

CHAPTER 6

RESTORATION STRATEGIES IN THE CORDELL HULL LAKE WATERSHED

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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 Cordell Hull Lake 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 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 Cordell Hull Lake Watershed public meeting was held as a joint meeting with the Obey River Watershed September 7, 1999 at Tennessee Technological University. 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

- East and West Forks Obey River need protection
- Dale Hollow Lake is a discharge lake (from houseboats)
- Increased sediment from streams after a rain
- Water taste from tap has gotten worse
- Effects of unplanned growth
- Effects of factory chicken houses coming to the Dale Hollow area
- Effects of abandoned mines and wells
- Increased nutrients on West Fork Obey River from agricultural feedlots

6.2.B. Year 3 Public Meeting. The second Cordell Hull Lake Watershed public meeting was held as a joint meeting with the Obey River Watershed November 15, 2001 in the Livingston Chamber of Commerce 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

- Decreased dissolved oxygen in Dale Hollow Lake
- Gravel removal from lower Blackburn Fork and Roaring River
- Cumulative effects of non-BMP agricultural resources
- Agriculture (cattle) too close to Livingston water supply
- Roaring River state scenic river designation is not known or appreciated by landowners
- Silt in East Fork Obey River drainage where people go four-wheeling
- TDOT projects should trigger sites to be monitored because of construction and the ensuing development

6.2.C. Year 5 Public Meeting. The third scheduled Cordull Hull Lake Watershed public meeting was held October 16, 2007 at the Smith County Chamber of Commerce Building in Carthage. The meeting was held jointly with the Barren River and Upper Cumberland River Watersheds and featured nine 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
- Nonpoint Source pollution self-guided slide show
- Water supply and ground water protection educational display
- Smith County Beautiful 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.

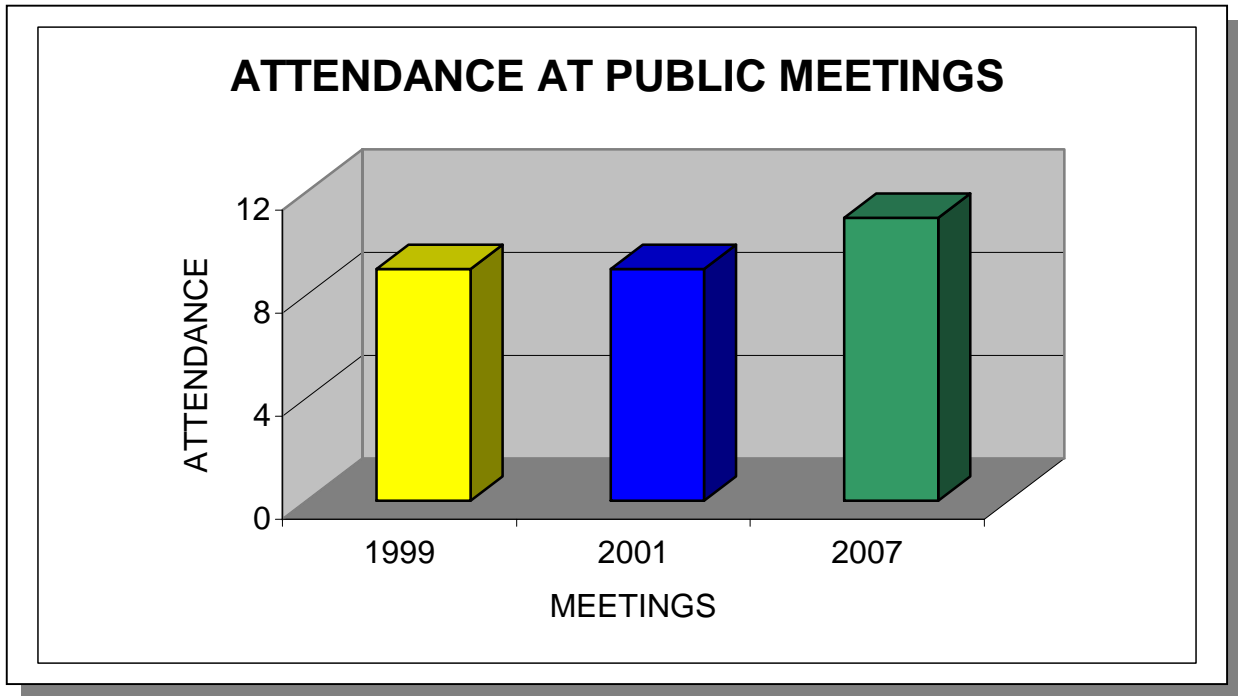


Figure 6-1. Attendance at Cordell Hull Lake Watershed Public Meetings. Attendance numbers do not include TDEC personnel. Meetings in 1999 and 2001 represent Cordell Hull Lake and Obey River Watersheds joint meetings. Meeting in 2007 represents Cordell Hull Lake, Upper Cumberland River, and Barren River Watersheds joint meeting.



Figure 6-2. The SmartBoard™ is an Effective Interactive Tool to Teach Citizens About the Power of GIS.



Figure 6-3. Watershed Meetings are an Effective Way to Facilitate Networking Among Consultants, Local Officials, Non-Government Organizations, Government Agencies, and Staff.



Figure 6-4. Scotty Sorrells (Division of Water Supply) explains the complicated issues involved with groundwater as a source of drinking water.

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/pes/pes_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.

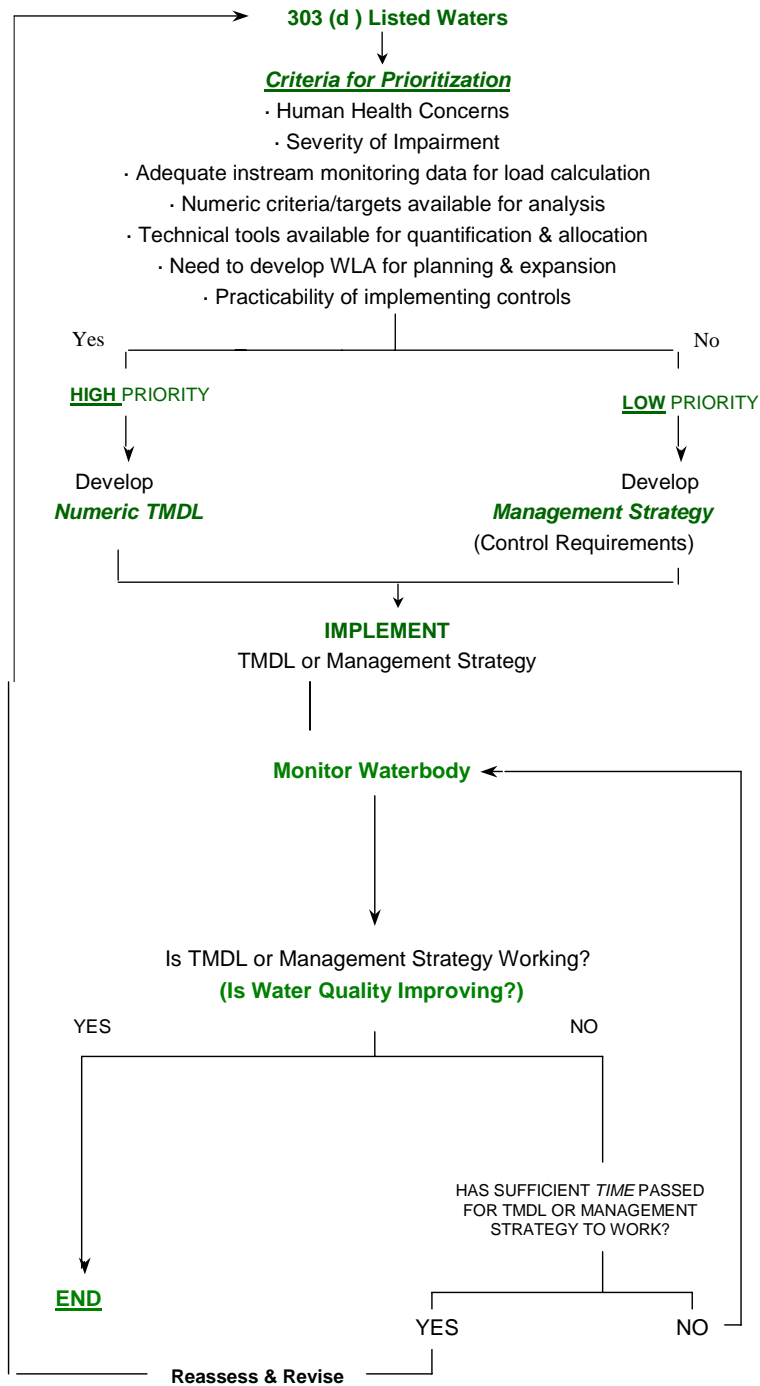


Figure 6-5. Prioritization Scheme for TMDL Development.

6.3.B. Nonpoint Sources

Common nonpoint sources of pollution in the Cordell Hull Lake 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 Cordell Hull Lake 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.

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.

6.3.B.i.b. From Channel and/or Bank Erosion. Many streams within the Cordell Hull Lake Watershed suffer from varying degrees of streambank erosion. When stream channels are altered, banks can become unstable and highly erodible. 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 Blackburn Fork in Putnam County, Flynn Creek in Jackson County, and Spring Creek in Overton County, would 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.
- 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 (tributaries to Spring Creek in Overton County).
- Limit cattle access to streams and bank vegetation (tributaries to Blackburn Fork in Putnam County and Spring Creek in Overton County).

Regulatory Strategies

- Require post-construction run-off rates to be no greater than pre-construction rates in order to avoid in-channel erosion.
- Implement additional restrictions on logging in streamside management zones.
- Restrict the use of off-highway vehicles on stream banks and in stream channels.

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 development in growing areas.
- Encourage or require strong local buffer ordinances.
- Limit clearing of stream and ditch banks or other alterations. *Note: Permits may be required for any work along streams.*
- Limit road and utility crossings of streams through better site design.

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 problem in some areas of the Cordell Hull Lake Watershed, due both to agricultural and residential/commercial land uses. Impacted streams that would benefit from the establishment of more extensive riparian buffer zones include Roaring River and its tributaries.

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 Cookeville Environmental Field Office 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, no stream systems in the Cordell Hull Lake Watershed are known to have excessive pathogen contamination, although contributions of bacterial contamination

coming from storm water runoff and agricultural watersheds could be suspect for causing elevated bacterial levels in Carr Creek and Blackburn Fork.

Some measures that may be necessary to control pathogens are:

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.

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.
- Develop and enforce leash laws and controls on pet fecal material.
- 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. All tributaries within agricultural areas would benefit from these practices.
- 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.*

Regulatory Strategies.

- Strengthen enforcement of regulations governing on-site wastewater treatment.
- Impose more stringent permit limits for nutrients discharged from sewage treatment plants.
- Impose timely and appropriate enforcement for noncomplying sewage treatment plants, large and small, and their collection systems.
- 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.
- 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 Cordell Hull Lake Watershed, Town Creek in Livingston (Overton County) receives a large amount of urban storm water runoff associated with road surfaces, parking lots, and factories. 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 are Town Creek and Carr Creek in Overton County.

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.

Enforcement strategies

- Continue to prohibit illicit discharges to storm drains and to search them out.
- Strengthen litter law enforcement at the local level.

Regulatory Strategies

- 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.

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.

Current regulations

- 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.

Additional Enforcement

- Increased enforcement may be needed when violations of current regulations occur, especially for illicit gravel dredging.

6.3.B.vi. 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 from in 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 Cordell Hull Lake 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 Cordell Hull Lake Watershed*.

6.4.A. Municipal Permits

TN0063886 Celina STP

Discharger rating: Minor
City: Celina
County: Clay
EFO Name: Cookeville
Issuance Date: 7/1/05
Expiration Date: 5/31/09
Receiving Stream(s): Cumberland River at mile 380.7 (Cordell Hull Lake)
HUC-12: 051301060101
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: Three cell lagoon system

Segment	TN05130106005_1000
Name	Cordell Hull Lake
Size	13901
Unit	Acres
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 6-1. Stream Segment Information for Celina STP.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
BOD % removal	All Year	65	Percent	MAvg % Removal	Weekly	Calculated	%Removal
BOD5	All Year	70	mg/L	DMax Conc	Weekly	Grab	Effluent
BOD5	All Year		mg/L	DMax Conc	Weekly	Composite	Influent (Raw Sewage)
BOD5	All Year	467	lb/day	DMax Load	Weekly	Grab	Effluent
BOD5	All Year		mg/L	MAvg Conc	Weekly	Composite	Influent (Raw Sewage)
BOD5	All Year	65	mg/L	WAvg Conc	Weekly	Grab	Effluent
BOD5	All Year	434	lb/day	WAvg Load	Weekly	Grab	Effluent
BOD5	All Year	300	lb/day	MAvg Load	Weekly	Grab	Effluent
BOD5	All Year	45	mg/L	MAvg Conc	Weekly	Grab	Effluent
Bypass of Treatment (occurrences)	All Year		Occurrences/Month	MAvg Load	Continuous	Visual	Wet Weather
D.O.	All Year	6	mg/L	DMin Conc	Weekdays	Grab	Effluent
E. coli	All Year	487	#/100mL	DMax Conc	Weekly	Grab	Effluent
E. coli	All Year	126	#/100mL	MAvg Geo Mean	Weekly	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	Influent (Raw Sewage)
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Effluent
Overflow Use Occurrences	All Year		Occurrences/Month	MAvg Load	Continuous	Visual	Non Wet Weather
Overflow Use Occurrences	All Year		Occurrences/Month	MAvg Load	Continuous	Visual	Wet Weather
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	120	mg/L	DMax Conc	Weekly	Grab	Effluent
TSS	All Year		mg/L	DMax Conc	Weekly	Composite	Influent (Raw Sewage)
TSS	All Year	801	lb/day	DMax Load	Weekly	Grab	Effluent
TSS	All Year		mg/L	MAvg Conc	Weekly	Composite	Influent (Raw Sewage)
TSS	All Year	110	mg/L	WAvg Conc	Weekly	Grab	Effluent
TSS	All Year	734	lb/day	WAvg Load	Weekly	Grab	Effluent
TSS	All Year	667	lb/day	MAvg Load	Weekly	Grab	Effluent
TSS	All Year	100	mg/L	MAvg Conc	Weekly	Grab	Effluent
TSS % Removal	All Year	65	Percent	MAvg % Removal	Weekly	Calculated	% Removal
pH	All Year	9	SU	DMax Conc	2/Week	Grab	Effluent
pH	All Year	6	SU	DMin Conc	2/Week	Grab	Effluent

Table 6-2. Permit Limits for Celina STP.

Enforcement:

10/1/07 Notice of Violation: Due to the lack of an operable influent flow meter and subsequently a lack of flow proportional sampling, a Notice of Violation was issued. Reportable flow and Influent BOD are invalid from the date that the flow meter became inoperable. Flow and BOD values reported during this period do not comply with Celina's NPDES permit.

10/14/04 Agreed Order #04-0614 for NPDES violations - flow meter out for several years 1999-2004. Also had NPDES violations most of which were leaving data off the Daily Monitoring Reports as well as a couple of overflows.

Comments:

The plant is a lagoon system with few problems. There is very little industry in the area. The collection system needs attention and continual maintenance.

9/13/07 Compliance Evaluation Inspection: Not in Compliance

Comments:

Operators need to improve documentation organization, add logbooks and improve laboratory bench sheets. Influent flow meter was not working, hence the influent sampler was not meeting permit requirements.

TN0026581 Gainesboro STP

Discharger rating: Minor
City: Gainesboro
County: Jackson
EFO Name: Cookeville
Issuance Date: 4/1/04
Expiration Date: 2/28/09
Receiving Stream(s): Cumberland River Mile 357.3
HUC-12: 051301060301
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: Activated sludge

Segment	TN05130106005_1000
Name	Cordell Hull Lake
Size	13901
Unit	Acres
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 6-3. Stream Segment Information for Gainesboro 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	167	lb/day	DMax Load	3/Week	Composite	Effluent
BOD5	All Year	30	mg/L	WAvg Conc	3/Week	Composite	Effluent
BOD5	All Year	125	lb/day	MAvg Load	3/Week	Composite	Effluent
BOD5	All Year	40	mg/L	MAvg Conc	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	Composite	Effluent
Fecal Coliform	All Year	200	#/100mL	MAvg Geo Mean	3/Week	Composite	Effluent
Settleable Solids	All Year	1	mL/L	DMax Conc	Weekdays	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	125	lb/day	MAvg Load	3/Week	Composite	Effluent
TSS	All Year	167	lb/day	DMax Load	3/Week	Composite	Effluent
TSS	All Year	30	mg/L	WAvg Conc	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 6-4. Permit Limits for Gainesboro STP.

Compliance History:

The following numbers of exceedences were noted in PCS:

- 5 Overflows
- 17 Bypasses
- 5 Total Suspended Solids
- 4 Biological Oxygen Demand
- 2 Suspended Solids % Removal
- 2 Dissolved Oxygen
- 1 pH
- 1 Fecal Coliform

Comments:

The Sequential Batch Reactor is relatively new. The plant works well. The collection system is in need of work. Several of the collection system lines are very deep due to the creation of Cordell Hull Lake, (sewer lines were buried deeper after the reservoir construction). Repairs are very expensive. Like many Upper Cumberland communities, industry is disappearing.

8/30/07 Compliance Evaluation Inspection: In Compliance

Comments:

Some minor improvements needed to documentation. Raw sampler in need of maintenance, temperature at 10 degrees. Loading calculation on computerized MOR needs correction. Staffing at the WWTP is adequate. Rehab work is being performed on the collection system.

TN0021873 Livingston STP

Discharger rating: Minor
City: Livingston
County: Overton
EFO Name: Cookeville
Issuance Date: 7/1/05
Expiration Date: 3/31/09
Receiving Stream(s): Town Creek at mile 0.8
HUC-12: 051301060201
Effluent Summary: Treated municipal wastewater from Outfall 001
Treatment system: Sequencing Batch Reactor to aerobic digester to land application or dry beds to landfill

Segment	TN05130106007_0710
Name	Town Creek
Size	6.2
Unit	Miles
First Year on 303(d) List	2004
Designated Uses	Recreation (Non-Supporting), Irrigation (Supporting), Fish and Aquatic Life (Non-Supporting), Livestock Watering and Wildlife (Supporting)
Causes	Escherichia coli, Nutrient/Eutrophication Biological Indicators, Dissolved Oxygen
Sources	Municipal (Urbanized High Density Area), Sanitary Sewer Overflows (Collection System Failures)

Table 6-5. Stream Segment Information for Livingston STP.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ammonia as N (Total)	Summer	3	mg/L	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	31	lb/day	WAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	1.5	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	2.3	mg/L	WAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Summer	20	lb/day	MAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	6	mg/L	DMax Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	3	mg/L	MAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	41	lb/day	MAvg Load	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	4.5	mg/L	WAvg Conc	3/Week	Composite	Effluent
Ammonia as N (Total)	Winter	61	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	20	mg/L	DMax Conc	3/Week	Composite	Effluent
CBOD5	All Year	15	mg/L	WAvg Conc	3/Week	Composite	Effluent
CBOD5	All Year	203	lb/day	WAvg Load	3/Week	Composite	Effluent
CBOD5	All Year		mg/L	DMax Conc	3/Week	Composite	Influent (Raw Sewage)
CBOD5	All Year	10	mg/L	MAvg Conc	3/Week	Composite	Effluent
CBOD5	All Year	135	lb/day	MAvg Load	3/Week	Composite	Effluent
CBOD5	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
D.O.	All Year	5	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	DMax 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)
Flow	All Year		MGD	MAvg Load	Daily	Continuous	Effluent
Hg (T)	All Year	0.05	mg/L	MAvg Conc	Semi-annually	Composite	Effluent
IC25 7day Ceriodaphnia Dubia	All Year	78	Percent	DMin Conc	Semi-annually	Composite	Effluent
IC25 7day Fathead Minnows	All Year	78	Percent	DMin Conc	Semi-annually	Composite	Effluent
Overflow Use Occurences	All Year		Occurences/ Month	MAvg Load	Continuous	Visual	Non Wet Weather
Overflow Use Occurences	All Year		Occurences/ Month	MAvg Load	Continuous	Visual	Wet Weather
Settleable Solids	All Year	1	mL/L	DMax Conc	3/Week	Composite	Effluent
TRC	All Year	0.02	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	540	lb/day	WAvg Load	3/Week	Composite	Effluent
TSS	All Year	30	mg/L	MAvg Conc	3/Week	Composite	Effluent
TSS	All Year	405	lb/day	MAvg Load	3/Week	Composite	Effluent

Table 6-6a.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
TSS	All Year		mg/L	MAvg Conc	3/Week	Composite	Influent (Raw Sewage)
TSS	All Year	40	mg/L	WAvg 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	8.5	SU	DMax Conc	Weekdays	Grab	Effluent
pH	All Year	6.5	SU	DMin Conc	Weekdays	Grab	Effluent

Table 6-6b.

Tables 6-6a-b. Permit Limits for Livingston STP.

Compliance History:

The following numbers of exceedences were noted in PCS:

- 42 Overflows
- 29 Bypasses
- 6 Total Chlorine
- 4 Ammonia
- 2 pH
- 3 Dissolved Oxygen
- 1 Fecal Coliform
- 3 Total Suspended Solids
- 1 Carbonaceous Oxygen Demand
- 3 Escherichia coli

Comments:

7/25/07 Cookeville EFO Livingston STP continues to perform well. It is well staffed with experienced personnel. The plant was designed with two polishing ponds prior to discharge. This greatly improves the Sequencing Batch Reactor effluent quality through flow equalization and additional detention time. The operators are reviewing the options for pond cleanout. Suggestions were made to evaluate the feasibility of retrofitting the first pond with a sludge return line. Collection system maintenance and rehabilitation has improved since the new collection system operator took over. Manhole covers have been replaced, I/I diagnostic work has been performed and pump station upgrades to two working pumps have been completed. Laboratory has been evaluated in detail during the December 2005 inspection. The laboratory water quality has been evaluated and comparison tested against purchased laboratory grade water. The results showed that the water produced at the wastewater laboratory is suitable for the compliance monitoring testes the laboratory conducts on regular basis. A comprehensive review of the laboratory QA/QC program resulted in several recommendations and improvements. The NPDES permit has been modified to reflect the current Water Quality Criteria and remove the fecal coliform monitoring requirement. Sludge is processed in aerobic digesters and land applied as liquid. New sludge application site was approved near the airport.

Livingston Pretreatment Program

The Town of Livingston has started the development of a pretreatment program in fall of 2002. During the renewal of the permit, the city provided hardness data for calculations of the pass through limits. Assistance was provided with industry initial inspections and category classification. Advice on discharge limit application and sampling locations was provided. Oil and Grease limits for Hutchison were revised. Parker Seals now samples at an internal monitoring point to separate domestic waste from the process wastewater.

TN0073105 TDEC Standing Stone State Park

Discharger rating: Minor
City: Hilham
County: Overton
EFO Name: Cookeville
Issuance Date: 7/1/04
Expiration Date: 5/28/09
Receiving Stream(s): Mill Creek at mile 15.0
HUC-12: 051301060103
Effluent Summary: Treated domestic wastewater from Outfall 001
Treatment system: Septic tank and recirculating sand filter

Segment	TN05130106018_1000
Name	Mill Creek
Size	14.3
Unit	Miles
First Year on 303(d) List	-
Designated Uses	Fish and Aquatic Life (Supporting), Livestock Watering and Wildlife (Supporting), Recreation (Supporting), Industrial Water Supply (Supporting), Irrigation (Supporting)
Causes	N/A
Sources	N/A

Table 6-7. Stream Segment Information for TDEC Standing Stone State Park.

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	20	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	0.08	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	SU	DMin Conc	2/Week	Grab	Effluent

Table 6-8. Permit Limits for TDEC Standing Stone State Park.

Comments:

7/27/07 Cookeville EFO: The system is a recirculating sand filter. In the wintertime when flows are low, some BOD issues arise due to the lack of food and possibly seasonal cleaning chemicals, which may create toxic effects during periods of low waste flow, (wintertime operation is not afforded the dilution of the summertime cleaning activities). Park personnel are very pro-active, asking many questions regarding the operation of the STP.

TN0024465 USA COE Cordell Hull Dam-Damsite, Left and Right Bank

Discharger rating: Minor
City: Carthage
County: Smith
EFO Name: Cookeville
Issuance Date: 10/1/04
Expiration Date: 8/31/09
Receiving Stream(s): Cumberland River (Cordell Hull Dam) at mile 313.2 and 313.0 (Outfalls 001 and 002)
HUC-12: 051301060309
Effluent Summary: Treated domestic wastewater from Outfalls 001 and 002
Treatment system: Septic tank, subsurface sand filter with chlorination

Segment	TN05130201001_1000
Name	Old Hickory Reservoir
Size	27439
Unit	Acres
First Year on 303(d) List	-
Designated Uses	Fish and Aquatic Life (Supporting), Livestock Watering and Wildlife (Supporting), Recreation (Supporting), Industrial Water Supply (Supporting), Domestic Water Supply (Supporting), Irrigation (Supporting)
Causes	N/A
Sources	N/A

Table 6-9. Stream Segment Information for US COE Cordell Hull Dam.

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
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 Geo Mean	Monthly	Grab	Effluent
Flow	All Year		MGD	DMax Load	2/Week	Grab	Effluent
Flow	All Year		MGD	MAvg Load	2/Week	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 6-10. Permit Limits for US COE Cordell Hull Dam.

Comments:

7/25/07 Cookeville EFO: The bathroom sand filters exist on both sides of the dam (left and right). The sand filters are possibly over-designed. The bathrooms are rarely used. A discharge has not been observed during inspections.

6.4.B. Industrial Permits

TN0059838 Nielsen and Bainbridge - Gainsboro

Discharger rating: Minor
City: Gainesboro
County: Jackson
EFO Name: Cookeville
Issuance Date: 2/1/05
Expiration Date: 12/30/09
Receiving Stream(s): Cordell Hull Reservoir to Cumberland River at mile 358.5
HUC-12: 051301060102
Effluent Summary: Industrial process wastewater through Outfall 001
Treatment system: Wastewater treatment by pH, adjustment, flocculation and clarification.

Segment	TN05130106005_1000
Name	Cordell Hull Lake
Size	13901
Unit	Acres
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 6-11. Stream Segment Information for Nielsen and Bainbridge.

PARAMETER	SEASON	LIMIT	UNITS	SAMPLE DESIGNATOR	MONITORING FREQUENCY	SAMPLE TYPE	MONITORING LOCATION
Ag (T)	All Year	0.43	mg/L	DMax Conc	Weekly	Grab	Effluent
Ag (T)	All Year	0.24	mg/L	MAvg Conc	Weekly	Grab	Effluent
Al (T)	All Year	10	mg/L	DMax Conc	Weekly	Grab	Effluent
Cd (T)	All Year	0.69	mg/L	DMax Conc	Weekly	Grab	Effluent
Cd (T)	All Year	0.26	mg/L	MAvg Conc	Weekly	Grab	Effluent
Cr (T)	All Year	2.77	mg/L	DMax Conc	Weekly	Grab	Effluent
Cr (T)	All Year	1.71	mg/L	MAvg Conc	Weekly	Grab	Effluent
Cu (T)	All Year	3.38	mg/L	DMax Conc	Weekly	Grab	Effluent
Cu (T)	All Year	2.07	mg/L	MAvg Conc	Weekly	Grab	Effluent
Cyanide, Total (CN-)	All Year	1.2	mg/L	DMax Conc	Weekly	Grab	Effluent
Cyanide, Total (CN-)	All Year	0.65	mg/L	MAvg Conc	Weekly	Grab	Effluent
Flow	All Year		MGD	DMax Load	Weekly	Instantaneous	Effluent
Flow	All Year		MGD	MAvg Load	Weekly	Instantaneous	Effluent
Ni (T)	All Year	3.98	mg/L	DMax Conc	Weekly	Grab	Effluent
Ni (T)	All Year	2.38	mg/L	MAvg Conc	Weekly	Grab	Effluent
Nitrite + Nitrate Total (as N)	All Year		mg/L	MAvg Conc	Monthly	Grab	Effluent
Oil and Grease (Freon EM)	All Year	52	mg/L	DMax Conc	Weekly	Grab	Effluent
Oil and Grease (Freon EM)	All Year	26	mg/L	MAvg Conc	Weekly	Grab	Effluent
Pb (T)	All Year	0.69	mg/L	DMax Conc	Weekly	Grab	Effluent
Pb (T)	All Year	0.43	mg/L	MAvg Conc	Weekly	Grab	Effluent
Phosphorus Total	All Year		mg/L	MAvg Conc	Monthly	Grab	Effluent
Sulfate (T)	All Year		mg/L	MAvg Conc	Monthly	Grab	Effluent
TSS	All Year	60	mg/L	DMax Conc	Monthly	Grab	Effluent
TSS	All Year	31	mg/L	MAvg Conc	Monthly	Grab	Effluent
Total Toxic Organics (TTO) (40CFR433)	All Year	2.13	mg/L	DMax Conc	Semi-annually	Grab	Effluent
Zn (T)	All Year	2.61	mg/L	DMax Conc	Weekly	Grab	Effluent
Zn (T)	All Year	1.48	mg/L	MAvg 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 6-12. Permit Limits for Nielsen and Bainbridge.

Compliance History:

The following numbers of exceedences were noted in PCS:

- 1 pH
- 1 Total Aluminum

Comments:

Aluminum extrusion for picture frames. Cookeville EFO: Last inspection July 31, 2007. Some Architectural aluminum extrusion. Excellent self-monitoring and storm water pollution prevention.