areas of animal production included broiler and layer poultry, and cattle. Dominant sources of sedimentation based upon erosion estimates from SWCD worksheets were Sand and Gravel Pits, Woodlands, and Mined lands (Table 14). The overall potential for nonpoint source impairment in the cataloging unit was estimated as *moderate* (Table 15). This potential was based upon SWCD estimates of sedimentation rates, animal unit densities, pasture and row cropland-uses, and the number of current construction stormwater authorizations (Development) in the CU (Table 15). Major areas of resource concerns within the CU as expressed by the local watershed committees related to management and land application of animal wastes and nutrients and pesticides in surface waters (Table 4e). Five sub-watersheds were listed as priorities by the local SWCD in public meetings during 1998 (010, 030, 040, 050, 070).

<u>Historical Biological Assessments</u>

Twenty-five (25) historical Fish IBI assessments and three (3) aquatic macroinvertebrate assessments were available from six sub-watersheds (Appendices G-1 and G-2). Of the twenty-eight (28) bioassessments conducted at fifteen stations, four (4) stations were assessed as having *good* or *fair/good* biological communities (40%) and eleven (11) had *fair* or *poor/fair* biological communities. No stations were evaluated as *poor* or *very-poor* (Appendices G-1 and G-2).

Priority Sub-watersheds

Based on the results of the historical bioassessments, no priority sub-watersheds were identified in the Bear Creek cataloging unit.

Sub-Watershed: Upper Bear Creek

NRCS Sub-Watershed Number 010

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
482-2/ TN074	Fish/ Fish	1998/ 1996	Bear Creek @Franklin Co Rd 57		S/F&W
TN067	Fish	1996	Bear Creek @Franklin Co T7S, R14W, S30	248	F&W
7916-1	Fish/ Fish	1999/ 1997	Mud Creek @Lawrence Co	45	F&W

Percent land cover of the Upper Bear Creek sub-watershed was estimated as 2% transitional forest, 40% deciduous forest, 11% evergreen forest, 20% mixed forest, 16% pasture/hay, 9% row crop, and 2% open water (Table 1e). Estimates of land-use (Table 2e) by the local SWCDs were similar. Ten current construction/stormwater authorizations and two municipal, one industrial, one mining, and one semi-public/private NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3e) were *moderate* (0.23 AU/Acre), with cattle and poultry being the dominant animals. Sedimentation estimates (Table 4e) indicated a *high* potential for NPS impairment (8.4 tons/acre). The overall potential for impairment from nonpoint sources (Table 5e) was estimated as *high*. Upper Bear Creek was also given a 1st priority sub-watershed rating by the local SWCD.

The Upper Bear Creek sub-watershed drains approximately 291 mi^2 in Franklin, Marion, Winston, and Lawrence Counties. Two stream segments are included on Alabama's 1998 §303(d) list of impaired waters. A segment of Bear Creek is listed due to metals (Al) and a 4.0 mile segment of Little Dice Creek is listed with partial attainment status due to siltation (Table 11).

Three stream reaches, two on Bear Creek and one on Mud Creek, were assessed by TVA and GSA from 1996 through 1999 (Appendices E-1, G-1). The fish communities were all determined to be in *fair* condition with the exception of station TN074 in 1996, which was in *good* condition. Two reaches of Bear Creek were sampled for water quality parameters in conjunction with the 1996 Clean Water Strategy (CWS) project (Appendices E-1 and F-7). Another site on Bear Creek was also sampled during the 1997 ALAMAP monitoring effort (Appendices E-1 and F-6).

Three additional stream segments were sampled in the Upper Bear Creek sub-watershed during 1996 and 1997. Turkey Creek and Little Dice Branch were sampled during the 1996 CWS project and an unnamed tributary of Bullen Branch was assessed during the 1997 ALAMAP project (Appendices E-1, F-6, and F-7).

Sub-Watershed: Little Bear Creek

NRCS Sub-Watershed Number 030

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
6441-1/ TN055	Fish	1998/ 1996	Little Bear Creek @ AL Hwy 187 Franklin Co.	34	S/F&W
TN049	Fish	1996	Little Bear Creek @Franklin Co Rd 23	78	S/F&W

Percent land cover of the Little Bear Creek sub-watershed was estimated as 4% transitional forest, 49% deciduous forest, 10% evergreen forest, 17% mixed forest, 12% pasture/hay, 5% row crop, and 3% open water (Table 1e). Estimates of land-use (Table 2e) by the local SWCDs were similar. Two current construction/stormwater authorizations and one mining NPDES permit have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3e) were *moderate* (0.23 AU/Acre), with cattle and poultry being the dominant animals. Sedimentation estimates (Table 4e) indicated a *moderate* potential for NPS impairment (3.4 tons/acre). The overall potential for impairment from nonpoint sources (Table 5e) was estimated as *moderate*. Little Bear Creek was also given a 3rd priority sub-watershed rating by the local SWCD.

The Little Bear Creek sub-watershed drains approximately 90 mi^2 in Franklin County. Two stream reaches of Little Bear Creek, upstream (6441-1) and downstream (TN049) of Little Bear Creek Reservoir, were evaluated by TVA and GSA from 1996 to 1998 (Appendices E-1, G-1). The fish community of station 6441-1 was assessed by TVA in 1998 as *fair*. A previous fish IBI assessment was conducted by GSA in 1996 that determined the fish community was in *good* condition. Little Bear Creek at station TN049 was evaluated by GSA in 1996 as having a *good* fish community. Two stations on Little Bear Creek were also included in the 1996 CWS project (Appendices E-1, F-7).

Sub-Watershed: Upper Cedar Creek

NRCS Sub-Watershed Number 040

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
TN023	Fish	1993	Cedar Creek @Franklin Co; NE of Pogo 6S, R15W, S9	307	F&W
TN028	Fish	1996	Cedar Creek @Franklin Co. 6S, R14W, S11	189	F&W
TN039	Fish	1996	Cedar Creek @Franklin Co. T6S, R12W, S32	85	F&W
2084-1	Fish Macroinv.	1997/ 1995	Cedar Creek @Franklin Co. T7S, R11W, S17	28	F&W
7915-1	Fish	1997	Mud Creek @Franklin Co.		F&W
9530-1	Fish	1999/ 1997	Robinson Creek Franklin Co T7S, R12W, S14		F&W

Percent land cover of the Upper Cedar Creek sub-watershed was estimated as 4% transitional forest, 42% deciduous forest, 12% evergreen forest, 21% mixed forest, 11% pasture/hay, 3% row crop, 1% low intensity residential, and 3% open water (Table 1e). Estimates of land-use (Table 2e) by the local SWCDs were similar. Eight current construction/stormwater authorizations and eight mining, one municipal and one industrial NPDES permits have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3e) were *moderate* (0.23 AU/Acre), with cattle and poultry being the dominant animals. Sedimentation estimates (Table 4e) indicated a *moderate* potential for NPS impairment (3.8 tons/acre). The overall potential for impairment from nonpoint sources (Table 5e) was estimated as *high*. Upper Cedar Creek was also given a 2nd priority sub-watershed rating by the local SWCD.

The Upper Cedar Creek sub-watershed drains approximately 200 mi^2 in Colbert and Franklin Counties. Lost Creek, from the confluence with Cedar Creek to its source, is included on the 1998 §303(d) list of impaired waters of Alabama with non-attainment status due to pH from unknown sources (Table 11). Approximately six reaches of three streams have been evaluated by TVA or GSA from 1993 to 1999 using fish community assessments. Water quality samples have been collected by ADEM from stream reaches of Stinking Bear Creek, Cedar Creek, and an unnamed tributary to Dunkin Creek (Appendices E-1, F-6, and F-7).

<u>Cedar Creek</u>

Cedar Creek at the downstream station (TN023) was assessed by GSA in 1993 as having a *good* fish community. Cedar Creek at TN028, assessed by GSA in 1996 had a *poor/fair* fish community. Cedar Creek upstream of the Cedar Creek Reservoir (TN039) had a *fair/good* fish community in 1996. The upstream station on Cedar Creek (2084-1) had *fair* fish (1997, 1998) and aquatic macroinvertebrate (1998) communities (Appendices E-1, G-1, and G-2). Water quality data were collected on Cedar Creek below the dam as part of the 1996 Clean Water Strategy project (Appendices E-1 and F-7).

Mud Creek

Mud Creek was evaluated by GSA in 1997 as having a *fair* fish community, using a fish community assessment. Mud Creek is a tributary to Cedar Creek, upstream of the Cedar Creek Reservoir (Appendices E-1, G-1).

Robinson Creek

One stream reach of Robinson Creek was evaluated by TVA (1999) and GSA (1997) as having a *fair* and *good* fish community, respectively (Appendices E-1 and G-1).

Sub-Watershed: Lower Cedar Creek

NRCS Sub-Watershed Number 050

Percent land cover of the Lower Cedar Creek sub-watershed was estimated as 2% transitional forest, 30% deciduous forest, 35% evergreen forest, 20% mixed forest, 10% pasture/hay, 2% row crop, and 1% wetland (Table 1e). Estimates of land-use (Table 2e) by the local SWCDs were similar. One current construction/stormwater authorization has been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3e) were *moderate* (0.19 AU/Acre), with cattle swine, and poultry being the dominant animals. Sedimentation estimates (Table 4e) indicated a *moderate* potential for NPS impairment (3.5 tons/acre). The overall potential for impairment from nonpoint sources (Table 5e) was estimated as *moderate*. Lower Cedar Creek was also given a 5th priority sub-watershed rating by the local SWCD.

The Lower Cedar Creek sub-watershed drains approximately 29 mi^2 in Colbert and Franklin Counties. One station on Cedar Creek was sampled for water quality parameters in the 1996 CWS project (Appendices E-1, F-7). No recent fish or aquatic macroinvertebrate community assessments were available. Due to the relatively small size of the drainage area, no additional assessments were conducted during this screening project.

Sub-Watershed: Rock Creek

NRCS Sub-Watershed Number 070

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
482-1	Fish, Macroinv, Habitat/ Fish	1996, 1999/ 1998	Bear Creek @ the mouth of Rock Creek, Colbert Co.	723	F&W
9555-1	Fish	1997	Rock Creek @Colbert Co.		F&W

Percent land cover of the Rock Creek sub-watershed was estimated as 6% transitional forest, 44% deciduous forest, 19% evergreen forest, 17% mixed forest, 7% pasture/hay, 4% row crop, 2% wetland, and 1% open water (Table 1e). Estimates of land-use (Table 2e) by the local SWCDs were similar. One current construction/ stormwater authorization and one mining NPDES permit have been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3e) were *low* (0.04 AU/Acre), with cattle and swine being the dominant animals. Sedimentation estimates (Table 4e) indicated a *moderate* potential for NPS impairment (3.3 tons/acre). The overall potential for impairment from nonpoint sources (Table 5e) was estimated as *low*. Rock Creek was also given a 3rd priority sub-watershed rating by the local SWCD.

The Rock Creek sub-watershed drains approximately 89 mi^2 in Colbert and Franklin Counties. Two stream reaches, one on Bear Creek and one on Rock Creek, were assessed by TVA from 1993 through 1999. The most recent fish IBI assessment by TVA indicated that the fish community at station 482-1 was in *good* condition. The aquatic macroinvertebrate community was assessed in 1996 as being in *fair* condition. Rock Creek was evaluated by GSA in 1997 as having a *fair* fish community. A site on Rock Creek was also sampled for water quality parameters during the 1997 ALAMAP monitoring effort (Appendices E-1 and F-6).

Sub-Watershed: Lower Bear Creek

NRCS Sub-Watershed Number 100

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
GSA-6	Fish	1997	Little Cripple Deer Creek @Colbert Co		F&W

Percent land cover of the Lower Bear Creek sub-watershed was estimated as 27% deciduous forest, 5% evergreen forest, 11% mixed forest, 3% pasture/hay, 4% row crop, 1% wetland, 1% high intensity commercial/ industrial/transportation, and 48% open water (Table 1e). No current construction stormwater authorizations or NPDES permits have been issued in the sub-watershed. The overall potential for impairment from nonpoint sources (Table 5e) was roughly estimated as *low*. The Lower Bear Creek sub-watershed drains approximately five square miles in Colbert County, Alabama with the majority of the sub-watershed located in Mississippi. One stream reach of Little Cripple Deer Creek was evaluated by GSA in 1997 as having a *fair* fish community.

Sub-Watershed: Buzzard Roost Creek

NRCS Sub-Watershed Number 110

Station	Assessment Type	Date	Location	Area (mi^2)	Classification
1741-1	Fish	1997	Buzzard Roost Creek @Colbert Co.		F&W

Percent land cover of the Buzzard Roost Creek sub-watershed was estimated as 5% transitional forest, 41% deciduous forest, 15% evergreen forest, 20% mixed forest, 8% pasture/hay, 4% row crop, 1% wetland, and 6% open water (Table 1e). Estimates of land-use (Table 2e) by the local SWCDs were similar. One current construction/stormwater authorization has been issued in the sub-watershed (Table 9). The SWCD estimates of animal concentrations in the sub-watershed (Table 3e) were *low* (0.00 AU/Acre), with broiler poultry being the dominant animal type. Sedimentation estimates (Table 4e) indicated a *moderate* potential for NPS impairment (3.50 tons/acre). The overall potential for impairment from nonpoint sources (Table 5e) was estimated as *low*.

The Buzzard Roost Creek sub-watershed drains approximately 91 mi^2 in Colbert County. One stream reach of Buzzard Roost Creek was evaluated by TVA in 1997 as having a *fair* fish community.

Table 1e. Land use percentages for the Bear Creek cataloging unit (0603-0006) from EPA landuse subcategory data (EPA 1997) and broader categories used in comparison with local SWCD Conservation Assessment Worksheet landuse estimates (ASWCC 1998).

	Percent Total Landuse (Category and Subcategory)													
	Open Water	Urban			Mining	Forest				Pasture/ Hay	Row Crops	Other		
Subwatershed	Open Water	Low Intensity Residential	High Intensity Residential	High Intensity Commercial/ Industrial/ Transportation	Quarries/ Strip Mines/ Gravel Pits	Transitional Forest	Deciduous Forest	Evergreen Forest	Mixed Forest	Pasture/ Hay	Row Crops	Other Grasses	Woody Wetlands	Herbaceous Wetlands
Bear Creek (0603-0006)														
10	2					2	40	11	20	16	9			
30	3					4	49	10	17	12	5			
40	3	1				4	42	12	21	11	3			
50						2	30	35	20	10	2		1	
70	1					6	44	19	17	7	4		2	
100	48			1			27	5	11	3	4		1	
110	6					5	41	15	20	8	4		1	

Table 2e. Land use percentages for the Bear Creek cataloging unit (0603-0006) from EPA landuse categories (EPA 1997) and local SWCD Conservation Assessment Worksheet landuse estimates (ASWCC 1998).

Sub-Watershed	Percent Total Landuse													
	Open Water		Urban		Mines		Forest		Pasture		Row Crops		Other	
	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA	SWCD	EPA
Bear Creek (0603-0006)														
010	2	2	4		2		69	73	12	16	9	9	2	
030	4	3	2		2		70	80	17	12	4	5	1	
040	5	3	3	1	2		70	79	14	11	4	3	1	
050			1				76	88	11	10	9	2	2	
070	1	1	2				80	88	8	7	6	4	3	
100		48		1				44		3		4		
110	1	6	3				80	82	8	8	5	4	3	

Table 3e. Estimations of animal concentrations, animal units (AU), and percent of acres where pesticides/herbicides applied in the Bear Creek Cataloging Unit (0603-0006). Numbers of animals and pesicides/herbicides listed by acreage and subwatershed were provided by the local SWCDs on Conservation Assessment Worksheets completed in 1998.

		Subwatershed*						
		010	030	040	050	070	110	Total
County (s)		Franklin Lawrence Marion Winston	Franklin	Franklin Colbert*	Franklin Colbert	Franklin* Colbert	Colbert	----
Acres Reported		100%	100%	96%	100%	98%	100%	98%
Pesticides Applied	Est. % Total Acres	4	1	1	1	1	0	2
Cattle	# / Acre	0.07	0.08	0.08	0.06	0.03	0.00	0.06
	A.U./Acre	**0.07**	**0.08**	**0.08**	**0.06**	**0.03**	**0.00**	**0.06**
Dairy	# / Acre	0.00	---	---	---	---	---	0.00
	A.U./Acre	**0.00**	---	---	---	---	---	**0.00**
Swine	# / Acre	0.00	---	---	0.05	0.02	---	0.00
	A.U./Acre	**0.00**	---	---	**0.02**	**0.01**	---	**0.00**
Poultry - Broilers	# / Acre	18.42	18.82	18.86	12.38	---	0.51	14.18
	A.U./Acre	**0.15**	**0.15**	**0.15**	**0.10**	---	**0.00**	**0.11**
Poultry - Layers	# / Acre	0.40	0.56	0.56	0.37	---	---	0.36
	A.U./Acre	**0.00**	**0.00**	**0.00**	**0.00**	---	---	**0.00**
Catfish	# Acres/ Acre	0.00	0.00	0.00	0.00	---	---	0.00
	A.U./Acre	---	---	---	---	---	---	---
Total	A.U./Acre	**0.23**	**0.23**	**0.23**	**0.19**	**0.04**	**0.00**	**0.17**
Potential for NPS Impairment		Mod.	Mod.	Mod.	Mod.	Low	Low	Mod.

* No data reported for this portion of the subwatershed (no data available for Subwatershed 100)

Table 4e. Sedimentation estimates by source, forest condition, septic tank information and resource concerns by subwatershed in the Bear Creek cataloging unit (0603-0006) as provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets (ASWCC 1998). (* Indicates not reported)

Basin Code- Cataloging Unit	0603-0006						
Subwatershed	**010**	**030**	**040**	**050**	**070**	**100**	**110**
Forest Condition							
% of Subwatershed Needing Forest Improvement	1	*	*	*	*	*	*
Sediment Contributions (Tons/Acre)							
Crop Sediment	0.2	0.1	0.1	0.2	0.1		0.7
Sand & Gravel Pits	3.8	0.2	0.2	0.2	0.0		0.0
Mined Land	1.1	1.5	2.2		0.5		
Developing Urban Land	0.1	0.0	0.0		0.0		0.1
Critical Areas	0.1	0.0	0.0	0.3	0.5		0.5
Gullies	0.1	0.2	0.1	0.7	1.3		1.5
Stream Banks	0.3	0.3	0.2	0.9	0.1		0.0
Dirt Roads	0.1	0.5	0.0	0.4	0.0		0.0
Woodlands	2.5	0.6	0.9	0.9	0.7		0.6
Total Sediment	**8.4**	**3.4**	**3.8**	**3.5**	**3.3**		**3.5**
Potential for Sediment NPS	**High**	**Mod.**	**Mod.**	**Mod.**	**Mod.**		**Mod.**
Current NPS Project	----	----	----	----	----	----	----
Septic Tanks							
# Septic Tanks per acre	0.01	0.02	0.01	0.01	0.01		0.01
# Septic Tanks Failing per acre	0.00	0.01	0.00	0.00	0.00		0.00
# of Alternative Septic Systems	81	50	82	10	6		16
Resource Concerns in the Subwatershed							
Excessive Erosion on Cropland							
Gully Erosion on Agricultural Land							
Road and Roadbank Erosion	X						
Poor Soil Condition (cropland)							
Excessive Animal Waste Applied to Land	X	X	X	X			
Excessive Pesticides Applied to Land							
Excessive Sediment from Cropland							
Excessive Sediment From Roads/Roadbanks							
Excessive Sediment from Urban Development			X				
Inadequate Management of Animal Wastes	X	X	X	X			
Nutrients in Surface Waters	X	X		X			
Pesticides in Surface Waters	X	X	X	X			
Livestock Commonly have Access to Streams							

Table 5e. Estimation of Potential Sources of NPS Impairment for subwatersheds in the Bear Creek Cataloging Unit (0603-0006). Source categories are based upon information provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets completed in 1998, and from Construction Stormwater Authorization information provided by the Mining and NPS Unit of ADEM.

Subwatershed	Potential NPS Impairment	Final Project Priority+	Potential Sources of Impairment							
			Urban	Mining	Forestry Practices	Development	Sedimentation	Animal Husbandry	Pasture Runoff	Row Crops
010	H				L	H	H	M	M	L
030	M				L	L	M	M	M	L
040	H		L		L	H	M	M	M	L
050	M				L	L	M	M	L	L
070	L				L	L	M	L	L	L
100	L		L		L				L	L
110	L				L	L	M		L	L

+ Final Priority may not coincide with estimated impairment potential; aquatic life use impairment determined the priority.

SWCD information was not received until after final priority was assigned.

Fig. 4e. ADEM Water Quality Sampling Stations and NPS Priority Sub-watersheds for the Bear Creek Cataloging Unit (0603-0006) of the Tennessee River Basin

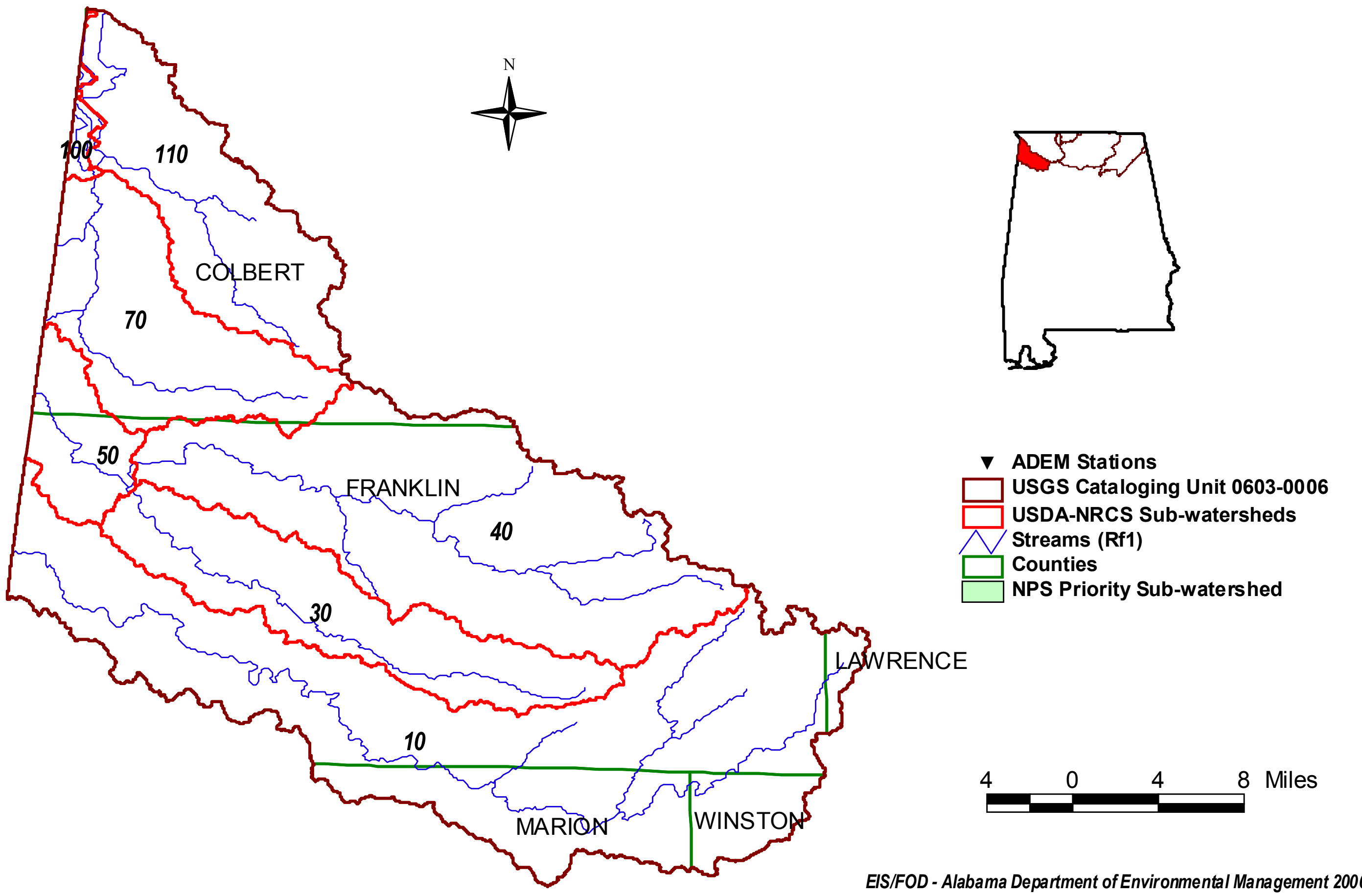


Table 8. List of previous water quality assessments (by cataloging unit) conducted on streams within the Tennessee R basin from 1985-1999. Chemical assessments are indicated when biological assessments were not conducted.

Waterbody	*Date(s)*	*Assessment Type**	*Reference+*
Guntersville Lake (0603-0001)			
Piney Cr	1986	B	3
East Fk Drum Cr	1990	B	9
Drum Cr	1990	C	9
Turkey Cr	1990	B	9
UT to Wimberly Br	1999	C	35
Burkhalter Cr	1998	C	34
Kash Cr	1996	C	32
Rocky Br	1996	C	32
Tennessee R	1996	C	32
UT to Traylor Br	1998	C	34
Coal Cr	1998	C	34
Whippoorwill Cr	1996, 1997, 1998	C	36
Short Cr	1990, 1993, 1994, 1995, 1996	B,C	12, 14, 17, 19
Scarham Cr	1990, 1993, 1994, 1995, 1996	B,C	12, 14, 17, 19
Bryant Cr	1993, 1994, 1995, 1996	B	12, 14, 17, 19
Kirby Cr	1998	B	31
Straight Cr	1998	B	31
Stringer Cr	1998	B	31
Town Cr	1993, 1994, 1995, 1996	B	12, 14, 17, 19
South Sauty Cr	1993, 1994, 1995, 1996	B	12, 14, 17, 19
Shoal Cr	1993, 1994, 1995, 1996	B	12, 14, 17, 19
Little Shoal Cr	1993, 1994, 1995, 1996	B	12, 14, 17, 19
Wheeler Lake (0603-0002)			
Aldridge Cr	1991	B	11
Baker's Cr	1987, 1990	B,C	6
Beaverdam Cr	1997	C	38
Big Cove Cr	1997	C	38
Big Shoal Cr	1992, 1995, 1997	B, C	18, 25, 38
Brier Fk	1997	C	38
Cedar Cr	1993, 1997	C	38, 13
Clear Cr	1997, 1998, 1999	B, C	37, 38
Cole Springs Cr	1997, 1998, 1999	B, C	37
Cotaco Cr	1994, 1997	B, C	38, ?
Crawford Cr	1997	C	33
Crowdabout Cr	1993, 1997	C	13, 33
Davis Br	1998	C	34
Dry Cr	1997, 1998, 1999	B, C	34, 37, 38
East Fk Flint Cr	Flint Ck 1998	C	38
Elam Cr	1997	C	38
Estill Fk	1997, 1998, 1999	B, C	37
First Cr	1997, 1998	B, C	31, 38
Flat Cr	1997	C	38
Flint Cr	1992, 1993, 1995	B,C	13, 18
Flint R	1997, 1998	C	34, 38
French Mill Cr	1997	C	38
Goose Cr	1997	C	38
Guess Cr	1997, 1998, 1999	B, C	37, 38

Table 8, cont. List of previous water quality assessments (by cataloging unit) conducted on streams within the Tennessee R basin from 1985-1999. Chemical assessments are indicated when biological assessments were not conducted.

Waterbody	*Date(s)*	*Assessment Type**	*Reference+*
Wheeler Lake (0603-0002), cont.			
Hester Cr	1997	C	38
Hughes Cr	1997	C	38
Huntsville Spring Br	1991	B	10
Hurricane Cr	1997, 1998, 1999	B, C	37, 38
Indian Cr	1997	C	38
Larkin Fk	1997, 1998, 1999	B, C	37
Lick Fk	1997, 1998, 1999	B, C	37, 38
Limestone Cr	1997	C	38
Little Cotaco Cr	1997	C	38
Little Limestone Cr	1997	C	38
Little Paint Cr	1997, 1998, 1999	B, C	37
Little Paint Rock Cr	1997, 1998, 1999	B, C	37
Mack Cr	1993	C	13
McDaniel Cr	1997	C	33
Mill Cr	1997	C	33
Mill Pond Cr	1997	C	38
Mountain Fk	1997	C	38
Neely Br	1998	B, C	31, 38
No Buisness Cr	1993	C	13
Paint Rock R	1997, 1998, 1999	B, C	37, 38
Piney Cr	1996, 1997	C	32, 38
Robinson Cr	1997	C	38
Rock Cr	1997	C	38
Sally Mike Cr	1997	C	38
Second Cr	1997	C	38
Shoal Cr	1993	C	13
Swan Cr	1990	B	7
Tennessee R	1990, 1996	C	8, 32
Town Cr	1990, 1997	B, C	7, 38
UT to Bakers Cr	1997	C	33
UT to Limestone Cr	1999	C	35
UT to Paint Rock R	1997, 1998, 1999	B, C	34
West Flint Cr	1993	C	13
West Fk Cotaco Cr	1997	C	38
West Fk Flint Cr	1992, 1995	B	18, 25
Yellow Br	1997	C	38
Yellow Bank Cr	1997	C	38
Lower Elk R (0603-0004)			
Anderson Cr	1997	C	38
Elk R	1994, 1996	B, C	32
Shoal Cr	1997	C	38
Sugar Cr	1997	C	38
Sulphur Cr	1997	C	38
Pickwick Lake (0603-0005)			
Big Nance Cr	1996, 1997	C	32, 38
Borden Cr	1996	C	32
Cypress Cr	1996, 1998	C	32, 34

Table 8, cont. List of previous water quality assessments (by cataloging unit) conducted on streams within the Tennessee R basin from 1985-1999. Chemical assessments are indicated when biological assessments were not conducted.

Waterbody	*Date(s)*	*Assessment Type**	*Reference+*
Pickwick Lake (0603-0005), cont.			
First Cr	1998, 1999	B	31, 35
Indian Camp Cr	1994, 1998	B	31
Muddy Fk of Big Nance	1997	C	33
Neely Br	1998	B	31
Pond Cr	1987	B	4
Shegog Cr	1999	C	35
Sinking Cr	1999	C	35
Tennessee R	1996	C	32
Town Cr	1994, 1996, 1997	B, C	15, 32, 38
White Br	1998	C	34
Bear Cr (0603-0006)			
Bear Cr	1985, 1992, 1994, 1997, 1996	B,C	33, 32
Bethel Br	1985	B	1
Caney Br	1985	B	1
Cedar Cr	1996	C	32
Gas Br	1985	B	1
Harris Cr		C	
Little Bear Cr	1985	B	1
Little Dice Cr	1985	B	1
Melton Br	1985	B	1
Mud Cr		C	5
Posey Cr	1985	B	1
Pretty Br	1985	B	1
Quarter Cr	1985	B	1
Rock Cr	1997	C	33
State Br	1985	B	1
Town Br		C	
Turkey Cr	1985	B	1
UT to Bullen Br	1997	C	33
UT to Dunkin Cr	1998	C	34
UT to Stinking Bear Cr	1997	C	33

* B= Biological Assessment (either fish or aquatic macroinvertebrate; C= Chemical Assessment
+ Key to References is located in Appendix I.

Table 9. Summary of the number of current Construction/Stormwater Authorizations and NPDES permits issued within each subwatershed. Those subwatersheds with more than five authorizations or permits in a category are in bold.

Cataloging Unit and Subwatershed	# of Authorizations / #NPDES permits					
	Total Number of Permits and Authorizations	Construction/ Stormwater Authorizations (c)	Mining NPDES (a)	Municipal NPDES (b)	Semi Public/ Private NPDES (b)	Industrial Process Wastewater - NPDES Majors (b)
Middle Tennessee (0602-0001)						
290						
350						
Guntersville Lake (0603-0001)						
060	*13*	6	2	1	3	1
080	*4*		2	1		1
100						
120						
140						
150						
160	*6*	2	2	1	1	
170	*3*	1	1	1		
180	*2*	1			1	
190	*7*	3	1	1		2
200						
210	*1*			1		
220	*10*	3		3	4	
230	*1*	1				
240	*6*	4			2	
250	*2*	1		1		
260						
270	*5*	2			3	
280	*13*	11		2		
290	*1*				1	
300	*12*	10	1			1
310	*11*	8	3			
320	*5*	2		1	2	
Wheeler Lake (0603-0002)						
020						
040						
050						
060						
070	*1*	1				
080						
090	*3*	2		1		
100	*3*	1	1	1		
110	*6*	2	1		1	2
130	*1*	1				

Table 9, cont. Summary of the number of current Construction/Stormwater Authorizations and NPDES permits issued within each subwatershed. Those subwatersheds with more than five authorizations or permits in a category are in bold.

Cataloging Unit and Subwatershed	# of Authorizations / #NPDES permits					
	Total Number of Permits and Authorizations	Construction/ Stormwater Authorizations (c)	Mining NPDES (a)	Municipal NPDES (b)	Semi Public/ Private NPDES (b)	Industrial Process Wastewater - NPDES Majors (b)
Wheeler Lake (0603-0002), cont.						
140	*5*	3			2	
160	*2*	1			1	
180	*8*	7			1	
190	*10*	8		1	1	
200	*7*	6		1		
210	*9*	7		2		
220	*5*	4			1	
230	*8*	7	1			
240	*30*	25	2			3
250	*21*	18			3	
260	*29*	27	1			1
270	*13*	7		3	3	
280	*6*	6				
300	*31*	24	1	1	5	
320	*5*	3		2		
330	*11*	4	3	2		2
340						
350	*13*	8	1		3	1
360	*3*	1			2	
370	*2*	1		1		
380	*29*	20	1			8
390	*18*	13		1	2	2
400	*6*	3			2	1
410	*17*	13	1			3
420	*3*	2				1
440	*5*	5				
Upper Elk River (0603-0003)						
120						
Lower Elk River (0603-0004)						
020	*1*	1				
060						
070						
080	*3*	1			2	
120	*3*	2			1	
130	*1*	1				
150	*3*	1			2	

Table 9, cont. Summary of the number of current Construction/Stormwater Authorizations and NPDES permits issued within each subwatershed. Those subwatersheds with more than five authorizations or permits in a category are in bold.

Cataloging Unit and Subwatershed	# of Authorizations / #NPDES permits					
	Total Number of Permits and Authorizations	Construction/ Stormwater Authorizations (c)	Mining NPDES (a)	Municipal NPDES (b)	Semi Public/ Private NPDES (b)	Industrial Process Wastewater - NPDES Majors (b)
Pickwick Lake (0603-0005)						
010	*16*	11	1	2	1	1
030	*5*	4			1	
040	*15*	11	1	2	1	
090	*4*	1	1		2	
140	*1*	1				
150	*20*	17			3	
160	*15*	7		3		5
180	*3*	1			2	
200	*13*	12				1
210	*9*	6	2			1
220	*2*	2				
230	*8*	3	2	1	1	1
240	*6*	3	1	1		1
250	*2*	2				
270	*2*	1			1	
280	*1*	1				
320	*1*	1				
Bear Creek (0603-0006)						
010	*16*	10	2	1	2	1
030	*3*	2	1			
040	*18*	8	8	1		1
050	*1*	1				
070	*2*	1	1			
100						
110	*1*	1				

(a) Source: ADEM Mining and Nonpoint Source Unit, Field Operations, database retrieval (9/14/99)

(b) Source: 1996 CWS Report (ADEM 1999a)

(c) Source: ADEM Mining and Nonpoint Source Unit, Field Operations, database retrieval (9/23/99)

Table 10. List of stations assessed as part of the surface water quality screening assessment within each cataloging unit of the Tennessee River Basin.

Stream Name	Station	Basin Size (sq. mi.)	Assessment Type*	Subwatershed Number	Sub-Ecoregion **	County	T	R	S
Guntersville Lake (0603-0001)									
Bengis Cr	BENJ-003	14	C, H	060	68b	Jackson	2S	8E	8
Little Coon Cr	LCNJ-002	23	C, H	120	68c	Jackson	1S	6E	35
Little Coon Cr	LCNJ-036	20	C, H	120	68c	Jackson	1S	6E	26
Flat Rock Cr	FLRJ-004	28	C, H	160	68b	Jackson	3S	9E	20
Mud Cr	MUDJ-006	74	C, H	170	68d	Jackson	3S	6E	10
Big Spring Cr	BGSM-022	45	C, H	300	71g	Marshall	8S	3E	32
Wheeler Lake (0603-0002)									
Cole Spring Br	CSPJ-070	10	C, H	070	71g	Jackson	4S	3E	20
Shanty Br	CSPJ-072	---	C, H	070	71g	Jackson	4S	3E	18
Little Paint Rock Cr	LPRM-090	9	C, H	100	68c	Marshall	6S	2E	26
Little Paint Rock Cr	LPRM-091	7	C, H	100	68d	Marshall	6S	2E	36
Mountain Fk	MTNM-160	83	C, H	160	71g	Madison	2S	1E	1
Mountain Fk	MTNM-161	32	C, H	160	71g	Madison	1S	2E	32
Hester Cr	MTNM-162	40	C, H	160	71g	Madison	1S	2E	32
Mountain Fk	MTNM-163	23	C, H	160	71g	Madison	1S	2E	34
Brier Fk	BFFM-180	106	C, H	180	71g	Madison	2S	1E	35
Brier Fk	BFFM-181	54	C, H	180	71g	Madison	2S	1E	20
Brier Fk	BFFM-182	22	C, H	180	71g	Madison	1S	1W	27
Beaverdam Cr	BVDM-017	34	C, H	180	71g	Madison	2S	1W	25
Chase Cr	CHSM-190	8	C, H	190	71g	Madison	3S	1E	14
Cane Cr	CANM-220	13	C, H	220	71g	Marshall	6S	1E	28
Aldridge Cr	ALDM-230	19	C, H	240	71g	Madison	5S	1E	17/20
Aldridge Cr	ALDM-231	14	C, H	240	71g	Madison	5S	1E	4
Aldridge Cr	ALDM-232	7	C, H	240	71g	Madison	4S	1E	20
Huntsville Spring Br	HSBM-240	47	C, H	240	71g	Madison	4S	1W	26
Fagan Cr	HSBM-241	4	C, H	240	71g	Madison	4S	1W	1
Pinhook Cr	HSBM-242	21	C, H	240	71g	Madison	3S	1W	35
Indian Cr	INDM-250	42	C, H	250	71g	Madison	3S	2W	26
Indian Cr	INDM-251	12	C, H	250	71g	Madison	3S	2W	11/14
Cotaco Cr	CTCM-026	158	C, H	270	71g	Morgan	7S	2W	12
Cotaco Cr	CTCM-037	136	C, H	270	71g	Morgan	7S	2W	24
Huges Cr	HGSM-027	12	C, H	270	68c	Morgan	7S	1W	23
Rock Cr	RCKM-023	6	C, H	270	68c	Morgan	8S	2W	1
Six Mile Cr	SXMM-036	14	C, H	270	71g	Morgan	7S	2W	23/24
Town Cr	TWNM-024	36	C, H	270	71g	Morgan	6S	2W	3
West Fk Cotaco Cr	WFCM-028	25	C, H	270	68c	Morgan	8S	1W	8
West Fk Cotaco Cr	WFCM-025	46	C	270	68c	Morgan	7S	1W	5
Limestone Cr	LIML-035	145	---	300	71g	Limestone	4S	3W	20
Limestone Cr	LIML-300	119	C, H	300	71g	Limestone	3S	3W	26
Limestone Cr	LIML-301	96	C, H	300	71g	Limestone	3S	3W	2/11
Limestone Cr	LIML-302	89	C, H	300	71g	Limestone	2S	3W	26
Piney Cr	PINL-320	84	C, H	320	71g	Limestone	4S	4W	24/25
Piney Cr	PINL-321	77	C, H	320	71g	Limestone	4S	4W	36/1
Piney Cr	PINL-322	60	C, H	320	71g	Limestone	3S	3W	7/18
Mack Cr	MACM-330	6	C, H	330	71g	Morgan	8S	4W	4
Robinson Cr	ROBM-331	9	C, H	330	71g	Morgan	8S	4W	11

Table 10, cont. List of stations assessed as part of the surface water quality screening assessment within each cataloging unit of the Tennessee River Basin.

Stream Name	Station	Basin Size (sq. mi.)	Assessment Type*	Subwatershed Number	Sub-Ecoregion**	County	T	R	S
Wheeler Lake (0603-0002), cont.									
Shoal Cr	SHLM-332	14	C, H	330	71g	Morgan	7S	4W	27
Shoal Cr	SHLM-333	12	C, H	330	71j	Morgan	7S	4W	14
Shoal Cr	SHLM-334	7	C, H	330	71j	Morgan	7S	4W	7
Town Br	TWNM-335	1	C, H	330	71j	Morgan	7S	4W	10
No Business Cr	NOBM-350	31	C, H	350	71j	Morgan	7S	5W	11
No Business Cr	NOBM-351	9	C, H	350	71g	Morgan	7S	5W	21/28
Village Cr	VILM-350	8	C, H	350	71j	Morgan	6S	4W	34
McDaniel	MCDL-360	13	C, H	360	71g	Lawrence	7S	6W	10
McDaniel	MCDL-361	3	C, H	360	71g	Lawrence	7S	6W	34
Swan Cr	SWNL-390	53	C, H	390	71g	Limestone	4S	4W	16
Swan Cr	SWNL-391	44	C, H	390	71g	Limestone	4S	4W	34/4
Swan Cr	SWNL-392	29	C, H	390	71g	Limestone	3S	4W	15
Round Island Cr	RNIL-400	27	C, H	400	71g	Limestone	3S	5W	32
Round Island Cr	RNIL-401	7	C, H	400	71g	Limestone	3S	5W	15/16
Mallard Cr	MALL-410	19	C, H	410	71g	Lawrence	4S	6W	20/29
Mallard Cr	MALL-411	6	C, H	410	71g	Lawrence	5S	6W	7
First Cr	FIRW-001	16	C, H, M+	440	71f	Lauderdale	2S	7W	30
Second Cr	SCDL-011	39	C, H	440	71f	Lauderdale	2S	8W	9
Lower Elk River (0603-0004)									
Big Cr	BIGL-014	13	C, H	080	71h	Limestone	2S	5W	29
Sulphur Cr	SLRL-015	17	C, H	080	71h	Limestone	1S	5W	35
Anderson Cr	ANDL-008	49	C, H	150	71f	Lauderdale	2S	7W	26
Pickwick Lake (0603-0005)									
Big Nance Cr	BGNL-032	150	C, H	010	71g	Lawrence	4S	7W	31
Big Nance Cr	BGNL-033	117	C, H	010	71j	Lawrence	5S	8W	23
Clear Fk of Big Nance Cr	CLFL-012	20	C, H	010	71j	Lawrence	6S	7W	8
Muddy Fk of Big Nance Cr	MBNL-034	25	C, H	010	71j	Lawrence	6S	8W	2
Poplar Cr	PPLC-001	15	C, H	040	71j	Colbert	5S	9W	19
Town Cr	TWNL-013	75	C, H	040	71g	Lawrence	6S	9W	9
Indian Camp Cr	INCL-001	10	C, H, M+	090	71f	Lauderdale	1S	W	31
Burcham Cr	BRML-009	16	C, H	180	71f	Lauderdale	2S	W	16
Sinking Cr	SNKL-010	46	C, H	220	71g	Lauderdale	3S	W	32

* Assessment Type: C=Chemical Assessment; H= Habitat Assessment; M=Aquatic Macroinvertebrate; F=Fish Assessment
\+ data collected as part of another study
** Level IV Ecoregions of Alabama (Griffith, etal 1999)

Table 11. List of the sixty-five (65) riverine waterbodies within the Tennessee River basin on ADEM's 1998 §303(d) list due to nonpoint source impacts. Nonpoint sources and causes of impairment are listed (ADEM 1999c). Five segments (in italics) are included on the 303(d) list with urban/industrial sources. (*Segments added by EPA; some information not yet available)

Waterbody	Sub-watershed	Miles impaired	Use	Support Status	Nonpoint Sources	Causes of Impairment
Guntersville Lake (0603-0001)						
Coon/Flat Rock Cr	160	20.0	F&W	Partial	Surface mining-abandoned Mine tailings-abandoned	Metals, pH, Siltation
Hogue Cr	160	2.4	F&W	Non	Unknown Source	Nutrients, Siltation Organic Enrichment/DO
Warrren Smith Cr	160	3.0	F&W	Non	Unknown Source	pH, Siltation
Dry Cr	160	8.0	F&W	Non	Unknown Source	Pesticides, pH, Siltation
Rocky Br	160	*	F&W	Non	Unknown Source	pH, Siltation
Mud Cr	170	21.0	F&W	Partial	Nonirrigated crop production Pasture grazing	Organic enrichment/DO
South Sauty Cr	220	all	S/F&W	*	Unknown Source	pH
Town Cr	250	all	F&W	*	Unknown Source	pH
Scarham Cr	270	12	F&W	Non	Nonirrigated crop production Specialty crop production Int. animal feeding oper. Pasture Grazing	Pesticides, Ammonia Siltation, Pathogens Organic enrichment/DO
Short Cr	280	all	PWS	*	Unknown Source	Pathogens
Wheeler Lake (0603-0002)						
Guess Cr	060	5.2	F&W	Non	Unknown Source	Unknown Toxicity
Cole Spring Br	070	2.1	F&W	Partial	Pasture grazing	Siltation Organic enrichment/DO
L. Paint Rock Cr	090	2.0	F&W	Partial	Pasture grazing	Siltation Organic enrichment/DO
Hester Cr	160	*	F&W	*	Unknown Source	Nutrients, Siltation Organic enrichment/DO
Mountain Fk	160	14.5	F&W	Non	Pasture grazing	Siltation, Pathogens Organic enrichment/DO
Brier Fk	180	3.9	F&W	Partial	Nonirrigated crop production	Unknown toxicity Siltation
Beaverdam Cr	180	*	F&W	*	Unknown Source	Siltation
Chase Cr	190	2.7	F&W	Partial	Agriculture Urban runoff/Storm sewers	Siltation Organic enrichment/DO
Hurricane Cr	200	*	F&W	*	Unknown Source	Organic enrichment/DO
Goose Cr	210	7.7	F&W	Non	Agriculture	Organic enrichment/DO Unknown Toxicity
Flint R	210	*	F&W	*	Unknown Source	Organic enrichment/DO
Yellow Bank Cr	210	*	F&W	*	Unknown Source	Organic enrichment/DO
Cane Cr	220	5.1	F&W	Non	Agriculture	Siltation Organic enrichment/DO

Table 11, cont. List of the sixty-five (65) riverine waterbodies within the Tennessee River basin on ADEM's 1998 §303(d) list due to nonpoint source impacts. Nonpoint sources and causes of impairment are listed (ADEM 1999c). Five segments (in italics) are included on the 303(d) list with urban/industrial sources. (*Segments added by EPA; some information not yet available)

Waterbody	Sub-watershed	Miles impaired	Use	Support Status	Nonpoint Sources	Causes of Impairment
Wheeler Lake (0603-0002), cont.						
Aldridge Cr	230	7.1	F&W	Partial	Urban runoff/Storm sewers Pasture grazing	Siltation Organic enrichment/DO
Huntsville Spring Br	*240*	*5*	*F&W*	*Non*	*Contaminated sediments*	*Priority Organics*
Huntsville Spring Br	*240*	*4.4*	*F&W*	*Partial*	*Urban runoff/Storm sewers*	*Metals*
Indian Cr	*250*	*3.6*	*F&W*	*Non*	*Contaminated sediments*	*Priority Organics*
Indian Cr	250	6.9	F&W	Partial	Nonirrigated crop production Land development Urban runoff/Storm sewers	Siltation Organic enrichment/DO
Cotaco Cr	270	11.8	F&W	Non	Agriculture	Pathogens
Huges Cr	270	*	F&W	*	Unknown Source	Siltation
Mill Pond Cr	270	*	F&W	Non	Unknown Source	Siltation
Town Cr	270	8.4	F&W	Non	Agriculture	Organic enrichment/DO
West Fk Cotaco Cr	270	7.8	F&W	Partial	Agriculture	Pathogens, Siltation
Limestone Cr	300	8.7	F&W	Non	Nonirrigated crop production Pasture grazing	Siltation Organic enrichment/DO
Piney Cr	320	11.5	F&W	Partial	Nonirrigated crop production Pasture grazing	Pesticides, Siltation Organic enrichment/DO
Flint Cr	330	40	PWS F&W A&I	Non	Municipal, Pasture grazing Nonirrigated crop production Int. animal feeding operations Urban runoff/Storm sewers	Siltation Organic enrichment/DO Pathogens
Shoal Cr	330	2.7	F&W	Non	Urban runoff/Storm sewers Agriculture	Organic enrichment/DO Pathogens
Town Br (Nasty Br)	*330*	*1.9*	*F&W*	*Non*	*Urban runoff/Storm sewers*	*Organic enrichment/DO*
Mack Cr	330	4.3	F&W	Partial	Pasture grazing	Siltation Organic enrichment/DO
Robinson Cr	330	5.6	F&W	Non	Agriculture	Siltation Organic enrichment/DO
Cedar Cr	330	23.4	F&W	Non	Agriculture	Organic enrichment/DO Pathogens
East Fk Flint Cr	330	all	F&W	*	Unknown Source	Organic enrichment/DO Pathogens
Crowdabout Cr	340	15.0	F&W	Non	Nonirrigated crop production Pasture grazing Int. animal feeding operations	Siltation Pathogens Organic enrichment/DO
Herrin Cr	340	all	F&W	Non	Pasture Grazing	Organic enrichment/DO Pathogens, Siltation Nutrients
No Business Cr	350	5.7	F&W	Non	Nonirrigated crop production Pasture grazing	Organic enrichment/DO Pathogens

Table 11, cont. List of the sixty-five (65) riverine waterbodies within the Tennessee River basin on ADEM's 1998 §303(d) list due to nonpoint source impacts. Nonpoint sources and causes of impairment are listed (ADEM 1999c). Five segments (in italics) are included on the 303(d) list with urban/industrial sources. (*Segments added by EPA; some information not yet available)

Waterbody	Sub-watershed	Miles impaired	Use	Support Status	Nonpoint Sources	Causes of Impairment
Wheeler Lake (0603-0002), cont.						
West Flint Cr	350	19.4	F&W	Partial	Nonirrigated crop production Pasture grazing Int. animal feeding operations	Siltation Pathogens Organic enrichment/DO
Village Br	350	2.2	F&W	Partial	Agriculture	Siltation Organic enrichment/DO
Elam Cr	360	all	F&W	*	Unknown Source	Organic enrichment/DO
Flat Cr	360	7.3	F&W	Non	Unknown Source	Organic enrichment/DO Ammonia, Nutrients Siltation
Big Shoal Cr	360	9.3	F&W	Partial	Pasture grazing	Organic enrichment/DO
McDaniel Cr	360	3.9	F&W	Partial	Agriculture	Siltation Organic enrichment/DO
Swan Cr	390	8.4	A&I F&W	Non	Nonirrigated crop production Urban runoff/Storm sewers Pasture grazing	Siltation Organic enrichment/DO
French Mill Cr	390	4.9	F&W	Non	Unknown Source	Pathogens
Round Island Cr	400	3.8	F&W	Partial	Agriculture	Siltation Organic enrichment/DO
Mallard Cr	410	11.5	F&W	Partial	Agriculture	Siltation Organic enrichment/DO
First Cr	440	1.6	S/F&W	Non	Unknown Toxicity	Pathogens
Second Cr	440	11.6	F&W	Non	Agriculture	Pathogens Organic enrichment/DO
Tennessee River	*440*	*10.0*	*PWS* *F&W*	*Partial*	*Industrial, Dam Construct.* *Flow reg/mod,* *Unknown Source*	*pH, Temp./Thermal Mod.*
Lower Elk River (0603-0004)						
Shoal Cr	060	5.5	F&W	Non	Unknown Source	Unknown Toxicity
Big Cr	080	*	F&W	*	Unknown Source	Organic enrichment/DO
Anderson Cr	150	*	F&W	*	Unknown Source	Siltation
Elk R	150	6	F&W S	Partial	Pasture grazing Nonirrigated crop production	pH Organic enrichment/DO
Pickwick Lake (0603-0005)						
Big Nance Cr	010	24.0	F&W	Non	Nonirrigated crop production Int. animal feeding operations Landfills, Pasture grazing	Pesticides, Ammonia Siltation, Pathogens Organic enrichment/DO
Town Cr	040	43.0	F&W	Partial	Nonirrigated crop production Pasture grazing	pH Organic enrichment/DO

Table 11, cont. List of the sixty-five (65) riverine waterbodies within the Tennessee River basin on ADEM's 1998 §303(d) list due to nonpoint source impacts. Nonpoint sources and causes of impairment are listed (ADEM 1999c). Five segments (in italics) are included on the 303(d) list with urban/industrial sources. (*Segments added by EPA; some information not yet available)

Waterbody	Sub-watershed	Miles impaired	Use	Support Status	Nonpoint Sources	Causes of Impairment
Pickwick Lake (0603-0005), cont.						
Harris Cr	040	5.9	F&W	Non	Pasture grazing	Siltation Organic enrichment/DO
Pond Cr	160	12.0	A&I	Non	Nonirrigated crop production Urban runoff/Storm sewers Natural sources	Metals Organic enrichment/DO
Donnegans Slough (Shegog Cr)	160	15.0	F&W	Non	Unknown Source	Organic enrichment/DO Ammonia, Nutrients Siltation
Bear Creek (0603-0006)						
Bear Cr	010	*	F&W	*	Unknown source	Metals (Al)
Little Dice Cr	010	4.0	F&W	Partial	Unknown source	Siltation
Lost Cr	040	4.0	F&W	Partial	Unknown source	pH

Table 12a. Land Use Percentages from EPA Landuse data layers (Subcategories) (EPA 1997) and broader categories used in comparison with local SWCD Conservation Assessment Worksheet Landuse Estimates (ASWCC 1998).

	Percent Total Landuse (Category and Subcategory)*													
	Open Water	Urban			Mining	Forest				Pasture/ Hay	Row Crops	Other		
Cataloging Unit	Open Water	Low Intensity Residential	High Intensity Residential	High Intensity Commercial/ Industrial/ Transportation	Quarries/ Strip Mines/ Gravel Pits	Transitional Forest	Deciduous Forest	Evergreen Forest	Mixed Forest	Pasture/ Hay	Row Crops	Other Grasses	Woody Wetlands	Herbaceous Wetlands
Chicamauga 0602-0001				1		1	52	12	21	8	4			
Guntersville Lake 0603-0001	6			1			30	9	18	18	14		2	
Wheeler Lake 0603-0002	4	1	1	1			30	5	11	18	22	1	6	
Upper Elk River 0603-0003							97		3					
Lower Elk River 0603-0004	3						41	2	9	26	17	0	1	
Pickwick Lake 0603-0005	5	1				1	34	4	12	21	18	1	2	
Bear Creek 0603-0006	3					4	42	14	19	12	5			

* The sum of total Landuse for each cataloging unit may range from 99% to 101% due to rounding.

Table 12b. Land Use Percentages from EPA Landuse data layers (EPA 1997) and local Soil and Water Conservation District (SWCD) Conservation Assessment Worksheets (ASWCC 1998).

			Percent Total Landuse						
Cataloging Unit	Size sq. mi.	Source	Open Water	Urban	Mining	Forest	Pasture/ Hay	Row Crops	Other
Chicamauga	53	EPA		1		87	8	4	
0602-0001		*SWCD*		*1*		*77*	*16*	*3*	*2*
Guntersville Lake	1,645	EPA	6	1		60	18	14	
0603-0001		*SWCD*	*5*	*2*	*1*	*50*	*22*	*18*	*2*
Wheeler Lake	2,670	EPA	4	3		52	18	22	1
0603-0002		*SWCD*	*4*	*7*		*43*	*28*	*18*	
Upper Elk River	0.4	EPA				100			
0603-0003		*SWCD*							
Lower Elk River	247	EPA	3			53	26	17	
0603-0004		*SWCD*	*3*	*3*		*37*	*35*	*22*	
Pickwick Lake	1,414	EPA	5	2		54	21	18	1
0603-0005		*SWCD*	*1*	*7*		*48*	*20*	*23*	*2*
Bear Creek	797	EPA	3	1		79	12	5	
0603-0006		*SWCD*	*3*	*3*	*2*	*72*	*12*	*6*	*2*

* The sum of total Landuse for each cataloging unit may range from 99% to 101% due to rounding.

Table 13. Animal concentration estimates by animal type and estimates of the percent of acres where pesticides/herbicides applied for cataloging units in the Tennessee Basin. Values are based upon information included in 1998 local SWCD Conservation Assessment Worksheets. Acres assessed are based on the total number of acres submitted on worksheets. Percent of Acres in CU where pesticides/herbicides were applied were estimated based upon acreages and pesticides/herbicides listed on worksheets.

Cataloging Unit	# Acres Assessed (% of Total*)	Animal Concentration Per Acre* (Animal Units Per Acre+)							Percent of Acres where pesticides/ herbicides applied
		Cattle	Dairy	Swine	Poultry-Broilers	Poultry-Layers	Catfish	Total AU (Impairment Potential)	
Chicamauga 0602-0001	33,829 (100%)	0.05 (0.05)			5.44 (0.04)	0.59 (0.00)		0.09 (Low)	20% ~6,600 Acres
Guntersville Lake 0603-0001	1,052,232 (100%)	0.09 (0.09)	0.00 (0.00)	0.07 (0.03)	25.25 (0.20)	1.63 (0.01)	0.00 (---)	0.33 (High)	37% ~388,000 Acres
Wheeler Lake 0603-0002	1,695,383 (99%)	0.10 (0.10)	0.00 (0.00)	0.00 (0.00)	7.44 (0.06)	0.39 (0.00)	0.00 (---)	0.16 (Mod.)	18% ~310,000 Acres
Upper Elk River 0603-0003	0 (0%)								
Lower Elk River 0603-0004	152,314 (96%)	0.10 (0.10)	0.00 (0.00)	0.03 (0.01)	1.21 (0.01)	1.14 (0.01)		0.14 (Low)	24% ~37,000 Acres
Pickwick Lake 0603-0005	902,657 (100%)	0.08 (0.08)	0.00 (0.00)	0.01 (0.00)	4.55 (0.04)	0.48 (0.00)	0.00 (---)	0.12 (Low)	13% ~116,000 Acres
Bear Creek 0603-0006	499,660 (98%)	0.06 (0.06)	0.00 (0.00)	0.00 (0.00)	14.18 (0.11)	0.36 (0.00)	0.00 (---)	0.17 (Mod.)	2% ~10,000 Acres

* Subwatersheds less than 5000 acres were not assessed. Assessments were not received on all subwatersheds >5000 acres

\+ Animal Unit concentration estimates were calculated using Animal Unit conversion factors from Concentrated Animal Feeding Operation (CAFO) Rules (ADEM Administrative Code Ch. 335-6-7) (ADEM 1999b)

Table 14. Sedimentation estimates by source category for cataloging units in the Tennessee Basin as provided by the local Soil and Water Conservation Districts (SWCD) on Conservation Assessment Worksheets (ASWCC 1998).

Cataloging Unit	# Acres Assessed (% of Total*)	Sediment Contributions (Tons/Acre/Year)									
		Crop Land	Sand & Gravel Pits	Mined Land	Developing Urban Land	Critical Areas	Gullies	Stream Banks	Dirt Roads	Woodlands	Total Sediment (Impairment Potential)
Chicamauga 0602-0001	33,829 (100%)	0.13	0.23	0.00	0.03	0.01	0.01	0.02	1.06	0.07	1.56 (Low)
Guntersville Lake 0603-0001	1,052,232 (100%)	0.60	0.03	0.64	0.06	0.27	0.09	0.11	0.34	0.08	2.22 (Mod.)
Wheeler Lake 0603-0002	1,695,383 (99%)	0.49	0.01	0.06	0.72	0.44	0.02	0.26	0.14	0.05	2.19 (Mod.)
Upper Elk River 0603-0003	0 (0%)										
Lower Elk River 0603-0004	152,314 (96%)	0.70	0.02	0.00	0.11	0.07	0.02	0.12	0.53	0.16	1.72 (Low)
Pickwick Lake 0603-0005	902,657 (100%)	0.66	0.12	0.12	0.49	0.10	0.22	0.14	0.35	0.25	2.44 (Mod.)
Bear Creek 0603-0006	499,660 (98%)	0.20	1.51	1.20	0.04	0.17	0.43	0.25	0.12	1.43	5.36 (High)

* Subwatersheds less than 5000 acres were generally not assessed. Assessments were not received on all subwatersheds >5000 acres

Table 15. Estimation of potential sources of NPS impairment for cataloging units in the Tennessee Basin. Information utilized to rate source categories are based upon: local Soil and Water Conservation Districts (SWCD) Conservation Assessment Worksheets completed in 1998; EPA landuse estimates (1997); and from Construction Stormwater Authorization information provided by the Mining and NPS Unit of the ADEM. The overall potential for NPS impairment for each cataloging unit was determined utilizing ranked sums the individual categories.

Cataloging Unit	Cataloging Unit Potential	Potential Sources of Impairment							
		Urban	Mining	Forestry Practices	Development	Sedimentation	Animal Husbandry	Pasture Runoff	Row Crops
Chicamauga 0602-0001	L	L	L	L	L	L	L	L	L
Guntersville Lake 0603-0001	H	L	L	L	M	M	H	M	M
Wheeler Lake 0603-0002	H	M	L	L	H	M	M	M	H
Upper Elk River 0603-0003	L	L	L	L	L	L	L	L	L
Lower Elk River 0603-0004	L	L	L	L	M	L	L	H	M
Pickwick Lake 0603-0005	M	L	L	L	H	M	L	M	M
Bear Creek 0603-0006	M	L	L	L	M	H	M	M	L

+ Final Priority may not coincide with estimated impairment potential; aquatic life use impairment determined the priority. SWCD information was not received until after final priority was assigned.

Table 16. Summary of Assessments conducted as part of the Tennessee Nonpoint Source Monitoring Project. Includes data collected as a part of the Tennessee NPS project and other available biological and chemical data collected since 1991.

Cataloging Unit and Subwatershed	Station Number	*Habitat*	*Macroinv.*	*Fish*	*Chemical*	Overall Assessment
		ADEM	TVA	TVA	Data Available	
Guntersville Lake (0603-0001)						
060	BENJ-003	G	---	F/G	X	Mod. Imp.
120	LCNJ-002	----	---	G/E	X	Unimpaired
120	LCNJ-036	G	---	---	X	
160	FLRJ-004	E	---	P (GSA)	X	Sev. Imp
170	MUDJ-006	G	---	P (GSA)	X	Sev. Imp
180	BYTJ-001	E	G (ADEM)	VP/P (ADEM)	X	Sev. Imp
300	BGSM-022	E	---	P	X	Sev. Imp
Wheeler Lake (0603-0002)						
070	CSPJ-070	F	---	P	X	Sev. Imp.
070	CSPJ-072	----	---	---	---	intermittent
100	LPRM-090	G	P	P/F	X	Sev. Imp
100	LPRM-091	F	---	*P/F	X	Mod. Imp
160	MTNM-160	E	F	P	X	Sev. Imp
160	MTNM-161	E	---	P	X	Sev. Imp
160	MTNM-162	E	---	VP/P	X	Sev. Imp
160	MTNM-163	E	---	---	X	
180	BFFM-180	E	---	*P/F	X	Mod. Imp
180	BFFM-181	E	G	P	X	Sev. Imp
180	BFFM-182	E	*F	*F	X	Mod. Imp
180	BVDM-017	E	P	P	X	Sev. Imp
190	CHSM-190	E	P/F	P	X	Sev. Imp
220	CANM-220	F	P	VP/P	X	Sev. Imp
230	ALDM-230	G	P	P	X	Sev. Imp
230	ALDM-231	E/F	---	---	X	---
230	ALDM-232	G	---	---	X	---
240	HSBM-240	G	P	P	X	Sev. Imp
240	HSBM-241	P	---	---	X	---
240	HSBM-242	F	---	---	X	---
250	INDM-250	E	P	P/F	X	Sev. Imp
250	INDM-251	E	---	---	X	---
270	CTCM-026	F	P/F	P	X	Sev. Imp
270	CTCM-037	F	---	---	X	---
270	HGSM-027	G	F	P	X	Sev. Imp
270	RCKM-023	E	---	P (GSA)	X	Sev. Imp
270	SXMM-036	P	---	---	X	---
270	TWNM-024	G	P/F	P	X	Sev. Imp
270	WFCM-028	F	---	P	X	Sev. Imp
300	LIML-035	----	---	---	---	---
300	LIML-300	E	F	VP/P	X	Sev. Imp
300	LIML-301	E	---	---	X	---
300	LIML-302	----	---	---	X	---
320	PINL-320	E	F	P	X	Sev. Imp
320	PINL-321	E	---	---	X	---
320	PINL-322	E	F	G	X	Mod. Imp
330	MACM-330	G	---	P	X	Sev. Imp
330	ROBM-331	G	---	P/F	X	Mod. Imp
330	SHLM-332	E	---	P	X	Sev. Imp
330	SHLM-333	E	---	P	X	Sev. Imp
330	SHLM-334	E	---	---	X	---

Table 16, cont. Summary of Assessments conducted as part of the Tennessee Nonpoint Source Monitoring Project. Includes data collected as a part of the Tennessee NPS project and other available biological and chemical data collected since 1991.

Cataloging Unit and Subwatershed	Station Number	*Habitat*	*Macroinv.*	*Fish*	*Chemical*	Overall Assessment
		ADEM	TVA	TVA	Data Available	
Wheeler Lake (0603-0002), cont.						
330	TOWM-335	G	---	---	X	---
350	NOBM-350	F	---	P	X	Sev. Imp
350	NOBM-351	G	---	---	X	---
350	VILM-350	E	---	P	X	Sev. Imp
360	MCDL-360	E	---	P	X	Sev. Imp
360	MCDL-361	E	---	---	X	---
390	SWNL-390	G	F	P	X	Sev. Imp
390	SWNL-391	E	---	---	X	---
390	SWNL-392	E	---	*P	X	Sev. Imp
400	RNIL-400	E	*F/G	*P/F	X	Mod. Imp
400	RNIL-401	E	---	---	X	---
410	MALL-410	E	---	P/F	X	Mod. Imp
410	MALL-411	G	---	---	X	---
440	FIRW-001	E	---	VP/P	X	Sev. Imp
440	SCDL-011	E	F/G	F	X	Mod. Imp
Lower Elk River (0603-0004)						
080	BIGL-014	E	G	P	X	Sev. Imp.
080	SLRL-015	E	---	F	X	Mod. Imp.
150	ANDL-008	E	F	F	X	Mod. Imp.
Pickwick Lake (0603-0005)						
010	BGNL-032	E	F/G	F	X	Mod. Imp.
010	BGNL-033	E	---	---	X	---
010	CLFL-012	E	F	P	X	Sev. Imp.
010	MBNL-034	E	---	---	X	---
040	PPLC-001	G	---	P	X	Sev. Imp.
040	TWNL-013	G	---	P	X	Sev. Imp.
090	INCL-001	E	E (ADEM)	G/E	X	Unimp.
180	BRML-009	E	---	P/F	X	Mod. Imp.
220	SNKL-010	E	P	P/F	X	Sev. Imp.

* At or near ADEM site, and includes the most recent assessment. The IBI assessment is used if available or if not available, the most recent Level I assessment .

Table 17. Priority listing of subwatersheds assessed as part of the Tennessee Basin (0603-) Nonpoint Source Monitoring Project. Subwatersheds that are part of current NPS Projects are not included.

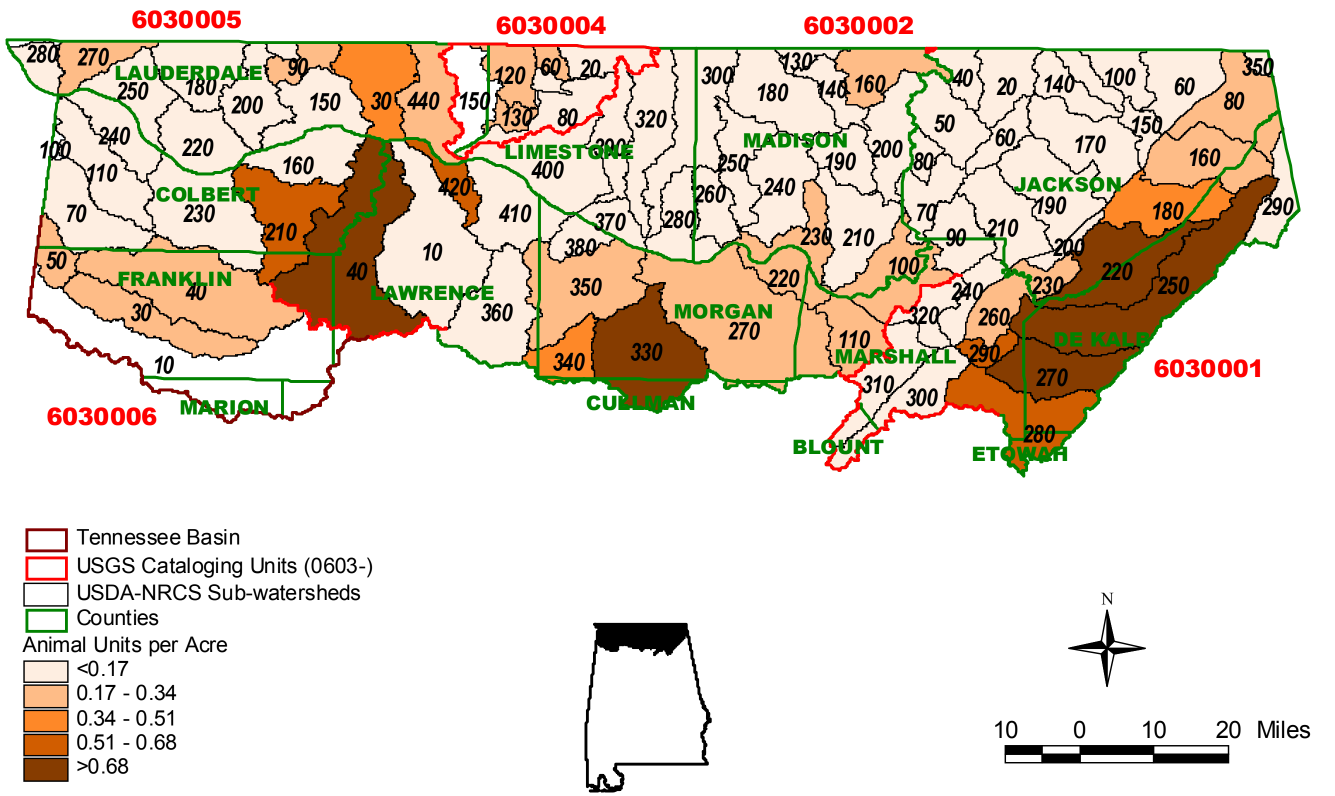
Priority^	Subwatershed Number	Subwatershed Name	Station Assessment (Mod. Imp. / Sev. Imp.)	Suspected Cause(s)
Guntersville Lake (0603-0001)				
H	300	Big Spring Cr	Sev. Imp.	Sedimentation, Nutrients
L	060	Widows Cr	Mod. Imp.	Nutrients, Pathogens,
M	160	Coon Cr	Sev. Imp.	Sedimentation, Nutrients
M	170	Mud Cr	Sev. Imp.	Nutrients, Pesticides
L	120	Little Coon Cr	Sl. Imp.+	Nutrients, Pathogens
Wheeler Lake (0603-0002)				
H	160	Mountain Fk Flint R	Sev. Imp.	Nutrients, Pathogens, Sedimentation, Pesticides
H	180	Brier Fk Flint R	Sev. Imp.	Nutrients, Pathogens, Sedimentation, Pesticides
H	190	Middle Flint R	Sev. Imp.	Sedimentation, Nutrients, Pathogens
H	300	Limestone Cr	Sev. Imp.	Sedimentation, Nutrients, Pathogens, Pesticides
H	320	Piney Cr*	Sev. Imp.	Sedimentation, Nutrients, Pathogens, Pesticides
H	440	Second Cr	Sev. Imp.	Nutrients, Pathogens
M	220	Dry Cr	Sev. Imp.	Sedimentation, Nutrients
M	270	Cotaco Cr	Sev. Imp.	Sedimentation, Nutrients, Pathogens, Pesticides
L	400	Round Island Cr	Mod. Imp.	Nutrients
Lower Elk River (0603-0004)				
M	080	Big Cr	Sev. Imp.	Nutrients
L	150	Anderson Cr	Mod. Imp.	Nutrients, Pathogens
Pickwick Lake (0603-0005)				
H	010	Big Nance Cr*	Sev. Imp.	Nutrients, Organic Enrichment/DO
H	040	Town Cr	Sev. Imp.	Sedimentation, Nutrients
L	180	Upper Cypress Cr	Mod. Imp.	Nutrients
M	220	Sinking Cr	Sev. Imp.	Sedimentation, Nutrients, Organic Enrichment/DO

* CWAP Subwatersheds

^ H = High Priority; M = Medium Priority; L = Low Priority

+ most recent data (1999) indicates only slight impairment as compared to data available at the time of initial prioritization of subwatersheds

Fig. 1. Estimates of Animal Concentrations Based on Local SWCD Estimates for Sub-watersheds of the Tennessee River Basin



* Current Animal Unit Conversion Factors from CAFO Rules.

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Fig. 2. Sedimentation Rates Based on Local SWCD Estimates for Sub-watersheds of the Tennessee River Basin.

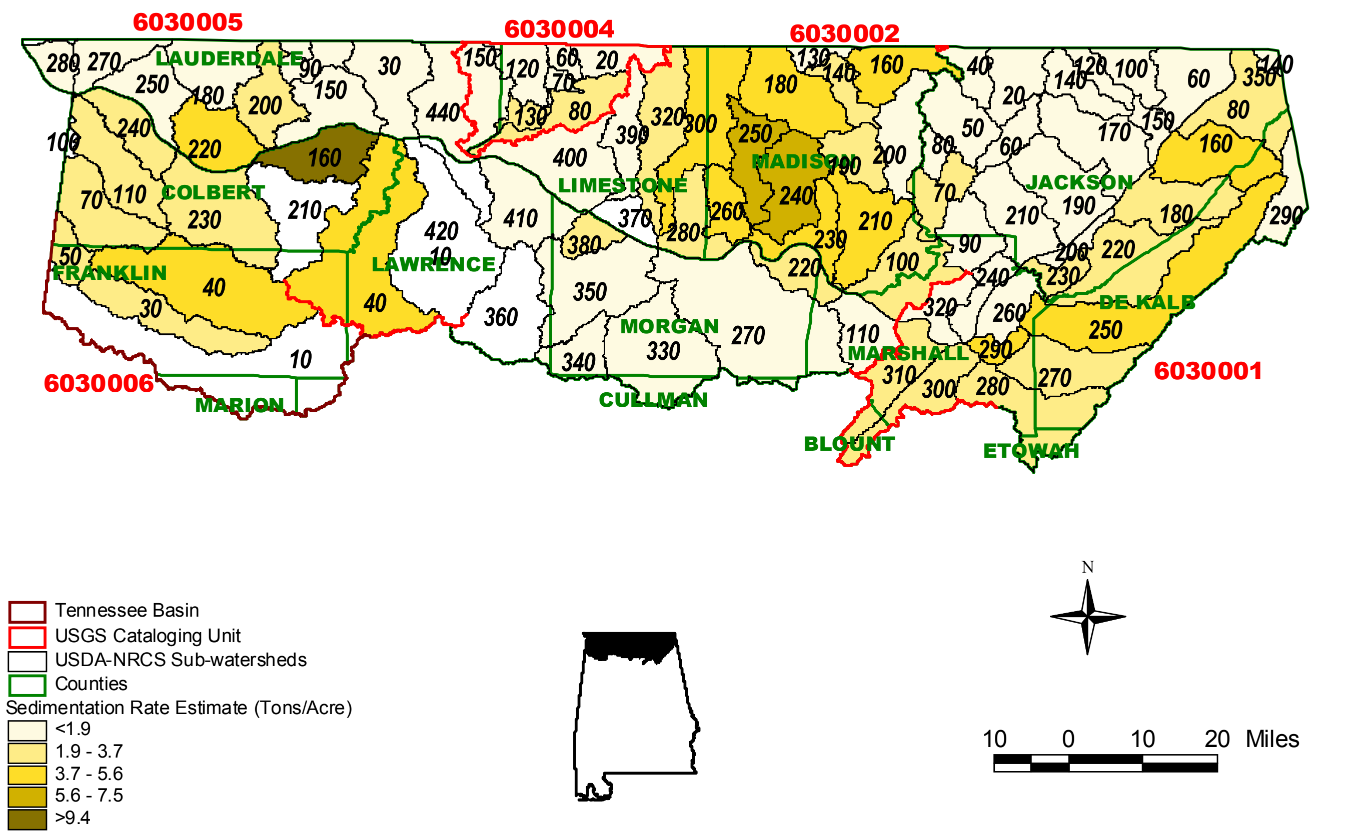

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Fig. 3. Estimates of Nonpoint Source Impairment Potential for Sub-watersheds of the Tennessee River Basin.

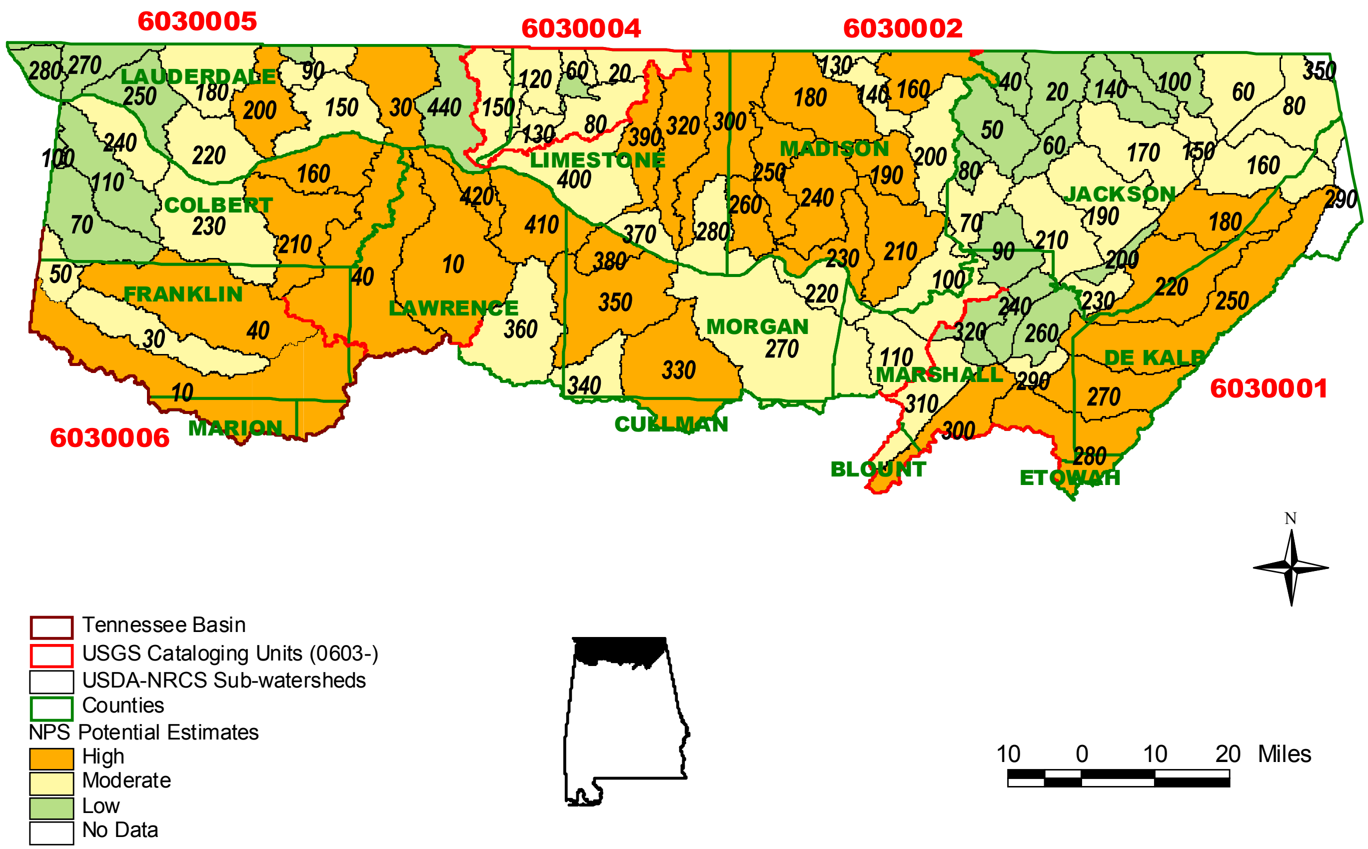

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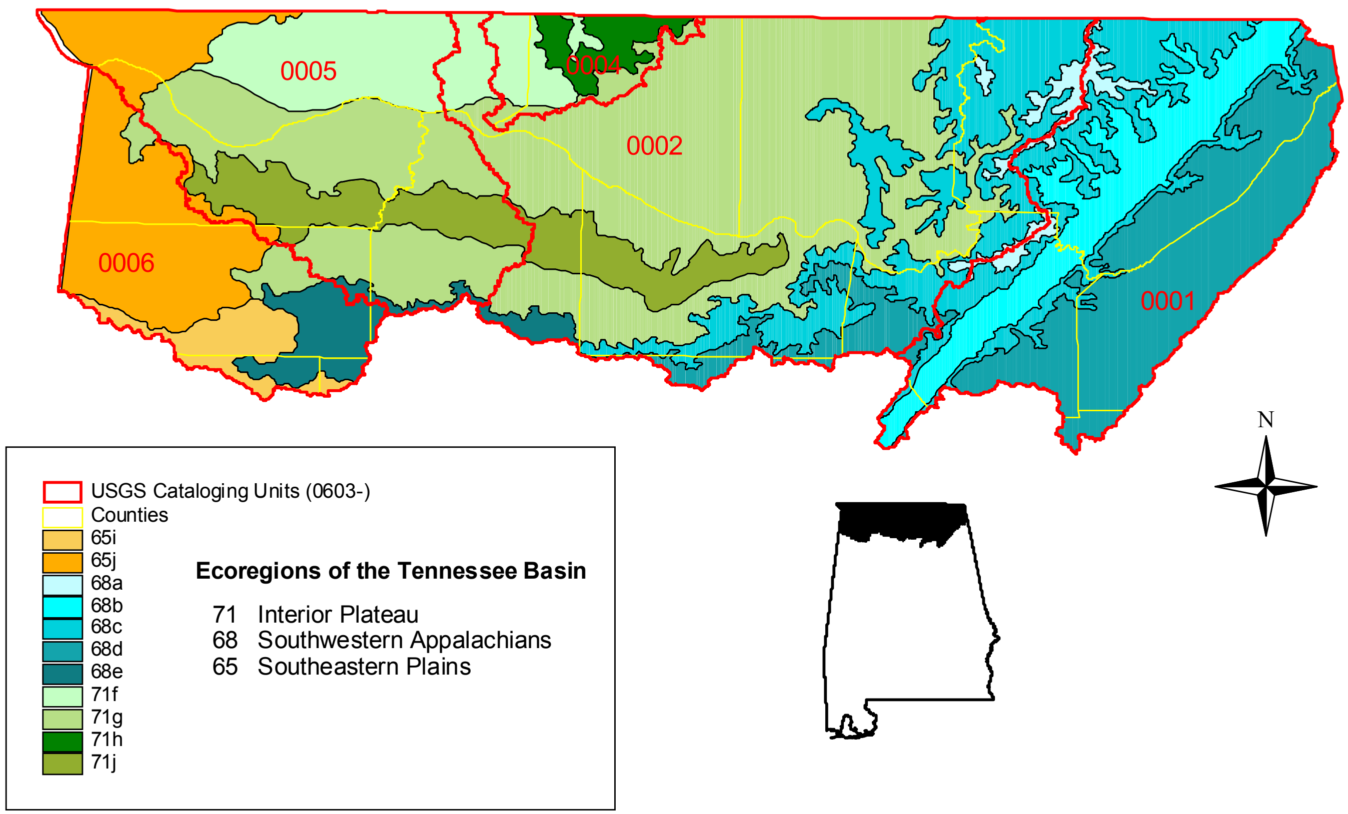
Fig. 5. Level III and IV Ecoregions of the Tennessee Basin (Draft)



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SURFACE WATER QUALITY SCREENING ASSESSMENT OF THE TENNESSEE RIVER BASIN 1998

----APPENDICES----

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ENVIRONMENTAL INDICATORS SECTION ✦ FIELD OPERATIONS DIVISION
ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

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COMMENTS OR QUESTIONS RELATED TO THE CONTENT OF THIS REPORT SHOULD BE ADDRESSED TO :

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LIST OF APPENDICES

LIST OF ABBREVIATIONS

Abbreviation	Interpretation
§	Section
ADEM	Alabama Department of Environmental Management
AU	Animal Unit as defined by ADEM CAFO Rules
Br	Branch
CAFO	Concentrated Animal Feeding Operation
cfs	Cubic Feet per Second
Chem.	Chemical/Physical Water Quality
Co.	County
Confl.	Confluence
Cr	Creek
CWA	Clean Water Act
CWAP	Clean Water Action Plan
ds	Downstream
EIS	Environmental Indicators Section of ADEM's Field Operations Division
EPA	U.S. Environmental Protection Agency
FOD	Field Operations Division
GSA	Geological Survey of Alabama
IBI	Index of Biotic Integrity (fish community)
Macroinv.	Aquatic Macroinvertebrate
mg/l	Milligrams per Liter
Mod.	Moderate
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
nr	Near
R	River
Rd	Road
RM	River Mile
SSWCC	State Soil and Water Conservation Committee
SWCD	Soil and Water Conservation District
TMDL	Total Maximum Daily Load
TVA	Tennessee Valley Authority
ug/g	Micrograms per Gram
ug/l	Micrograms per Liter
us	Upstream

APPENDIX A

EROS Land Cover Data Set

--South-Central Portion of EPA Region IV--

VERSION 1

INTRODUCTION

The main objective of this project was to generate a generalized and consistent (i.e. seamless) land cover data layer for the South-central portion of EPA Region IV, which includes most of Alabama, Western Georgia, Eastern Mississippi, and the Florida Panhandle. This data set was developed by personnel at the EROS Data Center (EDC), Sioux Falls, SD. The project was initiated during the summer of 1997, and a first draft product was completed in November, 1997 (Version 1). The write-up that follows pertains to Version 1. Questions about the data set can be directed to Terry Sohl (EDC; email sohl@edcmail.cr.usgs.gov; telephone 605-594-6537).

GENERAL PROCEDURES

Data sources: The primary source of data for this project was leaves-off (primarily spring) Landsat TM data, acquired in 1988, 1990, 1991, 1992 and 1993. While most of the leaves-off data sets were acquired in spring, a few were from late autumn due to the difficulties in acquiring cloud-free TM data. These data sets were referenced to Albers Conical Equal Area coordinates (see table 1). Additionally, leaves-on (summer) TM data sets were acquired and referenced. The south-central and north-central portions of Region IV were processed as one unit and later split for distribution purposes; in total, 40 TM scenes were analyzed. Data sets used are provided in Table 2. In addition, other intermediate scale spatial data were acquired and utilized. These included 3-arc second Digital Terrain Elevation Dataset (DTED) and derivative DTED products (slope, shaded relief, and relative elevation), population density and housing units density data at the census block level, USGS land use and land cover data (LUDA), National Wetlands Inventory (NWI) data, and STATSGO soils information (available water and organic carbon).

Methods: The general procedure of this project was to (1) mosaic multiple spring TM scenes and classify them using an unsupervised classification algorithm, (2) interpret and label classes into sixteen land cover categories using aerial photographs as reference data, (3) resolve confused classes using the appropriate ancillary data source(s), and (4) incorporate land cover information from leaves-on TM data, NWI data, and other data sources to refine and augment the "basic" classification developed above. The entire area (north-central and south-central portions of Region IV) was analyzed as one large mosaic consisting of 20 leaves-off scenes. For mosaicing purposes, a base scene was selected, and other scenes were normalized to mimic spectral properties of the base scene following histogram equalization using pixels in regions of spatial overlap.

Following mosaicing, mosaiced scenes were clustered into 100 spectrally distinct classes using the Cluster algorithm developed by Los Alamos [1]. Clusters were assigned into Anderson level 1 and 2 land cover classes using National High Altitude Photography program (NHAP) aerial photographs as reference information. Almost invariably, individual spectral classes were confused between/among two or more "targeted" land cover classes. Separation of spectral classes into meaningful land cover units was accomplished using ancillary data. Briefly, for a given confused spectral class, digital values of the various ancillary data layers were compared to determine: (1) which data layers were the most effective for splitting the confused class into the appropriate land cover units, and (2) the appropriate thresholds for splitting the classes. Models were then developed using one to several data sets to split each confused class into the desired land cover categories. As an example, a spectral class might be confused between row crop and high-intensity residential areas. In order to split this particular class into more meaningful land cover units, population density and housing units density data were assessed to determine if they could be used to split the class into the respective categories, and if so, to define the appropriate thresholds to be used in the class splitting model.

Following the above class splitting steps, a "first order" classification product was constructed from the clustered leaves-off data. Leaves-on data were then clustered with the goal of refining certain land cover features not easily discriminated using leaves-off TM data. Land cover classes that were spatially but not spectrally distinct in the leaves-off data (barren areas, clearcuts) were digitized off the screen from the leaves-on data. These digitized data layers were used in conjunction with clustered leaves-on data to define barren and cleared areas that were then incorporated into the classification product. A digitized layer outlining wetland areas was also used to refine the wetlands information. "Other grasses", consisting largely of parks, urban lawns, and golf courses, were defined at this point by using hand-digitized information and

LUDA urban information to separate "other grasses" from "hay/pasture". Similarly, high-intensity residential and high-intensity commercial/industrial areas were separated by using a threshold in the population density data.

The resulting classification (Version 1) includes the following. Please note that not all classes were used for this region:

Water
- 11 Open Water
- 12 Perennial Ice/Snow

Developed
- 21 Low Intensity Residential
- 22 High Intensity Residential
- 23 High Intensity Commercial/Industrial/Transportation

Barren
- 31 Bare Rock/Sand
- 32 Quarries/Strip Mines/Gravel Pits
- 33 Transitional

Natural Forested Upland (non-wet)
- 41 Deciduous Forest
- 42 Evergreen Forest
- 43 Mixed Forest

Natural Shrubland
- 51 Deciduous Shrubland
- 52 Evergreen Shrubland
- 53 Mixed Shrubland

Non-Natural Woody
- 61 Planted/Cultivated (orchards, vineyards, groves)

Herbaceous Upland Natural/Semi-Natural Vegetation
- 71 Grassland/Herbaceous

Herbaceous Planted/Cultivated
- 81 Pasture/Hay
- 82 Row Crops

83 Small Grains

84 Bare Soil

85 Other Grasses (Urban/recreational; e.g. parks, lawns, golf courses)

Wetlands

91 Woody Wetlands

92 Herbaceous Wetlands

Current definitions of the classes are as follows; percentages given must be viewed as guidelines.

Water - All areas of open water or permanent ice/snow cover

Water - all areas of open water, generally with less than 25% cover of vegetation/land cover.

Perennial Ice/Snow - all areas characterized by yearlong surface cover of ice and/or snow.

Developed - areas characterized by high percentage (approximately 30% or greater) of construction materials (e.g. asphalt, concrete, buildings, etc).

Low Intensity Residential - Land includes areas with a mixture of constructed materials and vegetation or other cover. Constructed materials account for 30-80 percent of the total area. These areas most commonly include single-family housing areas, especially suburban neighborhoods. Generally, population density values in this class will be lower than in high intensity residential areas.

High Intensity Residential - Includes heavily built-up urban centers where people reside. Examples include apartment complexes and row houses. Vegetation occupies less than 20 percent of the landscape. Constructed materials account for 80-100 percent of the total area. Typically, population densities will be quite high in these areas.

High-Intensity Commercial/Industrial/Transportation - Includes all highly developed lands not classified as High Intensity Residential, most of which is Commercial/Industrial/Transportation.

Barren - Bare rock, sand, silt, gravel, or other earthen material with little or no vegetation regardless of its inherent ability to support life. Vegetation, if present, is more widely spaced and scrubby than that in the vegetated categories.

Bare Rock / Sand - Includes areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, and other accumulations of rock without vegetative cover.

Quarries / Strip Mines / Gravel Pits - Areas of extractive mining activities with significant surface expression.

Transitional - Areas dynamically changing from one land cover to another, often because of land use activities. Examples include forestlands cleared for timber, and may include both freshly cleared areas as well as areas in the earliest stages of forest regrowth.

Natural Forested Upland (non-wet) - A class of vegetation dominated by trees generally forming > 25 percent canopy cover.

Deciduous Forest - Areas dominated by trees where 75 percent or more of the tree species shed foliage simultaneously in response to an unfavorable season.

Evergreen Forest - Areas dominated by trees where 75 percent or more of the tree species maintain their leaves all year. Canopy is never without green foliage.

Mixed Forest - Areas dominated by trees where neither deciduous nor evergreen species represent more than 75 percent of the cover present. Natural Shrubland - A class of vegetation defined by areas dominated by shrubs generally less than 6 meters tall with individuals or clumps not touching to interlocking. The species may include true shrubs or trees and shrubs that are small or stunted because of environmental conditions. Shrub canopy cover is generally greater than 25 percent when tree canopy is less than 25 percent. Shrub cover may be less than 25 percent if cases when the cover of each other life form (herbaceous, tree) is less than 25 percent and shrubs exceed the cover of the other life forms. Not currently represented in the central portion of the EPA Region IV data set.

Deciduous Shrubland - Areas dominated by shrubs where 75 percent or more of the shrub species shed foliage simultaneously in response to an unfavorable season.

Evergreen Shrubland - Areas dominated by shrubs where 75 percent or more of the shrub species maintain their leaves all year. Canopy is never without green foliage.

Mixed Shrubland - Areas dominated by shrubs where neither deciduous nor evergreen species represent more than 75 percent of the cover present. Non-Natural Woody - Areas dominated by non-natural woody plant species such as orchards, vineyards, and groves. The classification of

Non-Natural Woody is subject to availability of sufficient ancillary data to differentiate from natural woody vegetation. Not currently represented in the central portion of the EPA Region IV data set.

Planted / Cultivated - Orchards, Vineyards, and tree plantations planted for the production of fruit, nuts, fiber (wood), or ornamental. Herbaceous Upland Natural/Semi-Natural Vegetation - Areas comprised of natural or semi-natural upland herbaceous vegetation.

Grassland/Herbaceous - A class of vegetation dominated by natural upland grasslands, i.e. neither planted nor cultivated by humans, as well as other non-woody plants known as herbs (graminoids, Forbes, and ferns). The grasses/herbs generally form at least 25 percent cover. Trees and shrubs generally have less than 25 percent cover. In rare cases, herbaceous cover is less than 25 percent but exceeds the combined cover of other life forms present.

Herbaceous Planted / Cultivated - Areas dominated with vegetation which has been planted in its current location by humans, and/or is treated with annual tillage, a modified conservation tillage, or other intensive management or manipulation. The majority of vegetation in these areas is planted and/or maintained for the production of food, feed, fiber, or seed.

Pasture / Hay - Grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops.

Row Crops - All areas used for the production of crops, such as corn, soybeans, vegetables, tobacco, and cotton.

Small Grains - All areas used for the production of graminoid crops such as wheat and rice. Not represented in the central portion of the EPA Region IV data set.

Bare Soil - Areas within planted or cultivated regions that have been tilled or plowed and do not exhibit any visible cover of vegetation. Not represented in the central portion of the EPA Region IV data set.

Other Grasses - Vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes. Examples include parks, lawns, and golf courses.

Wetlands - Non-woody or woody vegetation where the substrate is periodically saturated with or covered with water as defined by Cowardin et al. [2].

Woody Wetlands - Areas of forested or shrubland vegetation where the soil or substrate is periodically saturated with or covered with water as defined by Cowardin et al. [2].

Emergent Woodlands - Non-woody vascular perennial vegetation where the soil or substrate is periodically saturated with or covered with water as defined by Cowardin et al. [2].

CAVEATS AND CONCERNS

While we believe that the approach taken has yielded a very good general land cover classification product for a very large region, it is important to indicate to the user where there might be some potential problems. The biggest concerns are listed below:

1) Quantitative accuracy checks have yet to be conducted. We plan to make comparisons with existing data sets in order to develop a general overview regarding the quality of the land cover data set developed. Feedback from users of the data will be greatly appreciated.

2) Some of the leaves-off data sets were not temporally ideal. In this project, leaves-off data sets are heavily relied upon for discriminating between hay/pasture and row crop, and also for discriminating between forest classes. The success of discriminating between these classes using leaves-off data sets hinges on the time of data acquisition. When hay/pasture areas are non-green, they are not easily distinguishable from other agricultural areas using remotely sensed data. However, there is a temporal window during which hay and pasture areas green up before most other vegetation (excluding evergreens, which have different spectral properties); during this window these areas are easily distinguishable from other crop areas. The discrimination between evergreen and deciduous forest is likewise optimized by selecting data in a temporal window where deciduous vegetation has yet to leaf out. Due to double-cropping practices and the long-growing season in this portion of the country, it's difficult to acquire a single-date of imagery that adequately differentiates between both deciduous/conifer and hay-pasture/row crop.

3) The data sets used cover a range of years, and changes that have taken place across the landscape over the time period may not have been captured. While this is not viewed as a major problem for most classes, it is possible that some land cover features change more rapidly than might be expected (e.g. hay one year, row crop the next).

4) Wetlands classes are extremely difficult to extract from Landsat TM spectral information alone. The use of ancillary information such as National Wetlands Inventory (NWI) data is highly desirable. NWI data were not available in digital format for much of this area. Manual digitizing was used in combination with spectral information to derive much of the wetlands information, a procedure that isn't able to provide the level of detail of NWI data. It is suspected that forested wetlands are underestimated in areas where NWI wasn't available.

5) Accurate definition of the transitional barren class was extremely difficult. The majority of pixels in this class correspond to clear-cut forests in various stages of regrowth. Spectrally, fresh clear-cuts are very similar to row-crops in the leaves-off data. Manual correction of coding errors was performed to improve differentiation between row-crops and clear-cuts, but some errors may still be found. As regrowth occurs in a clear-cut region, the definition of transitional barren verses a forested class becomes problematic. An attempt was made to classify only fresh clear-cuts or those in the earliest stages of regrowth, but there are likely forested regions classed as transitional barren and vice versa.

6) Due to the confusion between clear-cuts, regrowth in clear-cuts, forested areas, and shrublands, no attempts were made to populate the shrubland classes. Any shrubland areas that exist in this area are classed in their like forest class, i.e. deciduous shrubland is classed as deciduous forest, etc.

ACKNOWLEDGMENTS

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REFERENCE

[1] Kelly, P.M., and White, J.M., 1993. Preprocessing remotely sensed data for efficient analysis and classification, Applications of Artificial Intelligence 1993: Knowledge-Based Systems in Aerospace and Industry, Proceedings of SPIE, 1993, 24-30.

[2] Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe, 1979. Classification of Wetlands and Deepwater Habitats of the United States, Fish and Wildlife Service, U.S. Department of the Interior, Washington, D.C.

Table C-1. Projection Information

The initial Landsat TM mosaics, all ancillary data sets, and the final classification product are all map-registered to an Albers Conical Equal Area projection. The following represents projection information for the final classification product:

Projection: Albers Conical Equal Area
    Datum: NAD83
    Spheroid: GRS80
    Standard Parallels: 29.5 degrees North Latitude 45.5 degrees North Latitude
    Central Meridian: 96 degrees West Longitude
    Origin of the Projection: 23 degrees North Latitude
    False Easting: 0 meters
    False Northing: 0 meters
    Number of Lines: 17220
    Number of Samples: 21773
    Number of Bands: 1
Pixel size: 30 X 30 meters
Upper Left Corner: 591953 meters (X), 1301000 meters (Y)
Upper Right Corner: 1245113 meters (X), 1301000 meters (Y)
Lower Left Corner: 591953 meters (X), 784430 meters (Y)
Lower Right Corner: 1245113 meters (X), 784430 meters (Y)

Table C-2. MRLC Landsat thematic mapper (TM) data sets used to develop north-central and south-central portions of the EPA Region IV data set.

No asterisk represents scenes used in south-central portion only
* Represents scenes used in north-central portion only.
** Represents scenes used in both the north-central and south-central portion

Path/Row	Date	EOSAT-ID
19/33	12/14/90	5019033009034810*
19/33	09/20/94	5019033009426310*
19/34	10/03/93	5019034009327610*
19/34	11/20/93	5019034009332410*
19/35	11/12/90	5019035009031610*
19/35	09/30/92	5019035009227410*
19/36	09/28/91	5019036009127110**
19/36	11/17/92	5019036009232210**
19/37	03/09/93	5019037009306810
19/37	10/03/93	5019037009327610
19/38	02/16/91	5019038009104710
19/38	10/03/93	5019038009327610
19/39	02/16/91	5019039009104710
19/39	10/03/93	5019039009327610
20/33	08/02/91	5020033009121410*
20/33	11/22/91	5020033009132610*
20/34	11/29/88	5020034008833410*
20/34	08/02/91	5020034009121410*
20/35	11/29/88	5020035008833410*
20/35	10/07/92	5020035009228110*
20/36	03/11/91	5020036009107010**
20/36	07/22/93	5020036009320310**
20/37	11/29/88	5020037008833410
20/37	10/23/92	5020037009229710
20/38	02/10/92	5020038009204110
20/38	10/23/92	5020038009229710
20/39	01/22/91	5020039009102210
20/39	11/06/91	5020039009131010
21/34	04/05/92	5021034009209610*
21/34	10/14/92	5021034009228810*
21/35	04/05/92	5021035009209610*
21/35	08/30/93	5021035009324210*
21/36	09/10/91	5021036009125310**
21/36	12/15/91	5021036009134910**
21/37	02/03/93	5021037009303410
21/37	10/01/93	5021037009327410
21/38	02/14/91	5021038009104510
21/38	10/12/91	5021038009128510
21/39	09/26/91	5021039009126910
21/39	02/01/92	5021039009203210

APPENDIX B-1.

ADEM-FIELD OPERATIONS-ECOLOGICAL STUDIES
RIFFLE/RUN HABITAT ASSESSMENT FIELD DATA SHEET

Name of Waterbody ______________________ Date: ______________

Station Number ______________ Investigators ______________________

Habitat Parameter	Category: Optimal	Category: Suboptimal	Category: Marginal	Category: Poor
1 **Instream Cover**	>50% mix of boulder, cobble, submerged logs, undercut banks, or other stable habitat.	50-30% mix of boulder, cobble, or other stable habitat; adequate habitat.	30-10% mix of boulder, cobble, or other stable habitat; habitat availability less than desirable.	<10% mix of boulder, cobble, or other stable habitat; lack of habitat is obvious.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2 **Epifaunal surface**	Well developed riffle and run; riffles as wide as stream and length extends 2x the width of stream; abundance of cobble.	Riffle is as wide as stream but length is <2 times width; abundance of cobble; boulders and gravel common.	Run area may be lacking; riffle not as wide as stream and its length is <2 times the stream width; gravel or large boulders and bedrock prevalent; some cobble present.	Riffles or run virtually non existent; large boulders and bedrock prevalent; cobble lacking.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3 **Embeddedness**	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble and boulder particles are >75% surrounded by fine sediment.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4 **Velocity/Depth Regimes**	All 4 velocity/depth regimes present (slow-deep, slow-shallow, fast-shallow, fast-deep).	Only 3 of 4 regimes present. (if fast-shallow is missing, score lower.)	Only 2 of 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/depth regime (usually slow-deep).
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5 **Channel Alteration**	No Channelization or dredging present.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (>20 years) may be present, but not recent.	New embankments present on both banks; and 40 - 80% of stream reach is channelized and disrupted.	Banks shored with gabion or cement; >80% of the stream reach channelized and disrupted.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6 **Sediment Deposition**	Little or no enlargement of islands or point bars and less than 5 % of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from coarse gravel; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel coarse sand on old and new bars; 30-50% of the bottom affected; sediment deposits at obstruction, constriction,, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; > 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7 **Frequency of Riffles**	Occurrence of riffles relatively frequent; distance between riffles divided by stream width equals 5-7; variety of habitat.	Occurrence of riffles relatively infrequent; distance between riffles divided by the stream width equals 7-15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided stream width is 15-25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by stream width >25.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8 **Channel flow Status**	Water reaches base of both lower banks and minimal amount t of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
9 **Condition of Banks**	Banks stable; no evidence of erosion or bank failure.	Moderately stable; infrequent, small areas of erosion mostly healed over.	Moderately unstable; up to 60% of banks in reach have areas of erosion.	Unstable; many eroded areas; "raw" areas frequent Along straight section and bends; on side slopes, 60-100% of bank has erosional scars.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
10 **Bank Vegetative Protection**	>90% of the stream bank surfaces covered by vegetation.	90-70% of the streambank surfaces covered by vegetation.	70-50% of the stream bank surfaces covered by vegetation.	<50% of the streambank surfaces covered by vegetation.
Score (LB) ______	10 9 8	7 6	5 4 3	2 1 0
Score (RB) ______	10 9 8	7 6	5 4 3	2 1 0
11 **Grazing or other disruptive pressure**	Vegetative disruption, through grazing or mowing, minimal or not evident; almost all plants allowed to grow naturally.	Disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	Disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Disruption of stream bank vegetation is very high; vegetation has been removed to 2 inches or less in average stubble height.
Score (LB) ______	10 9 8	7 6	5 4 3	2 1 0
Score (RB) ______	10 9 8	7 6	5 4 3	2 1 0
12 **Riparian vegetative zone (each bank)**	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone.	Width of riparian zone 18-12 meters; human activities have impacted zone only minimally.	Width of riparian zone 12-6 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters;: little or no riparian vegetation due to human activities.
Score (LB) ______	10 9 8	7 6	5 4 3	2 1 0
Score (RB) ______	10 9 8	7 6	5 4 3	2 1 0

APPENDIX B-2.

ADEM-FIELD OPERATIONS-ECOLOGICAL STUDIES
GLIDE/POOL HABITAT ASSESSMENT FIELD DATA SHEET

Name of Waterbody ______________________________ Date: ______________

Station Number ______________ Investigators ______________________________

Habitat Parameter	Category			
	Optimal	Suboptimal	Marginal	Poor
1 **Instream Cover**	> 50% mix of snags, submerged logs, undercut banks, or other stable habitat; rubble, gravel may be present.	50-30% mix of stable habitat; adequate habitat for maintenance of populations.	30-10% mix of stable habitat; habitat availability less than desirable.	<10% stable habitat; lack of habitat is obvious.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2 **Pool Substrate Characterization**	Mixture of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mixture of soft sand, mud, or clay; mud may be dominant ; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan clay or bedrock; no root mat or vegetation.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3 **Pool Variability**	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4 **Channel Alteration**	No Channelization or dredging present.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (>20 years) may be present, but not recent.	New embankments present on both banks; channelization may be extensive, usually in urban or agriculture lands; and > 80% of stream reach is channelized and disrupted.	Extensive channelization; banks shored with gabion or cement; heavily urbanized areas; instream habitat greatly altered or removed entirely.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5 **Sediment Deposition**	<20% of bottom affected; minor accumulation of fine and coarse material at snags and submerged vegetation; little or no enlargement of islands or point bars.	20-50% affected; moderate accumulation; substantial sediment movement only during major storm event; some new increase in bar formation.	50-80% affected; major deposition; pools shallow, heavily silted; embankments may be present on both banks; frequent and substantial sediment movement during storm events.	Channelized; mud, silt, and/or sand in braided or non-braided channels; pools almost absent due to deposition.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
6 **Channel Sinuosity**	Bends in stream increase stream length 3 to 4 times longer than if it was in a straight line.	Bends in stream increase stream length 2 to 3 times longer than if it was in a straight line.	Bends in stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7 **Channel flow Status**	Water reaches base of both lower banks and minimal amount t of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
8 **Condition of Banks**	Banks stable; no evidence of erosion or bank failure; <5% affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% affected.	Moderately unstable; 30-60% of banks in reach have areas of erosion.	Unstable; many eroded areas; "raw" areas frequent Along straight section and bends; on side slopes, 60-100% of bank has erosional scars.
Score ______	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
9 **Bank Vegetative Protection (each bank)**	> 90% of the stream bank surfaces covered by vegetation.	90-70% of the streambank surfaces covered by vegetation.	70-50% of the stream bank surfaces covered by vegetation.	<50% of the streambank surfaces covered by vegetation.
Score (LB) ______	10 9 8	7 6	5 4 3	2 1 0
Score (RB) ______	10 9 8	7 6	5 4 3	2 1 0
10 **Grazing or other disruptive pressure (each bank)**	Vegetative disruption, through grazing or mowing, minimal or not evident; almost all plants allowed to grow naturally.	Disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	Disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Disruption of stream bank vegetation is very high; vegetation has been removed to 2 inches or less in average stubble height.
Score (LB) ______	10 9 8	7 6	5 4 3	2 1 0
Score (RB) ______	10 9 8	7 6	5 4 3	2 1 0
11 **Riparian vegetative zone Width (each bank)**	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clearcuts, lawns, or crops) have not impacted zone.	Width of riparian zone 18-12 meters; human activities have impacted zone only minimally.	Width of riparian zone 12-6 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters; little or no riparian vegetation due to human activities.
Score (LB) ______	10 9 8	7 6	5 4 3	2 1 0
Score (RB) ______	10 9 8	7 6	5 4 3	2 1 0

APPENDIX C.

ADEM-FIELD OPERATIONS-ECOLOGICAL STUDIES

PHYSICAL CHARACTERIZATION / WATER QUALITY FIELD DATA SHEET-Wadeable Streams

Station # ________ -- ____________ Collector Names ____________________

Reach Description: ____________________

WATERSHED CHARACTERISTICS

Watershed Land Use: Forest Pasture Ag. Residential Commercial Ind. Other: ________

Local Watershed Erosion: None Slight Moderate Heavy

Local Watershed NPS Pollution: No Evidence Potential sources Obvious Sources

REACH CHARACTERISTICS

Land Use at Reach: Pasture Crops Residential Forest Commercial Ind. Other: ________

Est. Stream Width: ______ ft Depth: Riffle: ______ ft Run: ______ ft Pool: ______ ft

Length of Reach: ______ ft Stream Gradient: ______ ft drop in 25 feet (representative seg..) Channelized: Y N

Rosgen Stream Type: ______ Bank Height: ______ ft High Water Mark: ______ ft Dam Present: Y N

Prev. 7 day precip: Fl. Flood Heavy Mod. light none

Canopy Cover:	Open	Mostly Open	Est. 50/50	Mostly Shaded	Shaded	Canopy Type: ________
	0-20%	20-40%	40-60%	60-80%	80-100%	

SEDIMENT / SUBSTRATE CHARACTERISTICS

Odors: Normal Sewage Petroleum Chemical Anaerobic Other: ________

Oils: Absent Slight Moderate Profuse

Deposits: Sludge Sawdust Paper-Fiber Sand Relict Shells Other: ________

Are the undersides of stones not deeply embedded, black? Y N N/A

WATER QUALITY CHARACTERISTICS

Water Odors: Normal Sewage Petroleum Chemical Other: ________

Water Surface Oils: None Slick Sheen Globs Flecks

Water Color: Clear Sl. Tannic Mod. Tannic Dk Tannic Green Gray Other: ________

Weather Conditions: Clear P/C Mostly Cloudy Cloudy Raining

Biological Indicators: Periphyton Macrophytes Fish Filamentous Slimes Others

PHOTOS Roll # ______

Picture # ______ Description ____________ Picture # ______ Description ____________

EST. % COMPOSITION IN SAMPLING AREA Inorganic + Organic = 100% Type	Diameter	Percent	*PEBBLE COUNT (100 Count)*	*WATER QUALITY*		
				Time	______	hrs
Bedrock		______ %				
Boulder	>10 in.	______ %		T-Air	______	C
Cobble	2.5 - 10 inches	______ %		T-H2O	______	C
Gravel	0.1 - 2.5 inches	______ %				
Sand	gritty	______ %		pH	______	s.u.
Silt		______ %				
Clay	slick	______ %		Cond.	______	umhos
Detritus	Stick, Wood	______ %			______	umhos @ 25c
	CPOM	______ %				
Mud-Muck	fine organic	______ %		D.O.	______	mg/l
Marl	Gray Shell Frag.	______ %		Turb.	______	ntu

Appendix D-1. Results of physical and chemical measurements and water quality samples collected from stations included as part of the nonpoint source watershed screening and CWA §303(d) segment evaluations of the Tennessee Basin, 1998.

Sub-Watershed Number	Station Number	Date (YYMMDD)	Time (24hr)	Water Temp. (C)	Dissolved Oxygen (mg/l)	pH (s.u.)	Conductivity (umhos)	Turbidity (ntu)	Flow (cfs)	Fecal Coliform (col/100ml)	TSS (mg/l)	TDS (mg/l)	NO2/ NO3 (mg/l)	T-PO4 (mg/l)	TKN (mg/l)	BOD-5 mg/l	Hardness mg/l
Guntersville Lake (0603-0001)																	
060	BENJ-003	980728	1205	23	5.1	7.4	334	6.2	1.2	440	5	188	0.914	0.101	0.185	0.6	170
120	LCNJ-002	980728	1320	24	2.7	6.9	308	4.9	NW	530	3	169	0.051	<0.005	0.595	1.2	160
120	LCNJ-036	980728	1350	20	7.6	7.4	333	3.8	3.3	540	4	195	0.29	<0.005	0.216	0.6	170
160	FLRJ-004	980728	1050	26	7.7	7.3	64	2.5	0.1	100	4	45	0.048	0.101	0.484	2.6	32
170	MUDJ-006	980728	1515	23	6.3	7.3	309	8.7	9.1	120	10	177	0.894	0.08	0.314	0.6	158
180	BYTJ-001	980519	1552	19	9.4	7.8	48	5.6	19.7	38	1	38	0.770	0.005	<0.15	0.2	16.4
300	BGSM-022	980728	1715	23	6.7	7.2	206	5.2	9.2	92	3	119	0.508	0.077	0.272	0.5	100
Wheeler Lake (0603-0002)																	
070	CSPJ-070	980526	1055	18	8.3	7.4	332	9.3	4.5	300	7	196	<0.005	0.055	<0.1	0.6	166
070	CSPJ-070	980707	1740	25	9.5	7.6	346	7.7	0	>1200	7	205	1.809	0.099	0.375	1.1	170
070	CSPJ-070	980818	1030		5.9	7.7	360	18.3	0	1300	12	221	2.537	0.084	0.127	1.1	182
070	CSPJ-072	980512							0								
070	CSPJ-072	980707							0								
070	CSPJ-072	980818							0								
100	LPRM-090	980527	0915	21	7.0	7.5	244	91.9	2.9	116	26	180	0.4	0.07	0.325	0.8	154
100	LPRM-090	980707	1640	29	6.8	7.7	281	17	0	920	21	171	0.256	0.122	0.978	0.9	138
100	LPRM-090	980819	0820		6.3	7.6	282	16.6	1.1	156	7	214	0.581	0.085	0.578	1.4	182
100	LPRM-091	980527	0806	19	6.8	7.5	201	191	1.6	>6000	126	88	0.455	0.16	0.89	2.8	
100	LPRM-091	980707	1530	32	7.5	7.6	280	16.9	0	780	18	161	0.079	0.103	1.3	2.2	140
100	LPRM-091	980819	0747		7.2	7.5	256	36	0.8	>1200	24	164	0.287	0.098	0.53	1.3	154
160	MTNM-160	980513	1100	24	9.6	7.2	224	11.2	high	240	12	137	0.981	0.148	0.18	0.8	
160	MTNM-160	980708	1120	23	7.8	7.2	223	6.7	31.0	250	6	146	3.465	0.309	0.246	1.4	102
160	MTNM-160	980910	0830	17	7.6	6.4	223	4.4	23.2	220	2	131	4.103	0.196	0.546	0.4	90

Appendix D-1, cont. Results of physical and chemical measurements and water quality samples collected from stations included as part of the nonpoint source watershed screening and CWA §303(d) segment evaluations of the Tennessee Basin, 1998.

Sub-Watershed Number	Station Number	Date (YYMMDD)	Time (24hr)	Water Temp. (C)	Dissolved Oxygen (mg/l)	pH (s.u.)	Conductivity (umhos)	Turbidity (ntu)	Flow (cfs)	Fecal Coliform (col/100ml)	TSS (mg/l)	TDS (mg/l)	NO2/ NO3 (mg/l)	T-PO4 (mg/l)	TKN (mg/l)	BOD-5 mg/l	Hardness mg/l
Wheeler Lake (0603-0002)																	
160	MTNM-161	980513	1140	22	9.1	7.4	275	9.4	high	200	9	168	1.691	0.267	0.067	1.9	
160	MTNM-161	980708	1245	22	7.7	7.4	239	4.8	23.6	300	1	153	2.738	0.338	0.235	1.5	126
160	MTNM-161	980910	0905	16	7.4	6.9	236	2.6	17.5	208	2	146	3.915	0.159	<0.005	1.5	100
160	MTNM-162	980513	1140	23	8.9	7.3	95	7.8	Equip.	330	2	67	0.789	0.086	0.092	0.5	
160	MTNM-162	980708	1310	26	8.2	7.5	101	7.6	5.7	168	1	71	0.562	0.092	0.097	0.5	70
160	MTNM-162	980910	0930	18	8.2	7.2	101	3.6	3.6	88	<1	64	0.345	0.049	0.163	0.3	50
160	MTNM-163	980513	1230	23	9.8	7.5	303	5.9	Equip.	108	7	178	1.504	0.218	1.247	1.2	
160	MTNM-163	980708	1400	20	8.4	7.2	270	4.9	High	290	<1	161	2.993	0.527	3.66	3.2	
160	MTNM-163	980910	1000	16	9.5	7.1	212	1.4	14.9	124	<1	132	1.481	0.049	0.046	0.1	
180	BFFM-180	980513	0730	19	8.6	6.8	144	6.8	94.8	136	4	93	1.162	0.076	0.093	0.5	70
180	BFFM-180	980708	0745	21	8.7	7.2	172	2.9	34.5	67	2	107	1.8	0.301	<0.05	0.2	100
180	BFFM-180	980909	1410	20	10.4	7.5	182	1.6	33.3	84	<1	102	1.709	0.103	0.046	0.4	96
180	BFFM-181	980513	0900	20	7.9	6.7	68	9.3	Equip.	100	4	56	0.832	0.083	0.218	0.4	38
180	BFFM-181	980708	0900	26	6.8	7.3	86	5.4	4.7	630	4	65	0.741	0.106	0.188	0.6	46
180	BFFM-181	980909	1505	22	7.4	7.4	90	4.3	4.4	204	2	61	0.671	0.078	0.309	0.3	38
180	BFFM-182	980513	0950	20	7.7	6.6	55	14.9	Equip.	>260	2	47	0.462	0.089	0.386	0.7	22
180	BFFM-182	980708	1000	25	3.7	7.1	62	7.3	0	570	6	53	0.125	0.109	0.463	0.5	40
180	BFFM-182	980909	1605	20	4.2	7.3	52	8.3	0	92	28	50	0.07	0.224	0.499	0.8	34
180	BVDM-017	980722	1709	17	7.7	7.0	271	7.5	2.6	15	9	160	2.171	0.109	0.006	<0.1	130
190	CHSM-190	980513	0640	18	7.5	7.7	332	5.0	1.2	350	2	197	0.877	0.073	<0.05	0.4	
190	CHSM-190	980707	1820	24	8.0	7.3	357	4.5	0	1240	19	212	1.248	<0.005	0.393	1.4	182
190	CHSM-190	980908	1610	25	7.6	7.3	373	7.3	0	164	6	215	0.907	<0.005	0.194	1.7	178
220	CANM-220	980511	1030	21	5.0	7.2	211	9.6	High	156	4	122	0.197	0.075	0.388	1.3	

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Wheeler Lake (0603-0002)																	
220	CANM-220	980706	1100	26	4.8	7.0	293	14.9	0	>1200	90	183	0.08	0.303	2.493	4.4	140
220	CANM-220	980908	1105	24	4.0	6.5	403	12.4	0	220	11	227	0.007	0.066	2.008	3.9	188
230	ALDM-230	980511	1120	21	11.5	7.8	400	5.1	23.5	540	4	242	1.141	0.071	0.094	0.9	
230	ALDM-230	980706	1300	29	12.7	7.8	332	9.4	0	172	1	197	0.077	0.113	0.995	1.9	
230	ALDM-230	980908	1150	27	8.7	7.1	325	7.6	0	92	18	215	0.086	0.069	0.949	1.2	
230	ALDM-231	980511	1220	24	12.0	8.0	387	3.3	15.8	370	<1	232	1.051	0.068	0.141	1.1	
230	ALDM-231	980706	1405	30	10.1	7.7	402	5.1	2.2	370	10	234	0.608	0.112	0.326	1	
230	ALDM-231	980908	1215	28	10.9	7.7	389	3.2	1.7	340	<1	235	0.428	0.374	0.313	0.9	
230	ALDM-232	980511	1310	24	10.0	7.5	432	11.1	3.4	1360	13	260	1.078	0.081	0.536	1.3	
230	ALDM-232	980706	1510	30	7.5	7.8	275	24.2	0	100	15	172	0.16	0.113	0.955	2.8	
230	ALDM-232	980908	1300	26	3.6	7.3	277	9.2	0.1	>1200	6	190	0.145	0.267	1.716	4.8	
240	HSBM-240	980511	1400	24	10.8	7.9	312	6.0	56.7	180	5	187	1.552	0.08	0.095	1.2	
240	HSBM-240	980706	1730	34	12.4	8.4	228	5.0	9.0	80	<1	141	0.535	0.094	0.442	1	
240	HSBM-240	980908	1350	27	9.1	7.7	304	7.3	7.0	32	11	179	0.444	0.079	0.5	1.3	
240	HSBM-241	980511	1630	22	10.3	7.2	355	2.1	19.3	92	3	205	1.945	0.072	<0.05	1	
240	HSBM-241	980706	1900	27	9.3	7.7	247	3.8	20.6	>1200	5	215	2.041	<0.005	<0.05	1.3	
240	HSBM-241	980908	1440	26	9.0	7.6	216	2.6	2.5	220	4	195	1.731	0.416	0.342	1.8	
240	HSBM-242	980511	1655	20	8.4	7.4	306	8.5	0.2	120	4	180	1.443	0.079	<0.05	1.3	
240	HSBM-242	980707	0730	22	9.1	7.9	308	3.3	4.6	>1200	<1	185	2.294	<0.005	<0.05	0.7	
240	HSBM-242	980908	1520	30	7.6	10.4	327	3.8	0.3	0	7	145	0.542	0.126	0.535	1.3	
250	INDM-250	980512	0620	15	8.8	7.5	201	13.9	39.9	500	8	116	1.242	0.081	0.064	0.8	
250	INDM-250	980707	0850	24	8.3	7.7	209	7.7	7.0	80	4	124	1.066	<0.005	<0.05	0.4	
250	INDM-250	980909	0730	19	8.2	6.9	209	4.9	3.2	80	1	169	1.142	<0.005	0.137	0.8	

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Wheeler Lake (0603-0002)																	
250	INDM-251	980512	0710	17	8.9	7.3	223	8.1	12.7	152	8	122	1.048	0.085	<0.05	0.9	
250	INDM-251	980707	1000	24	7.6	7.6	210	5.9	4.8	84	2	121	0.71	0.277	0.063	0.5	
250	INDM-251	980909	0815	19	7.8	7.4	214	4.7	1.5	320	<1	154	0.208	0.181	0.181	0.5	
270	CTCM-026	980723	0835	26	4.0	7.2	208	20.2	0	470	17	129	0.323	0.113	0.567	0.9	94
270	CTCM-037	980723	1050	27	3.8	7.1	201	30.5	3.8	160	28	123	0.358	0.125	0.679	0.6	92
270	HGSM-027	980723	1147	20	8.8	7.7	265	5.4	0.5	500	11	153	0.449	<0.005	0.537	0.5	132
270	RCKM-023	980729	0945	24	6.0	7.1	154	9.1	0.1	60	<1	88	0.372	<0.005	0.424	0.6	78
270	SXMM-036	980723	0945	25	3.9	7.2	245	9.9	0.2	1620	7	145	0.18	0.117	0.563	1	112
270	TWNM-024	980723	0730	25	3.5	7.2	288	4.9	0.6	132	3	159	0.11	<0.005	0.007	0.5	138
270	WFCM-028	980729	0835	22	6.7	7.1	154	8.0	2.9	>1200	4	90	0.52	<0.005	0.368	0.5	74
270	WFCM-025	980729	814	24	5.3	7	156	9.1	NW	230	8	90	0.430	0.084	0.457	0.6	76
300	LIML-035	980723							0								
300	LIML-300	980512	0800	17	8.8	6.8	96.7	9.1	111.7	224	6	54	0.898	0.099	0.264	0.7	
300	LIML-300	980707	1130	26	8.6	7.4	106	16	21.9	132	6	76	0.922	0.121	0.403	0.7	48
300	LIML-300	980909	0900	20	7.5	7.4	116	4.2	22.3	132	<1	89	0.857	<0.005	0.346	0.4	54
300	LIML-301	980512	0900	17	8.3	6.9	100	8.8	97.0	140	7	55	0.859	0.108	0.304	0.9	
300	LIML-301	980707	1300	27	6.7	7.3	111	16.7	16.4	340	6	73	0.831	0.131	0.814	0.7	
300	LIML-301	980909	0940	21	6.6	7.3	119	4.5	13.7	144	4	87	0.823	0.089	0.249	0.4	
300	LIML-302	980512	1000	19	8.1	6.7	79	9.2	NW	180	27	54	0.814	0.086	0.237	1.1	
300	LIML-302	980707	1355	28	7.8	7.4	99	6.1	NW	90	<1	66	0.808	<0.005	0.388	0.6	
300	LIML-302	980909	1025	20	6.6	7.3	107	4.3	NW	128	6	85	0.851	<0.005	0.178	0.4	
320	PINL-320	980512	1045	21	8.0	6.7	84	14.2	89.7	96	7	53	0.916	0.088	0.336	0.9	34
320	PINL-320	980715	0820	23	8.3	7.2	96	34	32.1	140	4	82	0.774	0.109	0.402	0.4	42

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Wheeler Lake (0603-0002)																	
320	PINL-320	980917	0815	22	7.3	7.0	124	2.4	11.4	180	<1	80	0.85	<0.005	0.179	0.6	
320	PINL-321	980512	1300	22	8.9	7.2	76	12.4	32.9	192	6	60	0.666	0.084	0.351	0.6	44
320	PINL-321	980715	0930	24	9.0	7.2	85	24.3	9.7	580	10	68	0.709	0.109	0.485	0.6	40
320	PINL-321	980917	0925	23	5.9	7.0	110	3.7	1.6	168	4	61	0.504	<0.005	0.212	0.6	
320	PINL-322	980512	1340	22	8.5	6.8	75	7.2	47.8	168	3	54	0.543	0.086	0.254	0.3	30
320	PINL-322	980715	1030	23	8.4	7.3	78	7.6	20	>1200	3	65	0.654	0.105	0.354	0.6	36
320	PINL-322	980917	1015	23	7.3	7.1	83	3.9	5.4	320	7	52	0.671	<0.005	0.228	0.7	
330	MACM-330	980505	1510	18	8.0	7.6	232	21.1	1.9	1960	7	139	0.369	0.054	0.333	1.6	
330	MACM-330	980713	1150	25	1.4	7.3	221	12.9	0	>1200	58	142	0.123	0.182	1.033	2.4	
330	MACM-330	980915	1110	24	3.4	7.8	342	39.5	0	460	143	191	0.444	0.16	2.682	>8.0	
330	ROBM-331	980505	1250	18	7.7	7.7	319	17.8	3.6	320	10	189	0.711	0.049	0.524	1.9	
330	ROBM-331	980713	1040	25	6.2	7.7	337	7.1	0.5	370	1	196	0.659	0.098	0.531	0.7	
330	ROBM-331	980915	1025	24	1.6	7.2	366	16.9	0	156	39	224	0.145	0.081	0.998	3.4	
330	SHLM-332	980505	1640	20	8.8	7.6	309	6.2	7.7	84	1	174	0.24	0.09	1.844	2.6	
330	SHLM-332	980713	1300	26	7.4	7.6	596	9.2	3.9	>1200	7	328	0.303	0.493	6.209	8.2	
330	SHLM-332	980915	1225	27	7.2	7.6	692	2.8	1.6	160	5	458	8.709	1.433	0.102	2.5	
330	SHLM-333	980505	1905	24	7.4	7.4	187	8.9	6.3	65	3	110	0.141	0.044	0.412	1.9	
330	SHLM-333	980713	1350	25	3.4	7.3	244	6.6	0	200	<1	152	0.156	0.092	0.65	1.1	
330	SHLM-333	980915	1250	23	3.0	6.9	261	6.7	0	20	5	167	0.485	0.066	0.175	1.2	
330	SHLM-334	980506	0710	18	6.1	7.0	186	14.7	2.9	104	6	111	0.277	0.043	0.375	1.6	
330	SHLM-334	980713	1500	26	3.8	7.2	220	11.2	0	270	5	135	0.083	0.091	0.62	1.2	
330	SHLM-334	980915	1315	23	0.3	7.2	292	9.5	0	35	5	197	0.428	0.077	0.969	3.5	
330	TOWM-335	980506	0800	18	3.0	7.3	456	19.7	0.0	22	14	278	<0.005	0.077	0.828	3	

Appendix D-1, cont. Results of physical and chemical measurements and water quality samples collected from stations included as part of the nonpoint source watershed screening and CWA §303(d) segment evaluations of the Tennessee Basin, 1998.

Sub-Watershed Number	Station Number	Date (YYMMDD)	Time (24hr)	Water Temp. (C)	Dissolved Oxygen (mg/l)	pH (s.u.)	Conductivity (umhos)	Turbidity (ntu)	Flow (cfs)	Fecal Coliform (col/100ml)	TSS (mg/l)	TDS (mg/l)	NO2/ NO3 (mg/l)	T-PO4 (mg/l)	TKN (mg/l)	BOD-5 mg/l	Hardness mg/l
Wheeler Lake (0603-0002)																	
330	TOWM-335	980713	1655	27	4.6	7.4	226	18.4	0	>1200	9	147	0.204	0.181	1.471	3.5	
330	TOWM-335	980915							0								
350	NOBM-350	980506	1120	20	7.0	7.8	321	18.3	5.8	370	12	205	0.74	0.065	0.438	1.6	
350	NOBM-350	980714	0850	23	6.3	7.5	293	6.3	0	>1200	4	176	0.082	0.103	0.531		
350	NOBM-350	980915	1430	28	1.8	7.4	298	25.0	0	96	30	191	0.04	<0.005	1.087	2.0	
350	NOBM-351	980506	1250	23	11.2	8.2	343	5.9	2.8	470	2	204	0.868	0.035	0.258	1.9	
350	NOBM-351	980714	0940	23	7.8	7.7	278	11.4	1.1	1200	7	168	0.144	0.096	0.653	1.8	
350	NOBM-351	980915							0								
350	VILM-350	980506	0950	18	7.1	7.6	251	13.1	4.4	72	7	151	0.145	0.053	0.423	1.7	
350	VILM-350	980714	0725	24	5.1	7.1	266	16.1	0.7	450	7	160	0.195	0.14	0.674	0.8	
350	VILM-350	980915							0								
360	MCDL-360	980506	1605	20	8.4	7.9	361	12.5	3.3	220	5	217	1.47	0.049	0.339	1.4	
360	MCDL-360	980714	1030	23	6.9	7.3	201	87.3	11.5	>1200	49	160	0.836	0.24	0.984	3.2	
360	MCDL-360	980915							0								
360	MCDL-361	980506	1450	20	9.6	8.0	336	11.9	0.8	2220	4	195	0.076	0.036	0.158	1.3	
360	MCDL-361	980714	1145	22	8.8	7.5	199	560	14.6	>1200	374	106	0.189	0.626	1.371	2	
360	MCDL-361	980915							0								
390	SWNL-390	980512	1445	26	10.3	8.4	191	5.6	36.9	32	2	114	1.899	0.353	0.057	0.9	
390	SWNL-390	980715	1130	25	10.2	7.9	267	7.0	15	>1200	2	164	3.159	1.845	0.462	1	94
390	SWNL-390	980916	0820	24	6.6	7.9	425	3.5	5.1	134	4	262	6.81	10.285	0.545	1.3	
390	SWNL-391	980512	1525	27	9.8	8.5	202	5.1	37.9	30	2	132	2.091	0.551	0.308	1.1	
390	SWNL-391	980715	1215	25	11.3	8.3	296	3.1	16.9	248	<1	183	4.366	1.506	0.074	0.9	
390	SWNL-391	980916	0930	23	9.4	7.5	450	1.3	6.3	220	2	266	7.608	1.66	<0.005	1.1	

Appendix D-1, cont. Results of physical and chemical measurements and water quality samples collected from stations included as part of the nonpoint source watershed screening and CWA §303(d) segment evaluations of the Tennessee Basin, 1998.

Sub-Watershed Number	Station Number	Date (YYMMDD)	Time (24hr)	Water Temp. (C)	Dissolved Oxygen (mg/l)	pH (s.u.)	Conductivity (umhos)	Turbidity (ntu)	Flow (cfs)	Fecal Coliform (col/100ml)	TSS (mg/l)	TDS (mg/l)	NO2/ NO3 (mg/l)	T-PO4 (mg/l)	TKN (mg/l)	BOD-5 mg/l	Hardness mg/l
Wheeler Lake (0603-0002)																	
390	SWNL-392	980512	1620	25	9.2	7.7	133	7.5	19.2	100	1	85	0.705	0.078	0.373	0.8	
390	SWNL-392	980715	1300	24	9.3	7.7	211	6.5	7.3	390	<1	127	0.952	0.104	0.345	0.6	
390	SWNL-392	980916	1000	23	6.9	7.4	245	2.3	2.1	67	2	140	0.863	<0.005	0.328	0.9	
400	RNIL-400	980512	1715	24	8.6	7.1	96	10.1	19.2	410	2	59	0.889	0.077	0.166	0.4	
400	RNIL-400	980714	1700	24	10.4	7.3	79	78	11.2	>1200	53	198	0.763	0.200	0.916	2.0	36
400	RNIL-400	980916	1035	24	6.2	7.2	149	1.5	0.7	240	3	84	1.713	0.085	0.290	1.4	
400	RNIL-401	980512	1815	23	8.4	7.2	90	8.0	4.5	116	2	56	1.064	0.078	0.256	0.4	
400	RNIL-401	980714	1730	23	9.4	7.5	80	47	2.9	980	14	83	0.889	0.173	0.283	1.2	
400	RNIL-401	980916	1105	23	6.8	7.2	125	14.0	1.4	124	16	76	0.907	0.064	0.597	1.2	
410	MALL-410	980506	1827	19	8.0	7.7	259	20.1	7.6	290	7	164	1.846	0.062	0.264	1.7	
410	MALL-410	980714	1450	23	8.1	7.2	83	316	high	>1200	61	202	0.694	0.437	1.321	2.6	
410	MALL-410	980916	1440	22	2.9	7.2	392	5.8	0	156	6	213	0.08	<0.005	0.341	1.6	
410	MALL-411	980506	1730	18	7.8	8.0	138	1000	0.2	>1200	700	47	0.38	1.529	2.258	6.6	
410	MALL-411	980714	1510	23	7.6	7.2	81	196	0	>1200	105	160	0.356	0.413	1.193	3.4	
410	MALL-411	980916							0								
440	FIRW-001	980722	1100	23	8.6	7.6	117	2.2	7.1	270	1	78	0.849	<0.005	0.142	0.5	62
440	SCDL-011	980722	0955	24	7.4	7.4	115	4.2	28.5	350	3	75	0.701	0.097	0.081	0.6	54
Lower Elk River (0603-0004)																	
080	BIGL-014	980722	1420	22	8.6	7.5	97	6.0	6.2	172	3	69	1.12	<0.005	0.165	0.1	54
080	SLRL-015	980722	1520	30	9.5	8.6	195	4.6	4.4	50	6	123	0.646	0.101	0.218	0.4	104
150	ANDL-008	980722	1300	28	9.0	8.2	106	2.3	21.4	92	2	66	0.66	0.094	0.074	0.3	44

Appendix D-1, cont. Results of physical and chemical measurements and water quality samples collected from stations included as part of the nonpoint source watershed screening and CWA §303(d) segment evaluations of the Tennessee Basin, 1998.

Sub-Watershed Number	Station Number	Date (YYMMDD)	Time (24hr)	Water Temp. (C)	Dissolved Oxygen (mg/l)	pH (s.u.)	Conductivity (umhos)	Turbidity (ntu)	Flow (cfs)	Fecal Coliform (col/100ml)	TSS (mg/l)	TDS (mg/l)	NO2/ NO3 (mg/l)	T-PO4 (mg/l)	TKN (mg/l)	BOD-5 mg/l	Hardness mg/l
Pickwick Lake (0603-0005)																	
010	BGNL-032	980721	1250	27	3.2	7.2	215	12.9	22.9	17	7	148	0.822	0.115	0.781	1.1	104
010	BGNL-033	980721	1147	27	2.0	7.1	203	8.7	11.0	57	4	144	0.314	0.109	0.91	1.1	94
010	CLFL-012	980721	0951	27	6.8	7.7	94	8.0	3.9	120	5	72	0.11	0.097	0.666	1.5	52
010	MBNL-034	980721	1041	27	5.0	7.6	303	14.2	3.6	75	11	206	0.626	0.131	0.86	1.2	140
040	PPLC-001	980721	1506	27	2.8	6.8	96	9.9	0.3	37	6	78	0.09	0.105	0.676	1.5	50
040	TWNL-013	980721	1354	29	6.4	7.6	317	19.5	4.2	112	9	209	0.644	0.133	0.916	1.4	126
090	INCL-001	980722	0825	20	8.2	7.5	89	2.2	7.1	330	1	60	0.47	<0.005	0.209	0.5	146
180	BRML-009	980722	0655	18	5.6	6.9	120	1.8	0.8	100	1	76	0.611	0.095	0.008	0.6	60
220	SNKL-010	980721	1702	18	5.6	6.9	274	4.6	14.7	15	1	173	1.498	0.095	0.033	0.4	144

Appendix D-2. Results of water quality samples collected from stations included as part of the nonpoint source watershed screening and CWA §303(d) segment evaluations of the Tennessee Basin, 1998. (* = less than minimum laboratory detection limit of 0.1 ug/l)

Sub-Watershed Number	Station Number	Date (YYMMDD)	Time (24hr)	Bis (2-Ethylhexyl) phthalate (ug/l)	Di (2-Ethylhexyl) phthalate (ug/l)	Simazine (ug/l)	Atrazine (ug/l)	Metolachlor (ug/l)
Guntersville Lake (0603-0001)								
060	BENJ-003	980728	1205	*	*	*	*	*
120	LCNJ-002	980728	1320	*	*	*	*	*
120	LCNJ-036	980728	1350	*	*	*	*	*
160	FLRJ-004	980728	1050	*	*	*	*	*
170	MUDJ-006	980728	1515	*	*	*	0.159	*
300	BGSM-022	980728	1715	*	*	*	*	*
Wheeler Lake (0603-0002)								
160	MTNM-160	980708	1120	*	*	*	*	*
160	MTNM-160	980910	0830	*	*	*	*	*
160	MTNM-161	980708	1245	*	*	*	*	*
160	MTNM-161	980910	0905	*	*	*	*	*
160	MTNM-162	980708	1310	*	*	*	0.127	*
160	MTNM-162	980910	0930	*	*	*	*	*
180	BFFM-180	980513	0730	*	*	*	1.03	0.13
180	BFFM-180	980708	0745	*	*	*	*	*
180	BFFM-180	980909	1410	*	*	*	*	*
180	BFFM-181	980513	0900	*	*	*	2.05	0.27
180	BFFM-181	980909	1505	*	*	*	*	*
180	BFFM-181	980708	0900	*	*	*	*	*
180	BFFM-182	980909	1605	*	*	*	*	*
180	BFFM-182	980708	1000	*	*	*	0.153	0.137
180	BFFM-182	980513	0950	*	*	*	2.48	0.15
180	BVDM-017	980722	1709	0.133	*	*	*	*

Appendix D-2, cont. Results of water quality samples collected from stations included as part of the nonpoint source watershed screening and CWA §303(d) segment evaluations of the Tennessee Basin, 1998. (* = less than minimum laboratory detection limit of 0.1 ug/l)

Sub-Watershed Number	Station Number	Date (YYMMDD)	Time (24hr)	Bis (2-Ethylhexyl) phthalate (ug/l)	Di (2-Ethylhexyl) phthalate (ug/l)	Simazine (ug/l)	Atrazine (ug/l)	Metolachlor (ug/l)
Wheeler Lake (0603-0002)								
190	CHSM-190	980513	0640	*	*	*	*	*
190	CHSM-190	980707	1820	*	*	*	*	*
190	CHSM-190	980908	1610	*	*	*	*	*
220	CANM-220	980706	1100	*	*	*	*	*
220	CANM-220	980908	1105	*	*	*	*	*
270	CTCM-026	980723	0835	*	*	*	*	*
270	CTCM-037	980723	1050	*	*	*	*	*
270	HGSM-027	980723	1147	*	*	*	*	*
270	RCKM-023	980729	0945	*	*	*	1.03	*
270	SXMM-036	980723	0945	*	*	*	*	*
270	TWNM-024	980723	0730	*	*	*	*	*
270	WFCM-028	980729	0835	*	*	*	*	*
270	WFCM-025	980729	0814	*	*	*	*	*
300	LIML-300	980707	1130	0.27	*	*	*	*
300	LIML-300	980909	0900	*	*	*	*	*
320	PINL-320	980512	1045	*	0.25	*	*	*
320	PINL-320	980715	0820	*	*	*	*	*
320	PINL-320	980917	0815	*	*	*	*	*
320	PINL-321	980512	1300	*	*	*	*	*
320	PINL-321	980715	0930	*	*	*	*	*
320	PINL-321	980917	0925	*	*	*	*	*
320	PINL-322	980512	1340	*	*	*	*	*
320	PINL-322	980715	1030	*	*	*	*	*

Appendix D-2, cont. Results of water quality samples collected from stations included as part of the nonpoint source watershed screening and CWA §303(d) segment evaluations of the Tennessee Basin, 1998. (* = less than minimum laboratory detection limit of 0.1 ug/l)

Sub-Watershed Number	Station Number	Date (YYMMDD)	Time (24hr)	Bis (2-Ethylhexyl) phthalate (ug/l)	Di (2-Ethylhexyl) phthalate (ug/l)	Simazine (ug/l)	Atrazine (ug/l)	Metolachlor (ug/l)
Wheeler Lake (0603-0002)								
320	PINL-322	980917	1015	*	*	*	*	*
390	SWNL-390	980715	1130	*	*	0.181	*	*
390	SWNL-390	980916	0820	*	*	*	*	*
400	RNIL-400	980714	1700	*	*	*	*	*
400	RNIL-400	980916	1035	*	*	*	*	*
440	FIRW-001	980722	1100	*	*	*	*	*
440	NLYW-001	980722	1130	0.133	*	*	*	*
440	SCDL-011	980722	0955	*	*	*	*	*
Lower Elk River (0603-0004)								
080	BIGL-014	980722	1420	*	*	*	*	*
080	SLRL-015	980722	1520	*	*	*	*	*
150	ANDL-008	980722	1300	*	*	*	*	*
Pickwick Lake (0603-0005)								
010	BGNL-032	980721	1250	*	*	*	*	*
010	BGNL-033	980721	1147	*	*	*	*	*
010	CLFL-012	980721	0951	*	*	*	*	*
010	MBNL-034	980721	1041	*	*	*	*	*
040	PPLC-001	980721	1506	*	*	*	*	*
040	TWNL-013	980721	1354	*	*	*	*	*
090	INCL-001	980722	0825	*	*	*	*	*
180	BRML-009	980722	0655	*	*	*	*	*
220	SNKL-010	980721	1702	*	*	*	*	*

Bis (2-Ethylhexyl) phthalate, a common plastisizer, is likely a laboratory contaminant. No detectable concentrations were collected for the following constituents during any of the sampling events: Alachlor, Aldrin, Benzo(a)pyrene, Butachlor, Dieldrin, Enfrin, Heptachlor, Heptachlor epoxide, hexachlorobenzene, Hexachlorocyclopentadiene, Lindane, Methoxychlor, Metribuzin, Propachlor

Appendix D-3. Results of water quality samples collected for metals analysis from stations included as part of the nonpoint source watershed screening and CWA §303(d) segment evaluations of the Tennessee Basin, 1998.

Sub-Watershed Number	Station Number	Date (YYMMDD)	Time (24hr)	Pb (mg/l)	Cd (mg/l)	As (mg/l)	Zn (mg/l)	Hg (mg/l)	CU (mg/l)	Fe (mg/l)	Mn (mg/l)
Guntersville Lake (0603-0001)											
060	BENJ-003	980728	1205							**0.258**	**0.084**
120	LCNJ-002	980728	1320							**0.487**	**0.212**
120	LCNJ-036	980728	1350							**0.087**	**0.033**
160	FLRJ-004	980728	1050							**0.817**	**0.257**
170	MUDJ-006	980728	1515							**0.347**	**0.061**
300	BGSM-022	980728	1715							<0.005	<0.005
Wheeler Lake (0603-0002)											
160	MTNM-160	980708	1120							**0.181**	**0.062**
160	MTNM-160	980910	0830							**0.156**	**0.018**
160	MTNM-161	980708	1245							**0.107**	**0.052**
160	MTNM-161	980910	0905							**0.095**	**0.019**
160	MTNM-162	980708	1310							**0.225**	**0.057**
160	MTNM-162	980910	0930							**0.299**	**0.016**
180	BFFM-180	980513	0730	<0.005	<0.005	<0.005	**0.009**	<0.5	<0.005		
180	BFFM-180	980708	0745	**0.006**	**0.005**	<0.005	**0.005**	**0.5**	**0.005**		
180	BFFM-180	980909	1410	**0.01**	**0.005**	<0.005	**0.005**	**0.3**	**0.005**		
180	BFFM-181	980513	0900	<0.005	<0.005	<0.005	**0.006**	<0.5	<0.005		
180	BFFM-181	980909	1505	<0.005	<0.005	<0.005	<0.005	<0.3	<0.005	**0.283**	**0.093**
180	BFFM-181	980708	0900	**0.006**	**0.005**	<0.005	**0.005**	**0.5**	**0.005**	**0.237**	**0.031**
180	BFFM-182	980909	1605	<0.005	<0.005	<0.005	<0.005	<0.3	<0.005		
180	BFFM-182	980708	1000	**0.007**	**0.005**	<0.005	**0.005**	**0.5**	**0.005**	**0.627**	**0.265**
180	BFFM-182	980513	0950	<0.005	<0.005	<0.005	**0.011**	<0.5	**0.005**	**0.620**	**0.081**
180	BVDM-017	980722	1709							**0.076**	**0.010**

Appendix D-3, cont. Results of water quality samples collected for metals analysis from stations included as part of the nonpoint source watershed screening and CWA §303(d) segment evaluations of the Tennessee Basin, 1998.

Sub-Watershed Number	Station Number	Date (YYMMDD)	Time (24hr)	Pb (mg/l)	Cd (mg/l)	As (mg/l)	Zn (mg/l)	Hg (mg/l)	Cu (mg/l)	Fe (mg/l)	Mn (mg/l)
Wheeler Lake (0603-0002)											
190	CHSM-190	980707	1820							**0.446**	**0.305**
190	CHSM-190	980908	1610							**0.094**	**0.063**
220	CANM-220	980706	1100							**2.51**	**1.16**
220	CANM-220	980908	1105							**0.787**	**0.940**
270	CTCM-026	980723	0835							**0.338**	**0.215**
270	CTCM-037	980723	1050							**0.416**	**0.342**
270	HGSM-027	980723	1147							**0.315**	**0.112**
270	RCKM-023	980729	0945							**0.545**	**0.050**
270	SXMM-036	980723	0945							**0.423**	**0.257**
270	TWNM-024	980723	0730							**0.451**	**0.341**
270	WFCM-028	980729	0835							**0.434**	**0.038**
270	WFCM-025	980729	0814							<0.005	<0.005
300	LIML-300	980707	1130							**0.310**	**0.061**
300	LIML-300	980909	0900							<0.005	<0.005
320	PINL-320	980512	1045	<0.005	<0.005	<0.005	**0.01**	<0.5	**0.007**		
320	PINL-320	980715	0820	<0.005	<0.005	<0.005	<0.005	<0.5	<0.005		
320	PINL-320	980917	0815	<0.005	<0.005	<0.005	**0.007**	<0.3	<0.005	**0.113**	**0.025**
320	PINL-321	980512	1300	<0.005	<0.005	<0.005	**0.009**	<0.5	**0.006**		
320	PINL-321	980715	0930	<0.005	<0.005	<0.005	<0.005	<0.5	<0.005		
320	PINL-321	980917	0925	<0.005	<0.005	<0.005	**0.007**	<0.3	<0.005		
320	PINL-322	980512	1340	<0.005	<0.005	<0.005	**0.007**	<0.5	<0.005		
320	PINL-322	980715	1030	<0.005	<0.005	<0.005	<0.005	<0.5	<0.005		
320	PINL-322	980917	1015								

Appendix D-3, cont. Results of water quality samples collected for metals analysis from stations included as part of the nonpoint source watershed screening and CWA §303(d) segment evaluations of the Tennessee Basin, 1998.

Sub-Watershed Number	Station Number	Date (YYMMDD)	Time (24hr)	Pb (mg/l)	Cd (mg/l)	As (mg/l)	Zn (mg/l)	Hg (mg/l)	Cu (mg/l)	Fe (mg/l)	Mn (mg/l)
Wheeler Lake (0603-0002), cont.											
390	SWNL-390	980916	0820							**0.055**	**0.025**
400	RNIL-400	980916	1035							**0.104**	**0.060**
440	SCDL-011	980722	0955							**0.078**	**0.016**
Lower Elk River (0603-0004)											
080	BIGL-014	980722	1420							**0.085**	**0.024**
080	SLRL-015	980722	1520							**0.140**	**0.036**
150	ANDL-008	980722	1300							**0.051**	**0.011**
Pickwick Lake (0603-0005)											
010	BGNL-032	980721	1250							<0.005	<0.005
010	BGNL-033	980721	1147							<0.005	<0.005
010	CLFL-012	980721	0951							**0.234**	**0.159**
010	MBNL-034	980721	1041							<0.005	<0.005
040	PPLC-001	980721	1506							**1.49**	**1.12**
040	TWNL-013	980721	1354							<0.005	<0.005
090	INCL-001	980722	0825							**0.051**	<0.005
180	BRML-009	980722	0655							**0.108**	**0.077**
220	SNKL-010	980721	1702							**0.054**	**0.022**

Appendix E-1. Location Descriptions for stations where data were collected as part of studies not associated with the 1998 Tennessee River Basin NPS Project.

Sub-watershed	County	Station Number	Purpose	Waterbody Name	Station Description	T / R / S	Latitude	Longitude
Guntersville Lake (0603-0001)								
060	Jackson	TE06U3-59	ALAMAP	Wimberly Br, UT to	1999	T1S, R8E, S25	34.9283	-85.8527
160	Dekalb	TE10U2-47	ALAMAP	Burkhalter Cr		T3S,R9E,S25	34.7513	-85.6497
160	Jackson	TN10	CWS 1996	Kash Cr	AL Hwy 117 NW of Flat Rock	T3S, R9, S7, SE1/4	34.7903	-85.7250
160	Jackson	TN11	CWS 1996	Rocky Br	Jackson Co. Rd. 81 NW of Flat Rock	T3S, R8E ,S2, NE1/4	34.8079	-85.7625
180	Jackson	BYTJ-1	State Parks Proj.	Bryant Cr		T4S, R8E, S31	34.6470	-85.8426
190	Jackson	TN22	CWS 1996	Tennessee R	AL Hwy 35 Bridge Scottsboro Intake TVA 17522		34.6489	-85.9858
210	Jackson	TN23	CWS 1996	Tennessee R	Scottsboro North Sauty Intake Trend Station TVA 17101		34.6039	-86.0767
220	Jackson	KIRD-1	State Parks Proj.	Kirby Cr		T6S, R7E, S7	34.5326	-85.9509
220	Dekalb	SS-5	Sand Mtn NPS	South Sauty Cr	At Bucks Pocket State Park	T6S, R6E, S31	34.47500	-86.0533
220	Dekalb	SS-3/ SCD-3	Sand Mtn NPS	South Sauty Cr	At Co Rd 47 West of Rainsville	T6S, R7E, S20	34.4986	-85.9294
220	Dekalb	SSCD-1	State Parks Proj.	South Sauty Cr		T6S, R7E, S20	34.4986	-85.9297
220	Dekalb	STGD-1	State Parks Proj.	Straight Cr		T6S, R7E, S19	34.5050	-85.9362
220	Jackson	STND-1	State Parks Proj.	Stringer Cr		T6S, R6E, S13	34.5205	-85.9680
250	Dekalb	T-5	Sand Mtn NPS	Town Cr	At Al 227 North of Geraldine	T7S, R6E, S28	34.3906	-86.0186
250	Dekalb	T-3/ TCD-3	Sand Mtn NPS	Town Cr	At Co. Rd 50 East of Fyffe (Guest Bridge)	T7S, R7E, S14	34.4275	-85.8758
250	Dekalb	TE09U2-43	ALAMAP	Traylor Br., UT to		T7S,R6E,S24	34.4093	-85.9653
270	Marshall	L SHOAL	Sand Mtn NPS	Little Shoal Cr	At secondary Rd	T8S, R5E, S9	34.3475	-86.0961
270	Dekalb	SC-3	Sand Mtn NPS	Scarham Cr	At Co Rd 1 NW of Kilpatrick	T8S, R5E, S34	34.2947	-86.0961
270	Marshall	SC-4	Sand Mtn NPS	Scarham Cr	At Co Rd 89 NE of Albertville (Double Bridges)	T8S, R5E, S19	34.3261	-86.1611
270	Marshall	SHOAL	Sand Mtn NPS	Shoal Cr	At secondary Rd	T8S, R5E, S9	34.3500	-86.1261
270	Marshall	W-1	Sand Mtn NPS	Whippoorwill Cr	At Co Rd 89 NE of Albertville (Double Bridges)	T8S, R5E, S19	34.3261	-86.1611
280	Dekalb	TE08U2-53	ALAMAP	Coal Cr		T9S,R6E,S30	34.2145	-86.0530
280	Marshall	DC-5	Short Cr Int. Survey	Drum Cr	Drum Cr, upstream of confluence with Short Cr (Rice Mill Bridge)	T8S, R4E,S27, NW 1/4	34.3111	-86.2117
280	Marshall	SSC-2	Short Cr Int. Survey	Shoal Cr	Shoal Cr, upstream of confluence with Scarham Cr	T8S, R4E, S24, NE1/4	34.3272	-86.1608
280	Marshall	SC-1	Short Cr Int. Survey	Short Cr	Short Cr, highway 75 crossing, upstream of confluence with Turkey Cr	T8S, R4E, S36, SE1/4	34.2936	-86.1631
280	Marshall	SC-2	Short Cr Int. Survey	Short Cr	Short Cr, bridge crossing	T8S, R4E, S35, NE1/4	34.3008	-86.1800
280	Marshall	SC-3	Short Cr Int. Survey	Short Cr	Short Cr, in area of bridge crossing	T8S, R4E,S22, SE1/4	34.3206	-86.2047
280	Marshall	SC-4	Short Cr Int. Survey	Short Cr	Short Cr, beginning of backwater	T8S, R4E, S14, N1/2	34.3417	-86.1883
280	Marshall	SC-6	Short Cr Int. Survey	Short Cr	Short Cr, highway 227 bridge crossing	T8S, R5E, S4, NE1/4	34.3686	-86.2197
280	Marshall	SH-4	Sand Mtn NPS	Short Cr	At Co Rd 50 North of Albertville	T8S, R4E, S22	34.2692	-86.1367
280	Marshall	SH-3	Sand Mtn NPS	Short Cr	At Co Rd 543 (Mrytletree Crossing)	T9S, R5E, S8	34.2703	-86.2047
280	Marshall	TK-2	Short Cr Int. Survey	Turkey Cr	Turkey Cr, bridge crossing at Hwy 75	T8S, R4E, S36, SW1/4	34.2875	-86.1781
280	Marshall	TK-3	Short Cr Int. Survey	Turkey Cr	Turkey Cr, Cochran Road crossing	T8S, R4E, S35, NE1/4	34.2972	-86.1789

Appendix E-1, cont. Location Descriptions for stations where data were collected as part of studies not associated with the 1998 Tennessee River Basin NPS Project.

Sub-watershed	County	Station Number	Purpose	Waterbody Name	Station Description	T / R / S	Latitude	Longitude
Wheeler Lake (0603-0002)								
020	Jackson	ESTL-1	Paint Rock NPS	Estill Fk	Jackson Co. Rd 140 crossing, downstream of riffle area	T1S, R5E, S6	34.9653	-86.1537
020	Jackson	HURR-1	Paint Rock NPS	Hurricane Cr	Jackson County Road 141 east of McCullough Cemetery	T1S, R5E, S31	34.9180	-86.1330
020	Jackson	5394-1	TVA 1997 WQ Site	Hurricane Cr	James Medley's Place		34.9160	-86.1389
040	Jackson	LARK-1	Paint Rock NPS	Larkin Fk	Off of Hwy 65 near Halls Chapel	T1S, R4E, S33	34.8656	-86.2082
050	Jackson	DRYJ-1	Paint Rock NPS	Dry Cr	at HWY 65	T3S, R3E, S12	34.7923	-86.2521
050	Jackson	3368-1	TVA 1997 WQ Site	Dry Cr	Bridge on Hwy 65 South of Hwy 4		34.8013	-86.2636
050	Jackson	LICK-1	Paint Rock NPS	Lick Fk	Jackson Co Rd 3	T2S, R4E, S19	34.8524	-86.2438
050	Jackson	6384-1	TVA 1997 WQ Site	Lick Fk	Hwy 65 Bridge Crossing		34.8444	-86.2368
060	Jackson	GUESS-1	Paint Rock NPS	Guess Cr	Near Jackson County Rd 20	T3S, R4E, S27	34.7597	-86.1897
060	Jackson	4641-1	TVA 1997 WQ Site	Guess Cr	Private Land off Co. Rd. 20		34.7585	-86.1928
060	Jackson	4641-2	TVA 1997 WQ Site	Guess Cr	Private Land off Co. Rd. 20		34.7455	-86.2210
070	Jackson	CSPR-1	Paint Rock NPS	Cole Springs Br	at HWY 65	T4S, R3E, S20	34.6828	-86.3297
080	Jackson	CLER-1	Paint Rock NPS	Clear Cr	at HWY 65	T4S, R3E, S4	34.7193	-86.3108
080	Jackson	2305-1	TVA 1997 WQ Site	Clear Cr	Highway 65		34.7194	-86.3115
090	Jackson	LPNT-1	Paint Rock NPS	Little Paint Cr	Jackson County Rd 63	T5S, R3E, S13	34.6013	-86.2695
090	Jackson	12460-1	TVA 1997 WQ Site	Yellow Br	First Bridge on Hwy 8		34.6264	-86.2656
090	Jackson	12460-2	TVA 1997 WQ Site	Yellow Br	Highway 63		34.6066	-86.2710
100	Marshall	LPRK-1	Paint Rock NPS	Little Paint Rock Cr	Marshall County Rd crossing south of Hwy 431	T6S, R2E, S26	34.4847	-86.3862
100	Jackson	TE07U2-44	ALAMAP	Paint Rock R., UT to		T4S,R3E,S31	34.6544	-86.3441
100	Marshall	PTRK-1	Paint Rock NPS	Paint Rock R	county road crossing north of 431, near New Hope	T6S, R2E, S14	34.5179	-86.3855
100	Marshall	8421-1	TVA 1997 WQ Site	Paint Rock R	Butler Mill Road Bridge		34.5798	-86.3017
140	Madison	TE05U2-50	ALAMAP	Flint R		T5S,R1E,S24	34.5815	-86.4684
140	Madison	4015-3	TVA 1997 WQ Site	Flint R	O Patterson Rd Bridge (Walela Canoe)		34.8796	-86.4811
160	Madison	TE06U2-54	ALAMAP	Dry Cr		T1S,R2E,S12	34.9637	-86.3624
160	Madison	5005-1	TVA 1997 WQ Site	Hester Cr	Above Confl. w/ Mountain Fk @ New Market Bridge		34.9144	-86.4406
160	Madison	7891-2	TVA 1997 WQ Site	Mountain Fk	Above Confl. w/ Hester Cr @ New Market Bridge		34.9125	-86.4336
180	Madison	580-1	TVA 1997 WQ Site	Beaverdam Cr	Highway 431 Bridge		34.8377	-86.5712
180	Madison	1370-1	TVA 1997 WQ Site	Brier Fk	Brier Fk Road Bridge		34.9256	-86.6345
180	Madison	1370-2	TVA 1997 WQ Site	Brier Fk	Meridianville Bottom Road Bridge		34.8534	-86.5431
180	Madison	1370-3	TVA 1997 WQ Site	Brier Fk	Private Prop: Henry Hovezak; Nauger Rd off Winchester		34.8323	-86.5019
200	Madison	5392-2	TVA 1997 WQ Site	Hurricane Cr	Gurley Pike Bridge		34.7533	-86.3914
200	Madison	5392-1	TVA 1997 WQ Site	Hurricane Cr	Mountain Lane off Salty Bottom Rd.		34.7317	-86.3883
210	Madison	872-1	TVA 1997 WQ Site	Big Cove Cr	Old Highway 431 Bridge		34.6593	-86.4780
210	Madison	4015-2	TVA 1997 WQ Site	Flint R	Owens Cross Road (Chickasaw Canoe)		34.5939	-86.4687
210	Madison	4402-1	TVA 1997 WQ Site	Goose Cr	Old Highway 431 Bridge		34.6297	-86.4525
210	Madison	12457-2	TVA 1997 WQ Site	Yellow Bank Cr	Hobbs Island Road Bridge		34.5489	-86.4524

Appendix E-1, cont. Location Descriptions for stations where data were collected as part of studies not associated with the 1998 Tennessee River Basin NPS Project.

Sub-watershed	County	Station Number	Purpose	Waterbody Name	Station Description	T / R / S	Latitude	Longitude
Wheeler Lake (0603-0002)								
230	Morgan	TN26	CWS 1996	Tennessee R	Northeast Morgan Co. Intake Trend Station TVA 17102		34.5606	-86.5392
270	Morgan	2647-2	TVA 1997 WQ Site	Cotaco Cr	NE of Lynntown, Co Hwy 73		34.4397	-86.7006
270	Morgan	5328-1	TVA 1997 WQ Site	Hughes Cr	Pines Ridge Road		34.4133	-86.6040
270	Marshall	6505-1	TVA 1997 WQ Site	Little Cotaco Cr	Saylor's Gap Road Bridge		34.3932	-86.5505
270	Marshall	7628-1	TVA 1997 WQ Site	Mill Pond Cr	Matt Morrow Road Bridge		34.3409	-86.5580
270	Morgan	11503-1	TVA 1997 WQ Site	Town Cr	Antioch Road		34.4649	-86.7368
270	Morgan	11770-2	TVA 1997 WQ Site	West Fk Cotaco Cr	County Rd. Bridge		34.3553	-86.6760
270	Morgan	11770-1	TVA 1997 WQ Site	West Fk Cotaco Cr	Downstream of Hwy 67 Bridge		34.3848	-86.6633
300	Limestone	TE04U2-56	ALAMAP	Davis Br		T1S,R3W,S12	34.9761	-86.7847
300	Limestone	TE05U3-49	ALAMAP	Limestone Cr, UT to	1999	T3S, R3W, S15	34.7750	-86.8358
300	Limestone	6409-3	TVA 1997 WQ Site	Limestone Cr	Hwy 72 Bridge		34.7517	-86.8231
300	Madison	6409-5	TVA 1997 WQ Site	Limestone Cr	Hwy 53 Bridge		34.9197	-86.7640
300	Limestone	6640-1	TVA 1997 WQ Site	Little Limestone Cr	Informal Vehicle Crossing		34.9121	-86.8001
320	Limestone	4124-1	TVA 1997 WQ Site	French Mill Cr	Cambridge Lane Bridge		34.7565	-86.8953
320	Limestone	TN06	CWS 1996	Piney Cr	Unnamed Limestone Co. Rd. S of Ardmore	T1S, R3W, S9, SW1/4	34.9619	-86.8489
320	Limestone	TN07	CWS 1996	Piney Cr	Limestone Co. Rd. 6 W of Belle Mina	T4S, R4W, S9, SE1/4	34.6569	-86.9005
320	Limestone	8773-3	TVA 1997 WQ Site	Piney Cr	Black Road (Co. Rd. 86) Bridge		34.8616	-86.9072
320	Limestone	8773-2	TVA 1997 WQ Site	Piney Cr	Pepper Road Bridge		34.7884	-86.8898
330	Morgan	SITE 13	Flint Cr NPS	Cedar Cr	At US Hwy 31	T7S, R4W, S25, SW1/4	34.3989	-86.9142
330	Morgan	2087-1	TVA 1997 WQ Site	Cedar Cr	Cedar Rd. Bridge		34.4076	-86.9119
330	Cullman	3544-1	TVA 1997 WQ Site	East Fk Flint	Bridge Crossing NE of Providence		34.2838	-86.8286
330	Cullman	SITE 8	Flint Cr NPS	Flint Cr	at Cullman Co Rd 1442	T9S, R3W, S2, SW1/4	34.2839	-86.8281
330	Morgan	SITE 5	Flint Cr NPS	Flint Cr	at Nanceford Bridge at RM 24.5	T7S, R4W, S29, Center	34.4058	-86.9767
330	Morgan	SITE 6	Flint Cr NPS	Flint Cr	at Huckaby Bridge approx. 1.75 miles downstream of Shoal Ck	T7S, R4W, S34, N1/2 of West Boundary	34.3961	-86.9517
330	Morgan	SITE 7	Flint Cr NPS	Flint Cr	AT Morgan Co Rd 55 approx. 1 mile West of Falkville	T8S, R4W, S2, SW1/4	34.3733	-86.9342
330	Morgan	5470-1	TVA 1997 WQ Site	Indian Cr	Highway 31 Bridge (at Stuckey's)		34.3119	-86.8997
330	Morgan	TE08U1	ALAMAP	Mill Cr		T8S, R3W, S12	34.3525	-86.8094
330	Morgan	9531-1	TVA 1997 WQ Site	Robinson Cr	Upstream of Bridge at Falkville Lagoon		34.3636	-86.9224
330	Cullman	9557-1	TVA 1997 WQ Site	Rock Cr	Hurricane Cr Park off Hwy 31		34.2864	-86.8950
330	Morgan	9957-1	TVA 1997 WQ Site	Sally Mike Cr	Upstream of Lacon Rd. ; off gravel rd.		34.3281	-86.9310
330	Morgan	SITE 12	Flint Cr NPS	Shoal Cr	Just upstream of Hartselle Wastewater Treatment	T7S, R4W, S27, SE1/4	34.4061	-86.9339
340	Morgan	TE06U1	ALAMAP	Crowdabout Cr	Approx. 3.4 miles us of confluence of Crowdabout Cr and Flint Ck	T7S, R5W, S25	34.4118	-87.0083
340	Morgan	SITE 10-A	Flint Cr NPS	Crowdabout Cr	At New Cut Rd	T7S, R5W, S36, NW1/4	34.3978	-87.0217
350	Morgan	TE02A1	ALAMAP	Crawford Cr	Approx. 2.5 mi. upstrm of confluence of W Flint Cr and Crawford CK	T6S, R5W, S33	34.4839	-87.0584
350	Morgan	SITE 1	Flint Cr NPS	Flint Cr	at AL Hwy 67 near Wheeler National Wildlife Refuge	T6S, R4W, S3, S1/2	34.5489	-86.9386

Appendix E-1, cont. Location Descriptions for stations where data were collected as part of studies not associated with the 1998 Tennessee River Basin NPS Project.

Sub-watershed	County	Station Number	Purpose	Waterbody Name	Station Description	T / R / S	Latitude	Longitude
Wheeler Lake (0603-0002)								
350	Morgan	SITE 2	Flint Cr NPS	Flint Cr	at US Hwy 31 near Hartselle water supply intake	T6S, R4W, S28, SW1/4	34.4917	-86.9647
350	Morgan	SITE 3	Flint Cr NPS	Flint Cr	at Morgan Co. Rd 28 approx. 1/2 mile NW of Hartselle	T7S, R4W, S5, SE1/4	34.4639	-86.9750
350	Morgan	SITE 4	Flint Cr NPS	Flint Cr	at AL Hwy 36 approx. 1 mile West of Hartselle	T7S, R4W, S17, NW1/4	34.4425	-86.9836
350	Morgan	SITE 11	Flint Cr NPS	No Business Cr	Approx. 1 mile upstream of mouth	T7S, R4W, S6, SW1/4	34.4594	-86.9972
350	Lawrence	SITE 9-B	Flint Cr NPS	West Flint Cr	At Lawrence Co Rd 327 (Stover Bridge) (Prev. Co. 59)	T6S, R6W, S36, N1/2	34.4842	-87.1164
350	Morgan	SITE 9-A	Flint Cr NPS	West Flint Cr	AT Morgan Co Rd 41 approx. 6 miles northwest of Falkville	T6S, R5W, S26, E1/2	34.4939	-87.0264
360	Lawrence	SITE 14	Flint Cr NPS	Big Shoal Cr	At Lawrence Co Rd 61	T6S, R6W, S34, NE1/4	34.4875	-87.1472
360	Lawrence	3658-1	TVA 1997 WQ Site	Elam Cr	County Rd 86		34.4642	-87.1958
360	Lawrence	3957-1	TVA 1997 WQ Site	Flat Cr	Old Molton Road Bridge(Co Rd 61)		34.4960	-87.1317
360	Lawrence	TE05U1	ALAMAP	McDaniel Cr		T7S, R6W, S3	34.4711	-87.1443
360	Lawrence	SITE 9-C	Flint Cr NPS	West Flint Cr	At Lawrence Co Rd 203 (Prev. Co. 61)	T7S, R6W, S3, SW1/4	34.4639	-87.1567
370	Limestone	TN25	CWS 1996	Tennessee R	Decatur Intake TVA 17009		34.6035	-86.9614
380	Morgan	TE02U1	ALAMAP	Bakers Cr, UT to	approx. 7.1 miles us of confluence of Bakers Cr and TN R	T5S. R5W, S32	34.5790	-87.0790
390	Limestone	TE04U3-56	ALAMAP	Swan Cr	1999	T2S, R4W, S9	34.8819	-86.9497
390	Limestone	11146-2	TVA 1997 WQ Site	Swan Cr	Between Elkton Rd Bridge & Muddy Cr Confl.		34.8308	-86.9511
390	Limestone	11146-3	TVA 1997 WQ Site	Swan Cr	Strain Rd Bridge		34.7626	-86.9465
420	Lawrence	TN27	CWS 1996	Tennessee R	Champion International Corp. Intake Trend Station TVA 16900 R.M. 277		34.7350	-87.2961
440	Lauderdale	FIRW-1	State Parks Proj.	First Cr	Ford on Turner Lane	T2S, R8W, S25	34.8509	-87.3206
440	Lauderdale	3910-1	TVA 1997 WQ Site	First Cr	Ford on Turner Lane		34.8498	-87.3206
440	Lauderdale	NLYW-1	State Parks Proj.	Neely Br		T3S, R7W, S5	34.8163	-87.3011
440	Lauderdale	10118-1	TVA 1997 WQ Site	Second Cr	County Road 76 Bridge		34.8854	-87.3734
440	Lauderdale	TN24	CWS 1996	Tennessee R	Arab Intake Trend Station TVA 17261		34.3576	-86.3307
Lower Elk River (0603-0004)								
020	Limestone	TN04	CWS 1996	Elk R	AL Hwy 127 NW of Elkmont	T1S, R5W, S11, SE1/4	34.9681	-87.0181
060	Limestone	10281-1	TVA 1997 WQ Site	Shoal Cr	Shoal Cr Road Bridge		34.9526	-87.0673
080	Limestone	875-1	TVA 1997 WQ Site	Big Cr	Townsend Ford Road Bridge		34.8404	-87.0780
080	Limestone	11094-1	TVA 1997 WQ Site	Sulphur Cr	Easter Ferry Road Bridge		34.9080	-87.0304
120	Limestone	11053-1	TVA 1997 WQ Site	Sugar Cr	Sugar Cr Road Bridge		34.9802	-87.1745
150	Limestone	TN05	CWS 1996	Elk R	US Hwy 72		34.8042	-87.2311
150	Lauderdale	122-1	TVA 1997 WQ Site	Anderson Cr	Snake Road Bridge		34.8545	-87.2370
Pickwick Lake (0603-0005)								
010	Lawrence	TN01	CWS 1996	Big Nance Cr	Lawrence Co. Rd. 70 at Red Bank	T3S, R8W, S28, NE1/4	34.7658	-87.3717
010	Lawrence	TN02	CWS 1996	Big Nance Cr	Lawrence Co. Rd. 29 SW of Courtland	T5S, R8W, S1, NE1/4	34.6417	-87.3250
010	Lawrence	BNC-B	TVA 1997 WQ Site	Big Nance Cr	County Rd. 151		34.5989	-87.3356

Appendix E-1, cont. Location Descriptions for stations where data were collected as part of studies not associated with the 1998 Tennessee River Basin NPS Project.

Sub-watershed	County	Station Number	Purpose	Waterbody Name	Station Description	T / R / S	Latitude	Longitude
Pickwick Lake (0603-0005)								
010	Lawrence	BNC-A	TVA 1997 WQ Site	Big Nance Cr	Downstream of Alt 72 Bridge		34.6906	-87.3142
010	Lawrence	TN16	CWS 1996	Borden Cr	Unnamed Lawrence Co. Rd. NW of Muck City	T6S, R8W, S28, SW1/4	34.4972	-87.3875
010	Lawrence	TN17	CWS 1996	Borden Cr	Lawrence Co. Rd. 29 N of Muck City	T6S, R8W, S15, SW1/4	34.5214	-87.3664
010	Lawrence	TE01U1	ALAMAP	Muddy Fk of Big Nance Cr		T5S, R8W, S25	34.5787	-87.3324
010	Lawrence	TE03U3-48	ALAMAP	Sinking Cr	1999	T5S, R7W, S21	34.5972	-87.2681
040	Lawrence	TN03	CWS 1996	Town Cr	Lawrence Co. Rd. 7 at Lackey Bridge	T6S, R9W, S21, NE1/4	34.5172	-87.4834
040	Lawrence	TC-C	TVA 1997 WQ Site	Town Cr	County Rd. 131		34.5658	-87.5244
040	Lawrence	TC-B	TVA 1997 WQ Site	Town Cr	Alt 72 bridge		34.6822	-87.4508
040	Lawrence	TC-A	TVA 1997 WQ Site	Town Cr	HWY 184 bridge		34.7542	-87.4244
090	Lauderdale	INCL-1	State Parks Proj.	*Indian Camp Cr		T1S, R10W, S31	34.9243	-87.6211
160	Colbert	TE01U3-54	ALAMAP	Shegog Cr	1999	T3S, R10W, S24	34.7808	-87.5364
160	Colbert	TN28	CWS 1996	Tennessee R	Muscle Shoals Intake Trend Station TVA 16912		34.7822	-87.6189
200	Lauderdale	TE02U2-35	ALAMAP	Cypress Cr		T2S,R11W,S32	34.8326	-87.7153
200	Lauderdale	TN18	CWS 1996	Cypress Cr	Lauderdale Co. Rd. 16 NW of Florence	T2S, R11W, S19, SE1/4	34.7858	-87.6961
200	Lauderdale	TN19	CWS 1996	Cypress Cr	Hwy 20 Bridge.		34.8581	-87.7353
440	Lauderdale	TE02U3-35	ALAMAP	First Cr	1999	T2S, R7W, S5	34.9042	-87.2871
440	Lauderdale	TE03U2-51	ALAMAP	White Br		T1S,R7W,S18	34.9618	-87.3057
160	Colbert	PC-C	TVA 1997 WQ Site	Pond Cr	Marathler Lane Bridge		34.7489	-87.5647
160	Colbert	PC-B	TVA 1997 WQ Site	Pond Cr	Pepi Drive		34.7594	-87.6175
160	Colbert	PC-A	TVA 1997 WQ Site	Pond Cr	Off Hwy 133		34.7772	-87.6347
Bear Creek (0603-0006)								
010	Franklin	TE07U1	ALAMAP	Bear Cr		T8S, R13W, S8	34.3736	-87.9298
010	Marion	TN20	CWS 1996	Bear Cr	At AL Hwy 172 Bridge.		34.2775	-87.7197
010	Marion	TN21	CWS 1996	Bear Cr	At Upper Bear Cr Reservoir Dam		34.2683	-87.6983
010	Franklin	TE04U1	ALAMAP	Bullen Br, UT to	Approx. 1.4 mi. us of confluence of Bullen Br and Bear Ck	T7S, R15W, S5	34.4897	-88.1314
010	Franklin	TN15	CWS 1996	Little Dice Br	Franklin Co. Rd. 85 SW of Posey Mill	T8S, R10W, S33, NE1/4	34.3189	-87.5983
010	Franklin	TN14	CWS 1996	Turkey Cr	Moved to Co. Rd. 89 (AL Hwy. 243 SE of Trapptown	T8S, R10W, S17, NE1/4	34.3631	-87.6069
030	Franklin	TN08	CWS 1996	Little Bear Cr	Franklin Co. Rd. 59 W of Phil Campbell	T8S, R12W, S11, NW1/4	34.4883	-88.0356
030	Franklin	TN09	CWS 1996	Little Bear Cr	Franklin Co. Rd. 23 NE of Red Bay	T7S, R14W, S5, NW1/4	34.3756	-87.7731
040	Franklin	TN13	CWS 1996	Cedar Cr	Below dam.		34.5469	-87.9772
040	Franklin	TE01U2-58	ALAMAP	Dunkin Cr, UT to		T6S,R12W,S23	34.5236	-87.7706
040	Franklin	TE03U1	ALAMAP	Stinking Bear Cr, UT to	Approx. 8.1 mi. us of confluence of stinking Bear Cr and Cook Ck	T6S, R11W, S9	34.5354	-87.6849
050	Franklin	TN12	CWS 1996	Cedar Cr	Unnamed Franklin Co. Rd. NE of Pogo	T6S, R15W, S9, SE1/4	34.5631	-88.1083
070	Colbert	TE01A1	ALAMAP	Rock Cr		T5S, R15W, S24	34.6098	-88.0641

Appendix E-2. Location Descriptions for stations where fish IBI or aquatic macroinvertebrate community assessments were collected or analyzed by the Tennessee Valley Authority (TVA) or the Geological Survey of Alabama (GSA) from 1993-1999.

Sub-Watershed	County	Station Number	Data Source	Waterbody Name	Site Description	Drainage Area	T / R / S			Latitude	Longitude
Guntersville Lake (0603-0001)											
060	Jackson	724	GSA	Bengis Cr		12				34.87233	-85.82117
060	Jackson	TN527	GSA	Widows Cr			2S	8E	1		
100	Jackson	2824	GSA	Crow Cr							
120	Jackson	6502-1	GSA	Little Coon Cr	Off Co. Rd 54 nr Cave Springs Church	21					
140	Jackson	TN511	GSA	Big Coon Cr			2S	7E	20		
160	Jackson	3978-1/TN509	TVA/GSA	Flat Rock Cr		28	3S	9E	20		
170	Jackson	TN716	GSA	Mud Cr			3S	6E	10		
180	Jackson	TN501	GSA	Bryant Cr			4S	8E	31		
180	Jackson	TN532	GSA	Jones Cr			1S	9E	8		
220	DeKalb	10653-1	TVA	South Sauty Cr	RM 16.7	44				34.49806	-85.92944
250	DeKalb	11504-1	TVA	Town Cr	Lakeview RM 22.8	129				34.39333	-85.95833
270	DeKalb	10068-1	TVA	Scarham Cr	Flat Bridge, RM 7.2	86.9				34.29444	-86.09667
270	Marshall	10068-2	TVA	Scarham Cr	Colvin Bridge, RM 5.8	89.4				34.29833	-86.11639
270	Marshall	10284-1	TVA	Shoal Cr	RM 5.8	7				34.34806	-86.12556
280	Marshall	10336-1	TVA	Short Cr	Bridge at Murtle Tree, RM 14.5	73.9				34.26889	-86.13667
280	Marshall	10336-2	TVA	Short Cr	Blessing Rd, RM 16	72.1				34.25861	-86.12333
300	Marshall	GSA2/957-1	GSA	Big Spring Cr		43	8S	3E	32		
Wheeler Lake (0603-0002)											
020	Jackson	3734-1	TVA	Estill Fk	Private land:Bobbie L Gifford's House, RM 1.8	47				34.91472	-86.16361
020	Jackson	3734-2	TVA	Estill Fk	End of County Road 175, RM 7.3	23				34.98417	-86.14722
020	Jackson	5394-1	TVA	Hurricane Cr	James Medley's Place, RM 2.7	45				34.91583	-86.13861
040	Jackson	6087-1	TVA	Larkin Fk	Private land along HWY 27 before 1st T, RM 2.6	40				34.88694	-86.21750
050	Jackson	3368-1	TVA	Dry Cr	County road 504, RM 1	14				34.80111	-86.26333
050	Jackson	6384-1	TVA	Lick Fk	Highway 65 Bridge crossing, RM 1	18				34.84417	-86.23667
060	Jackson	TN442	GSA	Guess Cr			3S	4E	23		
060	Jackson	4641-1	TVA	Guess Cr	Private land, RM 3.6	27.9				34.75833	-86.19278
060	Jackson	4641-2	TVA	Guess Cr	At Little Nashville	5.1				34.74528	-86.22083
070	Jackson	2466-1	TVA	Cole Spring Cr	Bridge at G.W. Jones' Farm, RM 1	9				34.68250	-86.32944
070	Jackson	GSA15	GSA	Paint Rock R			4S	3E	29		
080	Jackson	2305-1/TN439	TVA/GSA	Clear Cr	Highway 65, RM 0.7	17	4S	3E	4	34.71917	-86.31139
090	Jackson	6675-1	TVA	Little Paint Cr	County Road 108 Bridge to Highway 63 B	37				34.60111	-86.27056
090	Jackson	6675-2	TVA	Little Paint Cr	AL Hwy 63	50.8				34.60111	-86.26889
090	Jackson	6675-3	TVA	Little Paint Cr	At County Rd 214, RM 2.2	51.1				34.60444	-86.27639
090	Jackson	12460-1	TVA	Yellow Br	1st Bridge on Highway 8, RM 1.9	14				34.62639	-86.26556
090	Jackson	12460-2	TVA	Yellow Br	@ Hwy 63 Br	15.2				34.60639	-86.27083
100	Marshall	6676-1	TVA	Little Paint Rock Cr	Merrill Road Bridge, RM 1.2	9				34.48444	-86.38611
100	Marshall	TN486	GSA	Paint Rock R	Butler Mill Road Bridge, RM 20	386	5S	3E	27	34.57972	-86.30167
100	Marshall	8421-1	TVA	Paint Rock R	Butler Mill Road Bridge, RM 21	387	5S	3E	27	34.57972	-86.30167
130	Madison	11778-1	TVA	W. Fk Flint R	Walker Creek at Fisk, RM 1.2	37				34.96083	-86.57139
140	Madison	4015-3	TVA	Flint R	O Patterson Rd Bridge (Walela Canoe), RM 41.7	130				34.87944	-86.48111

Appendix E-2, cont. Location Descriptions for stations where data were collected or analyzed by the Tennessee Valley Authority (TVA) or the Geological Survey of Alabama (GSA) from 1993-1999.

Sub-Watershed	County	Station Number	Data Source	Waterbody Name	Site Description	Drainage Area	T / R / S			Latitude	Longitude
Wheeler Lake (0603-0002)											
140	Madison	4015-4	TVA	Flint R		315					
160	Madison	5005-1	TVA	Hester Cr	Abv Confl /Mountn Fk @ New Mkt Bridge, RM 0.1	39				34.91417	-86.44056
160	Madison	5005-2	TVA	Hester Cr		33					
160	Madison	7891-1	TVA	Mountain Fk	Mountain Fk At Subdivision(Landfill), RM 1.8	83				34.89556	-86.46472
160	Madison	7891-2	TVA	Mountain Fk	Abv Confl /Hester Cr @ New Mkt Bridge, RM 3.9	32				34.91222	-86.43361
180	Madison	580-1	TVA	Beaverdam Cr	Highway 431 Bridge, RM 2.7	34.4				34.83750	-86.57111
180	Madison	1370-1	TVA	Brier Fk	Brier Fk Road Bridge, RM 1.4	28				34.92556	-86.63444
180	Madison	1370-2	TVA	Brier Fk	Meridianville Bottom Road Bridge, RM 4.8	54				34.85333	-86.54306
180	Madison	1370-3	TVA	Brier Fk	Private property: Henry Hovezak, RM 13.5	109				34.83222	-86.50167
190	Madison	2157-1	TVA	Chase Cr	Blackwell/McMillan Property, RM 0.9	8				34.78389	-86.49111
200	Madison	5392-1	TVA	Hurricane Cr	Field Behind Alvestos Sanders' Farm, RM 5.4	52				34.73167	-86.38806
210	Madison	872-1	TVA	Big Cove Cr	RM 1.4	9				34.65917	-86.47778
210	Madison	4015-2/TN609	TVA/GSA	Flint R	Owens Cross Road (Chickasaw Canoe) RM 12.1	513	5S	1E	13	34.59389	-86.46861
210	Madison	4402-1	TVA	Goose Cr	Old Highway 431 Bridge, RM 1.3	13				34.62972	-86.45222
210	Madison	12457-2	TVA	Yellow Bank Cr	Hobbs Island Road Bridge, RM 1.2	8				34.54889	-86.45222
220	Marshall	1873-1	TVA	Cane Cr	Greenbrier Road Bridge, RM 1.2	13				34.48500	-86.53139
230	Madison	43-1	TVA	Aldridge Cr	Green Cove Road Bridge, RM 2.3	19				34.59917	-86.54361
240	Madison	5358-1	TVA	Huntsville Spring Br	Johnson Rd Bridge/Madison Cy Parcourse, RM 10.2	46				34.69028	-86.59667
250	Madison	5471-1	TVA	Indian Cr	Highway 72 Bridge,RM 17	42				34.74861	-86.69972
270	Morgan	2647-2	TVA	Cotaco Cr	NE of Lynntown, RM 14.5	159				34.43944	-86.70056
270	Morgan	5328-1	TVA	Hughes Cr	Pines Ridge Road, RM 1	12				34.41306	-86.60389
270	Marshall	6505-1	TVA	Little Cotaco Cr	Saylor's Gap Road Bridge, RM 4.5	4				34.39306	-86.55028
270	Marshall	7628-1	TVA	Mill Pond Cr	Matt Morrow Road Bridge, RM 1.3	11				34.34083	-86.55778
270	Morgan	TN368	GSA	Rock Cr			8S	2W	1		
270	Morgan	11503-1	TVA	Town Cr	Antioch Road, RM 2.1	36				34.46472	-86.73667
270	Morgan	11770-2	TVA	W. Fk Cotaco Cr	Ryan Bridge, RM 4.9	25				34.35528	-86.67583
270	Morgan	11770-1	TVA	W. Fk Cotaco Cr	Downstream of Hwy 67 Bridge, RM 1.5	51				34.38472	-86.66306
300	Limestone	6409-3	TVA	Limestone Cr	Highway 72 Bridge, RM 17	115				34.75167	-86.82306
300	Limestone	6409-4	TVA	Limestone Cr	Browns Ferry Road, RM 14.5	111				34.72917	-86.84389
300	Madison	6409-5	TVA	Limestone Cr	Hwy 53 Bridge, RM 34	29				34.91972	-86.76389
300	Limestone	6640-1	TVA	Little Limestone Cr	Informal Vehicle Crossing, RM 1.4	23				34.91194	-86.80000
320	Limestone	4124-1	TVA	French Mill Cr	Bridge Site, RM 0.3	7				34.75639	-86.89528
320	Limestone	8773-1	TVA	Piney Cr	Church site, RM 6.7	84				34.67167	-86.90694
320	Limestone	8773-2	TVA	Piney Cr	Pepper Road Bridge, RM 18.2	60				34.78833	-86.88972
320	Limestone	8773-3	TVA	Piney Cr	Black Rd(Co.Rd 86) Bridge, RM 25	35				34.86139	-86.90694
330	Morgan	2087-1	TVA	Cedar Cr	RM 2.5	7				34.40750	-86.91167
330	Cullman	3544-1	TVA	E. Fk Flint Cr	RM 10.4	9				34.28361	-86.82861
330	Morgan	4011-2	TVA	Flint Cr	Huckaby Bridge Road and Bridge, RM 28.2	134				34.39611	-86.95250
330	Morgan	4011-3	TVA	Flint Cr	RM 32.3	111				34.37278	-86.93417
330	Morgan	5470-1	TVA	Indian Cr	Highway 31 Bridge (at Stuckeys), RM 0.4	4				34.31167	-86.89972
330	Morgan	7109-1	TVA	Mack Cr	Highway 55 Bridge, RM 1.7	6				34.37056	-86.95972

Appendix E-2, cont. Location Descriptions for stations where data were collected or analyzed by the Tennessee Valley Authority (TVA) or the Geological Survey of Alabama (GSA) from 1993-1999.

Sub-Watershed	County	Station Number	Data Source	Waterbody Name	Site Description	Drainage Area	T / R / S			Latitude	Longitude
Wheeler Lake (0603-0002)											
330	Morgan	7577-1	TVA	Mill Cr	Railroad Bridge (marker 329), RM 0.1	20				34.31917	-86.89306
330	Morgan	9531-1	TVA	Robinson Cr	Upstream of Bridge at Falkville Lagoon, RM 0.2	9				34.36333	-86.92222
330	Cullman	9557-1	TVA	Rock Cr	Hurricane Creek Park, RM 0.7	6				34.28639	-86.89500
330	Morgan	9957-1	TVA	Sally Mike Cr	RM 1.4	6				34.32806	-86.93083
330	Morgan	10282-1	TVA	Shoal Cr	Airport Downstream Of Hartselle STP, RM 0.2	14				34.40306	-86.93389
330	Morgan	10282-2	TVA	Shoal Cr	Airport Upstream Of Hartselle STP, RM 1	12				34.40944	-86.93389
340	Morgan	2827-1	TVA	Crowdabout Cr	Hopewell Road, RM 5.9	38				34.39333	-87.02861
340	Morgan	2827-2	TVA	Crowdabout Cr	Summerford Property, RM 7.8	17				34.36889	-87.05417
340	Morgan	2827-3	TVA	Crowdabout Cr	Below Phillip Hill Dairy, RM 11.2	7				34.33361	-87.07472
340	Morgan	2827-4	TVA	Crowdabout Cr	New Cut Rd, RM 5.5	39				34.39639	-87.02528
350	Morgan	TN612	GSA	Flint Cr			6S	4W	31		
350	Morgan	4011-1	TVA	Flint Cr	Above Public Boat Ramp @ Confluence, RM 12.1	246				34.48750	-86.96806
350	Morgan	7943-1	TVA	Mud Tavern Cr	Mud Tavern Road Bridge, RM 0.6	15				34.51361	-87.05194
350	Morgan	8231-1	TVA	No Business Cr	Ironman Road Bridge, RM 2.3	31				34.44444	-87.02111
350	Morgan	90004-1	TVA	UT to Nasty Br	Hartselle Stormwater Park, RM 1	1				34.44222	-86.93500
350	Morgan	11739-1	TVA	Village Branch	Bridge, RM 2.6	7				34.47667	-86.94111
350	Morgan	12045-1	TVA	West Flint Cr	Private property:Henry Bullard's House, RM 13.5	112				34.50806	-87.09083
350	Morgan	12045-2	TVA	West Flint Cr		37.2					
360	Lawrence	950-1	TVA	Big Shoal Cr	Old Molton Road Bridge, RM 1.4	19				34.48806	-87.14611
360	Lawrence	3658-1	TVA	Elam Cr	Elam Creek RM 0.9	29				34.46417	-87.19583
360	Lawrence	3957-1	TVA	Flat Cr	Old Molton Road Bridge, RM 1.6	9				34.49583	-87.13167
360	Lawrence	7342-1	TVA	Mcdaniel Cr	Little Bridge On Gravel Road, RM 1.2	13				34.44778	-87.14333
390	Limestone	TN301	GSA	Swan Cr			3S	4W	9		
390	Limestone	11146-1	TVA	Swan Cr	Highway 31 Bridge, RM 2.2	51				34.68833	-86.95306
390	Limestone	11146-2	TVA	Swan Cr	Between Elkton Rd. Bdg.& Muddy Cr.Conf, RM 13.3	20				34.83056	-86.95111
390	Limestone	11146-3	TVA	Swan Cr	@ Hwy 251 bridge	25				34.76250	-86.94639
400	Limestone	9782-1	TVA	Round Island Cr	Browns Ferry Road Bridge, RM 2.1	36				34.71389	-87.05194
410	Lawrence	7139-1	TVA	Mallard Cr	Bridge By Smith Cemetary, RM 3	19				34.67861	-87.18972
440	Lauderdale	3910-1	TVA	First Cr	Ford On unnamed Rd, RM 4.6	14				34.84972	-87.32056
440	Lauderdale	10118-1	TVA	Second Cr	County Road 76 Bridge, RM 7	39				34.88528	-87.37333
Lower Elk River (0603-0004)											
060	Limestone	10281-1	TVA	Shoal Cr	Shoal Creek Road Bridge, RM 3.2	58				34.95250	-87.06722
080	Limestone	875-1	TVA	Big Cr	Townsend Ford Road Bridge, RM 3	13				34.84028	-87.07806
080	Limestone	11094-1 / TN265	TVA / GSA	Sulphur Cr			1S	5W	35		
120	Limestone	11053-1	TVA	Sugar Cr	Sugar Creek Road Bridge, RM 12.2	136				34.98000	-87.17444
150	Lauderdale	122-1	TVA	Anderson Cr	Snake Road Bridge, RM 5	48				34.85444	-87.23694
Pickwick Lake (0603-0005)											
010	Lawrence	930-1	TVA	Big Nance Cr	Al Hwy 70	187					
010	Lawrence	TN211	GSA	Big Nance Cr			4S	7W	31		
010	Lawrence	TN599	GSA	Big Nance Cr			3S	8W	21		
010	Lawrence	7973-1	TVA	Muddy Fk		40					

Appendix E-2, cont. Location Descriptions for stations where data were collected or analyzed by the Tennessee Valley Authority (TVA) or the Geological Survey of Alabama (GSA) from 1993-1999.

Sub-Watershed	County	Station Number	Data Source	Waterbody Name	Site Description	Drainage Area	T / R / S			Latitude	Longitude
Pickwick Lake (0603-0005)											
010	Lawrence	2324-1/TN662	GSA	Clear Fk		27	T4S	R7W	31		
030	Lauderdale	TN719	GSA	Bluewater Cr			1S	9W	24		
030	Lauderdale	1157-1 / GSA12	TVA / GSA	Bluewater Cr		110	1S	9W	36		
030	Lauderdale	1157-2	TVA	Bluewater Cr							
030	Lauderdale	7574-1	TVA	Mill Cr		14					
040	Colbert	TN195	GSA	Poplar Cr	Colbert Co Rd 48	9	5S	9W	19		
040	Lawrence	11500-1/TN193	TVA/GSA	Town Cr	Al Hwy 184	226	3S	9W	36		
040	Lawrence	TN196	GSA	Town Cr	Harris Bridge		6S	9W	9		
090	Lauderdale	5458-1	TVA	Indiancamp Cr	RM 1.3	8				34.92222	-87.62056
090	Lauderdale	10280-1/TN600	TVA/GSA	Shoal Cr	Lauderdale Co Rd 8		1S	10W	21		
130	Lauderdale	TN186/1725-1	GSA/TVA	Butler Cr	Co Rd. 302	55	1S	10W	17		
150	Lauderdale	TN138	GSA	Cox Cr			2S	11W	34		
150	Lauderdale	10448-1	TVA	Sixmile Cr	Lauderdale Co rd 37						
180	Lauderdale	TN148	GSA	Burcham Cr			2S	12W	16		
180	Lauderdale	2888	TVA	Cypress Cr							
180	Lauderdale	6417-1/TN153	TVA/GSA	Lindsey Cr	Co Rd 278		2S	12W	4		
180	Lauderdale	TN624	GSA	Middle Cypress Cr			1S	11W	6		
180	Lauderdale	7508	TVA	Middle Cypress Cr							
180	Lauderdale	TN163	GSA	N. Fk Cypress Cr			1S	12W	7		
200	Lauderdale	2888-1/TN533	TVA/GSA	Cypress Cr	Co Rd 14		3S	11W	9		
200	lauderdale	6547-1 / GSA10	TVA / GSA	Little Cypress Cr			2S	11W	32		
200	Lauderdale	6547-2	TVA	Little Cypress Cr							
210	Colbert	TN130	GSA	Foxtrap Cr			5S	10W	31		
210	Colbert	10725-1	TVA	Spring Cr	Co Rd 55	100					
210	Colbert	TN648	GSA	Spring Cr			4S	11W	23		
220	Lauderdale	10420-1/TN120	GSA	Sinking (Gravelly) Cr		40	3S	12W	32		
230	Colbert	1870-1/TN642	GSA	Cane Cr	AL Hwy 247	42	4S	13W	12		
230	Colbert	TN124	GSA	Little Bear Cr			5S	11W	6		
230	Colbert	6442-1	TVA	Little Bear Cr	Colbert Co Rd 65	52					
250	Lauderdale	1162-1	TVA	Bluff Cr	Co Rd 87						
250	Lauderdale	TN107	GSA	Bluff Cr			2S	13W	16		
250	Lauderdale	1460-1/TN105	TVA/GSA	Brush Cr	Co Rd 133		2S	14W	35		
270	Lauderdale	TN099	GSA	Bumpass Cr			1S	15W	24		
270	Lauderdale	TN003	GSA	Cedar Fk			1S	15W	18		
270	Lauderdale	10117-1/TN102	TVA/GSA	Second Cr	Co Rd 90		1S	14W	20		
280	Lauderdale	TN005	GSA	UT to Tenn R			1S	15W	33		
320	Lauderdale	TN001	GSA	UT to Tenn R			1S	16W	1		
330	Lauderdale	8470-1/TN004	TVA/GSA	Panther Cr	Co Rd105		1S	15W	20		
Bear Creek (0603-0006)											
010		482-2	TVA	Bear Cr	Co Rd 57						
010	Franklin	TN067	GSA	Bear Cr			7S	14W	30		

Appendix E-2, cont. Location Descriptions for stations where data were collected or analyzed by the Tennessee Valley Authority (TVA) or the Geological Survey of Alabama (GSA) from 1993-1999.

Sub-Watershed	County	Station Number	Data Source	Waterbody Name	Site Description	Drainage Area	T / R / S			Latitude	Longitude
Bear Creek (0603-0006)											
010	Franklin	TN074	GSA	Bear Cr			8S	13W	36		
010	Lawrence	7916-1	TVA	Mud Cr		45					
030	Franklin	TN049	GSA	Little Bear Cr			6S	14W	31		
030	Franklin	6441-1/TN055	TVA/GSA	Little Bear Cr	Al Hwy 187		7S	13W	35		
040	Franklin	TN023	GSA	Cedar Cr			6S	15W	9		
040	Franklin	TN028	GSA	Cedar Cr			6S	14W	11		
040	Franklin	TN039	GSA	Cedar Cr			6S	12W	32		
040	Franklin	2084-1 / GSA8	TVA / GSA	Cedar Cr			7S	11W	17		
040	Franklin	7915-1	TVA	Mud Cr							
040	Franklin	9530 / GSA14	TVA / GSA	Robinson Cr			7S	12W	14		
050	Franklin	2084-1	TVA	Cedar Cr	Pogo, AL						
070	Colbert	482-1	TVA	Bear Cr	Mouth of Rock Creek, RM 25	723				34.66444	-88.09056
070	Colbert	9555-1	TVA	Rock Cr							
100	Colbert	GSA6	GSA	Little Cripple Deer Cr			3S	15W	34		
110	Colbert	1741-1 / GSA7	TVA / GSA	Buzzard Roost Cr			4S	11W	4		

Appendix F-1. Physical / chemical data collected during the Short Creek Intensive Survey (0603-0001-280) conducted by ADEM in October 1998 (ADEM 1998).

Stream Name	Station Number	Date *yymmdd*	Time *24hr*	Stream Depth *m*	Photometer Depth *m*	Secchi Depth *m*	Water Temp. *C*	Dissolved Oxygen *mg/l*	pH *s.u.*	Conductivity *umhos @25c*	Turbidity *NTU*	Stream Flow *cfs*	Weather Comment	BOD-5 *mg/L*	TDS *mg/L*	TSS *mg/L*	Hardness *mg/L*	NO2/ NO3 *mg/L*	TKN *mg/L*	T-PO4 *mg/l*	Ortho-Phosphate *mg/l*	Fecal Coliform *col/100ml*	Chlorophyll a *ug/l*
Drum Cr	DC-5	981006	1232	0.1			22	6.8	7.44	231	1.3		Cloudy										
Drum Cr	DC-5	981007	0920	0.1			22	7.2	6.71	230	1.6		Cloudy	1.9	122	<1	96	0.01	0.68	0.088	0.034	410	
Drum Cr	DC-5	981007	1317	0.1			22	6.5	7.11	227	0.9		Light Showers	1.5			96	0.02	0.53	0.083	0.047		
Drum Cr	DC-5	981008	0817	0			19	7.9	6.78	210	2.1		Scattered Clouds	1.6	138	1	84	0.02	0.43	0.098	0.065	270	
Short Cr	SC-1	981006	1350	0			24	7.7	7.05	114	1.5		Cloudy										
Short Cr	SC-1	981007	0822	0			22	2.9	6.91	124	1.5		Cloudy	1	70	<1	40	0.05	0.53	<0.005	0.007	440	
Short Cr	SC-1	981007	1532	0			23	5.5	6.88	117	1.9		Light Shower	1.5	125	2	48	0.07	0.51	0.076	0.016		
Short Cr	SC-1	981008	1018	0.1			22	4.0	6.75	136.9	2.3		Scattered Clouds	1.3	92	<1	48	0.06	0.53	<0.005	0.008	320	
Short Cr	SC-2	981006	1304	0.2			24	8.4	7.89	780	1.3		Cloudy										
Short Cr	SC-2	981007	0756	0			23	7.0	6.98	780	1.2		Cloudy	1.4	437	<1	120	3.08	0.90	10.487	3.360	104	
Short Cr	SC-2	981007	1458	0			23	7.8	7.53	796	1.1		Light Shower	1	69	1	118	3.89	1.21	8.661	3.252		
Short Cr	SC-2	981008	0922	0.1			21	7.8	7.17	770	1.4		Scattered Clouds	0.8	453	<1	104	6.23	1.22	9.263	2.727	220	
Short Cr	SC-3	981006	1300	0			24	11.9	8.15	778	0.8		Cloudy										
Short Cr	SC-3	981007	0806	0.1			22	6.1	6.66	771	3.0		Cloudy	1.2	422	1	110	3.30	0.94	7.64	2.937	156	
Short Cr	SC-3	981007	1354	0.2			23	9.1	7.59	760	0.8		Light Shower	1.1	942	<1	110	3.13	1.10	9.24	2.792		0.53
Short Cr	SC-3	981008	0838	0			20	7.7	6.96	748	1.0		Scattered Clouds	0.9	414	1	108	3.00	0.93	11.759	3.050	152	0.53
Short Cr	SC-4	981006	1513	0.2	2.7	1.4	25	10.7	8.63	461	6.5		Cloudy										
Short Cr	SC-4	981007	1145	0.2	2.5	1.0	24	8.0	7.16	516	5.5		Cloudy	2.4	288	5	96	0.90	1.13	0.922	1.250	<1	
Short Cr	SC-4	981007	1415	0.2	2.7	1.0	24	8.5	7.51	512	6.2		Light Shower	2.8	411	<1	90	0.89	1.33	1.172	1.254		47.53
Short Cr	SC-4	981008	0917	0.3	2.5	1.0	23	5.7	7.12	512	9.4		Scattered Clouds	2	294	6	92	0.90	0.89	0.909	1.185	37	24.03
Short Cr	SC-6	981006	1438	0.2	2.7	1.5	26	7.0	7.02	188	8.4		Cloudy										
Short Cr	SC-6	981007	1100	0.2	2.8	1.5	25	6.6	6.82	188	7.7		Cloudy	1.9	100	8	70	0.06	0.40	0.082	0.007	<1	
Short Cr	SC-6	981007	1336	0.3	2.8	1.6	25	7.2	6.97	188	7.2		Light Showers	2.1	108	5	68	0.06	0.53	0.088	0.008		34.71
Short Cr	SC-6	981008	0835	0.3	2.9	1.2	25	6.6	6.96	186	15.5		Scattered Clouds	1.9	115	3	70	0.09	0.43	0.086	0.011	2	18.69
Shoal Cr	SCC-2	981006	1201	0.1			25	6.7	6.79	78	1.7		Cloudy										
Shoal Cr	SCC-2	981007	0847	0			23	7.2	6.23	79	1.3		Cloudy	1.1	45	<1	24	0.01	0.29	<0.005	0.005	520	
Shoal Cr	SCC-2	981007	1431	0.1			24	7.2	6.9	77	3.7		Light Showers	0.9	48	5	36	0.03	0.37	<0.005	0.013		
Shoal Cr	SCC-2	981008	0902	0			21	6.8	6.12	75	2.6		Scattered Clouds	1.2	53	<1	26	0.02	0.27	<0.005	0.005	1300	
WWTP	STP-2	981006	1412	0.1			26	7.7	7.32	814	2.0		Cloudy										
WWTP	STP-2	981007	0906	0.4			25	7.7	7.06	838	2.2		Cloudy	1.9	454	2	116	3.62	1.53	9.893	3.800	7	
WWTP	STP-2	981007	1559	0.1			25	7.7	7.01	838	1.8		Light Showers										
WWTP	STP-2	981008	0817	0			19	8.0	6.72	210	6.8		Scattered Clouds	0.3	477	<1	114	6.95	1.15	13.661	3.330	2	

Appendix F-1, cont. Physical / chemical data collected during the Short Creek Intensive Survey conducted in October 1998, Lake Guntersville Cataloging Unit, Subwatershed 280. (ADEM 1998)

Stream Name	Station Number	Date *yymmdd*	Time *24hr*	Stream Depth *m*	Photometer Depth *m*	Secchi Depth *m*	Water Temp. *C*	Dissolved Oxygen *mg/l*	pH *s.u.*	Conductivity *umhos @25c*	Turbidity *NTU*	Stream Flow *cfs*	Weather Comment	BOD-5 *mg/L*	TDS *mg/L*	TSS *mg/L*	Hardness *mg/L*	NO2/ NO3 *mg/L*	TKN *mg/L*	T-PO4 *mg/l*	Ortho-Phosphate *mg/l*	Fecal Coliform *col/100ml*	Chlorophyll a *ug/l*
Turkey Cr	TK-2	981006	1401	0.1			25	6.9	7.5	802	1.6		Cloudy										
Turkey Cr	TK-2	981007	0842	0			24	6.5	7.28	803	1.3		Cloudy	1.5	448	1	120	4.238	1.309	9.142	3.377	470	
Turkey Cr	TK-2	981007	1548	0			24	6.6	7.2	809	1.6		Light Showers	1.4	458	<1	104	5.935	1.461	10.156	3.232		
Turkey Cr	TK-2	981008	1035	0.1			21	7.0	7.03	715	2.4		Scattered Clouds	1.1	425	3	122	6.578	1.293	8.049	2.688	>1200	
Turkey Cr	TK-3	981006	1340	0.2			24	7.9	7.62	789	1.6		Cloudy										
Turkey Cr	TK-3	981007	0805	0.1			23	7.5	7.04	806	1.0		Cloudy	1	448	<1	118	3.589	1.251	10.148	3.556	140	
Turkey Cr	TK-3	981007	1518	0.2			24	7.6	7.38	806	1.7		Light Showers	1.2	437	<1	118	4.798	1.332	14.679	3.283		
Turkey Cr	TK-3	981008	0950	0.1			21	7.8	7.13	695	2.0		Scattered Clouds	1.1	417	1	124	6.034	1.2	12.987	2.504	880	

Appendix F-2. Physical / chemical data collected monthly from January 1996 to March 1998 as part of the Sand Mountain Nonpoint Source Monitoring Project in the Lake Guntersville Cataloging Unit (0603-0001) (ADEM 1998b).

Sub-Watershed	Stream Name	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	TON
#		#	*yymmdd*	*24hr*	*C*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*col/100ml*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*
220	S. Sauty Cr	SS-3	960118	1200	14	11	10.0	6.4	80	2	0	26	0.4	48	<1	0.038	2.149	0.182	0.046	0.144
220	S. Sauty Cr	SS-3	960215	1100	7	7	12.0	6.0	77	2	118	41	1.1	62	2	<.04	1.432	0.290	0.209	0.290
220	S. Sauty Cr	SS-3	960314	1120	24	12	10.9	7.0	72	3	122	30	1.0	53	2	<.05	1.714	0.223	0.282	0.223
220	S. Sauty Cr	SS-3	960425	1115	23	16	10.5	6.8	83	4	128	148	0.9	51	4	<.05	1.203	0.126	0.143	0.126
220	S. Sauty Cr	SS-3	960522	1100	29	23	8.0	7.2	111	1	0	60	0.9	85	<1	<.05	0.877	0.221		0.221
220	S. Sauty Cr	SS-3	960612	1045	24	20	8.1	7.1	133	21	0	750	1.8	95	26	0.086	0.748	0.100	0.388	0.014
220	S. Sauty Cr	SS-3	960717	1045	30	22	8.6	7.6	451	1	0	400	1.1	267	1	<.05	1.218	0.446	0.106	0.446
220	S. Sauty Cr	SS-3	960814	1030	26	22	8.0	6.4	117	4	40	290	0.8	61	2	<.05	1.142	0.244	0.056	0.244
220	S. Sauty Cr	SS-3	960904	1100	28	17	8.1	7.0	151	16	70	2100	2.2	63	7	0.132	0.833	0.515	0.048	0.383
220	S. Sauty Cr	SS-3	961023	1100	15	9	9.5	6.5	120	2	28	470	2.3	108	1	<.10	1.940		<.05	
220	S. Sauty Cr	SS-3	961120	0940	14	12	9.8	6.7	90	2	52	570	0.7	72	<1	<.05	1.190	0.342	0.140	
220	S. Sauty Cr	SS-3	961218	1115	2	8	11.2	7.0	56	5	150	164	0.2	51	2	<.01	1.880	0.101	0.123	0.101
220	S. Sauty Cr	SS-3	970123	1100	16	9	11.0	6.4	54	5	134	46	0.7	50	3	<.005	1.718	0.234	0.052	0.234
220	S. Sauty Cr	SS-3	970220	1145	20	11	10.8	6.9	61	2	92	13	2.1	44	1	<.05	2.017	0.236	0.029	0.236
220	S. Sauty Cr	SS-3	970319	1100	19	14	9.3	5.6	44	193		>620	4.7	65	286	0.226	0.786	2.498	0.390	2.272
220	S. Sauty Cr	SS-3	970410	1100	15	12	10.2	7.0	49	1	54	66	2.5	56	2	0.378	1.117	0.468	0.067	0.090
220	S. Sauty Cr	SS-3	970514	1100	28	15	9.7	6.4	57	2	52	50	1.3	57	1	0.056	1.124	0.303	0.098	0.247
220	S. Sauty Cr	SS-3	970625	1045	27	23	8.6	7.1	62	5	110	148	0.5	65	6	0.034	1.136	0.353	0.085	0.219
220	S. Sauty Cr	SS-3	970723	1125	30	25	7.6	7.2	60	1	0	192	1.2	134	1	0.009	1.013	0.685	0.066	0.676
220	S. Sauty Cr	SS-3	970828	1010	26	22	8.5	7.5	95	2	0	450	0.7	450	<1	<.005	0.119	0.474	0.051	
220	S. Sauty Cr	SS-3	970924	1030	25	21	6.4	6.5	150	1	0	144	4.4	275	<1	<.05	0.234	0.725	0.095	0.725
220	S. Sauty Cr	SS-3	971015	1045	15	14	8.5	7.0	549	1	0	200	<.1	310	<1	0.046	1.596	0.912	0.157	0.866
220	S. Sauty Cr	SS-3	971120	1100	14	7	12.3	6.9	76	1	38	25	1.0	72	<1	<.05	1.576	0.223	0.113	0.233
220	S. Sauty Cr	SS-3	971203	1100	14	10	10.0	6.6	69	1	52	>3000	0.6	70	2	<.05	1.451	0.122	<.05	0.122
220	S. Sauty Cr	SS-3	980128	1100	14	7	11.0	6.5	65	4	106	100	1.2	62	3	<.05	2.729	0.278	<.05	0.278
220	S. Sauty Cr	SS-3	980218	1030	7	9	10.0	7.1	55	14	162	550	1.2	58	15	<.05	1.923	0.579	0.088	0.579
220	S. Sauty Cr	SS-3	980312	1100	0	6	12.0	5.1	48	6	110	48	0.7	63	5	<.05	1.719	0.138	0.083	0.138
220	S. Sauty Cr	SS-5	960118	1100	15	11	10.3	6.4	80	2		44	<.1	43	<1	0.038	2.270	0.278	0.023	0.240
220	S. Sauty Cr	SS-5	960215	1030	5	7	11.9	6.2	71	3		21	1.3	60	5	<.04	1.531	0.264	0.555	0.264
220	S. Sauty Cr	SS-5	960314	1000	19	9	11.3	6.7	61	2		54	0.7	44	<1	<.05	1.819	0.176	0.181	0.176
220	S. Sauty Cr	SS-5	960425	1030	21	14	10.9	6.6	58	6		102	1.0	42	1	<.05	1.253	<.1	0.117	<.1
220	S. Sauty Cr	SS-5	960522								DRY									
220	S. Sauty Cr	SS-5	960612								DRY									
220	S. Sauty Cr	SS-5	960717								DRY									
220	S. Sauty Cr	SS-5	960814								DRY									

Appendix F-2, cont. Physical / chemical data collected monthly from January 1996 to March 1998 as part of the Sand Mountain Nonpoint Source Monitoring Project in the Lake Guntersville Cataloging Unit (0603-0001) (ADEM 1998b).

Sub-Watershed	Stream Name	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	TON
#		#	*yymmdd*	*24hr*	*C*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*col/100ml*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*
220	S. Sauty Cr	SS-5	960904	1100	28	17	8.1	7.0	151	16		2100	2.2	63	7	0.132	0.833	0.515	0.048	0.383
220	S. Sauty Cr	SS-5	961023								DRY									
220	S. Sauty Cr	SS-5	961120	0900	10	11	10.2	7.4	74	2		108	1.3	65	<1	<.05	1.020	0.232	0.140	0.000
220	S. Sauty Cr	SS-5	961218	1040	3	8	11.8	7.2	48	5		220	0.4	45	1	<.01	1.780	<.05	0.123	<.05
220	S. Sauty Cr	SS-5	970123	1030	15	9	11.2	5.6	49	4		56	0.2	56	1	<.005	1.914	0.106	0.059	0.106
220	S. Sauty Cr	SS-5	970220	1100	21	11	11.0	6.7	49	2		25	2.3	34	<1	<.05	2.001	0.170	0.380	0.171
220	S. Sauty Cr	SS-5	970319	1030	19	14	10.0	6.5	42	158		>620	5.5	75	434	0.224	0.901	2.636	0.457	2.412
220	S. Sauty Cr	SS-5	970410	1030	14	14	9.0	6.9	58	3		15	0.6	48	<1	0.093	1.043	0.580	0.067	0.487
220	S. Sauty Cr	SS-5	970514	1030	21	16	9.7	6.8	46	2		13	1.2	48	<1	0.242	1.149	0.038	0.098	0.066
220	S. Sauty Cr	SS-5	970625	1010	24	22	8.6	7.2	52	4		70	0.3	60	2	0.042	1.225	0.420	0.023	0.378
220	S. Sauty Cr	SS-5	970723								DRY									
220	S. Sauty Cr	SS-5	970828								DRY									
220	S. Sauty Cr	SS-5	970924								DRY									
220	S. Sauty Cr	SS-5	971015								DRY									
220	S. Sauty Cr	SS-5	971120	1015	10	6	12.9	7.0	8330	1		6	0.6	1401	1	0.059	1.533	<.1	<.050	<.1
220	S. Sauty Cr	SS-5	971203	1015	15	9	10.6	7.1	55	1		33	0.7	60	1	<.05	1.326	<.1	<.005	<.1
220	S. Sauty Cr	SS-5	980128	1030	15	7	11.7	5.3	58	4		19	1.4	57	2	<.05	2.812	0.217	<.05	0.217
220	S. Sauty Cr	SS-5	980218	1000	9	9	10.2	6.7	48	16		540	1.4	54	10	<.05	1.921	0.454	0.087	0.454
220	S. Sauty Cr	SS-5	980312	1030	0	5	12.7	6.0	42	4		55	1.1	60	1	<.05	1.783	0.154	0.079	0.154
250	Town Cr	T-3	960118	1230	15	11	10.3	6.2	62	11	26	40	<.1	40	14	0.034	1.821	0.172	0.020	0.138
250	Town Cr	T-3	960215	1130	7	7	11.3	5.5	63	3	190	57	1.1	54	2	0.072	1.301	0.263	0.364	0.191
250	Town Cr	T-3	960314	1200	20	10	11.5	6.5	56	4	170	42	0.8	37	1	<.05	1.548	0.170	0.141	0.170
250	Town Cr	T-3	960425	1145	21	15	10.0	6.7	53	6	144	244	1.0	36	5	<.05	1.041	0.105	0.873	0.105
250	Town Cr	T-3	960522	1130	28	24	7.5	7.2	71	1	50	58	0.8	59	<1	0.074	0.539	0.143		0.069
250	Town Cr	T-3	960612	1115	25	20	8.2	7.1	65	690	235	>6000	6.7	33	1120	0.177	0.567	1.341	1.977	1.264
250	Town Cr	T-3	960717	1115	31	23	7.8	7.1	94	3	16	19	0.8	74	<1	0.060	0.233	0.229	0.100	0.169
250	Town Cr	T-3	960814	1100	27	23	7.7	6.5	77	11	72	340	0.7	56	6	0.064	0.722	0.281	0.054	0.217
250	Town Cr	T-3	960904	1200	28	18	7.7	7.1	150	34		1240	0.7	74	12	0.271	0.536	0.455	0.048	0.184
250	Town Cr	T-3	961023	1245	16	10	9.0	6.8	60	3	35	240	1.9	75	1	<.10	1.390		<.05	
250	Town Cr	T-3	961120	1010	12	11	7.7	6.4	64	3	120	50	1.0	61	1	<.05	0.980	0.313	0.120	
250	Town Cr	T-3	961218	1145	2	8	11.1	6.9	46	9	180	260	0.9	39	4	<.01	1.720	0.426	0.141	0.426
250	Town Cr	T-3	970123	1130	16	9	10.7	6.2	44	5	176	57	0.3	56	2	<.005	1.815	0.145	0.037	0.145
250	Town Cr	T-3	970220	1310	21	11	12.1	6.7	44	3	190	12	2.0	32	3	<.05	1.848	0.151	0.008	0.151
250	Town Cr	T-3	970319	1130	18	14	9.4	5.8	42	156		>240	5.6	67	2.67	0.154	0.830	2.172	0.272	2.018
250	Town Cr	T-3	970410	1200	19	13	9.9	6.6	39	2	187	24	0.6	40	1	0.073	0.913	0.598	0.067	0.525

Appendix F-2, cont. Physical / chemical data collected monthly from January 1996 to March 1998 as part of the Sand Mountain Nonpoint Source Monitoring Project in the Lake Guntersville Cataloging Unit (0603-0001) (ADEM 1998b).

Sub-Watershed	Stream Name	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	TON
#		#	*yymmdd*	*24hr*	*C*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*col/100ml*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*
250	Town Cr	T-3	970514	1230	28	16	9.5	6.4	0	3	126	25	1.1	49	1	0.185	0.999	0.225	0.039	0.040
250	Town Cr	T-3	970625	1130	24	21	8.7	6.8	44	10	165	120	0.9	55	10	0.027	0.898	0.509	0.198	0.482
250	Town Cr	T-3	970723	1150	27	25	7.2	7.0	58	2		240	0.2	61	<1	<.005	0.702	0.504	0.048	0.504
250	Town Cr	T-3	970828	1045	31	23	6.4	6.9	61	1	0	290	0.3	87	<1	<.005	0.104	0.318	0.043	
250	Town Cr	T-3	970924	1100	24	21	6.4	6.3	101	1	22	260	2.8	77	<1	<.05	0.102	0.425	0.031	0.425
250	Town Cr	T-3	971015	1120	14	15	7.0	6.1	111	7	26	640	0.1	73	<1	0.091	0.136	0.807	<.005	0.716
250	Town Cr	T-3	971120	1230	13	7	12.3	6.6	8030	2	95	17	0.7	1447	4	0.076	1.339	<.1	<.050	<.1
250	Town Cr	T-3	971203	1130	12	9	10.1	6.5	48	1	92	20	0.5	57	<1	<.05	1.202	<.1	<.005	<.1
250	Town Cr	T-3	980128	1130	12	7	11.0	5.7	53	6	115	52	1.6	54	3	<.05	1.988	0.227	<.05	0.227
250	Town Cr	T-3	980218	1100	8	9	10.3	6.9	42	21		900	1.6	48	23	<.05	1.616	0.555	0.084	0.555
250	Town Cr	T-3	980312	1130	0	6	11.7	6.3	41	8	192	30	1.2	58	16	<.05	1.400	0.228	0.087	0.228
250	Town Cr	T-5	960118	1315	15	12	10.2	6.2	67	4		70	0.3	40	1	0.034	2.054	0.222	0.062	0.188
250	Town Cr	T-5	960215	1000	8	7	12.2	7.7	66	2		22	0.9	56	3	<.04	1.355	0.247	0.172	0.247
250	Town Cr	T-5	960314	0945	19	10	11.2	6.6	59	3		25	1.0	40	1	0.085	2.150	0.419	0.322	0.334
250	Town Cr	T-5	960425	1000	22	15	9.9	6.4	55	6		328	1.0	42	5	<.05	1.112	0.115	0.139	0.115
250	Town Cr	T-5	960522	1200	29	27	10.5	7.1	69	2		116	1.1	61	<1	0.161	0.792	0.254		0.093
250	Town Cr	T-5	960612	1000	21	21	7.8	7.0	61	5		212	0.9	51	0.2	0.063	0.431	<.1	0.367	<.1
250	Town Cr	T-5	960717	1000	28	23	7.4	7.1	87	1		176	1.2	76	1	0.082	0.361	0.298	0.096	0.216
250	Town Cr	T-5	960814	0930	24	23	7.4	6.7	74	13		156	1.0	58	<1	0.085	0.475	0.311	0.052	0.231
250	Town Cr	T-5	960904	1000	26	18	8.2	7.0	138	4		750	1.0	52	1	0.103	0.411	0.324	<.04	0.221
250	Town Cr	T-5	961023	1000	12	9	9.2	6.6	59	1		104	1.8	70	<1	<.10	1.200		0.080	
250	Town Cr	T-5	961120	1050	16	12	9.8	7.5	71	3		164	1.5	64	<1	<.05	1.050	0.250	0.200	
250	Town Cr	T-5	961218	1000	3	8	11.3	6.9	47	12		200	0.8	44	9	<.01	1.750	0.581	0.141	0.581
250	Town Cr	T-5	970123	1000	15	9	10.9	6.2	48	6		65	0.7	65	2	<.005	2.016	0.224	0.132	0.224
250	Town Cr	T-5	970220	1030	21	10	10.6	6.1	48	2		23	1.5	34	<1	<.05	1.954	0.171	0.268	0.171
250	Town Cr	T-5	970319	1000	18	14	9.6	6.2	45	88		>1240	7.6	67	159	<.05	1.211	1.610	0.165	1.610
250	Town Cr	T-5	970410	1000	13	13	9.4	6.9	41	3		19	0.9	42	2	0.093	0.970	0.411	0.067	0.318
250	Town Cr	T-5	970514	1000	22	15	9.5	6.3	42	3		28	1.1	47	1	0.102	0.059	0.335	0.039	0.233
250	Town Cr	T-5	970625	0945	25	21	8.4	7.1	46	5		144	0.3	54	5	0.047	0.973	0.378	0.021	0.331
250	Town Cr	T-5	970723	1030	28	27	7.1	6.3	57	1		800	1.3	56	<1	0.030	0.373	0.435	0.041	0.405
250	Town Cr	T-5	970828	1115	30	26	7.8	7.2	44	1		92	1.0	59	<1	<.005	0.127	0.497	0.040	
250	Town Cr	T-5	970924	1000	23	22	5.3	5.9	88	2		27	5.7	55	<1	1.040	0.379	1.683	0.048	0.643
250	Town Cr	T-5	971015	1000	16	16	8.2	6.5	106	1		104	<.1	70	<1	0.092	0.512	0.780	<.005	0.688
250	Town Cr	T-5	971120	1000	14	6	12.3	6.6	45	1		16	0.7	52	<1	<.05	1.460	0.111	<.050	0.111
250	Town Cr	T-5	971203	1000	12	9	10.3	6.6	51	1		58	0.7	56	1	<.05	1.425	<.1	<.005	<.1

Appendix F-2, cont. Physical / chemical data collected monthly from January 1996 to March 1998 as part of the Sand Mountain Nonpoint Source Monitoring Project in the Lake Guntersville Cataloging Unit (0603-0001) (ADEM 1998b).

Sub-Watershed	Stream Name	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	TON
#		#	*yymmdd*	*24hr*	*C*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*col/100ml*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*
250	Town Cr	T-5	980128	1000	11	7	11.3	6.1	55	4		37	1.4	53	2	<.05	2.092	0.062	<.05	0.062
250	Town Cr	T-5	980218	1130	8	9	10.7	7.0	44	31		620	1.4	58	38	<.05	1.759	0.841	0.108	0.841
250	Town Cr	T-5	980312	1000	0	6	12.0	6.0	40	5		19	1.1	56	4	<.05	1.612	0.189	0.087	0.189
270	Little Shoal Cr	L SHOAL	960117	1135	10	9	10.8	6.0	71	2		98	0.9	54	3	0.080	2.344	0.277	0.057	0.097
270	Little Shoal Cr	L SHOAL	960214	1045	11	7	11.8	6.1	68	2		58	1.3	55	<1	<.04	1.580	0.275	0.233	0.275
270	Little Shoal Cr	L SHOAL	960313	1205	22	10	11.3	6.7	70	2		9	0.9	36	<1	0.073	2.377	0.189	0.237	0.116
270	Little Shoal Cr	L SHOAL	960424	1100	18	14	10.0	6.1	58	2		310	0.8	40	<1	0.065	1.637	0.096	<.03	0.031
270	Little Shoal Cr	L SHOAL	960521	1201	34	24	7.4	6.8	66	1		40	0.7	54	<1	<.05	0.904	0.161	0.533	0.161
270	Little Shoal Cr	L SHOAL	960611	1031	21	20	8.1	7.4	69	4		156	2.4	60	6	<.05	0.474	0.236	1.033	0.236
270	Little Shoal Cr	L SHOAL	960716	1050	29	19	6.6	7.0	82	2		47	0.8	54	<1	0.073	0.165	0.259	<.04	0.186
270	Little Shoal Cr	L SHOAL	960813	1115	29	22	8.0	6.9	97	3		190	0.3	55	1	<.05	1.030	0.212	<.04	0.212
270	Little Shoal Cr	L SHOAL	960903	1135	27	17	8.1	6.9	99	5		400	1.1	58	2	0.073	0.801	0.328	<.04	0.255
270	Little Shoal Cr	L SHOAL	961022	1135	24	11	9.1	6.8	49	1		34	1.2	60	1	<.10	1.890		<.05	
270	Little Shoal Cr	L SHOAL	961119	1050	21	14	9.9	6.8	53	2		50	<.1	58	<1	<.05	1.210	0.278	0.170	
270	Little Shoal Cr	L SHOAL	961217	1105	3	10	10.6	6.3	48	6		2530	2.0	42	3	0.021	2.170	0.124	0.211	0.103
270	Little Shoal Cr	L SHOAL	970122	1045	11	9	10.6	5.3	49	2		84	0.9	39	1	<.005	2.741	0.049	0.048	0.050
270	Little Shoal Cr	L SHOAL	970219	1125	17	10	10.9	6.1	52	1		10	0.4	39	4	<.05	2.777	<.1	0.008	<.10
270	Little Shoal Cr	L SHOAL	970318	1045	21	13	10.0	6.2	47	3		88	0.8	55	3	<.05	2.230	<.1	<.05	<.10
270	Little Shoal Cr	L SHOAL	970409	1130	16	14	10.0	6.6	47	2		66	0.4	46	2	0.091	1.635	0.235	0.080	0.044
270	Little Shoal Cr	L SHOAL	970513	1145	20	16	9.1	6.4	42	3		120	1.1	53	1	0.151	1.707	0.105	0.036	<.05
270	Little Shoal Cr	L SHOAL	970624	1030	32	24	8.7	6.9	55	3		320	2.0	64	<1	0.027	2.188	0.169	0.016	0.142
270	Little Shoal Cr	L SHOAL	970722	1040	23	24	6.8	7.2	61	2		45	0.9	54	<1	0.030	0.905	0.516	0.041	0.486
270	Little Shoal Cr	L SHOAL	970827	1105	28	21	7.0	6.8	49	2		14	2.9	47	<1	0.015	0.256	0.287	0.033	0.272
270	Little Shoal Cr	L SHOAL	970923	1105	23	19	6.5	6.0	85	4			0.5	46	8	<.05	0.109	0.376	0.041	0.376
270	Little Shoal Cr	L SHOAL	971014	1030	12	18	8.1	6.1	83	2		1040	0.4	62	2	0.100	1.456	0.611	<.005	0.511
270	Little Shoal Cr	L SHOAL	971119	1200	12	9	11.0	6.3	51	1		0	1.3	53	<1	<.05	2.256	<.1	<.050	<.1
270	Little Shoal Cr	L SHOAL	971202	1135	11	9	10.4	5.4	50	1		102	0.6	60	<1	<.05	2.191	<.1	<.005	<.1
270	Little Shoal Cr	L SHOAL	980127	1030	8	8	10.7	5.7	58	4		60	3.4	56	<1	<.05	3.580	0.067	<.05	0.067
270	Little Shoal Cr	L SHOAL	980217	1100	14	10	10.5	6.3	46	70		>6000	3.4	58	92	0.050	1.941	1.491	0.353	1.441
270	Little Shoal Cr	L SHOAL	980311	1025	3	7	11.5	6.6	52	3		56	1.2	63	1	<.05	2.441	<.05	0.079	<.05
270	Scarham Cr	SC-3	960117	1100	9	9	11.0	6.1	78	3	85	216	1.2	44	1	0.115	2.359	0.338	0.060	0.223
270	Scarham Cr	SC-3	960214	1030	12	7	12.4	6.4	73	3		140	0.9	58	1	0.069	1.669	0.368	0.222	0.299
270	Scarham Cr	SC-3	960313	1140	20	10	11.6	6.5	74	4	149	70	1.6	46	2	<.05	2.333	0.235	0.212	0.235
270	Scarham Cr	SC-3	960424	1030	15	15	10.0	6.2	66	5	102	310	1.2	48	3	<.05	1.533	0.155	0.950	0.155
270	Scarham Cr	SC-3	960521	1100	38	24	6.9	7.0	81	1	10	230	0.9	59	<1	<.05	1.283	0.266	0.804	0.266

Appendix F-2, cont. Physical / chemical data collected monthly from January 1996 to March 1998 as part of the Sand Mountain Nonpoint Source Monitoring Project in the Lake Guntersville Cataloging Unit (0603-0001) (ADEM 1998b).

Sub-Watershed	Stream Name	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	BOD-5	TDS	TSS	NH3	NO2/NO3	TKN	T-PO4	TON
#		*#*	*yymmdd*	*24hr*	*C*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*col/100ml*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*
270	Scarham Cr	SC-3	960611	1020	20	20	7.3	7.0	79	2	55	660	<.1	66	1	0.069	0.903	<.1	0.065	<.1
270	Scarham Cr	SC-3	960716	1030	28	21	5.1	6.9	89	1		300	1.1	58	1	0.110	0.085	0.385	<.04	0.275
270	Scarham Cr	SC-3	960813	1045	27	24	7.3	6.8	114	2	13	88	0.4	61	1	0.054	0.722	0.300	0.058	0.246
270	Scarham Cr	SC-3	960903	1045	28	18	6.9	7.0	119	2	15	168	1.1	60	<1	0.088	0.866	0.345	<.04	0.257
270	Scarham Cr	SC-3	961022	1100	22	11	9.1	6.8	62	1	3	65	1.3	71	1	<.10	1.510		<.05	
270	Scarham Cr	SC-3	961119	1025	19	13	10.4	7.1	68	4	90	410	0.6	71	<1	<.05	1.440	0.387	0.150	
270	Scarham Cr	SC-3	961217	1030	3	9	10.4	6.4	55	27		4200	2.6	56	35	<.01	2.140	1.228	0.211	1.228
270	Scarham Cr	SC-3	970122	1015	10	8	10.7	6.2	53	3	65	110	0.8	43	1	0.029	2.594	0.142	0.037	0.113
270	Scarham Cr	SC-3	970219	1040	15	10	11.0	6.3	54	2	46	32	0.8	37	4	<.05	2.518	<.1	0.022	<.10
270	Scarham Cr	SC-3	970318	1030	21	12	9.9	6.4	48	5	115	196	0.9	53	4	<.05	1.959	0.236	<.005	0.236
270	Scarham Cr	SC-3	970409	1100	15	13	9.9	6.5	49	3	111	60	0.7	47	4	0.111	1.434	0.467	0.080	0.356
270	Scarham Cr	SC-3	970513	1030	19	16	9.0	6.3	47	3	88	56	1.3	52	<1	0.083	1.503	0.167	0.042	0.084
270	Scarham Cr	SC-3	970624	1000	32	23	8.9	6.9	56	4	67	168	2.0	63	3	<.005	1.596	0.464	0.181	0.464
270	Scarham Cr	SC-3	970722	1017	23	24	5.7	6.7	65	2	12	210	1.3	60	<1	0.010	1.115	0.695	0.081	0.685
270	Scarham Cr	SC-3	970827	1030	28	22	6.8	6.7	59	1	0	80	3.0	57	<1	<.005	0.109	0.418	0.044	0.418
270	Scarham Cr	SC-3	970923	1015	22	20	4.5	6.1	94	1	28		1.0	57	<1	<.05	0.038	0.566	0.046	0.566
270	Scarham Cr	SC-3	971014	1020	12	18	7.3	6.1	86	1	13	340	0.1	59	<1	0.046	0.622	0.612	0.225	0.566
270	Scarham Cr	SC-3	971119	1115	11	7	11.5	7.0	51	1	71	42	1.2	50	<1	<.05	1.811	0.196	<.050	0.196
270	Scarham Cr	SC-3	971202	1045	12	9	10.7	4.7	52	2	69	72	1.1	58	<1	0.077	1.631	0.249	0.110	0.172
270	Scarham Cr	SC-3	980127	1020	9	8	10.7	5.7	58	8	125	240	4.7	56	2	<.05	2.823	0.235	<.05	0.235
270	Scarham Cr	SC-3	980217	1025	15	9	10.4	7.2	46	136		12,700	4.7	60	223	<.05	1.504	2.099	0.532	2.099
270	Scarham Cr	SC-3	980311	1000	1	6	11.6	6.1	48	8		180	1.4	61	8	<.05	1.921	0.056	0.093	0.056
270	Scarham Cr	SC-4	960117	1235	11	9	10.8	6.4	77	3		160	1.2	43	<1	0.147	2.427	0.263	0.036	0.116
270	Scarham Cr	SC-4	960214	1105	12	7	11.9	6.3	73	2		60	1.2	63	2	0.044	1.644	0.404	0.400	0.360
270	Scarham Cr	SC-4	960313	1235	22	9	11.6	6.8	72	4		44	1.4	40	2	<.05	2.183	0.354	0.217	0.354
270	Scarham Cr	SC-4	960424	1130	17	16	10.2	6.4	67	5		200	1.3	45	3	<.05	1.427	0.176	0.341	0.176
270	Scarham Cr	SC-4	960521	1300	34	24	8.5	7.5	75	1		20	1.5	54	<1	0.133	0.971	0.415	0.834	0.282
270	Scarham Cr	SC-4	960611	1100	20	20	8.8	7.2	93	5		148	<.1	68	2	0.370	1.316	0.300	0.547	
270	Scarham Cr	SC-4	960716	1120	28	22	7.3	7.5	86	2		96	1.5	56	<1	0.158	0.038	0.340	<.04	0.182
270	Scarham Cr	SC-4	960813	1200	29	25	8.5	7.2	197	3		52	<.1	74	<1	<.05	1.082	0.362	0.059	0.362
270	Scarham Cr	SC-4	960903	1205	28	19	8.3	7.2	114	2		68	1.0	62	<1	0.085	0.663	0.399	<.04	0.314
270	Scarham Cr	SC-4	961022	1145	28	11	10.0	6.8	61	1		94	1.2	71	1	<.10	1.750		<.05	
270	Scarham Cr	SC-4	961119	1125	20	14	10.5	6.9	77	3		340	0.9	69	<1	0.060	1.540	0.432	0.140	0.428
270	Scarham Cr	SC-4	961217	1120	3	10	10.7	6.6	54	30		4120	2.5	55	37	0.055	2.300	1.133	0.217	1.078
270	Scarham Cr	SC-4	970122	1110	10	8	11.1	6.2	52	3		94	0.7	41	2	0.031	2.507	0.072	0.060	0.041

Appendix F-2, cont. Physical / chemical data collected monthly from January 1996 to March 1998 as part of the Sand Mountain Nonpoint Source Monitoring Project in the Lake Guntersville Cataloging Unit (0603-0001) (ADEM 1998b).

Sub-Watershed	Stream Name	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	TON
#		#	*yymmdd*	*24hr*	*C*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*col/100ml*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*
270	Scarham Cr	SC-4	970219	1200	16	10	11.0	6.4	53	3		17	0.6	53	2	<.05	2.407	0.161	0.022	0.161
270	Scarham Cr	SC-4	970318	1115	27	13	10.2	6.5	46	5		77	1.2	52	4	<.05	1.880	0.319	<.05	0.319
270	Scarham Cr	SC-4	970409	1200	15	14	9.5	6.8	48	3		45	0.6	46	<1	0.106	1.341	0.467	0.079	0.361
270	Scarham Cr	SC-4	970513	1210	19	16	9.2	6.7	44	3		38	1.3	51	1	0.179	1.390	0.153	0.040	<.05
270	Scarham Cr	SC-4	970624	1110	30	22	8.8	7.1	53	3		110	2.2	60	1	0.061	1.455	0.430	0.019	0.369
270	Scarham Cr	SC-4	970722	1115	23	25	6.8	7.0	67	3		630	1.6	64	1	0.006	1.269	1.023	0.099	0.917
270	Scarham Cr	SC-4	970827	1140	34	23	7.5	7.4	54	1		32	3.1	50	<1	<.004	0.070	0.455	0.045	0.455
270	Scarham Cr	SC-4	970923	1130	23	21	5.9	6.1	69	2			1.0	40	1	<.05	0.053	0.524	0.048	0.524
270	Scarham Cr	SC-4	971014	1100	15	18	7.8	5.8	84	1		1340	0.5	57	<1	0.095	0.625	0.670	0.110	0.575
270	Scarham Cr	SC-4	971119	1230	14	8	11.8	6.6	51	1		10	1.9	53	<1	<.05	1.692	0.301	<.050	0.301
270	Scarham Cr	SC-4	971202	1205	14	10	10.5	6.0	50	1		20	1.1	56	<1	<.05	1.560	<.1	<.005	<.1
270	Scarham Cr	SC-4	980127	1100	12	8	11.0	5.8	54	5		200	4.3	54	<1	<.05	2.720	0.191	<.05	0.191
270	Scarham Cr	SC-4	980217	1140	13	10	10.7	6.5	46	136		10800	4.3	59	209	0.051	1.554	2.078	0.498	2.027
270	Scarham Cr	SC-4	980311	1005	1	7	11.8	6.8	54	12		118	1.8	64	13	<.05	1.678	0.488	0.095	0.488
270	Shoal Cr	SHOAL	960117	1130	10	9	10.6	6.1	72	3		60	1.4	57	2	0.073	2.593	0.298	<.020	0.225
270	Shoal Cr	SHOAL	960214	1040	11	7	11.9	6.3	70	3		32	1.0	62	1	0.044	1.617	0.361	0.192	0.317
270	Shoal Cr	SHOAL	960313	1200	22	11	11.0	6.6	65	4		23	1.4	41	1	<.05	2.545	0.453	0.051	0.453
270	Shoal Cr	SHOAL	960424	1105	18	16	9.8	5.9	62	6		480	1.1	50	4	0.296	1.596	0.371	0.690	0.075
270	Shoal Cr	SHOAL	960521	1200	34	24	7.5	6.7	77	2		88	0.9	56	<1	<.05	0.841	0.192	0.539	0.192
270	Shoal Cr	SHOAL	960611	1030	21	19	7.7	7.2	69	6		196	<.1	63	2	<.05	0.627	<.1	0.336	<.1
270	Shoal Cr	SHOAL	960716	1045	29	20	7.5	7.0	84	2		22	0.4	56	<1	<.05	0.364	0.196	<.04	0.196
270	Shoal Cr	SHOAL	960813	1125	29	24	7.6	6.9	83	5		36	1.8	45	4	0.208	0.658	0.411	0.050	0.203
270	Shoal Cr	SHOAL	960903	1130	27	18	7.6	6.9	92	4		96	1.6	51	3	0.094	0.568	0.471	<.04	0.377
270	Shoal Cr	SHOAL	961022	1130	24	13	8.8	6.8	51	2		26	1.7	60	2	<.10	1.500		<.05	
270	Shoal Cr	SHOAL	961119	1055	21	14	10.0	6.8	57	2		74	0.7	56	<1	<.05	1.380	0.252	0.130	
270	Shoal Cr	SHOAL	961217	1100	3	10	10.5	6.3	51	5		112	1.4	43	3	<.01	2.480	0.180	0.136	0.180
270	Shoal Cr	SHOAL	970122	1040	11	7	10.8	5.2	50	3		50	1.1	40	3	0.045	2.741	<.05	0.141	<.05
270	Shoal Cr	SHOAL	970219	1120	17	10	10.6	6.2	54	2		15	<1	35	5	<.05	2.682	0.101	0.171	0.101
270	Shoal Cr	SHOAL	970318	1040	21	13	9.5	6.5	48	4		88	1.6	50	4	<.05	2.043	0.241	<.005	0.241
270	Shoal Cr	SHOAL	970409	1135	16	15	9.2	6.6	50	2		11	0.4	44	2	0.152	1.562	0.109	0.067	<.05
270	Shoal Cr	SHOAL	970513	1150	20	18	8.6	5.9	46	3		37	1.3	53	<1	0.056	1.267	0.306	0.039	0.250
270	Shoal Cr	SHOAL	970624	1030	32	25	7.7	7.0	52	3		72	2.0	53	1	0.027	1.405	0.522	0.080	0.495
270	Shoal Cr	SHOAL	970722	1045	23	24	6.5	7.1	66	2		>620	1.0	59	<1	0.030	0.761	0.421	0.153	0.391
270	Shoal Cr	SHOAL	970827	1100	28	20	7.7	7.0	62	1		47	2.6	57	<1	<.005	0.301	0.218	0.067	0.218
270	Shoal Cr	SHOAL	970923	1100	23	19	6.4	6.5	111	1			0.3	60	<1	<.05	0.174	0.420	0.035	0.420

Appendix F-2, cont. Physical / chemical data collected monthly from January 1996 to March 1998 as part of the Sand Mountain Nonpoint Source Monitoring Project in the Lake Guntersville Cataloging Unit (0603-0001) (ADEM 1998b).

Sub-Watershed	Stream Name	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	BOD-5	TDS	TSS	NH3	NO2/NO3	TKN	T-PO4	TON
#		#	*yymmdd*	*24hr*	*C*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*col/100ml*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*
270	Shoal Cr	SHOAL	971014	1035	12	18	7.6	5.8	83	4		930	0.5	58	5	0.096	0.622	0.718	<.005	0.622
270	Shoal Cr	SHOAL	971119	1205	12	9	10.7	6.5	51	2		4	1.2	49	<1	<.05	1.824	<.1	<.050	<.1
270	Shoal Cr	SHOAL	971202	1130	11	10	10.0	5.0	51	2		62	0.8	54	<1	<.05	1.807	0.118	<.005	0.118
270	Shoal Cr	SHOAL	980127	1035	8	8	10.7	5.7	58	5		44	1.8	56	1	<.05	3.249	0.268	<.05	0.268
270	Shoal Cr	SHOAL	980217	1050	14	9	10.6	6.4	54	13		1000	1.8	56	21	<.05	2.488	0.792	0.108	0.792
270	Shoal Cr	SHOAL	980311	1030	3	8	11.0	6.3	52	9		640	1.9	66	5	<.05	2.063	0.470	0.110	0.470
270	Whippoorwill Cr	W-1	960117	1230	11	10	10.9	6.1	64	2		124	0.7	40	<1	<.05	2.179	0.216	0.040	0.216
270	Whippoorwill Cr	W-1	960214	1100	12	7	12.1	6.5	62	2		13	0.7	48	1	0.050	1.435	0.273	0.284	0.223
270	Whippoorwill Cr	W-1	960313	1230	22	9	11.5	6.8	61	3		8	0.9	32	<1	0.069	1.914	0.209	0.210	0.140
270	Whippoorwill Cr	W-1	960424	1135	17	14	9.9	6.3	59	4		248	1.0	40	1	<.05	1.361	0.137	0.117	0.137
270	Whippoorwill Cr	W-1	960521	1301	34	24	8.8	8.4	63	1		26	0.9	49	<1	<.05	0.685	0.154	0.468	0.154
270	Whippoorwill Cr	W-1	960611	1105	20	19	9.0	7.4	63	4		260	<.1	50	4	0.056	0.476	<.1	0.423	<.1
270	Whippoorwill Cr	W-1	960716	1115	28	22	9.5	7.7	77	1		37	0.7	52	<1	0.127	0.063	0.198	0.040	0.071
270	Whippoorwill Cr	W-1	960813	1210	29	24	8.4	7.1	88	4		70	0.3	47	4	<.05	0.771	0.256	0.080	0.256
270	Whippoorwill Cr	W-1	960903	1200	28	18	8.4	7.2	95	4		260	1.1	51	<1	0.112	0.687	0.276	<.04	0.164
270	Whippoorwill Cr	W-1	961022	1150	28	11	9.7	7.0	50	1		15	0.8	60	1	<.10	1.090		<.05	
270	Whippoorwill Cr	W-1	961119	1120	20	13	10.3	6.9	48	2		56	0.7	55	1	<.05	0.930	0.443	0.150	
270	Whippoorwill Cr	W-1	961217	1115	3	10	10.7	6.4	45	8		530	2.0	50	7	<.01	1.830	0.237	0.148	0.237
270	Whippoorwill Cr	W-1	970122	1115	10	8	10.9	6.2	42	3		52	0.9	31	<1	<.005	2.188	0.052	0.078	0.052
270	Whippoorwill Cr	W-1	970219	1205	16	10	11.1	6.2	46	2		5	0.2	31	<1	<.05	2.154	0.146	0.056	0.146
270	Whippoorwill Cr	W-1	970318	1120	27	13	10.0	6.5	44	3		58	0.5	44	3	<.05	1.721	0.127	0.343	0.127
270	Whippoorwill Cr	W-1	970409	1205	15	14	9.6	6.6	44	2		40	0.5	42	2	0.083	1.223	0.455	0.148	0.372
270	Whippoorwill Cr	W-1	970513	1205	19	16	9.0	6.4	40	3		53	1.8	46	1	0.049	1.255	0.266	0.035	0.117
270	Whippoorwill Cr	W-1	970624	1105	30	22	8.9	7.0	48	3		100	1.9	54	5	0.320	1.379	0.354	0.037	0.322
270	Whippoorwill Cr	W-1	970722	1110	23	25	7.4	7.2	57	2		>620	0.9	51	<1	0.030	0.672	0.376	0.040	0.346
270	Whippoorwill Cr	W-1	970827	1150	34	23	10.1	8.4	44	3		55	3.6	5	43	<.005	0.034	0.366	0.052	0.366
270	Whippoorwill Cr	W-1	970923	1135	23	21	6.6	6.3	88	1			0.6	44	<1	<.05	0.030	0.229	0.029	0.227
270	Whippoorwill Cr	W-1	971014	1105	15	18	8.7	6.3	75	2		570	<.1	48	<1	0.105	0.525	0.571	<.005	0.466
270	Whippoorwill Cr	W-1	971119	1235	14	8	11.4	6.5	45	1		7	1.5	48	1	<.05	1.657	0.169	<.050	0.169
270	Whippoorwill Cr	W-1	971202	1200	14	9	10.7	4.7	44	1		24	0.9	53	<1	<.05	1.516	<.1	<.005	<.1
270	Whippoorwill Cr	W-1	980127	1105	12	8	11.0	6.1	54	5		64	3.5	50	2	<.05	2.799	0.189	<.05	0.189
270	Whippoorwill Cr	W-1	980217	1130	13	10	10.7	6.4	45	94		>1200	3.5	56	129	<.05	1.743	1.506	0.333	1.506
270	Whippoorwill Cr	W-1	980311	1100	1	7	11.8	6.7	46	5		180	1.2	54	3	<.05	1.798	0.183	0.083	0.183
280	Short Cr	SH-3	960117	1000	10	10	10.3	5.9	70	6	130	136	0.9	46	3	0.115	2.170	0.286	0.059	0.171
280	Short Cr	SH-3	960214	1000	11	7	11.5	6.5	67	5	128	55	1.3	56	4	<.04	1.571	0.372	0.395	0.372

Appendix F-2, cont. Physical / chemical data collected monthly from January 1996 to March 1998 as part of the Sand Mountain Nonpoint Source Monitoring Project in the Lake Guntersville Cataloging Unit (0603-0001) (ADEM 1998b).

Sub-Watershed	Stream Name	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	TON
#		#	*yymmdd*	*24hr*	*C*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*col/100ml*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*
280	Short Cr	SH-3	960313	1100	20	10	11.3	6.7	69	10	177	64	2.2	39	6	<.05	2.168	0.291	0.276	0.291
280	Short Cr	SH-3	960424	1000	17	16	9.2	6.4	62	8	120	204	1.2	45	4	0.090	1.285	0.244	0.818	0.154
280	Short Cr	SH-3	960521	1030	30	22	7.1	7.8	73	3	0	112	0.8	53	1	0.061	0.617	0.246	0.915	0.085
280	Short Cr	SH-3	960611	1000	23	20	6.9	7.1	74	8	0	270	<.1	66	3	0.186	0.461	0.125	0.738	
280	Short Cr	SH-3	960716	1000	27	20	5.6	7.1	109	2	30	350	1.0	65	<1	0.097	0.119	0.340	<.04	0.243
280	Short Cr	SH-3	960813	1000	28	24	6.0	6.8	111	17	62	104	0.2	52	2	0.162	0.471	0.422	0.070	0.260
280	Short Cr	SH-3	960903	1000	27	18	6.5	7.0	118	6	13	156	1.3	67	1	0.211	0.600	0.456	<.04	0.245
280	Short Cr	SH-3	961022	1000	19	11	8.7	7.5	55	2	52	124	1.1	70	2	<.10	1.900		<.05	
280	Short Cr	SH-3	961119	1000	16	12	9.7	6.6	61	7	90	232	0.8	66	4	<.05	0.860	0.388	0.170	
280	Short Cr	SH-3	961217	1000	3	10	10.1	6.9	48	47		1650	2.5	47	72	<.01	1.610	1.340	0.201	1.340
280	Short Cr	SH-3	970122	1000	9	8	10.5	6.2	47	6	100	510	1.0	31	7	0.029	2.086	0.339	0.051	0.310
280	Short Cr	SH-3	970219	1000	14	9	10.4	6.0	49	5	104	37	0.8	38	3	0.054	2.160	0.314	0.017	0.260
280	Short Cr	SH-3	970318	1000	19	13	9.5	6.4	44	9	155	176	1.4	53	7	<.05	1.752	0.321	0.007	0.321
280	Short Cr	SH-3	970409	1000	18	14	8.8	6.4	46	7	129	144	0.9	46	6	0.086	1.310	0.630	0.084	0.544
280	Short Cr	SH-3	970513	1000	15	16	8.6	6.0	45	5	66	77	1.3	47	2	0.070	1.343	0.354	0.042	0.284
280	Short Cr	SH-3	970624	0930	28	23	7.9	6.6	51	6	102	240	2.0	62	6	<.005	1.301	0.628	0.037	0.628
280	Short Cr	SH-3	970722	1000	23	24	5.6	6.6	61	18	8	880	1.4	62	6	<.005	0.776	0.849	0.085	0.849
280	Short Cr	SH-3	970827	1000	27	21	7.2	6.7	54	4	0	260	2.6	58	<1	<.005	0.273	0.512	0.052	0.512
280	Short Cr	SH-3	970923	0945	21	20	4.5	6.0	97	1	0		0.8	56	<1	<.05	0.053	0.516	0.039	0.516
280	Short Cr	SH-3	971014	1000	14	18	7.3	5.9	76	3	0	560	<.1	54	<1	0.098	0.420	0.738	<.005	0.640
280	Short Cr	SH-3	971119	1000	12	8	11.2	6.5	47	3	88	45	1.7	49	1	<.05	1.341	0.388	<.050	0.388
280	Short Cr	SH-3	971202	1000	11	10	9.6	4.7	46	4	87	61	0.9	55	<1	<.05	1.169	0.190	<.005	0.190
280	Short Cr	SH-3	980127	1000	9	8	10.6	6.9	54	8	148	220	3.9	53	6	<.05	2.444	0.184	<.05	0.184
280	Short Cr	SH-3	980217	1000	16	9	10.2	6.4	38	152		6000	3.9	56	264	<.05	1.162	1.723	0.341	1.723
280	Short Cr	SH-3	980311	0930	1	6	11.3	6.7	46	17		184	1.7	61	21	<.05	1.837	0.397	0.101	0.397
280	Short Cr	SH-4	960117	1300	12	10	10.8	6.7	92	4		77	0.9	55	2	0.234	2.233	0.390	0.057	0.156
280	Short Cr	SH-4	960214	1130	12	8	11.6	6.5	100	5		58	1.6	70	5	0.371	1.497	0.670	0.243	0.299
280	Short Cr	SH-4	960313	1315	23	11	11.4	7.2	88	7		184	1.4	52	4	0.085	2.150	0.419	0.322	0.334
280	Short Cr	SH-4	960424	1200	18	16	10.0	6.6	96	7		340	1.1	63	5	0.065	1.655	0.225	0.189	0.160
280	Short Cr	SH-4	960521	1330	30	25	8.8	8.2	188	2		60	0.6	122	1	0.116	3.271	0.317	0.887	0.201
280	Short Cr	SH-4	960611	1130	22	21	8.6	7.5	162	5		330	<1	112	3	0.091	2.216	<.1	0.886	
280	Short Cr	SH-4	960716	1145	29	22	8.4	7.5	678	1		119	0.5	367	<1	0.249		0.786	1.094	0.537
280	Short Cr	SH-4	960813	1245	29	25	8.9	7.6	389	3		81	<.1	161	1	0.095	4.744	0.413	0.351	0.318
280	Short Cr	SH-4	960903	1230	26	19	8.8	7.7	363	2		40	0.6	160	<1	0.114	3.293	0.456	0.194	0.342
280	Short Cr	SH-4	961022	1230	24	13	10.2	8.1	150	2		35	1.1	138	2	<.10	4.600		0.240	

Appendix F-2, cont. Physical / chemical data collected monthly from January 1996 to March 1998 as part of the Sand Mountain Nonpoint Source Monitoring Project in the Lake Guntersville Cataloging Unit (0603-0001) (ADEM 1998b).

Sub-Watershed	Stream Name	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	TON
#		#	*yymmdd*	*24hr*	*C*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*col/100ml*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*
280	Short Cr	SH-4	961119	1150	20	13	10.6	7.3	84	5		100	0.4	82	1	<.05	1.050	0.367	0.500	
280	Short Cr	SH-4	961217	1145	2	9	10.8	6.5	58	22		490	2.2	54	25	<.01	1.670	0.927	0.164	0.927
280	Short Cr	SH-4	970122	1150	11	8	11.2	5.9	64	4		55	0.8	50	2	<.005	2.065	0.066	0.078	0.066
280	Short Cr	SH-4	970219	1245	7	11	11.0	7.0	65	4		23	0.7	48	3	<.05	2.232	0.293	0.051	0.293
280	Short Cr	SH-4	970318	1145	27	13	10.0	6.7	60	6		82	0.7	57	4	<.05	1.648	0.355	0.014	0.355
280	Short Cr	SH-4	970409	1230	17	15	9.5	6.7	65	5		50	1.1	58	3	0.090	1.347	0.857	0.148	0.767
280	Short Cr	SH-4	970513	1240	20	17	9.0	6.8	69	4		41	1.6	70	1	0.439	1.163	0.480	0.046	0.041
280	Short Cr	SH-4	970624	1145	32	22	8.7	7.4	70	6		94	2.1	72	5	<.005	1.144	0.544	0.045	0.544
280	Short Cr	SH-4	970722	1145	24	25	6.4	7.3	199	10		>1200	1.6	158	3	2.626	4.612	3.251	0.170	0.625
280	Short Cr	SH-4	970827	1215	29	23	9.0	7.8	266	2		69	2.8	226	<1	0.024	0.808	0.648	1.291	0.624
280	Short Cr	SH-4	970923	1215	24	21	7.0	7.2	79	1			0.7	431	<1	<.05	1.534	0.955	0.069	0.955
280	Short Cr	SH-4	971014	1145	14	19	7.8	7.2	255	12		2090	0.9	149	5	1.177	2.109	2.872	0.304	1.695
280	Short Cr	SH-4	971119	1300	14	9	11.8	6.9	78	3		37	1.7	70	<1	<.05	1.270	0.421	0.136	0.421
280	Short Cr	SH-4	971202	1230	13	10	10.5	7.2	76	3		22	0.8	73	<1	<.05	1.140	0.144	0.147	0.144
280	Short Cr	SH-4	980127	1145	11	8	10.8	7.3	67	8		136	3.5	60	2	<.05	2.303	<.05	<.05	<.05
280	Short Cr	SH-4	980217	1200	13	9	10.8	6.6	43	149		7800	3.5	56	212	<.05	1.091	1.792	0.310	1.792
280	Short Cr	SH-4	980311	1130	1	7	11.5	6.2	49	7		156	1.3	58	8	<.05	1.825	0.344	0.084	0.344

Appendix F-3. Physical / chemical data collected from January 1995 to December 1997 by Geological Survey of Alabama (GSA) undercontract by ADEM as part of the Flint Creek Nonpoint Source Monitoring Project in the Wheeler Lake Cataloging Unit (0603-0002) (ADEM 1998C).

Sub-Watershed	Stream Name	Station	Stormwater Sampling Event	Date	Time	Stream Depth	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	Fecal Strep.	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	SO4
#		*#*	*X*	*yymmdd*	*24hr*	*ft*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*col/100ml*	*col/100ml*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*
330	Flint Cr	SITE 5		950111	1050	3.9	9	9.5	7.3	189	9	196	320	3,070	0.7	131	16	0.051	0.834	0.59	<0.08	12.00
330	Flint Cr	SITE 5		950206	1400	3.2	6	11.2	7.2	179	6	120	70	57	0.4	93	7	0.029	0.953	0.10	<0.08	10.30
330	Flint Cr	SITE 5		950313	1330	5.8	13	10.4	6.9	156	9	343	198	130	0.4	101	20	0.028	0.928	0.11	<0.08	8.36
330	Flint Cr	SITE 5		950410	1330	2.6	21	6.0	7.2	202	15	39	62	66	0.6	92	24	0.064	0.311	0.28	<0.08	11.10
330	Flint Cr	SITE 5		950501	1320	4.4	17	8.2	7.2	170	39	170	1,030	3,100	0.8	112	29	0.036	0.579	0.23	<0.08	9.24
330	Flint Cr	SITE 5		950502	0730	5.2	16	9.3	6.8	187	39	200	2,200	7,200	0.8	108	31	0.047	0.552	0.27	<0.08	9.60
330	Flint Cr	SITE 5		950606	1240	2.0	24	3.9	7.7	222	20	16	420	150	1.4	111	18	0.071	0.476	0.38	<0.08	15.40
330	Flint Cr	SITE 5		950717	1230	1.7	26	3.4	6.8	335	21	8.2	540	240	1.4	205	15	0.080	0.198	0.53	<0.08	35.60
330	Flint Cr	SITE 5		950807	1300	4.2	26	4.7	6.6	174	43	142	26,000	26,000	2.2	87	71	0.069	0.388	0.53	0.19	11.00
330	Flint Cr	SITE 5		950905	1250	1.4	23	3.4	6.9	310	20	1.2	330	143	1.6	200	22	0.037	0.695	0.57	<0.08	41.80
330	Flint Cr	SITE 5		951010	1320	3.6	19	7.3	6.6	190	19	84	500	680	0.6	119	22	0.063	1.140	0.34	<0.08	16.30
330	Flint Cr	SITE 5	X	951102	1100	5.5	16	7.1	6.5	222	48	242	8,300	21,000	2.0	144	41	0.020	0.401	0.50	<0.08	14.50
330	Flint Cr	SITE 5		951113	1340	9.0	9	8.8	6.5	136	25	580	620	1,220	0.7	91	19	0.016	0.908	0.42	<0.08	9.07
330	Flint Cr	SITE 5		951204	1250	5.4	11	9.7	6.4	137	4	290	370	6,100	0.6	91	11	0.018	0.974	0.17	<0.08	9.93
330	Flint Cr	SITE 5		960108	1340	16.0	3	11.6	6.8	90	8	1,310	965	4,300	2.0	76	12	0.024	0.765	0.25	<0.08	8.01
330	Flint Cr	SITE 5		960205	1515	6.0	1	12.6	6.3	157	3	320	17	37	2.0	71	7	0.061	1.140	0.15	<0.08	8.66
330	Flint Cr	SITE 5		960304	1330	3.7	8	11.3	6.1	140	8	96	97	60	1.1	103	13	0.053	0.569	0.37	<0.08	10.40
330	Flint Cr	SITE 5		960408	1250	4.0	11	10.2	6.8	128	10	160	70	47	0.9	57	20	0.044	0.717	0.30	<0.08	8.04
330	Flint Cr	SITE 5	X	960423	1020	13.3	17	6.6	5.3	106	28	2,300	1,600	2,600	2.4	99	22	0.071	0.522	0.55	<0.08	6.91
330	Flint Cr	SITE 5		960506	1240	3.7	20	6.9	6.6	140	20	81	120	250	0.8	104	19	0.068	0.573	0.40	<0.08	8.36
330	Flint Cr	SITE 5		960604	1226	2.0	20	4.9	6.6	210	18	19	103	200	0.9	166	20	0.073	0.711	0.45	<0.08	20.50
330	Flint Cr	SITE 5		960701	1200	1.5	25	3.3	6.6	322	15	4	100	176	1.7	215	10	0.109	1.020	0.63	<0.08	45.80
330	Flint Cr	SITE 5		960805	1240	3.0	22	7.1	6.4	178	18	99	600	1,800	0.5	114	30	0.059	0.817	0.38	<0.08	14.70
330	Flint Cr	SITE 5		960903	1240	2.0	20	4.6	6.3	209	20	15	1,500	2,800	1.1	142	34	0.072	0.622	0.57	<0.08	14.40
330	Flint Cr	SITE 5		961001	1230	2.6	16	6.1	6.4	172	18	42	1,240	830	0.7	153	38	0.041	0.670	0.44	<0.08	11.10
330	Flint Cr	SITE 5		961104	1240	3.4	9	8.5	6.9	153	30	76	3,400	860	0.9	154	14	0.019	0.214	0.31	<0.08	15.20
330	Flint Cr	SITE 5		961118	1050	3.2	10	8.9	6.0	154	10	170	187	410	1.0	158	20	0.030	0.521	0.24	<0.08	12.80
330	Flint Cr	SITE 5		961202	1250	13.8	10	7.1	6.2	87	50	1,240	6,400	14,800	2.8	90	37	0.021	0.307	0.54	0.11	7.48
330	Flint Cr	SITE 5		970106	1240	8.0	13	8.2	6.5	172	36	460	5,300	19,000	2.0	115	49	0.068	0.521	0.49	<0.08	7.67
330	Flint Cr	SITE 5		970203	1240	5.8	11	9.7	6.8	152	12	370	60	70	0.5	83	20	0.025	0.915	0.40	<0.08	8.68
330	Flint Cr	SITE 5	X	970303	1240	14.0	15	7.7	6.3	104	48	1,950	6,300	30,000	2.1	88	37	0.050	0.327	0.61	<0.08	5.04
330	Flint Cr	SITE 5		970305	0940	13.7	14	8.0	6.3	122	28	1,340	780	890	1.1	80	13	0.045	0.554	0.82	<0.08	6.89
330	Flint Cr	SITE 5		970401	1320	3.2	15	8.0	6.8	173	22	96	87	103	0.9	101	17	0.119	0.411	0.44	<0.08	9.10
330	Flint Cr	SITE 5		970505	1250	17.6	16	6.1	6.8	82	30	1,470	480	650	1.2	68	19	0.053	0.423	0.15	<0.08	6.01
330	Flint Cr	SITE 5		970603	1330	5.8	17	7.1	6.2	138	27	440	3,800	5,400	2.5	130	57	0.098	0.687	2.00	<0.08	8.37
330	Flint Cr	SITE 5		970714	1250	2.8	22	6.1	6.4	204	12	54	240	233	1.3	126	29	0.122	0.536	0.56	<0.08	8.99
330	Flint Cr	SITE 5		970804	1250	2.7	22	4.4	6.3	216	14	15	67	500	1.6	146	38	0.122	0.842	0.55	<0.08	14.10
330	Flint Cr	SITE 5		970902	1250	1.5	22	4.3	6.4	248	12	7	123	500	2.5	172	15	0.572	0.826	1.50	0.11	18.60
330	Flint Cr	SITE 5		971001	1210	2.2	16	5.5	6.9	193	20	29	590	990	1.0	145	30	0.036	0.322	0.80	<0.08	18.40
330	Flint Cr	SITE 5		971103	1310	5.0	8	9.0	6.6	151	25	160	520	1,500	1.0	96	29	0.031	0.609	0.78	<0.08	11.70
330	Flint Cr	SITE 5	X	971113	0950	3.4	5	10.4	6.7	189	15	170	110	550	1.0	135	7	<0.010	0.586	0.56	<0.08	11.90
330	Flint Cr	SITE 5		971201	1320	4.2	12	7.5	6.7	194	18	120	800	940	1.4	149	30	0.084	0.312	0.75	<0.08	11.10
330	Flint Cr	SITE 6		950111	0930	7.0	8	9.6	7.2	177	28	177	5,900	410	0.8	102	20	0.064	0.820	0.25	<0.08	11.60
330	Flint Cr	SITE 6		950206	1245	5.5	5	11.4	7.2	168	5	107	40	57	0.4	79	5	0.032	0.951	0.10	<0.08	9.96

Appendix F-3, cont. Physical / chemical data collected from January 1995 to December 1997 by Geological Survey of Alabama (GSA) undercontract by ADEM as part of the Flint Creek Nonpoint Source Monitoring Project in the Wheeler Lake Cataloging Unit (0603-0002) (ADEM 1998C).

Sub-Watershed	Stream Name	Station	Stormwater Sampling Event	Date	Time	Stream Depth	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	Fecal Strep.	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	SO4
#		#	X	yymmdd	24hr	ft	C	mg/l	s.u.	umhos @25c	NTU	cfs	col/100ml	col/100ml	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/l	mg/l
330	Flint Cr	SITE 6		950313	1210	8.3	13	10.2	7.1	152	5	309	117	87	0.4	94	24	0.031	0.908	0.17	<0.08	8.51
330	Flint Cr	SITE 6		950410	1220	4.9	20	6.0	7.3	218	20	35.3	124	42	0.6	90	20	0.157	0.306	0.37	<0.08	12.00
330	Flint Cr	SITE 6		950501	1230	6.1	16	7.9	6.7	170	35	153	1,030	3,000	0.8	109	26	0.042	0.586	0.26	<0.08	10.30
330	Flint Cr	SITE 6		950606	1150	3.8	23	4.0	7.3	272	10	14.1	510	170	2.2	116	18	0.393	0.647	0.83	<0.08	24.00
330	Flint Cr	SITE 6		950717	1150	3.3	27	2.9	7.0	380	13	7.4	250	280	0.8	228	30	0.131	0.513	0.36	<0.08	48.10
330	Flint Cr	SITE 6		950807	1200	6.8	25	5.4	7.1	176	28	128	18,000	23,000	2.4	94	59	0.059	0.216	0.55	0.20	11.30
330	Flint Cr	SITE 6		950905	1200	3.0	22	4.5	7.1	560	25	1.1	420	250	0.8	361	17	0.130	7.360	0.85	1.28	110.00
330	Flint Cr	SITE 6		951010	1230	6.2	18	7.5	6.8	196	19	76	113	220	0.5	118	22	0.074	1.220	0.36	<0.08	15.70
330	Flint Cr	SITE 6		951113	1220	10.8	9	9.0	6.1	142	20	525	420	1,100	0.6	91	18	0.014	0.984	0.59	<0.08	9.22
330	Flint Cr	SITE 6		951204	1150	7.2	11	10.0	6.2	152	15	262	143	186	0.6	88	12	0.018	1.010	0.12	<0.08	9.72
330	Flint Cr	SITE 6		960108	1220	14.1	2	11.8	6.6	98	5	1,180	163	400	1.6	79	7	0.027	0.863	0.29	<0.08	8.30
330	Flint Cr	SITE 6		960205	1410	8.4	1	12.7	6.2	204	2	288	27	63	1.4	72	7	0.041	1.170	0.08	<0.08	8.58
330	Flint Cr	SITE 6		960304	1230	6.0	7	11.3	6.0	152	7	86.6	240	73	1.0	97	15	0.077	0.570	0.42	<0.08	10.10
330	Flint Cr	SITE 6		960408	1150	6.2	10	10.4	6.8	129	4	142	133	37	0.8	65	37	0.062	0.722	0.25	<0.08	7.99
330	Flint Cr	SITE 6		960506	1140	6.2	20	7.1	6.6	141	8	72.8	147	277	0.8	103	20	0.061	0.559	0.42	<0.08	8.08
330	Flint Cr	SITE 6		960604	1140	4.2	20	5.5	6.7	195	5	17.4	270	390	0.9	149	22	0.048	0.743	0.70	<0.08	17.10
330	Flint Cr	SITE 6		960701	1120	3.2	24	3.6	6.7	408	18	3.37	170	730	1.6	292	28	0.146	3.020	0.49	0.39	75.20
330	Flint Cr	SITE 6		960805	1150	5.8	21	7.4	6.5	171	20	89.3	750	2,200	0.7	109	26	0.070	0.867	0.30	<0.08	15.00
330	Flint Cr	SITE 6		960903	1150	3.6	20	5.4	5.8	248	17	13.7	104,000	1,200	1.4	167	24	0.059	1.730	0.53	0.16	19.90
330	Flint Cr	SITE 6		961001	1145	4.6	16	7.1	6.0	174	3	38	910	810	0.6	158	18	0.048	0.786	0.67	<0.08	12.70
330	Flint Cr	SITE 6		961104	1140	6.3	8	9.6	6.6	151	11	68.5	7,000	630	0.4	148	8	0.026	0.350	0.40	<0.08	14.60
330	Flint Cr	SITE 6		961202	1200	14.3	10	7.4	6.1	87	38	1,120	3,300	14,000	2.6	97	30	0.016	0.387	0.55	0.08	8.78
330	Flint Cr	SITE 6		970106	1140	8.7	13	8.6	6.4	166	38	418	5,000	20,000	1.2	117	50	0.093	0.588	1.39	<0.08	8.31
330	Flint Cr	SITE 6		970203	1150	7.3	11	9.7	6.7	147	12	336	150	90	0.5	60	24	0.022	0.945	0.31	<0.08	9.00
330	Flint Cr	SITE 6		970303	1150	15.0	14	7.5	6.4	101	38	1,760	4,300	8,900	2.0	99	29	0.048	0.356	0.48	<0.08	5.01
330	Flint Cr	SITE 6		970401	1230	5.1	14	8.9	6.5	176	18	87	73	90	0.7	131	11	0.091	0.413	0.54	<0.08	8.82
330	Flint Cr	SITE 6		970505	1200	16.2	15	6.7	6.6	107	19	1,320	710	1,600	1.1	76	15	0.066	0.470	0.34	<0.08	7.76
330	Flint Cr	SITE 6		970603	1230	7.4	17	7.6	6.8	149	29	396	4,300	3,300	2.0	123	67	0.099	0.502	1.25	<0.08	8.94
330	Flint Cr	SITE 6		970714	1150	5.1	22	6.1	6.4	178	12	49	143	230	1.2	131	20	0.197	0.507	0.73	<0.08	9.01
330	Flint Cr	SITE 6		970804	1150	3.8	21	4.0	6.3	256	8	13	203	440	3.5	159	17	0.942	0.552	1.35	<0.08	3.25
330	Flint Cr	SITE 6		970902	1150	3.5	22	5.9	6.5	275	3	6	200	540	9.8	168	10	2.090	0.432	2.75	<0.08	16.90
330	Flint Cr	SITE 6		971001	1120	4.2	15	6.5	6.9	212	15	26	650	950	0.9	154	26	0.058	0.359	0.66	<0.08	19.30
330	Flint Cr	SITE 6		971103	1140	7.0	8	9.4	6.6	150	20	146	310	2,000	0.9	97	24	0.012	0.638	0.79	<0.08	11.70
330	Flint Cr	SITE 6		971201	1230	5.8	12	8.0	6.7	189	18	111	710	760	1.5	137	19	0.089	0.336	0.63	<0.08	10.60
330	Flint Cr	SITE 7		950111	0750	4.0	7	9.8	7.2	145	20	114	130	550	0.6	89	16	0.052	0.885	0.25	<0.08	8.52
330	Flint Cr	SITE 7		950206	1215	5.8	5	11.4	7.2	142	5	69	30	23	1.0	67	6	0.028	0.992	0.07	<0.08	7.64
330	Flint Cr	SITE 7		950227	1300	5.8	12	9.6	6.8	147	10	258	150	313	<0.1	81	18	0.044	1.040	0.08	<0.08	8.28
330	Flint Cr	SITE 7		950313	1145	6.0	12	10.6	6.9	128	2	215	130	93	0.2	85	26	0.015	1.000	0.08	<0.08	7.32
330	Flint Cr	SITE 7		950410	1155	3.9	19	6.7	7.1	160	15	22	146	122	0.7	54	89	0.027	0.340	0.13	<0.08	6.30
330	Flint Cr	SITE 7		950501	1145	5.6	16	8.2	6.6	142	39	82	800	2,700	0.4	93	26	0.031	0.683	0.18	<0.08	7.44
330	Flint Cr	SITE 7		950606	1115	3.2	23	4.8	7.2	182	20	6	370	240	1.0	71	142	0.040	0.407	0.23	<0.08	6.05
330	Flint Cr	SITE 7		950607	0750	5.2	22	5.2	7.2	163	95	76	35,000	57,000	4.5	90	14	0.082	0.687	1.91	0.13	7.76
330	Flint Cr	SITE 7		950717	1120	3.1	26	3.1	6.8	206	15	3.8	780	450	0.5	113	39	0.073	0.164	0.22	<0.08	4.81
330	Flint Cr	SITE 7		950807	1130	3.5	25	3.9	7.0	160	50	50	21,000	29,000	2.3	76	77	0.090	0.554	0.65	0.21	7.85

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Sub-Watershed	Stream Name	Station	Stormwater Sampling Event	Date	Time	Stream Depth	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	Fecal Strep.	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	SO4
#		#	X	yymmdd	24hr	ft	C	mg/l	s.u.	umhos @25c	NTU	cfs	col/100ml	col/100ml	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/l	mg/l
330	Flint Cr	SITE 7		950905	1130	2.2	22	2.3	6.9	238	20	0	40	120	2.4	103	24	0.034	0.031	0.79	0.11	3.45
330	Flint Cr	SITE 7		951010	1200	5.1	16	6.6	6.5	176	18	68	4,800	980	0.4	109	26	0.060	1.420	0.29	<0.08	13.50
330	Flint Cr	SITE 7		951113	1150	8.6	9	9.3	6.6	118	15	330	400	740	0.5	70	13	0.014	1.200	0.34	<0.08	8.27
330	Flint Cr	SITE 7		951204	1120	6.5	11	9.1	6.4	121	8	185	1,480	4,200	1.0	71	16	0.025	0.937	0.21	<0.08	8.44
330	Flint Cr	SITE 7		960108	1150	9.6	3	12.2	6.9	100	7	720	77	283	1.4	68	10	0.020	1.140	0.20	<0.08	7.67
330	Flint Cr	SITE 7		960205	1315	6.0	1	12.6	5.8	116	4	185	50	57	1.4	52	7	0.013	1.310	0.09	<0.08	7.64
330	Flint Cr	SITE 7		960304	1200	4.0	7	11.7	6.7	114	7	45	83	47	0.8	90	11	0.014	0.738	0.09	<0.08	7.42
330	Flint Cr	SITE 7	X	960306	0830	9.4	12	9.7	6.8	120	60	520	12,000	41,000	3.8	75	218	0.088	0.457	0.38	<0.08	6.44
330	Flint Cr	SITE 7		960408	1110	4.9	12	10.2	6.9	113	8	105	290	143	0.6	52	19	<0.010	0.833	0.25	<0.08	6.37
330	Flint Cr	SITE 7		960506	1120	3.9	19	6.7	6.7	125	12	54	370	400	0.7	87	25	0.064	0.614	0.43	<0.08	6.47
330	Flint Cr	SITE 7		960604	1110	2.3	19	5.5	6.5	165	25	10	460	540	0.9	135	23	0.106	0.428	0.44	<0.08	8.38
330	Flint Cr	SITE 7		960701	1100	1.8	24	1.7	6.7	180	18	0.3	127	2,500	4.4	109	11	0.144	0.094	0.40	<0.08	3.62
330	Flint Cr	SITE 7	X	960708	1110	7.2	22	5.6	6.5	177	80	190	33,000	61,000	3.0	168	197	0.178	0.474	0.39	<0.08	6.07
330	Flint Cr	SITE 7		960805	1120	3.6	21	7.0	6.3	153	20	60	580	1,400	0.5	84	33	0.063	0.765	0.19	<0.08	11.80
330	Flint Cr	SITE 7		960903	1120	1.6	20	4.3	6.0	175	15	3	16,000	12,000	1.2	113	14	0.045	0.426	0.42	<0.08	6.00
330	Flint Cr	SITE 7		961001	1100	2.6	16	7.1	6.3	165	15	18	410	900	0.6	135	25	0.025	0.504	0.47	<0.08	9.55
330	Flint Cr	SITE 7		961104	1110	3.1	8	9.4	6.9	148	25	48	850	430	0.1	133	<4	0.012	0.229	0.34	<0.08	13.20
330	Flint Cr	SITE 7		961202	1120	9.0	8	8.2	6.6	90	32	550	2,900	5,700	2.0	88	30	0.050	0.634	0.36	0.08	7.92
330	Flint Cr	SITE 7		970106	1110	6.3	12	9.3	6.5	144	30	200	2,200	4,500	1.2	101	50	0.047	0.813	0.32	<0.08	8.46
330	Flint Cr	SITE 7	X	970116	0920	9.8	6	12.0	6.7	115	85	500	5,400	35,000	2.9	73	115	0.060	0.928	0.84	0.17	8.02
330	Flint Cr	SITE 7		970203	1120	5.8	11	9.8	6.4	127	15	180	70	120	0.4	51	28	0.022	1.060	0.45	<0.08	7.42
330	Flint Cr	SITE 7		970303	1120	11.0	14	8.4	6.4	82	50	1,500	4,700	24,000	1.6	72	29	0.040	0.657	0.60	<0.08	4.83
330	Flint Cr	SITE 7		970401	1200	3.2	13	9.5	6.5	137	20	41	90	123	0.7	120	18	0.027	0.510	0.62	<0.08	6.51
330	Flint Cr	SITE 7		970505	1130	12.7	14	8.2	6.4	106	22	800	540	2,100	0.7	76	25	0.022	0.657	0.17	<0.08	7.98
330	Flint Cr	SITE 7		970603	1115	7.9	16	8.0	6.0	136	39	250	1,360	2,000	1.4	116	58	0.045	0.605	1.16	<0.08	9.00
330	Flint Cr	SITE 7	X	970701	1010	11.7	19	7.7	6.4	96	38	550	4,600	13,200	1.6	74	26	0.041	0.492	0.83	<0.08	5.80
330	Flint Cr	SITE 7		970714	1120	5.6	21	6.4	6.2	162	16	36	186	500	0.4	105	27	0.045	0.530	0.19	<0.08	6.77
330	Flint Cr	SITE 7		970804	1120	4.5	21	5.5	6.3	180	15	6	400	790	0.8	130	26	0.028	0.463	0.27	<0.08	3.81
330	Flint Cr	SITE 7		970902	1120	4.2	21	4.8	6.4	198	11	1	560	610	0.9	112	16	0.020	0.158	0.39	<0.08	6.27
330	Flint Cr	SITE 7		971001	1100	4.8	15	7.0	7.0	171	15	9	630	1,200	0.4	131	21	0.014	0.346	0.55	<0.08	13.00
330	Flint Cr	SITE 7		971103	1110	7.6	8	9.2	6.6	132	17	90	290	1,800	0.6	85	19	<0.010	0.752	0.49	<0.08	10.50
330	Flint Cr	SITE 7		971201	1200	7.0	12	8.1	6.7	135	8	90	380	550	0.8	113	15	0.012	0.488	0.24	<0.08	8.56
330	Flint Cr	SITE 8		950110	1200	0.6	5	10.2	6.9	45	10	9.9	700	700	0.7	43	<4	0.021	1.410	0.17	<0.08	4.56
330	Flint Cr	SITE 8		950206	1045	0.8	3	12.6	7.4	65	3	8.8	23	47	1.5	39	4	<0.010	1.610	0.08	<0.08	4.68
330	Flint Cr	SITE 8		950313	1040	1.2	11	12.0	6.3	60	2	47.6	83	37	0.2	41	7	0.010	1.590	0.10	<0.08	4.60
330	Flint Cr	SITE 8		950410	1100	0.8	17	8.9	6.0	62	5	3.2	116	64	0.7	13	<4	<0.010	0.587	<0.07	<0.08	3.65
330	Flint Cr	SITE 8		950501	1035	0.6	16	9.6	6.3	53	19	9.8	333	2,600	0.2	40	<4	<0.010	1.080	0.12	<0.08	3.91
330	Flint Cr	SITE 8		950606	1030	0.6	21	6.2	6.0	80	3	0.5	220	360	0.2	22	<4	0.025	0.273	0.25	<0.08	3.02
330	Flint Cr	SITE 8		950717	1040	0.5	25	5.5	6.7	111	13	0.1	250	770	0.5	56	<4	0.049	0.190	0.24	<0.08	3.19
330	Flint Cr	SITE 8		950807	1030	0.8	24	5.0	6.6	106	20	4.5	23,000	63,000	2.3	51	21	0.106	0.723	0.68	0.15	2.32
330	Flint Cr	SITE 8		950905	1040	0.2	24	5.0	6.4	185	18	0.0	13	153	0.8	56	<4	0.053	0.050	0.48	<0.08	1.67
330	Flint Cr	SITE 8		951010	1100	0.8	16	8.7	6.4	91	17	7.8	340	250	0.1	67	<4	0.049	2.160	0.24	<0.08	4.92
330	Flint Cr	SITE 8		951113	1050	1.2	10	11.0	5.7	60	10	32.1	143	1,040	0.4	<10	<4	<0.010	2.000	0.23	<0.08	4.81
330	Flint Cr	SITE 8		951204	1030	1.2	11	10.5	6.3	55	3	27	157	130	0.8	34	<4	<0.010	1.850	0.16	<0.08	4.40

Appendix F-3, cont. Physical / chemical data collected from January 1995 to December 1997 by Geological Survey of Alabama (GSA) undercontract by ADEM as part of the Flint Creek Nonpoint Source Monitoring Project in the Wheeler Lake Cataloging Unit (0603-0002) (ADEM 1998C).

Sub-Watershed	Stream Name	Station	Stormwater Sampling Event	Date	Time	Stream Depth	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	Fecal Strep.	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	SO4
#		*#*	*X*	*yymmdd*	*24hr*	*ft*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*col/100ml*	*col/100ml*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*
330	Flint Cr	SITE 8		960108	1050	1.4	4	13.0	6.3	48	3	47.8	67	63	1.1	44	<4	<0.010	2.020	0.19	<0.08	5.11
330	Flint Cr	SITE 8		960207	1100	1.0	4	12.2	6.7	48	5	18.9	63	20	0.9	22	<4	<0.010	1.880	0.13	<0.08	4.59
330	Flint Cr	SITE 8		960304	1040	0.6	6	12.4	6.9	49	5	7.2	10	3	1.1	34	53	0.012	1.320	0.22	<0.08	4.06
330	Flint Cr	SITE 8		960408	1010	0.8	9	11.0	7.0	75	0	13.1	80	23	0.7	16	4	<0.010	1.420	0.26	<0.08	4.13
330	Flint Cr	SITE 8		960506	1010	0.7	18	8.4	7.2	53	9	6.4	153	370	0.8	36	4	0.016	0.921	0.25	<0.08	3.74
330	Flint Cr	SITE 8		960604	1020	0.5	18	6.1	6.0	77	7	1.4	60	510	0.9	65	<4	0.054	0.241	0.39	<0.08	3.42
330	Flint Cr	SITE 8		960701	1020	0.3	22	4.7	6.5	33	10	0.1	23	340	1.1	55	<4	0.083	0.079	0.46	<0.08	1.59
330	Flint Cr	SITE 8		960805	1020	0.8	20	9.5	6.6	61	5	8.5	220	1,260	0.7	34	<4	0.032	1.010	0.24	<0.08	4.01
330	Flint Cr	SITE 8		960903	1020	0.5	19	6.1	7.2	80	7	0.7	103	340	0.8	66	<4	0.042	0.298	0.84	<0.08	3.44
330	Flint Cr	SITE 8		961001	1000	0.8	15	7.3	6.1	68	5	2.0	300	510	0.5	100	<4	<0.010	0.418	0.50	<0.08	3.64
330	Flint Cr	SITE 8		961104	1020	0.8	7	0.4	7.3	63	5	4.0	380	93	<0.1	80	<4	<0.010	0.405	0.22	<0.08	3.99
330	Flint Cr	SITE 8		961202	1020	1.0	8	1.1	6.4	44	2	23.1	150	240	1.1	56	6	<0.010	1.360	0.28	<0.08	5.04
330	Flint Cr	SITE 8		970106	1010	1.0	11	10.6	6.2	71	17	21.4	580	4,100	0.8	<10	7	0.030	1.470	0.42	<0.08	4.65
330	Flint Cr	SITE 8		970203	1020	1.0	10	10.7	6.1	54	23	29.8	5,600	9,100	1.2	25	38	0.039	1.670	0.50	<0.08	4.58
330	Flint Cr	SITE 8		970303	1010	2.0	13	10.2	6.6	50	45	222.0	4,500	28,000	2.0	59	146	0.039	0.999	2.31	<0.08	4.24
330	Flint Cr	SITE 8		970401	1100	0.6	12	11.6	6.7	49	12	6.0	17	117	0.8	62	<4	0.023	0.809	0.38	<0.08	3.70
330	Flint Cr	SITE 8		970505	1030	1.2	12	10.3	6.2	39	7	43.9	290	490	0.5	37	12	0.021	1.110	<0.07	<0.08	4.45
330	Flint Cr	SITE 8		970603	1020	1.0	15	9.4	6.0	53	58	15.4	10,900	27,000	2.2	72	36	0.071	0.726	1.16	<0.08	3.60
330	Flint Cr	SITE 8		970714	1020	0.5	20	7.9	6.2	70	12	2.8	133	670	0.1	53	<4	<0.010	0.660	0.17	<0.08	3.52
330	Flint Cr	SITE 8		970804	1030	0.4	20	7.0	6.3	87	2	0.8	157	2,100	0.9	76	<4	0.022	0.397	0.24	<0.08	3.38
330	Flint Cr	SITE 8		970902	1030	0.6	20	7.0	6.2	86	1	0.4	87	700	0.9	58	<4	<0.010	0.073	0.31	<0.08	3.06
330	Flint Cr	SITE 8		971001	1000	0.6	13	7.6	6.7	70	2	580.0	270	270	0.6	68	4	<0.010	0.475	0.23	<0.08	4.23
330	Flint Cr	SITE 8		971103	1000	0.8	7	10.8	6.2	58	15	13.1	190	640	0.8	44	<4	<0.010	1.130	0.53	<0.08	4.81
330	Flint Cr	SITE 8		971201	1100	1.0	11	9.8	6.2	59	3	11.7	100	380	0.6	48	<4	0.015	0.955	0.14	<0.08	4.10
330	Shoal Cr	SITE 12	X	950601	1040	1.5	22	7.5	7.5	153	20	21.1	28,000	56,000	2.3	107	18	0.030	0.333	0.61	<0.08	6.77
330	Shoal Cr	SITE 12	X	951114	0850	2.2	8	10.6	6.5	185	15	24.2	1,040	610	1.8	99	<4	0.015	0.416	0.33	<0.08	10.20
330	Shoal Cr	SITE 12	X	960528	1140	1.4	20	7.0	6.7	130	30	10.8	42,000	32,000	5.5	90	21	0.556	1.436	0.95	0.21	10.60
330	Shoal Cr	SITE 12	X	961125	1220	2.2	11	9.7	6.1	98	52	80.8	4,500	20,000	2.0	94	49	<0.010	0.203	0.38	<0.08	8.43
330	Shoal Cr	SITE 12	X	970319	1130	3.4	14	9.0	6.3	132	42	105	8,500	20,000	2.8	95	63	0.083	0.325	0.80	<0.08	6.35
330	Shoal Cr	SITE 12	X	971204	1010	1.8	11	10.4	6.9	145	15	30.5	680	1,300	0.8	125	6	<0.010	0.137	0.55	<0.08	8.82
330	Cedar Cr	SITE 13	X	950601	1130	1.3	21	6.1	7.2	163	35	10.0	34,000	106,000	4.9	122	67	0.080	0.431	0.88	0.10	11.20
330	Cedar Cr	SITE 13	X	951114	0800	2.0	8	9.9	6.2	275	22	45.1	470	1,110	0.7	141	8	0.013	0.543	0.33	<0.08	12.40
330	Cedar Cr	SITE 13	X	960528	1240	1.0	21	4.5	6.3	275	18	2.8	4,700	2,700	2.4	172	22	0.087	0.207	0.48	<0.08	7.48
330	Cedar Cr	SITE 13	X	961125	1120	1.4	10	9.3	5.5	211	25	17.9	2,600	5,600	1.3	167	26	0.013	0.259	0.87	<0.08	12.70
330	Cedar Cr	SITE 13	X	970319	1030	3.8	15	8.4	6.4	176	60	124	5,900	21,000	4.0	123	116	0.171	0.452	0.83	<0.08	8.50
330	Cedar Cr	SITE 13	X	971204	0900	1.4	11	9.2	6.7	172	22	48.3	2,400	23,000	1.9	144	16	0.013	0.073	0.92	<0.08	13.40
340	Crowdabout Cr	SITE 10-A		950112	1100	11.1	13	8.0	7.1	206	50	200	3,700	10,500	2.4	146	25	0.212	0.499	0.76	0.14	9.82
340	Crowdabout Cr	SITE 10-A		950207	1240	9.0	4	12.0	7.2	279	12	26	120	77	1.5	151	8	0.029	0.786	0.11	<0.08	8.13
340	Crowdabout Cr	SITE 10-A		950314	1240	9.2	16	10.2	7.3	230	18	80	260	117	1.0	113	16	0.023	0.690	0.22	<0.08	6.94
340	Crowdabout Cr	SITE 10-A		950411	1245	8.5	17	3.8	7.0	287	22	8	260	250	0.6	121	21	0.126	0.260	0.34	<0.08	6.25
340	Crowdabout Cr	SITE 10-A		950412	0830	8.6	18	4.3	7.0	290	18	3	2,000	2,100	1.2	142	23	0.182	0.337	0.32	<0.08	6.32
340	Crowdabout Cr	SITE 10-A		950502	0815	9.5	15	8.8	7.7	264	50	63	4,700	57,000	1.0	153	42	0.040	0.573	0.36	<0.08	6.67
340	Crowdabout Cr	SITE 10-A		950608	0900	8.2	25	3.4	7.3	245	60	1	2,700	840	3.2	130	42	0.087	0.582	0.48	0.08	7.68
340	Crowdabout Cr	SITE 10-A		950718	1120	6.9	28	1.1	7.2	322	28	2	800	127	1.2	183	30	0.062	<0.010	0.48	<0.08	3.95

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Sub-Watershed	Stream Name	Station	Stormwater Sampling Event	Date	Time	Stream Depth	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	Fecal Strep.	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	SO4
#		#	X	yymmdd	24hr	ft	C	mg/l	s.u.	umhos @25c	NTU	cfs	col/100ml	col/100ml	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/l	mg/l
340	Crowdabout Cr	SITE 10-A		950808	1210	6.8	27	1.0	7.1	225	35	7	113	63	1.4	118	45	0.141	0.047	0.49	<0.08	16.00
340	Crowdabout Cr	SITE 10-A		950906	1100	5.6	24	2.4	6.9	233	45	0	113	117	2.4	126	63	0.111	0.049	0.40	<0.08	14.70
340	Crowdabout Cr	SITE 10-A	X	951003	1130	7.1	21	4.6	6.6	184	70	40	7,400	11,200	3.2	175	75	0.066	2.290	0.51	0.08	20.60
340	Crowdabout Cr	SITE 10-A		951011	1150	8.0	17	6.4	6.7	246	22	8	2,000	1,940	0.4	168	<4	0.038	1.200	0.37	<0.08	13.80
340	Crowdabout Cr	SITE 10-A		951114	1350	9.6	9	9.0	6.7	234	20	124	920	1,000	0.5	141	7	0.184	1.190	0.56	<0.08	9.48
340	Crowdabout Cr	SITE 10-A		951204	1310	10.1	12	8.2	6.4	197	28	120	4,500	4,200	1.7	136	13	0.133	0.894	0.61	<0.08	9.23
340	Crowdabout Cr	SITE 10-A		960109	1320	10.1	4	12.0	6.8	178	18	194	173	840	1.2	121	5	0.047	1.320	0.24	<0.08	8.01
340	Crowdabout Cr	SITE 10-A		960206	1240	9.0	2	10.2	6.8	195	8	50	240	7,400	1.8	126	7	0.360	1.420	0.56	<0.08	7.75
340	Crowdabout Cr	SITE 10-A		960305	1300	8.2	10	10.0	6.5	228	15	15	350	107	0.9	141	20	0.020	0.529	0.25	<0.08	7.59
340	Crowdabout Cr	SITE 10-A	X	960319	1020	11.2	8	8.9	6.3	184	70	360	26,000	51,000	4.5	122	57	0.275	0.703	0.94	0.17	6.14
340	Crowdabout Cr	SITE 10-A		960408	1320	8.3	17	10.0	6.7	216	15	13	213	47	1.0	114	13	<0.010	0.545	0.30	<0.08	6.76
340	Crowdabout Cr	SITE 10-A		960506	1300	7.6	20	5.7	6.5	233	40	7	650	330	1.7	147	46	0.115	0.493	0.42	<0.08	5.97
340	Crowdabout Cr	SITE 10-A		960604	1250	7.7	19	4.3	6.4	262	32	5	550	640	1.3	191	31	0.054	0.345	0.47	<0.08	6.78
340	Crowdabout Cr	SITE 10-A		960701	1220	7.2	25	0.7	6.5	314	22	1	173	87	3.2	208	30	0.303	0.046	0.54	<0.08	4.69
340	Crowdabout Cr	SITE 10-A		960805	1300	7.6	23	5.6	6.5	285	20	7	875	2,000	1.3	187	38	0.102	1.282	0.66	<0.08	6.45
340	Crowdabout Cr	SITE 10-A		960903	1300	6.9	21	2.7	6.7	288	48	4	1,030	6,100	3.9	198	56	0.147	0.192	0.63	<0.08	8.29
340	Crowdabout Cr	SITE 10-A		960917	0950	9.3	20	4.6	6.6	142	130	68	800,000	1,000,000	3.6	150	115	0.120	0.513	1.21	0.73	7.99
340	Crowdabout Cr	SITE 10-A		961001	1300	7.0	16	5.1	6.4	275	28	1	7,100	450	1.2	214	37	0.099	0.546	0.74	<0.08	7.68
340	Crowdabout Cr	SITE 10-A		961104	1310	8.0	8	9.2	6.8	270	40	12	5,700	5,100	1.7	234	11	1.560	0.649	3.18	<0.08	9.96
340	Crowdabout Cr	SITE 10-A		961202	1320	10.5	9	8.5	6.0	134	42	300	2,300	3,800	1.8	131	26	0.164	0.714	0.55	0.13	7.62
340	Crowdabout Cr	SITE 10-A		970106	1310	10.0	11	8.2	6.6	235	40	120	3,000	15,000	1.8	154	25	0.271	0.632	0.80	<0.08	6.74
340	Crowdabout Cr	SITE 10-A		970203	1300	8.6	13	8.8	6.8	238	20	53	350	450	0.8	122	20	0.029	0.809	0.39	<0.08	7.29
340	Crowdabout Cr	SITE 10-A	X	970227	0950	10.2	14	8.5	6.7	162	125	384	30,000	42,000	1.4	125	166	0.089	0.407	2.09	0.09	4.62
340	Crowdabout Cr	SITE 10-A		970303	1310	11.6	14	8.2	6.6	125	70	910	9,200	27,000	2.9	76	60	0.271	0.231	2.11	0.15	4.23
340	Crowdabout Cr	SITE 10-A		970401	1340	7.0	13	10.2	6.7	237	10	18	70	127	1.2	174	15	0.026	0.346	0.56	<0.08	6.24
340	Crowdabout Cr	SITE 10-A		970505	1320	10.8	15	8.9	6.7	200	20	180	2,000	1,400	0.7	127	35	0.027	0.649	0.31	<0.08	6.61
340	Crowdabout Cr	SITE 10-A		970603	1150	9.1	16	7.2	6.2	251	30	47	9,750	4,000	1.2	175	30	0.049	0.621	1.09	<0.08	7.04
340	Crowdabout Cr	SITE 10-A		970714	1320	8.4	22	5.1	6.5	302	7	6	250	410	0.7	160	18	0.034	0.582	<0.07	<0.08	5.35
340	Crowdabout Cr	SITE 10-A		970804	1320	7.8	22	3.4	6.4	310	16	1	290	120	2.1	197	22	0.039	0.089	0.69	<0.08	5.05
340	Crowdabout Cr	SITE 10-A		970902	1310	7.1	22	4.3	6.5	304	22	0.5	260	137	1.6	233	27	0.017	0.016	1.20	<0.08	4.72
340	Crowdabout Cr	SITE 10-A		971001	1230	7.4	12	6.7	6.9	244	15	4	940	3,100	0.9	192	21	<0.010	0.187	0.57	<0.08	18.30
340	Crowdabout Cr	SITE 10-A		971103	1330	8.6	8	8.6	6.7	227	15	42	680	980	0.7	146	11	<0.010	0.438	0.81	<0.08	8.59
340	Crowdabout Cr	SITE 10-A	X	971106	0930	8.4	7	8.2	6.7	237	15	23	480	3,600	1.3	168	10	<0.010	0.512	0.66	<0.08	8.46
340	Crowdabout Cr	SITE 10-A		971201	1340	9.7	12	7.4	6.8	237	25	30	4,200	3,900	1.8	181	16	0.026	0.236	1.17	<0.08	8.74
350	No Business Cr	SITE 11		950502	0900	2.3	16	9.0	7.2	247	49	82	4,300	8,900	1.8	159	70	0.077	0.900	0.51	<0.08	8.01
350	No Business Cr	SITE 11	X	951102	1210	2.6	17	6.6	6.7	242	13	75.4	5,100	5,500	1.8	163	41	0.024	0.694	0.80	<0.08	11.30
350	No Business Cr	SITE 11	X	960423	1110	9.9	18	4.3	5.6	122	40	550	2,100	1,400	3.4	123	24	0.192	0.734	1.29	0.12	5.82
350	No Business Cr	SITE 11	X	961118	1130	2.0	10	8.6	6.1	180	30	210	2,100	16,000	1.8	194	42	0.016	0.514	0.41	<0.08	9.10
350	No Business Cr	SITE 11	X	970303	1330	13.0	15	7.0	6.3	107	62	2,320	6,900	37,000	2.8	91	24	0.038	0.146	1.21	0.08	3.14
350	No Business Cr	SITE 11	X	971113	1030	0.7	5	10.2	6.7	282	8	16.2	100	450	1.0	203	<4	<0.010	0.819	0.34	<0.08	10.90
350	Flint Cr	SITE 1		950112	0845	5.4	8	10.2	7.3	219	16	1,250	370	1,730	1.0	145	23	0.087	0.620	0.35	<0.08	10.10
350	Flint Cr	SITE 1		950207	1115	11.5	6	8.5	7.2	218	30	370	87	140	0.5	116	80	0.051	0.741	0.14	<0.08	8.54
350	Flint Cr	SITE 1		950314	1110	8.0	14	8.7	7.0	160	25	940	67	33	1.8	125	27	0.040	0.679	0.25	<0.08	7.31

Appendix F-3, cont. Physical / chemical data collected from January 1995 to December 1997 by Geological Survey of Alabama (GSA) undercontract by ADEM as part of the Flint Creek Nonpoint Source Monitoring Project in the Wheeler Lake Cataloging Unit (0603-0002) (ADEM 1998C).

Sub-Watershed	Stream Name	Station	Stormwater Sampling Event	Date	Time	Stream Depth	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	Fecal Strep.	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	SO4
#		*#*	*X*	*yymmdd*	*24hr*	*ft*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*col/100ml*	*col/100ml*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*
350	Flint Cr	SITE 1		950411	0945	6.7	20	7.4	7.3	226	35	87	18	26	2.0	97	40	<0.010	0.070	0.19	<0.08	7.42
350	Flint Cr	SITE 1		950502	1050	8.5	16	9.1	7.2	182	35	725	167	233	1.1	116	21	0.031	0.588	0.21	<0.08	7.08
350	Flint Cr	SITE 1		950607	1015	8.8	27	6.9	7.2	226	30	300	180	20	4.1	99	37	<0.010	<0.010	0.31	<0.08	6.53
350	Flint Cr	SITE 1		950718	0900	8.8	30	4.1	7.2	227	18	28	360	40	1.8	129	23	0.021	<0.01	0.40	<0.08	5.71
350	Flint Cr	SITE 1		950808	0930	9.4	28	4.5	7.0	208	20	290	320	67	2.5	106	23	0.017	<0.01	0.32	<0.08	4.79
350	Flint Cr	SITE 1		950906	0820	7.3	26	4.0	7.3	234	30	2.2	230	76	2.3	112	28	0.022	<0.010	0.17	<0.08	6.97
350	Flint Cr	SITE 1		951011	0910	7.4	19	3.6	6.8	170	38	220	520	103	1.8	134	29	0.082	0.438	0.61	0.15	8.65
350	Flint Cr	SITE 1		951114	1230	8.4	8	8.9	6.9	150	35	1,630	680	1,000	1.0	106	20	0.050	0.623	0.41	<0.08	8.15
350	Flint Cr	SITE 1		951205	1120	6.0	11	8.7	6.4	179	32	730	210	143	0.9	111	22	0.041	0.821	0.34	<0.08	9.16
350	Flint Cr	SITE 1		960109	1050	9.2	2	11.8	6.8	90	28	3,550	2,300	3,300	2.1	96	17	0.074	0.590	0.40	<0.08	6.61
350	Flint Cr	SITE 1		960206	0730	6.8	1	11.6	6.1	145	10	895	43	530	1.8	96	19	0.046	0.869	0.18	<0.08	8.13
350	Flint Cr	SITE 1		960305	1030	5.5	8	10.4	6.6	184	15	400	166	73	1.5	113	176	0.029	0.570	0.35	<0.08	7.83
350	Flint Cr	SITE 1		960409	1100	7.5	10	9.0	7.0	150	22	560	50	7	1.0	26	26	0.017	0.581	0.37	<0.08	7.02
350	Flint Cr	SITE 1		960507	1030	8.7	22	7.4	7.0	175	30	360	107	60	3.7	121	27	0.013	0.130	0.78	<0.08	6.70
350	Flint Cr	SITE 1		960605	0920	7.8	22	5.4	6.8	207	25	55	40	50	3.1	142	29	0.013	0.022	0.49	<0.08	5.74
350	Flint Cr	SITE 1		960702	0920	9.1	28	3.3	6.7	208	22	20	90	43	3.0	101	11	0.028	<0.010	0.29	<0.08	4.97
350	Flint Cr	SITE 1		960806	0910	9.4	25	4.1	6.7	145	32	210	1,800	3,800	1.9	72	26	0.055	0.250	0.64	<0.08	6.74
350	Flint Cr	SITE 1		960904	1020	8.6	22	3.2	6.8	169	30	910	2,300	8,700	2.8	129	35	0.092	0.197	0.53	<0.08	7.20
350	Flint Cr	SITE 1		961002	1030	8.0	17	4.3	6.9	130	18	290	240	230	1.4	134	19	0.062	0.171	0.65	<0.08	5.27
350	Flint Cr	SITE 1		961105	1000	5.1	10	7.5	6.8	142	42	390	350	330	2.2	162	129	0.050	0.297	0.45	<0.08	8.21
350	Flint Cr	SITE 1		961203	1100	11.1	10	7.1	6.9	85	58	2,600	3,600	16,000	2.6	127	41	0.045	0.252	0.54	0.09	6.57
350	Flint Cr	SITE 1		970107	1040	7.7	11	8.0	7.1	168	60	1,510	6,000	11,600	2.2	128	49	0.105	0.389	0.60	<0.08	6.20
350	Flint Cr	SITE 1		970204	1030	7.4	12	9.4	6.9	185	20	1,390	200	580	0.6	98	36	0.036	0.753	0.31	<0.08	7.76
350	Flint Cr	SITE 1		970304	1100	10.7	15	7.2	6.3	100	55	4,060	2,500	5,400	2.1	96	40	0.040	0.232	1.15	<0.08	4.28
350	Flint Cr	SITE 1		970402	1010	5.9	14	6.8	6.9	202	25	330	47	73	1.0	121	26	0.073	0.474	0.48	<0.08	6.76
350	Flint Cr	SITE 1		970506	1050	11.6	16	5.4	6.9	70	55	4,300	140	230	1.5	70	41	0.077	0.323	0.38	<0.08	4.19
350	Flint Cr	SITE 1		970604	1110	10.0	21	6.2	6.4	136	16	1,230	140	80	1.5	105	31	0.061	0.347	1.12	<0.08	5.57
350	Flint Cr	SITE 1		970715	1030	9.0	26	6.8	6.4	207	18	150	193	87	3.3	127	32	<0.010	0.044	0.70	<0.08	4.98
350	Flint Cr	SITE 1		970805	0920	9.2	26	4.1	6.6	212	20	46	310	160	3.1	143	24	<0.010	<0.010	0.78	<0.08	4.35
350	Flint Cr	SITE 1		970903	1010	7.4	25	5.4	6.4	204	30	12	130	130	2.9	108	38	<0.010	0.012	1.60	<0.08	7.73
350	Flint Cr	SITE 1		971002	0800	6.7	16	6.7	6.7	142	30	64	170	180	2.5	120	26	0.014	0.083	1.18	<0.08	9.34
350	Flint Cr	SITE 1		971104	0930	7.4	7	8.6	6.7	175	30	420	83	140	0.8	121	22	0.027	0.646	0.77	<0.08	10.10
350	Flint Cr	SITE 1		971202	1000	5.3	10	8.3	6.7	190	20	370	260	1,300	0.9	167	20	0.061	0.357	0.45	<0.08	9.69
350	Flint Cr	SITE 2		950112	0800	20.2	9	10.0	7.3	212	17	1,140	370	3,900	1.2	131	30	0.057	0.624	0.35	<0.08	10.60
350	Flint Cr	SITE 2		950207	1000	10.2	5	11.2	7.2	224	8	333	80	67	0.2	115	9	0.055	0.755	0.11	<0.08	8.24
350	Flint Cr	SITE 2		950314	1000	13.3	13	8.5	7.3	179	12	854	136	80	1.3	119	21	0.039	0.812	0.16	<0.08	7.12
350	Flint Cr	SITE 2		950411	0910	11.3	19	6.0	7.0	230	22	79	56	90	0.3	104	34	0.017	0.315	0.15	<0.08	8.08
350	Flint Cr	SITE 2		950502	0930	14.0	16	8.4	7.2	194	40	658	500	1,070	0.8	123	20	0.075	0.696	0.27	<0.08	7.59
350	Flint Cr	SITE 2		950607	0820	13.2	24	2.9	7.3	218	30	275	190	170	2.8	100	20	0.146	0.570	0.77	<0.08	8.38
350	Flint Cr	SITE 2		950718	0820	23.4	28	1.9	7.1	243	15	25	120	13	1.0	136	11	0.034	<0.010	0.30	<0.08	6.12
350	Flint Cr	SITE 2		950808	0900	13.6	26	1.0	7.1	232	15	260	60	97	0.6	118	7	0.080	0.030	0.34	<0.08	9.69
350	Flint Cr	SITE 2		950906	0750	11.6	25	2.3	7.1	238	18	2	47	53	1.7	116	21	0.016	0.031	<0.07	<0.08	10.40
350	Flint Cr	SITE 2		951011	0840	12.2	18	4.6	6.2	197	32	200	140	216	1.1	130	25	0.118	0.923	0.53	<0.08	12.00
350	Flint Cr	SITE 2		951114	1120	14.3	9	8.9	6.8	168	15	1,480	400	1,040	0.7	116	14	0.028	0.776	0.39	<0.08	8.32

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Sub-Watershed	Stream Name	Station	Stormwater Sampling Event	Date	Time	Stream Depth	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	Fecal Strep.	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	SO4
#		#	X	yymmdd	24hr	ft	C	mg/l	s.u.	umhos @25c	NTU	cfs	col/100ml	col/100ml	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/l	mg/l
350	Flint Cr	SITE 2		951205	0940	11.0	11	9.2	6.8	195	24	661	193	226	0.6	111	16	0.039	0.864	0.27	<0.08	9.09
350	Flint Cr	SITE 2		960109	0950	17.8	2	11.6	6.6	107	18	3,230	1,140	5,800	1.8	87	8	0.055	0.698	0.52	<0.08	7.11
350	Flint Cr	SITE 2		960206	0900	12.1	0	12.8	6.4	161	2	814	30	290	1.4	102	6	0.083	1.090	0.19	<0.08	7.80
350	Flint Cr	SITE 2		960305	0940	10.0	8	10.5	5.9	180	4	364	113	67	1.0	115	19	0.079	0.633	0.33	<0.08	8.08
350	Flint Cr	SITE 2		960409	1000	13.1	10	9.7	6.8	167	8	510	73	27	0.6	89	16	0.030	0.692	0.41	<0.08	6.84
350	Flint Cr	SITE 2		960507	0920	13.1	19	5.6	7.0	189	10	325	73	67	0.7	116	19	0.079	0.516	0.28	<0.08	6.35
350	Flint Cr	SITE 2		960605	0850	12.8	20	2.4	6.7	214	22	50	47	97	1.6	152	16	0.137	0.360	0.58	<0.08	8.61
350	Flint Cr	SITE 2		960702	0850	13.4	26	4.5	6.6	216	20	18	27	47	3.7	105	4	0.047	0.021	0.43	0.10	5.73
350	Flint Cr	SITE 2		960806	0850	13.6	22	3.8	6.4	185	22	190	300	420	1.9	96	23	0.100	0.518	0.55	<0.08	8.07
350	Flint Cr	SITE 2		960904	0910	13.8	20	5.1	6.8	117	60	828	20,000	19,000	2.9	105	118	0.074	0.195	0.56	<0.08	5.38
350	Flint Cr	SITE 2		961002	1000	12.5	16	6.6	6.8	182	10	260	270	610	0.6	155	18	0.032	0.471	0.82	<0.08	6.03
350	Flint Cr	SITE 2		961105	0910	10.0	9	8.5	6.8	158	15	357	620	470	1.4	288	14	0.036	0.398	0.43	<0.08	8.11
350	Flint Cr	SITE 2		961203	0930	17.3	9	7.4	6.9	90	50	2,390	4,500	11,800	2.5	120	37	0.057	0.295	0.55	0.10	6.54
350	Flint Cr	SITE 2		970107	0920	12.9	11	8.4	6.9	178	40	1,370	4,200	7,000	2.3	54	38	0.154	0.476	0.66	<0.08	6.53
350	Flint Cr	SITE 2		970204	0930	13.1	12	9.5	6.7	193	16	1,260	210	670	0.6	96	57	0.029	0.787	0.36	<0.08	7.26
350	Flint Cr	SITE 2		970304	0940	20.4	14	7.1	6.5	100	45	3,690	2,300	6,100	2.1	97	30	0.061	0.267	0.60	<0.08	4.36
350	Flint Cr	SITE 2		970402	0900	11.0	13	7.9	6.9	200	18	300	53	80	0.6	124	18	0.050	0.485	0.33	<0.08	5.95
350	Flint Cr	SITE 2		970506	0930	20.9	16	5.0	6.9	69	40	3,920	280	340	1.5	60	29	0.078	0.377	0.40	<0.08	4.28
350	Flint Cr	SITE 2		970604	1200	16.6	17	6.7	6.4	159	33	1,120	240	440	1.4	112	29	0.065	0.621	1.31	<0.08	6.53
350	Flint Cr	SITE 2		970715	1000	13.4	22	4.0	6.4	220	8	136	107	170	0.8	142	16	0.060	0.544	0.28	<0.08	5.57
350	Flint Cr	SITE 2		970805	0850	13.5	24	4.4	6.4	248	18	42	480	37	2.3	149	13	0.035	0.114	0.48	<0.08	5.50
350	Flint Cr	SITE 2		970903	0910	12.1	22	4.2	6.3	193	20	10	43	90	2.3	106	19	<0.010	0.132	0.68	<0.08	6.20
350	Flint Cr	SITE 2		971002	0730	11.4	16	2.9	6.5	170	22	58	160	150	2.0	114	15	0.107	0.313	0.78	<0.08	13.90
350	Flint Cr	SITE 2		971104	0900	11.7	8	8.3	6.7	177	17	380	370	540	0.8	123	21	0.026	0.600	0.68	<0.08	10.60
350	Flint Cr	SITE 2		971202	0850	9.9	12	7.8	6.7	190	18	340	580	5,000	1.3	165	24	0.029	0.284	0.67	<0.08	9.52
350	Flint Cr	SITE 3		950111	1340	9.4	8	10.6	7.3	202	32	188	340	2,270	0.9	135	16	0.076	0.740	0.40	<0.08	11.30
350	Flint Cr	SITE 3		950207	0915	8.2	5	11.2	7.3	206	6	140	163	310	0.2	102	7	0.040	0.866	0.22	<0.08	10.00
350	Flint Cr	SITE 3		950314	0915	10.0	14	8.6	7.2	163	18	376	200	140	1.2	115	23	0.047	0.847	0.24	<0.08	8.42
350	Flint Cr	SITE 3		950411	0810	9.8	20	5.3	6.9	225	18	44	62	76	0.1	77	23	0.044	0.276	0.14	<0.08	10.60
350	Flint Cr	SITE 3		950501	1440	12.2	18	6.5	7.1	190	41	206	2,000	3,700	1.1	121	26	0.059	0.668	0.32	<0.08	9.28
350	Flint Cr	SITE 3		950606	1340	12.0	23	1.4	7.0	200	18	21	220	90	2.6	102	13	0.110	0.517	0.61	<0.08	11.20
350	Flint Cr	SITE 3		950717	1330	12.8	26	1.4	7.0	255	17	0.02	250	11	0.9	142	10	0.033	0.066	0.35	<0.08	13.90
350	Flint Cr	SITE 3		950808	0830	13.0	26	0.9	6.8	207	8	240	60	143	2.8	107	<4	0.194	0.047	0.54	0.23	11.70
350	Flint Cr	SITE 3		950905	1350	10.4	24	0.7	6.9	260	18	1.6	780	280	1.3	155	4	0.095	0.424	0.12	<0.08	31.20
350	Flint Cr	SITE 3		951011	0810	10.8	17	6.0	6.1	208	30	112	400	680	0.9	133	41	0.078	1.170	0.34	<0.08	15.20
350	Flint Cr	SITE 3		951114	1050	14.0	9	8.7	6.8	166	18	649	420	1,080	0.5	109	13	0.046	0.960	0.46	<0.08	9.25
350	Flint Cr	SITE 3		951205	0900	10.9	11	9.0	6.5	186	22	397	640	790	0.9	108	20	0.032	0.890	0.25	<0.08	9.80
350	Flint Cr	SITE 3		960109	0910	20.0	2	12.0	6.9	102	19	1,530	1,160	6,200	1.6	86	7	0.067	0.746	0.37	<0.08	7.22
350	Flint Cr	SITE 3		960206	1010	11.6	0	12.8	6.3	130	2	295	17	137	1.8	98	5	0.047	1.220	0.16	<0.08	8.70
350	Flint Cr	SITE 3		960305	0900	9.3	9	10.2	6.0	188	5	123	143	93	0.8	110	21	0.124	0.639	0.31	<0.08	9.90
350	Flint Cr	SITE 3		960409	0920	12.1	11	9.6	7.0	172	8	207	83	30	0.7	72	18	0.021	0.693	0.29	<0.08	7.83
350	Flint Cr	SITE 3		960507	0900	12.4	20	5.2	6.8	183	18	98	53	53	0.8	113	14	0.091	0.550	0.58	<0.08	7.88
350	Flint Cr	SITE 3		960605	0820	11.6	20	1.4	6.7	184	18	26	50	93	1.4	132	6	0.104	0.406	0.45	<0.08	9.54

Appendix F-3, cont. Physical / chemical data collected from January 1995 to December 1997 by Geological Survey of Alabama (GSA) undercontract by ADEM as part of the Flint Creek Nonpoint Source Monitoring Project in the Wheeler Lake Cataloging Unit (0603-0002) (ADEM 1998C).

Sub-Watershed	Stream Name	Station	Stormwater Sampling Event	Date	Time	Stream Depth	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	Fecal Strep.	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	SO4
#		#	X	yymmdd	24hr	ft	C	mg/l	s.u.	umhos @25c	NTU	cfs	col/100ml	col/100ml	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/l	mg/l
350	Flint Cr	SITE 3		960702	0820	12.2	24	1.0	6.3	248	18	5.1	60	500	2.2	137	4	0.094	0.060	0.42	<0.08	12.50
350	Flint Cr	SITE 3		960806	0820	12.2	22	5.2	6.3	202	20	131	113	750	0.5	128	24	0.058	0.766	0.62	<0.08	12.90
350	Flint Cr	SITE 3		960904	0840	12.1	20	3.0	6.5	218	22	21	6,200	19,000	2.6	147	28	0.070	0.397	0.55	<0.08	9.49
350	Flint Cr	SITE 3		961002	0930	11.3	16	4.1	6.6	162	9	41	390	290	0.6	156	16	0.057	0.418	0.64	<0.08	8.97
350	Flint Cr	SITE 3		961105	0840	9.1	8	8.5	6.6	164	25	94	2,200	620	1.6	164	14	0.081	0.331	0.42	<0.08	13.20
350	Flint Cr	SITE 3		961203	0900	19.0	9	6.9	6.8	62	50	1,860	4,900	9,100	2.8	96	31	0.054	0.320	0.68	0.14	6.58
350	Flint Cr	SITE 3		970107	0850	13.6	11	8.7	6.8	182	35	580	4,000	5,000	1.6	124	36	0.110	0.592	1.03	<0.08	7.70
350	Flint Cr	SITE 3		970204	0850	12.6	13	9.1	6.8	187	10	560	230	590	0.7	102	35	0.055	0.821	0.73	<0.08	8.92
350	Flint Cr	SITE 3		970304	0910	22.4	14	7.1	6.6	95	53	2,470	3,600	7,900	2.1	97	27	0.068	0.313	0.91	<0.08	4.23
350	Flint Cr	SITE 3		970402	0830	8.9	14	7.7	6.7	203	18	93	57	153	0.8	118	21	0.098	0.421	0.55	<0.08	7.68
350	Flint Cr	SITE 3		970506	0850	26.0	17	4.6	6.8	69	40	3,390	280	310	1.5	65	20	0.080	0.380	0.44	0.08	4.42
350	Flint Cr	SITE 3		970603	1400	16.0	16	7.0	6.0	157	13	577	3,000	2,500	1.9	65	40	0.087	0.539	1.02	<0.08	7.88
350	Flint Cr	SITE 3		970715	0930	12.1	22	3.4	6.3	220	2	74	53	150	0.7	141	23	0.071	0.527	0.45	<0.08	7.55
350	Flint Cr	SITE 3		970805	0820	12.4	22	2.6	6.4	235	12	20	660	180	2.7	149	7	0.031	0.388	0.47	<0.08	9.24
350	Flint Cr	SITE 3		970903	0850	11.0	21	2.9	6.3	213	16	7	100	270	2.9	114	20	0.012	0.318	1.03	<0.08	10.40
350	Flint Cr	SITE 3		971001	1300	10.9	16	3.7	6.8	190	20	40	250	320	1.9	150	22	0.083	0.363	0.73	<0.08	18.60
350	Flint Cr	SITE 3		971104	0830	10.9	7	8.7	6.6	170	23	220	200	620	0.8	115	19	0.024	0.567	0.76	<0.08	11.10
350	Flint Cr	SITE 3		971202	0820	9.5	11	7.8	6.7	202	22	180	710	790	1.3	163	22	0.054	0.291	0.82	<0.08	10.60
350	Flint Cr	SITE 4		950111	1230	4.6	8	10.0	7.4	204	13	184	220	1,640	0.9	124	11	0.057	0.710	0.31	<0.08	11.40
350	Flint Cr	SITE 4		950207	0815	4.0	5	11.6	7.0	185	8	136	147	320	0.5	86	7	0.034	0.874	0.15	<0.08	9.58
350	Flint Cr	SITE 4		950314	0815	8.0	13	8.8	6.9	164	7	370	200	210	0.6	119	26	0.035	0.837	0.20	<0.08	8.43
350	Flint Cr	SITE 4		950411	0740	3.0	20	5.0	6.4	224	15	43.4	88	178	0.2	98	30	0.048	0.305	0.24	<0.08	10.80
350	Flint Cr	SITE 4		950412	0930	3.0	19	5.4	7.1	222	22	17	230	330	0.2	98	21	0.078	0.329	0.28	<0.08	6.31
350	Flint Cr	SITE 4		950501	1410	5.4	17	7.7	7.2	202	31	202	1,620	2,900	1.1	123	31	0.056	0.615	0.34	<0.08	9.57
350	Flint Cr	SITE 4		950606	1315	4.7	24	2.4	7.0	230	20	21	250	290	2.5	111	22	0.075	0.481	0.38	<0.08	12.50
350	Flint Cr	SITE 4		950717	1300	5.3	27	3.2	7.2	298	5	11	47	37	0.7	168	10	0.051	0.131	0.32	<0.08	19.10
350	Flint Cr	SITE 4		950808	0750	5.1	25	2.7	6.8	156	28	235	730	650	0.9	80	23	0.098	0.287	0.54	0.20	12.20
350	Flint Cr	SITE 4		950905	1320	3.3	23	1.5	7.1	230	21	1.6	147	203	1.8	139	20	0.121	0.079	0.64	<0.08	19.70
350	Flint Cr	SITE 4	X	951003	1300	4.4	20	7.1	6.6	125	53	210	56,000	74,000	5.5	77	126	0.190	0.615	0.81	0.26	4.73
350	Flint Cr	SITE 4		951011	0745	4.3	16	7.2	6.3	207	25	110	180	1,120	0.7	127	22	0.059	1.120	0.37	<0.08	16.30
350	Flint Cr	SITE 4		951114	0950	9.4	9	8.9	6.6	168	18	636	340	940	0.6	108	13	0.042	0.971	0.43	<0.08	9.38
350	Flint Cr	SITE 4		951205	0820	6.4	11	8.9	6.9	186	20	389	1,180	2,100	1.1	102	22	0.041	0.779	0.27	<0.08	10.00
350	Flint Cr	SITE 4		960109	0800	11.9	2	11.8	6.2	113	16	1,510	1,060	5,500	1.7	84	6	0.060	0.779	0.29	<0.08	7.44
350	Flint Cr	SITE 4		960206	1050	4.0	1	12.4	6.4	137	4	292	37	2,700	1.8	92	7	0.170	1.190	0.29	<0.08	9.02
350	Flint Cr	SITE 4		960305	0800	4.4	8	11.3	6.0	175	6	122	230	67	0.9	110	18	0.037	0.555	0.35	<0.08	9.50
350	Flint Cr	SITE 4	X	960319	1050	8.4	11	8.4	6.4	168	55	562	8,600	13,000	3.4	103	62	0.191	0.612	0.61	0.08	7.31
350	Flint Cr	SITE 4		960409	0810	5.1	10	10.0	6.7	183	6	205	123	67	0.6	75	15	0.035	0.650	0.34	<0.08	7.71
350	Flint Cr	SITE 4		960507	0800	5.4	20	6.1	6.8	183	11	97.1	67	137	0.9	110	17	0.066	0.537	0.51	<0.08	8.06
350	Flint Cr	SITE 4		960605	0750	4.6	20	3.7	6.7	222	20	26	67	360	0.8	144	16	0.066	0.460	0.37	<0.08	12.90
350	Flint Cr	SITE 4		960702	0800	5.0	24	1.2	6.3	271	12	5	60	620	1.9	150	4	0.107	0.203	0.47	<0.08	20.40
350	Flint Cr	SITE 4		960806	0800	5.0	22	6.5	6.3	200	18	130	220	1,900	0.5	99	27	0.043	0.827	0.26	<0.08	14.10
350	Flint Cr	SITE 4		960904	0820	4.8	20	3.6	6.5	238	20	20	550	4,900	2.4	158	28	0.077	0.850	0.51	<0.08	18.30
350	Flint Cr	SITE 4	X	960917	1020	7.4	20	5.6	6.5	140	58	460	42,000	114,000	3.9	133	113	0.088	0.258	0.83	0.13	9.78

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Sub-Watershed	Stream Name	Station	Stormwater Sampling Event	Date	Time	Stream Depth	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	Fecal Strep.	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	SO4
#		#	X	yymmdd	24hr	ft	C	mg/l	s.u.	umhos @25c	NTU	cfs	col/100ml	col/100ml	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/l	mg/l
350	Flint Cr	SITE 4		961002	0810	3.9	16	6.2	6.5	188	10	40.4	620	760	0.7	157	20	0.040	0.599	0.53	<0.08	10.90
350	Flint Cr	SITE 4		961105	0800	3.2	9	9.2	6.2	169	17	93.3	640	670	1.1	169	13	0.154	0.329	0.61	<0.08	14.50
350	Flint Cr	SITE 4		961203	0810	14.0	8	6.8	7.1	97	42	1,840	4,700	8,400	2.6	99	29	0.063	0.345	0.60	0.14	6.94
350	Flint Cr	SITE 4		970107	0800	8.2	11	9.2	7.0	181	35	573	1,550	2,650	1.3	132	34	0.116	0.632	0.50	<0.08	8.29
350	Flint Cr	SITE 4		970204	0800	7.9	12	9.3	6.7	184	23	552	320	640	1.1	99	39	0.054	0.750	0.40	<0.08	9.16
350	Flint Cr	SITE 4	X	970227	1030	8.4	13	9.8	6.5	161	42	582	2,500	14,400	1.6	118	71	0.073	0..636	0.67	<0.08	7.45
350	Flint Cr	SITE 4		970304	0800		14	7.3	6.4	101	50	2,450	4,400	7,300	1.9	90	22	0.080	0.400	0.62	<0.08	4.72
350	Flint Cr	SITE 4		970402	0750	3.0	12	7.9	6.8	197	14	92	67	220	0.8	113	18	0.047	0.398	0.54	<0.08	8.66
350	Flint Cr	SITE 4		970506	0750	20.7	17	4.6	6.2	79	32	3,360	240	330	1.4	66	15	0.077	0.358	0.28	0.08	4.94
350	Flint Cr	SITE 4		970603	1440	9.4	17	6.8	6.1	153	30	571	3,300	6,600	2.6	129	56	0.095	0.805	1.46	0.09	7.69
350	Flint Cr	SITE 4		970715	0810	4.2	22	4.7	6.2	214	10	73	83	410	0.7	142	17	0.069	0.556	0.41	<0.08	8.25
350	Flint Cr	SITE 4		970805	0750	4.9	22	3.2	6.3	236	12	20	73	196	2.0	146	11	0.081	0.718	0.59	<0.08	11.50
350	Flint Cr	SITE 4		970903	0820	3.4	21	3.0	6.2	240	16	7	67	270	1.9	150	13	0.038	0.500	0.63	<0.08	14.30
350	Flint Cr	SITE 4		971001	1330	3.5	16	5.7	6.8	193	18	39	340	1,800	0.8	149	28	0.050	0.311	0.07	<0.08	17.40
350	Flint Cr	SITE 4		971104	0800	5.0	7	9.8	6.6	165	22	218	170	720	0.8	118	18	0.021	0.557	0.76	<0.08	11.30
350	Flint Cr	SITE 4	X	971106	1000	4.2	7	9.6	6.7	170	15	160	150	490	1.0	134	14	<0.010	0.571	0.90	<0.08	11.20
350	Flint Cr	SITE 4		971202	0730	4.4	10	8.3	6.7	202	17	179	560	840	1.2	152	17	0.054	0.282	0.84	<0.08	10.20
350	W. Flint Cr	SITE 9-A		950112	1030	10.4	10	10.0	7.1	198	35	405	4,630	7,600	1.4	126	30	0.059	0.484	0.34	<0.08	9.44
350	W. Flint Cr	SITE 9-A		950207	1200	8.4	5	11.6	7.2	237	12	97	83	70	0.9	119	9	0.032	0.680	<0.07	<0.08	6.53
350	W. Flint Cr	SITE 9-A		950227	1230	9.4	12	9.7	7.0	230	15	185	113	265	<0.1	123	18	0.032	0.837	0.12	<0.08	6.23
350	W. Flint Cr	SITE 9-A		950314	1200	11.1	14	8.5	7.0	192	20	360	143	77	0.4	151	25	0.028	0.770	0.17	<0.08	6.04
350	W. Flint Cr	SITE 9-A		950411	1030	6.7	20	6.0	7.2	245	15	24	98	96	<0.1	111	19	0.023	0.396	0.15	<0.08	5.01
350	W. Flint Cr	SITE 9-A		950502	1145	10.4	16	9.5	7.3	183	37	237	667	2,200	0.7	131	33	0.040	0.739	0.22	<0.08	5.77
350	W. Flint Cr	SITE 9-A		950607	1100	6.4	28	5.2	7.3	228	38	26	570	390	0.5	112	34	0.037	0.561	0.21	<0.08	5.06
350	W. Flint Cr	SITE 9-A		950608	0800	8.0	24	5.9	7.3	255	35	59	780	1,600	0.8	121	94	0.039	0.730	0.23	<0.08	5.20
350	W. Flint Cr	SITE 9-A		950718	0930	6.0	27	4.1	7.2	220	18	11	173	173	0.7	125	19	0.041	0.159	0.22	<0.08	4.50
350	W. Flint Cr	SITE 9-A		950808	1000	6.0	26	2.3	7.0	231	22	18	200	213	0.3	109	21	0.050	0.137	0.26	<0.08	3.82
350	W. Flint Cr	SITE 9-A		950906	0910	4.8	23	2.2	7.0	230	25	0	33	120	2.1	119	17	0.011	<0.010	0.63	<0.08	1.55
350	W. Flint Cr	SITE 9-A		951011	0950	7.6	17	7.0	6.6	214	22	53	163	840	0.8	105	13	0.053	0.985	0.34	<0.08	9.90
350	W. Flint Cr	SITE 9-A		951114	1310	11.5	9	9.5	6.5	190	22	510	255	800	0.5	102	19	0.013	0.778	0.25	<0.08	7.51
350	W. Flint Cr	SITE 9-A		951205	1200	9.3	11	9.2	6.1	216	17	207	260	200	0.7	126	10	0.031	0.726	0.17	<0.08	7.56
350	W. Flint Cr	SITE 9-A		960109	1130	16.6	3	12.0	6.9	126	18	1,082	210	600	1.4	93	6	0.021	0.871	0.31	<0.08	6.62
350	W. Flint Cr	SITE 9-A		960206	1200	10.0	1	12.0	6.7	185	10	277	67	60	1.6	107	5	0.020	1.090	0.11	<0.08	6.84
350	W. Flint Cr	SITE 9-A		960305	1120	8.7	8	10.6	6.5	179	14	156	223	87	0.8	109	21	0.013	0.634	0.12	<0.08	6.17
350	W. Flint Cr	SITE 9-A	X	960306	0930	16.7	12	9.6	6.9	90	130	1,300	18,000	96,000	4.8	64	400	0.212	0.474	0.60	<0.08	4.40
350	W. Flint Cr	SITE 9-A		960409	1140	8.6	10	9.5	6.9	182	18	151	97	17	0.7	83	17	<0.010	0.645	0.31	<0.08	5.61
350	W. Flint Cr	SITE 9-A		960507	1100	7.4	20	6.7	6.8	202	25	61	93	140	0.7	130	27	0.059	0.561	0.58	<0.08	4.96
350	W. Flint Cr	SITE 9-A		960605	0950	6.2	19	5.3	6.7	201	28	17	300	560	0.9	152	37	0.094	0.602	0.42	<0.08	5.50
350	W. Flint Cr	SITE 9-A		960702	0950	5.5	25	3.4	6.7	226	25	12	107	320	2.7	149	17	0.103	0.352	0.22	<0.08	3.70
350	W. Flint Cr	SITE 9-A	X	960708	1150	6.8	22	5.0	6.4	255	32	31	3,200	5,800	1.0	146	43	0.090	0.250	0.43	<0.08	3.35
350	W. Flint Cr	SITE 9-A		960806	0950	6.6	23	4.5	6.6	218	30	26	330	2,100	0.7	132	37	0.058	0.461	0.32	<0.08	4.82
350	W. Flint Cr	SITE 9-A		960904	1100	14.3	20	5.1	6.9	93	60	812	18,000	51,000	3.2	88	62	0.046	0.177	0.07	0.10	4.67
350	W. Flint Cr	SITE 9-A		961002	1100	7.0	16	7.2	7.0	194	18	197	880	7,500	0.7	161	30	0.040	0.578	0.35	<0.08	6.04
350	W. Flint Cr	SITE 9-A		961105	1050	9.2	10	9.7	6.9	159	25	232	97	233	0.9	152	8	0.025	0.567	0.19	<0.08	6.64

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Sub-Watershed	Stream Name	Station	Stormwater Sampling Event	Date	Time	Stream Depth	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	Fecal Strep.	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	SO4
#		*#*	*X*	*yymmdd*	*24hr*	*ft*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*col/100ml*	*col/100ml*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*
350	W. Flint Cr	SITE 9-A		961203	1130	12.5	10	8.9	6.0	154	10	615	210	1,180	1.0	158	20	0.030	0.521	0.24	<0.08	12.80
350	W. Flint Cr	SITE 9-A		970107	1120	12.0	11	9.6	7.0	200	36	510	1,250	2,500	1.0	134	35	0.047	0.538	0.86	<0.08	5.83
350	W. Flint Cr	SITE 9-A	X	970116	0820	14.2	6	12.4	6.6	141	80	980	7,300	47,000	3.3	90	232	0.076	0.588	1.34	0.11	6.43
350	W. Flint Cr	SITE 9-A		970204	1100	11.8	13	9.6	7.0	204	35	703	700	3,400	0.9	109	66	0.025	0.690	0.36	<0.08	6.05
350	W. Flint Cr	SITE 9-A		970304	1130	18.0	14	8.1	6.5	92	90	2,860	2,000	8,500	1.8	87	47	0.027	0.221	0.62	<0.08	3.86
350	W. Flint Cr	SITE 9-A		970402	1050	7.4	12	9.0	7.0	209	15	105	60	87	0.7	152	10	0.012	0.534	0.65	<0.08	5.11
350	W. Flint Cr	SITE 9-A		970506	1120	14.0	15	6.5	6.7	136	35	1,030	350	720	1.2	95	32	0.036	0.427	0.34	<0.08	5.16
350	W. Flint Cr	SITE 9-A		970604	1025	11.9	16	8.0	6.5	184	20	530	310	710	0.8	135	38	0.036	0.539	0.80	<0.08	5.36
350	W. Flint Cr	SITE 9-A	X	970701	1100	16.6	20	6.9	6.5	153	72	1,320	5,900	8,600	1.7	86	95	0.033	0.274	1.25	<0.08	3.32
350	W. Flint Cr	SITE 9-A		970715	1110	7.2	22	6.1	6.5	235	14	44	120	320	0.3	150	21	0.031	0.688	0.51	<0.08	4.19
350	W. Flint Cr	SITE 9-A		970805	1000	6.0	22	4.9	6.5	255	20	17	113	520	0.8	168	24	0.033	0.457	0.52	<0.08	3.55
350	W. Flint Cr	SITE 9-A		970903	1050	4.5	21	5.3	6.5	226	21	2	87	480	0.7	146	22	0.014	0.263	0.58	<0.08	4.28
350	W. Flint Cr	SITE 9-A		971002	0840	5.6	13	6.3	6.6	183	22	10	190	560	0.6	141	21	<0.010	0.310	0.32	<0.08	7.34
350	W. Flint Cr	SITE 9-A		971104	1030	8.1	7	9.0	7.0	193	16	107	110	470	0.6	142	11	<0.010	0.601	0.55	<0.08	8.00
350	W. Flint Cr	SITE 9-A		971202	1040	7.8	11	8.8	6.7	194	19	110	120	380	0.8	152	11	0.014	0.287	0.46	<0.08	8.10
350	W. Flint Cr	SITE 9-B		950411	1200	2.8	19	6.0	6.7	270	16		176	630	0.1	127	11	0.030	0.468	0.19	<0.08	5.25
350	W. Flint Cr	SITE 9-B		950503	0900	4.0	15	8.7	7.2	230	28		1,170	6,300	0.5	138	34	0.038	0.692	0.22	<0.08	5.38
350	W. Flint Cr	SITE 9-B		950607	1240	4.0	24	5.6	7.0	187	300		19,000	59,000	5.0	97	242	0.081	0.947	0.47	<0.08	4.88
350	W. Flint Cr	SITE 9-B		950718	1050	1.6	27	2.3	7.0	318	8	0	250	380	0.4	184	9	0.073	0.170	0.38	<0.08	3.46
350	W. Flint Cr	SITE 9-B		950808	1130	1.8	26	1.2	7.0	268	10	0	70	120	1.2	142	4	0.093	<0.010	0.48	<0.08	1.53
350	W. Flint Cr	SITE 9-B		950906	1030	0.8	22	1.2	6.9	276	20	0	33	23	1.6	151	4	0.147	0.030	0.50	<0.08	0.77
350	W. Flint Cr	SITE 9-B		951011	1110	3.0	17	7.9	6.6	248	22		260	920	0.4	168	14	0.041	1.120	0.41	<0.08	10.40
350	W. Flint Cr	SITE 9-B		951115	0930	5.4	8	10.4	6.5	225	15		193	800	0.3	123	5	0.018	0.862	0.25	<0.08	7.57
350	W. Flint Cr	SITE 9-B		951206	0920	4.2	11	9.3	6.7	251	8		280	400	0.6	152	<4	0.014	0.663	0.10	<0.08	7.35
350	W. Flint Cr	SITE 9-B		960109	1250	7.8	4	12.7	6.6	151	15		200	250	1.2	110	9	0.020	1.090	0.13	<0.08	6.46
350	W. Flint Cr	SITE 9-B		960207	0930	5.0	4	11.2	6.6	180	8		33	100	0.8	90	6	<0.010	1.240	0.11	<0.08	6.48
350	W. Flint Cr	SITE 9-B		960305	1150	4.8	9	10.6	6.4	191	8		293	330	0.8	118	15	<0.010	0.683	0.14	<0.08	5.87
350	W. Flint Cr	SITE 9-B		960409	1220	3.6	10	10.4	6.8	205	12		120	43	0.9	90	15	0.010	0.693	0.30	<0.08	5.21
350	W. Flint Cr	SITE 9-B		960507	1130	2.8	20	7.3	6.8	212	18		147	157	0.8	126	23	0.062	0.663	0.77	<0.08	4.86
350	W. Flint Cr	SITE 9-B		960605	1020	1.0	19	5.7	6.7	232	28		520	890	0.9	164	50	0.072	0.703	0.33	<0.08	5.53
350	W. Flint Cr	SITE 9-B		960702	1020	1.8	24	2.1	6.7	272	22		123	650	2.8	175	10	0.150	0.431	0.61	<0.08	3.76
350	W. Flint Cr	SITE 9-B		960806	1020	2.4	22	6.5	6.7	255	35		430	3,500	0.9	139	54	0.058	0.612	0.62	<0.08	5.15
350	W. Flint Cr	SITE 9-B		960904	1120	4.2	20	6.7	6.7	159	48		7,300	17,000	2.4	127	69	0.061	0.238	0.56	<0.08	5.14
350	W. Flint Cr	SITE 9-B		961002	1130	3.0	16	7.8	7.0	219	15		390	1,700	0.7	177	23	0.028	0.622	0.40	<0.08	5.90
350	W. Flint Cr	SITE 9-B		961105	1130	4.5	10	9.9	6.8	183	20		143	310	0.9	161	7	0.019	0.706	0.33	<0.08	6.50
350	W. Flint Cr	SITE 9-B		961203	1200	4.8	8	1.0	6.6	140	16		230	560	0.7	137	24	0.023	0.591	0.22	<0.08	6.34
350	W. Flint Cr	SITE 9-B		970107	1140	5.5	10	10.7	6.9	220	28		900	1,350	0.9	144	25	0.034	0.638	0.29	<0.08	5.57
350	W. Flint Cr	SITE 9-B		970204	1130	6.6	14	9.2	7.0	184	60		4,400	5,500	1.4	74	72	0.033	0.560	0.49	<0.08	6.13
350	W. Flint Cr	SITE 9-B		970304	1200	16.0	13	8.6	6.5	103	68		2,300	4,300	1.3	75	43	0.030	0.254	0.73	<0.08	4.65
350	W. Flint Cr	SITE 9-B		970402	1200	2.8	13	10.3	6.9	215	15		80	87	0.8	144	9	0.017	0.605	0.36	<0.08	4.90
350	W. Flint Cr	SITE 9-B		970506	1150	5.2	14	8.9	6.9	180	35		370	670	0.6	114	37	0.025	0.660	<0.07	<0.08	5.12
350	W. Flint Cr	SITE 9-B		970604	0945	4.0	16	8.8	6.7	203	15		350	700	0.7	145	32	0.020	0.646	0.36	<0.07	5.20
350	W. Flint Cr	SITE 9-B		970715	1130	3.6	22	6.8	6.4	248	8		240	350	0.3	169	13	0.020	0.762	0.34	<0.08	4.16
350	W. Flint Cr	SITE 9-B		970805	1030	2.0	21	5.0	6.5	272	18		163	400	1.0	179	14	0.040	0.315	0.46	<0.08	6.35

Appendix F-3, cont. Physical / chemical data collected from January 1995 to December 1997 by Geological Survey of Alabama (GSA) undercontract by ADEM as part of the Flint Creek Nonpoint Source Monitoring Project in the Wheeler Lake Cataloging Unit (0603-0002) (ADEM 1998C).

Sub-Watershed	Stream Name	Station	Stormwater Sampling Event	Date	Time	Stream Depth	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	Fecal Strep.	BOD-5	TDS	TSS	NH3	NO2/NO3	TKN	T-PO4	SO4
#		#	X	yymmdd	24hr	ft	C	mg/l	s.u.	umhos @25c	NTU	cfs	col/100ml	col/100ml	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/l	mg/l
350	W. Flint Cr	SITE 9-B		970903	1120	2.0	21	3.7	6.5	230	16		196	700	0.8	136	12	0.038	0.400	0.60	<0.08	4.61
350	W. Flint Cr	SITE 9-B		971002	0900	2.0	13	6.0	6.7	224	25		490	820	0.8	162	22	0.037	0.467	0.50	<0.08	7.45
350	W. Flint Cr	SITE 9-B		971104	1100	3.2	6	10.0	7.1	226	18		140	460	0.7	161	6	<0.010	0.635	0.59	<0.08	8.07
350	W. Flint Cr	SITE 9-B		971202	1110	3.0	10	9.6	6.8	227	15		150	330	0.9	166	7	0.012	0.314	0.29	<0.08	7.74
360	W. Flint Cr	SITE 9-C		950411	1135	3.0	20	6.2	6.8	280	12		230	1,040	0.3	126	6	0.043	0.593	0.22	<0.08	4.45
360	W. Flint Cr	SITE 9-C		950503	0830	2.6	14	8.6	7.2	249	15		633	2,600	0.3	141	21	0.016	0.691	0.21	<0.08	4.89
360	W. Flint Cr	SITE 9-C		950607	1200	4.0	23	6.8	7.4	272	45		1,700	2,000	1.2	131	87	0.037	0.787	0.24	<0.08	4.50
360	W. Flint Cr	SITE 9-C		950718	1020	0.8	26	3.9	7.1	307	8		83	93	0.8	181	4	0.050	0.225	0.17	<0.08	3.61
360	W. Flint Cr	SITE 9-C		950808	1100	0.4	26	3.0	7.3	275	8		350	70	1.2	155	5	0.039	0.091	0.22	<0.08	9.12
360	W. Flint Cr	SITE 9-C		950906	1000	0.8	21	1.1	7.1	298	20		400	1,640	2.4	164	27	0.080	<0.010	0.72	<0.08	1.64
360	W. Flint Cr	SITE 9-C		951011	1050	0.8	17	8.0	6.7	259	15		200	860	0.1	179	9	0.039	1.020	0.22	<0.08	10.20
360	W. Flint Cr	SITE 9-C		951115	0900	2.8	8	10.1	6.5	240	10		170	1,000	0.1	128	5	0.013	0.880	0.28	<0.08	6.95
360	W. Flint Cr	SITE 9-C		951206	0850	2.0	11	9.3	6.7	264	6		176	430	0.5	167	9	0.013	0.652	0.12	<0.08	6.65
360	W. Flint Cr	SITE 9-C		960109	1220	4.2	4	12.2	6.4	160	15		110	173	0.8	116	11	0.013	1.070	0.08	<0.08	5.76
360	W. Flint Cr	SITE 9-C		960207	0900	2.4	5	11.0	6.5	193	7		97	87	0.9	114	6	0.020	1.300	0.11	<0.08	5.74
360	W. Flint Cr	SITE 9-C		960305	1210	1.8	9	10.6	6.5	206	10		127	150	0.7	110	19	<0.010	0.719	0.08	<0.08	5.24
360	W. Flint Cr	SITE 9-C		960409	1310	2.4	12	10.8	6.9	202	15		57	37	1.1	94	13	<0.010	0.700	0.24	<0.08	4.58
360	W. Flint Cr	SITE 9-C		960507	1200	1.2	20	7.7	7.0	217	18		100	193	0.7	133	18	0.073	0.717	0.73	<0.08	4.28
360	W. Flint Cr	SITE 9-C		960605	1050	0.8	18	6.9	6.7	250	20		180	450	0.6	183	18	0.045	0.908	0.22	<0.08	5.73
360	W. Flint Cr	SITE 9-C		960702	1040	0.8	22	5.5	6.8	263	18		143	430	1.0	176	12	0.089	0.635	0.22	<0.08	4.30
360	W. Flint Cr	SITE 9-C		960806	1040	0.8	22	7.6	6.7	280	20		157	2,000	0.8	173	22	0.041	0.645	0.29	<0.08	4.38
360	W. Flint Cr	SITE 9-C		960904	1150	1.0	20	6.1	6.7	203	40		7,000	27,000	2.4	149	39	0.032	0.273	0.69	<0.08	4.53
360	W. Flint Cr	SITE 9-C		961002	1200	1.5	16	7.4	6.9	263	9		250	870	0.5	196	12	0.029	0.743	0.31	<0.08	5.38
360	W. Flint Cr	SITE 9-C		961105	1200	1.8	10	9.6	6.7	213	18		113	250	0.7	188	4	0.021	0.778	0.15	<0.08	6.02
360	W. Flint Cr	SITE 9-C		961203	1230	3.0	8	0.5	6.5	144	16		90	390	0.6	138	23	0.011	0.577	0.16	<0.08	5.87
360	W. Flint Cr	SITE 9-C		970107	1210	3.8	10	10.4	7.2	288	25		1,250	1,000	0.7	147	23	0.041	0.673	0.32	<0.08	4.95
360	W. Flint Cr	SITE 9-C		970204	1200	3.4	14	9.2	7.1	201	38		860	2,300	1.0	110	52	0.029	0.574	0.44	<0.08	5.77
360	W. Flint Cr	SITE 9-C		970304	1230	11.0	12	8.6	6.2	110	60		890	3,200	1.0	95	33	0.034	0.334	0.29	<0.08	4.51
360	W. Flint Cr	SITE 9-C		970402	1230	1.6	13	9.0	6.9	230	12		33	67	0.9	152	5	0.034	0.715	0.44	<0.08	4.63
360	W. Flint Cr	SITE 9-C		970506	1210	3.3	15	8.8	7.1	175	28		180	660	0.5	115	37	0.022	0.621	0.36	<0.08	4.65
360	W. Flint Cr	SITE 9-C		970604	0830	3.2	16	8.7	6.4	202	17		70	610	0.6	148	31	0.034	0.605	0.19	<0.08	4.66
360	W. Flint Cr	SITE 9-C		970715	1150	1.4	22	7.0	6.7	264	8		90	330	0.3	167	13	0.021	0.771	0.23	<0.08	4.01
360	W. Flint Cr	SITE 9-C		970805	1050	0.6	21	6.5	6.4	306	14		157	540	1.0	194	7	0.025	0.775	0.30	<0.08	13.90
360	W. Flint Cr	SITE 9-C		970903	1140	1.0	21	6.3	6.5	270	14		113	510	0.5	209	8	<0.010	0.415	0.42	<0.08	4.55
360	W. Flint Cr	SITE 9-C		971002	0930	1.0	13	7.0	6.8	244	15		400	680	0.4	174	6	<0.010	0.346	0.14	<0.08	6.41
360	W. Flint Cr	SITE 9-C		971104	1130	1.6	7	9.8	7.1	240	17		100	340	0.5	172	6	<0.010	0.631	0.54	<0.08	7.23
360	W. Flint Cr	SITE 9-C		971202	1140	1.6	11	10.2	6.8	250	15		100	160	0.9	176	4	0.019	0.298	0.32	<0.08	6.64
360	Big Shoal Cr	SITE 14		950411	1105	0.8	19	3.4	6.9	224	12		310	200	0.3	90	6	0.064	0.139	0.29	<0.08	5.59
360	Big Shoal Cr	SITE 14		950503	0810	0.6	14	8.9	7.1	179	25		1,030	3,800	0.7	106	8	0.020	0.341	0.27	<0.08	6.23
360	Big Shoal Cr	SITE 14		950607	1140	0.8	23	5.5	7.2	193	32		6,300	9,100	2.0	103	27	0.050	0.406	0.53	<0.08	6.56
360	Big Shoal Cr	SITE 14		950718	1000	0.3	26	2.4	7.0	225	10		117	310	0.4	128	<4	0.065	0.100	0.30	<0.08	2.18
360	Big Shoal Cr	SITE 14		950808	1040	0.2	26	2.0	7.2	230	18		330	650	0.8	106	<4	0.087	0.106	0.58	<0.08	1.86
360	Big Shoal Cr	SITE 14		950906	0940	0.5	21	1.4	6.9	255	30		37	80	2.1	140	<4	0.117	0.076	0.74	<0.08	3.29
360	Big Shoal Cr	SITE 14		951011	1030	0.8	17	7.6	6.8	170	15		780	540	1.1	116	11	0.031	0.402	0.41	<0.08	11.10

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Sub-Watershed	Stream Name	Station	Stormwater Sampling Event	Date	Time	Stream Depth	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	Fecal Strep.	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	SO4
#		#	X	yymmdd	24hr	ft	C	mg/l	s.u.	umhos @25c	NTU	cfs	col/100ml	col/100ml	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/l	mg/l
360	Big Shoal Cr	SITE 14		951115	0830	1.0	7	10.5	6.9	152	12		320	1,060	0.7	88	8	0.014	0.452	0.36	<0.08	9.58
360	Big Shoal Cr	SITE 14		951206	0820	1.0	9	9.8	6.4	219	5		166	216	<0.1	133	6	<0.010	0.221	0.36	<0.08	10.00
360	Big Shoal Cr	SITE 14		960109	1200	1.8	2	13.6	6.6	112	12		380	193	2.0	85	6	0.020	0.741	0.19	<0.08	8.20
360	Big Shoal Cr	SITE 14		960207	0830	1.0	2	13.4	6.3	118	8		97	93	1.7	72	<4	0.014	0.664	0.14	<0.08	8.21
360	Big Shoal Cr	SITE 14		960305	1230	1.2	9	10.8	6.4	150	5		330	80	0.8	90	15	0.011	0.353	0.20	<0.08	7.14
360	Big Shoal Cr	SITE 14		960409	1250	1.0	10	11.4	6.8	150	10		90	27	0.9	66	<4	<0.010	0.293	0.31	<0.08	6.35
360	Big Shoal Cr	SITE 14		960507	1220	0.8	19	6.8	6.9	157	15		250	210	1.0	99	5	0.078	0.321	0.51	<0.08	5.63
360	Big Shoal Cr	SITE 14		960605	1110	0.6	19	5.5	6.8	170	18		420	480	0.9	136	4	0.077	0.317	0.44	<0.08	8.32
360	Big Shoal Cr	SITE 14		960702	1100	1.0	24	3.6	6.9	244	10		310	2,200	2.2	155	<4	0.103	0.157	0.29	<0.08	3.27
360	Big Shoal Cr	SITE 14		960806	1100	1.5	22	5.6	6.7	193	18		250	2,700	0.7	131	<4	0.072	0.287	0.47	<0.08	5.58
360	Big Shoal Cr	SITE 14		960904	1210	1.6	20	7.0	6.8	106	50		33,000	13,000	2.6	101	31	0.031	0.184	0.66	<0.08	6.96
360	Big Shoal Cr	SITE 14		961002	1220	1.0	16	8.0	7.0	173	7		2,200	2,000	0.7	156	5	0.010	0.293	0.49	<0.08	6.55
360	Big Shoal Cr	SITE 14		961105	1230	1.0	10	0.1	7.0	117	12		113	137	0.9	123	<4	0.016	0.288	0.26	<0.08	7.16
360	Big Shoal Cr	SITE 14		961203	1250	1.2	7	2.0	6.8	110	5	22	140	180	0.8	117	6	<0.010	0.275	0.30	<0.08	7.62
360	Big Shoal Cr	SITE 14		970107	1230	0.6	8	12.6	7.0	180	22	31.8	560	570	1.0	122	7	0.029	0.308	0.33	<0.08	6.97
360	Big Shoal Cr	SITE 14		970204	1220	0.8	13	10.2	7.1	162	15	42	740	620	0.8	91	14	0.021	0.295	0.44	<0.08	8.31
360	Big Shoal Cr	SITE 14		970305	0900	1.0	14	9.7	6.6	125	28	53.1	200	270	0.9	95	27	0.040	0.423	0.37	<0.08	6.06
360	Big Shoal Cr	SITE 14		970402	1250	1.0	13	9.7	6.8	178	15	6.6	77	87	1.0	112	<4	<0.010	0.142	0.40	<0.08	6.20
360	Big Shoal Cr	SITE 14		970506	1230	0.8	15	9.2	6.7	125	16	14.3	520	750	0.7	100	9	0.031	0.361	0.14	<0.08	6.69
360	Big Shoal Cr	SITE 14		970604	0900	0.6	16	8.9	6.8	147	19	19.5	240	470	0.6	118	10	0.026	0.335	0.68	<0.08	6.54
360	Big Shoal Cr	SITE 14		970715	1210	0.7	22	6.1	6.5	195	8	2.8	166	350	1.0	135	<4	0.037	0.315	0.23	<0.08	4.76
360	Big Shoal Cr	SITE 14		970805	1120	0.4	21	4.6	6.5	247	6	0.36	17	980	1.2	155	<4	0.080	0.131	0.25	<0.08	3.38
360	Big Shoal Cr	SITE 14		970903	1200	0.8	21	4.5	6.6	140	10	0.7	90	1200	1.2	151	4	0.020	0.179	0.45	<0.08	4.93
360	Big Shoal Cr	SITE 14		971002	0950	0.5	12	6.3	6.6	143	18	0.9	190	460	0.7	121	5	0.015	0.072	0.40	<0.08	7.36
360	Big Shoal Cr	SITE 14		971104	1200	1.0	6	10.6	6.7	130	18	8.7	110	440	0.9	107	6	<0.010	0.138	0.61	<0.08	8.95
360	Big Shoal Cr	SITE 14		971202	1210	1.0	10	9.8	6.7	139	21	11.0	200	600	1.2	122	6	<0.010	0.050	0.41	<0.08	9.81

Appendix F-4a. Physical / chemical data collected from July 1997 to August 1999 as part of the Paint Rock Nonpoint Source Monitoring Project in the Wheeler Lake Cataloging Unit (0603-0002) (ADEM 1999a).

Sub-Watershed	Stream Name	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform*	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	Total Alkalinity	Hardness
#		#	*yymmdd*	*24hr*	*C*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*col/100ml*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*	*mg/l*
020	Estill Fk	ESTL-1	970722	1525	35	30	6.9	7.8	346	2		384	0.9	206	<1	0.048	0.134	0.310	0.036	149	186
020	Estill Fk	ESTL-1	970825	0920	27	21	5.5	7.6	267	2		30	2.5	210	3	<0.005	0.059	0.224	0.031	137	180
020	Estill Fk	ESTL-1	970924	1045	21	21	5.8	7.6	329	3		350	2.7	187	<1	<0.05	0.063	0.246	0.034	129	174
020	Estill Fk	ESTL-1	971021	1445	15	14	8.6	7.8	371	2	1.2	62	0.8	216	<1	0.088	0.028	0.431	<0.005	145	192
000	Estill Fk	ESTL-1	971118	1150	10	7	10.8	7.9	187	1		45	0.8	194	<1	<0.005	0.110	0.083	<0.005	148	184
020	Estill Fk	ESTL-1	971216	1335	15	9	11.9	7.6	332	1	14.4	12	<0.1	182	1	<0.005	0.116	0.284	<0.005	140	170
020	Estill Fk	ESTL-1	980205	1005	4	9	10.6	7.9	240	5		63	1.1	136	<1	<0.05	0.157	0.052	<0.05	101	120
020	Estill Fk	ESTL-1	980225	1400	24	14	11	7.8	234	2	40.7	<1	1.2	166	1	<0.005	0.115	0.112	0.051	127	154
020	Estill Fk	ESTL-1	980324	1350	20	14	10.6	8	286	3	73.4	2	0.4	169	<1	<0.005	0.101	0.162	<0.005	130	156
020	Estill Fk	ESTL-1	980429	0740	16	13	9.2	8.3	297	2	20.3	480	0.5	171	<1	0.005	0.084	0.105	0.012	132	170
020	Estill Fk	ESTL-1	980526	1510	28	23	7.8	7.8	346	3	1.3	88	1.2	206	<1	<0.005	0.153	0.128	<0.05	144	172
020	Estill Fk	ESTL-1	980622	1620	34	21	9	7.9	313	5	14.5	228	1.1	181	1	<0.005	0.118	0.137	0.005	144	174
020	Estill Fk	ESTL-1	980818	1330	34		8	7.7	335	5	6.6	144	1.0	204	1	<0.005	0.272	0.377	<0.005	150	170
020	Estill Fk	ESTL-1	981027	1426	27	15	10.8	7.6	371	2	0.9	15	<0.1	217	4	<0.005	0.008	0.215	<0.005	159	166
020	Estill Fk	ESTL-1	990126	1100	17	13	11.1	7.5	200	3	71.1	27	0.5	149	1	<0.005	0.273	0.273	<0.005	114	132
020	Estill Fk	ESTL-1	990427	1305	26	15	9.6	7.8	295	9	66.7	110	<0.1	164	1	<0.005	0.163	0.287	<0.005	132	156
020	Estill Fk	ESTL-1	990525	1430	24	20	8.5	7.5	316	2	5.4										
020	Estill Fk	ESTL-1	990629	1615	27	19	8.8	7.3	303	10	70.7										
020	Estill Fk	ESTL-1	990824	1655	33	26	6.3	7.7	358	3	1.2	32	2.0	204	4	<0.015	0.025	0.277	0.009	151	180
020	Hurricane Cr	HURR-1	970722	1455	31	27	6.9	7.8	295	4		340	0.9	160	6	0.005	0.134	0.374	0.042	128	180
020	Hurricane Cr	HURR-1	970825	0935	22	24	6.9	7.7	233	3	2.8	136	2.6	183	1	0.008	0.088	0.209	0.032	125	176
020	Hurricane Cr	HURR-1	970924	1105	21	20	5.8	7.5	283	4		460	2.3	161	4	<0.05	0.079	0.258	0.040	120	152
020	Hurricane Cr	HURR-1	971021	1530	15	13	7.6	7.7	305	4	2.9	176	0.6	176	3	<0.005	0.048	0.406	<0.005	127	150
020	Hurricane Cr	HURR-1	971118	1210	10	8	10.9	7.9	135	2		42	0.7	139	1	<0.005	0.112	0.117	<0.005	104	156
020	Hurricane Cr	HURR-1	971216	1405	15	8	11.3	7.5	228	3	30.1	12	0.1	124	2	<0.005	0.132	0.236	<0.005	97	110
020	Hurricane Cr	HURR-1	980205	1025	2	9	10.6	7.7	192	17		112	0.9	115	13	<0.05	0.184	0.214	<0.05	78	98
020	Hurricane Cr	HURR-1	980225	1435	23	14	10.6	7.6	167	4	89.2	2	1.3	120	2	<0.005	0.130	<0.05	<0.005	88	112
020	Hurricane Cr	HURR-1	980324	1425	17	13	10.4	7.9	214	6	148.9	17	0.4	125	2	<0.005	0.105	0.128	<0.005	90	110
020	Hurricane Cr	HURR-1	980429	0855	15	13	9.5	7.8	220	5	43.8	100	0.5	139	2	<0.005	0.106	0.033	0.028	97	124
020	Hurricane Cr	HURR-1	980526	1551	25	22	8.3	7.8	280	4	8.9	248	0.9	166	1	<0.005	0.154	0.100	<0.05	120	156
020	Hurricane Cr	HURR-1	980622	1719	30	22	8.5	7.9	258	5	20.5	144	1.6	159	1	<0.005	0.163	0.176	<0.005	114	138
020	Hurricane Cr	HURR-1	980818	1400	33		7.2	7.6	288	4	4.8	90	0.9	172	2	<0.005	0.180	0.253	<0.005	126	150
020	Hurricane Cr	HURR-1	981027	1455	28	13	8.5	7.5	317	4		60	0.2	202	10	<0.005	0.022	0.216	<0.005	139	164
020	Hurricane Cr	HURR-1	990126	1400	22	14	10.4	7.3	144	7		32	0.6	113	3	<0.005	0.264	0.158	<0.005	77	84
020	Hurricane Cr	HURR-1	990427	1348	23	15	9.6	7.7	232	19		580	<0.1	133	12	<0.005	0.154	0.329	<0.005	101	116
020	Hurricane Cr	HURR-1	990525	1655	25	20	8.4	7.6	246	365	12.5										
020	Hurricane Cr	HURR-1	990629	1700	27	17	8.7	7.1	228	28											
020	Hurricane Cr	HURR-1	990824	1825	26	23	6.3	7.6	289	3		116	1.4	165	3	<0.015	0.086	0.229	0.012	125	146
040	Larkin Fk	LARK-1	970722	1350	33	27	6.7	7.7	374	2		720	0.8	227	<1	0.03	0.112	0.281	0.036	167	214
040	Larkin Fk	LARK-1	970825	0851	21	19	5.4	7.4	268	1		390	2.8	217	<1	<0.005	0.145	0.186	0.030	154	214

Appendix F-4a, cont. Physical / chemical data collected from July 1997 to August 1999 as part of the Paint Rock Nonpoint Source Monitoring Project in the Wheeler Lake Cataloging Unit (0603-0002) (ADEM 1999a).

Sub-Watershed	Stream Name	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	Total Alkalinity	Hardness
#		*#*	*yymmdd*	*24hr*	*C*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*col/100ml*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*	*mg/l*
040	Larkin Fk	LARK-1	970924	1025	20	21	5.6	7.6	306	4		460	2.5	171	2	<0.05	0.076	0.283	0.044	133	166
040	Larkin Fk	LARK-1	971021	1410	13	15	8	7.7	356	3	2.1	1840	1.0	205	<1	<0.005	0.044	0.453	0.087	152	182
040	Larkin Fk	LARK-1	971118	1130	8	7	11.4	7.5	205	1		25	0.9	215	<1	<0.005	0.424	0.123	<0.005	160	204
040	Larkin Fk	LARK-1	971216	1309	15	9	12.3	7.6	347	2	24.0	15	0.2	191	1	<0.005	0.398	0.119	<0.005	148	174
040	Larkin Fk	LARK-1	980205	0940	4	9	10.5	7.8	286	6		56	0.9	166	5	<0.05	0.574	0.213	<0.05	124	146
040	Larkin Fk	LARK-1	980225	1320	25	17	9.3	7.7	248	2	65.8	30	1.4	170	1	<0.005	0.335	0.112	<0.005	118	164
040	Larkin Fk	LARK-1	980324	1320	19	14	11.1	8	297	6	180.9	57	0.7	173	3	<0.005	0.650	0.186	<0.005	128	152
040	Larkin Fk	LARK-1	980428	0945	17	15	8.9	7.8	306	3	31.2	128	0.7	160	2	<0.005	0.348	0.116	0.031	138	166
040	Larkin Fk	LARK-1	980526	1435	26	23	7	7.6	333	4	2.8	132	1.1	191	2	<0.005	0.222	0.142	0.083	144	172
040	Larkin Fk	LARK-1	980622	1525	34	24	7.1	7.7	327	10	10.7	300	1.1	197	6	<0.005	0.439	0.312	0.085	144	170
040	Larkin Fk	LARK-1	980818	1255	38		6.7	7.7	349	8	8.8	96	0.9	212	6	<0.005	0.318	0.267	<0.005	154	186
040	Larkin Fk	LARK-1	981027	1352	27	14	9.7	7.5	362	4	0.8	10	0.3	212	6	<0.005	0.030	0.228	<0.005	161	162
040	Larkin Fk	LARK-1	990126	1000	19	13	10	7.5	212	4	108.6	164	0.4	160	3	<0.005	0.746	0.136	<0.005	121.5	144
040	Larkin Fk	LARK-1	990427	1230	21	16	8.8	7.6	327	10	71.3	980	0.2	180	7	<0.005	0.390	0.557	<0.005	145	168
040	Larkin Fk	LARK-1	990525	1300	26	25	7.4	7.4	320	3	8.7										
040	Larkin Fk	LARK-1	990629	1530	30	20	8.3	7.2	327	11	100.9										
040	Larkin Fk	LARK-1	990824	1550	28	25	6.2	7.6	333	4	1.1	68	2.1	188	<1	<0.015	0.050	0.289	0.019	148	172
050	Lick Fk	LICK-1	970722	1320	27	25	6.5	7.5	275	5		210	0.9	177	4	0.03	0.297	0.331	0.042	120	156
050	Lick Fk	LICK-1	970825	0820	20	19	5.8	7.4	215	2		210	2.5	173	2	<0.005	0.303	0.192	0.032	115	196
050	Lick Fk	LICK-1	970924	0945	21	20	6.5	7.5	230	25		400	4.2	135	16	<0.05	0.372	0.461	0.084	98	126
050	Lick Fk	LICK-1	971021	1330	14	14	8.5	7.7	291	3	0.0	96	1.0	161	5	<0.005	0.174	0.404	<0.005	122	146
050	Lick Fk	LICK-1	971118	1115	7	8	11.5	7.3	134	1		22	0.7	142	<1	<0.005	0.250	0.086	<0.005	105	184
050	Lick Fk	LICK-1	971216	1235	15	9	11.9	7.4	234	2	10.1	17	0.1	129	1	<0.005	0.271	0.149	<0.005	96	124
050	Lick Fk	LICK-1	980205	0925	4	9	10.5	7.7	201	4		54	1.1	109	<1	<0.05	0.253	<0.05	<0.05	83	106
050	Lick Fk	LICK-1	980225	1255	25	16	11.3	7.7	183	2	31.8	10	1.4	122	<1	<0.005	0.225	0.056	0.044	99	112
050	Lick Fk	LICK-1	980324	1245	17	14	10.6	7.8	224	5	79.7	25	0.4	130	1	<0.005	0.454	0.210	<0.005	95	118
050	Lick Fk	LICK-1	980428	0955	17	14	9.5	7.8	223	3	16.9	200	0.6	134	<1	<0.005	0.252	0.041	0.025	99	132
050	Lick Fk	LICK-1	980526	1353	27	22	8.4	7.6	264	3	1.1	600	1.0	157	1	<0.005	0.302	<0.1	<0.05	115	134
050	Lick Fk	LICK-1	980622	1440	34	23	8.7	7.7	272	7	4.9	410	1.0	167	2	<0.005	0.393	0.185	<0.005	120	150
050	Lick Fk	LICK-1	980818	1230	30		5.4	7.6	304	4		560	<0.1	181	2	<0.005	0.319	0.240	<0.005	134	150
050	Lick Fk	LICK-1	981027	1328	26	14	9.9	7.4	299	4		152	<0.1	171	8	<0.005	0.131	0.158	<0.005	158	156
050	Lick Fk	LICK-1	990126	0800	5	11	9.5	7.2	150	3	55.6	42	0.4	105	1	<0.005	0.468	0.175	<0.005	78	96
050	Lick Fk	LICK-1	990427	1209	21	14	9.7	7.5	254	7		320	<0.1	134	2	<0.005	0.261	0.179	<0.005	114	126
050	Lick Fk	LICK-1	990525	0955	24	23	8.5	7.4	253	2	4.1										
050	Lick Fk	LICK-1	990629	1455	27	19	9.8	7.3	253	9	48.4										
050	Lick Fk	LICK-1	990824																		
050	Dry Cr	DRYJ-1	970722	1756	32	26	6.8	7.8	268	6		1020	1.2	162	1	0.005	0.398	0.354	0.039	116	146
050	Dry Cr	DRYJ-1	970825	0805	19	19	6.9	7.7	214	6	1.9	390	2.6	173	2	<0.005	0.357	0.163	0.035	124	184
050	Dry Cr	DRYJ-1	970924	0930	21	21	6.5	7.6	274	13		510	3.8	155	7	<0.05	0.210	0.340	0.050	117	146

Appendix F-4a, cont. Physical / chemical data collected from July 1997 to August 1999 as part of the Paint Rock Nonpoint Source Monitoring Project in the Wheeler Lake Cataloging Unit (0603-0002) (ADEM 1999a).

Sub-Watershed	Stream Name	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	Total Alkalinity	Hardness
#		#	*yymmdd*	*24hr*	*C*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*col/100ml*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*	*mg/l*
050	Dry Cr	DRYJ-1	971021	1305	14	14	8.2	7.6	284	6	1.7	400	2.8	158	3	<0.005	0.221	0.505	<0.005	124	148
050	Dry Cr	DRYJ-1	971118	1105	5	6	11.2	7.3	139	3		37	0.8	146	1	<0.005	0.318	0.130	<0.005	109	176
050	Dry Cr	DRYJ-1	971216	1213	14	9	11.2	7.4	219	3	20.2	30	0.2	121	1	<0.005	0.302	0.075	<0.005	89	114
050	Dry Cr	DRYJ-1	980205	0905	6	10	10.5	7.5	184	9		88	1.0	112	4	<0.05	0.288	0.075	<0.05	74	100
050	Dry Cr	DRYJ-1	980225	1215	25	15	10.5	7.6	170	3	43.3	20	1.3	119	1	<0.005	0.271	0.075	<0.005	90	106
050	Dry Cr	DRYJ-1	980324	1210	17	15	10.8	7.9	211	7	118.4	37	0.5	121	5	<0.005	0.476	0.199	<0.005	86	112
050	Dry Cr	DRYJ-1	980428	1015	18	15	9.5	7.7	207	6	21.3	228	0.5	127	<1	<0.005	0.297	0.046	0.030	93	124
050	Dry Cr	DRYJ-1	980526	1310	27	22	8	7.7	252	5	2.9	460	0.9	150	4	<0.005	0.372	<0.1	<0.05	109	136
050	Dry Cr	DRYJ-1	980622	1350	32	24	7.9	7.8	249	5	5.6	280	0.9	151	3	<0.005	0.405	0.117	<0.005	110	132
050	Dry Cr	DRYJ-1	980818	1200	34		7	7.9	285	6	3.9	360	0.8	168	3	<0.005	0.354	0.225	0.079	126	150
050	Dry Cr	DRYJ-1	981027	1300	28	13	10.1	7.3	310	3		760	0.1	179	9	<0.005	0.235	0.227	<0.005	133	154
050	Dry Cr	DRYJ-1	990125	1600	18	13	7.8	7.8	166	6	102.5	72	0.5	95	4	<0.005	0.480	0.306	<0.005	69	86
050	Dry Cr	DRYJ-1	990427	1140	22	15	9.7	7.4	224	12	28.3	450	<0.1	119	8	<0.005	0.264	0.233	<0.005	100	114
050	Dry Cr	DRYJ-1	990525	0745	19	18	7.7	8.1	231	5	6.2										
050	Dry Cr	DRYJ-1	990629	1420	27	17	8.8	7.6	234	17	88.4										
050	Dry Cr	DRYJ-1	990824	1425	28	25	5.7	7.7	280	3	1.2	104	1.8	157	1	<0.015	0.291	0.251	0.015	124	140
060	Guess Cr	GUES-1	970723	1235	30	21	6.5	7.3	210	10	4.3	370	0.9	122	1	0.005	0.211	0.233	0.038	88	130
060	Guess Cr	GUES-1	970825	0745	18	17	6	7.3	177	6		260	2.4	140	1	<0.005	0.256	0.104	0.032	96	136
060	Guess Cr	GUES-1	970924	0905	21	20	4.4	7.4	244	6		1000	1.9	138	3	<0.05	0.143	0.223	0.065	103	128
060	Guess Cr	GUES-1	971021	1230	14	13	5.9	7.3	242	5	1.4	320	0.6	133	1	0.090	0.209	0.452	<0.005	102	124
060	Guess Cr	GUES-1	971118	1046	2	9	9.9	7.1	69	2		92	0.7	72	<1	<0.005	0.227	0.094	<0.005	50	88
060	Guess Cr	GUES-1	971216	1145	14	10	10.6	7.3	114	3	27.6	12	<0.1	67	2	<0.005	0.311	<0.05	<0.005	40	56
060	Guess Cr	GUES-1	980205	0845	3	9	10.8	7.4	96	6		49	0.9	60	4	<0.05	0.303	0.062	<0.05	33	52
060	Guess Cr	GUES-1	980225	1145	22	15	11	7.2	87	4	78.2	7	1.7	64	<1	<0.005	0.291	<0.05	<0.005	41	52
060	Guess Cr	GUES-1	980324	1140	15	12	10.9	7.8	119	6	104.0	10	0.1	70	1	<0.005	0.494	0.207	<0.005	41	72
060	Guess Cr	GUES-1	980428	1033	18	14	9.5	7.4	121	4	28.8	32	0.7	67	3	<0.005	0.232	0.036	0.029	52	58
060	Guess Cr	GUES-1	980526	1230	24	16	8.2	7.4	174	6	9.0	296	1.2	110	1	<0.005	0.232	<0.1	<0.05	75	100
060	Guess Cr	GUES-1	980622	1250	30	17	12.9	7.8	156	63	10.6	800	1.3	107	11	<0.005	0.446	0.354	0.112	68	90
060	Guess Cr	GUES-1	980818	1125	28		7.2	7.9	205	9	4.1	340	1.0	130	2	<0.005	0.324	0.144	<0.005	90	120
060	Guess Cr	GUES-1	981027	1230	27	13	6.1	7.3	261	6		116	0.1	145	3	<0.005	0.141	0.142	<0.005	117	130
060	Guess Cr	GUES-1	990125	1500	18	12	10.8	7.9	86	5	125.2	30	0.5	55	3	<0.005	0.510	0.159	<0.005	114	132
060	Guess Cr	GUES-1	990427	1100	21	14	9.5	6.8	124	4	29.8	230	<0.1	62	2	<0.005	0.196	<0.15	<0.005	51	72
060	Guess Cr	GUES-1	990524	1545	23	18	8.4	7.3	155	3	9.1										
060	Guess Cr	GUES-1	990629	1330	26	14	9.4	7.7	139	14											
060	Guess Cr	GUES-1	990824	1345	29	23	3.7	7.3	237	4	1.1	980	2.1	128	16	<0.015	0.158	0.258	0.01	101	114
070	Cole Spr. Br	CSPR-1	970723	1130	33	24	7.1	7.5	350	16	2.1	>1200	0.9	207	7	0.054	2.814	0.179	0.053	144	170
070	Cole Spr. Br	CSPR-1	970825	0723	17	19	5.9	7.6	275	34	1.0	740	2.1	220	36	<0.005	2.581	0.046	0.075	144	180
070	Cole Spr. Br	CSPR-1	970924	0730	22	20	5.9	7.2	354	16	1.4	1620	3.6	189	15	0.066	2.100	0.376	0.107	135	174
070	Cole Spr. Br	CSPR-1	971021	1115	12	15	7.7	7.4	345	6	1.5	940	0.8	196	4	0.072	2.231	0.499	0.156	145	172

Appendix F-4a, cont. Physical / chemical data collected from July 1997 to August 1999 as part of the Paint Rock Nonpoint Source Monitoring Project in the Wheeler Lake Cataloging Unit (0603-0002) (ADEM 1999a).

Sub-Watershed	Stream Name	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	Total Alkalinity	Hardness
#		#	*yymmdd*	*24hr*	*C*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*col/100ml*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*	*mg/l*
070	Cole Spr. Br	CSPR-1	971118	0955	2	10	8.7	6.9	185	14	1.5	380	1.1	195	32	<0.005	3.270	<0.05	<0.005	120	160
070	Cole Spr. Br	CSPR-1	971216	1055	9	13	9.4	7.4	364	11	6.2	76	0.3	185	13	<0.005	2.039	<0.05	<0.005	125	160
070	Cole Spr. Br	CSPR-1	980205	0800	4	10	9.7	7.6	252	17		430	1.6	144	14	<0.05	1.104	0.377	0.076	95	138
070	Cole Spr. Br	CSPR-1	980225	1050	21	13	11.1	7.1	234	6	18.4	100	6.2	164	6	<0.005	1.554	<0.05	0.056	121	156
070	Cole Spr. Br	CSPR-1	980324	1035	14	14	9.1	7.3	241	41	51.1	>1200	4.6	166	24	<0.005	1.200	1.334	0.192	92	124
070	Cole Spr. Br	CSPR-1	980428	1105	18	15	8.6	7.5	303	7	13.7	200	0.7	172	3	<0.005	2.349	<0.005	0.034	130	164
070	Cole Spr. Br	CSPR-1	980526	1055	29	18	8.3	7.4	330	9	4.5	300	0.6	196	7	<0.005	<0.005	<0.1	0.055	136	166
070	Cole Spr. Br	CSPR-1	980622	1100	35	22	7.4	7.7	345	6	0.0	1200	1.3	200	13	<0.005	2.164	0.125	<0.005	143	186
070	Cole Spr. Br	CSPR-1	980818	1030	32		5.9	7.7	360	18		1300	1.1	221	12	<0.005	2.537	0.127	0.084	154	182
070	Cole Spr. Br	CSPR-1	981027	1125	26	14	7.2	6.9	371	13		310	0.5	215	31	<0.005	1.602	0.386	0.094	159	186
070	Cole Spr. Br	CSPR-1	990125	1215	18	14	9.5	7.3	247	12	54.9	252	1.0	147	13	<0.005	2.193	0.295	<0.005	93.5	116
070	Cole Spr. Br	CSPR-1	990427	1454	23	18	2.5	6.9	514	447	12.6	TNTC	>156	452	204	11.834	0.863	39.4	4.584	158	207
070	Cole Spr. Br	CSPR-1	990524	1210	24	22	7.5	8	322	9	4.3										
070	Cole Spr. Br	CSPR-1	990629	1145	29	19	8	8	290	13	28.1										
070	Cole Spr. Br	CSPR-1	990824	1125	28	22	5.3	7.4	351	24		720	2.8	204	79	<0.015	2.707	0.416	0.031	148	174
080	Clear Cr	CLER-1	970722	1200	33	27	8.9	8.1	284	3		360	1.0	168	<1	<0.005	0.359	0.374	0.039	125	158
080	Clear Cr	CLER-1	970825	0723	18	19	6.5	7.8	221	12	1.0	340	2.5	182	35	<0.005	0.255	0.260	0.049	131	180
080	Clear Cr	CLER-1	970924	0830	21	20	6.6	7.2	240	52	1.3	4200	3.0	159	36	<0.05	0.317	0.365	0.089	108	134
080	Clear Cr	CLER-1	971021	1150	13	15	10	8	289	5	0.5	192	1.1	160	1	<0.005	0.138	0.798	<0.005	123	150
080	Clear Cr	CLER-1	971118	1015	2	5	11.3	7.2	152	4		35	1.1	155	<1	<0.005	0.256	0.181	<0.005	116	166
080	Clear Cr	CLER-1	971216	1115	15	9	12.3	7.5	245	3	7.3	57	0.1	133	2	<0.005	0.256	0.050	<0.005	100	124
080	Clear Cr	CLER-1	980205	0820	4	10	10.3	7.7	205	8		77	1.0	119	<1	<0.05	0.283	<0.05	<0.05	80	118
080	Clear Cr	CLER-1	980225	1115	23	16	10.7	7.7	180	4	25.8	30	1.6	128	2	<0.005	0.224	0.089	0.051	99	120
080	Clear Cr	CLER-1	980324	1100	14	13	10.7	7.8	232	10	105.2	72	0.5	137	3	0.005	0.452	0.185	<0.005	96	128
080	Clear Cr	CLER-1	980428	1050	17	14	10.3	7.7	223	4	17.7	124	0.8	94	<1	<0.005	0.310	0.086	0.025	99	122
080	Clear Cr	CLER-1	980526	1150	30	22	9.5	7.9	262	4	3.2	720	0.9	153	3	<0.005	0.177	0.156	<0.05	120	140
080	Clear Cr	CLER-1	980622	1145	33	26	8.9	7.9	282	4	1.3	82	1.1	160	1	<0.005	0.279	0.153	<0.005	122	150
080	Clear Cr	CLER-1	980818	1055	34		8.9	8.1	302	5	1.0	80	1.1	188	5	<0.005	0.249	0.269	0.106	134	164
080	Clear Cr	CLER-1	981027	1200	28	17	10.3	7.6	308	2	0.3	80	<0.1	182	4	<0.005	0.096	0.169	<0.005	132	150
080	Clear Cr	CLER-1	990125	1400	17	14	10.4	7.6	175	7	82.3	55	0.4	102	10	<0.005	0.508	0.209	<0.005	73	94
080	Clear Cr	CLER-1	990427	1425	23	16	10.7	7.9	238	8	17.1	720	0.1	125	5	<0.005	0.271	0.352	<0.005	104	118
080	Clear Cr	CLER-1	990524	1400	24	23	9.4	7.9	241	2	5.3										
080	Clear Cr	CLER-1	990629	1240	28	16	9.5	7.8	265	11	15.2										
080	Clear Cr	CLER-1	990824	1215	34	28	8.5	7.9	298	2	0.5	70	2.5	168	13	<0.015	0.267	0.240	0.027	130	146
090	Little Paint Cr	LPNT-1	970723	1215	34	27	7	7.6	336	5	2.5	108	1.0	200	2	0.033	0.708	0.423	0.055	145	182
090	Little Paint Cr	LPNT-1	970825	1045	24	23	8.1	7.9	217	4		172	2.7	172	1	<0.005	0.269	0.25	0.034	121	176
090	Little Paint Cr	LPNT-1	970924	1215	21	21	7.4	7.7	283	23	5.2	700	3.1	161	29	<0.05	0.138	0.462	0.076	119	144
090	Little Paint Cr	LPNT-1	971021	1000	11	13	9.3	7.6	309	3	4.5	228	0.5	172	1	<0.005	0.351	0.594	0.176	132	150
090	Little Paint Cr	LPNT-1	971118	1255	9	8	12.9	7.3	145	7		40	1.1	149	2	<0.005	0.549	0.201	0.166	105	138
090	Little Paint Cr	LPNT-1	971216	1500	14	10	12.3	7.3	291	5	23.8	32	0.1	164	3	<0.005	0.550	0.271	<0.005	120	146

Appendix F-4a, cont. Physical / chemical data collected from July 1997 to August 1999 as part of the Paint Rock Nonpoint Source Monitoring Project in the Wheeler Lake Cataloging Unit (0603-0002) (ADEM 1999a).

Sub-Watershed	Stream Name	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	Total Alkalinity	Hardness
#		#	*yymmdd*	*24hr*	*C*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*col/100ml*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*	*mg/l*
090	Little Paint Cr	LPNT-1	980205	1120	3	9	10.2	7.6	230	30		370	1.1	141	23	<0.05	0.484	<0.05	0.074	94	118
090	Little Paint Cr	LPNT-1	980225	1550	24	17	10.3	7.6	238	10	79.3	20	1.5	163	7	<0.005	0.445	<0.05	0.056	120	140
090	Little Paint Cr	LPNT-1	980324	1535	17	15	10.1	7.8	291	27		116	0.8	180	26	<0.005	0.400	0.325	0.07	128	154
090	Little Paint Cr	LPNT-1	980428	1118	18	14	9.7	7.9	266	5	29.3	25	0.7	156	1	<0.005	0.452	0.090	0.027	116	148
090	Little Paint Cr	LPNT-1	980527	0710	22	22	6.5	7.5	296	9	8.2	240	1.1	175	5	<0.005	0.415	0.176	<0.05	125	158
090	Little Paint Cr	LPNT-1	980623	0816	27	27	6.9	7.6	306	6	2.3	172	1.2	186	3	<0.005	0.361	0.306	<0.005	131	158
090	Little Paint Cr	LPNT-1	980818	1510	34		8.4	7.7	347	11	3.9	156	1.4	214	7	<0.005	0.581	0.578	0.085	147	182
090	Little Paint Cr	LPNT-1	981027	1600	26	17	10.4	7.8	347	3	0.2	212	0.6	197	5	<0.005	0.017	0.306	<0.005	149	162
090	Little Paint Cr	LPNT-1	990126	1630	22	16	9.1	7.1	183	30		132	0.8	153	32	<0.005	1.241	0.522	0.100	84	118
090	Little Paint Cr	LPNT-1	990427	1525	23	18	10	7.8	259	8	29.6	480	0.2	138	7	<0.005	0.449	0.220	<0.005	109	138
090	Little Paint Cr	LPNT-1	990526	0745	16	19	6.9	7.3	256	6	9.7										
090	Little Paint Cr	LPNT-1	990630	0700	24	19	8.3	7.3	242	38											
090	Little Paint Cr	LPNT-1	990825	0810	25	25	6.2	7.7	288	4	2.1	52	1.6	165	4	<0.015	0.196	0.353	0.011	121	140
100	Little Paint Rock Cr	LPRK-1	970722	1345	35	26	7.1	7.7	241	69		>1200	1.7	155	64	0.03	0.287	0.834	0.091	105	134
100	Little Paint Rock Cr	LPRK-1	970825	1135	27	20	6.6	7.7	214	37	0.4	>1200	3.4	182	28	<0.005	0.261	0.493	0.073	125	168
100	Little Paint Rock Cr	LPRK-1	970924	1330	21	23	7.2	6.9	93	1000	104.7	700	7.3	19	1950	0.102	0.340	4.795	2.285	31	52
100	Little Paint Rock Cr	LPRK-1	971021	0850	9	13	8.2	7.5	249	9	2.7	560	0.9	141	2	<0.005	0.221	0.454	0.065	107	124
100	Little Paint Rock Cr	LPRK-1	971118	1319	13	9	11	7.5	117	4	3.8	50	0.9	126	<1	<0.005	0.346	<0.05	0.156	86	110
100	Little Paint Rock Cr	LPRK-1	971216	1540	15	9	11.1	7.2	221	5	6.5	88	0.3	123	3	<0.005	0.396	0.173	<0.005	88	108
100	Little Paint Rock Cr	LPRK-1	980205	1200	4	9	10.5	7.5	171	20		208	1.1	109	15	<0.05	0.435	0.208	<0.05	68	114
100	Little Paint Rock Cr	LPRK-1	980226	0745	12	11	9.9	7.6	148	8	14.9	57	1.7	118	12	<0.005	0.433	0.091	0.053	83	104
100	Little Paint Rock Cr	LPRK-1	980324	1630	16	15	9.5	7.7	208	22	30.9	340	0.5	131	14	<0.005	0.295	0.378	0.039	88	108
100	Little Paint Rock Cr	LPRK-1	980428	1155	19	15	9.3	7.7	223	12	6.7	740	0.9	129	7	<0.005	0.424	0.144	0.036	99	110
100	Little Paint Rock Cr	LPRK-1	980527	0915	25	21	7	7.5	244	92	2.9	>6000	2.2	165	46	<0.005	0.467	0.620	0.133	102	116
100	Little Paint Rock Cr	LPRK-1	980623	0930	31	26	4.9	7.4	290	315	0.5	>1200	>6.9	194	306	0.093	0.498	3.038	0.325	126	148
100	Little Paint Rock Cr	LPRK-1	980819	0820	25		6.3	7.6	282	17	1.1	400	1.1	175	12	<0.005	0.446	0.379	0.117	123	152
100	Little Paint Rock Cr	LPRK-1	990127	0728	12	13	9.6	7	125	12	20.4	152	0.7	117	11	<0.005	0.900	0.381	<0.005	61	80
100	Little Paint Rock Cr	LPRK-1	990427	1610	23	18	8.3	7.5	215	37	10.4	TNTC	0.7	125	26	<0.005	0.369	0.588	0.102	90	104
100	Little Paint Rock Cr	LPRK-1	990526	1030	21	19	7.3	7	216	12	3.8										
100	Little Paint Rock Cr	LPRK-1	990630	0820	27	22	8.1	7.4	178	15	36.6										
100	Little Paint Rock Cr	LPRK-1	990825																		
100	Paint Rock R	PTRK-1	970924	1500	23	22	6.8	7.5	150	568		2620	6.9	112	273	0.073	0.717	1.309	0.442	55	76
100	Paint Rock R	PTRK-1	971021	0805	8	13	7.8	7.7	318	12		184	0.7	180	12	0.090	0.460	0.644	<0.005	134	156
100	Paint Rock R	PTRK-1	971118	1400	11	7	11	7.5	166	5		55	0.8	174	1	<0.005	0.474	0.179	<0.005	121	158
100	Paint Rock R	PTRK-1	971216	1610		8	11	7.4	273	6		42	0.1	155	4	<0.005	0.410	0.233	<0.005	111	140
100	Paint Rock R	PTRK-1	980205	1230	7	7	10.5	7.6	179	58		1040	1.5	141	22	<0.05	0.191	0.625	0.108	73	106
100	Paint Rock R	PTRK-1	980226	0830	13	13	9.7	7.8	181	11		32	1.5	138	11	<0.005	0.434	0.116	0.059	101	120
100	Paint Rock R	PTRK-1	980324	1700	14	13	9.8	7.6	219	28		580	0.7	139	18	<0.005	0.375	0.338	0.075	91	114
100	Paint Rock R	PTRK-1	980429	1210	20	16	8.1	7.5	234	13		204	0.9	135	10	0.005	0.442	0.172	0.048	103	122
100	Paint Rock R	PTRK-1	980527	1035	25	24	6.2	7.4	281	23		1528	1.7	170	18	<0.005	0.618	0.285	0.079	115	152

Appendix F-4a, cont. Physical / chemical data collected from July 1997 to August 1999 as part of the Paint Rock R Nonpoint Source Monitoring Project in the Wheeler Lake Cataloging Unit (0603-0002) (ADEM 1999a).

Sub-Watershed	Stream Name	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	BOD-5	TDS	TSS	NH3	NO2/ NO3	TKN	T-PO4	Total Alkalinity	Hardness
#		*#*	*yymmdd*	*24hr*	*C*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*col/100ml*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*	*mg/l*
100	Paint Rock R	PTRK-1	980623	1016	29	27	6.1	7.5	282	15		104	1.0	161	15	<0.005	0.321	0.244	<0.005	121	144
100	Paint Rock R	PTRK-1	980819	0850	25		4.5	7.5	270	15		76	1.4	170	12	<0.005	0.458	0.448	0.092	113	162
100	Paint Rock R	PTRK-1	981027	0745	15	13	6.7	7.3	316	12		80	0.3	182	13	0.078	0.329	0.473	0.086	134	154
100	Paint Rock R	PTRK-1	990127	0840	13	13	7.9	6.9	137	26		180	1.0	128	11	<0.005	0.468	0.617	0.106	70	82
100	Paint Rock R	PTRK-1	990427	1640	25	19	8.1	7.6	255	9		280	<0.1	131	10	<0.005	0.390	0.253	<0.005	107	120
100	Paint Rock R	PTRK-1	990526	1200	19	24	6.6	7.5	261	10											
100	Paint Rock R	PTRK-1	990630	0905	27	21	6.9	7.4	238	53											
100	Paint Rock R	PTRK-1	990825	0950	30		6.7	7.8	299	12		116	3.0	178	17	<0.015	0.085	0.501	0.048	132	146

* TNTC = Too numerous to count

Appendix F-4b. Pesticide data collected in the water column from July 1997 to June 1999 as part of the Paint Rock Nonpoint Source Monitoring Project in the Wheeler Lake Cataloging Unit (0603-0002) (ADEM 1999a).

Sub-Watershed	Stream Name	Station	Date	Time	Simazine	Atrazine	Metolachlor	Di (2-Ethylhexyl) adipate	Pendimethalin	Bis (2-Ethylhexyl) phthalate	Di (2-Ethylhexyl) phthalate
#		#	*yymmdd*	*24hr*	*ug/l*	*ug/l*	*ug/l*	*ug/l*	*ug/l*	*ug/l*	*ug/l*
020	Estill Fork	ESTL-1	971021	1445	*	*	*	*	*		*
020	Estill Fork	ESTL-1	980526	1510	*	*	*	0.283	*		0.235
020	Estill Fork	ESTL-1	980622	1620	*	*	*	*	*		0.139
020	Estill Fork	ESTL-1	981027	1426	*	*	*	*	*	*	*
020	Estill Fork	ESTL-1	990525	1430	*	*	*	*	*	*	*
020	Estill Fork	ESTL-1	990629	1615	*	*	*	*	*	*	*
020	Hurricane Cr	HURR-1	971021	1530	*	*	*	*	*		*
020	Hurricane Cr	HURR-1	980526	1551	*	*	*	*	*		0.436
020	Hurricane Cr	HURR-1	980622	1719	*	*	*	*	*		0.103
020	Hurricane Cr	HURR-1	981027	1455	*	*	*	*	*	*	*
020	Hurricane Cr	HURR-1	990525	1655	*	*	*	*	*	*	*
020	Hurricane Cr	HURR-1	990629	1700	*	*	*	*	*	*	*
040	Larkin Fork	LARK-1	971021	1410	*	*	*	*	*		*
040	Larkin Fork	LARK-1	980526	1435	*	*	*	*	*		0.572
040	Larkin Fork	LARK-1	980622	1525	*	*	*	*	*		0.364
040	Larkin Fork	LARK-1	981027	1352	*	*	*	*	*	*	*
040	Larkin Fork	LARK-1	990525	1300	*	*	*	*	*	*	*
040	Larkin Fork	LARK-1	990629	1530	*	*	*	*	*	*	*
050	Dry Cr	DRYJ-1	971021	1305	*	*	*	*	*		*
050	Dry Cr	DRYJ-1	980526	1310	*	*	0.112	*	*		0.269
050	Dry Cr	DRYJ-1	980622	1350	*	0.118	*	*	*		0.159
050	Dry Cr	DRYJ-1	981027	1300	*	*	*	*	*	*	*
050	Dry Cr	DRYJ-1	990525	0745	*	*	*	*	*	*	*
050	Dry Cr	DRYJ-1	990629	1420	*	*	*	*	*	*	*
050	Lick Fork	LICK-1	971021	1330	*	*	*	*	*		*
050	Lick Fork	LICK-1	980526	1353	*	*	*	*	*		*
050	Lick Fork	LICK-1	980622	1440	*	0.125	0.109	*	0.103		0.210
050	Lick Fork	LICK-1	981027	1328	*	*	*	*	*	*	*
050	Lick Fork	LICK-1	990525	0955	*	*	*	*	*	*	*
050	Lick Fork	LICK-1	990629	1455	*	*	*	*	*	*	*

Appendix F-4b, cont. Pesticide data collected in the water column from July 1997 to June 1999 as part of the Paint Rock Nonpoint Source Monitoring Project in the Wheeler Lake Cataloging Unit (0603-0002) (ADEM 1999a).

Sub-Watershed	Stream Name	Station	Date	Time	Simazine	Atrazine	Metolachlor	Di (2-Ethylhexyl) adipate	Pendimethalin	Bis (2-Ethylhexyl) phthalate	Di (2-Ethylhexyl) phthalate
#		#	*yymmdd*	*24hr*	*ug/l*	*ug/l*	*ug/l*	*ug/l*	*ug/l*	*ug/l*	*ug/l*
060	Guess Cr	GUES-1	971021	1230	*	*	*	*	*		*
060	Guess Cr	GUES-1	980526	1230	*	*	*	*	*		1.060
060	Guess Cr	GUES-1	980622	1250	*	*	*	*	*		0.150
060	Guess Cr	GUES-1	981027	1230	*	*	*	*	*	*	*
060	Guess Cr	GUES-1	990524	1545	*	*	*	*	*	*	*
060	Guess Cr	GUES-1	990629	1330	*	*	*	*	*	*	*
070	Cole Spring Br	CSPR-1	971021	1115	*	*	*	*	*		*
070	Cole Spring Br	CSPR-1	980526	1055	*	*	*	*	*		0.159
070	Cole Spring Br	CSPR-1	980622	1100	*	0.168	*	*	*		0.433
070	Cole Spring Br	CSPR-1	981027	1125	*	*	*	*	*	*	*
070	Cole Spring Br	CSPR-1	990524	1210	*	0.814	*	*	*	*	*
070	Cole Spring Br	CSPR-1	990629	1145	*	*	*	*	*	*	*
080	Clear Cr	CLER-1	971021	1150	*	*	*	*	*		*
080	Clear Cr	CLER-1	980526	1150	*	*	*	0.255	*		0.459
080	Clear Cr	CLER-1	980622	1145	*	*	*	*	*		0.281
080	Clear Cr	CLER-1	981027	1200	*	*	*	*	*	*	*
080	Clear Cr	CLER-1	990524	1400	*	*	*	*	*	*	*
080	Clear Cr	CLER-1	990629	1240	*	*	*	*	*	*	*
090	Little Paint Cr	LPNT-1	971021	1000	*	*	*	*	*		*
090	Little Paint Cr	LPNT-1	980527	0710	*	*	*	*	*		0.260
090	Little Paint Cr	LPNT-1	980623	0816	*	*	*	*	*		0.213
090	Little Paint Cr	LPNT-1	981027	1600	*	*	*	*	*	*	*
090	Little Paint Cr	LPNT-1	990526	0745	*	*	*	*	*	*	*
090	Little Paint Cr	LPNT-1	990630	0700	*	*	*	*	*	*	*
100	Paint Rock R	PTRK-1	971021	0805	*	*	*	*	*		*
100	Paint Rock R	PTRK-1	980527	1035	*	3.170	*	*	0.116		0.272
100	Paint Rock R	PTRK-1	980623	1016	*	*	*	*	*		0.358
100	Paint Rock R	PTRK-1	981027	0745	*	*	*	*	*	*	*
100	Paint Rock R	PTRK-1	990526	1200	*	1.01	*	*	*	*	*
100	Paint Rock R	PTRK-1	990630	0905	*	*	*	*	*	*	*

Appendix F-4b, cont. Pesticide data collected in the water column from July 1997 to June 1999 as part of the Paint Rock Nonpoint Source Monitoring Project in the Wheeler Lake Cataloging Unit (0603-0002) (ADEM 1999a).

Sub-Watershed	Stream Name	Station	Date	Time	Simazine	Atrazine	Metolachlor	Di (2-Ethylhexyl) adipate	Pendimethalin	Bis (2-Ethylhexyl) phthalate	Di (2-Ethylhexyl) phthalate
#		#	*yymmdd*	*24hr*	*ug/l*	*ug/l*	*ug/l*	*ug/l*	*ug/l*	*ug/l*	*ug/l*
100	Little Paint Rock Cr	LPRK-1	971021	0850	*	*	*	*	*		*
100	Little Paint Rock Cr	LPRK-1	980527	0915	*	*	*	1.97	*		0.417
100	Little Paint Rock Cr	LPRK-1	980623	0930	*	*	*	*	*		0.287
100	Little Paint Rock Cr	LPRK-1	990526	1030	*	*	*	*	*	*	*
100	Little Paint Rock Cr	LPRK-1	990630	0820	*	*	*	*	*	*	*

* Below Minimum Detection Limit of 0.1 ug/l

Appendix F-4c. Habitat quality and physical characteristic estimates during the aquatic macroinvertebrate assessments for the Paint Rock River NPS watershed project in the Wheeler Lake cataloging unit (0603-0002). In order to compare levels of habitat degradation between stations, values given for each of three major habitat parameter categories are presented as percent of maximum score.

Parameter		Station										
		ESTL-1	HURR-1	LARK-1	LICK-1	DRYJ-1	GUESS1	CSPR-1	CLER-1	LPNT-1	LPRK-1	PTRK-1
Subwatershed #		020	020	040	050	050	060	070	080	090	100	100
Instream Habitat Quality		80	61	73	77	72	59	43	67	76	57	
Sediment Deposition		78	43	65	81	61	61	66	73	63	66	
Sinuosity		78	55	55	85	65	70	48	45	85	43	
Bank and Vegetative Stability		64	61	55	79	46	58	50	70	70	51	
Riparian Zone Measurements		48	44	63	74	70	63	49	48	61	31	
% Maximum Total Score		69	57	66	79	65	63	48	64	71	54	
Habitat Quality Category		Excel	Good	Excel	Excel	Excel	Good	Excel	Excel	Excel	Good	
EPT Taxa Collected		18	23	15	19	20	15	4	15	12	11	
Aq. Macroinvertebrate Assess.		Excel	Excel	Excel	Excel	Excel	Excel	Poor	Excel	Good	Good	
Width (ft)		30	30	40	30	25	25	25	20	20	10	
Depth (ft)	Riffle	1	1.5	1	0.25	1	1.75	---	---	0.5	1	
	Run	2.5	2.5	2	1.5	1.75	1.25	1.5	1.75	1.75	3	
	Pool	4	4.5	3	3	>2.5	>3.5	>2.5	2	2.5	---	
Substrate (%)	Bedrock	0	0	0	0	0	0	0	0	58	0	
	Boulder	3	7	3	0	5	0	0	0	5	0	
	Cobble	40	5	15	3	5	0	0	3	2	2	
	Gravel	40	10	50	43	41	10	2	45	10	20	
	Sand	10	70	25	50	41	58	65	45	20	2	
	Silt	0	1	2	2	2	2	3	2	2	2	
	Detritus	5	7	5	3	6	30	5	2	3	6	
	Clay	2	0	0	0	0	0	10	3	0	60	
	Org. Silt	0	0	0	0	0	0	15	0	0	8	

^ RR = Riffle Run; GP = Glide Pool (ADEM 1999)
+S = Shaded; MS = Mostly Shaded; 50/50 = Approx. Half Shaded; MO = Mostly Open; O = Open

Appendix F-5. Physical / chemical data collected from May to September 1998 as part of the Monitoring associated with Alabama State Parks (ADEM 1999b).

Cu & Sub-Watershed	Stream Name	Station	Date	Time	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Fecal Coliform	BOD-5	TSS	TDS	Total Alkalinity	Hardness	NH3	NO2/ NO3	TKN	T-PO4	CL
#		#	yymmdd	24hr	C	mg/l	s.u.	umhos @25c	NTU	cfs	col/100ml	mg/L	mg/L	mg/L	mg/l	mg/l	mg/L	mg/L	mg/L	mg/l	mg/l
Guntersville Lake (0603-0001)																					
180	Bryant Cr	BYTJ-1	980519		19	9.4	7.8	48	5.6	19.7	38	0.2	1	38	5	16.4	<0.015	0.770	<0.15	0.005	9.4
180	Bryant Cr	BYTJ-1	980706		25	7.3	6.5	72		2.1	90	1.8	7	87	10	23.9	<0.015	1.060	0.48	0.05	6.9
180	Bryant Cr	BYTJ-1	980923							0.0											
220	Kirby Cr	KIRD-1	980519	1331	19	8.8	7.7	26	4.1	13.6	48	1.3	2	51	6	22.6	<0.015	1.060	<0.15	0.005	5.2
220	Kirby Cr	KIRD-1	980706	1550	31	8.6	7.3	82		0.2	163	2.0	6	74	25	30.4	<0.015	<0.003	0.43	0.02	5.8
220	Kirby Cr	KIRD-1	980923							0.0											
220	South Sauty Cr	SSCD-1	980519	1123	19	11.0	8.0	91	2.5	22.8	42	0.6	1	59	10	24.2	<0.015	1.180	<0.15	0.02	5.3
220	South Sauty Cr	SSCD-1	980707	0710	24	6.8	7.3	195		3.4	23	0.8	3	135	31	35.7	<0.015	0.570	0.65	0.06	29.4
220	South Sauty Cr	SSCD-1	980923	1320					1.3	0.2	5	1.1	2	723	154	83.8	<0.015	0.025	0.78	0.056	306.0
220	Straight Cr	STGD-1	980519	1228	19	13.9	8.1	61	3.0	9.3	49	0.5	1	50	1	19.4	<0.015	1.190	<0.15	0.007	5.5
220	Straight Cr	STGD-1	980707	0755	22	7.6	7.3	80		0.8	90	1.2	3	70	14	28.7	<0.015	0.360	<0.15	<0.004	6.3
220	Straight Cr	STGD-1	980923							0.0											
220	Stringer Cr	STND-1	980519		19	11.2	7.9	58	4.6	8.6	215	0.8	1	52	4	20.8	<0.015	1.400	<0.15	<0.004	5.3
220	Stringer Cr	STND-1	980706		23	4.9	6.6	68		0.2	77	1.4	7	77	20	23.6	<0.015	0.120	0.69	0.04	5.6
220	Stringer Cr	STND-1	980923							0.0											
Wheeler Lake (0603-0002)																					
440	First Cr	FIRW-1	980603		24	8.8	7.3	112	2.0	7.0	120	3.0	1	98	1	48.4	<0.015	0.820	<0.15	0.01	4.1
440	First Cr	FIRW-1	980722	1100	23	8.6	7.6	117	2.2	7.1	270	0.5	1	78	46	62.0	0.005	0.849	0.14	<0.005	
440	First Cr	FIRW-1	980916		21	9.3	7.5	139	1.4	4.1	52	0.7	3	83	56	62.0	<0.005	0.772	0.12	0.122	
440	Neely Br	NLYW-1	980603		22	8.5	7.3	104	4.3	0.9	150	3.0	2	114	45	41.2	<0.015	2.030	<0.15	0.007	5.2
440	Neely Br	NLYW-1	980722	1130	25	7.7	7.5	119	2.1	0.4	220	0.9	<1	82	42	54.0	0.005	1.618	0.15	0.094	
440	Neely Br	NLYW-1	980916		26	8.0	7.5	140	1.9	0.6	1540	1.8	8	86	53	58.0	<0.005	1.148	0.34	0.061	
Pickwick Lake (0603-0005)																					
090	Indian Camp Cr	INCL-1	980603		23	8.2	7.2	77	1.6	8.7	145	2.5	1	79	32	35.6	<0.015	0.340	<0.15	0.005	3.5
090	Indian Camp Cr	INCL-1	980722	0825	20	8.2	7.5	89	2.2	7.1	330	0.4	1	60		46.0	<0.005	0.469	0.21	<0.005	
090	Indian Camp Cr	INCL-1	980916		22	8.8	7.5	100	0.8	3.9	108	0.3	186	62	42	46.0	<0.005	0.350	<0.04	0.08	

Appendix F-6. Physical / chemical data collected from August 1997-1999 as part of the Alabama Monitoring and Assessment Program (ALAMAP) (ADEM 1997a)

Sub-Watershed	Stream Name	Station	Date	Time	Air Temp.	Water Temp.	Dissolved Oxygen	pH	Conductivity	Turbidity	Stream Flow	Depth	Fecal Coliform	BOD-5	TDS	TSS	NO2/ NO3	T-PO4	Cl-
#		#	*yymmdd*	*24hr*	*C*	*C*	*mg/l*	*s.u.*	*umhos @25c*	*NTU*	*cfs*	*m*	*col/100ml*	*mg/L*	*mg/L*	*mg/L*	*mg/L*	*mg/l*	*mg/l*
Guntersville Lake (0603-0001)																			
060	UT to Wimberly Br	TE06U3-59	00/00/99																
160	Burkhalter Cr	TE10U2-47	980813	0830	23	21	3.0	6.7	86	25	+	0.1	>600	3.2	70	18	0.534	0.102	<1
250	UT to Traylor Br	TE09U2-43	980813								0								
280	Coal Cr	TE08U2-53	980813								0								
Wheeler Lake (0603-0002)																			
100	UT to Paint Rock R	TE07U2-44	980812								0								
140	Flint R	TE05U2-50	980812	1130	29	25	7.0	7.4	125	11		0.1	440	0.8	111	10	1.641	0.112	<1
160	Dry Cr	TE06U2-54	980811	0830							0								
300	UT to Limestone Cr	TE05U3-49	00/00/99																
300	Davis Br	TE04U2-56	980811	1105	31	24	6.0	6.8	74	2.5	+	0.1	100	0.2	56	3	0.082	<0.005	<1
330	Mill Cr	TE08U1	970813	1117	28	23	7.6	7.3	202	8.3	0.3	0.2	250	1.1	172	1	0.22	0.04	5.93
340	Crowdabout Cr	TE06U1	970813	0950	26	23	6.9	7.3	247	5.5	0.9	0.4	180	1.2	207	1	0.49	0.06	8.06
350	Crawford Cr	TE02A1	970813	0856	26	22	6.0	6.8	117	4.23	0	0	190	1.5	104	<1	<0.003	0.04	6.03
360	McDaniel Cr	TE05U1	970813	0656	23	23	7.5	7.5	218	10.8	16	0.4	90	0.8	187	6	0.8	0.04	6.38
380	UT to Bakers Cr	TE02U1*	970813	0815															
390	Swan Cr	TE04U3-56	990811	1100	29	28	7.8	6.7	126	162			860	2.2		260	1.645	0.061	<0.5
440	White Br	TE03U2-51	980811	1050	26	25	7.1	6.0	25	3.2		0.1	2600	0.8	31	<1	0.115	<0.005	<1
Pickwick Lake (0603-0005)																			
010	Muddy Fk of Big Nance Cr	TE01U1	970812	1812	26	24	6.9	7.1	246	8.57	6	0.3	65	1.4	201	6	0.24	0.08	13.41
010	Sinking Cr	TE03U3-48	00/00/99																
160	Shegog Cr	TE01U3-54	990818	1100	30	24	4.1	7.0	102	2.2	2		122	1.8		<1.0	0.61	0.015	4.9
200	Cypress Cr	TE02U2-35	980811	1245	27	24	8.4	6.5	60.8	5.9	159	0.1	260	0.5	260	60	0.423	<0.005	<1
440	First Cr	TE02U3-35	00/00/99																
Bear Creek (0603-0006)																			
010	UT to Bullen Br	TE04U1	970812	1151	29	22	9.0	5.1	27	9.4	0.2	0.2	170	0.7	85	12	0.08	0.04	3077
010	Bear Cr	TE07U1	970812	1309	29	25	8.3	6.1	52	13		0.3	65	1.3	90	12	0.34	0.04	4.39
040	UT to Dunkin Cr	TE01U2-58	980812	0930	24	23	7.7	7.4	221	11	3.5	0.1	60	0.6	171	19	0.204	<0.005	<1
040	UT to Stinking Bear Cr	TE03U1	970812	1600	28	24	8.7	7.4	174	213	2.3	0.1	>2000	6.3	173	179	0.22	0.16	4.73
070	Rock Cr	TE01A1	970812	1029	28	24	7.8	6.8	85	6.3	5.8	0.2	73	0.5	127	3	0.09	0.03	3.91

*Unable to locate either the tributary or Bakers Creek. New road construction in area. No flow in stream beds.

+ No measureable flow

00/00/99 Dates indicate the data was to be collected in August 1999 --await reporting of the data to EIS

Appendix F-7a. Clean Water Strategy water quality data collected by ADEM during 1996 from selected stations in the Tennessee R Basin.

Sub-watershed #	Stream Name	Station #	Date *yymmdd*	Time *24hr*	Stream Depth *m*	Sampling Depth *m*	Water Temp. *C*	Dissolved Oxygen *mg/l*	pH *s.u.*	Conductivity *umhos @25c*	Turbidity *NTU*	BOD-5 *mg/L*	NO2/ NO3 *mg/L*	NH3-N *mg/L*	TKN *mg/L*	T-PO4 *mg/l*
Guntersville Lake (0603-0001)																
160	Kash Cr	TN10	960626	1206	0.5	0.25	28	6.0	6.7			0.4	0.026	0.086	0.337	0.549
160	Kash Cr	TN10	960724	1330	0.5	0.25	27	6.1	6.8							
160	Kash Cr	TN10	960822	1302	0.5	0.25	24	5.2	6.9	95	10	1.6	<0.01	0.023	0.303	<0.04
160	Kash Cr	TN10	960930	1225	0.5	0.25	16	8.0	6.5							
160	Kash Cr	TN10	961029	1143			18	7.9	6.5	510	40	0.2	1.36	0.1	<0.15	<0.05
160	Rocky Br	TN11	960626	1138	0.5	0.25	27	7.2	6.7			0.1	0.012	0.145	0.178	0.115
160	Rocky Br	TN11	960724	1306	0.5	0.25	27	7.5	7.0							
160	Rocky Br	TN11	960822	1241			24	6.3	6.2	835	64	1.1	0.014	0.266	0.181	<0.04
160	Rocky Br	TN11	960930	1253	0.5	0.25	17	8.5	6.5							
160	Rocky Br	TN11	961029	1206			18	8.6	5.5	63	3	0.5	0.15	<0.1	0.69	<0.05
Wheeler Lake (0603-0002)																
320	Piney Cr	TN06	960620	1126	1	0	29	6.3	6.9			6.5	4.55	0.119	0.713	0.321
320	Piney Cr	TN06	960716	1614	1.5	0.75	28	11.5	7.1							
320	Piney Cr	TN06	960828	1058	2	1	27	7.0	6.7	455	16	1.8	4	0.015	0.95	0.45
320	Piney Cr	TN06	960904	1142	2	1	30	7.6	6.9							
320	Piney Cr	TN06	961023	1434	2	1	17	7.5	6.7	136	17	3	3.2	0.1	0.7	0.26
320	Piney Cr	TN07	960620	1003	2	0	29	6.5	6.5			1.3	0.933	0.013	0.233	0.223
320	Piney Cr	TN07	960716	1332	2	1	28	7.8	7.0							
320	Piney Cr	TN07	960828	1025	2	1	24	7.8	6.4	171	6	0.7	0.62	0.015	0.222	0.09
320	Piney Cr	TN07	961023	1340			18	8.8	7.0	87	3		1.17	0.1	<0.15	<0.05
Lower Elk River (0603-0004)																
020	Elk R	TN04	960620	1215	7	0	30	12.2	7.9			1.6	0.854	<0.005	0.177	0.172
020	Elk R	TN04	960716	1242	10	5	28	8.5	6.5							
020	Elk R	TN04	960828	1145	10	5	23	8.7	7.2	421	15	0.6	0.74	0.015	0.17	0.27

Appendix F-7a, cont. Clean Water Strategy water quality data collected by ADEM during 1996 from selected stations in the Tennessee R Basin.

Sub-watershed #	Stream Name	Station #	Date *yymmdd*	Time *24hr*	Stream Depth *m*	Sampling Depth *m*	Water Temp. *C*	Dissolved Oxygen *mg/l*	pH *s.u.*	Conductivity *umhos @25c*	Turbidity *NTU*	BOD-5 *mg/L*	NO2/ NO3 *mg/L*	NH3-N *mg/L*	TKN *mg/L*	T-PO4 *mg/l*
Lower Elk River (0603-0004)																
020	Elk R	TN04	960904	1220	10	5	25	11.5	7.3							
020	Elk R	TN04	961023	1506	10	5	17	9.8	7.2	201	17	1	1.51	0.1	<0.15	0.2
150	Elk R	TN05	960620	1222	6.5	0	32	9.7	7.5			5.5	0.018	0.005	0.507	0.098
150	Elk R	TN05	960718	1245	6.5	3.25	32	9.7	7.5							
150	Elk R	TN05	960828	1342	5	2.5	28	12.0	7.9	383	9	4	0.03	0.015	0.25	0.17
150	Elk R	TN05	960904	1349	7	3.5	27	12.5	8.3							
150	Elk R	TN05	961024	1414	10	5	16	12.0	8.2	133	17	2	9	0.1	0.41	0.22
Pickwick Lake (0603-0005)																
010	Big Nance Cr	TN01	960620	1412	2	0	29	12.2	8.0			1.4	1.591	0.008	0.158	<0.05
010	Big Nance Cr	TN01	960717	1159	1.5	0.75	27	11.2	6.7							
010	Big Nance Cr	TN01	960815	1452	1	0.5		10.3	6.7			<0.1	0.919	0.012	0.26	0.108
010	Big Nance Cr	TN01	960904	1439	4	2	25	11.0	7.5							
010	Big Nance Cr	TN01	961022	1506	2	1	17	10.0	7.3	257		1.4	1.8	<0.1	0.17	<0.05
010	Big Nance Cr	TN02	960620	1558	1.5	0	29	7.8	7.7			1.6	1.312	0.034	0.252	<0.05
010	Big Nance Cr	TN02	960718	0936	2	1	26	4.5	7.1							
010	Big Nance Cr	TN02	960815	1425	1	1		6.7	6.5			1.2	0.952	0.099	0.421	0.088
010	Big Nance Cr	TN02	960904	1504	2	1	25	10.0	7.4							
010	Big Nance Cr	TN02	961022	1539	2	1	16	6.8	7.6	338		1.1	1.5	<0.1	<0.15	0.06
010	Borden Cr	TN16	960619	0853	0.3	0.16	29	8.7	6.8	647	15	2.6	0.214	0.096	0.349	0.069
010	Borden Cr	TN16	960731	1510	0.5	0.25	24	9.2	7.6							
010	Borden Cr	TN16	960829	1528			28	12.0	7.8	575	33	1.5	0.05	0.015	0.19	0.13
010	Borden Cr	TN16	960924	1425			23	9.2	7.5							
010	Borden Cr	TN16	961024	0925	2	1	14	8.5	7.4	505	10	1.8	0.15	<0.1	<0.15	<0.05
010	Borden Cr	TN17	960619	0921	0.66	0.33	27	6.5	6.3	512	3	1.8	0.255	0.065	0.32	0.172

Appendix F-7a, cont. Clean Water Strategy water quality data collected by ADEM during 1996 from selected stations in the Tennessee R Basin.

Sub-watershed #	Stream Name	Station #	Date *yymmdd*	Time *24hr*	Stream Depth *m*	Sampling Depth *m*	Water Temp. *C*	Dissolved Oxygen *mg/l*	pH *s.u.*	Conductivity *umhos @25c*	Turbidity *NTU*	BOD-5 *mg/L*	NO2/ NO3 *mg/L*	NH3-N *mg/L*	TKN *mg/L*	T-PO4 *mg/l*
Pickwick Lake (0603-0005)																
010	Borden Cr	TN17	960717	1305	1.5	0.75	28	10.2	7.2							
010	Borden Cr	TN17	960829	1546	1	0.5	28	10.0	7.6	667	13	1.1	0.13	0.015	0.16	0.13
010	Borden Cr	TN17	960924	1437	1	0.5	22									
010	Borden Cr	TN17	961024	0943	1	0.5	14	8.5	7.6	415	17	1.7	1.32	<0.1	<0.15	0.08
040	Town Cr	TN03	960620	1504	2	0	31	9.3	7.9			2.85	0.078	<0.005	0.253	0.084
040	Town Cr	TN03	960731	1420	2	1	25	7.2	7.1							
040	Town Cr	TN03	960829	1502	1	0.5	27	6.0	7.6	344	38	1.4	0.67	0.015	0.26	0.18
040	Town Cr	TN03	960924	1406	2	1	23	6.9	7.3							
040	Town Cr	TN03	961022	1620	2	1	16	7.9	8.0				1.1	<0.1	<0.15	<0.05
200	Cypress Cr	TN18	960627	1035	0.66	0.33	28	9.8	6.6			<0.1	0.475	0.007	0.164	0.287
200	Cypress Cr	TN18	960717	1600	10	5	29	8.5	7.2							
200	Cypress Cr	TN18	960828	1522	0.5	0.25	27	12.5	7.6	586	4	0.9	0.4	0.015	0.15	0.11
200	Cypress Cr	TN18	960923	1527	1.5	0.75	21	9.1	6.3							
200	Cypress Cr	TN18	961024	1308	1	0.5	16	10.5	7.8	85	2	0.9	<0.1	<0.1	<0.15	<0.05
200	Cypress Cr	TN19	960627	0955	10.5	5	29	9.2	7.2			<0.1	0.432	0.047	0.196	0.237
200	Cypress Cr	TN19	960828	1546	10	5	27	9.0	7.4	872	11	0.9	0.34	0.015	0.15	0.12
200	Cypress Cr	TN19	960923	1614	10	5	22	8.1	7.6							
200	Cypress Cr	TN19	961024	1238	10	5	13	10.3	7.6	128	12	1.1	1.13	<0.1	0.47	<0.05
Bear Creek (0603-0006)																
010	Bear Cr	TN20	960606	1130			25	8.7	8.0	60						
010	Bear Cr	TN20	960711	1030			24	8.3	7.2	68		1.4	0.294		0.2	<0.05
010	Bear Cr	TN20	960725	1221	0.5	0.25	26	8.5	7.4							
010	Bear Cr	TN20	960806	1115			28	7.6	7.4	121	2	0.6	0.284		0.2	<0.04
010	Bear Cr	TN20	960829	1032			27	9.8	7.1	124	2	0.5	0.29	0.015	0.27	0.1

Appendix F-7a, cont. Clean Water Strategy water quality data collected by ADEM during 1996 from selected stations in the Tennessee R Basin.

Sub-watershed #	Stream Name	Station #	Date *yymmdd*	Time *24hr*	Stream Depth *m*	Sampling Depth *m*	Water Temp. *C*	Dissolved Oxygen *mg/l*	pH *s.u.*	Conductivity *umhos @25c*	Turbidity *NTU*	BOD-5 *mg/L*	NO2/ NO3 *mg/L*	NH3-N *mg/L*	TKN *mg/L*	T-PO4 *mg/l*
Bear Creek (0603-0006)																
010	Bear Cr	TN20	960912	1100			25	7.8	6.9	91	4	0.7	0.288		<0.1	<0.04
010	Bear Cr	TN20	960924	1211	0.5	0.25	22	9.3	7.4							
010	Bear Cr	TN20	961017	1130	1	0.5	19	8.9	7.3	78		0.6	0.1			<0.05
010	Bear Cr	TN20	961031	1057	1	0.5	18	9.8	7.2	85	2	0.7	0.13	<0.1	0.65	<0.05
010	Bear Cr	TN21	960606	1115			23	8.5	7.5	69						
010	Bear Cr	TN21	960711	1000			25	7.8	7.4	55		1.3	0.163		0.4	<0.05
010	Bear Cr	TN21	960806	1050			29	7.8	7.5	121			0.052		0.4	<0.04
010	Bear Cr	TN21	960829	0952		15	26		6.4	110	2		0.14	0.03	0.33	0.12
010	Bear Cr	TN21	960912	1025			26	7.9	6.9	79	4	1.1	0.072		0.2	<0.04
010	Bear Cr	TN21	961017	1045	2	1	20	7.4	6.9	55		0.4	0.1			<0.05
010	Turkey Cr	TN14	960619	1121	0.5	0	30	7.9	6.8	60	5	2.2	0.829	0.08	0.348	0.242
010	Turkey Cr	TN14	960725	1005	0.5	0.25	22	5.8	6.5							
010	Turkey Cr	TN14	960829	0840			25	7.4	5.7	65	5	1.9	0.46	0.015	0.36	0.13
010	Turkey Cr	TN14	960924	1308			20	7.2	7.4							
010	Turkey Cr	TN14	961031	1021			7	7.0	6.9	53	5	2.2	1.81	0.28	<0.1	<0.05
010	Little Dice Br	TN15	960619	1037	0.5	0.25	26	5.8	6.5	920	5	1.8	0.083	0.074	0.157	<0.05
010	Little Dice Br	TN15	960725	1030	0.5	0.25	22	4.3	6.7							
010	Little Dice Br	TN15	960829	0905	5	2.5	24	6.2	6.6	1229	10	0.2	0.06	0.015	0.15	0.11
010	Little Dice Br	TN15	960924	1251	4	2	18	6.2	7.1							
010	Little Dice Br	TN15	961031	0948	7	3.5	16	5.1	6.5	436	10	0.31	1.21	<0.1	0.7	
030	Little Bear Cr	TN08	960619	1226	1.5	0	25	8.0	6.8	51	3	1.6	0.332	0.005	0.157	<0.05
030	Little Bear Cr	TN08	960725	1310	3	1.5	25	10.0	7.6							
030	Little Bear Cr	TN08	960829	1106	2	1	24	9.5	7.2	114	5	0.5	0.23	0.015	0.15	0.1
030	Little Bear Cr	TN08	960924	1124	2.5	1.25	18	9.3	7.4							

Appendix F-7a, cont. Clean Water Strategy water quality data collected by ADEM during 1996 from selected stations in the Tennessee R Basin.

Sub-watershed #	Stream Name	Station #	Date *yymmdd*	Time *24hr*	Stream Depth *m*	Sampling Depth *m*	Water Temp. *C*	Dissolved Oxygen *mg/l*	pH *s.u.*	Conductivity *umhos @25c*	Turbidity *NTU*	BOD-5 *mg/L*	NO2/ NO3 *mg/L*	NH3-N *mg/L*	TKN *mg/L*	T-PO4 *mg/l*
Bear Creek (0603-0006)																
030	Little Bear Cr	TN08	961031	1130	2	1	15	10.3	7.3	92	4	1.4	1.1	0.16	0.66	<0.05
030	Little Bear Cr	TN09	960619	1348	1	0.5	29	11.2	6.8	124	3	1.6	0.189	0.008	0.163	<0.05
030	Little Bear Cr	TN09	960725	1402	1	0.5	27	10.2	7.3							
030	Little Bear Cr	TN09	960829	1207	0.5	0.25	24	10.1	7.3	228	6	0.4	0.24	0.015	0.15	0.12
030	Little Bear Cr	TN09	960924	0926	1	0.5	18	8.5	6.1							
030	Little Bear Cr	TN09	961031	1323	1	0.5	17	10.0	7.1	131	4	1.1	1.2	0.44	0.61	<0.05
040	Cedar Cr	TN13	960619	1431	0.5	0.25	29	9.2	7.4	194	4	1.9	0.044	0.04	0.173	<0.05
040	Cedar Cr	TN13	960725	1445	1	0.5	28	9.4	7.5							
040	Cedar Cr	TN13	960829	1233	1	0.5	28	8.4	7.2	325	7	0.5	0.02	0.015	0.36	0.9
040	Cedar Cr	TN13	960924	0950	2	1	22	8.0	7.2							
040	Cedar Cr	TN13	961031	1350	1	0.5	18	9.4	7.6	267	3	1.2	<0.1	0.34	0.68	<0.05
050	Cedar Cr	TN12	960619	1504	1	0.5	28	8.8	7.3	172	5	2	0.127	0.17	0.189	0.57
050	Cedar Cr	TN12	960725	1510	1	0.5	29	8.5	7.5							
050	Cedar Cr	TN12	960829	1302	1	0.5	26	8.5	7.7	287	8	0.5	0.15	0.015	0.15	0.11
050	Cedar Cr	TN12	960924	1018	1	0.5	20	8.0	7.2							
050	Cedar Cr	TN12	961031	1424	1	0.5	18	9.4	7.6	227	8	0.9	0.15	0.2	0.45	<0.05
Tennessee River																
---	Tennessee R	TN22	960822	1104			26		8.2	164	4					
---	Tennessee R	TN23	960822	1400			30		7.9	143	3		0.12			
---	Tennessee R	TN24	960813	1400		15	29		7.9				0.06	<0.015	<0.15	0.08
---	Tennessee R	TN25	960813	1608		25	28		7.6				0.24	0.015	<0.15	0.06
---	Tennessee R	TN26	960813	1438		15	28		7.5				0.2	<0.015	<0.15	0.03
---	Tennessee R	TN27	960815	1230		15	28		7.3				0.05	<0.015	0.27	0.04
---	Tennessee R	TN28	960815	1610		25	28		8.6				0.02	<0.015	<0.15	0.03

Appendix F-7b. Clean Water Strategy water quality data collected by ADEM during 1996 from selected stations in the Tennessee R Basin.

Sub- watershed *#*	Stream Name	Station *#*	Date *yymmdd*	Time *24hr*	Sampling Depth *m*	Fe *mg/l*	Mn *mg/L*	Alkalinity *mg/L*	TOC *mg/L*	Fecal Coliform *col/100ml*	Stream Flow *cfs*
Guntersville Lake (0603-0001)											
160	Kash Cr	TN10	960822	1302	0.25	3.15	0.63				
160	Kash Cr	TN10	961029	1143		4.68	4.99				
160	Kash Cr	TN10	960930	1225	0.25	7.41	3.81				
160	Rocky Br	TN11	961029	1206		0.95	0.13				
160	Rocky Br	TN11	960930	1253	0.25	1.13	0.11				
160	Rocky Br	TN11	960822	1241		6	5.31				
Bear Creek (0603-0006)											
010	Bear Cr	TN20	961031	1057	0.5						73
010	Bear Cr	TN21	960829	0952	15			16	5.03		
010	Bear Cr	TN21	961017	1045	1					1	
010	Bear Cr	TN20	961017	1130	0.5					94	
Tennessee River											
---	Tennessee R	TN24	960813	1400	15			55	2.76		
---	Tennessee R	TN28	960815	1610	25			57	2.81		
---	Tennessee R	TN26	960813	1438	15			58	2.38		
---	Tennessee R	TN25	960813	1608	25			60	2.3		
---	Tennessee R	TN27	960815	1230	15			60	2.94		
---	Tennessee R	TN23	960822	1400				63	2.71		
---	Tennessee R	TN22	960822	1104				65	2.46		

Appendix F-7c. Clean Water Strategy water quality data collected by ADEM in 1996 at selected stations in the Tennessee River Basin. (* indicates that the value was less than the minimum laboratory detection limit)

Parameter	Minimum Detection Limit	Tennessee River Station Number						
		TN22	TN23	TN24	TN25	TN26	TN27	TN28
Date	yymmdd	960822	960822	960813	960813	960813	960815	960815
Time	24hr	1104	1400	1400	1608	1438	1230	1610
Specific Conductance	um/cm	167	157					
Turbidity	NTUs	4	3					
NO2-NO3	mg/L		0.12	0.06	0.24	0.2	0.05	0.02
TOC	mg/L	2.46	2.71	2.76	2.3	2.38	2.94	2.81
Alkalinity	mg/L	65	63		60	58	60	57
1,2-Dibromo-3-chloropropane	0.02 ug/L	*	*	*	*	*	*	*
Ethylene dibromide	0.02 ug/L	*	*	*	*	*	*	*
1,1,1,2-Tetrachloroethane	0.5 ug/L	*	*	*	*	*	*	*
1,1,1-Trichloroethane	0.5 ug/L	*	*	*	*	*	*	*
1,1,2,2-Tetrachloroethane	0.5 ug/L	*	*	*	*	*	*	*
1,1,2-Trichloroethane	0.5 ug/L	*	*	*	*	*	*	*
1,1-Dichloroethane	0.5 ug/L	*	**0.5**	*	*	*	*	*
1,1-Dichloroethylene	0.5 ug/L	*	*	*	*	*	*	*
1,1-Dichloropropene	0.5 ug/L	*	*	*	*	*	*	*
1,2,3-Trichlorobenzene	0.5 ug/L	*	*	*	*	*	*	*
1,2,3-Trichloropropane	0.5 ug/L	*	*	*	*	*	*	*
1,2,4-Trimethylbenzene	0.5 ug/L	*	*	*	*	*	*	*
1,2-Dichloroethane	0.5 ug/L	*	*	*	*	*	*	*
1,2-Dichloropropane	0.5 ug/L	*	*	*	*	*	*	*
1,3,5-Trimethylbenzene	0.5 ug/L	*	*	*	*	*	*	*
1,3-Dichloropropane	0.5 ug/L	*	*	*	*	*	*	*
1,3-Dichloropropene	0.5 ug/L	*	*	*	*	*	*	*
2,2-Dichloropropane	0.5 ug/L	*	*	*	*	*	*	*
Tetrachlorethylene	0.5 ug/L	*	*	*	*	*	*	*
Bromobenzene	0.5 ug/L	*	*	*	*	*	*	*
Bromochloromethane	0.5 ug/L	*	*	*	*	*	*	*
Bromodichloromethane	0.5 ug/L	*	*	*	*	*	*	*

Appendix F-7c, cont. Clean Water Strategy water quality data collected by ADEM in 1996 at selected stations in the Tennessee River Basin. (* indicates that the value was less than the minimum laboratory detection limit)

Parameter	Minimum Detection Limit	Tennessee River Station Number						
		TN22	TN23	TN24	TN25	TN26	TN27	TN28
Benzene	1.2 ug/L	**1.2**	*	*	*	*	*	*
Bromomethane	0.5 ug/L	*	*	*	*	*	*	*
cis-1,2-Dichloroethylene	0.5 ug/L	*	*	*	*	*	*	*
Chlorobenzene	0.5 ug/L	*	*	*	*	*	*	*
Chlorodibromomethane	0.5 ug/L	*	*	*	*	*	*	*
Chloroethane	0.5 ug/L	*	*	*	*	*	*	*
Bromoform	0.5 ug/L	*	*	*	*	*	*	*
Chloroform	0.5 ug/L	*	*	*	*	*	*	*
Chloromethane	0.5 ug/L	*	*	*	*	*	*	*
Carbon tetrachloride	0.5 ug/L	*	*	*	*	*	*	*
Dibromomethane	0.5 ug/L	*	*	*	*	*	*	*
Dichlorodifluoromethane	0.5 ug/L	*	*	*	*	*	*	*
Dichloromethane	0.5 ug/L	*	*	*	*	*	*	*
Ethylbenzene	0.5 ug/L	*	*	*	*	*	*	*
Fluorotrichloromethane	0.5 ug/L	*	*	*	*	*	*	*
Hexachlorobutadiene	0.5 ug/L	*	*	*	*	*	*	*
Isopropylbenzene	0.5 ug/L	*	*	*	*	*	*	*
m-Dichlorobenzene	0.5 ug/L	*	*	*	*	*	*	*
m & p Xylene	0.5 ug/L	*	*	*	*	*	*	*
Naphthalene	0.5 ug/L	*	*	*	*	*	*	*
n-Butylbenzene	0.5 ug/L	*	*	*	*	*	*	*
n-Propylbenzene	0.5 ug/L	*	*	*	*	*	*	*
o-Chlorotoluene	0.5 ug/L	*	*	*	*	*	*	*
o-Dichlorobenzene	0.5 ug/L	*	*	*	*	*	*	*

Appendix F-7d. Clean Water Strategy water quality data collected by ADEM in 1996 at selected stations in the Tennessee River Basin. (* indicates that the value was less than the minimum laboratory detection limit)

Parameter	Minimum Detection Limit	Tennessee River Station Number						
		TN22	TN23	TN24	TN25	TN26	TN27	TN28
o-Xylene	0.5 ug/L	*	*	*	*	*	*	*
p-Chlorotoluene	0.5 ug/L	*	*	*	*	*	*	*
p-Dichlorobenzene	0.5 ug/L	*	*	*	*	*	*	*
p-Isopropyltoluene	0.5 ug/L	*	*	*	*	*	*	*
Secbutylbenzene	0.5 ug/L	*	*	*	*	*	*	*
Styrene	0.5 ug/L	*	*	*	*	*	*	*
t-1,2-Dichloroehtylene	0.5 ug/L	*	*	*	*	*	*	*
Tertbutylbenzene	0.5 ug/L	*	*	*	*	*	*	*
Trichloroethylene	0.5 ug/L	*	*	*	*	*	*	*
Toluene	0.5 ug/L	*	*	*	*	*	*	*
Vinyl Chloride	0.5 ug/L	*	*	*	*	*	*	*
Diquat	0.44 ug/L	*	*	*	*	*	*	*
2,4-D	0.05 ug/L	*	*	*	*	*	*	*
Dalapon	1.3 ug/L	*	*	*	*	*	*	*
Dicamba	0.81 ug/L	*	*	*	*	*	*	*
Dinoseb	0.19 ug/L	*	*	*	*	*	*	*
Pentachlorophenol	0.076 ug/L	*	*	*	*	*	*	*
Picloram	0.14 ug/L	*	*	*	*	*	*	*
Silvex	0.04 ug/L	*	*	*	*	*	*	*

Appendix F-8a. Physical / chemical data collected by TVA in the Tennessee River Basin from July through October 1997 under contract with ADEM (TVA 1997)

Subwatershed #	Stream Name	Station #	Date yymmdd	Time 24hr	Stream Depth m	Water Temp. C	Dissolved Oxygen mg/l	pH s.u.	Conductivity umhos @25c	Turbidity NTU	Stream Flow cfs	BOD-5 mg/L	TDS mg/L	TSS mg/L	Hardness mg/L	NH3-N mg/L	NO2/ NO3 mg/L	TKN mg/L	T-PO4 mg/l	Ortho-phosphate mg/l	Fecal Coliform col/100ml
Wheeler Lake (0603-0002)																					
020	Hurricane Cr	5394-1	970630	1850		18.8	9.3	8	235	10.2	High	< 2		4		< 0.01	0.09	0.16	0.02	0.009	INT
020	Hurricane Cr	5394-1	970710	0800	1.1	21.2	8.6	7.8	277	2.5	17.6	< 2		2		0.02	0.09	0.13		0.005	INT
020	Hurricane Cr	5394-1	970806	1340	1.2	22.7	6	7.6	312	3.5	3.7	< 2		5		0.02	0.07	0.29	0.02	0.004	80
020	Hurricane Cr	5394-1	970904	1300	1	21.8	5.4	7.5	311	3.3	4.1	< 2		3		0.04	0.03	0.33	0.02	0.004	INT
020	Hurricane Cr	5394-1	971008	1410	1	17.7	6.4	7.5	311	2.6	2.7	< 2		3		0.02	0.03	0.28	0.02	0.004	INT
050	Dry Cr	3368-1	970616	1510	3	17	8.8	7.5	198	42	102	2		54		0.02	0.25	0.32	0.12	0.057	INT
050	Dry Cr	3368-1	970710	1200	0.9	20.1	8.2	7.7	252	5.5	7.6	< 2		4		0.02	0.32	0.1		0.006	290
050	Dry Cr	3368-1	970806	1220	0.7	21.8	6.3	7.6	284	3.4	1.7	< 2		3		0.03	0.35	0.2	0.02	0.007	400
050	Dry Cr	3368-1	970904	1145	0.6	20.4	6.5	7.7	302	3.2	1	< 2		3		0.02	0.26	0.22	0.02	0.007	320
050	Dry Cr	3368-1	971008	1245	0.6	18.6	7.5	7.5	294	2.8	1	< 2		2		0.02	0.27	0.32	0.01	0.005	1360
050	Lick Fk	6384-1	970616	1530	3.3	16.4	9	7.6	225	36	211	2		43		< 0.01	0.16	0.34	0.09	0.033	INT
050	Lick Fk	6384-1	970710	1325	1.3	21.3	7.9	7.6	268	2.3	6.8	< 2		2		0.02	0.28	0.12		0.004	110
050	Lick Fk	6384-1	970806	1310	1.1	22.4	5.7	7.3	283	2.9	0.6	< 2		2		0.02	0.22	0.23	0.02	0.007	120
050	Lick Fk	6384-1	970904	1230	0.6	21.4	5.4	7.4	255	2.1	1	< 2		2		0.04	0.21	0.27	0.02	0.008	INT
050	Lick Fk	6384-1	971008	1340	0.6	19.5	6.8	7.4	290	2.2	0.5	< 2		5		0.01	0.1	0.23	0.02	0.008	INT
060	Guess Cr	4641-1	970616	1300	3	15	9.5	7.5	98	3.6	NM	< 2		3		< 0.01	0.17	0.05	0.01	0.007	INT
060	Guess Cr	4641-1	970710	1045		16.3	8.7	7.3	165	2.1	NM	< 2		2		0.02	0.2	0.07		0.004	INT
060	Guess Cr	4641-1	970806	1115		18.8	6.4	7.2	234	2.7	NM	< 2		2		0.02	0.09	0.17		0.004	160
060	Guess Cr	4641-1	970904	1100		19.3	4.5	7.2	243	3	NM	< 2		1		0.04	0.03	0.14	0.01	0.004	660
060	Guess Cr	4641-1	971008	1155		17.5	4.8	7.1	251	4.8	NM	< 2		2		0.02	0.02	0.24	0.02	0.006	3080
060	Guess Cr	4641-2	970616	1340	2.5	15.1	9.2	7.3	106	5.1	133	< 2		6		0.36	0.49	0.03	0.02	0.009	INT
060	Guess Cr	4641-2	970710	0800	1.5	18.4	8	7.4	181	3.7	14.5	< 2		4		0.01	0.19	0.16		0.004	INT
060	Guess Cr	4641-2	970806	1140	1.5	21.5	5.7	7.3	230	4.7	2.1	< 2		4		0.03	0.12	0.21	0.02	0.005	140
060	Guess Cr	4641-2	970904	1125	1.8	20.6	5	7.3	238	3.6	3.2	< 2		2		0.07	0.06	0.21	0.02	0.005	INT
060	Guess Cr	4641-2	971008	0800	1.5	17.8	6.2	7.3	244	2.6	2.4	< 2		3		0.02	0.11	0.25	0.01	0.005	400
080	Clear Cr	2305-1	970616	1230	1.8	15.4	9.6	7.7	232	4.6	40.5	< 2		2		< 0.01	0.2			0.007	INT
080	Clear Cr	2305-1	970710	1010	1.6	18.9	9.2	7.8	265	3.5	12	< 2				< 0.01	0.27	0.15		0.004	330
080	Clear Cr	2305-1	970806	1100	1.6	21.7	7.8	7.9	312	4.7	1.3	< 2		4		0.01	0.38	0.22	0.02	0.006	880

Appendix F-8a, cont. Physical / chemical data collected by TVA in the Tennessee River Basin from July through October 1997 under contract with ADEM (TVA 1997)

Subwatershed #	Stream Name	Station #	Date *yymmdd*	Time *24hr*	Stream Depth *m*	Water Temp. *C*	Dissolved Oxygen *mg/l*	pH *s.u.*	Conductivity *umhos @25c*	Turbidity *NTU*	Stream Flow *cfs*	BOD-5 *mg/L*	TDS *mg/L*	TSS *mg/L*	Hardness *mg/L*	NH3-N *mg/L*	NO2/ NO3 *mg/L*	TKN *mg/L*	T-PO4 *mg/l*	Ortho-phosphate *mg/l*	Fecal Coliform *col/100ml*
Wheeler Lake (0603-0002), cont.																					
080	Clear Cr	2305-1	970904	1030	1.1	20.6	7.4	7.8	296	7.3	0.7	< 2		7		0.03	0.18	0.27	0.02	0.006	1140
080	Clear Cr	2305-1	971008	1130	0.8	19.2	8.9	7.8	313	8.6	1.1	< 2		7		0.03	0.19	0.37	0.02	0.009	INT
090	Yellow Br	12460-1	970616	0940	1.5	16.2	8.6	7.5	322	4.8	39.4	< 2		4		< 0.01	0.41	0.1	0.02	0.012	INT
090	Yellow Br	12460-1	970710	1730	1	22.8	8.2	7.4	317	2	4	< 2		4		0.02	0.78	0.04		0.007	80
090	Yellow Br	12460-1	970806	1440	0.8	21.2	7.1	7.4	348	1.5	1.7	< 2		1		0.01	0.85	0.15	0.03	0.004	100
090	Yellow Br	12460-1	970904	0850	0.7	17.7	5.5	7.3	359	2.6	0.6	< 2				0.02	0.84	0.14	0.01	0.006	1880
090	Yellow Br	12460-1	971008	1520	0.7	19.6	8.5	7.2	385	1.3	1	< 2		4		0.01	0.85	0.24	0.01	0.008	INT
090	Yellow Br	12460-2	970616	1740	1	17.6	8.9	7.5	342	5.7	NM	< 2		4		< 0.01	0.47	0.12	0.02	0.015	INT
090	Yellow Br	12460-2	970710	0800		26.3	12.3	8	318	3.5	NM	< 2		4		0.04	0.57	0.14	0.03	0.01	120
090	Yellow Br	12460-2	970806	1500		26	7.3	7.7	336	4.9	NM	< 2		6		0.05	0.54	0.26	0.02	0.009	80
090	Yellow Br	12460-2	970904	1420		24.1	6.8	7.7	335	6.8	NM	< 2		7		0.06	0.3	0.37	0.04	0.006	INT
090	Yellow Br	12460-2	971008	1540		22	8.5	7.5	390	3.3	NM	< 2		4		0.05	0.54	0.46	0.08	0.07	2140
100	Paint Rock R	8421-1	970616	0830	6	17.8	8.2	7.6	253	15.4	NM	< 2		24		< 0.01	0.24	0.11	0.04	0.021	INT
100	Paint Rock R	8421-1	970710	1700		25.3	7.6	7.7	283	7.2	NM	< 2		8		0.02	0.48	0.1		0.009	80
100	Paint Rock R	8421-1	970806	0900		24.6	6.1	7.6	317	6.2	NM	< 2		8		< 0.01	0.45		0.01	0.005	180
100	Paint Rock R	8421-1	970904	0830		24	6.3	7.6	315	6.6	NM	< 2		7		0.02	0.34	0.26	0.02	0.007	240
100	Paint Rock R	8421-1	971008	0845		19.8	6.4	7.5	332	7.6	NM	< 2	180	12	180	0.02	0.52	0.38	0.02	0.009	2120
140	Flint R	4015-3	970624	1700	3	24.6	9	7.3	92	3.7	157	< 2		6		< 0.01	0.95	0.2	0.02	0.01	INT
140	Flint R	4015-3	970715	1530	2.7	26.2	8.3	7.4	105	10.9	72.9	< 2		14		0.03	0.85	0.14	0.03	0.02	160
140	Flint R	4015-3	970819	1400	2.4	25.4	8.6	7.5	113	5.4	41.5	< 2		6		0.01	0.79	0.17	0.03	0.01	100
140	Flint R	4015-3	970916	1330	2.2	21.5	9.1	7.4	112	4.5	24.8	< 2		6		< 0.01	0.87	0.15	0.02	0.01	2720
140	Flint R	4015-3	971021	1345	2.4	13	9.7	7.4	104	3.2	44	< 2		2		< 0.01	0.83	0.19	0.01	0.007	1100
160	Hester Cr	5005-1	970624	1815	0.8	26.1	7.7	7.2	95	4.1	15.6	< 2		4		0.02	0.95	0.21	0.04	0.03	INT
160	Hester Cr	5005-1	970715	1615	0.6	26.1	7.8	7.2	98	5.3	11	< 2		5		0.03	0.7	0.21	0.04	0.03	INT
160	Hester Cr	5005-1	970819	1445	0.5	26.1	7.8	7.5	103	3.4	6	< 2		3		0.02	0.48	0.21	0.04	0.02	120
160	Hester Cr	5005-1	970916	1400	0.5	21.6	8.4	7.4	96	2.9	3.8	< 2		1		0.01	0.31	0.2	0.03	0.02	340
160	Hester Cr	5005-1	971021	0800						2.3	7.2	< 2		1		0.01	0.49	0.17	0.04	0.01	INT
160	Mountain Fk	7891-2	970624	1810	1	23.1	7.3	7.6	308	4.3	46.8	3		4		0.49	1.8	1.3	0.22	0.21	INT

Appendix F-8a, cont. Physical / chemical data collected by TVA in the Tennessee River Basin from July through October 1997 under contract with ADEM (TVA 1997)

Subwatershed #	Stream Name	Station #	Date *yymmdd*	Time *24hr*	Stream Depth *m*	Water Temp. *C*	Dissolved Oxygen *mg/l*	pH *s.u.*	Conductivity *umhos @25c*	Turbidity *NTU*	Stream Flow *cfs*	BOD-5 *mg/L*	TDS *mg/L*	TSS *mg/L*	Hardness *mg/L*	NH3-N *mg/L*	NO2/ NO3 *mg/L*	TKN *mg/L*	T-PO4 *mg/l*	Ortho-phosphate *mg/l*	Fecal Coliform *col/100ml*
Wheeler Lake (0603-0002), cont.																					
160	Mountain Fk	7891-2	970715	1630	0.8	23.5	7.8	7.6	266	3.3	28.2	6		5		0.7	2.5	1.3	0.39	0.36	INT
160	Mountain Fk	7891-2	970819	1430	0.7	24.5	6.1	7.2	267	6.2	20.4	16		9		1.4	4.6	2.4	0.88	0.27	INT
160	Mountain Fk	7891-2	970916	1415	0.7	25.3	6.2	7.2	257	2.5	14.2	8		2		0.81	4.7	1.3	0.69	0.63	3840
160	Mountain Fk	7891-2	971021	1300	0.8					2.3	27.4	< 2	130	2	110	0.38	1.9	0.95	0.5	0.39	5200
180	Brier Fk	1370-1	970624	1950	0.7	25.1	6.9	6.7	60	5.7	NM	< 2		4		0.02	0.48	0.41	0.04	0.02	INT
180	Brier Fk	1370-1	970715	1700		26.4	6.1	7	58	4.2	NM	< 2		3		0.04	0.27	0.33	0.04	0.02	180
180	Brier Fk	1370-1	970819	1535		26.9	6.1	6.8	55	3.7	NM	< 2		3		0.03	0.1	0.22	0.05	0.02	INT
180	Brier Fk	1370-1	970916	0800		22.2	6.2	6.7	49	3.3	NM	< 2		3		0.02		0.28	0.04	0.01	INT
180	Brier Fk	1370-1	971022	1600		12.2	9.2	7	50	3.3	NM	< 2		2		< 0.01	0.11	0.19	0.02	0.01	INT
180	Brier Fk	1370-2	970624	1400	1.5	23.6	7.4	6.8	69	8.2	28.3	< 2		7		0.02	0.89	0.29	0.04	0.02	INT
180	Brier Fk	1370-2	970715	1245	1.1	24.3	7.3	7.2	80	3.8	12.6	< 2		2		0.02	0.92	0.19	0.02	0.01	100
180	Brier Fk	1370-2	970819	1215	0.9	25.2	7.2	7.2	86	3.9	12.3	< 2		6		0.02	0.79	0.19	0.02	0.01	120
180	Brier Fk	1370-2	970916	1145	0.8	20.4	7.9	7.2	87	5.5	5.6	9		3		< 0.01	0.87	0.16	0.03	0.009	1780
180	Brier Fk	1370-2	971021	1200	0.9	12.8	9.2	7.2	78	4.7	9.6	< 2		4		0.04	1	0.19	0.02	0.008	2900
180	Brier Fk	1370-3	970624	1620	2	24	8	7.1	124	15.4	110	< 2		17		0.02	1.2	0.35	0.05	0.02	INT
180	Brier Fk	1370-3	970715	1330	1.7	22.8	8.6	7.6	171	6.2	45.9	< 2		10		0.01	1.6	0.16	0.02	0.01	190
180	Brier Fk	1370-3	970819	0800	1.5	22.6	8.5	7.5	180	5.6	26.3	< 2		7		0.01	1.5	0.14	0.03	0.01	300
180	Brier Fk	1370-3	970916	1230	1.4	19.2	8.7	7.5	178	5.3	22.7	< 2		6		0.01	1.5	0.21	0.03	0.006	720
180	Brier Fk	1370-3	971021	1230	1.6	13.2	9.5	7.5	158	4.7	29.9	< 2		4		0.05	1.5	0.16	0.02	0.01	250
180	Beaverdam Cr	580-1	970624	1330	3	21.5	7.7	6.9	140	15.4	32.6	< 2		9		< 0.01	1.2	0.32	0.04	0.02	INT
180	Beaverdam Cr	580-1	970715	1200	2.4	17.9	7.9	7.1	245	2.1	10.7	< 2		2		0.02	1.9	0.1	0.02	0.01	10
180	Beaverdam Cr	580-1	970819	1130	2.2	16.1	8.3	7	273	1.1	6.9	< 2		2		< 0.01	2		0.03	0.02	40
180	Beaverdam Cr	580-1	970916	1100	2	15.8	8.1	7	268	0.9	5.3	< 2		1		< 0.01	2	0.07	0.03	0.02	140
180	Beaverdam Cr	580-1	971021	1130	2.1	14.8	7.9	7.1	242	1.7	6.9	< 2	160	2	120	0.03	1.9	0.15	0.06	0.02	217
200	Hurricane Cr	5392-1	970616	1050	2	19	8.4	7.8	301	3.7	67.9	< 2		5		< 0.01	0.41	0.06	0.02	0.012	INT
200	Hurricane Cr	5392-1	970710	0930	4	20.5	7.4	7.2	154	186	740	4		180		0.07	0.25	1.2	0.41	0.37	540
200	Hurricane Cr	5392-1	970806	0945	1.2	23.3	6.3	7.8	306	8.3	4.9	< 2		12		0.01	0.46	0.22	0.02	0.008	1240
200	Hurricane Cr	5392-1	970904	1000	1.1	23.3	6.2	7.7	293	12.7	2.9	< 2		18		0.04	0.11	0.37	0.03	0.01	3520

Appendix F-8a, cont. Physical / chemical data collected by TVA in the Tennessee River Basin from July through October 1997 under contract with ADEM (TVA 1997)

Subwatershed #	Stream Name	Station #	Date yymmdd	Time 24hr	Stream Depth m	Water Temp. C	Dissolved Oxygen mg/l	pH s.u.	Conductivity umhos @25c	Turbidity NTU	Stream Flow cfs	BOD-5 mg/L	TDS mg/L	TSS mg/L	Hardness mg/L	NH3-N mg/L	NO2/ NO3 mg/L	TKN mg/L	T-PO4 mg/l	Ortho-phosphate mg/l	Fecal Coliform col/100ml
Wheeler Lake (0603-0002), cont.																					
200	Hurricane Cr	5392-1	971008	1000	1	19.4	7.3	7.7	320	9.9	1.9	< 2	170	170	170	0.02	0.27	0.31	0.02	0.009	900
200	Hurricane Cr	5392-2	970616	1150	1.5	18.6	8.3	7.7	301	5.4	NM	< 2		8		< 0.01	0.42	0.11	0.02	0.012	INT
200	Hurricane Cr	5392-2	970710	0850		20.3	7.9	7.2	159	180	NM	5		180		0.06	0.26	1.1	0.43	0.38	170
200	Hurricane Cr	5392-2	970806	1015		22.7	6.4	7.7	312	3.8	NM	< 2		4		0.01	0.52	0.19		0.008	60
200	Hurricane Cr	5392-2	970904	0930		22.4	6.3	7.7	305	3.7	NM	< 2		4		0.02	0.18	0.26	0.02	0.007	820
200	Hurricane Cr	5392-2	971008	1050		19.3	7.2	7.5	323	3.2	NM	< 2		4		0.01	0.29	0.35	0.02	0.007	820
210	Yellow Bank Cr	12457-2	970624	1025	1.5	22	8.1	7.4	253	11.8	2.5	< 2		6		0.05	0.15	0.92	0.2	0.17	INT
210	Yellow Bank Cr	12457-2	970715	0830	1.4	25.4	5.5	7.9	342	4.9	0.2	< 2		5		0.02	0.06	0.22	0.19	0.13	200
210	Yellow Bank Cr	12457-2	970819	0930	1.3	26	4.8	7.5	249	6.7	0.2	2		9		0.01		0.46	0.09	0.05	INT
210	Yellow Bank Cr	12457-2	970916	0930	1	19.1	6.4	7.7	180	6	0	< 2		8		< 0.01		0.62	0.04	0.004	INT
210	Yellow Bank Cr	12457-2	971021	0900	1	12.5	7.6	7.7	316	5.2	0	< 2		4		< 0.01	0.09	0.18	0.02	0.004	1100
210	Flint R	4015-2	970624	0950		21.5	7.9	7.3	175	25	NM	< 2		28		0.01	0.97	0.28	0.07	0.03	INT
210	Flint R	4015-2	970715	0810		23.9	6.7	7.7	197	24	NM	< 2		32		0.04	1	0.24	0.06	0.04	191
210	Flint R	4015-2	970819	1000		25.6	7	7.6	194	12.7	NM	< 2		16		0.03	1.5	0.27	0.08	0.06	120
210	Flint R	4015-2	970916	0940		21.1	7.9	7.6	190	10.1	NM	< 2		12		0.03	1.8	0.25	0.07	0.06	380
210	Flint R	4015-2	971021	0930		14	9	7.7	183	6.1	NM	< 2	120	7	88	0.02	0.68	0.19	0.05	0.03	300
210	Goose Cr	4402-1	970624	1130	3	16.4	8.8	7.3	194	11.1	30.6	< 2		8		< 0.01	0.47	0.13		0.01	INT
210	Goose Cr	4402-1	970715	1025	1.7	20.7	7.7	7.7	255	5.7	2.5	< 2		4		0.02	0.89	0.14		0.009	80
210	Goose Cr	4402-1	970819	1015	1.7	24.3	3.3	7.4	330	4.2	1.6	< 2		5		0.04	0.55	0.24	0.02	0.008	120
210	Goose Cr	4402-1	970916	0800	1.6	19.3	2.8	7.2	233	7.3	0	< 2		6		0.04		0.36	0.05	0.01	220
210	Goose Cr	4402-1	971021	1015	1.5	12.7	6.6	7.6	321	4.7	0	< 2		4		0.02	0.68	0.23	0.02	0.007	200
210	Big Cove Cr	872-1	970624	1215	2	19.2	9	7.7	309	60	22.1	< 2		72		0.02	0.27	0.29	0.06	0.02	INT
210	Big Cove Cr	872-1	970715	1100	1.5	22.4	8.6	7.9	286	4.7	4.2	< 2		3		0.02	0.29	0.16		0.008	130
210	Big Cove Cr	872-1	970819	1040	1.1	25.8	6.1	7.6	282	5.3	0.4	< 2		6		0.04	0.12	0.21	0.02	0.007	340
210	Big Cove Cr	872-1	970916	0800	0.9	21.4	6.7	7.5	247	6.2	0.1	< 2		4		0.02	0.04	0.38	0.03	0.01	1600
210	Big Cove Cr	872-1	971021	1030	1.2	13.6	9.4	7.9	298	3.1	0.6	< 2	170	2	150	0.02	0.08	0.19	0.02	0.003	200
270	Town Cr	11503-1	970625	0900	5	20.5	7.1	7.2	210	8.2	High	< 2		8		0.02	0.4	0.26	0.02	0.02	INT
270	Town Cr	11503-1	970716	0930	2	23.1	7.4	7.6	276	5.5	9.4	2		5		0.05	0.4	0.22	0.02	0.009	330

Appendix F-8a, cont. Physical / chemical data collected by TVA in the Tennessee River Basin from July through October 1997 under contract with ADEM (TVA 1997)

Subwatershed #	Stream Name	Station #	Date yymmdd	Time 24hr	Stream Depth m	Water Temp. C	Dissolved Oxygen mg/l	pH s.u.	Conductivity umhos @25c	Turbidity NTU	Stream Flow cfs	BOD-5 mg/L	TDS mg/L	TSS mg/L	Hardness mg/L	NH3-N mg/L	NO2/ NO3 mg/L	TKN mg/L	T-PO4 mg/l	Ortho-phosphate mg/l	Fecal Coliform col/100ml
Wheeler Lake (0603-0002), cont.																					
270	Town Cr	11503-1	970820	0930	1.6	24.1	3.9	7.3	262	7.5	1.6	< 2		7		0.03		0.37	0.06	0.009	1940
270	Town Cr	11503-1	970917	0840	1.9	19.6	3.2	7.3	293	2.5	0	< 2		3		0.02		0.28	0.02	0.006	480
270	Town Cr	11503-1	971022	0800	2.4	12.4	8.9	7.5	275	10.3	30.9	< 2		6		< 0.01	0.34	0.28	0.04	0.02	6200
270	W. Fk Cotaco Cr	11770-1	970625	1000	7	19.3	7.3	7	107	12.9	162	7		15		0.03	0.68	0.26	0.03	0.05	INT
270	W. Fk Cotaco Cr	11770-1	970716	1125	4.1	23.5	5.6	7.2	151	8.3	6.1	< 2		4		0.05	0.6	0.41	0.02	0.01	590
270	W. Fk Cotaco Cr	11770-1	970820	1100	4	23.9	5.6	7	137	11.7	3	< 2		6		0.04	0.72	0.35	0.07	0.01	1080
270	W. Fk Cotaco Cr	11770-1	970917	0800	3.7	20	3.4	7	170	6.8	0	< 2		7		0.01	0.05	0.32	0.03	0.007	60
270	W. Fk Cotaco Cr	11770-1	971022	1040	4.8	13.1	7.9	7.1	141	16.9	46.3	< 2		18		0.02	0.74	0.19	0.04	0.02	6900
270	W. Fk Cotaco Cr	11770-2	970625	1030	6	18.1	8.7	7.1	101	11.2	101	< 2		14		0.02	0.52	0.19	0.02	0.02	INT
270	W. Fk Cotaco Cr	11770-2	970716	1200	3.4	21.5	7.1	7.4	152	7.3	4.8	< 2		20		0.04	0.4	0.25	0.01	0.007	430
270	W. Fk Cotaco Cr	11770-2	970820	0800	3.1	22.3	6.9	7.2	143	7.8	1.9	< 2		9		0.03	0.44	0.23	0.04	0.006	INT
270	W. Fk Cotaco Cr	11770-2	970917	0800	2.4	18.4	5	7.2	177	5.5	0	< 2		5		0.03		0.22	0.03	0.005	220
270	W. Fk Cotaco Cr	11770-2	971022	0800	3.9	12.7	8.7	7.3	138	7.2	19.6	< 2		4		0.01	0.66	0.16	0.02	0.009	
270	Cotaco Cr	2647-2	970625	1400	8	21.8	6.9	7.1	132	10.9	749	< 2		10		0.02	0.55	0.31	0.07	0.05	INT
270	Cotaco Cr	2647-2	970716	1100	2.8	25.2	6.1	7.4	195	17.6	56	< 2		20		0.06	0.54	0.32	0.06	0.01	200
270	Cotaco Cr	2647-2	970820	1015	2.3	24.8	6.9	7.2	183	25	28.5	< 2		31		0.04	1.1	0.58	0.14	0.06	INT
270	Cotaco Cr	2647-2	970917	0900	2.2	21.1	5.4	7.4	221	14.6	0	< 2		16		0.01	0.1	0.34	0.05	0.02	680
270	Cotaco Cr	2647-2	971022	0800		13.2	8.5	7.4	205	24	121	< 2		33		0.44	0.83	0.63	0.12	0.09	4100
270	Hughes Cr	5328-1	970625	1300	2.5	16.5	9.2	7.5	149	12.4	32.8	< 2		12		< 0.01	0.37	0.1	0.01	0.01	INT
270	Hughes Cr	5328-1	970716	1430	1.3	17.6	9	7.8	198	6.2	6.3	< 2		2		< 0.01	0.38	0.05	0.02	0.007	150
270	Hughes Cr	5328-1	970820	0800	1.6	15.7	9	7.7	253	7.4	6.6	< 2		5		< 0.01	0.35	0.11	0.03	0.01	INT
270	Hughes Cr	5328-1	970917	0800	1	16.2	8.8	7.8	226	9	1	2		2		< 0.01	0.65	0.48	0.03	0.01	600
270	Hughes Cr	5328-1	971022	1345	1.5	15.1	9.6	7.8	170	8.6	8	< 2		3		< 0.01	0.46		0.02	0.01	460
270	Little Cotaco Cr	6505-1	970625	1250	3	19.1	8.6	7.4	133	18.1	32.8	< 2		20		0.02	0.99	0.33	0.04	0.02	INT
270	Little Cotaco Cr	6505-1	970716	1340	2.2	21.3	7.6	7.6	202	39	2.5	< 2		28		0.06	0.51	0.36	0.03	0.008	INT
270	Little Cotaco Cr	6505-1	970820	0800	1.9	22.6	5.7	7.4	247	12	1.9	< 2		6		0.1	0.45	0.44	0.07	0.01	INT
270	Little Cotaco Cr	6505-1	970917	0800	2.2	19.1	5.3	7.4	232	12.1	1.4	< 2		6		0.07	0.22	0.45	0.03	0.009	INT
270	Little Cotaco Cr	6505-1	971022	1310	2.4	13.5	9.6	7.5	185	8.6	7.2	< 2		4		0.02	0.6	0.11	0.02	0.01	INT

Appendix F-8a, cont. Physical / chemical data collected by TVA in the Tennessee River Basin from July through October 1997 under contract with ADEM (TVA 1997)

Subwatershed #	Stream Name	Station #	Date yymmdd	Time 24hr	Stream Depth m	Water Temp. C	Dissolved Oxygen mg/l	pH s.u.	Conductivity umhos @25c	Turbidity NTU	Stream Flow cfs	BOD-5 mg/L	TDS mg/L	TSS mg/L	Hardness mg/L	NH3-N mg/L	NO2/ NO3 mg/L	TKN mg/L	T-PO4 mg/l	Ortho-phosphate mg/l	Fecal Coliform col/100ml
Wheeler Lake (0603-0002), cont.																					
270	Mill Pond Cr	7628-1	970625	1130	2	21.6	8	6.9	73	7.1	54.5	7		7		0.13	0.78	0.42	0.09	0.06	INT
270	Mill Pond Cr	7628-1	970716	1330	0.8	24.5	7.5	7.5	176	2	3.8	< 2		1		0.08	0.88	0.35	0.16	0.11	500
270	Mill Pond Cr	7628-1	970820	0800	0.6	24.5	7.7	7.5	245	1.8	1.5	< 2				0.02	0.86	0.46	0.34	0.22	INT
270	Mill Pond Cr	7628-1	970917	0800	0.4	19.8	8.2	7.5	303	1.4	2.2	< 2		1		0.01	1.5	0.48	0.34	0.31	300
270	Mill Pond Cr	7628-1	971022	1215	1.3	14.1	9.8	7.4	111	4.5	14.5	< 2		2		0.04	0.54	0.13	0.1	0.08	6000
300	Limestone Cr	6409-3	970610	0845	4	17.3	8.5	6.9	77	27	388.7	< 2		30		0.01	0.65	0.31	0.12	0.05	620
300	Limestone Cr	6409-3	970709	1000	5.3	21.6	7.7	7.1	101	9	82.4	< 2		8		0.02	1	0.14	0.06	0.041	110
300	Limestone Cr	6409-3	970813	1000	5.8	23	7.3	7.2	107	9.1	26.6	< 2		10		0.01	1	0.18	0.08	0.05	200
300	Limestone Cr	6409-3	970910	0845	5.7	20.8	7.3	7.2	106	32	29.1	< 2		24		< 0.01	0.89	0.25	0.09	0.07	280
300	Limestone Cr	6409-3	971015	0930	5.3	15.2	8.6	7.1	99	9.9	82.4	< 2		9		0.01	0.71	0.36	0.08	0.07	INT
300	Limestone Cr	6409-5	970610	1445	2	17.2	8.9	6.8	62	10.9	93.2	< 2		10		0.01	0.32	0.49	0.11	0.04	173
300	Limestone Cr	6409-5	970709	1600	1.2	23.1	8.6	7.1	91	3.7	13.1	< 2		3		0.02	0.79	0.16	0.03	0.014	110
300	Limestone Cr	6409-5	970813	1500	1	23.5	7.8	7.2	89	3	6.3	< 2		3		0.02	0.62	0.16	0.02	0.01	240
300	Limestone Cr	6409-5	970910	1320	1.3	21.3	7.9	7.3	90	1.9	4.2	< 2		2		0.02	0.56	0.18	0.01	0.008	600
300	Limestone Cr	6409-5	971015	1430	0.1	14.9	9.5	7.1	78	3.8	11.2	< 2		2		0.01	0.26	0.23	0.03	0.02	INT
300	Little Limestone Cr	6640-1	970610	1410	2	17	9.1	6.8	71	7.2	61.8	< 2		6		0.01	0.52	0.29	0.09	0.04	630
300	Little Limestone Cr	6640-1	970709	1420	1.2	23.2	9.3	7.3	84	4.1	11.9	< 2		2		0.01	0.83	0.16	0.04	0.019	160
300	Little Limestone Cr	6640-1	970813	1400	0.9	23.1	7.4	7.2	102	3.6	3	< 2		4		0.02	0.96	0.17	0.02	0.01	180
300	Little Limestone Cr	6640-1	970910	1240	0.8	22.5	6.7	7.3	108	4.5	1.3	< 2		5		0.02	0.84	0.2	0.05	0.009	1360
300	Little Limestone Cr	6640-1	971015	1345	1.1	14.8	9.7	7.1	82	5.2	13	< 2		3		0.01	0.42	0.37	0.07	0.04	INT
320	French Mill Cr	4124-1	970610	0930	1	17.3	8.3	7.1	102	8.2	17.1	< 2		4		< 0.01	0.59	0.31	0.04	0.01	230
320	French Mill Cr	4124-1	970709	1140	0.8	21	8.4	7.2	117	4.5	6.9	< 2		3		< 0.01	1.2	0.16	0.03	0.011	150
320	French Mill Cr	4124-1	970813	1100	0.6	21.7	7.9	7.5	133	2.6	4.3	< 2				< 0.01	1	0.08	0.03	0.01	INT
320	French Mill Cr	4124-1	970910	0940	0.7	20.2	7.8	7.3	119	15	5.3	< 2		8		0.01	0.66	0.24	0.11	0.08	3360
320	French Mill Cr	4124-1	971015	1045	2.3	13.7	9.4	7.3	115	6.3	5.1	< 2		1		< 0.01	0.78	0.31	0.04	0.02	
320	Piney Cr	8773-2	970610	1015	2	17.3	8.9	6.8	65	10.1	309	3		11		< 0.01	0.5	0.26	0.05	0.02	230
320	Piney Cr	8773-2	970709	1030	1.3	22	7.5	6.7	79	2.9	58.2	< 2				0.02	0.87	0.11	0.02	0.013	230
320	Piney Cr	8773-2	970813	1020	1	23.2	6.9	6.9	79	3	16.6	< 2		2		< 0.01	0.66	0.19	0.05	0.01	140

Appendix F-8a, cont. Physical / chemical data collected by TVA in the Tennessee River Basin from July through October 1997 under contract with ADEM (TVA 1997)

Subwatershed #	Stream Name	Station #	Date yymmdd	Time 24hr	Stream Depth m	Water Temp. C	Dissolved Oxygen mg/l	pH s.u.	Conductivity umhos @25c	Turbidity NTU	Stream Flow cfs	BOD-5 mg/L	TDS mg/L	TSS mg/L	Hardness mg/L	NH3-N mg/L	NO2/ NO3 mg/L	TKN mg/L	T-PO4 mg/l	Ortho-phosphate mg/l	Fecal Coliform col/100ml
Wheeler Lake (0603-0002), cont.																					
320	Piney Cr	8773-2	970910	0900	0.9	21	6.9	6.9	84	3	11.3	< 2		2		0.02	0.81	0.11	0.02	0.01	200
320	Piney Cr	8773-2	971015	0945	1.5	14.4	8.9	7	68	6	62.7	< 2	60	4	30	0.01	0.26	0.31	0.07	0.04	INT
320	Piney Cr	8773-3	970610	1335	2.5	17.2	8.9	6.8	68	9.5	NM	< 2		8		< 0.01	0.46	0.31	0.05	0.02	440
320	Piney Cr	8773-3	970709	0800		24.9	8.6	7.1	75	3.1	NM	< 2		2		0.02	0.42	0.17	0.02	0.013	150
320	Piney Cr	8773-3	970813	0800		23.7	7.4	7.1	79	3.6	NM	< 2		4		0.01	0.32	0.18	0.03	0.01	340
320	Piney Cr	8773-3	970910	1200		22.3	7.3	7.2	84	3.7	NM	< 2		2		0.02	0.2	0.13	0.02	0.01	INT
320	Piney Cr	8773-3	971015	1500		15.7	9.5	7.1	101	5.1	NM	8		9		0.02	0.06	0.44	0.05	0.03	INT
330	Cedar Cr	2087-1	970626	0930	1.5	21.3	7.3	7.7	284	8.3	18.4	< 2		8		0.02	0.23	0.29	0.03	0.02	INT
330	Cedar Cr	2087-1	970717	1130	1.2	24.1	6.4	7.8	337	3.4	3.1	< 2		4		0.03	0.32	0.17	0.03	0.02	73
330	Cedar Cr	2087-1	970821	0800	1.1	23	4.8	7.4	219	7.3	0.5	< 2		4		0.04	0.12	0.52	0.08	0.03	INT
330	Cedar Cr	2087-1	970918	1100	0.6	21	2	7.3	261	2.2	5.8	< 2		2		< 0.01		0.49	0.04	0.007	INT
330	Cedar Cr	2087-1	971023	1125	1.2	10.9	9.1	7.8	336	5.2	3.5	< 2	200	3	170	0.02	0.11	0.19	0.02	0.01	INT
330	E. Fk Flint Cr	3544-1	970626	1515	1.3	20.4	8.4	6.8	59	11.9	26.7	< 2		5		0.01	0.91	0.18	0.03	0.02	INT
330	E. Fk Flint Cr	3544-1	970717	1430	0.7	23.8	7.9	7.1	86	3.5	2	< 2				0.01	0.43	0.2	0.01	0.006	136
330	E. Fk Flint Cr	3544-1	970821	0800	0.7	23.5	7.6	7.1	93	3.3	2.7	< 2		2		0.01	0.45	0.25	0.04	0.008	INT
330	E. Fk Flint Cr	3544-1	970918	0800	0.3	24.3	6.7	7.4	26	1.8	0.1	< 2		2		0.03		0.37	0.02	0.002	180
330	E. Fk Flint Cr	3544-1	971023	1330	0.5	10.5	7.2	7.4	10	2.7	2.9	< 2		1		< 0.01	0.66	0.23	0.01	0.005	1000
330	Indian Cr	5470-1	970626	1215	1	18.1	8.6	7.2	155	10.1	16	< 2		20		0.01	0.49	0.18	0.01	0.01	INT
330	Indian Cr	5470-1	970717	1245	0.2	21.9	9.2	7.7	209	5.7	3.5	< 2		5		0.03	0.47	0.16	0.01	0.01	140
330	Indian Cr	5470-1	970821	1300	0.2	21.2	9.8	7.8	250	3.9	1.3	< 2		4		0.03	0.45	0.18	0.04	0.007	INT
330	Indian Cr	5470-1	970918	1145	0	21.3	8.8	7.9	322	2.9	0.5	< 2		2		0.04	0.65	0.33	0.02	0.004	520
330	Indian Cr	5470-1	971023	1245	0.1	12.9	10.6	7.8	253	3.6	1.4	< 2		2		0.02	0.58	0.09	0.01	0.009	700
330	Robinson Cr	9531-1	970626	1000	3.5	20.7	7.6	7.6	273	14.9	19.3	< 2		20		0.04	0.64	0.37	0.05	0.03	INT
330	Robinson Cr	9531-1	970717	1200	2.2	23.6	6.4	7.8	358	8.4	1.8	< 2		6		0.04	0.75	0.24	0.02	0.01	2500
330	Robinson Cr	9531-1	970821	1215	2.7	23.4	4.1	7.6	385	13.6	9.6	< 2		15		0.06	0.27	0.41	0.06	0.01	INT
330	Robinson Cr	9531-1	970918	1120	2.3	21.4	0.7	7.4	394	5.4	3.1	3		7		0.03		0.64	0.06	0.01	INT
330	Robinson Cr	9531-1	971023	0800	2.3	10.9	8.4	7.7	351	8.6	2.4	< 2		6		0.01	0.41	0.2	0.02	0.01	INT
330	Rock Cr	9557-1	970626	1330	1.5	20.6	8	7.5	79	3.4	15.4	< 2		1		0.02	1.2	0.28	0.06	0.05	INT

Appendix F-8a, cont. Physical / chemical data collected by TVA in the Tennessee River Basin from July through October 1997 under contract with ADEM (TVA 1997)

Subwatershed #	Stream Name	Station #	Date yymmdd	Time 24hr	Stream Depth m	Water Temp. C	Dissolved Oxygen mg/l	pH s.u.	Conductivity umhos @25c	Turbidity NTU	Stream Flow cfs	BOD-5 mg/L	TDS mg/L	TSS mg/L	Hardness mg/L	NH3-N mg/L	NO2/ NO3 mg/L	TKN mg/L	T-PO4 mg/l	Ortho-phosphate mg/l	Fecal Coliform col/100ml
Wheeler Lake (0603-0002), cont.																					
330	Rock Cr	9557-1	970717	1330	0.6	22.2	8.4	7.6	104	1.3	2.1	< 2				0.01	0.8	0.18	0.04	0.02	70
330	Rock Cr	9557-1	970821	1330	0.4	22.1	8.3	7.6	131	3.3	0.3	< 2		3		< 0.01	0.27	0.23	0.05	0.01	INT
330	Rock Cr	9557-1	970918	0800	0.2	19.8	7.4	7.6	202	1.2	0.1	< 2				< 0.01	0.08	0.15		0.008	20
330	Rock Cr	9557-1	971023	1500	0.5	9.6	11.2	7.6	117	1	0.3	< 2				0.02	0.48	0.15	0.01	0.006	INT
330	Sally Mike Cr	9957-1	970626	1150	3.5	22.1	7.2	7	107	11.3	22.1	< 2		16		0.04	0.22	0.27	0.02	0.008	INT
330	Sally Mike Cr	9957-1	970717	1230	2.6	27.2	6.7	7.2	163	18.4	0.1	< 2		19		0.11	0.39	0.37	0.01	0.005	200
330	Sally Mike Cr	9957-1	970821	0800	2.5	24.4	5.9	7.1	186	9.7	0	< 2		9		0.08		0.28	0.04	0.006	INT
330	Sally Mike Cr	9957-1	970918	1135	2.3	22.3	2.5	7.2	212	14.5	0	< 2		12		0.04		0.52	0.04	0.02	INT
330	Sally Mike Cr	9957-1	971023	0800	2.8	11.7	8	7.2	146	8.3	0	< 2		8		0.01		0.28	0.02	0.008	500
360	Elam Cr	3658-1	970626	1850	4	22.4	7.5	7.5	258	9.4	61.9	< 2		8		0.02	0.97	0.25	0.04	0.02	INT
360	Elam Cr	3658-1	970717	0930	2.8	24.2	6.8	7.7	320	5.3	6.8	< 2		4		0.03	0.59	0.2	0.03	0.02	190
360	Elam Cr	3658-1	970821	0930	2.6	23.6	6.2	7.6	350	4	5.7	< 2		4		0.04	0.46	0.23	0.06	0.01	INT
360	Elam Cr	3658-1	970918	0950	2.5	20.7	3.7	7.4	356	2.6	0	< 2		3		0.02	0.04	0.33	0.03	0.01	INT
360	Elam Cr	3658-1	971023	0930	3.8	10.9	6.5	7.4	323	2.6	0	< 2		2		0.02	0.11	0.22	0.05	0.01	800
360	Flat Cr	3957-1	970626	1810	0.8	22.9	7.8	7.3	100	6.8	15.1	< 2		5		0.01	0.82	0.28	0.04	0.02	INT
360	Flat Cr	3957-1	970717	0930	0.4	23.4	6.5	7.4	133	4.3	2.6	< 2		3		0.03	0.12	0.23	0.02	0.01	200
360	Flat Cr	3957-1	970821	1015	0.8	22.8	7.5	7.4	132	69	10	< 2		33		0.02	0.4	0.74	0.14	0.05	INT
360	Flat Cr	3957-1	970918	1000	0	21.9	2.3	7.2	172	4.3	0.1	2		4		0.04		0.41	0.04	0.005	920
360	Flat Cr	3957-1	971023	0800	1.4	10.2	9	7.4	140	6.8	2.1	< 2		3		< 0.01		0.27	0.05	0.007	1400
390	Swan Cr	11146-2	970610	1240	1	17.1	9.1	6.9	64	9.9	104	< 2		6		< 0.01	0.33	0.37	0.04	0.01	520
390	Swan Cr	11146-2	970709	1330	0.7	25.6	8	7.2	95	6	34.7	< 2		3		0.02	0.33	0.18	0.02	0.009	1360
390	Swan Cr	11146-2	970813	0800	0.6	23.9	5.9	7.3	173	18.3	14.9	< 2		6		0.03	0.18	0.21	0.03	0.01	INT
390	Swan Cr	11146-2	970910	0800	0.6	22.2	6.5	7.5	218	7.1	18.8	< 2		6		0.04	0.13	0.16	0.02	0.01	1180
390	Swan Cr	11146-2	971015	1300	0.6	15.1	9.9	7.2	86	5	54.4	< 2		2		< 0.01	0.08	0.47	0.03	0.02	INT
390	Swan Cr	11146-3	970610	1140	1	17.6	8.8	7.3	130	8.6	42.2	< 2		5		0.06	1.2	0.42	0.44	0.32	INT
390	Swan Cr	11146-3	970709	1245	0.5	23.5	10	7.9	216	3.6	5.9	< 2		2		0.03	1.1	0.19	0.57	0.48	INT
390	Swan Cr	11146-3	970813	1145	0.3	25.2	8.6	7.6	408	2.1	0.9	< 2		2		0.04	3.8	0.53	1.8	1.6	INT
390	Swan Cr	11146-3	970910	0800	1.3	23.2	7.6	7.4	307	13.8	0.6	11		9		0.15	3.1	0.89	1.3	1.2	INT

Appendix F-8a, cont. Physical / chemical data collected by TVA in the Tennessee River Basin from July through October 1997 under contract with ADEM (TVA 1997)

Subwatershed #	Stream Name	Station #	Date yymmdd	Time 24hr	Stream Depth m	Water Temp. C	Dissolved Oxygen mg/l	pH s.u.	Conductivity umhos @25c	Turbidity NTU	Stream Flow cfs	BOD-5 mg/L	TDS mg/L	TSS mg/L	Hardness mg/L	NH3-N mg/L	NO2/ NO3 mg/L	TKN mg/L	T-PO4 mg/l	Ortho-phosphate mg/l	Fecal Coliform col/100ml
Wheeler Lake (0603-0002), cont.																					
390	Swan Cr	11146-3	971015	1130	0.5	16.4	9.9	7.5	238	4.6	8.2	< 2		3		0.07	1.2	0.64	0.53	0.02	INT
440	Second Cr	10118-1	970609	1100	3.5	17.1	8.3	7	88	58	457	< 2		100		0.06	0.58	0.86	0.27	0.1	3200
440	Second Cr	10118-1	970708	1100	1.5	19.7	8.6	7.2	98	3.2	63.2	< 2		2		< 0.01	0.6	0.04	0.02	0.013	55
440	Second Cr	10118-1	970812	1100	1.2	21.7	8.5	7.5	121	3.3	23.3	< 2		1		0.01	0.67	0.18	0.03	0.01	1820
440	Second Cr	10118-1	970909	1045	1	20.6	8.3	7.5	131	2.6	20.1	< 2		3		0.01	0.51	0.21	0.04	0.01	1940
440	Second Cr	10118-1	971014	1030	1.4	16.7	8.6	7.4	126	5.4	39.3	< 2		7		< 0.01	0.41	0.24	0.06	0.03	2860
440	First Cr	3910-1	970609	1010	1.1	16.7	9	7.1	73	10.1	54.9	< 2		16		< 0.01	0.73	0.25	0.04	0.03	INT
440	First Cr	3910-1	970708	1020	0.7	18.8	9.2	7.2	87	2.5	17.3	< 2		1		0.03	0.09	0.07	0.03	0.013	100
440	First Cr	3910-1	970812	1015	0.7	20.6	8.9	7.4	118	1.6	6.5	< 2		1		0.02	0.86	0.19	0.03	0.02	540
440	First Cr	3910-1	970909	1020	0.7	19.4	9	7.4	126	1.2	5.1	< 2				< 0.01	0.79	0.13	0.08	0.01	INT
440	First Cr	3910-1	971014	1000	0.7	15.5	9.4	7.3	117	2.5	8.7	< 2		1		< 0.01	0.73	0.21	0.07	0.04	2020
Lower Elk River (0603-0004)																					
60	Shoal Cr	1028101	970627	1130	2	19.9	8.8	7.58	191	5.3	106	<2		6		0.01	0.36	0.16	0.18	0.15	INT
60	Shoal Cr	1028101	970708	1610	1.72	22.8	9.8	7.97	198	3	66.7	<2		3		<0.01	0.05	0.08	0.22	0.13	70
60	Shoal Cr	1028101	970812	1330	1.07	24.7	8.5	7.9	212	3.2	16.5	<2		3		0.01	0.19	0.17	0.21	0.16	INT
60	Shoal Cr	1028101	970909	1250	0.88	22.8	7.8	7.78	224	3	9.3	<2		2		0.02	0.06	0.17	0.27	0.18	INT
60	Shoal Cr	1028101	971014	1230	1.63	17.6	8.8	7.62	216	6.7	48	<2		6		<0.01	0.15	0.29	0.39	0.3	2040
80	Big Cr	875-1	970609	1540	0.75	17	9.8	7.16	63	5.8	28.5	<2		4		0.01	0.91	0.11	0.02	0.01	470
80	Big Cr	875-1	970708	1730	0.59	20.9	8.7	7.19	80	2	15.4	<2		1		<0.01	1	0.07	0.02	0.011	30
80	Big Cr	875-1	970812	1445	0.49	21.6	8.8	7.4	95	75	6.9	<2		32		<0.01	1.1	0.28	0.06	0.05	1400
80	Big Cr	875-1	970909	1400	0.46	20.2	9.3	7.56	103	1.7	5.6	<2		2		0.04	1	0.13	0.04	0.01	INT
80	Big Cr	875-1	971014	1500	0.54	16.1	9.8	7.23	84	6.3	10.8	<2		2		<0.01	0.73	0.52	0.06	0.05	INT
80	Sulphur Cr	11094-1	970609	1420	1.2	16.8	10	7.92	152	10.3	42.5	<2		6		<0.01	0.84	0.08	0.05	0.03	INT
80	Sulphur Cr	11094-1	970708	1645	1.02	23.7	8.6	8.01	169	17.9	18.9	<2		14		0.01	0.96	0.17	0.06	0.042	70
80	Sulphur Cr	11094-1	970812	1400	0.79	27.9	10.2	8.74	199	4.2	8.5	<2		4		0.04	0.86	0.22	0.06	0.05	300
80	Sulphur Cr	11094-1	970909	1325	0.75	24.4	11	8.75	207	2.7	3.7	<2		2		0.04	0.74	0.26	0.09	0.04	1440
80	Sulphur Cr	11094-1	971014	1330	0.98	18.4	10.6	8.29	181	24	17.8	<2	90	6	90	0.01	0.67	0.49	0.19	0.14	INT
120	Sugar Cr	11053-1	970627	1015	4.5	20	8.1	7.12	100	3.9	9.7	<2		4		0.01	0.54	0.11	0.04	0.04	INT

Appendix F-8a, cont. Physical / chemical data collected by TVA in the Tennessee River Basin from July through October 1997 under contract with ADEM (TVA 1997)

Subwatershed #	Stream Name	Station #	Date yymmdd	Time 24hr	Stream Depth m	Water Temp. C	Dissolved Oxygen mg/l	pH s.u.	Conductivity umhos @25c	Turbidity NTU	Stream Flow cfs	BOD-5 mg/L	TDS mg/L	TSS mg/L	Hardness mg/L	NH3-N mg/L	NO2/ NO3 mg/L	TKN mg/L	T-PO4 mg/l	Ortho-phosphate mg/l	Fecal Coliform col/100ml
Lower Elk River (0603-0004), cont.																					
120	Sugar Cr	11053-1	970708	1400	4.33	21.1	8.2	7.24	107	4.1	267	<2		5		<0.01	0.41	0.07	0.06	0.036	110
120	Sugar Cr	11053-1	970812	1215	3.33	22.8	7.8	7.4	119	6.1	86.6	<2		8		0.01	0.43	0.2	0.05	0.04	440
120	Sugar Cr	11053-1	970909	1130	3.14	21.5	7.7	7.43	124	3.5	59.9	<2		4		0.06	0.18	0.2	0.06	0.04	560
120	Sugar Cr	11053-1	971014	1130	3.55	18.1	7.9	7.29	127	5.8	123	<2		9		<0.01	0.24	0.22	0.09	0.07	INT
150	Anderson Cr	122-1	970609	1210	4	17.2	8.7	7.19	72	31	328	<2		45		0.05	0.75	0.59	0.15	0.07	INT
150	Anderson Cr	122-1	970708	1200	2.92	20.9	8.6	6.97	69	2.1	54.6	<2		1		<0.01	0.67	0.08	0.04	0.015	200
150	Anderson Cr	122-1	970812	1545	2.81	24.7	8	7.53	95	5.4	35.6	<2		9		0.02	0.72	0.11	0.06	0.02	1040
150	Anderson Cr	122-1	970909	1440	2.53	24	9.6	8.16	105	1.6	18.5	<2		2		0.02	0.62	0.21	0.04	0.02	440
150	Anderson Cr	122-1	971014	1545	2.66	19.5	10.1	7.82	102	3.1	29.4	<2		1		<0.01	0.59	0.22	0.05	0.03	1200
Pickwick Lake (0603-0005)																					
10	Big Nance Cr	BNC-A	970630	1620		23.8	5.7	7.18	121	94	NM	3		120		0.06	0.16	0.96	0.23	0.1	INT
10	Big Nance Cr	BNC-A	970722	1530		22.6	5.2	7.3	303	4.7	NM	<2		5		0.02	1.9	0.28	0.03	0.02	120
10	Big Nance Cr	BNC-A	970814	0800		24	6	7.2	185	26	NM	<2		20		0.1	0.56	0.43	0.09	0.05	140
10	Big Nance Cr	BNC-A	970911	0800		21.4	5.1	7.31	303	9.8	NM	<2		10		0.03	1.3	0.28	0.05	0.02	283
10	Big Nance Cr	BNC-A	971016	1530		16.1	6	7.25	219	6.3	NM	<2		3		0.02	0.3	0.3	0.07	0.03	300
10	Big Nance Cr	BNC-B	970630	1300	12	23.3	6.1	6.99	117	41	782	3		36		0.06	0.07	0.82	0.16	0.08	INT
10	Big Nance Cr	BNC-B	970722	1500	3.97	26.1	3.5	7.24	25	10.6	17.9	<2		7		0.06	0.09	0.31	0.03	0.01	60
10	Big Nance Cr	BNC-B	970814	0800	7.07	24.5	5.9	7.06	141	48	201	3		42		0.11	0.58	0.77	0.23	0.17	40
10	Big Nance Cr	BNC-B	970911	1330	3.48	22.4	5.8	7.29	194	4.3	7	<2		3		0.03	<0.01	0.22	0.02	0.007	267
10	Big Nance Cr	BNC-B	971016	1440	3.64	14.9	6.6	7.29	214	6	10.6	<2		2		0.03	<0.01	0.28	0.05	0.02	<1
40	Town Cr	TC-A	970630	1140	5						285										INT
40	Town Cr	TC-A	970722	1200	2.7	20.1	7	7.32	286	3.5	126	<2		3		0.01	1.8	0.15	0.03	0.02	140
40	Town Cr	TC-A	970814	1140	2.58	20	7.3	7.31	297	4.6	111	2		4		0.01	1.6	0.16	0.05	0.02	480
40	Town Cr	TC-A	970911	1110	2.37	18.5	6.6	7.39	331	1.9	40.3	<2		1		0.02	1.9	0.14	0.03	0.02	180
40	Town Cr	TC-A	971016	1245	2.28	15.1	8.4	7.41	322	2.7	50.2	<2		1		0.01	1.6	0.16	0.04	0.02	120
40	Town Cr	TC-B	970630	1300	10	23.7	5.3	6.79	88	127	NM	3		120		0.05	0.19	1	0.34	0.16	INT
40	Town Cr	TC-B	970722	1240		20.9	5.5	7.16	304	3.8	NM	<2		4		0.02	1.6	0.18	0.03	0.02	40
40	Town Cr	TC-B	970814	1220		21.7	5	7.13	280	21	NM	<2		24		0.03	0.91	0.31	0.05	0.02	1300

Appendix F-8a, cont. Physical / chemical data collected by TVA in the Tennessee River Basin from July through October 1997 under contract with ADEM (TVA 1997)

Subwatershed #	Stream Name	Station #	Date *yymmdd*	Time *24hr*	Stream Depth *m*	Water Temp. *C*	Dissolved Oxygen *mg/l*	pH *s.u.*	Conductivity *umhos @25c*	Turbidity *NTU*	Stream Flow *cfs*	BOD-5 *mg/L*	TDS *mg/L*	TSS *mg/L*	Hardness *mg/L*	NH3-N *mg/L*	NO2/ NO3 *mg/L*	TKN *mg/L*	T-PO4 *mg/l*	Ortho-phosphate *mg/l*	Fecal Coliform *col/100ml*
Pickwick Lake (0603-0005), cont.																					
40	Town Cr	TC-B	970911	0800		18.7	6.2	7.23	334	2.5	NM	<2		<1		0.03	1.5	0.18	0.03	0.02	220
40	Town Cr	TC-B	971016	1330		15.4	8	7.22	321	1.9	NM	<2		<1		0.01	1.3	0.2	0.03	0.02	260
40	Town Cr	TC-C	970630	1415	4	23.2	7	7.4	166	81	276	2		75		0.06	0.24	0.95	0.24	0.18	INT
40	Town Cr	TC-C	970722	1220	1.86	26.3	7.1	7.99	296	6.7	11.2	<2		12		0.03	0.47	0.2	0.03	0.02	220
40	Town Cr	TC-C	970814	0800	3	24.7	7.8	7.51	212	106	109	2		110		0.05	0.6	0.66	0.19	0.11	67
40	Town Cr	TC-C	970911	1250	1.33	21	6.1	7.53	278	2.2	0.1	<2		2		0.03	<0.01	0.3	0.03	0.008	INT
40	Town Cr	TC-C	971016	1410	1.54	14.1	10.6	7.94	249	1.6	2.5	<2		<1		0.01	<0.01	0.18	0.03	0.02	200
160	Pond Cr	PC-A	970630	1015	1.5	27.5	5.5	7.1	348	4.6	89.6	<2		8		0.13	0.36	0.47	0.13	0.08	INT
160	Pond Cr	PC-A	970722	0950	1	30.5	4.7	7.17	440	2.7	59.4	<2		2		0.11	0.26	0.4	0.06	0.06	INT
160	Pond Cr	PC-A	970911	0940	0.37	29.3	6.8	6.95	2640	2.7	32	26		3		0.06	0.41	0.25	0.27	0.23	INT
160	Pond Cr	PC-A	971016	1000	0.36	24.1	7.2	6.99	1734	2.1	31.5	<2	910	4	76	0.1	0.57	0.51	0.18	0.13	INT
160	Pond Cr	PC-B	970630	1100	6	25.2	2.4	6.99	259	7.3	NM	<2		8		0.07	0.19	0.41	0.05	0.008	INT
160	Pond Cr	PC-B	970722	1030		28.6	2.8	7.34	316	8.9	NM	<2		11		0.11	0.02	0.6	0.05	0.009	INT
160	Pond Cr	PC-B	970814	0800		25.2	2.2	7.02	352	10.9	NM	4		13		0.15	0.09	0.7	0.09	0.01	1600
160	Pond Cr	PC-B	970911	1015		22.4	2	7.15	443	10.2	NM	8		13		0.29	0.5	0.81	0.08	0.009	INT
160	Pond Cr	PC-B	971016	1030		13.9	3	7.15	486	4.7	NM	<2	200	5	120	0.16	0.2	0.63	0.06	0.01	940
160	Pond Cr	PC-C	970630	1200	5	20.9	3.9	6.7	130	93	57.1	<2		44		0.06	0.41	0.75	0.23	0.09	INT
160	Pond Cr	PC-C	970722	1100	4.17	18.2	6.4	7.11	257	10.4	9.4	<2		19		0.04	1.3	0.16	0.02	0.009	INT
160	Pond Cr	PC-C	970814	0800	4.39	20.8	2.8	6.7	160	31	14	3		18		0.04	0.45	0.47	0.11	0.04	INT
160	Pond Cr	PC-C	970911	1030	4.21	16.4	4.2	7.05	257	6.1	9.6	6		7		0.04	1.1	0.14	0.02	0.008	780
160	Pond Cr	PC-C	971016	1130	4.67	12.8	4	6.99	262	3.2	34	<2	140	2	130	<0.01	0.67	0.13	0.03	0.01	INT

NM = No measurement
INT = interferene from other bacteria (cream colored) or medium was pink.

Appendix F-8b. Pesticide data collected by TVA in the Tennessee River Basin under contract with ADEM from July through October 1997 (TVA 1997)

Sub-watershed #	Stream Name	TVA Station #	Date *yymmdd*	Time *(24h)*	Aldrin *ug/l*	alpha-BHC *ug/l*	beta-BHC *ug/l*	gamma-BHC (Lindane) *ug/l*	delta-BHC *ug/l*	Chlor-dane *ug/l*	P'P "DDT *ug/l*	P'P "DDE *ug/l*	P'P "DDD *ug/l*	Diel-drin *ug/l*	alpha-Endo-sulfan *ug/l*	beta-Endo-sulfan *ug/l*	Endo-sulfan sulfate *ug/l*	Endrin *ug/l*	Endrin alde hyde *ug/l*	Hepta-chlor *ug/l*	Hepta-chlor epoxide *ug/l*	Toxa-phene *ug/l*
Guntersville Lake (0603-0001)																						
100	Paint Rock R	8421-1	970710	1700	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
100	Paint Rock R	8421-1	970806	0900	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
160	Mountain Fk	7891-2	970715	1630	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
160	Mountain Fk	7891-2	970819	1430	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
180	Beaverdam Cr	580-1	970715	1200	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
180	Beaverdam Cr	580-1	970819	1130	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
180	Brier Fk	1370-2	970715	1245	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
180	Brier Fk	1370-2	970819	1215	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
210	Big Cove Cr	872-1	970715	1100	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
210	Big Cove Cr	872-1	970819	1040	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
210	Flint R	4015-2	970715	0810	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
210	Flint R	4015-2	970819	1000	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
270	Cotaco Cr	2647-2	970716	1100	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
270	Cotaco Cr	2647-2	970820	1015	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
300	Limestone Cr	6409-5	970709	1600	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
300	Limestone Cr	6409-5	970813	1500	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
320	Piney Cr	8773-2	970709	1030	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
320	Piney Cr	8773-2	970813	1020	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
390	Swan Cr	11146-2	970709	1330	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
390	Swan Cr	11146-2	970813	0800	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
440	Second Cr	10118-1	970708	1100	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
440	Second Cr	10118-1	970812	1100	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
Pickwick Lake (0603-0005)																						
010	Big Nance Cr	BNC-A	970722	1530	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
010	Big Nance Cr	BNC-A	970814	0800	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
040	Town Cr	TC-A	970722	1200	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
040	Town Cr	TC-A	970814	1140	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
160	Pond Cr	PC-C	970722	1100	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+
160	Pond Cr	PC-C	970814	0800	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+

* Less than minimum detection limit of 0.01 ug/l
+ Less than minimum laboratory detection limit of 0.5 ug/l

Appendix F-8c. Sediment metals data collected by TVA in the Tennessee River Basin under contract with ADEM from July through October 1997 (TVA 1997)

Sub-watershed #	Stream Name	TVA Station #	Date *yymmdd*	Time *(24h)*	Pb *mg/kg*	Zn *mg/kg*	Cd *mg/kg*	Cu *mg/kg*
Wheeler Lake (0603-0002)								
100	Paint Rock R	8421-1	971008	0845	14	36	<0.08	3.3
160	Mountain Fk	7891-2	971021	1300	32	45	0.51	7
180	Beaverdam Cr	580-1	971021	1130	63	79	0.91	10
200	Hurricane Cr	5392-1	971008	1000	17	35	<0.08	2.7
210	Big Cove Cr	872-1	971021	1030	6.6	19	0.21	1.5
210	Flint R	4015-2	971021	0930	6.1	15	0.19	1.4
320	Piney Cr	8773-2	971015	0945	19	41	0.19	5.2
330	Cedar Cr	2087-1	971023	1125	31	54	0.28	2
Lower Elk River (0603-0004)								
080	Sulphur Cr	11094-1	971014	1331	30	50	0.18	5.4
Pickwick Lake (0603-0005)								
040	Pond Cr	PC-A	971016	1000	25	140	0.23	31
040	Pond Cr	PC-B	971016	1030	48	79	0.45	91
040	Pond Cr	PC-C	971016	1130	31	97	0.87	12

Appendix G-1. Fish community assessments and evaluations for stations in the Tennessee Basin where data were collected and / or analyzed by the Tennessee Valley Authority (TVA) or the Geological Survey of Alabama (GSA) from 1991-1999+.

Sub-Watershed	Stream Name	Subwatershed Included in Project+	Date	Station	County	IBI	Level I	Classification+	Source Agency
#		*Part I or II*	*yymmdd*	#		*Score*	*Score*		
Guntersville Lake (0603-0001)									
060	Bengis Cr	II	1997	724	Jackson	---	13	poor	GSA
060	Bengis Cr	II	970625	724-1	Jackson	46		fair/good	TVA
060	Widows Cr		910815	TN527	Jackson			fair/good	GSA
100	Crow Cr		1997	2824-1	Jackson		17	fair	GSA
120	Little Coon Cr	II	970625	6502-1	Jackson	54		good/excellent	TVA
120	Little Coon Cr	II	1997	6502-1	Jackson	---	13	poor	GSA
140	Big Coon Cr		910523	TN511	Jackson			fair	GSA
160	Flat Rock Cr	II	970626	3978-1	Jackson	22		very poor	TVA
160	Flat Rock Cr	II	1997	3978-1	Jackson	---	11	very poor	GSA
160	Flat Rock Cr	II	910604	TN509	Jackson			poor	GSA
170	Mud Cr	II	950907	TN716	Jackson	---		poor	GSA
180	Bryant Cr	II	910604	TN501	Jackson			poor	GSA
180	Jones Cr		910815	TN532	Jackson			fair/good	GSA
220	S. Sauty Cr	-------	990512	10653-1	DeKalb	34		poor	TVA
220	S. Sauty Cr	-------	960528	10653-1	DeKalb	30		poor	TVA
220	S. Sauty Cr	-------	940526	10653-1	DeKalb	30		poor	TVA
250	Town Cr	-------	990511	11504-1	DeKalb	34		poor	TVA
250	Town Cr	-------	960528	11504-1	DeKalb	30		poor	TVA
250	Town Cr	-------	940526	11504-1	DeKalb	32		poor	TVA
270	Scarham Cr	-------	990614	10068-2	Marshall	36		poor/fair	TVA
270	Scarham Cr	-------	960529	10068-2	Marshall	24		very poor/poor	TVA
270	Scarham Cr	-------	940608	10068-2	Marshall	26		very poor/poor	TVA
280	Short Cr	-------	990511	10336-2	Marshall	32		poor	TVA
280	Short Cr	-------	960529	10336-2	Marshall	24		very poor/poor	TVA
280	Short Cr	-------	940609	10336-1	Marshall	28		poor	TVA
300	Big Spring Cr	II	970818	957-1	Marshall	32		poor	TVA
Wheeler Lake (0603-0002)									
020	Hurricane Cr	-------	940707	5394-1	Jackson	58		good/excellent	TVA
020	Estill Fk	-------	950410	3734-2	Jackson	46		fair/good	TVA
020	Estill Fk	-------	940708	3734-1	Jackson	50		good	TVA

Appendix G-1, cont. Fish community assessments and evaluations for stations in the Tennessee Basin where data were collected and / or analyzed by the Tennessee Valley Authority (TVA) or the Geological Survey of Alabama (GSA) from 1991-1999+.

Sub-Watershed	Stream Name	Subwatershed Included in Project+	Date	Station	County	IBI	Level I	Classification+	Source Agency
#		*Part I or II*	*yymmdd*	#		*Score*	*Score*		
Wheeler Lake (0603-0002), cont.									
040	Larkin Fk	-------	990514	6087-1	Jackson	52		good	TVA
040	Larkin Fk	-------	940707	6087-1	Jackson	56		good/excellent	TVA
050	Dry Cr	-------	940706	3368-1	Jackson	44		fair	TVA
050	Lick Fk	-------	940707	6384-1	Jackson	52		good	TVA
060	Guess Cr		910520	TN442	Jackson			fair/good	GSA
060	Guess Cr	-------	940706	4641-1	Jackson	48		good	TVA
070	Cole Spring Cr	I	940705	2466-1	Jackson	30		poor	TVA
080	Clear Cr	-------	940706	2305-1	Jackson	42		fair	TVA
080	Clear Cr		910520	TN439	Jackson			good	GSA
090	Little Paint Cr	-------	960613	6675-2	Jackson	46		fair/good	TVA
090	Little Paint Cr	-------	940712	6675-1	Jackson	50		good	TVA
090	Yellow Br	-------	940712	12460-1	Jackson	42		fair	TVA
090	Yellow Br	-------	960516	12460-2	Jackson	48		good	TVA
100	Little Paint Rock Cr	I	990513	6676-1	Marshall	38		poor/fair	TVA
100	Little Paint Rock Cr	I	940713	6676-1	Marshall	28		poor	TVA
100	Paint Rock R	-------	930630	TN486	Marshall	---		good	GSA
100	Paint Rock R.	-------	950712	8421-1	Marshall	46		fair/good	TVA
130	W. Fk Flint R.		990525	11778-1	Madison	48		good	TVA
130	W. Fk Flint R.		950413	11778-1	Madison	42		fair	TVA
130	W. Fk Flint R.		940614	11778-1	Madison	40		fair	TVA
140	Flint R.		940622	4015-3	Madison	40		fair	TVA
140	Flint R.		990729	4015-4	Madison	42		fair	TVA
160	Hester Cr	I	950418	5005-1	Madison	26		very poor/poor	TVA
160	Hester Cr	I	990616	5005-2	Madison	32		poor	TVA
160	Mountain Fk	I	990524	7891-2	Madison	34		poor	TVA
160	Mountain Fk	I	950418	7891-2	Madison	26		very poor/poor	TVA
160	Mountain Fk	I	940622	7891-1	Madison	32		poor	TVA
180	Beaverdam Cr	I	990527	580-1	Madison	34		poor	TVA
180	Beaverdam Cr	I	950417	580-1	Madison	28		poor	TVA
180	Brier Fk		940617	1370-3	Madison	36		poor/fair	TVA
180	Brier Fk	I	950413	1370-2	Madison	28		poor	TVA

Appendix G-1, cont. Fish community assessments and evaluations for stations in the Tennessee Basin where data were collected and / or analyzed by the Tennessee Valley Authority (TVA) or the Geological Survey of Alabama (GSA) from 1991-1999+.

Sub-Watershed	Stream Name	Subwatershed Included in Project+	Date	Station	County	IBI	Level I	Classification+	Source Agency
#		*Part I or II*	*yymmdd*	#		*Score*	*Score*		
Wheeler Lake (0603-0002), cont.									
180	Brier Fk	I	990526	1370-1	Madison	40		fair	TVA
180	Brier Fk	I	950711	1370-1	Madison	32		poor	TVA
190	Chase Cr	I	950412	2157-1	Madison	30		poor	TVA
210	Big Cove Cr		950412	872-1	Madison	36		poor/fair	TVA
210	Flint R		930521	TN609	Madison	---		good	GSA
210	Flint R.		950803	4015-2	Madison	28		poor	TVA
210	Goose Cr		950411	4402-1	Madison	28		poor	TVA
210	Yellow Bank Cr		950411	12457-2	Madison	28		poor	TVA
220	Cane Cr		950809	1873-1	Marshall	26		very poor/poor	TVA
230	Aldridge Cr	I	950421	43-1	Madison	30		poor	TVA
240	Huntsville Spring Br	I	990513	5358-1	Madison	32		poor	TVA
240	Huntsville Spring Br	I	950808	5358-1	Madison	30		poor	TVA
250	Indian Cr	I	990528	5471-1	Madison	38		poor/fair	TVA
250	Indian Cr	I	950712	5471-1	Madison	30		poor	TVA
270	Cotaco Cr	II	950802	2647-2	Morgan	30		poor	TVA
270	Hughes Cr	II	950718	5328-1	Morgan	30		poor	TVA
270	Little Cotaco Cr		950717	6505-1	Marshall	48		good	TVA
270	Mill Pond Cr		950717	7628-1	Marshall	28		poor	TVA
270	Rock Cr	II	910822	TN368	Morgan			poor	GSA
270	Town Cr	II	950809	11503-1	Morgan	28		poor	TVA
270	W. Fk Cotaco Cr	II	960515	11770-2	Morgan	32		poor	TVA
270	W. Fk Cotaco Cr	II	950718	11770-1	Morgan	30		poor	TVA
300	Limestone Cr		990525	6409-5	Madison	42		fair	TVA
300	Limestone Cr		950713	6409-5	Madison	42		fair	TVA
300	Limestone Cr	I	950802	6409-4	Limestone	22		very poor	TVA
300	Limestone Cr	I	990519	6409-3	Limestone	24		very poor/poor	TVA
300	Limestone Cr	I	950419	6409-3	Limestone	26		very poor/poor	TVA
300	Little Limestone Cr		990526	6640-1	Limestone	36		poor/fair	TVA
300	Little Limestone Cr		940615	6640-1	Limestone	38		poor/fair	TVA
320	French Mill Cr		960515	4124-1	Limestone	40		fair	TVA

Appendix G-1, cont. Fish community assessments and evaluations for stations in the Tennessee Basin where data were collected and / or analyzed by the Tennessee Valley Authority (TVA) or the Geological Survey of Alabama (GSA) from 1991-1999+.

Sub-Watershed	Stream Name	Subwatershed Included in Project+	Date	Station	County	IBI	Level I	Classification+	Source Agency
#		*Part I or II*	*yymmdd*	#		*Score*	*Score*		
Wheeler Lake (0603-0002), cont.									
320	French Mill Cr		940615	4124-1	Limestone	42		fair	TVA
320	Piney Cr	I	960514	8773-3	Limestone	38		poor/fair	TVA
320	Piney Cr	I	950713	8773-3	Limestone	38		poor/fair	TVA
320	Piney Cr	I	990615	8773-2	Limestone	48		good	TVA
320	Piney Cr	I	960514	8773-2	Limestone	40		fair	TVA
320	Piney Cr	I	950419	8773-2	Limestone	36		poor/fair	TVA
320	Piney Cr	I	990519	8773-1	Limestone	32		poor	TVA
320	Piney Cr	I	940615	8773-1	Limestone	32		poor	TVA
330	Cedar Cr		940602	2087-1	Morgan	40		fair	TVA
330	E. Fk Flint Cr	-------	990518	3544-1	Cullman	30		poor	TVA
330	E. Fk Flint Cr	-------	940531	3544-1	Cullman	22		very poor	TVA
330	Flint Cr	-------	940615	4011-3	Morgan	34		poor	TVA
330	Flint Cr	-------	940615	4011-2	Morgan	36		poor/fair	TVA
330	Indian Cr	-------	940608	5470-1	Morgan	42		fair	TVA
330	Mack Cr	I	940616	7109-1	Morgan	32		poor	TVA
330	Mill Cr	-------	940608	7577-1	Morgan	34		poor	TVA
330	Robinson Cr	I	940531	9531-1	Morgan	38		poor/fair	TVA
330	Rock Cr	-------	940608	9557-1	Cullman	32		poor	TVA
330	Sally Mike Cr	-------	940616	9957-1	Morgan	46		fair/good	TVA
330	Shoal Cr	I	940607	10282-2	Morgan	34		poor	TVA
330	Shoal Cr	I	940607	10282-1	Morgan	32		poor	TVA
340	Crowdabout Cr	-------	960515	2827-4	Morgan	28		poor	TVA
340	Crowdabout Cr	-------	960508	2827-3	Morgan	32		poor	TVA
340	Crowdabout Cr	-------	960509	2827-2	Morgan	30		poor	TVA
340	Crowdabout Cr	-------	940601	2827-1	Morgan	36		poor/fair	TVA
350	Flint Cr	-------	940614	4011-1	Morgan	32		poor	TVA
350	Flint Cr	-------	930608	TN612	Morgan	---		poor	GSA
350	Mud Tavern Cr	-------	940601	7943-1	Morgan	38		poor/fair	TVA
350	No Business Cr	I	940601	8231-1	Morgan	28		poor	TVA
350	UT to Nasty Br	-------	950810	90004-1	Morgan	28		poor	TVA
350	Village Br	I	940602	11739-1	Morgan	34		poor	TVA

Appendix G-1, cont. Fish community assessments and evaluations for stations in the Tennessee Basin where data were collected and / or analyzed by the Tennessee Valley Authority (TVA) or the Geological Survey of Alabama (GSA) from 1991-1999+.

Sub-Watershed	Stream Name	Subwatershed Included in Project+	Date	Station	County	IBI	Level I	Classification+	Source Agency
#		*Part I or II*	*yymmdd*	#		*Score*	*Score*		
Wheeler Lake (0603-0002), cont.									
350	W. Flint Cr	-------	990519	12045-1	Morgan	30		poor	TVA
350	W. Flint Cr	-------	940615	12045-1	Morgan	38		poor/fair	TVA
350	W. Flint Cr	-------	990519	12045-2	Morgan	28		poor	TVA
360	Big Shoal Cr	-------	940517	950-1	Lawrence	20		very poor	TVA
360	Elam Cr	-------	940518	3658-1	Lawrence	22		very poor	TVA
360	Elam Cr	-------	990519	3658-1	Lawrence	28		poor	TVA
360	Flat Cr	-------	940518	3957-1	Lawrence	36		poor/fair	TVA
360	McDaniel Cr	I	940518	7342-1	Lawrence	28		poor	TVA
390	Swan Cr	I	960803	11146-3	Limestone	34		**poor**	TVA
390	Swan Cr	I	950805	11146-2	Limestone	38		poor/fair	TVA
390	Swan Cr	I	990610	11146-1	Limestone	32		**poor**	TVA
390	Swan Cr	I	940713	11146-1	Limestone	26		very poor/poor	TVA
390	Swan Cr	I	920226	TN301	Limestone	---		poor/fair	GSA
400	Round Island Cr	I	990611	9782-1	Limestone	38		poor/fair	TVA
400	Round Island Cr	I	940713	9782-1	Limestone	32		poor	TVA
410	Mallard Cr	I	940804	7139-1	Lawrence	38		poor/fair	TVA
440	First Cr	II	940714	3910-1	Lauderdale	26		very poor/poor	TVA
440	Second Cr	II	990525	10118-1	Lauderdale	42		fair	TVA
440	Second Cr	II	940804	10118-1	Lauderdale	30		poor	TVA
Lower Elk River (0603-0004)									
060	Shoal Cr		950427	10281-1	Limestone	44		fair	TVA
080	Big Cr	II	990520	875-1	Limestone	28		poor	TVA
080	Big Cr	II	950420	875-1	Limestone	34		poor	TVA
080	Sulphur Cr	II	950420	11094-1	Limestone	44		fair	TVA
080	Sulphur Cr	II	930225	11094-1	Limestone			fair	GSA
120	Sugar Cr		950426	11053-1	Limestone	42		fair	TVA
120	Anderson Cr	II	990525	122-1	Lauderdale	42		fair	TVA
150	Anderson Cr	II	950426	122-1	Lauderdale	32		poor	TVA
Pickwick Lake (0603-0005)									
010	Big Nance Cr	II	990526	930-1	Lawrence	38		poor/fair	TVA

Appendix G-1, cont. Fish community assessments and evaluations for stations in the Tennessee Basin where data were collected and / or analyzed by the Tennessee Valley Authority (TVA) or the Geological Survey of Alabama (GSA) from 1991-1999+.

Sub-Watershed	Stream Name	Subwatershed Included in Project+	Date	Station	County	IBI	Level I	Classification+	Source Agency
#		*Part I or II*	*yymmdd*	#		*Score*	*Score*		
Pickwick Lake (0603-0005), cont.									
010	Big Nance Cr	II	980826	930-1	Lawrence	---		fair	TVA
010	Big Nance Cr	II	920715	TN599	Lawrence	---		fair/good	GSA
010	Big Nance Cr		910826	TN211	Lawrence			fair	GSA
010	Clear Fk	II	990610	2324-1	Lawrence	34		poor	TVA
010	Clear Fk	II	930711	TN662	Lawrence	---		poor	GSA
030	Bluewater Cr		990505	1157-1	Lauderdale	46		fair/good	TVA
030	Bluewater Cr		1997	1157-2	Lauderdale	---	16	fair	GSA
030	Bluewater Cr		1997	1157-1	Lauderdale	---	19	fair	GSA
030	Bluewater Cr		960815	TN719	Lauderdale	---		fair/good	GSA
030	Mill Cr		990505	7574	Lauderdale	38		poor/fair	TVA
030	Mill Cr		1997	7574	Lauderdale	---	19	fair	GSA
040	Poplar Cr	II	910328	TN195	Colbert			poor	GSA
040	Town Cr	II	990526	11500-1	Lawrence	40		fair	TVA
040	Town Cr	II	980826	11500-1	Lawrence	---		poor	TVA
040	Town Cr	II	910826	TN193	Lawrence			poor	GSA
040	Town Cr	II	910823	TN196	Lawrence			poor	GSA
090	Indiancamp Cr		940714	5458-1	Lauderdale	56		good/excellent	TVA
090	Shoal Cr		960714	TN600	Lauderdale	---		good	GSA
090	Shoal Cr		1997	10280-1	Lauderdale	---	18	fair	GSA
090	Shoal Cr		1997	10280-2	Lauderdale	---	18	fair	GSA
090	Shoal Cr		1997	10280-3	Lauderdale	---	21	good	GSA
140	Butler Cr		980806	1725-1	Lauderdale	---		good	TVA
140	Butler Cr		990504	1725-1	Lauderdale	52		good	TVA
140	Butler Cr		930224	TN186	Lauderdale	---		good	GSA
150	Cox Cr		910325	TN138	Lauderdale			fair	GSA
180	Burcham Cr	II	920225	TN148	Lauderdale	---		poor/fair	GSA
180	Lindsey Cr		980806	6417-1	Lauderdale	---		good	TVA
180	Lindsey Cr		920115	TN153	Lauderdale	---		good	GSA
180	Middle Cypress Cr		1997	7508	Lauderdale	---	18	fair	GSA
180	Middle Cypress Cr		920130	TN624	Lauderdale	---		good	GSA
180	N. Fk Cypress Cr		920129	TN163	Lauderdale	---		good	GSA

Appendix G-1, cont. Fish community assessments and evaluations for stations in the Tennessee Basin where data were collected and / or analyzed by the Tennessee Valley Authority (TVA) or the Geological Survey of Alabama (GSA) from 1991-1999+.

Sub-Watershed	Stream Name	Subwatershed Included in Project+	Date	Station	County	IBI	Level I	Classification+	Source Agency
#		*Part I or II*	*yymmdd*	#		*Score*	*Score*		
Pickwick Lake (0603-0005), cont.									
200	Cypress Cr		980730	2888-1	Lauderdale	---		good	TVA
200	Cypress Cr		1997	2888-1	Lauderdale	---	19	fair	GSA
200	Cypress Cr		960829	TN533	Lauderdale	---		good	GSA
200	Little Cypress Cr		1997	6547-2	Lauderdale	---	15	fair	GSA
200	Little Cypress Cr		1997	6547-1	Lauderdale	---	15	fair	GSA
210	Foxtrap Cr		931009	TN130	Colbert	---		fair/good	GSA
210	Spring Cr		990608	10725-1	Colbert	40		fair	TVA
210	Spring Cr		980826	10725-1	Colbert	---		fair	TVA
210	Spring Cr		931009	TN648	Colbert	---		fair/good	GSA
220	Sinking Cr	II	990608	10420-1	Lauderdale	36		poor/fair	TVA
220	Sinking Cr	II	970322	TN120	Lauderdale	---		poor	GSA
230	Cane Cr		990527	1870-1	Colbert	48		good	TVA
230	Cane Cr		930610	TN642	Colbert	---		fair/good	GSA
230	Little Bear Cr		990806	6442-1	Colbert	44		fair	TVA
230	Little Bear Cr		980806	6442-1	Colbert	---		fair	TVA
230	Little Bear Cr		930710	TN124	Colbert	---		good	GSA
250	Bluff Cr		980805	1162-1	Lauderdale	---		good	TVA
250	Bluff Cr		910326	TN107	Lauderdale			good	GSA
250	Brush Cr		980805	1460-1	Lauderdale			good	TVA
250	Brush Cr		910326	TN105	Lauderdale			good	GSA
270	Second Cr		980805	10117-1	Lauderdale	---		good	TVA
270	Second Cr		1997	TN102	Lauderdale	---	21	good	GSA
270	Second Cr		910327	TN102	Lauderdale			good	GSA
270	Bumpass Cr		910327	TN099	Lauderdale			good	GSA
270	Cedar Fk		920716	TN003	Lauderdale	---		good	GSA
280	Tenn R Trib		910326	TN005	Lauderdale			good	GSA
280	Panther Cr		980805	8470-1	Lauderdale	---		fair	TVA
280	Panther Cr		910326	TN004	Lauderdale			good	GSA
320	Tenn R Trib		910327	TN001	Lauderdale			poor	GSA

Appendix G-1, cont. Fish community assessments and evaluations for stations in the Tennessee Basin where data were collected and / or analyzed by the Tennessee Valley Authority (TVA) or the Geological Survey of Alabama (GSA) from 1991-1999+.

Sub-Watershed	Stream Name	Subwatershed Included in Project+	Date	Station	County	IBI	Level I	Classification+	Source Agency
#		*Part I or II*	*yymmdd*	#		*Score*	*Score*		
Bear Creek (0603-0006)									
010	Bear Cr		980807	482-2	Franklin	---		fair	TVA
010	Bear Cr		960622	TN067	Franklin	---		fair	GSA
010	Bear Cr		960622	TN074	Franklin	---		good	GSA
010	Mud Cr		990609	7916-1	Lawrence	42		fair	TVA
010	Mud Cr		1997	7916-1	Lawrence	---	15	fair	GSA
030	Little Bear Cr		980807	6441-1	Franklin	---		fair	TVA
030	Little Bear Cr		960830	TN055	Franklin	---		good	GSA
030	Little Bear Cr		960625	TN049	Franklin	---		good	GSA
040	Cedar Cr		980827	2084-1	Franklin	---		fair	TVA
040	Cedar Cr		1997	2084-1	Franklin	---	16	fair	GSA
040	Cedar Cr		960625	TN028	Franklin	---		poor/fair	GSA
040	Cedar Cr		960610	TN039	Franklin	---		fair/good	GSA
040	Cedar Cr		931019	TN023	Franklin	---		good	GSA
040	Mud Cr		1997	7915-1	Franklin	---	16	fair	GSA
040	Robinson Cr		990503	9530-1	Franklin	40		fair	TVA
040	Robinson Cr		1997	9530-1	Franklin	---	21	good	GSA
070	Bear Cr		990603	482-1	Colbert	48		good	TVA
070	Bear Cr		980811	482-1	Colbert	---		poor	TVA
070	Bear Cr		960606	482-1	Colbert	38		poor/fair	TVA
070	Bear Cr		950523	482-1	Colbert	38		poor/fair	TVA
070	Bear Cr		940623	482-1	Colbert	38		poor/fair	TVA
070	Bear Cr		930609	482-1	Colbert	36		poor/fair	TVA
070	Rock Cr		1997	9555	Colbert	---	18	fair	GSA
100	Little Cripple Deer Cr		1997	GSA6	Colbert	---	16	fair	GSA
110	Buzzard Roost Cr		1997	1741-1	Colbert	---	16	fair	GSA

Appendix G-2. Macroinvertebrate community assessments and habitat evaluations for stations in the Tennessee Basin conducted by the Tennessee Valley Authority (TVA) from 1991-1999. Habitat assessment scores are not comparable to ADEM results due to differences in the matrices used.

Sub-Watershed	Station #	Stream Name	Habitat			Benthic - EPT Family			Drainage Area
			Date	Score	Percent	Date	Score	Class	sq. mi.
Guntersville Lake (0603-0001)									
220	10653-1	South Sauty Ck	990512	35	88	990512	5	poor/fair	
270	10068-2	Scarham Ck	990614	35	88				
280	10336-2	Short Ck	990511	38	95	990511	7	fair	
Wheeler Lake (0603-0002)									
020	3734-1	Estill Fk	940707	25	63				47
020	3734-2	Estill Fk	950410	30	75	950410	13	good	23
020	5394-1	Hurricane Cr	940707	32	80				45
030	2087-1	Cedar Cr	940602	31	78				7
040	6087-1	Larkin Fk	990514	36	90	990514	20		40
040	6087-1	Larkin Fk	940707	29	73				40
050	3368-1	Dry Cr	940706	30	75				14
050	6384-1	Lick Fk	940707	30	75				18
060	4641-1	Guess Cr	940706	23	58				28
060	4641-2	Guess Cr	960516	28	70	960607	8	fair	5
070	2466-1	Cole Spring Cr	940705	20	50				9
080	2305-1	Clear Cr	940706	29	73				17
090	6675-1	Little Paint Cr	940712	19	48				37
090	6675-2	Little Paint Cr	960516	24	60				51
090	6675-3	Little Paint Cr	960613	16	40				51
090	12460-1	Yellow Br	940712	20	50				14
100	6676-1	Little Paint Rock Ck	990513	19	48	990513	3	poor	9
100	6676-1	Little Paint Rock Cr	940713	17	43				9
100	8421-1	Paint Rock R	940802	24	60				387
100	8421-1	Paint Rock R	950712	18	45	950712	10	fair	387
130	11778-1	W. Fk Flint R	990525	38	95	990525	5	poor/fair	37
130	11778-1	W. Fk Flint R	940614	38	95				37
130	11778-1	W. Fk Flint R	950413	38	95	950413	16	good	37
140	4015-3	Flint R	940622	30	75				130
160	5005-1	Hester Cr	950418	34	85	950418	9	fair	39

Appendix G-2, cont. Macroinvertebrate community assessments and habitat evaluations for stations in the Tennessee Basin conducted by the Tennessee Valley Authority (TVA) from 1991-1999. Habitat assessment scores are not comparable to ADEM results due to differences in the matrices used.

Sub-Watershed	Station #	Stream Name	Habitat			Benthic - EPT Family			Drainage Area
			Date	Score	Percent	Date	Score	Class	sq. mi.
Wheeler Lake (0603-0002), cont.									
160	7891-2	Mountain Fk Flint R.	990524	37	93	990524	1	poor	32
160	7891-1	Mountain Fk	950418	33	83	950418	8	fair	83
160	7891-2	Mountain Fk	940622	26	65				32
180	580-1	Beaverdam Cr	990527	30	75	990527	4	poor	34
180	580-1	Beaverdam Cr	950417	31	78	950417	6	poor/fair	34
180	1370-1	Brier Fk	990526	34	85	----			28
180	1370-1	Brier Fk	950711	23	58	950711	7	fair	28
180	1370-2	Brier Fk	950413	13	33	950413	13	good	54
180	1370-3	Brier Fk	940617	37	93				109
190	2157-1	Chase Cr	950412	29	73	950412	5	poor/fair	8
200	5392-1	Hurricane Cr	960717	29	73				52
200	5392-1	Hurricane Cr	940623	25	63				52
210	872-1	Big Cove Cr	950412	32	80	950412	10	fair	9
210	4015-2	Flint R	950803	32	80	950803	8	fair	513
210	4402-1	Goose Cr	950411	37	93	950411	9	fair	13
210	12457-2	Yellow Bank Cr	950411	31	78	950411	7	fair	8
220	1873-1	Cane Cr				950809	3	poor	13
230	43-1	Aldridge Cr	950421	22	55	950421	4	poor	19
240	5358-1	Huntsville Spring Br	990513	25	63	990513	2	poor	46
240	5358-1	Huntsville Spring Br	950808	32	80	950808	3	poor	46
250	5471-1	Indian Cr	990528	30	75	990528	3	poor	42
250	5471-1	Indian Cr	950712	32	80	950712	5	poor/fair	42
270	2647-2	Cotaco Cr				950802	6	poor/fair	159
270	5328-1	Hughes Cr	950718	26	65	950718	7	fair	12
270	6505-1	Little Cotaco Cr	950717	24	60	950717	10	fair	4
270	7628-1	Mill Pond Cr	950717	11	28	950717	6	poor/fair	11
270	11503-1	Town Cr	950809	22	55	950809	6	poor/fair	36
270	11770-2	W. Fk Cotaco	960515	29	73				25
270	11770-1	W. Fk Cotaco Cr	950718	32	80	950718	7	fair	51

Appendix G-2, cont. Macroinvertebrate community assessments and habitat evaluations for stations in the Tennessee Basin conducted by the Tennessee Valley Authority (TVA) from 1991-1999. Habitat assessment scores are not comparable to ADEM results due to differences in the matrices used.

Sub-Watershed	Station #	Stream Name	Habitat			Benthic - EPT Family			Drainage Area
			Date	Score	Percent	Date	Score	Class	sq. mi.
Wheeler Lake (0603-0002), cont.									
300	6409-5	Limestone Cr	990525	40	100	990525	6	fair	29
300	6409-3	Limestone Cr	990519	30	75	990519	7	fair	115
300	6409-3	Limestone Cr	950419	36	90	950419	8	fair	115
300	6409-4	Limestone Cr	950802	34	85	950802	2	poor	111
300	6409-5	Limestone Cr	950713	21	53	950713	9	fair	29
300	6640-1	Little Limestone Cr	990526	40	100				23
300	6640-1	Little Limestone Cr	940615	38	95				23
320	4124-1	French Mill Cr	940615	31	78				7
320	4124-1	French Mill Cr	960516	26	65	960606	5	poor/fair	7
320	8773-2	Piney Cr	990615	30	75	990615	9	fair/good	60
320	8773-1	Piney Cr	990519	31	78	990519	7	fair	84
320	8773-1	Piney Cr	940615	35	88				84
320	8773-2	Piney Cr	960514	27	68	960606	7	fair	60
320	8773-2	Piney Cr	950419	15	38	950419	12	fair/good	60
320	8773-3	Piney Cr	960514	32	80	960523	11	fair	35
320	8773-3	Piney Cr	950713	20	50	950713	10	fair	35
330	3544-1	E. Fk Flint Cr	990518	21	53	990518	8	fair	9
330	3544-1	E. Fk Flint Cr	940616	37	93				9
330	4011-2	Flint Cr	940615	25	63				134
330	4011-3	Flint Cr	940615	24	60				111
330	5470-1	Indian Cr	940608	30	75				4
330	7109-1	Mack Cr	940616	24	60				6
330	7577-1	Mill Cr	940608	24	60				20
330	9531-1	Robinson Cr	940503	23	58				9
330	9557-1	Rock Cr	940608	39	98				6
330	9957-1	Sally Mike Cr	940616	31	78				6
330	10282-1	Shoal Cr	940607	26	65				14
330	10282-2	Shoal Cr	940607	37	93				12
340	2827-1	Crowdabout Cr	940601	27	68				38

Appendix G-2, cont. Macroinvertebrate community assessments and habitat evaluations for stations in the Tennessee Basin conducted by the Tennessee Valley Authority (TVA) from 1991-1999. Habitat assessment scores are not comparable to ADEM results due to differences in the matrices used.

Sub-Watershed	Station #	Stream Name	Habitat			Benthic - EPT Family			Drainage Area
			Date	Score	Percent	Date	Score	Class	sq. mi.
Wheeler Lake (0603-0002), cont.									
340	2827-2	Crowdabout Cr	960509	19	48				17
340	2827-3	Crowdabout Cr	960508	32	80				7
340	2827-4	Crowdabout Cr	960515	17	43				39
350	4011-1	Flint Cr	940614	30	75				246
350	7943-1	Mud Tavern Cr	940601	27	68				15
350	8231-1	No Business Cr	940601	25	63				31
350	90004-1	UT to Nasty Br				950810	0	poor	1
350	11739-1	Village Br	940602	28	70				7
350	12045-1	W. Flint Cr				990519	5	poor/fair	112
350	12045-1	W. Flint Cr	940615	26	65				112
360	950-1	Big Shoal Cr	940517	21	53				19
360	3658-1	Elam Cr	990519	26	65	990519	6	fair	29
360	3658-1	Elam Cr	940518	22	55				29
360	3957-1	Flat Cr	940518	22	55				9
360	7342-1	Mcdaniel Cr	940518	27	68				13
390	11146-1	Swan Cr	990610	35	88	990610	6	fair	35
390	11146-1	Swan Cr	940713	31	78				51
390	11146-2	Swan Cr				950805	7	fair	20
390	11146-3	Swan Cr	960803	22	55				25
400	9782-1	Round Island Cr	990611	26	65	990611	9	fair/good	36
400	9782-1	Round Island Cr	940713	30	75				36
410	7139-1	Mallard Cr	940804	25	63				19
440	3910-1	First Cr	940714	32	80				14
440	10118-1	Second Cr				990525	9	fair/good	39
440	10118-1	Second Cr	940804	33	83				39
Lower Elk River (0603-0004)									
060	10281-1	Shoal Cr	950427	36	90	950427	12	fair/good	58
080	875-1	Big Cr	990520	37	93	990520	12	good	13
080	875-1	Big Cr	950420	35	88	950420	13	good	13

Appendix G-2, cont. Macroinvertebrate community assessments and habitat evaluations for stations in the Tennessee Basin conducted by the Tennessee Valley Authority (TVA) from 1991-1999. Habitat assessment scores are not comparable to ADEM results due to differences in the matrices used.

Sub-Watershed	Station #	Stream Name	Habitat Date	Habitat Score	Habitat Percent	Benthic - EPT Family Date	Benthic - EPT Family Score	Benthic - EPT Family Class	Drainage Area sq. mi.
Lower Elk River (0603-0004), cont.									
120	11053-1	Sugar Cr	950426	36	90	950426	19	good	136
150	122-1	Anderson Cr	990525	31	78	990525	8	fair	48
150	122-1	Anderson Cr	950426	35	88	950426	15	good	48
Pickwick Lake (0603-0005)									
010	930-1	Big Nance	990526	30	75	990526	9	fair/good	187
010	930-1	Big Nance				980826	4	poor	187
010	2324-1	Clear Fk of Big Nance	990610	35	88	990610	7	fair	27
030	1157-1	Bluewater Cr	990507	24	60	990507	14	good	110
030	7574-1	Mill Ck	990505	33	83	990505	14	good	14
040	7916-1	Mud Ck	990609	27	68	990609	9	fair/good	45
040	9530-1	Robinson Ck	990503	32	80	990503	12	good	10
040	11500-1	Town Ck				980826	9	fair/good	
090	10280-1	Shoal Cr				980827	13	good	
090	5458-1	Indiancamp Cr	940714	33	83				8
130	1725-1	Butler Ck	990504	32	80	990504	17	good	55
130	1725-1	Butler Ck				980806	11	good	55
150	10448-1	Sixmile Ck				980828	9	fair/good	
180	6417	Lindsey Ck				980806	10	good	
200	2888-1	Cypress Ck				980730	9	fair/good	
210	10725-1	Spring Ck				980826	7	fair	
220	10420-1	Sinking Cr	990607	34	85	990607	3	poor	40
230	1870-1	Cane Cr				980827	10	good	
230	6442-1	Little Bear Ck				980806	12	good	
250	1162-1	Bluff Cr				980805	12	good	
250	1460-1	Brush Cr				980805	12	good	
270	10117-1	Second Cr				980805	14	good	
330	8470-1	Panther Ck				980805	12	good	
Bear Creek (0603-0006)									
040	2084-1	Cedar Cr				850529	8	fair	

Appendix G-2, cont. Macroinvertebrate community assessments and habitat evaluations for stations in the Tennessee Basin conducted by the Tennessee Valley Authority (TVA) from 1991-1999. Habitat assessment scores are not comparable to ADEM results due to differences in the matrices used.

Sub-Watershed	Station #	Stream Name	Habitat			Benthic - EPT Family			Drainage Area
			Date	Score	Percent	Date	Score	Class	sq. mi.
Bear Creek (0603-0006), cont.									
070	482-1	Bear Cr	960606	30	75	960620	11	fair	723
070	482-1	Bear Cr	950523	24	60				723
070	482-1	Bear Cr	990603	22	55	990603	10		723

Appendix H. Subwatersheds not included in the screening process for selection of subwatersheds for assessment, the number of previous assessments conducted in the subwatershed and the justification for exclusion.

Subwatershed	# Assessments*	Justification for Exclusion
Guntersville Lake (06030001)		
060	3	
080	0	(no available data)
100	1	
120	2	
140	1	
150	0	very small and backwater of TN River
160	3	
170	1	
180	3	
190	0	City of Scottsboro
200	0	very small and backwater of TN River
210	0	(no available data)
220	3	Sand Mountain NPS Project
230	0	very small and adjacent to TN River
240	0	very small and adjacent to TN River
250	3	Sand Mountain NPS Project
260	0	very small and backwater of TN River
270	3	Sand Mountain NPS Project
280	4	Sand Mountain NPS Project
290	0	very small and backwater of TN River
300	1	
310	0	(no available data)
320	0	very small and backwater of TN River
Wheeler Lake (06030002)		
020	4	Paint Rock River NPS Project
040	3	Paint Rock River NPS Project
050	2	Paint Rock River NPS Project
060	3	Paint Rock River NPS Project
070	1	Paint Rock River NPS Project
080	2	Paint Rock River NPS Project
090	4	Paint Rock River NPS Project
100	6	Paint Rock River NPS Project
110	0	(no available data)

Appendix H, cont. Subwatersheds not included in the screening process for selection of subwatersheds for assessment, the number of previous assessments conducted in the subwatershed and the justification for exclusion.

Subwatershed	# Assessments*	Justification for Exclusion
Wheeler Lake (06030002), cont.		
130	5	
140	2	
160	8	
180	10	
190	2	
200	0	(no available data)
210	9	City of Huntsville
220	2	
230	2	City of Huntsville
240	4	City of Huntsville
250	4	City of Huntsville
260	0	City of Huntsville
270	14	
280	0	(no available data)
300	12	
320	16	
330	13	Flint Creek NPS Project
340	4	Flint Creek NPS Project
350	11	Flint Creek NPS Project
360	6	Flint Creek NPS Project
370	0	City of Decatur \ small size
380	0	City of Decatur
390	7	City of Athens
400	3	
410	1	
420	0	very small and backwater of TN River
440	4	
Upper Elk River (06030003)		
120	0	very small sub-watershed on Tennessee border
Lower Elk River (06030004)		
020	0	very small sub-watershed on Tennessee border
060	2	
070	0	very small and backwater of TN River

Appendix H, cont. Subwatersheds not included in the screening process for selection of subwatersheds for assessment, the number of previous assessments conducted in the subwatershed and the justification for exclusion.

Subwatershed	# Assessments*	Justification for Exclusion
Lower Elk River (06030004), cont.		
080	6	
120	3	
130	0	very small subwatershed
150	3	
Pickwick Lake (06030005)		
010	9	
030	8	
040	8	
090	6	
140	5	small subwatershed in AL, most located in TN
150	2	City of Florence
160	0	City of Tuscumbia/Muscle Shoals
180	7	
200	6	City of Florence
210	5	
220	3	
230	7	
240	0	very small streams and adjacent to TN River
250	6	
270	5	
280	4	
320	1	very small sub-watershed on Tennessee border
Bear Creek (06030006)		
010	5	
030	3	
040	8	
050	1	
070	5	
100	1	very small sub-watershed on MS border
110	1	

* number of fish and aquatic macroinvertebrate assessments and evaluations conducted by TVA and GSA 1991 - 1999 (Appendix G)

APPENDIX I

Reference for Historical Assessments Conducted in the Tennessee River Basin Cited in Table 8

1. Alabama Department of Environmental Management (ADEM). 1985. Upper Bear Creek Reservoir: water quality and biological assessment. Alabama Department of Environmental Management, Montgomery, Alabama.
2. Alabama Department of Environmental Management (ADEM). 1986. Piney Creek water quality survey above and below the Rainsville WWTP: Dekalb Co., AL. Alabama Department of Environmental Management, Montgomery, Alabama.
3. Alabama Department of Environmental Management (ADEM). 1986. Slab Creek water quality demonstration study above and below the Boaz WWTP: Marshall Co., AL, 1983 and 1985. Alabama Department of Environmental Management, Montgomery, Alabama.
4. Alabama Department of Environmental Management (ADEM). 1987. Pond Creek study :Muscle Shoals, Colbert Co., AL: 1986. Alabama Department of Environmental Management, Montgomery, Alabama.
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APPENDIX J

Nonpoint source priority subwatershed summaries by cataloging unit.

Guntersville Lake CU (0603-0001)

060 Widows Creek: The overall potential for impairment from nonpoint sources for the Widows Creek Sub-watershed was estimated as *moderate*, mainly from pasture, row crops and development in the sub-watershed. Widows Creek had a *good* fish community (1997). The Bengis Creek fish community was in *fair/good* condition (upgraded from *poor* in 1997). Habitat quality was assessed as *good*. Dissolved oxygen concentrations were low (5.1mg/l), and fecal coliform counts (440 colonies/100ml) and NO2/NO3 concentrations (0.914 mg/l) were elevated.

120 Little Coon Creek: The overall potential for impairment from nonpoint sources for the Little Coon Creek Sub-watershed was estimated as *low*. The Little Coon Creek fish community was *poor*. Cattle were noted to have direct access to the stream at Little Coon Creek station LCNJ-36 in July 1998. Fecal coliform counts (540 colonies/100ml), and NO2/NO3 (0.29 mg/l) and TDS (195 mg/l) concentrations were elevated (LCNL-36). Little Coon Creek at LCNJ-2 was not wadeable and no flow was apparent. Dissolved oxygen concentrations were low (2.7mg/l). Fecal coliform counts (530 colonies/100ml), TKN (0.595 mg/l), and TDS (169 mg/l) concentrations were elevated.

160 Coon Creek: EPA Percent land cover of the Coon Creek sub-watershed included 10% pasture/hay and 8% row crop. Estimates of land-use by the local SWCDs were higher for pastureland (17%). The SWCD estimates of animal concentrations in the sub-watershed were *high* (0.32 AU/Acre), with broiler poultry being the dominant animal. Sedimentation estimates indicated a *high* potential for NPS impairment (5.3 tons/acre), mostly from erosion of mined land. The overall potential for impairment from nonpoint sources was estimated as *moderate*. Coon /Flat Rock Creek, Hogue Creek (nutrients, pH, organic enrichment/DO) and Warren Smith Creek (pH, siltation) are included on the 1998 §303(d) list of impaired waters of Alabama. Two reaches of Flat Rock Creek (1997) had *poor* fish communities. Flat Rock Creek water quality data (1998) found slightly elevated TPO4 (0.101 mg/l) and TKN concentrations. Stream flow was estimated at 0.1 cfs below a historical low-head dam.

170 Mud Creek: EPA Percent land included 11% pasture/hay and 15% row crop The overall potential for impairment from nonpoint sources was estimated as *moderate*. The Mud Creek sub-watershed was listed as a 3rd priority by the local SWCD. Mud Creek is included on the 1998 §303(d) list of impaired waters of Alabama due to organic enrichment/DO from non-irrigated crop production and pasture grazing. Mud Creek (1997) had a *poor* fish community. 1998 water quality data found elevated NO2/NO3 (0.894 mg/l) and TKN (0.314 mg/l) concentrations. The herbicide Atrazine was also detected (0.159 μg/l).

300 Big Spring Creek: EPA Percent land cover included 20% pasture/hay, 12% row crop, and 2 % Urban. Estimates of land-use by the local SWCDs were somewhat higher for pasture (25%), row crop (19%), and urban (7%) land-uses. Sedimentation estimates indicated a *moderate* potential for NPS impairment (2.5 tons/acre), mainly from cropland erosion. The overall potential for impairment from nonpoint sources was estimated as *high*. Big Spring Creek was also given a 1st priority sub-watershed rating by the local SWCD. One stream reach of Big Spring Creek was evaluated by GSA in 1997 as having a *poor* fish community. Water quality data indicated that NO2/NO3, TPO4 and TKN were slightly elevated (0.508, 0.077 and 0.272 mg/l, respectively).

Wheeler Lake CU (0603-0002)

160 Mountain Fork Flint River: EPA percent land cover for the Mountain Fork of the Flint River sub-watershed included 16% pasture/hay and 31% row crop. Estimates of land-use by the local SWCDs were higher for pasture land-uses (28%) and lower for row crops (19%). The SWCD estimates of animal concentrations in the sub-watershed were *moderate,* with cattle being the dominant animal. Sedimentation estimates indicated a *high* potential for NPS impairment as did the estimate of overall potential for impairment from nonpoint sources. Mountain Fork of the Flint River was also given a 1st priority sub-watershed rating by the local SWCD. Mountain Fork (siltation, pathogens, and organic enrichment/DO from pasture grazing) and Hester Creek (nutrients, siltation and organic enrichment/dissolved oxygen impairment) are included on the 1998 §303(d) list for Alabama. Three reaches had fish communities that were in poor or *very-poor/poor* condition and aquatic macroinvertebrate communities that were in *fair or poor* condition. Water quality data from 1997-98 indicated that nutrients and fecal coliform were elevated to varying degrees. Detectable concentrations of the herbicide atrazine (0.127 ug/l) were found in a July 1998 water sample at Hester Creek.

180 Brier Fork Flint River: EPA percent land cover included 22% pasture/hay, and 48% row crop. Estimates of land-use by the local SWCDs were higher for pasture land-uses (45%) and lower for row crops (35%). Sedimentation estimates indicated a *high* potential for NPS impairment (4.2 tons/acre) as did the estimate of overall nonpoint source impairment potential. Segments of Brier Fork (unknown toxicity and siltation from non-irrigated crop production) and Beaverdam Creek (siltation impacts) are included on Alabama's 1998 §303(d) list of impaired waters. Four stream reaches were assessed by TVA in 1994-95 as having *poor* or *poor/fair* fish communities; one station on Brier Fork was re-assessed in 1999 as *fair.* The Brier Fork aquatic macroinvertebrate communities were assessed to be in *fair* or *good* condition. Water quality data (1997-98) indicated elevated nitrite/nitrate concentrations in Brier Fork and elevated nutrient concentrations and fecal coliform counts in Beaverdam Creek. Herbicides (Atrazine and Metolachlor) and metals (Lead, Cadmium, Zinc, Mercury, and Copper) were detected during 1998 water quality sampling at all ADEM Brier Fork locations.

190 Middle Flint River: EPA percent land cover of the Middle Flint River sub-watershed included 18% pasture/hay, 35% row crop, and 2% urban land-uses. Estimates of land-use by the local SWCDs were higher for pasture land-uses (41%) and lower for row crops (17%). Sedimentation estimates indicated a *moderate* potential for NPS impairment (3.2 tons/acre). The overall potential for impairment from nonpoint sources was estimated as *high*. A segment of Chase Creek is on Alabama's 1998 §303(d) list of impaired waters. Chase Creek had a *poor* fish community, and a *poor/fair* aquatic macroinvertebrate community. Water quality data were collected at or near the same reach during May 1998. Subsequent visits to this site (July, September) found a reach dominated by intermittent pools. Water quality data collected in May indicated that fecal coliform counts, and NO2/NO3 and TDS concentrations were elevated.

20 Dry Creek: EPA percent land cover of the Dry Creek sub-watershed included 9% pasture/hay and 13% row crop. Estimates by the local SWCDs were higher for the pasture land-use (26%). The overall potential for impairment from nonpoint sources was estimated as *moderate*. One stream reach of Cane Creek was assessed by TVA as having a *very poor/poor* fish community and a *poor* aquatic macroinvertebrate community. A segment of Cane Creek is on Alabama's 1998 §303(d) list due to siltation and organic enrichment/D.O. from agriculture sources. Cane Creek, at the CANM-220 sampling reach was out of its banks during the May sampling event. In July and September, there was insufficient stream flow to conduct a measurement. Water quality data collected during no-measurable flow, indicated low dissolved oxygen concentrations (4.0 - 4.8 mg/l) and elevated TPO4, TKN, TDS, and TSS concentrations.

270 Cotaco Creek: EPA percent land cover of the Cotaco Creek sub-watershed included 19% pasture/hay and 13% row crop. Estimates of land-use by the local SWCDs were higher for pasture (30%) and lower for row crop (3%) land-uses. The SWCD estimates of animal concentrations in the sub-watershed were *moderate* (0.19 AU/Acre), with cattle being the dominant animal. The overall potential for impairment from nonpoint sources was estimated as *moderate*. Cotaco Creek was also given a 4th priority sub-watershed rating by the local SWCD. Segments of Cotaco Creek (pathogens from agriculture sources), Hughes Creek (siltation), Mill Pond Creek (pathogens and siltation), West Fork Cotaco Creek (pathogens from agriculture sources) and Town Creek (organic enrichment/DO from agriculture sources) are included on Alabama's 1998 §303(d) list of impaired waters. The fish communities of seven of the eight stream reaches assessed (1991-95) were in *poor* condition (Little Cotaco – *good*). Cotaco Creek water quality data indicated that fecal coliform counts, NO2/NO3, NH3-N, TKN and TPO4 concentrations were elevated to varying degrees. TVA (1997) and ADEM (1998) water quality assessments on Hughes Creek indicated fecal coliform counts, NO2/NO3 and TKN concentrations were slightly elevated. Little Cotaco Creek (TVA) water quality data indicated NO2/NO3, NH3-N and TKN concentrations were slightly elevated. Mill Pond Creek (TVA) water quality data indicated nutrient (NH3-N, NO2/NO3, TKN, TPO4, and Ortho-P) concentrations and fecal coliform counts were elevated to vary degrees. A semi/public private wastewater discharge is located upstream from this sampling reach. During the spring reconnaissance of station 7628-1, it was noted that the entire flow of the stream went underground within view from the downstream side of the bridge. Rock Creek water quality data indicated that NO2/NO3 and TKN concentrations were slightly elevated. The herbicide Atrazine was detected (1.03 ug/l) at the time of water quality sampling. Sixmile Creek data (ADEM 1998) indicated habitat quality was *poor* (bank stability and riparian zone measurement adverse impacts), dissolved oxygen concentrations were low (3.9 mg/l) and fecal coliform counts, TPO4 and TKN concentrations were elevated. Town Creek (1997-98) data indicated low dissolved oxygen concentrations and stream flows, and elevated NO2/NO3 concentrations and fecal coliform counts. The West Fork of Cotaco Creek data indicated elevated nutrient (NO2/NO3, TKN) concentrations and elevated fecal coliform counts.

300 Limestone Creek: EPA percent land-cover of the Limestone Creek sub-watershed included 23% pasture/hay and 47% row crop. Estimates of land-use by the local SWCDs were somewhat higher for pasture (34%) and lower for row crop (27%) land-uses. The SWCD sedimentation estimates indicated a *high* potential for NPS impairment (5.6 tons/acre) as did the estimate of overall potential for NPS impairment. Limestone Creek was given 2nd and 3rd priority sub-watershed ratings by the local SWCDs. A segment of Limestone Creek is on Alabama's 1998 §303(d) list due to siltation, organic enrichment/DO from pasture grazing and non-irrigated crop production sources. Limestone Creek (1995) had *very-poor/poor or very-poor* fish, and *fair or poor* aquatic macroinvertebrate communities. TVA water quality data (1997) indicated elevated fecal coliform counts and nutrient (NO2/NO3, TKN) and TSS concentrations. ADEM (1998) data also found elevated nutrients (NO2/NO3, TKN and TPO4) and TSS concentrations. The Little Limestone Creek fish community (1994) was in *poor/fair* condition and water quality data (1997) indicated fecal coliform counts and nutrient (NO2/NO3 and TKN) concentrations were elevated.

320 Piney Creek: EPA percent land cover of the Piney Creek sub-watershed included 30% pasture/hay and 32% row crop. Estimates of land-use by the local SWCDs were somewhat higher for row crops (39%). The SWCD estimates of sedimentation (2.0 tons/acre) and animal concentrations (0.16 AU/Acre) in the sub-watershed indicated a *moderate* potential for NPS impairment, with cattle and broiler poultry being the dominant animals. The overall potential for impairment from nonpoint sources was estimated as *high*. Piney Creek was also given a 1st priority sub-watershed rating by the local SWCD. Segments of Piney Creek (pesticides, siltation, and organic enrichment/DO from non-irrigated crop production and pasture grazing) and French Mill Creek (pathogens) are on the Alabama 1998 §303(d) list of impaired waters. French Mill Creek had a *fair* fish community and a *poor/fair* aquatic macroinvertebrate community. Water quality data indicated some elevated nutrients (NO2/NO3, TKN) and fecal coliform counts. Three stream reaches of Piney Creek had *poor*, *poor/fair* or *good* fish communities, and *fair* or *fair/good* aquatic macroinvertebrate communities. Water quality data (1996-98) indicated intermittent elevated nutrient concentrations (NO2/NO3, TKN) and fecal Coliform counts. Copper and Zinc were detected in the two downstream stations and Zinc was detected at the upstream station water column.

400 Round Island Creek: EPA percent land cover of the Round Island Creek sub-watershed includes 20% pasture/hay and 33% row crop. Estimates of land-use by the local SWCDs were somewhat higher for row crops (53%) and lower for pasture (3%) land-uses. The overall potential for impairment from nonpoint sources was estimated as *moderate*. Round Island Creek was also given a 4th priority sub-watershed rating by the local SWCD. A segment of Round Island Creek is included on the Alabama 1998 §303(d) list of impaired waters with due to siltation and organic enrichment/DO from agricultural sources. The fish community of Round Island Creek was in poor (1994) and poor/fair (1999) condition. Water quality data indicated that NO2/NO3 and TKN concentrations were moderately elevated.

440 Second Creek: EPA Percent land cover of the Second Creek sub-watershed included 28% pasture/hay and 22% row crop. Estimates of land-use by the local SWCDs were somewhat higher for pasture (30%) and lower for row crops (12%) land-uses. The SWCD estimates of animal concentrations in the sub-watershed were *moderate* (0.22 AU/Acre), with cattle and broiler poultry being the dominant animals. The overall potential for impairment from nonpoint sources was estimated as *high*. Segments of Second Creek (pathogens from agricultural sources) and First Creek (pathogens) are included on the Alabama 1998 §303(d) list of impaired waters. Two streams, First Creek and Second Creek, were assessed by TVA in 1994 as having *very poor/poor* and *poor* fish communities, respectively. A re-assessment of the Second Creek site in 1999 determined the fish community was in *fair* condition. Water quality data from First Creek and Second Creek indicated that NO2/NO3 concentrations and fecal coliform counts were elevated. Six EPT genera, collected from Neely Branch (1998), indicated that the aquatic macroinvertebrate community was in *poor* condition. Water quality data indicated elevated NO2/NO3 and BOD_5 concentrations.

Lower Elk River CU (0603-0004)

080 Big Creek: EPA percent land cover of the Big Creek sub-watershed included 24% pasture/hay and 21% row crop. Estimates of land-use by the local SWCDs were higher for row crops (51%). The overall potential for impairment from nonpoint sources was estimated as *moderate*. Big Creek was also given a 5th priority sub-watershed rating by the local SWCD. A segment of Big Creek is included on the 1998 §303(d) list of impaired waters of Alabama due to impairment from organic enrichment/ dissolved oxygen. Two stream reaches were evaluated by TVA in 1995 as having *poor or fair* fish communities. Big Creek water quality data (1997-98) indicated that the NO2/NO3 concentrations and fecal coliform counts were elevated. Sulphur Creek water quality data indicated that fecal coliform counts and NO2/NO3 and TPO4 concentrations were elevated.

150 Anderson Creek: EPA percent land cover of the Anderson Creek sub-watershed included 35% pasture/hay and 22% row crop. Estimates of land-use by the local SWCDs were lower for row crops (9%) and pastureland (23%). The overall potential for impairment from nonpoint sources was estimated as *moderate*. Anderson Creek was also given a 4th priority sub-watershed rating by the local SWCD. Anderson Creek (siltation from an unknown sources) and Elk River (pH and organic enrichment from pasture grazing and non-irrigated crop production) are included on the 1998 §303(d) list of impaired waters of Alabama. In 1995, Anderson Creek had a *poor* fish community and a *good* aquatic macroinvertebrate community; re-evaluated in 1999 both communities were in *fair* condition. Water quality data indicated elevated NO2/NO3 concentrations (1997-98) and fecal coliform counts (1997).

Pickwick Lake CU (0603-0005)

010 Big Nance Creek: EPA percent land cover of the Big Nance Creek sub-watershed included 27% pasture/hay and 21% row crop. Estimates of land-use by the local SWCDs were somewhat higher for row crops (39%) and lower for pasture (14%). The overall potential for impairment from nonpoint sources was estimated as *high*. The subwatershed was also given a 1st priority rating by the local SWCD. Big Nance Creek is included on the 1998 §303(d) list of impaired waters of Alabama due to pesticides, NH3-N, siltation, organic enrichment/DO, and pathogens from intensive animal feeding operations, landfills, pasture grazing and non-irrigated crop production. The fish communities of three locations on Big Nance Creek were assessed as *fair/good*, *fair*, or *poor/fair*. The aquatic macroinvertebrate of one station was assessed as *poor* in 1998 and *fair/good* in 1999. Water quality data from Big Nance Creek indicated that the dissolved oxygen concentration during the station visits in July 1998 were below the 5.0 mg/l water quality standard at both stations (3.2 and 2.0 mg/l). Nutrient concentrations (including NO2/NO3, TPO4, TKN and NH3) were elevated to varying degrees in samples collected from 1996-1998. One stream reach of the Clear Fork of Big Nance Creek was assessed as having a *poor* fish community and a *fair* aquatic macroinvertebrate community. Water quality data indicated slightly elevated TKN and TPO4 concentrations. Data collected from the Muddy Fork of Big Nance Creek had a dissolved oxygen concentration of 5.0 mg/l; however, the water quality standard for this A&I classified stream is 3.0 mg/l. Nutrient concentrations were all elevated, when compared to the Clear Fork.

040 Town Creek: EPA percent land cover of the Town Creek sub-watershed included 26% pasture/hay and 24% row crop. Estimates of land-use by the local SWCDs were somewhat higher for row crops (36%). Sedimentation estimates (2.1 tons/acre) and estimates of animal concentrations (0.18 AU/Acre) in the sub-watershed indicated a *moderate* potential for NPS impairment, with cattle and poultry being the dominant animals. The overall potential for impairment from nonpoint sources was estimated as *high.* Town Creek was also given a 1st priority sub-watershed rating by the local SWCD. Town Creek (pH and organic enrichment/DO from pasture grazing and non-irrigated crop production) and Harris Creek (siltation and organic enrichment/DO impairment due to pasture grazing activities) is included on the 1998 §303(d) list of impaired waters of Alabama. Three of the four Fish IBI assessments conducted at two stations on Town Creek found *poor* fish communities. The fourth station had a *fair* fish community in 1999 and a *fair/good* aquatic macroinvertebrate community in 1998. Town Creek water quality data (1998) indicated that TDS, NO2/NO3, TPO4, and TKN concentrations were elevated. Water quality data collected in 1997 at two stations had elevated NO2/NO3 concentrations; the third station (upstream) had much lower NO2/NO3 concentrations over the same period. Poplar Creek had a poor fish community. Stream flow was very low (0.3 cfs) during the July sampling event and the dissolved oxygen concentration was 2.8 mg/l, below the water quality standard of 5.0 mg/l for a Fish and Wildlife Classified stream. Water quality data indicated that the TKN and TPO4 concentrations were elevated.

180 Upper Cypress Creek: EPA percent land cover of the Upper Cypress Creek sub-watershed included 29% pasture/hay and 18% row crop. The overall potential for impairment from nonpoint sources was estimated as *moderate*. Upper Cypress Creek was also given a 2nd priority sub-watershed rating by the local SWCD. Burcham Creek had a *poor/fair* fish community. Water quality data indicated that the NO2/NO3 and TPO4 concentrations were slightly elevated (0.611, 0.095 mg/l, respectively). Fish and aquatic macroinvertebrate biological assessments conducted at Lindsey Creek indicated *good* community condition. The fish community of Middle Cypress Creek was assessed as *good* in 1992 and *fair* in 1997. North Fork of Cypress Creek had a fish community in *good* (1992) condition.

220 Sinking Creek: EPA percent land cover of the Sinking Creek sub-watershed included 22% pasture/hay, 42% row crop. Estimates of land-use by the local SWCDs were higher for row crops (65%). Sedimentation estimates indicated a *high* potential for NPS impairment (4.7 tons/acre) mostly from cropland and dirt roads. The overall potential for impairment from nonpoint sources was estimated as *moderate*. Sinking Creek was also given a 3rd priority sub-watershed rating by the local SWCD. In 1997, the fish community of Sinking Creek was evaluated as *poor*. In 1999, the fish and aquatic macroinvertebrate communities were assessed as *poor/fair* and *poor*, respectively. Water quality data indicated that the NO2/NO3 and TPO4 concentrations were elevated (1.498, 0.095 mg/l, respectively). The dissolved oxygen concentration was 5.6 mg/l in the late afternoon.