

## **CHAPTER 6**

### **FUTURE DIRECTIONS IN THE WATTS BAR WATERSHED**

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#### **6.1 BACKGROUND.**

The Watershed 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 stormwater rules (implemented under the NPDES program) are transitioning from Phase 1 to Phase 2. More information on stormwater rules may be found at: <http://www.state.tn.us/environment/wpc/stormh2o/MS4.htm>.

This Chapter addresses point and nonpoint source approaches to water quality problems in the Watts Bar 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 permittees, business people, farmers, and local river conservation interests. Locations for meetings were frequently 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/public.htm>.

**6.2.A. Year 1 Public Meeting.** The first Watts Bar Watershed public meeting was held September 11, 1996 at the Harrison 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 nongovernment organization partners, 3)review water quality monitoring plans, and 4)solicit input from the public.

#### Major Concerns/Comments

- ◆ Agriculture impact from small operations
- ◆ Exotic plants (purple loosestrife) are taking over lake
- ◆ Destruction of riparian areas
- ◆ Groundwater contamination from landfill
- ◆ Contaminated drinking water from wells
- ◆ Contaminated fish in Watts Bar Reservoir
- ◆ Fines for water quality violations are set too low
- ◆ Relic contaminants in sediment

**6.2.B. Year 3 Public Meeting.** The second Watts Bar public meeting was held May 28, 1998 at the Harriman Utility District Office. 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.

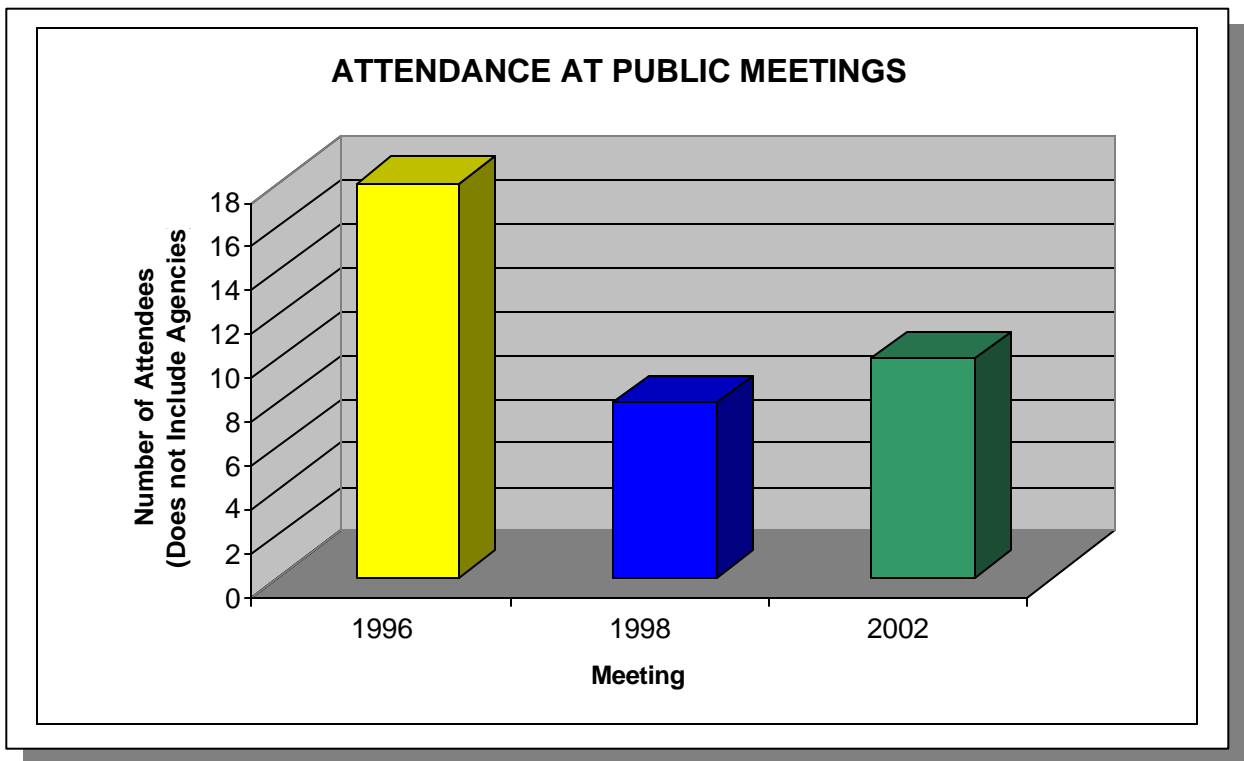
#### Major Concerns/Comments

- ◆ Health hazards associated with fish consumption
- ◆ Odor from landfill and nearby streams
- ◆ NPS is biggest problem but TDEC has no authority to address it

**6.2.C. Year 5 Public Meeting.** The third Watts Bar Watershed public meeting was held August 12, 2002 at Kingston Community Center (Kingston). The meeting featured seven educational stations:

- Draft Watershed Water Quality Management Plan
- Benthic macroinvertebrate samples and interpretation
- Smart Board with interactive GIS maps
- “Watershed Approach” (self-guided slide show)
- “How We Monitor Streams” (self-guided slide show)
- “Why We Do Biological Sampling” (self-guided slide show)
- Landowner Assistance Programs (NRCS and TDA)

In addition, citizens had the opportunity to make formal comments on the Draft Year 2002 303(d) List.



**Figure 6-1. Attendance at Public Meetings in the Watts Bar Watershed.** Attendance numbers do not include agency personnel.

### **6.3. ASSESSMENT OF NEEDS.**

**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/index.html>. Discharge monitoring data submitted by NPDES-permitted facilities may be viewed at [http://www.epa.gov/enviro/html/pcs/pcs\\_query\\_java.html](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.htm>

TMDLs are prioritized for development based on many factors.

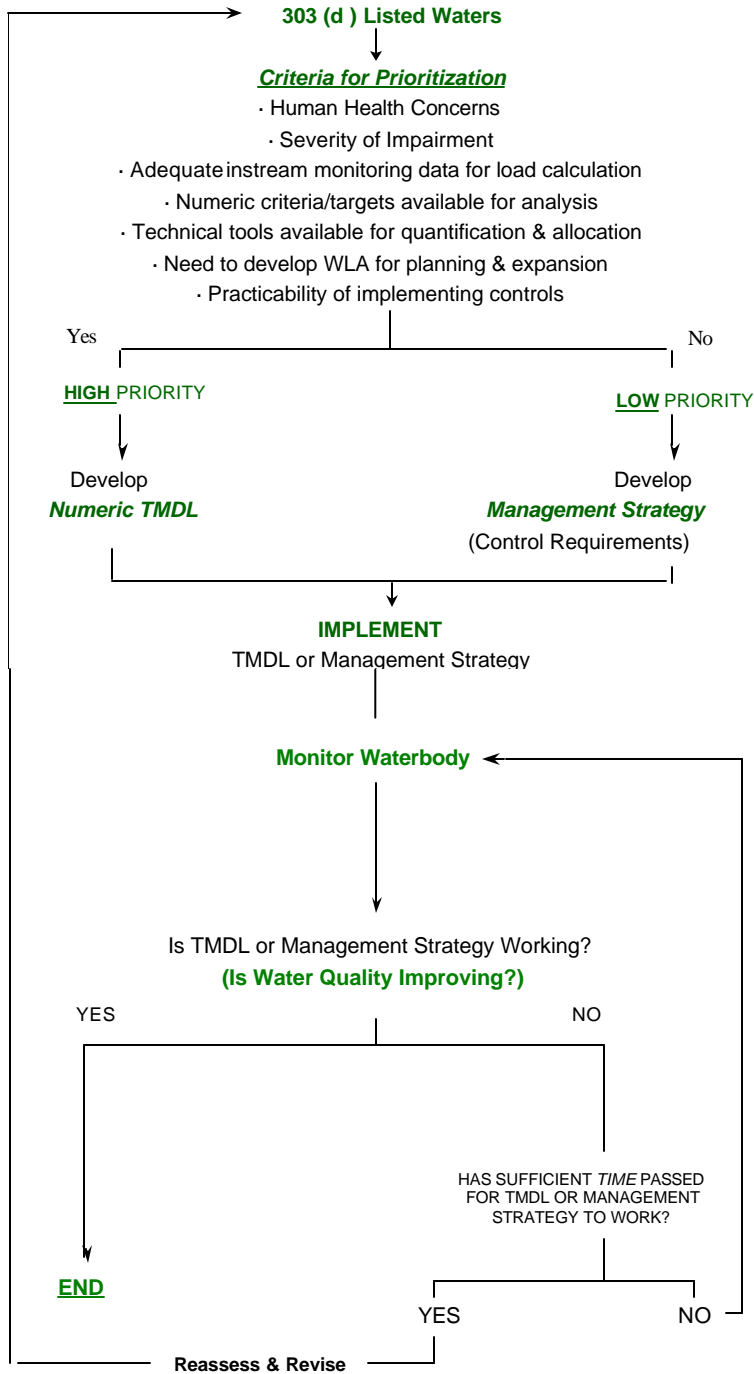


Figure 6.2. Prioritization scheme for TMDL Development.

### 6.3.B. Nonpoint Sources.

Common nonpoint sources of pollution include urban runoff, riparian vegetation removal, and inappropriate land development, agricultural, and road construction practices. Since nonpoint pollution exists essentially everywhere rain falls and drains to a stream, existing point source regulations can have only a limited effect, so other measures are necessary.

There are several state and federal regulations that can address some of the contaminants impacting the Watts Bar watershed. Most of these are limited to only 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 voluntary efforts by landowners and volunteer groups, while others may involve new regulations. Many agencies, including the Tennessee Department of Agriculture and 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 certain types of impairments, causes, suggested improvement measures, and control strategies. The suggested measures and streams are only examples and efforts should not be limited to only those streams and measures mentioned.

#### 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 are disturbed. The general permit issued for such construction sites sets out conditions for maintenance of the sites to minimize pollution from stormwater including requirements for inspection of the controls. Also the general permit imposes more stringent inspection and self-monitoring requirements on sites in the watershed of streams that are impaired due to sedimentation.

Construction sites within a sediment-impaired watershed may also have higher priority for inspections by WPC personnel, and are likely to have enforcement actions for failure to control erosion.

The same requirements apply to sites in the drainage of high quality waters. Whites Creek and PineyCreek are examples of high quality streams in the Watts Bar watershed.

The same measures, which are currently required of all sites of 5 acres or more, can also be required on a site-by-site basis for smaller sites. New federal requirements will reduce the size of the sites subject to construction stormwater permitting to one acre. Local regulations may already address smaller sites. Regardless of the size, no construction site is allowed to cause a condition of pollution.

**6.3.B.i.b.** From Channel and/or Bank Erosion. Due to the past alteration of some streams in the Watts Bar watershed, the channels are unstable. Several agencies are working to stabilize portions of stream banks. These include NRCS and Tennessee Department of Agriculture. Other methods or controls that might be necessary to address common problems are:

*Voluntary activities*

- Re-establishment of bank vegetation, (examples: Steekee Creek and Pond Creek).
- Establish off channel watering of cattle by moving watering troughs and feeders back from stream banks ( example: Pond Creek).
- Limit cattle access to streams and bank vegetation (examples: Pond Creek and Black Creek).

*Additional strategies*

- Increase efforts in the Master Logger program to recognize impaired streams and require more effective management practices.
- Better community planning for the impacts of development on small streams, especially in rapidly developing areas (examples: Town Creek and Black Creek).
- Restrictions requiring post construction run-off rates to be no greater than pre-construction rates in order to avoid in-channel erosion (example: Town Creek and Sweetwater Creek).
- Additional restrictions on logging in stream side management zones.
- Prohibition on clearing of stream and ditch banks (example: Town Creek). *Note: Permits are now required for any work along streams.*
- Additional restriction to road and utilities crossings of streams.
- Restrictions on the use of off-highway vehicles on stream banks and in stream channels.

**6.3.B.ii.** Pathogen contamination.

Possible sources of pathogens 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 in streams and storm drains due to pets, livestock and wildlife. Permits issued by the Division of Water Pollution Control regulate discharges from point sources. These permits require adequate control for these sources, and require subsurface, on-site treatment (i.e., septic tank and field lines) if public sewers are not available. Septic tank and field lines are regulated by the Division of Ground Water Protection within TDEC and delegated county health departments. In addition to discharges to surface waters, businesses may employ either subsurface or surface disposal of wastewater. The Division of Water Pollution Control regulates surface disposal.

Other measures that may be necessary to control pathogens are:

*Voluntary activities*

- Off-channel watering of livestock (example: Pond Creek).
- Limiting livestock access to streams (example: Pond Creek).

- Proper management of animal waste from feeding operations (example: Pond Creek).

#### *Enforcement strategies*

- Greater enforcement of regulations governing on-site wastewater treatment.
- Timely and appropriate enforcement for non-complying sewage treatment plants, large and small, and their collection systems.
- Identification of Concentrated Animal Feeding Operations not currently permitted, and enforcement of current regulations.

#### *Additional strategies*

- Restrict development in areas where sewer is not available to those sites with appropriate soils.
- Discourage the creation of “duck holes” that attract waterfowl.
- Develop and enforce leash laws and controls on pet fecal material.
- Greater efforts by sewer utilities to identify leaking lines or overflowing manholes, (examples: Town Creek and Sweetwater Creek).

### **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 and from fertilized lawns and croplands.

Other sources of nutrients can be addressed by:

#### *Voluntary activities*

- Encourage no-till farming, (example of a stream that could benefit is Pond Creek).
- Encourage farmers to use the proper rate of fertilizer for the soil and crop, (Pond Creek).
- Educate homeowners and lawn care companies in the proper application of fertilizers.
- Encourage landowners, developers, and builders to leave stream buffer zones (examples: Town Creek and Steekee Creek). Streamside vegetation can filter out many nutrients and other pollutants before they reach the stream. These riparian buffers are also vital along livestock pastures.
- Use grassed drainageways that can remove fertilizer before it enters streams.
- Use native plants for landscaping since they don't require as much fertilizer and water.



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. Pond Creek and Steekee Creek suffer from canopy removal.
- Discourage impoundments. Ponds and lakes do not aerate water. *Note: Permits are required for any work on a stream, including impoundments.*

#### **6.3.B.iv. Toxins and Other Materials.**

Many materials enter our streams due to apathy, or lack of civility or knowledge by the public. Litter in roadside ditches, garbage bags tossed over bridge railings, paint brushes washed off over storm drains, and oil drained into ditches are blatant examples of pollution in streams. Some can be addressed by:

##### *Voluntary activities*

- Providing public education.
- Painting warnings on storm drains that connect to a stream. (This would benefit Sweetwater and Town Creeks).
- Sponsoring community clean-up days.
- Landscaping of public areas.
- Encouraging public surveillance of their streams and reporting of dumping activities to their local authorities.

##### *Needing regulation*

- Prohibition of illicit discharges to storm drains.
- Litter laws and strong enforcement at the local level.

#### **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.

Measures that can help address this problem are:

##### *Voluntary activities*

- Sponsoring litter pickup days to remove litter that might enter streams.
- Organizing stream cleanups removing trash, limbs and debris before they cause blockage.

- Avoiding use of heavy equipment to “clean out” streams. Black Creek and Sweetwater Creek have historically suffered from such activity.
- Planting vegetation along streams to stabilize banks and provide habitat.
- Encouraging developers to avoid extensive culverts in streams.

#### *Current regulations*

- Restrict modification of streams by such means as culverting, lining, or impounding.
- Require mitigation for impacts to streams and wetlands when modifications are allowed.

#### *Additional Enforcement*

- Increased enforcement may be needed when violations of current regulations occur.