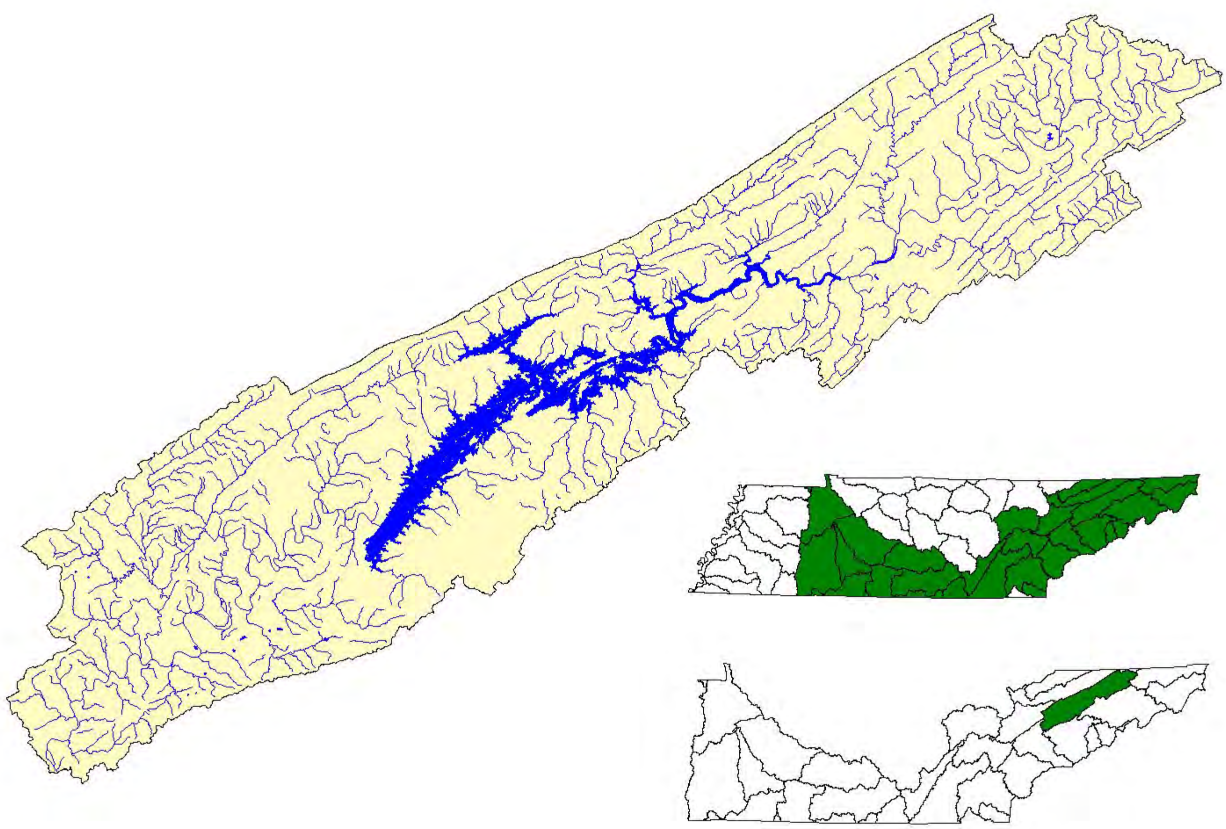
HOLSTON RIVER WATERSHED (06010104)
OF THE TENNESSEE RIVER BASIN

WATERSHED WATER QUALITY
MANAGEMENT PLAN



TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER POLLUTION CONTROL
WATERSHED MANAGEMENT SECTION

Presented to the people of the Holston River Watershed by the Division of Water Pollution Control October 29, 2007.

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HOLSTON RIVER WATERSHED
WATER QUALITY MANAGEMENT PLAN

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GLOSSARY

1Q20. The lowest average 1 consecutive days flow with average recurrence frequency of once every 20 years.

30Q2. The lowest average 3 consecutive days flow with average recurrence frequency of once every 2 years.

7Q10. The lowest average 7 consecutive days flow with average recurrence frequency of once every 10 years.

303(d). The section of the federal Clean Water Act that requires a listing by states, territories, and authorized tribes of impaired waters, which do not meet the water quality standards that states, territories, and authorized tribes have set for them, even after point sources of pollution have installed the minimum required levels of pollution control technology.

305(b). The section of the federal Clean Water Act that requires EPA to assemble and submit a report to Congress on the condition of all water bodies across the Country as determined by a biennial collection of data and other information by States and Tribes.

AFO. Animal Feeding Operation.

Ambient Sites. Those sites established for long term instream monitoring of water quality.

ARAP. Aquatic Resource Alteration Permit.

Assessment. The result of an analysis of how well streams meet the water quality criteria assigned to them.

Bankfull Discharge. The momentary maximum peak flow before a stream overflows its banks onto a floodplain.

Basin. An area that drains several smaller watersheds to a common point. Most watersheds in Tennessee are part of the Cumberland, Mississippi, or Tennessee Basin (The Conasauga River and Barren River Watersheds are the exceptions).

Benthic. Bottom dwelling.

Biorecon. A qualitative multihabitat assessment of benthic macroinvertebrates that allows rapid screening of a large number of sites. A Biorecon is one tool used to recognize stream impairment as judged by species richness measures, emphasizing the presence or absence of indicator organisms without regard to relative abundance.

BMP. An engineered structure or management activity, or combination of these, that eliminates or reduces an adverse environmental effect of a pollutant.

BOD. Biochemical Oxygen Demand. A measure of the amount of oxygen consumed in the biological processes that break down organic and inorganic matter.

CAFO. Concentrated Animal Feeding Operation.

Designated Uses. The part of Water Quality Standards that describes the uses of surface waters assigned by the Water Quality Control Board. All streams in Tennessee are designated for Recreation, Fish and Aquatic Life, Irrigation, and Livestock Watering and Wildlife. Additional designated uses for some, but not all, waters are Drinking Water Supply, Industrial Water Supply, and Navigation.

DMR. Discharge Monitoring Report. A report that must be submitted periodically to the Division of Water Pollution Control by NPDES permitees.

DO. Dissolved oxygen.

EPA. Environmental Protection Agency. The EPA Region 4 web site is http://www.epa.gov/region4/

Field Parameter. Determinations of water quality measurements and values made in the field using a kit or probe. Common field parameters include pH, DO, temperature, conductivity, and flow.

Fluvial Geomorphology. The physical characteristics of moving water and adjoining landforms, and the processes by which each affects the other.

HUC-8. The 8-digit Hydrologic Unit Code corresponding to one of 54 watersheds in Tennessee.

HUC-10. The 10-digit NRCS Hydrologic Unit Code. HUC-10 corresponds to a smaller land area than HUC-8.

HUC-12. The 12-digit NRCS Hydrologic Unit Code. HUC-12 corresponds to a smaller land area than HUC-10.

MRLC. Multi-Resolution Land Classification.

MS4. Municipal Separate Storm Sewer System.

Nonpoint Source (NPS). Sources of water pollution without a single point of origin. Nonpoint sources of pollution are generally associated with surface runoff, which may carry sediment, chemicals, nutrients, pathogens, and toxic materials into receiving waterbodies. Section 319 of the Clean Water Act of 1987 requires all states to assess the impact of nonpoint source pollution on the waters of the state and to develop a program to abate this impact.

NPDES. National Pollutant Discharge Elimination System. Section 402 of the Clean Water Act of 1987 requires dischargers to waters of the U.S. to obtain NPDES permits.

NRCS. Natural Resources Conservation Service. NRCS is part of the federal Department of Agriculture. The NRCS home page is http://www.nrcs.usda.gov

Point Source. Any discernable, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural storm water discharges and return flows from irrigated agriculture (Clean Water Act Section 502(14)).

Q Design. The average daily flow that a treatment plant or other facility is designed to accommodate.

Reference Stream (Reference Site). A stream (site) judged to be least impacted. Data from reference streams are used for comparisons with similar streams.

SBR. Sequential Batch Reactor.

Stakeholder. Any person or organization affected by the water quality or by any watershed management activity within a watershed.

STATSGO. State Soil Geographic Database. STATSGO is compiled and maintained by the Natural Resources Conservation Service.

STORET. The EPA repository for water quality data that is used by state environmental agencies, EPA and other federal agencies, universities, and private citizens. STORET (Storage and Retrieval of National Water Quality Data System) data can be accessed at http://www.epa.gov/storet/

TDA. Tennessee Department of Agriculture. The TDA web address is http://www.state.tn.us/agriculture

TDEC. Tennessee Department of Environment and Conservation. The TDEC web address is http://www.tdec.net

TMDL. Total Maximum Daily Load. A TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and an allocation of the amount to the pollutant's sources. A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. The calculation includes a margin of safety to ensure that the waterbody can be used for the purposes the State has designated. The calculation must also account for seasonal variation in water quality. A TMDL is required for each pollutant in an impaired stream as described in Section 303 of the Federal Clean Water Act of 1987. Updates and information on Tennessee's TMDLs can be found at http://www.tdec.net/wpc/tmdl/

TMSP. Tennessee Multi-Sector Permit.

USGS. United States Geological Survey. USGS is part of the federal Department of the Interior. The USGS home page is http://www.usgs.gov/.

WAS. Waste Activated Sludge.

Water Quality Standards. A triad of designated uses, water quality criteria, and antidegradation statement. Water Quality Standards are established by Tennessee and approved by EPA.

Watershed. A geographic area which drains to a common outlet, such as a point on a larger stream, lake, underlying aquifer, estuary, wetland, or ocean.

WET. Whole Effluent Toxicity.

WWTP. Waste Water Treatment Plant

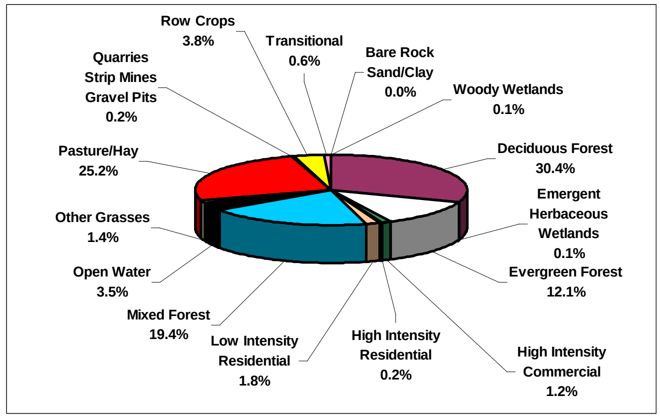
Summary – Holston River Watershed (06010104)

In 1996, the Tennessee Department of Environment and Conservation Division of Water Pollution Control adopted a watershed approach to water quality. This approach is based on the idea that many water quality problems, like the accumulation of point and nonpoint pollutants, are best addressed at the watershed level. Focusing on the whole watershed helps reach the best balance among efforts to control point sources of pollution and polluted runoff as well as protect drinking water sources and sensitive natural resources such as wetlands. Tennessee has chosen to use the USGS 8-digit Hydrologic Unit Code (HUC-8) as the organizing unit.

The Watershed Approach recognizes awareness that restoring and maintaining our waters requires crossing traditional barriers (point *vs.* nonpoint sources of pollution) when designing solutions. These solutions increasingly rely on participation by both public and private sectors, where citizens, elected officials, and technical personnel all have opportunities to participate. The Watershed Approach provides the framework for a watershed-based and community-based approach to address water quality problems.

Chapter 1 of the Holston River Watershed Water Quality Management Plan discusses the Watershed Approach and emphasizes that the Watershed Approach is not a regulatory program or an EPA mandate; rather it is a decision-making process that reflects a common strategy for information collection and analysis as well as a common understanding of the roles, priorities, and responsibilities of all stakeholders within a watershed. Traditional activities like permitting, planning and monitoring are also coordinated in the Watershed Approach.

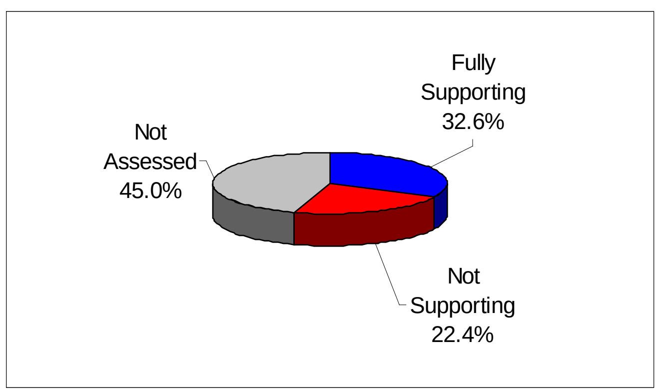
A detailed description of the watershed can be found in Chapter 2. The Holston River Watershed is approximately 999 square miles and includes parts of nine Tennessee counties. A part of the Tennessee River drainage basin, the watershed has 1,175.6 stream miles and 6,499 lake acres.



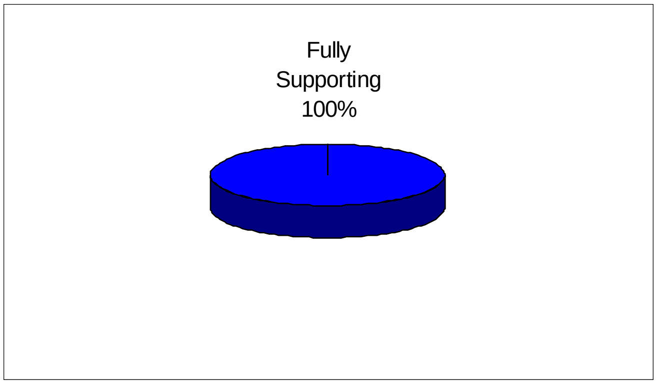
Land Use Distribution in the Holston River Watershed.

Two designated state natural areas, two state parks, and three wildlife management areas are located in the watershed. Fifty-six rare plant and animal species have been documented in the watershed, including eight rare fish species, eleven rare mussel species, and one rare snail species. A portion of one stream in the Holston River Watershed is listed in the National Rivers Inventory as having one or more outstanding natural or cultural values.

A review of water quality sampling and assessment is presented in Chapter 3. Using the Watershed Approach to Water Quality, 504 sampling events occurred in the Holston River Watershed in 2000-2005. These were conducted at ambient, ecoregion or watershed monitoring sites. Monitoring results support the conclusion that 62.7% of stream miles and 100% of lake acres assessed fully support one or more designated uses.



Water Quality Assessment of Streams and Rivers in the Holston River Watershed. Assessment data are based on the 2004 Water Quality Assessment of 1,175.6 stream miles in the watershed.



Water Quality Assessment of Lakes in the Holston River Watershed. Assessment data are based on the 2004 Water Quality Assessment of 6,499 lake acres in the watershed.

Also in Chapter 3, a series of maps illustrate overall use support in the watershed, as well as use support for the individual uses of Fish and Aquatic Life Support, Recreation, Irrigation, and Livestock Watering and Wildlife. Another series of maps illustrate streams that are listed for impairment by specific causes (siltation, low flow alterations, other habitat alterations).

Point and Nonpoint Sources are addressed in Chapter 4. Chapter 4 is organized by HUC-12 subwatersheds. Maps illustrating the locations of STORET monitoring sites and stream gauging stations are also presented in each subwatershed.

HUC-10	HUC-12
0601010401	060101040101 (Holston River)
	060101040102 (Holston River)
	060101040103 (Big Creek)
	060101040104 (Beech Creek)
0601010402	060101040201 (Cherokee Lake)
	060101040202 (Robertson Creek)
	060101040203 (Cherokee Lake)
	060101040204 (Caney Creek)
	060101040205 (Poor Valley Creek)
	060101040206 (Cherokee Lake)
	060101040207 (Turkey Creek)
	060101040208 (German Creek)
	060101040209 (Cherokee Lake)
	060101040210 (Cherokee Lake)

HUC-10	HUC-12
0601010403	060101040301 (Holston River)
	060101040302 (Holston River)
	060101040303 (Richland Creek)
	060101040304 (Holston River)
	060101040305 (Flat Creek)
	060101040306 (Roseberry Creek)

The Holston River Watershed is Composed of twenty USGS-Delineated Subwatersheds (12-Digit Subwatersheds).

Point source contributions to the Holston River Watershed consist of twenty-four individual NPDES-permitted facilities, twelve of which discharge into streams that have been listed on the 2004 303(d) list. Other point source permits in the watershed (as of October 29, 2007) are Tennessee Multi-Sector Permits (69), Mining Permits (18), Aquatic Resource Alteration Permits (12), Ready Mix Concrete Plant Permits (7), Water Treatment Plant Permits (7), and Concentrated Animal Feeding Operations (2). Agricultural operations include cattle, chicken, hog, and sheep farming. Maps illustrating the locations of permit sites and tables summarizing livestock practices are presented in each subwatershed.

Chapter 5 is entitled *Water Quality Partnerships in the Holston River Watershed* and highlights partnerships between agencies and between agencies and landowners that are essential to success. Programs of federal agencies (Natural Resources Conservation Service, U.S. Fish and Wildlife Service, U.S. Geological Survey, U.S. Army Corps of Engineers, and Tennessee Valley Authority), and state agencies (TDEC/State Revolving Fund, TDEC Division of Water Supply and Tennessee Department of Agriculture) are summarized. Local initiatives of organizations active in the watershed (Caney Creek Watershed Partnership, Holston River Watershed Alliance, Smoky Mountain RC&D Council, and The Nature Conservancy) are also described.

Point and Nonpoint source approaches to water quality problems in the Holston River Watershed are addressed in Chapter 6. Chapter 6 also includes comments received during public meetings, links to EPA-approved TMDLs in the watershed, and an assessment of needs for the watershed.

The full Holston River Watershed Water Quality Management Plan can be found at: http://www.state.tn.us/environment/wpc/watershed/wsmplans/

CHAPTER 1

WATERSHED APPROACH TO WATER QUALITY

1.1 BACKGROUND. The Division of Water Pollution Control is responsible for administration of the Tennessee Water Quality Control Act of 1977 (TCA 69–3–101). Information about the Division of Water Pollution Control, updates and announcements, may be found at http://www.state.tn.us/environment/wpc/index.html, and a summary of the organization of the Division of Water Pollution Control may be found in Appendix I.

The mission of the Division of Water Pollution Control is to abate existing pollution of the waters of Tennessee, to reclaim polluted waters, to prevent the future pollution of the waters, and to plan for the future use of the waters so that the water resources of Tennessee might be used and enjoyed to the fullest extent consistent with the maintenance of unpolluted waters.

The Division monitors, analyzes, and reports on the quality of Tennessee's water. In order to perform these tasks more effectively, the Division adopted a Watershed Approach to Water Quality in 1996.

This Chapter summarizes TDEC's Watershed Approach to Water Quality.

1.2 WATERSHED APPROACH TO WATER QUALITY. The Watershed Approach to Water Quality is a coordinating framework designed to protect and restore aquatic systems and protect human health more effectively (EPA841-R-95-003). The Approach is based on the concept that many water quality problems, like the accumulation of pollutants or nonpoint source pollution, are best addressed at the watershed level. In addition, a watershed focus helps identify the most cost-effective pollution control strategies to meet clean water goals. Tennessee's Watershed Approach, updates and public participation opportunities, may be found on the web at http://www.state.tn.us/environment/wpc/wshed1.htm.

Watersheds are appropriate as organizational units because they are readily identifiable landscape units with readily identifiable boundaries that integrate terrestrial, aquatic, and geologic processes. Focusing on the whole watershed helps reach the best balance among efforts to control point source pollution and polluted runoff as well as protect drinking water sources and sensitive natural resources such as wetlands (EPA-840-R-98-001).

Four main features are typical of the Watershed Approach: 1) Identifying and prioritizing water quality problems in the watershed, 2) Developing increased public involvement, 3) Coordinating activities with other agencies, and 4) Measuring success through increased and more efficient monitoring and other data gathering.

Typically, the Watershed Approach meets the following description (EPA841-R-95-003):

- Features watersheds or basins as the basic management units
- Targets priority subwatersheds for management action
- Addresses all significant point and nonpoint sources of pollution
- Addresses all significant pollutants
- Sets clear and achievable goals
- Involves the local citizenry in all stages of the program
- Uses the resources and expertise of multiple agencies
- Is not limited by any single agency's responsibilities
- Considers public health issues

An additional characteristic of the Watershed Approach is that it complements other environmental activities. This allows for close cooperation with other state agencies and local governments as well as with federal agencies such as the Tennessee Valley Authority and the U.S. Army Corps of Engineers, U.S. Department of Agriculture (*e.g.*, Natural Resources Conservation Service, United States Forest Service), U.S. Department of the Interior (*e.g.* United States Geological Survey, U.S. Fish and Wildlife Service, National Park Service). When all permitted dischargers are considered together, agencies are better able to focus on those controls necessary to produce measurable improvements in water quality. This also results in a more efficient process: It encourages agencies to focus staff and financial resources on prioritized geographic locations and makes it easier to coordinate between agencies and individuals with an interest in solving water quality problems (EPA841-R-003).

The Watershed Approach is not a regulatory program or a new EPA mandate; rather it is a decision making process that reflects a common strategy for information collection and analysis as well as a common understanding of the roles, priorities, and responsibilities of all stakeholders within a watershed. The Watershed Approach utilizes features already in state and federal law, including:

- Water Quality Standards
- National Pollutant Discharge Elimination System (NPDES)
- Total Maximum Daily Loads (TMDLs)
- Clean Lakes Program
- Nonpoint Source Program
- Groundwater Protection

Traditional activities like permitting, planning, and monitoring are also coordinated in the Watershed Approach. A significant change from the past, however, is that the Watershed Approach encourages integration of traditional regulatory (point source pollution) and nonregulatory (nonpoint sources of pollution) programs. There are additional changes from the past as well:

THE PAST	WATERSHED APPROACH
Focus on fixed-station ambient monitoring	Focus on comprehensive watershed monitoring
Focus on pollutant discharge sites	Focus on watershed-wide effects
Focus on WPC programs	Focus on coordination and cooperation
Focus on point sources of pollution	Focus on all sources of pollution
Focus on dischargers as the problem	Focus on dischargers as an integral part of the solution
Focus on short-term problems	Focus on long-term solutions

Table 1-1. Contrast Between the Watershed Approach and the Past.

This approach places greater emphasis on all aspects of water quality, including chemical water quality (conventional pollutants, toxic pollutants), physical water quality (temperature, flow), habitat quality (channel morphology, composition and health of benthic communities), and biodiversity (species abundance, species richness).

1.2.A. Components of the Watershed Approach. Tennessee is composed of fifty-five watersheds corresponding to the 8-digit USGS Hydrologic Unit Codes (HUC-8). These watersheds, which serve as geographic management units, are combined in five groups according to year of implementation.

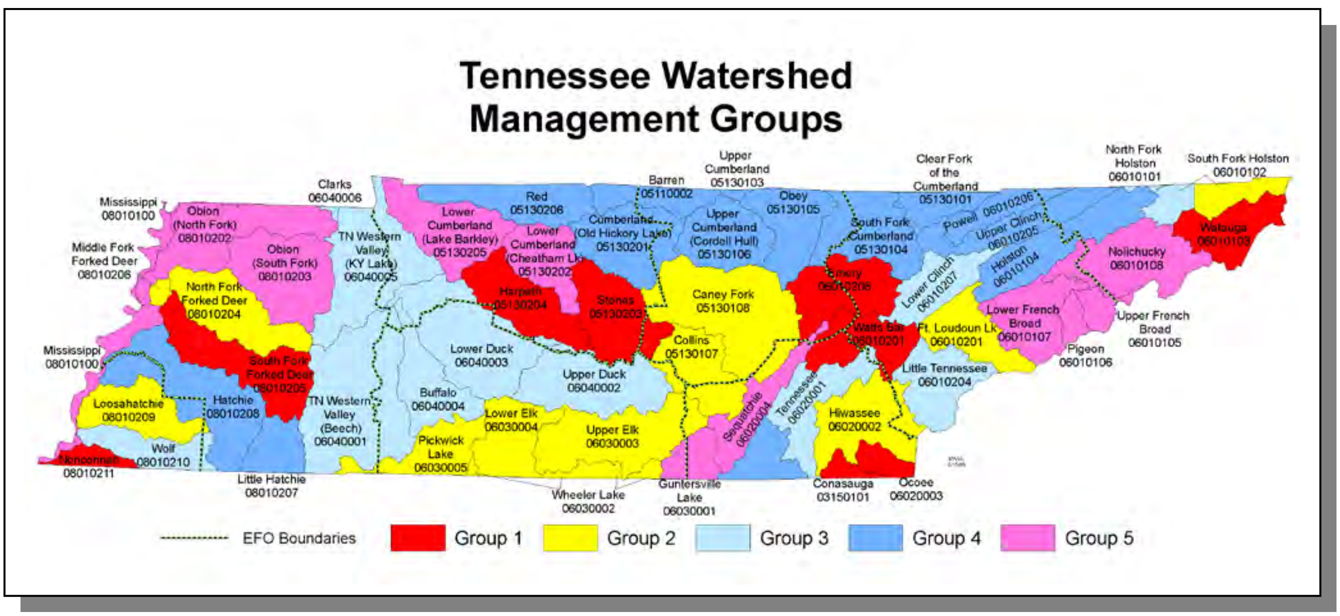


Figure 1-1. Watershed Groups in Tennessee's Watershed Approach to Water Quality.

Each year, TDEC conducts monitoring in one-fifth of Tennessee's watersheds; assessment, priority setting and follow-up monitoring are conducted in another one fifth of watersheds; modeling and TMDL studies in another one fifth; developing management plans in another one fifth; and implementing management plans in another one fifth of watersheds.

GROUP	WEST TENNESSEE	MIDDLE TENNESSEE	EAST TENNESSEE
1	Nonconnah South Fork Forked Deer	Harpeth Stones	Conasauga Emory Ocoee Watauga Watts Bar
2	Loosahatchie Middle Fork Forked Deer North Fork Forked Deer	Caney Fork Collins Lower Elk Pickwick Lake Upper Elk Wheeler Lake	Fort Loudoun Hiwassee South Fork Holston (Upper) Wheeler Lake
3	Tennessee Western Valley (Beech River) Tennessee Western Valley (KY Lake) Wolf River	Buffalo Lower Duck Upper Duck	Little Tennessee Lower Clinch North Fork Holston South Fork Holston (Lower) Tennessee (Upper)
4	Lower Hatchie Upper Hatchie	Barren Obey Red Upper Cumberland (Cordell Hull Lake) Upper Cumberland (Old Hickory Lake) Upper Cumberland (Cumberland Lake)	Holston Powell South Fork Cumberland Tennessee (Lower) Upper Clinch Upper Cumberland (Clear Fork)
5	Mississippi North Fork Obion South Fork Obion	Guntersville Lake Lower Cumberland (Cheatham Lake) Lower Cumberland (Lake Barkley)	Lower French Broad Nolichucky Pigeon Upper French Broad

Table 1-2. Watershed Groups in Tennessee's Watershed Approach.

In succeeding years of the cycle, efforts rotate among the watershed groups. The activities in the five year cycle provide a reference for all stakeholders.

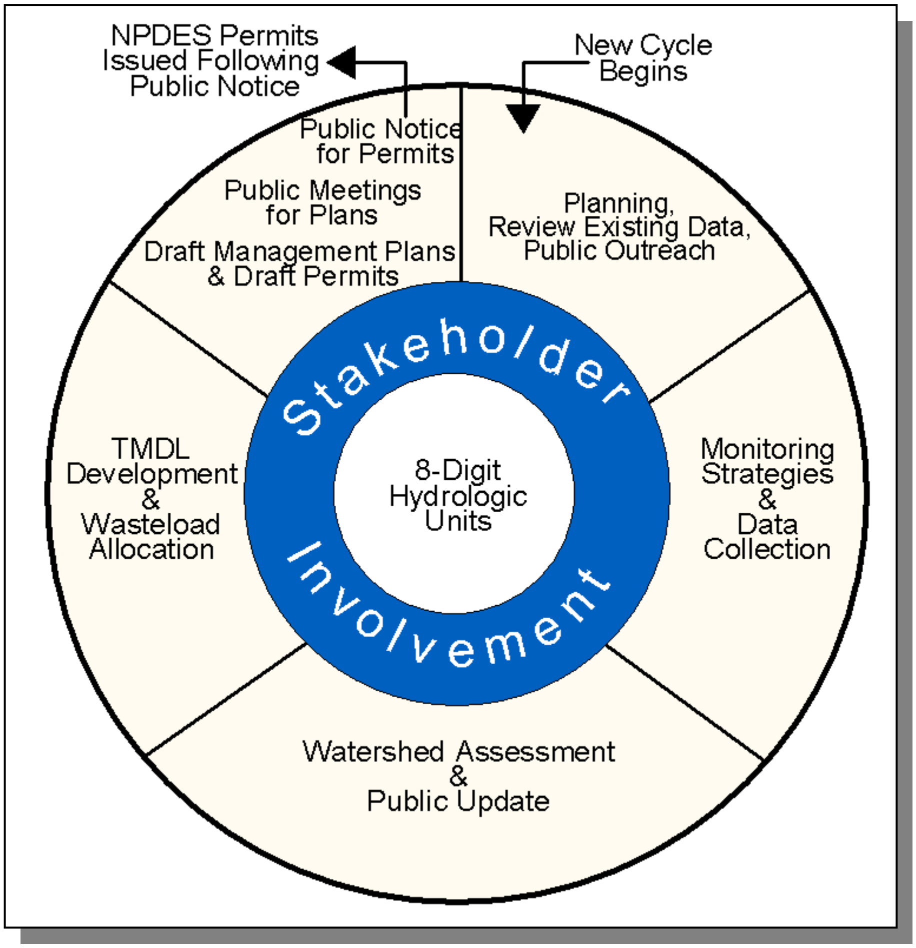


Figure 1-2. The Watershed Approach Cycle.

The six key activities that take place during the cycle are:

1. Planning and Existing Data Review. Existing data and reports from appropriate agencies and organizations are compiled and used to describe the current conditions and status of rivers and streams. Reviewing all existing data and comparing agencies' work plans guide the development of an effective monitoring strategy.

2. Monitoring. Field data is collected for streams in the watershed. These data supplement existing data and are used for the water quality assessment.

3. Assessment. Monitoring data are used to determine the status of the stream's designated use supports.

4. Wasteload Allocation/TMDL Development. Monitoring data are used to determine nonpoint source contributions and pollutant loads for permitted dischargers releasing wastewater to the watershed. Limits are set to assure that water quality is protected.

5. Permits. Issuance and expiration of all discharge permits are synchronized based on watersheds. Currently, 1700 permits have been issued in Tennessee under the federally delegated National Pollutant Discharge Elimination System (NPDES).

6. Watershed Management Plans. These plans include information for each watershed including general watershed description, water quality goals, major water quality concerns and issues, and management strategies.

Public participation opportunities occur throughout the entire five year cycle. Participation in Years 1, 3 and 5 is emphasized, although additional meetings are held at stakeholder's request. People tend to participate more readily and actively in protecting the quality of waters in areas where they live and work, and have some roles and responsibilities:

- Data sharing
- Identification of water quality stressors
- Participation in public meetings
- Commenting on management plans
- Shared commitment for plan implementation

1.2.B. Benefits of the Watershed Approach. The Watershed Approach fosters a better understanding of the physical, chemical and biological effects on a watershed, thereby allowing agencies and citizens to focus on those solutions most likely to be effective. The Approach recognizes the need for a comprehensive, ecosystem-based approach that depends on local governments and local citizens for success (EPA841-R-95-004). On a larger scale, many lessons integrating public participation with aquatic ecosystem-based programs have been learned in the successful Chesapeake Bay, Great Lakes, Clean Lakes, and National Estuary Programs.

Benefits of the Watershed Approach include (EPA841-R-95-004):

- Focus on water quality goals and ecological integrity rather than on program activities such as number of permits issued.

- Improve basis for management decisions through consideration of both point and nonpoint source stressors. A watershed strategy improves the scientific basis for decision making and focuses management efforts on basins and watersheds where they are most needed. Both point and nonpoint control strategies are more effective under a watershed approach because the Approach promotes timely and focused development of TMDLs.

- Enhance program efficiency, as the focus becomes watershed. A watershed focus can improve the efficiency of water management programs by facilitating consolidation of programs within each watershed. For example, handling all point source dischargers in a watershed at the same time reduces administrative costs due to the potential to combine hearings and notices as well as allowing staff to focus on more limited areas in a sequential fashion.

- Improve coordination between federal, state and local agencies including data sharing and pooling of resources. As the focus shifts to watersheds, agencies are better able to participate in data sharing and coordinated assessment and control strategies.

- Increase public involvement. The Watershed Approach provides opportunities for stakeholders to increase their awareness of water-related issues and inform staff about their knowledge of the watershed. Participation is via three public meetings over the five-year watershed management cycle as well as meetings at stakeholder's request. Additional opportunities are provided through the Department of Environment and Conservation homepage and direct contact with local Environmental Assistance Centers.

- Greater consistency and responsiveness. Developing goals and management plans for a basin or watershed with stakeholder involvement results in increased responsiveness to the public and consistency in determining management actions. In return, stakeholders can expect improved consistency and continuity in decisions when management actions follow a watershed plan.

Additional benefits of working at the watershed level are described in the Clean Water Action Plan (EPA-840-R-98-001), and can be viewed at http://www.cleanwater.gov/action/toc.html.

The Watershed Approach represents awareness that restoring and maintaining our waters requires crossing traditional barriers (point *vs.* nonpoint sources of pollution) when designing solutions. These solutions increasingly rely on participation by both public and private sectors, where citizens, elected officials and technical personnel all have opportunity to participate. This integrated approach mirrors the complicated relationships in which people live, work and recreate in the watershed, and suggests a comprehensive, watershed-based and community-based approach is needed to address these (EPA841-R-97-005).

CHAPTER 2

DESCRIPTION OF THE HOLSTON RIVER WATERSHED

2.1. BACKGROUND. The Holston River is a major river system of southwestern Virginia and East Tennessee. The three major forks of the Holston (its North, Middle, and South Forks) rise in southwestern Virginia and have their confluence near Kingsport, TN. From there the river flows roughly southwestward until it reaches its confluence with the French Broad River just east of downtown Knoxville, TN. This confluence is considered to be the headwaters of theTennessee River.

Native Americans called the Holston River "Hogoheegee." Early explorers called it "Indian River" and French traders called it the "Cherokee River." Today, the Holston River is named in honor of Stephen Holston (also spelled Holstein). Holston, an early explorer and surveyor with The Expedition of 1748, was the first settler to explore the Holston River system, including South Fork of the Holston River.

This Chapter describes the location and characteristics of the Holston River Watershed.

2.2. DESCRIPTION OF THE WATERSHED.

2.2.A. General Location. The Holston River Watershed is located in East Tennessee and includes parts of Grainger, Greene, Hamblen, Hawkins, Jefferson, Knox, Sevier, Sullivan, and Union Counties.

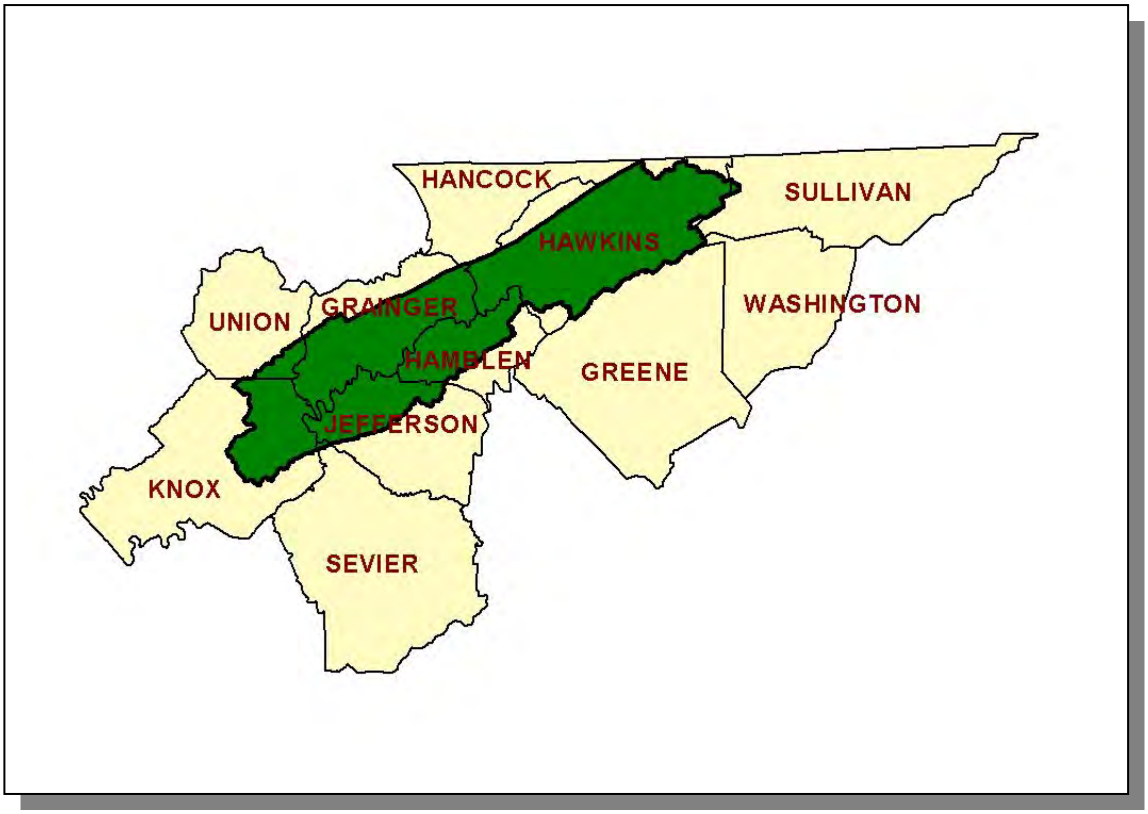


Figure 2-1. General Location of the Holston River Watershed.

COUNTY	% OF WATERSHED IN EACH COUNTY
Hawkins	42.1
Grainger	21.9
Knox	11.7
Jefferson	10.8
Hamblen	10.6
Union	2.1
Sullivan	0.4
Greene	0.2
Sevier	0.2

Table 2-1. The Holston River Watershed Includes Parts of Nine East Tennessee Counties. 0*.25 square miles in Hancock County and 0.08 square miles in Washington County are also in the watershed.*

2.2.B. Population Density Centers. Twenty-four highways serve the major communities in the Holston River Watershed.

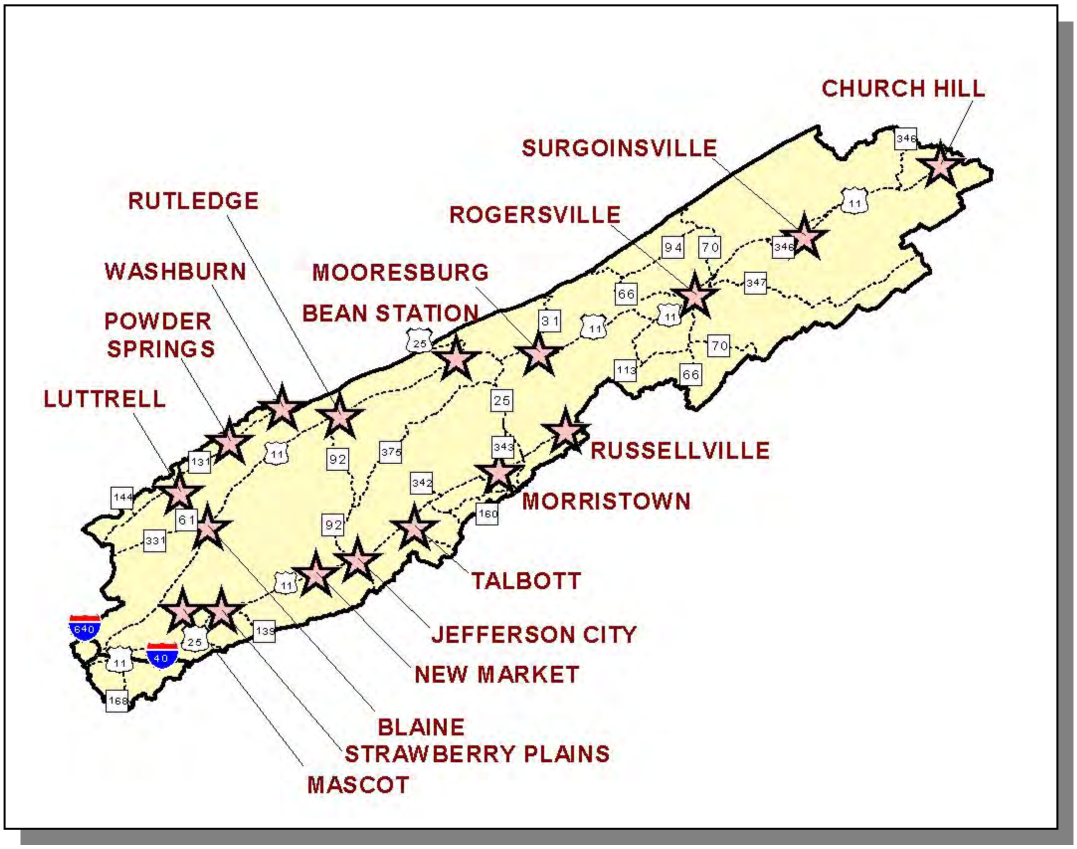


Figure 2-2. Communities and Roads in the Holston River Watershed.

MUNICIPALITY	POPULATION	COUNTY
Morristown*	24,965	Hamblen
Jefferson City	7,760	Jefferson
Church Hill	5,916	Hawkins
Rogersville*	4,240	Hawkins
Bean Station	2,599	Grainger
Mascot	2,119	Knox
Blaine	1,585	Grainger
Surgoinsville	1,484	Hawkins
New Market	1,234	Jefferson
Rutledge*	1,187	Grainger
Luttrell	915	Union

Table 2-2. Municipalities in the Holston River Watershed. *Population based on 2000 census (Tennessee Blue Book) or http://www.hometownlocator.com. Asterisk (*) indicates county seat.*

2.3. GENERAL HYDROLOGIC DESCRIPTION.

2.3.A. Hydrology. The Holston River Watershed, designated 06010104 by the USGS, is approximately 999 square miles and drains to the Tennessee River.

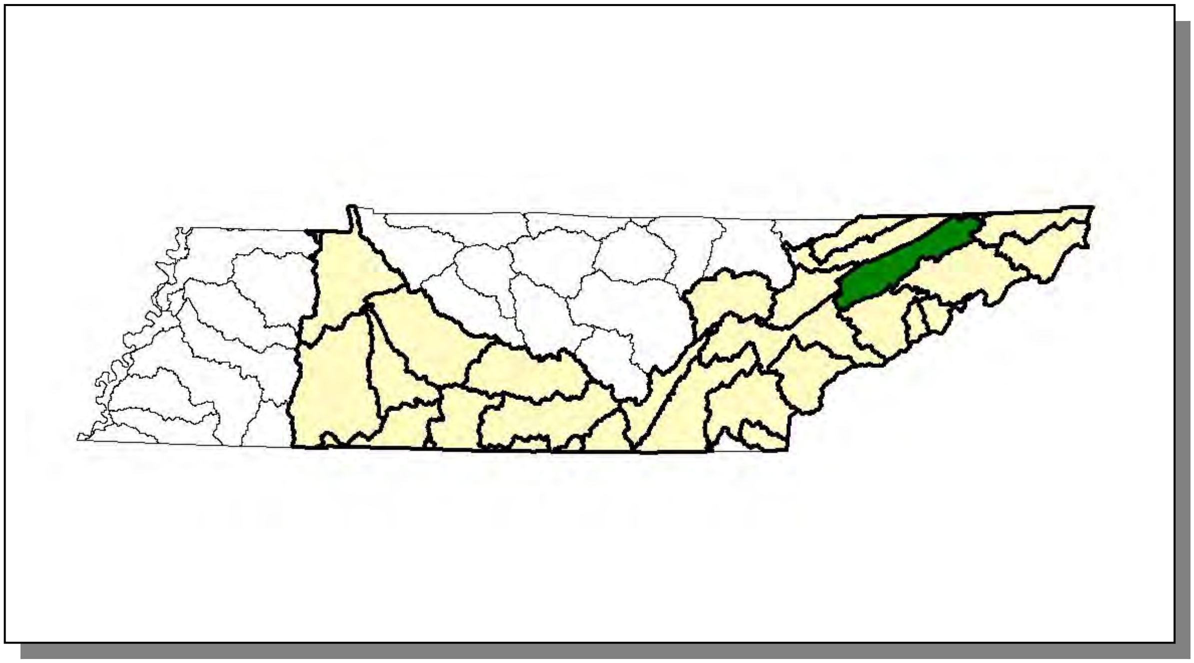


Figure 2-3. The Holston River Watershed is Part of the Tennesse River Basin.

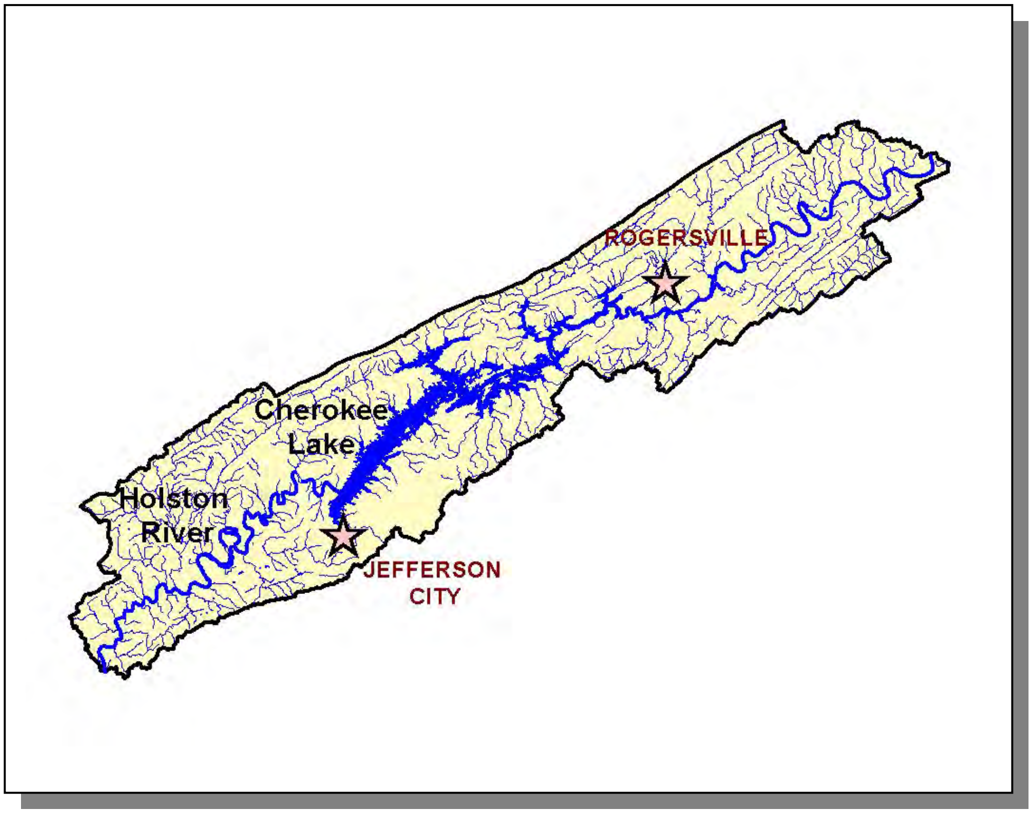


Figure 2-4. Hydrology in the Holston River Watershed. *There are 1,175.6 stream miles and 6,499 lake acres recorded in River Reach File 3 in the Holston River Watershed. Location of the Holston River, including Cherokee Lake, and the cities of Jefferson City and Rogersville are shown for reference.*

2.3.B. Dams. There are 16 dams inventoried by TDEC Division of Water Supply in the Holston River Watershed. These dams either retain 30 acre-feet of water or have structures at least 20 feet high.

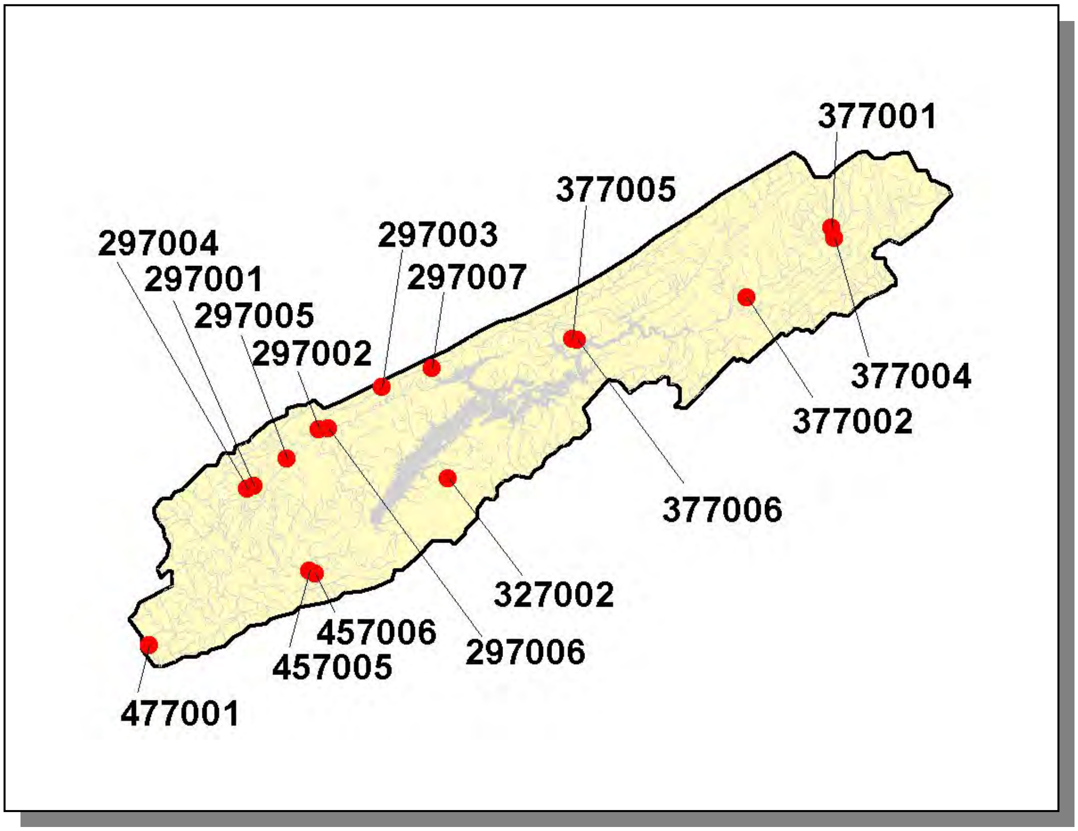


Figure 2-5. Location of Inventoried Dams in the Holston River Watershed. *More information, including identification of inventoried dams labeled, is provided in Appendix II and at http://gwidc.memphis.edu/website/dams/viewer.htm.*

2.4. LAND USE. Land Use/Land Cover information was provided by EPA Region 4 and was interpreted from 1992 Multi-Resolution Land Cover (MRLC) satellite imagery.

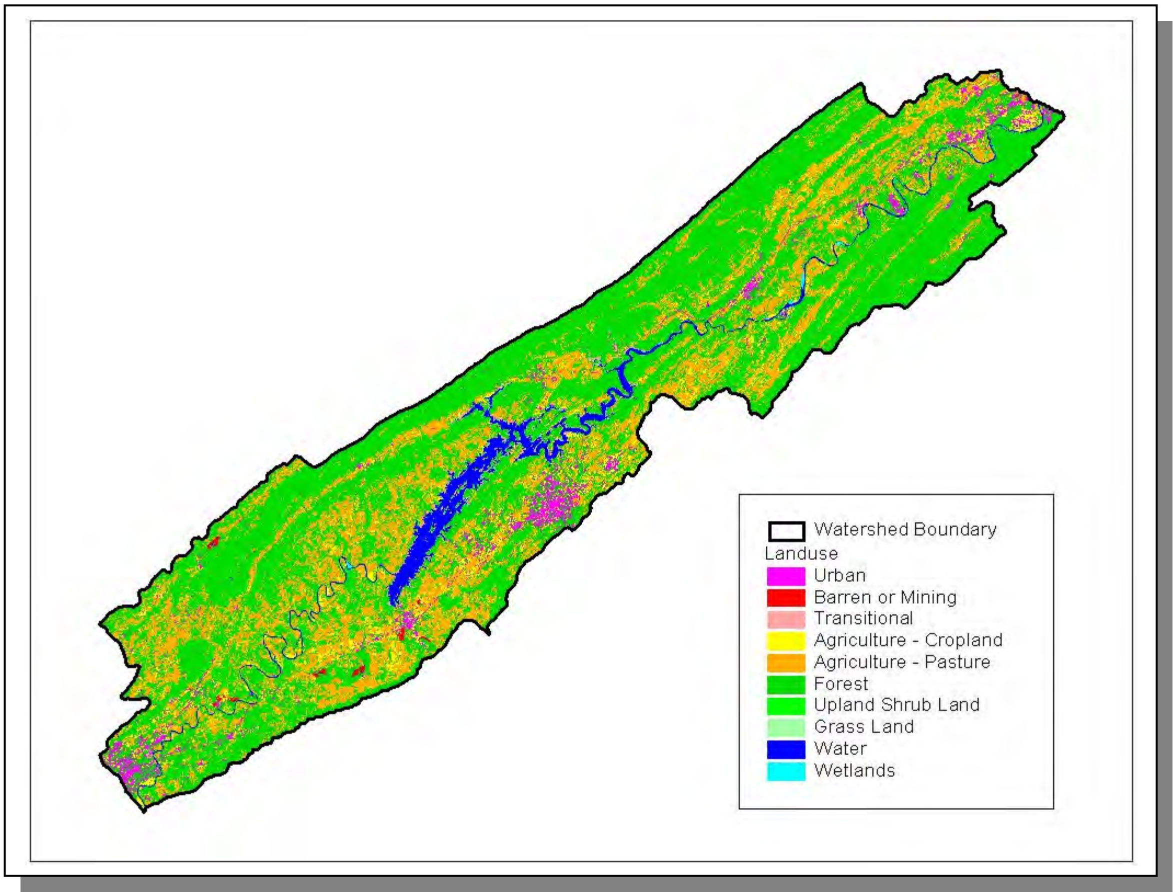


Figure 2-6. Illustration of Select Land Cover/Land Use Data from MRLC Satellite Imagery.

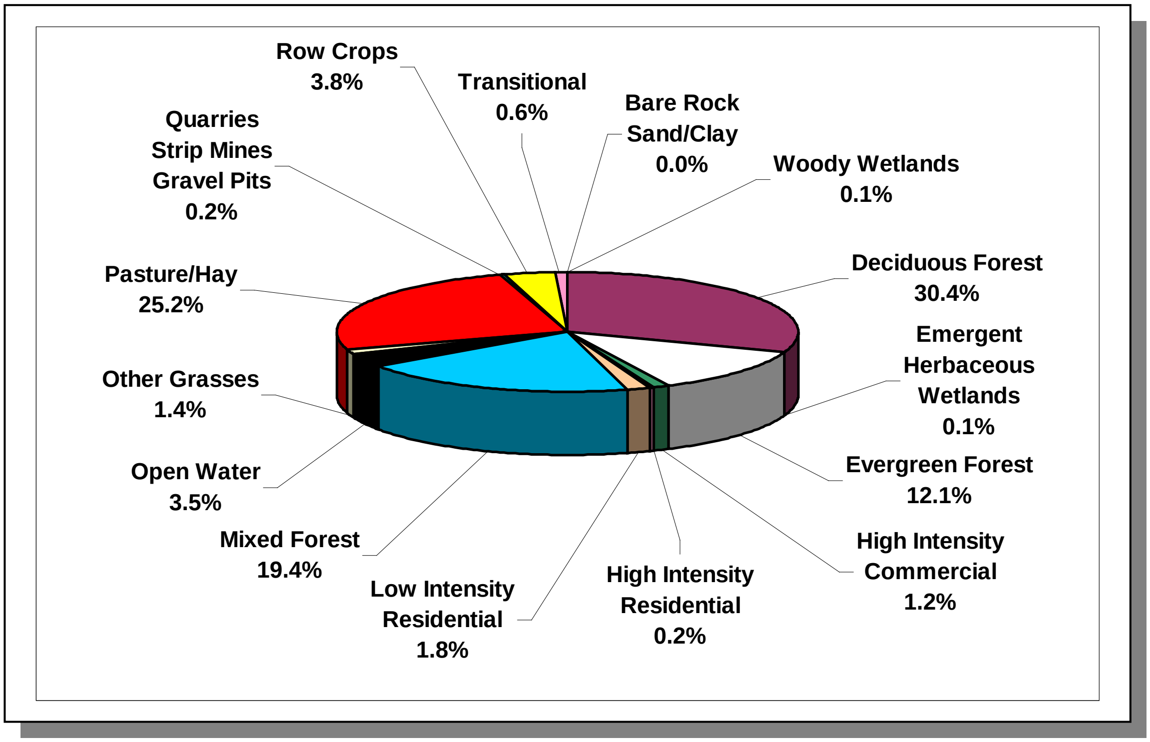


Figure 2-7. Land Use Distribution in the Holston River Watershed. *More information is provided in Appendix II.*

Sinkholes, springs, disappearing streams and caves characterize karst topography. The term "karst" describes a distinctive landform that indicates dissolution of underlying soluble rocks by surface water or ground water. Although commonly associated with limestone and dolomite (carbonate rocks), other highly soluble rocks such as gypsum and rock salt can be sculpted into karst terrain. In karst areas, the ground water flows through solution-enlarged channels, bedding planes and microfractures within the rock. The characteristic landforms of karst regions are: closed depressions of various size and arrangement; disrupted surface drainage; and caves and underground drainage systems. The term "karst" is named after a famous region in the former country of Yugoslavia.

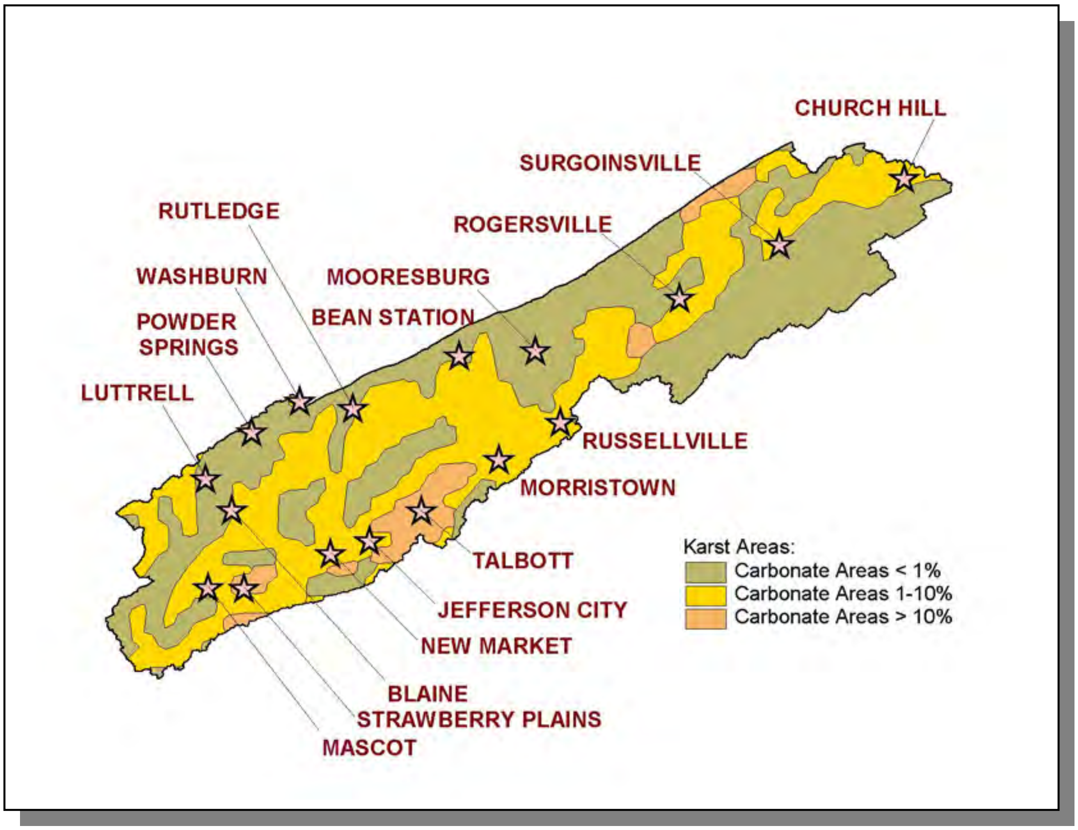


Figure 2-8. Illustration of Karst Areas in the Holston River Watershed. *Locations of communities in the watershed are shown for reference.*

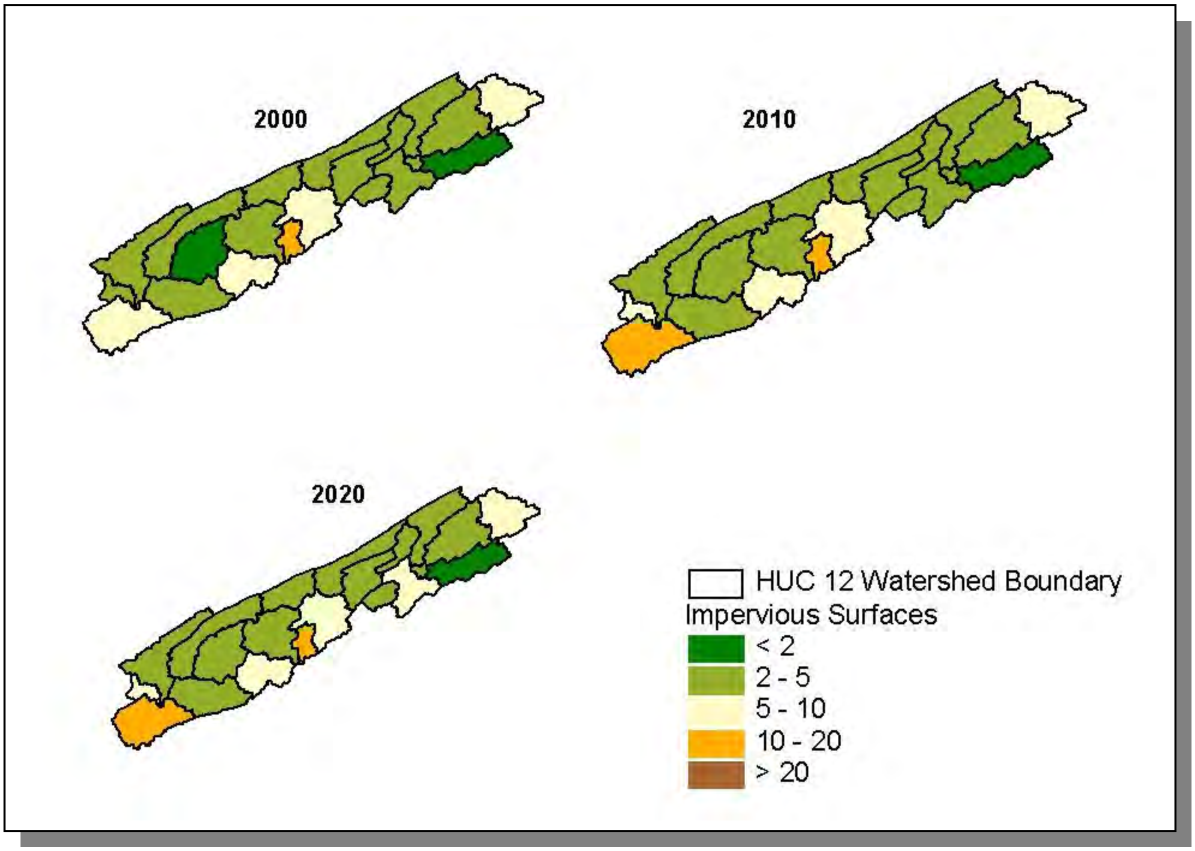


Figure 2-9. Illustration of Total Impervious Area in the Holston River Watershed. *All HUC-12 subwatersheds are shown. Current and projected total impervious cover (percent of total area) is provided by EPA Region 4. More information can be found at: http://www.epa.gov/ATHENS/research/impervious/*

2.5. ECOREGIONS AND REFERENCE STREAMS. Ecoregions are relatively homogeneous areas of similar geography, topography, climate and soils that support similar plant and animal life. Ecoregions serve as a spatial framework for the assessment, management, and monitoring of ecosystems and ecosystem components. Ecoregion studies can aid the selection of regional stream reference sites, identifying high quality waters, and developing ecoregion-specific chemical and biological water quality criteria.

There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee. The Holston River Watershed lies within 1 Level III ecoregion (Ridge and Valley) and contains 4 Level IV subecoregions:

- The **Southern Limestone / Dolomite Valleys and Low Rolling Hills (67f)** ecoregion form a heterogeneous region composed predominantly of limestone and cherty dolomite. Landforms are mostly low rolling ridges and valleys, and the solids vary in their productivity. Landcover includes intensive agriculture, urban and industrial, or areas of thick forest. White oak forests, bottomland oak forests, and sycamore-ash-elm riparian forests are the common forest types, and grassland barrens intermixed with cedar-pine glades also occur here.

- The **Southern Shale Valleys (67g)** ecoregion consist of lowlands, rolling valleys, and slopes and hilly areas that are dominated by shale materials. The northern areas are associated with Ordovician-age calcareous shale, and the well-drained soils are often slightly acidic to neutral. In the south, the shale valleys are associated with Cambrian-age shales that contain some narrow bands of limestone, but the soils tend to be strongly acid. Small farms and rural residences subdivide the land. The steeper slopes are used for pasture or have reverted to brush and forested land, while small fields of hay, corn, tobacco, and garden crops are grown on the foot slopes and bottom land.

- The **Southern Sandstone Ridges (67h)** ecoregion encompasses the major sandstone ridges, but these ridges also have areas of shale and siltstone. The steep, forested ridges have narrow crests, and the soils are typically stony, sandy, and of low fertility. The chemistry of streams flowing down the ridges can vary greatly depending on the geologic material. The higher elevation ridges are in the north, including Wallen Ridge, Powell Mountain, Clinch Mountain, and Bays Mountain. White Oak Mountain in the south has some sandstone on the west side, but abundant shale and limestone as well. Grindstone Mountain, capped by the Gizzard Group sandstone, is the only remnant of Pennsylvanian-age strata in the Ridge and Valley of Tennessee.

- The **Southern Dissected Ridges and Knobs (67i)** contain more crenulated, broken, or hummocky ridges, compared to the smoother, more sharply pointed sandstone ridges of 67h. Although shale is common, there is a mixture and interbedding of geologic materials. The ridges on the east side of Tennessee's Ridge and Valley tend to be associated with the Ordovician-age Sevier shale, Athens shale, and Holston and Lenoir limestones. These can include calcareous shale, limestone, siltstone, sandstone, and conglomerate. In the central and western part of Ecoregion 67, the shale ridges are associated with the Cambrian-age Rome Formation: shale and siltstone with beds of sandstone. Chestnut oak forests and pine forests are typical for the higher elevations of the ridges, with areas of white oak, mixed mesophytic forest, and tulip poplar on the lower slopes, knobs, and draws.

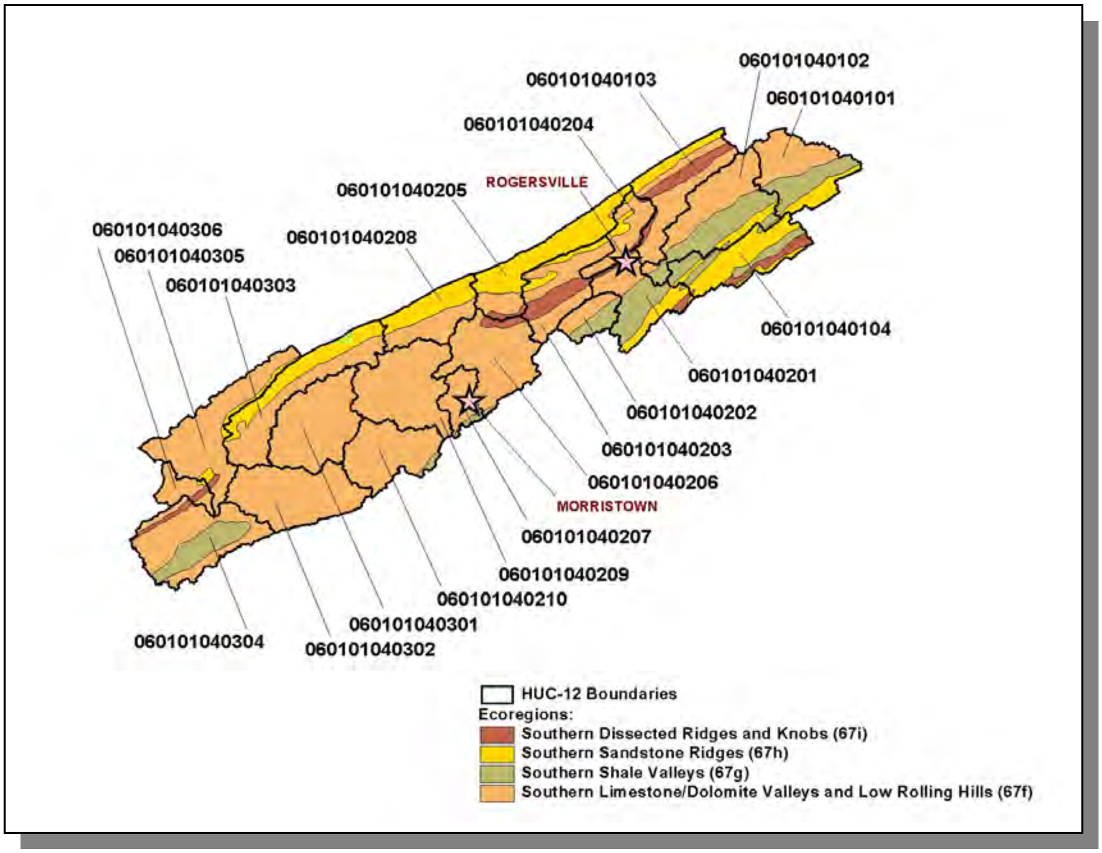


Figure 2-10. Level IV Ecoregions in the Holston River Watershed. *HUC-12 subwatershed boundaries and locations of Morristown and Rogersville are shown for reference.*

Each Level IV Ecoregion has at least one reference stream associated with it. A reference stream represents a least impacted condition and may not be representative of a pristine condition.

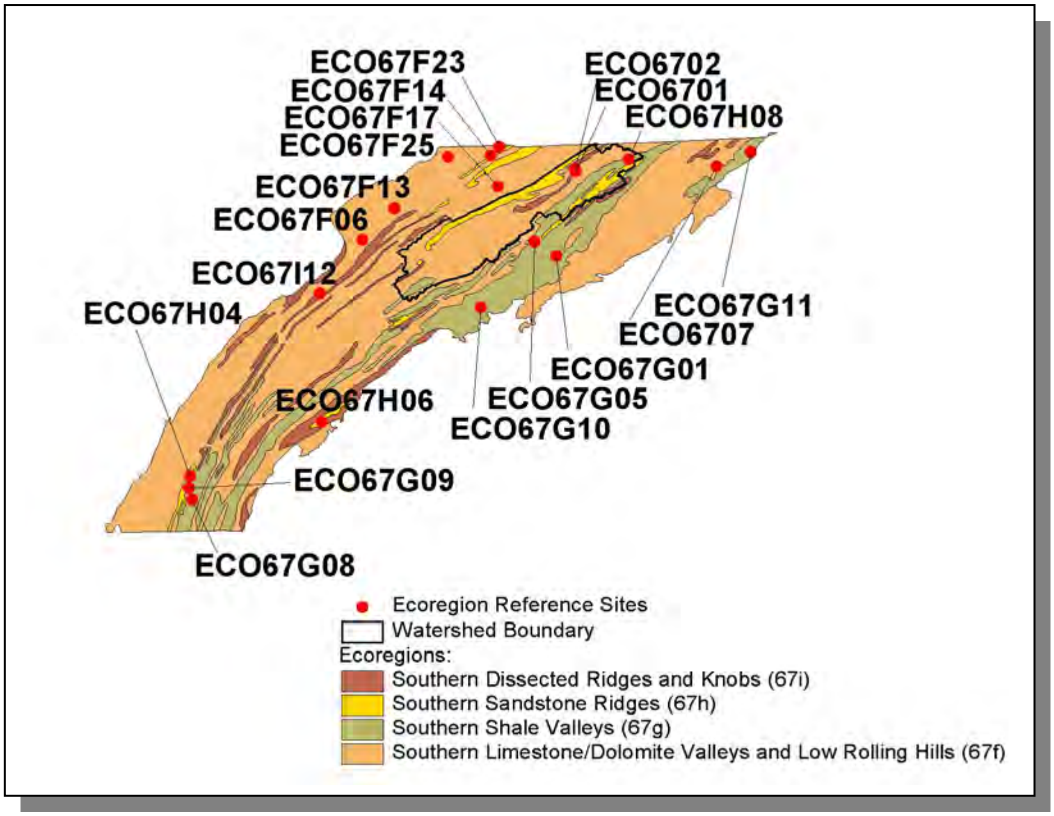


Figure 2-11. Ecoregion Monitoring Sites in Level IV Ecoregions 67f, 67g, 67h, and 67i. *The Holston River Watershed is shown for reference. More information, including which ecoregion reference sites were inactive or dropped prior to 01/01/2006, is provided in Appendix II.*

2.6. NATURAL RESOURCES.

2.6.A. Designated State Natural Area. The Natural Areas Program was established in 1971 with the passage of the Natural Areas Preservation Act. TDEC/Division of Natural Heritage administers the State Natural Areas program. Further information may be found at http://www.state.tn.us/environment/na/.

The Holston River Watershed has two Designated State Natural Areas:

Bays Mountain Class I Scenic-Recreational State Natural Area is a 3,000-acre natural area located only six miles from downtown Kingsport, Tennessee. This natural area is located in Sullivan and Hawkins Counties along the crest and inside slopes of Holston River Mountain and Bays Mountain in the Ridge and Valley Physiographic Province. When viewed from lower elevations, these two mountains, which are joined at their northern termini, appear to be a single ridge. But when inside the park, they form a natural and spectacular "bowl or basin" within which the park lies. The basin, surrounding slopes, and ridges are underlain with limestone, shale, and sandstone that support a diversity of plant and animal life.

House Mountain Class I Scenic-Recreational State Natural Area is an 850-acre natural area located in Knox County approximately eight miles from Knoxville. It is cooperatively managed under a lease agreement with the State by the Knox County Department of Parks and Recreation. The 2,100-foot crest of House Mountain provides significant vistas where visitors may scan the parallel ranges of the Unakas and Cumberlands some 50 miles away, or look northeast at the adjacent Clinch Mountain, and across the valley where the Trail of the Lonesome Pine is planned to lead north into Virginia.

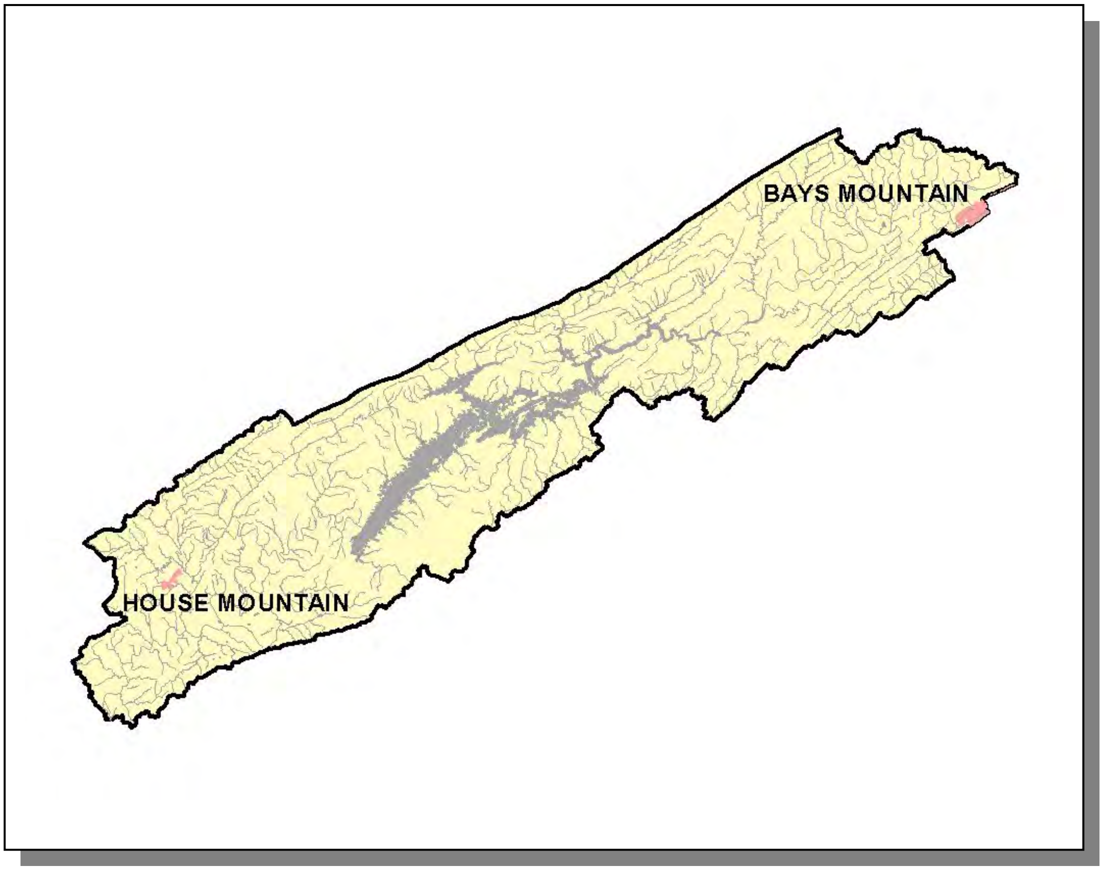


Figure 2-12. There are Two Designated State Natural Areas in the Holston River Watershed.

2.6.B. Rare Plants and Animals. The Heritage Program in the TDEC Division of Natural Heritage maintains a database of rare species that is shared by partners at The Nature Conservancy, Tennessee Wildlife Resources Agency, the US Fish and Wildlife Service, and the Tennessee Valley Authority. The information is used to: 1) track the occurrence of rare species in order to accomplish the goals of site conservation planning and protection of biological diversity, 2) identify the need for, and status of, recovery plans, and 3) conduct environmental reviews in compliance with the federal Endangered Species Act.

GROUPING	NUMBER OF RARE SPECIES
Insects/Spiders	3
Mussels	11
Snails	1
Birds	4
Fish	8
Mammals	7
Plants	22
Total	**56**

Table 2-3. There are 56 Known Rare Plant and Animal Species in the Holston River Watershed.

In the Holston River Watershed, there are eight known rare fish species, eleven known rare mussel species, and one known rare snail species.

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
Carpiodes velifer	Highfin carpsucker		D
Cycleptus elongates	Blue sucker		T
Cyprinella monacha	Spotfin chub	LT	T
Erimystax cahni	Slender chub	LT	T
Percina aurantiaca	Tangerine darter		D
Percina burtoni	Blotchside darter		D
Percina tanasi	Snail darter	LT	T
Phoxinus tennesseensis	Tennessee dace		D
Conradilla caelata	Birdwing pearlymussel	LE	E
Cumberlandia monodonta	Spectaclecase		
Dromus dromas	Dromadary pearlymussel	LE	E
Fusconaia cuneolus	Fine-rayed pigtoe	LE	E
Fusconaia edgariana	Shiny pigtoe	LE	E
Lampsilis abrupta	Pink mucket	LE	E
Plethobasus cicatricosus	White wartyback	LE	E
Quadrula intermedia	Cumberland monkeyface	LE	E
Ventridens coelaxis	Bidentate dome		
Villosa perpurea	Purple bean	LE	E
Villosa trabalis	Cumberland bean	LE	E
Io fluvialis	Spiny riversnail		

Table 2-4. Rare Aquatic Species in the Holston River Watershed. *Federal Status: LE, Listed Endangered by the U.S. Fish and Wildlife Service, MC, Management Concern for U.S. Fish and Wildlife Service. State Status: E, Listed Endangered by the Tennessee Wildlife Resources Agency; D, Deemed in Need of Management by the Tennessee Wildlife Resources Agency. More information may be found* at http://www.state.tn.us/environment/na/.

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2.6.C. Wetlands. The Division of Natural Areas maintains a database of wetland records in Tennessee. These records are a compilation of field data from wetland sites inventoried by various state and federal agencies. Maintaining this database is part of Tennessee's Wetland Strategy, which is described at:

http://www.state.tn.us/environment/na/wetlands/

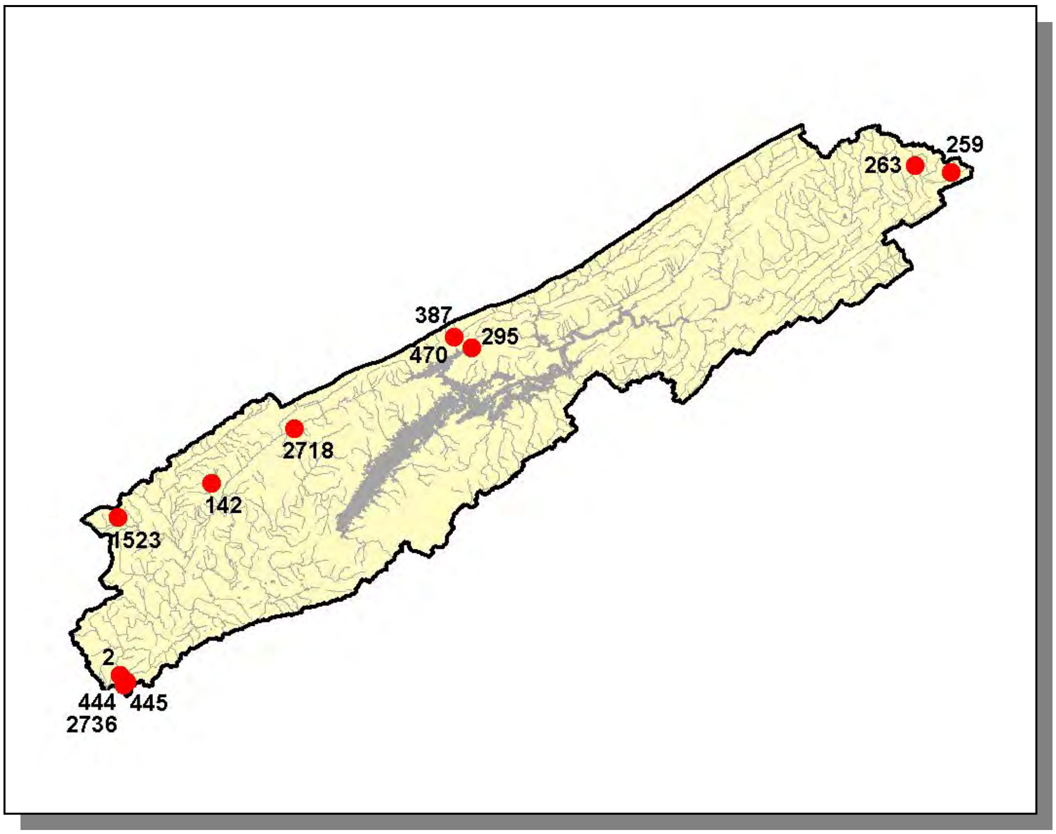

Figure 2-13. Location of Wetland Sites in TDEC Division of Natural Heritage Database in Holston River Watershed. This map represents an incomplete inventory and should not be considered a dependable indicator of the presence of wetlands. *There may be additional wetland sites in the watershed. More information, including identification of wetland sites labeled, is provided in Appendix II.*

2.7. CULTURAL RESOURCES.

2.7.A. Nationwide Rivers Inventory. The Nationwide Rivers Inventory, required under the Federal Wild and Scenic Rivers Act of 1968, is a listing of free-flowing rivers that are believed to possess one or more outstanding natural or cultural values. Exceptional scenery, fishing or boating, unusual geologic formations, rare plant and animal life, cultural or historic artifacts that are judged to be of more than local or regional significance are the values that qualify a river segment for listing. The Tennessee Department of Environment and Conservation and the Rivers and Trails Conservation Assistance branch of the National Park Service jointly compile the Nationwide Rivers Inventory from time to time (most recently in 1997). Under a 1980 directive from the President's Council on Environmental Quality, all Federal agencies must seek to avoid or mitigate actions that would have an adverse effect on Nationwide Rivers Inventory segments.

The most recent version of the Nationwide Rivers Inventory lists portions of one river in the Holston River Watershed:

> Holston River (RM 0 to RM 53) is a scenic stream segment affording excellent duck hunting and fishing.

RIVER	SCENIC	RECREATION	GEOLOGIC	FISH	WILDLIFE	HISTORIC	CULTURAL
Holston River	X	X	X	X	X	X	X

Table 2-5. Attributes of Streams Listed in the Nationwide Rivers Inventory.

Additional information may be found online at http://www.ncrc.nps.gov/rtca/nri/

2.7.B. Public Lands. Some sites representative of the cultural heritage are under state or federal protection:

- Bays Mountain Park is a 3500-acre park featuring a 44-acre lake. Most of the Park is in the South Fork Holston River Watershed. More information may be found at http://www.baysmountain.com/.

- Buffalo Springs Wildlife Management Area a 342-acre area managed by TWRA in Grainger County.

- Cherokee Dam Public Camping Area is a 41-site campground located along the shores of Cherokee Lake. More information may be found at http://www.tva.gov/river/recreation/camping.htm#cherokee.

- Cherokee Park is a 74-site campground located along the shores of Cherokee Lake. More information may be found at http://www.tnvacation.com/vendors/cherokee_park_campground/.

- Fall Creek Public Camping Area (Campground and Marina) is located on Cherokee Lake. More information may be found at http://fallcreekmarinaoncherokee.com/index.html.

- Grainger County Park is located in Rutledge.

- Holston Ordinance Works Wildlife Management Area is a public hunting area managed by the Tennessee Wildlife Resources Agency and Holston Army Ammunition Plant.

- John Sevier Dam Public Use Area is a campground operated by the Tennessee Valley Authority on the Holston River near Rogersville.

- John Sevier Refuge Wildlife Management Area is a state waterfowl refuge located in Hawkins County managed by the Tennessee Wildlife Resources Agency.

- May Springs Public Camping Area (Greenlee Campground) is located along the shores of Cherokee Lake in Rutledge. More information may be found at http://www.tnvacation.com/vendors/greenlee_campground_may_springs.

- Panther Creek Park is a 1,435-acre state park located along the shores of Cherokee Lake. More information may be found at http://www.state.tn.us/environment/parks/parks/PantherCreek.

- Phipps Bend Refuge is a 315-acre refuge located along the Holston River in Hawkins County and managed by the Tennessee Wildlife Resources Agency.

- Rogersville Historic District is listed on the National Register of Historic Places. It has the largest number of Federal-style architecture in the state. More information may be found at http://www.rogersville.us/attractdetail.htm.

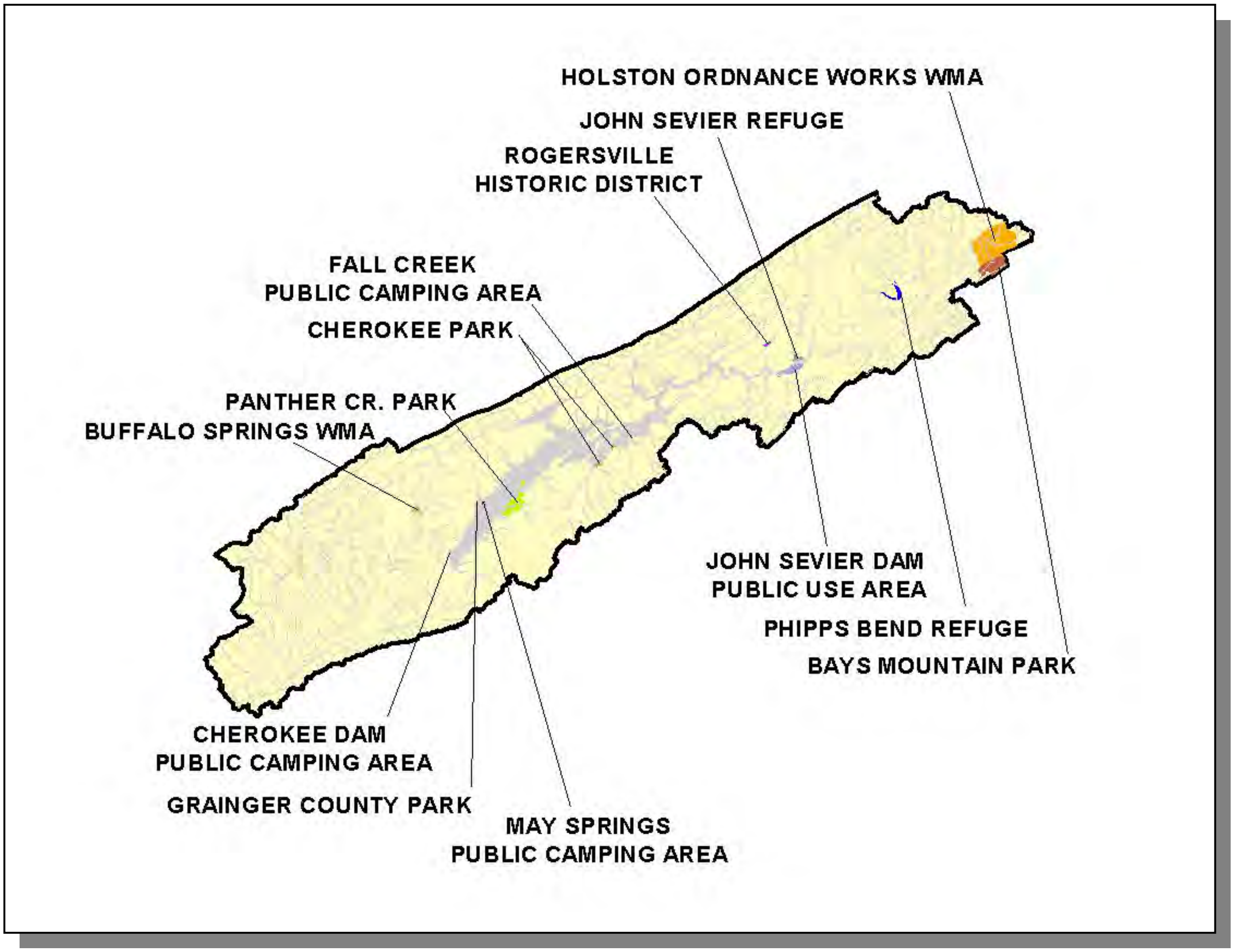

Figure 2-14. Public Lands in the Holston River Watershed. *Data are from Tennessee Wildlife Resources Agency. WMA, Wildlife Management Area.*

2.8. TENNESSEE RIVERS ASSESSMENT PROJECT. The Tennessee Rivers Assessment is part of a national program operating under the guidance of the National Park Service's Rivers and Trails Conservation Assistance Program. The Assessment is an inventory of river resources, and should not be confused with "Assessment" as defined by the Environmental Protection Agency. A more complete description can be found in the Tennessee Rivers Assessment Summary Report, which is available from the Department of Environment and Conservation and on the web at:

http://www.state.tn.us/environment/wpc/publications/riv/

STREAM	NSQ	RB	RF	STREAM	NSQ	RB	RF
Beaver Creek	4			Honeycutt Creek	3		
Beech Crek	2		2	Little Flat Creek	3		
Big Creek	3		1	Mossy Creek	4		1
Bradley Creek	3			North Fork Beech Creek	3		
Caney creek	3			Panther Creek	3		
Cedar Creek	3			Poor Valley Creek	3		2
Cloud Creek	3		2	Richland Creek	4		2
Crockett Creek	4			Robertson Creek	3		2
Dodson Creek	3			Roseberry Creek	3		
Dryland Creek	4			Stanley Creek	2		2
Fall Crek	3			Stubblefield Creek	3		
Fisher Creek	3			Swanpond Creek	3		
Flat Creek	3		2	Thompson Creek	3		
Hard Creek	3		2	Turkey Creek	4		
Holston River	2,3	1,2	1,2	Young Creek	3		

Table 2-6. Tennessee Rivers Assessment Project Stream Scoring in the Holston River Watershed.

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Categories: NSQ, Natural and Scenic Qualities
RB, Recreational Boating
RF, Recreational Fishing

Scores: 1. Statewide or greater Significance; Excellent Fishery
2. Regional Significance; Good Fishery
3. Local Significance; Fair Fishery
4. Not a significant Resource; Not Assessed

CHAPTER 3

WATER QUALITY ASSESSMENT OF THE HOLSTON RIVER WATERSHED.

3.1. BACKGROUND. Section 305(b) of The Clean Water Act requires states to report the status of water quality every two years. Historically, Tennessee's methodologies, protocols, frequencies and locations of monitoring varied depending upon whether sites were ambient, ecoregion, or intensive survey. Alternatively, in areas where no direct sampling data existed, water quality may have been assessed by evaluation or by the knowledge and experience of the area by professional staff.

In 1996, Tennessee began the watershed approach to water quality protection. In the Watershed Approach, resources—both human and fiscal—are better used by assessing water quality more intensively on a watershed-by-watershed basis. In this approach, water quality is assessed in year three of the watershed cycle, following one to two years of data collection. More information about the Watershed Approach may be found in Chapter 1 and at http://www.state.tn.us/environment/wpc/watershed/

The assessment information is used in the 305(b) Report (The Status of Water Quality in Tennessee) and the 303(d) list as required by the Clean Water Act.

The 305(b) Report documents the condition of the State's waters. Its function is to provide information used for water quality based decisions, evaluate progress, and measure success.

Tennessee uses the 305(b) Report to meet four goals (from 2006 305(b) Report):

1. Describe the water quality assessment process

2. Categorize waters in the State by placing them in the assessment categories suggested by federal guidance

3. Identify waterbodies that pose imminent human health risks due to elevated bacteria levels or contamination of fish

4. Provide detailed information on each watershed

EPA aggregates the state use support information into a national assessment of the nation's water quality. This aggregated use support information can be viewed at EPA's "Surf Your Watershed" site at http://cfpub.epa.gov/surf/locate/index.cfm.

The 303(d) list is a compilation of the waters of Tennessee that fail to support some or all of their classified uses. The 303(d) list does not include streams determined to be fully supporting designated uses nor streams the Division of Water Pollution Control cannot assess due to lack of water quality information. Also absent are streams where a control strategy is already in the process of being implemented.

Once a stream is placed on the 303(d) list, it is considered a priority for water quality improvement efforts. These efforts not only include traditional regulatory approaches such as permit issuance, but also include efforts to control pollution sources that have historically been exempted from regulations, such as certain agricultural and forestry activities. If a stream is on the 303(d) list, the Division of Water Pollution Control cannot use its regulatory authority to allow additional sources of the same pollutant(s) for which it is listed.

States are required to develop Total Maximum Daily Loads (TMDLs) for 303(d)-listed waterbodies. The TMDL process establishes the maximum amount of a pollutant that a waterbody can assimilate without exceeding water quality standards and allocates this load among all contributing pollutant sources. The purpose of the TMDL is to establish water quality objectives required to reduce pollution from both point and nonpoint sources and to restore and maintain the quality of water resources.

The current 303(d) List is available on the TDEC homepage at:
http://tennessee.gov/environment/wpc/publications/303d2006.pdf

and information about Tennessee's TMDL program may be found at:
http://www.state.tn.us/environment/wpc/tmdl/.

This chapter provides a summary of water quality in the Holston River Watershed, summarizes data collection and assessment results, and describes impaired waters.

3.2. DATA COLLECTION. The figures and table below represent data collected in the last 5-year cycle (July 1, 2000 through June 30, 2005). Water quality data are from one of four site types: (1) Ambient sites, (2) Ecoregion sites, (3) Watershed Screening sites, or (4) Tier Evaluation sites.

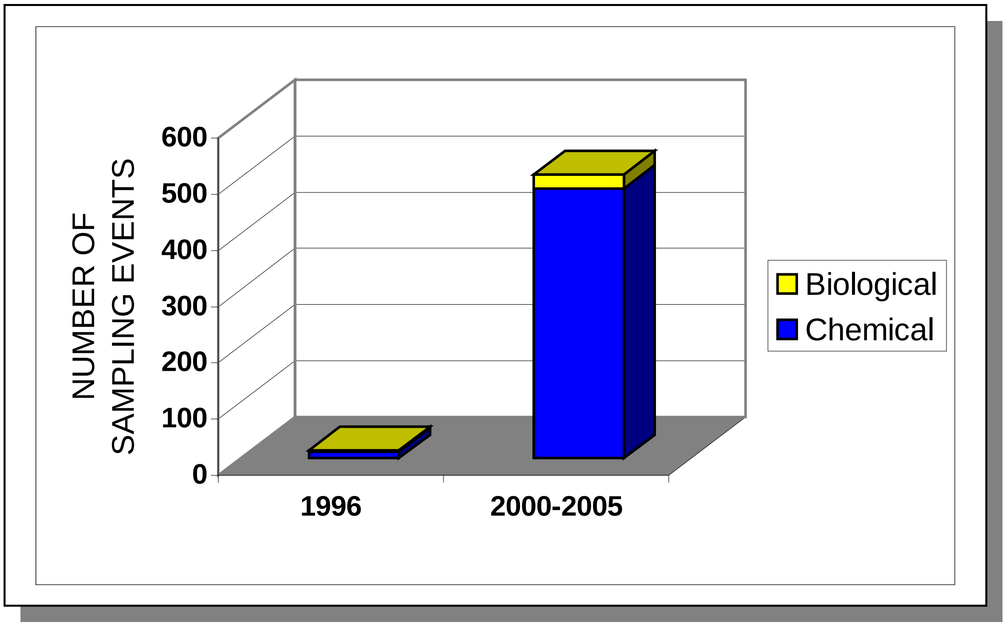

Figure 3-1. Number of Sampling Events Using the Traditional Approach (1996) and Watershed Approach (July 1, 2000 through June 30, 2005) in the Holston River Watershed.

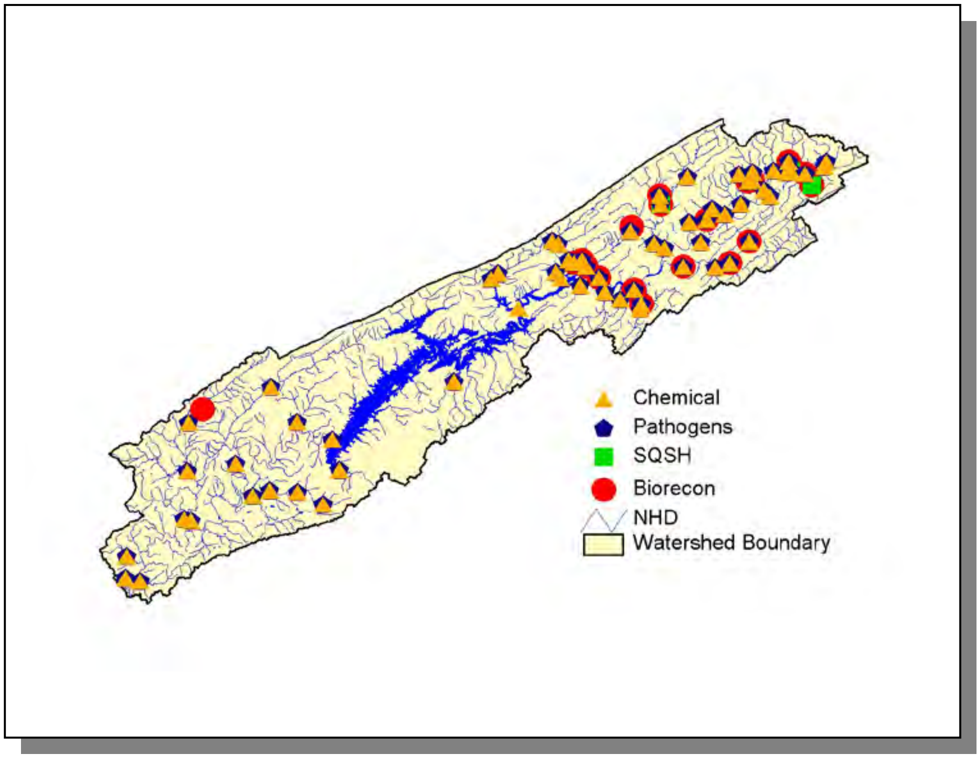

Figure 3-2. Location of Monitoring Sites in the Holston River Watershed (July 1, 2000 through June 30, 2005). *Pathogens include E. coli and fecal coliform; NHD, National Hydrography Dataset of Streams; SQSH, Semi-Quantitative Single Habitat Assessment.*

	1996	**2000-2005**
Biological	2	25
Chemical	12	479
Total	**14**	**504**

Table 3-1. Number of Sampling Events in the Holston River Watershed in the last 5-Year Cycle (July 1, 2000 through June 30, 2005).

3.2.A. Ambient Monitoring Sites. These fixed-station chemical monitoring sites are sampled quarterly or monthly by the Environmental Field Office-Knoxville staff (this is in addition to samples collected by water and wastewater treatment plant operators). Samples are analyzed by the Tennessee Department of Health, Division of Environmental Laboratory Services. Ambient monitoring data are used to assess water quality in major bodies of water where there are NPDES facilities and to identify trends in water quality. Water quality parameters traditionally measured at ambient sites in the Tennessee portion of the Holston River Watershed are provided in Appendix IV.

Data from ambient monitoring stations are entered into the STORET (Storage and Retrieval) system administered by EPA.

3.2.B. Ecoregion Sites. Ecoregions are relatively homogeneous areas of similar geography, topography, climate and soils that support similar plants and animals. The delineation phase of the Tennessee Ecoregion Project was completed in 1997 when the ecoregions and subecoregions were mapped and summarized (EPA/600/R-97/022). There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee (see Chapter 2 for more details). The Holston River Watershed lies within 1 Level III ecoregion (Ridge and Valley) and contains 4 subecoregions (Level IV):

- Southern Limestone/Dolomite Valleys and Low Rolling Hills (67f)
- Southern Shale Valleys (67g)
- Southern Sandstone Ridges (67h)
- Southern Dissected Ridges and Knobs (67i)

Ecoregion reference sites are chemically monitored using methodology outlined in the Division's Chemical Standard Operating Procedure (Standard Operating Procedure for Modified Clean Technique Sampling Protocol). Macroinvertebrate samples are collected in spring and fall. These biological sample collections follow methodology outlined in the Tennessee Biological Standard Operating Procedures Manual. Volume 1: Macroinvertebrates and EPA's Revision to Rapid Bioassessment Protocols for use in Streams and Rivers.

Ecoregion stations are scheduled to be monitored during the watershed sampling time period.

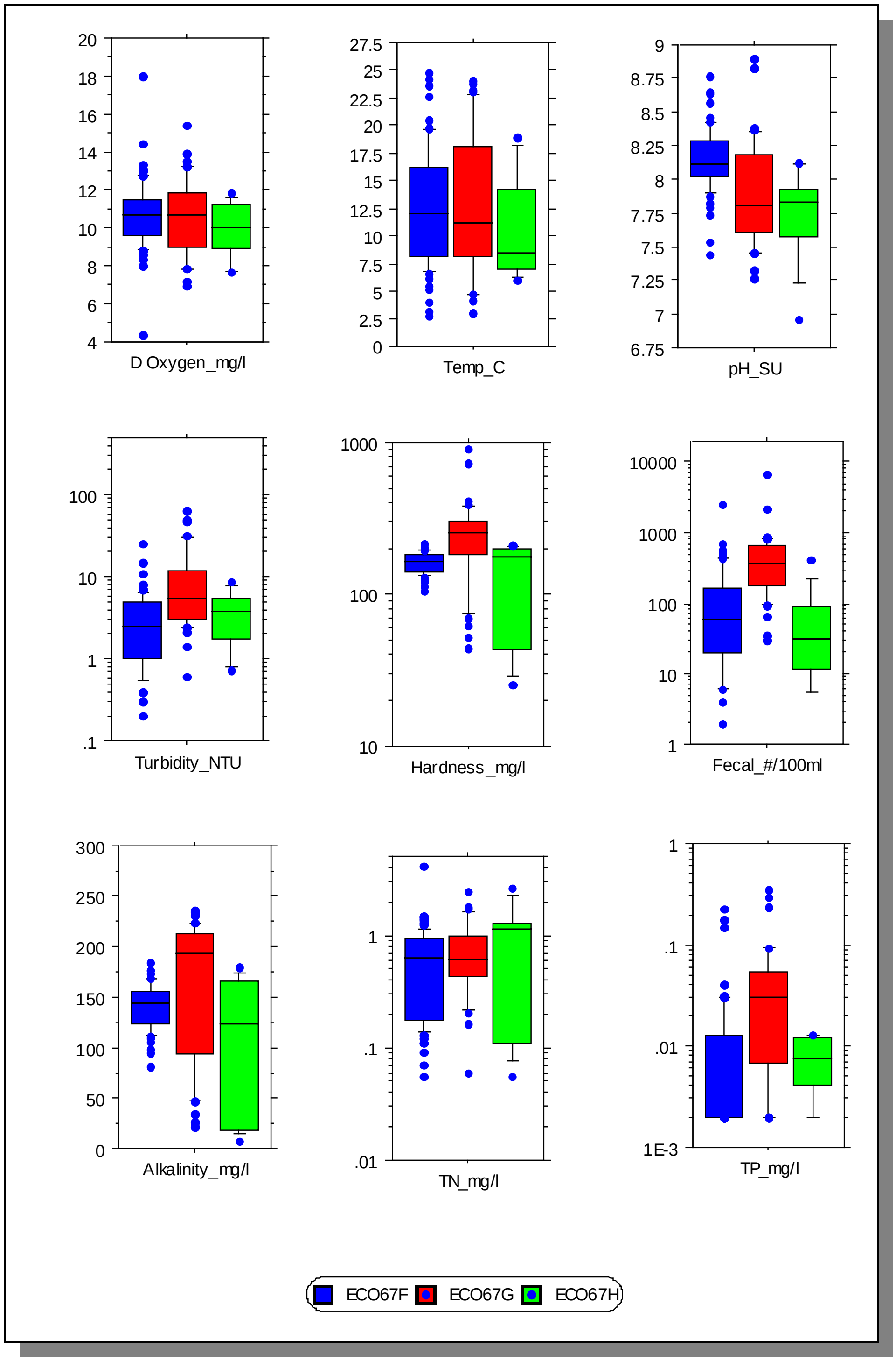

Figure 3-3. Select Chemical Data Collected in Holston River Watershed Ecoregion Sites. *Boxes and bars illustrate 10th, 25th, median, 75th, and 90th percentiles. Extreme values are also shown as dots. Fecal, fecal coliform bacteria; TN, Total Nitrogen; TP, Total Phosphorus.*

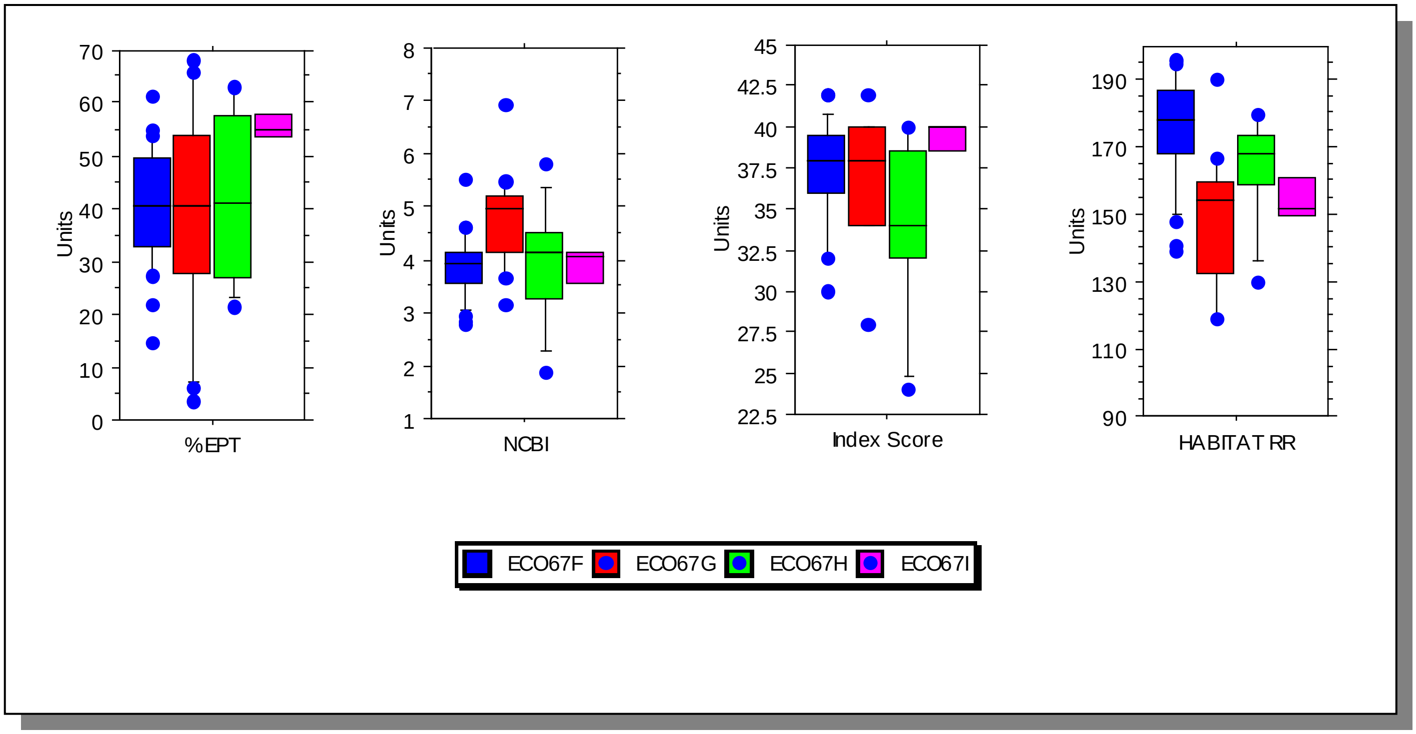

Figure 3-4. Benthic Macroinvertebrate and Habitat Scores for Holston River Watershed Ecoregion Sites. *Boxes and bars illustrate 10th, 25th, median, 75th, and 90th percentiles. Extreme values are also shown as dots. NCBI, North Carolina Biotic Index. Index Score and Habitat Riffle/Run scoring system are described in TDEC's Quality System Standard Operating Procedure for Macroinvertebrate Stream Surveys (2006).*

3.2.C. Watershed Screening Sites. Activities that take place at watershed sites are benthic macroinvertebrate stream surveys, physical habitat determinations and/or chemical monitoring. Following review of existing data, watershed sites are selected in Year 1 of the watershed approach when preliminary monitoring strategies are developed. Additional sites may be added in Year 2 when additional monitoring strategies are implemented.

A Biological Reconnaissance (BioRecon) is used as a screening tool to describe the condition of water quality, in general, by determining the absence or presence of clean water indicator organisms, such as EPT (Ephemeroptera [mayfly], Plecoptera [stonefly], Trichoptera [caddisfly]). Factors and resources used for selecting BioRecon sites are:

- The current 303(d) list,
- HUC-10 maps (every HUC-10 is scheduled for a BioRecon)
- Land Use/Land Cover maps
- Topographic maps
- Locations of NPDES facilities
- Sites of recent ARAP activities.

An intensive multiple or single habitat assessment involves the regular monitoring of a station over a fixed period of time. Intensive surveys (Rapid Bioassessment Protocols) are performed when BioRecon results warrant it.

3.2.D. Special Surveys. These investigations are performed when needed and include:

- ARAP in-stream investigation
- Time-of-travel dye study
- Sediment oxygen demand study
- Lake eutrophication study

3.3. STATUS OF WATER QUALITY. Overall use support is a general description of water quality conditions in a water body based on determination of individual use supports. Use support determinations, which can be classified as monitored or evaluated, are based on:

- Data less than 5 years old (monitored)
- Data more than 5 years old (evaluated)
- Knowledge and experience of the area by technical staff (evaluated)
- Complaint investigation (monitored, if samples are collected)
- Other readily available Agencies' data (monitored)
- Readily available Volunteer Monitoring data (monitored, if certain quality assurance standards are met)

All readily available data are considered, including data from TDEC Environmental Field Offices, Tennessee Department of Health (Aquatic Biology Section of Laboratory Services), Tennessee Wildlife Resources Agency, National Park Service, Tennessee Valley Authority, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Geological Survey, U.S. Forest Service, universities and colleges, the regulated community, and the private sector.

The assessment is based on the degree of support of designated uses as measured by compliance with Tennessee's water quality standards.

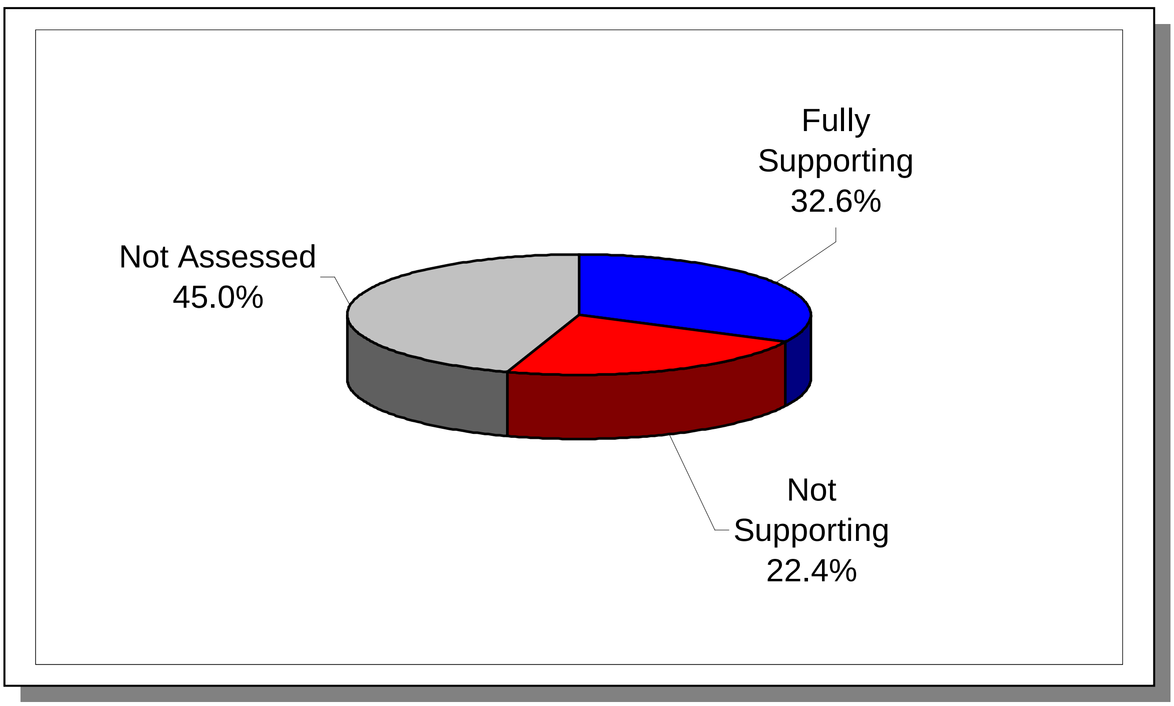

Figure 3-5. Water Quality Assessment of Streams in the Holston River Watershed. *Assessment data are based on the 2004 Water Quality Assessment of 1,175.6 stream miles in the watershed. More information is provided in Appendix III.*

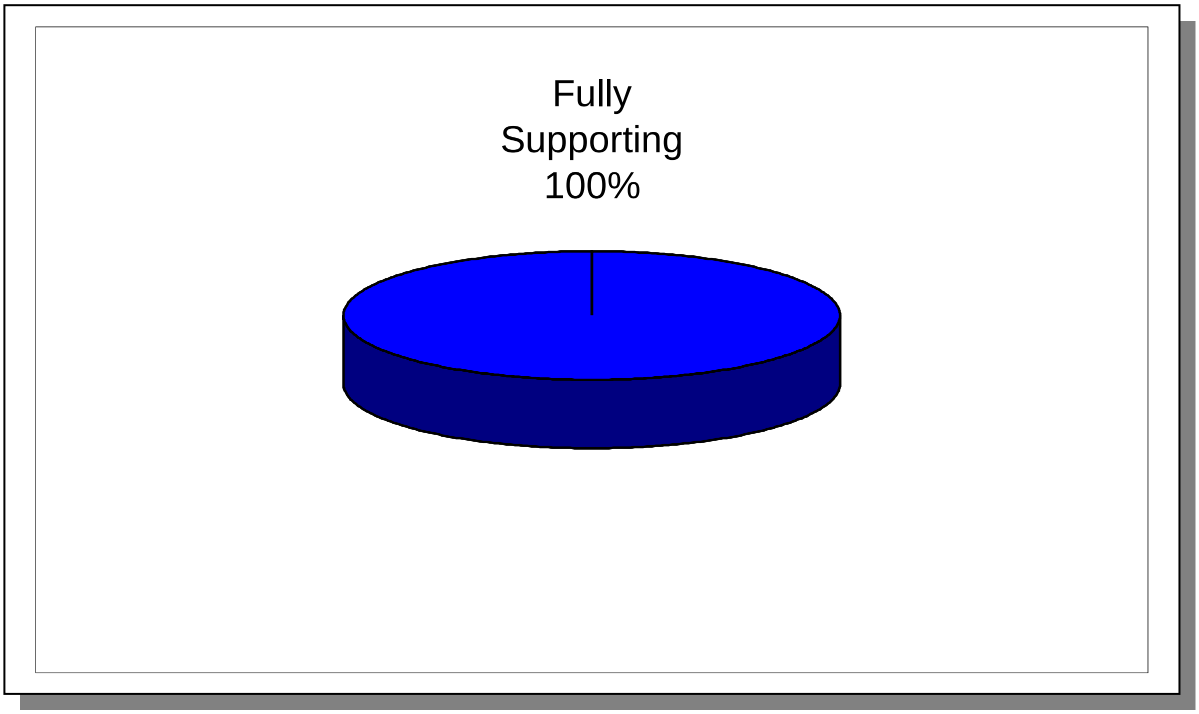

Figure 3-6. Water Quality Assessment of Lakes in the Holston River Watershed. *Assessment data are based on the 2004 Water Quality Assessment of 5,109 lake acres in the watershed. More information is provided in Appendix III.*

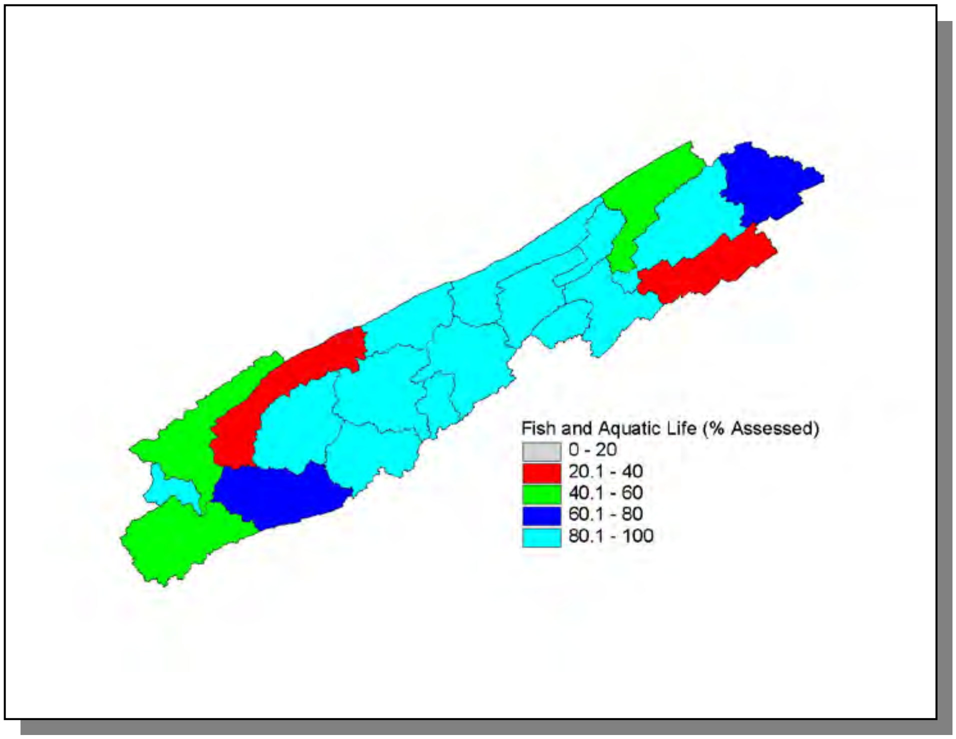

Figure 3-7. Percentage of Stream Miles Assessed for Support of Fish and Aquatic Life Designated Use in HUC-12 Subwatersheds.

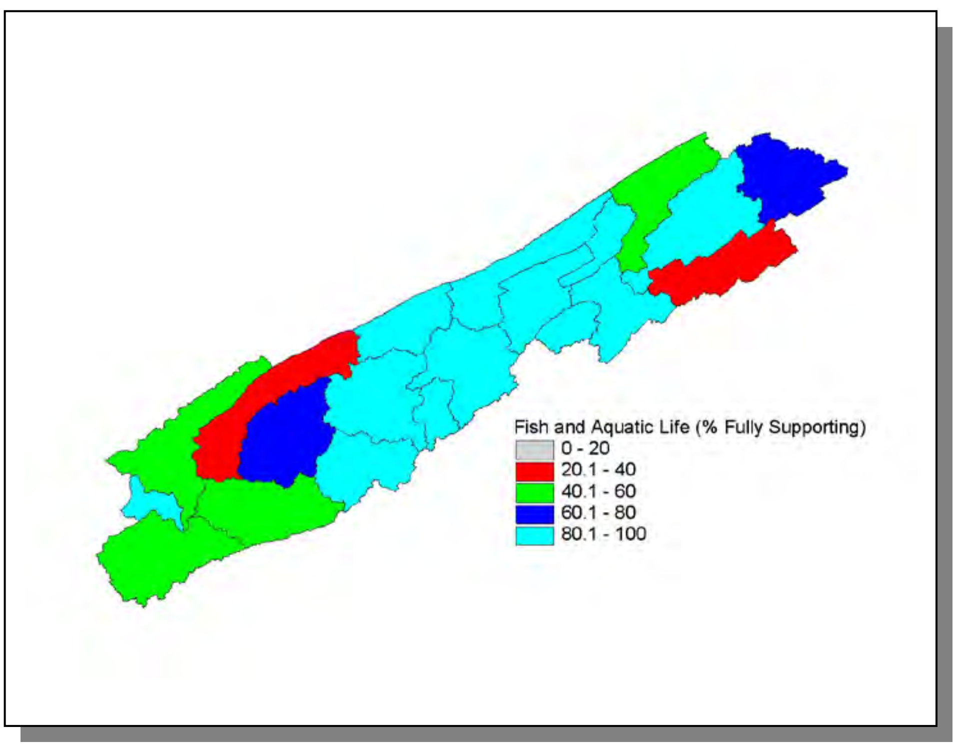

Figure 3-8. Percentage of Stream Miles Fully Supporting for Fish and Aquatic Life Designated Use in HUC-12 Subwatersheds.

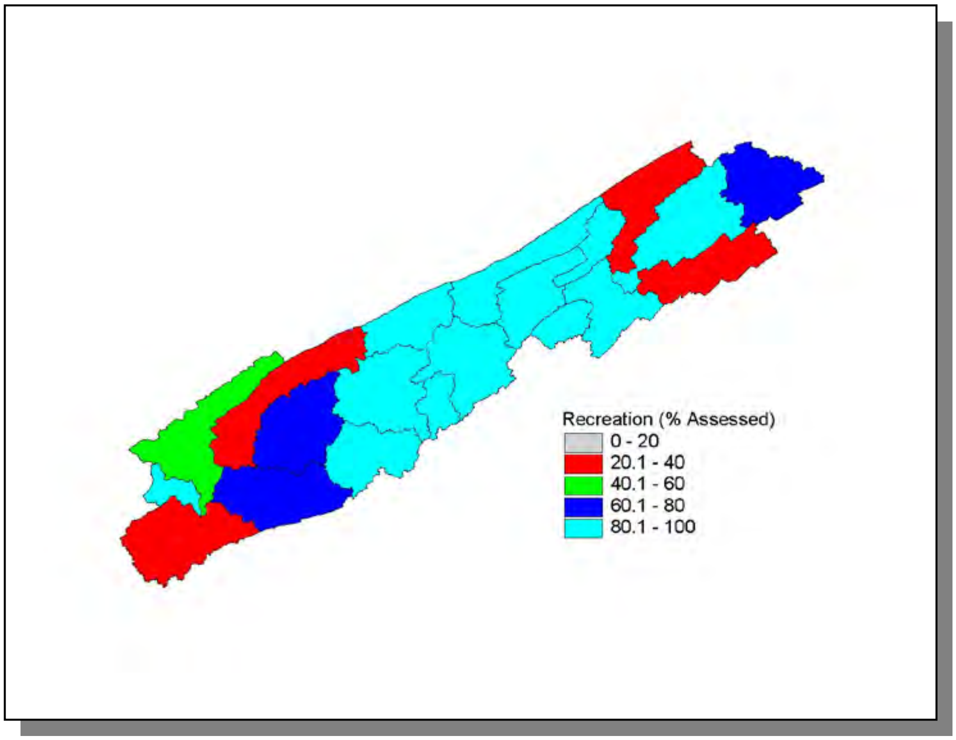

Figure 3-9. Percentage of Stream Miles Assessed for Support of Recreation Designated Use in HUC-12 Subwatersheds.

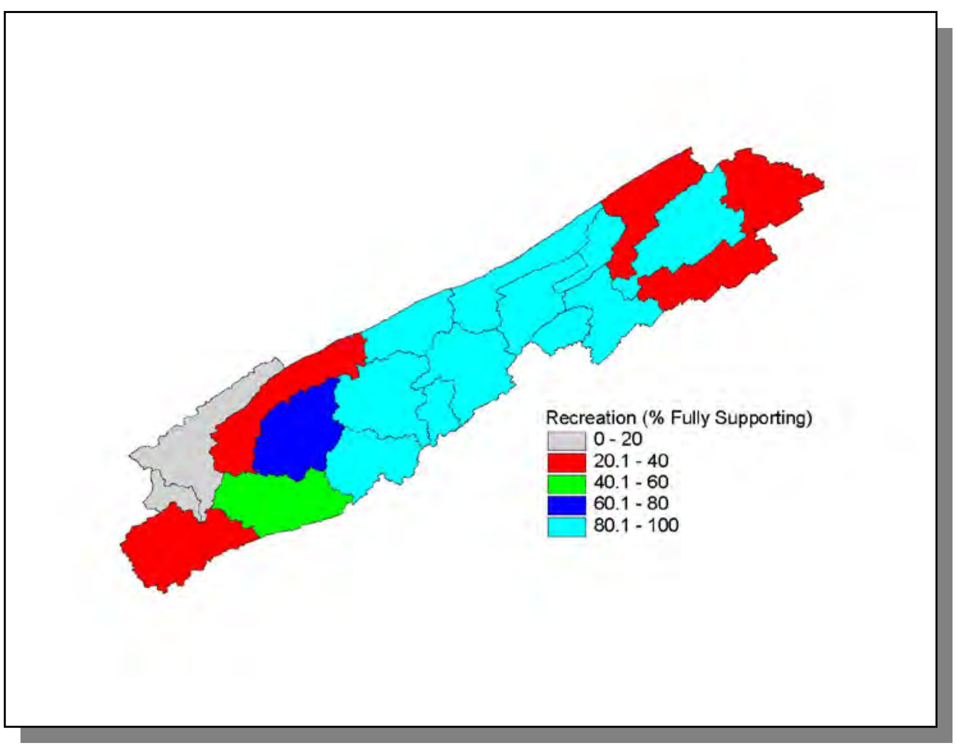

Figure 3-10. Percentage of Stream Miles Fully Supporting for Recreation Designated Use in HUC-12 Subwatersheds.

3.3.A. Assessment Summary.

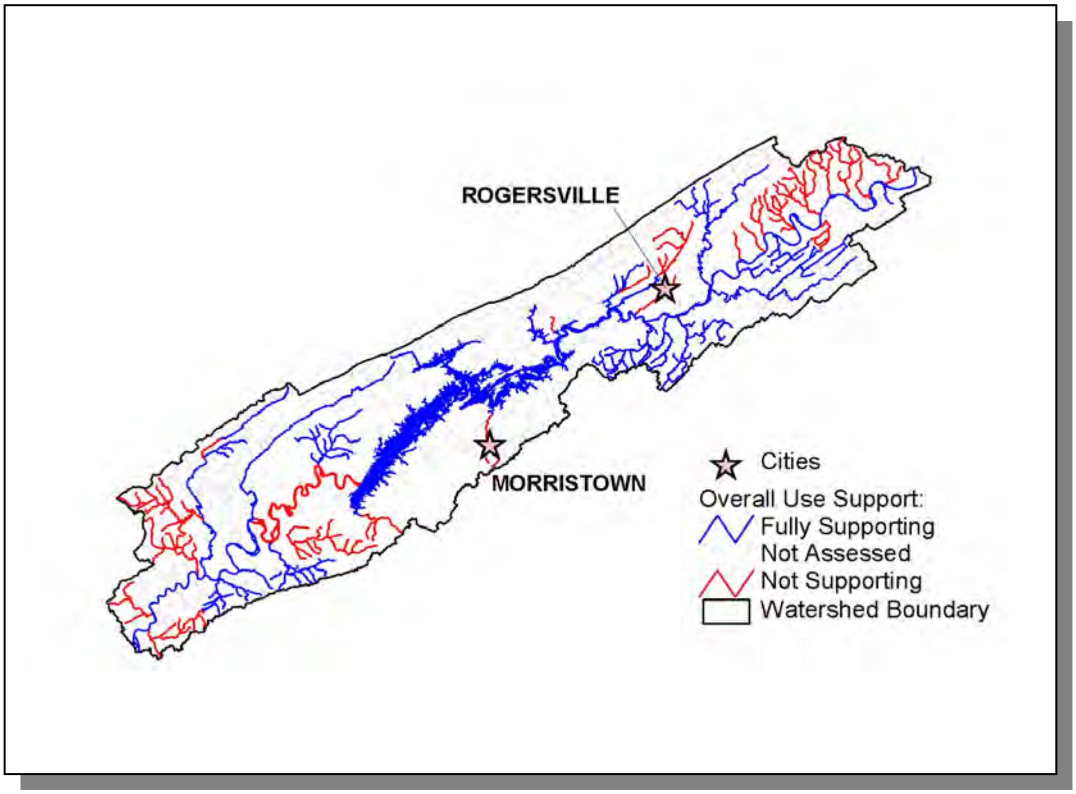

Figure 3-11. Overall Use Support Attainment in the Holston River Watershed. *Assessment data are based on the 2004 Water Quality Assessment. Water Quality Standards are described at http://www.state.tn.us/sos/rules/1200/1200-04/1200-04.htm. Locations of Morristown and Rogersville are shown for reference. More information is provided in Appendix III.*

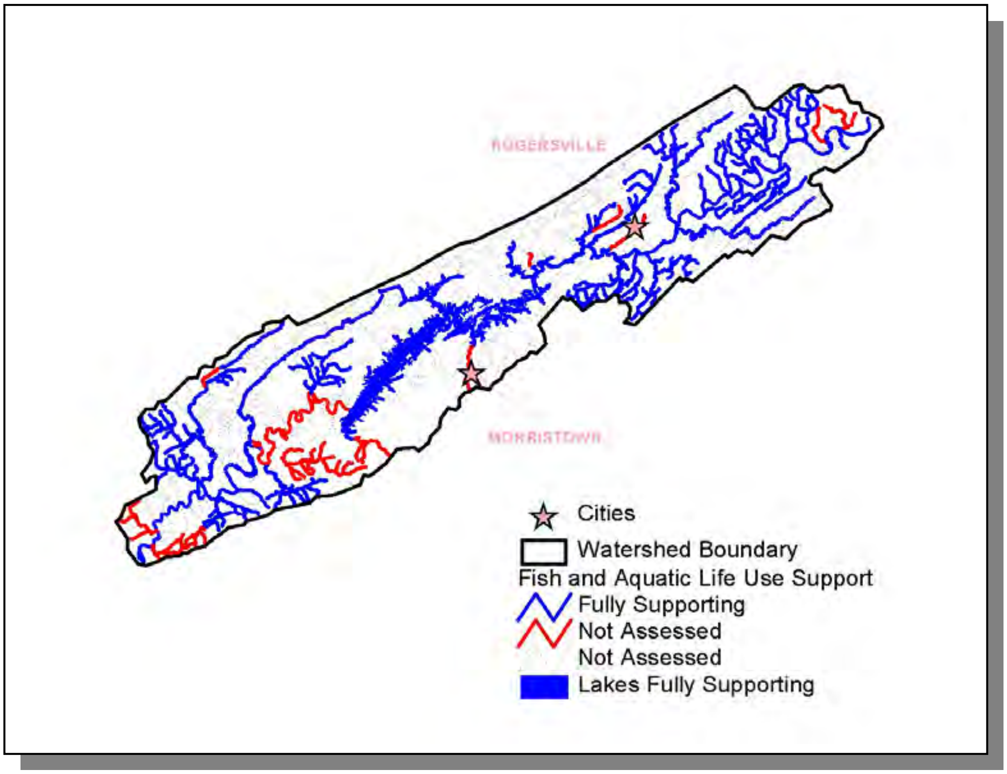

Figure 3-12. Fish and Aquatic Life Use Support Attainment in the Holston River Watershed. *Assessment data are based on the 2004 Water Quality Assessment. Water Quality Standards are described at http://www.state.tn.us/sos/rules/1200/1200-04/1200-04.htm. Locations of Morristown and Rogersville are shown for reference. More information is provided in Appendix III.*

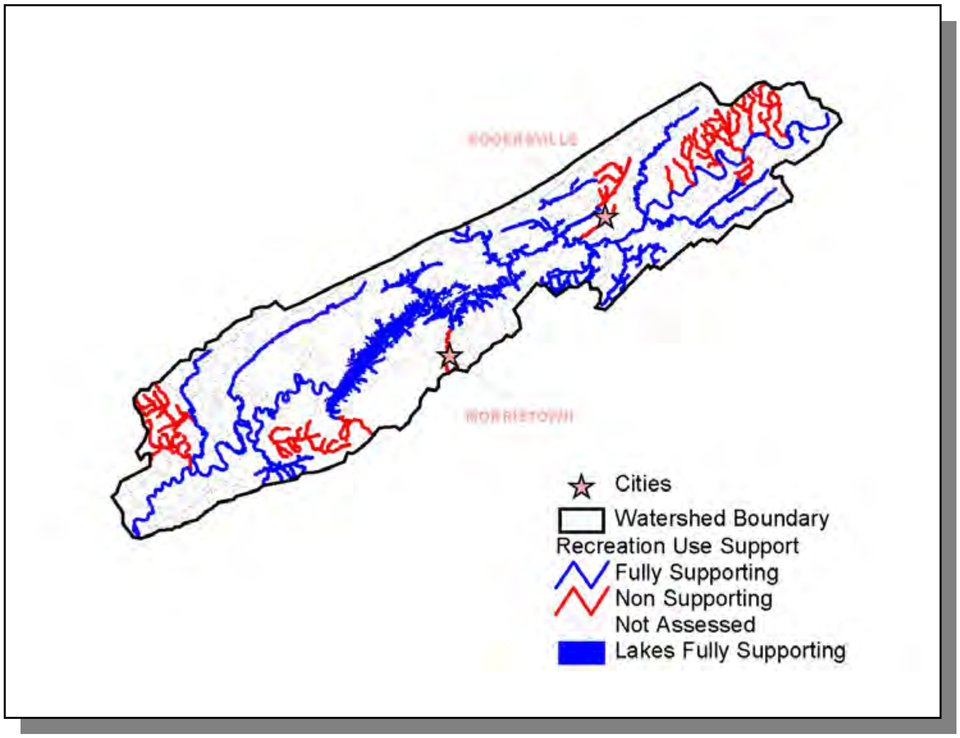

Figure 3-13. Recreation Use Support Attainment the Holston River Watershed. *Assessment data are based on the 2004 Water Quality Assessment. Water Quality Standards are described at http://www.state.tn.us/sos/rules/1200/1200-04/1200-04.htm. Locations of Morristown and Rogersville are shown for reference. More information is provided in Appendix III.*

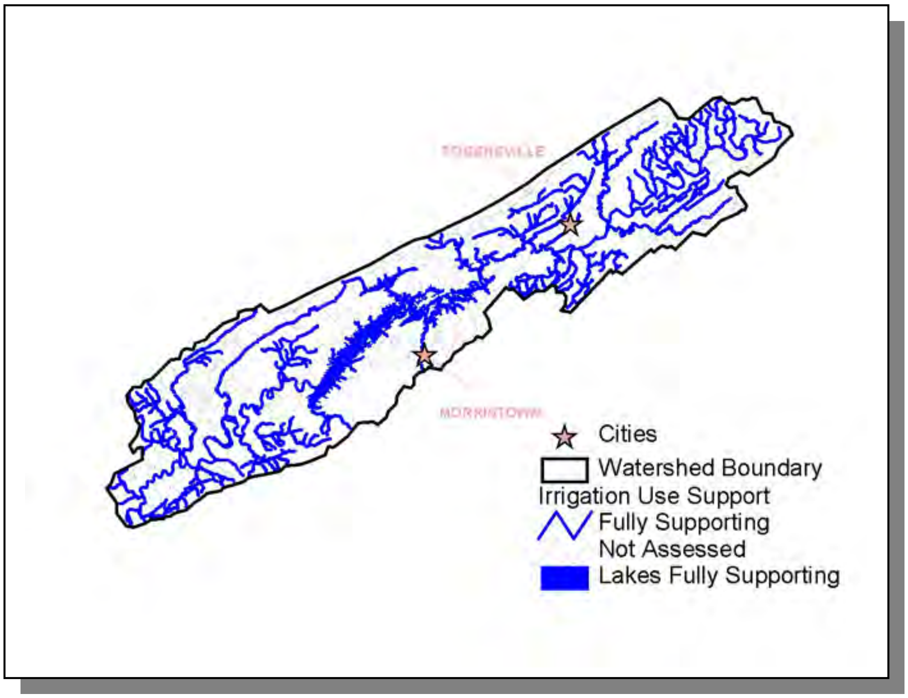

Figure 3-14. Irrigation Use Support Attainment in the Holston River Watershed. *Assessment data are based on the 2004 Water Quality Assessment. Water Quality Standards are described at http://www.state.tn.us/sos/rules/1200/1200-04/1200-04.htm. Locations of Morristown and Rogersville are shown for reference. More information is provided in Appendix III.*

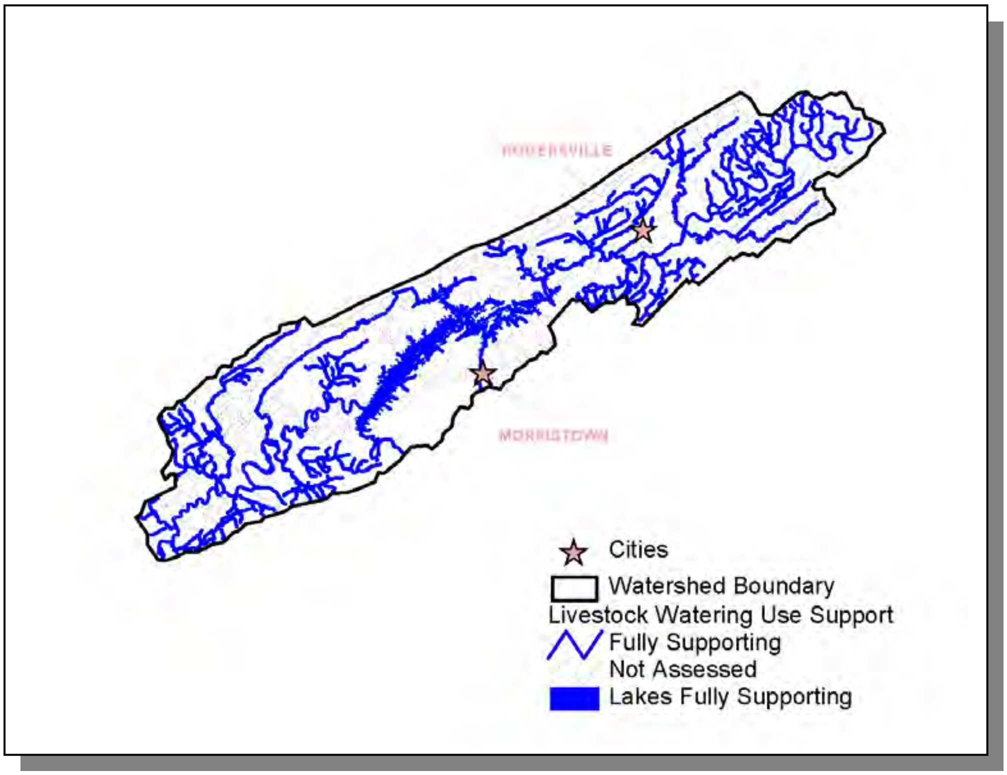

Figure 3-15. Livestock Watering and Wildlife Use Support Attainment the Holston River Watershed. *Assessment data are based on the 2004 Water Quality Assessment. Water Quality Standards are described at http://www.state.tn.us/sos/rules/1200/1200-04/1200-04.htm. Locations of Morristown and Rogersville are shown for reference. More information is provided in Appendix III.*

3.3.B. Use Impairment Summary.

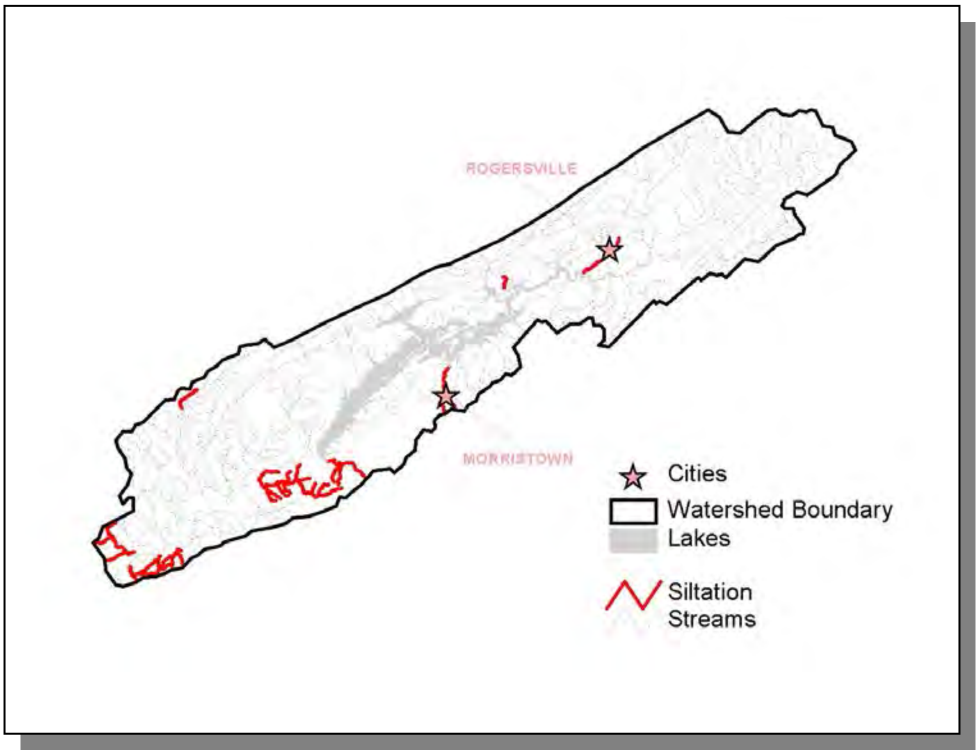

Figure 3-16. Impaired Streams Due to Siltation in the Holston River Watershed. *Assessment data are based on the 2004 Water Quality Assessment. Locations of Morristown and Rogersville are shown for reference. More information is provided in Appendix III.*

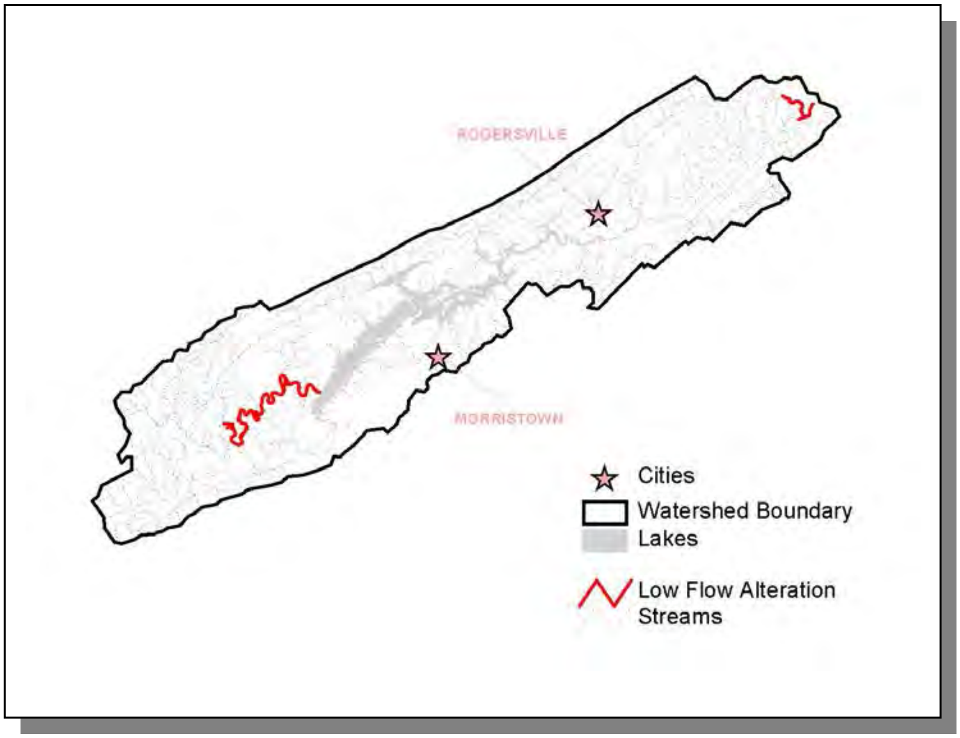

Figure 3-17. Impaired Streams Due to Low Flow Alteration in the Holston River Watershed. *Assessment data are based on the 2004 Water Quality Assessment. Locations of Morristown and Rogersville are shown for reference. More information is provided in Appendix III.*

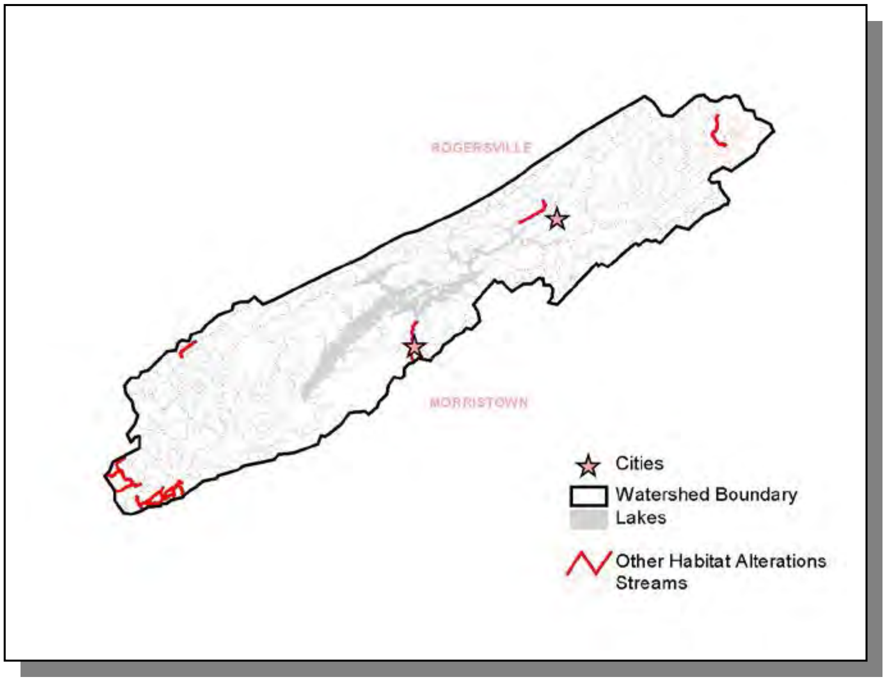

Figure 3-18. Impaired Streams Due to Other Habitat Alteration in the Holston River Watershed. *Assessment data are based on the 2004 Water Quality Assessment. Locations of Morristown and Rogersville are shown for reference. More information is provided in Appendix III.*

The listing of impaired waters that do not support designated uses (the 303(d) list) is traditionally submitted to EPA every two years. A copy of the most recent 303(d) list may be downloaded from:
http://tennessee.gov/environment/wpc/publications/303d2006.pdf

Since the year 2002, the 303(d) list has been compiled by using EPA's ADB (Assessment Database) software developed by RTI (Research Triangle Institute). The ADB allows for a more detailed segmentation of waterbodies. While this results in a more accurate description of the status of water quality, it makes it difficult when comparing water quality assessments with and without using this tool. A more meaningful comparison will be between assessments completed in Year 3 of each succeeding five-year cycle.

The ADB was used to create maps that illustrate water quality. These maps may be viewed on TDEC's homepage at http://gis2.memphis.edu/wpc.

CHAPTER 4

POINT AND NONPOINT SOURCE CHARACTERIZATION OF THE HOLSTON RIVER WATERSHED

4.1. BACKGROUND. This chapter is organized by HUC-12 subwatershed, and the description of each subwatershed is divided into four parts:

i. General description of the subwatershed
ii. Description of point source contributions
ii.a. Description of facilities discharging to water bodies listed on the 2004 303(d) list
iii. Description of nonpoint source contributions

The Holston River Watershed (HUC 06010104) has been delineated into three HUC 10 (10-digit) subwatersheds, each of which is composed of one or more HUC-12 subwatersheds.

Information for this chapter was obtained from databases maintained by the Division of Water Pollution Control or provided in the WCS (Watershed Characterization System) data set. The WCS used was version 2.0 (developed by Tetra Tech, Inc for EPA Region 4) released in 2003.

WCS integrates with ArcView® v3.x and Spatial Analyst® v1.1 to analyze user-delineated (sub)watersheds based on hydrologically connected water bodies. Reports are generated by integrating WCS with Microsoft® Word. Land Use/Land Cover information from 1992 MRLC (Multi-Resolution Land Cover) data are calculated based on the proportion of county-based land use/land cover in user-delineated (sub)watersheds. Nonpoint source data in WCS are based on agricultural census data collected 1992–1998; nonpoint source data were reviewed by Tennessee NRCS staff.

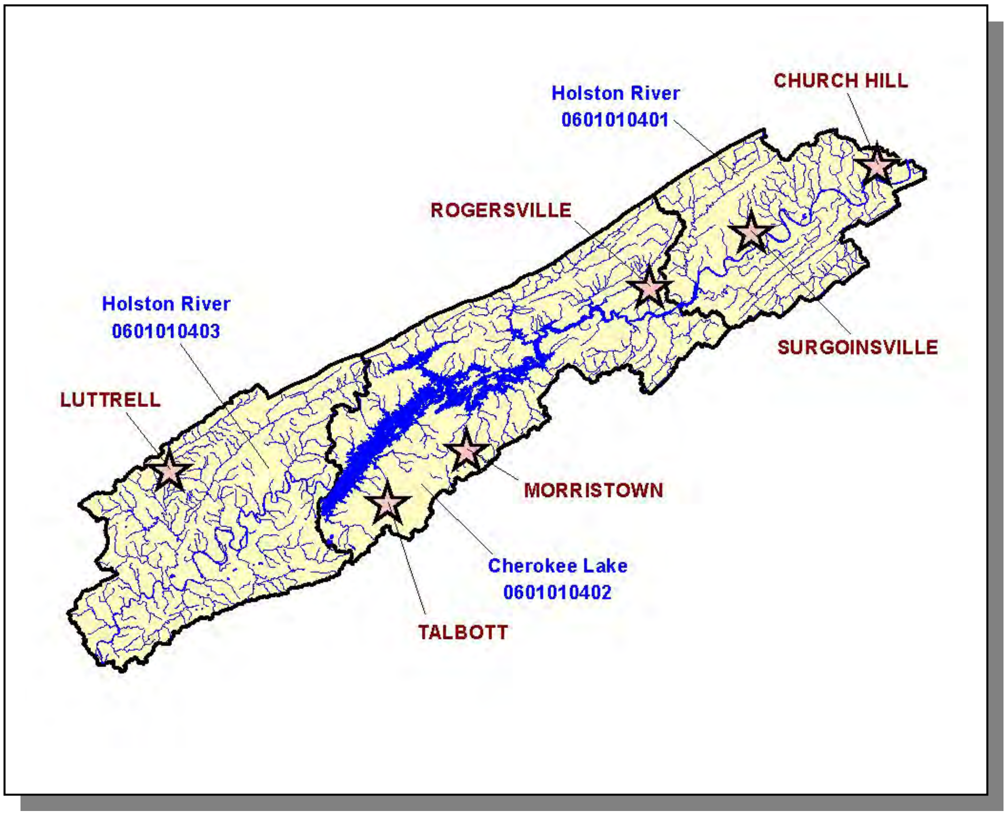

Figure 4-1. The Holston River Watershed is Composed of Three USGS-Delineated Subwatersheds (10-Digit Subwatersheds). *Locations of Church Hill, Luttrell, Morristown, Rogersville, Surgoinsville, and Talbott are shown for reference.*

4.2. CHARACTERIZATION OF HUC-10 SUBWATERSHEDS. The Watershed Characterization System (WCS) software and data sets provided by EPA Region IV were used to characterize each subwatershed in the Holston River Watershed.

HUC-10	HUC-12
0601010401	060101040101 (Holston River)
	060101040102 (Holston River)
	060101040103 (Big Creek)
	060101040104 (Beech Creek)
0601010402	060101040201 (Cherokee Lake)
	060101040202 (Robertson Creek)
	060101040203 (Cherokee Lake)
	060101040204 (Caney Creek)
	060101040205 (Poor Valley Creek)
	060101040206 (Cherokee Lake)
	060101040207 (Turkey Creek)
	060101040208 (German Creek)
	060101040209 (Cherokee Lake)
	060101040210 (Cherokee Lake)
0601010403	060101040301 (Holston River)
	060101040302 (Holston River)
	060101040303 (Richland Creek)
	060101040304 (Holston River)
	060101040305 (Flat Creek)
	060101040306 (Roseberry Creek)

Table 4-1. HUC-12 Drainage Areas are Nested Within HUC-10 Drainages. *NRCS worked with USGS to delineate the HUC-10 and HUC-12 drainage boundaries.*

4.2.A. 0601010401.

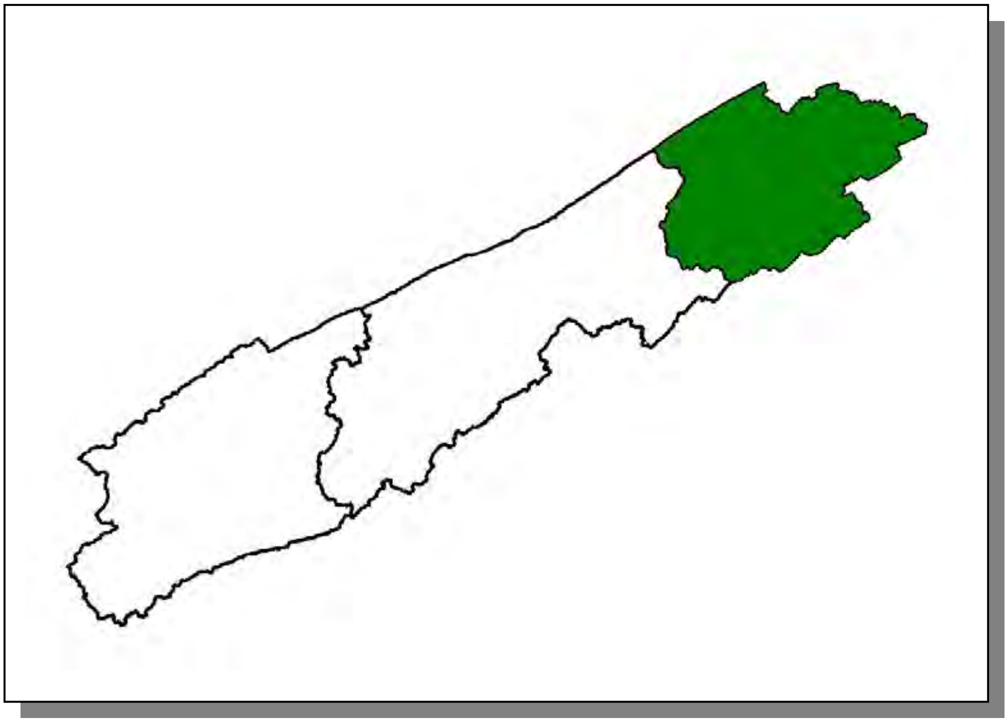

Figure 4-2. Location of Subwatershed 0601010401. *All Holston River HUC-10 subwatershed boundaries are shown for reference.*

4.2.A.i. 060101040101 (Holston River).

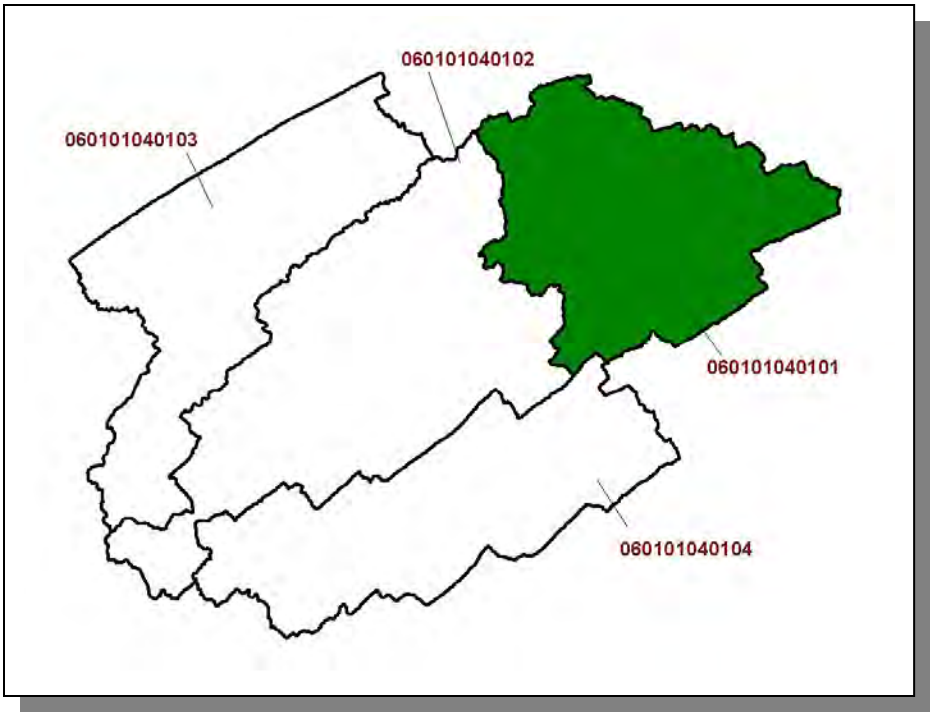

Figure 4-3. Location of Subwatershed 060101040101. *HUC-12 subwatershed boundaries are shown for reference.*

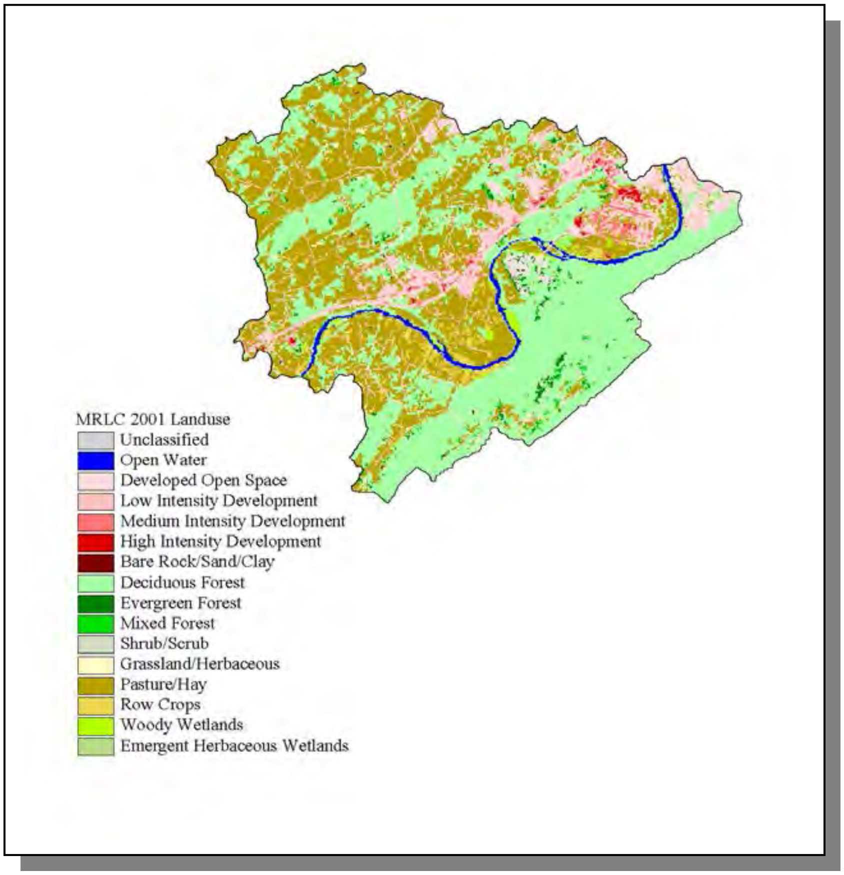

Figure 4-4. Illustration of Land Use Distribution in Subwatershed 060101040101.

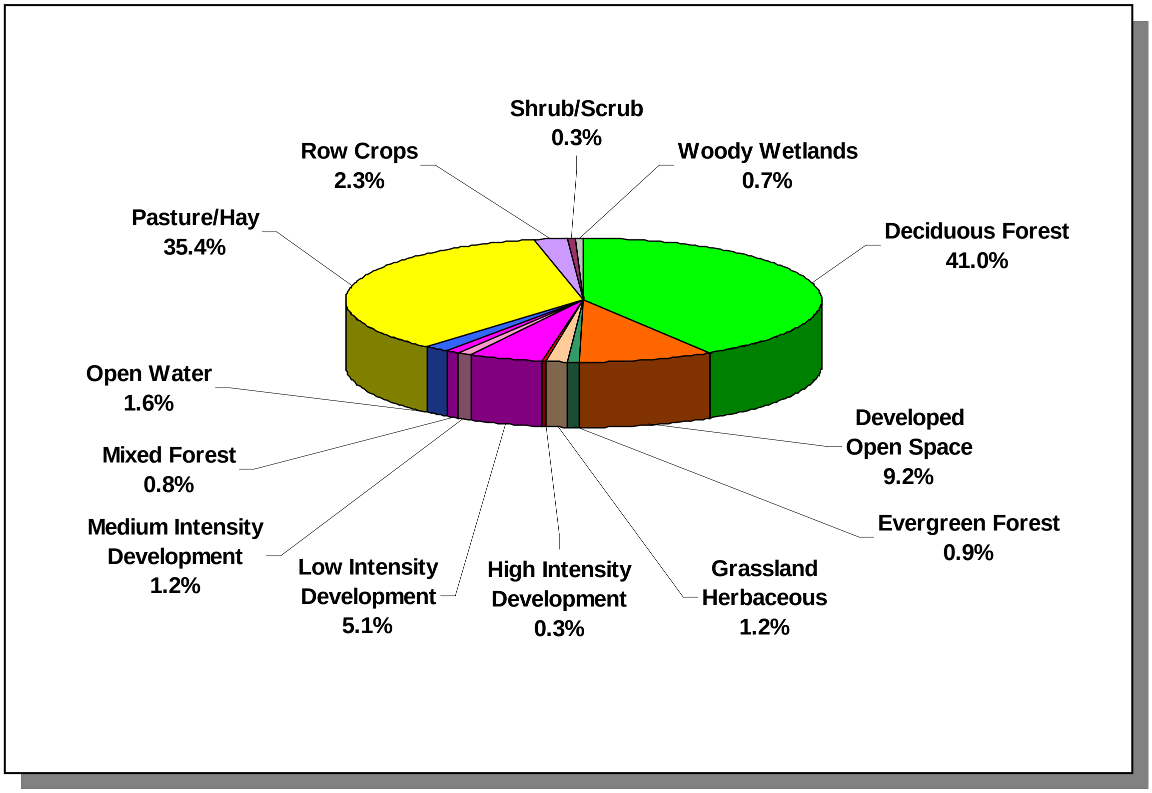

Figure 4-5. Land Use Distribution in Subwatershed 060101040101. *More information is provided in Appendix IV.*

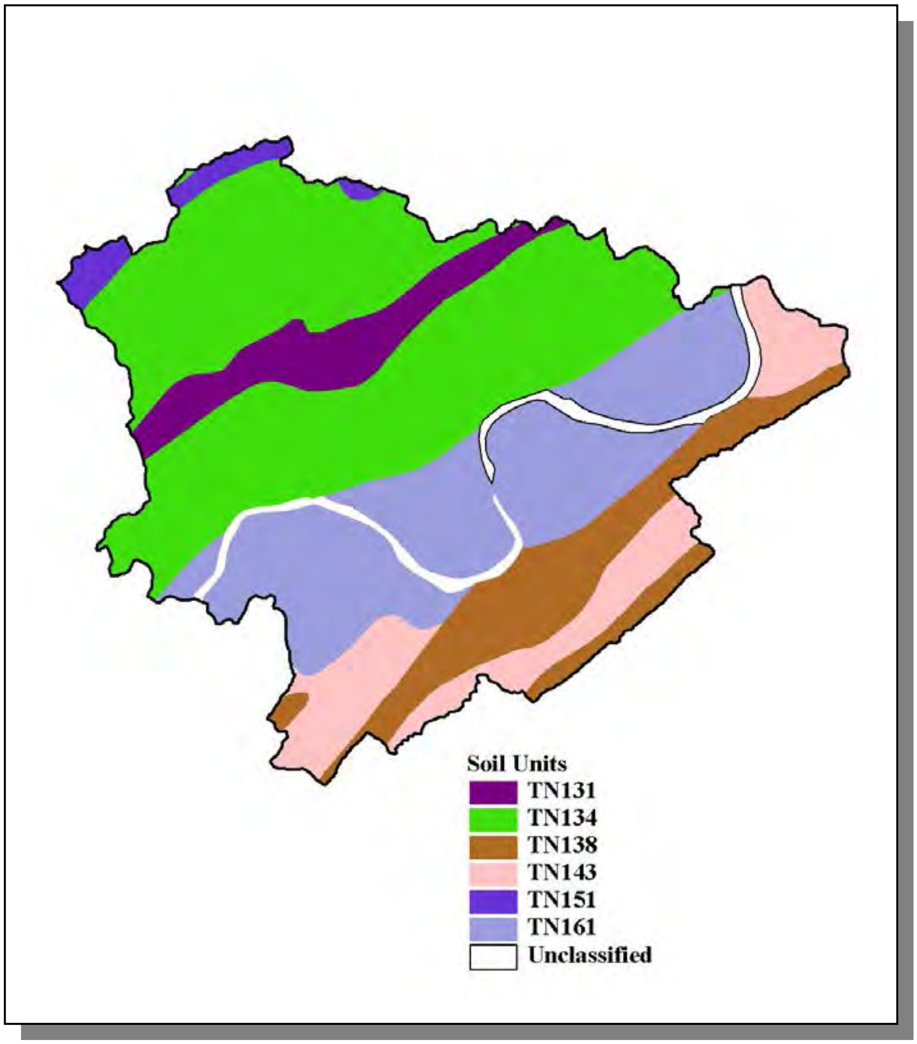

Figure 4-6. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040101.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN131	0.00	C	1.17	4.95	Silty Loam	0.33
TN134	0.00	B	1.38	5.18	Loam	0.31
TN138	0.00	C	2.48	4.26	Sandy Loam	0.22
TN143	0.00	C	1.22	6.44	Loam	0.32
TN151	0.00	C	2.88	4.75	Loam	0.40
TN161	7.00	C	1.41	5.11	Loam	0.31

Table 4-2. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040101. *The definition of "Hydrologic Group" is provided in Appendix IV.*

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Hawkins	44,565	48,821	53,563	10.54	4,696	5,145	5,645	20.2
Sullivan	143,596	150,371	153,048	0.64	923	966	984	6.6
Total	**188,161**	**199,192**	**206,611**		**5,619**	**6,111**	**6,629**	**18.0**

Table 4-3. Population Estimates in Subwatershed 060101040101.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Church Hill	Hawkins	4,834	2,004	1,558	429	17
Kingsport	Hawkins	36,408	16,738	14,810	1,903	25
Mount Carmel	Hawkins	4,039	1,634	1,077	557	0
Total		**45,281**	**20,736**	**17,445**	**2,889**	**42**

Table 4-4. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 060101040101.

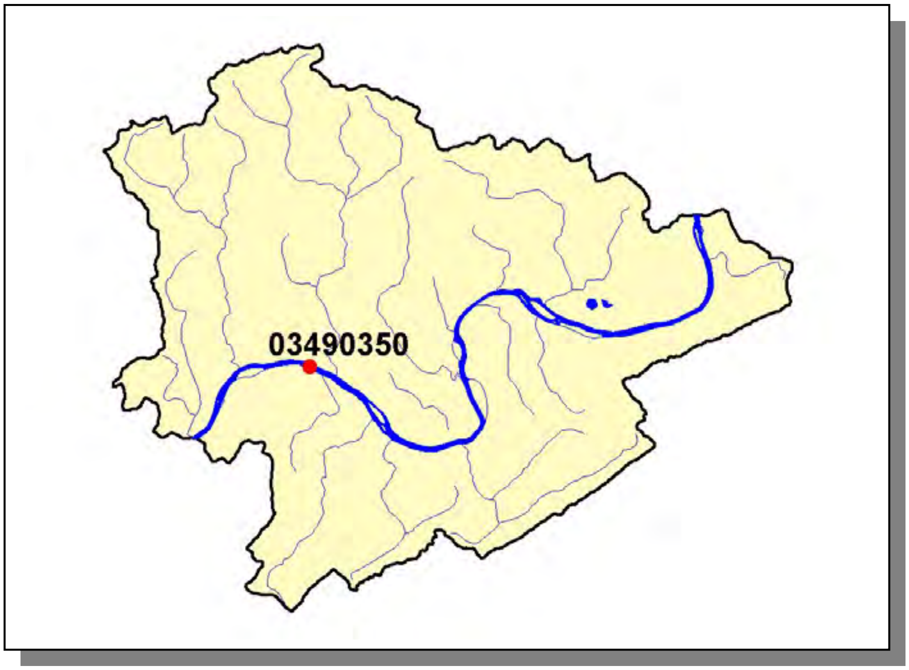

***Figure 4-7. Location of Historical Streamflow Data Collection Sites in Subwatershed 060101040101.** More information is provided in Appendix IV.*

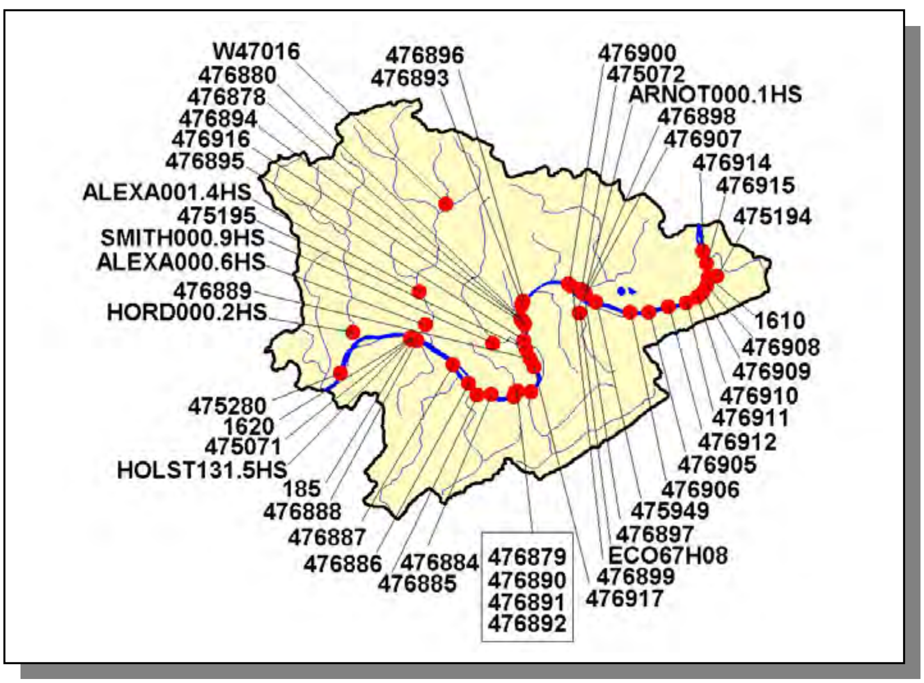

***Figure 4-8. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 060101040101.** More information, including site names and locations, is provided in Appendix IV.*

4.2.A.i.a. Point Source Contributions.

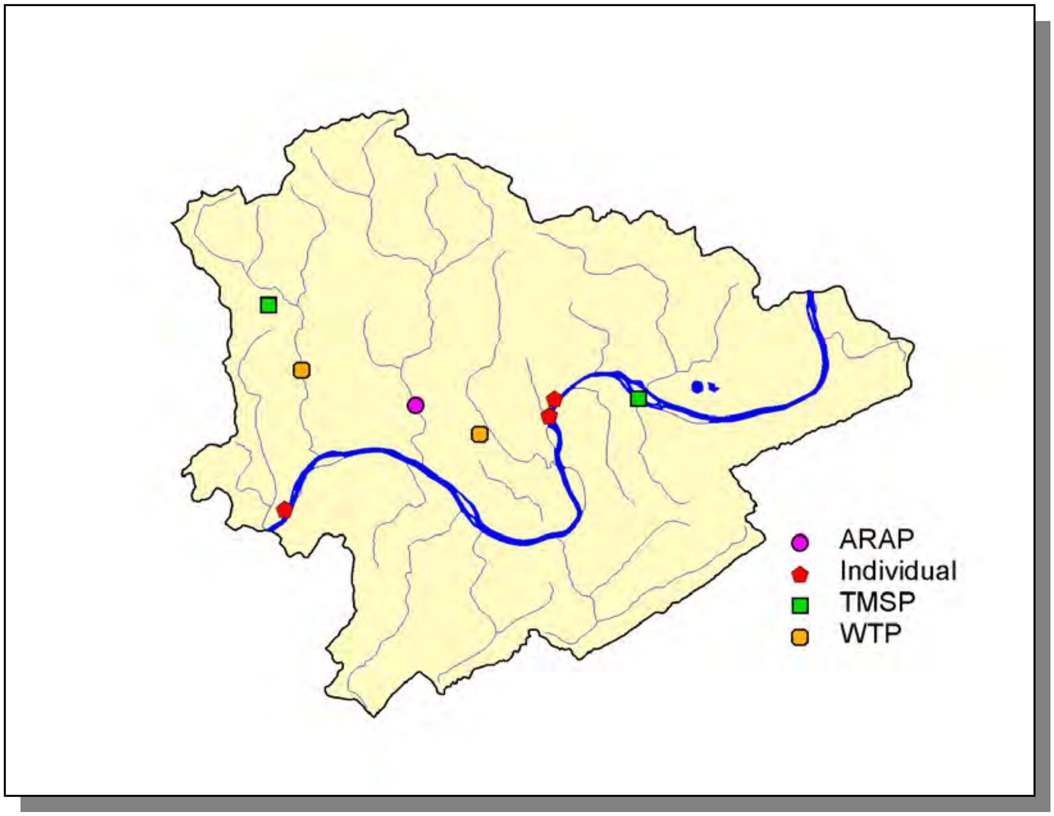

Figure 4-9. Location of Permits Issued in Subwatershed 060101040101. *More information, including the names of facilities, is provided in Appendix IV.*

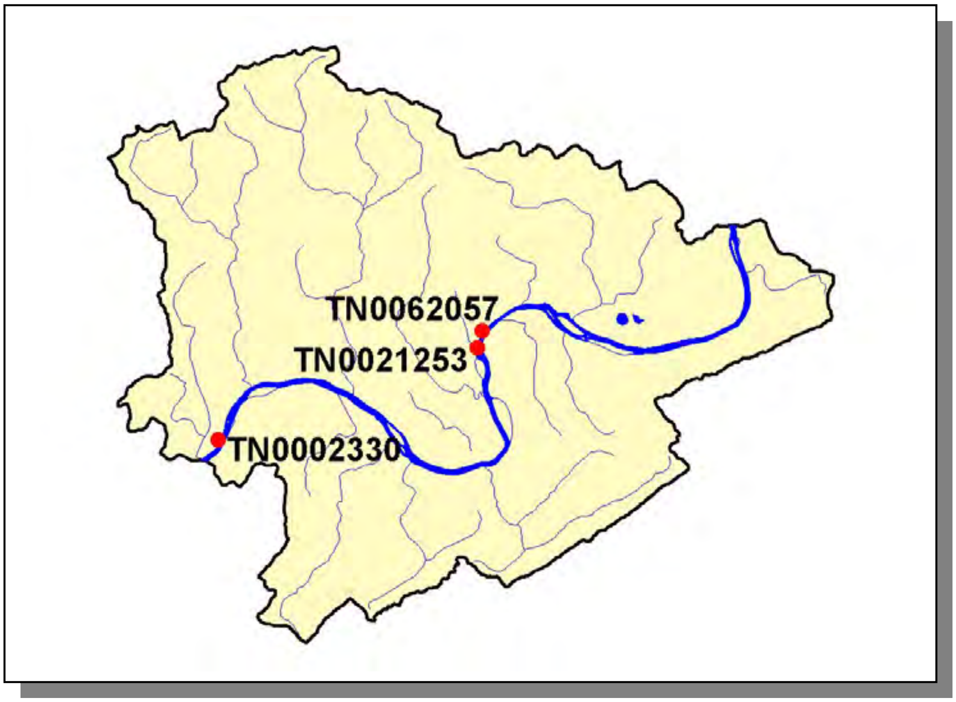

Figure 4-10. Location of Active NPDES Sites in Subwatershed 060101040101. *More information, including the names of facilities, is provided in Appendix IV.*

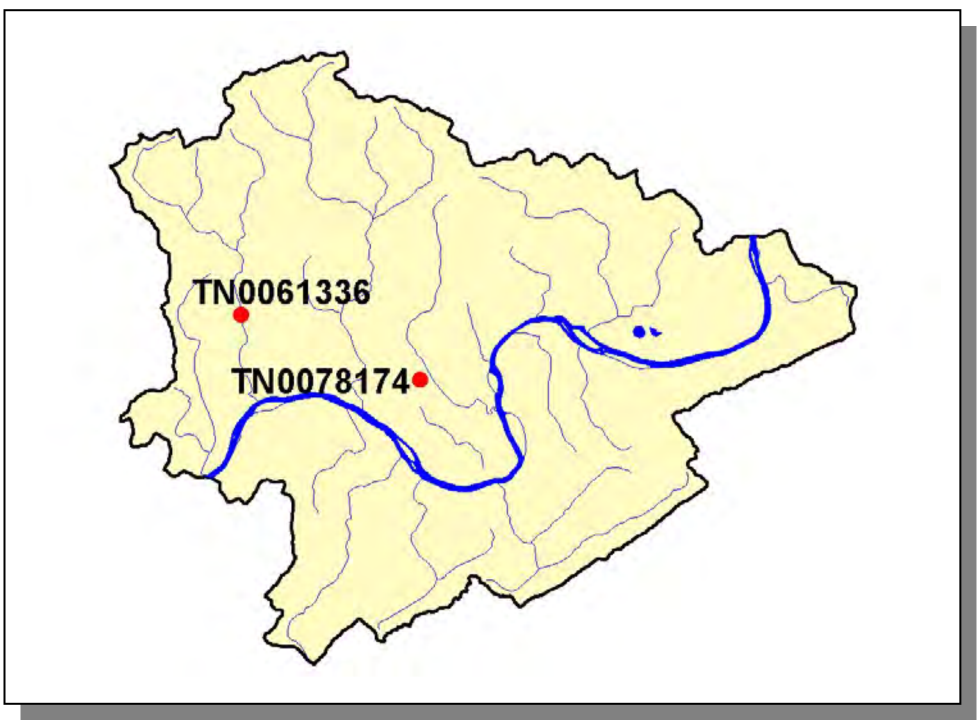

Figure 4-11. Location of Water Treatment Plants in Subwatershed 060101040101. *More information, including the names of facilities, is provided in Appendix IV.*

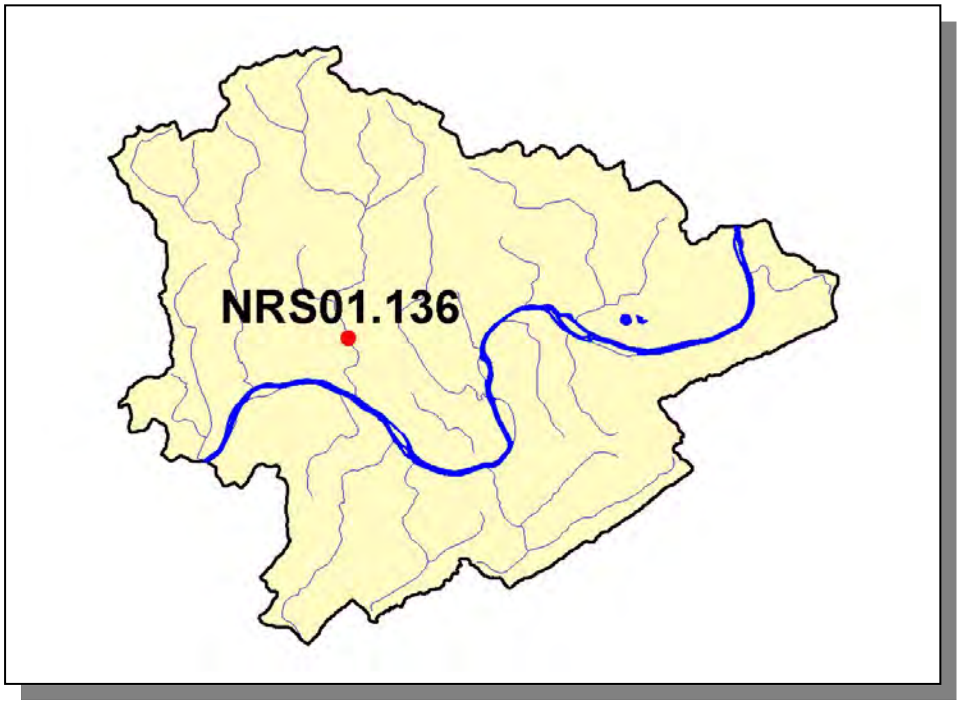

Figure 4-12. Location of Aquatic Resource Alteration Permit (ARAP) Sites (Individual Permits) in Subwatershed 060101040101. *More information is provided in Appendix IV.*

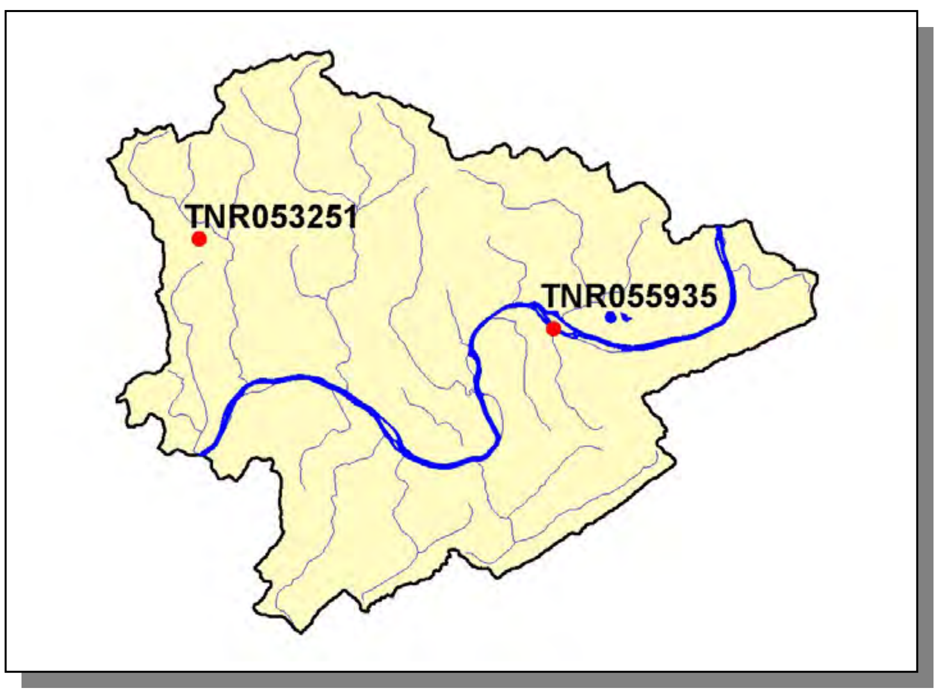

Figure 4-13. Location of TMSP Sites in Subwatershed 060101040101. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.A.i.a.i. Dischargers to Water Bodies Listed on the 2004 303(d) List.

There is one NPDES facility discharging to water bodies listed on the 2004 303(d) list in Subwatershed 060101040101:

- TN0078174 (1st Utility District Hawkins County WTP) discharges to Alexander Creek @ RM 0.2

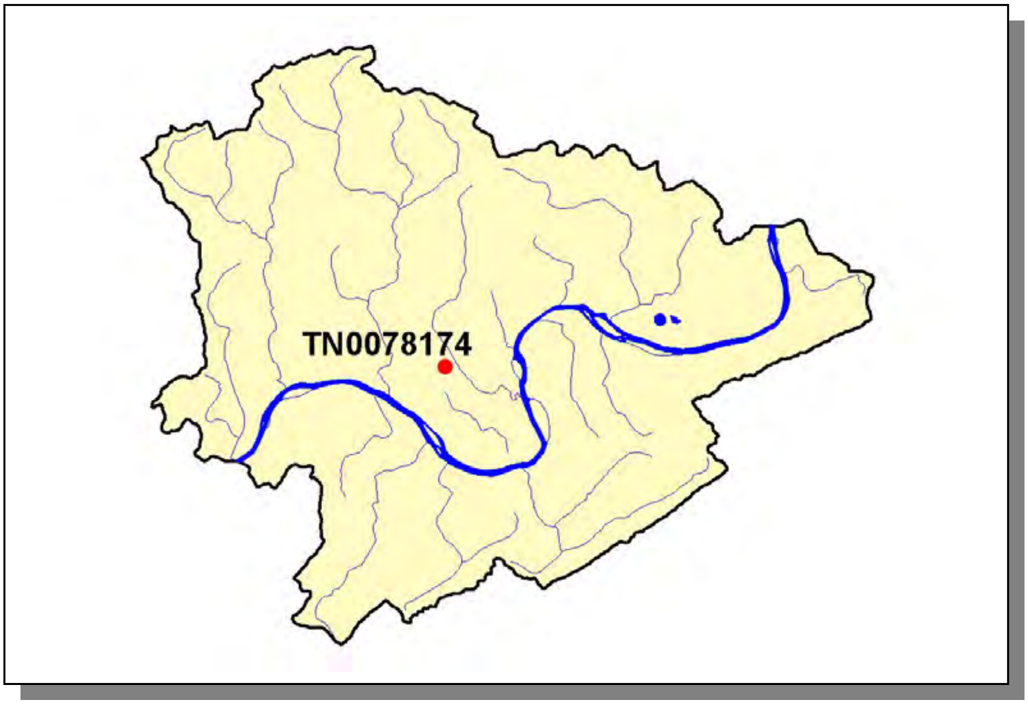

Figure 4-14. Location of NPDES Dischargers to Water Bodies Listed on the 2004 303(d) List in Subwatershed 060101040101. *More information, including the names of facilities, is provided in Appendix IV.*

Permit #	3Q2	1Q10	3Q10	3Q20	7Q10
TN0078174	0.00	na	0.00	0.00	0.00

Table 4-5. Receiving Stream Low Flow Information for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 060101040101. *Data are in cubic feet per second (CFS). Data were obtained from the USGS web application StreamStats at http://water.usgs.gov/osw/streamstats/. (na, data not available)*

PERMIT #	HARDNESS
TN0078174	X

Table 4-6. Monitoring Requirements for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 060101040101.

PERMIT #	NO_3	TRC	TSS	SETTLEABLE SOLIDS	Al
TN0078174	X	X	X	X	X

Table 4-7. Parameters Monitored for Daily Maximum Limits for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 0601010401. *WET, Whole Effluent Toxicity; $CBOD_5$, Carbonaceous Biochemical Oxygen Demand (5-Day); TRC, Total Residual Chlorine; TSS, Total Suspended Solids.*

4.2.A.i.b. Nonpoint Source Contributions.

LIVESTOCK COUNTS					
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
2,125	4,142	105	7	49	27

Table 4-8. Summary of Livestock Count Estimates in Subwatershed 060101040101. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Hawkins	18,796	36,429	903	1,079	442	243
Sullivan	13,322	29,386	1,075	594	104	69

Table 4-9. Summary of Livestock Count Estimates in Sullivan and Hawkins Counties. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Hawkins	177.4	177.4	0.4	2.1
Sullivan	123.7	123.7	0.1	0.3

Table 4-10. Forest Acreage and Annual Removal Rates (1987-1994) in Hawkins and Sullivan Counties.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.32
Grass (Hayland)	0.55
Legumes, Grass (Hayland)	0.39
Legumes (Hayland)	0.16
Grass, Forbs, Legumes (Mixed Pasture)	0.59
Corn (Row Crops)	8.20
Tobacco (Row Crops)	15.76
Other Vegetable and Truck Crops	33.50
Other Land in Farms	0.02
Farmsteads and Ranch Headquarters	0.40

Table 4-11. Annual Estimated Total Soil Loss in Subwatershed 060101040101.

4.2.A.ii. 060101040102 (Holston River).

Figure 4-15. Location of Subwatershed 060101040102. *HUC-12 subwatershed boundaries are shown for reference.*

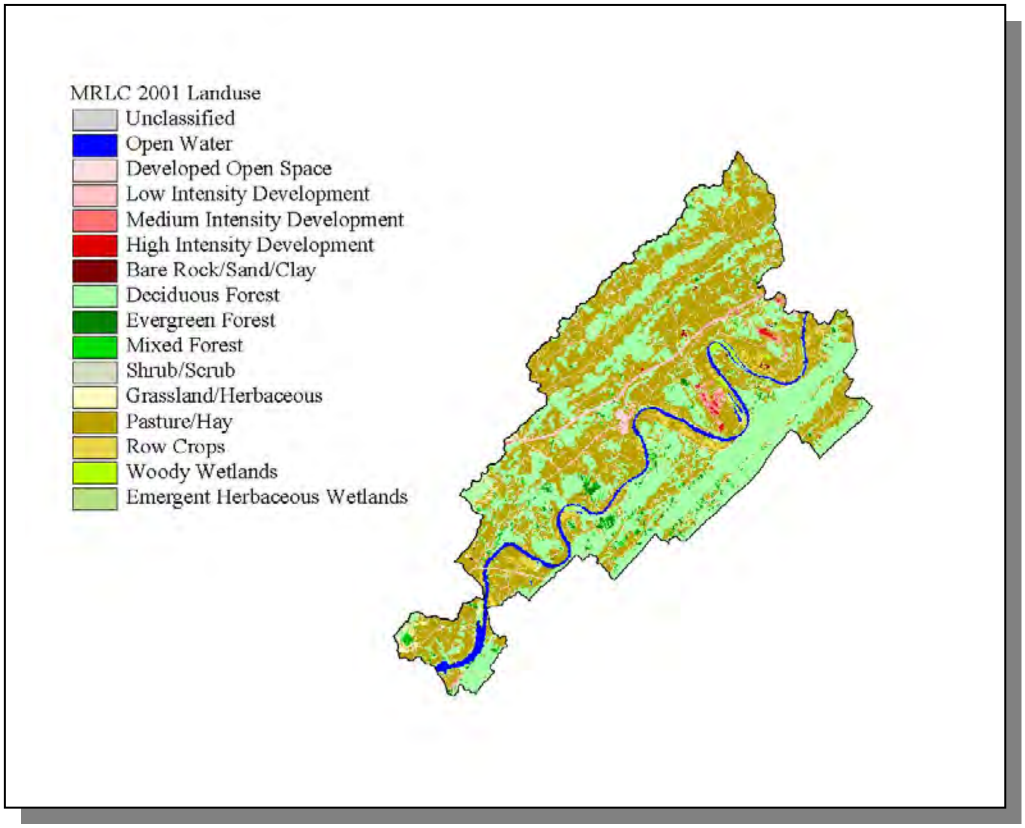

Figure 4-16. Illustration of Land Use Distribution in Subwatershed 060101040102.

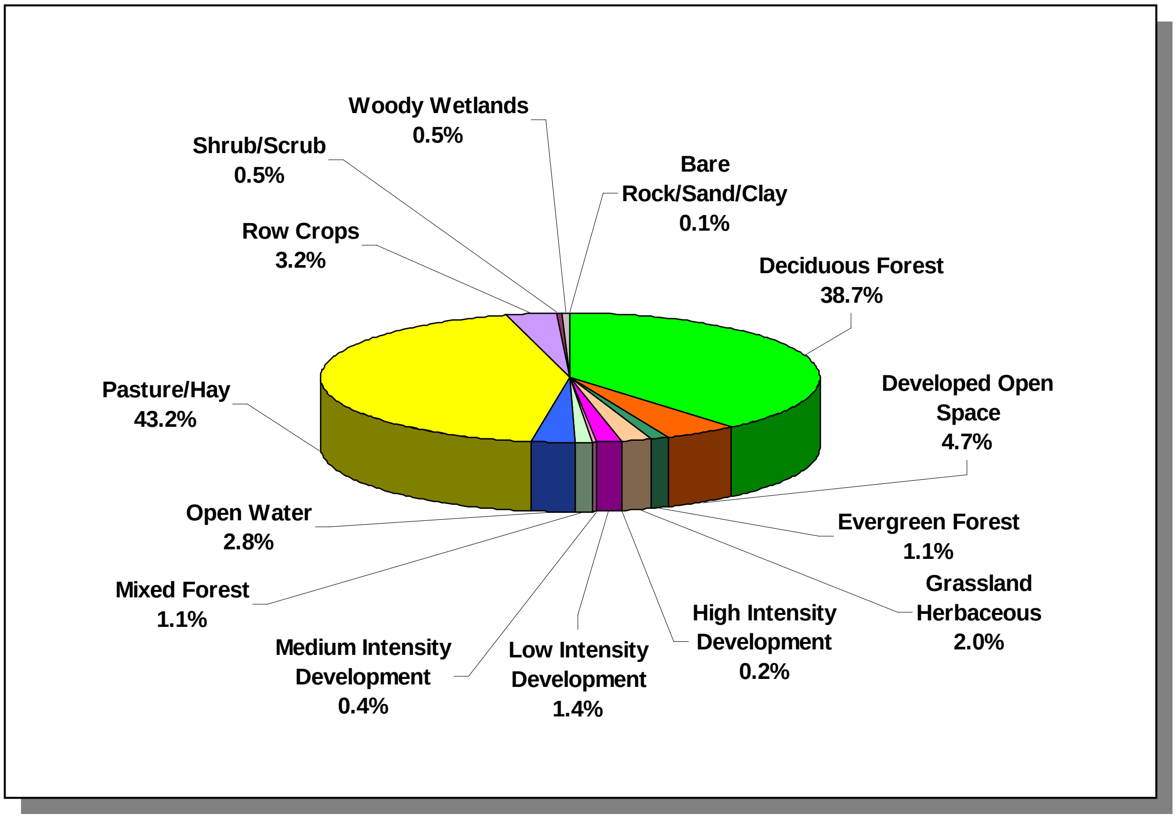

Figure 4-17. Land Use Distribution in Subwatershed 060101040102. *More information is provided in Appendix IV.*

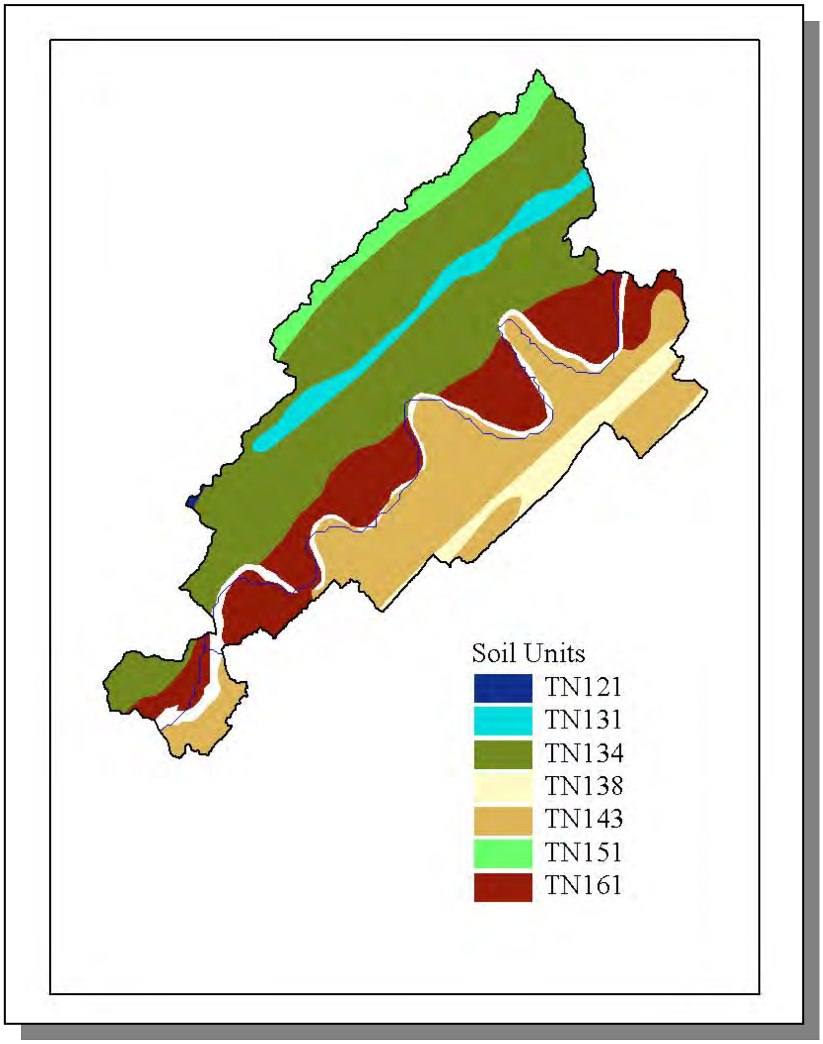

Figure 4-18. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040102.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN121	0.00	B	1.30	5.21	Loam	0.33
TN131	0.00	C	1.17	4.95	Silty Loam	0.33
TN134	0.00	B	1.38	5.18	Loam	0.31
TN138	0.00	C	2.48	4.26	Sandy Loam	0.22
TN143	0.00	C	1.22	6.44	Loam	0.32
TN151	0.00	C	2.88	4.75	Loam	0.40
TN161	7.00	C	1.41	5.11	Loam	0.31

Table 4-12. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040102. *The definition of "Hydrologic Group" is provided in Appendix IV.*

.

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Hawkins	44,565	48,821	53,563	15.12	6,737	7,380	8,097	20.2

Table 4-13. Population Estimates in Subwatershed 060101040102.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Church Hill	Hawkins	4,834	2,004	1,558	429	17
Surgoinsville	Hawkins	1,499	625	38	553	34
Total		**6,333**	**2,629**	**1,596**	**982**	**51**

Table 4-14. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 060101040102.

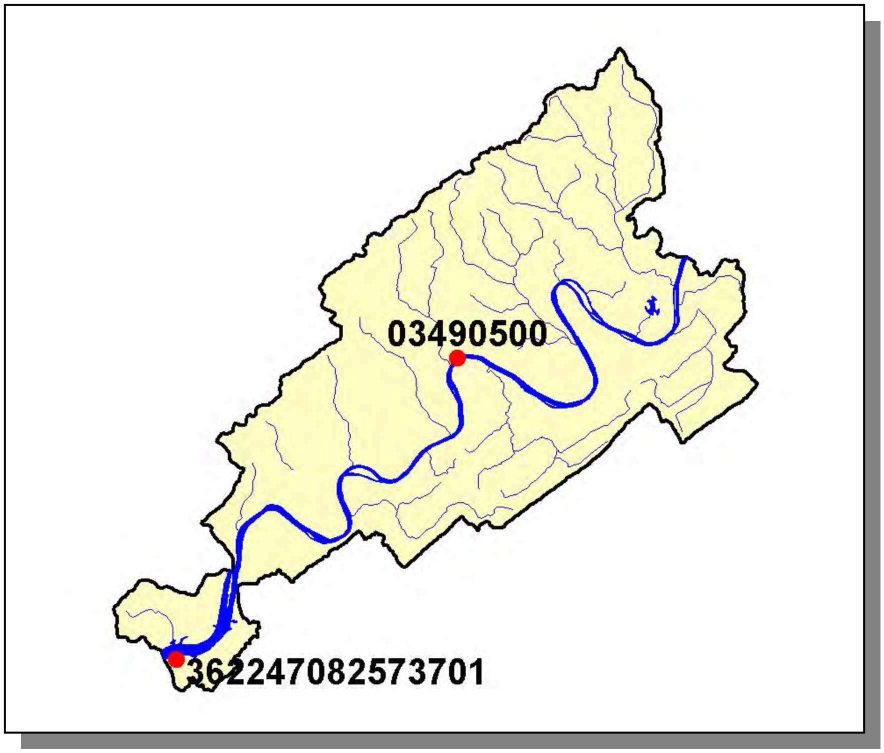

Figure 4-19. Location of Historical Streamflow Data Collection Sites in Subwatershed 060101040102. *More information is provided in Appendix IV.*

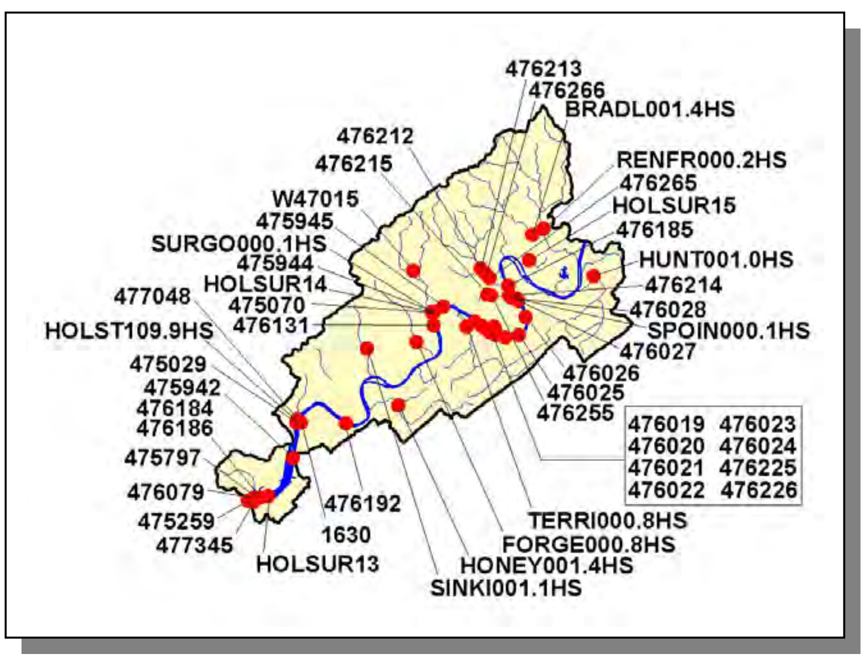

Figure 4-20. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 060101040102. *More information, including site names and locations, is provided in Appendix IV.*

4.2.A.ii.a. Point Source Contributions.

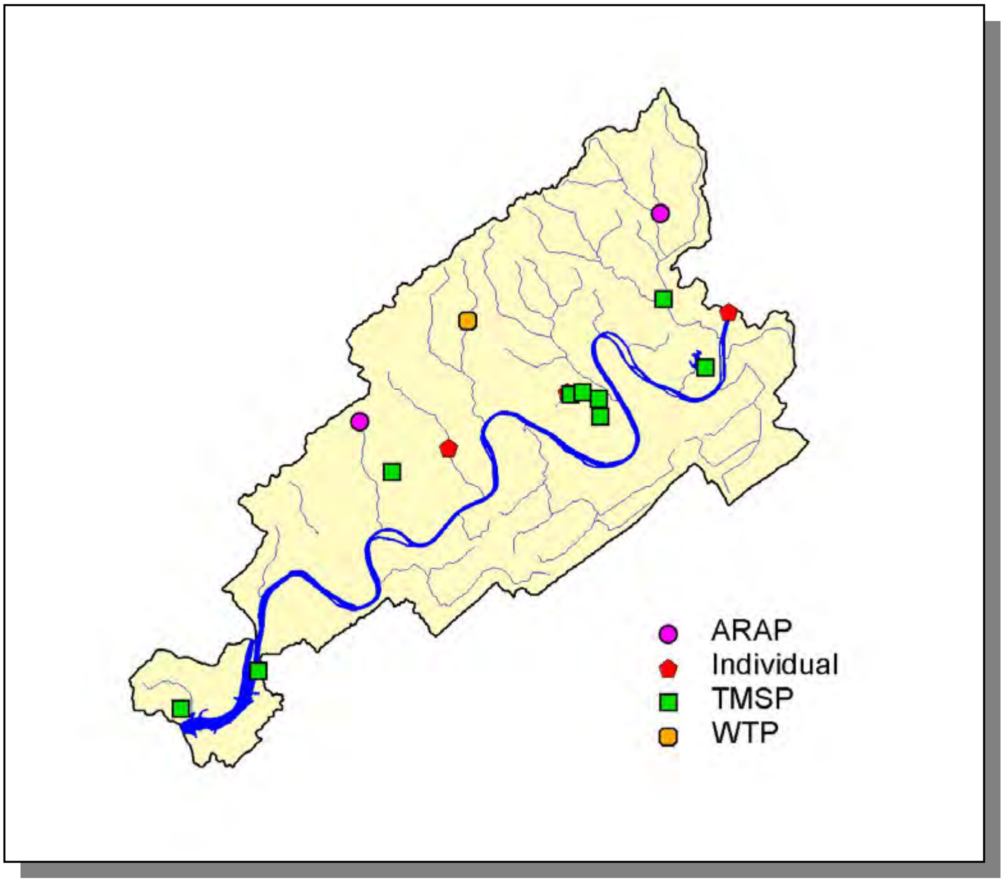

Figure 4-21. Location of Permits Issued in Subwatershed 060101040102. *More information, including the names of facilities, is provided in Appendix IV.*

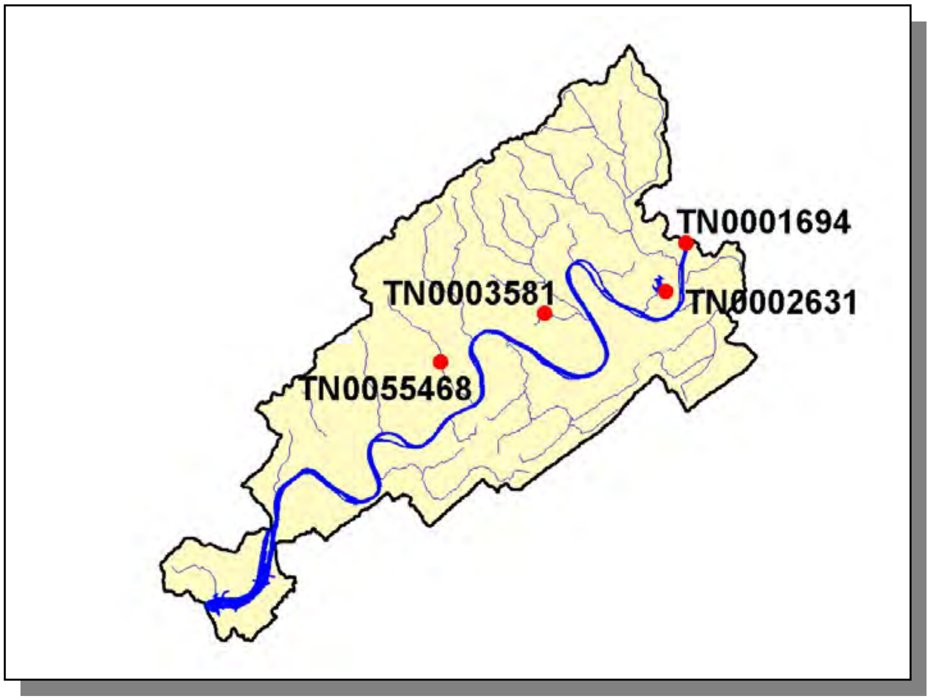

Figure 4-22. Location of Active NPDES Sites in Subwatershed 060101040102. *More information, including the names of facilities, is provided in Appendix IV.*

Figure 4-23. Location of Water Treatment Plants in Subwatershed 060101040102. *More information, including the names of facilities, is provided in Appendix IV.*

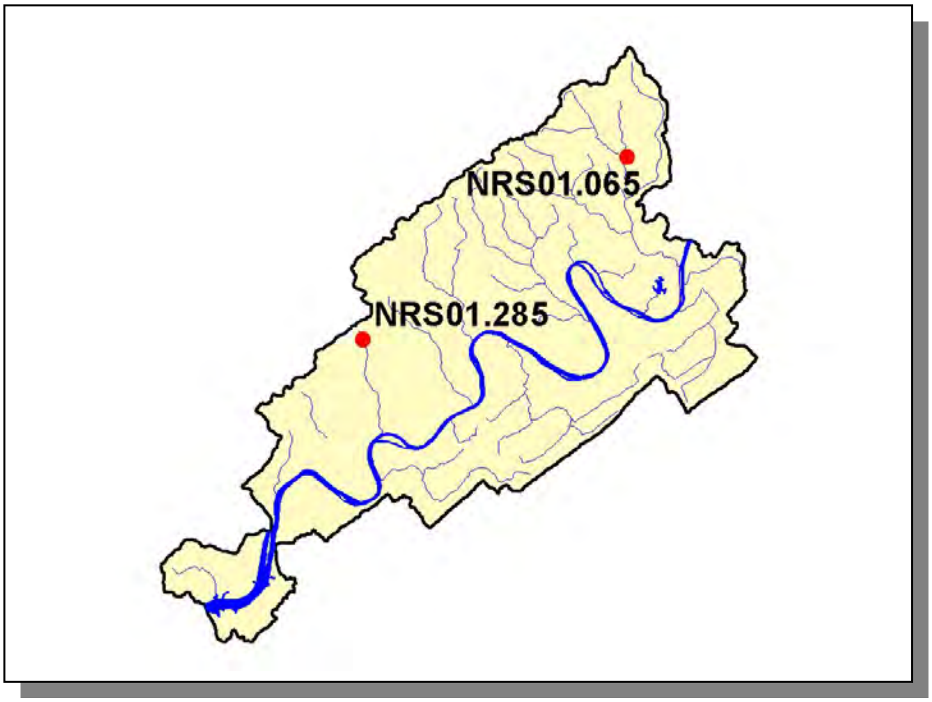

Figure 4-24. Location of Aquatic Resource Alteration Permit (ARAP) Sites (Individual Permits) in Subwatershed 060101040102. *More information is provided in Appendix IV.*

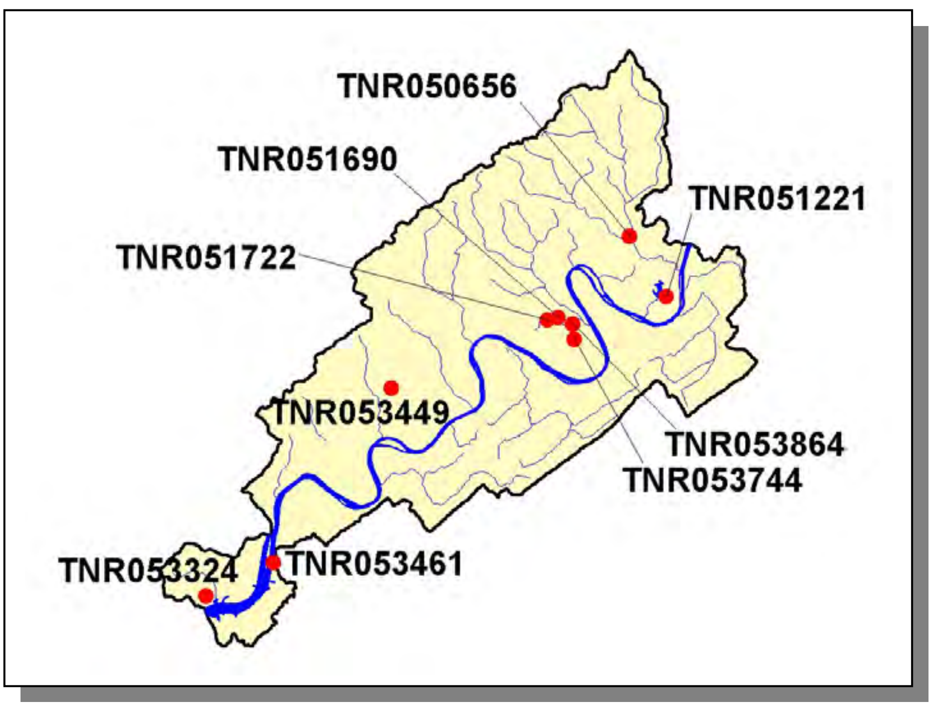

Figure 4-25. Location of TMSP Sites in Subwatershed 060101040102. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.A.ii.a.i. Dischargers to Water Bodies Listed on the 2004 303(d) List

There are four NPDES facilities discharging to water bodies listed on the 2004 303(d) list in Subwatershed 060101040102:

- TN0001694 (Quebecor World) discharges to an unnamed tributary to Bradley Creek @ RM 1.4
- TN0003581 (Alladin Investments, Inc. discharges to an unnamed tributary @ RM 0.08 to Stoney Point Creek @ RM 0.2
- TN0055468 (Surgoinsville Middle and Elementary Schools) discharges to Forgey Creek @ RM 1.4
- TN0073261 (Surgoinsville Utility District WTP) discharges to Young Branch, Surgoinsville Creek, and the Holston River @ RM 118.5

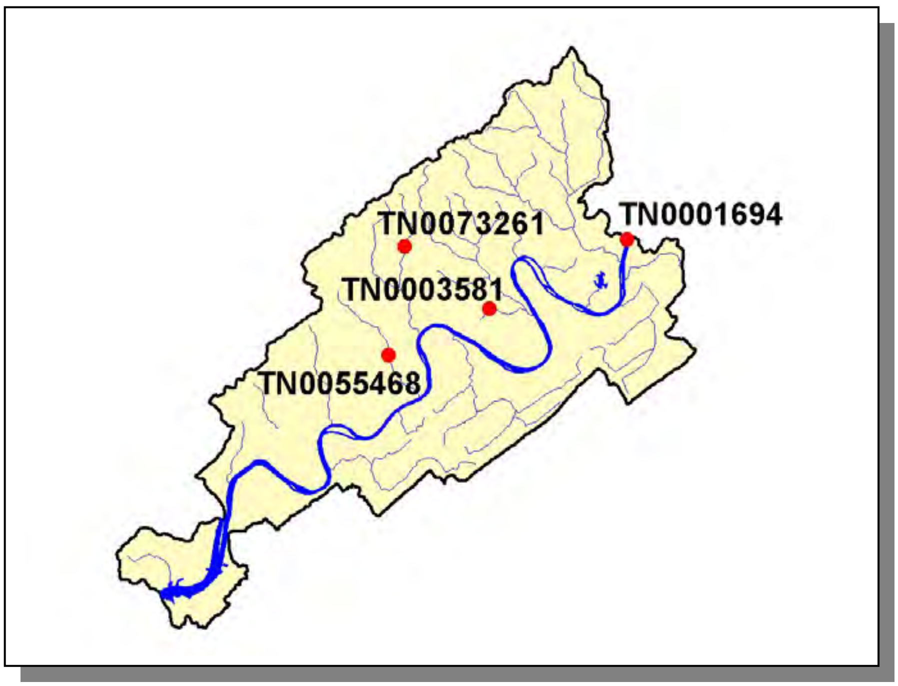

Figure 4-26. Location of NPDES Dischargers to Water Bodies Listed on the 2004 303(d) List in Subwatershed 060101040102. *More information, including the names of facilities, is provided in Appendix IV.*

Permit #	3Q2	1Q10	3Q10	3Q20	7Q10
TN0001694	Na	na	na	na	na
TN0003581	0.01	na	0.01	0.01	0.01
TN0055468	0.39	na	0.21	0.17	0.23
TN0073261	0.02	na	0.01	0.00	0.01

Table 4-15. Receiving Stream Low Flow Information for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 060101040102. *Data are in cubic feet per second (CFS). Data were obtained from the USGS web application StreamStats at http://water.usgs.gov/osw/streamstats/. (na, data not available)*

PERMIT #	FLOW	TEMP	HARDNESS	COLOR	FOAM	FLOATING MATERIAL	OIL SHEEN
TN0001694	X	X					
TN0003581	X	X		X	X	X	X
TN0055468	X						
TN0073261	X						

Table 4-16. Monitoring Requirements for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 060101040102.

PERMIT #	ETHYLBENZENE	BENZENE	METHYLETHYLKETONE	ACETONE	TOLUENE
TN0001694	X	X	X	X	X

Table 4-17. Monitoring Requirements for Organic Parameters for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 060101040102.

PERMIT #	WET	$CBOD_5$	NH_3	NO_3	TRC	TSS	SETTLEABLE SOLIDS	DO	pH	OIL and GREASE	Al
TN0001694	X	X			X	X	X				
TN0003581	X	X	X		X	X	X	X	X	X	
TN0055468		X			X	X	X	X	X		
TN0073261					X	X	X		X		X

Table 4-18. Parameters Monitored for Daily Maximum Limits for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 060101040102. *WET, Whole Effluent Toxicity; $CBOD_5$, Carbonaceous Biochemical Oxygen Demand (5-Day); TRC, Total Residual Chlorine; TSS, Total Suspended Solids.*

PERMIT #	*E. coli*	FECAL COLIFORM
TN0003581		X
TN0055468	X	X

Table 4-19. Bacteria Monitored for Daily Maximum Limits for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 060101040102.

4.2.A.ii.b. Nonpoint Source Contributions.

LIVESTOCK COUNTS					
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
3,959	7,673	190	13	93	51

Table 4-20. Summary of Livestock Count Estimates in Subwatershed 060101040102. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Hawkins	18,796	36,429	903	1,079	442	243

Table 4-21. Summary of Livestock Count Estimates in Hawkins County. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Hawkins	177.4	177.4	0.4	2.1

Table 4-22. Forest Acreage and Annual Removal Rates (1987-1994) in Hawkins County

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.26
Grass (Hayland)	0.56
Legumes, Grass (Hayland)	0.40
Legumes (Hayland)	0.16
Grass, Forbs, Legumes (Mixed Pasture)	0.54
Tobacco (Row Crops)	16.40
Other Vegetable and Truck Crops	33.50
Farmsteads and Ranch Headquarters	0.40

Table 4-23. Annual Estimated Total Soil Loss in Subwatershed 060101040102.

4.2.A.iii. 060101040103 (Big Creek).

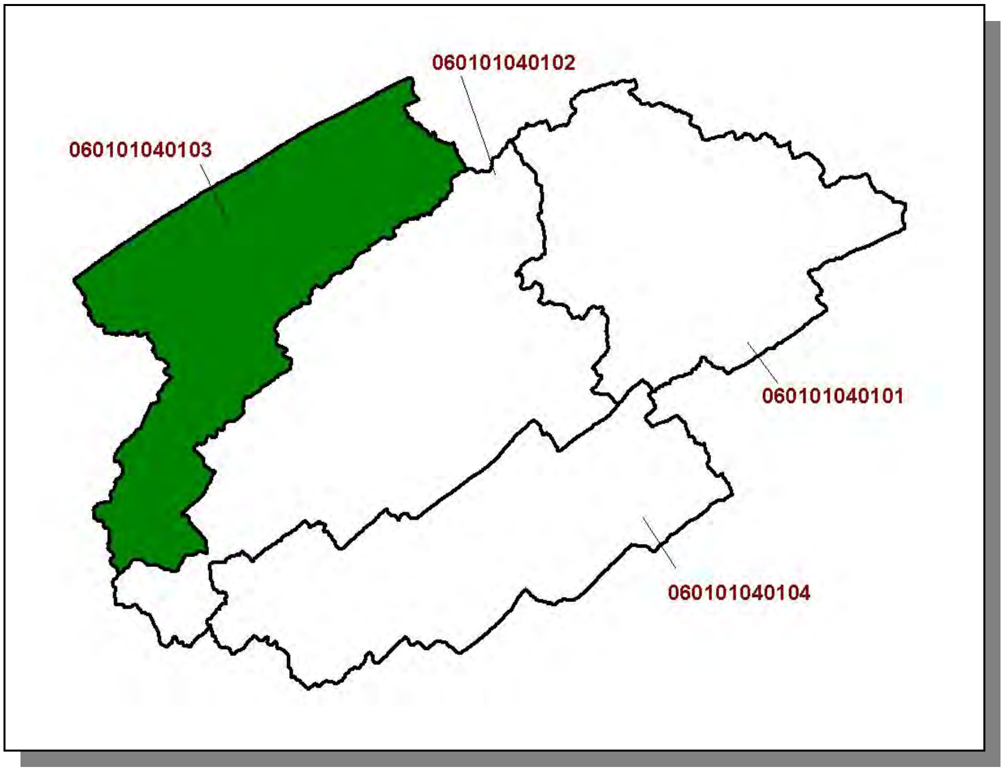

Figure 4-27. Location of Subwatershed 060101040103. *HUC-12 subwatershed boundaries are shown for reference.*

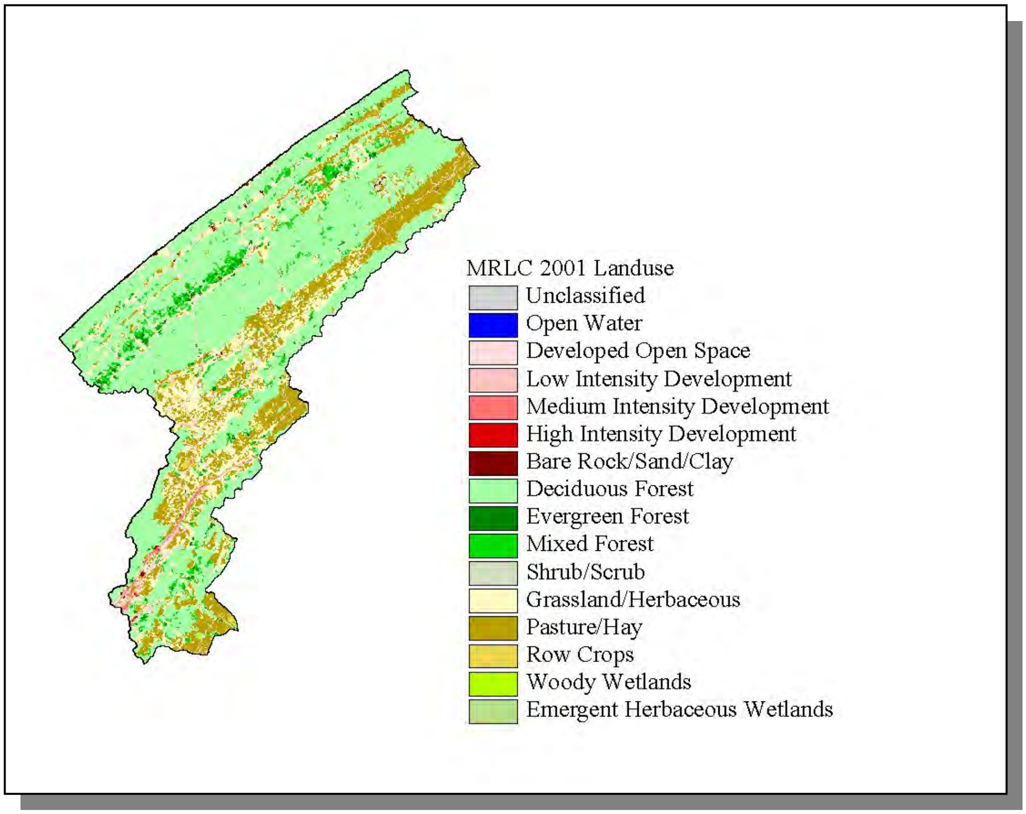

Figure 4-28. Illustration of Land Use Distribution in Subwatershed 060101040103.

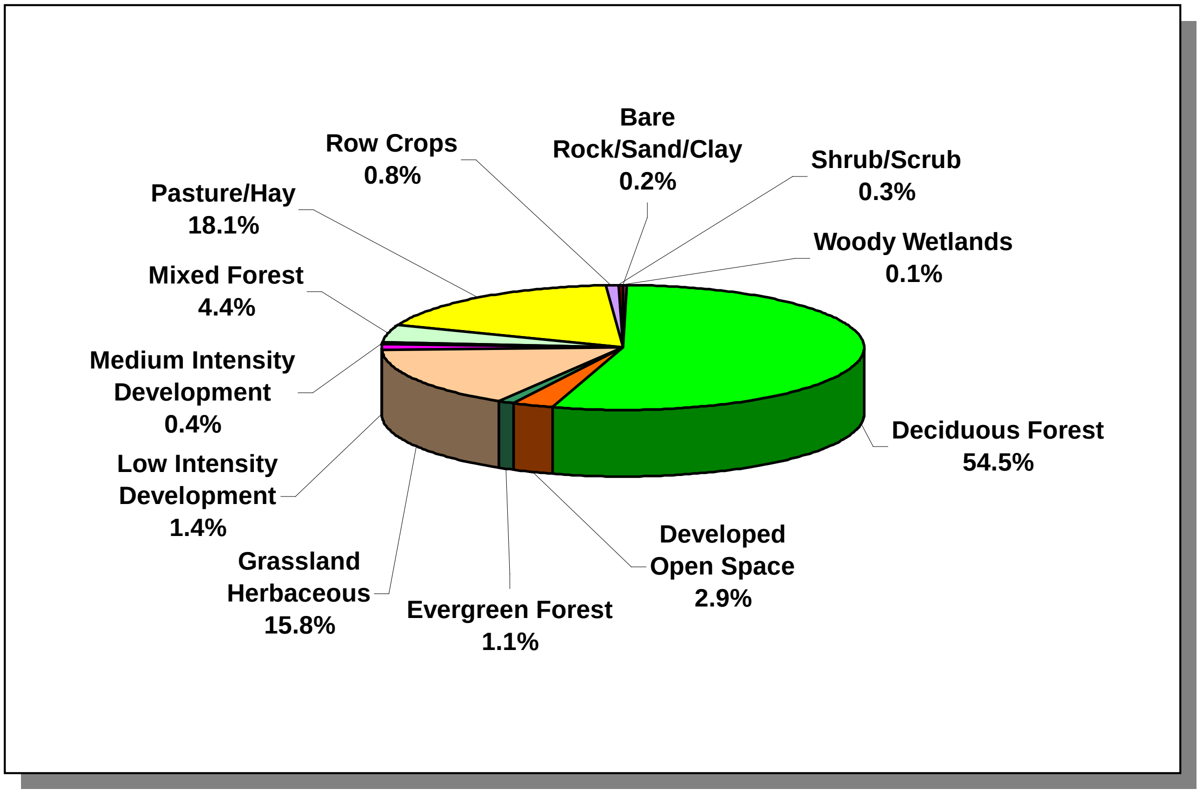

Figure 4-29. Land Use Distribution in Subwatershed 060101040103. *More information is provided in Appendix IV.*

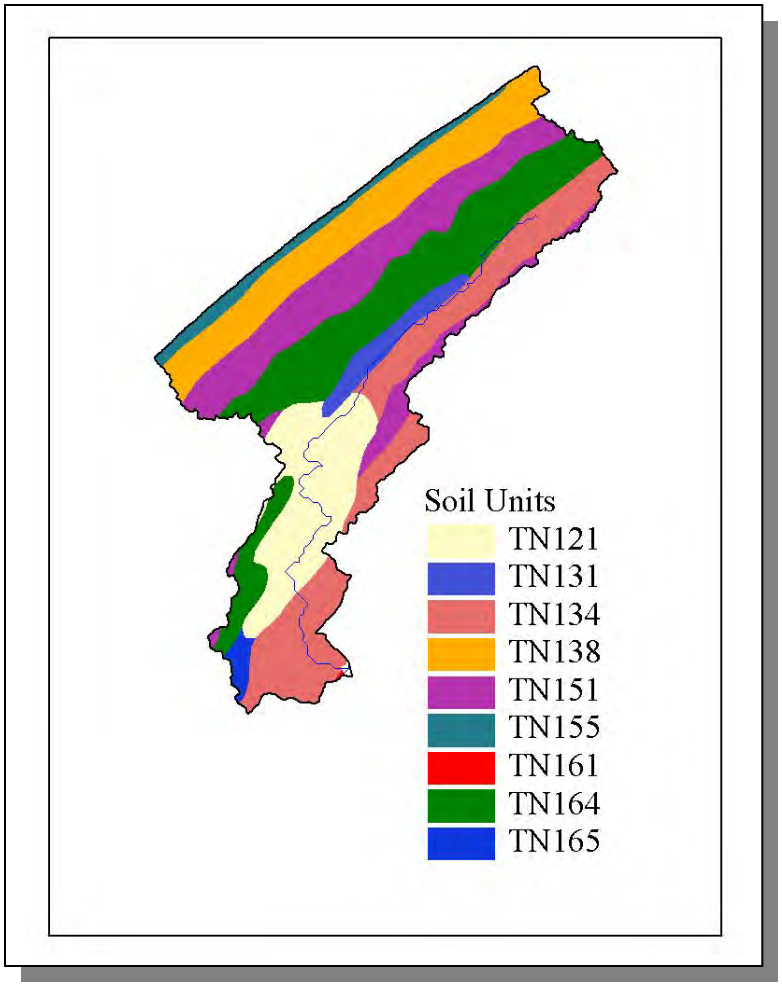

Figure 4-30. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040103.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN121	0.00	B	1.30	5.21	Loam	0.33
TN131	0.00	C	1.17	4.95	Silty Loam	0.33
TN134	0.00	B	1.38	5.18	Loam	0.31
TN138	0.00	C	2.48	4.26	Sandy Loam	0.22
TN151	0.00	C	2.88	4.75	Loam	0.40
TN155	0.00	C	1.71	5.31	Loam	0.32
TN161	7.00	C	1.41	5.11	Loam	0.31
TN164	0.00	C	4.48	5.15	Loam	0.25
TN165	0.00	B	4.79	5.51	Silty Loam	0.32

Table 4-24. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040103. *The definition of "Hydrologic Group" is provided in Appendix IV.*

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	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Hancock	6,739	6,801	6,786	0.11	7	7	7	0.0
Hawkins	44,565	48,821	53,563	10.92	4,867	5,332	5,849	20.2
Total	**51,304**	**55,622**	**60,349**		**4,874**	**5,339**	**5,856**	**20.1**

Table 4-25. Population Estimates in Subwatershed 060101040103.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Rogersville	Hawkins	4,149	1,995	1,833	133	29

Table 4-26. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 060101040103.

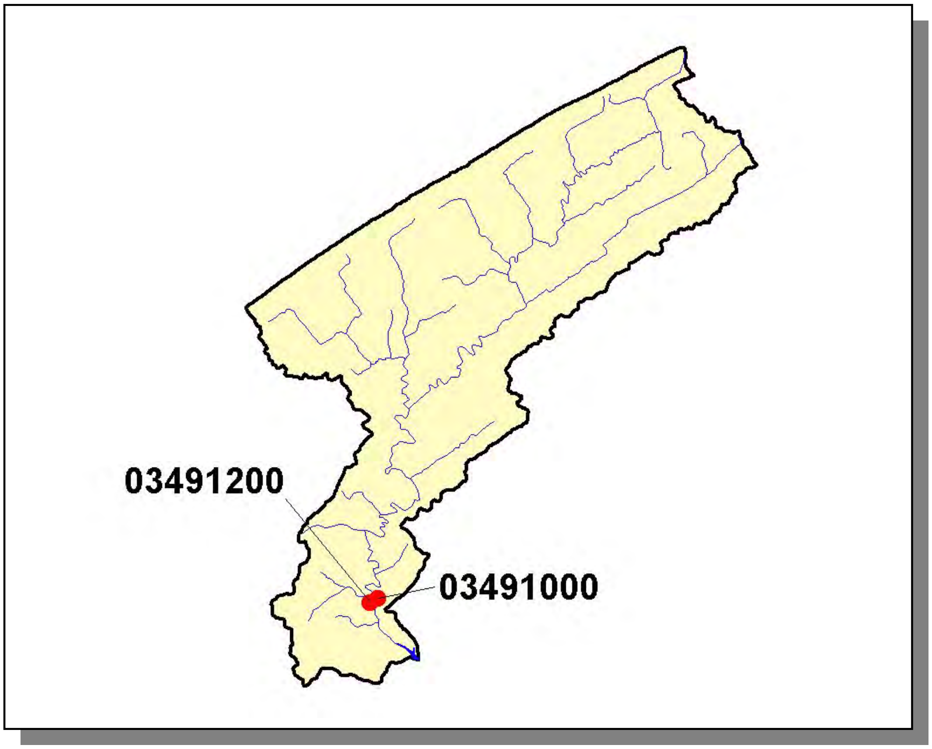

Figure 4-31. Location of Historical Streamflow Data Collection Sites in Subwatershed 060101040103. *More information is provided in Appendix IV.*

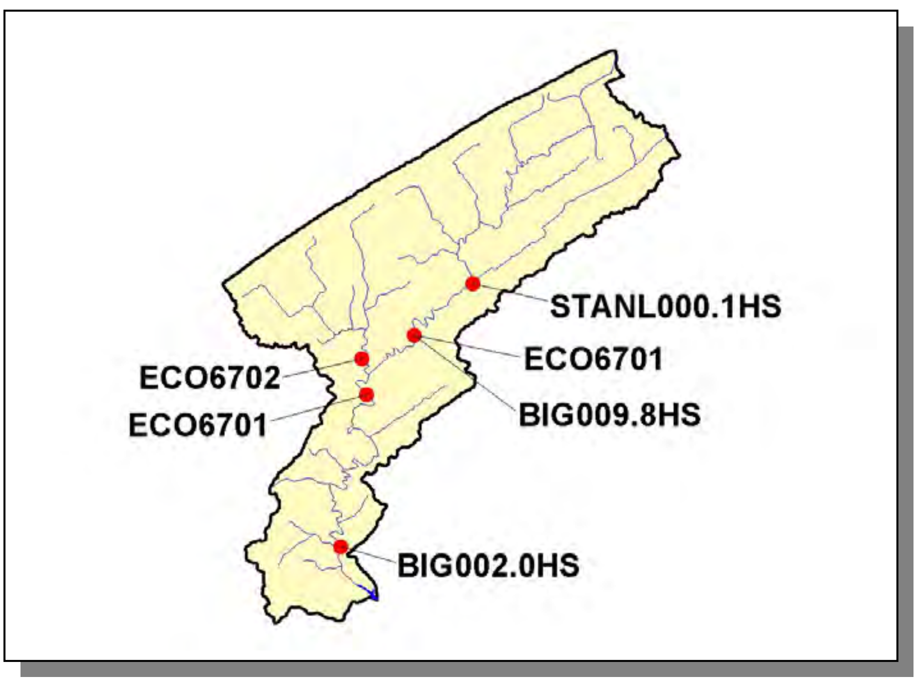

Figure 4-32. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 060101040103. *More information, including site names and locations, is provided in Appendix IV.*

4.2.A.iii.a. Point Source Contributions.

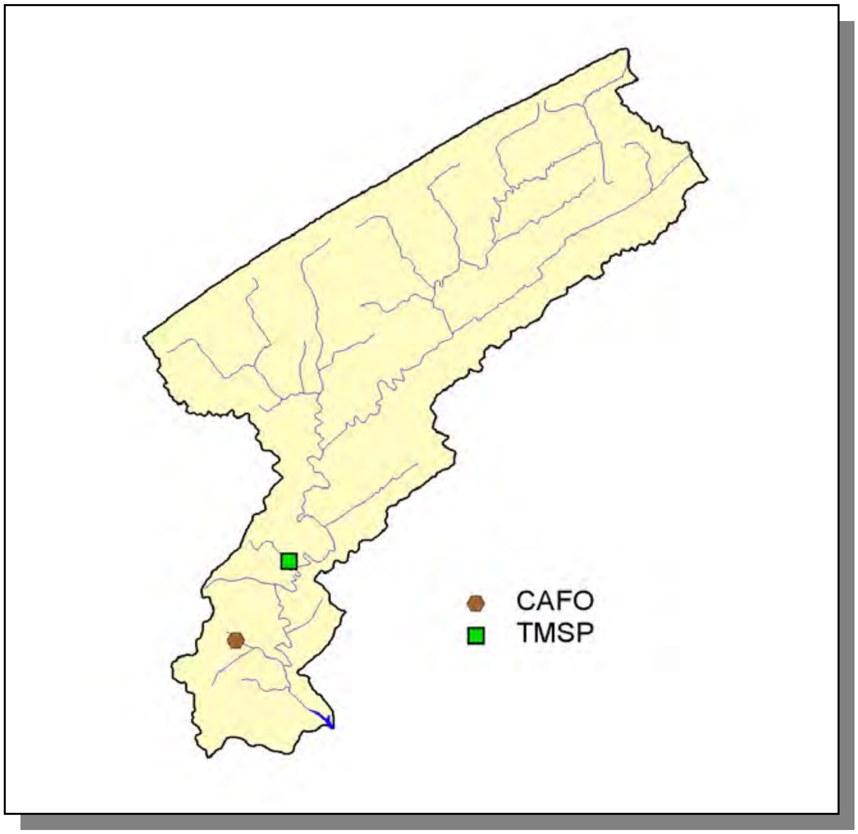

Figure 4-33. Location of Permits Issued in Subwatershed 060101040103. *More information, including the names of facilities, is provided in Appendix IV.*

Figure 4-34. Location of Concentrated Animal Feeding Operations (CAFO) in Subwatershed 060101040103. *More information, including the names of facilities, is provided in Appendix IV.*

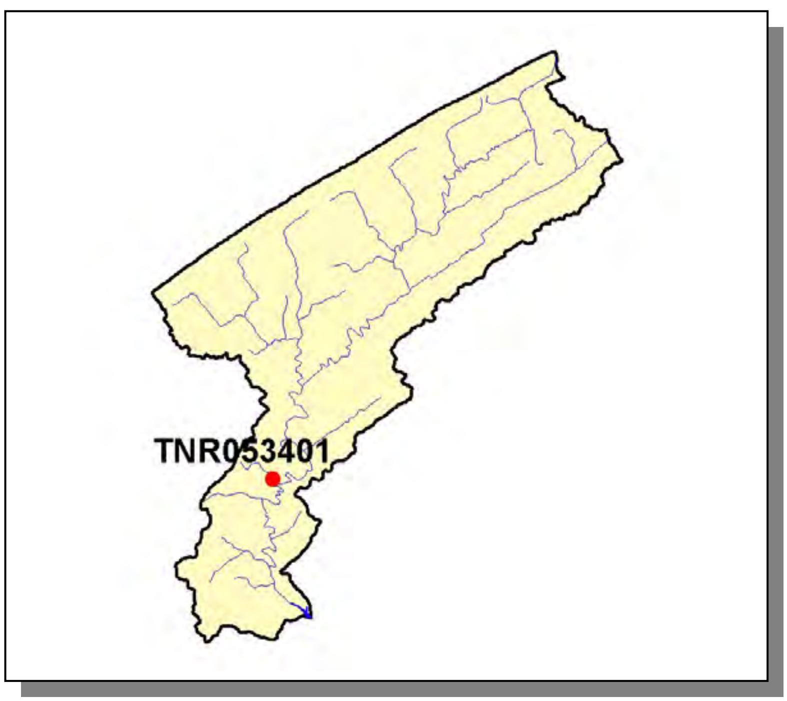

Figure 4-35. Location of TMSP Sites in Subwatershed 060101040103. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.A.iii.b. Nonpoint Source Contributions.

LIVESTOCK COUNTS					
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
2,153	4,172	103	7	51	28

Table 4-27. Summary of Livestock Count Estimates in Subwatershed 060101040103. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Hancock	7,079	14,311	89	364	0	67
Hawkins	18,796	36,429	903	1,079	442	243

Table 4-28. Summary of Livestock Count Estimates in Hancock and Hawkins Counties. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Hancock	92.9	92.9	2.7	14.2
Hawkins	177.4	177.4	0.4	2.1

Table 4-29. Forest Acreage and Annual Removal Rates (1987-1994) in Hancock and Hawkins Counties.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.27
Grass (Hayland)	0.56
Legumes, Grass (Hayland)	0.40
Legumes (Hayland)	0.16
Grass, Forbs, Legumes (Mixed Pasture)	0.54
Corn (Row Crops)	2.42
Tobacco (Row Crops)	16.43
Other Vegetable and Truck Crops	33.50
Farmsteads and Ranch Headquarters	0.40

Table 4-30. Annual Estimated Total Soil Loss in Subwatershed 060101040103.

4.2.A.iv. 060101040104 (Beech Creek).

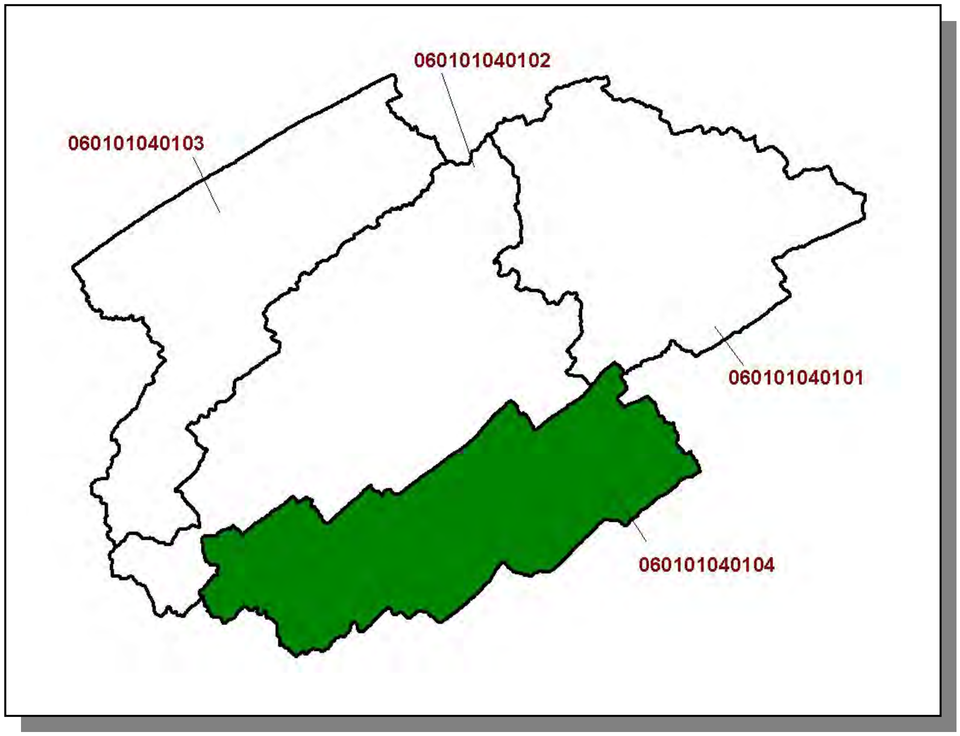

Figure 4-36. Location of Subwatershed 060101040104. *HUC-12 subwatershed boundaries are shown for reference.*

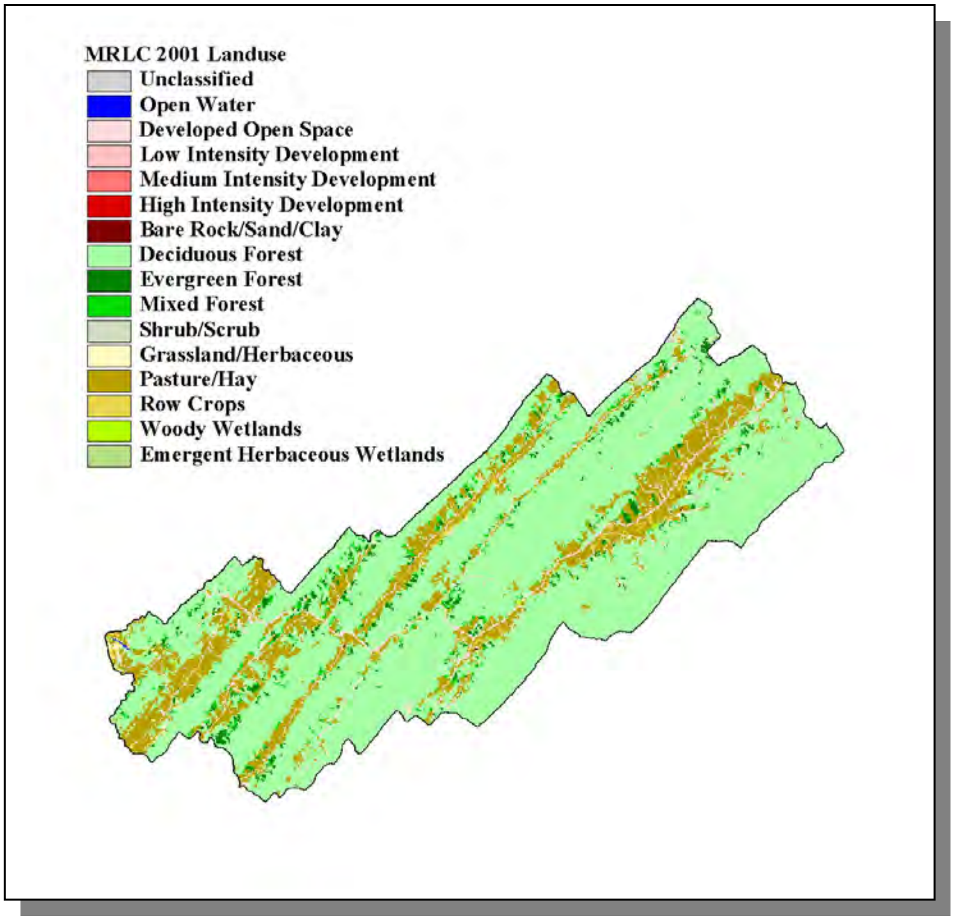

Figure 4-37. Illustration of Land Use Distribution in Subwatershed 060101040104.

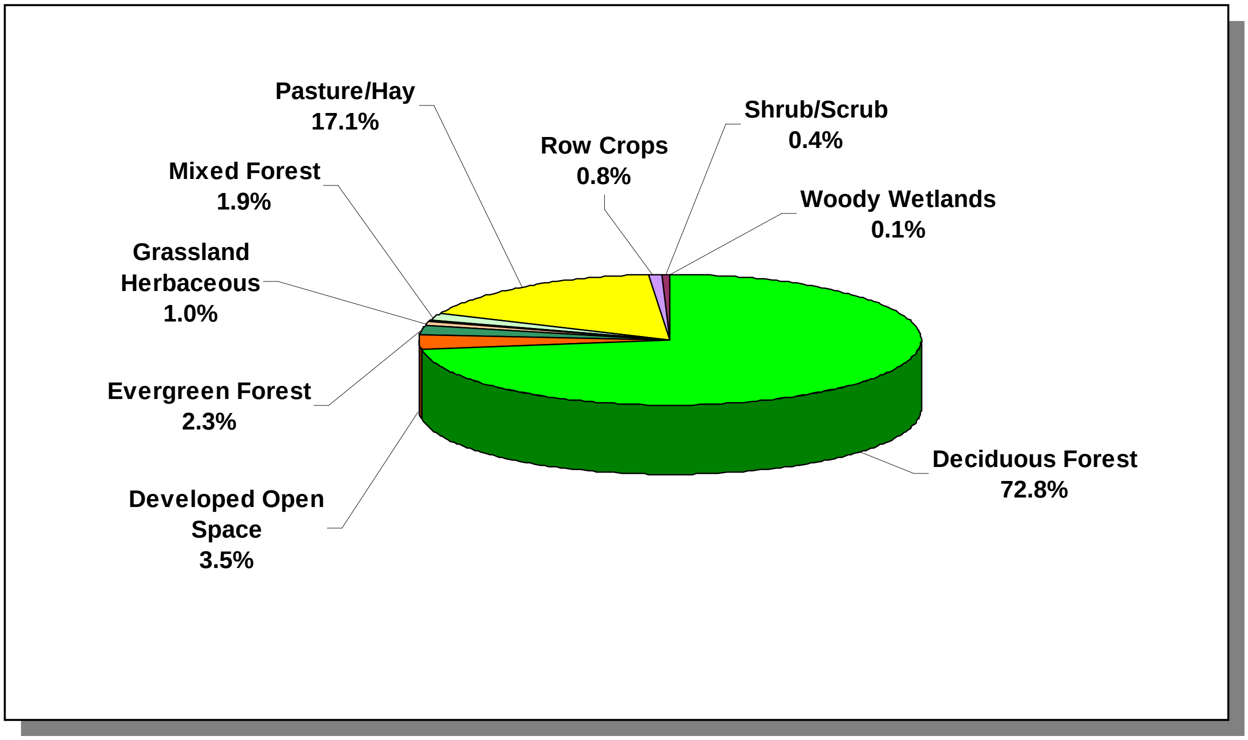

Figure 4-38. Land Use Distribution in Subwatershed 060101040104. *More information is provided in Appendix IV.*

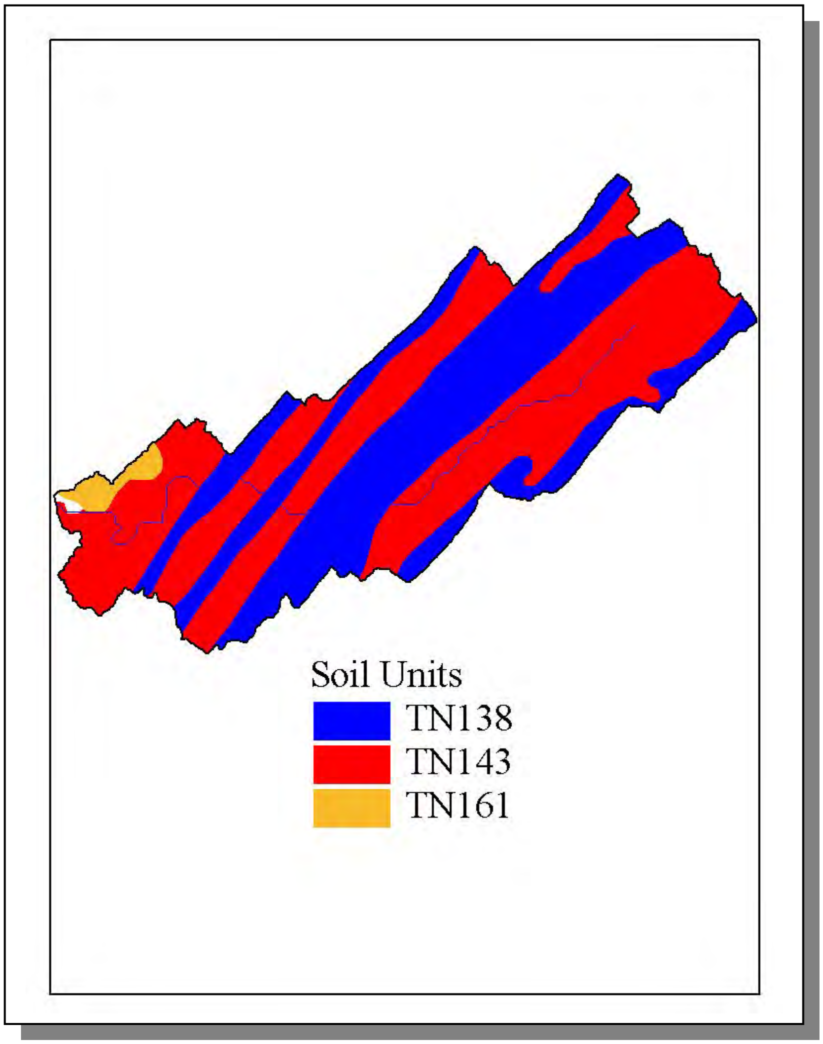

Figure 4-39. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040104.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN138	0.00	C	2.48	4.26	Sandy Loam	0.22
TN143	0.00	C	1.22	6.44	Loam	0.32
TN161	7.00	C	1.41	5.11	Loam	0.31

Table 4-31. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040104. *The definition of "Hydrologic Group" is provided in Appendix IV.*

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Greene	55,853	59,369	62,009	0.23	128	136	144	12.5
Hawkins	44,565	48,821	53,563	10.14	4,520	4,952	5,432	20.2
Sullivan	143,596	150,371	153,048	0.11	165	173	176	6.7
Washington	92,315	101,136	107,198	0.11	103	113	119	15.5
Total	**336,329**	**359,929**	**376,718**		**4,916**	**5,374**	**5,871**	**19.4**

Table 4-32. Population Estimates in Subwatershed 060101040104.

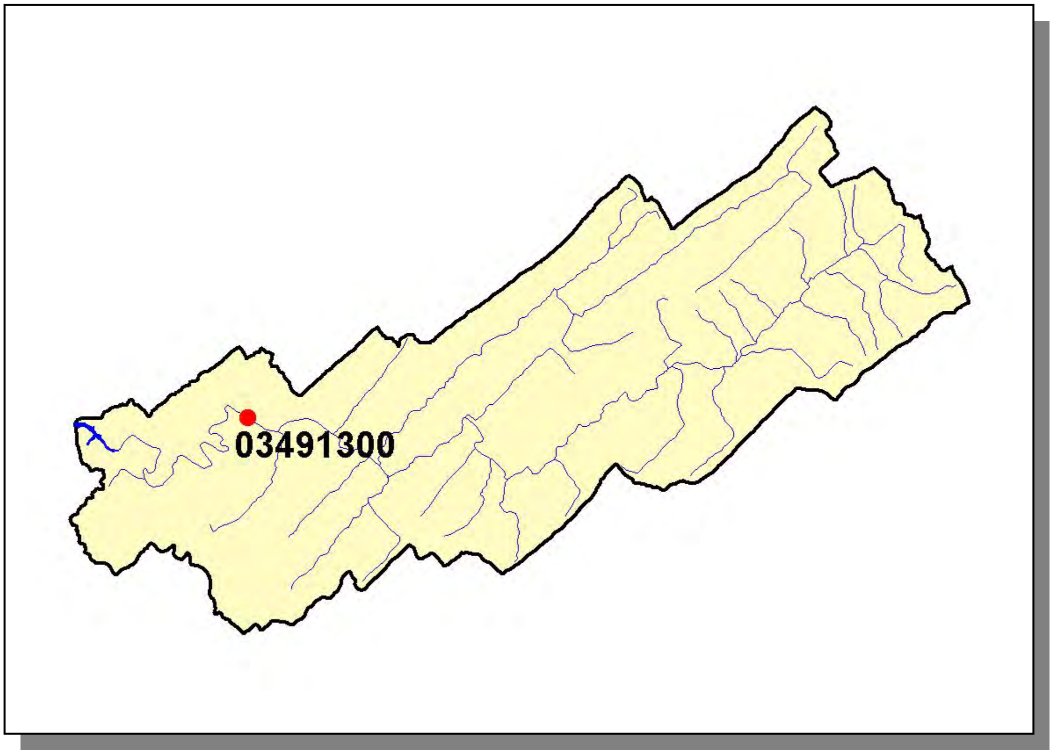

Figure 4-40. Location of Historical Streamflow Data Collection Sites in Subwatershed 060101040104. *More information is provided in Appendix IV.*

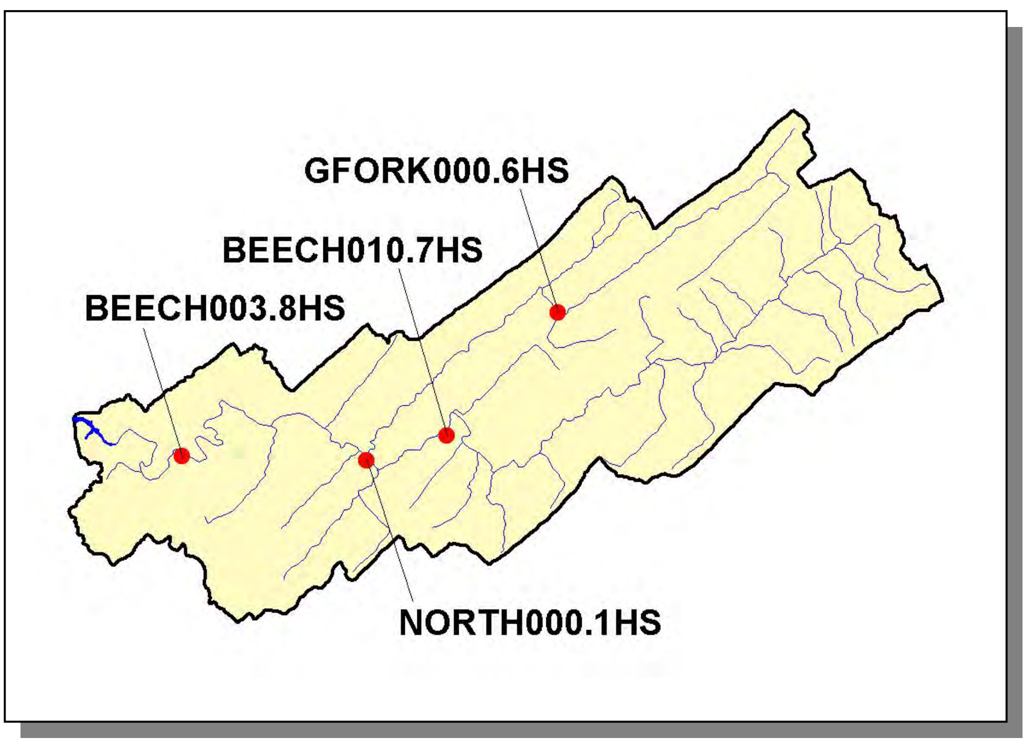

Figure 4-41. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 060101040104. *More information, including site names and locations, is provided in Appendix IV.*

4.2.A.iv.a. Point Source Contributions.

There are no point source contributions in this subwatershed.

4.2.A.iv.b. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens (Broilers Sold)	Hogs	Sheep
971	1,897	49	3	262	22	12

Table 4-33. Summary of Livestock Count Estimates in Subwatershed 060101040104. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/),* **"***Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS							
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens (Broilers Sold)	Hogs	Sheep
Greene	33,962	72,582	7,282	1,190	4,908,815	495	226
Hawkins	18,796	36,429	903	1,079	0	442	243
Sullivan	13,322	29,386	1,075	594	0	104	69
Washington	23,073	53,186	5,190	38	0	262	353

Table 4-34. Summary of Livestock Count Estimates in Greene, Hawkins, Sullivan, and Washington Counties. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/),* **"***Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Greene	180.0	171.8	2.0	10.5
Hawkins	177.4	177.4	0.4	2.1
Sullivan	123.7	123.7	0.1	0.3
Washington	54.8	50.3	0.3	0.2

Table 4-35. Forest Acreage and Annual Removal Rates (1987-1994) in Greene, Hawkins, Sullivan, and Washington Counties.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.28
Grass (Hayland)	0.55
Legumes, Grass (Hayland)	0.39
Legumes (Hayland)	0.16
Grass, Forbs, Legumes (Mixed Pasture)	0.55
Corn (Row Crops)	14.40
Tobacco (Row Crops)	16.18
Other Vegetable and Truck Crops	32.68
Other Land in Farms	0.02
Farmsteads and Ranch Headquarters	0.44

Table 4-36. Annual Estimated Total Soil Loss in Subwatershed 060101040104.

4.2.B. 0601010402.

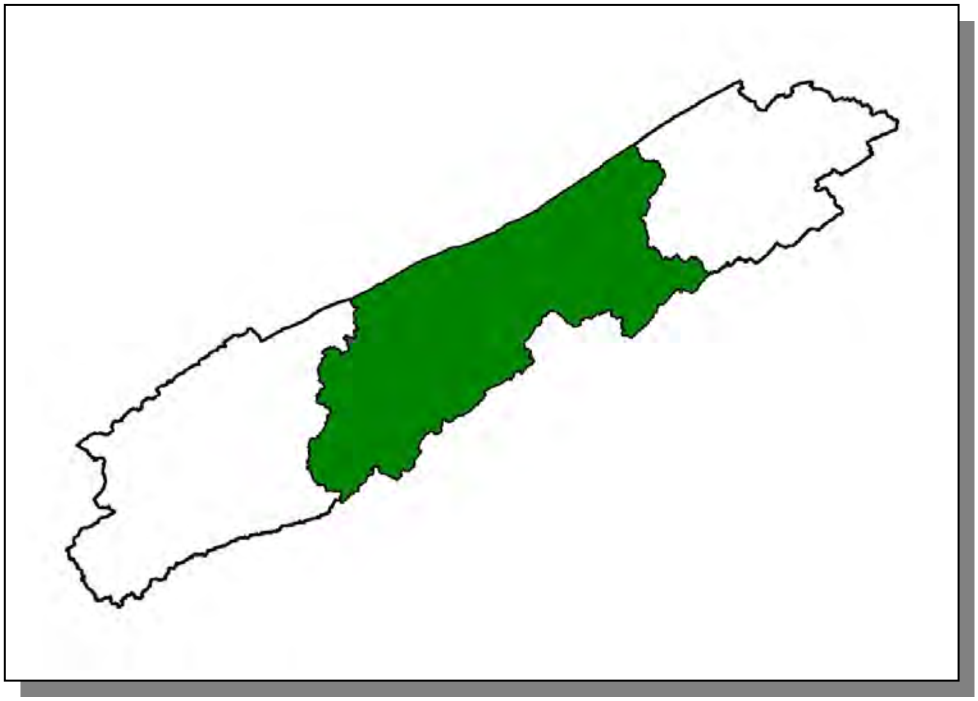

Figure 4-42. Location of Subwatershed 0601010402. *All Holston River HUC-10 subwatershed boundaries are shown for reference.*

4.2.B.i. 060101040201 (Cherokee Lake).

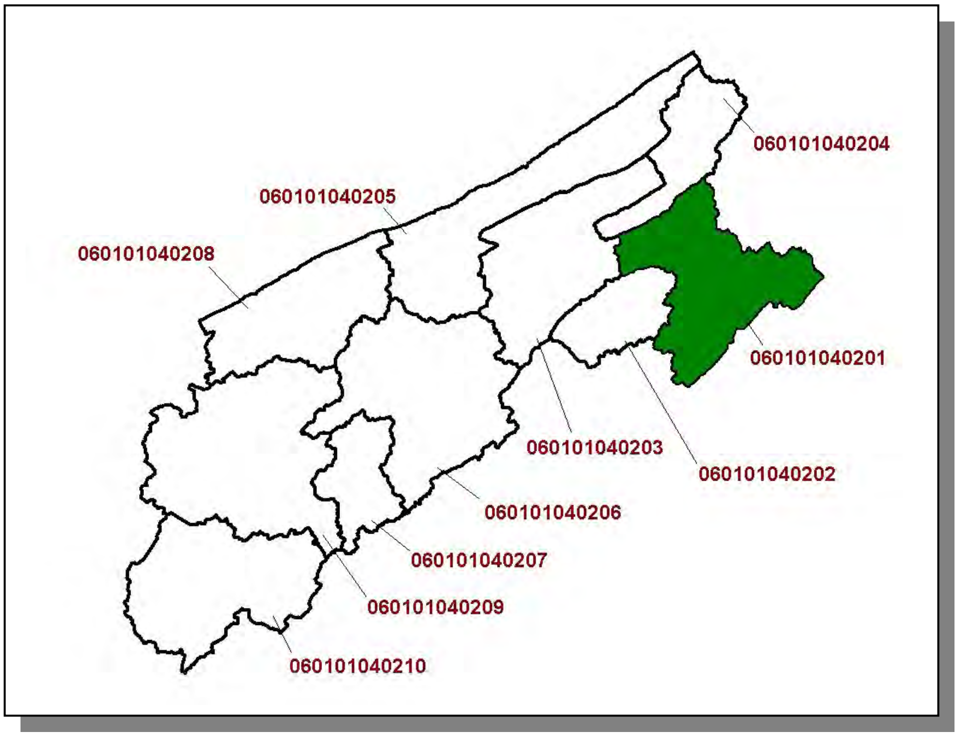

Figure 4-43. Location of Subwatershed 060101040201. *HUC-12 subwatershed boundaries are shown for reference.*

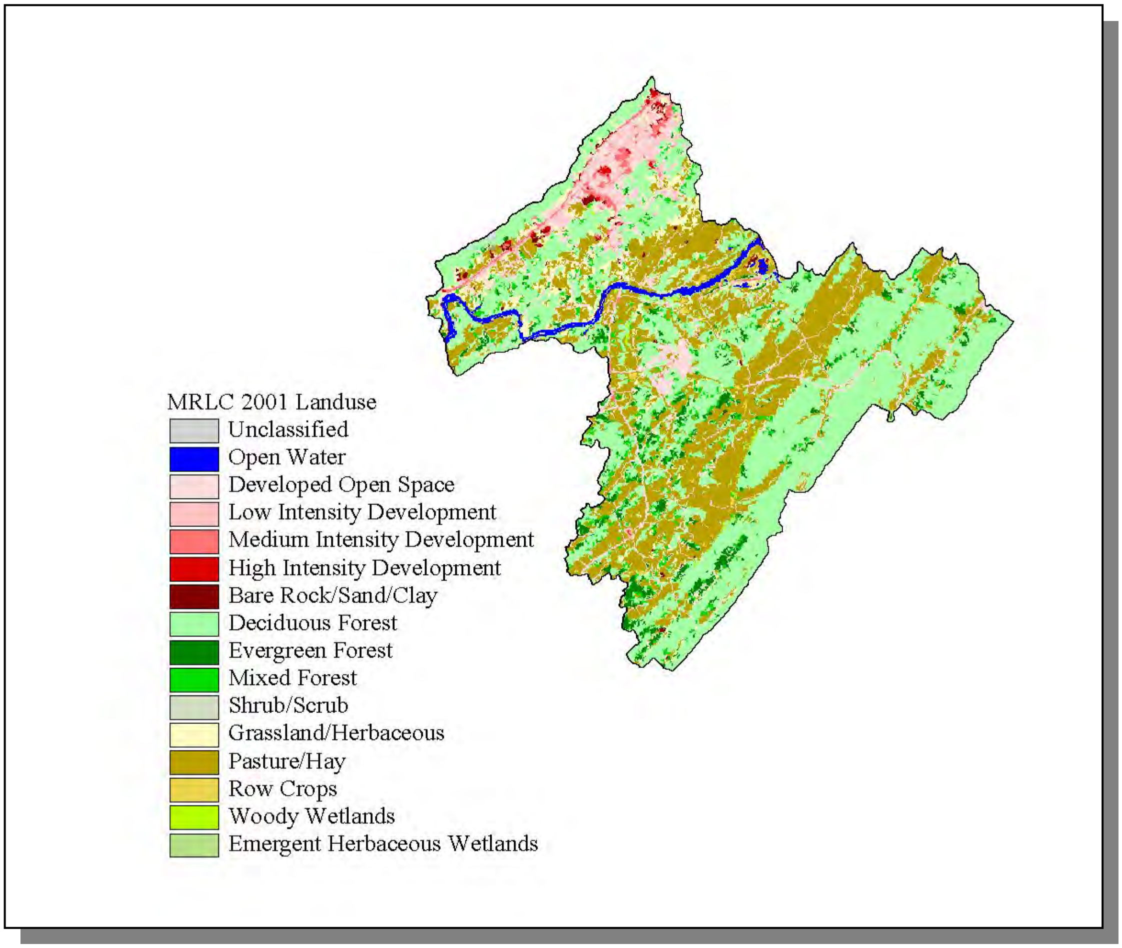

Figure 4-44. Illustration of Land Use Distribution in Subwatershed 060101040201.

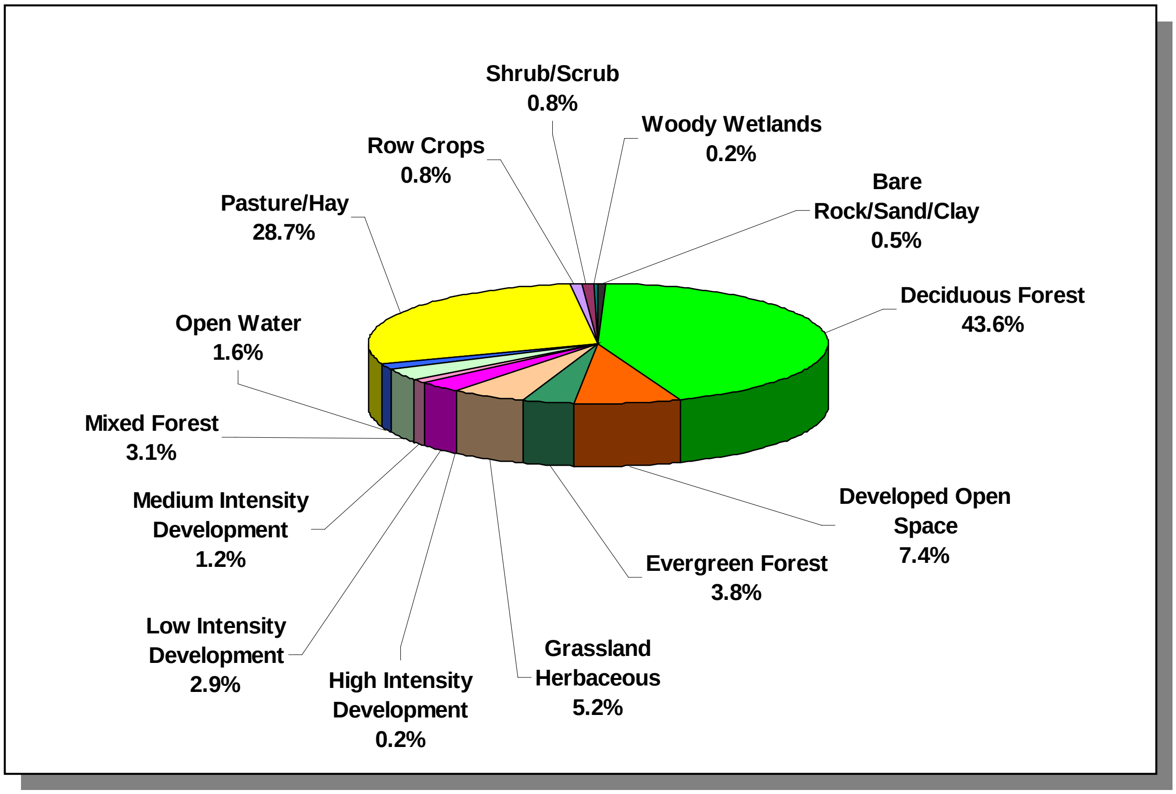

Figure 4-45. Land Use Distribution in Subwatershed 060101040201. *More information is provided in Appendix IV.*

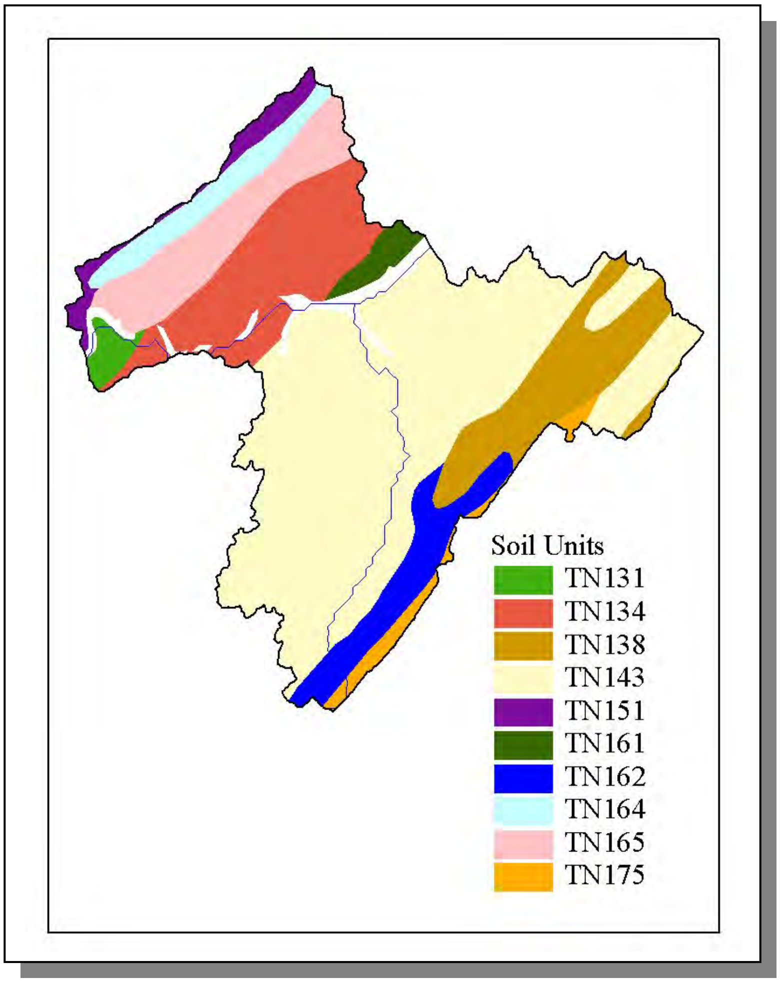

Figure 4-46. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040201.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN131	0.00	C	1.17	4.95	Silty Loam	0.33
TN134	0.00	B	1.38	5.18	Loam	0.31
TN138	0.00	C	2.48	4.26	Sandy Loam	0.22
TN143	0.00	C	1.22	6.44	Loam	0.32
TN151	0.00	C	2.88	4.75	Loam	0.40
TN161	7.00	C	1.41	5.11	Loam	0.31
TN162	1.00	C	1.52	6.20	Loam	0.36
TN164	0.00	C	1.48	5.15	Loam	0.25
TN165	0.00	B	1.79	5.51	Silty Loam	0.32
TN175	0.00	B	1.49	5.23	Loam	0.30

Table 4-37. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040201. *The definition of "Hydrologic Group" is provided in Appendix IV.*

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	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Greene	55,853	59,369	62,909	0.34	190	202	214	12.6
Hawkins	44,565	48,821	53,563	8.71	3,880	4,250	4,663	20.2
Total	**100,418**	**108,190**	**116,472**		**4070**	**4,452**	**4,877**	**19.8**

Table 4-38. Population Estimates in Subwatershed 060101040201.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Rogersville	Hawkins	4,149	1,995	1,833	133	29

Table 4-39. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 060101040201.

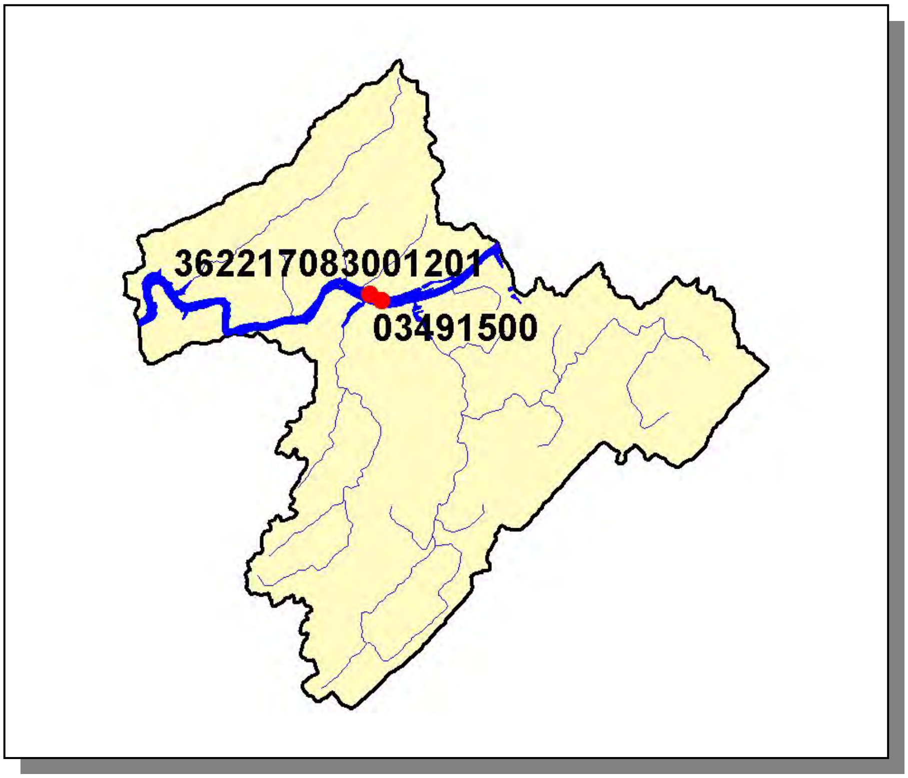

Figure 4-47. Location of Historical Streamflow Data Collection Sites in Subwatershed 060101040201. *More information is provided in Appendix IV.*

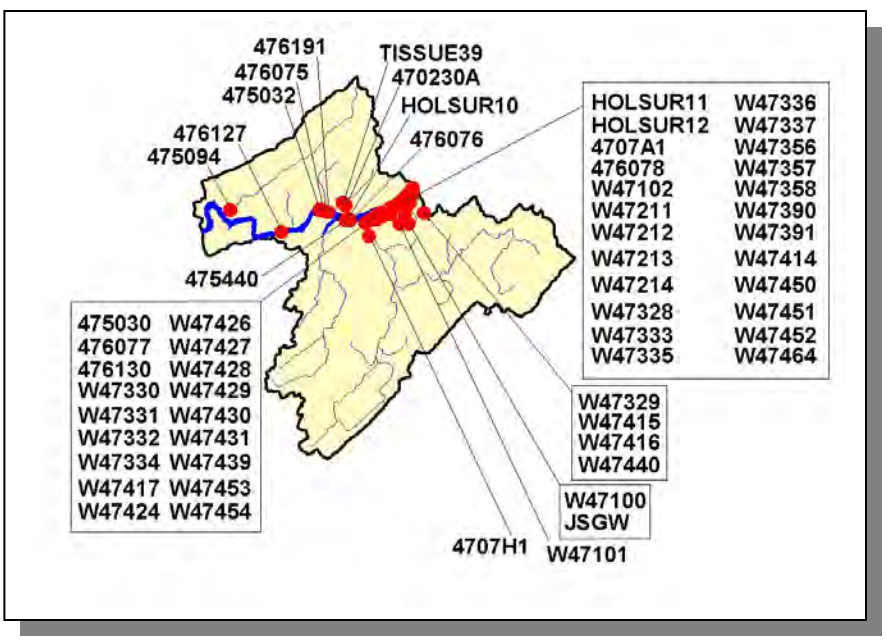

Figure 4-48. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 060101040201. *More information, including site names and locations, is provided in Appendix IV.*

4.2.B.i.a. Point Source Contributions.

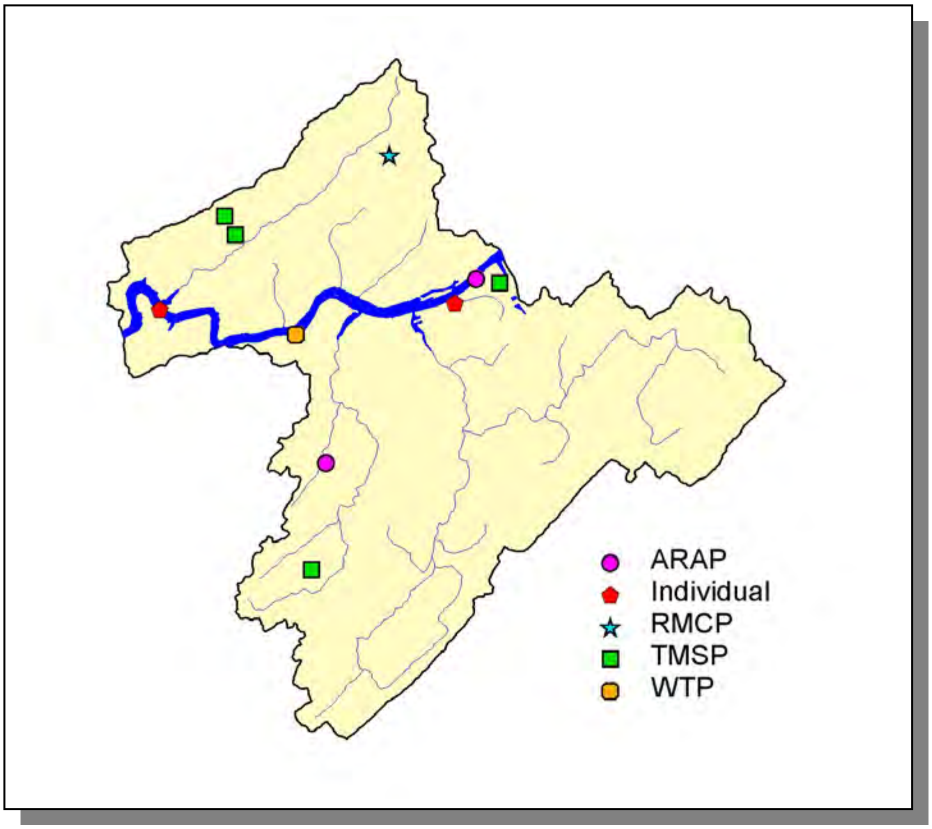

Figure 4-49. Location of Permits Issued in Subwatershed 060101040201. *More information, including the names of facilities, is provided in Appendix IV.*

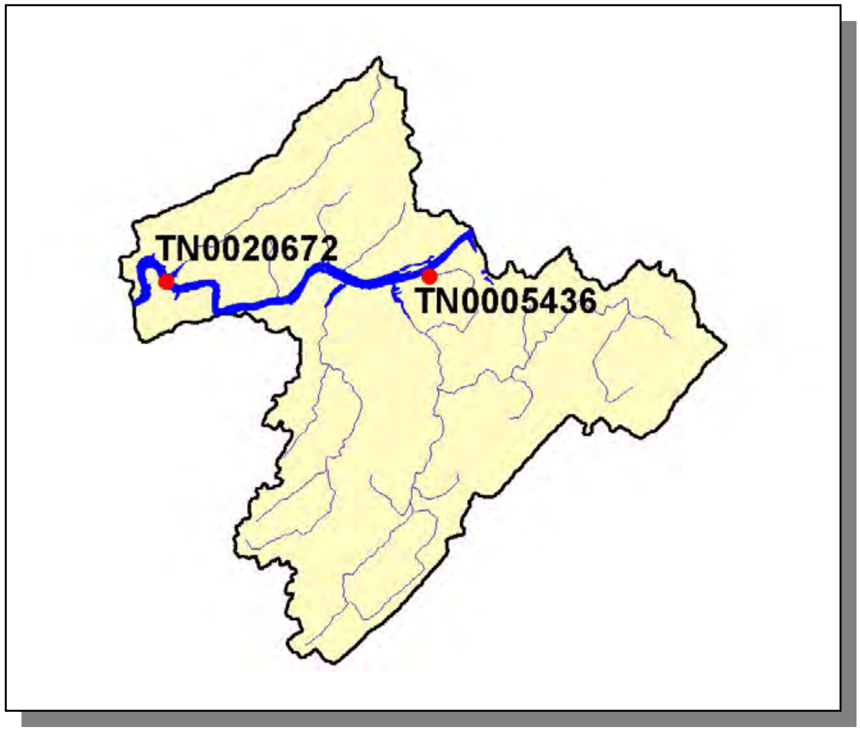

Figure 4-50. Location of Active NPDES Sites in Subwatershed 060101040201. More information, including the names of facilities, is provided in Appendix IV.

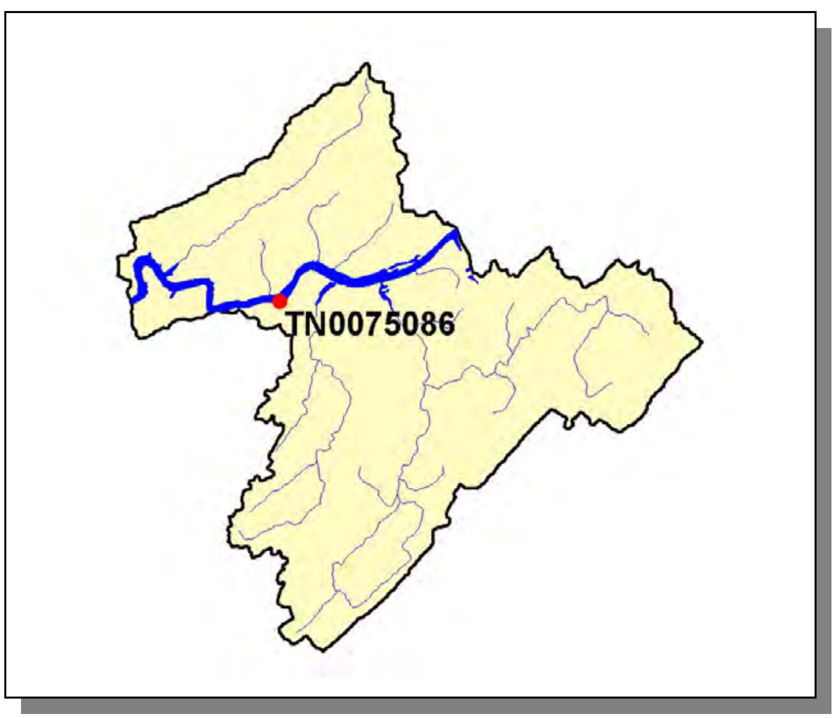

Figure 4-51. Location of Water Treatment Plants in Subwatershed 060101040201. More information, including the names of facilities, is provided in Appendix IV.

Figure 4-52. Location of Ready Mix Concrete Plants (RMCP) in Subwatershed 060101040201. *More information is provided in Appendix IV.*

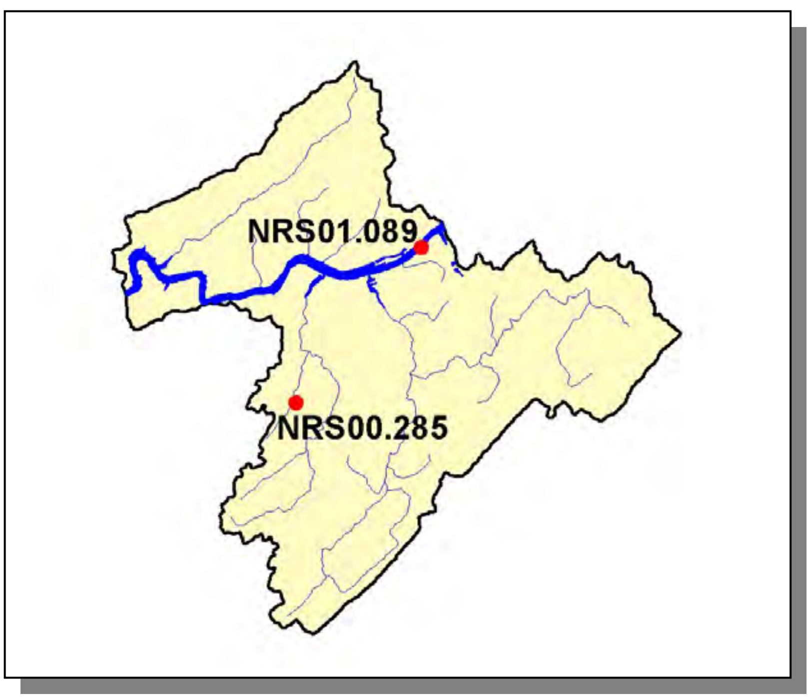

Figure 4-53. Location of Aquatic Resource Alteration Permit (ARAP) Sites (Individual Permits) in Subwatershed 060101040201. *More information is provided in Appendix IV.*

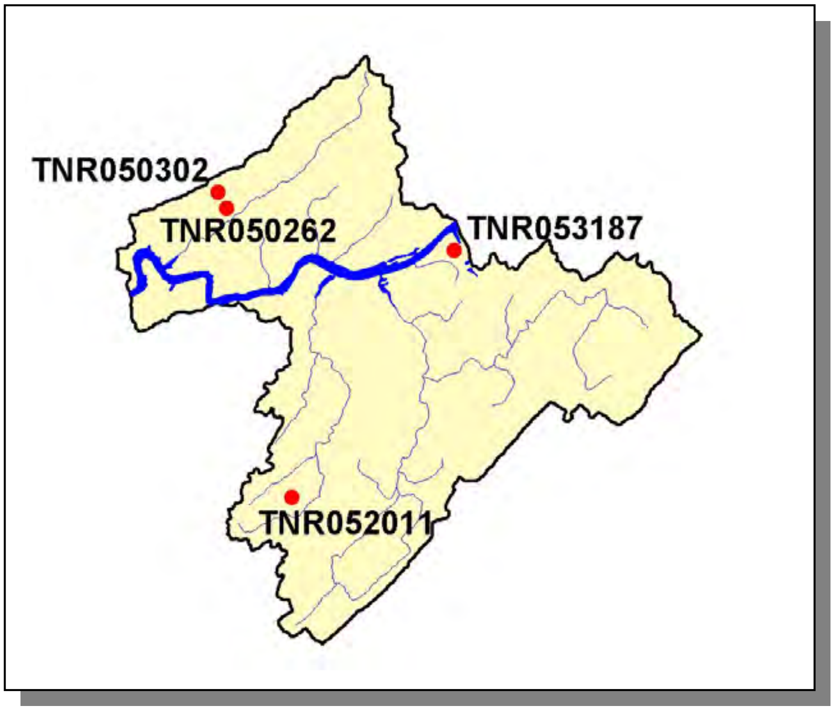

Figure 4-54. Location of TMSP Sites in Subwatershed 060101040201. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.B.i.a.i. Dischargers to Water Bodies Listed on the 2004 303(d) List

There is one NPDES facility discharging to water bodies listed on the 2004 303(d) list in Subwatershed 060101040201:

- TN0020672 (Rogersville STP) discharges to the Holston River @ RM 99.7

Figure 4-55. Location of NPDES Dischargers to Water Bodies Listed on the 2004 303(d) List in Subwatershed 060101040201. *More information, including the names of facilities, is provided in Appendix IV.*

Permit #	3Q2	1Q10	3Q10	3Q20	7Q10
TN0020672	582.00	463.00	428.00	535.00	614.00

Table 4-40. Receiving Stream Low Flow Information for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 060101040201. *Data are in cubic feet per second (CFS). Data were obtained from the USGS web application StreamStats at http://water.usgs.gov/osw/streamstats/. (na, data not available)*

PERMIT #	FLOW	DISCHARGE RATIO
TN0020672	X	X

Table 4-41. Monitoring Requirements for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 060101040201.

PERMIT #	WET	$CBOD_5$	FECAL COLIFORM	TRC	TSS	SETTLEABLE SOLIDS	DO	pH
TN0020672	X	X	X	X	X	X	X	X

Table 4-42. Parameters Monitored for Daily Maximum Limits for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 060101040201. *WET, Whole Effluent Toxicity; $CBOD_5$, Carbonaceous Biochemical Oxygen Demand (5-Day); TRC, Total Residual Chlorine; TSS, Total Suspended Solids.*

4.2.B.i.b. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens (Broilers Sold)	Hogs	Sheep
2,081	4,034	101	7	1,095	49	27

Table 4-43. Summary of Livestock Count Estimates in Subwatershed 060101040201. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/),* ***"****Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS							
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens (Broilers Sold)	Hogs	Sheep
Greene	33,962	72,582	7,282	1,190	4,908,815	495	226
Hawkins	18,796	36,429	903	1,079	0	442	243

Table 4-44. Summary of Livestock Count Estimates in Greene and Hawkins Counties. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/),* ***"****Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Greene	180	171.8	2.0	10.5
Hawkins	177.4	177.4	0.4	2.1

Table 4-45. Forest Acreage and Annual Removal Rates (1987-1994) in Greene and Hawkins Counties.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.27
Grass (Hayland)	0.54
Legumes, Grass (Hayland)	0.40
Legumes (Hayland)	0.16
Grass, Forbs, Legumes (Mixed Pasture)	0.53
Corn (Row Crops)	16.75
Tobacco (Row Crops)	16.35
Other Vegetable and Truck Crops	32.10
Farmsteads and Ranch Headquarters	0.46

Table 4-46. Annual Estimated Total Soil Loss in Subwatershed 060101040201.

4.2.B.ii. 060101040202 (Robertson Creek).

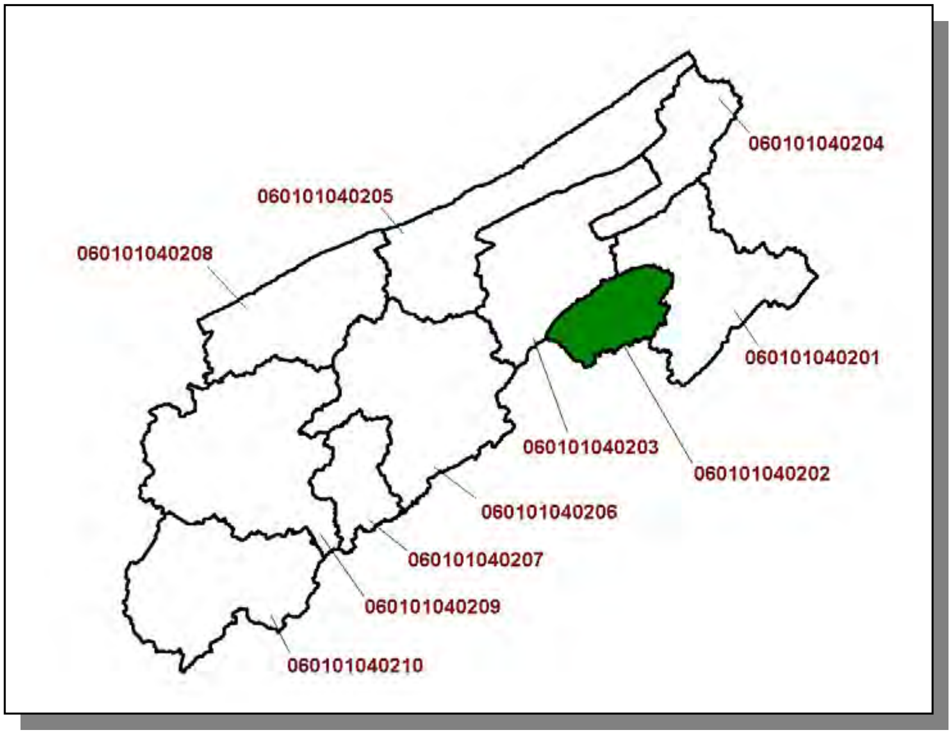

Figure 4-56. Location of Subwatershed 060101040202. *HUC-12 subwatershed boundaries are shown for reference.*

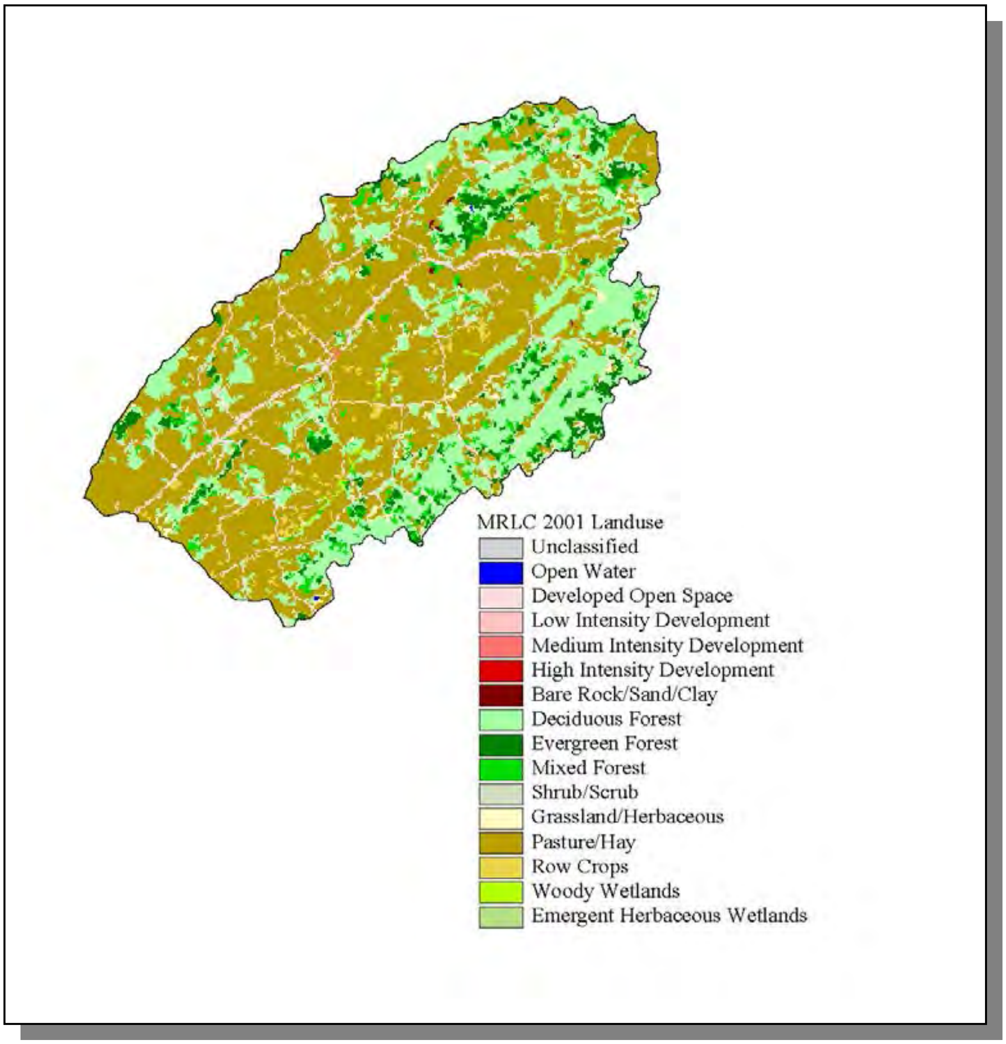

Figure 4-57. Illustration of Land Use Distribution in Subwatershed 060101040202.

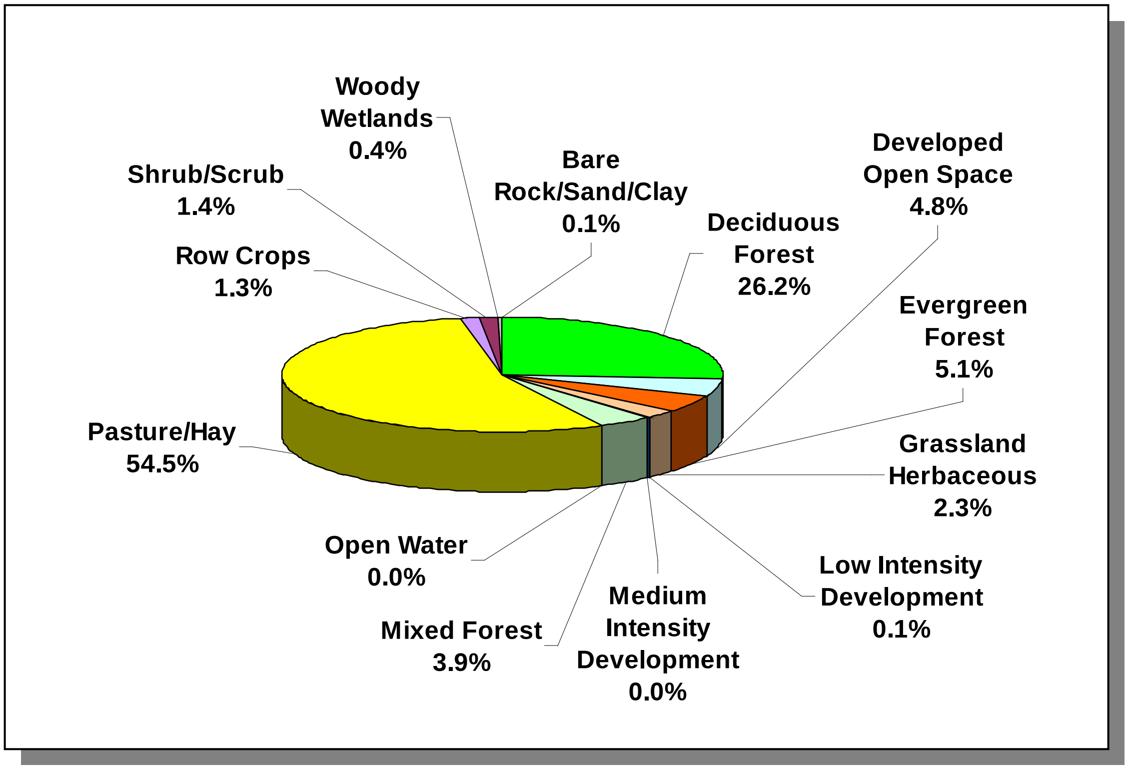

Figure 4-58. Land Use Distribution in Subwatershed 060101040202. *More information is provided in Appendix IV.*

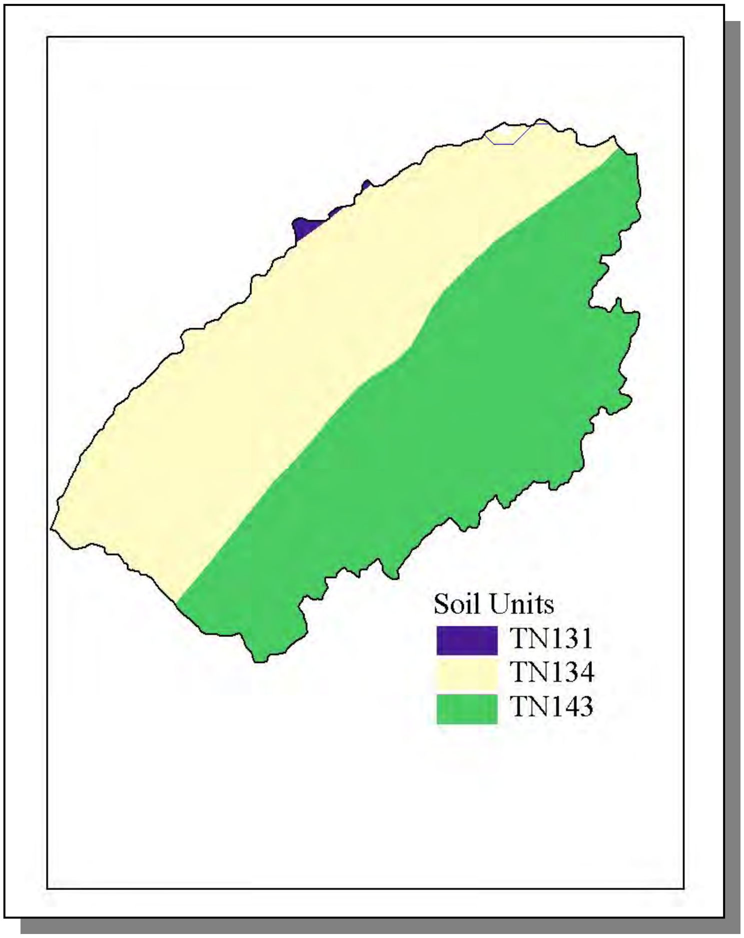

Figure 4-59. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040202.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN131	0.00	C	1.17	4.95	Silty Loam	0.33
TN134	0.00	B	1.38	5.18	Loam	0.31
TN143	0.00	C	1.22	6.44	Loam	0.32

Table 4-47. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040202. *The definition of "Hydrologic Group" is provided in Appendix IV.*

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Hawkins	44,565	48,821	53,563	3.72	1,656	1,814	1,991	20.2

Table 4-48. Population Estimates in Subwatershed 060101040202.

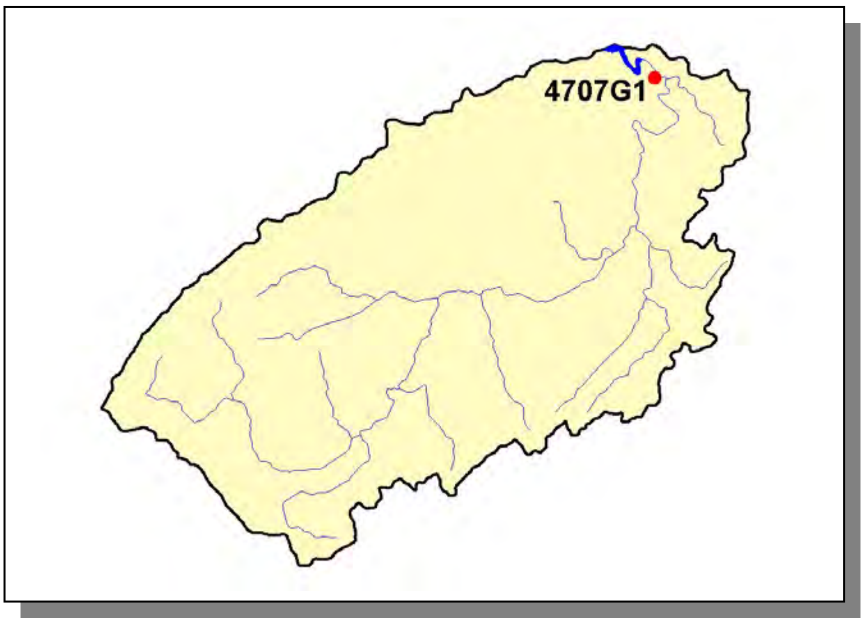

Figure 4-60. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 060101040202. *More information, including site names and locations, is provided in Appendix IV.*

4.2.B.ii.a. Point Source Contributions.

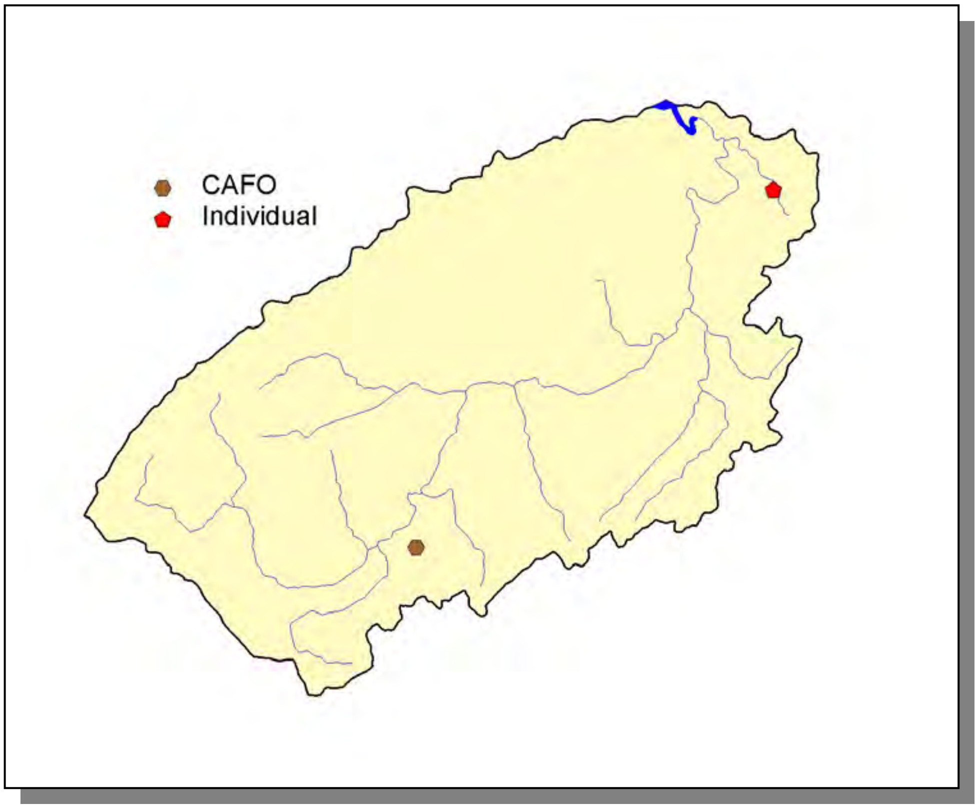

Figure 4-61. Location of Permits Issued in Subwatershed 060101040202. *More information, including the names of facilities, is provided in Appendix IV.*

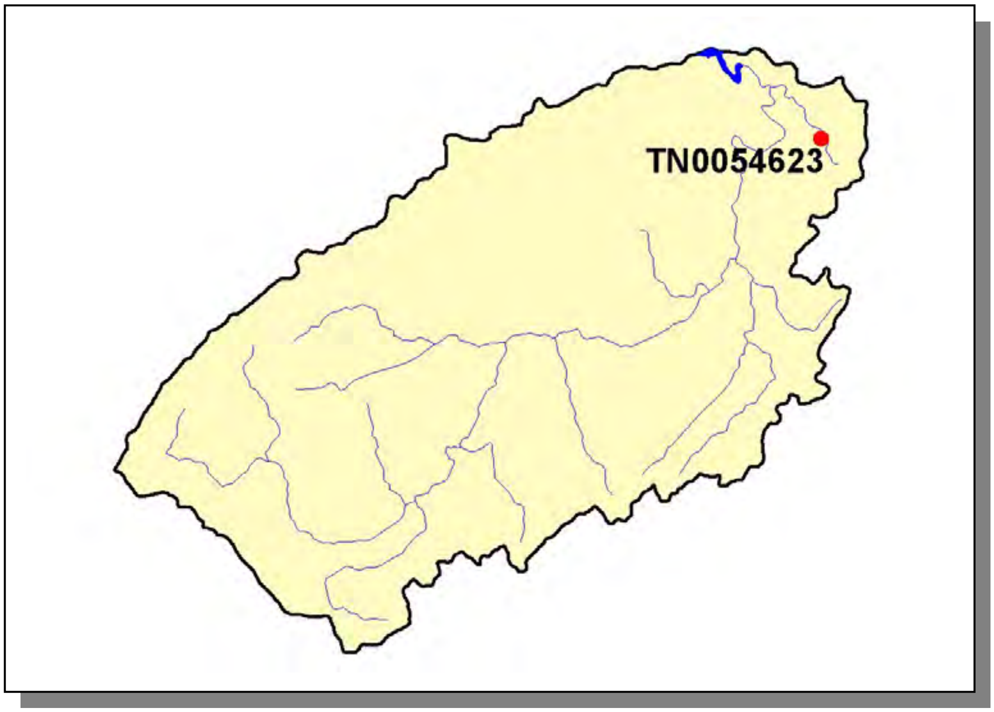

Figure 4-62. Location of Active NPDES Sites in Subwatershed 060101040202. *More information, including the names of facilities, is provided in Appendix IV.*

Figure 4-63. Location of Concentrated Animal Feeding Operations (CAFO) in Subwatershed 060101040202. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.B.ii.b. Nonpoint Source Contributions.

LIVESTOCK COUNTS					
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
1,553	3,011	75	5	37	20

Table 4-49. Summary of Livestock Count Estimates in Subwatershed 060101040202. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Hawkins	18,796	36,429	903	1,079	442	243

Table 4-50. Summary of Livestock Count Estimates in Hawkins County. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Hawkins	177.4	177.4	0.4	2.1

Table 4-51. Forest Acreage and Annual Removal Rates (1987-1994) in Hawkins County.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.26
Grass (Hayland)	0.56
Legumes, Grass (Hayland)	0.40
Legumes (Hayland)	0.16
Grass, Forbs, Legumes (Mixed Pasture)	0.54
Tobacco (Row Crops)	16.40
Other Vegetable and Truck Crops	33.50
Farmsteads and Ranch Headquarters	0.40

Table 4-52. Annual Estimated Total Soil Loss in Subwatershed 060101040202.

4.2.B.iii. 060101040203 (Cherokee Lake).

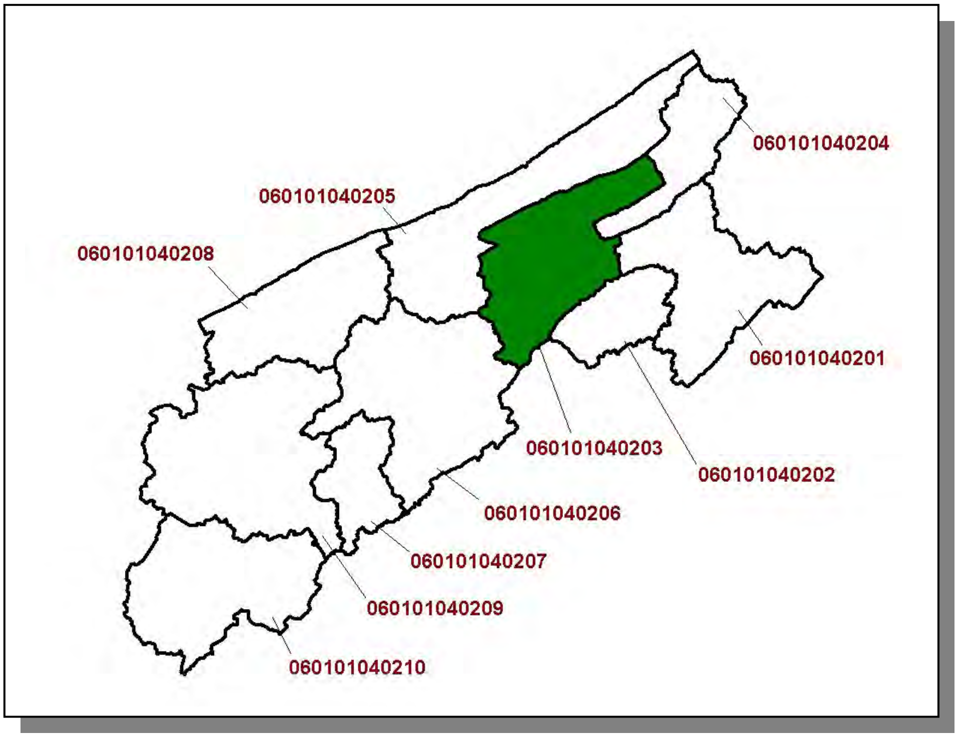

Figure 4-64. Location of Subwatershed 060101040203. *HUC-12 subwatershed boundaries are shown for reference.*

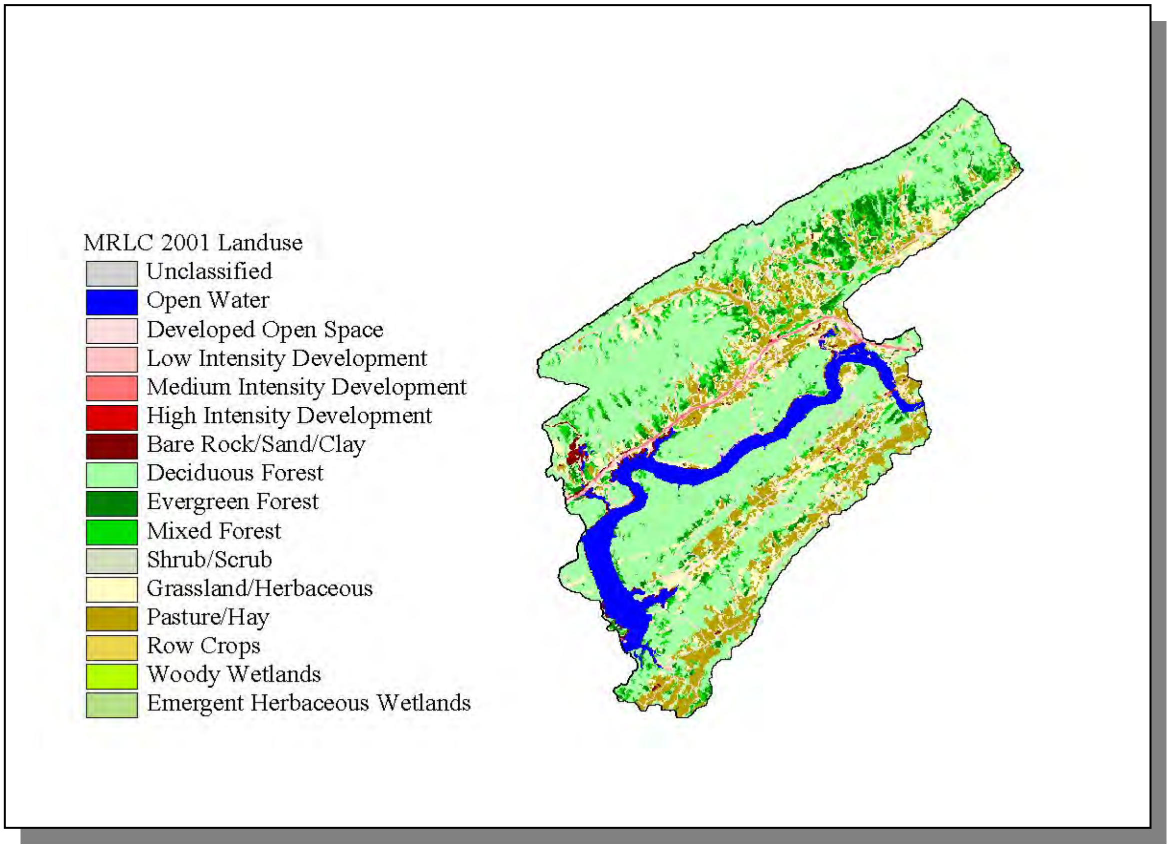

Figure 4-65. Illustration of Land Use Distribution in Subwatershed 060101040203.

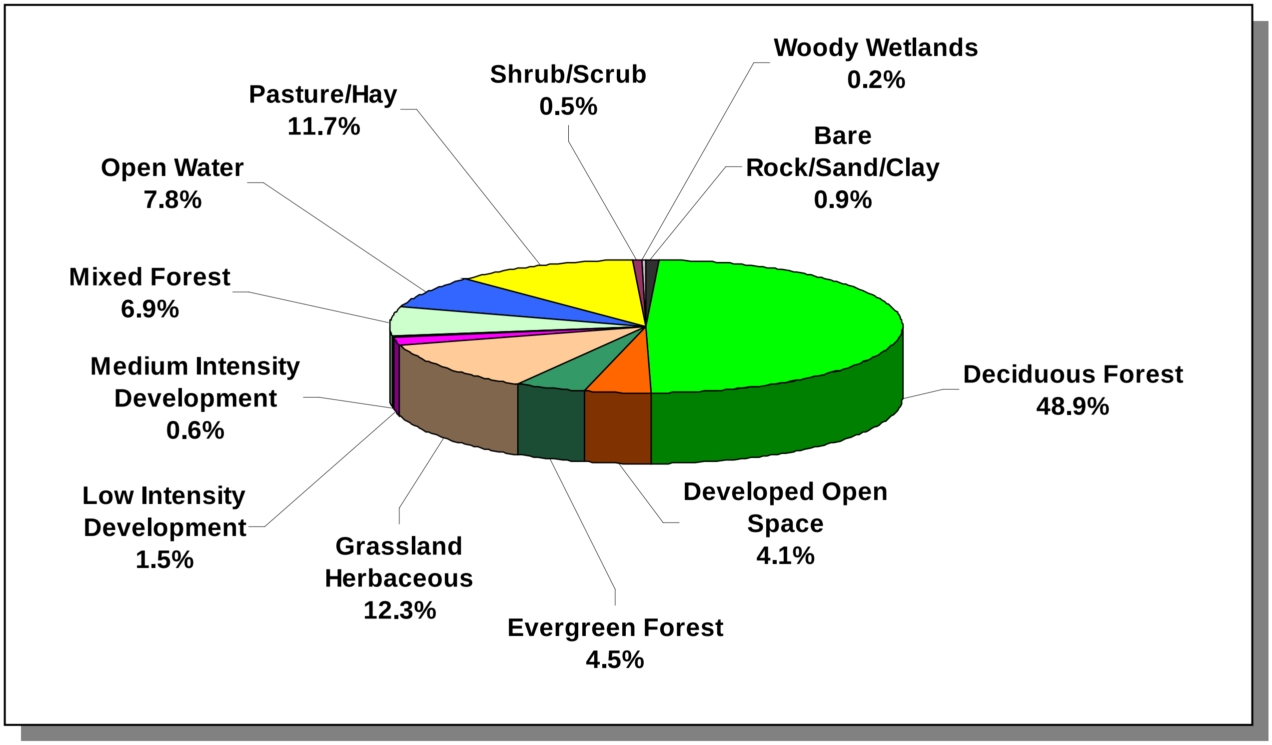

Figure 4-66. Land Use Distribution in Subwatershed 060101040203. *More information is provided in Appendix IV.*

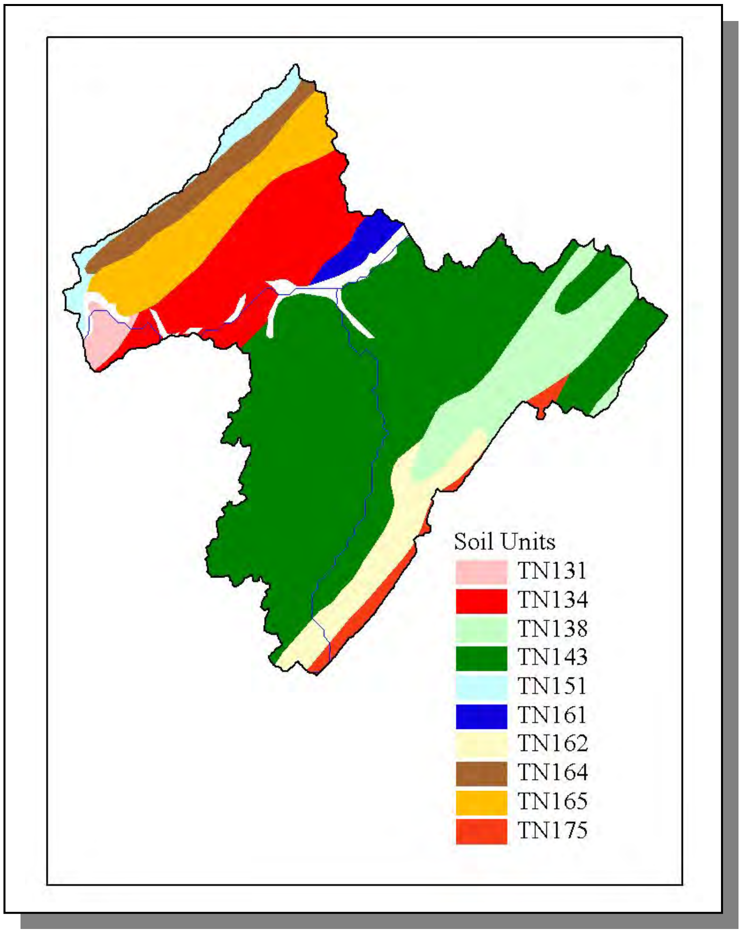

Figure 4-67. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040203.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN131	0.00	C	1.17	4.95	Silty Loam	0.33
TN134	0.00	B	1.38	5.18	Loam	0.31
TN138	0.00	C	2.48	4.26	Sandy Loam	0.22
TN143	0.00	C	1.22	6.44	Loam	0.32
TN151	0.00	C	2.88	4.75	Loam	0.40
TN161	7.00	C	1.41	5.11	Loam	0.31
TN162	1.00	C	1.52	6.20	Loam	0.36
TN164	0.00	C	4.48	5.15	Loam	0.25
TN165	0.00	B	1.79	5.51	Silty Loam	0.32
TN175	0.00	B	1.49	5.23	Loam	0.30

Table 4-53. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040203. *The definition of "Hydrologic Group" is provided in Appendix IV.*

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	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Greene	55,853	59,369	62,909	0.34	190	202	214	12.6
Hawkins	44,565	48,821	53,563	8.71	3,880	4,250	4,663	20.2
Total	**100,418**	**108,190**	**116,472**		**4,070**	**4,452**	**4,877**	**19.8**

Table 4-54. Population Estimates in Subwatershed 060101040203.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Rogersville	Hawkins	4,149	1,995	1,833	133	29

Table 4-55. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 060101040203.

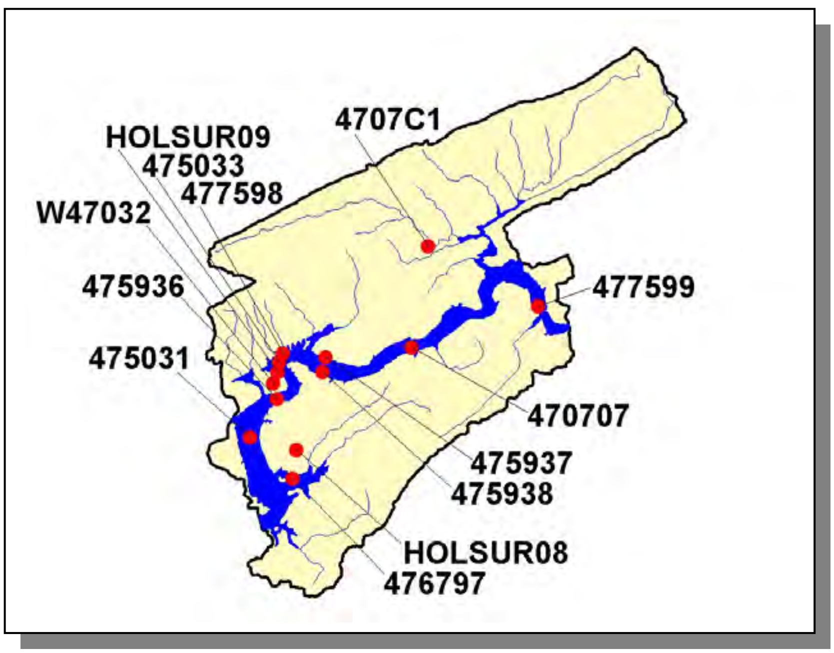

Figure 4-68. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 060101040203. *More information, including site names and locations, is provided in Appendix IV.*

4.2.B.iii.a. Point Source Contributions.

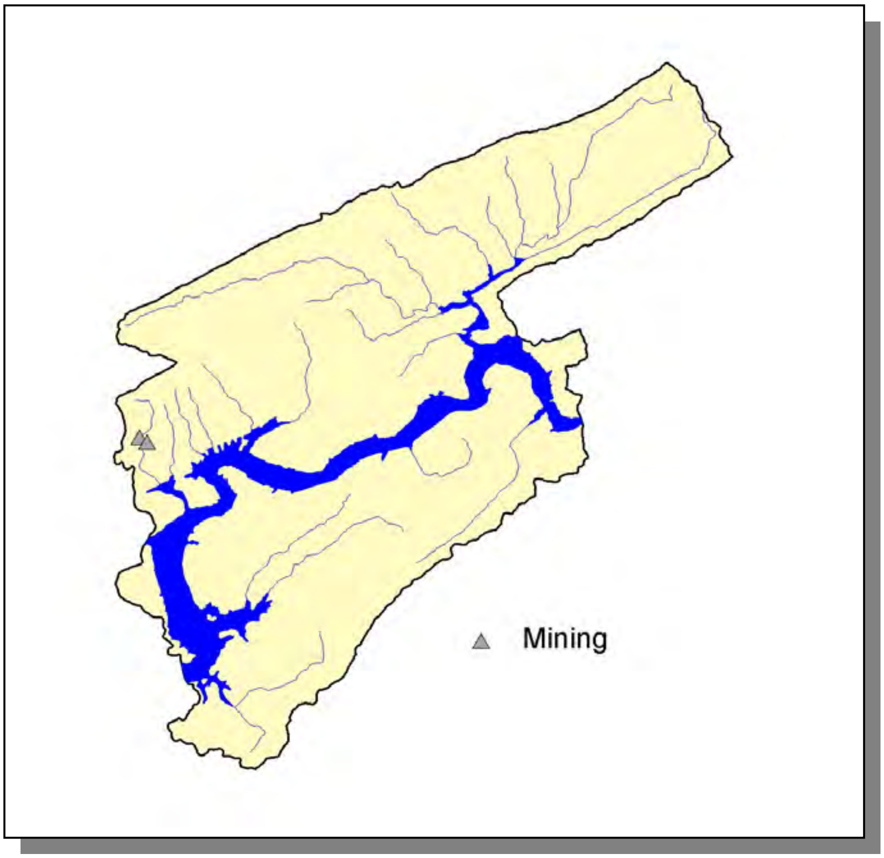

Figure 4-69. Location of Permits Issued in Subwatershed 060101040203. *More information, including the names of facilities, is provided in Appendix IV.*

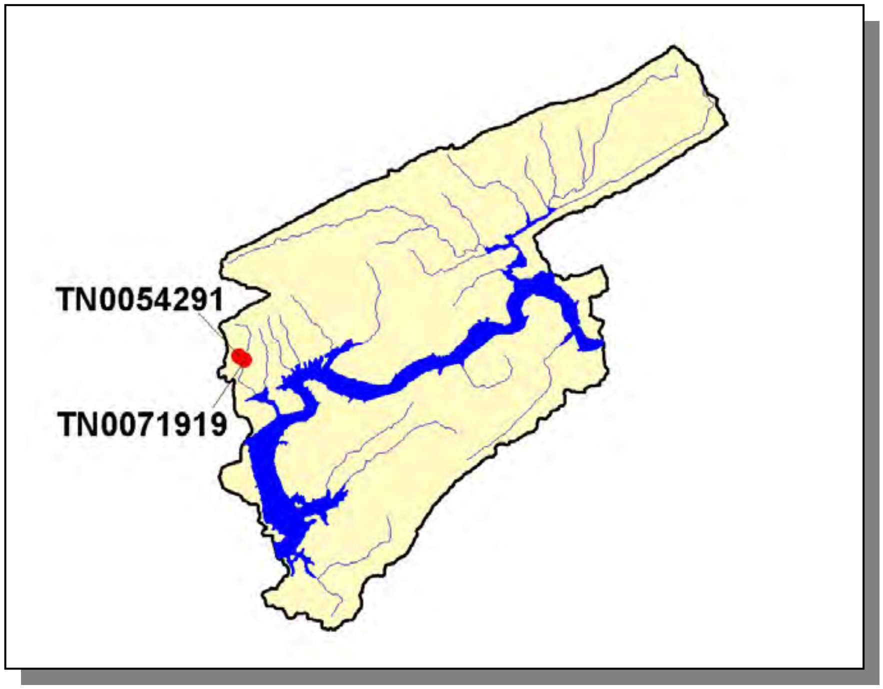

Figure 4-70. Location of Active Mining Sites in Subwatershed 060101040203. *More information, including the names of mining operations, is provided in Appendix IV.*

4.2.B.iii.b. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens (Broilers Sold)	Hogs	Sheep
2,081	4,034	101	7	1,095	49	27

Table 4-56. Summary of Livestock Count Estimates in Subwatershed 060101040203. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), **"**Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS							
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens (Broilers Sold)	Hogs	Sheep
Greene	33,962	72,582	7,282	1,190	4,908,815	495	226
Hawkins	18,796	36,429	903	1,079	0	442	243

Table 4-57. Summary of Livestock Count Estimates in Greene and Hawkins Counties. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), **"**Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Greene	180.0	171.8	2.0	10.5
Hawkins	177.4	177.4	0.4	2.1

Table 4-58. Forest Acreage and Annual Removal Rates (1987-1994) in Greene and Hawkins Counties.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.27
Grass (Hayland)	0.54
Legumes, Grass (Hayland)	0.40
Legumes (Hayland)	0.16
Grass, Forbs, Legumes (Mixed Pasture)	0.53
Corn (Row Crops)	16.75
Tobacco (Row Crops)	16.35
Other Vegetable and Truck Crops	32.10
Farmsteads and Ranch Headquarters	0.46

Table 4-59. Annual Estimated Total Soil Loss in Subwatershed 060101040203.

4.2.B.iv. 060101040204 (Caney Creek).

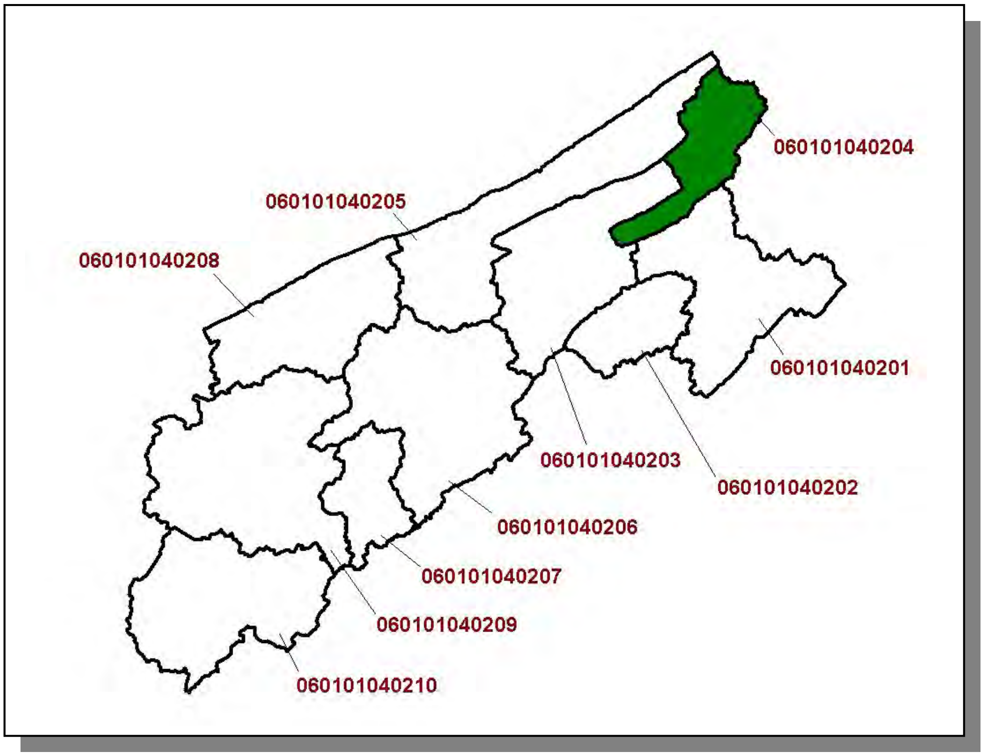

Figure 4-71. Location of Subwatershed 060101040204. *HUC-12 subwatershed boundaries are shown for reference.*

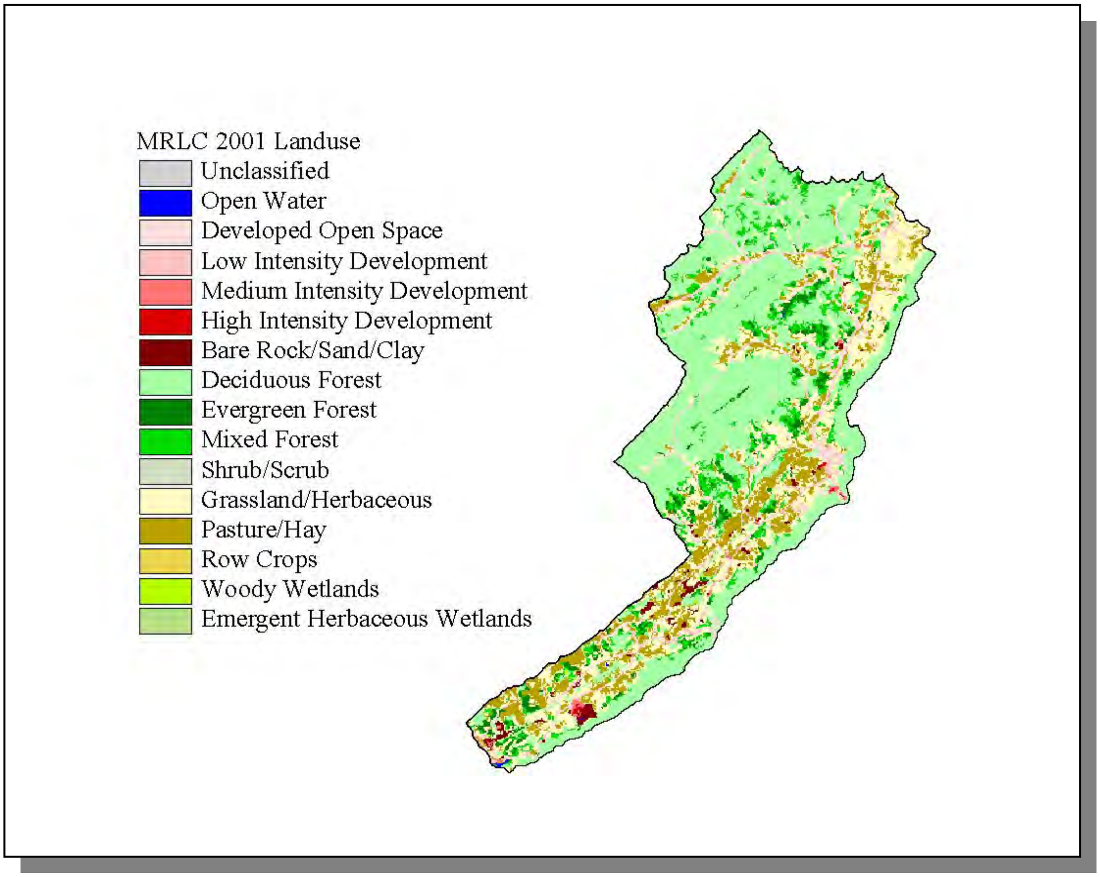

Figure 4-72. Illustration of Land Use Distribution in Subwatershed 060101040204.

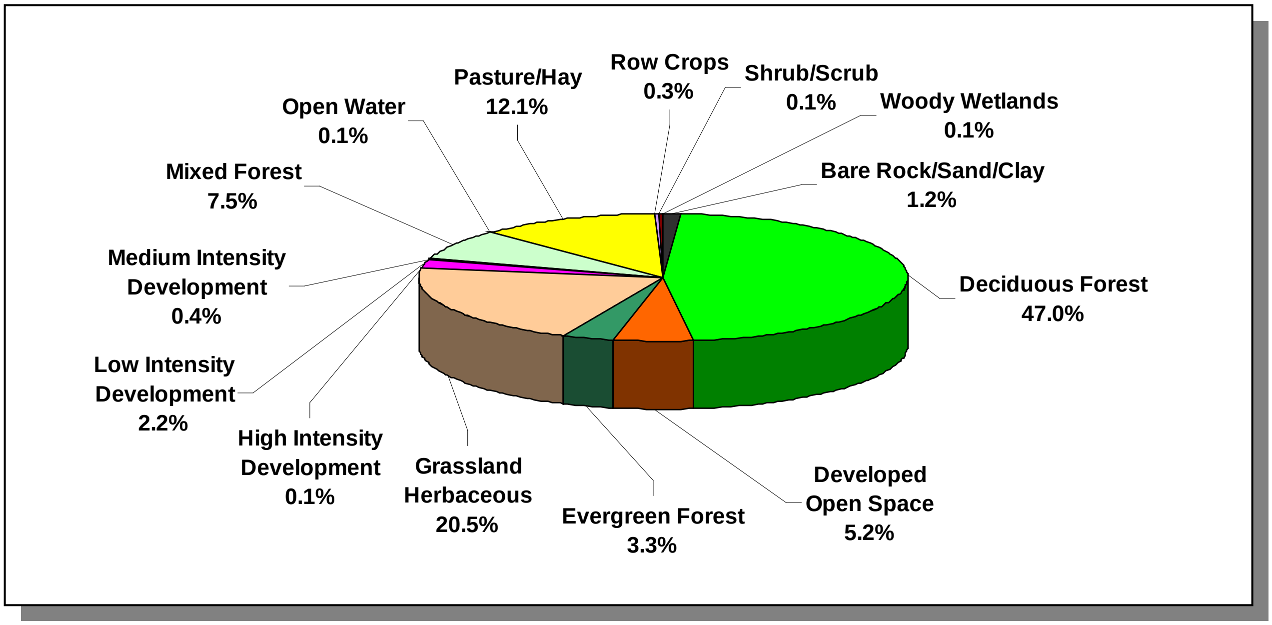

Figure 4-73. Land Use Distribution in Subwatershed 060101040204. *More information is provided in Appendix IV.*

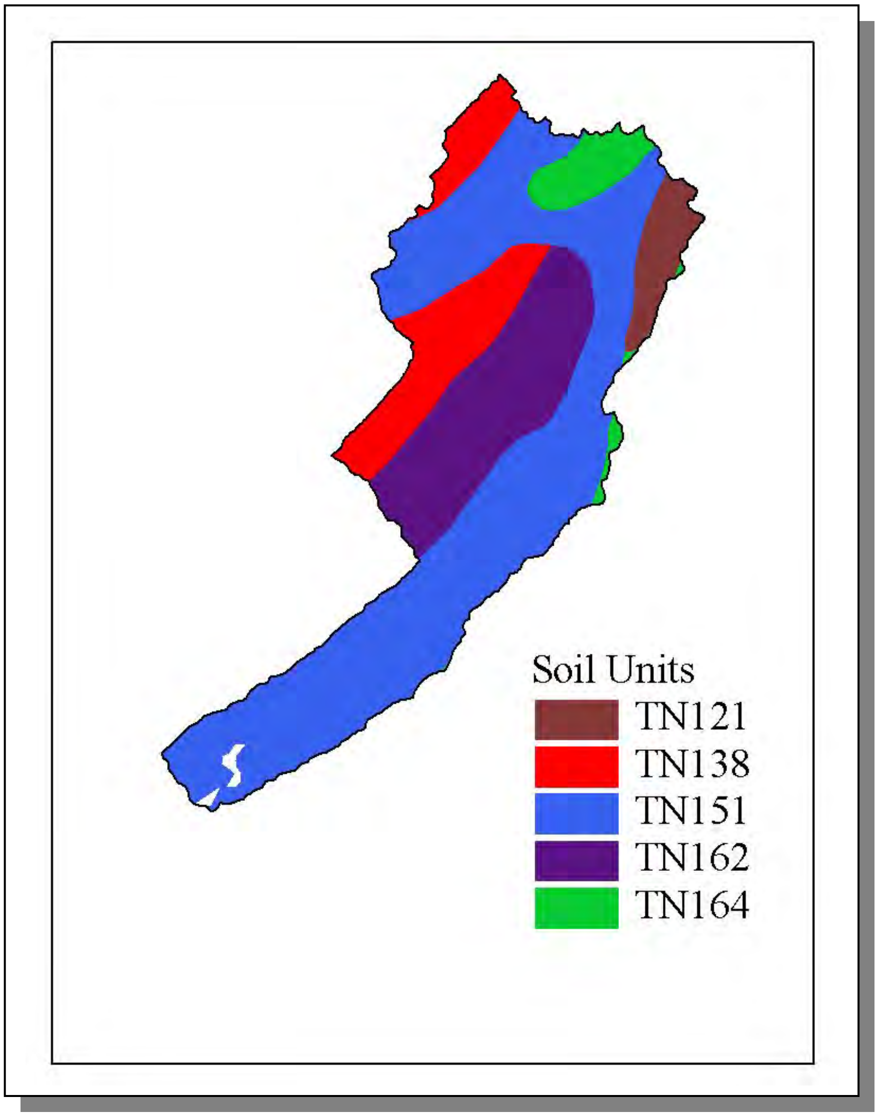

Figure 4-74. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040204.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN121	0.00	B	1.30	5.21	Loam	0.33
TN138	0.00	C	2.48	4.26	Sandy Loam	0.22
TN151	0.00	C	2.88	4.75	Loam	0.40
TN162	1.00	C	1.52	6.20	Loam	0.36
TN164	0.00	C	4.48	5.15	Loam	0.25

Table 4-60. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040204. *The definition of "Hydrologic Group" is provided in Appendix IV.*

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Hawkins	44,565	48,821	53,563	4.53	2,017	2,210	2,425	20.2

Table 4-61. Population Estimates in Subwatershed 060101040204.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Rogersville	Hawkins	4,149	1,995	1,833	133	29

Table 4-62. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 060101040204.

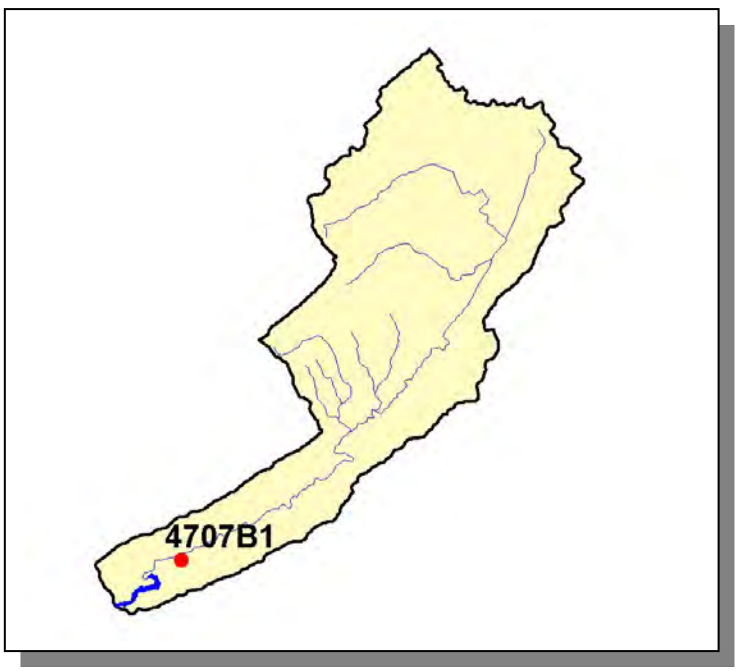

Figure 4-75. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 060101040204. *More information, including site names and locations, is provided in Appendix IV.*

4.2.B.iv.a. Point Source Contributions.

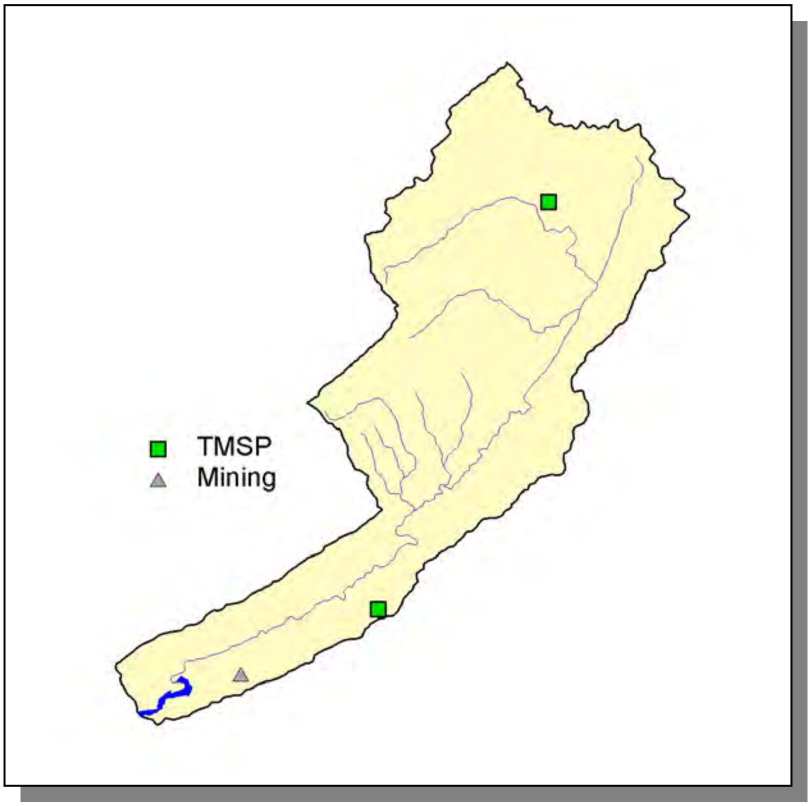

Figure 4-76. Location of Permits Issued in Subwatershed 060101040204. *More information, including the names of facilities, is provided in Appendix IV.*

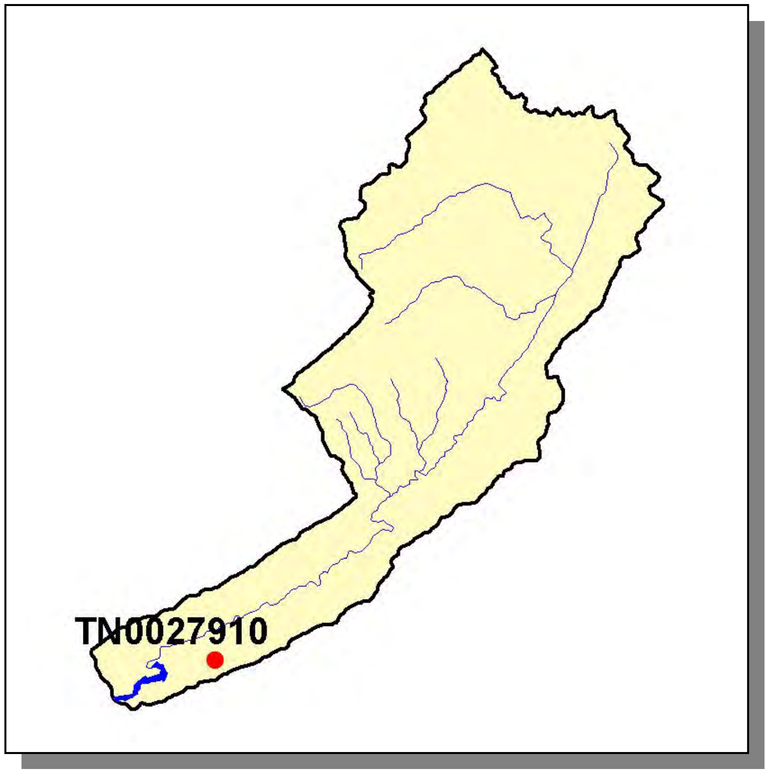

Figure 4-77. Location of Active Mining Sites in Subwatershed 060101040204. *More information, including the names of mining operations, is provided in Appendix IV.*

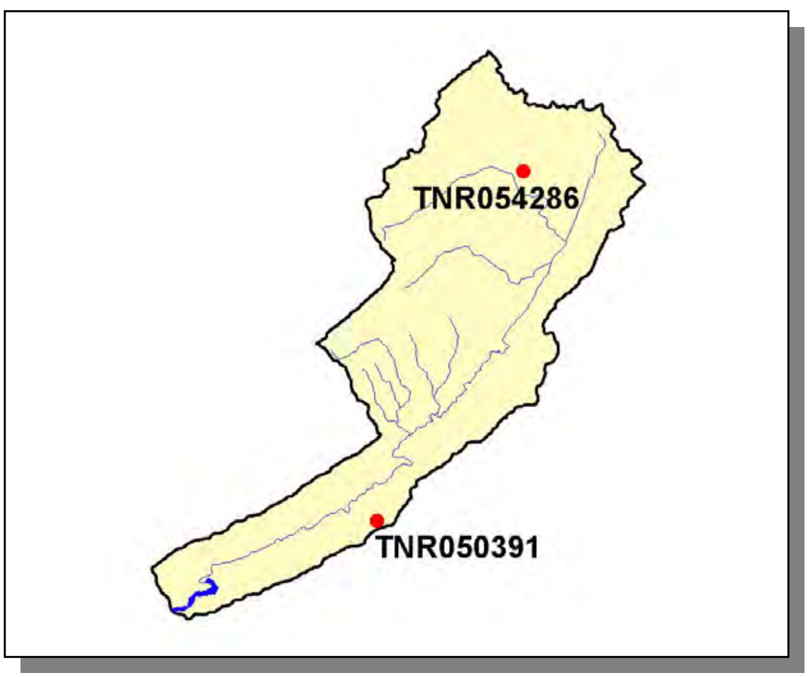

Figure 4-78. Location of TMSP Sites in Subwatershed 060101040204. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.B.iv.b. Nonpoint Source Contributions.

LIVESTOCK COUNTS					
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
843	1,633	40	<5	20	11

Table 4-63. Summary of Livestock Count Estimates in Subwatershed 060101040204. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Hawkins	18,796	36,429	903	1,079	442	243

Table 4-64. Summary of Livestock Count Estimates in Hawkins County. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Hawkins	177.4	177.4	0.4	2.1

Table 4-65. Forest Acreage and Annual Removal Rates (1987-1994) in Hawkins County.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.26
Grass (Hayland)	0.56
Legumes, Grass (Hayland)	0.40
Legumes (Hayland)	0.16
Grass, Forbs, Legumes (Mixed Pasture)	0.54
Tobacco (Row Crops)	16.40
Other Vegetable and Truck Crops	33.50
Farmsteads and Ranch Headquarters	0.40

Table 4-66. Annual Estimated Total Soil Loss in Subwatershed 060101040204.

4.2.B.v. 060101040205 (Poor Valley Creek).

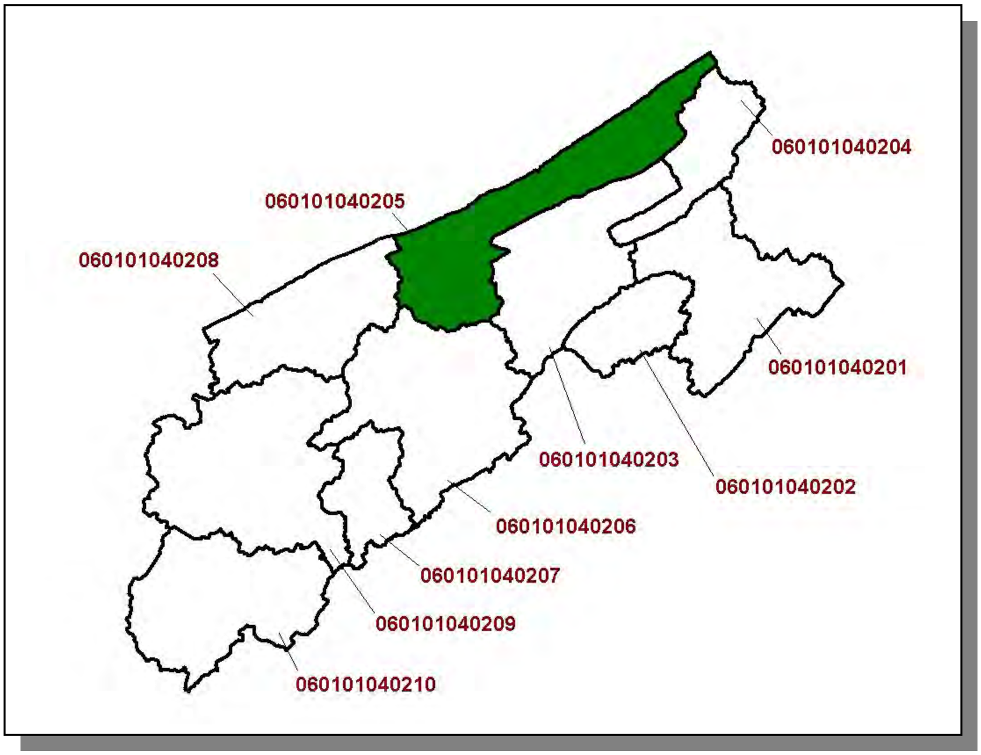

Figure 4-79. Location of Subwatershed 060101040205. *HUC-12 subwatershed boundaries are shown for reference.*

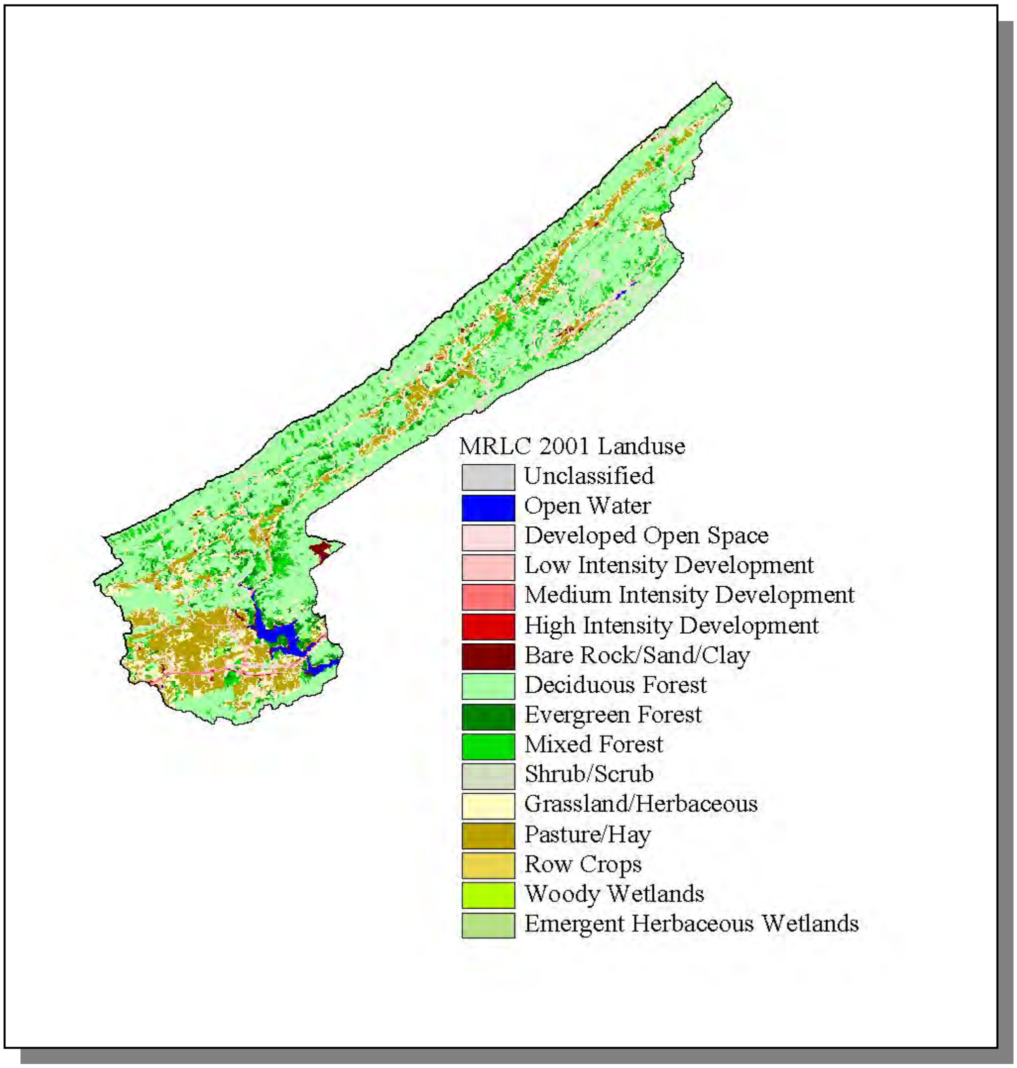

Figure 4-80. Illustration of Land Use Distribution in Subwatershed 060101040205.

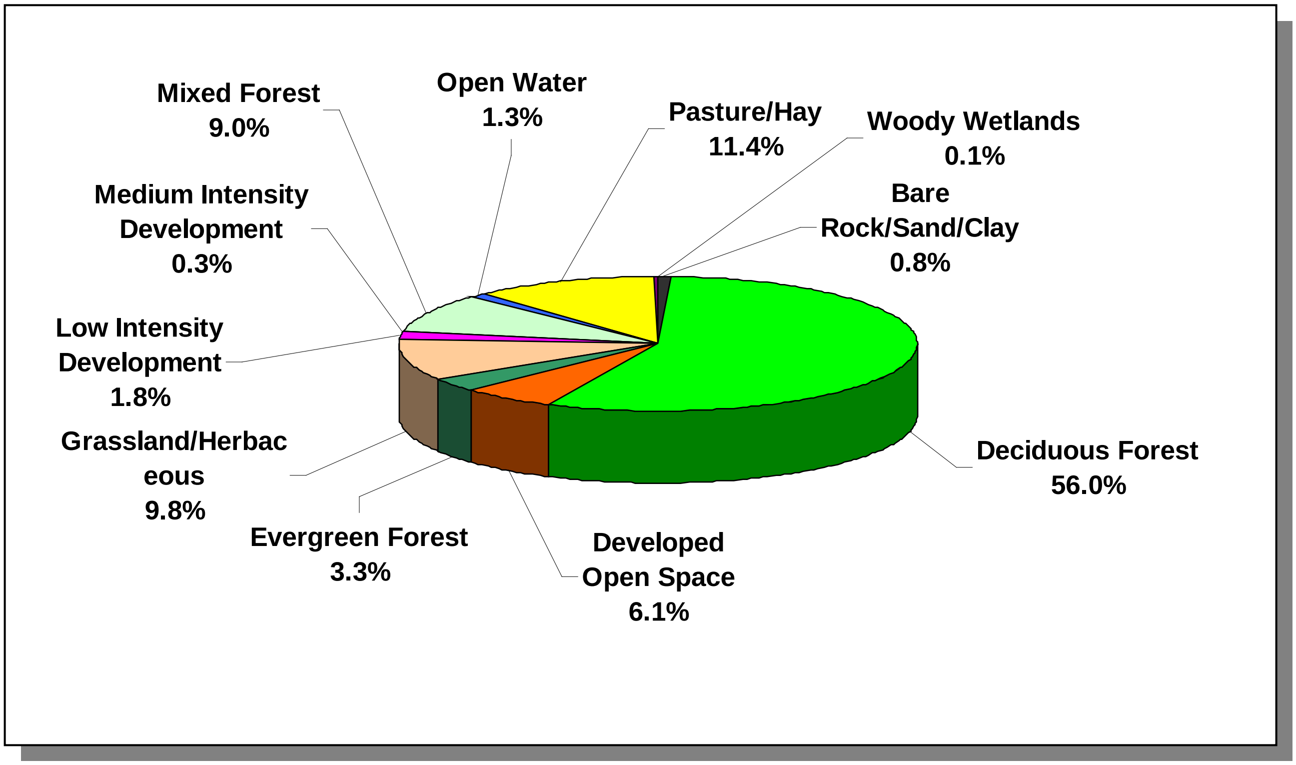

Figure 4-81. Land Use Distribution in Subwatershed 060101040205. *More information is provided in Appendix IV.*

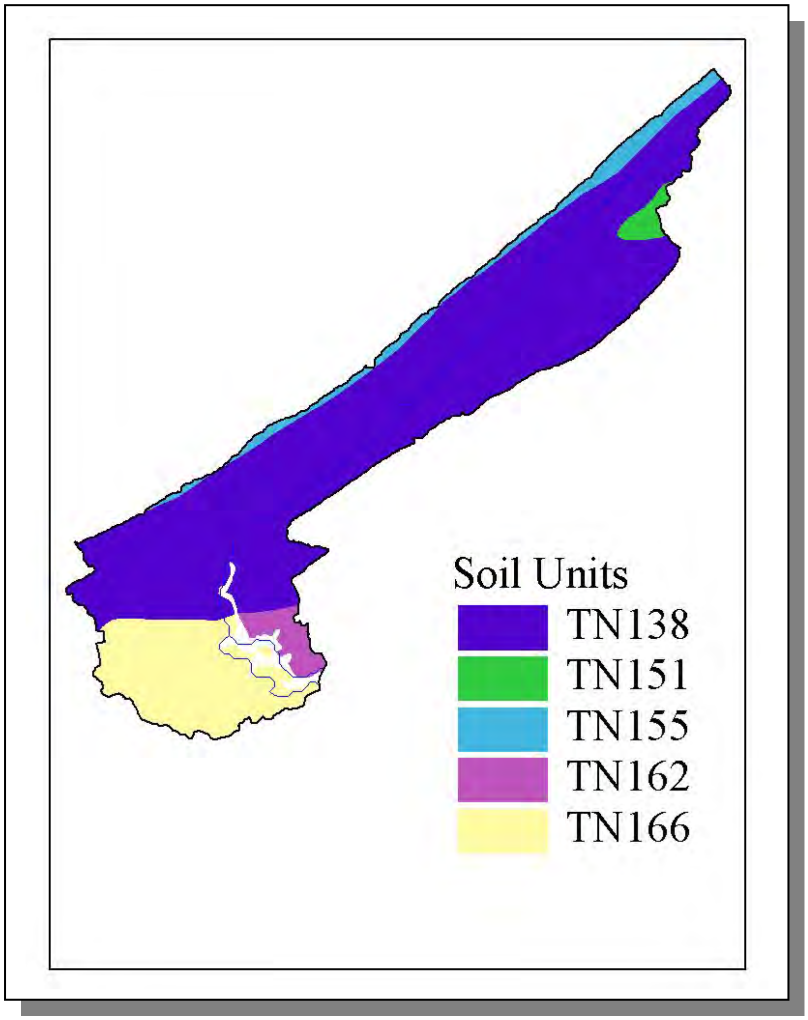

Figure 4-82. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040205.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN138	0.00	C	2.48	4.26	Sandy Loam	0.22
TN151	0.00	C	2.88	4.75	Loam	0.40
TN155	0.00	C	1.71	5.31	Loam	0.32
TN162	1.00	C	1.52	6.20	Loam	0.36
TN166	1.00	C	2.36	5.06	Loam	0.30

Table 4-67. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040205. *The definition of "Hydrologic Group" is provided in Appendix IV.*

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Grainger	17,095	19,456	20,659	0.45	78	88	94	20.5
Hancock	6,739	6,801	6,786	0.09	6	6	6	0.0
Hawkins	44,565	48,821	53,563	10.44	4,653	5,098	5,593	20.2
Total	**68,399**	**75,078**	**81,008**		**4,737**	**5,192**	**5,693**	**20.2**

Table 4-68. Population Estimates in Subwatershed 060101040205.

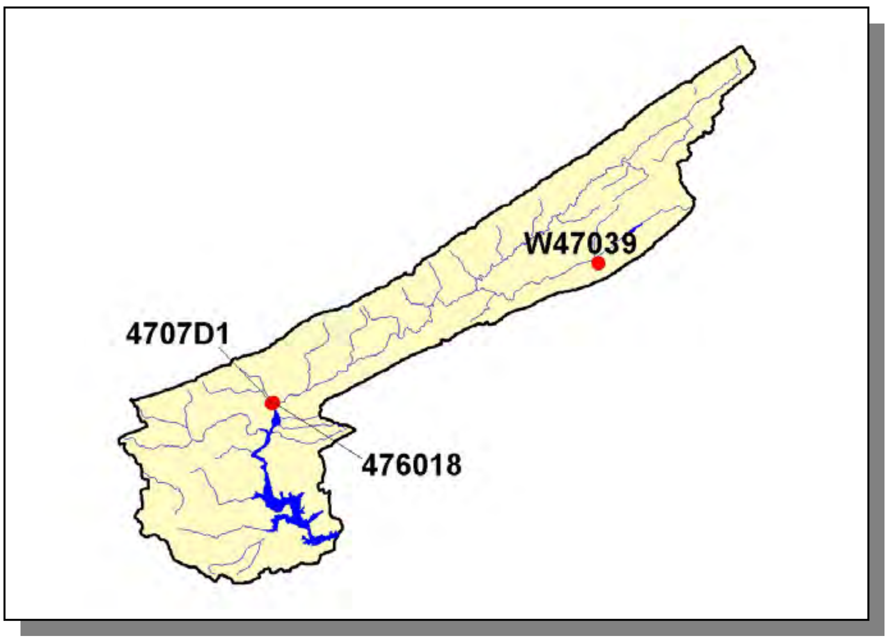

Figure 4-83. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 060101040205. *More information, including site names and locations, is provided in Appendix IV.*

4.2.B.v.a. Point Source Contributions.

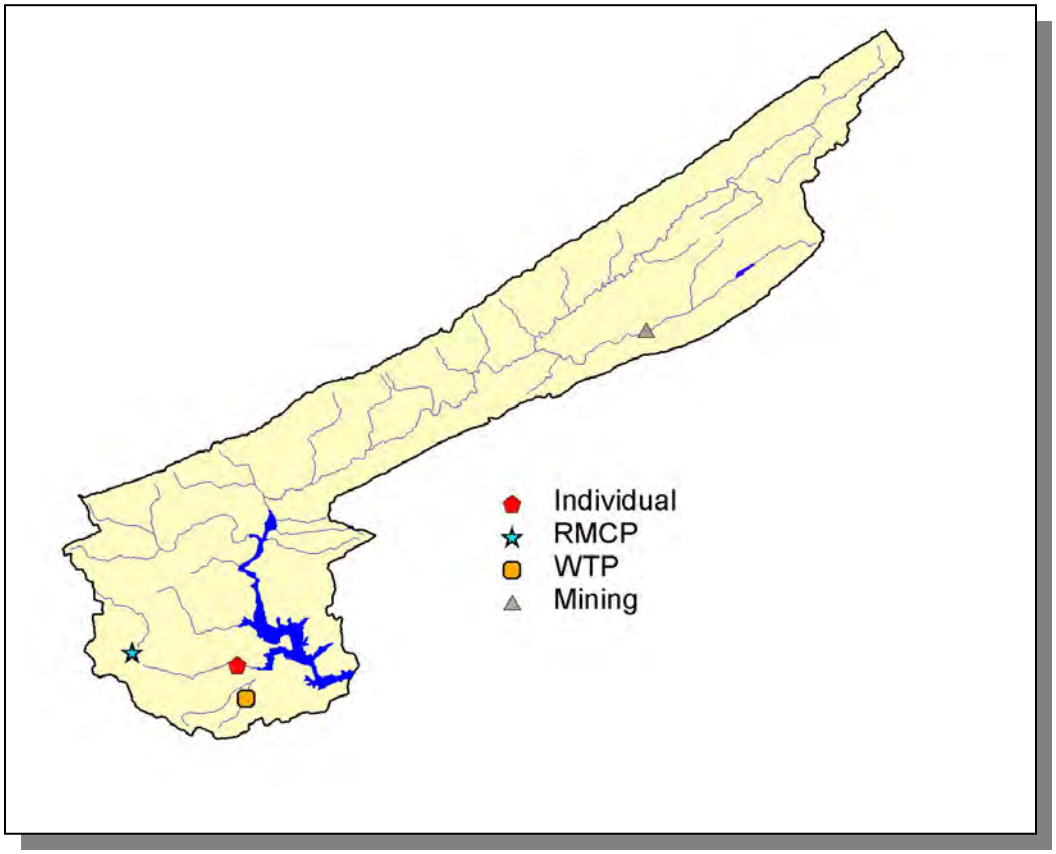

Figure 4-84. Location of Permits Issued in Subwatershed 060101040205. *More information, including the names of facilities, is provided in Appendix IV.*

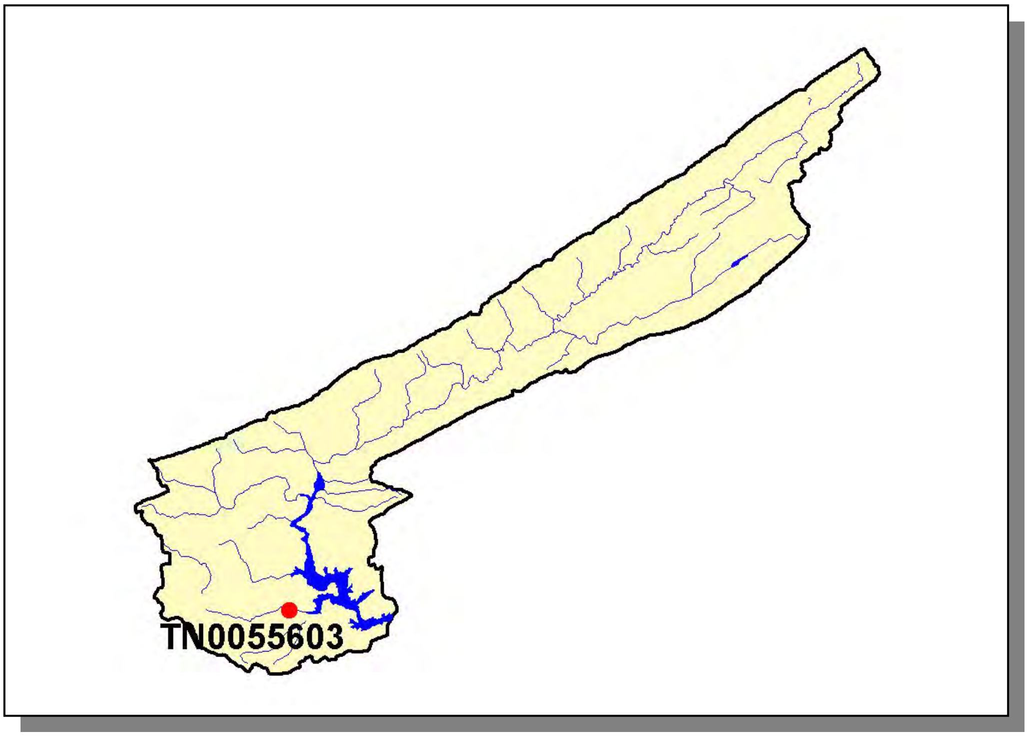

Figure 4-85. Location of Active NPDES Sites in Subwatershed 060101040205. *More information, including the names of facilities, is provided in Appendix IV.*

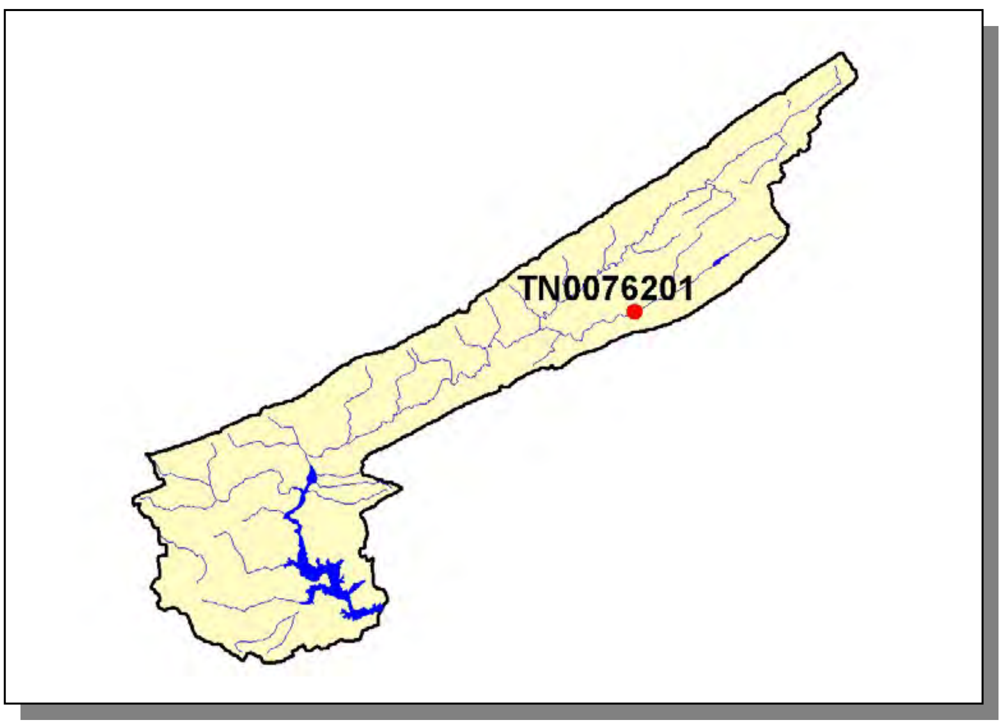

Figure 4-86. Location of Active Mining Sites in Subwatershed 060101040205. *More information, including the names of mining operations, is provided in Appendix IV.*

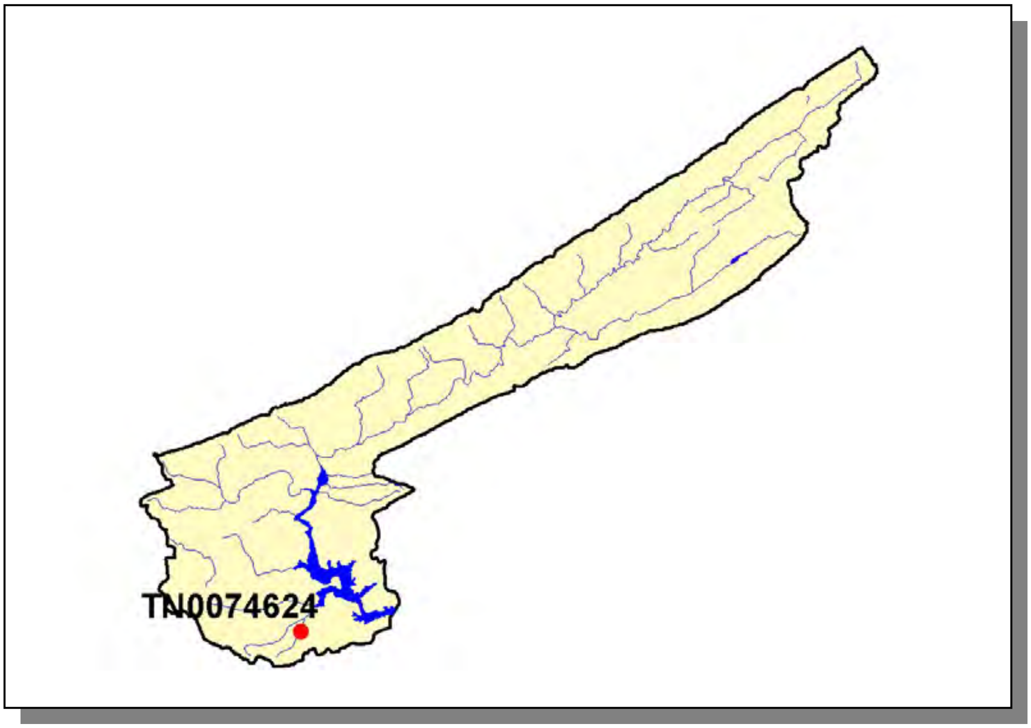

Figure 4-87. Location of Water Treatment Plants in Subwatershed 060101040205. *More information, including the names of facilities, is provided in Appendix IV.*

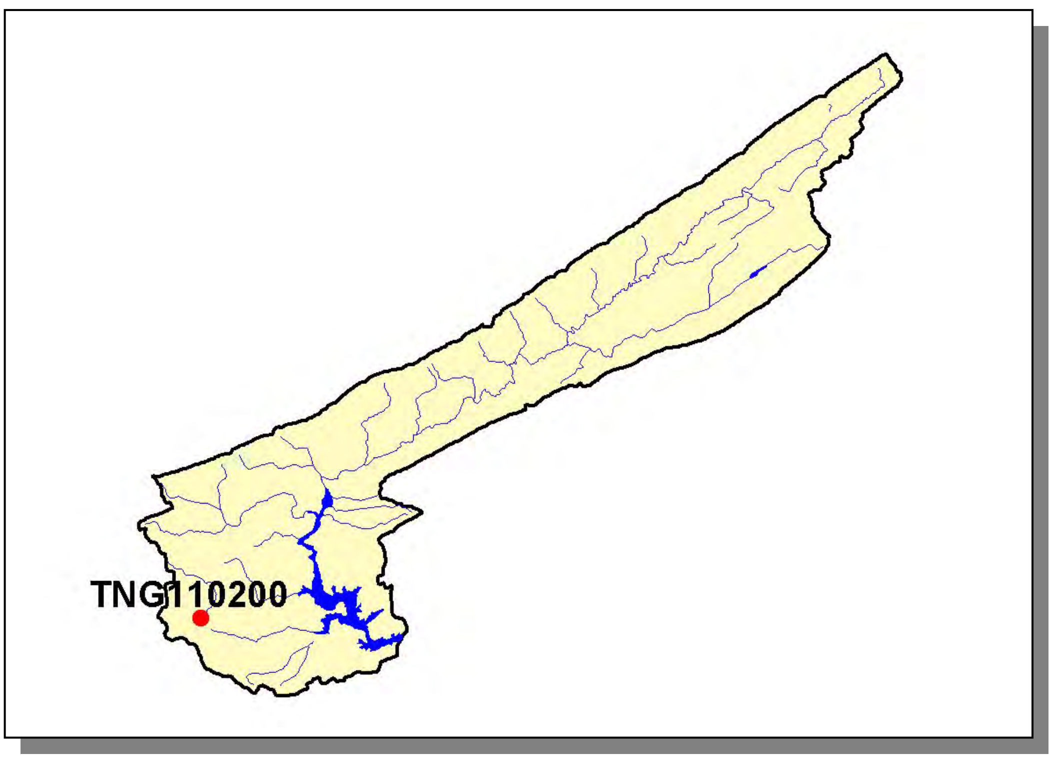

Figure 4-88. Location of Ready Mix Concrete Plants (RMCP) in Subwatershed 060101040205. *More information is provided in Appendix IV.*

4.2.B.v.b. Nonpoint Source Contributions.

LIVESTOCK COUNTS					
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
1,367	2,652	68	<5	34	18

Table 4-69. Summary of Livestock Count Estimates in Subwatershed 060101040205. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Grainger	12,115	23,927	942	1,184	510	195
Hancock	7,079	14,311	89	364	0	67
Hawkins	18,796	36,429	903	1,079	442	243

Table 4-70. Summary of Livestock Count Estimates in Grainger, Hancock, and Hawkins Counties. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Grainger	102.6	102.6	0.3	1.8
Hancock	92.9	92.9	2.7	14.2
Hawkins	177.4	177.4	0.4	2.1

Table 4-71. Forest Acreage and Annual Removal Rates (1987-1994) in Grainger, Hancock, and Hawkins Counties.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.29
Grass (Hayland)	0.55
Legumes, Grass (Hayland)	0.41
Legumes (Hayland)	0.16
Grass, Forbs, Legumes (Mixed Pasture)	0.55
Corn (Row Crops)	5.29
Tobacco (Row Crops)	16.18
Other Vegetable and Truck Crops	33.50
Farmsteads and Ranch Headquarters	0.41

Table 4-72. Annual Estimated Total Soil Loss in Subwatershed 060101040205.

4.2.B.vi. 060101040206 (Cherokee Lake).

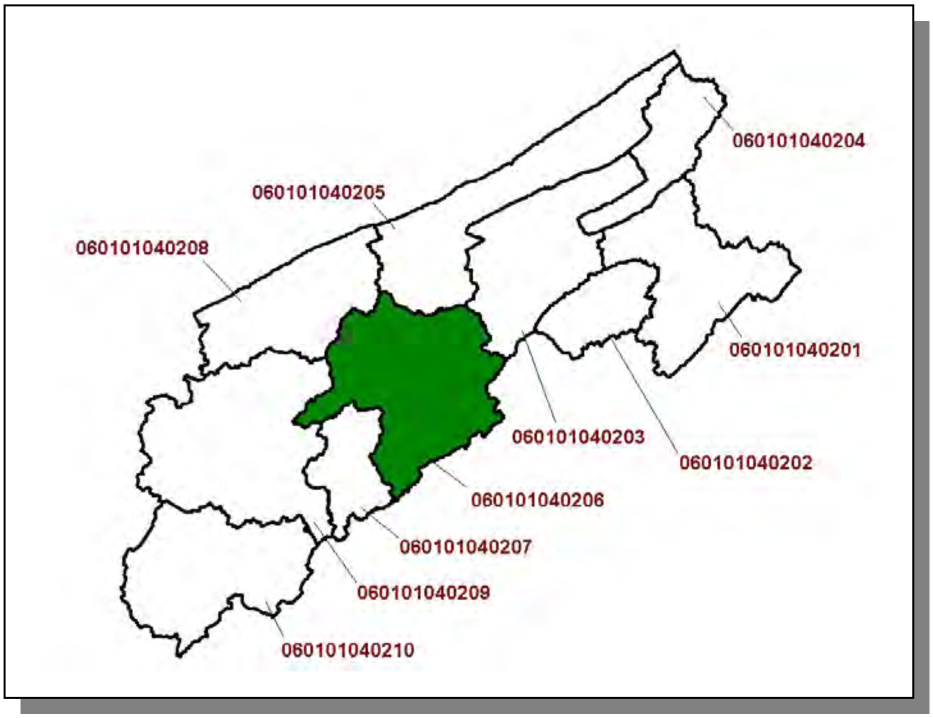

Figure 4-89. Location of Subwatershed 060101040206. *HUC-12 subwatershed boundaries are shown for reference.*

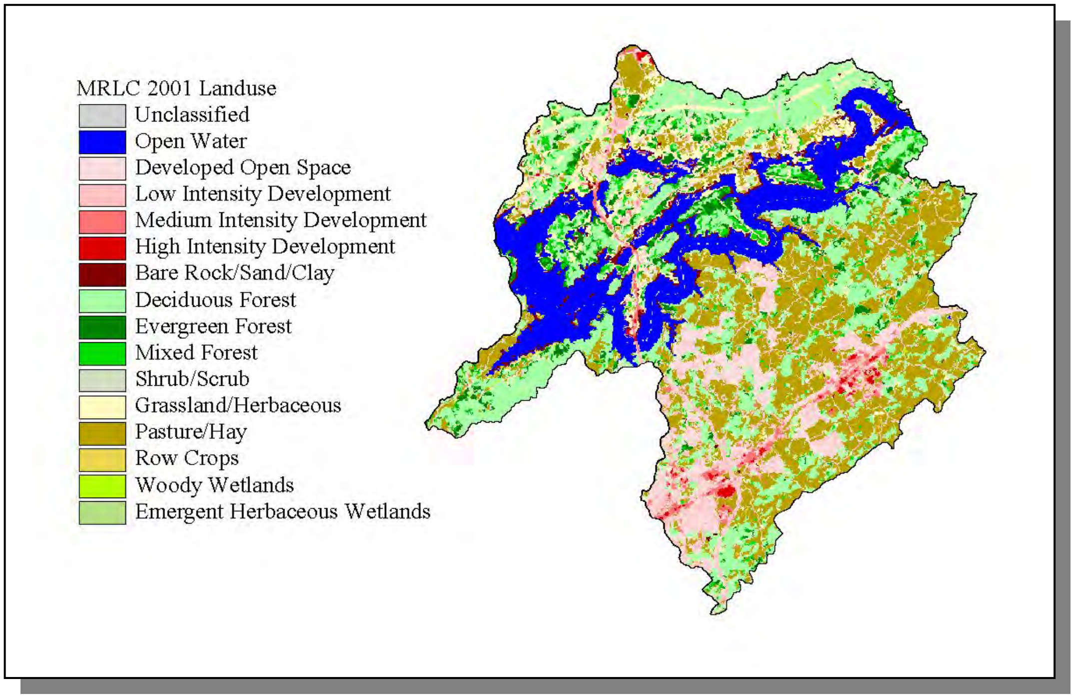

Figure 4-90. Illustration of Land Use Distribution in Subwatershed 060101040206.

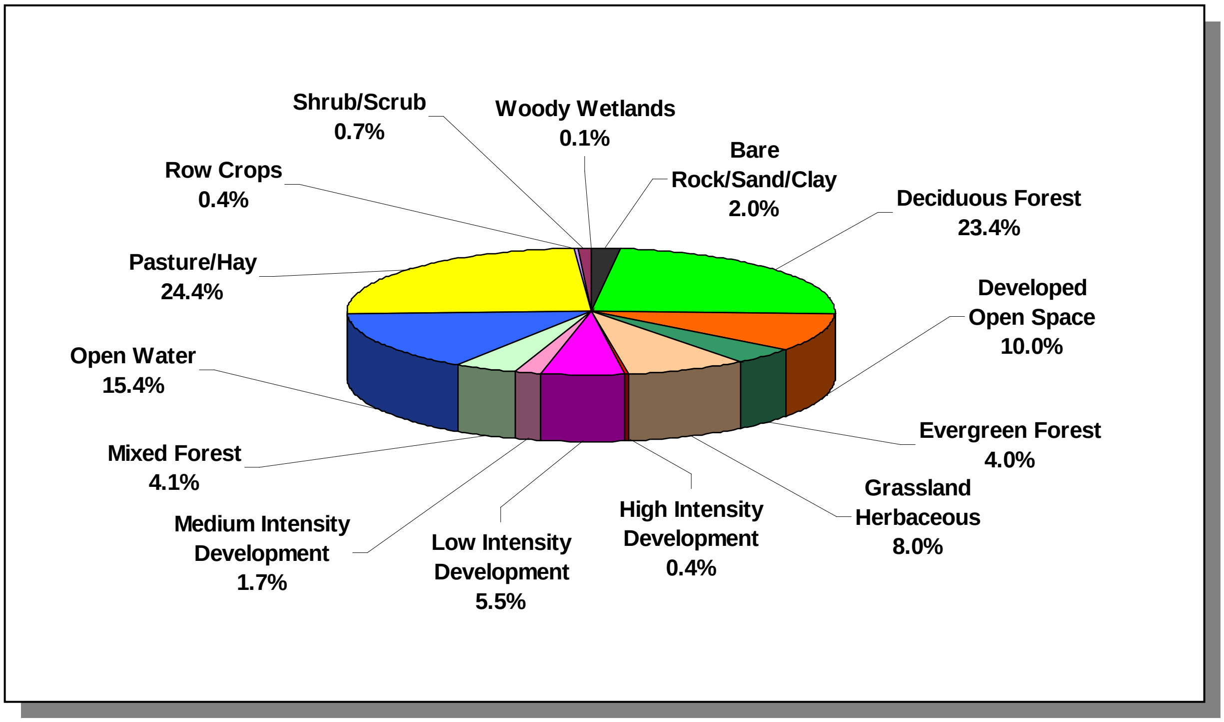

Figure 4-91. Land Use Distribution in Subwatershed 060101040206. *More information is provided in Appendix IV.*

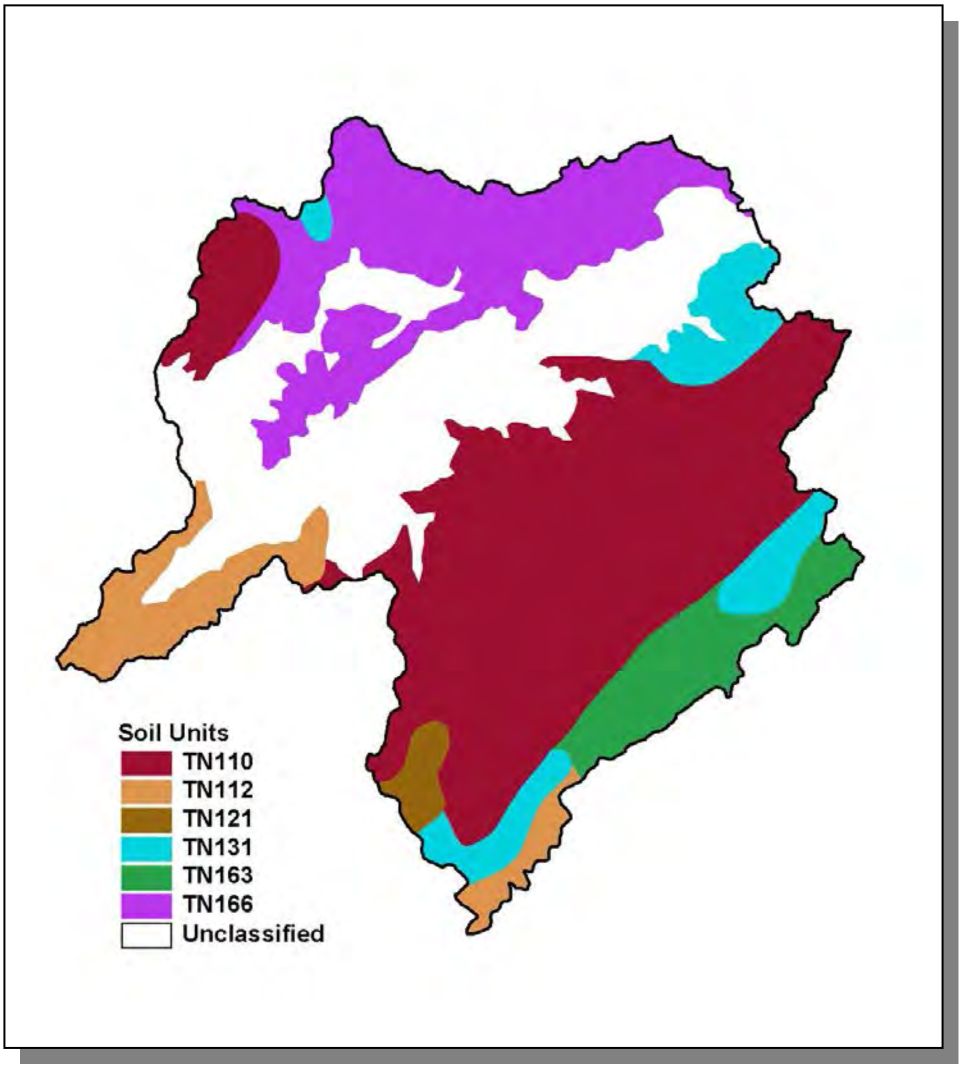

Figure 4-92. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040206.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN110	0.00	B	2.22	4.96	Loam	0.31
TN112	6.00	C	2.36	5.09	Loam	0.35
TN121	0.00	B	1.30	5.21	Loam	0.33
TN131	0.00	C	1.17	4.95	Silty Loam	0.33
TN163	0.00	B	1.37	5.15	Loam	0.31
TN166	1.00	C	2.36	5.06	Loam	0.30

Table 4-73. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040206. *The definition of "Hydrologic Group" is provided in Appendix IV.*

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Grainger	17,095	19,456	20,659	4.08	698	794	844	20.9
Hamblen	50,480	53,699	58,128	21.88	11,045	11,749	12,718	15.1
Hawkins	44,565	48,821	53,563	2.05	913	1,000	1,097	20.2
Total	**112,140**	**121,976**	**132,350**		**12,656**	**13,543**	**14,659**	**15.8**

Table 4-74. Population Estimates in Subwatershed 060101040206.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Morristown	Hamblen	21,385	9,248	8,768	466	14

Table 4-75. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 060101040206.

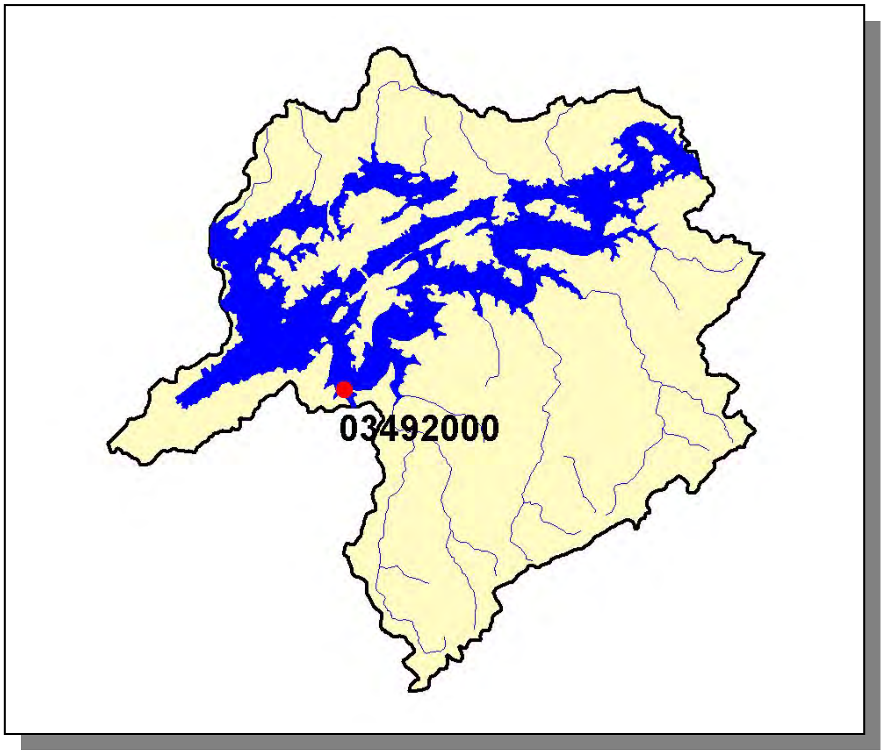

***Figure 4-93. Location of Historical Streamflow Data Collection Sites in Subwatershed 060101040206.** More information is provided in Appendix IV.*

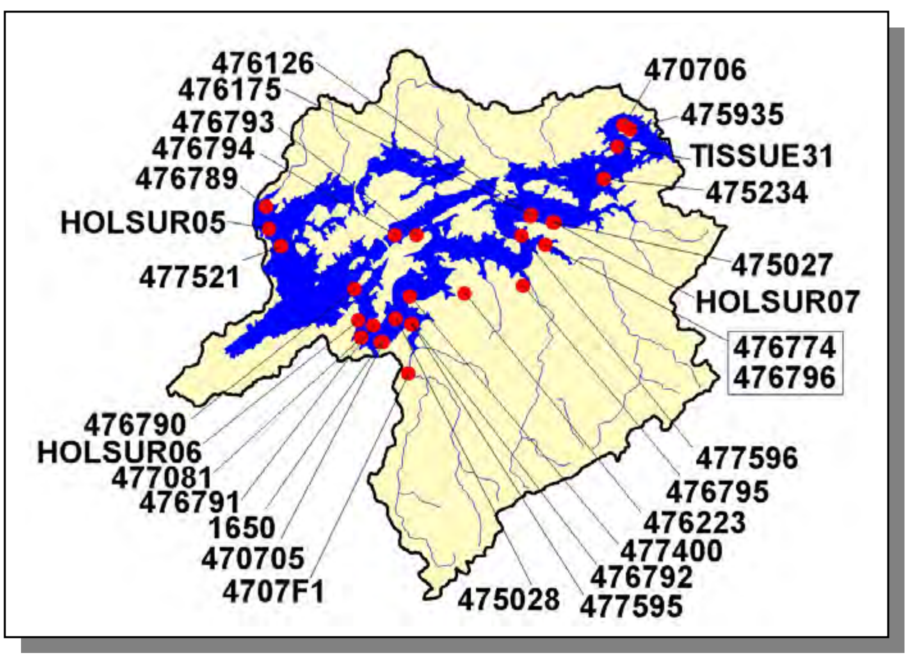

***Figure 4-94. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 060101040206.** More information, including site names and locations, is provided in Appendix IV.*

4.2.B.vi.a. Point Source Contributions.

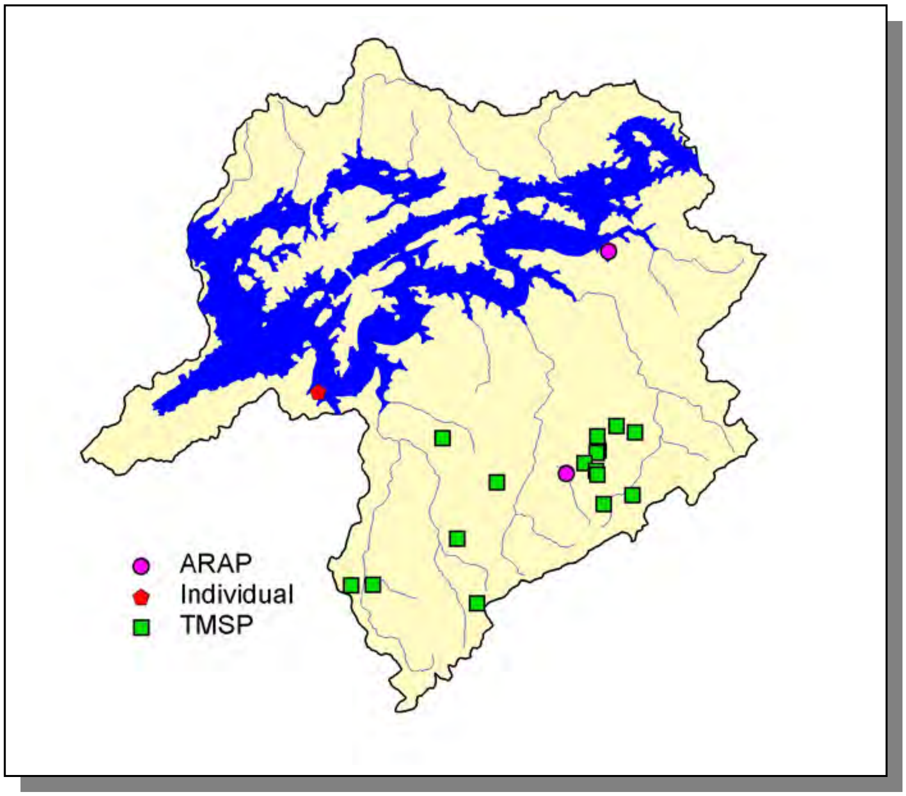

Figure 4-95. Location of Permits Issued in Subwatershed 060101040206. *More information, including the names of facilities, is provided in Appendix IV.*

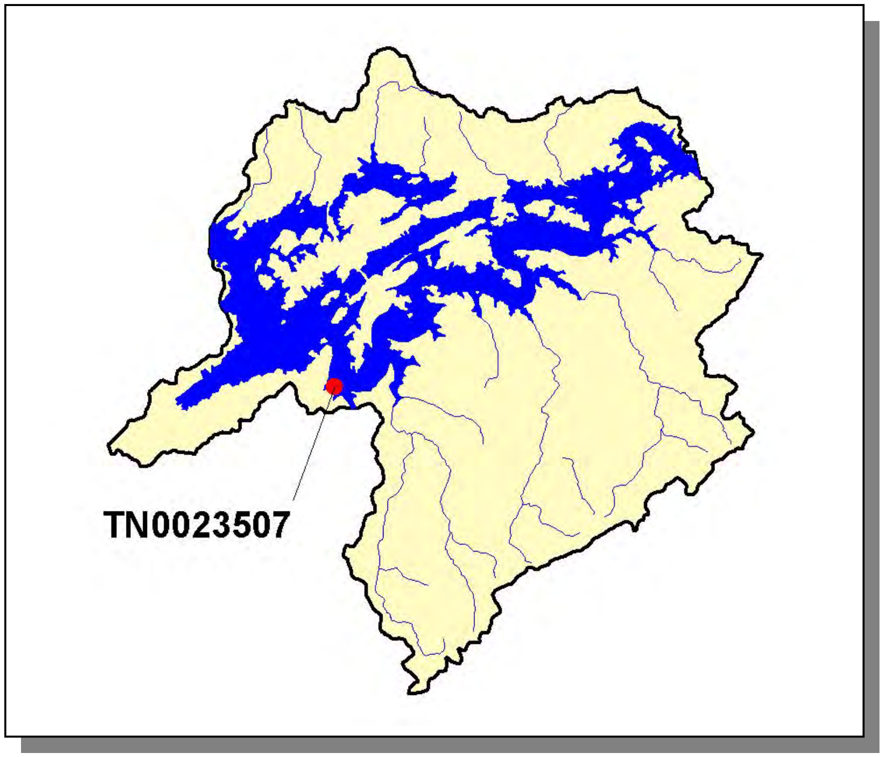

Figure 4-96. Location of Active NPDES Sites in Subwatershed 060101040206. *More information, including the names of facilities, is provided in Appendix IV.*

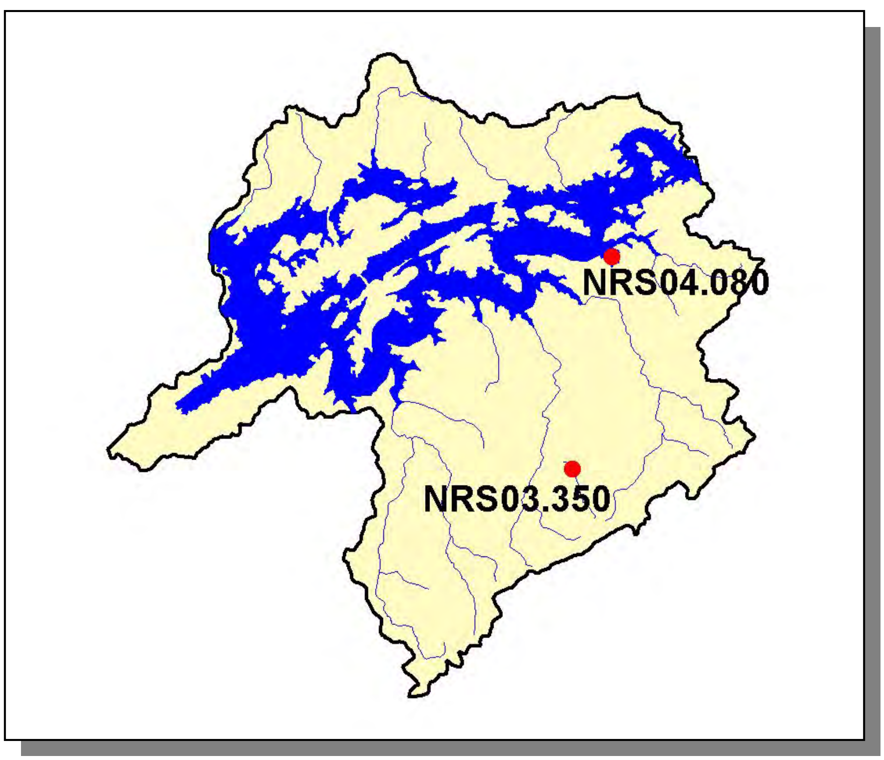

Figure 4-97. Location of Aquatic Resource Alteration Permit (ARAP) Sites (Individual Permits) in Subwatershed 060101040206. *More information is provided in Appendix IV.*

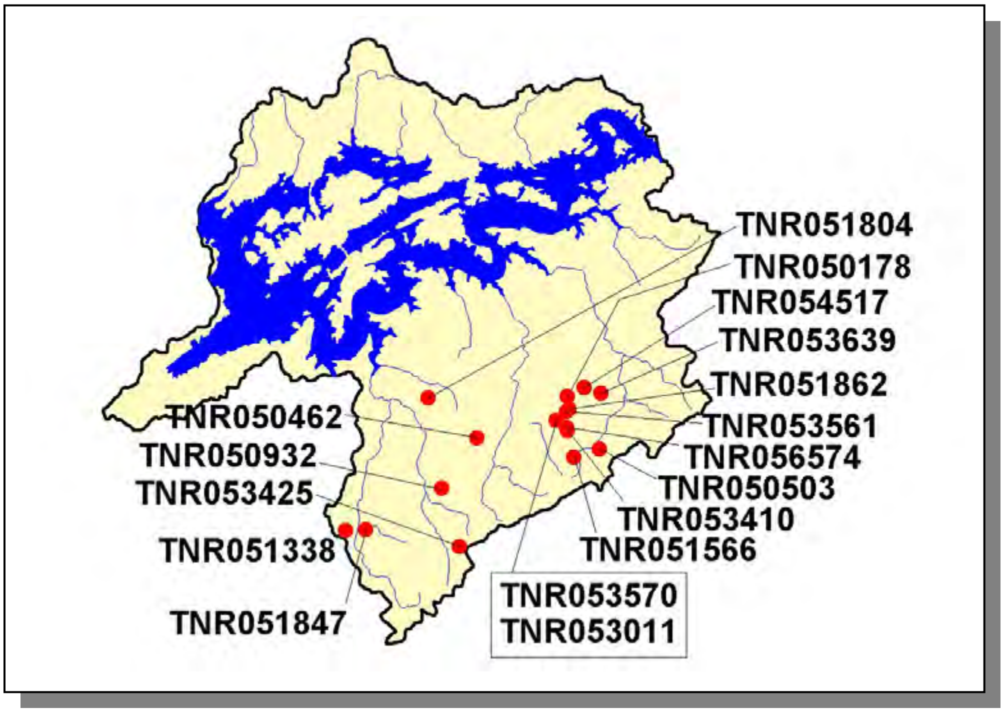

Figure 4-98. Location of TMSP Sites in Subwatershed 060101040206. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.B.vi.b. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens (Broilers Sold)	Hogs	Sheep
2,124	4,065	243	4	331,502	240	76

Table 4-76. Summary of Livestock Count Estimates in Subwatershed 060101040206. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS							
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens (Broilers Sold)	Hogs	Sheep
Grainger	12,115	23,927	942	1,184	0	510	195
Hamblen	8,620	16,376	1,129	233	1,776,000	1,195	367
Hawkins	18,796	36,429	903	1,079	0	442	243

Table 4-77. Summary of Livestock Count Estimates in Grainger, Hamblen, and Hawkins Counties. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), "Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Grainger	102.6	102.6	0.3	1.8
Hamblen	32.8	32.8	0.0	0.0
Hawkins	177.4	177.4	0.4	2.1

Table 4-78. Forest Acreage and Annual Removal Rates (1987-1994) in Grainger, Hamblen, and Hawkins Counties.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.61
Grass (Hayland)	0.39
Legumes, Grass (Hayland)	0.28
Legumes (Hayland)	0.16
Grass, Forbs, Legumes (Mixed Pasture)	0.45
Corn (Row Crops)	12.64
Tobacco (Row Crops)	9.51
Other Vegetable and Truck Crops	33.50
Aquaculture in a Crop Rotation	0.15
Other Land in Farms	0.21
Farmsteads and Ranch Headquarters	0.26

Table 4-79. Annual Estimated Total Soil Loss in Subwatershed 060101040206.

4.2.B.vii. 060101040207 Turkey Creek).

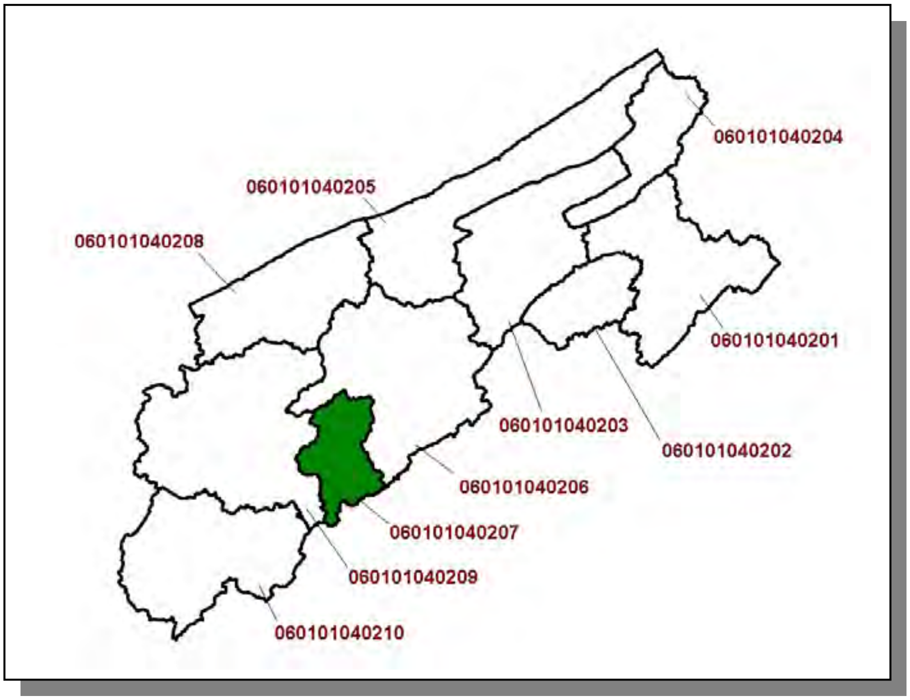

Figure 4-99. Location of Subwatershed 060101040207. *HUC-12 subwatershed boundaries are shown for reference.*

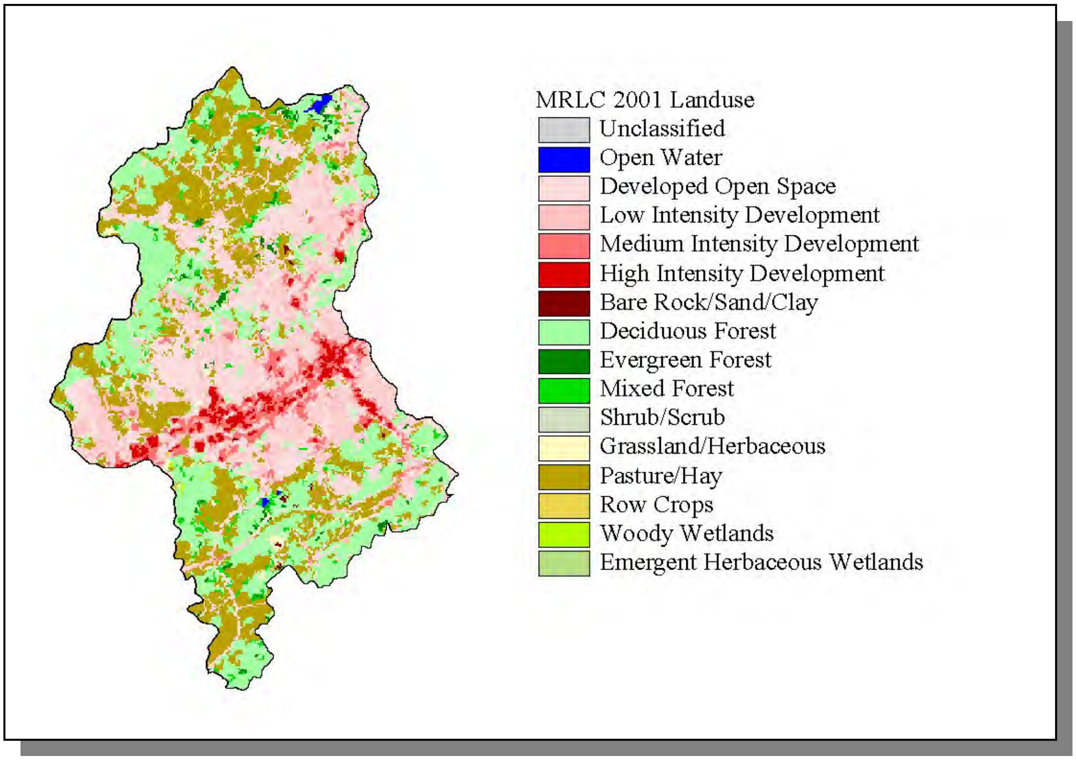

Figure 4-100. Illustration of Land Use Distribution in Subwatershed 060101040207.

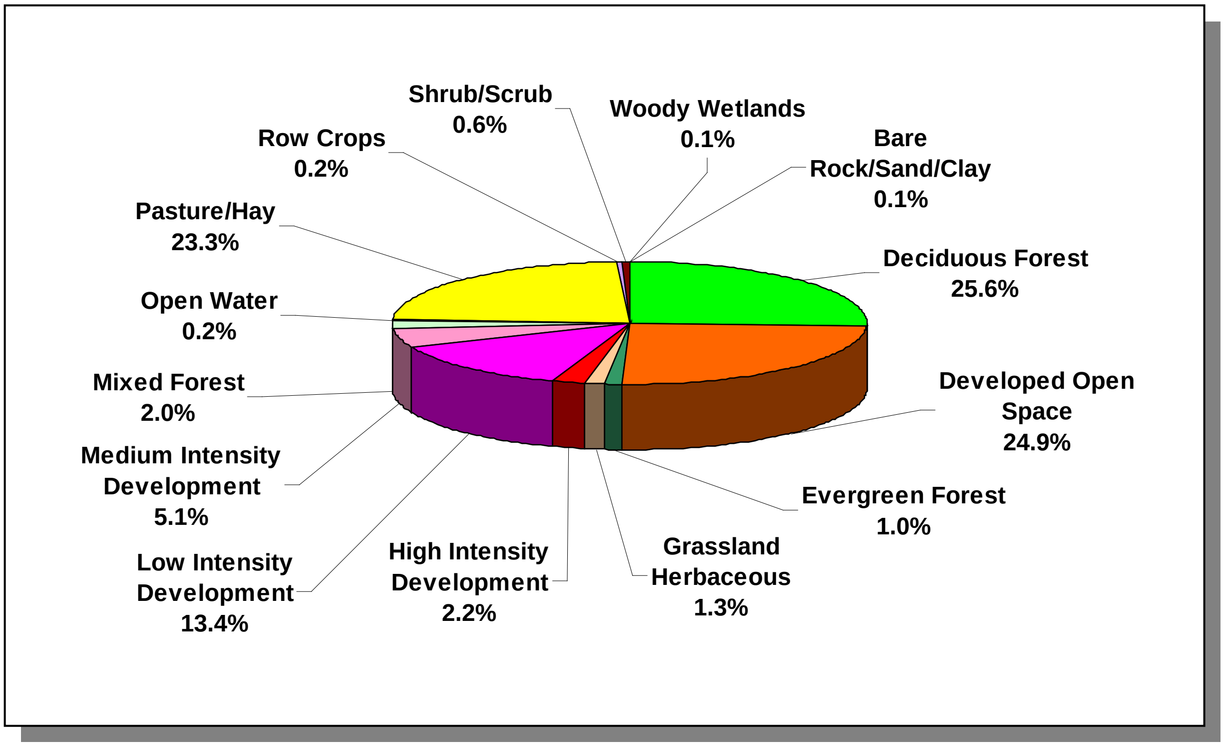

Figure 4-101. Land Use Distribution in Subwatershed 060101040207. *More information is provided in Appendix IV.*

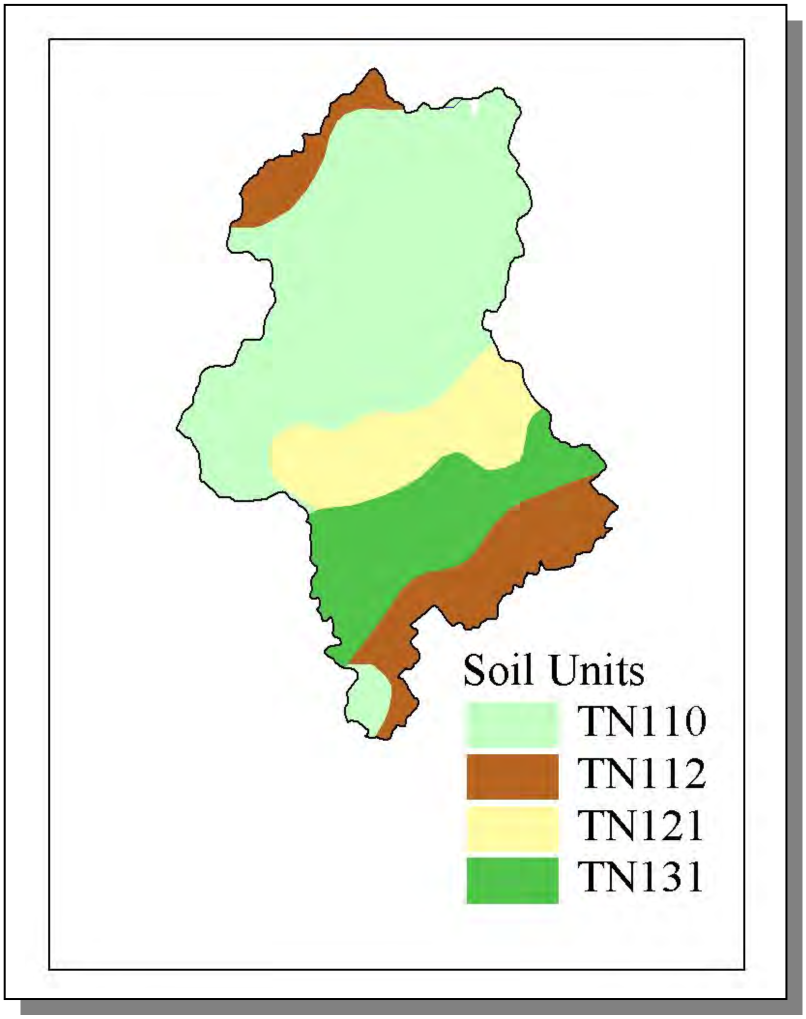

Figure 4-102. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040207.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN110	0.00	B	2.22	4.96	Loam	0.31
TN112	6.00	C	2.36	5.09	Loam	0.35
TN121	0.00	B	1.30	5.21	Loam	0.33
TN131	0.00	C	1.17	4.95	Silty Loam	0.33

Table 4-80. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040207. *The definition of "Hydrologic Group" is provided in Appendix IV.*

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	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Hamblen	50,480	53,699	58,128	10.49	5,295	5,633	6,098	15.2

Table 4-81. Population Estimates in Subwatershed 060101040207.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Morristown	Hamblen	21,385	9,248	8,768	466	14

Table 4-82. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 060101040207.

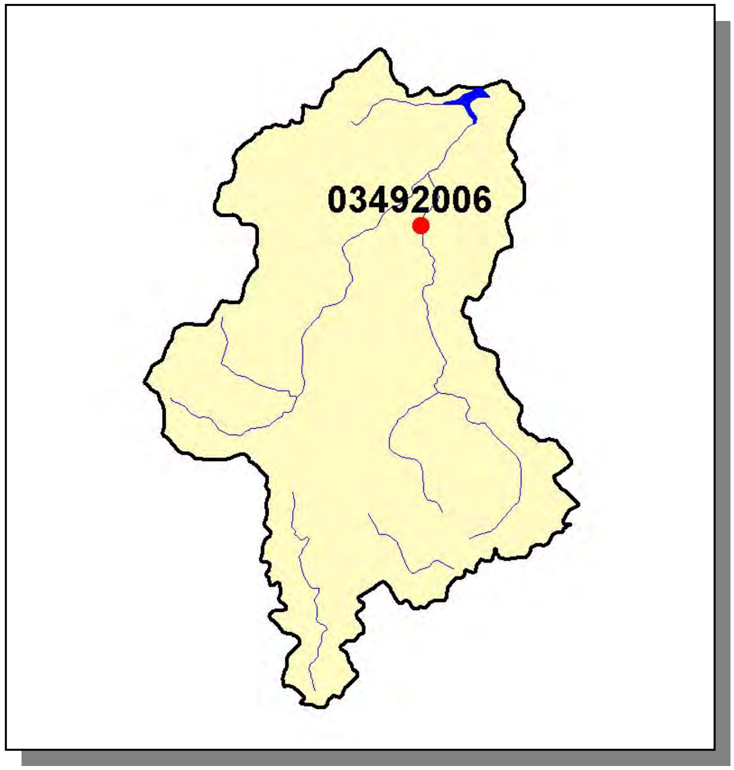

Figure 4-103. Location of Historical Streamflow Data Collection Sites in Subwatershed 060101040207. *More information is provided in Appendix IV.*

Figure 4-104. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 060101040207. *More information, including site names and locations, is provided in Appendix IV.*

4.2.B.vii.a. Point Source Contributions.

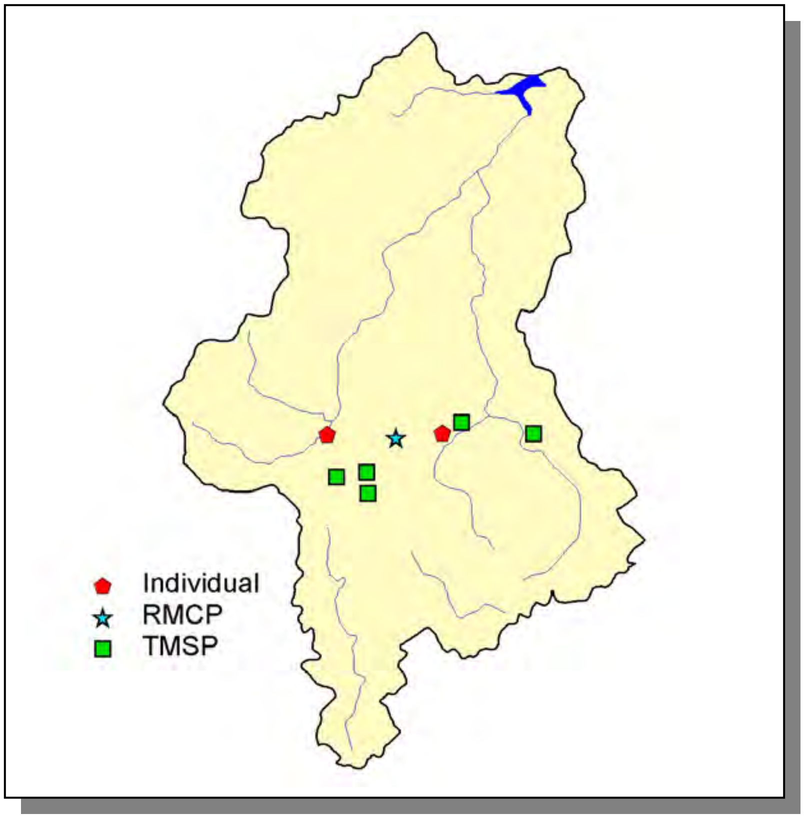

Figure 4-105. Location of Permits Issued in Subwatershed 060101040207. *More information, including the names of facilities, is provided in Appendix IV.*

Figure 4-106. Location of Active NPDES Sites in Subwatershed 060101040207. *More information, including the names of facilities, is provided in Appendix IV.*

Figure 4-107. Location of Ready Mix Concrete Plants (RMCP) in Subwatershed 060101040207. *More information is provided in Appendix IV.*

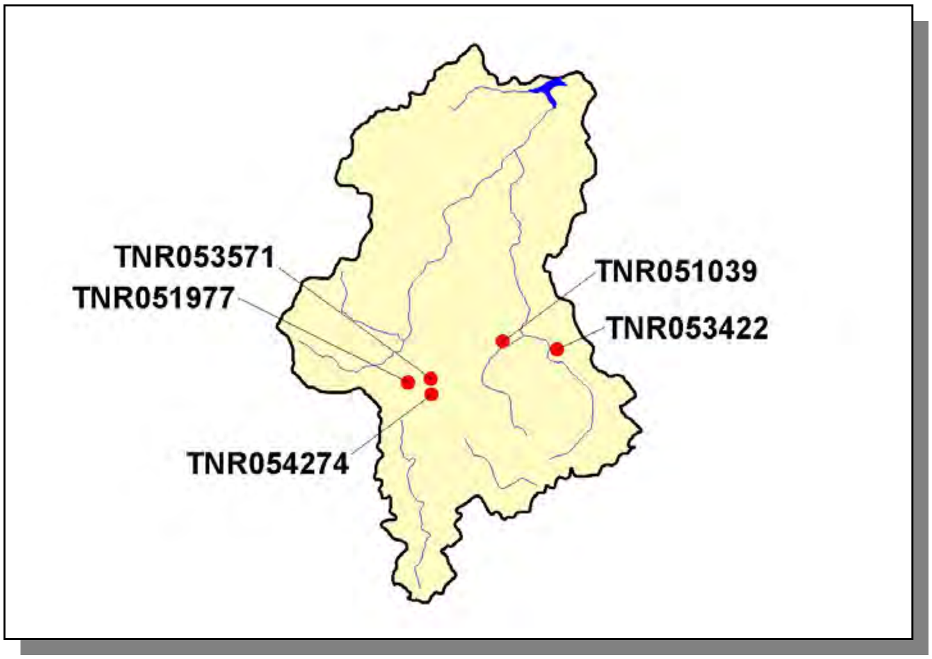

Figure 4-108. Location of TMSP Sites in Subwatershed 060101040207. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.B.vii.a.i. Dischargers to Water Bodies Listed on the 2004 303(d) List

There is one NPDES facility discharging to water bodies listed on the 2004 303(d) list in Subwatershed 060101040207:

- TN0067989 (Koch Foods, LLC) discharges to West Fork Turkey Creek @ RM 0.1

Figure 4-109. Location of NPDES Dischargers to Water Bodies Listed on the 2004 303(d) List in Subwatershed 060101040207. *More information, including the names of facilities, is provided in Appendix IV.*

Permit #	3Q2	1Q10	3Q10	3Q20	7Q10
TN0067989	0.02		0.02	0.01	0.02

Table 4-83. Receiving Stream Low Flow Information for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 060101040207. *Data are in cubic feet per second (CFS). Data were obtained from the USGS web application StreamStats at http://water.usgs.gov/osw/streamstats/. (na, data not available)*

PERMIT #	FLOW
TN0067989	X

Table 4-84. Monitoring Requirements for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 060101040207.

PERMIT #	$CBOD_5$	NH_3	NO_3	TSS	OIL AND GREASE	DO	pH
TN0067989	X	X	X	X	X	X	X

Table 4-85. Parameters Monitored for Daily Maximum Limits for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 060101040207. *WET, Whole Effluent Toxicity; $CBOD_5$, Carbonaceous Biochemical Oxygen Demand (5-Day); TRC, Total Residual Chlorine; TSS, Total Suspended Solids.*

4.2.B.vii.b. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens (Broilers Sold)	Hogs	Sheep
603	1,146	79	<5	124,299	84	26

Table 4-86. Summary of Livestock Count Estimates in Subwatershed 060101040207. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/),* ***"****Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS							
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens (Broilers Sold)	Hogs	Sheep
Hamblen	8,620	16,376	1,129	233	1,776,000	1,195	367

Table 4-87. Summary of Livestock Count Estimates in Hamblen County. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/),* ***"****Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Hamblen	32.8	32.8	0.0	0.0

Table 4-88. Forest Acreage and Annual Removal Rates (1987-1994) in Hamblen County.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.57
Grass (Hayland)	0.36
Legumes, Grass (Hayland)	0.15
Grass, Forbs, Legumes (Mixed Pasture)	0.30
Corn (Row Crops)	14.92
Tobacco (Row Crops)	8.43
Aquaculture in a Crop Rotation	0.15
Other Land in Farms	0.21
Farmsteads and Ranch Headquarters	0.13

Table 4-89. Annual Estimated Total Soil Loss in Subwatershed 060101040207.

4.2.B.viii. 060101040208 (German Creek).

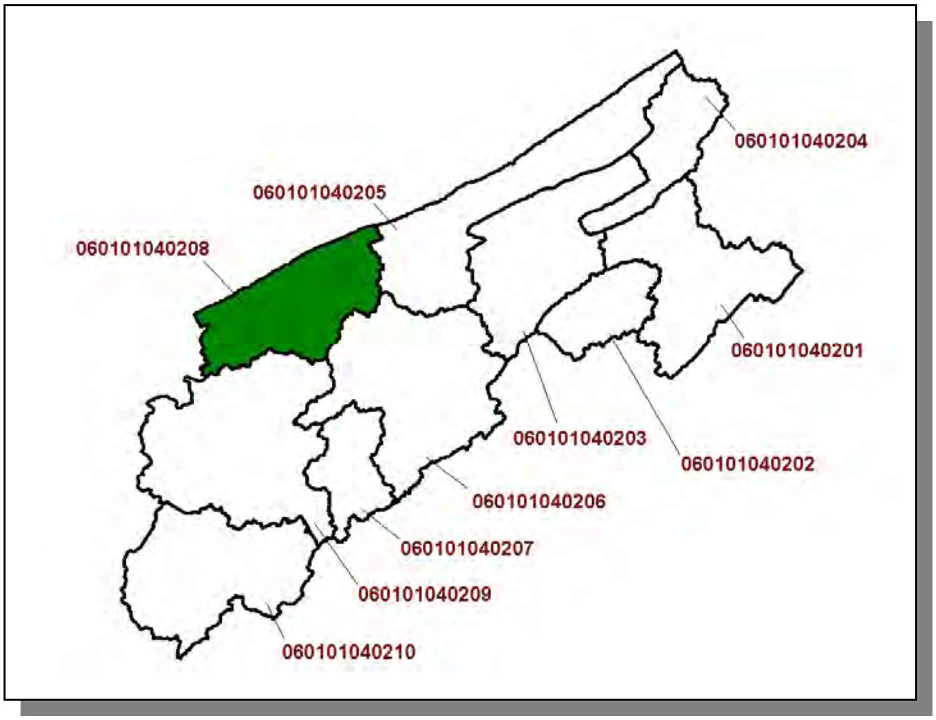

Figure 4-110. Location of Subwatershed 060101040208. *HUC-12 subwatershed boundaries are shown for reference.*

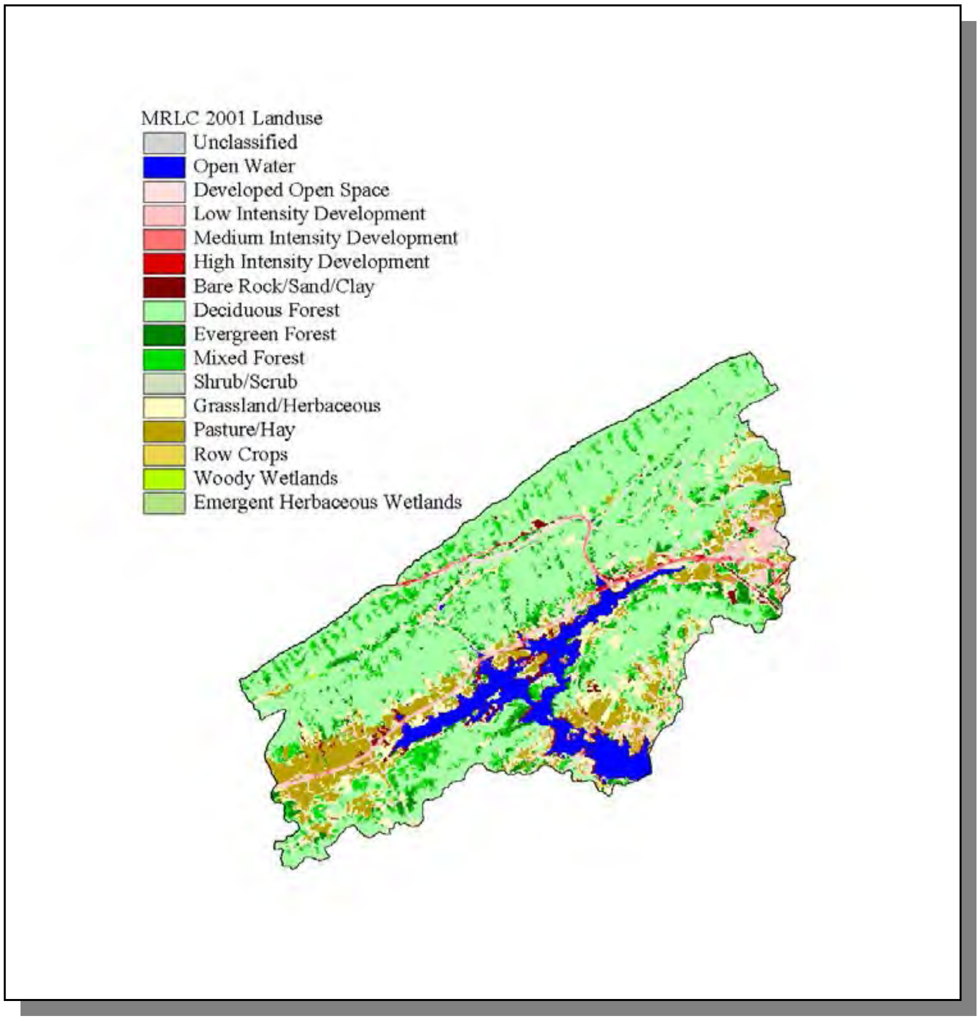

Figure 4-111. Illustration of Land Use Distribution in Subwatershed 060101040208.

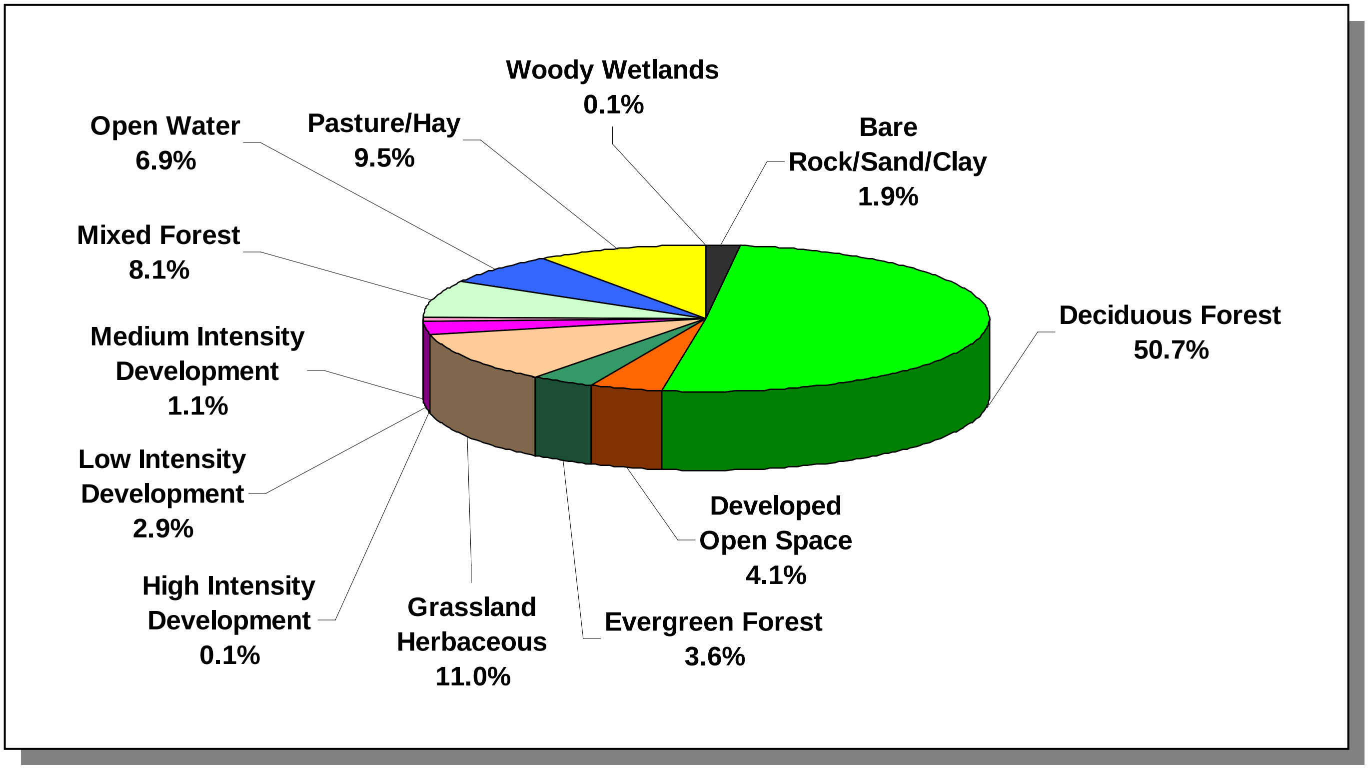

Figure 4-112. Land Use Distribution in Subwatershed 060101040208. *More information is provided in Appendix IV.*

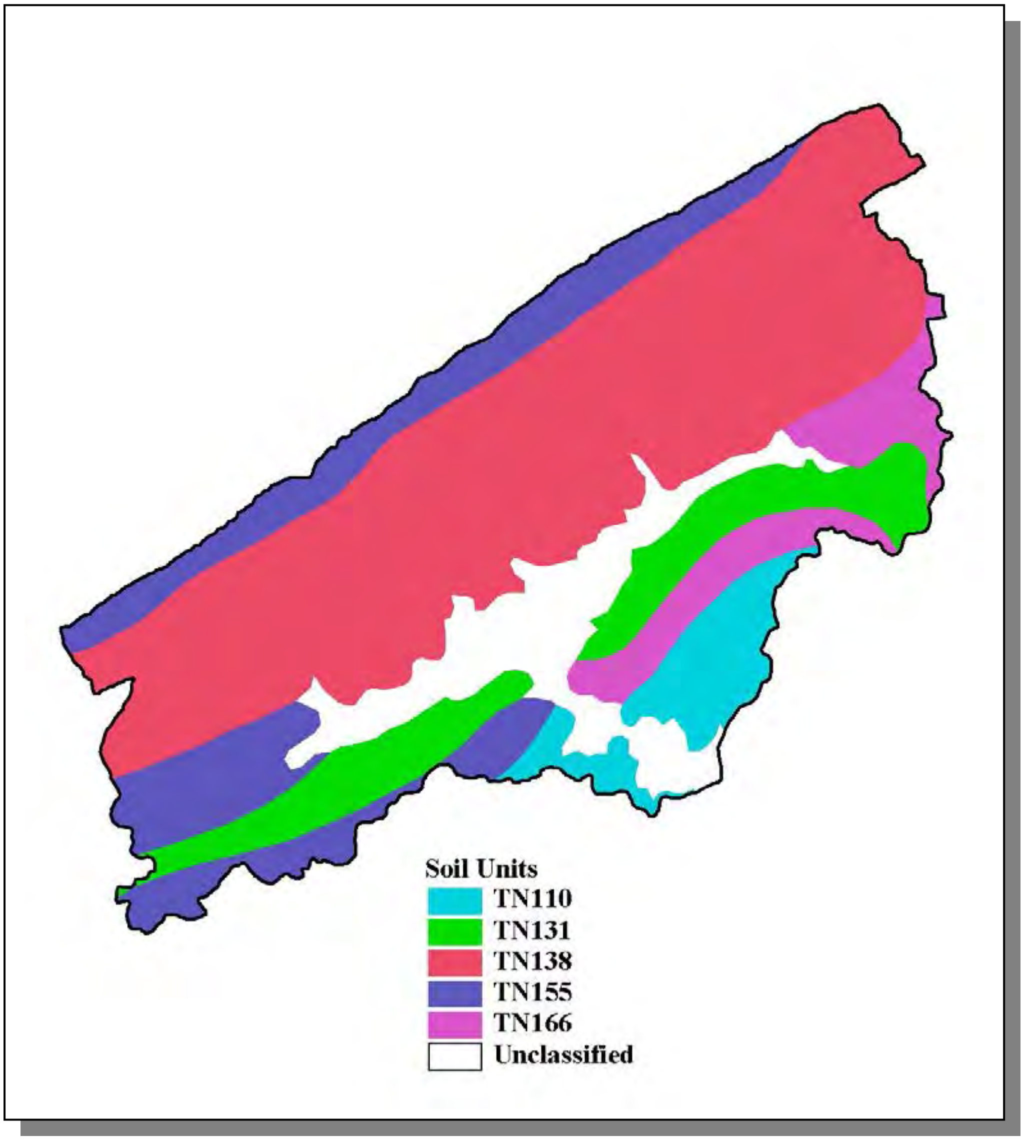

Figure 4-113. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040208.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN110	0.00	B	2.22	4.96	Loam	0.31
TN131	0.00	C	1.17	4.95	Silty Loam	0.33
TN138	0.00	C	2.48	4.26	Sandy Loam	0.22
TN155	0.00	C	1.71	5.31	Loam	0.32
TN166	1.00	C	2.36	5.06	Loam	0.30

Table 4-90. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040208. *The definition of "Hydrologic Group" is provided in Appendix IV.*

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	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Grainger	17,095	19,456	20,659	12.92	2,208	2,513	2,668	20.8
Hancock	6,739	6,801	6,786	0.13	9	9	9	0.0
Hawkins	44,565	48,821	53,563	0.01	5	5	6	20.0
Total	**68,399**	**75,078**	**81,008**		**2,222**	**2,527**	**2,683**	**20.7**

Table 4-91. Population Estimates in Subwatershed 060101040208.

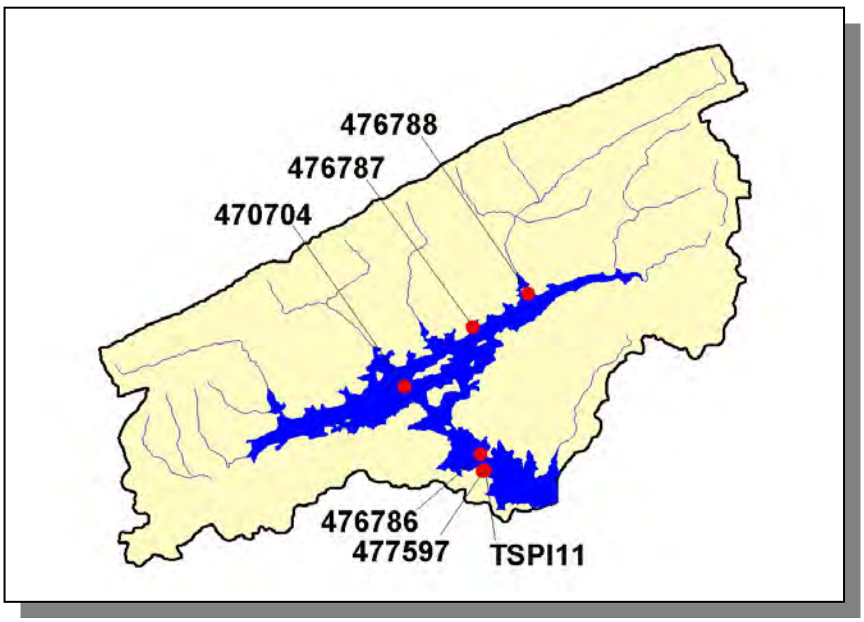

Figure 4-114. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 060101040208. *More information, including site names and locations, is provided in Appendix IV.*

4.2.B.viii.a. Point Source Contributions.

There are no point source contributions in this subwatershed.

4.2.B.viii.b. Nonpoint Source Contributions.

LIVESTOCK COUNTS					
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
869	1,715	68	<5	37	14

Table 4-92. Summary of Livestock Count Estimates in Subwatershed 060101040208. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), **"**Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Grainger	12,115	23,927	942	1,184	510	195
Hancock	7,079	14,311	89	364	0	67
Hawkins	18,796	36,429	903	1,079	442	243

Table 4-93. Summary of Livestock Count Estimates in Grainger, Hancock, and Hawkins Counties. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), **"**Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Grainger	102.6	102.6	0.3	1.8
Hancock	92.9	92.9	2.7	14.2
Hawkins	177.4	177.4	0.4	2.1

Table 4-94. Forest Acreage and Annual Removal Rates (1987-1994) in Grainger, Hancock, and Hawkins Counties.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	1.01
Grass (Hayland)	0.32
Legumes, Grass (Hayland)	0.60
Legumes (Hayland)	0.16
Grass, Forbs, Legumes (Mixed Pasture)	0.84
Corn (Row Crops)	5.67
Tobacco (Row Crops)	7.34
Other Vegetable and Truck Crops	33.50
Farmsteads and Ranch Headquarters	0.52

Table 4-95. Annual Estimated Total Soil Loss in Subwatershed 060101040208.

4.2.B.ix. 060101040209 (Cherokee Lake).

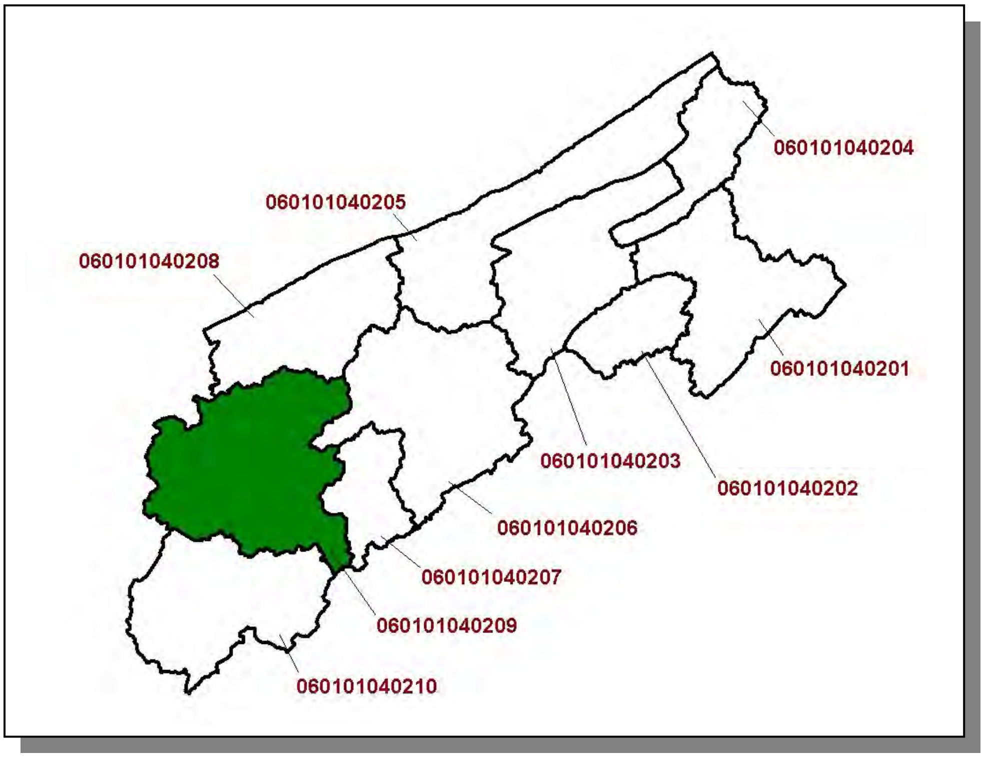

Figure 4-115. Location of Subwatershed 060101040209. *HUC-12 subwatershed boundaries are shown for reference.*

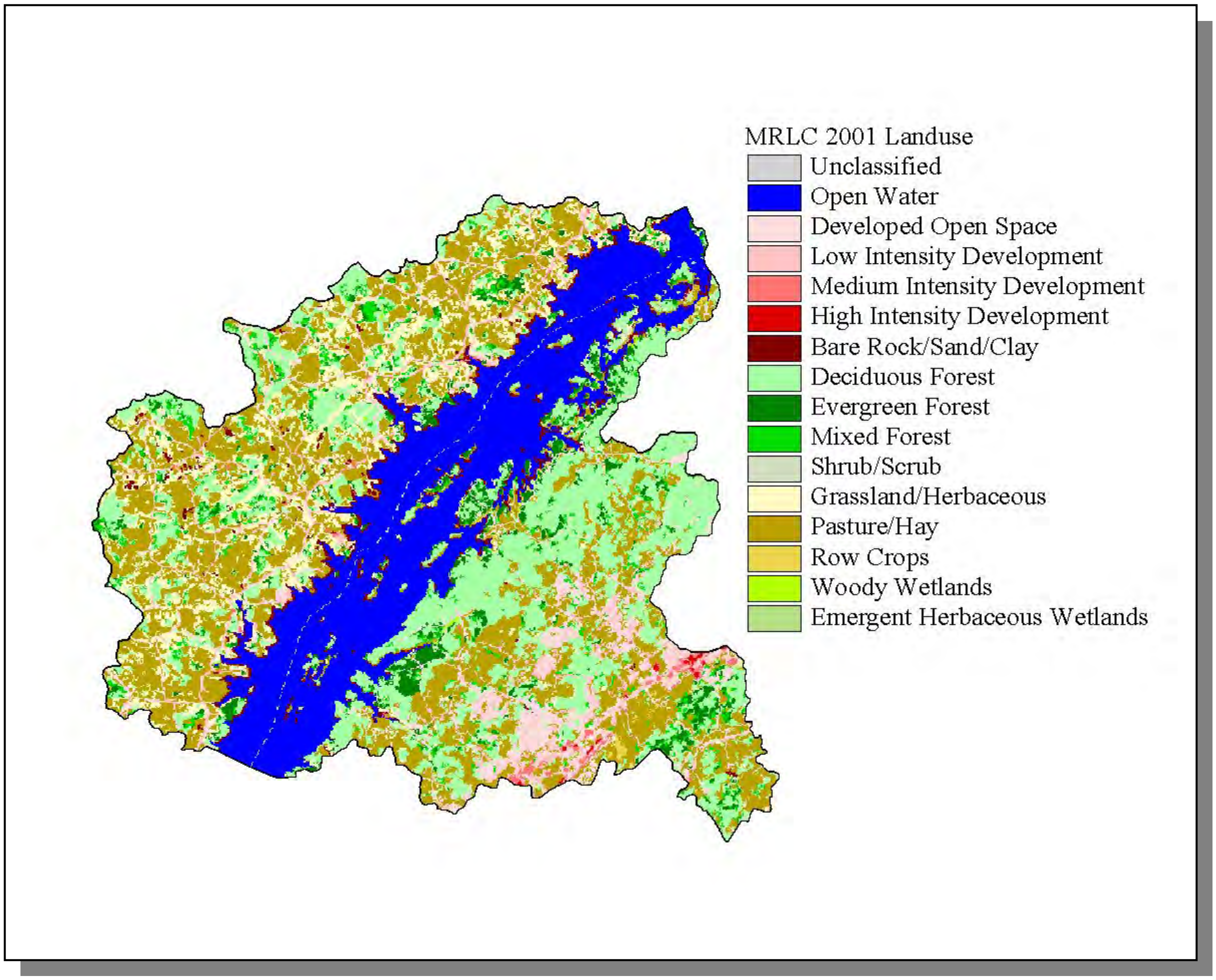

Figure 4-116. Illustration of Land Use Distribution in Subwatershed 060101040209.

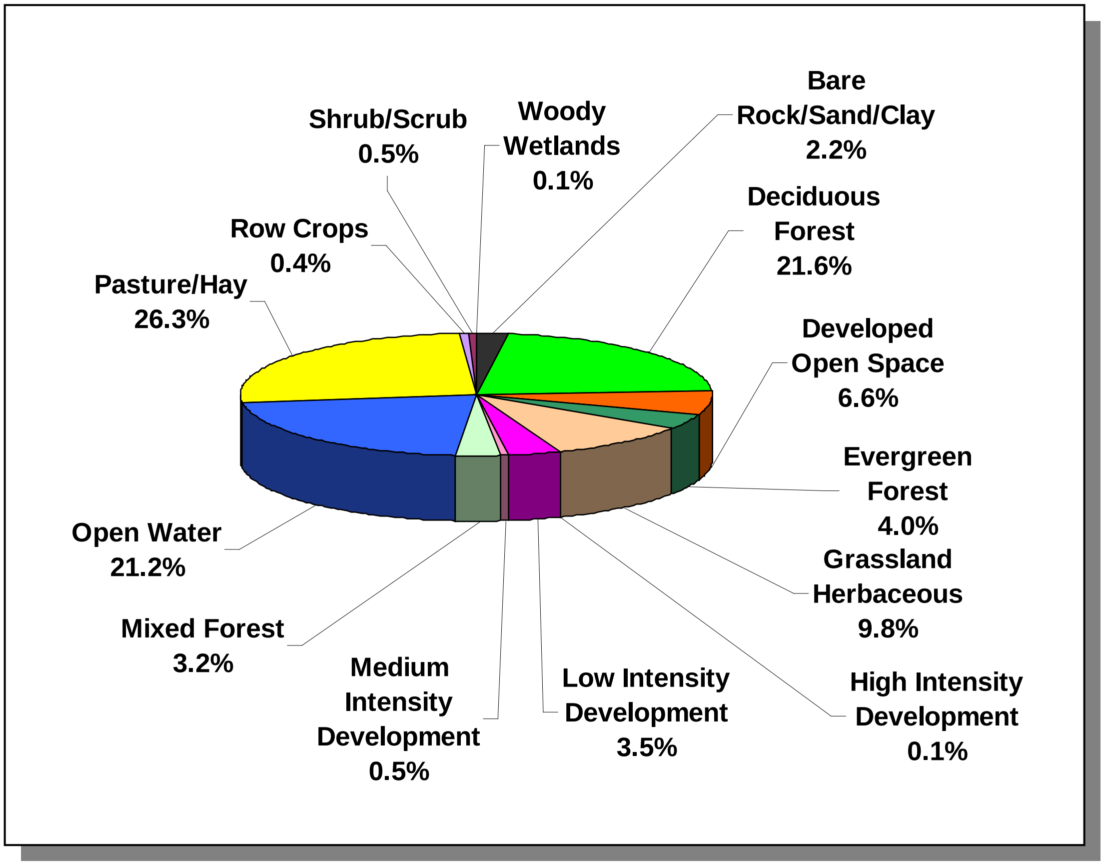

Figure 4-117. Land Use Distribution in Subwatershed 060101040209. *More information is provided in Appendix IV.*

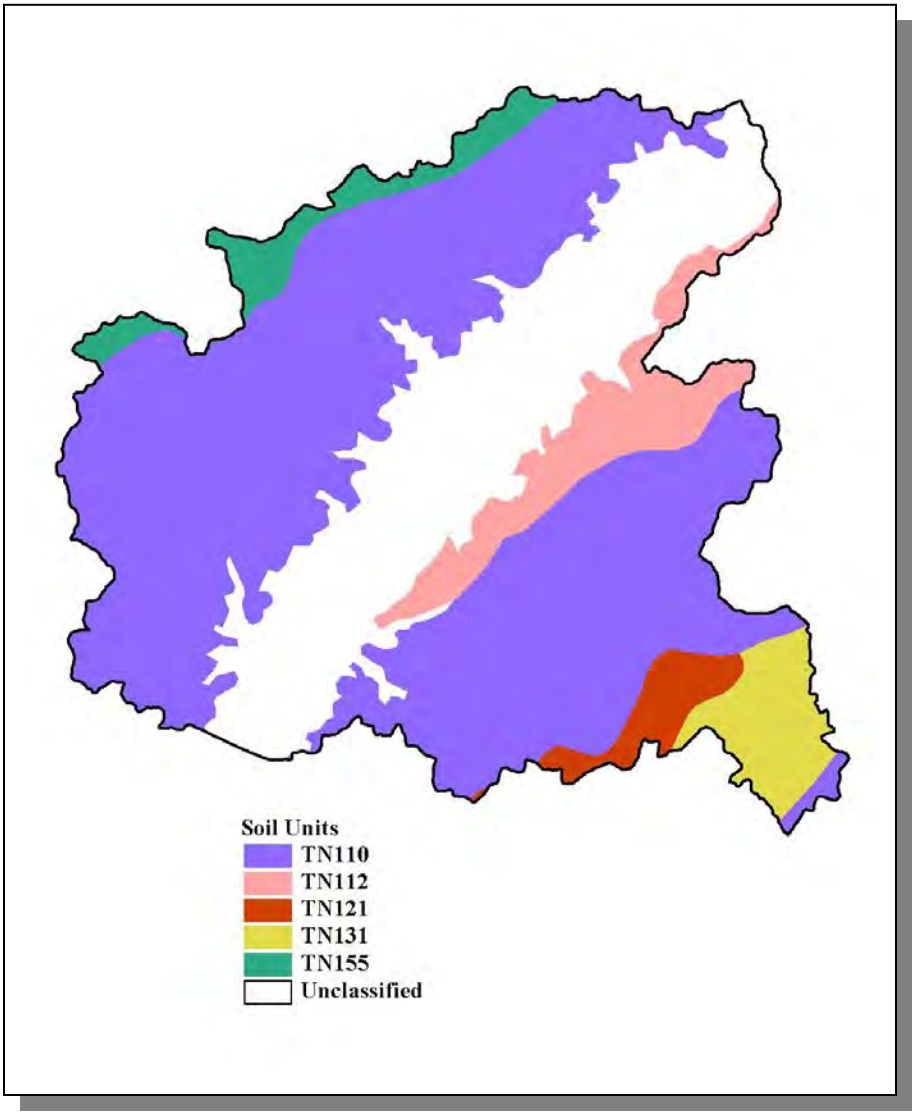

Figure 4-118. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040209.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN110	0.00	B	2.22	4.96	Loam	0.31
TN112	6.00	C	2.36	5.09	Loam	0.35
TN121	0.00	B	1.30	5.21	Loam	0.33
TN131	0.00	C	1.17	4.95	Silty Loam	0.33
TN155	0.00	C	1.71	5.31	Loam	0.32

Table 4-96. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040209. *The definition of "Hydrologic Group" is provided in Appendix IV.*

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	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Grainger	17,095	19,456	20,659	10.68	1,827	2,079	2,207	20.8
Hamblen	50,480	53,699	58,128	19.95	10,069	10,711	11,595	15.2
Total	**67,575**	**73,155**	**78,787**		**11,896**	**12,790**	**13,802**	**16.0**

Table 4-97. Population Estimates in Subwatershed 060101040209.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Morristown	Hamblen	21,385	9,248	8,768	466	14

Table 4-98. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 060101040209.

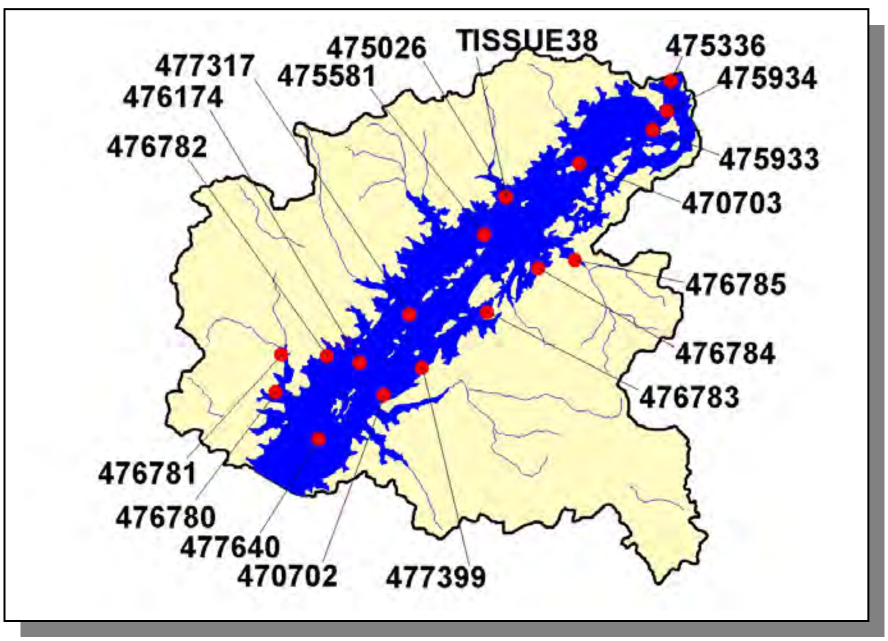

Figure 4-119. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 060101040209. *More information, including site names and locations, is provided in Appendix IV.*

4.2.B.ix.a. Point Source Contributions.

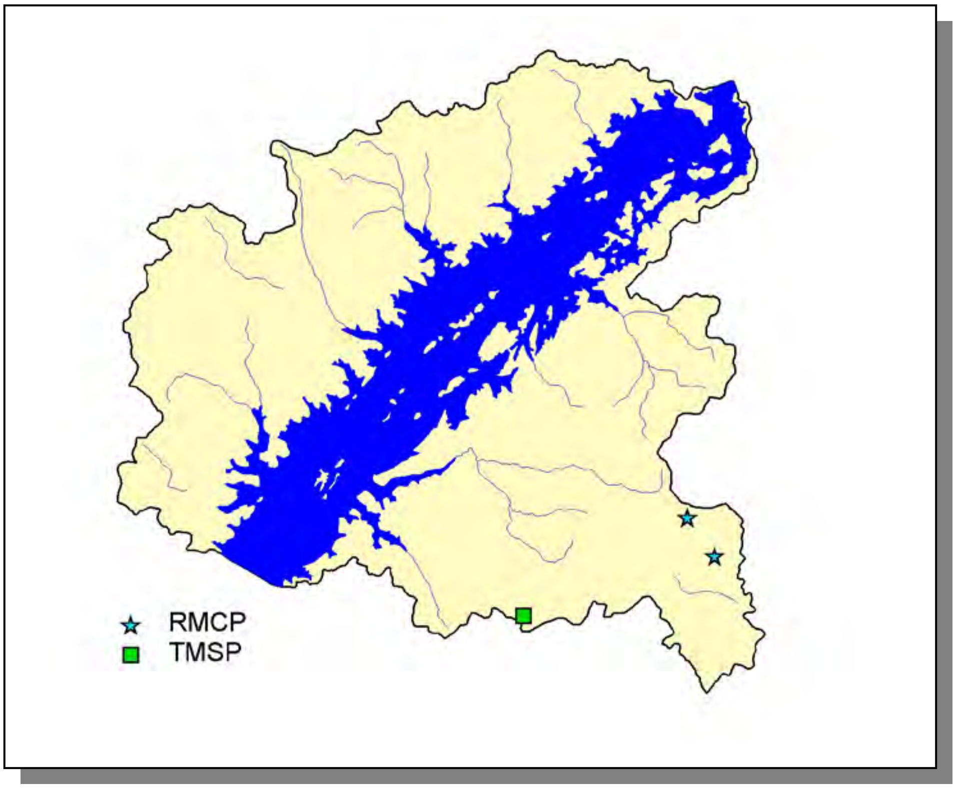

Figure 4-120. Location of Permits Issued in Subwatershed 060101040209. *More information, including the names of facilities, is provided in Appendix IV.*

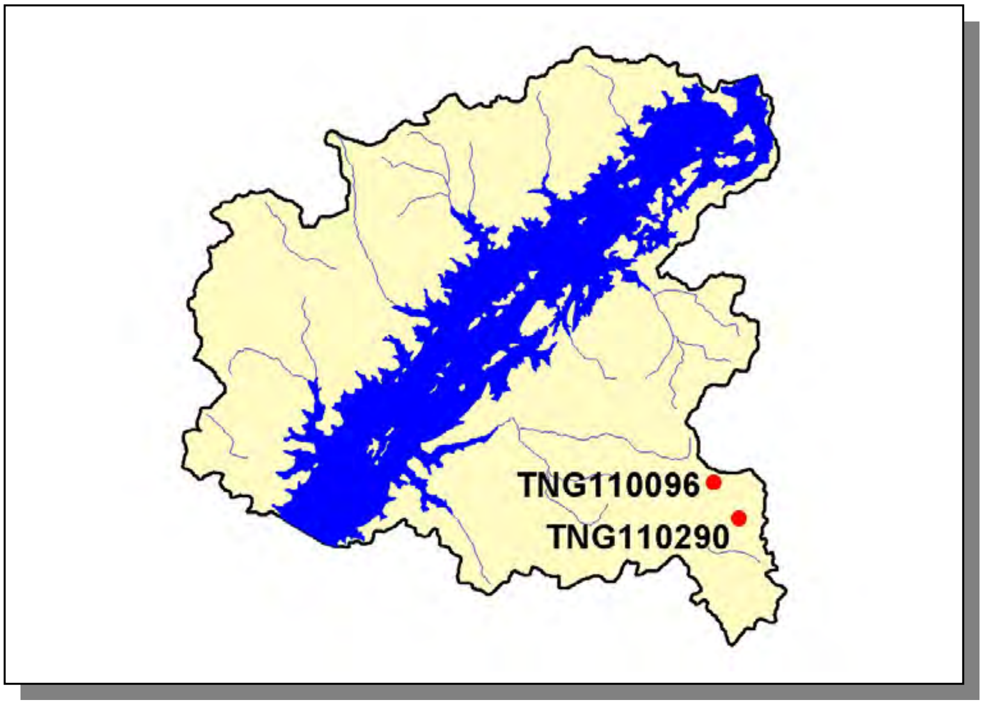

Figure 4-121. Location of Ready Mix Concrete Plants (RMCP) in Subwatershed 060101040209. *More information is provided in Appendix IV.*

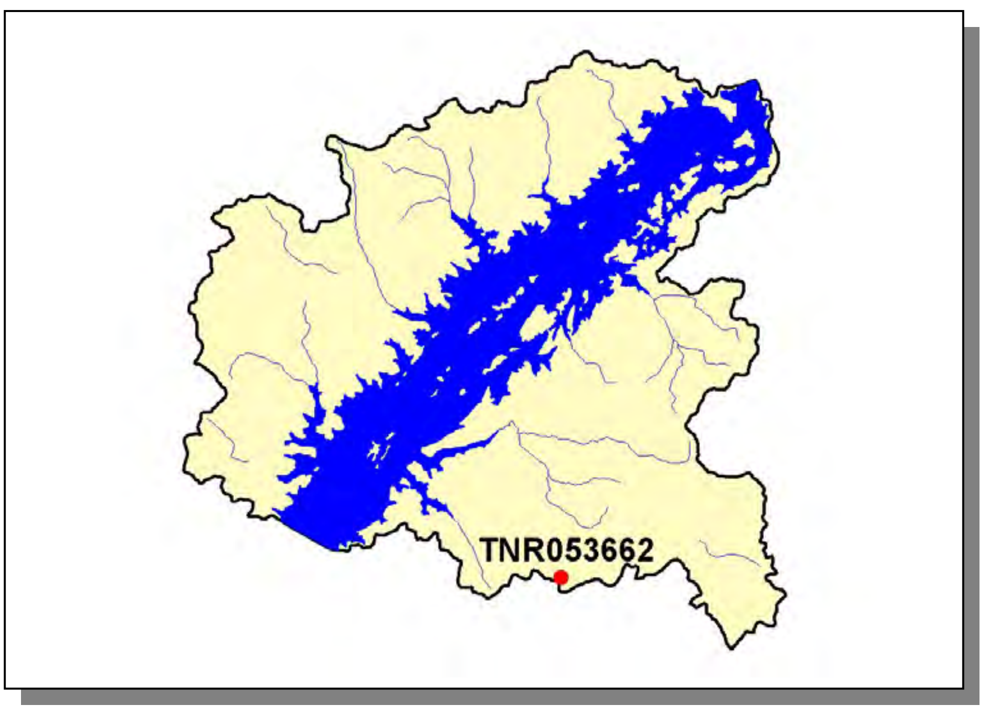

Figure 4-122. Location of TMSP Sites in Subwatershed 060101040209. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.B.ix.b. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens (Broilers Sold)	Hogs	Sheep
2,984	5,822	283	7	196,249	218	73

Table 4-99. Summary of Livestock Count Estimates in Subwatershed 060101040209. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/),* ***"****Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS							
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens (Broilers Sold)	Hogs	Sheep
Grainger	12,115	23,927	942	1,184	0	510	195
Hamblen	8,620	16,376	1,129	233	1,776,000	1,195	367

Table 4-100. Summary of Livestock Count Estimates in Grainger and Hamblen Counties. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/),* ***"****Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Grainger	102.6	102.6	0.3	1.8
Hamblen	32.8	32.8	0.0	0.0

Table 4-101. Forest Acreage and Annual Removal Rates (1987-1994) in Grainger and Hamblen Counties.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.78
Grass (Hayland)	0.34
Legumes, Grass (Hayland)	0.37
Grass, Forbs, Legumes (Mixed Pasture)	0.56
Corn (Row Crops)	10.44
Tobacco (Row Crops)	7.84
Aquaculture in Crop Rotation	0.15
Other Land in Farms	0.21
Farmsteads and Ranch Headquarters	0.32

Table 4-102. Annual Estimated Total Soil Loss in Subwatershed 060101040209.

4.2.B.x. 060101040210 (Cherokee Lake).

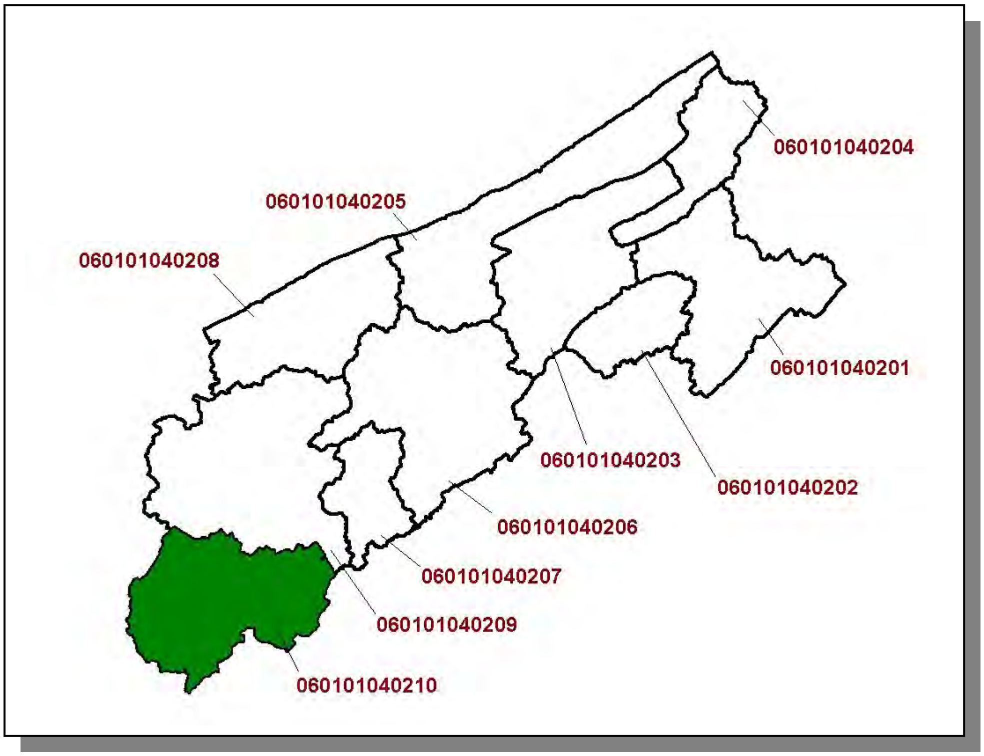

Figure 4-123. Location of Subwatershed 060101040210. *HUC-12 subwatershed boundaries are shown for reference.*

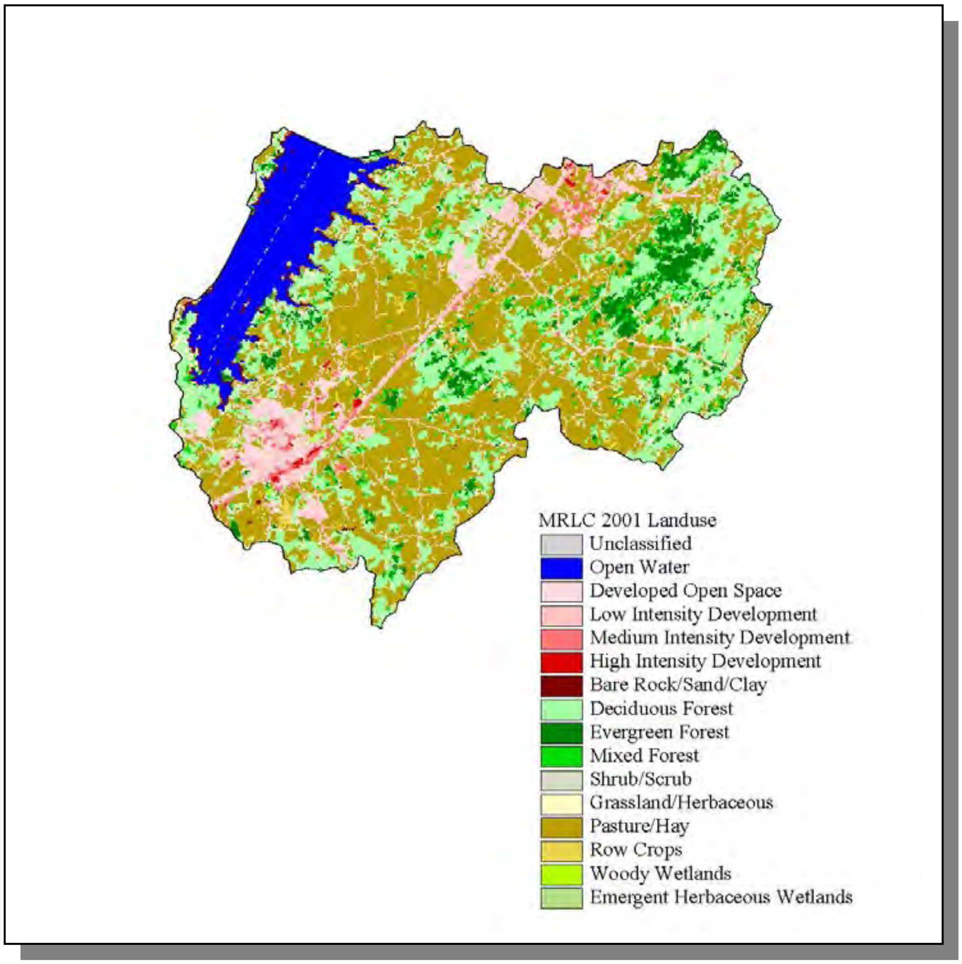

Figure 4-124. Illustration of Land Use Distribution in Subwatershed 060101040210.

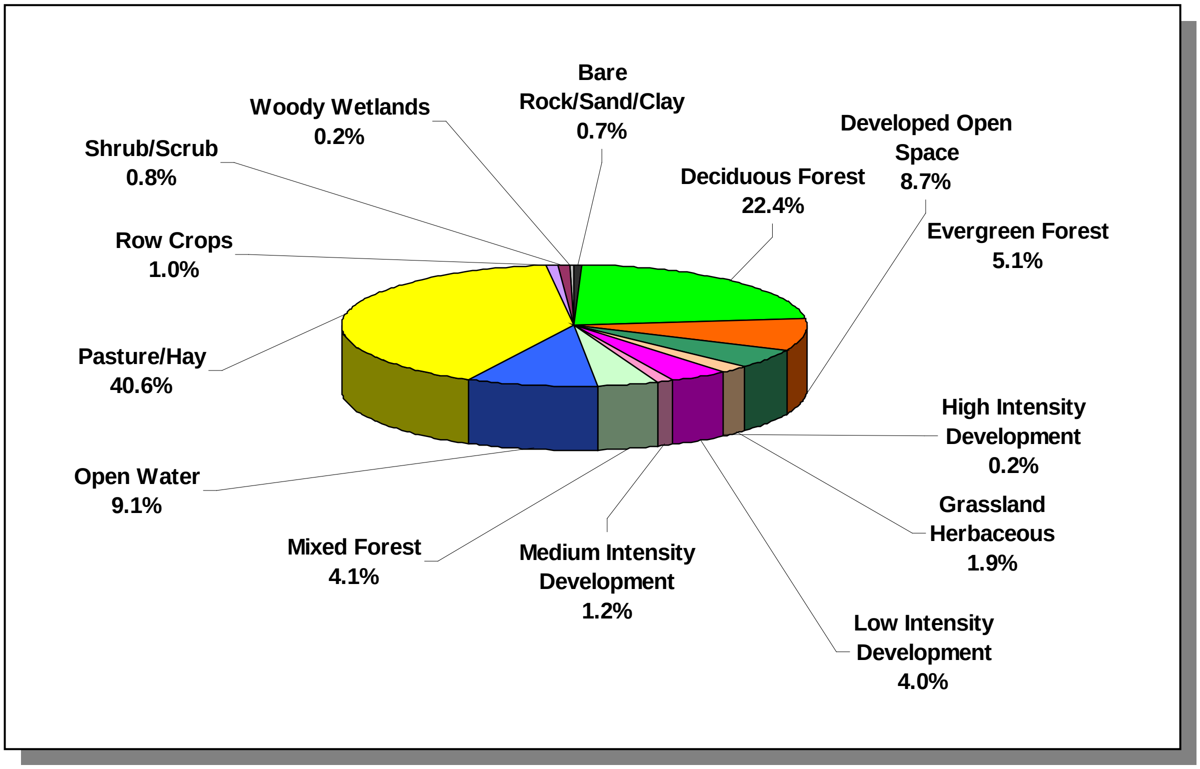

Figure 4-125. Land Use Distribution in Subwatershed 060101040210. *More information is provided in Appendix IV.*

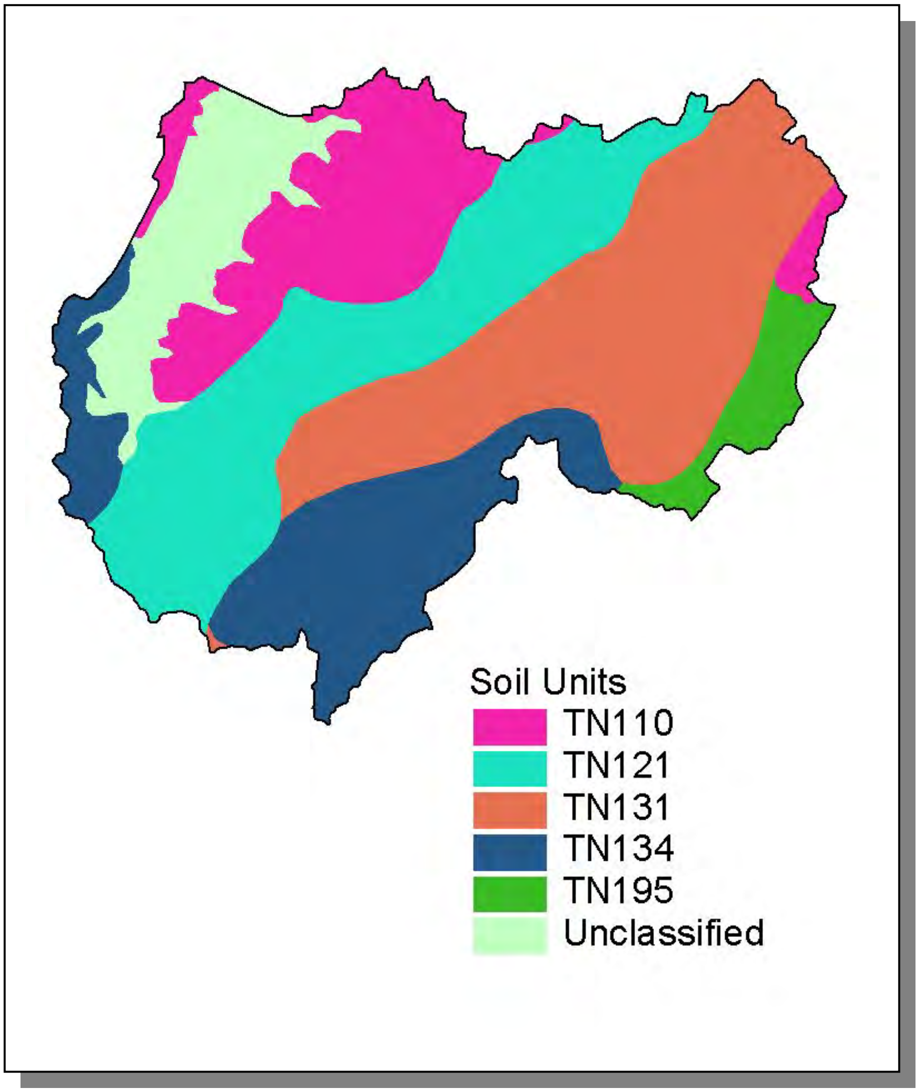

Figure 4-126. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040210.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN110	0.00	B	2.22	4.96	Loam	0.31
TN121	0.00	B	1.30	5.21	Loam	0.33
TN131	0.00	C	1.17	4.95	Silty Loam	0.33
TN134	0.00	B	1.38	5.18	Loam	0.31
TN195	0.00	C	1.93	5.19	Silty Loam	0.34

Table 4-103. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040210. *The definition of "Hydrologic Group" is provided in Appendix IV.*

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	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Grainger	17,095	19,456	20,659	0.83	142	161	171	20.4
Hamblen	50,480	53,699	58,128	5.89	2,976	3,166	3,427	15.2
Jefferson	33,016	42,168	44,294	11.45	3,781	4,829	5,073	34.2
Total	**100,591**	**115,323**	**123,081**		**6,899**	**8,156**	**8,671**	**25.7**

Table 4-104. Population Estimates in Subwatershed 060101040210.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Jefferson City	Jefferson	5,494	2,006	1,922	84	0
Morristown	Hamblen	21,385	9,248	8,768	466	14
Total		**26,879**	**11,254**	**10,690**	**550**	**14**

Table 4-105. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 060101040210.

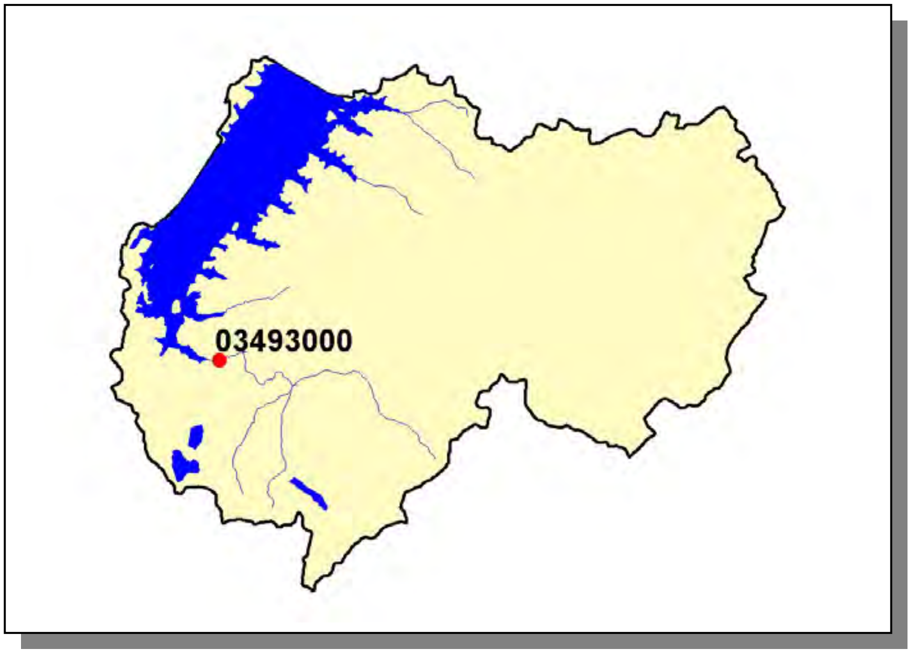

Figure 4-127. Location of Historical Streamflow Data Collection Sites in Subwatershed 060101040210. *More information is provided in Appendix IV.*

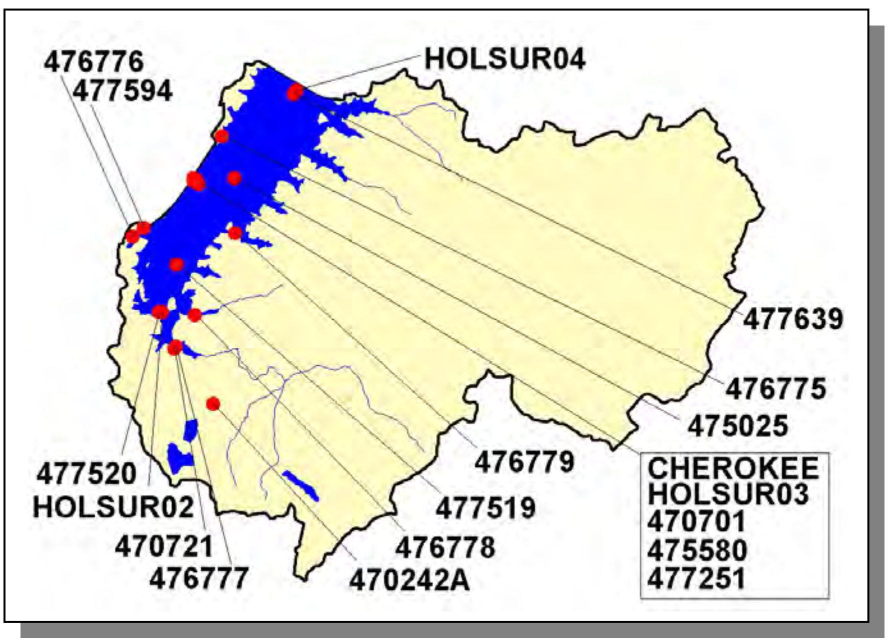

Figure 4-128. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 060101040210. *More information, including site names and locations, is provided in Appendix IV.*

4.2.B.x.a. Point Source Contributions.

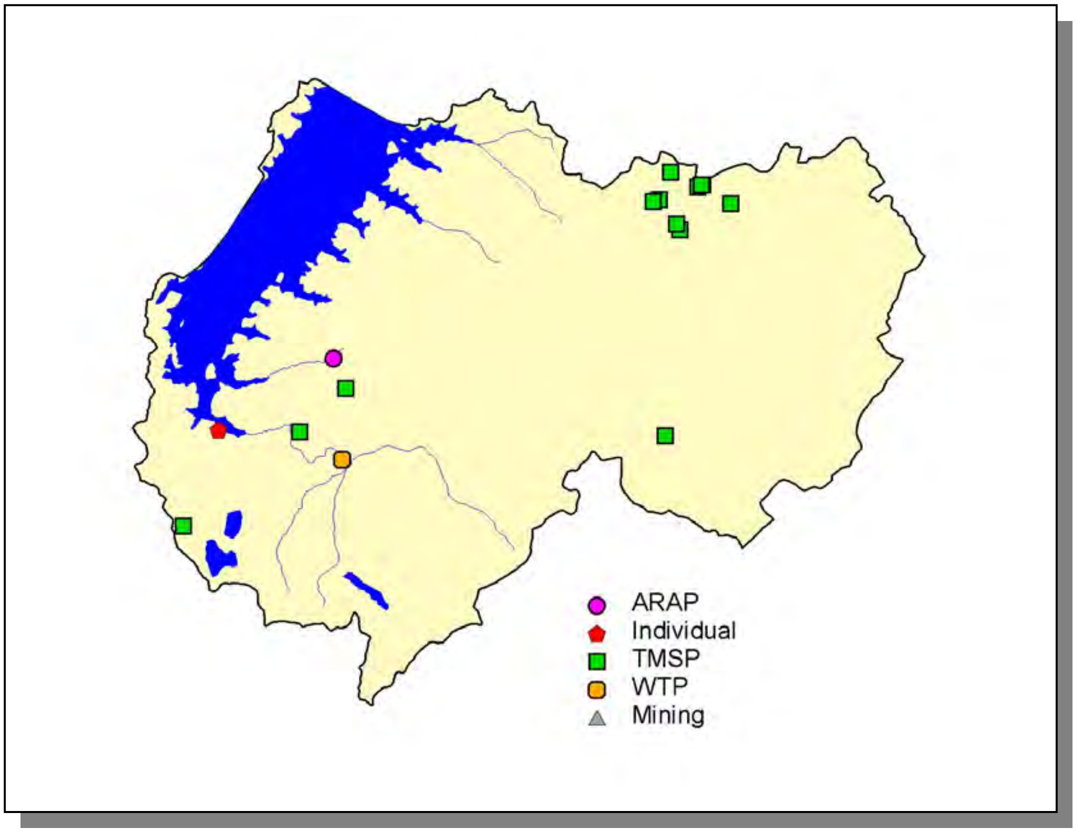

Figure 4-129. Location of Permits Issued in Subwatershed 060101040210. *More information, including the names of facilities, is provided in Appendix IV.*

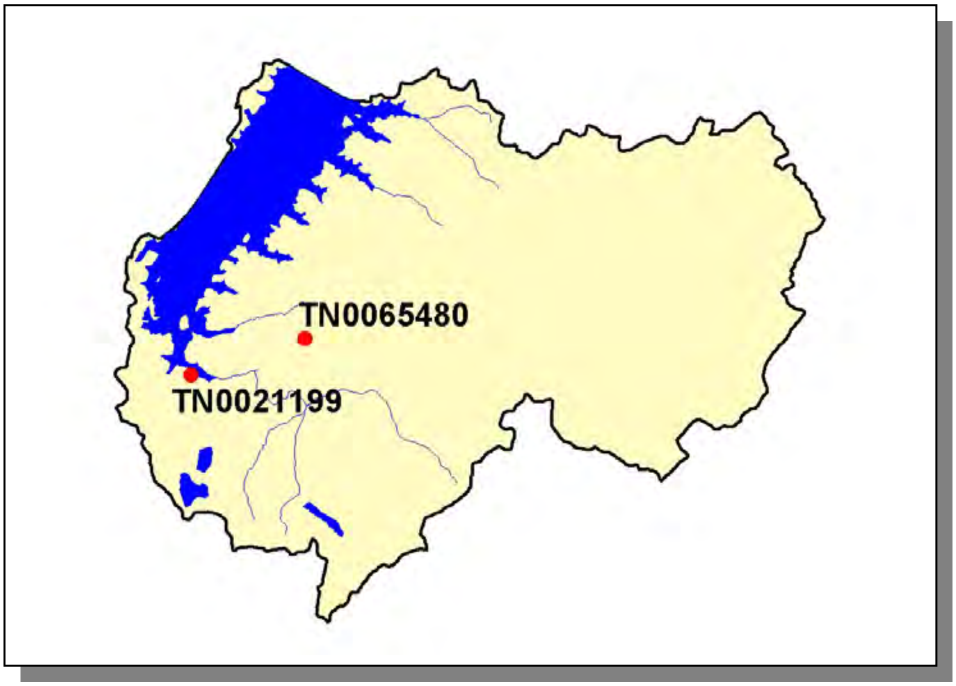

Figure 4-130. Location of Active NPDES Sites in Subwatershed 060101040210. *More information, including the names of facilities, is provided in Appendix IV.*

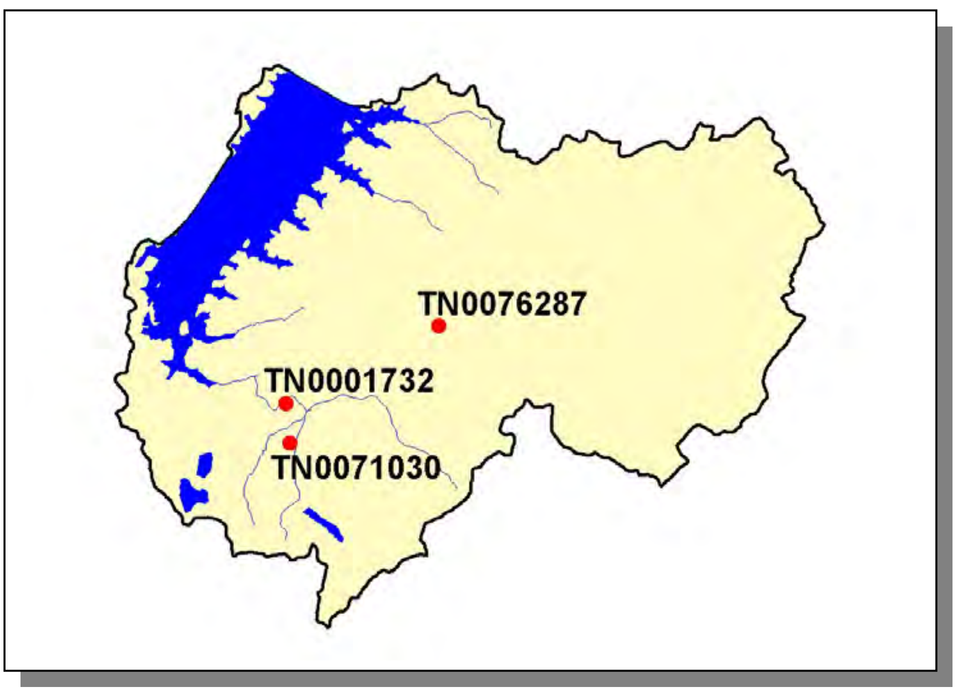

Figure 4-131. Location of Active Mining Sites in Subwatershed 060101040210. *More information, including the names of mining operations, is provided in Appendix IV.*

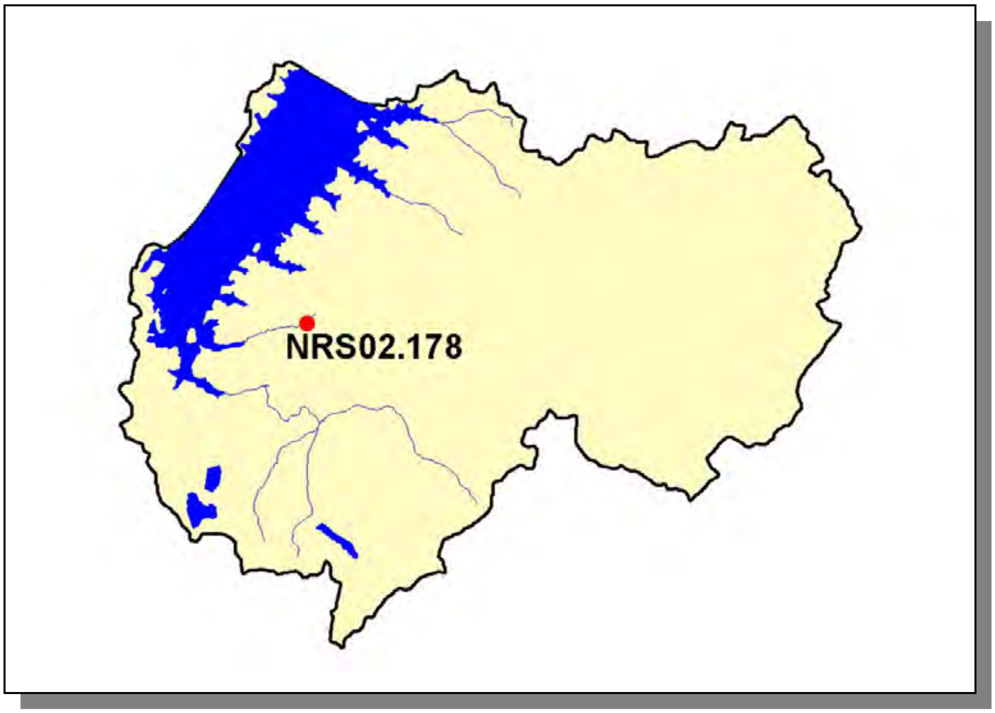

Figure 4-132. Location of Aquatic Resource Alteration Permit (ARAP) Sites (Individual Permits) in Subwatershed 060101040210. *More information is provided in Appendix IV.*

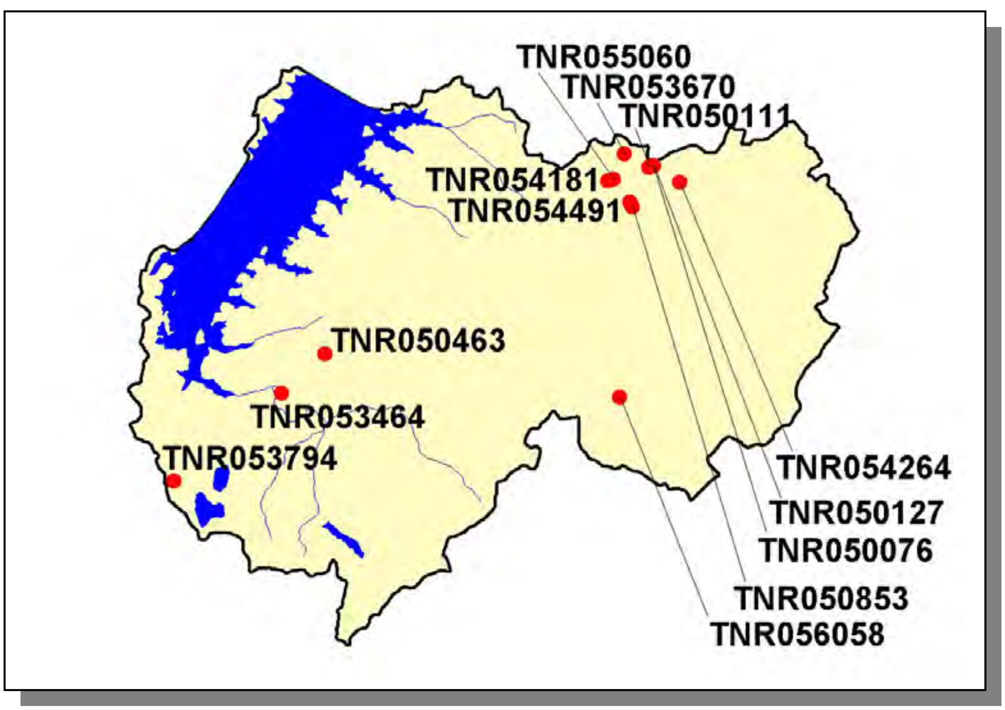

Figure 4-133. Location of TMSP Sites in Subwatershed 060101040210. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.B.x.b. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens (Broilers Sold)	Hogs	Sheep
2,636	5,674	314	<5	350,975	95	96

Table 4-106. Summary of Livestock Count Estimates in Subwatershed 060101040210. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/),* ***"****Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS							
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens (Broilers Sold)	Hogs	Sheep
Grainger	12,115	23,927	942	1,184	0	510	195
Hamblen	8,620	16,376	1,129	233	1,776,000	1,195	367
Jefferson	16,126	35,718	1,878	1,633	1,880,000	183	567

Table 4-107. Summary of Livestock Count Estimates in Grainger, Hamblen, and Jefferson Counties. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/),* ***"****Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Grainger	102.6	102.6	0.3	1.8
Hamblen	32.8	32.8	0	0
Jefferson	62.2	62.2	0.6	1.8

Table 4-108. Forest Acreage and Annual Removal Rates (1987-1994) in Grainger, Hamblen, and Jefferson Counties.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.58
Grass (Hayland)	0.27
Legumes, Grass (Hayland)	0.34
Grass, Forbs, Legumes (Mixed Pasture)	0.42
Corn (Row Crops)	20.26
Tobacco (Row Crops)	4.35
Oats (Close-Grown Cropland)	13.51
Aquaculture in a Crop Rotation	0.15
Other Land in Farms	0.21
Farmsteads and Ranch Headquarters	0.05

Table 4-109. Annual Estimated Total Soil Loss in Subwatershed 060101040210.

4.2.C. 0601010403.

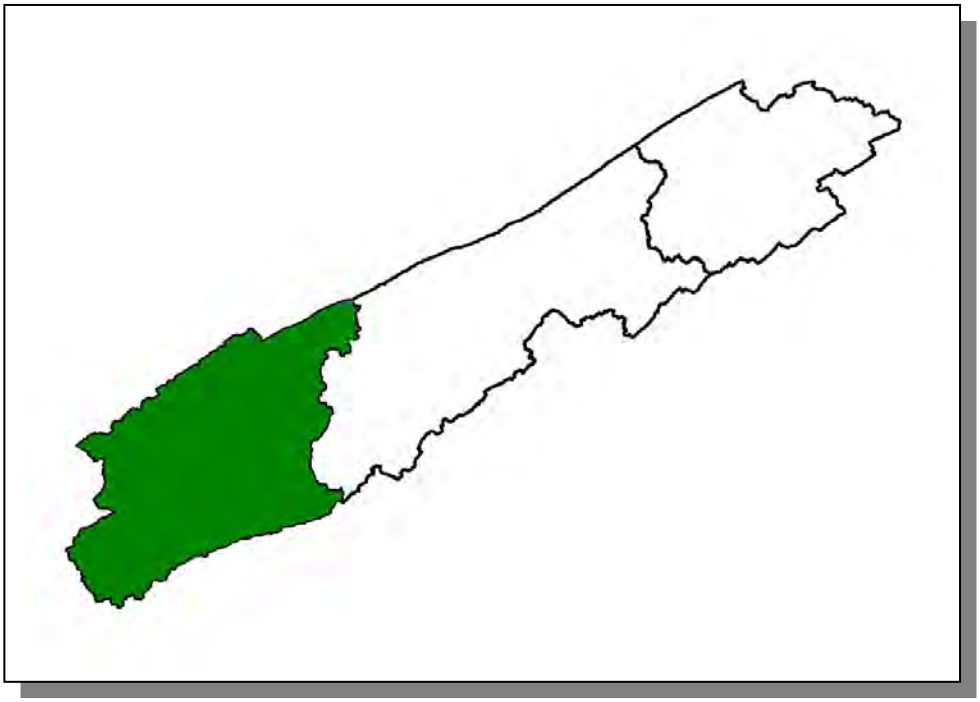

Figure 4-134. Location of Subwatershed 0601010403. *All Holston River HUC-10 subwatershed boundaries are shown for reference.*

4.2.C.i. 060101040301 (Holston River).

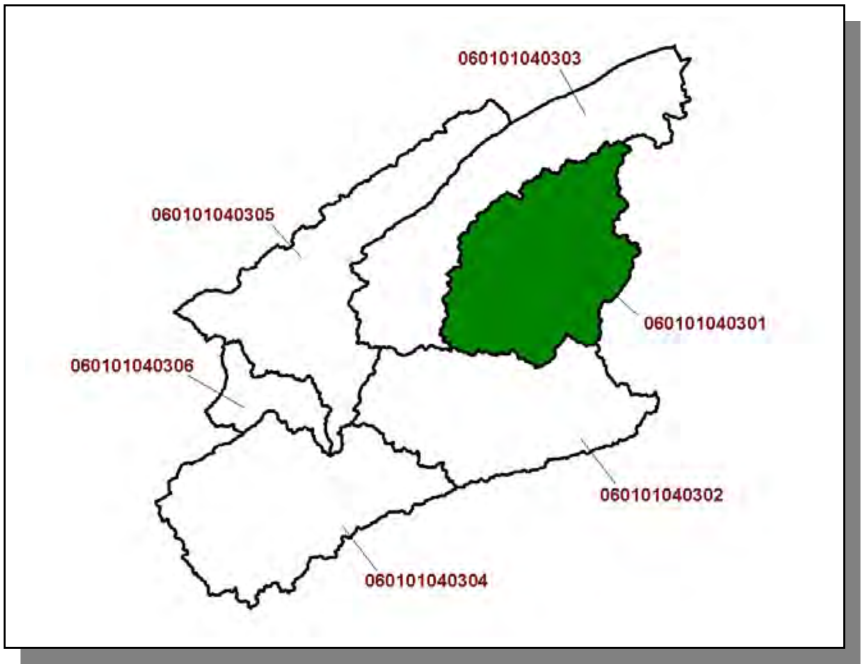

Figure 4-135. Location of Subwatershed 060101040301. *HUC-12 subwatershed boundaries are shown for reference.*

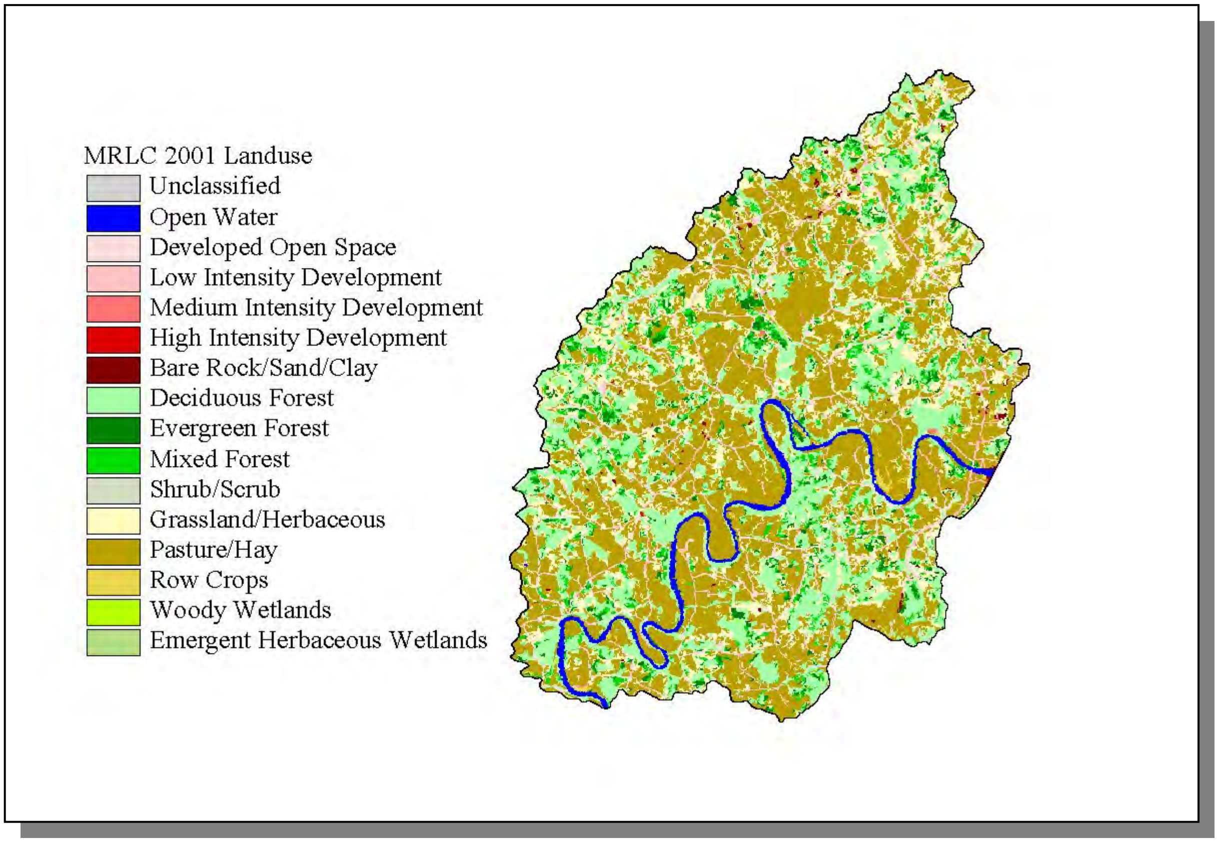

Figure 4-136. Illustration of Land Use Distribution in Subwatershed 060101040301.

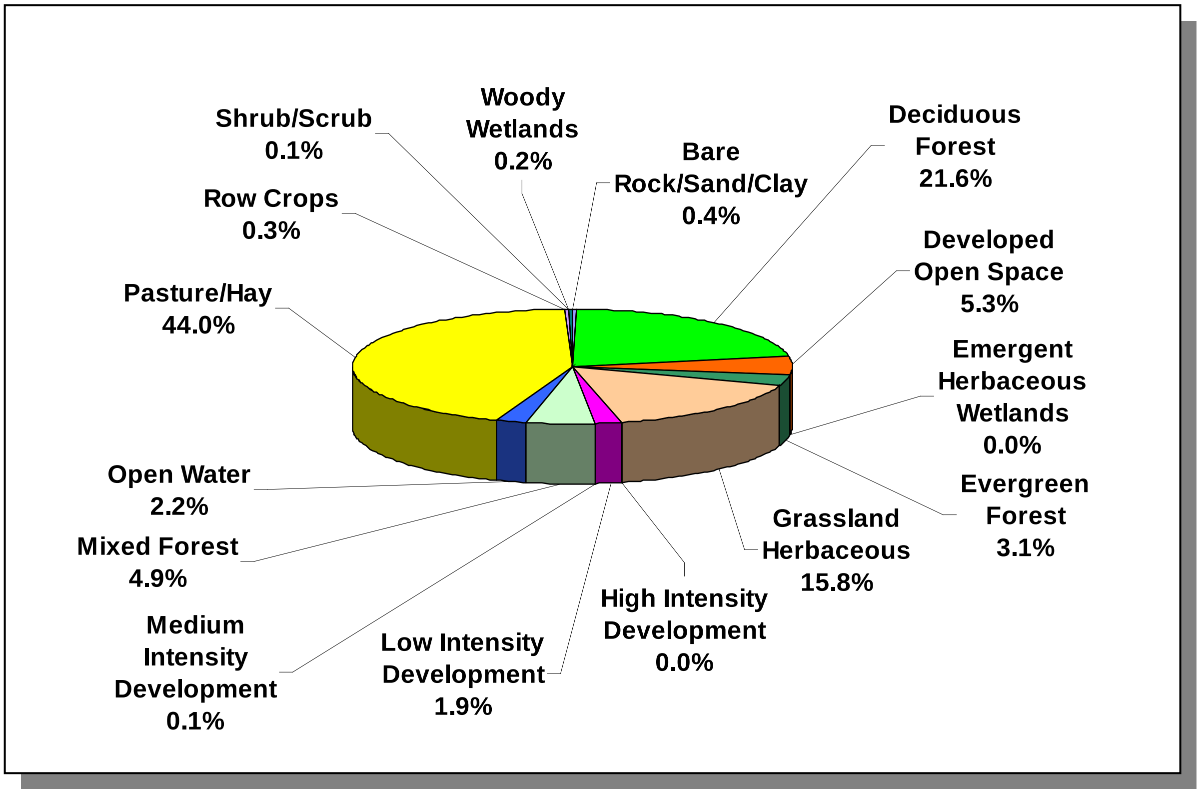

Figure 4-137. Land Use Distribution in Subwatershed 060101040301. *More information is provided in Appendix IV.*

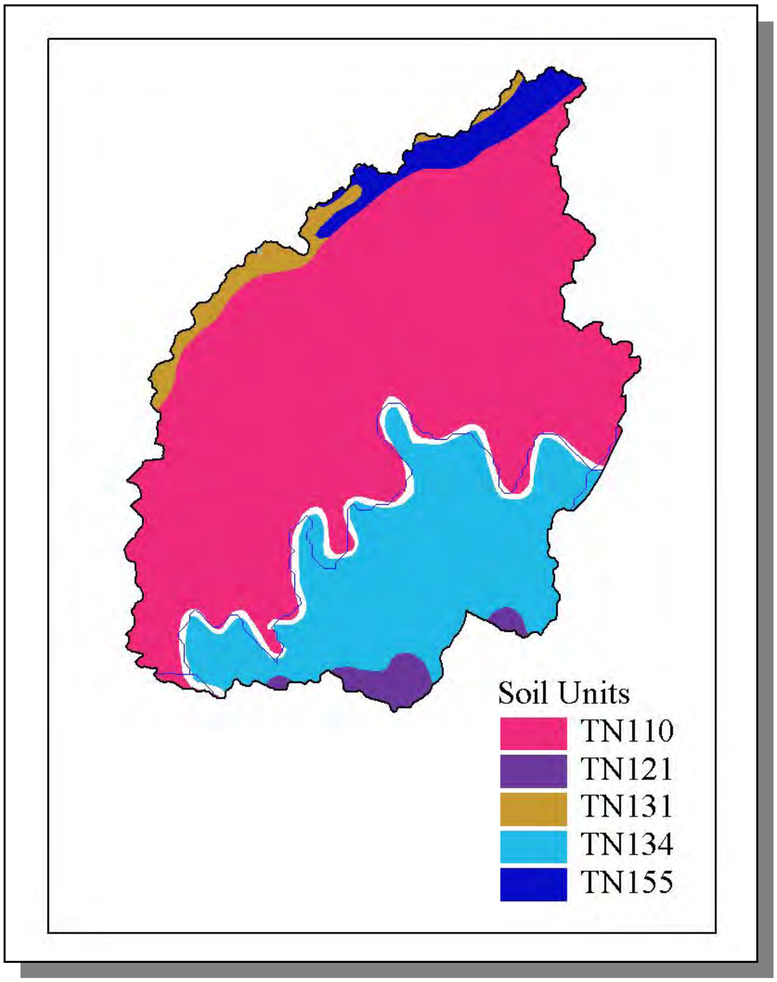

Figure 4-138. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040301.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN110	0.00	B	2.22	4.96	Loam	0.31
TN121	0.00	B	1.30	5.21	Loam	0.33
TN131	0.00	C	1.17	4.95	Silty Loam	0.33
TN134	0.00	B	1.38	5.18	Loam	0.31
TN155	0.00	C	1.71	5.31	Loam	0.32

Table 4-110. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040301. *The definition of "Hydrologic Group" is provided in Appendix IV.*

.

	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Grainger	17,095	19,456	20,659	15.65	2,676	3,045	3,233	20.8
Jefferson	33,016	42,168	44,294	5.24	1,730	2,210	2,321	34.2
Total	**50,111**	**61,624**	**64,953**		**4,406**	**5,255**	**5,554**	**26.1**

Table 4-111. Population Estimates in Subwatershed 060101040301.

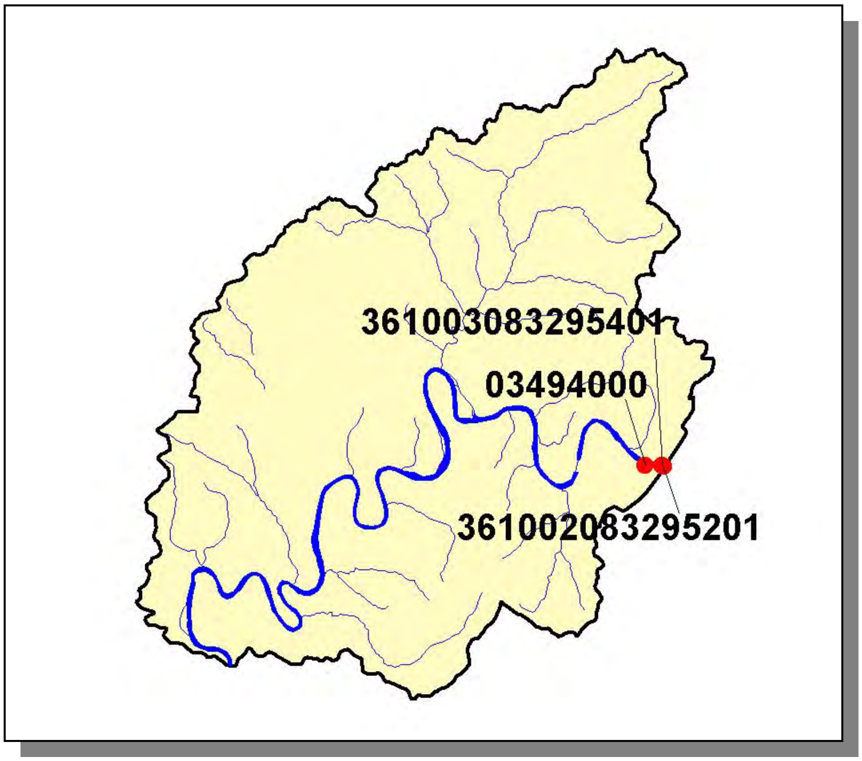

Figure 4-139. Location of Historical Streamflow Data Collection Sites in Subwatershed 060101040301. *More information is provided in Appendix IV.*

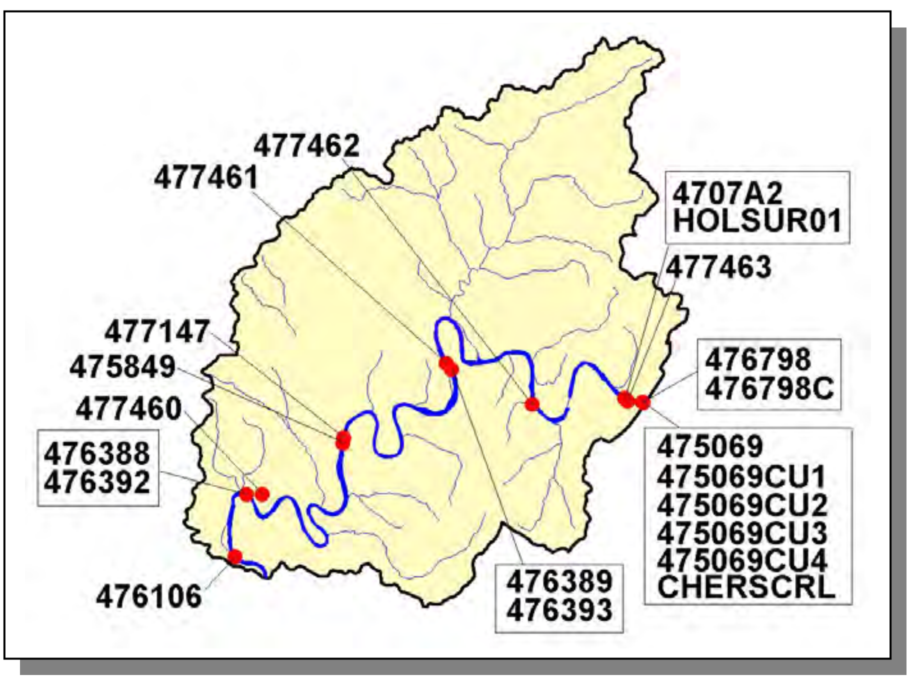

Figure 4-140. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 060101040301. *More information, including site names and locations, is provided in Appendix IV.*

4.2.C.i.a. Point Source Contributions.

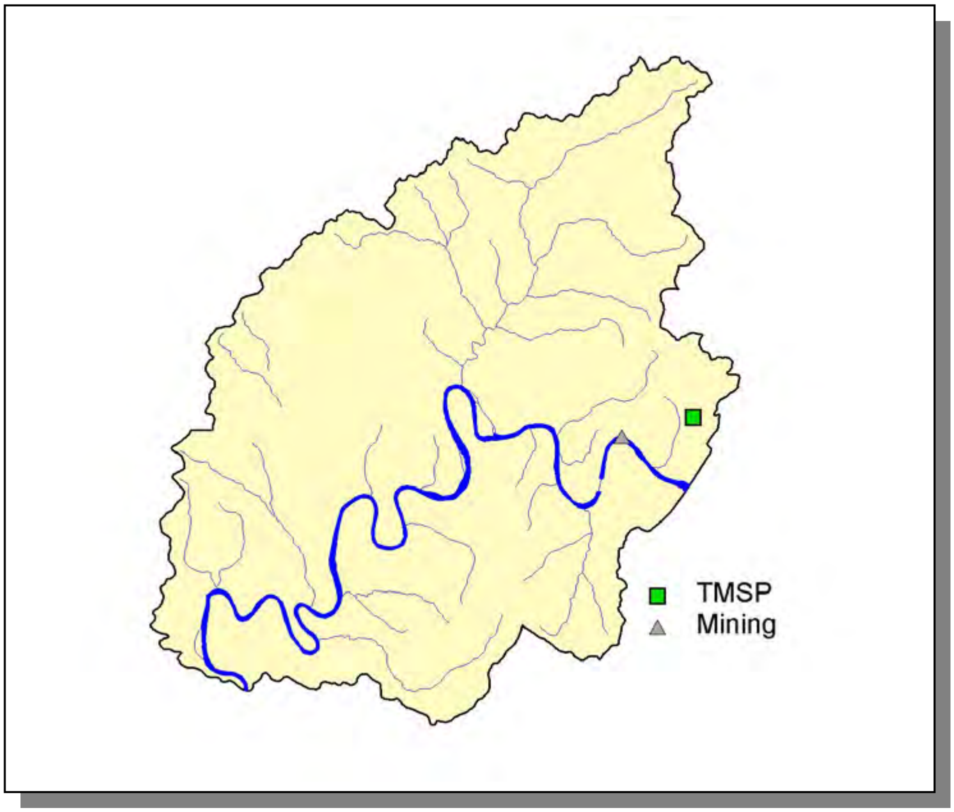

Figure 4-141. Location of Permits Issued in Subwatershed 060101040301. *More information, including the names of facilities, is provided in Appendix IV.*

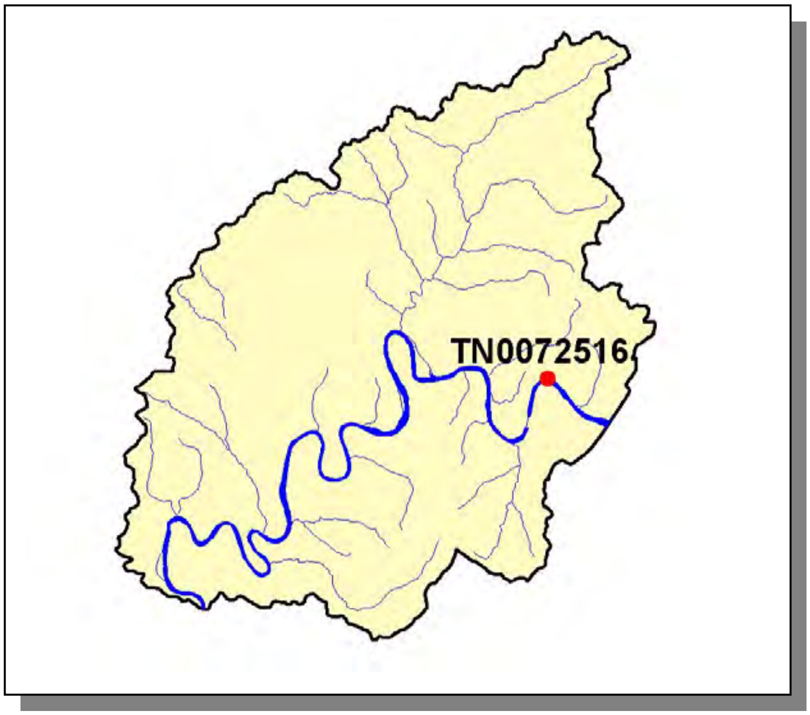

Figure 4-142. Location of Active Mining Sites in Subwatershed 060101040301. *More information, including the names of mining operations, is provided in Appendix IV.*

Figure 4-143. Location of TMSP Sites in Subwatershed 060101040301. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.C.i.b. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens (Broilers Sold)	Hogs	Sheep
4,650	9,415	399	12	112,637	166	93

Table 4-112. Summary of Livestock Count Estimates in Subwatershed 060101040301. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/),* **"***Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS							
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens (Broilers Sold)	Hogs	Sheep
Grainger	12,115	23,927	942	1,184	0	510	195
Jefferson	16,126	35,718	1,78	1,633	1,880,000	183	567

Table 4-113. Summary of Livestock Count Estimates in Grainger and Jefferson Counties. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/),* **"***Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Grainger	102.6	102.6	0.3	1.8
Jefferson	62.2	62.2	0.6	1.8

Table 4-114. Forest Acreage and Annual Removal Rates (1987-1994) in Grainger and Jefferson Counties.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.89
Grass (Hayland)	0.30
Legumes, Grass (Hayland)	0.55
Grass, Forbs, Legumes (Mixed Pasture)	0.74
Corn (Row Crops)	10.08
Tobacco (Row Crops)	6.13
Oats (Close-Grown Cropland)	13.51
Farmsteads and Ranch Headquarters	0.39

Table 4-115. Annual Estimated Total Soil Loss in Subwatershed 060101040301.

4.2.C.ii. 060101040302 (Holston River).

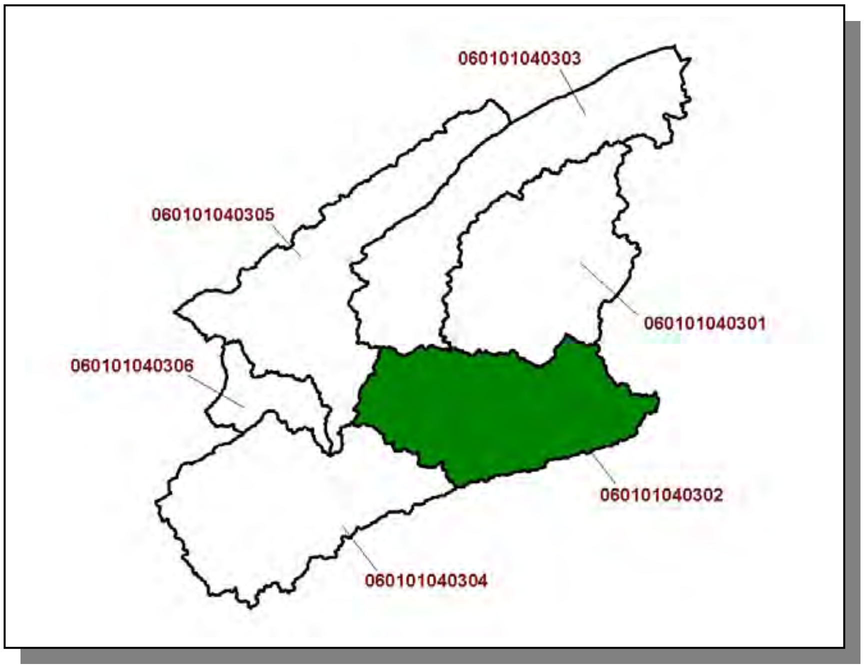

Figure 4-144. Location of Subwatershed 060101040302. *HUC-12 subwatershed boundaries are shown for reference.*

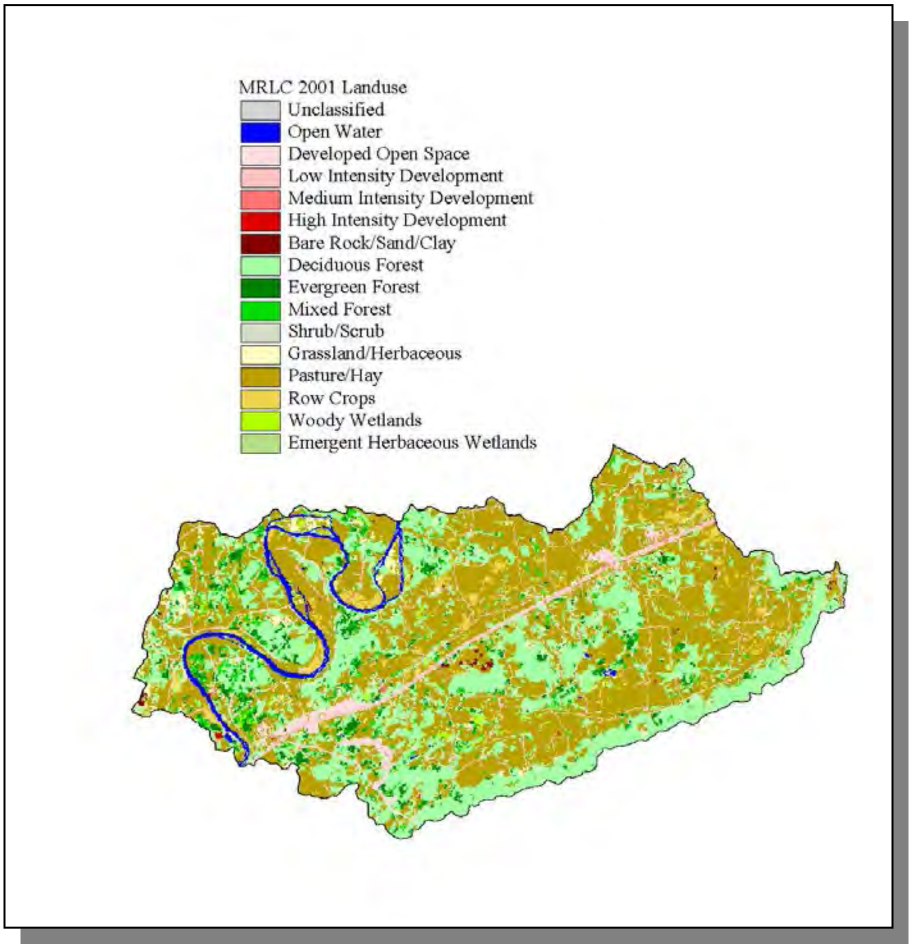

Figure 4-145. Illustration of Land Use Distribution in Subwatershed 060101040302.

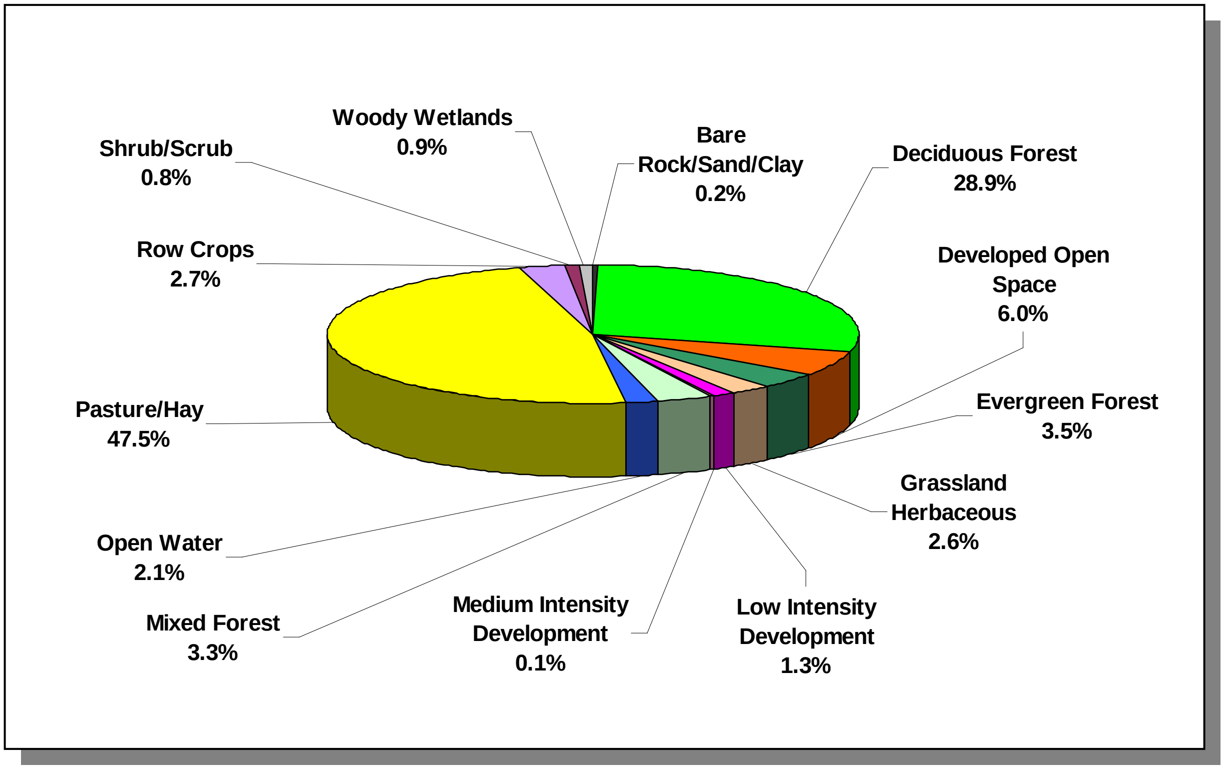

Figure 4-146. Land Use Distribution in Subwatershed 060101040302. *More information is provided in Appendix IV.*

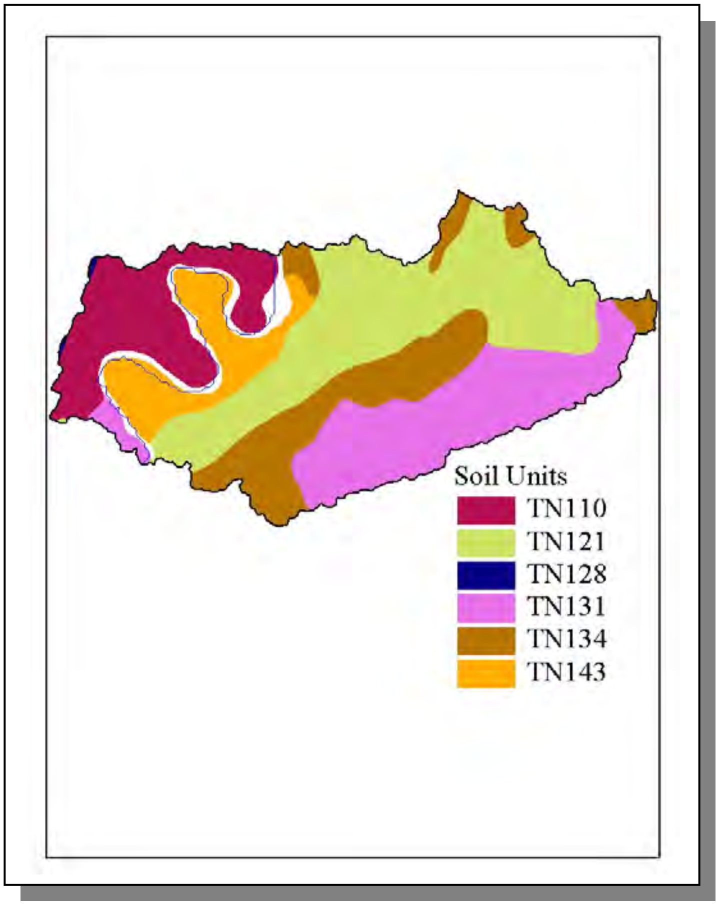

Figure 4-147. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040302.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN110	0.00	B	2.22	4.96	Loam	0.31
TN121	0.00	B	1.30	5.21	Loam	0.33
TN128	0.00	C	1.30	6.53	Clayey Loam	0.26
TN131	0.00	C	1.17	4.95	Silty Loam	0.33
TN134	0.00	B	1.38	5.18	Loam	0.31
TN143	0.00	C	1.22	6.44	Loam	0.32

Table 4-116. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040302. *The definition of "Hydrologic Group" is provided in Appendix IV.*

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	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Grainger	17,095	19,456	20,659	2.15	367	417	443	20.7
Jefferson	33,016	42,168	44,294	16.5	5,448	6,959	7,309	34.2
Knox	335,749	365,900	382,032	1.38	4,642	5,059	5,282	13.8
Sevier	51,043	62,774	71,170	0.05	26	32	37	42.3
Total	**436,903**	**490,298**	**518,155**		**10,483**	**12,467**	**13,071**	**24.7**

Table 4-117. Population Estimates in Subwatershed 060101040302.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Jefferson City	Jefferson	5,494	2,006	1,922	84	0
New Market	Jefferson	1,086	412	13	395	4
Blaine	Grainger	1,326	505	9	473	23
Total		**7,908**	**2,923**	**1,944**	**952**	**27**

Table 4-118. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 060101040302.

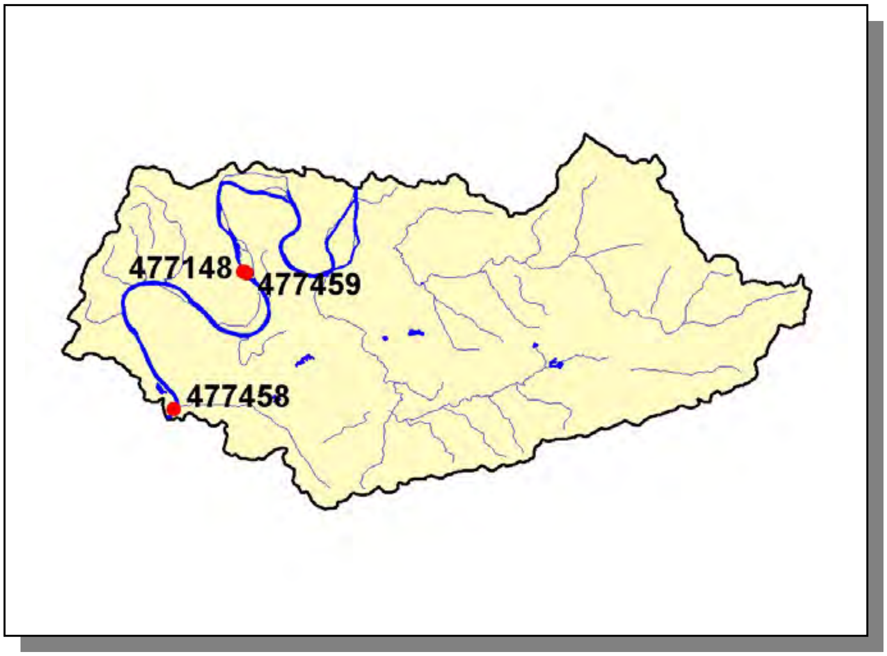

Figure 4-148. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 060101040302. *More information, including site names and locations, is provided in Appendix IV.*

4.2.C.ii.a. Point Source Contributions.

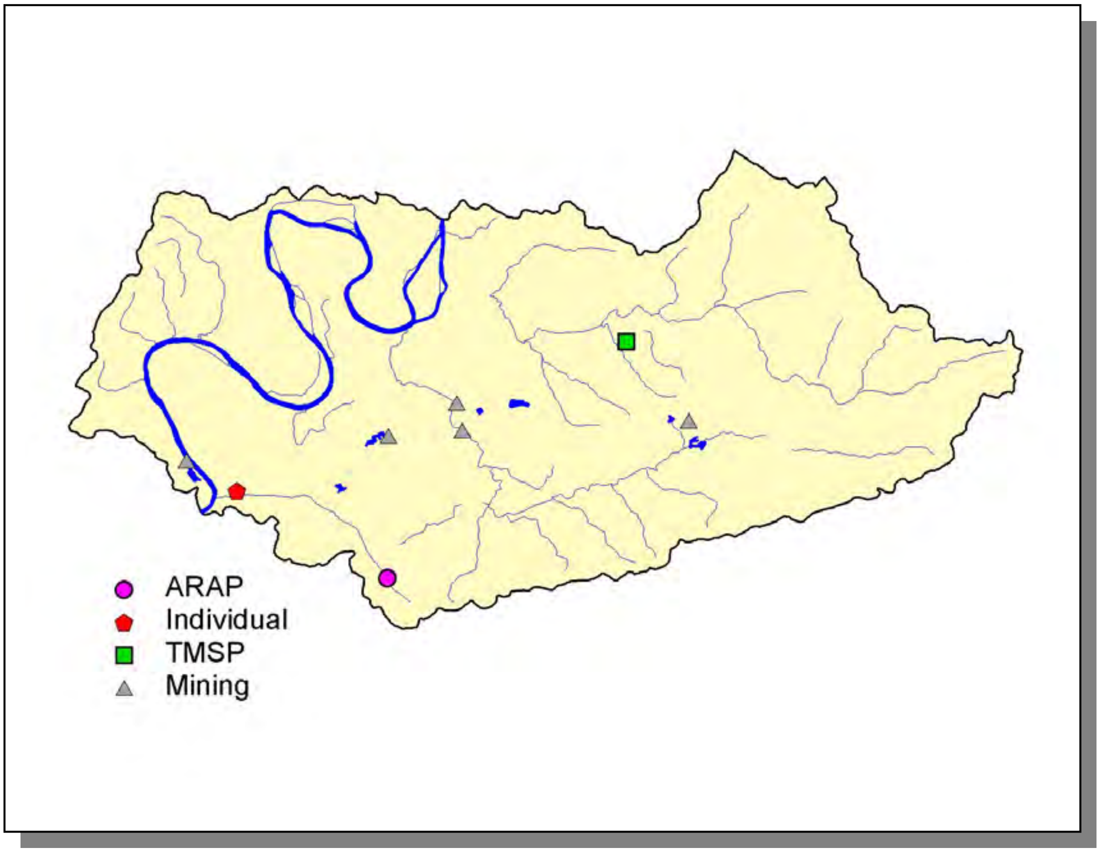

Figure 4-149. Location of Permits Issued in Subwatershed 060101040302. *More information, including the names of facilities, is provided in Appendix IV.*

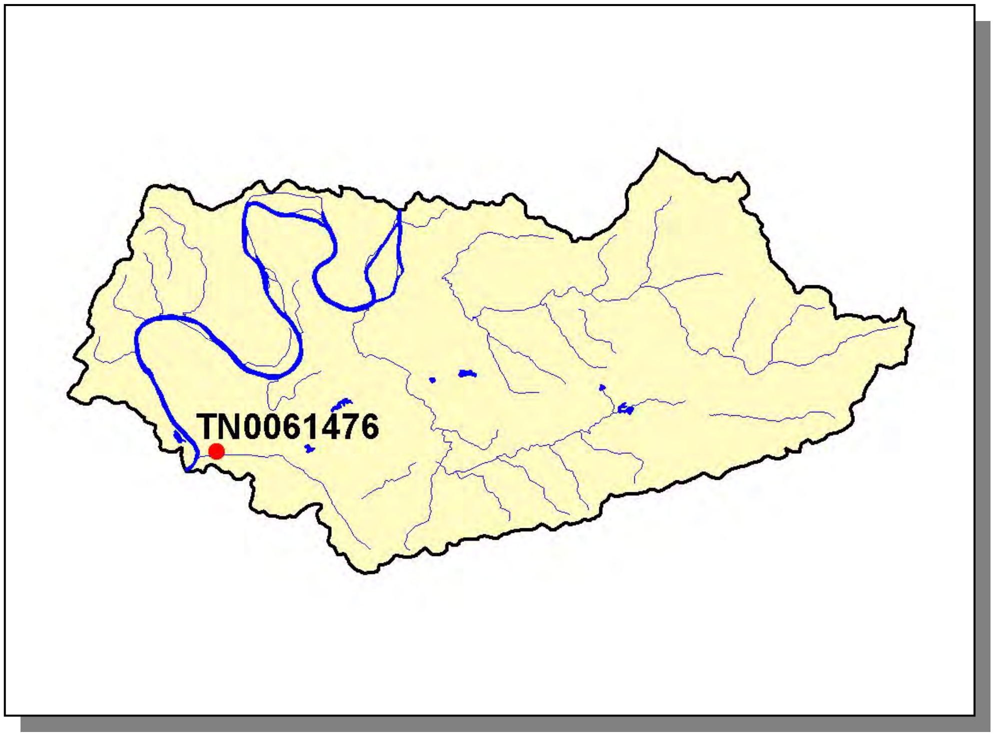

Figure 4-150. Location of Active NPDES Sites in Subwatershed 060101040302. *More information, including the names of facilities, is provided in Appendix IV.*

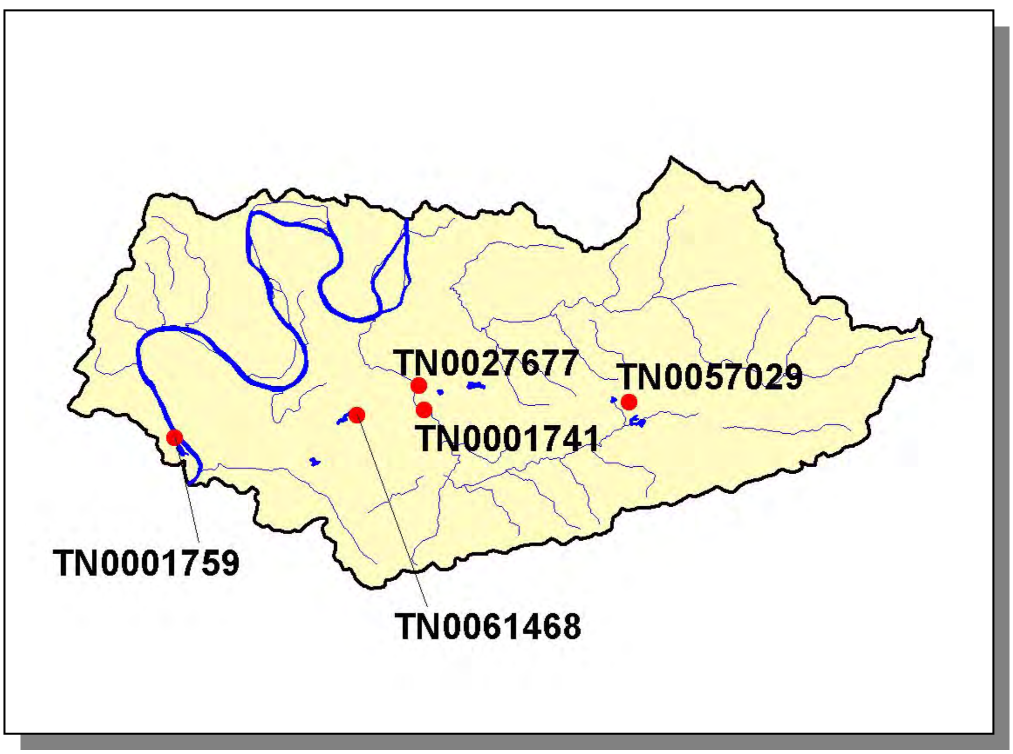

Figure 4-151. Location of Active Mining Sites in Subwatershed 060101040302. *More information, including the names of mining operations, is provided in Appendix IV.*

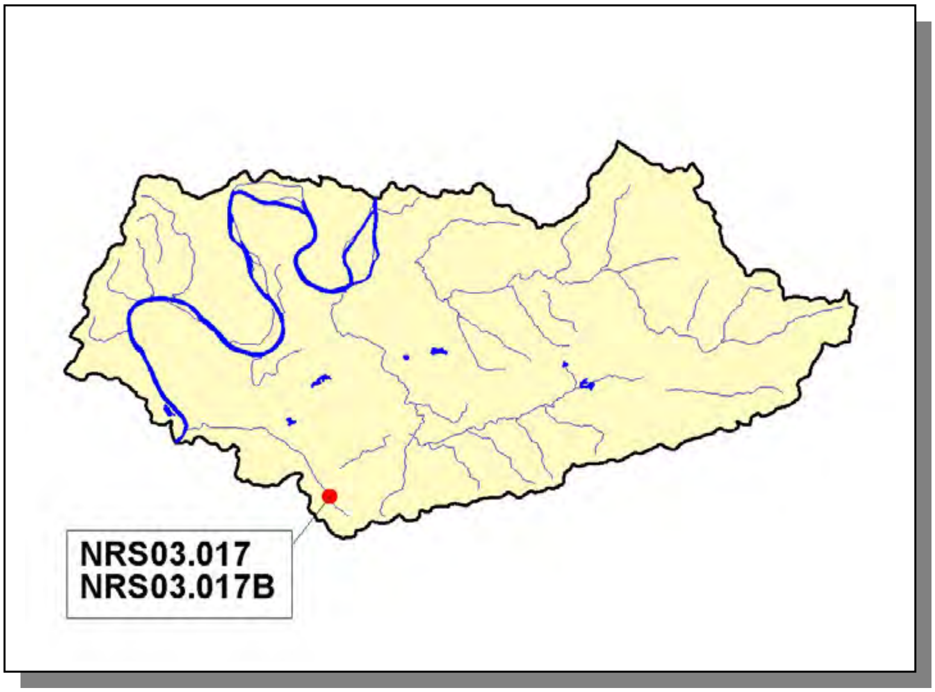

Figure 4-152. Location of Aquatic Resource Alteration Permit (ARAP) Sites (Individual Permits) in Subwatershed 060101040302. *More information is provided in Appendix IV.*

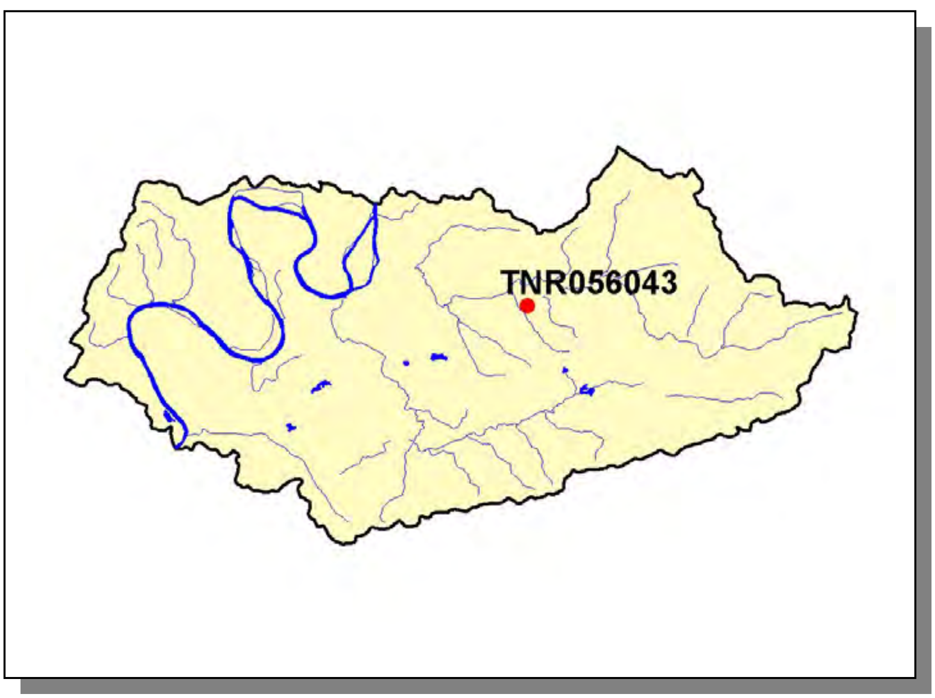

Figure 4-153. Location of TMSP Sites in Subwatershed 060101040302. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.C.ii.b. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens (Broilers Sold)	Hogs	Sheep
4,023	8,722	433	7	375,189	82	142

Table 4-119. Summary of Livestock Count Estimates in Subwatershed 060101040302. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), **"**Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS							
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens (Broilers Sold)	Hogs	Sheep
Grainger	12,115	23,927	942	1,184	0	510	195
Jefferson	16,126	35,718	1,878	1,633	1,880,000	183	567
Knox	12,424	24,664	855	2,056	0	851	649
Sevier	9,816	19,013	172	26	1,572,010	394	234

Table 4-120. Summary of Livestock Count Estimates in Grainger, Jefferson, Knox, and Sevier Counties. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), **"**Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Grainger	102.6	102.6	0.3	1.8
Jefferson	62.2	62.2	0.6	1.8
Knox	127.5	127.0	2.2	8.2
Sevier	254.5	127.4	0.3	0.9

Table 4-121. Forest Acreage and Annual Removal Rates (1987-1994) in Grainger, Jefferson, Knox, and Sevier Counties.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.64
Grass (Hayland)	0.23
Legumes, Grass (Hayland)	0.38
Grass, Forbs, Legumes (Mixed Pasture)	0.48
Corn (Row Crops)	18.63
Soybeans (Row Crops)	15.54
Tobacco (Row Crops)	3.53
Oats (Close-Grown Cropland)	13.51
Summer Fallow (Other Cropland)	3.31
Farmsteads and Ranch Headquarters	0.07

Table 4-122. Annual Estimated Total Soil Loss in Subwatershed 060101040302.

4.2.C.iii. 060101040303 (Richland Creek).

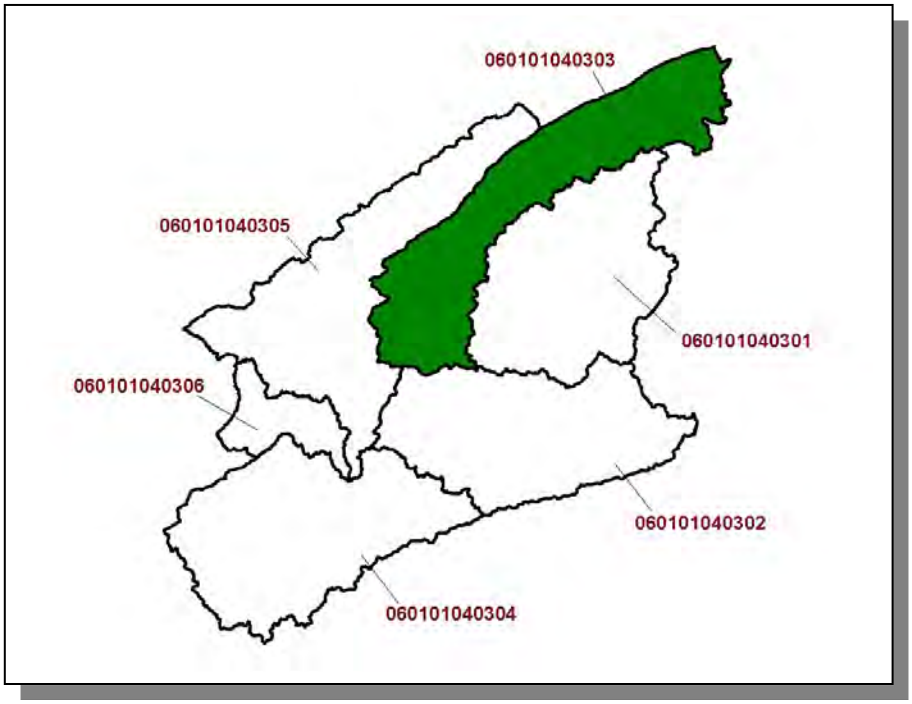

Figure 4-154. Location of Subwatershed 060101040303. *HUC-12 subwatershed boundaries are shown for reference.*

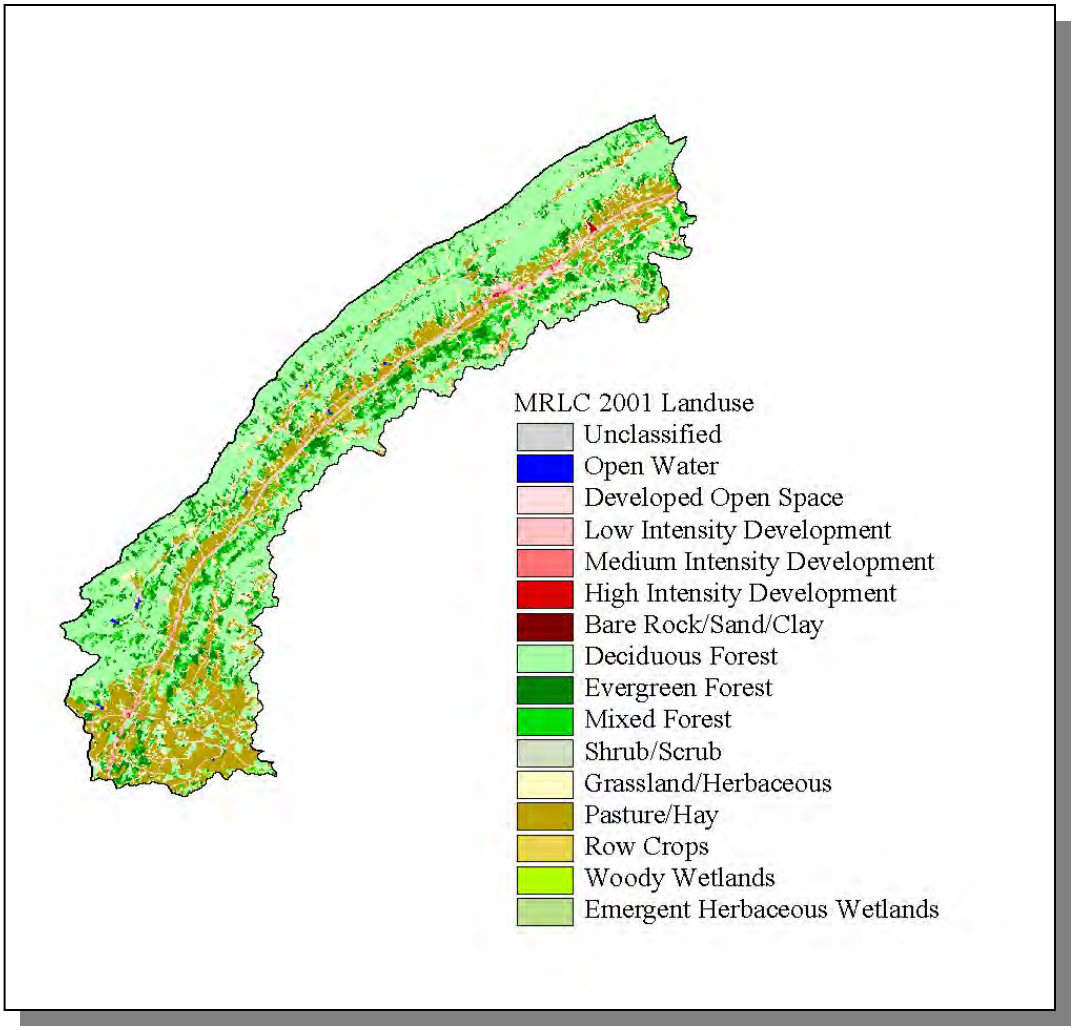

Figure 4-155. Illustration of Land Use Distribution in Subwatershed 060101040303.

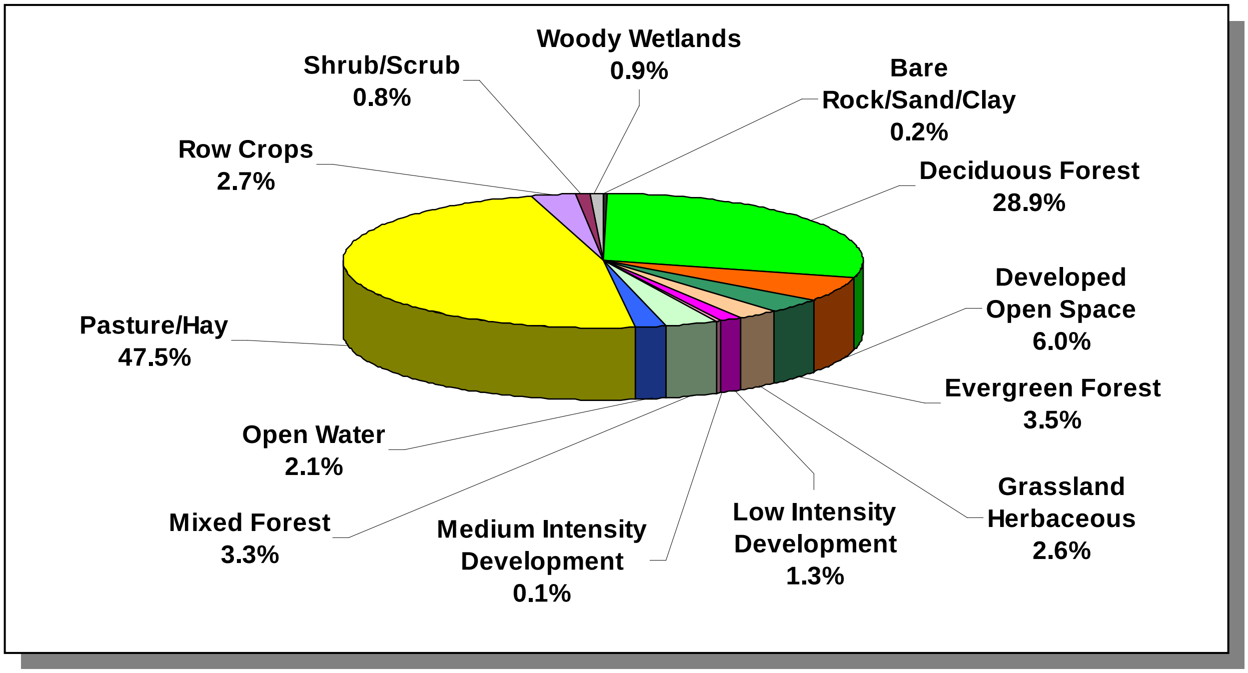

Figure 4-156. Land Use Distribution in Subwatershed 060101040303. *More information is provided in Appendix IV.*

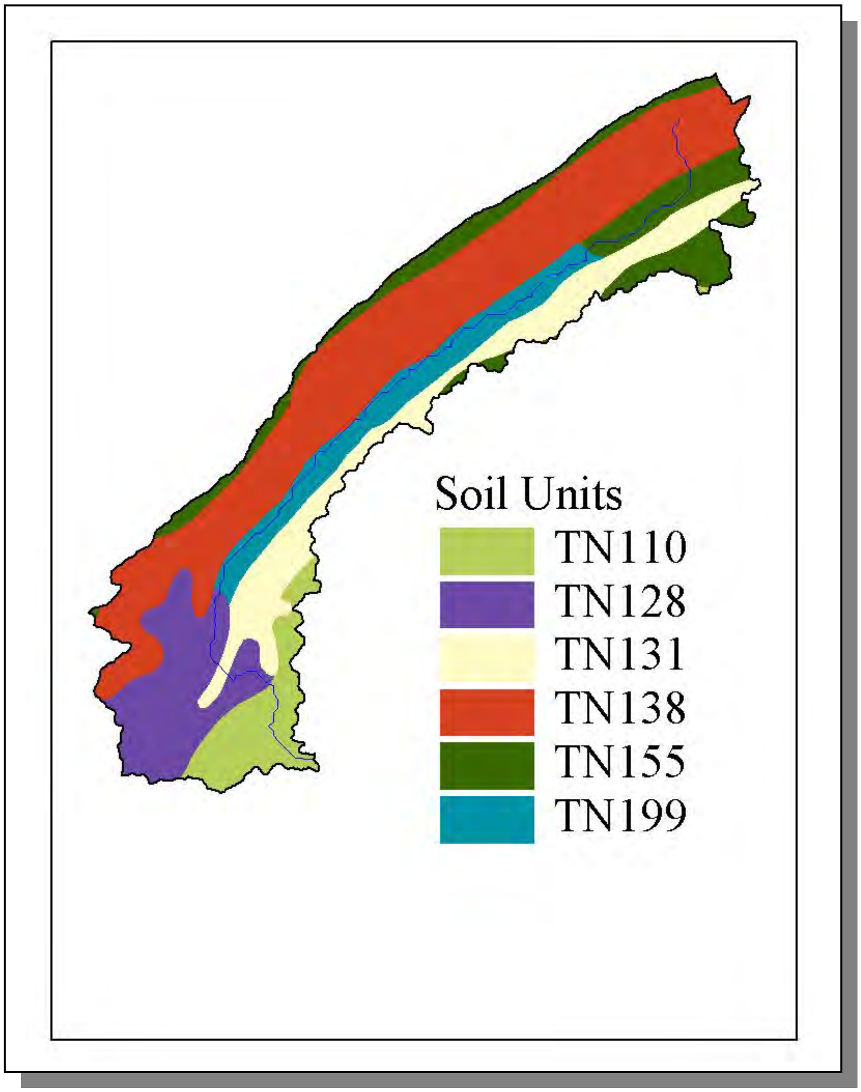

Figure 4-157. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040303.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN110	0.00	B	2.22	4.96	Loam	0.31
TN128	0.00	C	1.30	6.53	Clayey Loam	0.26
TN131	0.00	C	1.17	4.95	Silty Loam	0.33
TN138	0.00	C	2.48	4.26	Sandy Loam	0.22
TN155	0.00	C	1.71	5.31	Loam	0.32
TN199	3.00	C	1.22	4.75	Silty Loam	0.30

Table 4-123. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040303. *The definition of "Hydrologic Group" is provided in Appendix IV.*

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	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Grainger	17,095	19,456	20,659	21.78	3,724	4,238	4,500	20.8
Knox	335,749	365,900	382,032	0.02	60	66	69	15.0
Total	**352,844**	**385,356**	**402,691**		**3,784**	**4,304**	**4,569**	**20.8**

Table 4-124. Population Estimates in Subwatershed 060101040303.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Blaine	Grainger	1,326	505	9	473	23
Rutledge	Grainger	878	369	213	151	5
Total		**2,204**	**874**	**222**	**624**	**28**

Table 4-125. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 060101040303.

Figure 4-158. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 060101040303. *More information, including site names and locations, is provided in Appendix IV.*

4.2.C.iii.a. Point Source Contributions.

There are no point source contributions in this subwatershed.

4.2.C.iii.b. Nonpoint Source Contributions.

LIVESTOCK COUNTS					
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
2,082	4,112	162	6	88	34

Table 4-126. Summary of Livestock Count Estimates in Subwatershed 060101040303. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/),* ***"****Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Grainger	12,115	23,927	942	1,184	510	195
Knox	12,424	24,664	855	2,056	851	649
Union	5,540	10,575	105	981	93	96

Table 4-127. Summary of Livestock Count Estimates in Grainger, Knox, and Union Counties. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/),* ***"****Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Grainger	102.6	102.6	0.3	1.8
Knox	127.5	127.0	2.2	8.2
Union	102.5	102.5	0.1	0.0

Table 4-128. Forest Acreage and Annual Removal Rates (1987-1994) in Grainger, Knox, and Union Counties.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	1.00
Grass (Hayland)	0.32
Legumes, Grass (Hayland)	0.60
Grass, Forbs, Legumes (Mixed Pasture)	0.84
Corn (Row Crops)	5.68
Soybeans (Row Crops)	15.54
Wheat (Close-Grown Cropland)	4.44
Tobacco (Close-Grown Cropland)	7.21
Farmsteads and Ranch Headquarters	0.52

Table 4-129. Annual Estimated Total Soil Loss in Subwatershed 060101040303.

4.2.C.iv. 060101040304 (Holston River).

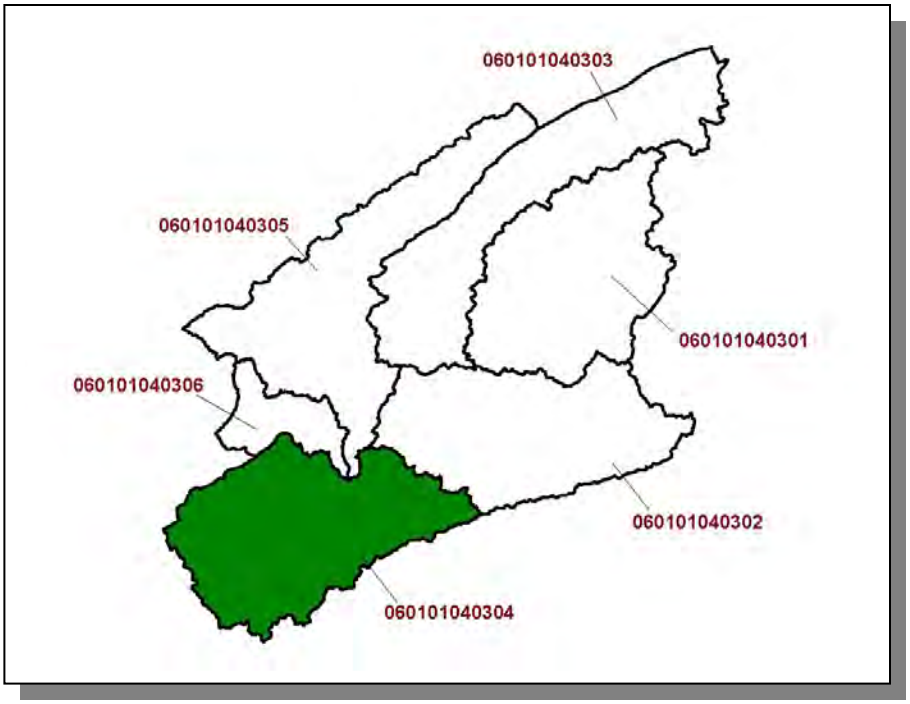

Figure 4-159. Location of Subwatershed 060101040304. *HUC-12 subwatershed boundaries are shown for reference.*

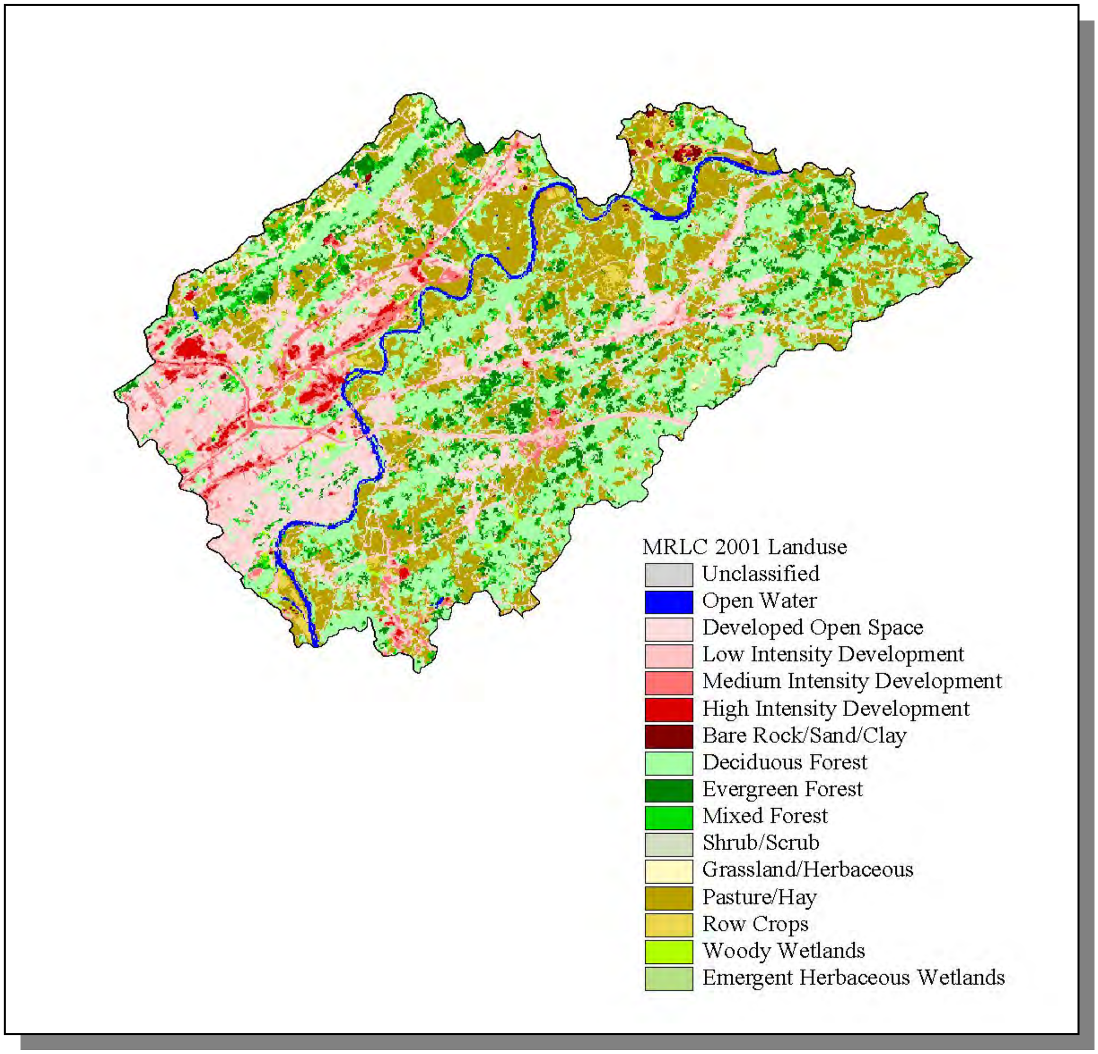

Figure 4-160. Illustration of Land Use Distribution in Subwatershed 060101040304.

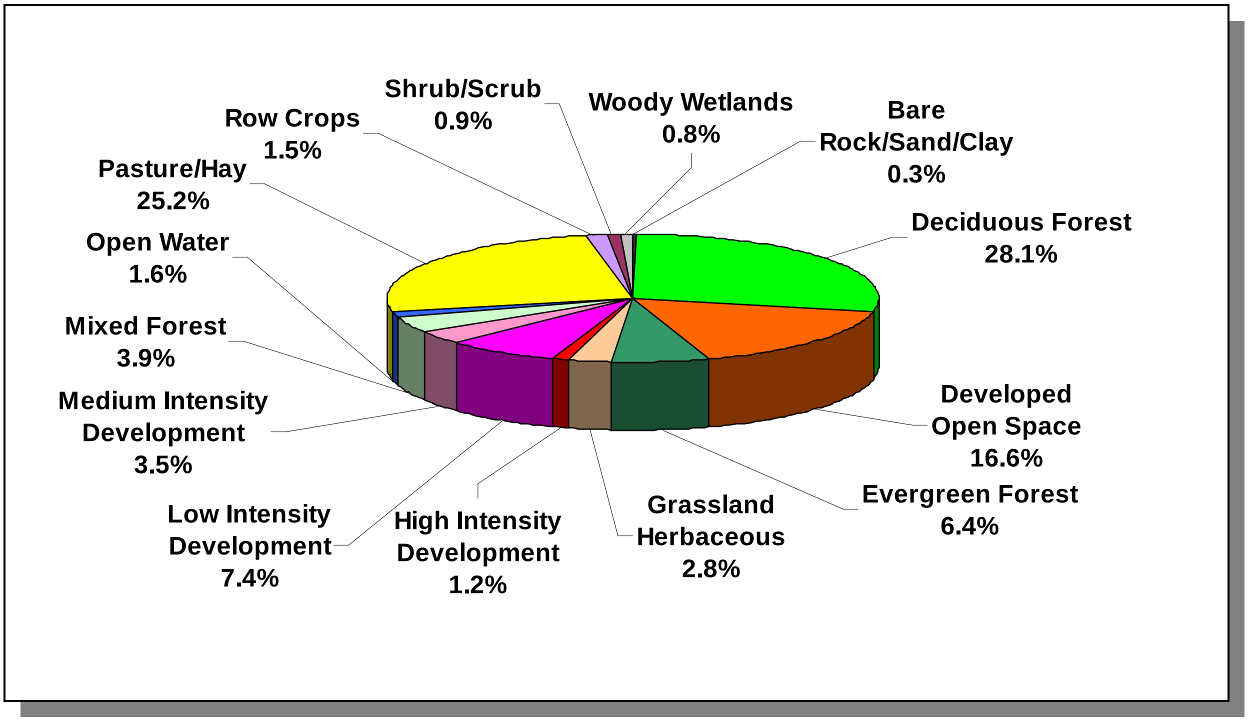

Figure 4-161. Land Use Distribution in Subwatershed 060101040304. *More information is provided in Appendix IV.*

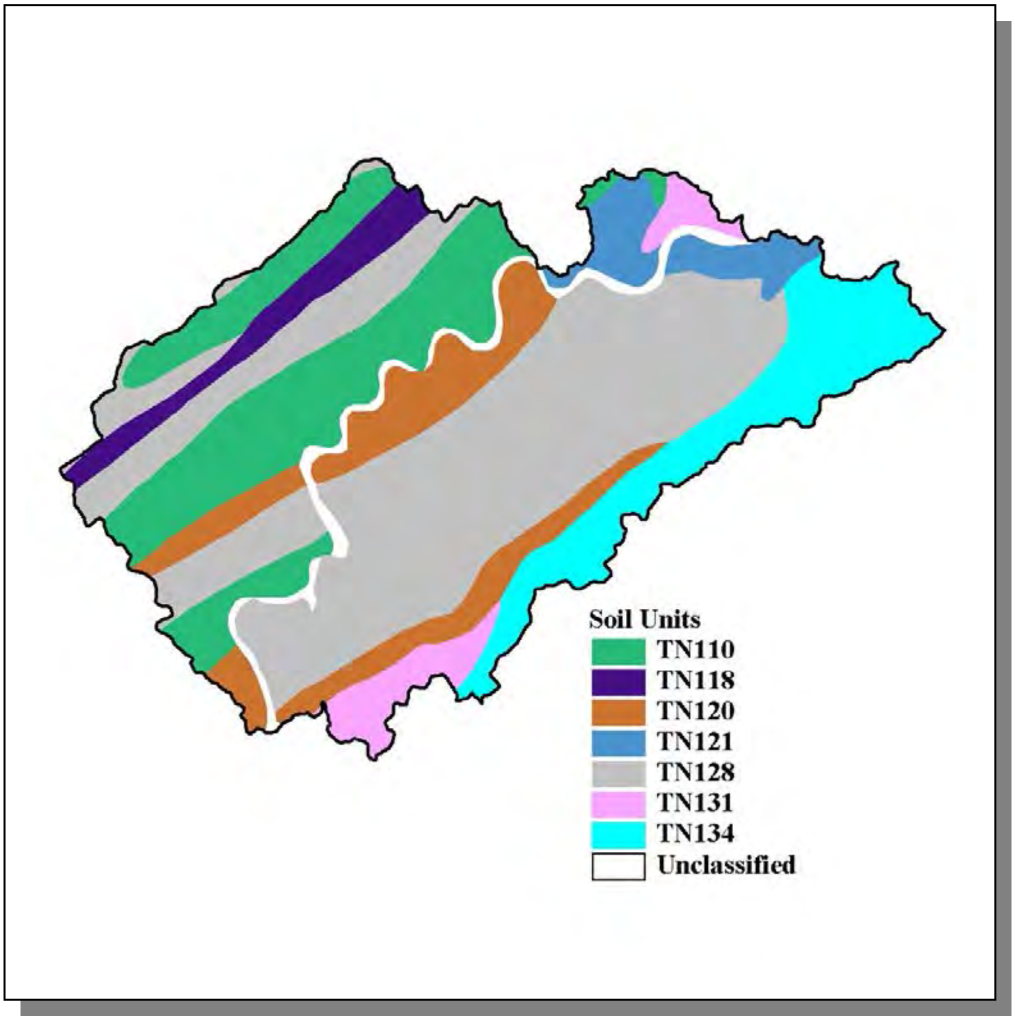

Figure 4-162. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040304.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN110	0.00	B	2.22	4.96	Loam	0.31
TN118	0.00	C	6.52	5.12	Loam	0.29
TN120	0.00	B	1.58	5.11	Loam	0.27
TN121	0.00	B	1.30	5.21	Loam	0.33
TN128	0.00	C	1.30	6.53	Clayey Loam	0.26
TN131	0.00	C	1.17	4.95	Silty Loam	0.33
TN134	0.00	B	1.38	5.18	Loam	0.31

Table 4-130. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040304. *The definition of "Hydrologic Group" is provided in Appendix IV.*

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	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Jefferson	33,016	42,168	44,294	0.04	13	16	17	30.8
Knox	335,749	365,900	382,032	13.15	44,144	48,108	50,229	13.8
Sevier	51,043	62,774	71,170	0.22	114	140	159	39.5
Total	**419,808**	**470,842**	**497,496**		**44,271**	**48,264**	**50,405**	**13.9**

Table 4-131. Population Estimates in Subwatershed 060101040304.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Knoxville	Knox	165,121	76,453	74,884	1,521	48

Table 4-132. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 060101040304.

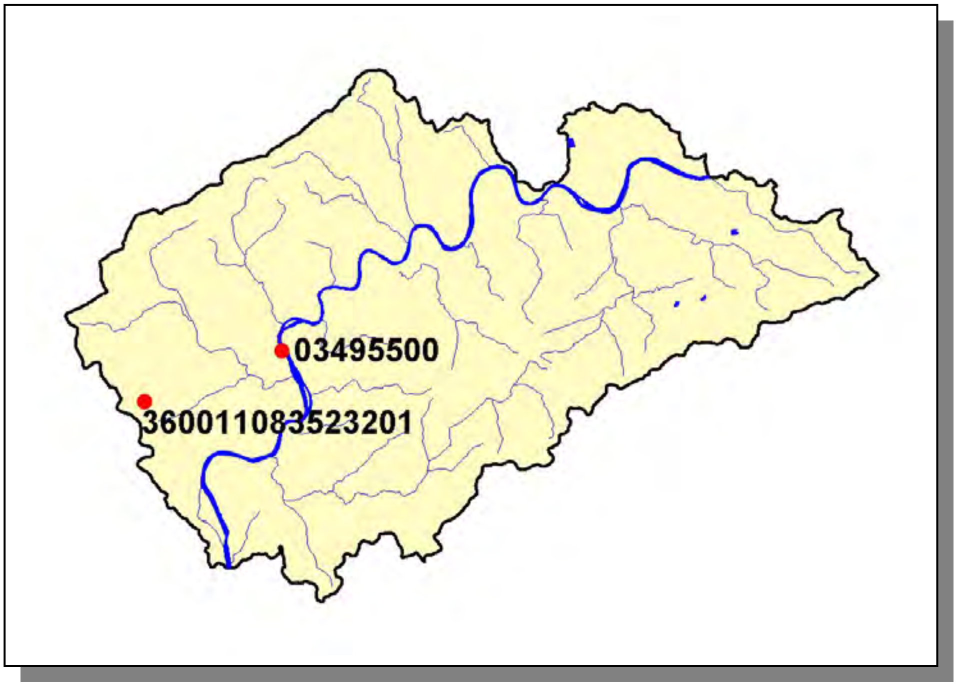

Figure 4-163. Location of Historical Streamflow Data Collection Sites in Subwatershed 060101040304. *More information is provided in Appendix IV.*

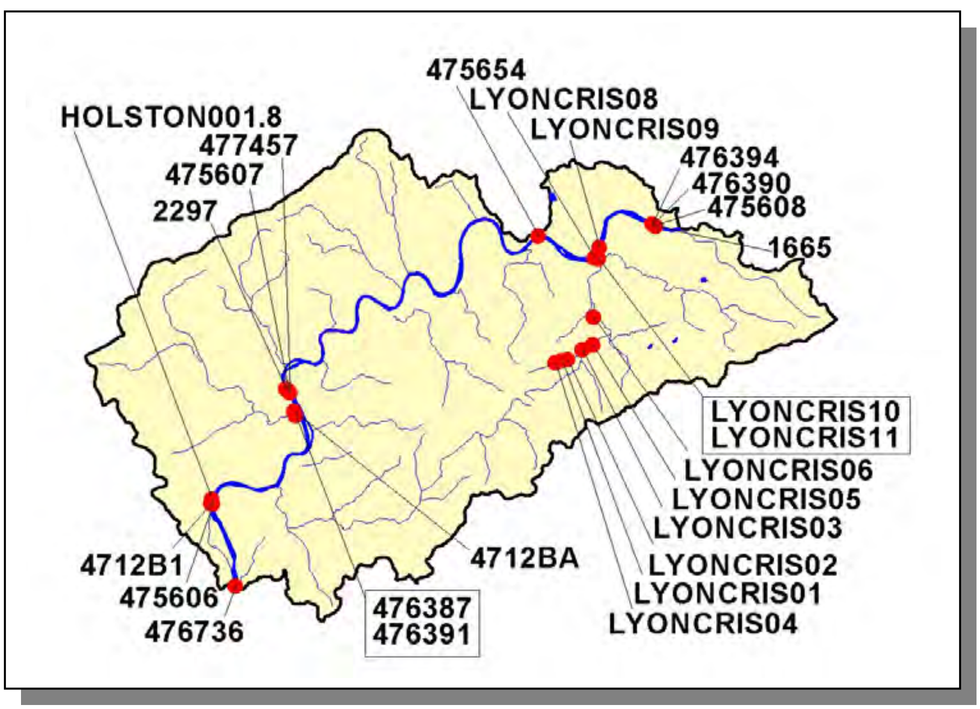

Figure 4-164. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 060101040304. *More information, including site names and locations, is provided in Appendix IV.*

4.2.C.iv.a. Point Source Contributions.

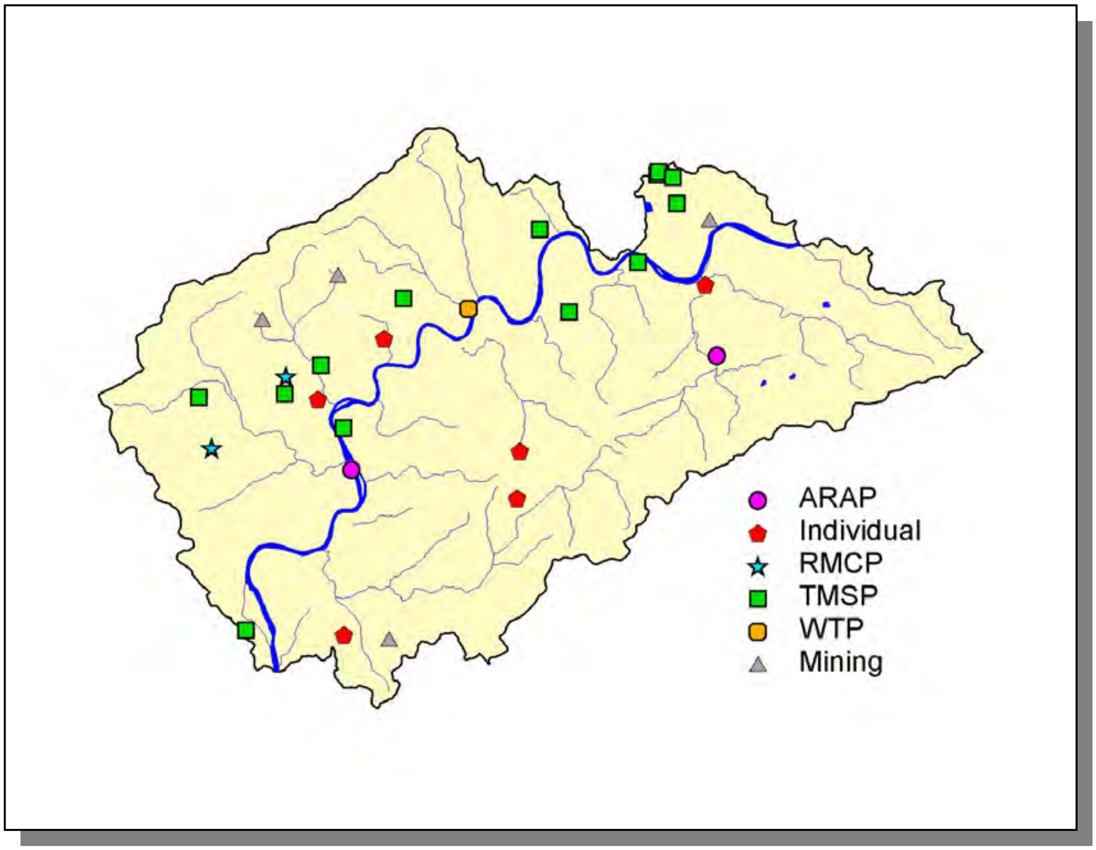

Figure 4-165. Location of Permits Issued in Subwatershed 060101040304. *More information, including the names of facilities, is provided in Appendix IV.*

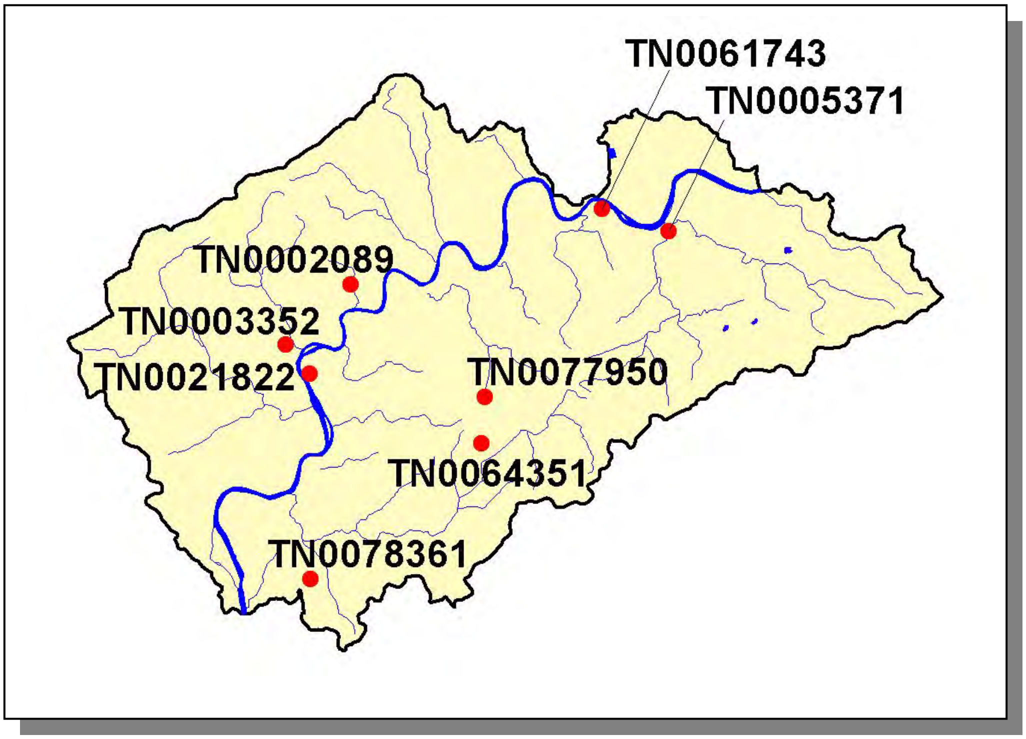

Figure 4-166. Location of Active NPDES Sites in Subwatershed 060101040304. *More information, including the names of facilities, is provided in Appendix IV.*

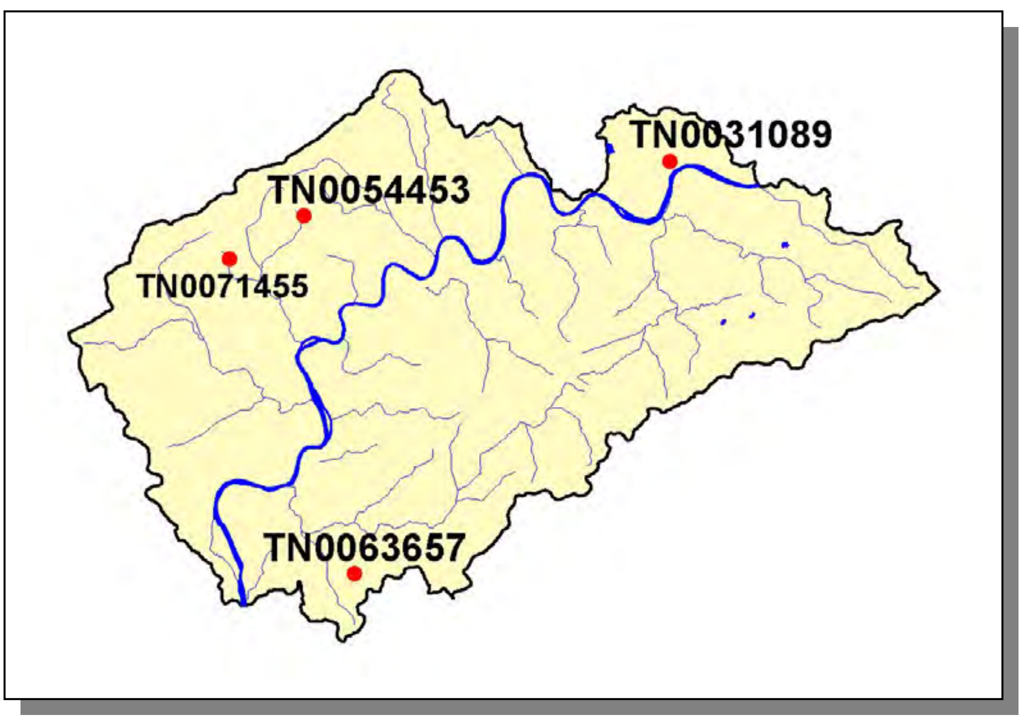

Figure 4-167. Location of Mining Sites in Subwatershed 060101040304. *More information, including the names of mining operations, is provided in Appendix IV.*

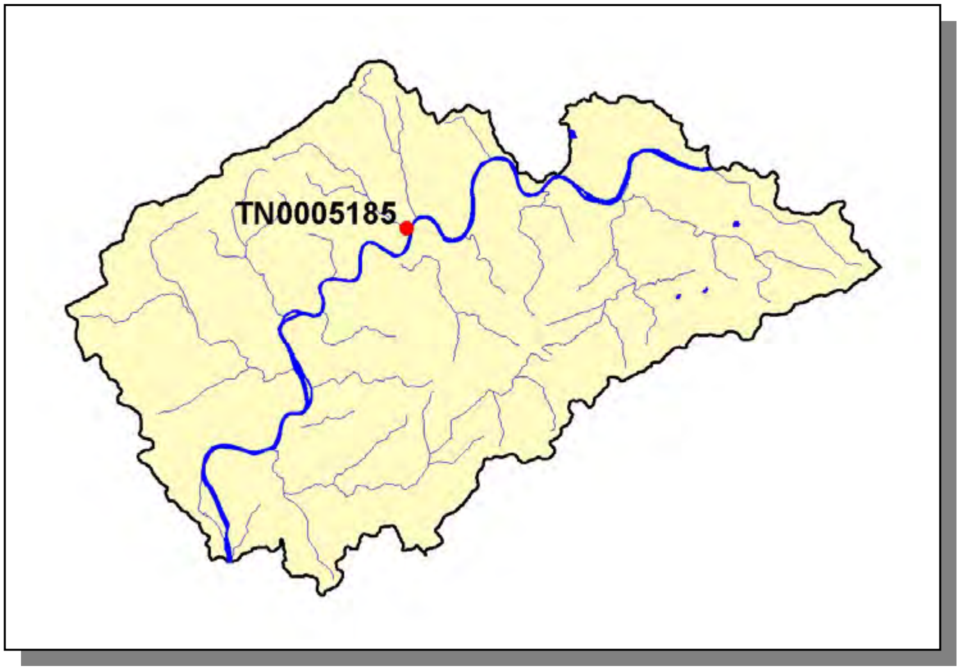

Figure 4-168. Location of Water Treatment Plants in Subwatershed 060101040304. *More information, including the names of facilities, is provided in Appendix IV.*

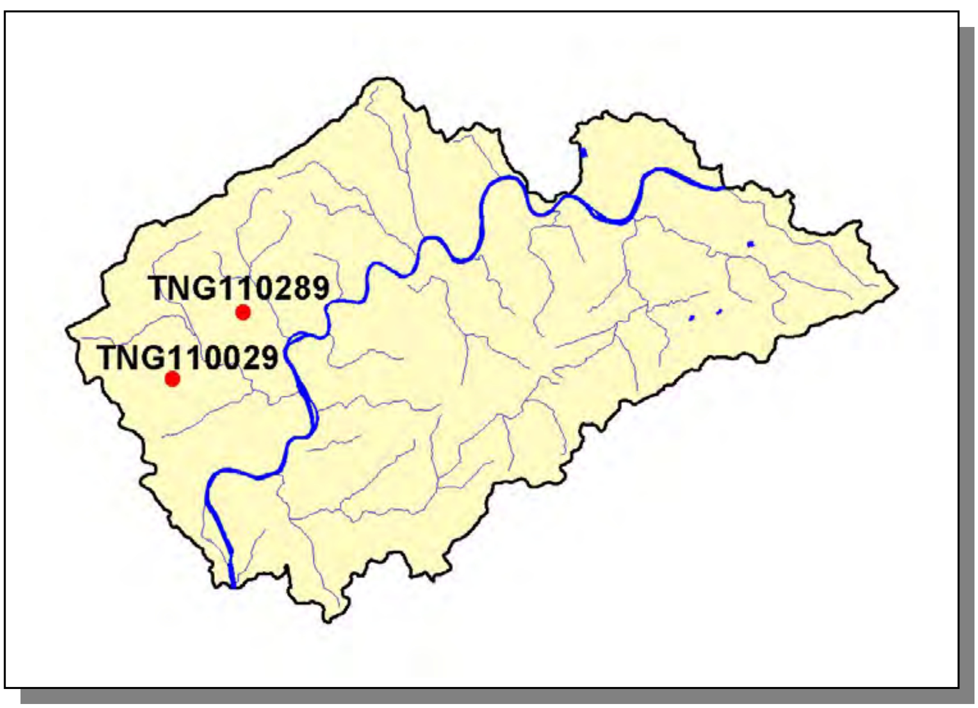

Figure 4-169. Location of Ready Mix Concrete Plants (RMCP) in Subwatershed 060101040304. *More information is provided in Appendix IV.*

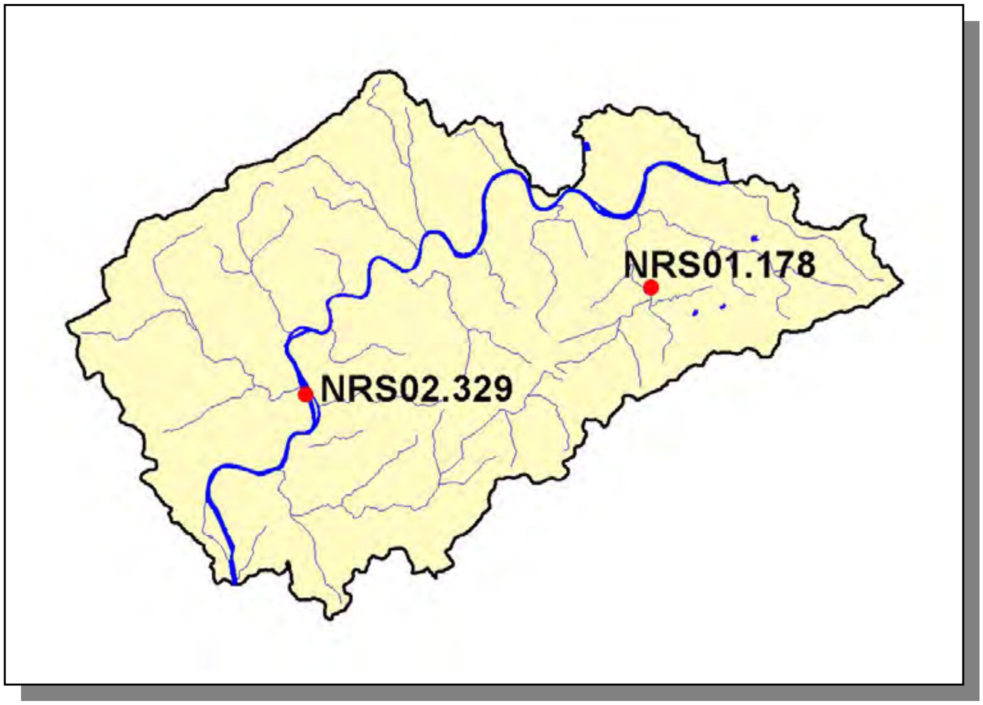

Figure 4-170. Location of Aquatic Resource Alteration Permit (ARAP) Sites (Individual Permits) in Subwatershed 060101040304. *More information is provided in Appendix IV.*

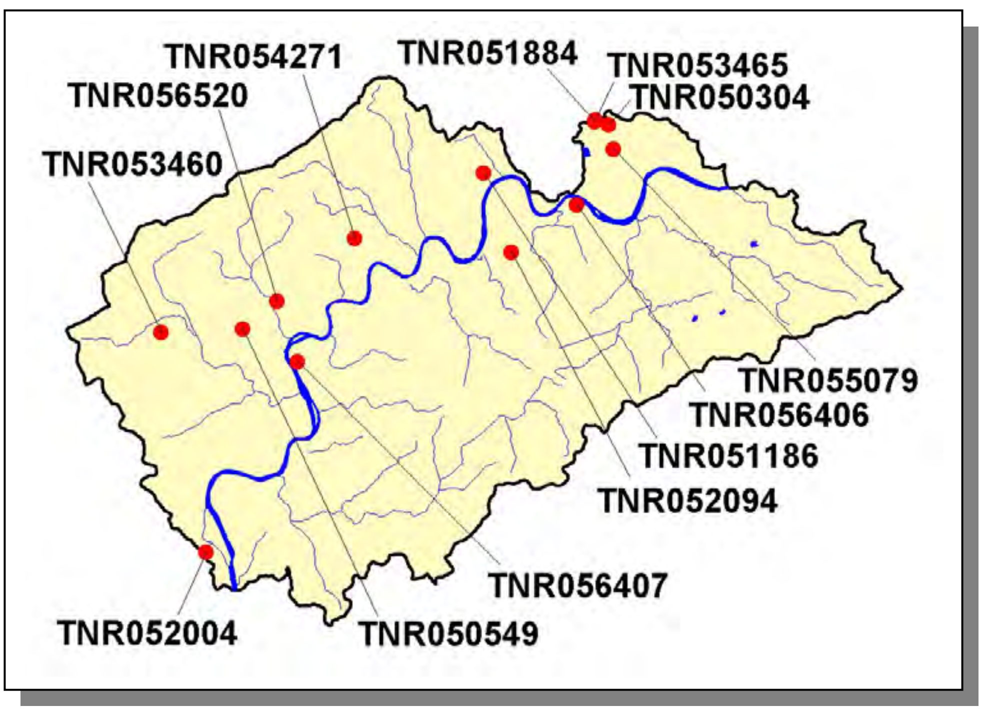

Figure 4-171. Location of TMSP Sites in Subwatershed 060101040304. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.C.vi.a.i. Dischargers to Water Bodies Listed on the 2004 303(d) List

There are three NPDES facilities discharging to water bodies listed on the 2004 303(d) list in Subwatershed 060101040304:

- TN0064351 (Pilot Travel Centers) discharges to Pratt Branch @ RM 0.2
- TN0077950 (Kwik-Shop #398) discharges to Pratt Branch @ RM 1.0
- TN0078361 (Aqua Chem, Inc.) discharges to Sand Branch

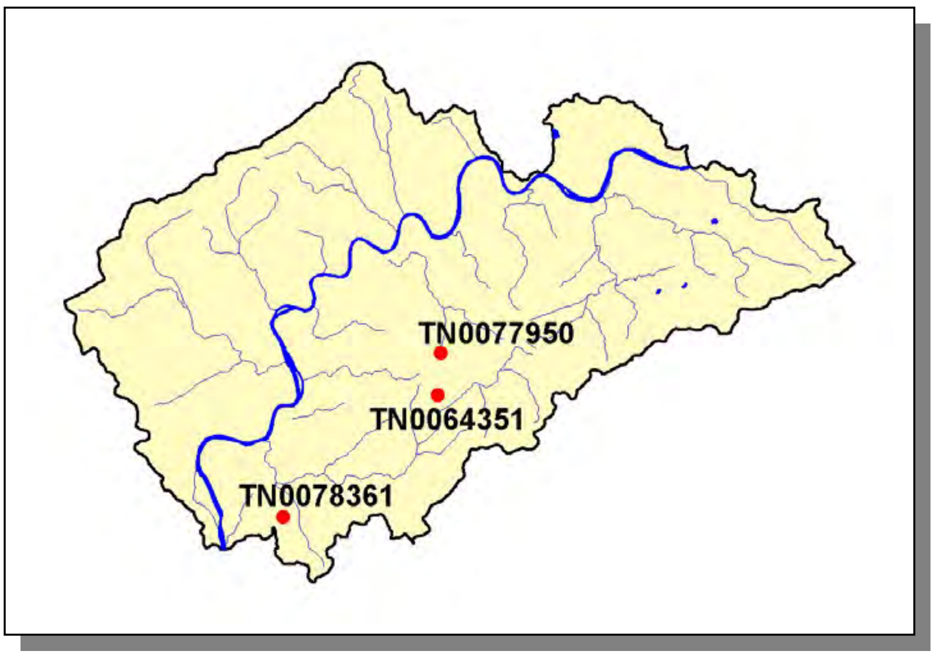

Figure 4-172. Location of NPDES Dischargers to Water Bodies Listed on the 2004 303(d) List in Subwatershed 060101040304. *More information, including the names of facilities, is provided in Appendix IV.*

Permit #	3Q2	1Q10	3Q10	3Q20	7Q10
TN0064351	0.08	na	0.04	0.03	0.05
TN0077950	0.00	na	0.00	0.00	0.00
TN0078361	0.00	na	0.00	0.00	0.00

Table 4-133. Receiving Stream Low Flow Information for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 060101040304. *Data are in cubic feet per second (CFS). Data were obtained from the USGS web application StreamStats at http://water.usgs.gov/osw/streamstats/. (na, data not available)*

PERMIT #	BENZENE	MBAS	VISIBLE OIL	NO_3+NO_2	Zn	Al	TEMPERATURE	FLOW
TN0064351	X	X	X					
TN0077950	X							X
TN0078361				X	X	X	X	X

Table 4-134. Monitoring Requirements for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 060101040304. *MBAS, Methylene-blue-active-substances.*

PERMIT #	$CBOD_5$	Zn	Al	TSS	SETTLEABLE SOLIDS	Oil and GREASE	DO	pH
TN0064351	X	X		X	X	X		X
TN0077950				X		X		X
TN0078361				X		X	X	X

Table 4-135. Parameters Monitored for Daily Maximum Limits for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 060101040304. *WET, Whole Effluent Toxicity; $CBOD_5$, Carbonaceous Biochemical Oxygen Demand (5-Day); TSS, Total Suspended Solids.*

4.2.C.iv.b. Nonpoint Source Contributions.

LIVESTOCK (COUNTS)						
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens (Broilers Sold)	Hogs	Sheep
2,804	5,566	190	7	12,403	190	144

Table 4-136. Summary of Livestock Count Estimates in Subwatershed 060101040304. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), **"**Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

LIVESTOCK COUNTS							
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Chickens (Broilers Sold)	Hogs	Sheep
Jefferson	16,126	35,718	1,878	1,633	1,880,000	183	567
Knox	12,424	24,664	855	2,056	0	851	649
Sevier	9,816	19,013	172	26	1,572,010	394	234

Table 4-137. Summary of Livestock Count Estimates in Jefferson, Knox, and Sevier Counties. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), **"**Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older; "Chickens Sold" are all chickens used to produce meat.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Jefferson	62.2	62.2	0.6	1.8
Knox	127.5	127.0	2.2	8.2
Sevier	254.5	127.4	0.3	0.9

Table 4-138. Forest Acreage and Annual Removal Rates (1987-1994) in Jefferson, Knox, and Sevier Counties.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.89
Grass (Hayland)	0.12
Legumes, Grass (Hayland)	0.24
Grass, Forbs, Legumes (Mixed Pasture)	0.47
Corn (Row Crops)	1.21
Tobacco (Row Crops)	15.24
Soybeans (Row Crops)	15.54
Wheat (Close-Grown Cropland)	4.54
Oats (Close-Grown Cropland)	13.51
Summer Fallow (Other Cropland)	3.31
Farmsteads and Ranch Headquarters	0.18

Table 4-139. Annual Estimated Total Soil Loss in Subwatershed 060101040304.

4.2.C.v. 060101040305 (Flat Creek).

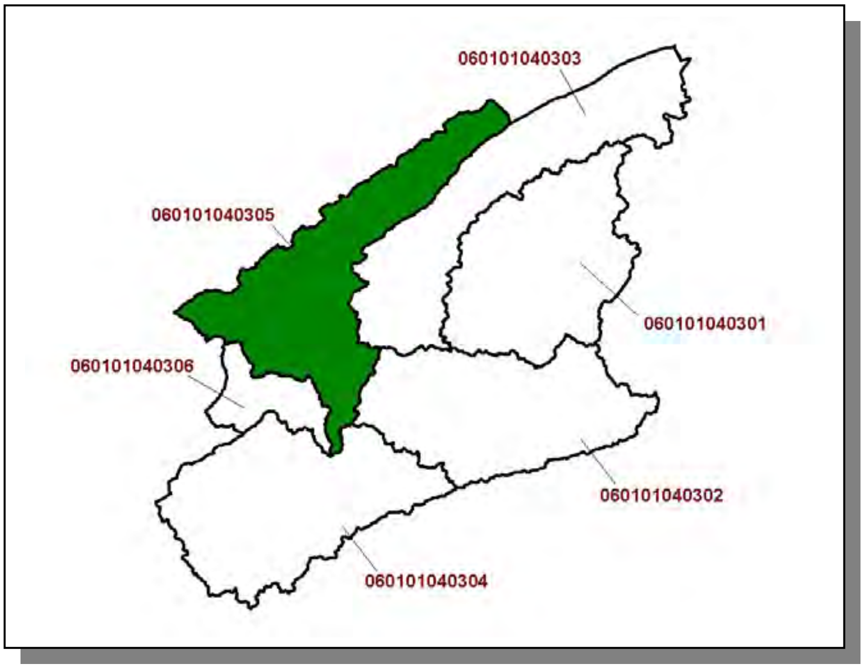

Figure 4-173. Location of Subwatershed 060101040305. *HUC-12 subwatershed boundaries are shown for reference.*

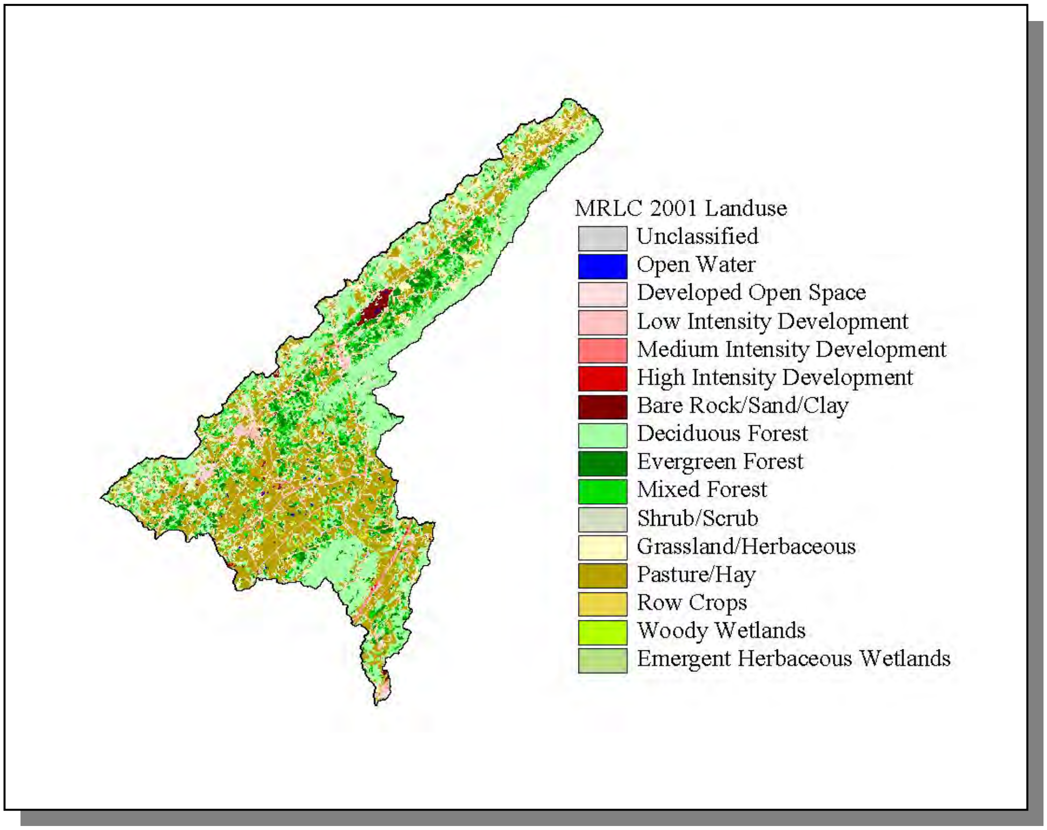

Figure 4-174. Illustration of Land Use Distribution in Subwatershed 060101040305.

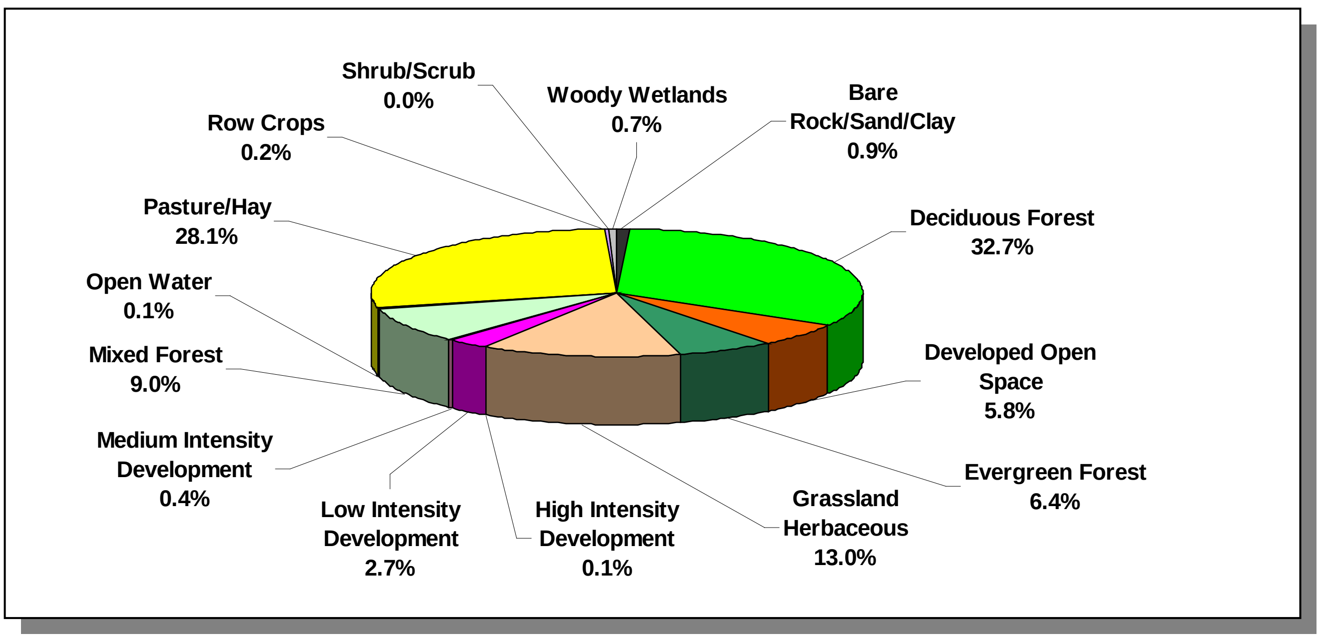

Figure 4-175. Land Use Distribution in Subwatershed 060101040305. More information is provided in Appendix IV.

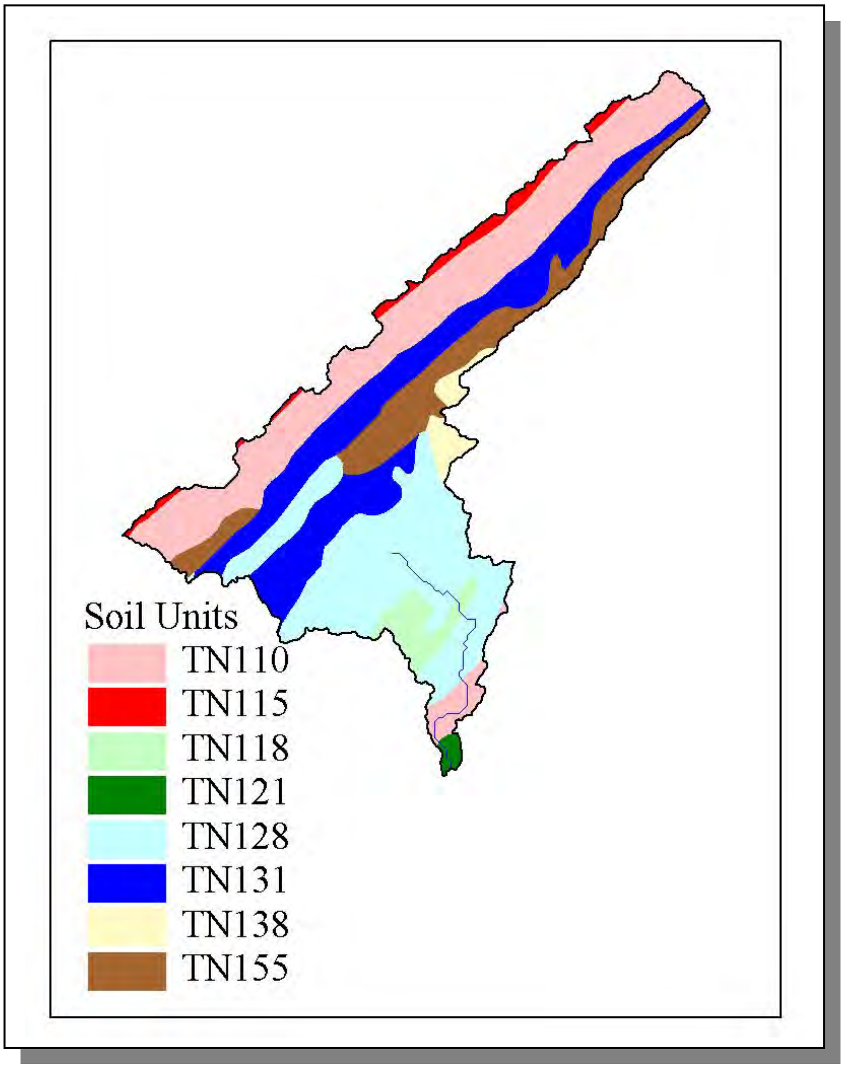

Figure 4-176. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040305.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN110	0.00	B	2.22	4.96	Loam	0.31
TN115	0.00	C	1.41	5.15	Silty Loam	0.36
TN118	0.00	C	6.52	5.12	Loam	0.29
TN121	0.00	B	1.30	5.21	Loam	0.33
TN128	0.00	C	1.30	6.53	Clayey Loam	0.26
TN131	0.00	C	1.17	4.95	Silty Loam	0.33
TN138	0.00	C	2.48	4.26	Sandy Loam	0.22

Table 4-140. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040305. *The definition of "Hydrologic Group" is provided in Appendix IV.*

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	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Grainger	17,095	19,456	20,659	5.17	885	1,007	1,069	20.8
Knox	335,749	365,900	382,032	6.24	20,956	22,838	23,845	13.8
Union	13,694	15,956	17,808	8.29	1,135	1,322	1,476	30.0
Total	**366,538**	**401,312**	**420,499**		**22,976**	**25,167**	**26,390**	**14.9**

Table 4-141. Population Estimates in Subwatershed 060101040305.

			NUMBER OF HOUSING UNITS			
Populated Place	County	Population	Total	Public Sewer	Septic Tank	Other
Luttrell	Union	812	303	4	274	25
Plainview	Union	2,165	853	50	789	14
Blaine	Grainger	1,326	505	9	473	23
Total		**4,303**	**1,661**	**63**	**1,536**	**62**

Table 4-142. Housing and Sewage Disposal Practices of Select Communities in Subwatershed 060101040305.

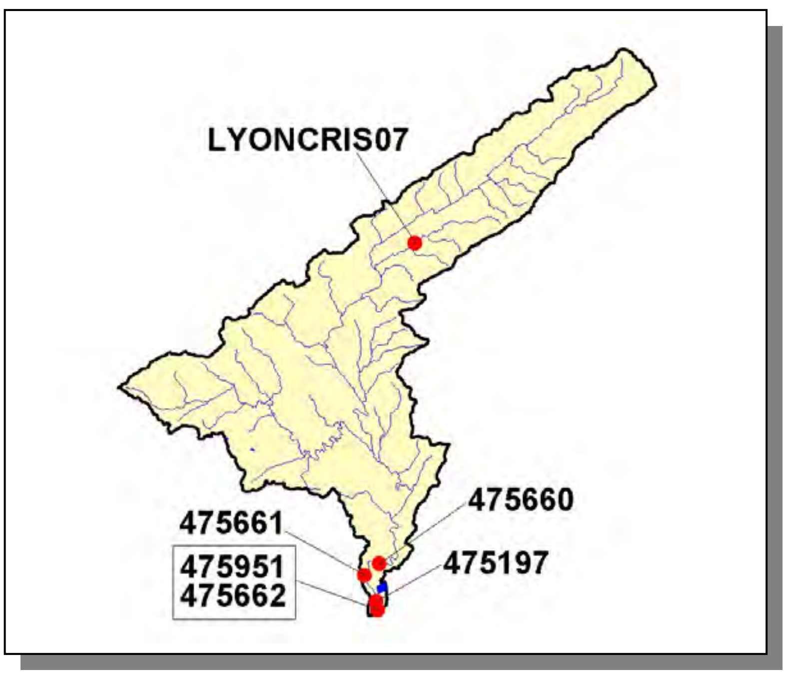

Figure 4-177. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 060101040305. *More information, including site names and locations, is provided in Appendix IV.*

4.2.C.v.a. Point Source Contributions.

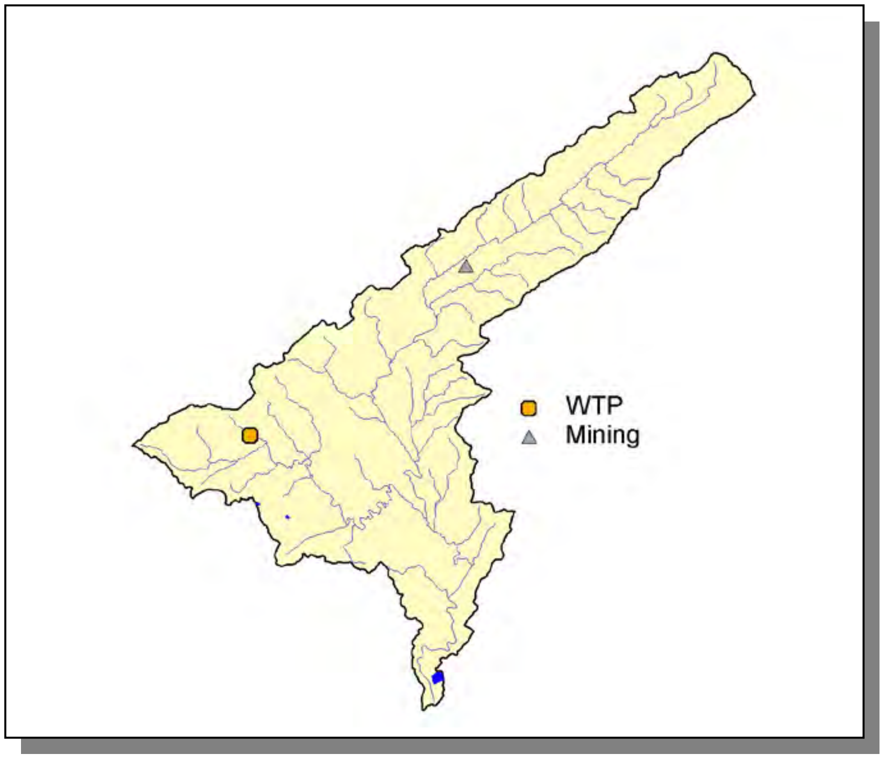

Figure 4-178. Location of Permits Issued in Subwatershed 060101040305. *More information, including the names of facilities, is provided in Appendix IV.*

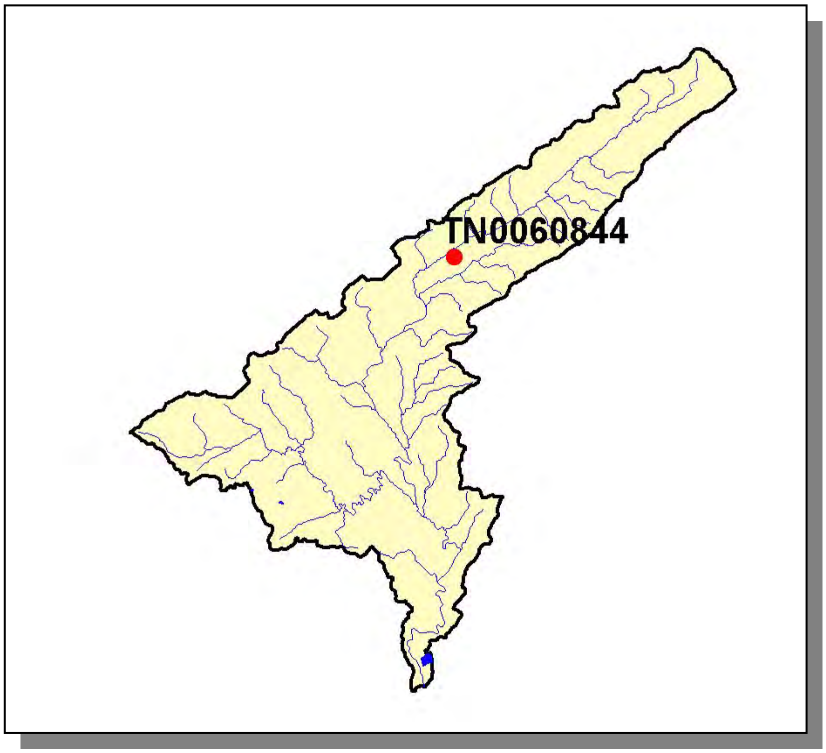

Figure 4-179. Location of Active Mining Sites in Subwatershed 060101040305. *More information, including the names of mining operations, is provided in Appendix IV.*

Figure 4-180. Location of Water Treatment Plants in Subwatershed 060101040305. *More information, including the names of facilities, is provided in Appendix IV.*

4.2.C.v.a.i. Dischargers to Water Bodies Listed on the 2004 303(d) List

There is one NPDES facility discharging to water bodies listed on the 2004 303(d) list in Subwatershed 060101040305:

- TN0074080 (Luttrell-Blaine-Corryton WTP) discharges to Little Flat Creek

Figure 4-181. Location of NPDES Dischargers to Water Bodies Listed on the 2004 303(d) List in Subwatershed 060101040305. *More information, including the names of facilities, is provided in Appendix IV.*

Permit #	3Q2	1Q10	3Q10	3Q20	7Q10
TN0074080	0.05	na	0.02	0.02	0.03

Table 4-143. Receiving Stream Low Flow Information for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 060101040305. *Data are in cubic feet per second (CFS). Data were obtained from the USGS web application StreamStats at http://water.usgs.gov/osw/streamstats/. (na, data not available)*

PERMIT #	FLOW
TN0074080	X

Table 4-144. Monitoring Requirements for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 060101040305. *MBAS, Methylene-blue-active-substances.*

PERMIT #	Al	TSS	TRC	SETTLEABLE SOLIDS	pH
TN0074080	X	X	X	X	X

Table 4-145. Parameters Monitored for Daily Maximum Limits for NPDES Dischargers to Waterbodies Listed on the 2004 303(d) List in Subwatershed 060101040305. *WET, Whole Effluent Toxicity; $CBOD_5$, Carbonaceous Biochemical Oxygen Demand (5-Day); TRC, Total Residual Chlorine; TSS, Total Suspended Solids.*

4.2.C.v.b. Nonpoint Source Contributions.

LIVESTOCK COUNTS					
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
3,729	7,342	226	11	202	147

Table 4-146. Summary of Livestock Count Estimates in Subwatershed 060101040305. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/),* **"***Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Grainger	12,115	23,927	942	1,184	510	195
Knox	12,424	24,664	855	2,056	851	649
Union	5,540	10,575	105	981	93	96

Table 4-147. Summary of Livestock Count Estimates in Grainger Knox, and Union Counties. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/),* **"***Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and olde*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Grainger	102.6	102.6	0.3	1.8
Knox	127.5	127.0	2.2	8.2
Union	102.5	102.5	0.1	0.0

Table 4-148. Forest Acreage and Annual Removal Rates (1987-1994) in Grainger, Knox, and Union Counties.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.79
Grass (Hayland)	0.69
Legumes, Grass (Hayland)	0.36
Grass, Forbs, Legumes (Mixed Pasture)	0.90
Corn (Row Crops)	2.59
Soybeans (Row Crops)	15.54
Tobacco (Row Crops)	7.21
Wheat (Close-Grown Cropland)	4.44
Farmsteads and Ranch Headquarters	0.27

Table 4-149. Annual Estimated Total Soil Loss in Subwatershed 060101040305.

4.2.C.vi. 060101040306 (Roseberry Creek).

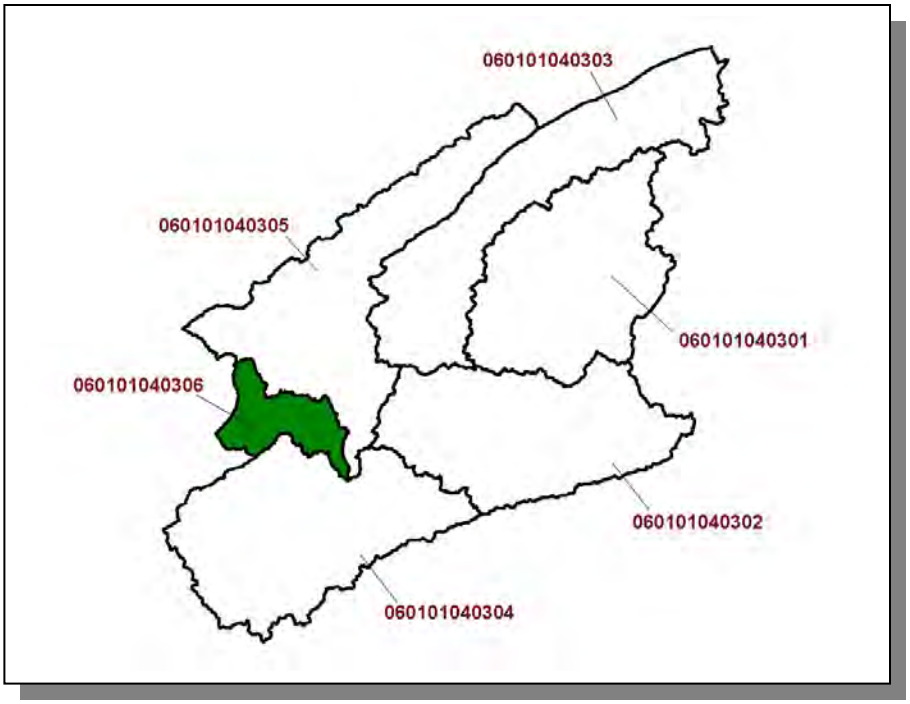

Figure 4-182. Location of Subwatershed 060101040306. *HUC-12 subwatershed boundaries are shown for reference.*

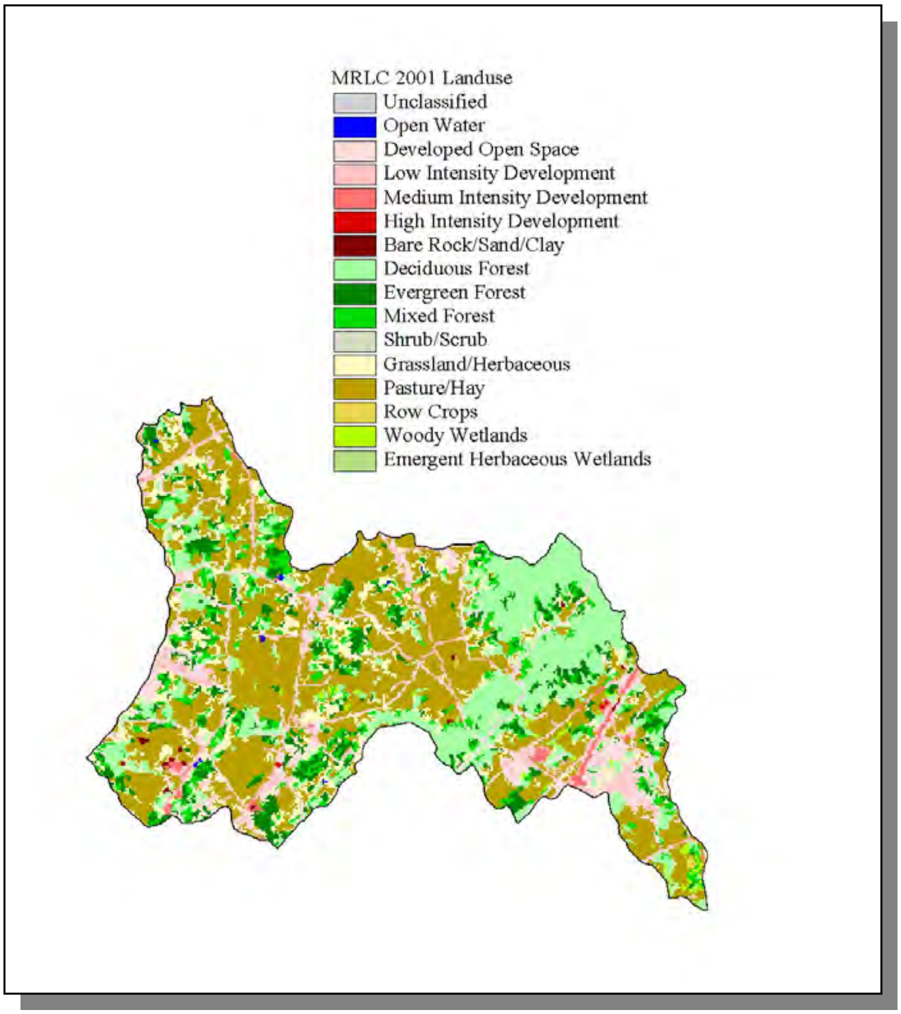

Figure 4-183. Illustration of Land Use Distribution in Subwatershed 060101040306.

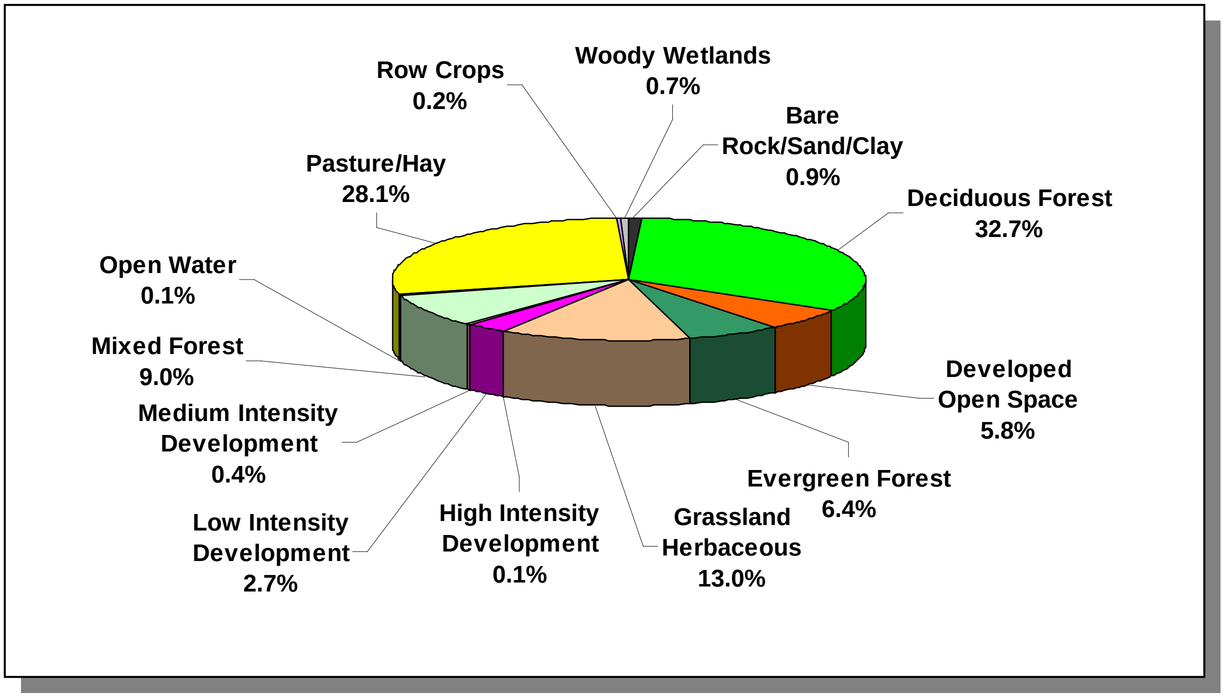

Figure 4-184. Land Use Distribution in Subwatershed 060101040306. *More information is provided in Appendix IV.*

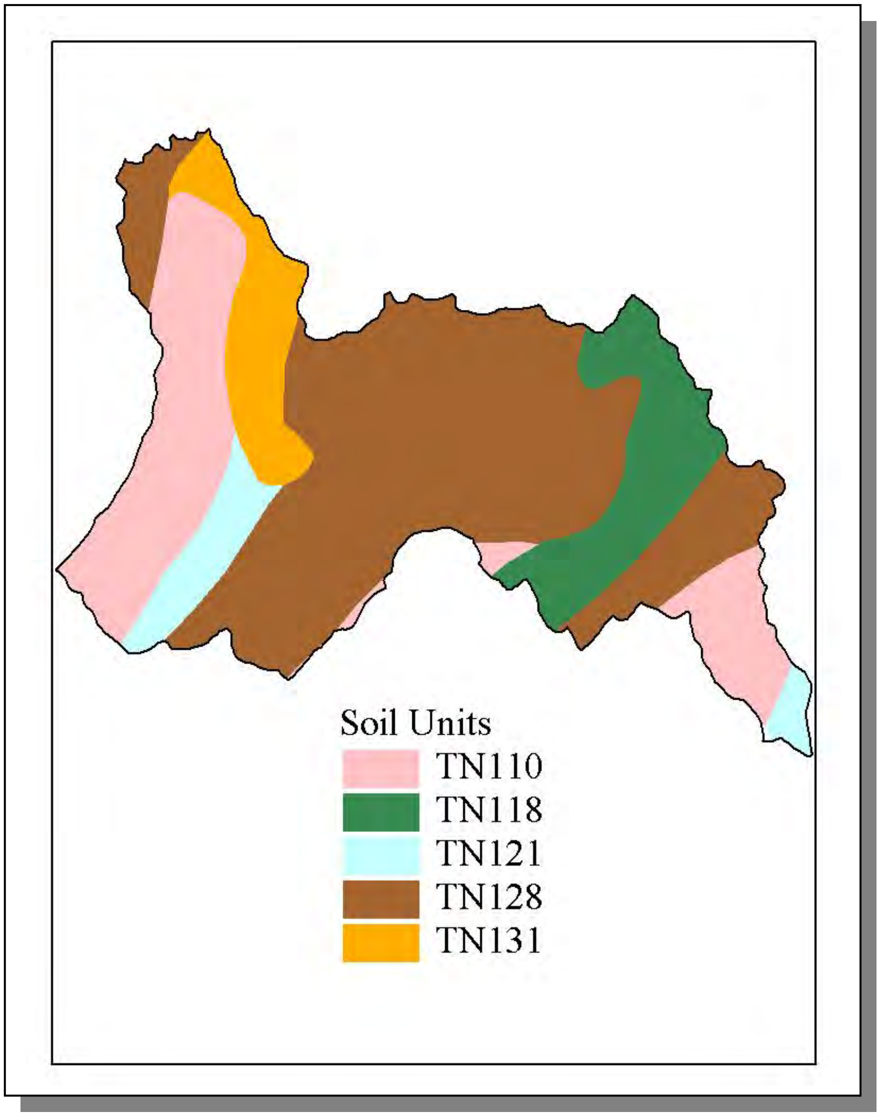

Figure 4-185. STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040306.

STATSGO MAP UNIT ID	PERCENT HYDRIC	HYDROLOGIC GROUP	PERMEABILITY (in/hour)	SOIL pH	ESTIMATED SOIL TEXTURE	SOIL ERODIBILITY
TN110	0.00	B	2.22	4.96	Loam	0.31
TN118	0.00	C	6.52	5.12	Loam	0.29
TN121	0.00	B	1.30	5.21	Loam	0.33
TN128	0.00	C	1.30	6.53	Clayey Loam	0.26
TN131	0.00	C	1.17	4.95	Silty Loam	0.33

Table 4-150. Soil Characteristics by STATSGO (State Soil Geographic Database) Soil Map Units in Subwatershed 060101040306. *The definition of "Hydrologic Group" is provided in Appendix IV.*

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	COUNTY POPULATION				ESTIMATED POPULATION IN WATERSHED			
County	1990	1997	2000	Portion of Watershed (%)	1990	1997	2000	% Change (1990-2000)
Knox	335,749	365,900	382,032	2.72	9,129	9,949	10,387	13.8

Table 4-151. Population Estimates in Subwatershed 060101040306.

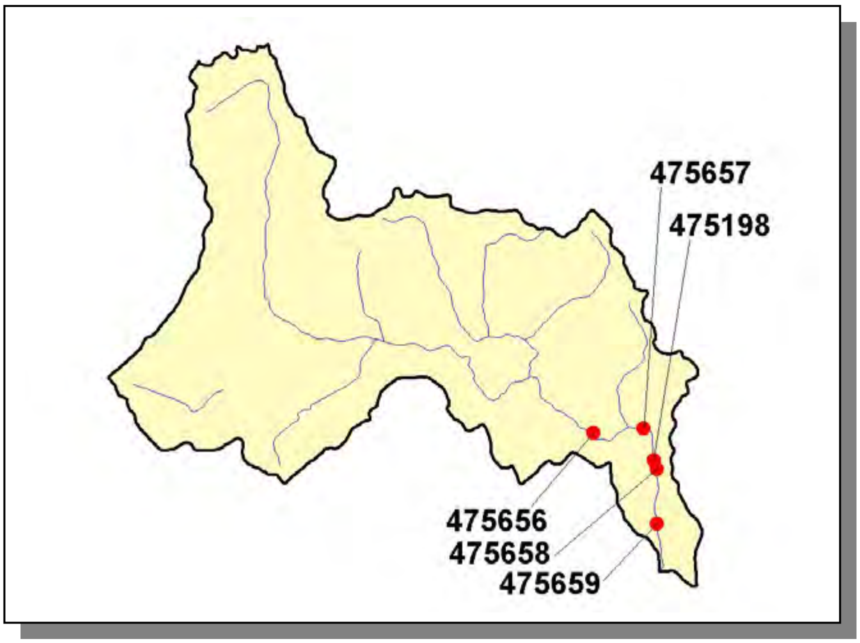

Figure 4-186. Location of Monitoring Sites in EPA's STORET Database in Subwatershed 060101040306. *More information, including site names and locations, is provided in Appendix IV.*

4.2.C.vi.a. Point Source Contributions.

There are no point source contributions in this subwatershed.

4.2.C.vi.b. Nonpoint Source Contributions.

LIVESTOCK COUNTS					
Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
939	1,864	65	<5	64	49

Table 4-152. Summary of Livestock Count Estimates in Subwatershed 060101040306. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), **"**Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older.*

LIVESTOCK COUNTS						
County	Beef Cow	Cattle	Milk Cow	Chickens (Layers)	Hogs	Sheep
Knox	12,424	24,664	855	2,056	851	649

Table 4-153. Summary of Livestock Count Estimates in Knox County. *According to the 1997 Census of Agriculture (http://www.agcensus.usda.gov/), **"**Cattle" includes heifers, heifer calves, steers, bulls and bull calves; "Chickens" are layers 20 weeks and older.*

	INVENTORY		REMOVAL RATE	
County	Forest Land (thousand acres)	Timber Land (thousand acres)	Growing Stock (million cubic feet)	Sawtimber (million board feet)
Knox	127.5	127.0	2.2	8.2

Table 4-154. Forest Acreage and Annual Removal Rates (1987-1994) in Knox County.

CROPS	TONS/ACRE/YEAR
Grass (Pastureland)	0.90
Grass (Hayland)	0.12
Legumes, Grass (Hayland)	0.25
Grass, Forbs, Legumes (Mixed Pasture)	0.47
Corn (Row Crops)	1.10
Soybeans (Row Crops)	15.54
Wheat (Close-Grown Cropland)	4.44
Farmsteads and Ranch Headquarters	0.18

Table 4-155. Annual Estimated Total Soil Loss in Subwatershed 060101040306.

CHAPTER 5

WATER QUALITY PARTNERSHIPS IN THE HOLSTON RIVER WATERSHED

5.1. BACKGROUND. The Watershed Approach relies on participation at the federal, state, local and nongovernmental levels to be successful. Two types of partnerships are critical to ensure success:

- Partnerships between agencies
- Partnerships between agencies and landowners

This chapter describes both types of partnerships in the Holston River Watershed. The information presented is provided by the agencies and organizations described.

5.2. FEDERAL PARTNERSHIPS.

5.2.A. Natural Resources Conservation Service. The Natural Resources Conservation Service (NRCS), an agency of the U.S. Department of Agriculture, provides technical assistance, information, and advice to citizens in their efforts to conserve soil, water, plant, animal, and air resources on private lands.

Performance Results System (PRS) is a Web-based database application providing USDA Natural Resources Conservation Service, conservation partners, and the public fast and easy access to accomplishments and progress toward strategies and performance. The PRS may be viewed at http://prms.nrcs.usda.gov/prs. From the opening menu, select “Reports” in the top tool bar. You will select the time period that you are interested in and the conservation treatment of interest on the page that comes up. Depending on the time period of interest, you will have various report options to choose from, such as location, reporting period and program involved in the reporting. You may be required to “refresh” the page in order to get the current report to come up.

The data can be used to determine broad distribution trends in service provided to customers by NRCS conservation partnerships. These data do not show sufficient detail to enable evaluation of site-specific conditions (e.g., privately-owned farms and ranches) and are intended to reflect general trends.

Conservation Practice	Feet	Acres	Number
Conservation Buffers	21,959	41	
Erosion Control		8,480	
Nutrient Management		17,902	
Pest Management		20,586	42
Grazing / Forages	50,671	17,913	
Tree and Shrub Practices		5,050	
Tillage and Cropping		5,714	
Waste Management Systems			1
Wildlife Habitat Management		5,006	
Water Supply	31,020		40

Table 5-1. Landowner Conservation Practices in Partnership with NRCS in the Holston River Watershed. *Data are from PRMS for October 1, 2001 through September 30, 2005 reporting period. More information is provided in Appendix V.*

5.2.B. United States Geological Survey – Tennessee Water Science Center Programs. The United States Geological Survey (USGS) provides relevant and objective scientific information and data for public use in evaluation of the quantity, quality, and use of the Nation's water resources. National USGS water resource assessments include the National Streamflow Information Program (http://water.usgs.gov/nsip/), National Atmospheric Deposition Network (http://bgs.usgs.gov/acidrain/), the National Stream Quality Accounting Network (http://water.usgs.gov/nasqan/), and the National Water-Quality Assessment Program (http://water.usgs.gov/nawqa). For a national overview of USGS water resources programs, please visit http://water.usgs.gov. Specific information on the Upper and Lower Tennessee River NAWQA study units can be found at http://tn.water.usgs.gov/lten/tenn.html .

In addition to National assessments, the USGS also conducts hydrologic investigations and data collection in cooperation with numerous Federal, State, and local agencies to address issues of National, regional, and local concern. Hydrologic investigations conducted by the USGS Tennessee Water Science Center address scientific questions pertaining to five general thematic topics:

1. Water Use and Availability,
2. Landforms and Ecology,
3. Watersheds and Land Use,
4. Occurrence, Fate, and Transport of Contaminants, and
5. Floods and Droughts.

In support of these investigations, the USGS Tennessee Water Science Center records streamflow continuously at more than 100 gaging stations, makes instantaneous measurements of streamflow at numerous other locations as needed or requested, monitors ground-water levels Statewide, and analyzes the physical, chemical, and biologic characteristics of surface and ground waters. In addition, the Water Science Center compiles annual water-use records for the State of Tennessee and collects a variety of data in support of National USGS baseline and other networks. More information pertaining to USGS activities in Tennessee can be accessed at http://tn.water.usgs.gov .

USGS Water Resources Information on the Internet. Real-time and historical streamflow, water-level, and water-quality data at sites operated by the USGS Tennessee Water Science Center can be accessed on-line at http://waterdata.usgs.gov/tn/nwis/nwis . Data can be retrieved by county, hydrologic unit code, or major river basin using drop-down menus on the web page. For specific information or questions about USGS streamflow data, contact Donna Flohr at (615) 837-4730 or dfflohr@usgs.gov . Recent USGS Tennessee Water Science Center publications can be accessed by visiting http://tn.water.usgs.gov/pubpg.html . A searchable bibliographic database is also provided for locating other USGS reports and products addressing specific scientific topics.

5.2.C. U.S. Fish and Wildlife Service. The mission of the U.S. Fish and Wildlife Service is working with others to conserve, protect, and enhance fish, wildlife, and plants and their habitats for the continuing benefit of the American people. Sustaining our nation's fish and wildlife resources is a task that can be accomplished only through the combined efforts of governments, businesses, and private citizens. The U.S. Fish and Wildlife Service (Service) works with State and Federal agencies and Tribal governments, helps corporate and private landowners conserve habitat, and cooperates with other nations to halt illegal wildlife trade. The Service also administers a Federal Aid program that distributes funds annually to States for fish and wildlife restoration, boating access, hunter education, and related projects across America. The funds come from Federal excise taxes on fishing, hunting, and boating equipment.

Endangered Species Program

Through the Endangered Species Program, the Service consults with other federal agencies concerning their program activities and their effects on endangered and threatened species. Other Service activities under the Endangered Species Program include the listing of rare species under the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended: 16 U.S.C. 1531 et seq.) and the recovery of listed species. Once listed, a species is afforded the full range of protections available under the ESA, including prohibitions on killing, harming or otherwise taking a species. In some instances, species listing can be avoided by the development of Candidate Conservation Agreements, which may remove threats facing the candidate species, and funding efforts such as the Private Stewardship Grant Program. Federally endangered and threatened species in the Holston River Watershed include the bald eagle (*Haliaeetus leucocephalus*), gray bat (*Myotis grisescens*), Indiana bat (*Myotis sodalis*), snail darter (*Percina tanasi*), spotfin chub (*Erimonax monacha*), Cumberland bean (*Villosa trabalis*), and pink mucket (*Lampsilis abrupta*). For a complete listing of endangered and threatened species in Tennessee, please visit the Service's website at http://*cookeville.fws.gov*.

On August 31, 2004, the Service designated critical habitat (Federal Register Volume 69, No. 168) for the federally endangered Cumberland elktoe (*Alasmidonta atropurpurea*), Cumberlandian combshell (*Epioblasma brevidens*), purple bean (*Villosa perpurpurea*), rough rabbitsfoot (*Quadrula cylindrical strigillata*), and oyster mussel (*Epioblasma capsaeformis*). This designation includes 14 river miles of Beech Creek in the vicinity of Slide, Hawkins County, Tennessee, upstream to the dismantled railroad bridge at RM 16. This reach of Beech Creek supports the best remaining population of the purple bean and the only remaining population of any of these species in the Holston River Watershed.

Recovery is the process by which the decline of an endangered or threatened species is stopped and reversed, and threats to the species' survival are eliminated, so that long-term survival in nature can be ensured. The goal of the recovery process is to restore listed species to a point where they are secure and self-sustaining in the wild and can be removed from the endangered species list. Under the ESA, the Service and National Marine Fisheries Service were delegated the responsibility of carrying out the recovery program for all listed species.

In a partnership with the Tennessee Chapter of The Nature Conservancy (TNC), Tennessee Wildlife Resources Agency (TWRA), and Tennessee Department of Environment and Conservation (TDEC) Division of Natural Heritage, the Service developed a State Conservation Agreement for Cave Dependent Species in Tennessee (SCA). The SCA targets unlisted but rare species and protects these species through a suite of proactive conservation agreements. The goal is to preclude the need to list these species under the ESA. This agreement covers middle and eastern Tennessee and will benefit water quality in many watersheds within the State.

In an effort to preclude the listing of a rare species, the Service engages in proactive conservation efforts for unlisted species. The program covers not only formal candidates but other rare species that are under threat. Early intervention preserves management options and minimizes the cost of recovery.

Partners for Fish and Wildlife Program

The U.S. Fish and Wildlife Service established the Partners for Fish and Wildlife Program to restore historic habitat types which benefit native fishes and wildlife. The program adheres to the concept that restoring or enhancing habitats such as wetlands or other unique habitat types will substantially benefit federal trust species on private lands by providing food and cover or other essential needs. Federal trust species include threatened and endangered species, as well as migratory birds (e.g. waterfowl, wading birds, shorebirds, neotropical migratory songbirds).

Participation is voluntary and various types of projects are available. Projects include livestock exclusion fencing, alternate water supply construction, streambank stabilization, restoration of native vegetation, wetland restoration/enhancement, riparian zone reforestation, and restoration of in-stream aquatic habitats.

HOW TO PARTICIPATE ...

- Interested landowners contact a Partners for Fish and Wildlife Biologist to discuss the proposed project and establish a site visit.
- A visit to the site is then used to determine which activities the landowner desires and how those activities will enhance habitat for trust resources. Technical advice on proposed activities is provided by the Service, as appropriate.
- Proposed cost estimates are discussed by the Service and landowner.
- A detailed proposal which describes the proposed activities is developed by the Service biologist and the landowner. Funds are competitive, therefore the proposal is submitted to the Service's Ecosystem team for ranking and then to the Regional Office for funding.
- After funding is approved, the landowner and the Service co-sign a Wildlife Extension Agreement (minimum 10-year duration).
- Project installation begins.
- When the project is completed, the Service reimburses the landowner after receipts and other documentation are submitted according to the Wildlife Extension Agreement.

For more information regarding the Endangered Species and Partners for Fish and Wildlife programs, please contact the Tennessee Ecological Services Field Office at 931/528-6481 or visit their website at [http://*cookeville.fws.gov*](http://cookeville.fws.gov).

5.2.D. Tennessee Valley Authority (TVA). Tennessee Valley Authority's (TVA) goals for the 21st century are to generate prosperity for the Tennessee Valley by promoting economic development, supplying low-cost, reliable power, and supporting a thriving river system. TVA is committed to the sustainable development of the region and is engaged in a wide range of watershed protection activities to improve or protect water quality conditions.

TVA's watershed activities are conducted by Watershed Teams located throughout the Valley. Watershed Teams help communities develop and implement protection and restoration activities in their local watersheds. In addition to water quality efforts, Watershed Teams carryout varied resource stewardship functions including management of TVA lands and shorelines, recreation, and resource management. TVA also operates a comprehensive monitoring program to provide water quality and aquatic information.

The following is a summary of TVA's resource stewardship and monitoring activities in the Upper Clinch watershed.

Water Quality Improvement Efforts

Watershed Initiatives: Watershed initiatives are major efforts to improve or protect water quality on a watershed scale. These long-term efforts represent a considerable commitment of resources. TVA participation is strategically targeted based on resource condition, partnership opportunity, and a need for TVA involvement. Watershed initiatives are cooperative efforts in which TVA's role varies depending on the needs and the capabilities of other participants.

While each watershed initiative is unique in many respects, TVA applies a conceptual model that provides a consistent framework and structure. This provides a basis for monitoring progress and ensures that each effort is of a sufficient quality to compete successfully for grant funds. Each initiative is viewed as proceeding through four stages of development: Explore, Build/Prepare, Implement, and Transition from an active initiative to a maintenance status. Within these phases, there a key elements that are deemed essential for a successful watershed initiative. These are cause/source identification, development of local capability, communication and marketing, funding strategy, and action plan development.

For more information on TVA's overall approach to watershed water quality, contact Donald Anderson at dwanderson@tva.gov or 423-876-6711.

Caney Creek Initiative:HUC TN06010104-060

Partners include The Natural Resource Conservation Service (NRCS), Clinch-Powell Resource Conservation and Development, The Soil and Water Conservation District, Holston Electric, Tennessee Department of Agriculture as well as local land owners. To date we have conducted three coalition building meetings, the third of which was December, 2005. Our next meeting is scheduled for early February and during this meeting, we will be creating our coalition name and organizing initial efforts. Projects will focus mainly on areas of heavy agriculture use along Caney Creek. This includes fencing cattle out of the creek, bank stabilization, and other BMP's. TVA and our partners have already significantly improved one farmer's agricultural facility by providing funding and services in order to improve the productivity of his operation while achieving our goal of reducing the amount of soil and nutrient runoff into Caney Creek, thus potentially improving water quality in the Caney Creek watershed.

For more information, contact Alisha Mulkey, Holston-Cherokee-Douglas Watershed Team, at asmulkey@tva.gov or 423-585-2132.

Tennessee Valley Clean Marina Initiative: The Tennessee Valley Clean Marina Initiative is an effort to promote environmentally responsible marina practices. This voluntary program helps marina operators protect the resource that provides them with their livelihood. It addresses sewage management, oil and gas control, marina siting, and erosion prevention. The program certifies marinas that comply with pollution-control standards and allows them to use the Clean Marina logo and flag. As of October 3, 2005, 53 marinas were flying the Clean Marina flag and going the extra mile to protect the waters of the Tennessee Valley.

Cherokee Reservoir will Clean marina certification include Cedar Hill, Fall Creek, Greenlee at May Springs, Greenelee's, and Hamblen County Marina. There are plans to certify two additional marinas in 2006.

For more information, contact Karen Stewart, Holston-Cherokee-Douglas Watershed Team, at kcstewart@tva.gov or 423-585-2120.

Growth Readiness: The Tennessee Growth Readiness program helps communities learn how land use decisions affect water quality, and then make informed choices about managing growth. It helps them comply with regulatory requirements. Planners and public works officials are the program's target audience. They are intimately involved in the nuts-and-bolts of their community's land use and water quality decisions. Since the program began in the fall of 2003, representatives from 280 Tennessee communities have participated. Nearly 200 of these communities have evaluated their existing development rules against a set of model development principles. Development following these principles is economically viable and protects the environment. Statewide 40 communities have changed their development rules to adopt these principles.

Water Quality Monitoring

TVA's monitoring efforts fall generally in three components: monitoring the ecological health and water quality of TVA reservoirs; assessing the ecological condition of selected stream sites; and monitoring of conditions directly related to human use of aquatic resources.

Reservoir Ecological Health: TVA's Reservoir Ecological Health Monitoring program evaluates current conditions, provides data for trend analysis, and provides assessments of current and future operations. TVA monitors ecological conditions at 69 sites on 31 reservoirs. Each site is monitored every other year unless a substantial change in the ecological health score occurs during a two-year cycle. The overall health ratings of TVA reservoirs include five ecological indicators: dissolved oxygen, chlorophyll, fish, bottom life, and sediment quality. Results from each of the five indicators are evaluated based on TVA's reservoir evaluation system and assigned a rating ranging from 1 (poor) to 5 (excellent).

Cherokee Reservoir rated poor in 2004 monitoring. Ecological conditions were similar to those found in previous years. Cherokee is a relatively deep storage impoundment with a long retention time and plenty of nutrients, resulting in low dissolved oxygen levels and high chlorophyll levels. Individual scores for each sampling site and component are presented in the table below.

Table 1: Ratings for Individual Ecological Health Indicators for Cherokee Reservoir, 2004

Monitoring Location	Dissolved Oxygen	Chlorophyll	Fish	Bottom Life	Sediment Quality
Forebay	Poor	Poor	Fair	Fair	Good
Mid-Reservoir	Poor	Poor	Good	Fair	Fair

As in previous years, dissolved oxygen rated poor at both sampling locations. Much of the water column had low dissolved oxygen levels during the summer months, and there were extended periods of time when virtually no oxygen was present in the water near the bottom. TVA has installed aeration equipment to add oxygen to the deep water above Cherokee Dam and to improve conditions immediately downstream in the Holston River.

Elevated concentrations resulted in poor ratings for chlorophyll at both monitoring locations in 2004. Chlorophyll typically rates poor at the mid-reservoir location, but concentrations have indicated a trend of increasing at the forebay since 1990 as ratings have changed from good and fair to fair and poor.

In conjunction with the Reservoir Ecological Health monitoring, TVA collects additional water samples to be analyzed for parameters of interest to public and industrial water supplies.

More information about Reservoir Ecological Health Monitoring and related monitoring can be obtained by contacting Tyler Baker at (423)-876-6733 or tfbaker@tva.gov or http://www.tva.gov .

Stream Monitoring

The condition of water resources in the streams is measured using three independent methods: Index of Biotic Integrity (IBI), number of mayfly, stonefly, and caddisfly taxa (EPT), and Habitat Assessment. EPT sampling and fish community assessment (IBI) are conducted at the same sites. Site selection is governed by study objectives, stream physical features, and stream access. TVA's objective is to characterize the quality of water resources within a sub-watershed (11-digit hydrologic unit). Sites are typically located in the lower end of sub-watersheds and at intervals on the mainstem to integrate the effects of land use.

IBI: The index of biotic integrity (IBI) assesses the water quality in flowing water by examining a stream's fish assemblage. Twelve metrics address species richness and composition, trophic structure (structure of the food chain), fish abundance, and fish health. Each metric reflects the condition of one aspect of the fish assemblage and is scored against high quality reference streams in the region.. Potential scores for each of the twelve metrics are 1-poor, 3-intermediate, or 5-the best to be expected. Scores for the 12 metrics are summed to produce the IBI for the site.

EPT: The number and types of aquatic insects, like fish, are indicative of the general quality of the environment in which they live. The method TVA uses involves only qualitative sampling and field identification of mayflies (Ephemeroptera), stoneflies (Plecoptera), and caddisflies (Trichoptera) to the family taxonomic level (EPT). The score for each site is simply the number of EPT families. The higher EPT scores are indicative of high quality streams because these insect larvae are intolerant of poor water quality.

Habitat Assessment: The quality and quantity of habitat (physical structure) directly affects aquatic communities. Habitat assessments are done at most stream sampling sites to help interpret IBI and EPT results. If habitat quality at a site is similar to that found at a good reference site, any impacts identified by IBI and EPT scores can reasonably be attributed to water quality problems. However, if habitat at the sample site differs considerably from that at a reference site, lower than expected IBI and EPT scores might be due to degraded habitat rather than water quality impacts.

The habitat assessment method used by TVA (modified EPA protocol) compares observed in-stream, channel, and bank characteristics at a sample site to those expected at a similar high-quality stream in the region. Individual attributes are scored from 1 (poorest condition) to 4 (best condition). The habitat score for the sample site is the sum of these attributes. Scores can range from a low of 10 to a high of 40.

EPT sampling and fish community assessment (IBI) are conducted at the same sites. Site selection is based on study objectives, stream physical features, and stream access. TVA's objective is to characterize the quality of water resources within a sub-watershed (11-digit hydrologic unit). Sites are typically located in the lower end of sub-watersheds and at intervals on the mainstem to integrate the effects of land use. Twenty-three sites in the Holston have been sampled since 2000 and are being sampled routinely. These sites are typically sampled every five years.

Details about stream sampling sites and scores can be obtained by contacting Charlie Saylor at 865-632-6406 or cfsaylor@tva.gov or http://www.tva.gov.

Human Use

Bacteriological Monitoring at Recreational Areas: Each summer TVA evaluates about 250 swimming areas and informal water contact recreational sites for *Escherichia coli* (*E. coli*) bacteria. These sites include those operated by TVA and many operated by other agencies. Indicator organisms such as *E. coli* are used to help protect bathers from illnesses that may be contracted from recreational activities in waters contaminated by fecal pollution. Although these tests are not proof of human health threats, they may indicate the presence of more harmful pathogens in waterbodies.

Bacteriological water sampling is conducted between Memorial Day and Labor Day when people are most likely to be recreating. Typically, swimming areas and heavily used canoe sites are monitored every year, while boat ramps and other canoe sites are monitored every other year.

E. coli bacteria levels in samples collected on Cherokee Reservoir by TVA in 2005 were within the state of Tennessee's guidelines for water contact with one exception. The single-sample maximum concentration was exceeded in one of the ten samples at John Sevier Campground boat ramp.

The 2005 sampling locations were Cherokee Dam Day Use Area beach, Panther Creek State Park swim area, Gap Branch boat ramp, and John Sevier Campground boat ramp

Fish Flesh Monitoring: TVA conducts fish tissue monitoring by collecting fish from its reservoirs and checking the tissue for metals, pesticides, PCBs, and other chemicals that could affect human health. This data is shared with state agencies, which are responsible for advising the public of health risks from eating contaminated fish.

TVA collected channel catfish and largemouth bass from the reservoir for tissue analysis in the autumn of 2002. All contaminant levels were either below detectable levels or below the levels used by the state of Tennessee to issue fish consumption advisories. TVA will collect fish from Cherokee again in the autumn of 2006.

More information about Bacteriological Monitoring at Recreational Areas and Fish Flesh Monitoring can be obtained by contacting Rebecca Hallman at 423-876-6736 or rlhallman@tva.gov or http://www.tva.gov .

Spring Sport Fish Monitoring: TVA conducts an annual spring sportfish survey to determine the number, age, and general health of black bass and crappie populations in its reservoirs. Results are used by state agencies to protect and improve sport fisheries.

More information about Spring Sport Fish Monitoring can be obtained by contacting Kurt Lakin at 423-876-6737 or kmlakin@tva.gov or http://www.tva.gov .

Sport Fishing Index: TVA and state fisheries agencies have created a Sport Fishing Index (SFI) to help anglers decide where they have the best chance of catching their favorite types of fish. SFI scores for different species are based both on population measures (the size and health of the individual fish, along with the number of fish present) and angler use and success information (the number of anglers looking for a particular type of fish, and the number of that type that they actually catch). The SFI score ranges from a high of 60 (excellent) to a low of 20 (very poor).

The spring sportfish surveys are conducted from March through early June and include twelve 30-minute electrofishing runs covering the various habitat types present. Fish are weighed, measured, checked for anomalies, and released. This approach to determining fish abundance is used by state game and fish agencies and academia. The survey predominantly targets three species of black bass — largemouth, smallmouth, and spotted bass — and black and white crappie.

The most recent Sport Fishing Index results were not available at the time of this submittal. Information about the Sport Fishing Index can be obtained by contacting Greg Shaffer at 865-632-6365 or gshaffer@tva.gov or http://www.tva.gov.

5.2.E. United States Army Corps of Engineers-Nashville District. The Nashville District, U.S. Army Corps of Engineers is one of seven districts in the Lakes and Rivers Division. The district's area is determined by the Cumberland River and the Tennessee River's watersheds and encompasses 59,000 square miles in portions of seven states. This geographic area is represented by 14 senators and 20 Congressional representatives. The Nashville District's missions include providing flood protection, recreation, hydropower, and navigation. The District also provides environmental stewardship through our Regulatory and Civil Works programs, conducts emergency response to disasters, and to performs other authorized Civil Works projects.

Within the 18,000 square mile Cumberland River Basin, overall responsibilities for the Nashville District include operation and maintenance of 10 reservoir projects. Each of these is operated for some or all of the following purposes: hydropower production, flood control, navigation, water supply, water quality, fish and wildlife, and recreation.

Within the much larger, 41,000 square mile Tennessee River Basin the Nashville District operates a series of navigation locks and has regulatory permit authority over dredge and fill activities under the Clean Water Act and the Rivers and Harbors Act.

As of 2005, the District's flood control projects have prevented more than $1.96 billion in flood damages. The District also provides flood prevention planning assistance to the states and local governments.

Lakes in the Nashville District are the most popular in the nation. More than 36 million people visited our 10 lakes last year. These recreation users had an economic impact on the region of nearly $877 million dollars. Five Nashville District lakes rank among the top 25 in Corps-wide visitation. In 2000, the District's 70 commercial concessionaires produced $1.3 million in profit, and returned more than $300,000 to the U.S. Treasury in rent payments for leases.

The Nashville District has the capacity to produce more than 914 megawatts of clean electricity, enough to power the needs of a city the size of Nashville, at nine different hydropower generations plants in the Cumberland River Basin. The District generates about $44 million in revenue from the sale of this power annually. This revenue is returned to the U.S. Treasury.

The Nashville District operates and maintains 1,175 commercially navigable river miles; almost 10% of the total within the U.S. Army Corps of Engineers. The district operates and maintains 14 navigation lock projects; nine on the Tennessee River, four on the Cumberland River, and one on the Clinch River. There are more than 40,000 commercial and recreational lockages annually. More than 74 million tons of commodities passed through these 14 locks during 2005. Wilson Lock in Alabama has the highest single lift east of the Rocky Mountains, between 93 and 100 feet, depending on the current river water level.

Regulatory Program

The U.S. Army Corps of Engineers has been involved in regulating certain activities in the nation's water since 1890. Prior to 1968, the primary thrust for the regulatory program was the protection of navigation. As a result of new laws and judicial decisions, the program has evolved to one that considers the full public interest by balancing the favorable impacts against detrimental impacts. The Nashville District annually handles more than 3,000 regulatory actions, 97% of which were evaluated in less than 60 days.

Section 10 of the Rivers and Harbors Act of 1899 **-** requires approval prior to the accomplishment of any work in or over navigable waters of the United States, or which affects the course, location, condition or capacity of such waters. Typical activities requiring Section 10 permits are:

•Construction of piers, wharves, bulkheads, dolphins, marinas, ramps, and cable/pipeline crossings.
• Dredging and excavation

Section 404 of the Clean Water Act **-** requires approval prior to discharging dredged or fill material into the waters of the United States. Typical activities requiring Section 404 permits are:

- Depositing of fill or dredged material in waters of the U.S. or adjacent wetlands.
- Site development fill for residential, commercial, or recreational developments.
- Construction of revetments, breakwaters, levees, dams, dikes, and weirs.
- Placement of riprap and road fills.

Civil Works Program

The Corps' ongoing Civil Works responsibilities date back to the early 1800's when Congress authorized the removal of navigation hazards and obstacles. Over the years, succeeding Administrations and Congresses have expanded the Corps' missions to include most all water-related planning, development, and construction areas where a Federal interest is involved. Funds for Congressionally Authorized Projects are provided through Energy and Water Appropriations Acts and through contributions from non-Federal entities for specific projects.

Civil Works projects may also be funded under the Continuing Authorities Program (CAP). Congress has provided the Corps with standing authorities to study and build specific water resources projects for specific purposes and with specified spending limits. CAP projects are usually implemented in a faster time frame, are limited in complexity, have Federal cost limits, are approved by the Division Commander, and do not need Congressional authorization.

Nashville District Corps of Engineers Water Quality Program

The Nashville District Corps of Engineers collects a significant volume of physical, chemical, and biological water quality data every year. These data are collected at representative points both within all ten Nashville District lakes, on various major and/or representative inflow streams, and in the tailwaters. Where there are known water quality problems, such as seasonal low DO in certain turbine releases, monitoring is significantly intensified to track and quantify a particular problem. This information is used to make informed decisions about how a project's powerplant should operate. Baseline, continuous recording, multiparameter water quality monitors keep track of conditions at critical points on the main stem of the Cumberland River from the mouth of the Obey River near Celina, Tennessee to the tailwater of Lake Barkley in western Kentucky. The monitor at the Old Hickory Dam tailwater, in particular, provides key information, since water discharged from Old Hickory must be able to absorb inputs from Nashville, which is just downstream.

The data collected by the Nashville District are used to help determine watershed water quality trends and to provide for better management of the comprehensive reservoir system. The data are essential for running predictive water quality models, a growing trend in Corps' water management practice.

Additional information concerning projects, programs, and activities of the Nashville District Corps of Engineers can be obtained on the World Wide Web at http://www.orn.usace.army.mil/

Environmental Education

Environmental education opportunities are provided to area school age children by the Nashville District Corps of Engineers. Water Quality personnel have participated in environmental awareness programs for the past several years at the majority of Nashville District lakes. These programs are organized by the local lake Resource Management staff and involve various area schools. The programs provided allow students to have a "hands on" experience in water quality surveillance techniques. Typically the programs include an interactive discussion of overall water quality issues. This is supplemented with demonstrations of sophisticated water quality instrumentation, collection and analysis of biological specimens from local aquatic environments, and viewing of reference materials and preserved specimens. The value of such environmental education is enormous, because it reaches young people early in their lives and exposes them to a scientific learning experience that is impossible to duplicate in a formal classroom. This experience hopefully contributes to a greater lifelong awareness by the individual of the importance of conserving and improving water quality and wise use of water resources.

Additional Information

To obtain additional information about the District, please refer to the home page at:
http://www.lrn.usace.army.mil/, or contact the following offices:
Public Affairs Office (General Information): (615) 736-7161
Regulatory Branch: (615) 369-7500

5.3. STATE PARTNERSHIPS.

5.3.A. TDEC Division of Water Supply. The Source Water Protection Program, authorized by the 1996 Amendments to the Safe Drinking Water Act, outline a comprehensive plan to achieve maximum public health protection. According to the plan, it is essential that every community take these six steps:

1) Delineate the drinking water source protection area
2) Inventory known and potential sources of contamination within these areas
3) Determine the susceptibility of the water supply system to these contaminants
4) Notify and involve the public about threats identified in the contaminant source inventory and what they mean to their public water system
5) Implement management measures to prevent, reduce or eliminate threats
6) Develop contingency planning strategies to deal with water supply contamination or service interruption emergencies (including natural disaster or terrorist activities).

Source water protection has a simple objective: to prevent the pollution of the lakes, rivers, streams, and ground water (wells and springs) that serve as sources of drinking water before they become contaminated. This objective requires locating and addressing potential sources of contamination to these water supplies. There is a growing recognition that effective drinking water system management includes addressing the quality and protection of the water sources.

Source Water Protection has a significant link with the Watershed Management Program goals, objectives and management strategies. Watershed Management looks at the health of the watershed as a whole in areas of discharge permitting, monitoring and protection. That same protection is important to protecting drinking water as well. Communication and coordination with a multitude of agencies is the most critical factor in the success of both Watershed Management and Source Water Protection.

Watershed management plays a role in the protection of both ground water and surface water systems. Watershed Management is particularly important in areas with karst (limestone characterized by solution features such as caves and sinkholes as well as disappearing streams and spring), since the differentiation between ground water and surface water is sometimes nearly impossible. What is surface water can become ground water in the distance of a few feet and vice versa.

Source water protection is not a new concept, but an expansion of existing wellhead protection measures for public water systems relying on ground water to now include surface water. This approach became a national priority, backed by federal funding, when the Safe Drinking Water Act amendments (SDWA) of 1996 were enacted. Under this Act, every public drinking water system in the country is scheduled to receive an assessment of both the sources of potential contamination to its water source of the threat these sources may pose by the year 2003 (extensions were available until 2004). The assessments are intended to enhance the protection of drinking water supplies within existing programs at the federal, state and local levels. Source water assessments were mandated and funded by Congress. Source water protection will be left up to the individual states and local governments without additional authority from Congress for that progression.

Tennessee's Wellhead Protection Rules were revised as of October 29, 2005 to include requirements for similar protection for public water systems using surface water sources under the heading of Drinking Water Source Protection Rule (1200-5-1-.34) in addition to the previous requirements for wellhead protection for public water systems using ground water sources. The rule addresses surface or ground water withdrawals in the vicinity of public water sources as well as potential contaminant sources threatening public water sources to reflect the amended prohibitions in the 2002 Amendments to the Tennessee Safe Drinking Water Act, TCA 68-221-771. There are additional reporting requirements of potential contaminant source inventories and emergency response for the public water systems as well. The Division of Water Supply will be able to use the Drinking Water Source Protection Rule to work in complimentary fashion with the Division of Water Pollution Control and other Departmental agencies in activities to protect public water sources.

As a part of the Source Water Assessment Program, public water systems are evaluated for their susceptibility to contamination. These individual source water assessments with susceptibility analyses are available to the public at http://www.state.tn.us/environment/dws as well as other information regarding the Source Water Assessment Program and public water systems.

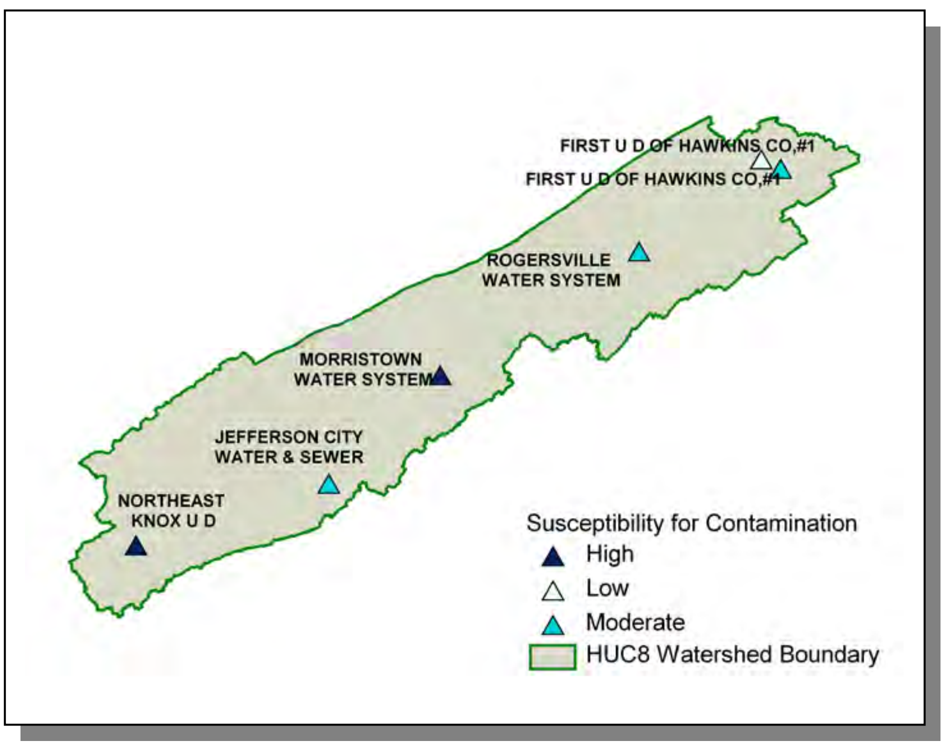

Figure 5-1. Susceptibility for Contamination in the Holston River Watershed.

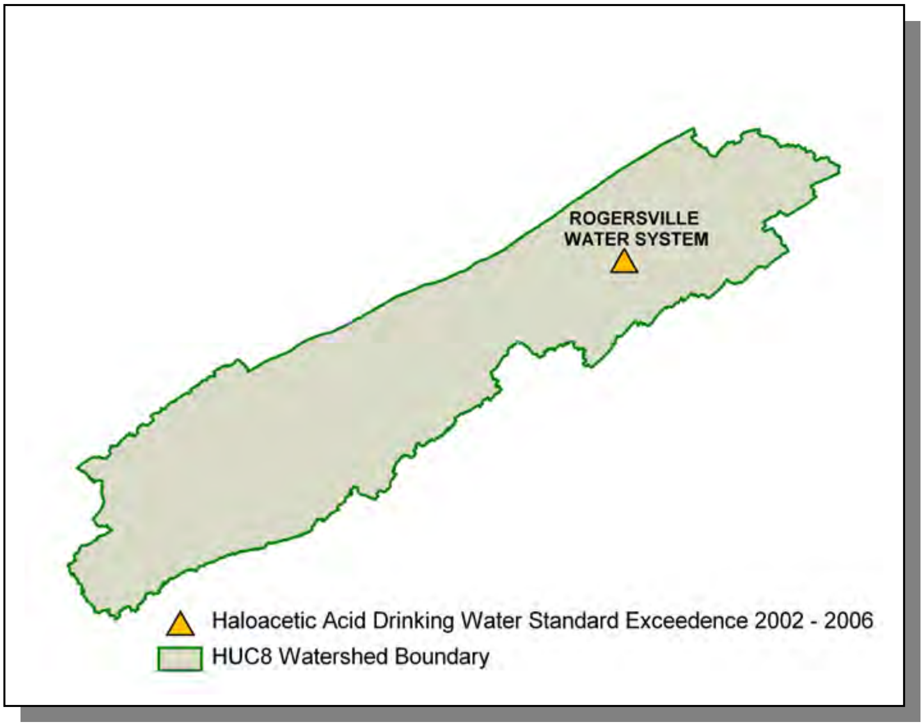

Figure 5-2. Exceedences of the Haloacetic Acid Drinking Water Standard in the Holston River Watershed.

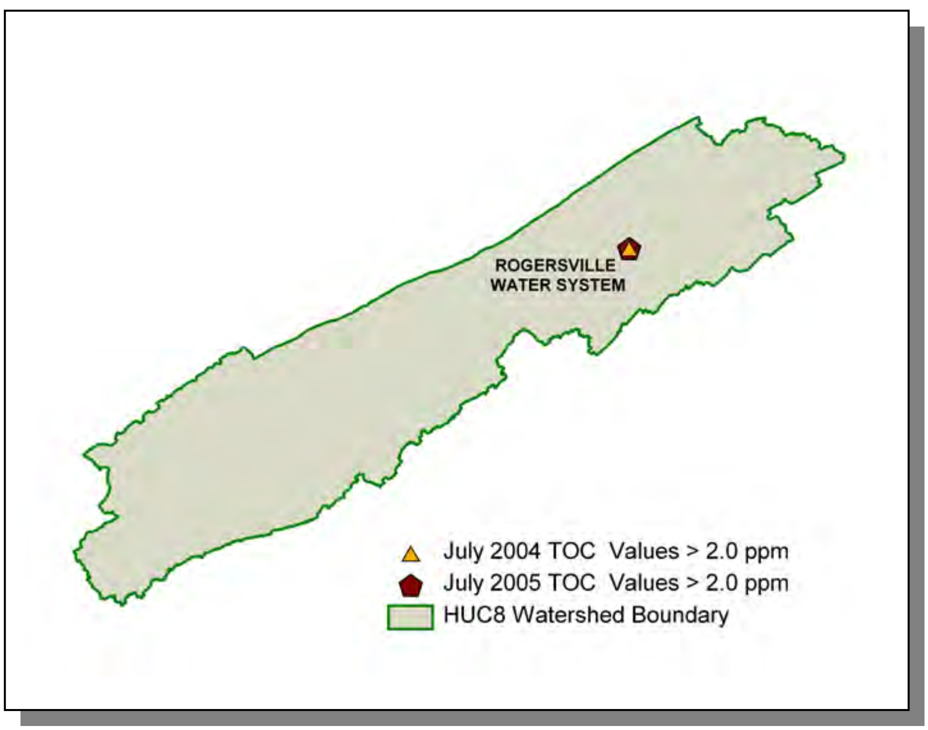

Figure 5-3. July 2004 and 2005 Raw Water Total Organic Carbon (TOC) Analysis in the Holston River Watershed.

For further discussion on ground water issues in Tennessee, the reader is referred to the Ground Water Section of the 305(b) Water Quality Report at: http://www.tdec.net/water.shtml.

5.3.B. State Revolving Fund. TDEC administers the state's Clean Water State Revolving Fund Program. Amendment of the Federal Clean Water Act in 1987 created the Clean Water State Revolving Fund (SRF) Program to provide low-interest loans to cities, counties, and utility districts for the planning, design, and construction of wastewater facilities. The U.S. Environmental Protection Agency awards annual capitalization grants to fund the program and the State of Tennessee provides a twenty-percent funding match. TDEC has awarded loans totaling approximately $550 million since the creation of the SRF Program. SRF loan repayments are returned to the program and used to fund future SRF loans.

SRF loans are available for planning, design, and construction of wastewater facilities, or any combination thereof. Eligible projects include new construction or upgrading/expansion of existing facilities, including wastewater treatment plants, pump stations, force mains, collector sewers, interceptors, elimination of combined sewer overflows, and nonpoint source pollution remedies.

SRF loan applicants must pledge security for loan repayment, agree to adjust user rates as needed to cover debt service and fund depreciation, and maintain financial records that follow governmental accounting standards. SRF loan interest rates range from zero percent to market rate, depending on the community's per-capita income, taxable sales, and taxable property values. Most SRF loan recipients qualify for interest rates between 2 and 4 percent. Interest rates are fixed for the life of the term of the loan. The maximum loan term is 20 years or the design life of the proposed wastewater facility, whichever is shorter.

TDEC maintains a Priority Ranking System and Priority List for funding the planning, design, and construction of wastewater facilities. The Priority Ranking List forms the basis for funding eligibility determinations and allocation of Clean Water SRF loans. Each project's priority rank is generated from specific priority ranking criteria and the proposed project is then placed on the Project Priority List. Only projects identified on the Project Priority List may be eligible for SRF loans. The process of being placed on the Project Priority List must be initiated by a written request from the potential SRF loan recipient or their engineering consultant. SRF loans are awarded to the highest priority projects that have met SRF technical, financial, and administrative requirements and are ready to proceed.

Since SRF loans include federal funds, each project requires development of a Facilities Plan, an environmental review, opportunities for minority and women business participation, a State-approved sewer use ordinance and Plan of Operation, and interim construction inspections.

For further information about Tennessee's Clean Water SRF Loan Program, call (615) 532-0445 or visit their Web site at http://www.tdec.net/srf.

5.3.C. Tennessee Department of Agriculture. The Tennessee Department of Agriculture's Water Resources Section consists of the federal Section 319 Nonpoint Source Program and the Agricultural Resources Conservation Fund Program. Both of these are grant programs which award funds to various agencies, non-profit organizations, and universities that undertake projects to improve the quality of Tennessee's waters and/or educate citizens about the many problems and solutions to water pollution. Both programs fund projects associated with what is commonly known as "nonpoint source pollution."

The Tennessee Department of Agriculture's Nonpoint Source Program (TDA-NPS) has the responsibility for management of the federal Nonpoint Source Program, funded by the US Environmental Protection Agency through the authority of Section 319 of the Clean Water Act. This program was created in 1987 as part of the reauthorization of the Clean Water Act, and it established funding for states, territories and Indian tribes to address NPS pollution. Nonpoint source funding is used for installing Best Management Practices (BMPs) to stop known sources of NPS pollution, training, education, demonstrations and water quality monitoring. The TDA-NPS Program is a non-regulatory program, promoting voluntary, incentive-based solutions to NPS problems. The TDA-NPS Program basically funds three types of programs:

- BMP Implementation Projects. These projects aid in the improvement of an impaired waterbody, or prevent a non-impaired water from becoming listed on the 303(d) List.

- Monitoring Projects. Up to 20% of the available grant funds are used to assist the water quality monitoring efforts in Tennessee streams, both in the state's 5-year watershed monitoring program, and also in performing before-and-after BMP installation, so that water quality improvements can be verified. Some monitoring in the Holston River Watershed was funded under an agreement with the Tennessee Department of Agriculture, Nonpoint Source Program (U.S. Environmental Protection Agency Assistance Agreement C99944674-04-0).

- Educational Projects. The intent of educational projects funded through TDA-NPS is to raise the awareness of landowners and other citizens about practical actions that can be taken to eliminate nonpoint sources of pollution to the waters of Tennessee.

The Tennessee Department of Agriculture Agricultural Resources Conservation Fund Program (TDA-ARCF) provides cost-share assistance to landowners across Tennessee to install BMPs that eliminate agricultural nonpoint source pollution. This assistance is provided through Soil Conservation Districts, Resource Conservation and Development Districts, Watershed Districts, universities, and other groups. Additionally, a portion of the TDA-ARCF is used to implement information and education projects statewide, with the focus on landowners, producers, and managers of Tennessee farms and forests.

Participating contractors in the program are encouraged to develop a watershed emphasis for their individual areas of responsibility, focusing on waters listed on the Tennessee 303(d) List as being impaired by agriculture. Current guidelines for the

TDA-ARCF are available. Landowners can receive up to 75% of the cost of the BMP as a reimbursement.

Since January of 1999, the Department of Agriculture and the Department of Environment and Conservation have had a Memorandum of Agreement whereby complaints received by TDEC concerning agriculture or silviculture projects would be forwarded to TDA for investigation and possible correction. Should TDA be unable to obtain correction, they would assist TDEC in the enforcement against the violator. More information forestry BMPs is available at:

http://www.state.tn.us/agriculture/forestry/bmpmanual.html

The complaint form is available at:

http://www.state.tn.us/environment/wpc/forms/wqlogging_cn1274.doc

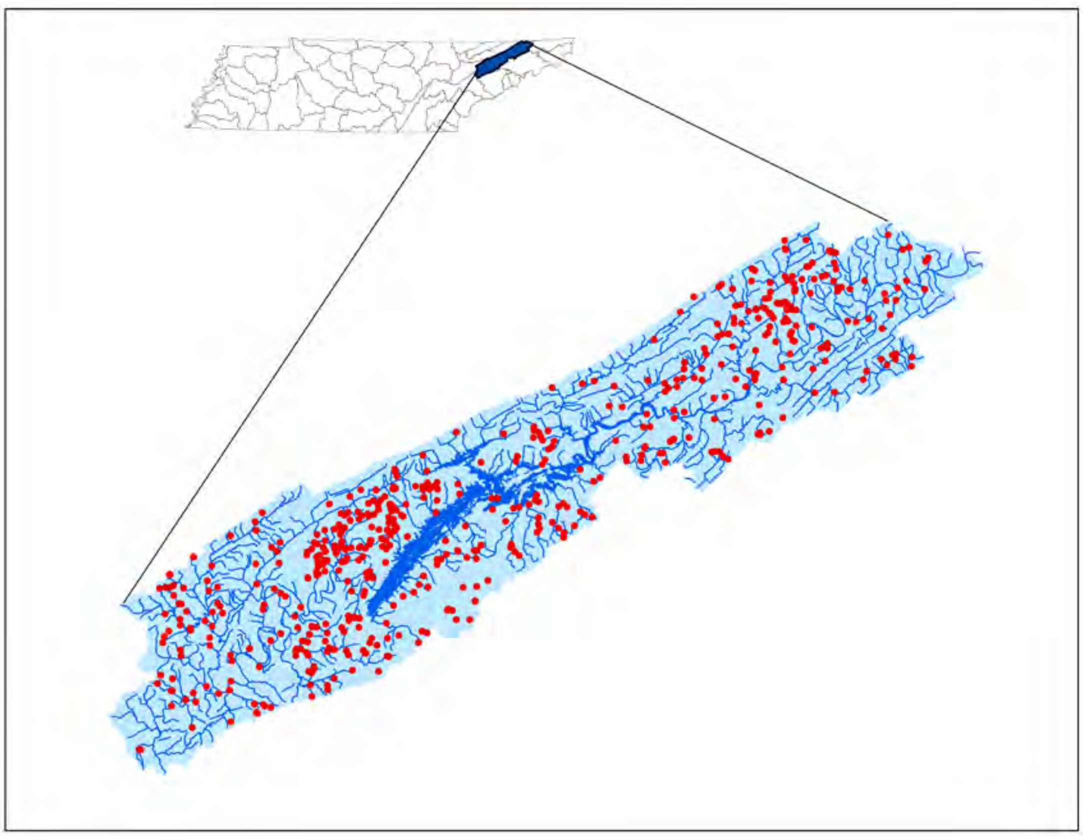

Figure 5-4. Location of BMPs installed from 1999 through 2005 in the Holston River Watershed with Financial Assistance from the Tennessee Department of Agriculture's Nonpoint Source and Agricultural Resources Conservation Fund Grant Programs. *More information is provided in Appendix V.*

5.4. LOCAL INITIATIVES.

5.4.A. Caney Creek Watershed Partnership. *Caney Creek Watershed Partnership* was organized in 2005 to promote environmental quality while involving our community through collaborations between public and private partnerships. Landowners are partnering with the Hawkins County SWCD, TVA, and TDA to plan watershed improvement activities, specifically to implement agricultural BMPs along the creek. Other goals are to increase wildlife in the area; promote/market projects within the community; educate landowners on the common water quality impacts of agriculture; and research/apply on funding for future projects. Meetings are currently held every other month and are open to all interested community members. For more information, please contact Bernice Scalf at (423) 272-0217, ext. 101 or Heather Hamilton at (423) 585-2136.

5.4.B. The Holston River Watershed Alliance. The Holston River Watershed Alliance was formed in March 2000 by TVA and local stakeholders to define a vision for the watershed and to involve key partnerships in a sustainable coalition advancing that vision. Kingsport Tomorrow, a citizen-based action organization, TVA, business and government leaders from Kingsport, Sullivan and Hawkins Counties and the State of Tennessee are active participants in the effort. Recent focus has been on projects to remove impacted waters from the State's list. For information on how to become involved in this partnership effort, contact Sam Jones (Chairman) 423-239-8225 or Susan LaGuardia 423-246-2017, or by email: (slaguardia@kingsporttomorrow.org).

5.4.C. The Smoky Mountain Resource Conservation and Development Council.

COUNCIL OVERVIEW

The Smoky Mountain Resource Conservation and Development (RC&D) Area encompasses both the Smoky Mountains of East Tennessee, as well as parts of the French Broad, Nolichucky, Little Tennessee, and Holston River basins. The counties included in this RC&D area are as follows: Blount, Cocke, Hamblen, Jefferson, Knox, and Sevier. The area includes approximately 1,629,440 acres – including parts of the Great Smoky Mountains National Park and the Cherokee National Forest. The area is bordered by the mountains of North Carolina along the southeast, by Greene County (TN) on the northeast, by the Holston River to the north, and by Anderson, Roane, and Loudon counties to the west. The area has a very diverse lane use and geology. This is a rugged, rural landscape that is dominated by the Appalachian Mountains. The severely dissected ridges and narrow valleys that formed the western frontier of early America continue to influence transportation, commerce, agriculture, and land use.

The population of the six county region is approximately 712,171 according to an estimated figure obtained by the US Census Bureau in 2002. Farming enterprises include beef cattle, tobacco, dairy, poultry, and specialty crops. The vast majority of farmers are part-time within this region. Most jobs are in a variety of service trades (16.7%) and manufacturing facilities (21.3%). The average per capita income for the area in 1999 was $17,970, with the median household income calculated to be $33,460 per year. Unemployment across the area was calculated at a rate of 5.7%.

The Smoky Mountain RC&D Area received its charter in June 1997, as well as successfully obtained its 501(c)3 tax status with the Internal Revenue Service. At this point, the Council consisted of only five counties (Blount, Cocke, Hamblen, Jefferson, and Sevier). The Council's borders were expanded to include Knox County in late 2004.

In addition, the Smoky Mountain RC&D Council has received grants from the USDA Forest Service, Tennessee Department of Agriculture, Tennessee Valley Authority, US Fish & Wildlife Service, Tennessee Arts Commission, and the USDA – Rural Development. The funds generated from these grantors have been (and will be) used to initiate and complete projects that will help to meet the goals and objectives of our council.

MISSION STATEMENT

The mission of the Smoky Mountain RC&D Council and its programs is to empower residents to improve their quality of life through economic and community development while sustaining the natural resources of the area.

COUNCIL GOALS

Goal A: Expand sustainable economic development while conserving the area's natural resources.

Goal B: Promote new and innovative entrepreneurial opportunities to individuals within the RC&D Area.

Goal C: Educate individuals within the area on the importance of clean drinking water, as well as on the value of teaching water quality – in general terms.

Goal D: Reach 25% of the RC&D Area population with educational programs by 2010 which will empower them with the knowledge and desire to improve their quality of life.

In the Holston Watershed we have received funding from the Tennessee Dept. of Agriculture, US Fish and Wildlife and Tennessee Valley Authority. By utilizing these funds we were able to install Best Management Practices such as: Critical Areas, Stream Crossings, Alternative Water Systems, Fencing, and Streambank Restoration (Bio energy materials). All of these funds were used with providing the landowner 75% cost share for their project.

5.4.D. The Nature Conservancy (TNC). The Tennessee State Wildlife Action Plan (SWAP), formerly known as the Comprehensive Wildlife Conservation Strategy (CWCS), was developed by the Tennessee Wildlife Resources Agency with assistance from The Nature Conservancy in 2005. Congress mandated that each state and territory in the United States develop a SWAP as a requirement for continued receipt of federal State Wildlife Grant funding. These plans require the completion of 8 key elements of wildlife planning: 1) a list of animal species of greatest conservation need, 2) information about the distribution and abundance of species targets, 3) locations and relative conditions of key habitats, 4) descriptions of problems affecting target species and their habitats, 5) descriptions of conservation actions and priorities for conserving target species and habitats, 6) details for monitoring target species, conservation actions, and adaptive management, 7) discussion of plans to review the SWAP at specific intervals, and 8) information about coordination and implementation of the SWAP with major stakeholders. In Tennessee, the SWAP was integrated into a spatial model using Geographic Information Systems (GIS) and other database technology. Priority aquatic, terrestrial, and subterranean areas for conservation were identified across the state. Priorities were determined in the GIS model based upon relative differences in species rarity, population viability, and potential mobility of species across habitat units.

Priority problems affecting species and needed conservation actions are detailed across each region of the state. For complete information about the Tennessee SWAP, please visit: http://www.state.tn.us/twra/cwcs/cwcsindex.html to read or download the full report.

Contact:
Chris Bullington
State Conservation Planning Manager
The Nature Conservancy, TN Chapter
2021 21st Avenue South; Suite C-400
Nashville, TN 37212
phone: (615) 383-9909 x 227

CHAPTER 6

RESTORATION STRATEGIES IN THE HOLSTON RIVER WATERSHED

6.1. BACKGROUND.

The Watershed Water Quality Management Plan serves as a comprehensive inventory of resources and stressors in the watershed, a recommendation for control measures, and a guide for planning activities in the next five-year watershed cycle and beyond. Water quality improvement will be a result of implementing both regulatory and nonregulatory programs.

In addition to the NPDES program, some state and federal regulations, such as the TMDL and ARAP programs, address point and nonpoint issues. Construction and MS4 storm water rules (implemented under the NPDES program) have transitioned from Phase 1 to Phase 2. More information on storm water rules may be found at: http://www.state.tn.us/environment/wpc/stormh2o/.

This Chapter addresses point and nonpoint source approaches to water quality problems in the Holston River Watershed.

6.2. COMMENTS FROM PUBLIC MEETINGS. Watershed meetings are open to the public, and most meetings were represented by citizens who live in the watershed, NPDES permitees, business people, farmers, and local river conservation interests. Locations for meetings were chosen after consulting with people who live and work in the watershed. Everyone with an interest in clean water is encouraged to be a part of the public meeting process. The times and locations of watershed meetings are posted at: http://www.state.tn.us/environment/wpc/watershed/public.shtml.

6.2.A. Year 1 Public Meeting. The first Holston River Watershed public meeting was held December 2, 1999 at the Morristown Utility Board. The goals of the meeting were to: (1) present, and review the objectives of, the Watershed Approach, (2) introduce local, state, and federal agency and nongovernmental organization partners, (3) review water quality monitoring strategies, and (4) solicit input from the public.

Major Concerns/Comments

- Sediment
- Unplanned construction
- Failing septic systems
- Straight pipes to river
- Flooding (downstream) due to increased construction
- Cultural bias (green suburban lawns are desirable)

6.2.B. Year 3 Public Meeting. The second Holston River Watershed public meeting was held December 4, 2001 at the Morristown Utilities Building. The goals of the meeting were to: (1) provide an overview of the watershed approach, (2) review the monitoring strategy, (3) summarize the most recent water quality assessment, (4) discuss the TMDL schedule and citizens' role in commenting on draft TMDLs, and (5) discuss BMPs and other nonpoint source tools available through the Tennessee Department of Agriculture 319 Program and NRCS conservation assistance programs.

Major Concerns/Comments

- Various comments concerning the John Sevier steam plant
- Zinc contamination of Mossy Creek
- Turkey Creek, posted for high bacteria counts, is not posted in Miller Park where human contact is likely

6.2.C. Year 5 Public Meeting. The third scheduled Holston River Watershed public meeting was held October 29, 2007 at the Morristown Utility Building. The meeting featured eight educational components:

- Overview of watershed approach flash video
- Benthic macroinvertebrate specimens and interpretation
- SmartBoard™ with interactive GIS maps
- "Is Your Stream Healthy" self-guided slide show
- "Why We Do Biological Sampling" self-guided slide show
- Water supply and ground water protection educational display
- Tennessee Valley Authority educational display
- Water quality and land use maps

In addition, citizens had the opportunity to make formal comments on the draft Watershed Water Quality Management Plan.

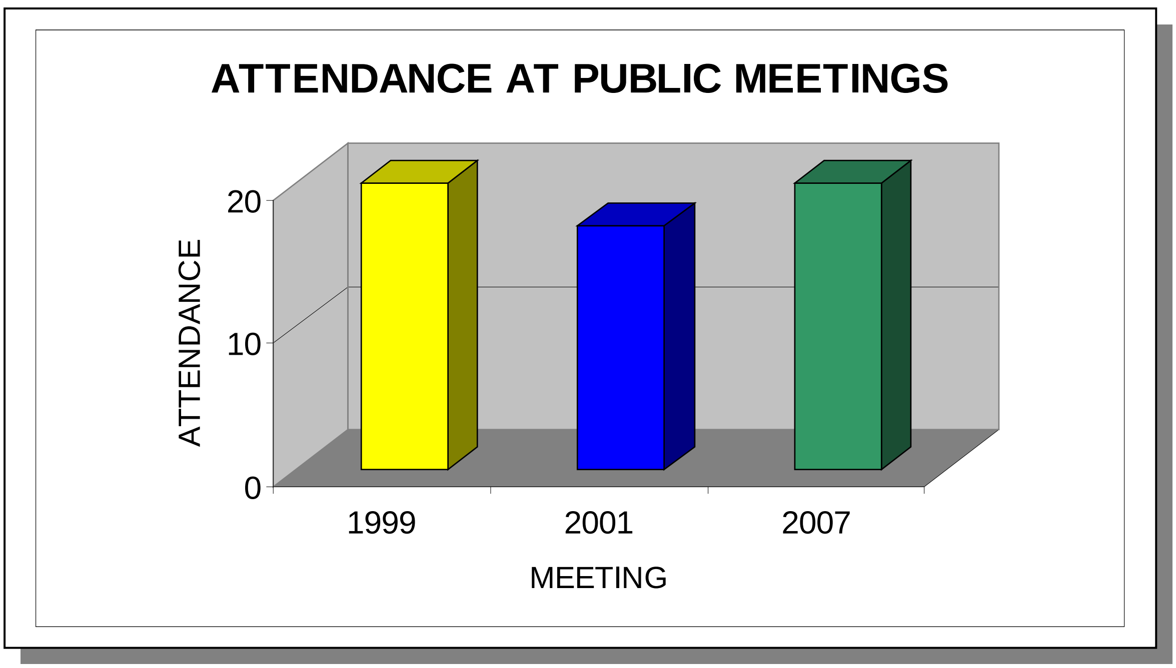

Figure 6-1. Attendance at the Holston River Watershed Public Meetings. *Attendance numbers do not include TDEC personnel.*

Figure 6-2. Watershed Meetings Bring Citizens, Discharge Permit Holders, Universities, Local Interest Groups, NGOs, and Staff Together to Discuss the Condition of the Watershed.

Figure 6-3. At Watershed Meetings, Citizens Learn About Benthic Macroinvertebrates (Small Invertebrates that Live on the Bottom of the Streams) in Their Watershed.

Figure 6-4. The SmartBoard™ is an Effective Interactive Tool to Teach Citizens About the Power of GIS.

Figure 6-5. Networking is a Valuable Outcome of Watershed Meetings. Here, Dr. Mary Ball (Carson-Newman College) Discusses Monitoring Strategies with Citizens.

6.3. APPROACHES USED.

6.3.A. Point Sources. Point source contributions to stream impairment are primarily addressed by NPDES and ARAP permit requirements and compliance with the terms of the permits. Notices of NPDES and ARAP draft permits available for public comment can be viewed at http://www.state.tn.us/environment/wpc/wpcppo/. Discharge monitoring data submitted by NPDES-permitted facilities may be viewed at http://www.epa.gov/enviro/html/pcs/pcs_query_java.html.

The purpose of the TMDL program is to identify remaining sources of pollution and allocate pollution control needs in places where water quality goals are still not being achieved. TMDL studies are tools that allow for a better understanding of load reductions necessary for impaired streams to return to compliance with water quality standards. More information about Tennessee's TMDL program may be found at: http://www.state.tn.us/environment/wpc/tmdl/.

TMDLs are prioritized for development based on many factors.

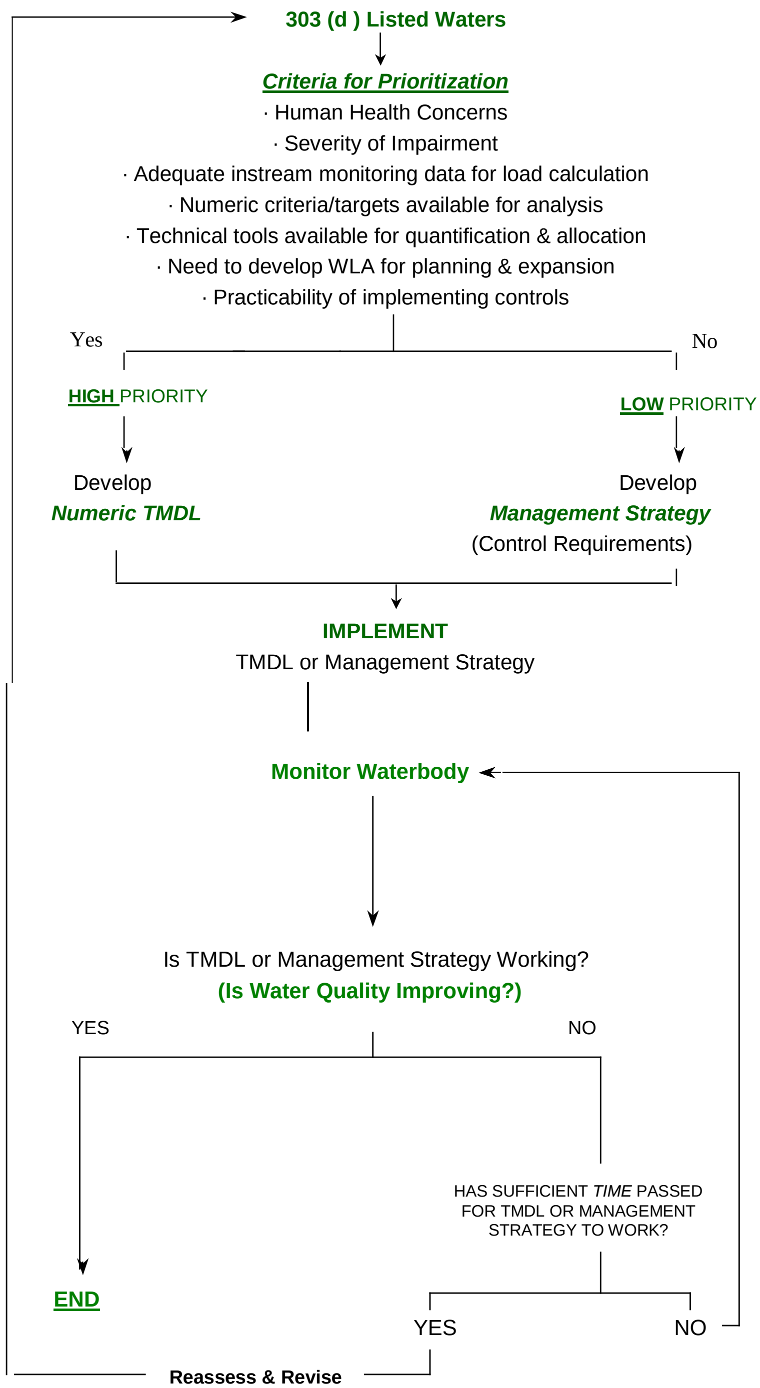

Figure 6-6. Prioritization Scheme for TMDL Development.

6.3.B. Nonpoint Sources

Common nonpoint sources of pollution in the Holston River Watershed include urban storm water runoff, riparian vegetation removal and other habitat alterations, as well as inappropriate land development, road construction, and agricultural practices. Since nonpoint pollution exists essentially everywhere rain falls, existing point source regulations can have only a limited effect. Other measures are, therefore, necessary.

There are several state and federal regulations that address contaminants impacting waters in the Holston River Watershed. Most of these are limited to point sources: a pipe or ditch. Often, controls of point sources are not sufficient to protect waters, so other measures are necessary. Some measures include efforts by landowners and volunteer groups and the possible implementation of new regulations. Many agencies, such as the Tennessee Department of Agriculture (TDA) and the Natural Resources Conservation Service (NRCS), offer financial assistance to landowners for corrective actions (like Best Management Practices) that may be sufficient for recovery of impacted streams. Many nonpoint problems will require an active civic involvement at the local level geared towards establishment of improved zoning guidelines, building codes, streamside buffer zones and greenways, and general landowner education.

The following text describes types of impairments, possible causes, and suggested improvement measures. Restoration efforts should not be limited to only those streams and measures suggested below.

6.3.B.i. Sedimentation.

6.3.B.i.a. From Construction Sites. Construction activities have historically been considered "nonpoint sources." In the late 1980's, EPA designated them as being subject to NPDES regulation if more than 5 acres were being disturbed. In the spring of 2003, that threshold became 1 acre. The general permit issued for such construction sites establishes conditions for maintenance of the sites to minimize pollution from storm water runoff, including requirements for installation and inspection of erosion prevention and sediment controls. Also, the general permit imposes more stringent inspection, design criteria, sediment control measures, and self-monitoring requirements on sites in the watershed of streams that are already impaired due to sedimentation or are considered high quality. Regardless of the size, no construction site is allowed to cause a condition of pollution. Examples of streams impaired by sediment and land development in the Holston River Watershed are Love Creek and Roseberry Creek (in the Knoxville area), Turkey Creek (in the Morristown area), Swanpond Creek (in Strawberry Plains), and Arnott and Alexander Creeks.

Beginning in 2003, the state began requiring some municipalities to obtain coverage under a permit designed to address nonpoint runoff issues: the General NPDES Municipal Separate Storm Sewer System Permit, commonly known as MS4. This permit requires the holder to develop a comprehensive storm water management program, including the adoption of local regulatory ordinances, regular inspection of construction sites and other discharges into their storm sewers, and a variety of educational, mapping, and monitoring activities. The state audits and oversees these local MS4 programs.

Construction sites within a sediment-impaired watershed may also have higher priority for inspections by WPC and MS4 personnel, and are likely to have enforcement actions for failure to control erosion.

6.3.B.i.b. From Channel and/or Bank Erosion. Many streams within the Holston River Watershed suffer from varying degrees of streambank erosion. When steam channels are altered, banks can become unstable and highly erodable. Heavy livestock traffic can also severely disturb banks. When large tracts of land are cleared of vegetation (especially trees) and replaced with impermeable surfaces like asphalt and rooftops, the large increases in the velocities and volumes of storm water runoff can also overwhelm channel and bank integrity because destabilized banks contribute to sediment loadings and to the loss of beneficial riparian vegetation.

Some inappropriate agricultural practices and overzealous land development have impacted the hydrology and morphology of stream channels in this watershed, although none severely enough to cause a loss of use impairment at this time.

Several agencies such as the NRCS and TDA, as well as citizen watershed groups, are working to stabilize portions of stream banks using bioengineering and other techniques. Many of the affected streams, (like Lost Creek, and Beaver Creek in Jefferson County, and Stock Creek), could benefit from these types of projects.

Some methods or controls that might be necessary to address common problems are:

Voluntary Activities

- Re-establish bank vegetation (Lost Creek, Bradley Creek, Stock Creek, and Flat Creek).
- Establish off-channel watering areas for livestock by moving watering troughs and feeders back from stream banks, or at least limit cattle access to restricted areas with armored bank entry (Stanley Creek, Hord Creek, Lost Creek, Caney Creek, and Beaver Creek).
- Limit cattle access to streams and bank vegetation (Surgoinsville Creek, Renfroe Creek, and Little Flat Creek).

Regulatory Strategies

- Increase efforts in the Master Logger program to recognize impaired streams and require more effective management practices.
- Require post-construction run-off rates to be no greater than pre-construction rates in order to avoid in-channel erosion (all MS4 areas should establish these ordinances).
- Encourage or require strong local buffer ordinances.
- Implement additional restrictions on logging in streamside management zones.
- Limit clearing of stream and ditch banks or other alterations (Smith Creek). *Note: Permits may be required for any work along streams.*

- Limit road and utility crossings of streams through better site design.
- Restrict the use of off-highway vehicles on stream banks and in stream channels.

Additional Strategies

- Better community planning and MS4 oversight for the impacts of development on small streams, especially development in growing areas (Turkey Creek in Morristown, Roseberry Creek in Knox County, Bradley Creek in Church Hill, Big Creek in Rogersville, and Flat Creek in Union and Knox Counties).

6.3.B.i.c. From Agriculture and Silviculture. The Water Quality Control Act exempts normal agricultural and silvicultural practices that do not result in a point source discharge. Nevertheless, efforts are being made to address impacts due to these exempted practices.

The Master Logger Program has been in place for several years to train loggers how to install Best Management Practices that lessen the impact of logging activities on streams. Recently, laws and regulations established the authority for the Commissioners of the Departments of Environment and Conservation and of Agriculture to stop the logging operation that, upon failing to install these BMPs, is causing impacts to streams.

Since the Dust Bowl era, the agriculture community has strived to protect the soil from wind and water erosion. Agencies such as the Natural resources Conservation Service (NRCS), the University of Tennessee Agricultural Extension Service, and the Tennessee Department of Agriculture are striving to identify better ways of farming, to educate the farmers, and to install the methods that address the sources of some of the impacts due to agriculture. Cost sharing is available for many of these measures.

Many sediment problems traceable to agricultural practices also involve riparian loss due to close row cropping or pasture clearing for grazing. Lack of vegetated buffers along stream corridors is a significant problem throughout the Holston River Watershed, due both to agricultural and residential/commercial land uses. Impacted streams that could benefit from the establishment of more extensive riparian buffer zones include Stanley Creek, Lost Creek, Beaver Creek, Flat Creek, Little Flat Creek, Caney Creek, Stock Creek, Alexander Creek, and Mossy Creek.

6.3.B.ii. Pathogen Contamination.

Possible sources of pathogens in streams are inadequate or failing septic tank systems, overflows or breaks in public sewer collection systems, poorly disinfected discharges from sewage treatment plants, and fecal matter from pets, livestock and wildlife washed into streams and storm drains. When fecal bacterial levels are shown to be consistently elevated to dangerously high levels, especially in streams with high potential for recreational uses, the division must post signage along the creek warning the public to avoid contact. Once pathogen sources have been identified and corrected, and pathogen level reductions are documented, the posting is lifted.

Permits issued by the Division of Water Pollution Control regulate discharges from point sources and require adequate control for these sources. Individual homes are required to have subsurface, on-site treatment (i.e., septic tank and field lines) if public sewers are not available. The Division of Ground Water Protection within the Knoxville and Johnson City Environmental Field Offices and delegated county health departments regulate septic tanks and field lines. In addition to discharges to surface waters, businesses may employ subsurface treatment for domestic wastewater or surface discharge of treated process wastewater. The Division of Water Pollution Control regulates surface water discharges and near-surface land application of treated wastewater.

Currently, 22 stream systems in the Holston River Watershed are known to have excessive pathogen contamination, Turkey Creek (Morristown), Mossy Creek (Jefferson City), Holston River (Church Hill), Arnott Creek, Alexander Creek, Crockett Creek, and Swanpond Creek (Strawberry Plains) are impacted by urban areas, with contributions of bacterial contamination coming from storm water runoff, sewage collection system leaks, and treatment plant operation failures. Many streams in agricultural watersheds show elevated bacterial levels, including Bradley Creek, Renfroe Creek, Forgey Creek, Fisher Creek, Lost Creek, Beaver Creek, Richland Creek, Flat Creek, and Little Flat Creek.

Voluntary Activities

- Clean up pet waste.
- Repair failed septic systems.
- Establish off-channel watering of livestock.
- Limit livestock access to streams and restrict stream crossings.
- Improve and educate on the proper management of animal waste from confined feeding operations.

Regulatory Strategies

- Strengthen enforcement of regulations governing on-site wastewater treatment.
- Determine timely and appropriate enforcement for non-complying sewage treatment plants, large and small, and their collection systems.
- Identify Concentrated Animal Feeding Operations not currently permitted.
- Review the pathogen limits in discharge permits to determine the need for further restriction.
- Develop and enforce leash laws and controls on pet fecal material.

Additional Strategies

- Develop intensive planning in areas where sewer is not available and treatment by subsurface disposal is not an option due to poor soils, floodplains, or high water tables.
- Greater efforts by sewer utilities to identify leaking lines or overflowing manholes

6.3.B.iii. Excessive Nutrients and/or Dissolved Oxygen Depletion.

These two impacts are usually listed together because high nutrients often contribute to low dissolved oxygen within a stream. Since nutrients often have the same source as pathogens, the measures previously listed can also address many of these problems. Elevated nutrient loadings are also often associated with urban runoff from impervious surfaces, from fertilized lawns and croplands, and faulty sewage disposal processes. Nutrients are often transported with sediment, so many of the measures designed to reduce sediment runoff will also aid in preventing organic enrichment of streams and lakes.

Dissolved oxygen depletion can also be due to the discharge of other biodegradable materials. These are limited in NPDES permits as ammonia and as either Biological Oxygen Demand (BOD) or Carbonaceous Oxygen Demand (CBOD).

Some sources of nutrients can be addressed by:

Voluntary Activities

- Educate homeowners and lawn care companies in the proper application of fertilizers.
- Encourage landowners, developers, and builders to leave stream buffer zones. Streamside vegetation can filter out many nutrients and other pollutants before they reach the stream. These riparian buffers are also vital along livestock pastures. Examples of streams that could benefit are Lost Creek, Bradley Creek, Arnott Creek, Alexander Creek, and Beaver Creek.
- Use grassed drainage ways that can remove fertilizer before it enters streams.
- Use native plants for landscaping since they don't require as much fertilizer and water.
- Develop better overall storm water management in urban and residential areas, including retrofitting existing commercial lots, homes, and roadways with storm water quality and quantity BMPs. This would especially improve the urban streams and lakes currently polluted by excessive nutrient inputs.

Physical changes to streams can prevent them from providing enough oxygen to biodegrade the materials that are naturally present. A few additional actions can address this problem:

- Maintain shade over a stream. Cooler water can hold more oxygen and retard the growth of algae. As a general rule, all stream channels suffer from some canopy removal. An intact riparian zone also acts as a buffer to filter out nutrient loads before they enter the water.
- Discourage impoundments. Ponds and lakes do not aerate water. *Note: Permits may be required for any work on a stream, including impoundments.*
- Strengthen enforcement of regulations governing on-site wastewater treatment.
- Impose more stringent permit limits for nutrients discharged from sewage treatment plants (Bradley Creek, Arnott Branch).

- Impose timely and appropriate enforcement for noncomplying sewage treatment plants, large and small, and their collection systems (Mossy Creek, Holston River).
- Identify Concentrated Animal Feeding Operations (CAFO) not currently permitted.
- Identify any Animal Feeding Operations (AFO) that contribute to stream impacts and declare them as a CAFO requiring a permit.
- Support and train local MS4 programs within municipalities to deal with storm water pollution issues and require additional storm runoff quality control measures.
- Require nutrient management plans for all golf courses.

Additional Strategies.

- Encourage TDA- and NRCS-sponsored educational programs targeted to agricultural landowners and aimed at better nutrient management, as well as information on technology-based application tools.

6.3.B.iv. Toxins and Other Materials.

Although some toxic substances are discharged directly into waters of the state from a point source, much of these materials are washed in during rainfalls from an upland location, or via improper waste disposal that contaminates groundwater. In the Holston River Watershed, a relatively small number of streams are damaged by storm water runoff from industrial facilities or urban areas. More stringent inspection and regulation of permitted industrial facilities, and local storm water quality initiatives and regulations, could help reduce the amount of contaminated runoff reaching state waters. Examples of streams that could benefit from these measures include Love Creek in Knoxville and Turkey Creek in Morristown.

Individuals may also cause contaminants to enter streams by activities that may be attributed to apathy or the lack of knowledge or civility. Litter in roadside ditches, garbage bags tossed over bridge railings, paint brushes washed off over storm drains, and oil drained into ditches are all blatant examples of pollution in streams. To lessen the future impact to the waters of the state, each community can strive to raise its awareness for better conservation practices and prosecution of violators.

Some of these problems can be addressed by:

Voluntary Activities

- Provide public education.
- Paint warnings on storm drains that connect to a stream.
- Sponsor community clean-up days.
- Landscape public areas.
- Encourage public surveillance of their streams and reporting of dumping activities to their local authorities.

Regulatory Strategies.

- Continue to prohibit illicit discharges to storm drains and to search them out.
- Strengthen litter law enforcement at the local level.
- Increase the restrictions on storm water runoff from industrial facilities.

6.3.B.v. Habitat Alteration.

The alteration of the habitat within a stream can have severe consequences. Whether it is the removal of the vegetation providing a root system network for holding soil particles together, the release of sediment, which increases the bed load and covers benthic life and fish eggs, the removal of gravel bars, "cleaning out" creeks with heavy equipment, or the impounding of the water in ponds and lakes, many alterations impair the use of the stream for designated uses. Habitat alteration also includes the draining or filling of wetlands.

One large-scale stream habitat alteration that has created serious, long-term impacts is TVA's Fort Patrick Henry Dam, which impounds the main tributary to the Holston River, the South Fork Holston River. The dam causes unnatural temperature and flow fluctuations downstream.

Although large-scale public projects such as highway construction can alter significant portions of streams, individual landowners and developers are responsible for the vast majority of stream alterations.

Some measures that can help address these problems are:

Voluntary Activities

- Sponsor litter pickup days to remove litter that might enter streams
- Organize stream cleanups removing trash, limbs and debris before they cause blockage.
- Avoid use of heavy equipment to "clean out" streams. Instream work other than debris removal will require an Aquatic Resource Alteration Permit (ARAP).
- Plant native vegetation along streams to stabilize banks and provide habitat.
- Encourage developers to avoid extensive use of culverts in streams.

Regulatory Strategies

- Restrict modification of streams by means such as culverting, lining, or impounding.
- Require mitigation for impacts to streams and wetlands when modifications are allowed.
- Require permitting of all rock harvesting operations.
- Increased enforcement may be needed when violations of current regulations occur, especially for illicit gravel dredging.

6.3.B.vi. Acid Rock Drainage (ARD).

Another source of pollution comes from abandoned and active mines as well as the disturbance of strata containing certain sulphide minerals such as those containing pyrite. Fore example, roads cuts through certain types of rock layers can also contribute to the pollution of waters of the state. These streams are impacted by ARD, which causes the pH to drop to below 6.0.

Streams may be impacted by chemical reactions that result in orange flocculant material in the water and on the bottom of streams. Seeps may develop an oily film on the surface of the water. The orange color comes from the iron in the water precipitating out when the water reaches the surface and starts to oxidize. Once the iron has precipitated out, other metals will start to precipitate, like manganese and aluminum (manganese forms a hard black coating on the substrate and aluminum a fine white chalky layer). An example of a river affected by ARD in the Holston River Watershed is a lower reach of the Holston River near the Cherokee Lake impoundment of Briar Fork.

The means necessary to remove ARD from these streams is complicated and expensive. There are two types of treatment systems, Passive Treatment and Active Treatment. Two examples of Passive Treatment facilities are anoxic limestone drains and constructed wetlands (alone or in some combination lined with limestone rock). These systems are used to precipitate the flocculants and stabilize the pH. Active Treatment systems collect the water at the source and actively drop neutralizing chemicals into the water in order to stabilize the pH and precipitate iron prior to discharging to a stream. Since these treatment systems will have to go on for many years, the most cost effective means to treat these streams is by Passive Treatment. In order to install these systems the landowners, stakeholders and Office of Surface Mining all have to work together.

Some of these problems can be addressed by:

Voluntary Activities
- Provide public education.
- Get stakeholders involved in the construction and maintenance of the wetlands.

Regulatory Strategies
- Mining (and some TDOT) activities covered by an NPDES or ARAP permit should have a longer period of post-termination monitoring and remediation as a requirement of permit issuance.

6.3.B.vii. Storm Water.

MS4 discharges are regulated through the Phase I or II NPDES-MS4 permits. These permits require the development and implementation of a Storm Water Management Program (SWMP) that will reduce the discharge of pollutants to the maximum extent practicable and not cause or contribute to violations of state water quality standards. The

NPDES General Permit for Discharges from Phase I and II MSF facilities can be found at:

http://www.state.tn.us/environment/wpc/stormh2o/.

For discharges into impaired waters, the MS4 General Permit requires that SWMPs include a section describing how discharges of pollutants of concern will be controlled to ensure that they do not cause or contribute to instream exceedances of water quality standards. Specific measurements and BMPs to control pollutants of concern must also be identified. In addition, MS4s must implement the proposed waste load allocation provisions of an applicable TMDL (i.e., siltation/habitat alteration, pathogens) and describe methods to evaluate whether storm water controls are adequate to meet the waste load allocation. In order to evaluate SWMP effectiveness and demonstrate compliance with specified waste load allocations, MS4s must develop and implement appropriate monitoring programs.

Some storm sewer discharges are not regulated through the NPDES MS4 program. Strategies to address runoff within these urban areas include adapting Tennessee Growth Readiness Program (TGRP) educational materials to the watershed. TGRP is a statewide program built on existing best management practices from the Nonpoint Education for Municipal Officials program and the Center for Watershed Protection. TGRP developed the program to provide communities and counties with tools to design economically viable and watershed friendly developments. The program assists community leaders in reviewing current land use practices, determining impacts of imperviousness on watershed functions, and allowing them to understand the economics of good watershed management and site design.

6.4. PERMIT REISSUANCE PLANNING

Under the *Tennessee Water Quality Control Act*, municipal, industrial and other dischargers of wastewater must obtain a permit from the Division. Approximately 1,700 permits have been issued in Tennessee under the federally delegated National Pollutant Discharge Elimination System (NPDES). These permits establish pollution control and monitoring requirements based on protection of designated uses through implementation of water quality standards and other applicable state and federal rules.

The following three sections provide specific information on municipal, industrial, and water treatment plant active permit holders in the Holston River Watershed. Compliance information was obtained from EPA's Permit Compliance System (PCS). All data was queried for a five-year period between August 1, 2002 and July 31, 2007. PCS can be accessed publicly through EPA's Envirofacts website. This website provides access to several EPA databases to provide the public with information about environmental activities that may affect air, water, and land anywhere in the United States:

http://www.epa.gov/enviro/html/ef_overview.html

Stream Segment information, including designated uses and impairments, are described in detail in Chapter 3, *Water Quality Assessment of the Holston River Watershed.*

6.4.A. Municipal Permits

TN0021253 Church Hill STP

Discharger rating: Major
City: Church Hill
County: Hawkins
EFO Name: Johnson City
Issuance Date: 6/1/04
Expiration Date: 4/30/09
Receiving Stream(s): Holston River at mile 136.5
HUC-12: 060101040101
Effluent Summary: Treated domestic, commercial, and industrial wastewaters.
Treatment system: Waste Activated Sludge (WAS) to aerobic digester to belt press to land application.

Segment	TN06010104011_2000
Name	Holston River
Size	23.9
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Industrial Water Supply (Supporting), Fish and Aquatic Life (Supporting), Recreation (Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting), Domestic Water Supply (Supporting)
Causes	N/A
Sources	N/A

Table 6-1. Stream Segment Information for Church Hill STP.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
48hr LC50: Ceriodaphnia Dubia	All Year	2.1	Percent	DMin Conc	Quarterly	Grab	Effluent
48hr LC50: Fathead Minnows	All Year	2.1	Percent	DMin Conc	Quarterly	Grab	Effluent
Ammonia as N (Total)	All Year	25	mg/L	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	All Year	417	lb/day	DMax Load	3/Week	Composite	Effluent
Ammonia as N (Total)	All Year	20	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	All Year	15	mg/L	WAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	All Year	313	lb/day	MAvg Load	3/Week	Composite	Effluent
CBOD % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	% Removal
CBOD % Removal	All Year	85	Percent	MAvg % Removal	3/Week	Calculated	% Removal
CBOD5	All Year	40	mg/L	DMax Conc	3/Week	Composite	Effluent
CBOD5	All Year	35	mg/L	MAvg Conc	3/Week	Composite	Effluent
CBOD5	All Year	521	lb/day	MAvg Load	3/Week	Composite	Effluent
CBOD5	All Year	25	mg/L	DMin Conc	3/Week	Composite	Effluent
CBOD5	All Year	730	lb/day	DMax Load	3/Week	Composite	Effluent
D.O.	All Year	1	mg/L	DMin Conc	Weekdays	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	3/Week	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	3/Week	Composite	Effluent
TSS	All Year	45	mg/L	DMax Conc	3/Week	Composite	Effluent
TSS	All Year	834	lb/day	DMax Load	3/Week	Composite	Effluent
TSS	All Year	30	mg/L	WAvg Conc	3/Week	Composite	Effluent
TSS	All Year	626	lb/day	MAvg Load	3/Week	Composite	Effluent
TSS	All Year	40	mg/L	MAvg Conc	3/Week	Composite	Effluent
TSS % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	% Removal
TSS % Removal	All Year	85	Percent	MAvg % Removal	3/Week	Calculated	% Removal
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-2. Permit Limits for Church Hill STP.

Compliance History:
The following numbers of exceedences were noted in PCS:

1 Total Suspended Solids
1 Ammonia

Comments:
5/12/06 Technical Review Visit and file review: In compliance

TN0059846 Grainger County Industrial Park STP

Discharger rating:	Minor
City:	Rutledge
County:	Grainger
EFO Name:	Knoxville
Issuance Date:	11/28/04
Expiration Date:	10/27/09
Receiving Stream(s):	Unnamed tributary at mile 0.4 to Shields Creek at mile 2.4
HUC-12:	060101040208
Effluent Summary:	Treated municipal wastewater from Outfall 001
Treatment system:	Will be connecting to Bean Station WWTP

Segment	TN06010104004T_0300
Name	Shields Creek
Size	3
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Fish and Aquatic Life (Supporting), Recreation (Not Assessed), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	N/A
Sources	N/A

Table 6-3. Stream Segment Information for Grainger County Industrial Park STP.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	Summer	4	mg/L	DMax Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	Summer	2	mg/L	MAvg Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	Summer	0.75	lb/day	MAvg Load	2/Month	Grab	Effluent
Ammonia as N (Total)	Summer	1.13	lb/day	WAvg Load	2/Month	Grab	Effluent
Ammonia as N (Total)	Summer	3	mg/L	WAvg Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	Winter	1.88	lb/day	MAvg Load	2/Month	Grab	Effluent
Ammonia as N (Total)	Winter	10	mg/L	DMax Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	Winter	5	mg/L	MAvg Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	Winter	7.5	mg/L	WAvg Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	Winter	2.82	lb/day	WAvg Load	2/Month	Grab	Effluent
CBOD % Removal	All Year	40	Percent	DMin % Removal	2/Month	Calculated	% Removal
CBOD % Removal	All Year	85	Percent	MAvg % Removal	2/Month	Calculated	% Removal
CBOD5	All Year	20	mg/L	DMax Conc	2/Month	Grab	Effluent
CBOD5	All Year		mg/L	DMax Conc	2/Month	Grab	Influent (Raw Sewage)
CBOD5	All Year	3.75	lb/day	MAvg Load	2/Month	Grab	Effluent
CBOD5	All Year	5.63	lb/day	WAvg Load	2/Month	Grab	Effluent
CBOD5	All Year	15	mg/L	WAvg Conc	2/Month	Grab	Effluent
CBOD5	All Year		mg/L	MAvg Conc	2/Month	Grab	Influent (Raw Sewage)
CBOD5	All Year	10	mg/L	MAvg Conc	2/Month	Grab	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Conc	Monthly	Calculated	Effluent
Flow	All Year		MGD	DMax Load	Weekdays	Instantaneous	Effluent
Flow	All Year		MGD	MAvg Load	Weekdays	Instantaneous	Influent (Raw Sewage)
Flow	All Year		MGD	MAvg Load	Weekdays	Instantaneous	Effluent
Flow	All Year		MGD	DMax Load	Weekdays	Instantaneous	Influent (Raw Sewage)
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Week	Grab	Effluent
TRC	All Year	0.18	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	2/Month	Grab	Effluent
TSS	All Year		mg/L	DMax Conc	2/Month	Grab	Influent (Raw Sewage)
TSS	All Year	30	mg/L	MAvg Conc	2/Month	Grab	Effluent
TSS	All Year	11.25	lb/day	MAvg Load	2/Month	Grab	Effluent
TSS	All Year	15	lb/day	WAvg Load	2/Month	Grab	Effluent
TSS	All Year	40	mg/L	WAvg Conc	2/Month	Grab	Effluent
TSS	All Year		mg/L	MAvg Conc	2/Month	Grab	Influent (Raw Sewage)
TSS % Removal	All Year	40	Percent	DMin % Removal	2/Month	Calculated	Effluent
TSS % Removal	All Year	85	Percent	MAvg % Removal	2/Month	Calculated	% Removal
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-4. Permit Limits for Grainger County Industrial Park STP.

Compliance History:
The following numbers of exceedences were noted in PCS:

1 Total Chlorine

Comments:
None.

TN0054623 Cherokee Comprehensive High School

Discharger rating:	Minor
City:	Rogersville
County:	Hawkins
EFO Name:	Johnson City
Issuance Date:	2/1/05
Expiration Date:	12/30/09
Receiving Stream(s):	Unnamed tributary at mile 0.9 to Robertson Creek at mile 0.8
HUC-12:	060101040202
Effluent Summary:	Treated domestic wastewater from Outfall 001
Treatment system:	Activated sludge

Segment	TN06010104004T_1500
Name	Robertson Creek
Size	28.2
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Fish and Aquatic Life (Supporting), Recreation (Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	N/A
Sources	N/A

Table 6-5. Stream Segment Information for Cherokee Comprehensive High School.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	All Year	10	mg/L	DMax Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	All Year	5	mg/L	MAvg Conc	2/Month	Grab	Effluent
CBOD5	All Year	20	mg/L	DMax Conc	2/Month	Grab	Effluent
CBOD5	All Year	10	mg/L	MAvg Conc	2/Month	Grab	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	941	#/100mL	DMax Conc	2/Month	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Conc	2/Month	Grab	Effluent
Flow	All Year		MGD	DMax Load	Weekdays	Grab	Effluent
Flow	All Year		MGD	MAvg Load	Weekdays	Grab	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Week	Grab	Effluent
TRC	All Year	0.5	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	2/Month	Grab	Effluent
TSS	All Year	30	mg/L	MAvg Conc	2/Month	Grab	Effluent
pH	All Year	8.5	SU	DMax Conc	2/Week	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	2/Week	Grab	Effluent

Table 6-6. Permit Limits for Cherokee Comprehensive High School.

Comments:
None.

TN0055590 Keplar Elementary School

Discharger rating:	Minor
City:	Rogersville
County:	Hawkins
EFO Name:	Johnson City
Issuance Date:	1/1/05
Expiration Date:	11/30/09
Receiving Stream(s):	Beech Creek at mile 6.2
HUC-12:	060101040103
Effluent Summary:	Treated domestic wastewater from Outfall 001
Treatment system:	Septic tank, recirculating sand filter

Segment	TN06010104012_1000
Name	Beech Creek
Size	19.1
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Fish and Aquatic Life (Supporting), Recreation (Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	N/A
Sources	N/A

Table 6-7. Stream Segment Information for Keplar Elementary School.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
BOD5	All Year	45	mg/L	DMax Conc	Monthly	Grab	Effluent
BOD5	All Year	30	mg/L	MAvg Conc	Monthly	Grab	Effluent
D.O.	All Year	1	mg/L	DMin Conc	2/Week	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Ari Mean	Monthly	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	Monthly	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Ari Mean	Monthly	Grab	Effluent
Flow	All Year		MGD	DMax Load	Weekdays	Instantaneous	Effluent
Flow	All Year		MGD	MAvg Load	Weekdays	Instantaneous	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Week	Grab	Effluent
TRC	All Year	2	mg/L	DMax Conc	2/Week	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	Monthly	Grab	Effluent
TSS	All Year	30	mg/L	MAvg Conc	Monthly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	2/Week	Grab	Effluent
pH	All Year	6	SU	DMin Conc	2/Week	Grab	Effluent

Table 6-8. Permit Limits for Keplar Elementary School.

Comments:
None.

TN0055603 Mooresburg Elementary School

Discharger rating:	Minor
City:	Mooresburg
County:	Hawkins
EFO Name:	Johnson City
Issuance Date:	5/1/05
Expiration Date:	3/31/09
Receiving Stream(s):	Mooresburg Branch at mile 1.4
HUC-12:	060101040205
Effluent Summary:	Treated municipal wastewater from Outfall 001
Treatment system:	Septic tank, recirculating sand filter and UV disinfection

Segment	TN06010104004T_0999
Name	Misc Tribs to Cherokee Reservoir
Size	94.4
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Fish and Aquatic Life (Not Assessed), Recreation (Not Assessed), Irrigation (Not Assessed), Livestock Watering and Wildlife (Not Assessed)
Causes	N/A
Sources	N/A

Table 6-9. Stream Segment Information for Mooresburg Elementary School.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	All Year	10	mg/L	DMax Conc	Monthly	Grab	Effluent
Ammonia as N (Total)	All Year	5	mg/L	MAvg Conc	Monthly	Grab	Effluent
CBOD5	All Year	40	mg/L	DMax Conc	Monthly	Grab	Effluent
CBOD5	All Year	25	mg/L	MAvg Conc	Monthly	Grab	Effluent
D.O.	All Year	1	mg/L	DMin Conc	2/Week	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	Monthly	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	Monthly	Grab	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Week	Grab	Effluent
TRC	All Year	0.5	mg/L	DMax Conc	2/Week	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	Monthly	Grab	Effluent
TSS	All Year	30	mg/L	MAvg Conc	Monthly	Grab	Effluent
pH	All Year	8.5	SU	DMax Conc	2/Week	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	2/Week	Grab	Effluent

Table 6-10. Permit Limits for Mooresburg Elementary School.

Comments:
None.

TN0062057 Mount Carmel STP

Discharger rating:	Minor
City:	Mount Carmel
County:	Hawkins
EFO Name:	Johnson City
Issuance Date:	9/1/06
Expiration Date:	8/31/09
Receiving Stream(s):	Holston mile 137.5
HUC-12:	060101040101
Effluent Summary:	Treated municipal wastewater from Outfall 001
Treatment system:	Waste Activated Sludge to aerobic digester to land application or to dry bed to land application

Segment	TN06010104011_2000
Name	Holston River
Size	23.9
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Industrial Water Supply (Supporting), Fish and Aquatic Life (Supporting), Recreation (Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting), Domestic Water Supply (Supporting)
Causes	N/A
Sources	N/A

Table 6-11. Stream Segment Information for Mount Carmel STP.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
BOD % removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	% Removal
BOD % removal	All Year	85	Percent	MAvg % Removal	3/Week	Calculated	% Removal
BOD5	All Year	45	mg/L	DMax Conc	3/Week	Composite	Effluent
BOD5	All Year	158	lb/day	WAvg Load	3/Week	Composite	Effluent
BOD5	All Year	40	mg/L	WAvg Conc	3/Week	Composite	Effluent
BOD5	All Year	119	lb/day	MAvg Load	3/Week	Composite	Effluent
BOD5	All Year	30	mg/L	MAvg Conc	3/Week	Composite	Effluent
Bypass of Treatment (occurrences)	All Year		Occurences/Month	Mavg Load	Continuous	Visual	
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	941	#/100mL	DMax Conc	3/Week	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Effluent
Flow	All Year		MGD	DMax Load	Daily	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	DMax Load	Daily	Continuous	Effluent
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Non Wet Weather
Settleable Solids	All Year	1	mL/L	DMax Conc	3/Week	Composite	Effluent
TRC	All Year	2	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	3/Week	Composite	Effluent
TSS	All Year	119	lb/day	MAvg Load	3/Week	Composite	Effluent
TSS	All Year	158	lb/day	WAvg Load	3/Week	Composite	Effluent
TSS	All Year	40	mg/L	WAvg Conc	3/Week	Composite	Effluent
TSS	All Year	30	mg/L	MAvg Conc	3/Week	Composite	Effluent
TSS % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	% Removal
TSS % Removal	All Year	85	Percent	MAvg % Removal	3/Week	Calculated	% Removal
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-12. Permit Limits for Mount Carmel STP.

Compliance History:
The following numbers of exceedences were noted in PCS:

9 Overflows
1 Bypass
4 Total Chlorine
6 Settleable Solids
24 Total Suspended Solids
1 Dissolved Oxygen
22 Biological Oxygen Demand
1 pH
1 Escherichia coli

Comments:
None.

TN0020672 Rogersville STP

Discharger rating: Major
City: Rogersville
County: Hawkins
EFO Name: Johnson City
Issuance Date: 11/1/00
Expiration Date: 12/31/09
Receiving Stream(s): Cherokee Reservoir at Holston River mile 99.7
HUC-12: 060101040201
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: Waste Activated Sludge to aerobic digesters to belt press to truck to land application sites

Segment	TN06010104001_2000
Name	Holston River
Size	26.9
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Recreation (Supporting), Irrigation (Supporting), Industrial Water Supply (Supporting), Domestic Water Supply (Supporting), Fish and Aquatic Life (Non-Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Oxygen, Dissolved, Low flow alterations
Sources	Upstream Impoundments (e.g., Pl-566 NRCS Structures)

Table 6-13. Stream Segment Information for Rogersville STP.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
48hr LC50: Ceriodaphnia Dubia	All Year	1.2	Percent	DMin Conc	Continuous	Composite	Effluent
48hr LC50: Fathead Minnows	All Year	1.2	Percent	DMin Conc	Continuous	Composite	Effluent
BOD % removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	% Removal
BOD % removal	All Year	85	Percent	MAvg % Removal	3/Week	Calculated	% Removal
BOD5	All Year	45	mg/L	DMax Conc	3/Week	Composite	Effluent
BOD5	All Year		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
BOD5	All Year	434	lb/day	DMax Load	3/Week	Composite	Effluent
BOD5	All Year	40	mg/L	MAvg Conc	3/Week	Composite	Effluent
BOD5	All Year	325	lb/day	MAvg Load	3/Week	Composite	Effluent
BOD5	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
BOD5	All Year	30	mg/L	WAvg Conc	3/Week	Composite	Effluent
Bypass of Treatment (occurrences)	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
D.O.	All Year	1	mg/L	DMin Conc	Weekdays	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	3/Week	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
Flow	All Year		MGD	DMax Load	Daily	Continuous	Effluent
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Effluent
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	DMax Load	Daily	Continuous	Influent (Raw Sewage)
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
Overflow Use Occurences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Non Wet Weather
Settleable Solids	All Year	1	mL/L	DMax Conc	3/Week	Composite	Effluent
TRC	All Year	2	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	3/Week	Composite	Effluent
TSS	All Year	325	lb/day	MAvg Load	3/Week	Composite	Effluent
TSS	All Year		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
TSS	All Year	434	lb/day	DMax Load	3/Week	Composite	Effluent
TSS	All Year	30	mg/L	WAvg Conc	3/Week	Composite	Effluent
TSS	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
TSS	All Year	40	mg/L	MAvg Conc	3/Week	Composite	Effluent
TSS % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	% Removal
TSS % Removal	All Year	85	Percent	MAvg % Removal	3/Week	Calculated	% Removal
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-14. Permit Limits for Rogersville STP.

Compliance History:
The following numbers of exceedences were noted in PCS:

15 Overflows
11 Bypasses
11 Biological Oxygen Demand
31 Total Suspended Solids
4 Suspended Solids % Removal
3 Fecal Coliform

Enforcement:
10/3/07 Notice of Violation for failure to enforce pretreatment standards and reporting requirements.

9/22/05 Director's Order #05-041D for multiple violations: effluent exceedances, not submitting application renewal in timely manner, submitting incomplete application, operating without a valid permit.

Comments:
8/30/07 Pretreatment Compliance Inspection

1. Evaluation of the Industrial User (IU) permit for Baldor Dodge Reliance revealed some required information was missing.
2. Inspection of self-monitoring reports for Baldor Dodge Reliance revealed that some reports were missing the flow values required by the IU permit. In addition, no documentation of enforcement action or other follow up on this deficiency was apparent. Rogersville must ensure that self-monitoring reports include all required information or take appropriate action to address deficiencies.
3. Although annual pretreatment program reports submitted to the division indicated use of verbal warnings to Baldor Dodge Reliance, no supporting documentation was available. Rogersville personnel indicated that verbal warnings were no longer used as an enforcement tool. Should verbal warnings be used in the future, documentation of the warning must be developed and maintained.
4. The flow values reported in the most recent Industrial Waste Survey (IWS), dated September 2006, for Baldor Dodge Reliance were substantially lower than the flows reported in IU self-monitoring reports, Control Authority (CA) monitoring reports, and CA inspections of the IU. The discrepancies were not addressed. Information submitted in the IWS must be indicative of current operating conditions at the Industrial User, and any changes in processes and/or flow must be communicated to Rogersville, the Control Authority, in a timely manner.
5. Rogersville must ensure that self-monitoring reports and other information received from Industrial Users is signed and certified as required.
6. Rogersville representatives indicated that Baldor Dodge Reliance has a slug discharge control plan. However, the IU permit for this facility contained no mention of this plan, and no copy of the plan was on file. In addition, no documentation was on file to indicate that this IU had been evaluated for the need to develop a slug discharge control plan. The evaluation must be documented and appropriate permit requirements included if a slug control plan

is deemed necessary. Rogersville must also have a copy of the plan for reference.

7. For both CA and IU sample analyses, a number of unapproved analytical methods were used during older sample events. Note that a number of previously approved methods are no longer approved for use in the most recent revision of Title 40 CFR §136, effective April 11, 2007. The CA must ensure that approved analytical procedures are used for all compliance monitoring.
8. As discussed during the inspection, revisions to the pretreatment program will likely be necessary to address the streamlining changes to 40 CFR §403, as incorporated into the newly issued division pretreatment rules in Tennessee Rule 1200-4-14. The streamlining changes must be incorporated into the Rogersville pretreatment program by June 2008.
9. As also discussed during the inspection, Rogersville must further investigate the source of continued discharge violations at Sekisui Ta and initiate appropriate escalated enforcement action as dictated by the town's approved Enforcement Response Plan (ERP).

TN0055468 Surgoinsville Middle & Elementary School

Discharger rating:	Minor
City:	Surgoinsville
County:	Hawkins
EFO Name:	Johnson City
Issuance Date:	7/1/04
Expiration Date:	5/28/09
Receiving Stream(s):	Forgey Creek mile 1.4
HUC-12:	060101040102
Effluent Summary:	Treated municipal wastewater from Outfall 001
Treatment system:	Extended aeration

Segment	TN06010104011_0200
Name	Forgey Creek
Size	3.6
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Fish and Aquatic Life (Supporting), Recreation (Non-Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Escherichia coli
Sources	Grazing in Riparian or Shoreline Zones

Table 6-15. Stream Segment Information for Surgoinsville Middle & Elementary School.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	All Year	10	mg/L	DMax Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	All Year	5	mg/L	MAvg Conc	2/Month	Grab	Effluent
BOD5	All Year	45	mg/L	DMax Conc	2/Month	Grab	Effluent
BOD5	All Year	30	mg/L	MAvg Conc	2/Month	Grab	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	2/Month	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	2/Month	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	2/Month	Grab	Effluent
Flow	All Year		MGD	DMax Load	Weekdays	Instantaneous	Effluent
Flow	All Year		MGD	MAvg Load	Weekdays	Instantaneous	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Week	Grab	Effluent
TRC	All Year	0.5	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	2/Month	Grab	Effluent
TSS	All Year	30	mg/L	MAvg Conc	2/Month	Grab	Effluent
pH	All Year	9	SU	DMax Conc	2/Week	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	2/Week	Grab	Effluent

Table 6-16. Permit Limits for Surgoinsville Middle & Elementary School.

Comments:
None.

TN0078565 Bean Station WWTP

Discharger rating:	Minor
City:	Bean Station
County:	Grainger
EFO Name:	Knoxville
Issuance Date:	2/21/07
Expiration Date:	10/3/09
Receiving Stream(s):	Holston River
HUC-12:	060101040206
Effluent Summary:	Treated municipal wastewater from Outfall 001
Treatment system:	This is a brand new permit – plant has yet to be built.

Compliance History:
No history yet

Comments:
Note: This facility will eliminate two and possibly three existing discharges (Bean Station E.S. and Kingswood Academy, and possibly Grainger Co. Industrial Park) as well as some failing septic tanks in the area. There is no physical way to reach the main channel of the Holston River from Bean Station.

TN0061743 KUB- East Bridge STP

Discharger rating:	Major
City:	Knoxville
County:	Knox
EFO Name:	Knoxville
Issuance Date:	6/1/04
Expiration Date:	4/30/09
Receiving Stream(s):	Holston River at mile 14.2
HUC-12:	060101040304
Effluent Summary:	Treated municipal wastewater from Outfall 001
Treatment system:	Waste Activated Sludge to aerobic digester to hauler to Knoxville Utility Board (KUB) Waste Water Treatment Plant

Segment	TN06010104001_1000
Name	Holston River
Size	30.5
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Recreation (Supporting), Irrigation (Supporting), Industrial Water Supply (Supporting), Domestic Water Supply (Supporting), Livestock Watering and Wildlife (Supporting), Fish and Aquatic Life (Supporting)
Causes	N/A
Sources	N/A

Table 6-17. Stream Segment Information for KUB- East Bridge STP.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
48hr LC50: Ceriodaphnia dubia	All Year	2.8	Percent	DMin Conc	Quarterly	Grab	Effluent
48hr LC50: Fathead Minnows	All Year	2.8	Percent	DMin Conc	Quarterly	Grab	Effluent
Ammonia as N (Total)	Summer	10	mg/L	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	5	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	7.5	mg/L	WAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	36	lb/day	MAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	54	lb/day	WAvg Load	3/Week	Composite	Effluent
Bypass of Treatment (occurrences)	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
CBOD % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	% Removal
CBOD % Removal	All Year	85	Percent	MAvg % Removal	3/Week	Calculated	% Removal
CBOD5	All Year	40	mg/L	DMax Conc	3/Week	Composite	Effluent
CBOD5	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
CBOD5	All Year	35	mg/L	WAvg Conc	3/Week	Composite	Effluent
CBOD5	All Year	254	lb/day	WAvg Load	3/Week	Composite	Effluent
CBOD5	All Year	181	lb/day	MAvg Load	3/Week	Composite	Effluent
CBOD5	All Year	25	mg/L	MAvg Conc	3/Week	Composite	Effluent
CBOD5	All Year		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
D.O.	All Year	3	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	3/Week	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	3/Week	Grab	Effluent
Flow	All Year		MGD	DMax Load	Daily	Continuous	Effluent
Flow	All Year		MGD	DMax Load	Daily	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Effluent
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Influent (Raw Sewage)
Overflow Use Occurrences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Non Wet Weather
Overflow Use Occurrences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
Settleable Solids	All Year	1	mL/L	DMax Conc	Weekdays	Composite	Effluent

Table 6-18a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
TRC	All Year	2	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	3/Week	Composite	Effluent
TSS	All Year		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
TSS	All Year	30	mg/L	MAvg Conc	3/Week	Composite	Effluent
TSS	All Year	218	lb/day	MAvg Load	3/Week	Composite	Effluent
TSS	All Year	290	lb/day	WAvg Load	3/Week	Composite	Effluent
TSS	All Year	40	mg/L	WAvg Conc	3/Week	Composite	Effluent
TSS	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
TSS % Removal	All Year	40	Percent	DMin % Removal	3/Week	Calculated	% Removal
TSS % Removal	All Year	85	Percent	MAvg % Removal	3/Week	Calculated	% Removal
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-18b.

Tables 6-18a-b. Permit Limits for KUB- East Bridge STP.

Compliance History:
The following numbers of exceedences were noted in PCS:

1 Ammonia

Enforcement:
1/17/03 Commissioner's Order #02-0824 State order superceded by Federal Consent order. Compliance will be tracked by EPA. Order issued for collection system overflows during '01 and '02.

Comments:
6/19/07 Compliance Evaluation Inspection: In compliance

As a result of the inspection the following comments have been noted:

1. The records, reports, and permit appeared to be in good order.

2. An increase in permitted discharge volume from 0.87 million gallons per day (MGD) to 1.3 MGD has been requested by KUB. This proposed permit modification is being reviewed by our Central Office in Nashville.

TN0030627 Bean Station Elementary School

Discharger rating:	Minor
City:	Bean Station
County:	Grainger
EFO Name:	Knoxville
Issuance Date:	1/1/05
Expiration Date:	11/30/09
Receiving Stream(s):	German Creek at mile 3.0 (Embayment to Cherokee Lake)
HUC-12:	060101040208
Effluent Summary:	Treated domestic wastewater from Outfall 001
Treatment system:	Activated sludge

Segment	TN06010104004_1000
Name	Cherokee Reservoir
Size	5109
Unit	Acres
First Year on 303(d) List	-
Designated Uses	Domestic Water Supply (Supporting), Fish and Aquatic Life (Supporting), Recreation (Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	N/A
Sources	N/A

Table 6-19. Stream Segment Information for Bean Station Elementary School.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	All Year	10	mg/L	DMax Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	All Year	5	mg/L	MAvg Conc	2/Month	Grab	Effluent
BOD5	All Year	20	mg/L	DMax Conc	2/Month	Grab	Effluent
BOD5	All Year	10	mg/L	MAvg Conc	2/Month	Grab	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Ari Mean	2/Month	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	2/Month	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	2/Month	Grab	Effluent
Flow	All Year		MGD	DMax Load	Weekdays	Instantaneous	Effluent
Flow	All Year		MGD	MAvg Load	Weekdays	Instantaneous	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Week	Grab	Effluent
TRC	All Year	0.5	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	2/Month	Grab	Effluent
TSS	All Year	30	mg/L	MAvg Conc	2/Month	Grab	Effluent
pH	All Year	9	SU	DMax Conc	2/Week	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	2/Week	Grab	Effluent

Table 6-20. Permit Limits for Bean Station Elementary School.

Comments:
None.

TN0021199 Jefferson City STP

Discharger rating: Major
City: Jefferson City
County: Jefferson
EFO Name: Knoxville
Issuance Date: 5/1/04
Expiration Date: 3/31/09
Receiving Stream(s): Mossy Creek Embayment at mile 3.0 of Cherokee Lake
HUC-12: 060101040201
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: Extended aeration

Segment	TN06010104011_0200
Name	Forgey Creek
Size	3.6
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Fish and Aquatic Life (Supporting), Recreation (Non-Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Escherichia coli
Sources	Grazing in Riparian or Shoreline Zones

Table 6-21. Stream Segment Information for Jefferson City STP.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	All Year	10	mg/L	DMax Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	All Year	5	mg/L	MAvg Conc	2/Month	Grab	Effluent
BOD5	All Year	45	mg/L	DMax Conc	2/Month	Grab	Effluent
BOD5	All Year	30	mg/L	MAvg Conc	2/Month	Grab	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	2/Month	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	2/Month	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	2/Month	Grab	Effluent
Flow	All Year		MGD	DMax Load	Weekdays	Instantaneous	Effluent
Flow	All Year		MGD	MAvg Load	Weekdays	Instantaneous	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Week	Grab	Effluent
TRC	All Year	0.5	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	2/Month	Grab	Effluent
TSS	All Year	30	mg/L	MAvg Conc	2/Month	Grab	Effluent
pH	All Year	9	SU	DMax Conc	2/Week	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	2/Week	Grab	Effluent

Table 6-22. Permit Limits for Jefferson City STP.

Compliance History:
The following numbers of exceedences were noted in PCS:

1 Overflow
23 Bypasses
7 Dissolved Oxygen
26 Biological Oxygen Demand
4 Escherichia coli
1 Suspended Solids % Removal
19 Total Suspended Solids
1 Total Chlorine
1 Settleable Solids

Enforcement:
12/7/06 Commissioner's Order #06-0520 for multiple effluent violations of the permit. Poor operation of the plant. Causing a condition of pollution with their effluent.

8/3/06 Notice of Violation (see below)

Comments:
9/13/07 Comments from Knoxville EFO: They are having trouble removing solids. They have applied for a special waste permit from Solid Waste and have applied for some land application sites from the division, but they have waited too long to begin taking action and are finding themselves in a state of emergency. The effluent doesn't look good. They have, however, improved some administrative procedures that has them headed in the right direction.

8/2/06 Compliance Evaluation Inspection – Notice of Violation
Comments from 8/3/06 letter: On August 2, 2006, Knoxville EFO-WPC personnel visited the Wastewater Treatment Plant (WWTP) and reviewed operations and maintenance, observed the treatment units and design, and conducted lengthy discussions with the operators. As you are aware from our recent Compliance Review Meeting and our telephone conversation on August 3, 2006, Jefferson City's recently upgraded WWTP has many problems. The effluent discharge to Mossy Creek Embayment of Cherokee Reservoir is in violation of NPDES permit effluent parameters. The tricking filters have been off line for over four months. There are many additional equipment, mechanical, electrical, and operation and maintenance problems.

The Knoxville EFO first became aware of these problems upon conducting a Compliance Biomonitoring Inspection the week of June 5-9, 2006. The Biomonitoring Inspection was not fully completed according to approved methods because the bus carrying the last set of samples to the Nashville Aquatic Biology Laboratory broke down and failed to transfer the samples to the replacement bus. However, in order to obtain some indication of the toxicity of the discharge, the test was completed without including the final sample. This test showed that there were obvious problems with survival of the organisms, and a failure in reproduction was exhibited. Also, analysis of permit effluent parameters indicated that the plant was in violation.

Since June 5, 2006, Knoxville personnel have visited your WWTP several times and sampled several times; during this time no single sample analyzed were found to be in compliance with permit limits.

TN0074497 Joppa Elementary School

Discharger rating:	Minor
City:	Rutledge
County:	Grainger
EFO Name:	Knoxville
Issuance Date:	1/1/05
Expiration Date:	11/30/09
Receiving Stream(s):	Richland Creek at mile 12.5
HUC-12:	060101040303
Effluent Summary:	Treated domestic wastewater from Outfall 001
Treatment system:	Septic tanks, recirculating sand filter, and UV disinfection

Segment	TN06010104018_1000
Name	Richland Creek
Size	26.7
Unit	Miles
First Year on 303(d) List	2006
Designated Uses	Recreation (Non-Supporting), Irrigation (Supporting), Fish and Aquatic Life (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Escherichia coli
Sources	Grazing in Riparian or Shoreline Zones

Table 6-23. Stream Segment Information for Joppa Elementary School.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	Summer	7.5	mg/L	DMax Conc	Monthly	Grab	Effluent
Ammonia as N (Total)	Summer	5	mg/L	MAvg Conc	Monthly	Grab	Effluent
Ammonia as N (Total)	Winter	12	mg/L	DMax Conc	Monthly	Grab	Effluent
Ammonia as N (Total)	Winter	8	mg/L	MAvg Conc	Monthly	Grab	Effluent
CBOD5	All Year	15	mg/L	DMax Conc	Monthly	Grab	Effluent
CBOD5	All Year	10	mg/L	MAvg Conc	Monthly	Grab	Effluent
D.O.	All Year	6	mg/L	DMin Conc	2/Week	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Ari Mean	Monthly	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	MAvg Ari Mean	Monthly	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	Monthly	Grab	Effluent
Flow	All Year		MGD	DMax Load	2/Week	Instantaneous	Effluent
Flow	All Year		MGD	MAvg Load	2/Week	Instantaneous	Effluent
Settleable Solids	All Year	1	mg/L	DMax Conc	2/Week	Grab	Effluent
TRC	All Year	1.05	mg/L	DMax Conc	2/Week	Grab	Effluent
TSS	All Year	40	mg/L	DMax Conc	Monthly	Grab	Effluent
TSS	All Year	30	mg/L	MAvg Conc	Monthly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	2/Week	Grab	Effluent
pH	All Year	6	SU	DMin Conc	2/Week	Grab	Effluent

Table 6-24. Permit Limits for Joppa Elementary School.

Comments:
None.

TN0061026 Kingswood School, Inc.

Discharger rating:	Minor
City:	Bean Station
County:	Grainger
EFO Name:	Knoxville
Issuance Date:	5/1/04
Expiration Date:	3/31/09
Receiving Stream(s):	Mile 6.0 of German Creek Embayment of Cherokee Lake via a drainage ditch
HUC-12:	060101040208
Effluent Summary:	Treated domestic wastewater from Outfall 001
Treatment system:	Extended aeration

Segment	TN06010104004_1000
Name	Cherokee Reservoir
Size	5109
Unit	Acres
First Year on 303(d) List	-
Designated Uses	Domestic Water Supply (Supporting), Fish and Aquatic Life (Supporting), Recreation (Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	N/A
Sources	N/A

Table 6-25. Stream Segment Information for Kingswood School.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
BOD5	All Year	45	mg/L	DMax Conc	Monthly	Grab	Effluent
BOD5	All Year	30	mg/L	MAvg Conc	Monthly	Grab	Effluent
D.O.	All Year	1	mg/L	DMin Conc	Weekdays	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	Monthly	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	Monthly	Grab	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Week	Grab	Effluent
TRC	All Year	2	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	Monthly	Grab	Effluent
TSS	All Year	30	mg/L	MAvg Conc	Monthly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	2/Week	Grab	Effluent
pH	All Year	6	SU	DMin Conc	2/Week	Grab	Effluent

Table 6-26. Permit Limits for Kingswood School.

Comments:
None

TN0021822 KUB- Loves Creek STP

Discharger rating:	Major
City:	Knoxville
County:	Knox
EFO Name:	Knoxville
Issuance Date:	12/1/04
Expiration Date:	10/29/09
Receiving Stream(s):	Holston River Mile 5.0
HUC-12:	060101040304
Effluent Summary:	Treated municipal wastewater from Outfall 001
Treatment system:	Waste Activated Sludge pumped to Kuwahee STP for treatment

Segment	TN06010104001_1000
Name	Holston River
Size	30.5
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Recreation (Supporting), Irrigation (Supporting), Industrial Water Supply (Supporting), Domestic Water Supply (Supporting), Livestock Watering and Wildlife (Supporting), Fish and Aquatic Life (Supporting)
Causes	N/A
Sources	N/A

Table 6-27. Stream Segment Information for KUB- Loves Creek STP.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	Summer	25	mg/L	DMax Conc	Daily	Composite	Effluent
Ammonia as N (Total)	Summer	13	mg/L	MAvg Conc	Daily	Composite	Effluent
Ammonia as N (Total)	Summer	20	mg/L	WAvg Conc	Daily	Composite	Effluent
Ammonia as N (Total)	Summer	1117	lb/day	MAvg Load	Daily	Composite	Effluent
Ammonia as N (Total)	Summer	1718	lb/day	WAvg Load	Daily	Composite	Effluent
Bypass of Treatment (occurrences)	All Year		Occurrences/Month	MAvg Load	Continuous	Visual	Wet Weather
CBOD % Removal	All Year	40	Percent	DMin % Removal	Daily	Calculated	Percent Removal
CBOD % Removal	All Year	85	Percent	MAvg % Removal	Daily	Calculated	Percent Removal
CBOD5	All Year	45	mg/L	DMax Conc	Daily	Composite	Effluent
CBOD5	All Year	40	mg/L	WAvg Conc	Daily	Composite	Effluent
CBOD5	All Year	3436	lb/day	WAvg Load	Daily	Composite	Effluent
CBOD5	All Year	2148	lb/day	MAvg Load	Daily	Composite	Effluent
CBOD5	All Year		mg/L	DMax Conc	Daily	Composite	Influent (Raw Sewage)
CBOD5	All Year	25	mg/L	MAvg Conc	Daily	Composite	Effluent
CBOD5	All Year		mg/L	MAvg Conc	Daily	Composite	Influent (Raw Sewage)
D.O.	All Year	5	mg/L	DMin Conc	Daily	Grab	Effluent
E. coli	All Year	941	#/100mL	DMax Conc	Daily	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	Daily	Grab	Effluent
Flow	All Year		MGD	DMax Load	Daily	Continuous	Effluent
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Effluent
Flow	All Year		MGD	DMax Load	Daily	Continuous	Influent (Raw Sewage)
IC25 7day Ceriodaphnia dubia	All Year	10	Percent	DMin Conc	Quarterly	Composite	Effluent
IC25 7day Fathead Minnows	All Year	10	Percent	DMin Conc	Quarterly	Composite	Effluent
Overflow Use Occurrences	All Year		Occurrences/Month	MAvg Load	Continuous	Visual	Wet Weather
Overflow Use Occurrences	All Year		Occurrences/Month	MAvg Load	Continuous	Visual	Non Wet Weather
Settleable Solids	All Year	1	mL/L	DMax Conc	Daily	Grab	Effluent
TRC	All Year	0.2	mg/L	DMax Conc	Daily	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	Daily	Composite	Effluent
TSS	All Year	30	mg/L	MAvg Conc	Daily	Composite	Effluent
TSS	All Year	2577	lb/day	MAvg Load	Daily	Composite	Effluent
TSS	All Year	3436	lb/day	WAvg Load	Daily	Composite	Effluent
TSS	All Year	40	mg/L	WAvg Conc	Daily	Composite	Effluent

Table 6-28a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
TSS % Removal	All Year	40	Percent	DMin % Removal	Daily	Calculated	Percent Removal
TSS % Removal	All Year	85	Percent	MAvg % Removal	Daily	Calculated	Percent Removal
pH	All Year	9	SU	DMax Conc	Daily	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Daily	Grab	Effluent

Table 6-28b.

Tables 6-28a-b. Permit Limits for KUB- Loves Creek STP.

Compliance History:
The following numbers of exceedences were noted in PCS:

1 Fecal Coliform
1 Total Suspended Solids

Enforcement:
1/17/03 Commissioner's Order #02-0824 State order superceded by Federal Consent order. Compliance will be tracked by EPA. Order issued for collection system overflows during '01 and '02.

Comments:
11/14/06 Reconnaissance Inspection:
On the day of the inspection the plant was operational and in good condition. The effluent leaving the plant was clear and had no signs of solids. The records, reports, and permit were all in order, available and accurate. The influent and effluent composite samplers were operating and maintaining proper temperature of four degrees Celsius. A log is kept recording the composite samples' start and stop times, temperature recordings in the storage refrigerators for samples, dissolved oxygen meter calibrations, and the time the pH samples are collected each day. Chain of custody forms for samples delivered to KUB Laboratory is also kept on site. The influent composite sample hose tubing had some solids build up and did not look to have been recently cleaned or purged. Properly cleaning and replacing the composite sampling hose can alleviate any discrepancies in sample results. Overall, the maintenance and operation of the KUB-Loves Creek STP is good.

TN0064149 Luttrell STP

Discharger rating:	Minor
City:	Luttrell
County:	Union
EFO Name:	Knoxville
Issuance Date:	6/1/04
Expiration Date:	12/30/09
Receiving Stream(s):	Flat Creek at mile 13.9
HUC-12:	060101040305
Effluent Summary:	Treated municipal wastewater from Outfall 001
Treatment system:	Biotower with recirculation with chlorination and dechlorination

Segment	TN06010104019_1000
Name	Flat Creek
Size	16.3
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Industrial Water Supply (Supporting), Fish and Aquatic Life (Supporting), Recreation (Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	N/A
Sources	N/A

Table 6-29. Stream Segment Information for Luttrell STP.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	Summer	15	mg/L	DMax Conc	Weekly	Composite	Effluent
Ammonia as N (Total)	Summer	5	mg/L	MAvg Conc	Weekly	Composite	Effluent
Ammonia as N (Total)	Summer	10	mg/L	WAvg Conc	Weekly	Composite	Effluent
Ammonia as N (Total)	Summer	8.3	mg/L	MAvg Load	Weekly	Composite	Effluent
Ammonia as N (Total)	Summer	17	mg/L	WAvg Load	Weekly	Composite	Effluent
Ammonia as N (Total)	Winter	20	mg/L	DMax Conc	Weekly	Composite	Effluent
Ammonia as N (Total)	Winter	25	mg/L	WAvg Load	Weekly	Composite	Effluent
Ammonia as N (Total)	Winter	10	mg/L	MAvg Conc	Weekly	Composite	Effluent
Ammonia as N (Total)	Winter	17	mg/L	MAvg Load	Weekly	Composite	Effluent
Ammonia as N (Total)	Winter	15	mg/L	WAvg Conc	Weekly	Composite	Effluent
CBOD % Removal	All Year	40	Percent	DMin % Removal	Weekly	Calculated	Effluent
CBOD % Removal	All Year	85	Percent	MAvg % Removal	Weekly	Calculated	Effluent
CBOD5	All Year	40	mg/L	DMax Conc	Weekly	Composite	Effluent
CBOD5	All Year	35	mg/L	WAvg Conc	Weekly	Composite	Effluent
CBOD5	All Year	42	mg/L	MAvg Load	Weekly	Composite	Effluent
CBOD5	All Year	25	mg/L	MAvg Conc	Weekly	Composite	Effluent
CBOD5	All Year	58	mg/L	WAvg Load	Weekly	Composite	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	941	#/100mL	MAvg Ari Mean	Weekly	Composite	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	Weekly	Composite	Effluent
Flow	All Year		MGD	DMax Load	Daily	Continuous	Effluent
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	Weekly	Composite	Effluent
TRC	All Year	0.06	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	Weekly	Composite	Effluent
TSS	All Year	30	mg/L	MAvg Conc	Weekly	Composite	Effluent
TSS	All Year	42	lb/day	MAvg Load	Weekly	Composite	Effluent
TSS	All Year	58	mg/L	WAvg Load	Weekly	Composite	Effluent
TSS	All Year	35	lb/day	WAvg Conc	Weekly	Composite	Effluent
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-30. Permit Limits for Luttrell STP.

Compliance History:
The following numbers of exceedences were noted in PCS:

27 Overflows
26 Bypasses

Comments:
None.

TN0023507 Morristown STP

Discharger rating:	Major
City:	Morristown
County:	Hamblen
EFO Name:	Knoxville
Issuance Date:	5/1/05
Expiration Date:	3/31/09
Receiving Stream(s):	Holston River Mile 75
HUC-12:	060101040206
Effluent Summary:	Treated municipal wastewater from Outfall 001
Treatment system:	Waste Activated Sludge to anaerobic digester to land application

Segment	TN06010104004_1000
Name	Cherokee Reservoir
Size	5109
Unit	Acres
First Year on 303(d) List	-
Designated Uses	Domestic Water Supply (Supporting), Fish and Aquatic Life (Supporting), Recreation (Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	N/A
Sources	N/A

Table 6-31. Stream Segment Information for Morristown STP.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
BOD % removal	All Year	40	Percent	DMin % Removal	Weekdays	Calculated	Percent Removal
BOD % removal	All Year	85	Percent	MAvg % Removal	Weekdays	Calculated	Percent Removal
BOD5	All Year	45	mg/L	DMax Conc	Weekdays	Composite	Effluent
BOD5	All Year		mg/L	DMax Conc	Weekdays	Composite	Influent (Raw Sewage)
BOD5	All Year	30	mg/L	MAvg Conc	Weekdays	Composite	Effluent
BOD5	All Year	1877	lb/day	MAvg Load	Weekdays	Composite	Effluent
BOD5	All Year	3670	lb/day	WAvg Load	Weekdays	Composite	Effluent
BOD5	All Year	40	mg/L	WAvg Conc	Weekdays	Composite	Effluent
BOD5	All Year		mg/L	MAvg Conc	Weekdays	Composite	Influent (Raw Sewage)
Bypass of Treatment (occurrences)	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
Cyanide, Total (CN-)	All Year	0.009	mg/L	MAvg Conc	Semi-annually	Grab	Effluent
D.O.	All Year	3	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	487	#/100mL	DMax Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	Weekdays	Grab	Effluent
Flow	All Year		MGD	DMax Load	Daily	Continuous	Effluent
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Effluent
Flow	All Year		MGD	DMax Load	Daily	Continuous	Influent (Raw Sewage)
IC25 7day Ceriodaphnia dubia	All Year	3.6	Percent	DMin Conc	See Permit	Composite	Effluent
IC25 7day Fathead Minnows	All Year	3.6	Percent	DMin Conc	See Permit	Composite	Effluent
Overflow Use Occurrences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Wet Weather
Overflow Use Occurrences	All Year		Occurences/Month	MAvg Load	Continuous	Visual	Non Wet Weather
Settleable Solids	All Year	1	mL/L	DMax Conc	Weekdays	Grab	Effluent
TRC	All Year	0.05	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	Weekdays	Composite	Effluent
TSS	All Year	3670	lb/day	WAvg Load	Weekdays	Composite	Effluent
TSS	All Year		mg/L	DMax Conc	Weekdays	Composite	Influent (Raw Sewage)
TSS	All Year	30	mg/L	MAvg Conc	Weekdays	Composite	Effluent
TSS	All Year		mg/L	MAvg Conc	Weekdays	Composite	Influent (Raw Sewage)
TSS	All Year	40	mg/L	WAvg Conc	Weekdays	Composite	Effluent
TSS	All Year	1877	lb/day	MAvg Load	Weekdays	Composite	Effluent
TSS % Removal	All Year	40	Percent	DMin % Removal	Weekdays	Calculated	Percent Removal

Table 6-32a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
TSS % Removal	All Year	85	Percent	MAvg % Removal	Weekdays	Calculated	Percent Removal
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-32b.

Tables 6-32a-b. Permit Limits for Morristown STP.

Compliance History:
The following numbers of exceedences were noted in PCS:

159 Overflows
6 Biological Oxygen Demand
6 Total Suspended Solids
2 Settleable Solids
1 Fecal Coliform

Comments:
None.

TN0061476 Rush Strong School

Discharger rating: Minor
City: Strawberry Plains
County: Jefferson
EFO Name: Knoxville
Issuance Date: 1/1/05
Expiration Date: 11/30/09
Receiving Stream(s): Crowder Branch at mile 0.4 to Holston River at mile 17.7
HUC-12: 060101040302
Effluent Summary: Treated domestic wastewater from Outfall 001
Treatment system: Activated sludge

Segment	TN06010104001_1100
Name	Crowder Branch
Size	3.9
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Fish and Aquatic Life (Supporting), Recreation (Not Assessed), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	N/A
Sources	N/A

Table 6-33. Stream Segment Information for Rush Strong School.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	Summer	4	mg/L	DMax Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	Summer	2	mg/L	MAvg Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	Winter	10	mg/L	DMax Conc	2/Month	Grab	Effluent
Ammonia as N (Total)	Winter	5	mg/L	MAvg Conc	2/Month	Grab	Effluent
CBOD5	All Year	25	mg/L	DMax Conc	2/Month	Grab	Effluent
CBOD5	All Year	15	mg/L	MAvg Conc	2/Month	Grab	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Ari Mean	2/Month	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	2/Month	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	2/Month	Grab	Effluent
Flow	All Year		MGD	DMax Load	Weekdays	Instantaneous	Effluent
Flow	All Year		MGD	MAvg Load	Weekdays	Instantaneous	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	2/Week	Grab	Effluent
TRC	All Year	0.5	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	2/Month	Grab	Effluent
TSS	All Year	30	mg/L	MAvg Conc	2/Month	Grab	Effluent
pH	All Year	9	SU	DMax Conc	2/Week	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	2/Week	Grab	Effluent

Table 6-34. Permit Limits for Rush Strong School.

Comments:
None.

TN0021105 Rutledge STP

Discharger rating:	Minor
City:	Rutledge
County:	Grainger
EFO Name:	Knoxville
Issuance Date:	2/1/05
Expiration Date:	12/30/09
Receiving Stream(s):	Richland Creek Mile 18.6
HUC-12:	060101040303
Effluent Summary:	Treated domestic wastewater from Outfall 001
Treatment system:	Activated sludge

Segment	TN06010104018_1000
Name	Richland Creek
Size	26.7
Unit	Miles
First Year on 303(d) List	2006
Designated Uses	Recreation (Non-Supporting), Irrigation (Supporting), Fish and Aquatic Life (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Escherichia coli
Sources	Grazing in Riparian or Shoreline Zones

Table 6-35. Stream Segment Information for Rutledge STP.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	Summer	3.6	mg/L	DMax Conc	Weekly	Composite	Effluent
Ammonia as N (Total)	Summer	1.8	mg/L	MAvg Conc	Weekly	Composite	Effluent
Ammonia as N (Total)	Summer	2.7	mg/L	WAvg Conc	Weekly	Composite	Effluent
Ammonia as N (Total)	Summer	3	lb/day	MAvg Load	Weekly	Composite	Effluent
Ammonia as N (Total)	Summer	4.5	lb/day	WAvg Load	Weekly	Composite	Effluent
Ammonia as N (Total)	Winter	7.2	mg/L	DMax Conc	Weekly	Composite	Effluent
Ammonia as N (Total)	Winter	5.4	mg/L	WAvg Conc	Weekly	Composite	Effluent
Ammonia as N (Total)	Winter	9	lb/day	WAvg Load	Weekly	Composite	Effluent
Ammonia as N (Total)	Winter	6	lb/day	MAvg Load	Weekly	Composite	Effluent
Ammonia as N (Total)	Winter	3.6	mg/L	MAvg Conc	Weekly	Composite	Effluent
CBOD % Removal	Summer	40	Percent	DMin % Removal	Weekly	Calculated	Effluent
CBOD5	Summer	15	mg/L	DMax Conc	Weekly	Composite	Effluent
CBOD5	Summer		mg/L	DMax Conc	Weekly	Composite	Influent (Raw Sewage)
CBOD5	Summer		mg/L	MAvg Conc	Weekly	Composite	Influent (Raw Sewage)
CBOD5	Summer	10	mg/L	WAvg Conc	Weekly	Composite	Effluent
CBOD5	Summer	17	lb/day	WAvg Load	Weekly	Composite	Effluent
CBOD5	Summer	13	lb/day	MAvg Load	Weekly	Composite	Effluent
CBOD5	Summer	7.5	mg/L	MAvg Conc	Weekly	Composite	Effluent
CBOD5	Winter	30	mg/L	DMax Conc	Weekly	Composite	Effluent
CBOD5	Winter		mg/L	DMax Conc	Weekly	Composite	Influent (Raw Sewage)
CBOD5	Winter	20	mg/L	MAvg Conc	Weekly	Composite	Effluent
CBOD5	Winter	33	mg/L	MAvg Load	Weekly	Composite	Effluent
CBOD5	Winter	42	lb/day	WAvg Load	Weekly	Composite	Effluent
CBOD5	Winter	25	mg/L	WAvg Conc	Weekly	Composite	Effluent
CBOD5	Winter		mg/L	MAvg Conc	Weekly	Composite	Influent (Raw Sewage)
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Ari Mean	Weekly	Grab	Effluent
E. coli	All Year	941	#/100mL	MAvg Geo Mean	Weekly	Grab	Effluent
Flow	All Year		MGD	DMax Conc	Daily	Continuous	Effluent
Flow	All Year		MGD	MAvg Conc	Daily	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	DMax Conc	Daily	Continuous	Influent (Raw Sewage)
Flow	All Year		MGD	MAvg Conc	Daily	Continuous	Effluent
Settleable Solids	All Year	1	mg/L	DMax Conc	Weekdays	Grab	Effluent
TRC	All Year	0.07	mg/L	DMax Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	Weekly	Composite	Effluent
TSS	All Year		mg/L	DMax Conc	Weekly	Composite	Influent (Raw Sewage)
TSS	All Year	30	mg/L	MAvg Conc	Weekly	Composite	Effluent
TSS	All Year	50	lb/day	MAvg Load	Weekly	Composite	Effluent
TSS	All Year	67	lb/day	WAvg Load	Weekly	Composite	Effluent

Table 6-36a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
TSS	All Year	40	mg/L	WAvg Conc	Weekly	Composite	Effluent
TSS	All Year		mg/L	MAvg Conc	Weekly	Composite	Influent (Raw Sewage)
TSS % Removal	All Year	40	Percent	DMin % Removal	Weekly	Calculated	Effluent
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-36b.

Tables 6-36a-b. Permit Limits for Rutledge STP.

Compliance History:
The following numbers of exceedences were noted in PCS:

1 Ammonia
2 Total Chlorine

Comments:
6/5/07 Compliance Evaluation Inspection: In compliance.

6.4.B. Industrial Permits

TN0003671 Holston Army Ammunition Plant (HAAP)

Discharger rating:	Major
City:	Kingsport
County:	Sullivan
EFO Name:	Johnson City
Issuance Date:	3/1/07
Expiration Date:	10/30/09
Receiving Stream(s):	South Fork Holston River for Outfalls 001, 002, 007 and 101, Holston River for Outfalls 020, 023, 025, 026, 030, 031, and 161, Mad Branch for Outfalls 011, 012 and 108, AFG Stream for Outfalls 014, 015 and 016, and Arnott Branch for Outfalls 036, 037 and 038 and confluence of Arnott Branch and Holston River for Outfall 040 (including IMP 039)
HUC-12:	060101020604
Effluent Summary:	Treated industrial wastewater including coal pile runoff, landfill leachate and treated domestic wastewater overflow during peak flow conditions from Outfall 020, treated domestic wastewater from Outfall 025, noncontact cooling water from Outfalls 001, 002, 011, 012, 014, 015, 016, 101 and 108 in Area A and Outfalls 026, 030, 031, 036, 037, 038, 040 and 161 in Area B traveling screen filter backwash from Outfalls 007, and 023, filtration wastewater from Outfalls 101 and 161, coal pile runoff from Internal Monitoring Point 039 and storm water runoff from Outfalls 026, 030, 031, 036, 037, 038, 040, 101, 108 and 161
Treatment system:	Aerated Lagoons, Neutralization, Nitrification and Denitrification, Anaerobic Treatment, Neutralization, Trickling Filter, Activated Sludge, Coagulation, Sedimentation, Multimedia Filtration, Gravity Thickening, Aerobic and Anaerobic Digestion, etc.

Segment	TN06010102001_1000
Name	South Fork Holston River
Size	5.5
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Domestic Water Supply (Supporting), Industrial Water Supply (Supporting), Fish and Aquatic Life (Supporting), Recreation (Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	N/A
Sources	N/A

Table 6-37. Stream Segment Information for Outfalls 001, 002. 014, 015, & 016 at the Holston Army Ammunition Plant.

Segment	TN06010102001_0100
Name	Madd Branch
Size	2.7
Unit	Miles
First Year on 303(d) List	2006
Designated Uses	Fish and Aquatic Life (Non-Supporting), Recreation (Not Assessed), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Physical substrate habitat alterations
Sources	Channelization, Discharges from Municipal Separate Storm Sewer Systems (MS4)

Table 6-38. Stream Segment Information for Outfalls 011 & 012 at the Holston Army Ammunition Plant.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Explosives Combined TNT + RDX + Tetryl	All Year		mg/L	DMax Conc	Annually	Grab	Effluent
Flow	All Year		MGD	DMax Load	Weekly	Instantaneous	Effluent
Flow	All Year		MGD	MAvg Load	Weekly	Instantaneous	Effluent
TSS	All Year	40	mg/L	DMax Conc	Monthly	Grab	Effluent
Temperature (°C)	All Year		°C	DMax Conc	Weekly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Weekly	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekly	Grab	Effluent

Table 6-39. Permit Limits for Outfall 001, 002, 012, & 014 at Holston Army Ammunition Plant.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Flow	All Year		MGD	DMax Load	Weekly	Instantaneous	Effluent
Flow	All Year		MGD	MAvg Load	Weekly	Instantaneous	Effluent
TSS	All Year	40	mg/L	DMax Conc	Monthly	Grab	Effluent
Temperature (°C)	All Year		°C	DMax Conc	Weekly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Weekly	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekly	Grab	Effluent

Table 6-40. Permit Limits for Outfall 011, 015, & 016 at Holston Army Ammunition Plant.

Comments:
Facility involved in RDX/HMX production, acetic anhydride production and recovery, concentrated nitric acid and ammonium nitrate production

TN0005436 TVA - John Sevier Fossil Plant

Discharger rating:	Major
City:	Rogersville
County:	Hawkins
EFO Name:	Johnson City
Issuance Date:	3/1/07
Expiration Date:	4/28/09
Receiving Stream(s):	Polly Branch to the Holston River (Outfall 001) and the Holston River at mile 106.7 (Outfall 002)
HUC-12:	060101040201
Effluent Summary:	Ash transport water, chemical and non-chemical metal cleaning wastewaters, coal pile runoff, low volume wastes, sanitary wastewater effluent, miscellaneous equipment cooling and lubricating water and wastewater from the landfill leachate collection system via Outfall 008, and storm water runoff from Outfall 001, main condenser cooling water, nonprocess wastewater and storm water runoff from Outfall 002, and air conditioning cooling water from Outfall 009
Treatment system:	pH adjustment, precipitation, aeration, settling

Segment	TN06010104004_1000
Name	Cherokee Reservoir
Size	5109
Unit	Acres
First Year on 303(d) List	-
Designated Uses	Domestic Water Supply (Supporting), Fish and Aquatic Life (Supporting), Recreation (Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	N/A
Sources	N/A

Table 6-41. Stream Segment Information for the TVA - John Sevier Fossil Plant.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
IC25 7day Ceriodaphnia dubia	All Year	100	Percent	DMin Conc	Monthly	Composite	Effluent
IC25 7day Fathead Minnows	All Year	100	Percent	DMin Conc	Monthly	Composite	Effluent
Oil and Grease (Freon EM)	All Year	14	mg/L	DMax Conc	2/Month	Grab	Effluent
Oil and Grease (Freon EM)	All Year	10	mg/L	MAvg Conc	2/Month	Grab	Effluent
TSS	All Year	72	mg/L	DMax Conc	2/Month	Grab	Effluent
TSS	All Year	24	mg/L	MAvg Conc	2/Month	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Weekly	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekly	Grab	Effluent

Table 6-42. Permit Limits for Outfall 001 at TVA - John Sevier Fossil Plant.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
IC25 7day Ceriodaphnia dubia	All Year	88.5	Percent	DMin Conc	Monthly	Composite	Effluent
IC25 7day Fathead Minnows	All Year	88.5	Percent	DMin Conc	Monthly	Composite	Effluent
TRC	All Year	0.056	mg/L	DMax Conc	Weekly	Grab	Effluent
Temperature (°C)	All Year	36.1	Deg. C	DMax Conc	Continuous	Recorder	Effluent
Time of Chlorine Addition (minute/day/unit)	All Year	120	Min/Day	DMax Conc	Daily	Grab or Composite	Effluent

Table 6-43. Permit Limits for Outfall 002 at TVA - John Sevier Fossil Plant.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Cu (T)	All Year	1	mg/L	DMax Conc	1/Batch	Grab	Effluent
Cu (T)	All Year	1	mg/L	MAvg Conc	1/Batch	Grab	Effluent
Fe (T)	All Year	1	mg/L	DMax Conc	1/Batch	Grab	Effluent
Fe (T)	All Year	1	mg/L	MAvg Conc	1/Batch	Grab	Effluent
Flow	All Year		MGD	DMax Load	1/Batch	Estimate	Effluent
Flow	All Year		MGD	MAvg Load	1/Batch	Estimate	Effluent

Table 6-44. Permit Limits for Outfall 005 at TVA - John Sevier Fossil Plant.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Oil and Grease (Freon EM)	All Year	20	mg/L	DMax Conc	Quarterly	Grab	Effluent
Oil and Grease (Freon EM)	All Year	15	mg/L	MAvg Conc	Quarterly	Grab	Effluent
TSS	All Year	100	mg/L	DMax Conc	Quarterly	Grab	Effluent
TSS	All Year	30	mg/L	MAvg Conc	Quarterly	Grab	Effluent

Table 6-45. Permit Limits for Outfall 006 at TVA - John Sevier Fossil Plant.

Comments:
Fossil-Fuel power plant with 4 generating units with capacity of 823 MW.
11/1/06 Compliance Evaluation Inspection. In compliance.

TN0002631 AFG Industries Inc. - Greenland Plant

Discharger rating:	Minor
City:	Church Hill
County:	Hawkins
EFO Name:	Johnson City
Issuance Date:	5/1/05
Expiration Date:	3/30/09
Receiving Stream(s):	Unnamed tributary at mile 0.6 to Holston River at mile 126.5
HUC-12:	060101040102
Effluent Summary:	Process wastewater, treated domestic wastewater, non-contact cooling water and storm water runoff through Outfall 004
Treatment system:	None

Segment	TN06010104011_2000
Name	Holston River
Size	23.9
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Industrial Water Supply (Supporting), Fish and Aquatic Life (Supporting), Recreation (Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting), Domestic Water Supply (Supporting)
Causes	N/A
Sources	N/A

Table 6-46. Stream Segment Information for AFG Industries Inc. - Greenland Plant.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Flow	All Year		MGD	DMax Load	Weekdays	Instantaneous	Effluent
Flow	All Year		MGD	MAvg Load	Weekdays	Instantaneous	Effluent
IC25 7day Ceriodaphnia dubia	All Year	100	Percent	DMin Conc	Annually	Composite	Effluent
IC25 7day Fathead Minnows	All Year	100	Percent	DMin Conc	Annually	Composite	Effluent
Oil and Grease (Freon EM)	All Year	15	mg/L	DMax Conc	2/Month	Grab	Effluent
Oil and Grease (Freon EM)	All Year	10	mg/L	MAvg Conc	2/Month	Grab	Effluent
Settleable Solids	All Year	0.5	mL/L	DMax Conc	Weekly	Grab	Effluent
TRC	All Year	0.019	mg/L	DMax Conc	Weekly	Grab	Effluent
TRC	All Year	0.011	mg/L	MAvg Conc	Weekly	Grab	Effluent
TSS	All Year	40	mg/L	DMax Conc	2/Month	Grab	Effluent
TSS	All Year	30	mg/L	MAvg Conc	2/Month	Grab	Effluent
Temperature (°C)	All Year		°C	MAvg Geo Mean	2/Month	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Continuous	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Continuous	Grab	Effluent

Table 6-47. Permit Limits for AFG Industries Inc. - Greenland Plant.

Compliance History:
The following numbers of exceedences were noted in PCS:

9 Total Suspended Solids
6 Total Phosphorus
3 Oil & Grease
1 Biological Oxygen Demand
2 pH
1 Total Chlorine

Enforcement:
4/7/07 Notice of Violation (NOV)
Comments from NOV

- At Outfall 001, during the October 2006 reporting period, a daily maximum quantity value for Total Phosphorous of 0.17 lbs/day was reported. The daily maximum limit for Total Phosphorous is 0.12 lbs/day.
- At Outfall 001, during the January 2007 reporting period, a monthly average quantity value for Total Phosphorous of 1.03 lbs/day was reported. The monthly average quantity limit for Total Phosphorous is 0.12 lbs/day. A daily maximum quantity value for Total Phosphorous of 2.05 lbs/day was reported. The daily maximum quantity limit for Total Phosphorous is 0.12 lbs/day.
- During the October 2006 through February 2007 monitoring period, the reported pH monitoring frequency for Outfall 004 was less than required. Continuous pH monitoring is required at this outfall.

Comments:
Produces flat glass by float glass and tempering.

TN0002330 Holliston Mills, LLC

Discharger rating:	Major
City:	Church Hill
County:	Hawkins
EFO Name:	Johnson City
Issuance Date:	8/1/04
Expiration Date:	6/29/09
Receiving Stream(s):	Holston River mile 129.5 (Outfall 001), Sevier Branch mile 1.0 (Outfalls 002 and SW2) and Holston River (Outfall SW3)
HUC-12:	060101040101
Effluent Summary:	Process wastewater, water treatment wastewater, steam generation wastewater, domestic wastewater, and storm water runoff from Outfall 001, emergency discharges only of non-contact cooling water from Outfall 002, and storm water runoff from Outfalls SW2 and SW3
Treatment system:	Settling Ponds

Segment	TN06010104011_2000
Name	Holston River
Size	23.9
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Industrial Water Supply (Supporting), Fish and Aquatic Life (Supporting), Recreation (Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting), Domestic Water Supply (Supporting)
Causes	N/A
Sources	N/A

Table 6-48. Stream Segment Information for Holliston Mills, LLC.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
BOD5	All Year	480	lb/day	DMax Load	3/Week	Composite	Effluent
BOD5	All Year	240	lb/day	MAvg Load	3/Week	Composite	Effluent
COD	All Year	3768	lb/day	DMax Load	3/Week	Composite	Effluent
COD	All Year	1884	lb/day	MAvg Load	3/Week	Composite	Effluent
Cr (T)	All Year	6	lb/day	DMax Load	Monthly	Composite	Effluent
Cr (T)	All Year	3	lb/day	MAvg Load	Monthly	Composite	Effluent
Cu (T)	All Year	1	mg/L	DMax Conc	2/Month	Composite	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	Weekly	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	Weekly	Grab	Effluent
Flow	All Year		MGD	DMax Load	3/Week	Recorder	Effluent
Flow	All Year		MGD	MAvg Load	3/Week	Recorder	Effluent
Formaldehyde	All Year		lb/day	DMax Load	Monthly	Composite	Effluent
Formaldehyde	All Year		lb/day	MAvg Load	Monthly	Composite	Effluent
Ni (T)	All Year	3	mg/L	DMax Conc	2/Month	Composite	Effluent
Pb (T)	All Year	0.1	mg/L	DMax Conc	2/Month	Composite	Effluent
Phenols	All Year	6	lb/day	DMax Load	Annually	Grab	Effluent
Phenols	All Year	3	lb/day	MAvg Load	Annually	Grab	Effluent
Sulfide Total (as S)	All Year	12	lb/day	DMax Load	Monthly	Composite	Effluent
Sulfide Total (as S)	All Year	6	lb/day	MAvg Load	Monthly	Composite	Effluent
TRC	All Year	2	mg/L	DMax Conc	3/Week	Grab	Effluent
TSS	All Year	1152	lb/day	DMax Load	3/Week	Composite	Effluent
TSS	All Year	576	lb/day	MAvg Load	3/Week	Composite	Effluent
Zn (T)	All Year	2	mg/L	DMax Conc	2/Month	Composite	Effluent
pH	All Year	9	SU	DMax Conc	3/Week	Grab	Effluent
pH	All Year	6	SU	DMin Conc	3/Week	Grab	Effluent

Table 6-49. Permit Limits for Holliston Mills, LLC.

Comments:

7/27/07 Comments from Johnson City EFO: Holliston Mills submitted a response to the letter on 7/17/07. All of the comments in the inspection letter are being addressed. A pond overflow occurred on 7/20/06 from the large pond. Holliston Mills annually has sludge pumped from the ponds. Holliston Mills has applied for Chapter 11 bankruptcy per a 5/22/07 Kingsport Times News article. The close of the sale to Agarista is expected per the news article.

7/3/07 Compliance Sampling Inspection
The following comments were noted:

1. The influent flow totalizer for the ponds was being used to totalize the effluent flow.

2. Solids from the ponds are planned to be pumped in Fall 2007. The removal of solids from the ponds on a regular basis will ensure the proper operation of the WWTP.

3. Equipment to sterilize the E. Coli analysis equipment must be obtained.

4. Corrections on lab records must not be made using “white-out”.

5. The pH meter calibration results must be recorded.

6. The thermometers for temperature checks on lab equipment must be calibrated annually. Please reference Standard Methods, 20th edition, Methods 2550(B) and 9030(B)(12).

7. The last comprehensive site compliance evaluation for the Storm Water Pollution Prevention Plan was done on March 3, 2006. The evaluation must be done at least once a year.

TN0001694 Quebecor World Hawkins

Discharger rating:	Minor
City:	Church Hill
County:	Hawkins
EFO Name:	Johnson City
Issuance Date:	8/31/04
Expiration Date:	8/30/09
Receiving Stream(s):	Unnamed tributary to Bradley Creek at river mile 1.4
HUC-12:	060101040102
Effluent Summary:	Boiler blowdown, storm water runoff and groundwater infiltration from Outfall 002
Treatment system:	Connected to sanitary sewer

Segment	TN06010104011_0500
Name	Bradley Creek
Size	9.2
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Livestock Watering and Wildlife (Supporting), Domestic Water Supply (Supporting), Fish and Aquatic Life (Supporting), Recreation (Non-Supporting), Irrigation (Supporting)
Causes	Escherichia coli
Sources	Unrestricted Cattle Access

Table 6-50. Stream Segment Information for Quebecor World Hawkins.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Acetone	All Year		mg/L	DMax Conc	Monthly	Grab	Effluent
BOD5	All Year	15	mg/L	DMax Conc	Weekly	Grab	Effluent
BOD5	All Year	10	mg/L	MAvg Conc	Weekly	Grab	Effluent
Benzene	All Year		mg/L	DMax Conc	Monthly	Grab	Effluent
Ethylbenzene	All Year		mg/L	DMax Conc	Monthly	Grab	Effluent
Flow	All Year		MGD	DMax Load	Weekly	Instantaneous	Effluent
Flow	All Year		MGD	MAvg Load	Weekly	Instantaneous	Effluent
Methyl Ethyl Ketone	All Year		mg/L	DMax Conc	Monthly	Grab	Effluent
NOEL 7day Ceriodaphnia dubia	All Year	100	Percent	DMin Conc	Semi-annually	Composite	Effluent
NOEL 7day Fathead Minnows	All Year	100	Percent	DMin Conc	Semi-annually	Composite	Effluent
Settleable Solids	All Year	0.5	mL/L	DMax Conc	Monthly	Grab	Effluent
TRC	All Year	0.019	mg/L	DMax Conc	Monthly	Grab	Effluent
TRC	All Year	0.011	mg/L	MAvg Conc	Monthly	Grab	Effluent
TSS	All Year	40	mg/L	DMax Conc	Monthly	Grab	Effluent
Temperature (°C)	All Year		°C	DMax Conc	Monthly	Grab	Effluent
Toluene	All Year		mg/L	DMax Conc	Monthly	Grab	Effluent
Xylene	All Year		mg/L	DMax Conc	Monthly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Weekly	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Weekly	Grab	Effluent

Table 6-51. Permit Limits for Quebecor World Hawkins.

Compliance History:
The following numbers of exceedences were noted in PCS:

6 Total Chlorine
2 Biological Oxygen Demand

Comments:
None

TN0065480 Cherokee Lumber & Dimension, LLC

Discharger rating:	Minor
City:	Jefferson City
County:	Jefferson
EFO Name:	Knoxville
Issuance Date:	7/1/04
Expiration Date:	5/27/09
Receiving Stream(s):	Groundwater (via sinkhole (pond) on company property adjacent to Byrd Spring Branch
HUC-12:	060101040201
Effluent Summary:	Non-contact cooling water from Outfall 001
Treatment system:	None

Segment	TN06010104004T_0999
Name	Misc Tribs to Cherokee Reservoir
Size	94.4
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Fish and Aquatic Life (Not Assessed), Recreation (Not Assessed), Irrigation (Not Assessed), Livestock Watering and Wildlife (Not Assessed)
Causes	N/A
Sources	N/A

Table 6-52. Stream Segment Information for Cherokee Lumber & Dimension, LLC.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Flow	All Year		MGD	DMax Load	Monthly	Instantaneous	Effluent
pH	All Year	8.5	SU	DMax Conc	Monthly	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Monthly	Grab	Effluent

Table 6-53. Permit Limits for Cherokee Lumber & Dimension, LLC.

Comments:
Manufacturer of wood and wood substrate television cabinets.

TN0064351 Pilot Travel Centers, LLC #219

Discharger rating:	Minor
City:	Church Hill
County:	Hawkins
EFO Name:	Knoxville
Issuance Date:	12/1/04
Expiration Date:	7/29/09
Receiving Stream(s):	Pratt Branch at mile 0.2 to Swanpond Creek.
HUC-12:	060101040304
Effluent Summary:	Truck wash water, fuel bays discharge, and contaminated storm water runoff through Outfall 001
Treatment system:	Oil/water separator system

Segment	TN06010104001_1400
Name	Swanpond Creek
Size	16.3
Unit	Miles
First Year on 303(d) List	2004
Designated Uses	Fish and Aquatic Life (Non-Supporting), Recreation (Non-Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Escherichia coli, Sedimentation/Siltation, Alteration in stream-side or littoral vegetative covers
Sources	Channelization, Site Clearance (Land Development or Redevelopment), Discharges from Municipal Separate Storm Sewer Systems (MS4)

Table 6-54. Stream Segment Information for Pilot Travel Centers, LLC #219.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
BOD5	All Year	45	mg/L	DMax Conc	2/Month	Grab	Effluent
BOD5	All Year	30	mg/L	MAvg Conc	2/Month	Grab	Effluent
Benzene	All Year	0.1	mg/L	DMax Conc	Semi-annually	Grab	Effluent
Benzene	All Year	0.05	mg/L	MAvg Conc	Semi-annually	Grab	Effluent
E. coli	All Year	941	#/100mL	DMax Conc	2/Month	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	2/Month	Grab	Effluent
Floating Solids Or Visible Foam-Visual	All Year		Visual	DMax Conc	2/Week	Visual	Effluent
Flow	All Year		GPD	DMax Conc	Weekly	Estimate	Effluent
Flow	All Year		GPD	MAvg Conc	Weekly	Estimate	Effluent
Methylene Blue Active Substances (MBAS)	All Year		mg/L	DMax Conc	Semi-annually	Grab	Effluent
Methylene Blue Active Substances (MBAS)	All Year		mg/L	MAvg Conc	Semi-annually	Grab	Effluent
Oil and Grease (Freon EM)	All Year	15	mg/L	DMax Conc	2/Month	Grab	Effluent
Oil and Grease (Freon EM)	All Year	10	mg/L	MAvg Conc	2/Month	Grab	Effluent
Settleable Solids	All Year	0.5	mL/L	DMax Conc	Annually	Grab	Effluent
TSS	All Year	40	mg/L	DMax Conc	2/Month	Grab	Effluent
Zn (T)	All Year	0.12	mg/L	DMax Conc	Annually	Grab	Effluent
pH	All Year	9	SU	DMax Conc	2/Month	Grab	Effluent
pH	All Year	6	SU	DMin Conc	2/Month	Grab	Effluent

Table 6-55. Permit Limits for Pilot Travel Centers, LLC #219.

Compliance History:
The following numbers of exceedences were noted in PCS:

6 Escherichia coli
14 Fecal Coliform
1 pH
1 Oil & Grease
1 Zinc
1 Total Suspended Solids
2 Benzene, Toulene, Xylene, in combination

Comments:
Gasoline Service Stations
4/10/07 Compliance Evaluation Inspection: Minor deficiency noted.

TN0078361 Aqua Chem, Inc.

Discharger rating:	Minor
City:	Knoxville
County:	Knox
EFO Name:	Knoxville
Issuance Date:	10/31/04
Expiration Date:	61030/09
Receiving Stream(s):	Sand Branch to Swanpond Creek at mile 2.5
HUC-12:	060101040304
Effluent Summary:	Water purification equipment hydrostatic test water from Outfall 001 and storm water from Outfall SW4
Treatment system:	Bio-sanitizer tablets in catch basin to treat residual chlorine

Segment	TN06010104001_1400
Name	Swanpond Creek
Size	16.3
Unit	Miles
First Year on 303(d) List	2004
Designated Uses	Fish and Aquatic Life (Non-Supporting), Recreation (Non-Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Escherichia coli, Sedimentation/Siltation, Alteration in stream-side or littoral vegetative covers
Sources	Channelization, Site Clearance (Land Development or Redevelopment), Discharges from Municipal Separate Storm Sewer Systems (MS4)

Table 6-56. Stream Segment Information for Aqua Chem, Inc.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
D.O.	All Year		mg/L	DMin Conc	Monthly	Grab	Effluent
Flow	All Year		MGD	DMax Load	Monthly	Instantaneous	Effluent
Flow	All Year		MGD	MAvg Load	Monthly	Instantaneous	Effluent
Oil and Grease (Freon EM)	All Year	46	mg/L	DMax Conc	Monthly	Grab	Effluent
TRC	All Year		mg/L	DMin Conc	Monthly	Grab	Effluent
TSS	All Year	62	mg/L	DMax Conc	Monthly	Grab	Effluent
Temperature (°C)	All Year	30.5	°C	DMax Conc	Monthly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Monthly	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Monthly	Grab	Effluent

Table 6-57. Permit Limits for Aqua Chem, Inc.

Comments:
Pressure Vessel and Heat Exchanger Manufacturer

TN0077950 Kwik Shop #398

Discharger rating:	Minor
City:	Knoxville
County:	Knox
EFO Name:	Knoxville
Issuance Date:	8/1/04
Expiration Date:	6/29/09
Receiving Stream(s):	Pratt Branch at mile 1.0 to Swanpond Creek
HUC-12:	060101040304
Effluent Summary:	Fuel island drainage and industrial storm water runoff through Outfall 001
Treatment system:	Oil/water separator, settlement pond

Segment	TN06010104001_1400
Name	Swanpond Creek
Size	16.3
Unit	Miles
First Year on 303(d) List	2004
Designated Uses	Fish and Aquatic Life (Non-Supporting), Recreation (Non-Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Escherichia coli, Sedimentation/Siltation, Alteration in stream-side or littoral vegetative covers
Sources	Channelization, Site Clearance (Land Development or Redevelopment), Discharges from Municipal Separate Storm Sewer Systems (MS4)

Table 6-58. Stream Segment Information for Kwik Shop #398.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Benzene	All Year		mg/L	DMax Conc	Monthly	Grab	Effluent
Flow	All Year		MGD	DMax Load	Weekly	Instantaneous	Effluent
Flow	All Year		MGD	MAvg Load	Weekly	Instantaneous	Effluent
Oil and Grease (Freon EM)	All Year	15	mg/L	DMax Conc	Monthly	Grab	Effluent
Oil and Grease (Freon EM)	All Year	10	mg/L	MAvg Conc	Monthly	Grab	Effluent
TSS	All Year	40	mg/L	DMax Conc	Monthly	Grab	Effluent
TSS	All Year	30	mg/L	MAvg Conc	Monthly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Weekly	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekly	Grab	Effluent
Ni (T)	All Year	3	Mg/L	Dmax Conc	2/Month	Composite	Effluent

Table 6-59. Permit Limits for Kwik Shop #398.

Comments:
Gasoline service station and retail store

TN0003352 Cemex, Inc.

Discharger rating:	Minor
City:	Knoxville
County:	Knox
EFO Name:	Knoxville
Issuance Date:	8/31/04
Expiration Date:	8/30/09
Receiving Stream(s):	Woods Creek to Holston River at mile 5.9 for Outfalls 001, SW1, and SW4, Holston River at mile 6.2 for Outfall 002 and SW2, and Holston River at mile 6.0 for Outfall 003 and SW3
HUC-12:	060101040304
Effluent Summary:	Sanitary wastewater through Outfall 001, quarry pump out water and truckwash wastewater through Outfall 002 (including overflow backwash pond water through Internal Monitoring Point 02A), non-contact cooling water and equipment washwater through Outfall 003, and storm water runoff from SW1, SW2, SW3 and SW4
Treatment system:	None.

Segment	TN06010104001_1000
Name	Holston River
Size	30.5
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Recreation (Supporting), Irrigation (Supporting), Industrial Water Supply (Supporting), Domestic Water Supply (Supporting), Livestock Watering and Wildlife (Supporting), Fish and Aquatic Life (Supporting)
Causes	N/A
Sources	N/A

Table 6-60. Stream Segment Information for Cemex, Inc.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
BOD5	All Year	45	mg/L	DMax Conc	2/Month	Grab	Effluent
BOD5	All Year	30	mg/L	MAvg Conc	2/Month	Grab	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	126	#/100mL	DMax Conc	Bi-monthly	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	2/Month	Grab	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	2/Month	Grab	Effluent
Flow	All Year		MGD	DMax Load	Weekdays	Instantaneous	Effluent
Flow	All Year		MGD	MAvg Load	Weekdays	Instantaneous	Effluent
Nitrogen Ammonia Total (as NH4)	All Year	10	mg/L	DMax Conc	2/Month	Grab	Effluent
Nitrogen Ammonia Total (as NH4)	All Year	5	mg/L	MAvg Conc	2/Month	Grab	Effluent
TRC	All Year	0.019	mg/L	DMax Conc	Weekdays	Grab	Effluent
TRC	All Year	0.011	mg/L	MAvg Conc	Weekdays	Grab	Effluent
TSS	All Year	45	mg/L	DMax Conc	2/Month	Grab	Effluent
TSS	All Year	30	mg/L	MAvg Conc	2/Month	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-61. Permit Limits for Outfall 001at Cemex, Inc.

Parameter	Season	Limit	Units	Designator	Frequency	Sample Type	Monitoring Location
Flow	All Year		MGD	DMax Load	Monthly	Instantaneous	Effluent
Flow	All Year		MGD	MAvg Load	Monthly	Instantaneous	Effluent
TSS	All Year	50	mg/L	DMax Conc	Monthly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Monthly	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Monthly	Grab	Effluent

Table 6-62. Permit Limits for Outfall 002 & 003 at Cemex, Inc.

Compliance History:
The following numbers of exceedences were noted in PCS:

3 pH
5 Total Suspended Solids
3 Biological Oxygen Demand
1 Ammonia

Comments:
Cement, Hydraulic

TN0067989 Koch Foods LLC

Discharger rating:	Minor
City:	Morristown
County:	Hamblen
EFO Name:	Knoxville
Issuance Date:	8/1/04
Expiration Date:	6/29/09
Receiving Stream(s):	West Fork of Turkey Creek at mile 0.1
HUC-12:	060101040207
Effluent Summary:	Storm water through Outfall SW1
Treatment system:	None

Segment	TN06010104004T_2100
Name	Turkey Creek
Size	8
Unit	Miles
First Year on 303(d) List	2004
Designated Uses	Fish and Aquatic Life (Non-Supporting), Recreation (Non-Supporting), Irrigation (Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Sedimentation/Siltation, Alteration in stream-side or littoral vegetative covers, Escherichia coli
Sources	Discharges from Municipal Separate Storm Sewer Systems (MS4), Sanitary Sewer Overflows (Collection System Failures)

Table 6-63. Stream Segment Information for Koch Foods, LLC.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	All Year		mg/L	DMax Conc	Quarterly	Grab	Effluent
BOD5	All Year		mg/L	DMax Conc	Quarterly	Grab	Effluent
D.O.	All Year		mg/L	DMax Conc	Quarterly	Grab	Effluent
Fecal Coliform	All Year		#/100mL	DMax Conc	Monthly	Grab	Effluent
Flow	All Year		MGD	DMax Conc	Quarterly	Estimate	Effluent
Nitrate Total (as N)	All Year		mg/L	DMax Conc	Quarterly	Grab	Effluent
Oil and Grease (Freon EM)	All Year		mg/L	DMax Conc	Quarterly	Grab	Effluent
TSS	All Year		mg/L	DMax Conc	Quarterly	Grab	Effluent
pH	All Year		SU	DMax Conc	Quarterly	Grab	Effluent

Table 6-64. Permit Limits for Koch Foods, LLC.

Comments:
2/28/07 Compliance Evaluation Inspection:
Koch Foods has an individual NPDES storm water permit. This facility has a long history of bacteriological problems with their storm water runoff discharging to an impaired creek (Turkey Creek). However, there has been a considerable improvement since Koch Foods took this facility over from the previous company, namely, Burnette Produce.

There was one Fecal Coliform monitoring over 200 Colonies/1000 ml reported during last twelve months. The NPDES permit requires the permittee to only report the monitoring results with no limits imposed.

They are building a roof over their truck delivery area. This area is for delivering live chickens before slaughtering.

They have an effective and documented housekeeping procedure in place. They treat the first half hour of storm water by pumping it to the pretreatment system for treatment and then discharging it to city sewer system. The pumping system has been upgraded in last twelve months. They also clean the yard by sweeping and cleaning any spill before rain carries them to the retention pond.

They are going to building a baffle in their pond in order to avoid any flow short-circuiting.

TN0002089 Norfork Southern Railway Company - John Sevier

Discharger rating:	Minor
City:	Knoxville
County:	Knox
EFO Name:	Knoxville
Issuance Date:	6/1/07
Expiration Date:	4/30/09
Receiving Stream(s):	Unnamed tributary to Holston River at mile 7.4
HUC-12:	060101040304
Effluent Summary:	Treated process wastewater and storm water runoff through Outfalls 001 and 002 and storm water runoff through Outfalls SW3, SW8, and SW9
Treatment system:	Influent equalization, grit removal, oil/water separation, and pH neutralization

Segment	TN06010104001_0999
Name	Misc Tribs to Holston River
Size	58.7
Unit	Miles
First Year	-
Uses	Fish and Aquatic Life (Not Assessed), Recreation (Not Assessed), Irrigation (Not Assessed), Livestock Watering and Wildlife (Not Assessed)
Causes	N/A
Sources	N/A

Table 6-65. Stream Segment Information for Norfork Southern Railway Company - John Sevier.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Flow	All Year		MGD	DMax Load	Weekly	Instantaneous	Effluent
Flow	All Year		MGD	MAvg Load	Weekly	Instantaneous	Effluent
Oil and Grease (Freon EM)	All Year	15	mg/L	DMax Conc	Monthly	Grab	Effluent
Oil and Grease (Freon EM)	All Year	10	mg/L	MAvg Conc	Monthly	Grab	Effluent
TSS	All Year	40	mg/L	DMax Conc	Monthly	Composite	Effluent
TSS	All Year	30	mg/L	MAvg Conc	Monthly	Composite	Effluent
pH	All Year	9	SU	DMax Conc	Weekly	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekly	Grab	Effluent
BOD5	All Year		mg/L	DMax Conc	Quarterly	Grab	Effluent
Flow	All Year		MGD	DMax Load	Quarterly	Instantaneous	Effluent
Oil and Grease (Freon EM)	All Year	15	mg/L	DMax Conc	Quarterly	Grab	Effluent
TSS	All Year		mg/L	DMax Conc	Quarterly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Quarterly	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Quarterly	Grab	Effluent

Table 6-66. Permit Limits for Outfall 001at Norfork Southern Railway Company - John Sevier.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
BOD5	All Year		mg/L	DMax Conc	Quarterly	Grab	Effluent
Flow	All Year		MGD	DMax Load	Quarterly	Instantaneous	Effluent
Oil and Grease (Freon EM)	All Year	15	mg/L	DMax Conc	Quarterly	Grab	Effluent
TSS	All Year		mg/L	DMax Conc	Quarterly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Quarterly	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Quarterly	Grab	Effluent

Table 6-67. Permit Limits for Outfall 002 at Norfork Southern Railway Company - John Sevier.

Compliance History:
The following numbers of exceedences were noted in PCS:

1 pH
1 Oil & Grease

Comments:
Railroads, line-haul operation

6/11/07 Compliance Evaluation Inspection: In compliance
2/6/07 Plans Approval Letter: On January 9, 2007, our office received plans for the above project. These plans involve the replacement, upgrading, and addition of certain wastewater treatment components at the Norfolk Southern Railroad John Sevier Yard. These improvements are not meant to increase flows or the capacity of the system, only to replace aging units and improve performance.

TN0027405 TVA Cherokee Hydro Plant

Discharger rating:	Minor
City:	Rutledge
County:	Grainger
EFO Name:	Knoxville
Issuance Date:	12/30/04
Expiration Date:	11/30/09
Receiving Stream(s):	Holston River at mile 52.3
HUC-12:	060101040301
Effluent Summary:	Noncontact cooling waters, station sump wastewater (which includes waters such as cooling water; river water that has leaked into the plant at various points; river water from unwatering of penstock, scroll case, and draft tube; air compressor blowdown and other condensate; and floor washwater); river water from unwatering operations; river water that has leaked into the plant; backwash of strainers; test waters from fire protection system; and spent waters from certain activities outdoors, including pressure washing of painted surfaces, drilling or slot cutting the dam and washing equipment
Treatment system:	None.

Segment	TN06010104001_2000
Name	Holston River
Size	26.9
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Recreation (Supporting), Irrigation (Supporting), Industrial Water Supply (Supporting), Domestic Water Supply (Supporting), Fish and Aquatic Life (Non-Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Oxygen, Dissolved, Low flow alterations
Sources	Upstream Impoundments (e.g., PI-566 NRCS Structures)

Table 6-68. Stream Segment Information for TVA Cherokee Hydro Plant.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Flow	All Year		MGD	DMax Conc	Daily	Estimate	Effluent
Flow	All Year		MGD	MAvg Conc	Daily	Estimate	Effluent
PCB Total Scan Effluent	All Year	0.01	mg/L	DMax Conc	Annually	Grab	Effluent
Settleable Solids	All Year	0.5	mL/L	DMax Load	Daily	Grab	Effluent

Table 6-69. Permit Limits for TVA Cherokee Hydro Plant.

Comments:
Hydro power plant

TN0062162 TWRA - Buffalo Springs Fish Hatchery

Discharger rating:	Minor
City:	Rutledge
County:	Grainger
EFO Name:	Knoxville
Issuance Date:	1/1/05
Expiration Date:	11/29/09
Receiving Stream(s):	Buffalo Creek at mile 1.8
HUC-12:	060101040301
Effluent Summary:	Industrial wastewater (water from a fish farm operation) through Outfall 001
Treatment system:	None

Segment	TN06010104001_0600
Name	Buffalo Creek
Size	26
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Livestock Watering and Wildlife (Supporting), Irrigation (Supporting), Fish and Aquatic Life (Supporting), Recreation (Supporting)
Causes	N/A
Sources	N/A

Table 6-70. Stream Segment Information for TWRA - Buffalo Springs Fish Hatchery.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
48hr LC50: Ceriodaphnia dubia	All Year	100	Percent	DMin Conc	Annually	Grab	Effluent
48hr LC50: Fathead Minnows	All Year	100	Percent	DMin Conc	Annually	Grab	Effluent
D.O.	All Year	6	mg/L	DMin Conc	Weekly	Grab	Effluent
Flow	All Year		MGD	DMax Load	Weekly	Estimate	Effluent
Flow	All Year		MGD	MAvg Load	Weekly	Estimate	Effluent
Settleable Solids	All Year	0.5	mL/L	DMax Conc	Bi-monthly	Grab	Effluent
TSS	All Year	15	mg/L	DMax Conc	Bi-monthly	Grab	Effluent
pH	All Year	9	SU	DMax Conc	Weekly	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Weekly	Grab	Effluent

Table 6-71. Permit Limits for TWRA - Buffalo Springs Fish Hatchery.

Comments:
None

TN0005371 Valley Protein

Discharger rating:	Minor
City:	Strawberry Plains
County:	Knox
EFO Name:	Knoxville
Issuance Date:	8/31/04
Expiration Date:	8/30/09
Receiving Stream(s):	Holston River at mile 15.2
HUC-12:	060101040304
Effluent Summary:	Storm water runoff, boiler blowdown, scrubber discharge, condenser discharge, and process wastewater from Outfall 001
Treatment system:	Aerated lagoons and chlorine disinfection

Segment	TN06010104001_1000
Name	Holston River
Size	30.5
Unit	Miles
First Year	-
Uses	Recreation (Supporting), Irrigation (Supporting), Industrial Water Supply (Supporting), Domestic Water Supply (Supporting), Livestock Watering and Wildlife (Supporting), Fish and Aquatic Life (Supporting)
Causes	N/A
Sources	N/A

Table 6-72. Stream Segment Information for Valley Protein.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	All Year	81	lb/day	DMax Load	2/Month	Composite	Effluent
Ammonia as N (Total)	All Year	92	lb/day	DMax Load	2/Month	Composite	Effluent
Ammonia as N (Total)	All Year	41	lb/day	MAvg Load	2/Month	Composite	Effluent
Ammonia as N (Total)	All Year	46	lb/day	MAvg Load	2/Month	Composite	Effluent
Ammonia as N (Total)	All Year	106	lb/day	DMax Load	2/Month	Composite	Effluent
Ammonia as N (Total)	All Year	53	lb/day	MAvg Load	2/Month	Composite	Effluent
BOD5	All Year	104	lb/day	DMax Load	2/Month	Composite	Effluent
BOD5	All Year	119	lb/day	DMax Load	2/Month	Composite	Effluent
BOD5	All Year	136	lb/day	DMax Load	2/Month	Composite	Effluent
BOD5	All Year	52	lb/day	MAvg Load	2/Month	Composite	Effluent
BOD5	All Year	59	lb/day	MAvg Load	2/Month	Composite	Effluent
BOD5	All Year	68	lb/day	MAvg Load	2/Month	Composite	Effluent
E. coli	All Year	126	#/100mL	MAvg Conc	2/Month	Grab	Effluent
Fecal Coliform	All Year	1000	#/100mL	DMax Conc	2/Month	Grab	Effluent
Flow	All Year		MGD	DMax Load	Daily	Instantaneous	Effluent
Flow	All Year		MGD	MAvg Load	Daily	Instantaneous	Effluent
Oil and Grease (Freon EM)	All Year	58	lb/day	DMax Load	2/Month	Grab	Effluent
Oil and Grease (Freon EM)	All Year	76	lb/day	DMax Load	2/Month	Grab	Effluent
Oil and Grease (Freon EM)	All Year	29	lb/day	MAvg Load	2/Month	Grab	Effluent
Oil and Grease (Freon EM)	All Year	38	lb/day	MAvg Load	2/Month	Grab	Effluent
Oil and Grease (Freon EM)	All Year	33	lb/day	MAvg Load	2/Month	Grab	Effluent
Oil and Grease (Freon EM)	All Year	66	lb/day	DMax Load	2/Month	Grab	Effluent
TRC	All Year	2	mg/L	DMax Conc	Monthly	Grab	Effluent
TSS	All Year	128	lb/day	DMax Load	2/Month	Composite	Effluent
TSS	All Year	83	lb/day	MAvg Load	2/Month	Composite	Effluent
TSS	All Year	73	lb/day	MAvg Load	2/Month	Composite	Effluent
TSS	All Year	145	lb/day	DMax Load	2/Month	Composite	Effluent
TSS	All Year	166	lb/day	DMax Load	2/Month	Composite	Effluent
TSS	All Year	64	lb/day	MAvg Load	2/Month	Composite	Effluent
pH	All Year	9	SU	DMax Conc	Daily	Grab	Effluent
pH	All Year	6	SU	DMin Conc	Daily	Grab	Effluent

Table 6-73. Permit Limits for Valley Protein.

Comments:
Animal and Marine Fats and Oils
6/4/07 Compliance Evaluation Inspection:
On Monday June 4, 2007, Knoxville EFO-WPC personnel visited your facility in order to conduct a compliance evaluation inspection on your company's NPDES and TMSP permits. Following is a report of this inspection:

- The Discharge Monitoring Report (DMR) for the month of April 2007 was not submitted because no sampling of discharge was performed during this month. DMR's for December 2006 through March 2007 could not be found. We were informed that the previous environmental coordinator at the plant quit abruptly in March 2007 and these problems were attributed to his sudden departure.

- At the time of inspection the discharge appeared to have a different color than has been previously observed at this location. This could be due to a change in waste loading or operation and maintenance procedures within the wastewater system.

- It is suggested that Valley Protein seek technical assistance regarding the operation of the Dissolved Air Flotation unit.

APPENDIX II

ID	NAME	HAZARD
477001	Pressmans Home	0
297001	Duncan Creek	L
297002	Lea Lake	B
297003	Corbin Lake	L
297004	Wolfe Lake	L
297005	Wayland Lake	S
297006	Highlands Springs Cove	L
327002	Wallace Hardware	2
377001	Levasy	L
377002	Greenland Park	S
377004	Burem Lake	0
377005	Deer Creek	3
377006	Lake Luanna	3
297007	Carter #2	N
457005	Grassland	1
457006	Cove Branch	3

Table A2-1. Inventoried Dams in the Holston River Watershed. *Hazard Codes: (H, 1), High; (S, 2), Significant; (L, 3), Low; B, Breached. TDEC only regulates dams indicated by a numeric hazard score.*

LAND COVER/LAND USE	ACRES	% OF WATERSHED
Bare Rock/Sand/Clay	4,283	0.7
Deciduous Forest	242,226	37.9
Developed Open Space	45,039	7.0
Emergent Herbaceous Wetlands	1	0.0
Evergreen Forest	24,647	3.9
Grassland/Herbaceous	47,974	7.5
High Intensity Development	1,482	0.2
Low Intensity Development	19,646	3.1
Medium Intensity Development	5,638	0.9
Mixed Forest	30,588	4.8
Open Water	27,218	4.3
Pasture/Hay	179,658	28.1
Row Crops	6,005	0.9
Shrub/Scrub	2,772	0.4
Woody Wetlands	2,288	0.4
Total	**639,465**	**100.0**

Table A2-2. Land Use Distribution in Holston River Watershed. *Data are from Multi-Resolution Land Characterization (MRLC) derived by applying a generalized Anderson level II system to mosaics of Landsat thematic mapper images collected every five years.*

ECOREGION	REFERENCE STREAM	WATERSHED (HUC)	
Southern Limestone/Dolomite Valleys and Low Rolling Hills (67f)	Big Creek (6701)	Holston River	06010104
	Fisher Creek (6702)	Holston River	06010104
	Possum Creek (6707)	SF Holston River	06010102
	Clear Creek (67F06)	Lower Clinch River	06010207
	White Creek (67F13)	Upper Clinch River	06010205
	Powell River (67F14)	Powell River	06010206
	Big War Creek (67F17)	Upper Clinch River	06010205
	Martin Creek (67F23)	Powell River	06010206
	Powell River (67F25)	Powell River	06010206
Southern Shale Valleys (67g)	Little Chuckey Creek (67G01)	Nolichucky River	06010108
	Bent Creek (67G05)	Nolichucky River	06010108
	Brymer Creek (67G08)	Hiwassee River	06020002
	Harris Creek (67G09)	Hiwassee River	06020002
	Flat Creek (67G10)	Lower French Broad	06010107
	North Prong Fishdam Creek (67G11)	Holston River	06010104
Southern Sandstone Ridges (67h)	Blackburn Creek (67H04)	Hiwassee River	06020002
	Laurel Creek (67H06)	Little Tennessee	06010204
	Parker Branch (67H08)	Holston River	06010104
Southern Dissected Ridges and Knobs (67i)	Mill Branch (67I12)	Lower Clinch River	06010207

Table A2-3. Ecoregion Monitoring Sites in Ecoregions 67f, 67g, 67h, and 67i.

CODE	NAME	AGENCY	AGENY ID
2	TDEC/DNA Vann Swamp Forest Site	TDEC/DNA	S.USTNHP 328
142	TDEC/DNA Lea Lake Site	TDEC/DNA	S.USTNHP 30
259	USACOE-Nashville Client Site	USACOE-Nashville	
263	USACOE-Nashville Client Site	USACOE-Nashville	
295	TDOT US 11W Mitigation Site	TDOT	
387	TDOT US 11W (SR 1) Permit Site	TDOT	
444	TDEC/WPC Sand Branch Tributary WPC Permit Site	TDEC/WPC	
445	TDEC/WPC Sand Branch Tributary WPC Mitigation Site	TDEC/WPC	
470	TDOT US 11W (SR 1) Permit Site	TDOT	
1523	USACOE-ORN-ERFO NWP Luttrell-Blane-Corryton Site	USFWS	
2718	TWRA Richland Creek Site	TWRA	
2736	USACOE Holston River 3.2 L Site	USACOE-Nashville	960047469

Table A2-4. Wetland Sites in the Holston River Watershed in TDEC Database. *TDEC, Tennessee Department of Environment and Conservation; DNA, Division of Natural Areas; WPC, Water Pollution Control; TDOT, Tennessee Department of Transportation; USACOE, US Army Corps of Engineers; USFWS, US Fish and Wildlife Service; TWRA, Tennessee Wildlife Resources Agency.* ***This table represents an incomplete inventory and should not be considered a dependable indicator of the presence of wetlands in the watershed.***

APPENDIX III

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Alexander Creek	TN06010104011_0800	1.0
Alexander Creek	TN06010104011_0850	12.5
Beaver Creek	TN06010104001_0900	21.0
Beech Creek	TN06010104012_1000	19.1
Big Creek	TN06010104015_1000	6.7
Big Creek	TN06010104015_2000	13.6
Bradley Creek	TN06010104011_0500	9.2
Buffalo Creek	TN06010104001_0600	26.0
Caney Creek	TN06010104004T_1100	5.2
Caney Creek	TN06010104004T_1150	16.8
Crowder Branch	TN06010104001_1100	3.9
Dodson Creek	TN06010104004T_1300	5.0
Dodson Creek	TN06010104004T_1350	8.3
Fisher Creek	TN06010104015_0100	5.0
Flat Creek	TN06010104019_1000	16.3
Flat Creek	TN06010104019_3000	9.0
Forgey Creek	TN06010104011_0200	3.6
Grassy Fork	TN06010104012_0110	10.6
Holston River	TN06010104001_1000	30.5
Holston River	TN06010104011_1000	14.6
Holston River	TN06010104011_2000	23.9
Honeycutt Creek	TN06010104004T_1400	9.9
Honeycutt Creek	TN06010104011_1800	6.1
Hord Creek	TN06010104011_0700	8.9
Hunt Creek	TN06010104011_1600	7.7
Little Creek	TN06010104019_0200	7.6
Little Flat Creek	TN06010104019_0100	30.3
Louderback Creek	TN06010104004T_1310	11.7
Lyon Creek	TN06010104001_1300	17.6
North Fork	TN06010104012_0100	8.2
Parker Branch	TN06010104011_1200	2.0
Renfroe Creek	TN06010104004T_0800	6.9
Renfroe Creek	TN06010104011_0510	12.5
Richland Creek	TN06010104018_1000	26.7
Robertson Creek	TN06010104004T_1500	28.2

Table A3-1a.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Roseberry Creek	TN06010104001_0500	20.0
Shields Creek	TN06010104004T_0300	3.0
Sinking Creek	TN06010104011_0100	2.7
Stoney Point Creek	TN06010104011_0400	13.1
Surgoinsville Creek	TN06010104011_0300	7.0
Terrill Creek	TN06010104011_1700	11.8

Table A3-1b.

Table A3-1a, b. Streams Fully Supporting Fish and Aquatic Life Designated Use in the Holston River Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (ACRES)
Cherokee Reservoir	TN06010104004_1000	5,109

Table A3-3. Lakes Fully Supporting Fish and Aquatic Life Designated Use in the Holston River Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Arnott Creek	TN06010104011_1100	2.8
Crockett Creek	TN06010104004T_1200	5.3
Flat Creek	TN06010104019_2000	2.8
Holston River	TN06010104001_2000	26.9
Lost Creek	TN06010104001_0800	26.8
Love Creek	TN06010104001_0100	9.7
Mossy Creek	TN06010104004T_2400	9.1
Smith Creek	TN06010104011_0900	4.6
Stock Creek	TN06010104004T_0900	4.2
Swanpond Creek	TN06010104001_1400	16.3
Turkey Creek	TN06010104004T_2100	8.0
Unnamed Trib to Red House Branch Embayment	TN06010104004T_0600	1.50

Table A3-4. Streams Not Supporting Fish and Aquatic Life Designated Use in the Holston River Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Briar Fork	TN06010104004T_0400	9.1
Buffalo Hide Branch	TN06010104018_0300	8.8
Caney Creek	TN06010104015_0200	10.7
Caney Fork	TN06010104004T_0500	7.7
Cedar Creek	TN06010104004T_1800	7.5
Cloud Creek	TN06010104004T_0700	8.2
Dyer Branch	TN06010104019_0300	10.0
Fall Creek	TN06010104004T_1700	8.2
Frost Branch	TN06010104018_0100	14.2
Goshen Valley Creek	TN06010104011_1500	4.1
Havley Springs Branch	TN06010104004T_2110	6.5
Laurel Run Creek	TN06010104011_1300	7.2
Lea Creek	TN06010104018_0200	8.2
Legg Creek	TN06010104001_0300	4.8
Little Poor Valley Creek	TN06010104017_0100	8.9
Mill Spring Creek	TN06010104001_0700	5.2
Misc Tribs to Beech Creek	TN06010104012_0999	41.3
Misc Tribs to Big Creek	TN06010104015_0999	16.2
Misc Tribs to Big Flat Creek	TN06010104019_0999	35.3
Misc tribs to Cherokee Reservoir	TN06010104004T_0999	94.4
Misc Tribs to Holston River	TN06010104001_0999	58.7
Misc Tribs to Poor Valley Creek	TN06010104017_0999	21.4
Misc Tribs to Richland Creek	TN06010104018_0999	43.7
Misc. Tribs to Holston River	TN06010104011_0999	18.2
Moyer Branch	TN06010104004T_2200	6.3
Panther Creek	TN06010104004T_2300	8.3
Poor Valley Creek	TN06010104017_1000	18.6
Ray Creek	TN06010104004T_0200	4.9
Rocky Branch	TN06010104004T_0100	3.3
Salem Creek	TN06010104004T_1110	4.8
Sevier Branch	TN06010104011_0600	5.1
Smith Gap Branch	TN06010104011_1400	4.2
Spring Creek	TN06010104004T_1900	12.1
Stanley Creek	TN06010104015_0300	7.7
Strong Creek	TN06010104001_0400	4.3
Thompson Creek	TN06010104001_1200	3.5
War Creek	TN06010104004T_1600	3.0
Woods Creek	TN06010104001_0200	5.8

Table A3-5. Streams Not Assessed for Fish and Aquatic Life Designated Use in the Holston River Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Alexander Creek	TN06010104011_0800	1.0
Beaver Creek	TN06010104001_0900	21.0
Beech Creek	TN06010104012_1000	19.1
Big Creek	TN06010104015_1000	6.7
Big Creek	TN06010104015_2000	13.6
Bradley Creek	TN06010104011_0500	9.2
Buffalo Creek	TN06010104001_0600	26.0
Caney Creek	TN06010104004T_1100	5.2
Caney Creek	TN06010104004T_1150	16.8
Crowder Branch	TN06010104001_1100	3.9
Dodson Creek	TN06010104004T_1300	5.0
Dodson Creek	TN06010104004T_1350	8.3
Fisher Creek	TN06010104015_0100	5.0
Flat Creek	TN06010104019_1000	16.3
Flat Creek	TN06010104019_3000	9.0
Forgey Creek	TN06010104011_0200	3.6
Grassy Fork	TN06010104012_0110	10.6
Holston River	TN06010104001_1000	30.5
Holston River	TN06010104011_1000	14.6
Holston River	TN06010104011_2000	23.9
Honeycutt Creek	TN06010104004T_1400	9.9
Honeycutt Creek	TN06010104011_1800	6.1
Hord Creek	TN06010104011_0700	8.9
Hunt Creek	TN06010104011_1600	7.7
Little Creek	TN06010104019_0200	7.6
Little Flat Creek	TN06010104019_0100	30.3
Louderback Creek	TN06010104004T_1310	11.7
Lyon Creek	TN06010104001_1300	17.6
North Fork	TN06010104012_0100	8.2
Parker Branch	TN06010104011_1200	2.0
Renfroe Creek	TN06010104004T_0800	6.9
Renfroe Creek	TN06010104011_0510	12.5
Richland Creek	TN06010104018_1000	26.7
Robertson Creek	TN06010104004T_1500	28.2
Roseberry Creek	TN06010104001_0500	20.0
Shields Creek	TN06010104004T_0300	3.0
Sinking Creek	TN06010104011_0100	2.7
Stoney Point Creek	TN06010104011_0400	13.1
Surgoinsville Creek	TN06010104011_0300	7.0
Terrill Creek	TN06010104011_1700	11.8

Table A3-6. Streams Fully Supporting Recreation Designated Use in the Holston River Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (ACRES)
Cherokee Reservoir	TN06010104004_1000	5,109

Table A3-7. Lakes Fully Supporting Recreation Designated Use in the Holston River Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Arnott Creek	TN06010104011_1100	2.8
Crockett Creek	TN06010104004T_1200	5.3
Flat Creek	TN06010104019_2000	2.8
Lost Creek	TN06010104001_0800	26.8
Love Creek	TN06010104001_0100	9.7
Mossy Creek	TN06010104004T_2400	9.1
Smith Creek	TN06010104011_0900	4.6
Swanpond Creek	TN06010104001_1400	16.3
Turkey Creek	TN06010104004T_2100	8.0
Unnamed Trib to Red House Branch Embayment	TN06010104004T_0600	1.5

Table A3-8. Streams Not Supporting Recreation Designated Use in the Holston River Watershed.

SEGMENT NAME	WATERBODY SEGMENT ID	SEGMENT SIZE (MILES)
Briar Fork	TN06010104004T_0400	9.1
Buffalo Hide Branch	TN06010104018_0300	8.8
Caney Creek	TN06010104015_0200	10.7
Caney Fork	TN06010104004T_0500	7.7
Cedar Creek	TN06010104004T_1800	7.5
Cloud Creek	TN06010104004T_0700	8.2
Dyer Branch	TN06010104019_0300	10.0
Fall Creek	TN06010104004T_1700	8.2
Frost Branch	TN06010104018_0100	14.2
Goshen Valley Creek	TN06010104011_1500	4.1
Havley Springs Branch	TN06010104004T_2110	6.5
Laurel Run Creek	TN06010104011_1300	7.2
Lea Creek	TN06010104018_0200	8.2
Legg Creek	TN06010104001_0300	4.8
Little Poor Valley Creek	TN06010104017_0100	8.9
Mill Spring Creek	TN06010104001_0700	5.2
Misc Tribs to Beech Creek	TN06010104012_0999	41.3
Misc Tribs to Big Creek	TN06010104015_0999	16.2
Misc Tribs to Big Flat Creek	TN06010104019_0999	35.3
Misc tribs to Cherokee Reservoir	TN06010104004T_0999	94.4
Misc Tribs to Holston River	TN06010104001_0999	58.7
Misc Tribs to Poor Valley Creek	TN06010104017_0999	21.4
Misc Tribs to Richland Creek	TN06010104018_0999	43.7
Misc. Tribs to Holston River	TN06010104011_0999	18.2
Moyer Branch	TN06010104004T_2200	6.3
Panther Creek	TN06010104004T_2300	8.3
Poor Valley Creek	TN06010104017_1000	18.6
Ray Creek	TN06010104004T_0200	4.9
Rocky Branch	TN06010104004T_0100	3.3
Salem Creek	TN06010104004T_1110	4.8
Sevier Branch	TN06010104011_0600	5.1
Smith Gap Branch	TN06010104011_1400	4.2
Spring Creek	TN06010104004T_1900	12.1
Stanley Creek	TN06010104015_0300	7.7
Strong Creek	TN06010104001_0400	4.3
Thompson Creek	TN06010104001_1200	3.5
War Creek	TN06010104004T_1600	3.0
Woods Creek	TN06010104001_0200	5.8

Table A3-9. Streams Not Assessed for Recreation Designated Use in the Holston River Watershed.

APPENDIX IV

LAND USE/LAND COVER	AREAS IN HUC-12 SUBWATERSHEDS (ACRES)				
	0101	0102	0103	0104	0201
Bare Rock/Sand/Clay		50	81	6	156
Deciduous Forest	14,297	18,354	18,743	24,225	12,492
Developed Open Space	3,203	2,241	999	1,154	2,117
Evergreen Forest	321	525	376	779	1,080
Grassland/Herbaceous	413	944	5,426	329	1,483
High Intensity Development	94	79	5		59
Low Intensity Development	1,780	678	496	18	829
Medium Intensity Development	422	202	136		337
Mixed Forest	277	536	1,521	644	888
Open Water	556	1,337	4	7	468
Pasture/Hay	12,329	20,488	6,212	5,683	8,219
Row Crops	790	1,536	271	266	224
Shrub/Scrub	109	229	117	143	238
Woody Wetlands	231	222	26	44	62
Total	**34,837**	**47,422**	**34,412**	**33,297**	**28,651**

Table A4-1a.

LAND USE/LAND COVER	AREAS IN HUC-12 SUBWATERSHEDS (ACRES)				
	0202	0203	0204	0205	0206
Bare Rock/Sand/Clay	10	263	169	262	773
Deciduous Forest	3,051	14,148	6,673	18,932	9,024
Developed Open Space	562	1,175	737	2,054	3,831
Evergreen Forest	592	1,315	469	1,117	1,529
Grassland/Herbaceous	266	3,555	2,920	3,319	3,098
High Intensity Development		9	14	16	171
Low Intensity Development	9	444	316	593	2,118
Medium Intensity Development	3	170	54	116	659
Mixed Forest	459	1,993	1,064	3,043	1,572
Open Water	2	2,270	9	427	5,922
Pasture/Hay	6,362	3,394	1,722	3,862	9,375
Row Crops	147	7	36		142
Shrub/Scrub	159	152	12	16	253
Woody Wetlands	45	54	15	31	34
Total	**11,667**	**28,948**	**14,208**	**33,788**	**38,503**

Table A4-1b.

LAND USE/LAND COVER	AREAS IN HUC-12 SUBWATERSHEDS (ACRES)				
	0207	0208	0209	0210	0301
Bare Rock/Sand/Clay	16	483	933	212	145
Deciduous Forest	2,967	12,828	9,252	6,940	8,847
Developed Open Space	2,889	1,047	2,804	2,704	2,179
Emergent Herbaceous Wetlands					1
Evergreen Forest	117	917	1,695	1,581	1,270
Grassland/Herbaceous	152	2,772	4,178	585	6,461
High Intensity Development	252	34	44	64	3
Low Intensity Development	1,552	722	1,508	1,256	796
Medium Intensity Development	595	272	214	383	42
Mixed Forest	231	2,040	1,388	1,263	2,013
Open Water	24	1,752	9,045	2,818	893
Pasture/Hay	2,695	2,402	11,235	12,597	17,989
Row Crops	23	1	163	311	134
Shrub/Scrub	66	3	233	256	28
Woody Wetlands	9	31	43	49	70
Total	**11,588**	**25,305**	**42,736**	**31,019**	**40,871**

Table A4-1c.

LAND USE/LAND COVER	AREAS IN HUC-12 SUBWATERSHEDS (ACRES)				
	0302	0303	0304	0305	0306
Bare Rock/Sand/Clay	97	55	137	398	20
Deciduous Forest	12,130	20,573	12,630	14,289	1,830
Developed Open Space	2,512	1,898	7,478	2,530	925
Evergreen Forest	1,458	3,119	2,865	2,817	705
Grassland/Herbaceous	1,091	3,098	1,243	5,661	981
High Intensity Development	17	37	555	24	4
Low Intensity Development	562	1,038	3,309	1,199	423
Medium Intensity Development	45	152	1,574	183	80
Mixed Forest	1,402	3,944	1,776	3,918	615
Open Water	861	47	713	54	9
Pasture/Hay	19,934	8,103	11,328	12,263	3,466
Row Crops	1,144	57	662	76	13
Shrub/Scrub	343	26	383	9	
Woody Wetlands	385	244	348	289	56
Total	**41,980**	**42,391**	**45,002**	**43,710**	**9,128**

Table A4-1d.

Table A4-1a-d. Land Use Distribution in the Holston River Watershed by HUC-12. *Data are from 1992 Multi-Resolution Land Characterization (MRLC) derived by applying a generalized Anderson Level II system to mosaics of Landsat thematic mapper images collected every five years.*

HYDROLOGIC SOIL GROUPS
GROUP A SOILS have low runoff potential and high infiltration rates even when wet. They consist chiefly of sand and gravel and are well to excessively drained.
GROUP B SOILS have moderate infiltration rates when wet and consist chiefly of soils that are moderately deep to deep, moderately to well drained, and moderately coarse to coarse textures.
GROUP C SOILS have low infiltration rates when wet and consist chiefly of soils having a layer that impedes downward movement of water with moderately fine to fine texture.
GROUP D SOILS have high runoff potential, very low infiltration rates, and consist chiefly of clay soils.

Table A4-2. Hydrologic Soil Groups in Tennessee as Described in WCS. *Soils are grouped into four hydrologic soil groups that describe a soil's permeability and, therefore, its susceptibility to runoff.*

STATION	HUC 10	STREAM	AREA (MI^2)	Daily Flow Avg	Daily Flow Max	Daily Flow Min	3Q2	1Q10	3Q10	7Q10	3Q20
3490500	0601010401	Holston River	2870.00	3774.3	52500.0	528.0	na	na	na	na	na
3491000	0601010401	Big Creek	47.30	58.3	4000.0	1.1	4.4	2.6	2.7	2.9	na
3491200	0601010401	Big Creek	2.00	na	na	na	na	na	na	na	na
3491300	0601010401	Beech Creek	47.00	48.2	2400.0	0.8	na	na	na	na	na
3491500	0601010402	Holston River	3035.00	4048.4	67000.0	459.0	na	na	na	614.0	535.0
3495500	0601010403	Holston River	3747.00	4670.5	54800.0	44.0	300.3	163.6	184.6	244.5	162.6

Table A4-3. Stream Flow Data from USGS Gaging Stations in the Holston River Watershed. Data are in cubic feet per second (CFS). Data were obtained from the USGS web application StreamStats at http://water.usgs.gov/osw/streamstats. (na, data not available)

AGENCY	STATION	LOCATION	HUC-12
TDECWPC	ALEXA000.6HS	Alexander Creek @ RM 0.6	060101040101
TDECWPC	ALEXA001.4HS	Alexander Creek @ RM 1.4	060101040101
TDECWPC	ARNOT000.1HS	Arnott Branch @ RM 0.1	060101040101
TDECWPC	ECO67H08	Parker Branch @ RM 0.5	060101040101
TDECWPC	HOLST131.5HS	Holston River @ RM 131.5	060101040101
TDECWPC	HORD000.2HS	Hord Creek @ RM 0.2	060101040101
TDECWPC	SMITH000.9HS	Smith Creek @ RM 0.9	060101040101
TDECWPC	BRADL001.4HS	Bradley Creek @ RM 1.4	060101040102
TDECWPC	FORGE000.8HS	Forgey Creek @ RM 0.8	060101040102
TDECWPC	HOLST109.9HS	Holston River @ RM 109.9	060101040102
TDECWPC	HONEY001.4HS	Honeycutt Creek @ RM 1.4	060101040102
TDECWPC	HUNT001.0HS	Hunt Creek @ RM 1.0	060101040102
TDECWPC	RENFR000.2HS	Renfro Creek @ RM 0.2	060101040102
TDECWPC	SINKI001.1HS	Sinking Creek @ RM 1.1	060101040102
TDECWPC	SPOIN000.1HS	Stoney Point @ RM 0.1	060101040102
TDECWPC	SURGO000.1HS	Surgoinsville Creek @ RM 0.1	060101040102
TDECWPC	TERRI000.8HS	Terrill Creek @ RM 0.8	060101040102
TDECWPC	BIG002.0HS	Big Creek @ RM 2.0	060101040103
TDECWPC	BIG009.8HS	Big Creek @ RM 9.8	060101040103
TDECWPC	ECO6701	Big Creek @ RM 9.75	060101040103
TDECWPC	ECO6702	Fisher Creek @ RM 0.58	060101040103
TDECWPC	STANL000.1HS	Stanley Creek @ RM 0.1	060101040103
TDECWPC	BEECH003.8HS	Beech Creek @ RM 3.8	060101040104
TDECWPC	BEECH010.7HS	Beech Creek @ RM 10.7	060101040104
TDECWPC	GFORK000.6HS	Grassy Fork Creek @ RM 0.6	060101040104
TDECWPC	NORTH000.1HS	North Fork @ RM 0.1	060101040104
TDECWPC	CROCK001.8HS	Crockett Creek @ RM 1.8	060101040201
TDECWPC	DODSO000.5HS	Dodson Creek @ RM 0.5	060101040201
TDECWPC	DODSO002.6HS	Dodson Creek @ RM 2.6	060101040201
TDECWPC	HONEY001.7HS	Honeycutt Creek @ RM 1.7	060101040201
TDECWPC	LOUDE000.6HS	Louderback Creek @ RM 0.6	060101040201
TDECWPC	ROBER000.7HS	Robertson Creek @ RM 0.7	060101040202
TDECWPC	CLOUD002.7HS	Cloud Creek @ RM 2.7	060101040203
TDECWPC	HOLST089.0HS	Holston River @ RM 89.0	060101040203
TDECWPC	HOLST089.0HSB	Holston River @ RM 89.0	060101040203
TDECWPC	HOLST089.0HSS	Holston River @ RM 89.0	060101040203
TDECWPC	HOLST093.5HS	Holston River @ RM 93.5	060101040203
TDECWPC	HOLST093.5HSB	Holston River @ RM 93.5	060101040203
TDECWPC	HOLST093.5HSS	Holston River @ RM 93.5	060101040203
TDECWPC	HOLST097.5HS	Holston River @ RM 97.5	060101040203
TDECWPC	HOLST097.5HSB	Holston River @ RM 97.5	060101040203

Table A4-4a.

AGENCY	STATION	LOCATION	HUC-12
TDECWPC	HOLST097.5HSS	Holston River @ RM 97.5	060101040203
TDECWPC	RENFR000.1HS	Renfro Creek @ RM 0.1	060101040203
TDECWPC	STOCK001.1HS	Stock Creek @ RM 1.1	060101040203
TDECWPC	CANEY002.6HS	Caney Creek @ RM 2.6	060101040204
TDECWPC	CANEY006.0HS	Caney Creek @ RM 6.0	060101040204
TDECWPC	CANEY009.1HS	Caney Creek @ RM 9.1	060101040204
TDECWPC	CANEY000.8HS	Caney Fork @ RM 0.8	060101040205
TDECWPC	PVALL006.3HS	Poor Valley Creek @ RM 6.3	060101040205
TDECWPC	PVALL013.2HS	Poor Valley Creek @ RM 13.2	060101040205
TDECWPC	HOLST001.8KN	Holston River @ RM 1.8	060101040304
TDECWPC	PRATT000.1KN	Pratt Branch @ RM 0.1	060101040304
TDECWPC	SPOND004.5KN	Swan Pond Creek @ RM 4.5	060101040304
TDECWPC	FLAT003.0UN	Flat Creek @ RM 3.0	060101040305
TDECWPC	FLAT004.0UN	Flat Creek @ RM 4.0	060101040305
TDECWPC	LITTL001.5UN	Little Creek @ RM 1.5	060101040305

Table A4-4b.

Table A4-4a-b. STORET Water Quality Monitoring Stations in the Holston River Watershed. *TDECWPC, Tennessee Department of Environment and Conservation Division of Water Pollution Control; UT, Unnamed Tributary.*

FACILITY NUMBER	FACILITY NAME	SIC	SIC NAME	MADI	WATERBODY	HUC-12
TN0002330	Holliston Mills, Inc.	2295 2261 2672	Coated Fabric, not Rubberized	Major	Holston River @ RM 129.5	060101040101
TN0021253	Church Hill STP	4952	Sewerage System	Major	Holston River @ RM 136.5	060101040101
TN0062057	Mount Carmel STP	4952	Sewerage System	Minor	Holton River @ RM 137.5	060101040101
TN0001694	Quebecor World	2732 2789	Book Printing	Minor	UT to Bradley Creek @ RM 1.4	060101040102
TN0002631	AFG Industries, Inc.	3211	Flat Glass	Minor	Holston River	060101040102
TN0003581	Alladin Investments, Inc.	3089	Plastic Products	Minor	UT @ RM 0.08 to Stoney Point Creek @ RM 0.2	060101040102
TN0055468	Surgoinsville Middle and Elementary Schools	4952	Sewerage System	Minor	Forgey Creek @ RM 1.4	060101040102
TN0020672	Rogersville STP	4952	Sewerage System	Major	Holston River @ RM 99.7	060101040201
TN0005436	TVA-John Sevier Fossil Fuel Plant	4911	Electric services	Major	Polly Branch	060101040201
TN0054623	Cherokee Comprehensive High School	4952	Sewerage System	Minor	UT @ RM 0.9 to Robertson Creek @ RM 0.8	060101040202
TN0055603	Mooresburg Elementary School	4952	Sewerage System	Minor	Mooresburg Branch @ RM 1.4	060101040205
TN0023507	Morristown, STP	4952	Sewerage System	Major	Holston River @ RM 75.0	060101040206
TN0067989	Koch Foods, LLC	2015	Poultry Slaughtering and Processing	Minor	West Fork Turkey Creek @ RM 0.1	060101040207
TN0021199	Jefferson City STP	4952	Sewerage System	Major	Mossy Creek Embayment @ RM 3.0	060101040210
TN0065480	Five Rivers Electronic	2517	Wood Cabinets for Television, Radio, Phonograph, and Sewing Machines	Minor	Groundwater Sinkhole	060101040210
TN0061476	Rush Strong School	4952	Sewerage System	Minor	Crowder Branch @ RM 0.4, Holston River @ RM 17.7	060101040302
TN0002089	Norfolk Southern Railway	4011	Railroad Switching and Operations	Minor	UT to Holston River @ RM 7.4	060101040304
TN0003352	Cemex, Inc.	3241	Cement Hydraulic	Minor	Woods Creek	060101040304
TN0005371	Valley Protein	2077	Animal and Marine Fats and Oils	Minor	Holston River @ RM 15.2	060101040304
TN0021822	KUB-Loves Creek STP	4952	Sewerage System	Major	Holston River @ RM 5.0	060101040304
TN0061743	KUB-East Bridge STP	4952	Sewerage System	Minor	Holston River @ RM 14.2	060101040304
TN0064351	Pilot Travel Centers	5541	Gasoline Service Station	Minor	Pratt Branch @ RM 0.2	060101040304
TN0077950	Kwik-Shop #398	5541	Gasoline Service Station	Minor	Pratt Branch @ RM 1.0	060101040304
TN0078361	Aqua Chem, Inc.	3443	Fabricated Plate Work	Minor	Sand Branch	060101040304

Table A4-5. NPDES Permittees in the Holston River Watershed. *SIC, Standard Industrial Classification; MADI, Major Discharge Indicator; UT, Unnamed Tributary.*

FACILITY NUMBER	PERMITEE	WATERBODY	HUC-12
TN0061336	First Utility District of Hawkins County WTP	Hord Creek	060101040101
TN0078174	First Utility District of Hawkins County WTP	Alexander Creek @ RM 0.2	060101040101
TN0073261	Surgoinsville Utility District	Young Branch, Surgoinsville Creek, Holston River @ RM 118.5	060101040102
TN0005185	NE Knox Utility District	Legg Creek RM 0.2	060101040304
TN0075086	Persia Utility District	Holston River @ RM 102.5	060101040201
TN0074624	Mooresburg WTP	Mooresburg Branch	060101040205
TN0074080	Luttrell-Blaine-Corryton WTP	Little Flat Creek	060101040305

Table A4-6. Water Treatment Plants in the Holston River Watershed.

FACILITY NUMBER	PERMITEE	COUNTY	LIVESTOCK	WATERBODY	HUC-12
TNA000070	Cope Poultry Farm	Hawkins	Poultry	Big Creek	060101040103
TNA000063	Valley Creek Farms	Hawkins	Poultry	Robertson Creek	060101040202

Table A4-7. CAFO Sites in the Holston River Watershed.

FACILITY NUMBER	PERMITEE	SIC	SIC NAME	WATERBODY	HUC-12
TN0054291	Short Mountain Silica (Short Mountain Sand Quarry)	1446	Industrial Sand	Poor Valley Creek Red House Branch	060101040203
TN0071919	Short Mountain Trucking, Inc. (Truck Loading and Maintenance Facility)	1446	Industrial Sand	Red House Branch	060101040203
TN0027910	Vulcan Construction Materials (Rogersville Quarry)	1422	Crushed and Broken Limestone	Caney Creek	060101040204
TN0076201	Fine Sands, LLC (Quarry #1)	1446	Silica Sand Mining	Little Poor Valley Creek	060101040205
TN0001732	ASARCO, Incorporated (Coy Mine)	1031	Lead and Zinc Ores	Mossy Creek	060101040210
TN0071030	Rinker Materials-South Central (Coy Stone and Concrete Plant)	1422	Crushed and Broken Limestone	UT to Mossy Creek	060101040210
TN0076287	Rocktown Road Quarry, Inc. (Rocktown Road Quarry)	1422	Limestone Crushed and Broken	Karst	060101040210
TN0072516	Riverbend Constr. Materials (Cherokee Quarry)	1422	Crushed and Broken Limestone	Holston River and Unnamed Tributary to Holston River	060101040301
TN0001741	ASARCO, Incorporated (Young Mine)	1031	Lead and Zinc Ores	Beaver Creek @ RM 2.8	060101040302
TN0001759	ASARCO, Incorporated (Immel Mine)	1031	Lead and Zinc Ores	Holston River	060101040302
TN0027677	ASARCO, Incorpo1031rated (Young Mill)	1031	Lead and Zinc Ores	Beaver Creek	060101040302
TN0057029	Mossy Creek Mining, LLC (New Market Mine)	1031	Lead and Zinc Ores	Ault Lake	060101040302
TN0061468	ASARCO, Incorporated (Beaver Creek Shaft)	1031	Lead and Zinc Ores	Hodges Lake	060101040302
TN0031089	Rinker Materials-South Central (Midway Quarry and Concrete)	1422	Crushed and Broken Limestone	Holston River	060101040304
TN0054453	General Shale Products, LLC (Mine #7)	1459	Clay, Ceramic, and Refractory Minerals	Legg Creek Woods Creek	060101040304
TN0060844	Global Stone (Luttrell Mine)	1422	Crushed and Broken Limestone	UT to Little Creek Flat Creek	060101040305
TN0063657	East Tennessee Industries (Asbury Project Area #1)	1422	Crushed and Broken Limestone	UT to Sand Branch	060101040304
TN0071455	General Shale Products	1459	Clay, Ceramic, and Refractory Minerals	UT to Woods Creek	060101040304

Table A4-8. Active Permitted Mining Sites in the Holston River Watershed. *SIC, Standard Industrial Classification; UT, Unnamed Tributary.*

FACILITY NUMBER	FACILITY NAME	WATERBODY	HUC-12
TNG110139	Tri-Cities Concrete Co.	Crockett Creek	060101040201
TNG110200	Cloud 9 Enterprises	UT to Cherokee Reservoir	060101040205
TNG110049	Concrete Materials, Inc.	UT to Turkey Creek	060101040207
TNG110096	Loven Ready-Mix	Havley Springs Branch	060101040209
TNG110290	Morristown Concrete Plant	Williams Branch	060101040209
TNG110029	Ready-Mix Concrete Co.	WWC to Love Creek	060101040304
TNG110289	Harrison Ready-Mix	Woods Creek	060101040304

Table A4-9. Ready Mix Concrete Plants in the Holston River Watershed. *UT, Unnamed Tributary; WWC, Wet Weather Conveyance.*

LOG NUMBER	COUNTY	DESCRIPTION	WATERBODY	HUC-12
NRS01.136	Hawkins	Utility Line Crossing	Alexander Creek	060101040101
NRS01.065	Hawkins	Road Alignment	UT to Renfro Creek	060101040102
NRS01.285	Hawkins	Impoundment		060101040102
NRS00.285	Hawkins	Stream Relocation	Three Forks Branch	060101040201
NRS01.089	Hawkins	Bank Stabilization	Holston River	060101040201
NRS03.350	Hamblen	Road Extension	Unnamed Tributary	060101040206
NRS04.080	Hamblen	Floating Boat Dock and Ramp	Kellar Branch	060101040206
NRS02.178	Jefferson	Sewer Line Construction	Byrd Springs Branch	060101040210
NRS03.017	Jefferson	Road Construction	Crowder Branch	060101040302
NRS03.017B	Jefferson	Road Construction	UT to Crowder Branch	060101040302
NRS01.178	Knox		Fourth Creek	060101040304
NRS02.329	Knox	Road Crossing	Holston River	060101040304

Table A4-10. Individual ARAP Permits Issued January 2000 Through June 2004 in Holston River Watershed. *UT, Unnamed Tributary.*

FACILITY NUMBER	FACILITY NAME	SECTOR	RECEIVING STREAM	AREA*	HUC-12
TNR053251	Carter Valley Landfill	L	Renfro Creek	364	060101040101
TNR055935	Appalachian Timber Company	A	Smith Creek	0.69	060101040101
TNR050656	Quebecor World	X	Bradley Creek	90	060101040102
TNR051221	AFG Industries, Incorporated	E	Holston River	363	060101040102
TNR051690	MIS	AA	UT to Stony Point Creek	6.94	060101040102
TNR051722	Alladin Plastics	Y	UT(s) to Holston River	51.09	060101040102
TNR053324	Tri-County Materials, Inc.	D	Caney Creek	18.11	060101040102
TNR053461	APAC Plant 0407	D		2.64	060101040102
TNR053744	Cooper-Standard Automotive	AB	UT to Holston River	8.98	060101040102
TNR053864	Peddinghaus Modern Technologies	AA	UT to Stoney Point Creek	25.2	060101040102
TNR053449	Hawkins County Airport	S		4.9	060101040102
TNR053401	Lender Services, Incorporated	P	Natural Evaporation	0.1	060101040103
TNR050262	Assured castings	F	Crockett Creek	9	060101040201
TNR050302	Dixie Customs	M	WWC to Crockett Creek	10	060101040201
TNR052011	East Tennessee Iron and Metal	N	Fall Creek	8.22	060101040201
TNR053187	TVA-John Sevier Fossil Plant	O, L	Holston River @ RM 106.8, @ RM 106.6, and @ RM 106.2	350.2	060101040201
TNR050391	International Playing Cards	X	Crockett Creek	8.07	060101040204
TNR054286	Full Cycle Woodworks, Inc.	A	Caney Creek	4.99	060101040204
TNR050178	Mahle, Incorporated	AB, F	Cedar Creek	46	060101040206
TNR050462	Berg Profiles	A	Fall Creek	5.7	060101040206
TNR050503	Shelby Williams Industries	W	Cedar Creek	13	060101040206
TNR050932	Stewart Furniture	A		11.5	060101040206
TNR051338	Quality Craft, Incorporated	W	Stubblefield Creek	0.3	060101040206
TNR051566	Press Repair and Engine Sales	AB	Turkey Creek	1.4	060101040206
TNR051804	Hardwoods of Morristown	W	Turkey Creek	13	060101040206
TNR051847	Berkline Plant 1	W, AD, P	Stubblefield Creek	11.19	060101040206
TNR051862	Pioneer Plastics Corporation	Y		21	060101040206
TNR053011	GE-Morristown	AC	Morristown Storm Sewer	4.1	060101040206
TNR053425	Federal Express	S, P	Cedar Creek	1.3	060101040206
TNR053410	Carolina Commercial Heating	F	Fall Creek, Holston River	8.7	060101040206
TNR053561	United Parcel Service	P	UT to Fall Creek	0.87	060101040206
TNR053570	Foamex LP Plant #1	Y	Cherokee Lake	5.7	060101040206
TNR053639	Arvin Meritor	AB	Cherokee Lake	22.1	060101040206
TNR054517	Morristown Block/Concrete	E	Fall Creek	3	060101040206
TNR056574	Pepsi Bottling Group	P	Fall Creek	0.6	060101040206
TNR051039	Flowers Baking Company	U	Hauley Springs	3.4	060101040207
TNR051977	Jeffrey Chain Corporation	AB, AA	Subsurface Waters	5	060101040207
TNR053422	Morristown Airport	S	Panther Creek	0.99	060101040207
TNR053571	Foamex LP Plant #3	Y	Cherokee Lake	3.7	060101040207
TNR054274	K-Chemicals, Incorporated	C		1	060101040207
TNR053662	Sonoco Flexible Packaging	X	Panther Creek	10	060101040209
TNR050076	Howmet Corporation	E	Various Sinkholes	3	060101040210
TNR050111	Colortech, Incorporated	Y	Morristown Storm Sewer	4.5	060101040210
TNR050127	Adams Wood Products	W	Fall Creek	12.71	060101040210

Table A4-11a.

FACILITY NUMBER	FACILITY NAME	SECTOR	RECEIVING STREAM	AREA*	HUC-12
TNR050463	Five Rivers Electronic	W	Sinkholes	24	060101040210
TNR050853	Vacument Metallized Paper	B		3	060101040210
TNR053464	APAC Plant 0418	D		6.5	060101040210
TNR053670	Vifan USA, Incorporated	Y	Holston River	36	060101040210
TNR053794	Mossy Creek Mining, LLC	J	Mossy Creek	250	060101040210
TNR054181	Tuff Torq Corporation	AB	Sinkhole	11.63	060101040210
TNR054264	J.W. Allen/Rich Products	U	Metro Storm Sewer	7	060101040210
TNR054491	Petoskey Plastics, Incorporated	Y	Metro Storm Sewer	9.79	060101040210
TNR055060	J.W. Allen/Rich Products	U	Metro Storm Sewer to Poplar Springs Branch	10	060101040210
TNR056058	Broken Wheel Auto Salvage	M	Sinkhole	23.89	060101040210
TNR051780	MacDermid Printing Solutions	Y		6.9	060101040301
TNR056043	Biddle Auto Parts, Inc.	M		4.99	060101040302
TNR050304	Timken-Rail Bearing Service	AB, AA		3	060101040304
TNR050549	Stowers Machinery Corporation	AD, P	Woods Creek	6.5	060101040304
TNR051186	Neal Auto Parts	M	Ditch to Holston River	10	060101040304
TNR051884	Dalkin Drivetrain Components	AB	Holston River	4	060101040304
TNR052004	Elf Lubricants, North America	D		2.8	060101040304
TNR052094	Poplar View Landfill	L	UT to Holston River @ RM 8.5	38.31	060101040304
TNR056406	Knoxville Utilities Board	T	Holston River @ RM 14.2	1.1	060101040304
TNR053460	APAC-Knoxville Shop/Yard	P		10.487	060101040304
TNR053465	APAC Plant 0402	D		2.35	060101040304
TNR054271	Pickel machine Shop, Inc.	AB	Legg Creek	0.4	060101040304
TNR055079	Packaging Corp. of America	B	Cliff Creek	19	060101040304
TNR056407	Knoxville Utilities Board	T	Holston River @ RM 5.0	3.32	060101040304
TNR056520	Rogers Auto Salvage	M, P	UT to Holston River	23.89	060101040304

Table A4-11b.

Table A4-11a-b. Active Permitted TMSP Facilities in Holston River Watershed. *Area, acres of property associated with industrial activity; UT, Unnamed Tributary; WWC, Wet Weather Conveyance. Sector details may be found in Table A4-11.*

SECTOR	TMSP SECTOR NAME
A	Timber Products Facilities
AA	Facilities That Manufacture Metal Products including Jewelry, Silverware and Plated Ware
AB	Facilities That Manufacture Transportation Equipment, Industrial or Commercial Machinery
AC	Facilities That Manufacture Electronic and Electrical Equipment and Components, Photographic and Optical Goods
AD	Facilities That Are Not Covered Under Sectors A Thru AC (Monitoring Required)
AE	Facilities That Are Not Covered Under Sectors A Thru AC (Monitoring Not Required)
B	Paper and Allied Products Manufacturing Facilities
C	Chemical and Allied Products Manufacturing Facilities
D	Asphalt Paving, Roofing Materials, and Lubricant Manufacturing Facilities
E	Glass, Clay, Cement, Concrete, and Gypsum Product Manufacturing Facilities
F	Primary Metals Facilities
G	Metal Mines (Ore Mining and Dressing) (RESERVED)
H	Inactive Coal Mines and Inactive Coal Mining-Related Facilities
I	Oil or Gas Extraction Facilities
J	Construction Sand and Gravel Mining and Processing and Dimension Stone Mining and Quarrying Facilities
K	Hazardous Waste Treatment Storage or Disposal Facilities
L	Landfills and Land Application Sites
M	Automobile Salvage Yards
N	Scrap Recycling and Waste and Recycling Facilities
O	Steam Electric Power Generating Facilities
P	Vehicle Maintenance or Equipment Cleaning areas at Motor Freight Transportation Facilities, Passenger Transportation Facilities, Petroleum Bulk Oil Stations and Terminals, the United States Postal Service, or Railroad Transportation Facilities
Q	Vehicle Maintenance Areas and Equipment Cleaning Areas of Water Transportation Facilities
R	Ship or Boat Building and Repair Yards
S	Vehicle Maintenance Areas, Equipment Cleaning Areas or From Airport Deicing Operations located at Air Transportation Facilities
T	Wastewater Treatment Works
U	Food and Kindred Products Facilities
V	Textile Mills, Apparel and other Fabric Product Manufacturing Facilities
W	Furniture and Fixture Manufacturing Facilities
X	Printing and Platemaking Facilities
Y	Rubber and Miscellaneous Plastic Product Manufacturing Facilities
Z	Leather Tanning and Finishing Facilities

Table A4-12. TMSP Sectors and Descriptions.

APPENDIX V

Land Treatment - Conservation Buffers					
	Contour Buffer Strips (acres)	Field Borders (feet)	Filter Strip (feet)	Streambank / Shoreline Protection (feet)	Riparian Forest Buffer (acres)
FY 2001	27			8365	3
FY 2002		3200	2	1290	9
FY 2003			2	3900	1
FY 2004				400	1
FY 2005		3600		1200	

Table A5-1a. Land Treatment Conservation Practices (Conservation Buffers), in Partnership with NRCS in the Holston River Watershed. *Data are from Performance & Results Measurement System (PRMS) for each fiscal year reporting period (October 1 through September 30) from 2001 to 2005.*

Erosion Control		
	Est. soil saved (tons/year)	Land Treated with erosion control measures (acres)
FY 2001	20785	3187
FY 2002	10336	1942
FY 2003	58522	3351
FY 2004		
FY 2005		

Table A5-1b. Erosion Control Conservation Practices, in Partnership with NRCS in the Holston River Watershed. *Data are from Performance & Results Measurement System (PRMS) for each fiscal year reporting period (October 1 through September 30) from 2001 to 2005.*

Nutrient Management			
	AFO Nutrient Mgmt Applied (acres)	Non-AFO Nutrient Mgmt. Applied (acres)	Total Applied (acres)
FY 2001		2873	2873
FY 2002		2467	2467
FY 2003		3255	3255
FY 2004	1357		1357
FY 2005	7950		7950

Table A5-1c. Nutrient Management Conservation Practices in Partnership with NRCS in the Holston River Watershed. *Data are from Performance & Results Measurement System (PRMS) for each fiscal year reporting period (October 1 through September 30) from 2001 to 2005.*

Pest Management		
	Pest Mgmt. Systems (number)	Pest Mgmt. Systems (acres)
FY 2001	42	3611
FY 2002		2735
FY 2003		3654
FY 2004		1171
FY 2005		9415

Table A5-1d. Pest Management Conservation Practices in Partnership with NRCS in the Holston River Watershed. *Data are from Performance & Results Measurement System (PRMS) for each fiscal year reporting period (October 1 through September 30) from 2001 to 2005.*

Grazing / Forages				
	Prescribed Grazing (acres)	Fencing (feet)	Heavy Use Area Protection (acres)	Pasture and Hay Planting (acres)
FY 2001	2432			
FY 2002	3052			
FY 2003	3436			
FY 2004	2529	24100	2	49
FY 2005	5072	26571	6	1335

Table A5-1e. Grazing/Forages Conservation Practices in Partnership with NRCS in the Holston River Watershed. *Data are from Performance & Results Measurement System (PRMS) for each fiscal year reporting period (October 1 through September 30) from 2001 to 2005.*

Tree & Shrub Practices				
	Land Prepared for revegetation of Forest (acres)	Land Improved through Forest Stand improvement (acres)	Total Tree & Shrub Estab. (acres)	Forestland Re-established or improved (acres)
FY 2001		731	2	733
FY 2002	1	36	2	38
FY 2003		544		544
FY 2004		1406		1406
FY 2005		2329		2329

Table A5-1f. Tree and Shrub Conservation Practices in Partnership with NRCS in the Holston River Watershed. *Data are from Performance & Results Measurement System (PRMS) for each fiscal year reporting period (October 1 through September 30) from 2001 to 2005.*

Land Treatment - Tillage & Cropping							
	Residue Mgmt, No-till, Strip till (acres)	Residue Mgmt - Mulch Till (acres)	Residue Mgmt - Ridge Till (acres)	Tillage & Residue Mgmt Systems (acres)	Conservation Crop Rotation (acres)	Contour Farming (acres)	Cover Crop (acres)
FY 2001				937			
FY 2002	170	194		364			
FY 2003				0			
FY 2004				0	726		73
FY 2005	468	155	7	629	2001	529	455

Table A5-1g. Land Treatment Conservation Practices (Tillage and Cropping), in Partnership with NRCS in the Holston River Watershed. *Data are from Performance & Results Measurement System (PRMS) for each fiscal year reporting period (October 1 through September 30) from 2001 to 2005.*

Waste Management Facilities		
	Waste Storage Facility (number)	Total Facilities (number)
FY 2001		
FY 2002	1	1
FY 2003		
FY 2004		
FY 2005		

Table A5-1h. Waste Management Conservation Practices in Partnership with NRCS in the Holston River Watershed. *Data are from Performance & Results Measurement System (PRMS) for each fiscal year reporting period (October 1 through September 30) from 2001 to 2005.*

Wildlife Habitat Management			
	Upland Habitat Mgmt (acres)	Wetland Habitat Mgmt (acres)	Total Wildlife Habitat Mgmt Applied (acres)
FY 2001	669		669
FY 2002	345	1	346
FY 2003	1004		1004
FY 2004	337		337
FY 2005	2650		2650

Table A5-1i. Wildlife Habitat Management Conservation Practices in Partnership with NRCS in the Holston River Watershed. *Data are from Performance & Results Measurement System (PRMS) for each fiscal year reporting period (October 1 through September 30) from 2001 to 2005.*

Water Supply			
	Pipeline (ft)	Pond (number)	Watering Facility (number)
FY 2001			
FY 2002			
FY 2003			
FY 2004	9,090	4	9
FY 2005	21930		27

Table A5-1j. Water Supply Conservation Practices in Partnership with NRCS in the Holston River Watershed. *Data are from Performance & Results Measurement System (PRMS) for each fiscal year reporting period (October 1 through September 30) from 2001 to 2005.*

COMMUNITY	AWARD DATE	AWARD AMOUNT
BEAN STATION	08/31/99	$ 25,000
JEFFERSON CITY	09/27/00	$ 1,353,800

Table A5-2a. Communities in the Holston River Watershed that have received Clean Water State Revolving Fund Grants or Loans since the inception of the program.

COMMUNITY	AWARD DATE	AWARD AMOUNT
JEFFERSON CITY	09/28/05	$ 5,000,000
MORRISTOWN	08/09/01	$ 10,500,000
ROGERSVILLE	09/28/05	$ 2,500,000

Table A5-2b. Communities in the Holston River Watershed that have received Drinking Water State Revolving Fund Grants or Loans since the inception of the program.

PRACTICE	NRCS CODE	NUMBER OF BMPs
Waste Management System	312	6
Waste Storage Facility	313	1
Critical Area Planting	342	125
Diversion	362	8
Pond	378	114
Fence	382	30
Riparian Buffer	391	1
Filter Strip	393	2
Grade Stabilization Structure	410	3
Grassed Waterway	412	3
Irrigation System/Tail water Recovery	447	1
Use Exclusion	472	5
Pasture/Hay Planting	512	106
Pipeline	516	36
Livestock Watering pumping plant	533	2
Roof Runoff Management	558	1
Access Road	560	1
Heavy Use Area	561	67
Spring Development	574	2
Stock Trails/Walkways	575	1
Stream Crossing	576	2
Stream Crossing	578	4
Streambank Protection	580	10
Stream Channel Stability	584	2
Watering Facility	614	147
Underground Outlet	620	2
TOTAL BMPs	**-**	**682**

Table A5-3. Best Management Practices Installed by Tennessee Department of Agriculture and Partners in the Holston River Watershed.