

# Water Quality Plan Blount County, Tennessee

Approved

**April 24, 2003**

By

**Blount County Regional Planning Commission**  
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Water Quality for Blount County, Tennessee - A County-Wide Planning Process

Assisted by TVA Integrated Pollutant Source Identification (IPSI) and Tennessee Growth Readiness Initiative Projects

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## INTRODUCTION

Water quality is a priority issue in Blount County. This Water Quality Plan is the culmination of activities and deliberations focused on that priority issue. The plan is divided into four main sections.

1. Process documentation addresses the history of the water quality planning process, the activities undertaken in support of the process, and related activities influencing the process.
2. Water quality situation of the county presents a summary of research results and other related information.
3. Policies address specific issues and priorities generated from the planning process, to give context and guidance to implementation.
4. Implementation identifies specific future activities to be undertaken to make the plan a reality.

## PROCESS DOCUMENTATION

### **Basis in 1999 Policies Plan.**

The history of this Water Quality Plan dated back to 1996 and the beginning of a comprehensive policy planning process for the county.

Blount County undertook long range policies planning from 1996 to 1999. Initial work in 1996 focused on data collation and analysis, showing that Blount County was experiencing the fastest growth in its history. In 1996, the County Commission made formal resolution to pursue a planning process, and decided to integrate direct citizen input for identifying a policy framework and implementation agenda.

From April to June of 1997, the Planning Department conducted a series of 17 citizen input workshops throughout the county to solicit answers to two simple questions: What is good about Blount County which should be preserved in the future? What needs to be changed in Blount County to make a better future?

About 250 citizens participated in the workshops and provided a list of issues and concerns. Water quality was identified as a priority issue. The issues and concerns were formulated into proposed policy statements and implementation strategies for further consideration by the citizenry.

From September to November of 1997, a second series of 17 citizen input workshops were conducted throughout the county to solicit input on the proposed set of policy statements and alternatives for implementation. About 450 citizens participated in the second round of workshops, and provided an indication of priority policies. Among those policies was the following relating to water quality.

The lakes, rivers and streams in the county should be protected as part of our natural environment and drinking water resource, and as part of our scenic and recreational resource. (agreed to by 87.58 percent of citizens participating)

A Citizen Advisory Committee was formed in June of 1998 to address policy refinement and detailed implementation strategy. The group of eleven people met 15 times as a whole from July 1998 to January 1999, and produced a report of recommendations. The recommendations were presented by issue. Three issues identified concerns with water quality as follows, along with specific recommended implementation strategies.

**Pollution of the Little River and its tributaries by septic failures, farm animals, and trash/junk along tributaries.**

Conduct a study of pollution sources of the Little River, and formulate a county wide pollution prevention program. Implementation: Coordinate a study of pollution sources with other agencies, such as TVA, and create an advisory committee to formulate a pollution prevention program.

**Health and water quality concerns in relation to septic fields.**

Protect the health of the citizens of Blount County, and protect the quality of water in the county. Implementation: Adopt more stringent septic field standards specific to Blount County (revision of existing

minimal state standards). Pursue more stringent enforcement and penalties for violation of septic disposal standards. The County should develop a water and pollution prevention program of its own. The county should undertake a county-wide sewer study and plan.

### **Drainage problems.**

Protect detention areas and drainage ways in a natural state to enhance drainage capabilities. Implementation: Amend subdivision regulations and any other development related regulations to require retention of natural cover for drainage facilities, require additional ground cover for degraded drainage facilities, and require minimization of disturbance and compaction during construction phase.

Formulate a county-wide drainage plan by drainage basin, addressing quantity of runoff as well as quality of runoff, such plan to form the basis for judging needed drainage requirements of individual new developments. Implementation: Appoint a committee with professional technical help to formulate a plan.

The Planning Commission took the citizen input and the recommendations of the Citizen Advisory Committee under advisement. After several months of deliberations, the Planning Commission adopted the Blount County Policies Plan in June of 1999. The policy option relating to water quality identified in the citizen input process was adopted as part of the plan (Objective Policy 1D on page 7 of the 1999 Policies Plan). Also in the Plan was a set of specific implementation strategies relating to water quality as follows:

### **Conduct study of pollution sources of the Little River and formulate a pollution prevention program.**

The Planning Commission supports a cooperative effort with other agencies to study the main source of water supply for the county, and recommends formation of a committee to formulate a pollution prevention program.

**Study and formulate a county wide plan for drainage.**

A committee should be formed to undertake this activity with professional assistance.

The planning process reflected in this Water Quality Plan built on the Policies Plan and was thus an expansion of the policies planning process undertaken from 1996 to 1999.

**Nonpoint Source Water Pollution.**

The water quality planning process focused mainly on nonpoint source water pollution. Nonpoint source pollution is pollution that is not specific to a point of discharge, such as a pipe into a waterway. It is pollution that is picked up over the land surface and carried by rainwater or other water runoff into drainage ways, and then into the streams and rivers of the county. Other types or forms of water pollution, such as point source or ground water, were considered within the planning process if raised as issues in citizen input or decision maker deliberation.

**The Integrated Pollutant Source Identification project (IPSI).**

In late 1999, the Tennessee Valley Authority (TVA) started programming for a study of the pollution sources of the Little River in the Tuckaleechee Cove area around Townsend. Planning Department staff was contacted to explore possibilities for expanding the study to the whole of the Little River. Staff suggested consideration of the whole county for the project. In late 1999, the County added \$3,000 to funding provided already through TVA to conduct infrared aerial photography of the whole county, excluding areas of the National Park. The aerial photographs were taken in February of 2000.

Subsequently, staff began discussions with TVA on an expanded coverage of the study to include all areas of the county, with cost to be shared by the County. This culminated in August 2001 with a contract for a county-wide IPSI project, with County funding being \$30,000, Tennessee Department of Agriculture funding being \$50,000, and TVA funding being \$65,000, for a total project funding of \$145,000 (Knox County subsequently added funds to support partial coverage and analysis in Knox County for the Stock Creek Watershed). The project delivered data (aerial photo interpretation) in Geographical Information System (GIS) format with ArcView software, a report of analysis and findings, and a set of atlas maps of pollution sources

in the county. Draft maps and data were used as part of the water quality planning process, in presentations to citizens, planning commissioners, citizen advisory committee members and county commissioners.

### **Tennessee Growth Readiness Initiative.**

Planning Department staff became aware of another opportunity for assistance as discussions progressed on the IPSI project. In late 2000, staff joined in discussions with TVA representatives and representatives of Maryville and Alcoa to develop a project for education on nonpoint pollution sources. The project used the University of Connecticut Nonpoint Education for Municipal Officials (NEMO) as a model, and prepared a pilot adapted for the State of Tennessee. Blount County was selected along with Maryville, Alcoa and Knox County to pilot development and testing of educational materials and delivery system. In June of 2001, a fully funded grant was secured from EPA through the Tennessee Department of Agriculture - Nonpoint Source Program. The project budget was just under \$167,000, and local match was provided by accounting time of staff and participants in the project.

Beginning June 2001, planning staff and representatives from Maryville, Alcoa, Knox County, the University of Tennessee, and TVA met with a consultant to prepare education modules for the project. The core education module was presented to the Citizen Advisory Committee for water quality planning, the County Commission and the Planning Commission in February 2002. The module was also presented in citizen input workshops from April to July 2002.

### **Citizen Input Workshops.**

The 1999 Policies Plan used citizen input to define the policy and implementation agenda of the county for general planning purposes. Citizen input was also identified as a desirable approach for developing specific plans addressing water quality issues. The Planning Department conducted citizen input workshops in 22 sites throughout the county from April to July 2002 as follows: Middlesettlements School, Louisville City Hall, Maryville City Hall, Eagleton School, Alcoa High School, John Sevier School, Fairview School, Chilhowee View Community Center, Montvale School, Townsend Vistor Center, Oakview Commiunity Center, Walland School, Rockford School, Porter School, Lanier School, Seymour Citizen National

Bank, Big Springs Community Center, Happy Valley Community Center, Carpenters School, Friendsville School, Heritage High School, and William Blount High School.

The workshops were designed to allow multiple inputs using a structured printed form, an open forum, and written input outside the community meetings. The meetings began with a welcome and introduction, followed by presentation of the Tennessee Growth Readiness education module on nonpoint pollution. Time was then allotted for completion of the structured input form, followed by time for open forum. The structured forms were collected, and the open forum comments were documented on large flip chart sheets. The workshops lasted about one-and-one-half hours. A total of 189 citizens participated fully with responses to the structured input form.

Results from the structured forms were processed for reporting, both tally of responses and transcription of written comments. The comments from open forums were transcribed separately for reporting. Other written comments were also reported. Two reports were prepared to document results: “Tally of Responses and Written Comments Collated from Citizen Input Workshop Response Forms and Other Sources – Blount County Water Quality Planning Process – April to July 2002” and “Open Comment Sessions – Citizen Input Workshops – Blount County Water Quality Planning Process – April 15 to July 2, 2002”.

### **Citizen Advisory Committee.**

As with the 1999 Policies Plan, a more focused Citizen Advisory Committee was used as another avenue for citizen input. Unlike the 1999 Plan, the Committee was formed at the beginning of the water quality planning process. The members selected by the Intergovernmental Committee of the County Commission were as follows: Daniel C. Cook, Dick Evey, Ben Greene, Beverly Green, Thomas Howard, Will Ludwig, Larry Smith, Darrell Webb, and Addison West. The Committee reviewed citizen input workshop results and intermediate plan content recommendations. The Committee also reviewed proposals for meeting requirements of the Phase II Storm Water program which influenced some of the plan content. Comments and recommendations of the Citizen Advisory Committee were part of the input into the final plan.

## **WQ4 Blount County.**

The overall water quality planning process was structured with four main components: Research, Education, Vision and Action.

The Research component was supported by the IPSI project, to give an objective overview of the present nonpoint pollution situation in the county. The Education component was supported by the Tennessee Growth Readiness project, to enhance informed participation by public officials and citizens.

The Vision component utilized results from citizen input workshops, with supporting input from the Citizen Advisory Committee. The Vision component gave greater detail to the policies identified in the Blount County Policies Plan, and formed the basis for this plan's policy content.

The Action component consisted of specific implementation strategies identified using citizen input, policy discussions and staff recommendations, to give guidance to future actions.

Results of the citizen input workshops and discussions in the Citizen Advisory Committee provided input into deliberations by the Planning Commission. This Water Quality Plan was formally adopted by the Planning Commission. The County Commission and the Planning Commission will be the final decision makers for implementation activities involving government action identified in this plan.

## **Phase II Storm Water Program.**

The water quality planning process was conceived independently of external mandates. However, the County faced an immediate mandate under the Phase II Storm Water program as the planning process progressed. The Phase II program was part of the National Pollution Discharge Elimination System (NPDES) of the Environmental Protection Agency (EPA), under the Clean Water Act.

Phase I of the program targeted large cities such as Knoxville. Phase II of the program targeted smaller urbanized areas, either surrounding large cities or independent of such cities. Maryville, Alcoa and Rockford, along with other urbanized areas of Blount County were included in Phase II coverage.

Phase II required that the cities and the County apply for a storm water discharge permit from the State of Tennessee, Department of Environment and Conservation (TDEC). The Phase II application process proceeded parallel to the county water quality planning process, but at the same time influenced some of the plan content. The Phase II Storm Water Program application deadline was March 2003, coinciding with final drafting of this Water Quality Plan.

### **Other Cooperation and Consultations.**

In various other venues, particularly in the 1101 Growth Plan Process in 2000, the County committed to working in cooperation with the cities to address joint concerns with water quality. Alcoa, Maryville, Louisville and Townsend were the main focus of this joint effort. The approach to the City of Townsend was mainly through the Tuckaleechee Cove Advisory Board. Sites for citizen input workshops were scheduled for all these cities, and direct contact was made to the city planning commissions for input into this Plan. Sites for citizen input workshops were also scheduled in the towns of Rockford and Friendsville.

The County worked closely with the cities of Alcoa and Maryville in development of the Tennessee Growth Readiness education modules which formed the basis for the education component of the citizen input workshops. In addition, the County and the two cities undertook a joint review of regulations in relation to water quality issues, and cooperated in addressing some joint concerns under the Phase II Storm Water Program.

The results of research and citizen input, along with ideas for plan content were presented also to the Little River Water Quality Forum (LRWQF) at various times. The LRWQF was an association of agencies and people with interest in the Little River, and included representatives from Blount County, Alcoa, Maryville, Blount County Soil Conservation District, TVA, the Little River Watershed Association and other interested agencies and individuals.

## **WATER QUALITY SITUATION**

The Integrated Pollutant Source Identification (IPSI) project provided much useful data and information for the water quality planning process. The

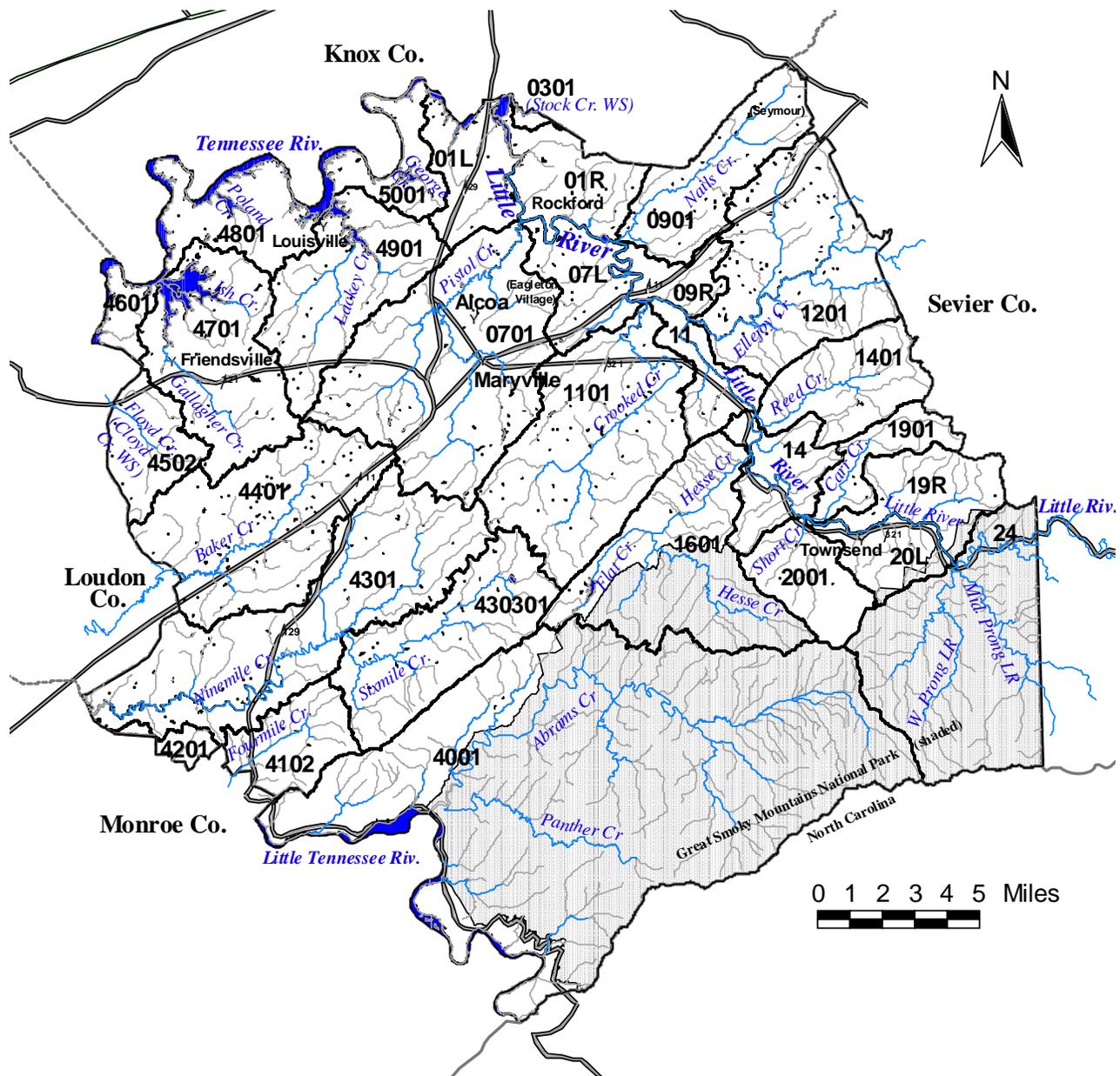
following summarizes selected highlights of the Blount County and Little River Basin Nonpoint Source Pollution Inventories and Pollutant Load Estimates (Tennessee Valley Authority, February 2003). This section also presents some supporting information from other sources, particularly population analysis by the Blount County Planning Department using U.S. Census Bureau data, and The Status of Water Quality in Tennessee – Year 2000 305(b) Report (Division of Water Pollution Control – Tennessee Department of Environment and Conservation, December 2000).

## **Watersheds.**

A watershed is that area of land that drains to a water course. A large watershed with several substantial sub-watersheds may be termed a basin. Blount County may be divided into several levels of watersheds. At the largest level of water basin, there are three divisions: 1) that area draining into the Little River generally in the north and eastern portion of the county, 2) that area draining into the Little Tennessee River generally in the southwestern portion of the county, and 3) that area draining directly into the Tennessee River (Fort Loudon Lake) generally in the northeastern portion of the county. Map 1 shows the lower level watersheds by basin.

Note that portions of the basins flow from or to areas outside the county. The Ellejoy and Nails Creek watersheds in the Little River basin, and a large extension of the Little River watershed in the National Park, have portions in Sevier County. Most of the Stock Creek watershed is in Knox County. The Baker Creek and Floyd Creek watersheds in the Little Tennessee River basin flow into Loudon County, and there is a small area of tributaries that flow into Monroe County. Watersheds know no political boundaries, and water may flow from one jurisdiction to another.

The lower level watersheds within Blount County provide the finest geographical level of analysis for this plan. The Little River basin is divided into 18 watersheds, including Nails, Pistol, Ellejoy, Crooked, Hesse, Reed, Carr and Short Creeks, and the continuation of the Little River to headwaters in the Great Smoky Mountains National Park. The area flowing into the Little Tennessee River is divided into six watersheds, including Baker, Ninemile, Sixmile, and Fourmile Creeks, and creeks flowing from the Great Smoky Mountains National Park. The area flowing directly into the Tennessee River (Fort Loudon Lake) is divided into six watersheds, including Gallagher-Ish, Poland and Lackey Creeks.



Map 1. Blount County Watersheds Location Map  
 (see next page for watershed number legend)

## Map 1. (Continued)

### **Watershed Number Legend**

#### **Little River Basin**

01L	Left side of Little River from mouth to Pistol Creek
01R	Right side of Little River from mouth to Nails Creek
0301	Stock Creek (most in Knox County)
0701	Pistol Creek
07L	Left side of Little River from Pistol Creek to Crooked Creek
0901	Nails Creek
09R	Right side of Little River from Nails Creek to Ellejoy Creek
11	Little River from Crooked Creek & Ellejoy Creek to Reed Creek
1101	Crooked Creek
1201	Ellejoy Creek
14	Little River from Reed Creek to Carr Creek & Short Creek
1401	Reed Creek
1601	Hesse Creek
1901	Carr Creek
19R	Right side of Little River from Carr Creek to National Park
2001	Short Creek
20L	Left side of Little River from Short Creek to National Park
24	Little River within Great Smoky Mountain National Park

#### **Little Tennessee River Basin (most in Monroe and Loudon Counties)**

4001	Abrams Creek – National Park and Happy Valley
4102	Fourmile Creek
4201	Minor tributaries to Little Tennessee River (part)
4301	Ninemile Creek
430301	Six Mile Creek
4401	Baker Creek

#### **Tennessee River Basin**

4502	Floyd Creek (into larger Cloyd Creek in Loudon County)
4601	Minor tributaries to Tennessee River west of Gallagher Creek
4701	Gallagher and Ish Creeks
4801	Poland Creek and surrounding minor tributaries to Tennessee River
4901	Lackey Creek
5001	George Creek and surrounding minor tributaries to Tennessee Riv.

(Number codes consistent with IPSI Study report.)

## Impacted Streams.

The Little River basin showed the most variability in water quality. The portion of the Little River in the Great Smoky Mountains National Park was almost pristine, and was designated an Outstanding National Resource Water in 1997. At the other end, the Little River embayment at Fort Loudon Lake had a fish advisory due to PCBs. (Year 2000 305(b) Report). In between, the Little River sub-watersheds showed a diversity of impact.

In the Tennessee, River and Little Tennessee River basins, the impact was less variable. The whole of the Fort Loudon reservoir (Tennessee River) was impacted by several jurisdictions, particularly Knoxville and Knox Counties to the north, as well as Blount County. The whole of the Tellico Reservoir (Little Tennessee River) was impacted, with streams flowing from Loudon and Monroe Counties, as well as Blount County. The Year 2000 305(b) Report identified the following impacted streams in Blount County:

Name/basin of LR = Little River TN = Tennessee River LTN= Little Tenn. Riv.	Pollutants	Sources
Stock Creek/LR (Knox & Blount)	Other habitat alterations, siltation, pathogens	Pasture grazing – riparian and or upland, channelization
Roddy Branch/LR	Pathogens, other habitat alterations, siltation	Channelization, removal of riparian vegetation, grazing and related sources
Russell Branch/LR	Siltation, PCBs	Hazardous waste, contaminated sediments, land development
Little River (first 7.1 miles from TN River)	PCBs	Contaminated sediments
Nails Creek/LR	Pathogens, other habitat alterations	Agriculture, grazing related sources, pasture grazing – riparian and/or upland
Pistol Creek/LR	Siltation, pathogens	Urban runoff/storm sewers

Brown Creek/LR (Pistol Creek watershed)	Nutrients, nitrate, siltation	Land development, urban runoff/storm sewers
(Laurel) Bank Branch/LR (Pistol Creek watershed)	Pathogens	Source unknown
Ellejoy Creek/LR	pathogens	Agriculture, grazing related sources, pasture grazing – riparian and/or upland
Little Ellejoy Creek/LR (Ellejoy Creek watershed)	Nutrients, nitrate	Pasture grazing – riparian and/or upland
Crooked Creek/LR	Siltation, pathogens	Pasture grazing – riparian and/or upland, livestock in stream
Short Creek/LR	Pathogens	Source unknown
Fort Loudon Reservoir (Tennessee River)	PCBs	Contaminated sediments
Gallagher Creek /TN	Siltation	Pasture grazing – riparian and/or upland
Floyd Creek/TN	Siltation, pathogens	Pasture grazing – riparian and/or upland, livestock in stream
Tellico Reservoir (Little Tennessee River)	PCBs	Contaminated sediments
Ninemile Creek/LTN	Pathogens	Pasture grazing – riparian and/or upland
Baker Creek/LTN	Pathogens	Pasture grazing – riparian and/or upland

There were more urban types of pollution in the lower part of the Little River basin, particularly for Russell Branch and the whole of the Pistol Creek watershed covering most of the cities of Alcoa and Maryville. There was a substantial impact of agriculture related sources, particularly pasture and grazing, in other parts of the county. Note that not all streams in the county were evaluated for the 305(b) report.

## **IPSI Report on Pollutant Loadings.**

The Integrated Pollutant Source Identification (IPSI) project identified four pollutants for reporting. These were phosphorous, nitrogen, suspended sediment, and zinc. Phosphorous and nitrogen were chemical pollutants indicative of many uses, both urban and rural. Suspended sediment was indicative of erosion for many uses, both urban and rural. Zinc was a selected chemical pollutant indicative of mainly urban uses. The IPSI study also reported land use and impervious surface, indicators of where likely impacts on water quality occur.

Total Phosphorous Loading. The IPSI study found a dichotomy similar to the 305(b) report, of urban and agriculture impact considering phosphorous as a pollutant in the county. For total phosphorous loading by land use, combined categories of residential/commercial/industrial were less than overall agricultural uses. However, on a per acre basis, residential/commercial/industrial uses showed highest loading.

Using disaggregate analysis, residential use and direct stream inputs from livestock were at about the same total loading and were the dominant pollutant sources. This was followed at about 1/2 the highest loadings by heavily overgrazed pasture and conventional tilled row crop. This was followed by commercial/institutional uses and fair pasture at about 1/4 the highest loadings.

Geographically by watershed, the Pistol Creek watershed (entire) showed the highest total loading of phosphorous. The next highest total loading watersheds were Crooked Creek and Ellejoy Creek in the Little River basin, and Ninemile Creek and Baker Creek in the Little Tennessee River basin, all at or a little less than half the loading of Pistol Creek. Nails Creek in the Little River basin, and Lackey Creek in the Tennessee River basin followed at about 1/3 the loading of Pistol Creek. The Russell Branch and adjacent minor watersheds, the Pistol Creek watershed (entire), and minor watersheds from mouth of Pistol Creek to mouth of Crooked Creek on the eastern side of the Little River showed the highest total phosphorous loading per acre.

Both the total and total per acre loading data reflected the impact of urban development, particularly for the Pistol Creek watershed covering parts of Alcoa and most of Maryville. Total loading and total loading per acre

showed decreased impact in the upper reaches of the Little River watershed, save for an increase in the Tuckaleechee Cove area around Townsend.

Total Nitrogen Loading. The IPSI study found that agricultural uses in aggregate had more impact than urban uses in aggregate considering nitrogen as a pollutant in the county. For total nitrogen loading by land use, combined categories of residential/commercial/industrial were substantially less than overall agricultural uses. However, on a per acre basis, residential/commercial/industrial uses showed highest loading.

Using disaggregate analysis, residential use was the highest single loading by land use, followed by heavily overgrazed pasture and conventional row cropping. This was followed at a substantially lower loading by commercial/institutional use, direct stream inputs from livestock, and fair pasture at about 1/2 the highest use loadings.

Geographically by watershed, the Pistol Creek watershed (entire) showed the highest total loading of nitrogen. The next highest total loading watersheds were Ninemile Creek and Baker Creek in the Little Tennessee basin, Nails Creek, Crooked Creek and Ellejoy Creek in the Little River basin, and Lackey Creek in the Tennessee River basin, all around 30 to 40 percent of Pistol Creek loading. The Russell Branch and adjacent minor watersheds, the Pistol Creek watershed (entire), and minor watersheds from mouth of Pistol Creek to mouth of Crooked Creek on the eastern side of the Little River showed the highest total nitrogen loading per acre.

Both the total and total per acre loading data showed the impact of urban development, particularly for the Pistol Creek watershed covering parts of Alcoa and most of Maryville. Total loading and total loading per acre showed decreased impact in the upper reaches of the Little River basin, save for an increase in the Tuckaleechee Cove area around Townsend.

Total Suspended Solids (TSS) Loadings. The IPSI study found that agricultural uses in aggregate had much more impact than urban uses in aggregate considering total suspended solids (TSS) as a pollutant in the county. For TSS loading by land use, combined categories of residential/commercial/ industrial were about 1/2 of overall agricultural uses. However, on a per acre basis, residential/commercial/industrial uses showed highest loading.

Using disaggregate analysis, heavily overgrazed pasture was the highest single loading by land use, followed by conventional tilled row crop. This was followed at a loading about 1/2 the highest by fair pasture and then residential use. This was followed at about 1/3 the highest loading by conservation tilled row crop and then residential under construction.

Geographically by watershed, the Pistol Creek watershed (entire) showed the highest total loading of TSS. The next highest total loading watersheds were Ninemile Creek and Baker Creek in the Little Tennessee River basin at about 2/3 the highest loading. At about 1/2 the highest loading were Nails Creek, Ellejoy Creek and Crooked Creek in the Little River basin, and Lackey Creek in the Tennessee River basin.

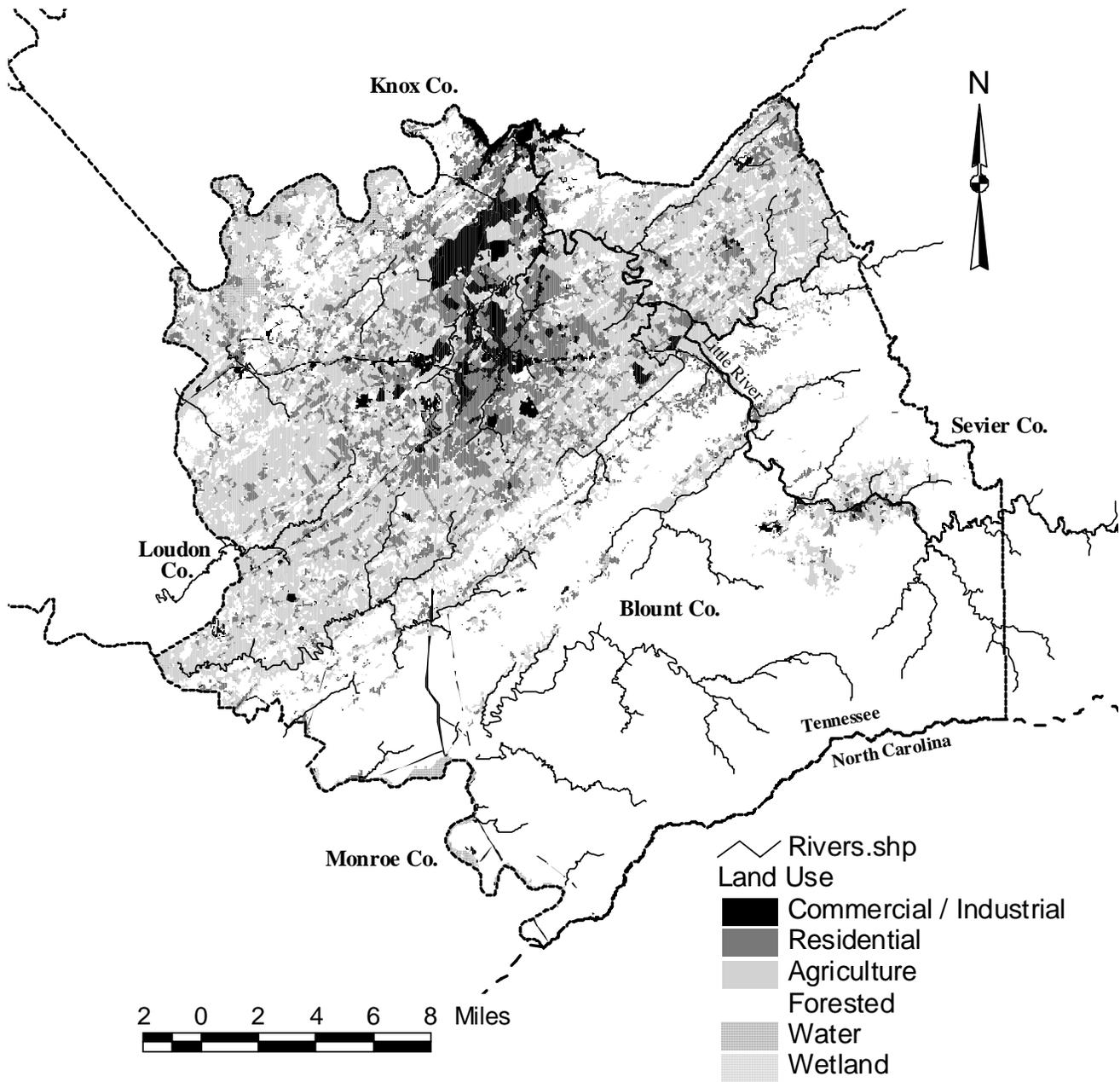
The urbanized Pistol Creek watershed showed the highest total TSS per acre. Other watersheds showed a mix of urban and agriculture impacts. Total loading and total loading per acre showed decreased impact in the upper reaches of the Little River basin, save for an increase in the Tuckaleechee Cove area around Townsend.

Zinc Loading. The IPSI study used zinc loading as an indicator for urban types of impact. As expected residential and commercial/industrial uses dominated the loadings, and agriculture uses were relatively insignificant. The most urbanized watershed of Pistol Creek dominated the geographical loading, followed at about 1/4 by Russell Branch and surrounding minor watersheds covering most of the cities of Alcoa and Maryville.

## **Land Use.**

Impact of land use on water quality was part of the analysis of pollution loadings above. The geographical variation of impact, notably for urban use, was also indicated above, particularly for Pistol Creek containing most of Maryville and Alcoa. A map of land use was also produced under the IPSI project, showing specific geographical variation in use. Map 2 of Blount County Land Use (based on IPSI data) on the following page gives a more specific view of use concentrations in the county.

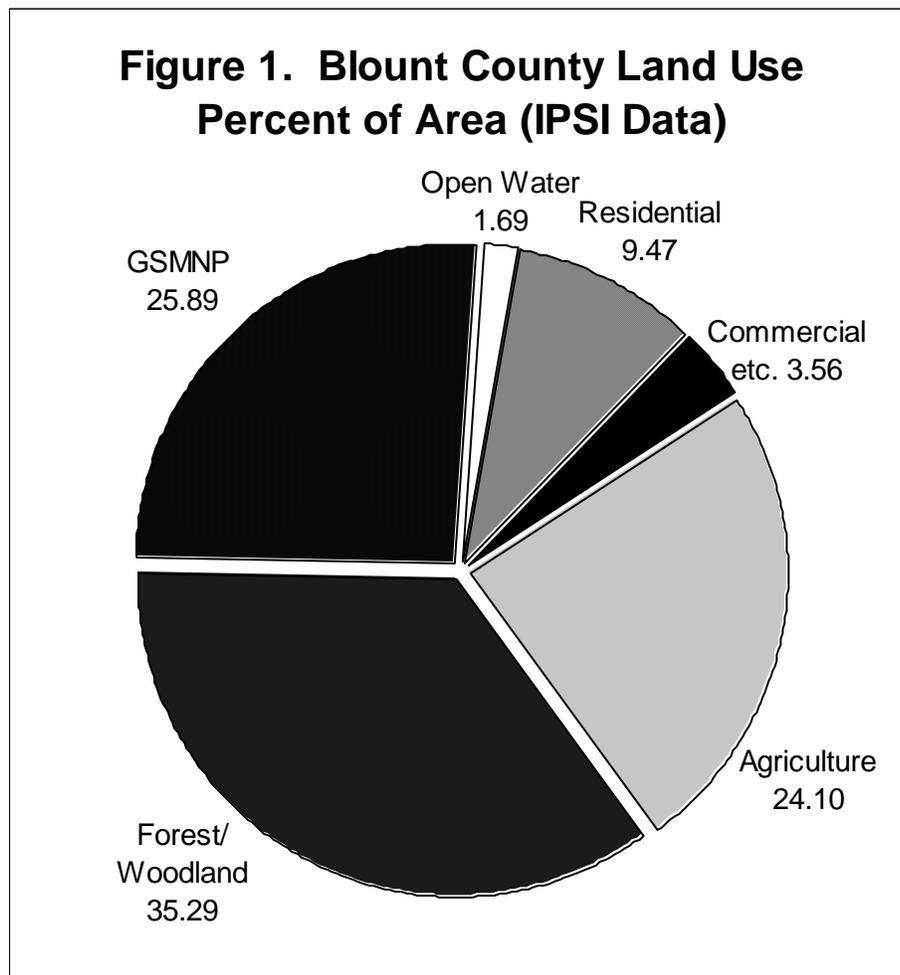
The land uses in the county showed variation from a high density core of residential, commercial and industrial use in the older parts of Maryville and Alcoa and the community of Eagleton Village, to medium density suburban



**Map 2. Blount County Land Use**

development around the two largest cities, to lower density lowland development mixed with agricultural use, to very low density development in mountainous areas outside the national park, to virtually undeveloped land inside the mountainous national park. The major roads in the county also provided a framework near which higher density development occurred.

Blount County was predominantly forested and agricultural land. Along with open water, about 87 percent of the county was relatively undeveloped. Only about 13 percent of the county was developed into residential, commercial and industrial uses. This is illustrated in Figure 1 (GSMP refers to Great Smoky Mountain National Park).



## **Impervious Surfaces.**

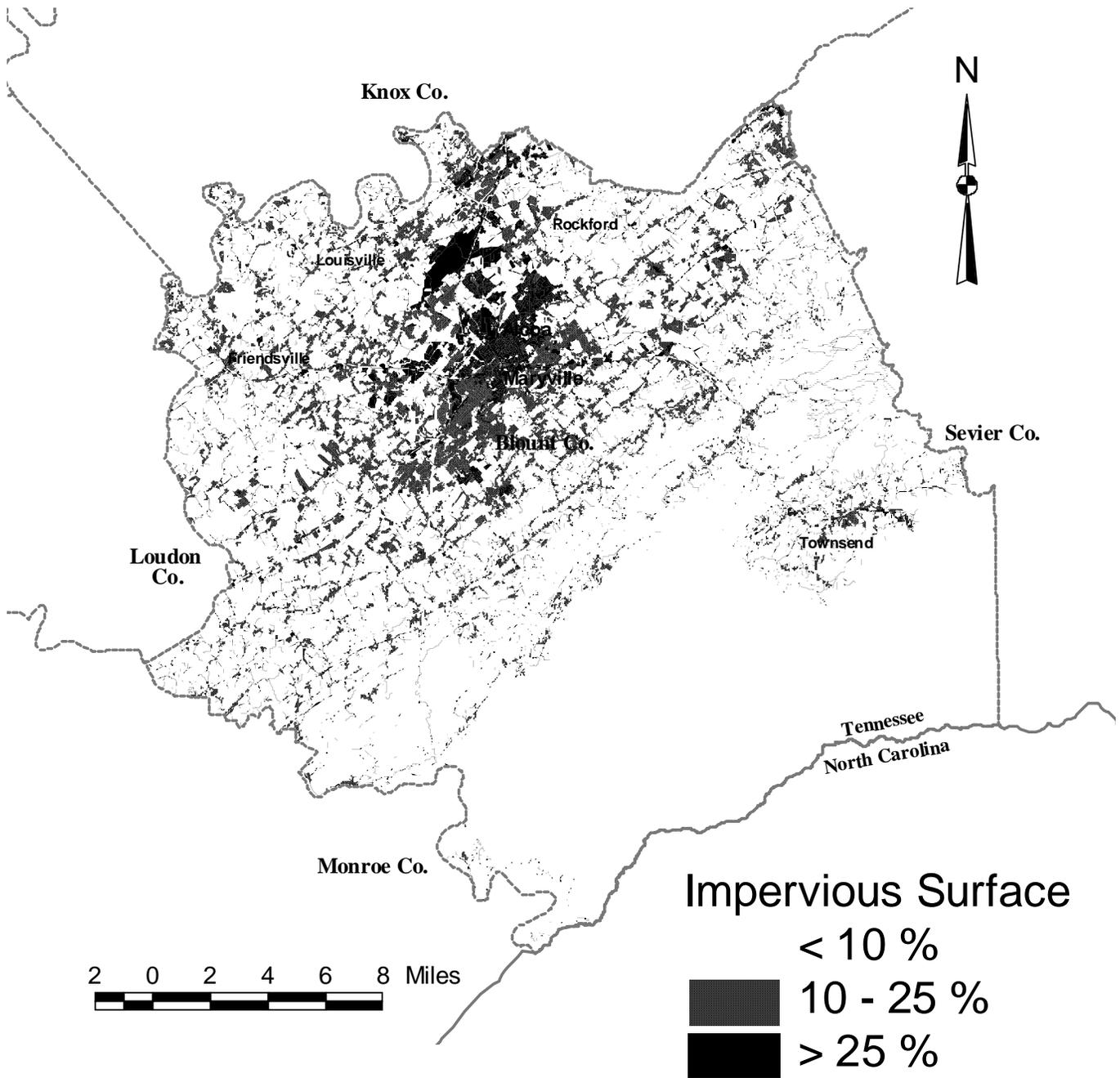
The location of impervious surface can give a good indication of where development is likely to have impact on water quality. An impervious surface hinders water from percolating into the land. Examples of impervious surfaces are paved roads, paved driveways, concrete sidewalks, paved parking lots, rooftops, hardened surface play grounds, and even compacted earth. Most impervious surfaces are associated with built areas, such as residential neighborhoods and commercial areas.

Unlike land use, impervious surface is more directly related to the intensity of development. This can be seen by comparing a low density residential use with a high density residential use. All other variables being equal, the lower density residential use would have less impervious surface (more land with no building cover) than higher density residential use (more land covered with buildings).

Impervious surface is related to water quality in two ways. First, impervious surfaces in built areas tend to collect pollutants. An example of this may be seen in a commercial parking lot where oil drippings collect. Second, when it rains, such pollutants are picked up by storm water and carried quickly to drainage ways and ultimately into streams and rivers. Generally, the more intense the use of land, the more impervious surfaces there are and the more pollutants are deposited on those surfaces. The analysis of impervious surface cover can thus provide an indication of development impact.

Map 3 on the following page shows the pattern of impervious surface in the county. Note that the pattern is very similar to the pattern of urban concentration of residential, commercial and industrial land use shown on Map 2. Impervious surfaces are concentrated in the urban areas of Maryville and Alcoa.

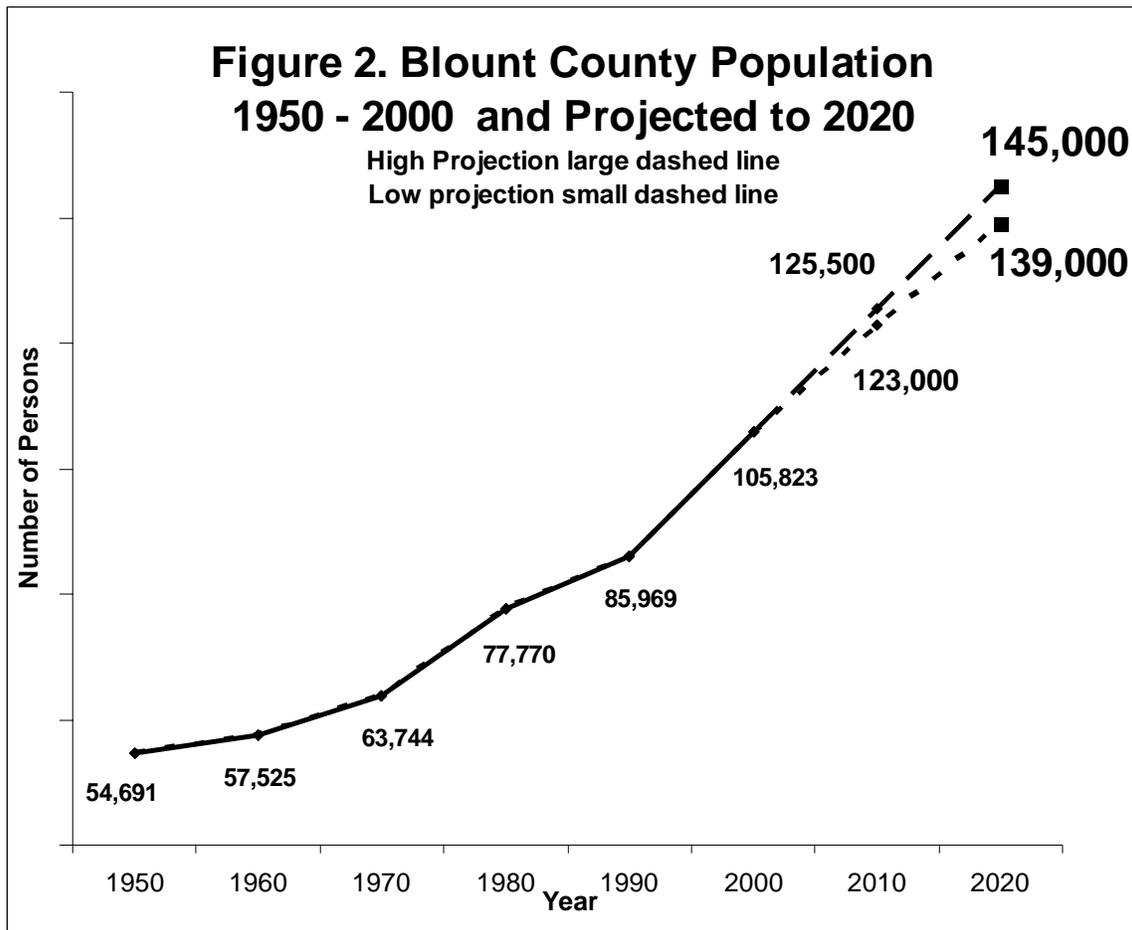
The Center for Watershed Protection established a rule of thumb, that watersheds with less than 10 percent impervious surface show limited overall impact of development. Watersheds with from 10 to 25 percent impervious surface begin to show moderate impact on water quality of streams. Watersheds with impervious surface greater than 25 percent of total area show degraded water quality. Map 3 thus reinforced the previous findings of substantial impact of urban use in the watersheds associated with the cities of Maryville and Alcoa.



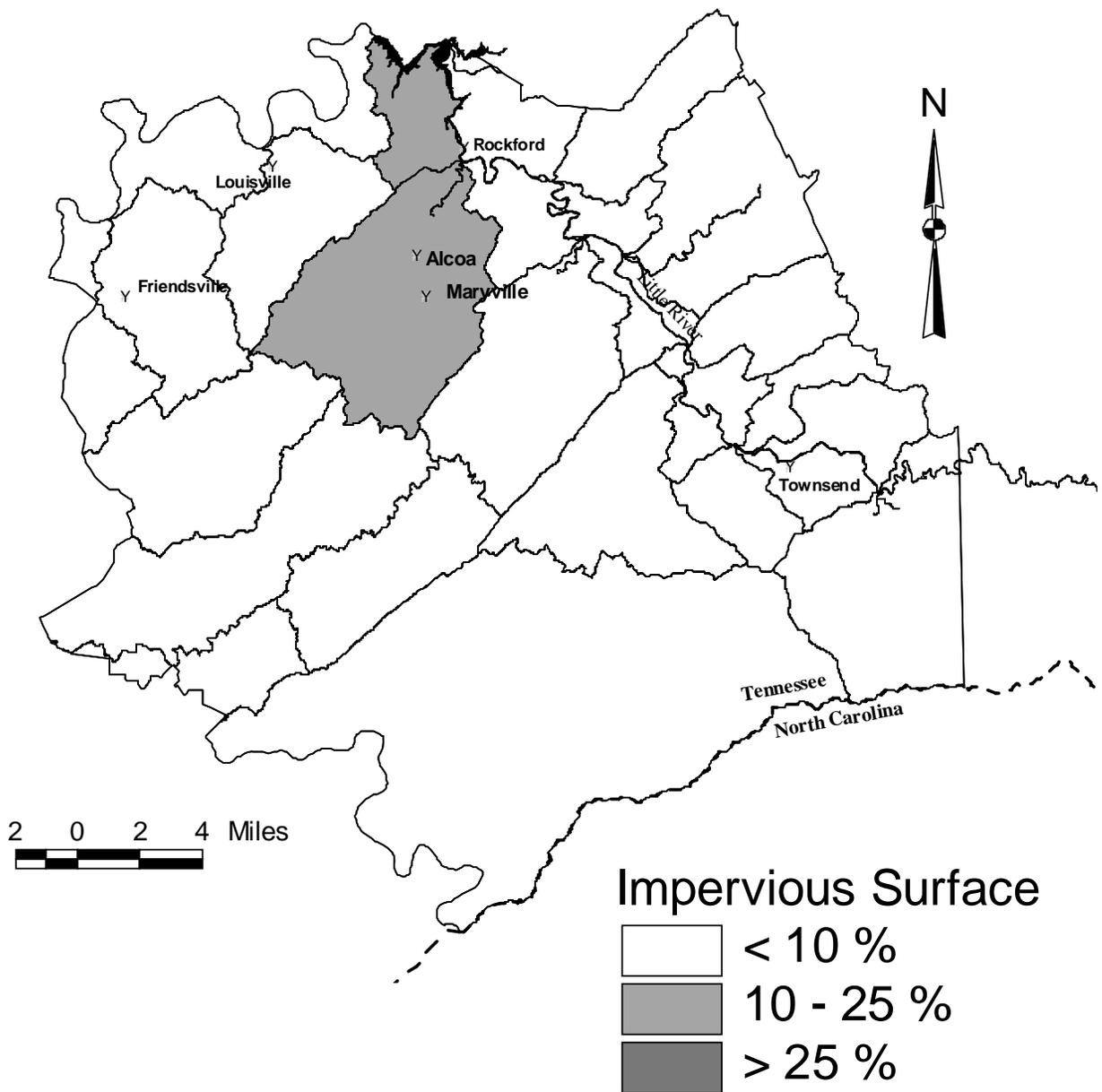
**Map 3. Blount County Impervious Surface.**

## Projected Impacts to 2020.

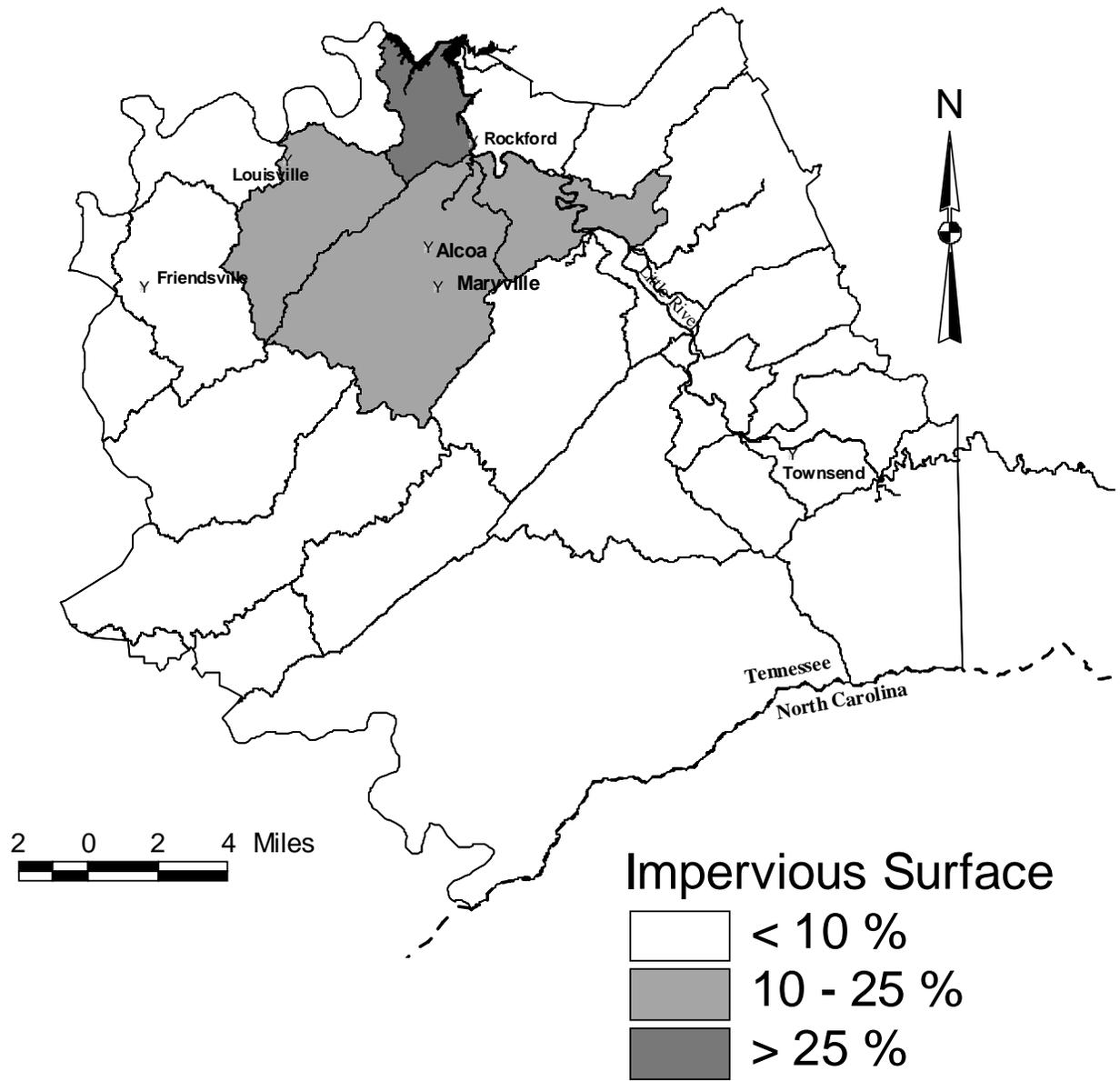
The impact of land uses and impervious surfaces, and the geographical variation of impact, are not static. Blount County grew fast in the last decade, increasing from a population of 85,969 persons in 1990 to 105,823 persons in 2000, for a change of 23 percent in ten years. This continued a long history of growth in the county, and such growth is predicted to continue for the next 20 years. This is illustrated in Figure 2.



The IPSI project calculated the impact of the high projected growth trend shown above on impervious surface by watershed. To see the impact of growth, impervious surface needs to be viewed on a watershed basis. Map 4 on the following page shows the present situation of average percent impervious surface by watershed in the county. Map 5 on the succeeding page shows the projected impact of growth on average percent impervious surface by watershed.



Map 4. Present (2002) Average Watershed Impervious Surface (IPSI Data).



Map 5. Projected (2020) Average Watershed Impervious Surface (IPSI Data).

At present (2002) the watersheds of Pistol Creek and Russell Branch and associated minor tributaries on the east side of the Little River show between 10 to 25 percent average impervious surface, indicating a moderate impact on water quality. This area contains the cities of Maryville and Alcoa, and shows urban impact on water quality consistent with other analysis above.

Projecting growth to the year 2020 results in a spread and intensification of impact. The watershed of Russell Branch and associated minor tributaries on the east side of the Little River, containing the northern portion of the City of Alcoa, shows an increase to greater than 25 percent impervious surface, associated with expected degraded water quality. The Pistol Creek watershed containing Maryville, the Lackey Creek watershed containing Louisville to the west of Alcoa, the watershed of minor tributaries on the left side of the Little River from Pistol to Crooked Creek, and the watershed of minor tributaries on the right side of the Little River from Nails Creek to Ellejoy Creek, show between 10 to 25 percent average impervious surface. This indicates a spread of moderate impact on water quality to the west of Alcoa into the Louisville area, and to the east of Maryville along the line of Highway 411 North into the Wildwood community.

## **POLICIES**

This section is presented in discussion form and not as a list of discrete policy statements. This allows introduction of linkages to process and context within the discussion.

The 1999 Blount County Policies Plan formed the initial basis for this Water Quality Plan. The water quality related policies from the 1999 Plan were presented in citizen input workshops for this Plan and showed strong citizen support. Thus, all water quality related policies in the 1999 Plan are carried forward in this Plan. See discussion in Process Documentation section for a summary of policies from the 1999 Plan.

Water quality is an important issue in the county. The County should take steps now to address present water quality problems, and to address means that would forestall future water quality problems.

Water quality issues know no jurisdictional boundaries. The County should cooperate with the cities to plan for water quality, and also plan with surrounding counties if the opportunity arises.

The Little River is an important source of drinking water, and is also important in defining the rural character and recreation potential of the county. Special attention should be paid in planning for the Little River basin. A specific plan for the basin and its watersheds should be formulated. The planning process should include further citizen and stakeholder participation, and should utilize the IPSI (Integrated Pollution Source Identification project) research. The Cities of Alcoa, Maryville, Rockford and Townsend should be included in the process.

The City of Louisville has expressed interest in planning for the Lackey Creek watershed. In particular, the City of Louisville is interested in addressing sedimentation originating within and outside the city, particularly from the airport and the potential Partnership Park North industrial park. The city is also interested in exploring possible effects of septic systems on water quality. The County should pursue joint planning activities with Louisville, inviting also Alcoa and Maryville to participate.

The County should pursue grants to implement plans, policies and objectives addressing water quality. Full grants should be top priority. Grants with matching fund requirements should be considered secondarily as budget and priorities warrant. Private entities are also encouraged to pursue grants to implement any part of this plan. The County may partner with the cities and with private entities in pursuit of grants. In all grants, care should be taken to assess “strings attached” in order to protect local initiative in implementation.

The County should participate fully in Federal or State programs required by law for addressing water quality. An example of this is the Phase 2 Storm Water Program. However, the County should not assume administrative and enforcement responsibilities lawfully required of and effectively pursued by other agencies.

All six components of the Phase 2 Storm Water program showed high acceptance in the Tally of Responses. These components were education, public participation, construction storm water management, post construction storm water management, illicit discharge elimination, and government operations good housekeeping. These components should form the basis for a countywide approach to addressing storm water issues.

An informed public can play an important role in addressing water quality problems. Education can help the public play a positive role. The county should extend education opportunities to the entire population of the county. This may be done through presentations at public meetings or public gatherings, handouts of relevant information during any permit process, and general information dissemination through public service presentations in newspapers, television and radio. The county may partner with the cities and private entities to help disseminate information on water quality to the population. The County can use the education modules of the Tennessee Growth Readiness project, developed in part with pilot community participation by the County. Public education within the coverage of the Phase 2 Storm Water application will follow additional requirements under that application.

Informed developers, builders, surveyors, engineers and construction workers can provide a first line of action to protect water quality, and these persons should avail of education opportunities. The Tennessee Department of Environment and Conservation has developed training programs on erosion and sedimentation control geared to site developers, designers, managers and operators. Local staff administering this plan should also avail of this training.

Informed farmers and agricultural workers can provide a first line of action to protect water quality. Blount County Soil Conservation District education programs for farmers and agriculture workers, along with other programs by the University of Tennessee College of Agriculture and other agencies, should be encouraged and supported.

Citizen involvement has been a hallmark of county planning leading to the adoption of the 1999 Policies Plan, and also to the formulation of this Water Quality Plan. To continue public involvement, the County should advertise any public meetings that involve consideration of water quality issues, and should include water quality issues and citizen participation in the periodic reviews of the 1999 Policies Plan. For specific planning of the Little River and Lackey Creek watersheds, defined citizen and stakeholder participation should be included.

There may be instances of illicit discharges into streams and rivers in the county. Upon reporting or finding of such, the County should take steps to have the illicit discharges eliminated. Illicit discharge and elimination

within the coverage of the Phase 2 Storm Water application will follow additional requirements under that application.

Construction site erosion and sedimentation control is a priority issue countywide. The County should develop and adopt appropriate regulations for erosion and sedimentation control, including requirements for use of best management practices contained in the Tennessee Erosion and Sedimentation Control Handbook (Second Edition, March 2002).

Formulation of regulations should involve joint activities with the Cities, and should involve stakeholder participation.

Water quality issues do not stop at the completion of project construction. Means for post construction storm water management should be included in new development or redevelopment. Plans for post construction storm water management should be included at the design stage for any project, should be constructed during overall project construction, and should include mechanisms for maintenance after project construction is complete. Best management practices may be patterned after those developed under the Phase 2 Storm Water application.

County Government also needs to act responsibly. All facets of County Government, including general government (the Courthouse), highway department, school department and other agencies, should formulate plans of operation consistent with best management practices to protect water quality.

Hazardous household waste, if not properly handled and disposed, can impact water quality. The Solid Waste Authority, a joint effort of the County along with the cities of Alcoa and Maryville, sponsors one or two household hazardous waste collection days each year, with support from Keep Blount Beautiful, and with financial support from the State. The County should continue to support this effort through the Solid Waste Authority.

There are several volunteer led activities that can benefit water quality in the county. These include river and lake clean-up days spearheaded by Keep Blount Beautiful, storm drain stenciling spearheaded by the Little River Watershed Association, and roadside litter pick-up by various civic and other groups. The County should encourage and support these and other volunteer efforts of benefit to water quality.

Some aspects of water quality protection are most directly addressed by regulations requiring the use of best management practices. The means of requiring best management practices for construction sites is often through an erosion and sedimentation control plan. Such site specific plan will set forth the best management practices to be used, and also will indicate the timing and maintenance of such practices.

Requirements for best management practices and plans may be incorporated into various existing regulations. For construction of subdivisions, the requirements could be incorporated into or referenced in the Subdivision Regulations and tied to subdivision plat review. For single site development, such as a site for an industry or business, the requirements could be incorporated into or referenced in the Zoning Regulations, and tied to site plan review and building permit.

Erosion and sedimentation control may best be addressed by a separate set of regulations, which may then be referenced by multiple regulatory texts without duplication. Such erosion and sedimentation control measures should include a requirement for an erosion and sedimentation control (ESC) plan prior to any grading or construction on site. The ESC plan will be tied to approvals of plats, site plans and building permits under the Subdivision Regulations and Zoning Regulations. The ESC plan will form the basis for actual implementation of best management practices during construction. The implementation of best management practices will be inspected periodically for conformity with the ESC plan, for maintenance in the field, and for actual effectiveness during storm events.

For small sites, such as individual home construction, an elaborate erosion and sediment control plan will not be needed. However, each small construction site should include erosion and sediment control measures. This will best be addressed at the permit stage, with counseling on the need for such measures and setting forth the requirement that those responsible for construction will also be responsible for installing and maintaining erosion and sedimentation control measures.

Water quality issues also arise with septic fields. Septic field assessment is done at the subdivision plat stage, best handled in the Subdivision Regulations, and at the single site installation stage, best handled by a separate set of septic field regulations. These sets of regulations should be

reviewed periodically for effectiveness in addressing proper septic field design, installation and functioning at both the development and individual site levels.

Different land uses have different characteristics and different impacts on water quality. Therefore, there should be different approaches to addressing water quality issues based the various land uses in the county.

Timberland and land used for agriculture or farming have certain exemptions from regulation under state statutes. Such activities are also valued parts of the rural character of the county.

Education in best management practices for timberland managers should be considered as part of the water quality plan for the county. The County may also explore regulations to address erosion control during tree harvesting. Traditional zoning and subdivision regulations are not appropriate for addressing timberland use.

Agriculture and farming should be addressed mainly through education, and through existing incentive programs for adopting best management practices. The Soil Conservation District should be the lead agency in this. The County may also explore regulations for large feedlot operations. Traditional zoning and subdivision regulations are not appropriate for addressing agriculture and farming.

The construction phase of new residential subdivisions should be under regulations requiring implementation of best management practices for erosion and sedimentation control. Such requirements can be included in subdivision regulations, zoning regulations and separate erosion control regulations. Distinction should be made between overall construction of a subdivision, and construction of individual houses. Subdivision development should be under full regulation, while construction of individual houses should be under advisory guidance at the permit stage. In both instances, however, the requirement should be that the managers of the construction site will take care of erosion and sedimentation on site through appropriate best management practices. Education or prior qualification of construction site managers and workers should be included as part of the overall water quality plan for new development.

The post construction phase of new residential subdivisions should incorporate best management practices for storm water quantity and quality control. Such measures may be modeled after those required under the Phase 2 Storm Water application, and may include long term management through structural and bio-engineered designs. Long term maintenance of improvements on private property should be the responsibility of the developer or ultimate owners of the development.

Existing residential use, that is, houses already in existence, should be addressed at the household level through education on best management practices. Traditional zoning regulations and new erosion control regulations may play a minor role in new construction of additions to existing houses through the building permit process.

New commercial or industrial development should be treated similar to new residential subdivision development, with defined regulations for erosion and sediment control and post construction storm water management requirements. Implementation of regulations for large commercial or industrial subdivisions can be tied to plat approvals. Implementation of regulations for site specific development can be tied to site plan review and building permits. Education of construction site managers and workers should be included as part of the overall water quality plan for new development. Long term maintenance of improvements on private property should be the responsibility of the developer or ultimate owners of the development.

Existing commercial and industrial uses, that is, commercial and industrial sites already in existence, should be addressed at the business operation level through education on best management practices. Traditional zoning regulations and new erosion control regulations may play a minor role in new construction of additions to existing commercial and industrial sites through the building permit process.

## **IMPLEMENTATION**

A plan is only as good as its implementation. The following is a list of implementation activities in support of the above policies. The time frame for implementation is generally within five years, with the pace of

implementation being tied to implementation of the Phase 2 Storm Water program for the county.

Implementation of Phase 2 Storm Water Program. The County is mandated to implement provisions of the Phase 2 Storm Water Program in the urbanized areas of the county. This program should be implemented fully to meet requirements of law. Many of the activities under the permit application will have links with activities under this general Water Quality Plan for the county.

Storm Water System Mapping. Under the Phase 2 Storm Water Program, the County is required to map the storm water system in the urbanized area. Mapping should extend to cover the whole county. Grants to cover the cost of such mapping should be pursued.

Little River Watershed Plan. The 1999 Policies Plan made specific mention of the need for a plan for the Little River. The water quality planning process confirmed that need. A detailed plan for the Little River watershed was outside the parameters of this water quality planning process. The County should help organize a separate, more intensive water quality planning process for the Little River watershed, to include joint participation of Alcoa, Maryville, Rockford and Townsend, to include also participation of the Soil Conservation District and other agriculture related agencies, and to include citizen and stakeholder participation. The Integrated Pollutant Source Identification (IPSI) project research should be used as the primary data source for the planning process, with possible additional assistance from TVA and other appropriate agencies for further data analysis. Start of the Little River watershed planning process should commence within the first year after adoption of this Water Quality Plan.

Lackey Creek Watershed Plan. The county planning staff met with the Louisville Planning Commission four times throughout the water quality planning process as part of a commitment to pursue joint planning for the Lackey Creek watershed. A more directed process focusing on the Lackey Creek watershed should be pursued, to include participation by the cities of Alcoa and Maryville and the Airport Authority. The process should include joint review of regulations with a view to incorporating similar best management practices.

Storm Water Drainage Control Plan. One of the objectives of the 1999 Policies Plan was to formulate a county-wide drainage plan. Part of the focus of such a plan would be control of water quantity. Recent problems with flooding and drainage have increased awareness of the need for better control over storm water quantity as development occurs in the county. The above “Storm Water System Mapping” should form the basis for a closer systematic look at storm water quantity controls that could help alleviate present problems, and help forestall future problems.

Public Education. The County has already utilized the core education module of the Tennessee Growth Readiness project in developing this Water Quality Plan, and was a pilot community for both developing and testing the module. The County is mandated to address public education in the urbanized area of the county under the Phase 2 Storm Water program. Various avenues for public education should be pursued to cover all the population of the county.

- i. The County should continue to seek venues to present the education components of the Tennessee Growth Readiness project. Such venues could include civic organizations, community or neighborhood groups, professional organizations, and building industry groups. The County already has five individuals trained in presentation of the education modules. Solicitation of venues for presentation should continue upon adoption of this Water Quality Plan.
- ii. The County should develop public service messages for publication in newspapers and broadcast on radio and television. A yearly schedule of broadcast and publication should be developed.
- iii. The County should develop and distribute education brochures and information materials on various water quality matters. General brochures should be available at all times at County offices, and should be made available at all County sponsored public meetings relating to water quality issues. Brochures and materials specific to development activities should be directly distributed at the time of development review and permitting.

Development Community Education. All construction sites should be required to have on site a person responsible for erosion and sedimentation

control trained and certified in the TDEC workshop “Fundamentals of Erosion Prevention and Sediment Control” or equivalent training and certification. Such a person will be responsible for overseeing the implementation of the erosion and sedimentation control plan for the site, and will also be responsible for inspection of control measures and management of control measure maintenance. Developers, surveyors, engineers, builders and other construction site personnel also should be encouraged to undertake the same or similar training. County staff involved in reviewing construction site plans and inspecting construction sites should also undergo the same or similar training. The County already has five staff trained in the “Fundamentals of Erosion Prevention and Sediment Control”.

Timberland and Agriculture Community Education. The County should support and encourage the wider implementation of existing Soil Conservation District programs, along with programs by the University of Tennessee College of Agriculture and other agencies. The County may jointly assist in planning and organizing for local implementation of education activities, but would expect the expertise to come from other agencies.

Illicit Discharge Management. The County should act on reports or findings of illicit discharges in a timely manner. A mechanism for public reporting of illicit discharges should be implemented, along with protocols on investigation and action. If management of an illicit discharge report or finding falls within the responsibility of any agency of County Government, that agency will take the lead in addressing the problem in a timely manner. If management of the reported problem falls within the responsibility of an agency outside County Government, then timely referral will be made to that agency.

Construction Site Storm Water Control Regulations. Construction site erosion and sedimentation control may best be addressed by regulations requiring a site plan incorporating best management practices. The requirement for an erosion and sedimentation control (ESC) plan should be incorporated into zoning and subdivision regulations, and the body of best management practices and design guidelines should be incorporated in a unified set of regulations. Review of the site plan may be undertaken in the subdivision plat, site plan review or building permit process. The design guidelines for best management practices should be referenced to the Tennessee Erosion and Sedimentation Control Handbook published by the

Tennessee Department of Environment and Conservation. Other design guidelines may also be referenced and used in ESC plans. ESC plan implementation on a specific site should be inspected as built, and also should be inspected periodically throughout the construction process to insure proper maintenance. Part of the ESC plan should be a requirement for a qualified person designated on-site and responsible for day-to-day operation and maintenance of control measures. The process of developing regulations should include stakeholder participation and input, along with participation and input from the cities.

Post Construction Storm Water Management Regulations. The County should develop and adopt regulations requiring design of post construction storm water control measures for new development. Both water quantity and water quality control measures should be addressed in the regulations, along with defined mechanisms for inspection and maintenance. Regulations may be developed using measures required under the Phase 2 Storm Water application as a guide. Particular attention should be given to preservation of natural drainage ways and installation of bio-engineered detention and retention structures.

Joint Review of Development Regulations. The County, along with the cities of Alcoa and Maryville, began joint review of development regulations in 2002 with assistance from TVA and the Southeast Watershed Forum using guidelines from the Center for Watershed Protection. This process should proceed to completion, and should include stakeholder participation. A similar process should be undertaken jointly with the City of Louisville.

Septic Field Regulations. The County should review regulations related to evaluation, design, approval, installation and monitoring of septic field systems. If avenues for improved standards or procedures are identified, the County should adopt appropriate regulations or amend existing regulations.

County Operations. The County should develop and adopt plans to address water quality measures for its own operations. All facets of County Government operations should be included. The operations plan may mirror that required under the Phase 2 Storm Water application.

Support for Other Activities. There are volunteer and mixed private sector and government activities that relate to protection of water quality in the county. The County should encourage and support these activities as

opportunity arises. The County should explore avenues for joint activities with private organizations in pursuit of common water quality policies and objectives.

Periodic Reporting and Review of the Water Quality Plan. Progress on the Water Quality Plan implementation should be reported along with yearly reporting of the 1999 Policies Plan. The Water Quality Plan and its implementation should be reviewed on the same cycle as the 1999 Policies Plan, generally every three years, including citizen input through community meetings. Appropriate amendments should be considered based on citizen input and formal review of the Water Quality Plan.

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CERTIFIED approved by the Blount County Regional Planning Commission by action at regular meeting on April 24, 2003.

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Charles E. Brown – Chairman  
Blount County Regional Planning Commission

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John Lamb - Secretary  
Blount County Regional Planning Commission