TENNESSEE
DIVISION OF WATER RESOURCES

FISCAL YEAR 2016-2017
SURFACE WATER
MONITORING AND ASSESSMENT
PROGRAM PLAN

FINAL
JULY 2016

Tennessee Department of Environment and Conservation
Division of Water Resources
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EXECUTIVE SUMMARY

The purpose of this document is to establish overall goals and objectives for key elements of the Tennessee Department of Environment and Conservation (TDEC), Division of Water Resources Watershed Stewardship and Support Branch, surface water quality monitoring program. Information concerning ground water monitoring will be provided in a separate document by the Water Supply Branch.

The United States Environmental Protection Agency (EPA) is requiring states to implement or commit to developing a monitoring program strategy. The details of this initiative can be found in the document, *Elements of a State Monitoring and Assessment Program*, published in March 2003. This initiative is intended to serve as a tool to assist EPA and the states in determining whether a monitoring program meets the requirements of Clean Water Act Section 106 (e)(1). EPA recommended the following ten elements be included in a state's monitoring program strategy:

A. A long-term state monitoring strategy
B. Identification of monitoring objectives
C. Selection of a monitoring design
D. Identification of core and non-critical water quality indicators
E. Development of quality management and quality assurance plans
F. Use of accessible electronic data systems
G. Methodology for assessing attainment of water quality standards
H. Production of water quality reports
I. Periodic review of monitoring program
J. Identification of current and future resource needs

Tennessee spent considerable time prior to the publication of EPA's recommendations developing an effective monitoring and assessment strategy, which has been used for many years. Publication of EPA's guidance resulted in the review and refinement of the existing plan to make certain all elements were included.

Tennessee already incorporates all 10 elements in its existing monitoring strategy. Those 10 elements have been outlined in this document. The division agrees that improvements can be made on some aspects of its program; particularly when addressing large rivers, lakes, reservoirs and wetlands.

Tennessee has developed a nutrient criteria development plan. The division has published Quality System Standard Operating Procedures (QSSOP's) for conducting bacteriological, chemical, biological, periphyton stream surveys, as well as a Quality Assurance Project Plan for 106 Monitoring. These documents can be accessed on the Department's website at http://tn.gov/environment/article/wr-wq-water-quality-reports-publications .

The purpose of the division's water quality monitoring program is to provide an accurate and defensible accounting of Tennessee's progress towards meeting the goals established in the federal Clean Water Act and the Tennessee Water Quality Control Act.

Data are collected and interpreted in order to:

- Assess the condition of the state's waters.
- Identify problem areas with parameter values that violate Tennessee numerical or narrative water quality standards.
- Identify causes and sources of water quality problems.
- Document areas with potential human health threats from fish tissue contamination or elevated bacteria levels.
- Establish trends in water quality.
- Gauge compliance with NPDES permit limits.
- Document damage to streams for enforcement efforts, if appropriate.
- Document baseline conditions prior to a potential impact or as a reference stream for downstream uses or other sites within the same ecoregion and/or watershed.
- Assess water quality improvements based on site remediation, implementation of Best Management Practices, and other restoration strategies.
- Identify proper stream-use classification, including antidegradation policy implementation.
- Identify natural reference conditions on an ecoregion basis for refinement of water quality standards.

Since 1996, Tennessee's monitoring program has been based on a five-year watershed cycle. The first cycle was completed in 2001. A third cycle was completed in 2011. The fourth cycle will be completed in 2016.

Tennessee relies heavily on ecoregion reference data to assess impairment and has spent much effort in developing regional reference guidelines for wadeable streams. In 2008, the division initiated monitoring to establish reference guidelines for headwater streams. A future challenge is to develop similar guidelines for rivers, lakes and reservoirs. A major limiting factor to this goal is funding and staff availability.

Note: All activities are funded by Section 106 Grant Funds unless otherwise noted.

I. ELEMENTS OF TENNESSEE'S SURFACE WATER MONITORING AND ASSESSMENT PROGRAM

A. Monitoring Program Strategy

The Division of Water Resources (DWR) has a comprehensive monitoring program that serves its water quality management needs and addresses all the state's surface waters including streams, rivers, lakes, reservoirs and wetlands.

In 1996, the Division of Water Pollution Control, currently DWR, adopted a watershed approach that reorganized existing programs and focused on place-based water quality management. The primary goals of the watershed approach are:

1. Provide for more focused and comprehensive water quality monitoring and assessment.
2. Assist in the calculation of pollutant limits for permitted dischargers.
3. Develop watershed water quality management strategies that integrate controls for regulated and non-regulated sources of pollution.
4. Increase public awareness of water quality issues and provide opportunities for public involvement.

There are 55 USGS eight-digit hydrologic units (HUC) in the state that have been divided into five monitoring groups for assessment purposes. One group, consisting of between 9 and 16 watersheds, is monitored and another is assessed each year**.** This allows intense monitoring of a limited number of watersheds each year with all watersheds monitored every five years. The watershed cycle provides for a logical progression from data collection and assessments through TMDL development and permit issuance. The watershed cycle coincides with the development of permits that are issued to industries, municipalities, mining and commercial entities.

The key activities involved in each five-year cycle are:

1. **Planning.** Existing data and reports from appropriate federal, state, and local agencies and citizen-based organizations are compiled and used to describe the quality of rivers and streams, and to determine monitoring priorities

2. **Monitoring.** Field data is collected by DWR staff for streams previously prioritized. These results supplement existing data and are used for water quality assessment.

3. **Assessment**. Monitoring data is used to determine if the streams support their designated uses based on stream classifications and water quality criteria. The assessment is used to create the 303(d) List and the 305(b) Report.

4. **Wasteload Allocation/TMDL**. Monitoring data are used to determine pollutant limits for permitted dischargers releasing treated wastewater to the watershed. Limits are set to ensure that water quality is protective. TMDLs are studies that determine the point and nonpoint source contributions of a pollutant in the watershed and propose strategies to achieve water quality standards.

5. **Permits.** Issuance and expiration of all discharge permits is synchronized to the five-year watershed cycle. Approximately 1,400 individual permits are issued by Tennessee under the federal National Pollutant Discharge Elimination System (NPDES).

6. **Watershed Water Quality Management Plans.** These watershed plans include a general watershed description, water quality assessment summary results, inventory of point and nonpoint sources, water quality concerns, federal, state, and local initiatives, and management strategies. Completed plans can be accessed on TDEC's website at http://tn.gov/environment/topic/wr-ws-basin-watersheds-by-basin

One of the advantages of this approach is that it considers all sources of pollution including discharges from industries and municipalities as well as runoff from agriculture and urban areas. Another advantage is the coordination of local, state and federal agencies and the encouragement of public participation.

B. Monitoring Objectives

The purpose of the division's water quality monitoring program is to provide a measure of Tennessee's progress towards meeting the goals established in the federal Clean Water Act and the Tennessee Water Quality Control Act. To accomplish this task, data are collected and interpreted in order to:

1. Assess the condition of the state's waters.

2. Identify problem areas with parameter values that violate Tennessee numerical or narrative water quality standards.

3. Identify causes and sources of water quality problems.

4. Document areas with potential human health threats from fish tissue contamination or elevated bacteria levels.

5. Establish trends in water quality.

6. Gauge compliance with NPDES permit limits.

7. Document baseline conditions prior to a potential impact or as a reference stream for downstream or other sites within the same ecoregion and/or watershed.

8. Assess water quality improvements based on site remediation, enforcement, Best Management Practices, and other restoration strategies.

9. Identify proper stream-use classification, plus assist in the implementation of the Antidegradation Statement.

10. Identify natural reference conditions on an ecoregion basis for refinement of water quality standards.

11. Identify and protect wetlands.

C. Monitoring Design

The division incorporates several approaches in its surface water monitoring design. The primary monitoring design is a five-year rotational cycle (Figure 1) based on USGS eight-digit Hydrologic Unit Code (HUC) sized watersheds. Also, Tennessee relies heavily on ecoregions to serve as a geographical framework for establishing regional water quality expectations (Arnwine et al, 2000).

Watersheds

The watershed approach serves as an organizational framework for systematic assessment of the state's water quality. By viewing the entire drainage area as a whole, the division is better able to address water quality problems through an organized schedule. This unified approach affords a more in-depth study of each watershed and encourages coordination of public and governmental organizations.

The watershed approach is a five-year cycle that has the following features:

1. Commits to a monitoring strategy that result in an accurate assessment of water quality.

2. Partners with other agencies to obtain the most current water quality and quantity data.

3. Reassesses water quality based on most recent data and water quality standards.

4. Establishes TMDLs by integrating point and non-point source pollution.

5. Synchronizes discharge permit issuance to coincide with the development of TMDLs.

In attaining the watershed goals mentioned above, four major objectives are to be met:

1. Attain good representation of all local interests at public meetings and continue a dialogue with local interest throughout the five-year cycle.
2. Develop a watershed water quality management plan.
3. Monitor water quality intensively within each watershed at the appropriate time in the five-year watershed cycle.
4. Establish TMDLs based on best available monitoring data and sound science.

The 55 USGS eight digit HUC codes found in Tennessee are addressed by groups on a five-year cycle that coincides with permit issuance. Each watershed group contains between 9 and 16 watersheds. (Table 1). Six watershed groups in middle Tennessee were revised in 2012 to better distribute monitoring loads between field offices:

- Stones River Watershed moved from Group 1 to Group 2
- Wheeler and Pickwick Watersheds moved from Group 2 to Group 1
- Collins River Watershed moved from Group 2 to Group 3
- Upper Duck River Watershed moved from Group 3 to Group 4
- Cordell Hull Watershed moved from Group 4 to Group 5

Figure 1: Graphic Representation of the Watershed Approach.

More details may be found on the DWR home page http://tn.gov/environment/article/wr-ws-watershed-management-approach

The watershed management groups and timeline are shown in Figure 2 and Table 1.

Monitoring activities are coordinated with Tennessee Valley Authority (TVA), Department of Energy (DOE), Tennessee Department of Agriculture (TDA), Tennessee Wildlife Resources Agency (TWRA), United States Geological Survey (USGS), and United States Army Corps of Engineers (USACE) to avoid duplication of effort and increase watershed coverage.

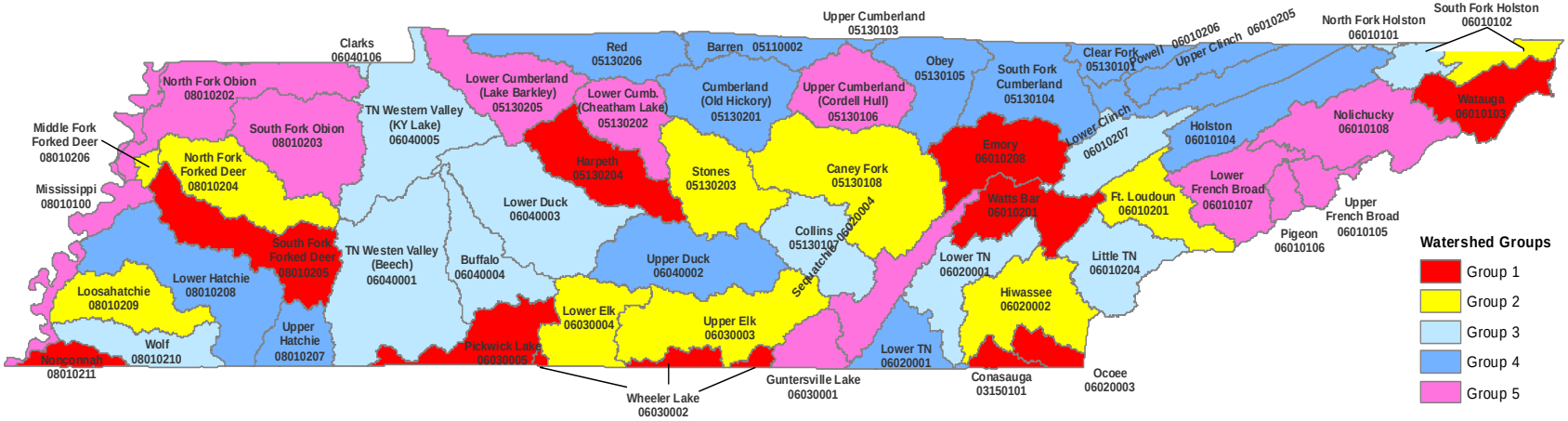


Figure 2: Tennessee Watershed Management Groups

Table 1. Watershed Groups and Monitoring Years

Group /Year	Watershed	HUC	EFO	Watershed	HUC	EFO
1 1996 2001 2006 2011 2016	Conasauga	03150101	CH	Ocoee	06020003	CH
	Harpeth	05130204	N	Pickwick Lake	06030005	CL, J
	Watauga	06010103	JC	Wheeler Lake	06030002	CL
	Upper TN (Watts Bar)	06010201	K, CH, CK	South Fork of the Forked Deer	08010205	J
	Emory	06010208	K, CK	Nonconnah	08010211	M
2 1997 2002 2007 2012 2017	Caney Fork	05130108	CK, CH, N	Upper Elk	06030003	CL
	Stones	05130203	N	Lower Elk	06030004	CL
	S. Fork Holston (u/s Boone Dam)	06010102	JC	North Fork Forked Deer	08010204	J
	Upper TN (Fort Loudoun)	06010201	K	Forked Deer	08010206	J
	Hiwassee	06020002	CH	Loosahatchie	08010209	M
3 1998 2003 2008 2013 2018	Collins	05130107	CK, CH, CL	TN Western Valley (Beech)	06040001	J
	N. Fork Holston	06010101	JC	Lower Duck	06040003	CL
	S. Fork Holston (d/s Boone Dam)	06010102	JC	Buffalo	06040004	CL, N
	Little Tennessee (Tellico)	06010204	K	TN Western Valley (KY Lake)	06040005	N, J
	Lower Clinch	06010207	K	Wolf	08010210	M
	Tennessee (Chickamauga)	06020001	CH	Clarks	06040006	J
4 1999 2004 2009 2014 2019	Barren	05110002	N	Holston	06010104	JC, K
	Clear Fork of the Cumberland	05130101	K, MS	Upper Clinch	06010205	JC, K
	Upper Cumberland	05130103	CK	Powell	06010206	JC, K
	South Fork Cumberland	05130104	K	Tennessee (Nickajack)	06020001	CH
	Obey	05130105	CK	Upper Duck	06040002	CL
	Cumberland (Old Hickory Lake)	05130201	N	Upper Hatchie	08010207	J
	Red	05130206	N	Lower Hatchie	08010208	J,M

Group /Year	Watershed	HUC	EFO	Watershed	HUC	EFO
5 2000 2005 2010 2015 2020	Lower Cumberland (Cheatham)	05130202	N	Nolichucky	06010108	JC, K
	Lower Cumberland (Lake Barkley)	05130205	N	Sequatchie	06020004	CH
	Upper Cumberland (Cordell Hull)	05130106	CK, N	Guntersville	06030001	CH, CL
	Upper French Broad	06010105	K	Mississippi	08010100	M, J
	Pigeon	06010106	K	Obion	08010202	J
	Lower French Broad	06010107	K	Obion South Fork	08010203	J

Key to EFOs:

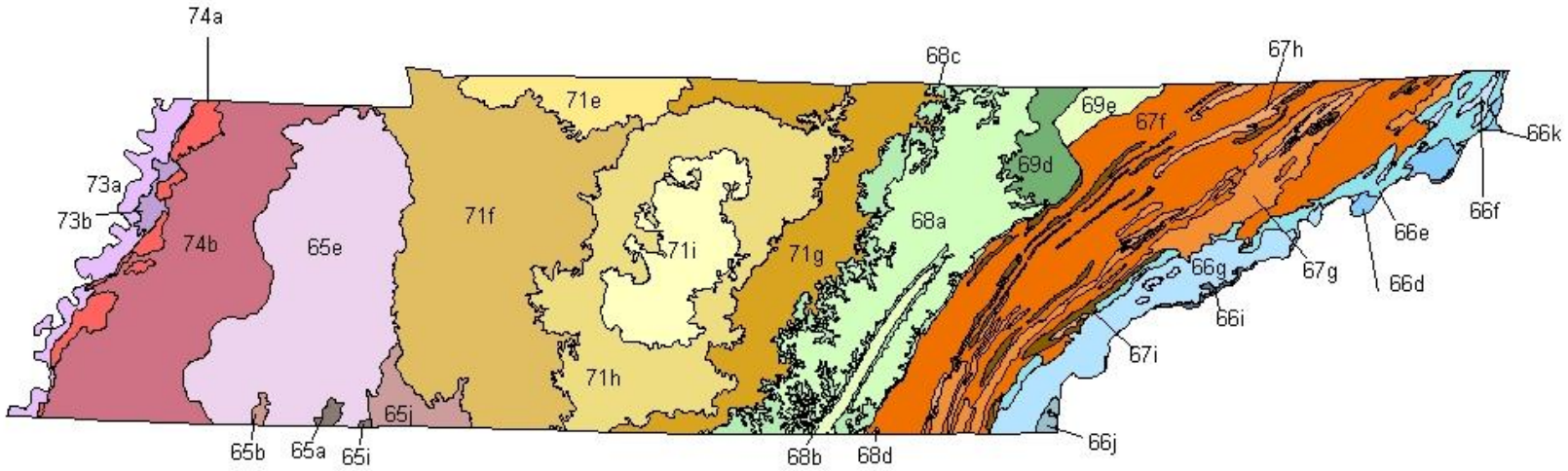
CH	Chattanooga	J	Jackson	M	Memphis
CK	Cookeville	JC	Johnson City	N	Nashville
CL	Columbia	K	Knoxville		

Ecoregions

Tennessee relies heavily on ecoregions to serve as a geographical framework for establishing regional water quality expectations (Arnwine et al, 2000). Tennessee has 31 Level IV ecoregions (Figure 3).

Since 1999, sites have been monitored as part of the five-year watershed cycle. New reference sites are added as they are located during watershed monitoring, while some of those originally selected sites have been dropped due to increased disturbances or unsuitability. Periphyton is also collected as a second biological indicator. In 2009, headwater streams were added to the reference monitoring program. There are currently approximately 190 active and candidate reference sites being monitored. This reference database has been used to establish regional guidelines for wadeable streams.

Six additional subregions have been delineated out of the original 25 in ecoregions 66, 68, 69 and 73 resulting in 31 Level IV ecoregions in Tennessee. In addition, the names of four subregions have been revised (65e, 66d, 69d and 73a). With the exception of 69e, the majority of new subregions are very small or the streams originate in a different subregion. Therefore, it may not be necessary or even possible to find reference streams. Until such time as reference sites can be established these subregions will be treated as part of their original subregion and/or bioregion for assessment purposes.



65a Blackland Prairie	66k Amphibolite Mountains	69e Cumberland Mountain Thrust Block
65b Flatwoods/Alluvial Prairie Margins	67f Southern Limestone/Dolomite Valleys and Low Rolling Hills	71e Western Pennyroyal Karst
65e Northern Hilly Gulf Coastal Plain	67g Southern Shale Valleys	71f Western Highland Rim
65i Fall Line Hills	67h Southern Sandstone Ridges	71g Eastern Highland Rim
65j Transition Hills	67i Southern Dissected Ridges & Knobs	71h Outer Nashville Basin
66d Southern Crystaline Ridges and Mountains	68a Cumberland Plateau	71i Inner Nashville Basin
66e Southern Sedimentary Ridges	68b Sequatchie Valley	73a Northern Holocene Meander Belts
66f Limestone Valleys and Coves	68c Plateau Escarpment	73b Northern Pleistocene Valley Trains
66g Southern Metasedimentary Mountains	68d Southern Table Plateaus	74a Bluff Hills
66i High Mountains	69d Dissected Appalachian Plateau	74b Loess Plains
66j Broad Basins		

Figure 3: Level IV Ecoregions in Tennessee

D. Monitoring Priorities

The division maintains a statewide monitoring system consisting of approximately 7,300 stations (Figure 4). In addition, new stations are created every year to increase the number of assessed streams. Approximately 590 stations will be monitored in FY 16-17 (Figure 5 and Appendix A). Stations are sampled monthly, quarterly, bimonthly, semi-annually, or annually depending on the objectives of the project. Within each watershed cycle, monitoring stations are coordinated between the central office and staff in the eight Environmental Field Offices (EFOs) and the Mining Unit located across the state, based on the following priorities.

Prior to developing workplans, field staff should fully coordinate with other monitoring agencies within the watershed in order to maximize resources and avoid duplication of efforts.

1. **Antidegradation Monitoring:** Before the Division can authorize degradation in Tennessee waterbodies, the appropriate category under the Antidegradation Policy must be determined. These categories are (1) Available or (2) Unavailable Parameters, (3) Exceptional Tennessee Waters, or (4) Outstanding National Resource Waters (ORNLs). ORNLs can only be established by promulgation by the Tennessee Board of Water Quality, Oil and Gas. The other three categories must be established by division field or permitting staff. Complicating matters further, waterbodies can be in more than one category at a time, due to the parameter-specific nature of categories 1 and 2 above.

   If a permit application requesting authorization to degrade water quality is for a stream without recent water quality data and the applicant is unwilling or unable to provide the needed information, these surveys must be done by field office staff. Because the identification of antidegradation status must be determined prior to permit issuance, this work must be done on the highest priority basis.

   Streams are evaluated as needed in response to requests for new or expanded NPDES and ARAP permits, or water withdrawal applications. Streams are evaluated for antidegradation status based on a standardized evaluation process, which includes information on specialized recreation uses, scenic values, ecological consideration, biological integrity and water quality. Since permit requests generally cannot be anticipated, these evaluations are generally not included in the workplan. The number of antidegradation evaluations conducted by the state is steadily increasing as the process becomes more refined and standardized.

2. **Posted Streams:** When the Department issues advisories due to elevated public health risks from excessive pathogen or contaminant levels in fish, it accepts a responsibility to monitor changes in those streams. In the case of fishing advisories, in conjunction with the monitoring cycle, field office staff should determine when tissue samples were collected most recently and if appropriate, notify the central office that the state lab should be contracted to sample in the upcoming year, unless another agency like TWRA or TVA are willing to do the collections. This should be coordinated with the central office.

For pathogen advisories, monthly E. coli samples, plus a minimum of one geo mean sample (5 in 30) must be scheduled and accomplished. If another entity (such as an MS4 program) has already planned to collect samples, that effort can substitute for division sampling, if staff have confidence that the other entity can meet data quality objectives. However, field office staff must confirm that this sampling is taking place, remembering that the ultimate responsibility to ensure that sampling is done remains with the division.

As fish tissue or pathogen results are received, field office staff should alert the central office if it appears that an advisory might be lifted. Additionally, field office staff have the primary responsibility to ensure that existing signs on posted waterbodies are inspected periodically and replaced if damaged or removed.

3. **Ecoregion Reference Streams, Ambient Monitoring Stations, and Southeastern Monitoring Network Trend Stations (SEMN):** Established ecoregion or headwater reference stations (FECO stations) are monitored in conjunction with the watershed cycle. Each station is sampled quarterly for chemical quality and pathogens as well as in spring and fall for macroinvertebrates and habitat. Periphyton is sampled once during the growing season (April – October). Both semi-quantitative and biorecon benthic samples are collected to provide data for both biocriteria and biorecon guidelines. If watershed screening efforts indicate a potential new reference site, more intensive reference stream monitoring protocols are used to determine potential inclusion in the reference database.

   Ambient Monitoring Sites are the division's longest existing trend stations and any disruption in sampling over time reduces our ability to make comparisons. Regardless of monitoring cycle, all ambient stations must be sampled quarterly according to the set list of parameters established for this sampling effort.

   Southeastern Monitoring Network Stations: Like ambient stations, SEMN stations within each field office area must be sampled according to the project plan and grant for this project, regardless of watershed cycle. See Chapter 2, section F for additional details.

4. **303(d) Listed segments:** The 303(d) list is a compilation of the streams and lakes in Tennessee that are "water quality limited" and need additional pollution controls. Water quality limited streams are those that have one or more properties that violate water quality standards. They are considered impaired by pollution and not fully meeting designated uses.

   Like posted streams, by identifying these streams as not meeting water quality standards, the Division accepts responsibility to develop control strategies and to continued monitoring in order to track progress towards restoration.

   Impaired waters are monitored, at a minimum, every five years coinciding with the watershed cycle. Waters that do not support fish and aquatic life are sampled once for

macroinvertebrates (semi-quantitative sample preferred) and monthly for the listed pollutant(s). Streams with impacted recreational uses, such as those impaired due to pathogens are sampled monthly for *E. coli.* Another acceptable sampling strategy for *E. coli* is called the Horton Rule. In this approach, an initial geometric mean within the first quarter is collected (5 samples within a 30-day period). If the results are well over the existing water quality criterion of 126 colony forming units, no addition sampling needs to be done. If the results meet the water quality criterion, staff will continue with monthly samples during the remainder of the monitoring cycle.

For parameters other than pathogens, resource limitations or data results may sometimes justify fewer sample collections. For example, there are cases where pollutants are at high enough levels that sampling frequency may be reduced while still providing a statistically sound basis for assessments. In other cases, monitoring may be appropriately bypassed during a monitoring cycle. (Chapter II, Section C).

When developing workplans prior to the next monitoring cycle, field office staff should coordinate with the Division of Remediation to confirm that any CERCLA sites are being monitored by either Remediation or the permittee. Remediation should be specifically asked if the site continued to violate water quality standards. If not, sampling should be designed to document improvement and provide a rationale for delisting.

5. **Sampling downstream of Major Dischargers and CAFO's:** During each monitoring cycle, the major dischargers should be identified. Stations should be established at those waterbodies, if the facility does not currently have in-stream monitoring requirements built into their permit. (Note: stations may not be required for dischargers into very large waterways such as the Mississippi River or large reservoirs.) Parameters should include those being discharged, plus a SQSH survey if the stream is wadeable. Stations downstream of STPs or industries that discharge nutrients should include a SQSH, plus monthly nutrient monitoring.

   Stations should also be established downstream of CAFOs with individual permits or others in which water quality based public complaints have been received. The emphasis on monitoring should be on monitoring biointegrity (SQSH survey if the stream is wadeable or in a region in which SQBANK surveys can be done) and monthly nutrient and pathogen monitoring.

6. **TMDL:** Waterbody monitoring is required to develop TMDLs. Monitoring for scheduled TMDLs in the watershed group is coordinated between the Watershed Management Unit (WMU) manager and the EFOs to meet objectives for each TMDL. The frequency and parameters monitored for TMDL monitoring depends on the specific TMDL. Detailed information about TMDLs can be found in the department's 106 Monitoring QAPP (TDEC 2015), and in the document *Monitoring to Support TMDL Development* (2001).

7. **Special Project Monitoring**: Occasionally, the division is given the opportunity to compete for special EPA grant resources for monitoring and other water quality research projects. If awarded, activities related to these grants become a high priority because the division is under contract to achieve the milestone set out in the workplan. Federal funds might have to be returned if the division fails to meet project goals. Additionally, failure to meet grant obligations may result in a loss of competitiveness for future grant opportunities.
   Examples of historical special studies include: sediment oxygen demand surveys, nutrient studies, ecoregion delineation, impounded stream surveys, coalfield studies, air deposition surveys, regional reference stream monitoring, and various probabilistic monitoring designs.

8. **Watershed Monitoring**: In addition to the previous priorities, each EFO should monitor additional stations to confirm continued support of designated uses and to increase the number of assessed waterbodies. Macroinvertebrate biorecons, habitat assessments, and field measurements of DO, specific conductance, pH and temperature are conducted at the majority of these sites. These priorities include:

   Previously assessed segments that would likely revert to Category 3 unassessed status. (Note that a single site per assessed segment is normally adequate if assessment was supporting and no changes are evident).

   Sites below ARAP activities in wadeable streams where biological impairment is suspected. Emphasis is placed on unpermitted activities, violations and those that are large scale or where there is a dense concentration of smaller alterations.

   Stream reaches receiving extensive non-point source pollution for example large scale development, clusters of stormwater permits or an increase of more than 10% impervious surfaces.

   Unassessed reaches in third order or larger streams or in disturbed headwaters.

   Pre-restoration or BMP monitoring. In most cases this sampling would be to document improvements, but might also be needed to confirm that the stream is a good candidate for such a project. This protects against the possibility that a good stream could be harmed by unnecessary restoration.

In addition to monitoring conducted by EFO staff in conjunction with the watershed cycle, other types of monitoring include:

a. **Fish Consumption Advisory**: Fish tissue monitoring for fishing advisories is planned by a workgroup consisting of staff from DWR-TDEC, TVA, ORNL and TWRA. The workgroup historically met annually to coordinate a monitoring strategy. Fish tissue sampling for TDEC is contracted to the state laboratory.

b. **NPDES Monitoring**: Tennessee is requiring some permitted dischargers to conduct upstream and downstream biological and habitat monitoring consistent with the division's macroinvertebrate QSSOP (TDEC, 2011). These data are submitted to the state for evaluation. In this way, Tennessee can supplement its monitoring program and permitted dischargers can take the lead in providing information about their receiving stream.

c. **Reservoir Monitoring:** Tennessee is dependent on TVA and USACE for the majority of these data. Timeline for monitoring is dependent on availability of these agencies or federal funding if they are not available.

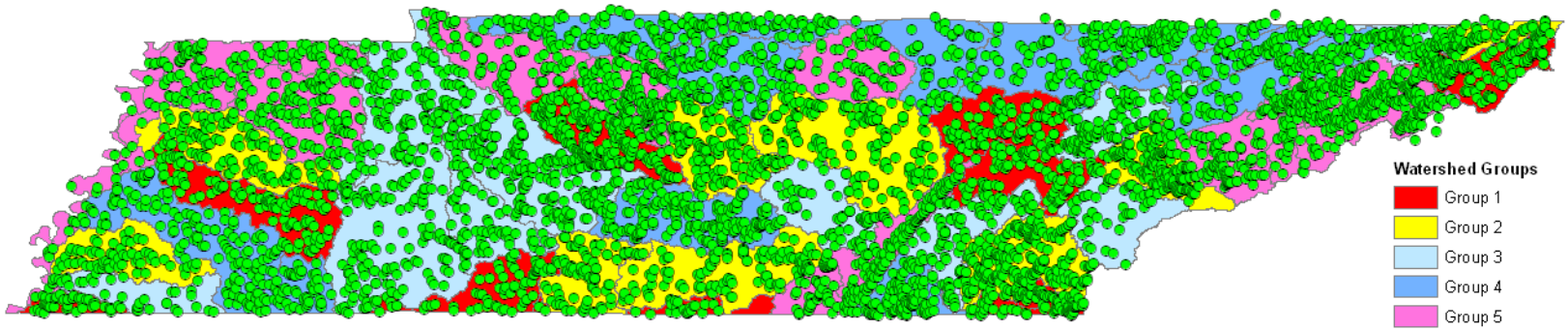


Figure 4: Water Quality Monitoring Stations in Tennessee. (Includes biological, chemical and bacteriological stations.)

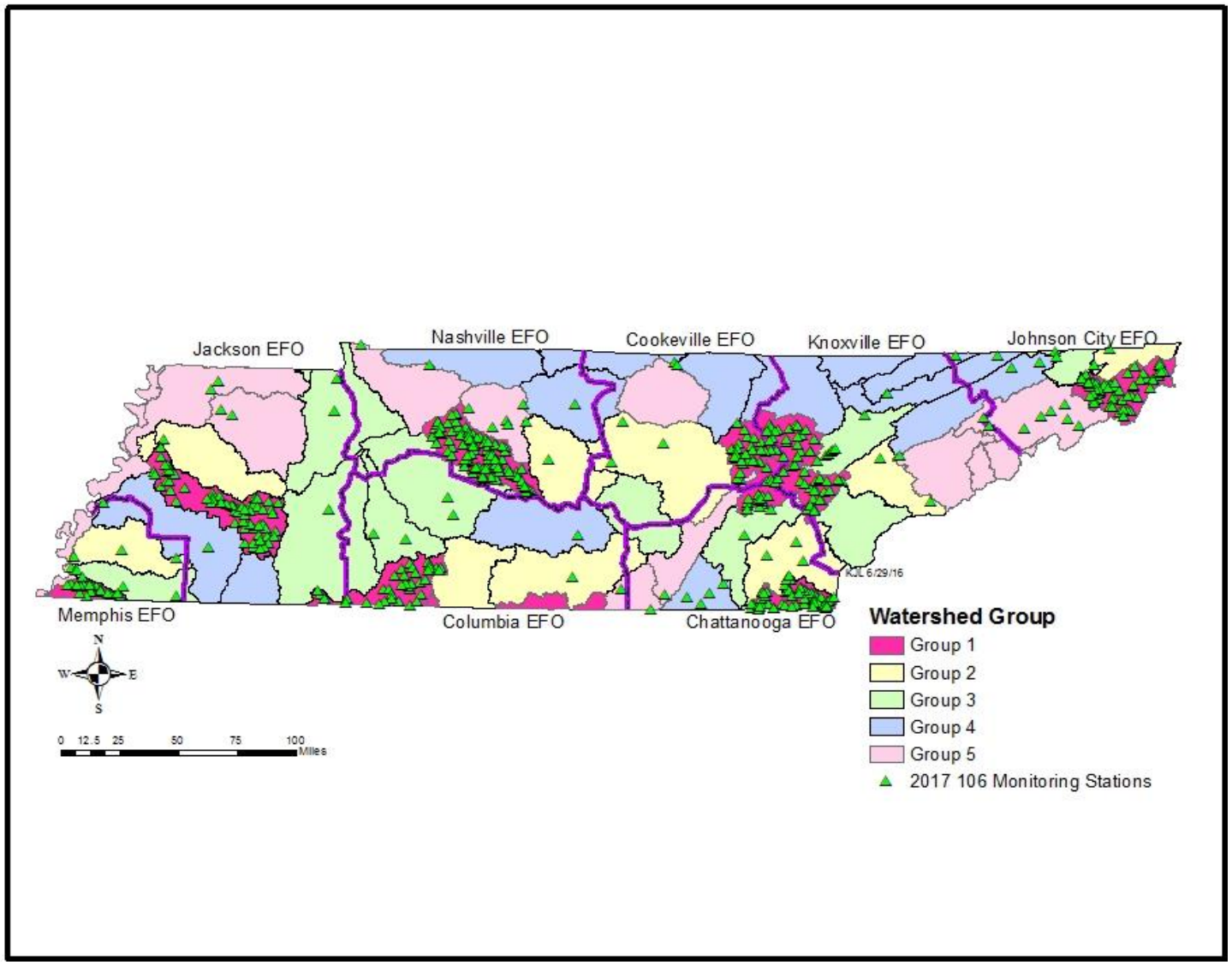


Figure 5: Monitoring stations scheduled to be sampled between July 2016 and June 2017 (Includes biological, chemical and bacteriological stations.)

Large Reservoirs (> 1000 acres)

Tennessee has 29 large reservoirs ranging from the 1,749 acre Chilhowee Reservoir on the Little Tennessee River to the 99,500 acre Kentucky Lake on the Tennessee River. Twenty-seven of these reservoirs are managed by the Tennessee Valley Authority (TVA) (Table 2) or the U.S. Army Corps of Engineers (USACE) (Table 3). All but four are routinely monitored. Seven are shared with other states. These shared lakes include Kentucky Lake, Lake Barkley and Dale Hollow (Kentucky), South Holston Lake (Virginia), Guntersville Lake (Alabama), Pickwick Lake (Alabama and Mississippi), and Calderwood Lake (North Carolina). Expertise and data are available from TVA, USACE and Alcoa Power Generating Incorporated (APGI).

Table 2: Reservoirs sampled by TVA

Beech	Melton Hill
Blue Ridge	Nickajack
Boone	Normandy
Cherokee	Norris
Chickamauga	Parksville
Douglas	Pickwick
Ft. Loudoun	South Holston
Ft. Patrick Henry	Tellico
Great Falls	Tims Ford
Guntersville	Watauga
Hiwassee	Watts Bar
Kentucky	Wheeler

Table 3: Reservoirs sampled by USACE

Dale Hollow	Old Hickory
Center Hill	Cheatham
J. Percy Priest	Barkley
Cordell Hull	

TVA samples reservoirs in three areas: the inflow area, which is generally riverine in nature, the transition zone or mid-reservoir, and the forebay. Due to meteorological conditions and year-to-year variation, TVA samples the reservoirs for five consecutive years. After that initial consecutive five years of sample collection, sampling occurs on an every other year basis (Table 4).

Table 4: TVA Sample Schedule

Ecological indicators	**Sampling Frequency**
benthic macroinvertebrates	Late autumn/early winter
chlorophyll	Monthly
dissolved oxygen	Monthly
fish assemblage	In autumn
sediment	Once in mid-summer

Medium Reservoirs (251- 1000 acres)

Tennessee has 16 reservoirs falling in this category. Six are fishing or recreational lakes managed by the TWRA. Eight reservoirs are managed by TVA, with 3 of these routinely monitored by TVA's Vital Signs Monitoring Program. One reservoir is monitored by Alcoa Aluminum for power production and one is municipal water supply reservoir.

Small Reservoirs (< 250 acres)

Tennessee has 1,302 documented reservoirs smaller than 250 acres (a total that only includes reservoirs that are permitted under the Safe Dams or ARAP programs). There are probably many more. These include one TVA managed reservoir (Wilbur Lake), municipal lakes, state parks, city parks, resorts, community developments, agricultural ponds and private lakes. There is little historic data on many of these impoundments. Although they are small, they are often in headwater areas and have the potential to affect downstream reaches. In 2006, downstream reaches of 75 of these small impoundments were monitored as part of a probabilistic study funded by 104(b)3 (Arnwine, et.al., 2006)

E. Critical and Secondary Water Quality Indicators

1. Biological Water Quality Indicators

a. Critical Biological

The state relies heavily on macroinvertebrate monitoring for assessing fish and aquatic life use support. Two types of biological monitoring represent the critical biological indicators in Tennessee.

Semi-quantitative Single Habitat macroinvertebrate samples (SQSH) are used for stream antidegradation category evaluations, TMDLs, permit compliance and enforcement, nutrient impaired streams as well as reference stream monitoring to refine biocriteria guidelines. In recent years this type of sampling has increased for routine watershed surveys. Regional biointegrity goals based on a multi-metric index composed of seven biometrics have been calculated and provide guidelines for each bioregion (TDEC, 2011).

The seven semi-quantitative single habitat (SQSH) indices are:

1. Taxa Richness
2. EPT Richness
3. EPT Density – *Cheumatopsyche* spp.
4. North Carolina Biotic Index (NCBI)
5. Density of Oligochaetes and Chironomids
6. Density of Clingers
7. Density of Tennessee nutrient tolerant organisms

Macroinvertebrate biorecons are a screening tool used for many routine watershed assessments. Biorecons have been performed at reference streams to refine biorecon guidelines. At test streams, a multi-metric index comprised of three qualitative biometrics is calculated and compared to reference guidelines for the bioregion.

The three biorecon biometrics are:

1. Taxa Richness

2. EPT Richness

3. Intolerant Taxa Richness

b. Secondary Biological

- Fish IBI
- Periphyton (has been added to reference monitoring and may become critical at
- Nutrient impaired streams once guidelines are developed).
- Chlorophyll *a*

2. **Habitat/Physical**

a. Critical

Habitat assessments adapted from protocols by Barbour et al. (1999) are conducted in conjunction with all biological monitoring and some chemical monitoring. The division has found these especially useful in assessing impairment due to riparian loss, erosion and sedimentation. The division's macroinvertebrate QSSOP (TDEC, 2011) defines regional expectations based on reference streams for each of the parameters addressed in the assessment.

1. Epifaunal Substrate/Available Cover
2. Embeddedness of Riffles
3. Channel Substrate Characterization
4. Velocity Depth Regimes
5. Pool Variability
6. Sediment Deposition
7. Channel Flow Status
8. Channel Alteration
9. Frequency Re-oxygenation Zones
10. Channel Sinuosity
11. Bank Stability
12. Bank Vegetative Protection
13. Riparian Vegetative Zone Width

b. Secondary Physical/Habitat

- Canopy Cover
- Stream Profile
- Particle Count
- Flow

3. **Critical and Secondary Chemical/Toxicological**

The type of chemical sampling depends on the monitoring needs. Minimally, the following are collected:

- Routine Watershed Screenings: Critical: dissolved oxygen, pH, temperature, specific conductance. Parameters are found in Table 11.
- 303(d) List: Including, but not limited to the parameters the segment is listed for.
- Fish Consumption: Metals and/or priority organics. Metals may be limited to mercury only.
- Contact Advisory: Critical: *E. coli*, Non-critical: fecal coliform.
- Permit Compliance/Enforcement: Parameters limited in permit.
- Reference Streams: Ecoregion and FECO site parameters are found in Table 11.
- TMDL Depends on the type of TMDL needed.

F. Quality Management and Assurance Plans

TDEC DWR has developed three Quality System Standard Operating Procedures (QSSOP) for use as guidance for collecting water pollution control data and appropriate quality control in the state. The *QSSOP for Macroinvertebrate Stream Survey* (TDEC, 2011) was first published in March of 2002 and was revised in October 2006 and June 2011. The *QSSOP for Chemical and Bacteriological Sampling of Surface Waters* was first published in March of 2004 and revised in 2009 and June 2011 (TDEC, 2011). The *QSSOP for Periphyton Stream Surveys* was completed in 2010 (TDEC, 2010). Each year, the division submits a *Quality Assurance Project Plan* to EPA (TDEC 2015). This document describes monitoring, analyses, quality control, and assessment procedures used by the division to develop TMDLs, 305(b) and 303(d) assessments.

All documents are reviewed annually and revised as needed. A copy of any document revisions made during the year is sent to all appropriate stakeholders and posted on the website. A report is made to the Deputy Commissioner and Quality Assurance Manager of any changes that occur.

Division staff are trained on field techniques outlined in the documents during the division's annual meeting and during biological workshops. Biological and inorganic chemical samples are analyzed by the TDH Environmental Laboratories. Organic chemical samples and most bacteriological samples are analyzed by contract labs. The biological laboratory follows the QSSOP for macroinvertebrate (TDEC, 2011) and for periphyton (TDEC, 2010) sample analysis. The state and contract chemistry and bacteriological laboratories has standard operating procedures which follow approved EPA methodologies. EPA audits the state laboratories on a regular schedule.

Quality Assurance Guidelines for Macroinvertebrate Surveys as specified in the 2011 QSSOP:

1. 10% of habitat assessments and biological samples are repeated by a second investigator.
2. Chain of custody is maintained on all biological samples.
3. A digital sample log with backup is maintained for biological samples.
4. 10% of all biological samples are re-sorted and re-identified by a second taxonomist.
5. Reference collections are maintained at the central laboratory for each taxon found in Tennessee. New specimens are verified by outside experts.
6. A minimum of 10% of all data entry and statistical calculations are verified.
7. Staff are trained and updated on new techniques as a group during the division's annual meeting or biologists training workshop.

Quality Assurance Guidelines for Periphyton Stream Surveys as specified in the 2010 QSSOP:

The same quality assurance required for macroinvertebrate surveys is necessary for periphyton surveys, with the exception of the reference collections. A master collection of images of all taxa identified in the state is maintained at the central Laboratory. As with macroinvertebrates, new specimens are verified by outside experts.

Quality Assurance for Chemical Field Collections as specified in the 2011 QSSOP:

1. Duplicates, field, and equipment blanks, are collected at 10% of sites.
2. Trip blanks are collected at 10% of trips.
3. Temperature blanks are included in each sample cooler.
4. Water quality probes are calibrated daily and include daily post-calibrations (at the beginning and end of the trip for overnight sampling). Duplicate measurements are recorded at each station.
5. Flow measurements are duplicated at 10% of sites.
6. Chain of custody is maintained on all samples.
7. Staff are trained and updated on new techniques as a group during the division's annual meeting or biologists training workshop.

G. Data Management through Electronic Data Systems

The division uses EPA's Assessment Database (ADB) to store assessment information. The ADB currently holds information on approximately 5700 waterbody segments, which represent the state's streams, rivers, lakes and reservoirs.

The public has access to assessment information through an online assessment database. The website links information in the assessment database to an interactive map using the Geographic Information System (GIS) http://bg0119054wa006.net.ads.state.tn.us/flexviewers/tdecwpc/ The department also partners with EME Environmental Solutions to power a Stream and Watershed Information Management GIS mapping tool to reflect previous, current and potential stream mitigation projects across the state. The information for both maps is updated regularly.

In the early 1970s, EPA developed the national water quality STOrage and RETrieval database called STORET. This database allowed for easy access to bacteriological and chemical information collected throughout the state and nation. TDEC Water Pollution Control station locations and chemical and bacteriological data were uploaded into the database quarterly. In September 2009, EPA ceased support of the current format that data are uploaded to STORET. The last historical data upload from TDEC WPC was sent to EPA the end of September 2009. The historical STORET data is found at http://www.epa.gov/storet/dw_home.html.

EPA developed the Water Quality Exchange (WQX), to replace STORET. WQX is a framework that is intended to make it easier for States, Tribes, and others to submit and share water quality monitoring data over the Internet. Subsequently, Tennessee Department of Health (TDH) state laboratory and contract labs submit chemical, bacteriological and fish tissue data electronically to TDEC-DWR. DWR uploads the chemical and bacteriological data to the web application to WQX. Approxiamately 130,000 chemical and bacteriological records have been uploaded to EPA WQX WEB through the web portal. All fish tissue data submitted to the state since 1984 and chemical data submitted to EPA after 2009 may be found at http://www.epa.gov/storet/wqx/.

Flow, macroinvertebrate, periphyton, fish tissue and habitat data collected from stations specified in the workplan are stored in the division's Access water quality database which includes data collected from 1996 to the present. The database also includes detailed station information for approximately 7,300 monitoring stations.

The amount of data has outgrown the capabilities of the current Access Database. Therefore DWR is in the process of migrating data from the Access Database platform to an Oracle platform. EPA requires states to enter all monitoring data collected using 106 funds (including chemical, biological, fish, habitat, tissue, toxicity, physical and sediment chemistry) into STOrage and RETrieval (STORET) data warehouse using the Water Quality Exchange (WQX) network.

In order to meet EPA reporting requirements to upload of all surface water data to WQX TDEC has developed the following plan, which has been adjusted over the years. Tennessee has uploaded chemical, bacteriological and fish tissue data to STORET using the WQX web application

In 2012 Tennessee was awarded a 106 supplemental grant (I-95494911) for development of an electronic data transfer system. A portion of that money was used to test the feasibility of using the EQuiS software for monitoring program needs, electronic data transfer from the state laboratory and upload to WQX. The software proved insufficient to meet these goals.

Additionally funding was used for research the state of Kentucky's database (K-WADE). Tennessee requested that FY 2015-2016 supplemental funds be used to complete modifications of the Kentucky database to meet Tennessee program needs, initiate electronic transfer of biological data from laboratory and upload chemical, macroinvertebrate, periphyton, habitat, tissue, physical and sediment data to WQX. The software was incompatible with Tennessee work flows and objectives.

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DWR approached the developer of Waterlog, the integrated data management system for DWR, to develop a system in Waterlog to upload all surface water data. After data are uploaded to a development – QC area, the data are uploaded to the production Waterlog program for all DWR staff to view.

Goals:

1. Adapt Waterlog to accept Tennessee chemical, macroinvertebrate, fish tissue, periphyton and habitat data.
2. Develop reporting functions for all data types.
3. Develop electronic data deliverables (EDDs) for laboratory reporting of all data types.
4. Successfully export all data-types to WQX-STORET.

H. Data Analysis/Assessment of Water Quality

The water quality assessment process in Tennessee consists of four parts:

1. Development of clean water goals (water quality standards) either by promulgating national numeric criteria, statewide narrative criteria, or regional goals based on reference conditions.

2. Implementation of a statewide water quality monitoring program, based on a watershed cycle.

3. Comparison of data to water quality standards for each waterbody in order to assess water quality and to categorize use support.

4. Geographic referencing of all water resources with the National Hydrography Dataset (NHD).

Water Quality Standards

The *Tennessee Water Quality Control Act* requires the protection of water quality in Tennessee. Tennessee first adopted water quality standards in 1967 and has amended them several times thereafter. Water quality standards consist of two principle regulations:

1. "Use Classifications for Surface Waters", Chapter 0400-40-04
2. "General Water Quality Criteria", Chapter 0400-40-03

The three essential elements comprising water quality standards as defined by Section 303 of the Federal Clean Water Act, PL 95-217, are stream use classifications, water quality criteria and the antidegradation statement.

Classification + Criteria + Antidegradation = Standards

In September 2009 the Water Quality Control Board (WQCB) voted to initiate the rulemaking process for the triennial review of water quality standards. This process was initiated when the division filed a notice for the Tennessee Administrative Register with the Secretary of State's Office in November 2009. At the same time, a set of proposed revisions to the regulations were posted on the department's webpage.

Following public hearings in December 2009 -January 2010 and a public comment period, a proposed final set of revisions were presented to the WQCB. After the WQCB approves the water quality standards the Attorney General's Office certifies the rules. The rules will then be filed with the Secretary of State for the required 75-day waiting period and were submitted to EPA for formal review. In November, 2011, at the request of the Water Quality Control Board, the previously revised water quality standards were again put on public notice and an additional review period was undertaken in the winter of 2011 and early spring of 2012. The standards were approved by EPA in January 2015.

1. Stream-use Classification

Tennessee's criteria specify baseline values for particular parameters of water quality necessary for the protection and maintenance of a prescribed use classification. The State has established seven principal uses of the waters for which criteria of quality are defined.

a. Fish and Aquatic Life (FAL) - Criteria protect fish and other aquatic life such as macroinvertebrates. These criteria are based on two types of toxicity. The first is acute toxicity, which refers to the level of a contaminant that causes death in organisms in a relatively short time. The other type is chronic toxicity. Chronic criteria are based on a lower level of a contaminant that causes death over a longer period of time or has other effects such as reproductive failure or the inhibition of growth. Fish and aquatic life criteria are generally the most stringent criteria for toxic substances.

b. Recreation - This classification protects the use of streams for swimming, wading, and fishing. Threats to the public's recreational uses of waters include loss of aesthetic values, elevated pathogen levels, and the accumulation of dangerous levels of metals or organic compounds in fish tissue. Tennessee coordinates with TVA, ORNL and TWRA to monitor levels of contaminants in fish. Waterbodies that pose an unacceptable risk to human health are posted for bacteriological or fish consumption advisories.

c. Irrigation - Irrigation criteria protect the quality of water so it may be used for agricultural needs.

d. Livestock Watering and Wildlife - These criteria protect farm animals and wildlife.

e. Drinking Water Supply - Drinking water criteria insure that water supplies contain no substances that might cause a public health threat, following conventional water

treatment. Since many contaminants are difficult and expensive to remove, it is more cost-effective to keep pollutants from entering the water supply in the first place.

f. Navigation - This use is designed to protect navigational rivers and reservoirs from any alterations that would adversely affect commercial uses.

g. Industrial Water Supply - These criteria protect the quality of water used for industrial purposes.

Tennessee has approximately 60,000 stream miles and over 570,000 publicly owned lake and reservoir acres. Most are classified for at least four public uses: protection of fish and aquatic life, recreation, irrigation, and livestock watering and wildlife. These minimum use classifications comply with the Federal Water Pollution Control Act, which requires that all waters provide for the "protection and propagation of a balanced population of fish and wildlife, and allow recreational activities in and on the water" (U.S. Congress, 2000).

Specific designated Use Classifications for Surface Waters in Tennessee are listed in the Rules of TDEC, Chapter 0400-40-04 (TDEC-WQOGB, 2013). All surface waters that are not specifically listed in the regulations are classified for fish and aquatic life, recreation, irrigation, livestock watering and wildlife.

2. Water Quality Criteria and Assessment Methodologies

The Water Quality Oil and Gas Board (WQOGB) has assigned specific water quality criteria to each of the designated uses. These criteria establish the level of water quality needed to support each of the designated uses. There are two types of criteria:

- **Numeric criteria** - Establish measurable thresholds for physical parameters and chemical concentrations to support classified uses.

- **Narrative criteria -** Are written descriptions of water quality. These descriptions generally state that the waters should be "free from" particular types or effects of pollution. To help provide regional interpretations of narrative criteria, guidance documents have been developed by the division for biological integrity, habitat and nutrient narrative criteria.

The regulations require that the most stringent criteria be applied to the waterbody. Typically, the most stringent criteria are for the protection of fish and aquatic life or recreational uses. General Water Quality Criteria for surface waters in Tennessee are listed in the Rules of TDEC, Chapter 0400-40-03 (TDEC-WQOGB, 2013).

Water quality assessments are the application of water quality criteria to ambient monitoring results to determine if waters are supportive of all designated uses. To facilitate this process, several provisions have been made:

To help the division interpret water quality expectations for biological integrity, nutrients and habitat, guidance documents for wadeable streams have been developed. These documents are referred to in the General Water Quality Criteria (TDEC-WPCB, 2013).

- Numeric criteria define physical and chemical conditions that are required to maintain designated uses.

- In order to make defensible assessments, data quality objectives must be met. For some parameters, a minimum number of observations are required in order to have increased confidence in the accuracy of the assessment.

- Provisions in the water quality criteria instruct staff to determine whether violations are caused by man-induced or natural conditions. Natural conditions are not considered pollution.

- The magnitude, frequency and duration of violations are considered in the assessment process.

- Streams in some ecoregions naturally go dry or subterranean during prolonged periods of low flow. Evaluations of biological integrity differentiate whether streams have been recently dry or have been affected by man-induced conditions.

- Waterbodies on the 303(d) List remain on the list until sufficient recent data provide a rationale for removing the waterbody from the list.

The following guidelines are used for determining specific causes of pollution:

a. Metals and Organics Criteria

One or two chemical samples are not considered an accurate representation of stream conditions. Therefore, more than two observations are used in assessments. Acute fish and aquatic life protection criteria are used, unless a site has 12 or more chemical collections. If a site has 12 or more chemical collections, chronic criteria are applied.

Metals data are appropriately "translated" according to the water quality standards before being compared to criteria. For example, toxicity of metals is altered by stream hardness and the amount of total suspended solids in the stream. Widely-accepted methodologies are used to make these and other translations of the data. The division consults with EPA concerning the latest revisions to the national criteria and updates the state criteria as appropriate.

b. Pathogens

Waterbodies are not assessed as impaired due to high bacteria levels with less than three water samples. The only waters assessed with one or two observations are those previously listed due to elevated bacteria levels or streams with obviously gross conditions, such as failing animal waste lagoons.

E. coli data are generally considered more reflective of true pathogen risk than are fecal coliform data. During the 1997 triennial review process, Tennessee added *E. coli* criteria to its existing fecal coliform criteria. This gave the regulated community time to become accustomed to the new criteria before fecal coliform were removed during the 2003 review.

If flow data are available, low flow, dry season data are considered more meaningful than high flow, wet season data. In the absence of flow data, samples collected in late summer and fall are considered low flow or dry season samples. Wet season pathogen samples are not disregarded. They are simply given less weight than dry season pathogen samples.

c. Dissolved Oxygen

For streams identified as trout streams, including tailwaters, the minimum DO standard is 6.0 mg/L. Streams designated as supporting a naturally reproducing population of trout have a DO standard of not less than 8.0 mg/L. This also includes tributaries to naturally reproducing trout streams as well as all streams in the Great Smoky Mountains National Park. If the source of the low DO is a natural condition, such as ground water, spring, or wetland, then the low DO is considered a natural condition and not pollution.

d. Nutrients

Regional nutrient goals were developed based on reference condition and are used for guidance when assessing wadeable streams (Denton et al., 2001). Streams are not generally assessed as impaired by nutrients unless biological or aesthetic impacts are also documented.

One or two chemical nutrient observations are considered a valid assessment only if they are supported by evidence of biological impairment. For example, if the macroinvertebrate community in a stream is very poor and/or the amount of algae present indicates organic enrichment, then one or two nutrient samples could be used to identify a suspected cause of pollution.

e. Suspended Solids/Siltation

Historically, silt has been one of the primary pollutants in Tennessee waterways. The division has experimented with multiple ways to determine stream impairment due to siltation. These methods include visual observations, chemical analysis (total suspended solids), and macroinvertebrate/habitat surveys. Biological surveys that include a habitat assessment have proven to be the most satisfactory method for identification of impairment.
Through monitoring reference streams, staff found that the appearance of sediment in the water is often, but not always, associated with loss of biological integrity. Additionally, ecoregions vary in

the amounts of silt that can be tolerated before aquatic life is impaired. Thus, for water quality assessment purposes, it is important to establish whether or not aquatic life is being impaired. For those streams where loss of biological integrity can be documented, the habitat assessment can determine if the stream has excessive amounts of silt.

The division has developed regional expectations based on reference data for the individual habitat parameters most associated with sedimentation including embeddedness and sediment deposition. These values are published in the macroinvertebrate QSSOP (TDEC, 2011) and reviewed annually.

f. Biological Criteria

Biological surveys using macroinvertebrates as the indicator organisms are the preferred method for assessing support of the fish and aquatic life designated use in wadeable streams. Two standardized biological methods, biorecons and semi-quantitative single habitat (SQSH) samples, are used to produce a biological index score. These methods are described in the macroinvertebrate QSSOP (TDEC, 2011).

For watershed screening the most frequently utilized biological surveys has historically been qualitative biorecons. Biological scores are compared to qualitative metric values obtained in ecoregion reference streams. The principal metrics used are the total families (or genera), the number of mayfly, stonefly and caddisfly (EPT) families (or genera), and the number of pollution intolerant families (or genera) found in a stream. The biorecon index is scored on a scale that goes from 1 - 15. A score less than or equal to 5 is considered impaired. A score equal to or greater than 11 is considered supporting. Scores between 5 and 11 are ambiguous and must be supplemented with other information such as chemical data, habitat data or a more intensive biological survey.

If a more definitive assessment is needed in a wadeable stream, a single habitat, semi-quantitative sample is collected. To be comparable to ecoregions guidance, streams must have the same order as the reference streams in a given ecoregion and must have been sampled similarly and at least 80 percent of the upstream drainage in that ecoregion. If both biorecon and single habitat semi-quantitative data are available, and the assessments do not agree, more weight is given to the single habitat semi-quantitative samples unless it is determined the targeted habitat was naturally limiting Streams are considered impaired where biological integrity falls below the expected range of conditions found at reference streams.

g. Habitat

Division staff use a standardized scoring system developed by EPA to rate the habitat in a stream (Barbour, et. al., 1999). The macroinvertebrate QSSOP (TDEC, 2011) provides guidance for completing a habitat assessment and how to evaluate the results. Habitat scores calculated by division biologists are compared to the guidelines developed from the ecoregion reference stream data. Streams with habitat scores lower than the guidance for the region are considered impaired, unless biological integrity meets expectations. If biological integrity meets ecoregional expectations, then poor habitat is not considered impairment.

h. pH

The pH criterion for wadeable streams is now 6.0 - 9.0. For nonwadeable rivers, streams, reservoirs and wetlands the pH criterion remains 6.5 - 9.0. Waterbodies with pH values outside these ranges are considered impaired.

3. Antidegradation

As one of the elements comprising Tennessee's water quality standards, the antidegradation statement has been contained in the criteria document since 1967. EPA has required the states, as a part of the standards process, to develop a policy and an implementation procedure for the antidegradation statement.

> "Additionally, the Tennessee Water Quality Standards shall not be construed as permitting the degradation of high quality surface waters. Where the quality of Tennessee waters is better than the level necessary to support propagation of fish, shellfish, wildlife, and recreation in and on the water, that quality will be maintained and protected unless the state finds, after intergovernmental coordination and public participation, that lowering water quality is necessary to accommodate important economic or social development in the area in which the waters are located" (TDEC-WQOGB, 2013).

A three-tiered antidegradation statement was incorporated into Tennessee's 1994 revisions. In the 1997 triennial review, the three tiers were more fully defined. A procedure for determining the proper tier of a stream was developed in 1998. The evaluation took into account specialized recreation, scenic considerations, ecology, biological integrity and water quality.

Tennessee further refined the antidegradation statement in 2004 specifying that alternatives analyses must take place before new or expanded discharges can be allowed in Tier I waters.

In 2006 the antidegradation statement was revised and the Tier designations were replaced by the following categories. (TDEC-WQCB, 2007). The antidegradation statement has been revised in the 2010 version of the Water Quality Standards. (TDEC-WQOGB, 2013).

a. **Unavailable parameters** exist where water quality is at, or fails to meet water quality criteria in Rule 0400-40-03 (the criterion for one or more parameters)

b. **Available parameters** exist where water quality is better than the levels specified in the water quality criteria in Rule 0400-40-03.

c. **Exceptional Tennessee Waters (ETW)** are waters that are in any one of the following categories:

   - Waters within state or national parks, wildlife refuges, wilderness areas or natural areas.
   - State Scenic Rivers or Federal Wild and Scenic Rivers.

- Federally-designated critical habitat or other waters with documented non-experimental populations of state or federally-listed threatened or endangered aquatic or semi-aquatic plants or animals.
- Waters within areas designated Lands Unsuitable for Mining.
- Waters with naturally reproducing trout.
- Waters with exceptional biological diversity as evidenced by a score of 40 or 42 on the TMI (or a score of 28 or 30 in subregion 73a), provided that the sample is considered representative of overall stream conditions.
- Other waters with outstanding ecological or recreational value as determined by the Department.

d. **Outstanding National Resource Waters** (ONRWs) - These Exceptional Tennessee Waters constitute an outstanding national resource due to their exceptional recreational or ecological significance. In 1998, the Water Pollution Control Board voted to accept six of the eight streams proposed for listing as ONRWs. The following streams or portions of the streams are designated as ONRWs are: Little River, Abrams Creek, Little Pigeon River, West Prong Little Pigeon River, Big South Fork Cumberland River and Reelfoot Lake.

In 1999, the Obed River was conditionally added as an ONRW. The condition placed upon the designation was that if the Obed were identified as the only viable drinking water source for Cumberland County, it would revert back to ETW status.

Information on waterbodies that have been evaluated and are identified as Exceptional Tennessee Waters is entered in the Waterlog database and is located on the TDEC website http://environment-online.tn.gov:8080/pls/enf_reports/f?p=9034:34304:1963060327755:::::

4. Categorization of Use Support and Assessment Process

In order to determine use support, it must be decided if the stream, river or reservoir meets water quality criteria. Monitored waters are compared to the most restrictive water quality standards to determine if they meet their designated uses. Generally, the most stringent criteria are for recreational use and support of fish and aquatic life.

To facilitate these analyses, all major rivers, streams, reservoirs and lakes have been placed into georeferencing sections called waterbody segments. These waterbody segments are given unique identification numbers that reference an eight-digit watershed Hydrologic Unit Code (HUC), plus a reach, and segment number.

All available water quality data are considered; however, not all data comply with state quality control standards and approved collection techniques. Assessments must be founded on scientifically sound monitoring methodologies. After use support is determined, waterbodies are placed in one of the five categories recommended by EPA.

- **Category 1** waters are those waterbody segments which have been monitored and meet water quality criteria. The biological integrity of Category 1 waters is

comparable with reference streams in the same subecoregion and pathogen criteria are met. Previously these waterbodies were reported as fully supporting.

- **Category 2** waters have only been monitored for some uses and have been assessed as fully supporting of those uses, but have not been assessed for the other designated uses. Often these waterbodies have been assessed and are fully supporting of fish and aquatic life, but have not been assessed for recreational use. In previous assessments, these waters were assessed as fully supporting.

- **Category 3** waters have insufficient or outdated data and therefore have not been assessed. These waters are targeted for future monitoring. In previous assessments, these waterbodies were identified as not assessed.

- **Category 4** waters are waters that have been monitored and found to be impaired for one or more uses, but a TMDL is not required. These waters are included in the 303(d) impaired waters list. Category 4 has been subdivided into three subcategories. Previously, these waters were reported as either partially or non-supporting.

    - **Category 4a** impaired waters have had all necessary TMDLs approved by EPA.

    - **Category 4b** impaired waters do not require TMDL development since "other pollution control requirements required by local, State or Federal authority are expected to address all water-quality pollutants" (EPA, 2003).

    - **Category 4c** waters are those in which the impacts are not caused by a pollutant (e.g. certain habitat alterations).

- **Category 5** waters have been monitored, and found not to meet one or more water quality standards. In previous assessments, these waters have been identified as partially supporting or not supporting designated uses. Category 5 waterbodies are moderately to highly impaired by pollution and need the development of TMDLs for known impairments.

TDEC strongly prefers to base assessments on recently collected data. Judgments based on modeling or land use information are much harder to defend. With given resources, it is not possible to monitor all of Tennessee's waterbodies every two years for 305(b) reporting purposes. Therefore, monitoring and assessments are conducted on the five-year rotating schedule.

The division continues to increase its reliance on rapid biological assessments. These assessments provide a quick and accurate assessment of the general water quality and aquatic life use support in a stream. However, biological assessments do not provide information to pinpoint specific toxic pollutants or bacterial levels in water. The challenge in the next few years will be

to combine biological assessments with chemical and bacteriological data so that both use support status and accurate cause and source information can be generated.

5. Data Sources

The division uses all reliable data gathered in the state for the assessment of Tennessee's waterways. These include data from TDEC, other state and federal agencies, citizens, universities, the regulated community, and the private sector. Every year, the division issues public notices requesting water quality data for use in the statewide water quality assessment. In addition other state and federal agencies known to have data are contacted directly for monitoring information. Tennessee regularly receives data from TVA, USGS, TWRA, and USACE. Biological and habitat data submitted by NPDES dischargers as part of permit requirements are also used.

All submitted data are considered. If data reliability cannot be established, submitted data are used to screen streams for future studies. If the data from the division and another reliable source do not agree, more weight is given to the division's data unless the other data are considerably more recent.

6. Data Use

The division's goal is to make assessments by quantifiable measures (objective) and therefore, require less professional (subjective) judgment (Table 5). DWR is accomplishing this goal as follows:

Criteria have been further refined to assist in the assessment of water quality data. The ecoregion project has dramatically reduced the uncertainty associated with the application of statewide narrative and numerical criteria.

By use of geographic referencing tools such as the National Hydrography Dataset (NHD), water segments have been further refined to allow more precise water quality assessments. Data from a sampling point are extrapolated over a much shorter distance than in the past. The decision on how far the information is applicable is made on a site-by-site basis using factors such as amount and type of data and the uniformity of the stream.

Minimum data requirements for some of the specific types of data have been set.

Critical periods have been determined for various criteria. Certain collection seasons and types of data have proven more important for the protection of specific water uses. For instance, the critical period for parameters like toxic metals or organics is the low flow season of late summer and early fall. Water contact activities like swimming and wading are most likely to occur in the summer.

Table 5. Types of Data Used in the Water Quality Assessment Process

Chemical Data	Biological Data	Physical Data	Sediment And Tissue Data
Compliance monitoring performed at the nearly 2,000 permitted dischargers in Tennessee. Data collected as a result of complaint investigations, fish kills, spills, and in support of enforcement activities.	Rapid biological surveys completed in association with the watershed project. These are performed primarily in tributary streams as a means of monitoring biological integrity.	Temperature and flow data collected throughout Tennessee.	Sediment and fish tissue data collected at various sites across Tennessee.
Over 7000 stations are established by the division to support the watershed approach.	Ecoregion biological monitoring. Benthic and fish IBI scores calculated at many sites.	Quantitative assessments of habitat made in conjunction with biological surveys.	EPA's report *The Incidence and Severity of Sediment Contamination in Surface Waters of the United States.*
Data collected at the division's 87 ecoregion reference sites. (These stations provide a baseline to which other sites within that ecoregion can be compared.)	Bioassay studies of effluent toxicity at most major NPDES dischargers. Many minor facilities also do this type testing.	Time-of-travel studies of flow, dissolved oxygen sags and BOD decay rates.	Locations of existing fishing advisories in Tennessee.
Chemical data collected by other entities.	Biological data collected by other entities.	Physical data collected by other entities.	Sediment and tissue data collected by other entities.

Future Assessment Goals

The division is committed to the ecoregion approach, particularly for the assessment of wadeable rivers and streams. The use of regional reference streams has proven a valuable tool in establishing guidelines for use in determining whether waterbodies meet their designated uses. The division goals, which are to continue to improve the assessment process, are listed in Table 6.

Table 6. Future Assessment Goals

Goal	Milestone	Future Plans
Dissolved oxygen in wadeable streams	Published study of regional dissolved oxygen patterns in 2003 based on diurnal and daylight monitoring. Proposed regional minimum DO criteria based on reference monitoring in 2003.	Continued regional monitoring to enhance existing data. Incorporate criteria base on diurnal patterns (duration and frequency of minimum). Consideration of criteria based on diurnal DO swings in future triennial reviews.
Nutrients in wadeable streams	Published guidance document for regional limits of total phosphorus and nitrate + nitrite in 2001. Incorporated guidance in 2004 WQS.	Continued refinement.
Nutrients in lakes, rivers and non-wadeable streams	Developed criteria development plan in 2004 with revisions in 2007 and 2009. Established biomass criterion in Pickwick Reservoir in 2007.	As resources allow, compose study group of appropriate professionals. Target reservoir for pilot project. Review existing data and look for data gaps. Begin development of criteria guidelines.
Biocriteria	Published macroinvertebrate guidelines for wadeable streams in 2001 which were updated in 2004, 2006 and 2011. Incorporated guidelines in 2004 WQS. Began monitoring of headwater reference streams in 2009. Began monitoring of periphyton at reference streams in 2008.	Continue testing wadeable streams guidelines. Develop guidelines for lakes, reservoirs, rivers and headwater and intermittent streams. Develop periphyton guidelines.

I. Water Quality Reports

The division continues to submit quarterly reports describing monitoring activities to EPA. Waterbodies will continue to be monitored to fulfill data needs for water quality standards, TMDLs, 303(d), 305(b), and special projects.

The Mid-Year Review and End-of-Year Review processes will be utilized by EPA Region 4 as the primary mechanism for evaluating performance and progress in implementing workplan

commitments. To comply with EPA Region 4's semi-annual progress reporting requirement, EPA's Mid-Year Review Report will serve as the first of the two semi-annual reports required. TDEC will prepare the second report and submit by December 31, 2016.

The 305(b) report details the status of Tennessee waters as well as sources and causes of pollution. The 2014 305(b) Report was finalized in December 2014. The report and assessment database were supplied to EPA Region 4 staff for inclusion in the 305(a) Report to Congress. The report, as well as an interactive database, is provided to the public through the TDEC website
http://environment-online.tn.gov:8080/pls/enf_reports/f?p=9034:34304:1963060327755

The 303(d) list is a compilation of streams in Tennessee that are not currently meeting water quality standards in spite of the implementation of best available technology (BATs) or best management practices (BMPs). The Final 2014 303(d) list was approved by EPA in May 2016 and may be found on TDEC's website. http://tn.gov/environment/article/wr-wq-water-quality-reports-publications.

Tennessee's water quality standards require the incorporation of the antidegradation policy into regulatory decisions (Chapter 0400-40-03-06). Part of the responsibility the policy places on the division is identification of Exceptional Tennessee Waters. In Exceptional Tennessee Waters, degradation cannot be authorized unless (1) there is no reasonable alternative to the proposed activity that would render it non-degrading and (2) the activity is in the economic or social interest of the public.

The division has compiled a list of streams based on the characteristics of Exceptional Tennessee Waters set forth in the regulation by the Tennessee Board of Water Quality, Oil and Gas. In general, these characteristics are streams with good water quality, important ecological values, valuable recreational uses, and/or outstanding scenery. Wherever possible, the division has utilized objective measures to apply these characteristics and the basis for each listing is provided. The list is on the TDEC website.
http://tdec.tn.gov:8080/pls/enf_reports/f?p=9034:34304:0::NO

Reports routinely produced by the division include technical publications, informational publications, criteria development reports, and standard operating procedures. In addition to reports, the division is committed to communicating information effectively. To reach this goal, the following products, among others, are provided as part of the reporting process:

- Access to water quality data
- Water quality assessment reports and on-line assessment database
- Data and interpretation for NPDES permit support
- Technical data sets for consultants/researchers
- Spatial and mapping data using Geographical Information System (GIS) tools
- Public outreach information, including the Internet
- Presentations at professional, scientific, citizen and school group meetings

J. Monitoring Program Evaluation

The division evaluates its monitoring program during each planning and assessment cycle and incorporates changes as needed to provide the most comprehensive and effective plan possible with available resources.

1. Evaluation of Monitoring Program Strategy

During development of the annual monitoring workplan, both central office and EFO staff provide input into monitoring needs:

a. The monitoring plan is reviewed to make sure all sampling and assessment priorities are covered.
b. The ADB is used to look for unassessed segments which are incorporated into the monitoring plan whenever possible.
c. During the monitoring plan development, Central Office and EFO staff coordinates location of monitoring stations and type of samples collected to insure adequate information is provided during that cycle.
d. The location of monitoring stations is coordinated with other state and federal agencies to eliminate duplication of effort.
e. At the end of each monitoring cycle, the plan is reviewed to make sure monitoring needs were covered. Uncompleted sampling or data gaps are incorporated into the next monitoring cycle or might be contracted to the state laboratory for completion.

2. Monitoring Objectives

During evaluation of monitoring objectives, the division strives to:

a. Determine where additional or more current data are needed to enhance the assessment process.
b. Target unassessed segments or those that were originally assessed qualitatively. Incorporate biological monitoring whenever possible to assess fish and aquatic life use support.
c. Develop or refine guidelines for narrative criteria: Refine wadeable streams and develop criteria for rivers, lakes and reservoirs (see nutrient workplan for details).
d. Biological: Refine wadeable streams and develop criteria for rivers, lakes and reservoirs.
e. Habitat: Refine wadeable streams and develop criteria for rivers, lakes and reservoirs.
f. Continue to refine regional numeric criteria whenever possible. Develop diurnal guidelines for dissolved oxygen levels.
g. Revisit monitoring sites every five years to look for changes.
h. Monitor below sites where BMPs or other restoration activities have taken place to assess effectiveness of improvement strategy.
i. Look for opportunities to analyze trends in water quality.

3. Monitoring Design

The division reviews the monitoring program during each cycle to ensure it is efficient and effective in generating data that serve management decision needs and meets the state's water quality management objectives.

a. Probabilistic monitoring results are compared to targeted monitoring results to check for bias in watershed assessment. Results from both types of monitoring are used in an integrated approach.
b. The antidegradation survey process is reviewed and updated based on feedback from field staff.
c. Ecoregion reference sites are re-evaluated annually. New sites are added whenever possible. Existing sites are dropped if data show the water quality has degraded, the site is not typical of the region, or does not reflect the best attainable conditions. Data from other states are used to test suitability of reference sites. Currently the state is reviewing river, lake and reservoir data to target reference conditions in these systems.
d. Watershed groupings are reviewed and revised if needed to ensure staffing is available for adequate coverage.

4. Critical and Non-Critical Water Quality Indicators

The division reviews both critical and non-critical water quality indicators minimally every three years as part of the triennial review process.

a. Biological guidelines for wadeable streams - New biometrics are tested for possible inclusion or replacement of existing index metrics. Additional reference data are incorporated and biometric ranges are adjusted if needed. Bioregions are tested and boundaries are adjusted if appropriate. Guidelines for rivers, lakes and reservoirs are currently in the initial development stage.

b. Nutrient guidelines - Additional reference data are incorporated and regional guidelines are adjusted if appropriate. Nutrient regions are tested and boundaries are adjusted if needed. Regional recommendations are tested against biological community data to test protectiveness. Guidelines for rivers, lakes and reservoirs are currently in the initial development stage.

c. Habitat guidelines - Additional reference data are incorporated and regional guidelines are adjusted if appropriate. Regional recommendations are tested against biological community data to test protectiveness. Guidelines for rivers, lakes and reservoirs are currently in the development stage.

d. Other narrative criteria are reviewed to determine whether guidelines can be developed using regional reference data.

e. Incorporation of national numeric criteria. Changes are incorporated into the state criteria during the triennial review process. Criteria are reviewed to determine effectiveness of statewide approach versus regionalization.

5. Quality Assurance

The division is committed to ensuring the scientific quality of its monitoring and laboratory activities.

The division developed and implemented a document entitled *Quality Systems Standard Operating Procedures for Macroinvertebrate Surveys* (including collections, habitat assessments and laboratory analyses) in 2002. This manual will be reviewed annually and updated if needed. The manual was last revised in 2011. Staff are trained on protocols during the annual statewide meeting or during the biologists workshops.

The division developed and implemented a document entitled *Quality Systems Standard Operating Procedures for Chemical and Bacteriological Sampling of Surface Waters* in 2011. This manual will be reviewed annually and updated if needed. Staff are trained on protocols during the annual statewide meeting or during the biologists workshops**.**

The division has developed a document entitled *Quality Standard Operating Procedures for Periphyton Stream Surveys* in 2010. This manual will be reviewed annually and updated if needed. Staff are trained on protocols during the annual statewide meeting or during the biologists workshops**.**

As time and staff allows the division will develop SOPs for Habitat Streams Surveys, antidegradation policy implementation, water quality assessments and data management. The division uses the state laboratory for chemical, bacteriological and biological analyses. The division also used contract laboratories. The state laboratory has developed standard operating procedures that meet the division's needs and are in accordance with EPA policy. EPA routinely inspects the state laboratory. Contract laboratories are required to follow approved EPA methods and QC practices. The division has a policy to maintain chain of custody on all samples.

Duplicate collections are completed at 10% of biological and chemical monitoring stations. Field blanks and equipment blanks are collected at 10% of stations. Trip blanks are collected at 10% of trips.

The division developed and implemented a document entitled *Quality Assurance Project Plan* in 2015. This manual will be reviewed annually and updated if needed. Staff are trained on protocols during the annual statewide meeting or biologists workshop.

6. Data Management

The division uses electronic formats to store data and assessment information.

The state water quality database is reviewed continuously and updated as needed to increase comprehensiveness and ease of use.

- New updates for STORET/WQX, ADB and GIS are incorporated as they become available and time allows with the states IT divisions assistance.
- The division is working with the state laboratory to develop the ability to electronically transfer data.
- The online assessment database is updated regularly to provide current public access to water quality information.

7. Reporting

The division uses feedback from EPA, other state and federal agencies as well as the private and public sectors to improve and enhance the reporting process whenever possible.

K. Support and Infrastructure Planning and Resource Needs

An organizational chart for the Division of Water Resources is illustrated in Figure 6. The division has nine Central Office Sections, eight Environmental Field Offices (EFOs) and the Mining Section (MS) with statewide responsibility.

In 2012 the department created the Division of Water Resources, combining Water Pollution Control, Water Supply and Ground Water Protection.

The division currently has 312 full-time staff. There are also 12 members of the Water Quality, Oil and Gas Board. Division staff are divided by activities associated with Clean Water Act, Safe Drinking Water Act and various state program efforts including Safe Dams, Oil and Gas Well Drilling, Abandoned Mine Reclamations, Water Well driller regulation, Underground Waste Disposal, Operator Certifications and training and the activities associated with the State Revolving Loan Fund.

The division's full-time central office staff process permits, develop water quality planning documents and water quality standards, develop standard operating procedures, oversee quality assurance programs, prepare special recovery plans called Total Maximum Daily Loads (TMDLs), track compliance and prepare enforcement documents as needed, manage data, review plans and manage administrative needs of the division.

Water quality monitoring, especially fixed-station and compliance, is generally performed by EFO staff. Data management and review take place both in the central office and in the EFOs. Water quality assessment is also a collaborative effort.

Tennessee has upgraded its accounting and personnel management software to a data system called EDISON. This will improve the state's personnel, fiscal, travel, training, property and inventory into a single integrated system and should allow better tracking of program expenditures.

Program accomplishments are tracked by each field office and most sections in the division with data entry through the Water Pollution Control Information Management System (WATERLOG). These data are used by the state's performance based budgeting measurements

and for the division's reports to the Water Quality, Oil and Gas Board, Bureau of Environment, and to EPA.
Performance-based measures of the department are summarized quarterly for each environmental division and reported to the Department of Finance and Administration.

A summary annual report is produced prior to development of the next year's budget by the governor. It is available for review by the state's General Assembly when the budget is acted upon. Additional management use of data is important to the division to support expenditure state appropriation revenue and fee collections.

1. Current Funding

The cost of a full time technical employee including benefits will be about $90,000 for the year, with indirect costs approximately $21,700.

In 1991, the state legislature passed a law creating the Environmental Protection Fund (EPF) which requires the division to charge fees for certain services such as the annual maintenance of NPDES permits, plans and specs reviews, issuance of aquatic resource alteration permits (ARAP), and gravel dredging permits. Money collected from civil penalties and damage assessments, natural resource damage assessments are added to this fund as well. EPF funds have been used to add staff and upgrade the salaries of existing staff. The collection for EPF in state Fiscal year (July 1, 2015- June 30, 2016) was $$7,100,000 for the regulatory program areas for water pollution control.

The division matched only the required amount for our Clean Water Act §106 grant money for the federal FY'15 grant. The State of Tennessee uses a performance partnership grant (PPG) that includes the water pollution effort under CWA§106 as part of the PPG. The state continues to use substantial effort funded with state dollars to address water quality assessments and regulation for water pollution control within Tennessee. State funds that are not explicitly reflected in the grant application will not be tracked with the PPG, but these funds are still available for Division of Water Resources state program efforts.

Special projects such as probabilistic monitoring, Southeast Monitoring Network, and electronic data migration are generally funded by 106 supplemental grants. The division intends to apply for an N-STEPS grant to aid in periphyton index development.

2. Salary Ranges

The division has been historically plagued by two problems generally associated with low salaries: the inability to retain trained staff and the inability to recruit well-qualified replacements. Salary adjustments in the past have come from "across the board" raises as outlined by legislative action on the state budget. A salary increase has been put in place for employees that have less than $50,000 in the base position class annual salary. In addition, the job classifications are revised to reflect the TDEC move toward allowing career tracks for both technical staff as well as supervisory/management positions. Table 7 reflects the current FY salary information for 2016. Table 7 also reflects new position classes that the division technical personnel are being transitioned into.

Table 7. Salary Grades for Positions in TDEC DWR (updated 7/13/16)

Class Title	Salary Grade	Minimum Salary	Maximum Salary
ACCOUNTANT 3	031	$3,366.00	$5,384.00
ADMIN SERVICES ASSISTANT 3	027	$2,769.00	$4,431.00
ADMIN SERVICES ASSISTANT 4	029	$3,053.00	$4,883.00
ADMIN SERVICES ASSISTANT 5	031	$3,366.00	$5,384.00
ADMIN SERVICES MANAGER	035	$4,091.00	$6,545.00
BIOLOGIST 3*	029	$3,053.00	$4,883.00
BIOLOGIST 4	031	$3,366.00	$5,384.00
CLERK 2	016	$1,620.00	$2,590.00
CLERK 3	019	$1,875.00	$2,999.00
ENV ASSISTANCE PROG MANAGER 1	033	$3,710.00	$5,936.00
ENV FIELD OFFICE MANAGER	036	$4,295.00	$6,873.00
ENV PROGRAM ADMINISTRATOR	120	$6,711.00	$12,081.00
ENV PROGRAM MANAGER 1	036	$4,252.00	$6,804.00
ENV PROGRAM MANAGER 2	038	$4,689.00	$7,501.00
ENV PROGRAM MANAGER 3	040	$5,170.00	$8,270.00
ENV PROTECTION SPECIALIST 3*	034	$3,896.00	$6,234.00
ENV PROTECTION SPECIALIST 4	036	$4,295.00	$6,873.00
ENV PROTECTION SPECIALIST 5	037	$4,511.00	$7,215.00
ENV PROTECTION SPECIALIST 6	038	$4,736.00	$7,576.00
ENV SPECIALIST 3*	028	$2,908.00	$4,652.00
ENV SPECIALIST 4	030	$3,205.00	$5,129.00
ENV SPECIALIST 5	032	$3,533.00	$5,655.00
ENV SPECIALIST 6	034	$3,896.00	$6,234.00
GEOLOGIST 3	028	$2,908.00	$4,652.00
GEOLOGIST 4	030	$3,205.00	$5,129.00
OPERATIONS SPECIALIST 2*	034	$3,896.00	$6,234.00
TDEC CHF DPTY DIR WATER RES	119	$6,392.00	$11,506.00

Class Title	Salary Grade	Minimum Salary	Maximum Salary
TDEC-ENV CONSULTANT 1	034	$4,091.00	$6,545.00
TDEC-ENV CONSULTANT 2	036	$4,295.00	$6,873.00
TDEC-ENV CONSULTANT 3	036	$4,736.00	$7,576.00
TDEC-ENV CONSULTANT 4	038	$5,222.00	$8,354.00
TDEC-ENVIRONMENTAL FELLOW	118	$6,087.00	$10,957
TDEC-ENVIRONMENTAL MANAGER 1	034	$4,091.00	$6,545.00
TDEC-ENVIRONMENTAL MANAGER 2	036	$4,295.00	$6,873.00
TDEC-ENVIRONMENTAL MANAGER 3	036	$4,736.00	$7,576.00
TDEC-ENVIRONMENTAL MANAGER 4	038	$5,222.00	$8,354.00
TDEC-ENVIRONMENTAL SCIENTIST 1*	026	$3,205.00	$5,129.00
TDEC-ENVIRONMENTAL SCIENTIST 2*	028	$3,533.00	$5,655.00
TDEC-ENVIRONMENTAL SCIENTIST 3	030	$3,896.00	$6,234.00
TDEC CHF DPTY DIR WATER RES		$6,329.00	$11,391.00

* Flex position that will re-classify to a more advanced working position after completion of probationary period.

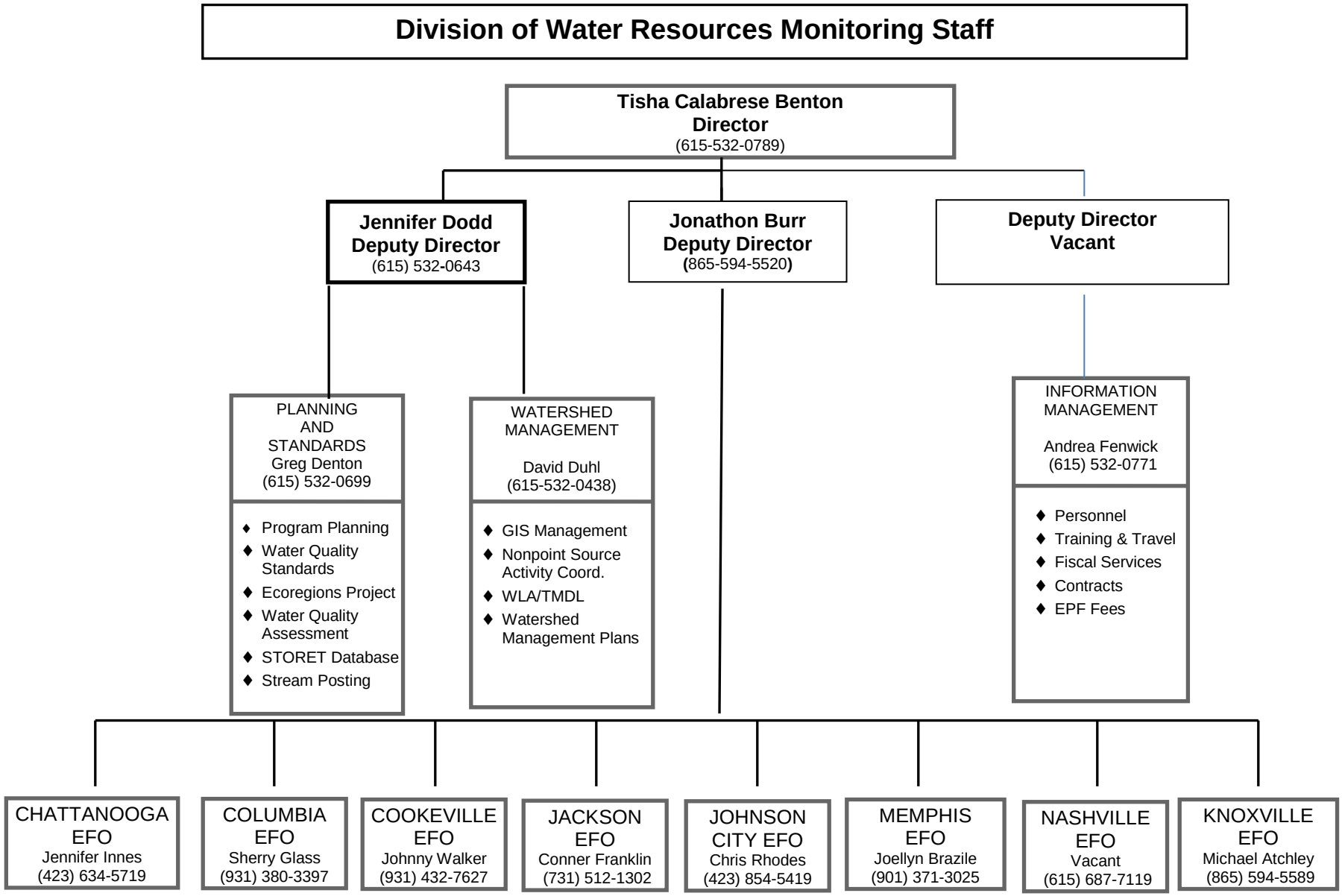

Figure 6: DWR Organizational Chart

3. Future Planning and Needs Assessment for Tennessee's Water Monitoring and Assessment Program

Tennessee has traditionally had a strong water quality monitoring and assessment program. In the last 16 years, water quality chemical and bacteriological monitoring have increased sixfold and biological monitoring has over doubled (Table 8). New procedures such as continuous monitoring, rapid periphyton surveys and probabilistic monitoring have been used to supplement targeted biological and chemical monitoring.

It is evident that Tennessee already spends a great deal of time, effort and money on water quality monitoring. However, a significant funding gap does exist if EPA requirements and guidance are to be met. Without a steady source of federal funding in addition to current funding, it is not likely that program activities will expand or that any significant increase in the percentage of waterbodies monitored and assessed will be feasible. Additional staffing and funding must be permanent and not in the form of competitive or temporary grants to expand programs. Tennessee is not expecting additional funding from other sources for these activities over the next ten years. Therefore, federal funding increases would be vital to implementation of all or part of the following water quality monitoring goals (Table 9).

Section 106 grant project activities in Tennessee are funded by state appropriation and EPA grant dollars. An estimated $1,569,200 obligated for employee salaries and benefits in support of this program in the state in FY 2016-2017. Another $216,900 is allocated to travel, printing, utility, communication, maintenance, professional service, rent, insurance, vehicle, and equipment expenses. Indirect charges are estimated at $373,700.

The grant money for Clean Water Act §106 is now part of a performance partnership grant and is no longer a stand-alone grant. Activities for the Water Quality Management Planning under Clean Water Act §604(b) are discussed as a separate work plan.

Table 8. Water Quality Monitoring From 1998 to 2015

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013*	2014	2015
Chemical & Bacteriological Sample Collections	705	1386	2805	2758	2615	2921	3540	3205	3302	3981	3600	4000	3600	3700	4482	>3392	4876	6810
Quality Assurance Sample Collections	76	66	196	159	339	325	628	585	763	941	900	713	776	930	618	>423	429	~540
Rapid Biological Stations (Biorecon)	86	394	602	672	318	365	183	162	285	248	338	318	223	288	157	>323	335	204 planned
Intensive Biological Stations (SQSH)	150	100	222	176	94	330	113	256	226	267	332	353	367	257	247	>190	192	443 planned
Habitat Assessments	236	494	824	848	412	695	504	386	462	497	612	597	512	525	361	>446	530	673
Periphyton Stations	0	0	94	14	80	154	121	0	2	120	60	72	22	55	10	>27	54	39
Antidegradation Surveys	2	5	11	5	5	49	33	17	97	81	2	59	51	18	12	>15	7	19
Probabilistic Monitoring Stations	0	0	50	50	75	95	313	2	0	90	0	0	90	0	0	0	0	0

Table 9. Projected funds necessary to increase wadeable stream assessment by 5% annually

Year	Approximate number of assessed stream miles reassessed annually if plan is funded	Additional stream miles to achieve 5% increase from previous year	Additional stations added (based on average 1 station per 11 stream miles)	Additional staff needed (Personnel Costs)	Indirect Costs (Based on 0.23%)	Additional laboratory analysis including QC	Cumulative federal dollars needed above existing funding
2006	6,059	303	28	2 Field = $154,800	$35,604	$38,000	$223,510
2007	6,362	318	29	2 CO (1 PAS, 1 TMDL) = $154,800	$35,604	$43,000	$430,740
2008	6,680	334	30			$44,000	$475,020
2009	7,014	351	32	2 Field = $154,800	$35,604	$46,000	$684,970
2010	7,365	368	33			$47,000	$731,970
2011	7,733	387	35			$53,000	$784,970
2012	8,120	406	37	2 Field and 2 CO (1 PAS, 1 TMDL) = $309,600	$71,208	$55,000	$1,189,709
2013	8,256	426	39			$57,000	$1,246,709
2014	8,952	448	41			$60,000	$1,306,709
2015	9,400	470	43	2 Field = $154,800	$35,604	$62,000	$1,511,659
2016	9,870	493	45			$68,000	$1,579,659
2017	10,363	518	47			$70,000	$1,649,659
2018	10,881	544	49	2 Field = $154,800	$35,604	$72,000	$1,885,619
2019	11,425	571	52			$75,000	$1,960,619
2020	11,996	600	54			$78,000	$2,038,619

II. RIVER, STREAM, RESERVOIR, LAKE, AND WETLAND MONITORING

The division maintains a statewide monitoring system consisting of approximately 7000 stations. In addition, new stations are created every year to increase the number of assessed streams. Approximately 590 stations will be monitored in FY 16-17. Stations are sampled monthly, quarterly, and semi-annually, depending on the requirements of the project long-term trend monitoring (ambient), 303(d), ecoregion, TMDLs, and watershed. Within each watershed cycle, monitoring stations are coordinated between the central office and staff in the eight Environmental Field Offices (EFOs) and the Mining Unit located across the state, based on the following priorities. A list of these stations is located in Appendix A. Additional streams may be added for sampling as the monitoring year progresses. Most large streams have at least one station. A list of parameters to be sampled is provided in Table 11.

After determining the watersheds to be monitored in a given year, monitoring resources are prioritized as follows: Details of monitoring priorities is found in Section I D, page 11.

1. Antidegradation Monitoring
2. Posted Streams
3. Ecoregion Reference Streams/Ambient Monitoring Stations/SEMN
4. 303(d) Listed Segments Monitoring
5. Sampling downstream Major Dischargers and CAFO's
6. TMDL Development Monitoring
7. Special Project Monitoring
8. Watershed Monitoring
   a. Previously Assessed Streams
   b. Sites downstream large scale or dense ARAP activities
   c. Non-point source
   d. Unassessed Stream Reaches

A. Monitoring Frequency

1. Antidegradation Monitoring Frequency

Since permit requests generally cannot be anticipated, antidegradation surveys are conducted as needed. Streams are evaluated for antidegradation status based on a standardized evaluation process, which includes information on specialized recreation uses, scenic values, ecological consideration, biological integrity and water quality

2. Posted Waters Monitoring Frequency

Waterbodies posted for pathogens advisories are sampled monthly for *E. coli* with at least one geomean (5 samples in 30 days). Streams posted for water contact must be monitored at a minimum every five years. If another responsible party will be monitoring the stream, then the EFO does not need to sample the stream. The failure of

another party to sample the stream places the burden back on the EFO to monitor the stream. There is no acceptable reason for failure to monitor a stream posted for water contact.

3. Ecoregion Reference Stream, Ambient and SEMN Monitoring

Ecoregion and First Order (FECO) Reference streams within the watershed group are sampled quarterly for physical, chemical and pathogen. Macroinvertebrates are collected spring and fall and periphyton are collected once. Ecoregion and FECO reference streams located in the Group 1 Watersheds in FY 2016-2017 are in Appendix A.

Physical, chemical and pathogen (E. coli) samples are collected at all long term monitoring or ambient stations quarterly regardless of watershed group. Ambient stations are included in Appendix A.

All Southeastern Regional Network Monitoring Stations regardless of watershed are monitored every year. See Section F for the monitoring plan and stations list.

4. Monitoring Frequency for 303(d) Listed Waters

Streams, rivers or reservoirs that have one or more properties that violate water quality standards and thus do not meet the designated uses are included in the 303(d) List. Impaired waters are monitored, at a minimum, every five years coinciding with the watershed cycle.

Monitoring impaired waters provides a great deal of information:

- Documentation of current conditions, which may change from year to year. This documentation can provide a rationale for "delisting" a stream from the 303(d) List or may just confirm the water's impairment status.
- Sampling can provide data for pre or post TMDL evaluation. Data can be used for model calibration.
- Surveys can document the need for enforcement actions.
- Data can assist in the evaluation of the effectiveness of BMPs or help target BMP installation for maximum effectiveness.
- Results over time can provide insight into historical water quality trends.
- Conditions may represent a human health threat.

For these reasons, the monitoring of impaired waters is identified as a high priority for division field staff. The division's intended goal is to always collect new data on these waters, unless there is a compelling reason for not doing so.

Waters that do not support fish and aquatic life are sampled once for macroinvertebrates (semi-quantitative sample preferred) and monthly for the listed pollutant(s). Streams with multiple listed segments should be sampled monthly for the listed pollutant for each segment.

Streams with impacted recreational uses, such as those impaired due to pathogens are sampled monthly for *E. coli* unless a geomean (5 *E. coli* in 30 days) collected in the first quarter is well over 126 MPN. If the geomean is near 126 or less monthly *E. coli* samples will be collected the remainder of the year.

Resource limitations or data results may sometimes justify fewer sample collections. For example, there are cases where pollutants are at high enough levels that sampling frequency may be reduced while still providing a statistically sound basis for assessments. In some other cases, monitoring may be appropriately bypassed during a monitoring cycle.

a. 303(d) Listed sites requiring no additional monitoring

All impaired streams in targeted watersheds must be accounted for in the annual monitoring workplan. If a field office is proposing to bypass monitoring of an impaired stream, an appropriate rationale must be provided and included in the workplan (Table 7).

It is recommended that the EFO verify the condition of the stream at least every other cycle. Streams impacted by poor biology, habitat alterations, or siltation due to habitat alterations must still be monitored at least once (habitat assessment, plus SQSH or biorecon). Streams posted for water contact must be monitored every cycle.

There are individual sites where conditions may justify retaining the impaired status of the stream without additional sampling during an assessment cycle. The reasons may include, but are not limited to, the following:

- Data have been collected by the division or another agency within the last five years and water quality is thought to be unchanged. If another division or agency has collected stream samples the EFO should follow up with that division or agency to retrieve the data and forward it to PAS.

- Another agency or a discharger has accepted responsibility for monitoring the stream and will provide the data to the division. During the planning process for each watershed cycle, field staff should recommend to the permitting section those streams where it would be appropriate for monitoring to be performed by a discharger. Where permits are up for renewal, such conditions could be added.

- The stream is known to be dry or without flow during the majority of the year that sampling is being scheduled. Should an impaired stream be dry during two consecutive cycles, consideration should be given to requesting the stream be delisted on the basis of low flow.

- Impounded streams impacted by flow alteration with no change in management of hydrology.

b. Impaired streams where additional sampling may be limited or discontinued

There are individual sites where initial results may justify a discontinuation of sampling. The reasons are limited to the following:

- Where emergency resource constraints may require that sampling be restricted after a monitoring cycle is initiated, but before it is completed. Discontinuation of monitoring on this basis must be approved in advance by the Deputy Director. Before requesting a halting of sampling in impaired streams, assistance from the Department of Health's Aquatic Biology section should be considered. Such requests should be coordinated through the Planning and Standards Unit.

- Initial stream sampling documents elevated levels of pollutants indicating, with appropriately high statistical confidence, that the applicable water quality criteria are still being violated. (Note – rain event sampling is inappropriate for this purpose.)

- The levels of pollutants that indicate continued water quality standards violations with statistical confidence are provided in Table 10. For example, if three samples are collected and all three values exceed the levels in the far right hand column, then sampling for that parameter may be halted, as there is a very high probability that criteria would be exceeded in future sampling. If all three samples do not exceed the level provided in the table, then at least four more samples must be collected. If all seven samples exceed the levels in the middle column of the table, then sampling may cease. If all seven samples do not exceed the value in the table, then all sampling must be completed.

Important notes about this process:

- This process only applies to chemical parameters or bacteriological results. Streams impacted by poor biology, habitat alterations, or siltation due to habitat alterations must still be monitored at least once (habitat assessment, plus SQSH or biorecon), flow permitting.

- Rain event samples cannot be used to justify a reduction in sampling frequency.

- The division is not establishing new criteria with Table 10 and the numbers in the table should not be used independently to assess streams. These numbers, which are based on the actual criteria, simply indicated the statistical probability that the criteria have been exceeded by a dataset when the numbers of observations are considered.

- Where streams are impacted by multiple pollutants, all parameters must exceed the values in Table 10 before sampling can be halted.

Table 10. Sampling Frequency Guidance for Parameters Associated with Impaired Streams

Nutrient Sampling

Nitrite-Nitrate	**Number of Samples**		
	10	7	3
73a	< 0.49	0.49 - 0.68	>0.68
74a, 65j, 68a	< 0.28	0.28 - 0.40	>0.40
74b	< 1.49	1.49 - 2.08	>2.08
65a, 65b, 65e, 65i	< 0.43	0.43 - 0.60	>0.60
71e	< 4.35	4.35 - 6.09	>6.09
71f	< 0.32	0.32 - 0.56	>0.56
71g, 71h, 71i	< 1.15	1.15 - 1.61	>1.61
68b	< 0.54	0.54 - 0.75	>0.75
69d	< 0.34	0.34 - 0.47	> 0.47
67f, 67g, 67h, 67i	< 1.53	1.53 - 2.14	>2.14
66d	< 0.63	0.63 - 0.88	>0.88
66e, 66f, 66g, 68c	<0.38	0.38 - 0.54	>0.54
Total Phosphate	**Number of Samples**		
	10	7	3
73a	<0.25	0.25 - 0.44	>0.44
74a	<0.12	0.12 - 0.21	>0.21
74b	<0.10	0.1 - 0.18	>0.18
65a, 65b, 65e, 65i, 65j, 71e, 68b, 67f, 67h, 67i	<0.04	0.04 - 0.07	>0.07
71f, 71g	<0.03	0.03 - 0.053	>0.053
71h. 71i	<0.18	0.18 - 0.32	>0.32
68a, 68c, 69d, 66f	<0.02	0.02 - 0.035	>0.035
67g	<0.09	0.09 - 0.16	>0.16
66d, 66e, 66g	<0.01	0.01 - 0.018	>0.018

Pathogen Sampling

E Coli	**Number of Samples**		
	10	7	3
Statewide	<941	941 - 1647	>1647

Total Suspended Solids Sampling

TSS	**Number of Samples**		
	10	7	3
65a, 67i, 73a	<64	64 - 112	>112
65e, 65i, 74b	<29	29 - 51	>51
65b, 67g, 68c, 71e, 71g, 71i, 74a	<13	13 - 23	>23
65j, 66d, 66e, 66f, 66g, 67f, 67h, 68a, 68b, 69d, 71f, 71h	<10	10 - 18	>18

Metals Sampling

Metals	Number of Samples		
	10	7	3
Chromium (hexavalent)	<11	11 - 19.5	>19.5
Mercury	<0.77	0.77 - 1.35	>1.35
Aluminum	<338	338 - 592	>592
Iron	<1218	1218 - 2132	>2132
Manganese	<185	185 - 325	>325
Copper* 65e, 65j, 66d, 66e, 66g, 68a, 74b	<1.25	1.25 - 2.19	>2.19
Copper* 66f, 71f	<4.44	4.44 - 7.77	>7.77
Copper* 67f, 67h, 67i, 68b, 68c, 71g, 71h, 73a	<11.6	11.6 - 20.3	>20.3
Copper* 67g, 71e, 74a	<18.0	18.0 - 31.5	>31.5
Lead* 65e, 65j, 66d, 66e, 66g, 68a, 74b	<0.19	0.19 - 0.33	>0.33
Lead* 66f, 71f	<1.02	1.02 - 1.79	>1.79
Lead* 67f, 67h, 67i, 68b, 68c, 71g, 71h, 73a	<3.51	3.15 - 6.14	>6.14
Lead* 67g, 71e, 74a	<6.07	6.07 - 10.6	>10.6
Zinc* 65e, 65j, 66d, 66e, 66g, 68a, 74b	<16.8	16.8 - 29.4	>29.4
Zinc* 66f, 71f	<58.9	58.9 - 103	>103
Zinc* 67f, 67h, 67i, 68b, 68c, 71g, 71h, 73a	<153	153 - 268	>268
Zinc* 67g, 71e, 74a	<237	237 - 415	>415

* Dependent on Hardness

5. Sampling Downstream of Major Discharges and CAFO's

Water quality information is needed downstream of Major Facilities with NPDES permits and CAFO's. Parameters sampled should include those being discharged (including nutrients if WWTP) and SQSH. If the facility has in-stream monitoring requirements in their permits their data may be used. (Note: stations may not be required for dischargers into very large waterways such as the Mississippi River or large reservoirs.)

Stations should also be established downstream of CAFOs with an emphasis on monitoring biointegrity (SQSH survey if the stream is wadeable) and monthly nutrient and pathogen monitoring.

6. TMDL Development Monitoring

Waterbody monitoring is required to develop TMDLs. The frequency and parameters monitored for TMDL monitoring depends on the specific TMDL and is coordinated with the Watershed Management Unit.

7. Special Projects

Except for the Southeast Monitoring Network stations, most special project monitoring activities will be contracted to TDH State Lab.

8. Watershed Stream Monitoring

In addition to the previous priorities, each EFO should monitor additional stations to confirm continued support of designated uses and to increase the number of assessed waterbodies. Macroinvertebrate biorecons, habitat assessments, and field measurements of DO, specific conductance, pH and temperature are conducted at the majority of these sites. These priorities include:

Previously assessed segments that would likely revert to Category 3 unassessed status. (Note that a single site per assessed segment is normally adequate if assessment was supporting and no changes are evident).

Sites below ARAP activities in wadeable streams where biological impairment is suspected. Emphasis is placed on unpermitted activities, violations and those that are large scale or where there is a dense concentration of smaller alterations.

Stream reaches receiving extensive non-point source pollution for example large scale development, clusters of stormwater permits or an increase of more than 10% impervious surfaces.

Unassessed reaches in third order or larger streams or in disturbed headwaters.

Pre-restoration or BMP monitoing. In most cases this sampling would be to document improvements, but might also be needed to confirm that the stream is a good candidate for such a project. This protects against the possibility that a good stream could be harmed by unnecessary

Group 1 watershed streams will be monitored by EFOs (Appendix A) in FY 2016-2017.

Table 11 provides the parameters list for each project for sampling. The *QSSOP for Chemical and Bacteriological Sampling of Surface Water* (TDEC, 2011) describes chemical and bacteriological sampling, field parameter readings, and flow measurement procedures. The *QSSOP for Macroinvertebrate Stream Surveys* (TDEC, 2011) describes protocols for collection of benthic macroinvertebrate samples and habitat assessment. The *QSSOP for Periphyton Stream Surveys* (TDEC, 2010) describes protocols for collection of periphyton sampling.

9. Watershed Monitoring Projects 319(h) and 106 Grant Funds

Selected watershed sites will be monitored as part of a watershed strategy integrating point and non-point sources of pollution. These sites and strategies are described more completely in specific 319(h) and 106 grant applications. TDEC's partnership with the Non-point Source Program at the Tennessee Department of Agriculture has resulted in several contracts being awarded to TDEC involving:

- Watershed monitoring
- Unified Watershed Assessment (UWA), designated watersheds monitoring
- TMDL support

Table 11. Parameter List for the Water Column

(same list as 2016 QAPP)

Parameter	TMDLs				Ref. Sites ECO & FECO	303(d)*	Long Term Trend Stations	Watershed Sites	Trip and Field Blanks
	Metals† /pH	DO	Nutrients	Pathogens					
Acidity, Total	X (pH)							O	
Alkalinity, Total	X (pH)				X	O	X	O	
Aluminum, Al	X†					O	X	O	
Ammonia Nitrogen as N		X	X		X	O	X	O	
Arsenic, As	X†				X	O	X	O	O
Cadmium, Cd	X†				X	O	X	O	O
Chromium, Cr	X†				X	O	X	O	O
$CBOD_5$		X				O		O	
Color, Apparent					X		X		
Color, True					X		X		
Conductivity (field)	X	X	X	X	X	X	X	X	
Copper, Cu	X†				X	O	X	O	
Dissolved Oxygen (field)	X	X	X	X	X	X	X	X	
Diurnal DO		X	X						
E. Coli				X	O	O	X	O	¥
Flow	O	O	O	O	X	O		O	
Iron, Fe	X†				X	O	X	O	O
Lead, Pb	X†				X	O	X	O	O
Manganese, Mn	X†				X	O	X	O	O
Mercury, Hg	X†					O	X	O	O
Nickel, Ni	X†					O	X	O	O
Nitrogen NO_3 & NO_2		X	X		X	O	X	O	O
pH (field)	X	X	X	X	X	X	X	X	
Residue, Dissolved					X	O	X	O	
Residue, Settleable						O	X	O	
Residue, Suspended	X		X	X	X	O	X	O	
Residue, Total						O	X	O	
Selenium, Se	X				X	O	X	O	O
Sulfates					X (69de & 68a)	O	X	O	O
Temperature (field)	X	X	X	X	X	X	X	X	
Total Hardness	X				X	O	X	O	O
Total Kjeldahl Nitrogen		X	X		X	O	X	O	O
Total Organic Carbon	X		X		X	O	X	O	O
Total Phosphorus (Total Phosphate)		X	X		X	O	X	O	O
Turbidity			X	X	X	O	X	O	O
Zinc, Zn	X†				X	O	X	O	O
Biorecon					X			X (or SQSH)	
SQSH			X(or biorecon)		X	X (or biorecon) unless listed for pathogens			
Habitat Assessment					X	X		X	
Chlorophyll *a* (Non-wadeable)		R	X			O (required for nutrient)			
Periphyton (Wadeable)		R	X		X	R			

Optional (O) – Not collected unless the waterbody has been previously assessed as impacted by that substance or if there are known or probable sources of the substance.

† – Sample for pollutant on 303(d) List.

R – Recommended if time allows.
* - Minimally parameters for which stream is 303(d) listed must be sampled.
¥ - Sample E. coli for Field Blanks and for duplicates only if E. coli is collected for the routine sample.

Do not check these parameters on the lab sample request form, unless you have a specific reason to do so::**antimony, barium, beryllium, calcium, magnesium, potassium, silver, sodium, boron, silica, total coliform, fecal coliform, enterococcus, fecal strep, cyanide, Nitrogen Nitrate, Nitrogen Nitrite, ortho-phosphorus and $CBOD_5$**

B. Monitoring Activities

1. Macroinvertebrate Surveys

There are several levels of stream surveys undertaken by the division to fulfill various information needs. These surveys are a very important source of information for the 305(b) report, toxics monitoring, compliance and enforcement activities, and other division information needs.

The division utilizes standardized stream survey methodologies. The surveys performed rely heavily on biological data instead of chemical data. The *QSSOP for Macroinvertebrate Stream Surveys* (TDEC, 2011) describes protocols for collection of benthic macroinvertebrate samples and habitat assessment. The Planning and Standards Section is responsible for the coordination of survey activities. Macroinvertebrate sampling is listed in Appendix A.

A biological reconnaissance (Biorecon) is often performed when a brief visit to a stream is appropriate. The biorecon is a field based assessment that yields relatively small amounts of data in a short amount of time. These surveys can be used for a water quality assessment in which the presence or absence of clean water indicator organisms reflects the degree of support of designated uses.

A more intensive survey, collecting a Single Habitat Semi-Quantitative Bank (SQBANK) or Single Habitat Semi-Quantitative Kick (SQKICK), is used when a quantifiable assessment of the benthic community is needed. Biometrics using relative abundance can be calculated. This method can be compared to the division's numeric translators for biocriteria. Both biorecon and intensive surveys are valuable when information beyond long-term trend monitoring is needed concerning a specific location.

2. Fish Tissue Monitoring

Fish tissue samples are often the best way to document chronic low levels of persistent contaminants. In the mid-1980's, sites were selected that had shown significant problems in the past and would benefit from regularly scheduled monitoring, one to five year cycle. A list of established fish tissue stations appears in Table 12. Additional sampling stations have been added at the dewatering areas mentioned in the TWRA Reservoir Fishing Regulations (table 13). Parameters to be sampled are listed in Table 14. TDEC DWR, TVA, TWRA and DOE regularly discuss fish monitoring surveys in the state. Data from these surveys help the division assess water quality and determine the issuance of fishing advisories.

Table 12. Tentative Locations of Fish Tissue Sampling Sites

STATION ID	RESERVOIR NAME/STREAM NAME	LOCATION	PARAMETER	LAST FY SAMPLED	SAMPLING AGENCY
BEECH000.5WE	Beech Ck	Beech Creek embayment	Metals, Organics, Dioxin, PCBS	2008	TDH ABS
BEECH002.0WE	Beech Ck	U/S Morrison Creek	Organics, PCBS	1994	TDEC
BEECH036.0HE	Beech Res	Near Lexington	Metals	2015	TVA
BFORK002.5WA	Barren Fork Rv	Near Spring Cave McMinnville	Metals, Organics, PCBS	1995	TDEC
BFORK005.0FR	Tims Ford Res/Boiling Fork	Hwy 41 at Manchester	Metals, Organics, Dioxin, PCBS	1993	TDEC
BRADL000.0CE	Woods Res/Bradley Ck	Bradley Creek Embayment	PCBS	1989	TDEC
BRUMA000.0FR	Woods Res/Brumalow Ck	200' U/S old Brick Church Rd	Metals, Organics, PCBS	1999	TDEC
BSAND007.4HN	Kentucky Res/Big Sandy Rv	D/S Poplar Creek	Metals, Organics, PCBS	2015	TVA
BSAND015.1BN	Kentucky Res/ Big Sandy Rv	D/S of levee at dewatering area	Metals	2014	TDH ABS
BSAND021.1BN	Kentucky Res/ Big Sandy Rv	U/S Hwy 641/70	Metals	2014	TDH ABS
BSAND038.4BN	Kentucky Res/ Big Sandy Rv	Hwy 114	Metals	2014	TDH ABS
BUFFA017.7PE	Buffalo Rv	Old Hwy 14 D/s Lobelville	Metals, Organics, PCBS	2015	TVA
BUFFA026.0PE	Buffalo Rv	U/S Lobelville STP	Metals	2008	TWRA
BUFFA041.0PE	Buffalo Rv	Hwy 412 Linden	Metals	2008	TWRA
BUFFA073.1WE	Buffalo Rv	Hwy 13 near Flatwoods	Metals	2008	TWRA
BUFFA098.1LS	Buffalo Rv	Hwy 99 near Oak Grove	Metals	2008	TWRA
CFORK028.0DB	Center Hill Res	near Center Hill Dam	Metals, Organics, PCBS	1993	TDEC
CFORK058.9DB	Center Hill Res	Hwy 70/ Sligo Bridge	Metals, Organics, Dioxin, PCBS	1994	TDEC
CHATT000.9HM	Chattanooga Ck	Rendering Plant	Metals, Organics, Dioxin, PCBS	1999	TDEC
CLINC001.2RO	Watts Bar Res/Clinch River	Near Kingston	Metals	2009	TWRA

STATION ID	RESERVOIR NAME/STREAM NAME	LOCATION	PARAMETER	LAST FY SAMPLED	SAMPLING AGENCY
CLINC002.3RO	Watts Bar Res/Clinch Rv	Brashear Island	Metals, Organics	2004	DOE
CLINC006.8RO	Watts Bar Res/Clinch Rv	U/S Young Creek	Metals	2003	TVA
CLINC008.0RO	Clinch Rv	2 mi d/s of Brashear Island	Metals	2009	TWRA
CLINC010.0RO	Watts Bar Res/Clinch Rv	D/S Gallaher Bridge	Metals	2009	TWRA
CLINC014.5RO	Watts Bar Res/Clinch Rv	U/S East Fork Poplar Creek	Metals	2003	DOE
CLINC017.9RO	Watts Bar Res/Clinch Rv	Grubbs Island	Metals	2003	DOE
CLINC019.0RO	Watts Bar Res/Clinch Rv	Jones Island	Metals, PCBs	2017	TVA
CLINC022.0RO	Watts Bar Res/Clinch Rv	U/S Hwy 321	Metals	2017	TVA
CLINC024.0RO	Melton Hill Res/Clinch Rv	1 mi U/S Melton Hill Dam	PCBS	2017	TVA
CLINC043.5AN	Watts Bar Res/Clinch Rv	Solway Bridge	Metals	2007	DOE
CLINC045.0AN	Melton Hill Res/Clinch Rv	Near Hwy 62	PCBS	2017	TVA
CLINC048.0AN	Melton Hill Res/Clinch Rv	Bull Run Steam Plant	Metals,	2004	DOE
CLINC080.0CA	Norris Res/Clinch Rv	Near Dam	Metals, Organics, Dioxin, PCBS	2009	TVA
CLINC120.5UN	Norris Res/Clinch Rv	Hwy 33	Metals	2008	TWRA
CLINC125.0CL	Norris Res/Clinch Rv	D/S Straight Creek	Metals	2007	TWRA
CLINC128.0CL	Clinch Rv	Black Fox Area	Organics, PCBS	2009	TWRA
CLINC172.4HK	Clinch Rv	D/S Swan Island	Metals, Organics, PCBS	2006	TVA
CUMBE185.7DA	Cheatham Res/Cumberland Rv	Bordeaux Bridge	Metals, Organics, Dioxin, PCBS	2007	TDEC
CUMBE191.1.DA	Cheatham Res/Cumberland Rv	Shelby Street Bridge	Metals, Organics, PCBS, Dioxin	2007	TDEC
CUMBE216.2DA	Old Hickory Res/Cumberland Rv	Near dam	Metals, Organics, Dioxin, PCBS	1993	TDEC
DUCK002.0HU	Kentucky/Duck Rv	Embayment	Metal, Organics, PCBS	2008	TWRA
DUCK022.0HU	Duck Rv	Hite Ford	Mercury	2015	TVA

STATION ID	RESERVOIR NAME/STREAM NAME	LOCATION	PARAMETER	LAST FY SAMPLED	SAMPLING AGENCY
DUCK026.0HU	Duck Rv	D/S Tumbling Creek	Metal, Organics, PCBS	2011	TVA
DUCK032.2HI	Duck Rv	Hwy 22 near Only	Metal, Organics, PCBS	2008	TWRA
DUCK064.0HI	Duck Rv	Hwy 50, D/S Centerville	Metal, Organics, PCBS	2008	TWRA
DUCK113.9MY	Duck Rv	Hwy 50 @ Williamsport	Metal, Organics, PCBS	2008	TWRA
DUCK249.5CE	Normandy Res/Duck Rv	Near dam		2017	TVA
DUCK255.1CE	Normandy Reservoir	Near pumping station	Hg,Se	2014	TDH ABS
EFPOP007.0RO	East Fork Poplar Ck	U/S Gum Hollow Road	Metals, Organics, Dioxin, PCBS	1998	TDEC
ELK036.5GS	Elk Rv	Prospect	Metals, Organics, PCBS	2008	TDEC
ELK041.5GS	Elk Rv	d/s Richland Creek at Hanna Ward Bridge		2014	TDH ABS
ELK077.1LI	Elk Rv	Off Hwy 273 D/S Fayetteville	Metals, Organics, PCBS	2008	TDEC
ELK135.0FR	Tims Ford Res/Elk Rv	Near Marble Plains	Hg, Se	2017	TVA
ELK150.0FR	Tims Ford Res/Elk Rv	Hwy 41, Maple Bend	Hg, Se	2017	TVA
ELK176.0FR	Woods Res/Elk Rv	Near Hwy 127 causeway	Metals, Organics, PCBS	1999	TDEC
EMORY021.4MG	Emory Rv	Camp Austin Bridge Deermont Rd	Mercury, PCBs	2017	TVA
EMORY027.7MG	Emory Rv	Nemo Br	Mercury	2008	TWRA
FBROA033.0S V	French Broad River	Douglas Reservoir near dam		2017	TVA
FBROA051.0JE	Douglas Res/French Broad Rv	Near Indian Creek and Douglas Estates	Metals, Organics, PCBS	2017	TVA
FBROA061.0CO	Douglas Res/French Broad Rv	Taylor Bend D/S Allen Ck	Dioxin	1993	TDEC
FBROA071.4CO	Douglas Res/French Broad Rv	Rankin Bridge	Metals, Organics, Dioxin, PCBS	2014	TDH ABS

STATION ID	RESERVOIR NAME/STREAM NAME	LOCATION	PARAMETER	LAST FY SAMPLED	SAMPLING AGENCY
FBROA077.5CO	French Broad Rv	Hwy 321 bridge at junction with Hwy 160 NE of Newport	Metals	2017	TVA
FBROA083.5CO	French Broad Rv	Hwy 70 east of Newport	Metals, Organics, Dioxin, PCBS	2014	TDH ABS
FBROAD033.0SV	Douglas Res/French Broad Rv	Near dam	Metals, Organics, Dioxin, PCBS	2008	TWRA
FWATE005.2PU	Center Hill Res/Falling Water Rv	U/S Cookeville Boatdock	Metals, Organics, PCBS	1993	TDEC
GREEN011.0WE	Green Rv			2008	TWRA
HARPE110.7WI	Harpeth Rv	D/S General Smelting	Metals	1999	TDEC
HATCH001.2TI	Hatchie Rv		Metals, Organics, PCBS	2007	TWRA
HATCH004.6TI	Hatchie River	D/D Indian Creek	Metals	2017 Tenative	TDH ABS
HATCH055.0TI	Hatchie River	Hwy 54 at Brownsville-off boat Ramp	Metals	2017 Tenative	TDH ABS
HATCH086.1	Hatchie River	Hwy 76 near Koko	Metals	2017 Tenative	TDH ABS
HATCH126.9	Hatchie River	Hwy 100 Br Near Toone D/S from Bolivar	Metals	2017 Tenative	TDH ABS
HATCH147.9HR	Hatchie River	Upstream Hwy 64	Metals	2017 Tenative	TDH ABS
HIWAS007.4ME	Chickamauga Res/Hiwassee Rv	Bridge on TN Hwy 58	Metals, Organics, PCBS	2012	TVA
HIWAS012.0BR	Chickamauga Res/Hiwassee Rv	Near Rogers Ck	Metals	1990	TVA
HIWAS015.4MM	Chickamauga Res/Hiwassee Rv	I-75, D/S/ Bowaters	Metals, Organics, Dioxin, PCBS	2007	TDEC
HIWAS018.6MM	Chickamauga Res/Hiwassee Rv	U/S Hwy 11 Bridge	Metals, Organics, Dioxin, PCBS	2008	OCEAN
HIWAS037.0PO	Hiwassee Rv	Patty Station Rd	Metals	2012	TVA
HIWASS057.5PO	Hiwassee Rv	Mouth of Coker Creek	Metals	2013	TDH ABS
HOLST055.0GR	Holston Rv	forebay	Metals	2015	TVA
HOLST076.0HA	Holston Rv	Mid-reservoir	Metals	2015	TVA
HOLST097.5HS	Holston Rv	Cherokee Lake at Malinda Br		2009	TWRA

STATION ID	RESERVOIR NAME/STREAM NAME	LOCATION	PARAMETER	LAST FY SAMPLED	SAMPLING AGENCY
HOLST118.7HS	Holston Rv	U/S Cox Island Near Surgoinsville	Metals	2015	TVA
HOLST121.0HS	Holston Rv	Phipps Bend	Metals	2007	TWRA
HOLST131.5HS	Holston Rv	Near Goshen Valley bridge	Metals	2007	TWRA
HOLST135.0HS	Holston Rv	D/S Holston Army Ordinance near Goshen Valley	Metals, Organics, Dioxin, PCBS	2007	TDEC
LITTL001.0BT	Fort Loudon/Little River	Near East Topside Road	Metals, Organics, Dioxin, PCBS	1993	TDEC
LOOSA001.5SH	Loosahatchie Rv	Benjestown Road	Metals, Organics, Dioxin, PCBS	2015	TDH ABS
LOOSA005.0SH	Loosahatchie Rv	Watkins Rd	Metals, Organics, Dioxin, PCBS	2015	TDH ABS
LOOSA017.0SH	Loosahatchie Rv	Hwy 14	Metals, Organics, Dioxin, PCBS	2015	TDH ABS
LSEQU001.3MI	Little Sequatchie Rv	Hwy 28 Bridge	Hg, Se	2014	TDH ABS
LSEQU009.0MI	Little Sequatchie Rv	Off Coppinger Cove Rd	Hg, Se	2014	TDH ABS
LTENN001.0LO	Tellico Res/Little Tennessee River	At dam	Metals, Organics, PCBS	2014	TDH ABS
LTENN015.0LO	Tellico Res/Little Tennessee River	U/S Baker Creek	Metals, Organics, PCBS	2014	TDH ABS
MCKEL001.8SH	McKellar Lake	McKellar Lake	Metals, Organics, Dioxin, PCBS	2014	TDH ABS
MISSI724.6SH	Mississippi Rv	Memphis South Plant	Metals, Organics, Dioxin, PCBS	2014	TDH ABS
MISSI735.0SH	Mississippi Rv	I-40	Metals, Organics, Dioxin, PCBS	2014	TDH ABS
MISSI754.0TI	Mississippi Rv	Meeman-Shelby S.P.	Metals, Organics, Dioxin, PCBS	2014	TDH ABS
MISSI786.0LE	Mississippi Rv	Osceola	Metals, Organics, Dioxin, PCBS	2014	TDH ABS
MISSI817.8LE	Mississippi Rv	Blytheville	Metals, Organics, Dioxin, PCBS	2014	TDH ABS
MISSI846.0LA	Mississippi Rv	Caruthersville	Metals, Organics, Dioxin, PCBS	2014	TDH ABS

STATION ID	RESERVOIR NAME/STREAM NAME	LOCATION	PARAMETER	LAST FY SAMPLED	SAMPLING AGENCY
MISSI873.0LA	Mississippi Rv	Tiptonville	Metals, Organics, Dioxin, PCBS	2014	TDH ABS
NFFDE009.8DY	North Fork Forked Deer Rv	Hwy 412 Linden	Metals	2013	TDH ABS
NFFDE020.5DY	North Fork Forked Deer Rv	Hwy 104	Metals, Organics, PCBS	2014	TDH ABS
NFHOL004.6SU	North Fork. Holston Rv	Bridge at Cloud Ford	Metals	2015	TVA
NOLIC008.5HA	Nolichucky Rv	Hurley Island	Hg, Se	2017	TVA
NOLIC072.5WN	Nolichucky Rv	Jonesboro Water Plant Intake	Metals, Organics, PCBS	1992	TDEC
NOLIC097.5UC	Nolichucky Rv	Chestoa Bridge	Hg, Se	2014	TDH ABS
OBED021.1CU	Obed River	Potters Bridge		2010	TWRA
OBEY008.0CY	Dale Hollow Res/Obey Rv	Near dam	Organics, Dioxin, PCBS	1993	TDEC
OBION002.0DY	Obion River	Near Hwy 181	Metals, Organics, Dioxin	2007	TWRA
OCOEE012.5PO	Parksville Res/Ocoee Rv	Near dam (Ocoee # 1)	Metals, Organics	2010	TVA
OCOEE014.0PO	Parksville Res/Ocoee Rv	Near FR 17 (Ocoee #1)	Metals, Organics	1992	TDEC
OCOEE031.0PO	Parksville Res/Ocoee Rv	Near Tumbling Creek Ocoee #3	Metals, Organics, Dioxin, PCBS	1994	TDEC
PIGEO007.6CO	Pigeon Rv	Tannery Island u/s of Newport	Hg, Se 106 organics, dioxin	2014	TDH ABS
PIGEO008.2CO	Pigeon Rv	Tannery Island	Metals, Organics, Dioxin, PCBS	2017	TVA
PIGEO016.5CO	Pigeon Rv	Denton Greasy Cove Road	Hg, Se 106 organics, dioxin	2014	TDH ABS
PIGEO024.7CO	Pigeon Rv	Waterville Powerhouse	Hg, Se 106 organics, dioxin	2014	TDH ABS
POPLA000.1RO	Watts Bar Res/Poplar Ck	Watts Bar Embayment D/S DOE-25 plant	Metals, Organics, PCBS	1998	TDEC
POWEL030.0UN	Norris Reservoir/Powell Rv	Stiners Woods	Metals	2009	TVA
REELF00002LA	Reelfoot Lake	Lower Blue Basin at Rays Camp	Metals, Organics,	2017	TDH ABS Tentative
REELF000030B	Reelfoot Lake	Indian Creek Embayment	Metals, Organics,	2017	TDH ABS Tentative
REELF000050B	Reelfoot Lake	Walnut Log Ditch	Metals, Organics,	2017	TDH ABS Tentative

STATION ID	RESERVOIR NAME/STREAM NAME	LOCATION	PARAMETER	LAST FY SAMPLED	SAMPLING AGENCY
RICHL024.3GS	Richland Creek	Pulaski, U/S Lowhead dam and STP	Metals	2008	TDEC
ROLLI000.0FR	Woods Res/Rollins Ck	Embayment	Metals, Organics, Dioxin, PCBS	2008	TDEC
SEQUA006.3MI	Sequatchie River	Valley Ebenezer Road		2011	TVA
SEQUA007.1MI	Sequatchie River	Nickletown	Metals	2017	TVA
SEQUA023.0MI	Sequatchie River	Near Whitwell	Metals	2008	TDEC
SEQUA048.8SE	Sequatchie River	Hwy 111 near Dunlap	Metals	2008	TDEC
SFFDE027.7HY	South Fork Forked Deer River	Hwy 54	Metals	NA	TDH ABS
SFHOL001.1SU	South Fork Holston River	Ridgefields Bridge in Kingsport	Metals, Organics, Dioxin, PCBS	2008	TDEC
SFHOL002.9SU	South Fork Holston River	Hwy 126 bridge near Kingsport	Metals, Organics, Dioxin, PCBS	2008	TDEC
SFHOL007.7SU	South Fork Holston River	D/S Ft. Patrick Henry Dam	Metals, Organics, Dioxin, PCBS	1998	TDEC
SFHOL008.5SU	Ft. Patrick Henry Res/South Fork Holston Rv	Ft. Patrick Lake at Dam	Metals, Organics, PCBS	2017	TVA
SFHOL018.8SUB	Boone Res/South Fork Holston Rv	Dam	Metals, Organics, Dioxin PCBS	2017	TVA
SFHOL022.5SU	Boone Res/South Fork Holston Rv	Mouth of Wagner Creek	Metals, Organics, Dioxin, PCBS	2007	TDEC
SFHOL027.0SU	Boone Res/South Fork Holston Rv	South Holston Arm/ U/S Devault Road Bridge	Metals, Organics, Dioxin, PCBS	2017	TVA
SFHOL050.0SU (51.)	South Fork Holston	South Holston Lake Dam	Metals	2015	TVA
SFHOL062.7SU (62.5)	South Fork Holston	TN/VA line over South Holston Lake	Metals	2015	TVA
TENNE085.0HU	Kentucky/Tennessee Rv	D/S Turkey Creek (and transition QA)	Metals, Organics, PCBS	2015	TVA
TENNE097.0HU	Kentucky/Tennessee Rv	D/S Dupont-Johnsonville Plant	Metals, Organics, Dioxin, PCBS	2008	TDEC
TENNE200.0HD	Kentucky/Tennessee Rv	Near Hamburg and Inflow QA	Metals, Organics, PCBS	2008	TVA
TENNE206.7HD	Tennessee River			2011	TVA

STATION ID	RESERVOIR NAME/STREAM NAME	LOCATION	PARAMETER	LAST FY SAMPLED	SAMPLING AGENCY
TENNE230.0_AL	Tennessee River			2011	TVA
TENNE424.0MI	Tennessee River	In Tailwaters of Nickajack Dam		2017	TVA
TENNE417.1MI	Guntersville/Tennessee Rv	South Pittsburg Waterworks Intake	Metal, Organics, PCBS	1992	TDEC
TENNE425.5MI	Nickajack Res/Tennessee Rv	Near dam	Metals, Organics, PCBS	2009	TVA
TENNE457.2HM	Nickajack Res/Tennessee Rv	D/S Moccasin Bend WWTP	Metals, Organics, Dioxin, PCBS	2004	TVA
TENNE469.0HM	Nickajack Res/Tennessee Rv	Tailwater	Metals, Organics, PCBS	2009	TVA
TENNE472.3HM	Chickamauga Res/Tennessee Rv	Chickamauga Forebay near lighted buoy	Metals, Organics, Dioxin, PCBS	2009	TVA
TENNE489.8HM	Chickamauga Res/Tennessee Rv	Opossum Ck Light	Metals, Organics, PCBS	2009	TVA
TENNE518.0ME	Chickamauga Res/Tennessee Rv	Hwy 30	Metals, Organics, PCBS	2009	TVA
TENNE529.5HM	Chickamauga Res/Tennessee Rv	Below Watts Bar Dam	Metals, Organics, PCBS	2003	TVA
TENNE531.0RH	Watts Bar Res/Tennessee Rv	Near dam	Metals, PCBS	2017	TVA
TENNE560.8RO	Watts Bar Res/Tennessee Rv	Near Bullet Branch	Metals, PCBS	2017	TVA
TENNE600.0LO	Watts Bar Res/Tennessee Rv	D/S/ Ft. Loudon/Tellico Reservoirs near Lenoir City	Metals, PCBS	2017	TVA
TENNE602.0LO	Watts Bar Res/Tennessee Rv	Ft. Loudon dam tailrace	Metals, Organics, PCBS	2017	TWRA
TENNE604.0LO	Ft. Loudoun Res/Tennessee Rv	Forebay	Metals, Organics	2011	TVA
TENNE624.6KN	Ft. Loudoun Res/Tennessee Rv	D/S Lackey Creek near Lakeview	Metals, Organics, PCBS	2011	TVA
TENNE643.3KN	Ft. Loudoun Res/Tennessee Rv	Marine Base	Metals, Organics, Dioxin, PCBS	1999	TDEC
TENNE652.0KN	Ft. Loudoun Res/Tennessee Rv	D/s Confluence French Broad River	Metals, Organics, PCBS	2011	TVA
WATAU003.0SU	Boone Res/Watauga Rv	Watuaga arm near Deerlick Bend	Metals, Organics, Dioxin, PCBS	2007	TDEC

STATION ID	RESERVOIR NAME/STREAM NAME	LOCATION	PARAMETER	LAST FY SAMPLED	SAMPLING AGENCY
WATAU006.0SUB	Boone Res/Watauga Rv	Watauga Rv Arm At Pickens Bridge	Metals, Organics, PCBs	2017	TVA
WATAU036.6CT (37.4)	Watauga Rv	Watauga Lake at dam (forebay)	Metals	2015	TVA
WATAU045.6JO (45.5)	Watauga Rv	Near Elk River Embayment (mid reservoir)	Metals	2015	TVA
WOLF000.5SH	Wolf Rv	North Plant Pipe crossing	Organics, PCBS	1992	TDEC
WOLF001.8SH	Wolf Rv	Hwy 51 near mouth	Metals, Organics, Dioxin, PCBS	2014	TDH ABS
WOLF009.3SH	Wolf Rv	Hwy 14	Metals, Organics, Dioxin, PCBS	1998	TWRA
WOLF015.3SH	Wolf Rv	Walnut Grove Road	Organics	2014	TDH ABS

Table 13 .Tentative Fish Sampling in Dewatering Areas Mentioned in TWRA Reservoir Fishing Regulations

Reservoir	Water body	Location	DWR Station ID	Lat	Long	Management	Closed Season	Fish Collection	Agency to Sample	Crappie Legal Size	Bass Legal Size	Target Fish (5 each)	Parameter
Barkley	Cumberland River Dewatering Area	Dover Bottoms (Barkley Unit 1) Wildlife Management Area	CUMBE_DW087.5ST	36.50619	-87.84801	TWRA	Nov-March	Mid March - May	TDEC	10 in	LMB 15 in SMB 18 in	Legal size black and white crappie, LMB (or SMB), Redear	Hg, Se
Barkley	Cumberland River Dewatering Area	Bear Creek Waterfowl Management Area	CUMBE_DW082.5ST	36.56100	-87.89748	TWRA	Nov-March	Mid March - May	TDEC	10 in	LMB 15 in SMB 18 in	Legal size black and white crappie, LMB (or SMB), Redear	Hg, Se
KY Lake	Big Sandy River Dewatering Area	Big Sandy Dewatering Area	BSAND_DW016.0BN	36.22589	-88.10365	TVA	Nov-March	Mid March - May	TVA	10 in	LMB 15 in SMB 15 in	Legal size black and white crappie, LMB (or SMB), Redear	Hg, Se

Reservoir	Water body	Location	DWR Station ID	Lat	Long	Management	Closed Season	Fish Collection	Agency to Sample	Crappie Legal Size	Bass Legal Size	Target Fish (5 each)	Parameter
KY Lake	Big Sandy River Dewatering Area	Gin Creek Dewatering Area (Part of Big Sandy)	BSAND_DW018.5BN	36.20678	-88.13843	TWRA	Nov-March	Mid March - May	TDEC (Check with TVA)	10 in	LMB 15 in SMB 15 in	Legal size black and white crappie, LMB (or SMB), Redear	Hg, Se
KY Lake	Tennessee River Dewatering Area	Camden Dewatering Area (Camden Bottoms)	TENNE_DW102.5BN	35.99633	--88.02077	TVA	Nov-March	Mid March - May	TVA	10 in	LMB 15 in SMB 15 in	Legal size black and white crappie, LMB (or SMB), Redear	Hg, Se
KY Lake	Duck River Dewatering Area	Duck River Dewatering Area (Duck River Bottoms)	DUCK_DW004.0HU	35.97731	-87.92152	USFWS	Nov-March	Mid March - May	TDEC (Check with TVA)	10 in	LMB 15 in	Legal size black and white crappie, LMB (or SMB), Redear	Hg, Se

Reservoir	Water body	Location	DWR Station ID	Lat	Long	Management	Closed Season	Fish Collection	Agency to Sample	Crappie Legal Size	Bass Legal Size	Target Fish (5 each)	Parameter
KY Lake	Tennessee River Dewatering Area	Busseltown Dewatering Area	TENNE_DW131.5DE	35.67634	-88.02572	USFWS	Nov-March	Mid March - May	TDEC (Check with TVA)	10 in	LMB 15 in	Legal size black and white crappie, LMB (or SMB), Redear	Hg, Se

Table 14. Analyses for Fish Tissue

Parameter		Parameter		Parameter
Weight (Pounds)		Chlordane, total		Methoxychlor
Length (Inches)		CIS Chlordane		Dioxins
Lipid Content (Percent)		Trans Chlordane		Selenium
PCBs		CIS Nonachlor		Zinc
Aldrin		Trans Nonachlor		Furans
Dieldrin		Alpha BHC		
DDT, total		Gamma BHC		
O, P - DDE		Hexachlorobenzene		
P, P - DDE		Arsenic		
O, P - DDD		Cadmium		
P, P - DDD		Chromium		
O, P - DDT		Copper		
P, P - DDT		Mercury		
Endrin		Lead		

* Fish Tissue results reported in mg/kg (ppm), wet weight. Analyzed by Tennessee Department of Health (TDH), Laboratory Services or a contract laboratory.

C. Stream and Reservoir Posting

The TDEC Commissioner is identified in the Tennessee Water Quality Control Act as having the authority to post bodies of water based on public health concerns. The Commissioner has delegated authority to the Director of the Division of Water Resources. This authority is carried out with assistance from TWRA and TVA. Bacteriological contamination is the major reason for posting a stream against water contact recreation. The major reason for posting a stream against the consumption of fish is bioaccumulation of carcinogens. The most current list of posted streams can be found in on
http://tn.gov/assets/entities/environment/attachments/water_fish-advisories.pdf
The list is also published in the 305(b) Report which is published every two years.

D. Sediment Sampling

The division collected a considerable number of sediment samples from 1984 - 1994. However, analysis of the data has been handicapped by a lack of sediment criteria. When criteria become available, analysis of sediment samples will be a more widely used component of long-term trend monitoring. During FY 2016-2017, sediment samples will be collected on an as-needed basis.

E. Wetlands Monitoring (draft)

Tennessee has approximately 787,000 acres of wetlands. The division has identified 54,811 impacted wetland acres. Historically, the largest single cause of impacts to existing wetlands was loss of hydrologic function due to channelization and leveeing. Presently development such as roads, subdivisions and commercial centers are impacting wetlands more than other activities.

Tennessee received a grant from EPA to develop a protocol for wetland assessment and to apply the state's antidegradation rules to wetlands permitting issues. Tennessee has completed its development of a rapid assessment methodology for wetlands. The Tennessee Rapid Assessment Methodology (TRAM) is based on models developed as part of the Hydrogeomorphic (HGM) approach for assessing wetland function in Tennessee. Tennessee has now developed HGM models for depressional, riverine, flat and slope wetlands.

The TRAM will allow for the identification of exceptional wetlands, impaired wetlands, aid in assessing the ecological consequences of §401 and ARAP permitting decisions, and assist in implementation the state's antidegradation rules. The Division of Water Resources Waterlog database will enable the permitting program to track compliance and provide a source of wetland impact and mitigation data for use by agencies involved in wetland's monitoring and research.

In 2010 Tennessee partnered with U.S. Army Corps of Engineers (COE) and The Nature Conservancy to undertake one pilot watershed approach project in Tennessee to fulfill the requirements of the 2008 COE/ EPA Compensatory Mitigation Rule. The pilot Watershed Approach project in Tennessee was targeted for completion by the end of calendar year 2012. The project has not been completed yet. The end product of this project will be 1) a watershed plan that identifies viable/potential wetland and stream restoration and preservation priorities in the selected 8-digit watershed; and 2) a report that summarizes the methodology utilized to apply the Watershed Approach in development of the plan. The report will be designed to serve as a guide for the application of the Watershed Approach in the region.

Tennessee Tech University was awarded an EPA grant to assess wetland mitigation in Tennessee and update their previous study from the late 1990's. The division is assisting in this assessment.

In 2013 TDEC was awarded an EPA Wetland Program Development Grant to build a sustainable and focused wetland program for the state of Tennessee. A key component of the grant is to develop a Wetland Program Plan built on the EPA's Core Elements Framework. This plan will outline the major provisions of the grant and the steps TDEC will take to accomplish them. Some of the primary goals are training personnel on the use of the Tennessee Rapid Assessment Method, the development of a Qualified Wetland Professional (QWP) Program, development of a stream functional assessment to guide compensatory mitigation projects, additional emphasis on enforcement and compliance, and the development of water quality standards for wetlands.

F. Southeast Monitoring Network Sites in Tennessee FY 106 Supplemental Monitoring Initiatives

During the Southeastern Water Pollution Biologist Association(SWPBA) annual meeting, in November 2011, the potential for stream community changes resulting from variations in hydrology and termperature as a result of changing climate was a focus of the Southeastern Water Pollution Biologist Association (SWPBA). The result was the creation of an interagency workgroup consisting of freshwater biologists from the eight EPA region IV states and the Tennessee Valley Authority (TVA) interested in developing a joint reference stream monitoring network. Staff from EPA, USFS and USGS are also on the committee to provide technical support and advise. Although two goals of the group are to assess existing responses to climate change and identify climate-sensitive indicators, it was agreed that a reference network with consistent sampling methodology would be useful for establishing regional reference conditions and consistency in assessments of shared watersheds and ecoregions.

Each of the region IV states and TVA agreed to target and monitor reference streams beginning in 2013 and continue annual monitoring indefinitely. Existing monitoring programs will be adjusted at key reference sites to include additional parameters so that monitoring will be consistent for all sites in the network. At a minimum, sampling will include macroinvertebrates, habitat assessments, field parameters, flow and continuous temperature monitoring. Some agencies, including TN intend to add periphyton, water quality, channel profiles and continuous flow. TVA has agreed to sample fish at sites draining into the Tennessee River.
Protocols and selection of vulnerable streams were based on studies done by the Northeast Regional Monitoring Network. Existing data will be mined where available.

The goal is to establish a minimum of 30 reference sites in protected watersheds where land-use is not expected to change significantly for at least 20 years. Tennessee has agreed to monitor 10 sites in ecoregions 66, 67, 68 and 71 (Table 15). Ten sites will enable some statistical determinations using sate data in addition to analysis of grouped data.

1. Project Objectives

a. Establish annual monitoring at 10 reference streams consistent with protocols agreed upon by Southeast Monitoring Network.

b. Develop a formal interagency partnership to develop a monitoring program that is done consistently, long-term and can withstand changes in staff.

c. Combine data with other SE states for statistical interpretation of current reference condition and changes over time in undisturbed systems.

d. Determine whether stream communities are being affected by variables such as changes in hydrology, temperature or riparian vegetation species.

e. Distinguish natural variation from other stressors.

f. Isolate biometrics/taxa that would be related to extreme weather events.

g. Detect changes early in a way that informs management strategies such as restoration and adaption.

Table 15. Southeast Monitoring Network Sites – Tennessee

Station	Stream	EFO	Lat	Long	HUC	ECOIV	Drainage sq mi.	% Forest	Protected Drainage
ECO66E09	Clark Creek	JC	36.15077	-85.5291	TN06010108	66E	9.2	96	Sampson Mtn. Wilderness Cherokee NF
ECO66G05	Little River	K	35.65333	-83.5773	TN06010201	66G	34.9	100	Great Smoky Mtns. NP
ECO66G12	Sheeds Creek	CH	35.00305	-84.6122	TN03150101	66G	5.7	99	Big Frog Wilderness Cherokee NF
ECO66G20	Rough Creek	CH	35.05386	-84.48031	TN06020003	66G	6.04		
ECO6702	Fisher Creek	JC	36.4900	-82.9403	TN06010104	67F	11.6		
ECO67F06	Clear Creek	K	36.21361	-84.0597	TN06010207	67F	4.59		
ECO67F13	White Creek	K	36.34361	-83.89166	TN06010205	67F	3.1	91	Chuck Swann Wildlife Management Area
ECO68A03	Laurel Fork Station Camp Creek	MS	36.51611	-84.6981	TN05130104	68A	5.9	90	Big South Fork NRRA
ECO68C20	Crow Creek	CH	35.1155	-85.9111	TN06030001	68C	18.4	95	Carter State Natural Area
ECO71F19	Brush Creek	CL	35.4217	-87.5355	TN06040004	71F	13.3		
ECO71F29	Hurricane	N	35.99393	87.7554	TN06040003	71f	21.5		
ECO71H17	Clear Fork Creek	CK	35928651	-85.992117	TN05130108	71H	14.3		
MYATT005.1CU	Myatt Creek	CK	36.1299	-84.9827	TN06010208	68A	5.1		

2. Methodology

a. Develop a joint inter-agency monitoring plan.

b. Select 10 established reference sites based on agreed upon reference criteria in ecoregions 66, 67, 68 and 71.

c. Deploy two continuous monitoring temperature and water level (barometric pressure) probes at each site (both water and air).

d. Monitor each site in April and September for macroinvertebrates and periphyton in April. Conduct habitat assessments concurrent with biological monitoring (Table 15).

e. Analyze biological data to species level.

f. Monitor each site four times annually (January, April, July, September) for standard TN ecoregion reference water quality parameters as well as any additional parameters specified by SE monitoring group.

g. Measure flow and field parameters quarterly at each site.

All field sampling and sample collection will be conducted by trained Environmental Scientists with Tennessee Department of Environment and Conservation (TDEC), Division of Water Resources. Macroinvertebrate analyses to species level will be contracted to Aquatic Resources Center through the Aquatic Biology Section, Tennessee Department of Health (TDH). Periphyton analysis will be conducted the Aquatic Biology Section. Chemical analysis will be completed by the Inorganic Chemistry Section, TDH. Data will be maintained and publicly available in a joint database with data from other agencies in the monitoring network.

III. WASTE LOAD ALLOCATION/TMDL DEVELOPMENT

A. Wasteload Allocations/TMDL Development – (state appropriations, 106 funds, and 319(h) funds)

Prior to issuance of NPDES permits, the limits for specific chemical constituents of the effluent must be determined. This process, known as a wasteload allocation, is based on the amounts of pollutants that the receiving waters can assimilate without adversely affecting the uses of the water.

Wasteload allocations are performed using computer models that represent the complicated physical and chemical processes occurring in the receiving waters. Variables in this mathematical model are often assumed, but would ideally be confirmed and verified by performing a field study called an assimilative capacity survey. EPA's consent decree requires that all 792 water quality segments and associated pollutants on the 1998 303(d) list be addressed either by the division developing a TMDL, EPA developing a TMDL, or EPA determining that a TMDL is no longer needed (Table 16). The development of the TMDLs by the division is funded by state appropriations, 106 funds, and 319(h) funds. There are no streams being sampled for TMDLs in FY 16-17.

Table 16. Cumulative Percent and Number of TMDLs

Year	Cumulative % of TMDLs to be Submitted that appear on the 1998 303(d) List	Cumulative Number of TMDLs to be Submitted that appear on the 1998 303(d) List
2002	5%	40
2003	10%	80
2004	15%	120
2005	20%	160
2006	25%	200
2007	40%	319
2008	55%	438
2009	70%	557
2010	85%	676
2011	100%	792

*Agreement between TDEC and EPA (May 1998). If unexpected circumstances warrant it, TMDLs may be written regardless of their scheduled development.

IV. COMPLAINTS, FISH KILLS, WASTE SPILLS AND OTHER EMERGENCIES

A. Complaints

The division investigates and attempts to resolve over 3000 complaints each year. Most of these are filed by private citizens who wish to convey information concerning suspected pollution events. As such, these complaint investigations are an important source of information. The division places a high priority on the investigation of these reports. Staff are assigned to this activity for the investigation to be accomplished in a timely and efficient manner. Due to its sporadic nature, complaint investigations are difficult to plan and often divert staff from other program needs.

On occasion, a formal 118(a) complaint is filed with the Commissioner's office. When the complaint involves water pollution, a formal process coordinated by the Enforcement and Compliance Section is begun. The division investigates the complaint and develops a formal response, which is then approved by the Commissioner's office.

B. Fish Kills, Waste Spills, and other Emergencies

The Federal Emergency Management Agency (FEMA) requires that each state have an Emergency Management Plan (EMP). Employees of the State are required to serve under emergency situations. The State has instituted the Tennessee Emergency Management Agency (TEMA) program for coordinating emergency response to spills of materials that may adversely affect Tennessee's waters. The main responsibilities are to respond in all emergency situations including, but not limited to:

1. Disasters, including natural and accidental; for example, truck wrecks or train derailment, structural or mechanical failure, fish kills due to spills or bypassing from wastewater treatment plants, etc.
2. War-related emergency (conventional or nuclear)
3. Resource crises (for example, shortage of water treatment plant chemicals)

When a fish kill is reported to the division, the ensuing investigation is often a joint effort between the division and the Tennessee Wildlife Resources Agency (TWRA). When arriving on-site, a preliminary attempt is made to determine whether the fish kill is due to natural conditions or human causes. If the fish kill appears related to pollution, division staff members collect samples, take photographs, and inspect nearby facilities for potential pollutant sources. The TWRA officer counts and identifies the dead fish, and calculates a monetary value of the damage to the fishery. An enforcement package is prepared if a source can be identified and turned over to the Enforcement and Compliance Section of DWR. A detailed list of waste spills and fish kills will be kept for environmental indicator purposes.

Organizational changes in TDEC have resulted in the creation within each EFO of an Emergency Response Team (ERT). If a waste spill has occurred, the ERT responds to major emergencies; teams usually have a DWR staff member and staff from other divisions. Moderate emergencies may be handled by DWR or the ERT, depending on the ERT's decision. Minor emergencies are handled by DWR. As soon as the major emergency is over, the ERT turns over the follow-up activities and remediation efforts to DWR or Solid Waste Management (SWM) as appropriate. DWR may recommend containment and mitigation efforts on-site.

V. COMPLIANCE MONITORING

A. Facility Inspection Schedule

The information in Appendix B reflects the proposed activities in the areas of compliance assurance and operation and maintenance (O & M) inspections for FY 16-17. These inspections have been coordinated to fulfill the data needs of the permits, O & M, and enforcement programs. Major facilities generally have a higher compliance rate than minors and do not necessarily need a compliance evaluation every year. Facilities in noncompliance with permit limits will be given priority scheduling. Inspections should be entered into Waterlog and into PCS (ICIS-NPDES). The DWR NPDES inspection year reflects EPA's fiscal year, October 1, 2016 – September 30, 2017.

B. Pretreatment Inspections and Audits

As part of the state's NPDES permit program, the division has developed and administers the pretreatment program. The intent of the pretreatment program is to prevent interference with, or inhibitions of, the pollutant removal performance of the wastewater treatment facility; provide protection for sludge disposal, provide protection for the receiving stream; and enforce categorical pretreatment standards.

Currently the division has 102 active pretreatment programs. The progress of each developing program is being tracked.

The State has the approval authority to overview the POTW's (Publicly Owned Treatment Works) pretreatment program to (1) determine whether the POTW is properly implementing and enforcing pretreatment program requirements, (2) identify any pretreatment program areas that may require improvement subsequent to program approval and (3) evaluate program progress and need for modifications.

C. Distribution of Audits to be Performed

The division is on a five-year cycle for pretreatment audits. During a five-year cycle, Central Office staff will perform a pretreatment audit on each POTW pretreatment program. In the remaining four years, the EFO staff will be responsible for conducting two pretreatment compliance inspections (PCIs) and two technical assistance visits (TAVs).
The TAVs conducted at sites with approved programs will, at a minimum, require the inspector to gather enough information to properly complete the WENDB (Water Enforcement National Data Base) data sheet and the RNC/SNC (Reportable Non-Compliance/Significant Non-Compliance) worksheet from the PCI form. It is recommended that PCIs be conducted the first and third year following an audit, and TAVs be conducted the second and fourth years. TAVs will also be conducted at sites under development to answer any questions that the municipality may have, plus at sites that have been inactivated to verify status.

The proposed quarterly audit, PCI and TAV schedules are listed in Table 17 and Appendix B.

The Central Office will perform some pretreatment audits and technical assistance visits of developing/reactivating programs.

Table 17. Pretreatment Inspection Schedule

EFO	FACILITY	# SIUs	NPDES NUMBER	OCT-DEC	JAN-MAR	APR-JUN	JULY-SEPT
CHEFO	Athens	7	TN0024201		Audit		
CHEFO	Chattanooga	77	TN0024210	PCI			
CHEFO	Cleveland	18	TN0024121	TAV			
CHEFO	Dayton	6	TN0020478			PCI	
CHEFO	Decatur	3	TN0058521			PCI	
CHEFO	Etowah Utilities	2	TN0063771			Audit	
CHEFO	Jasper	6	TN0054585		Audit		
CHEFO	Niota	2	TN0025470	TAV			
CHEFO	Pikeville	2	TN0025054		TAV		
CHEFO	South Pittsburg	2	TN0024295	PCI			
CHEFO	Spring City	1	TN0021261				TAV
CLEFO	Centerville	1	TN0024937			PCI	
CLEFO	Columbia	5	TN0056103				Audit
CLEFO	Decherd	1	TN0020508		TAV		
CLEFO	Fayetteville	3	TN0021814				PCI
CLEFO	Hohenwald	1	TN0020087	PCI			
CLEFO	Lawrenceburg	5	TN0022551			TAV	
CLEFO	Lewisburg	7	TN0022888	PCI			
CLEFO	Lynchburg	0	TN0025101	TAV			
CLEFO	Manchester	5	TN0025038		TAV		
CLEFO	Mount Pleasant	1	TN0020800	Audit			
CLEFO	Pulaski	5	TN0021687		Audit		
CLEFO	Shelbyville	2	TN0024180			Audit	
CLEFO	Tullahoma	3	TN0023469		PCI		
CLEFO	Winchester	1	TN0021857			PCI	

EFO	FACILITY	# SIUs	NPDES NUMBER	OCT-DEC	JAN-MAR	APR-JUN	JULY-SEPT
CKEFO	Cookeville	5	TN0024198	TAV			
CKEFO	Crossville	5	TN0024996			Audit	
CKEFO	Livingston	3	TN0021873			TAV	
CKEFO	McMinnville	2	TN0023591			TAV	
CKEFO	Monterey	2	TN0064688				TAV
CKEFO	RBS	1	TN0067547			TAV	
CKEFO	Smithville	1	TN0065358			PCI	
CKEFO	Sparta	3	TN0061166				PCI
CKEFO	West Warren-Viola UD	1	TN0025372				TAV
JEFO	Adamsville	2	TN0064785	TAV			
JEFO	Bells	1	TN0026247			TAV	
JEFO	Brownsville	6	TN0062367				PCI
JEFO	Bruceton		TN0062014				TAV
JEFO	Camden	2	TN0064611		Audit		
JEFO	Dyersburg	7	TN0023477			PCI	
JEFO	Halls	0	TN0057291	TAV			
JEFO	Henderson	1	TN0064220	TAV			
JEFO	Humboldt	5	TN0062588			PCI	
JEFO	Huntingdon	2	TN0026174		PCI		
JEFO	Jackson	18	TN0024813	Audit			
JEFO	Lexington	9	TN0024341			Audit	
JEFO	Martin	1	TN0062545			PCI	
JEFO	McKenzie	5	TN0020613		TAV		
JEFO	Middleton	1	TN0062642				TAV
JEFO	Milan	1	TN0062375		TAV		
JEFO	Newbern	5	TN0062111		TAV		
JEFO	Paris	4	TN0061271	Audit			
JEFO	Ripley	3	TN0078191		PCI		
JEFO	Savannah	2	TN0061565			TAV	
JEFO	Selmer	6	TN0062308			TAV	
JEFO	Union City	6	TN0021580			PCI	
JCEFO	Bristol	19	TN0023531				PCI
JCEFO	Church Hill	11	TN0021253				PCI

EFO	FACILITY	# SIUs	NPDES NUMBER	OCT-DEC	JAN-MAR	APR-JUN	JULY-SEPT
JCEFO	Elizabethton	4	TN0023515	TAV			
JCEFO	Erwin	6	TN0023001				TAV
JCEFO	Greeneville	9	TN0021229				PCI
JCEFO	Johnson City	10	TN0024244				TAV
JCEFO	Jonesborough	2	TN0021547		TAV		
JCEFO	Kingsport	4	TN0020095			Audit	
JCEFO	Mosheim	10	TN0059366		PCI		
JCEFO	Rogersville	3	TN0020672				PCI
KEFO	Caryville-Jacksboro	2	TN0026263			PCI	
KEFO	Claiborne Co. UD	2	TN0024791			PCI	
KEFO	Clinton	2	TN0026506			PCI	
KEFO	Knoxville UB	29	TN0023582		TAV		
KEFO	Lenoir City	3	TN0020494		Audit		
KEFO	Loudon	9	TN0058181	TAV			
KEFO	Maryville	5	TN0020079	PCI			
KEFO	Morristown	30	TN0023507		PCI		
KEFO	Newport	5	TN0020702		Audit		
KEFO	Oak Ridge	7	TN0024155				PCI
KEFO	Oneida	4	TN0064424			TAV	
KEFO	Sevierville	4	TN0063959	TAV			
KEFO	Sweetwater	9	TN0020052			TAV	
KEFO	TASS (Monroe CO.)	4	TN0058238	TAV			
KEFO	TRDA	2	TN0059897		TAV		
KEFO	Wartburg	2	TN0028622				TAV
KEFO	West Knox UD	3	TN0060020		TAV		
MEFO	Arlington	4	TN0078603			PCI	
MEFO	Collierville	2	TN0057461			TAV	
MEFO	Covington	6	TN0020982				PCI
MEFO	Memphis	93	TN0020711				TAV

EFO	FACILITY	# SIUs	NPDES NUMBER	OCT-DEC	JAN-MAR	APR-JUN	JULY-SEPT
MEFO	Rossville	1	TN0064092			Audit	
NEFO	Clarksville	11	TN0020656			PCI	
NEFO	Dickson	11	TN0066958		PCI		
NEFO	Dover	1	TN0022667	Audit			
NEFO	Franklin	3	TN0028827	TAV			
NEFO	Gallatin	5	TN0020141				PCI
NEFO	Greenbrier	1	TN0020621	Audit			
NEFO	Lebanon	4	TN0028754	Audit			
NEFO	McEwen	1	TN0021741				TAV
NEFO	Murfreesboro	5	TN0022586				Audit
NEFO	Nashville	63	TN0020575				Audit
NEFO	Portland	6	TN0021865			PCI	
NEFO	Smyrna	5	TN0020541	PCI			
NEFO	Springfield	4	TN0024961				TAV
NEFO	Watertown	1	TN0025488	PCI			

TAV = Technical Assistance Visit
PCI =Performance Compliance Inspection

D. Whole Effluent Toxicity Testing

Biomonitoring in Tennessee has two distinct stages. For the first ten years of biomonitoring (1978 - 1988), the division documented the presence of toxicity in industrial and municipal effluents and established the need to include whole effluent toxicity (WET) limits in NPDES permits. The science and need for this program are well established and most discharger permits incorporate these limits. The division's biomonitoring efforts have shifted more toward compliance assurance and enforcement activities. The state will require EFOS to conduct 10 % of inspections of major or minor facilities with WET limits to be monitored. A list of permitted bioassays proposed for FY 16-17 appears in Table 18 The tests will be administered by TDH, Aquatic Biology Section. Toxicity tests will be sent ESC Lab Sciences for analyses in 2016-2017.

Table 18. Permitted Bioassay Toxicity Schedule

SAMPLE COLLECTION DAYS 2017	EFO	FACILITY Name and Permit #	Test Type (Acute or Chronic)	Outfall	CONTACT
October 6,8, 10	CKEFO	Smithville STP – TN0065358	Chronic	1	Brian Mayo
1	CLEFO	Pulaski STP - TN0021687	Chronic	1	DeWitt Logsdon
2	CLEFO	Fayetteville STP - TN0021814	Chronic	1	DeWitt Logsdon
March 27, 29, 31					
1					
2					
3					
April 17, 19, 21					
1					
2					
3					
May 1, 3, 5					
1	JCEFO	Mountain City WWTP TN0024945	Chronic	1	Sandra Vance
2					
3					
May 15, 17, 19					
1					
2					
3					
June 5, 7, 9					
1	CKEFO	City of Jamestown WWTP	Chronic	001	Oakley Hall

SAMPLE COLLECTION DAYS 2017	EFO	FACILITY Name and Permit #	Test Type (Acute or Chronic)	Outfall	CONTACT
2	MEFO	City of Rossville STP TN0064092	Chronic	001	Steve Owens
3	MEFO	Penn A Kem, LLC TN0000078	Chronic	001	Maylynne Wilbert
June 19, 21, 23					
1	CHEFO	Wacker Polysilicon North America, LLC TN0081311	Acute	1	Angela Young
2					
3					

Each week either 3 chronic tests or 1 chronic and 1 acute test can be run – per lab.

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APPENDIX A:

Monitoring Stations Scheduled to be Sampled Between July 2016 and June 2017

Projected Monitoring Stations for 2016-2017

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
BAKER002.6PO	Baker Creek	Watershed	TN06020003010_1000	CHEFO			1			1	
BBURR000.3PO	Burra Burra Creek	303(d)	TN06020003014_0110	CHEFO	12	12		1		1	
BELLT000.3PO	Belltown Creek	303(d)	TN06020003014_0210	CHEFO	12	12		1		1	
BIG006.4PO	Big Creek	Watershed	TN06020003045_1000	CHEFO			1			1	
BLACK001.7BR	Blackburn Branch	303(d)	TN03150101021_0500	CHEFO	12	12		1		1	
BPLAY000.3PO	Ball Play Creek	303(d)	TN03150101012_0300	CHEFO	12	12	1			1	
BRUSH003.1PO	Brush Creek	Watershed	TN06020003013.7T_0100	CHEFO	12	12	1			1	
BUMBE002.9RH	Bumbee Creek	Watershed	TN06010201041_0500	CHEFO			1			1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
CAMP001.4RH	Camp Creek	Watershed	TN06010201533_1000	CHEFO			1			1	
CANE001.5MM	Cane Creek	Ambient	TN06020002081-0100	CHEFO	4	4					
CANEY000.1PO	Caney Creek	Watershed	TN06020003013_0300	CHEFO	12	12	1			1	
CHATT000.9HM	Chattanooga Creek	Ambient	TN060200011244-1000	CHEFO	4	4					
CLEAR000.1PO	Clear Creek	Watershed	TN06020003035_0100	CHEFO	5		1			1	
CLOUD000.5PO	Cloud Branch	303(d)	TN06020003001_0200	CHEFO	12	12	1			1	
COAHU030.2BR	Coahulla Creek	303(d)	TN03150101021_1000	CHEFO	12	12	1			1	
COAHU043.9BR	Coahulla Creek	303(d)	TN03150101021_2000	CHEFO	12	12		1		1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
COAHU41.9T0.8BR	Unnamed Trib to Coahulla Creek	303(d)	TN03150101021_0900	CHEFO	12	12		1		1	
COAHU45.4T0.4T0.2BR	Unnamed Trib to Coahulla Creek	303(d)	TN03150101021_0700	CHEFO	12	12	1			1	
CONAS054.4PO	Conasauga River	Watershed	TN03150101012_1000	CHEFO	12	12	1			1	
CONAS061.4PO	Conasauga River	Watershed	TN03150101012_2000	CHEFO	5		1			1	
COOKS001.3PO	Cookson Creek	303(d)	TN06020003001_0300	CHEFO	12	12	1			1	
CRACK000.6RH	Cracker Creek	303(d)	TN06010201001T_0100	CHEFO	12	12		1		1	
DUNLA004.2BL	Dunlap Creek	Watershed	TN06010201041_0820	CHEFO			1			1	
DUSKI003.0RH	Duskin Creek	Watershed	TN06010201041_0600	CHEFO			1			1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
ECO66G12	Sheeds Creek	SEMN	TN03150101012_0500	CHEFO		4	2	2	1	2	
ECO66G20	Rough Creek	SEMN	TN06020003013.55_0400	CHEFO		4	2	2	1	2	
ECO68C20	Crow Creek	SEMN	TN06030001067_1000	CHEFO		4	2	2	1	2	
ELLIS000.1PO	Ellis Branch	303(d)	TN06020003014_0140	CHEFO	12	12		1		1	
FECO66G04	Tumbling Creek Unnamed Tributary	FECO	TN06020003013.7T_0410	CHEFO		4	2	2	1	2	
FECO67F03	Council Spring	FECO	TN03150101021_0110	CHEFO		4	2	2	1	2	
FIGHT000.6_GA	Fightingtown Creek	Watershed	TN06020003014_0300	CHEFO			1			1	
FOURM001.2PO	Fourmile Creek	303(d)	TN06020003001_0100	CHEFO	12	12		1		1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
FOURM002.4PO	Fourmile Creek	Watershed	TN06020003001_0150	CHEFO	12	12		1		1	
FRY000.1PO	Fry Branch	303(d)	TN06020003001_0400	CHEFO	12	12		1		1	
GASSA000.1PO	Gassaway Creek	Watershed	TN06020003013.5T_0200	CHEFO			1			1	
GOFOR000.1PO	Goforth Creek	Watershed	TN06020003013_0400	CHEFO	12	12	1			1	
GRASS001.2PO	Grassy Creek	303(d)	TN06020003013.7T_0300	CHEFO	12	12		1		1	
GREAS002.9PO	Greasy Creek	Watershed	TN06020003035_1000	CHEFO	12	12	1			1	
HICKS002.3BR	Hicks Branch	303(d)	TN03150101021_0800	CHEFO	12	12		1		1	
HIWAS013.4MM	Hiwassee River	Ambient	TN06020002008-1000	CHEFO	4	4					
HORNS000.8PO	Horns Creek	303(d)	TN06020003001_0310	CHEFO	12	12	1			1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
INDIA000.1PO	Indian Creek	Watershed	TN06020003004T_0400	CHEFO			1			1	
JERRY001.2BR	Jerry Branch	303(d)	TN03150101021_0300	CHEFO	12	12		1		1	
LFORD000.3RH	Laurel Ford Branch	303(d)	TN06010201462_0100	CHEFO	12	12	1			1	
LPINE003.7RH	Little Piney Creek	Watershed	TN06010201041_0840	CHEFO			1			1	
MADDE000.2PO	Madden Branch	Watershed	TN06020003013_0100	CHEFO			1			1	
MAROO001.4BR	Maroon Branch	303(d)	TN03150101021_0120	CHEFO	12	12		1		1	
MILL000.1BR	Mill Creek	303(d)	TN03150101012_0200	CHEFO	12	12	1			1	
MILLS004.9BR	Mills Creek	303(d)	TN03150101021_0100	CHEFO	12	12	1			1	
MINNE000.3PO	Minnewauga Creek	Watershed	TN03150101012_0400	CHEFO			1			1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
MOCCA000.9RH	Moccasin Creek	Watershed	TN06010201041_0400	CHEFO			1			1	
MUDDY002.6RH	Muddy Creek	303(d)	TN06010201526_1000	CHEFO	12	12		1		1	
NPOTA000.1PO	North Potato Creek	303(d)	TN06020003014_0100	CHEFO				1		1	
NPOTA001.5PO	North Potato Creek	303(d)	TN06020003014_0100	CHEFO				1		1	
NPOTA003.3PO	North Potato Creek	303(d)	TN06020003014_0100	CHEFO	12	12		1		1	
NPOTA004.6PO	North Potato Creek	303(d)	TN06020003014_0100	CHEFO	12	12		1		1	
NPOTA006.0PO	North Potato Creek	Watershed	TN06020003014_0150	CHEFO			1			1	
OCOEE001.0PO	Ocoee River	Ambient	TN06020003001-1000	CHEFO	4	4					
OCOEE004.0PO	Ocoee River	303(d)	TN06020003001_1000	CHEFO	12	12		1		1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
OCOEE011.9PO	Ocoee River	303(d)	TN06020003001_1000	CHEFO				1		1	
OCOEE019.6PO	Ocoee River	303(d)	TN06020003013-1000	CHEFO	12	12		1		1	
OCOEE024.8PO	Ocoee River	303(d)	TN06020003013.5_1000	CHEFO	12	12		1		1	
OCOEE026.6PO	Ocoee River	303(d)	TN06020003013.55_1000	CHEFO	12	12		1		1	
OCOEE029.3PO	Ocoee Number 3 Reservoir	303(d)	TN06020003013.7_1000	CHEFO	12	12					
OCOEE035.5PO	Ocoee River	303(d)	TN06020003014_1000	CHEFO	12	12		1		1	
OCOEE036.9PO	Ocoee River	303(d)	TN06020003014_1000	CHEFO				1		1	
OCOEE037.3PO	Ocoee River	Watershed	TN06020003014_2000	CHEFO	12	12					

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
OFORT004.1BR	Old Fort Creek	Watershed	TN03150101012_0210	CHEFO	12	12	1			1	
OOSTA028.4MM	Oostanaula Creek	Ambient	TN06020002083-3000	CHEFO	4	4					
PENIT000.9PO	Penitentiary Branch	Watershed	TN06020003045_0100	CHEFO				1		1	
PINEY005.0RH	Piney River	Ambient	TN06010201041-1000	CHEFO	4	4					
PINEY008.1RH	Piney Creek	303(d)	TN06010201041_2000	CHEFO	12	12		1		1	
PINEY009.0RH	Piney River	Watershed	TN06010201041_1000	CHEFO	12	12	1			1	
RHILL000.2BR	Red Hill Branch	303(d)	TN03150101021_0400	CHEFO	12	12		1		1	
ROCK000.1PO	Rock Creek	Watershed	TN06020003092_1000	CHEFO	5		1			1	
ROCK000.2PO	Rock Creek	Watershed	TN06020003013.55_0100	CHEFO	12	12	1			1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
SCHIC000.4HM	South Chickamauga Creek	Ambient	TN06020001007-1000	CHEFO	4	4					
SEQUA006.3MI	Sequatchie River	Ambient	TN06020004001_1000	CHEFO	4	4					
SOAK000.1RH	Soak Creek	Watershed	TN06010201041_0800	CHEFO			1			1	
SUGAR008.2BR	Sugar Creek	303(d)	TN03150101012_0100	CHEFO	12	12	1			1	
SYLCO002.3PO	Sylco Creek	Watershed	TN06020003376_1000	CHEFO			1			1	
TATE000.3BR	Tate Branch	303(d)	TN03150101021_1100	CHEFO	12	12		1		1	
TENNE416.5MI	TENNESSEE RIVER	Ambient	TN06020001055-1000	CHEFO	4	4					
TENNE444.0MI	TENNESSEE RIVER	Ambient	TN06020001001-1000	CHEFO	4	4					

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
TENNE477.0HM	TENNESSEE RIVER	Ambient	TN06020001020-1000	CHEFO	4	4					
TENNE503.3RH	Tennessee River	Ambient	TN06020001020-1000	CHEFO	4	4					
TENNE529.5RH	TENNESSEE RIVER	Ambient	TN06020001020-1000	CHEFO	4	4					
TOWN000.5RH	Town Creek	303(d)	TN06010201462_1000	CHEFO	12	12	1			1	
TUMBL000.9PO	Tumbling Creek	Watershed	TN06020003013.7T_0400	CHEFO	5		1			1	
VANS000.6RH	Vans Creek	Watershed	TN06010201041_0900	CHEFO	12	12	1			1	
WEATH000.6BR	Weatherly Branch	303(d)	TN03150101021_0200	CHEFO	12	12	1			1	
WHITE006.1RO	Whites Creek	Watershed	TN06010201040_1000	CHEFO			1			1	
WHITE011.5RH	Whites Creek	Watershed	TN06010201040_3000	CHEFO			1			1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
WOLF000.6BR	Wolf Branch	303(d)	TN03150101021_0600	CHEFO	12	12		1		1	
WOLF003.1RH	Wolf Creek	303(d)	TN06010201001T_0200	CHEFO	12	12		1		1	
PINEY000.2RO	Piney Creek	Watershed	TN06010201040_0500	CHEFO /CKEFO	12	12		1		1	
SANDY005.0CU	Sandy Creek	Watershed	TN06010201040_0300	CHEFO /CKEFO							
WHITE007.3RO	Whites Creek	Watershed	TN06010201040_2000	CHEFO /KEFO			1			1	
BAGWE1.6T0.2CU	Bagwell Branch	303(d)	TN06010208015_1111	CKEFO				1		1	
BAKER000.6CU	Baker Branch	Watershed	TN06010208015_0300	CKEFO				1		1	
BASSE001.3CU	Basses Creek	Watershed	TN06010208015_0700	CKEFO				1		1	
BDROW001.0CU	Black Drowning Creek	303(d)	TN06010208013_0400	CKEFO	12	12		1		1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
BGUM000.5CU	Black Gum Branch	303(d)	TN06010208015_1410	CKEFO				1		1	
BYRD002.6CU	Byrd Creek	303(d)	TN06010208015_0900	CKEFO	12	12		1		1	
CFORK011.2SM	Caney Fork River	Ambient	TN05130108001_1000	CKEFO	4	4					
CLEAR029.0CU	Clear Creek	Watershed	TN06010208008_3000	CKEFO	12	12		1		1	
COPEL000.5CU	Copeland Creek	303(d)	TN06010208013_0420	CKEFO				1		1	
CORCH012.6CU	Crab Orchard Creek	Watershed	TN06010208020_4000	CKEFO				1		1	
CUMBE381.1CY	Cumberland River	Ambient	TN05130103001_1000	CKEFO	4	4					
DADDY020.1CU	Daddy's Creek	Watershed	TN06010208015_2000	CKEFO	12	12		1		1	
ECO71H17	Clear Fork Creek	SEMN	TN05130108004_0220	CKEFO		4	2	2	1	2	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
FALL007.6CU	Fall Creek	Watershed	TN06010201040_0510	CKEFO				1		1	
FECO68A03	South Fork Elmore Creek	FECO	TN06010208007_0310	CKEFO		4	2	2	1	1	
FECO68A04	Crabapple Branch	FECO	TN06010208015_0200	CKEFO		4	2	2	1	1	
FWATE009.6PU	Falling Water River	Ambient	TN05130108045_1000	CKEFO	4	4					
LICK000.5CU	Lick Creek	303(d)	TN06010208015_0600	CKEFO	12	12		1		1	
LMEAD000.4CU	Little Meadow Branch	Watershed	TN06010208005_0111	CKEFO				1		1	
LOBED000.7CU	Little Obed River	303(d)	TN06010208013_0200	CKEFO	12	12		1		1	
LONG000.1CU	Long Branch	303(d)	TN06010208015_0610	CKEFO				1		1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
MEADO000.1CU	Meadow Creek	Watershed	TN06010208013_0410	CKEFO				1		1	
MEADO001.7CU	Meadow Branch	Watershed	TN06010208005_0110	CKEFO				1		1	
MYATT005.1CU	Myatt Creek	SEMN	TN06010208008_0100	CKEFO		4	2	2	1	2	
new station	Basin Creek	Watershed	TN06010201040_0511	CKEFO				1		1	
new station	Whites Creek	Watershed	TN06010201040_3000	CKEFO				1		1	
new station	Dunlap Creek	Watershed	TN06010201041_0820	CKEFO				1		1	
new station	Fox Creek	Watershed	TN06010208007_0200	CKEFO				1		1	
new station	Elmore Creek	Watershed	TN06010208007_0300	CKEFO				1		1	
new station	Rocky Branch	Watershed	TN06010208013_0100	CKEFO				1		1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
new station	Adams Creek	Watershed	TN06010208013_0600	CKEFO				1		1	
new station	Clear Branch	Watershed	TN06010208015_0400	CKEFO				1		1	
NORTH000.3CU	North Creek	Watershed	TN06010208015_1100	CKEFO				1		1	
NORTH005.7CU	North Creek	303(d)	TN06010208015_1150	CKEFO				1		1	
OBED020.8CU	Obed River	303(d)	TN06010208007_2000	CKEFO	12	12		1		1	
OBED033.4CU	Obed River	303(d)	TN06010208013_1000	CKEFO	12	12		1		1	
OBED036.9CU	Obed River	303(d)	TN06010208013_1000	CKEFO	12	12		1		1	
OBED040.2CU	Obed River	303(d)	TN06010208013_2000	CKEFO				1		1	
OBEY002.1CY	Obey River	303(d)	TN05130105001_1000	CKEFO	4	4					

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
ONEMI001.9CU	One Mile Creek	303(d)	TN06010208015_0930	CKEFO	12	12		1		1	
OTTER003.3CU	Otter Creek	Watershed	TN06010208007_0100	CKEFO				1		1	
ROGER000.1CU	Rogers Creek	Watershed	TN06010208015_0110	CKEFO				1		1	
SCANT001.3CU	Scantling Branch	303(d)	TN06010208007-0210	CKEFO				1		1	
SCOTT001.2CU	Scott Creek	Watershed	TN06010208013_0500	CKEFO				1		1	
SPIER000.3CU	Spier Branch	Watershed	TN06010208013_0310	CKEFO				1		1	
THREE000.4CU	Threemile Creek	Watershed	TN06010208015_0920	CKEFO				1		1	
YELLO003.6CU	Yellow Creek	Watershed	TN06010208015_0100	CKEFO				1		1	
AARON000.1LW	Aaron Branch	Watershed	TN06030005087_0300	CLEFO				1			

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
BBIGB008.5MY	Big Bigby Creek	Ambient	TN06040003019_2000	CLEFO	4	4					
BFSHO002.5LW	Beeler Fork Shoal Ck.	Watershed	TN06030005082_0200	CLEFO				1			
BLUEW020.5LW	Bluewater Ck.	Watershed	TN06030005074_1000	CLEFO				1			
BUFFA073.1WE	Buffalo River	Ambient	TN06040004002_1000	CLEFO	4	4					
BUTLE009.3WE	Butler Ck.	Watershed	TN06030005093_1000	CLEFO				1			
CHISH001.5LW	Chisholm Ck.	Watershed	TN06030005087_1000	CLEFO				1			
CLACK000.4LW	Clack Branch	Watershed	TN06030005078_0200	CLEFO				1			
CRAWF001.3LW	Crawfish Creek	Watershed	TN06030005084_0100	CLEFO	12	12		1			
CROWS000.5LW	Crowson Ck.	Watershed	TN06030005085_1000	CLEFO				1			

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
CYPRE023.5WE	Cypress Ck.	Watershed	TN06030005099_1000	CLEFO				1			
DIXON001.0LW	Dixon Branch	Watershed	TN06030005074_0200	CLEFO				1			
DLAND000.1LW	Dry Land Ck.	Watershed	TN06030005082_0300	CLEFO				1			
DUCK113.9MY	Duck River	Ambient	TN06040003024_1000	CLEFO	4	4					
DUCK248.0BE	Duck River	Ambient	TN06040002030_1000	CLEFO	4	4					
ECO71F19	Brush Creek	SEMN	TN06040004013_0400	CLEFO	4	4		2	2		
ECO71F27	Swanegan Branch	Ecoregion	TN06030005093_0700	CLEFO	4	4		2	1		
ELK133.0FR	Elk River	Ambient	TN06030003015_1000	CLEFO	4	4					
FACTO005.1LW	Factory Ck.	Watershed	TN06030005089_1000	CLEFO				1			

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
FBUTL000.3WE	First Butler Creek	Watershed	TN06030005093_0400	CLEFO				1			
GRAND000.7LW	Granddaddy Creek	Watershed	TN06030005086_0300	CLEFO				1			
GRASS000.4WE	Grassy Ck.	Watershed	TN06030005106_0100	CLEFO				1			
HOLLY000.6LW	Holly Ck.	Watershed	TN06030005092_1000	CLEFO				1			
KNOB001.8LW	Knob Ck.	Watershed	TN06030005086_1000	CLEFO				1			
LBLUE006.0LW	Little Bluewater Ck.	Watershed	TN06030005074_0100	CLEFO	12	12		1			
LBUTL000.8WE	Last Butler Creek	Watershed	TN06030005093_0600	CLEFO				1			
LCYPR014.6WE	Little Cypress Ck.	Watershed	TN06030005095_1000	CLEFO				1			
LONG000.3LW	Long Branch	Watershed	TN06030005081_0100	CLEFO				1			

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
LSHOA001.5LW	Little Shoal Ck.	Watershed	TN06030005084_1000	CLEFO	12	12		1			
MCYPR007.6WE	Middle Cypress Ck.	Watershed	TN06030005098_1000	CLEFO				1			
PINEY003.2LW	Piney Branch	Watershed	TN06030005086_0200	CLEFO				1			
POND000.3LW	Pond Ck.	Watershed	TN06030005309_1000	CLEFO				1			
RPATC000.1LW	Reed Patch Ck.	Watershed	TN06030005087_0200	CLEFO				1			
SECON010.5WE	Second Ck.	Watershed	TN06030005106_1000	CLEFO				1			
SHAWN000.9WE	Shawnette Ck.	Watershed	TN06030005089_0100	CLEFO				1			
SHOAL032.2LW	Shoal Creek	Ambient/ Watershed	TN06030005078_1000	CLEFO	4	4		1			
SHOAL046.2LW	Shoal Ck.	Watershed	TN06030005081_1000	CLEFO	12	12		1			

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
SHOAL054.1LW	Shoal Ck.	Watershed	TN06030005082_1000	CLEFO	12	12		1			
SHOAL056.1LW	Shoal Ck.	Watershed	TN06030005082_2000	CLEFO	12	12		1			
SPRIN001.8LW	Spring Creek	Watershed	TN06030005086_0500	CLEFO				1			
TTOWN000.6LW	Tripp Town Branch	303(d)	TN06030005082_0100	CLEFO	12	12		1			
BEAVE001.0SU	BEAVER CREEK	Ambient	TN06010102042_1000	JCEFO	4	4					
BEAVE015.3SU	BEAVER CREEK	Ambient	TN06010102042_2000	JCEFO	4	4					
BLIME000.5GE	BIG LIMESTONE CREEK	Ambient	TN06010108030_1000	JCEFO	4	4					
BOONE000.7WN	Boones Creek	303(d)	TN06010103006-1000	JCEFO	10	10		1			
BRUSH000.7WN	Brush Creek	303(d)	TN06010103009-1000	JCEFO	10	10		1			

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
BUCK000.5CT	Buck Creek	Watershed	TN060101003013-0200	JCEFO	10	10	1				
BUFFA000.2CT	Buffalo Creek	303(d)	TN060101030111000	JCEFO	10	10		1			
BUFFA005.5CT	Buffalo Creek	303(d)	TN060101030111000	JCEFO	10	10		1			
BUFFA007.0UC	Buffalo Creek	Watershed	TN060101030112000	JCEFO	10	10		1			
CAMPB000.4JO	Campbell Creek	Watershed	TN060101030370400	JCEFO	10	10	1				
CAMPB000.7CT	Campbell Branch	303(d)	TN060101030080200	JCEFO	10	10		1			
CARRO000.5WN	Carroll Creek	303(d)	TN060101030060100	JCEFO	10	10		1			
CASH_G0.5WN	Cash Hollow (Unnamed Creek In Hollow)	303(d)	TN060101036350100	JCEFO	14	14		1			

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
CASH_G1.5WN	Cash Hollow (Unnamed Creek In Hollow)	303(d)	TN06010103635-0100	JCEFO	14	14					
CASH_G2.7WN	Cash Hollow Creek	303(d)	TN06010103635-0100	JCEFO	14	14					
CATBI000.2WN	Catbird Creek	303(d)	TN06010103046-0100	JCEFO				1			
CLINC189.8HK	CLINCH RIVER	Ambient	TN06010205016_1000	JCEFO	4	4					
COBB000.1WN	Cobb Creek	303(d)	TN06010103635-0200	JCEFO	10	10	1				
COBB001.0WN	Cobb Creek	303(d)	TN06010103635-0200	JCEFO	10	10	1				
COBB002.1JO	Cobb Creek	Watershed	TN06010103052_1000	JCEFO	10	10	1				
CORN000.1JO	Corn Creek	Watershed	TN06010103034-0312	JCEFO	10	10	1				

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
CROOK000.2JO	Crooked Branch	303(d)	TN06010103034-0311	JCEFO			1				
DARR001.2SU	Darr Creek	303(d)	TN06010103001T-0100	JCEFO	10	10	1				
DAVIS000.9CT	Davis Branch	303(d)	TN06010103008-0400	JCEFO	10	10		1			
DOE001.1CT	Doe River	Ambient	TN06010103013-1000	JCEFO	4	4		1			
DOE001.2JO	Doe Creek	Watershed	TN06010103037-1000	JCEFO	10	10		1			
DOE018.8CT	Doe River	Watershed	TN06010103013-2000	JCEFO	10	10		1			
DRY001.6CT	Dry Creek	Watershed	TN06010103011-0300	JCEFO	10	10	1				
ECO66D03	Laurel Fork	Ecoregion	TN06010103013-0155	JCEFO	4	4	2	2	1		
ECO66D05	Doe River	Ecoregion	TN06010103013-3000	JCEFO	4	4	2	2	1		

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
ECO66E09	Clark CREEK	SEMN	TN06010108010_3200	JCEFO		4	2	2	1		
ECO66F08	Stony Creek	Ecoregion	TN06010103038-1000	JCEFO	4	4	2	2	1		
ECO6702	FISHER CREEK	SEMN	TN06010104015-0100	JCEFO		4	2	2	1		
ECO67F14	POWELL RIVER	Ambient	TN06010206007_2000	JCEFO	4	4					
ELK004.6CT	Elk River	Watershed	TN06010103027-1000	JCEFO	10	10		1			
FECO66D01	Black Branch	FECO	TN06010103020T-0510	JCEFO	4	4	2	2	1		
FECO66D07	Little Stony Creek	FECO	TN06010103020T-0600	JCEFO	4	4	2	2	1		
FECO66E02	Dye Leaf Branch	FECO	TN06010103338-0200	JCEFO	4	4	2	2	1		
FORGE000.5JO	Forge Creek	303(d)	TN06010103034-0400	JCEFO				1			

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
FURNA000.3JO	Furnace Creek	303(d)	TN06010103034-0320	JCEFO				1			
GAP000.1CT	Gap Creek	303(d)	TN06010103008-0800	JCEFO	10	10		1			
GEORG000.2CT	George Creek	Watershed	TN06010103013-0500	JCEFO	10	10	1				
GOOSE000.0JO	Goose Creek	Watershed	TN06010103034-0310	JCEFO	10	10		1			
GOUGE000.1CT	Gouge Branch	303(d)	TN0601103013-0811	JCEFO			1				
HAMPT000.1CT	Hampton Creek	Watershed	TN06010103013-0300	JCEFO	10	10		1			
HOLST131.5HS	HOLSTON RIVER	Ambient	TN06010104011_2000	JCEFO	4	4					
KNOB001.0WN	Knob Creek	303(d)	TN06010103635-1000	JCEFO	10	10		1			
LAURE000.3CT	Laurel Fork	Watershed	TN06010103013-0100	JCEFO	10	10	1				

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
LDOE000.3CT	Little Doe River	Watershed	TN06010103013-0800	JCEFO	10	10	1				
LICK000.9CT	Lick Creek	Watershed	TN06010103008_0100	JCEFO	10	10	1				
LICK001.0GE	LICK CREEK	Ambient	TN06010108035_1000	JCEFO	4	4					
LLIME007.0WN	LITTLE LIMESTONE CREEK	Ambient	TN06010103510-2000	JCEFO	4	4					
MILL000.4JO	Mill Creek	Watershed	TN06010103034-1300	JCEFO	10	10	1				
new station	Bearwallow Branch	Watershed	TN06010103027-0200	JCEFO							
new station	Big Laurel Branch	Watershed	TN0601010374-1000	JCEFO							
NFHOL004.6SU	NORTH FORK HOLSTON RIVER	Ambient	TN06010104001_1000	JCEFO	4	4					

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
NOLIC020.8GE	NOLICHUCKY RIVER	Ambient	TN06010108001_3000	JCEFO	4	4					
NOLIC097.5UC	NOLICHUCKY RIVER	Ambient	TN06010108010_5000	JCEFO	4	4					
POWDE000.4CT	Powder Branch	303(d)	TN06010103011-0100	JCEFO	10	10		1			
REEDY001.8WN	Reedy Creek	303(d)	TN06010103061-1000	JCEFO	10	10		1			
RICHL001.3GE	RICHLAND CREEK	Ambient	TN06010108102-1000	JCEFO	4	4					
ROAN007.5JO	Roan Creek	303(d)	TN06010103034-1000	JCEFO	10	10		1			
ROAN011.8JO	Roan Creek	303(d)	TN06010103034-1000	JCEFO	10	10					
ROAN016.6JO	Roan Creek	303(d)	TN06010103034-2000	JCEFO	10	10		1			
ROAN018.2JO	Roan Creek	Watershed	TN06010103034-3000	JCEFO	10	10					

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
ROARI002.4CT	Roaring Creek	303(d)	TN06010103013-0600	JCEFO	10	10		1			
SCOVE000.1CT	Sally Cove Creek	Watershed	TN06010103013-0821	JCEFO							
SFHOL001.1SU	SOUTH FORK HOLSTON RIVER	Ambient	TN06010104001-1000	JCEFO	4	4					
SHELL000.1CT	Shell Creek	Watershed	TN06010103013-0210	JCEFO	10	10	1				
SIMER000.1CT	Simerly Creek	Watershed	TN06010103013-0820	JCEFO	10	10	1				
SINK000.7JO	Sink Branch	303(d)	TN06010103020T-0200	JCEFO	10	10		1			
SINKI000.5GE	SINKING CREEK	Ambient	TN06010108064_1000	JCEFO	4	4					
SINKI000.6CT	Sinking Creek	303(d)	TN06010103046-1000	JCEFO	14	14		1			

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
SINKI002.9WN	Sinking Creek	303(d)	TN06010103046-1000	JCEFO	14	14					
SINKI005.5WN	Sinking Creek	303(d)	TN06010103046-1000	JCEFO	14	14					
STONY000.3CT	Stony Creek	Watershed	TN06010103038-1000	JCEFO	10	10		1			
STONY008.5CT	Stony Creek	Watershed	TN06010103038-1000	JCEFO	10	10		1			
TIGER000.1CT	Tiger Creek	Watershed	TN06010103013-0810	JCEFO	10	10	1				
TOLL000.3CT	Toll Branch	303(d)	TN06010103011-0200	JCEFO	10	10	1				
TOWN000.3JO	Town Creek	303(d)	TN06010103034-0300	JCEFO	10	10		1			
TOWN000.9JO	Town Creek	303(d)	TN06010103034-0300	JCEFO	10	10		1			
VAUGH001.6JO	Vaught Creek	Watershed	TN06010103034-0900	JCEFO	10	10	1				

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
WATAU006.0SU	Watauga River	303(d)	TN06010103001-1000	JCEFO							
WATAU011.0WN	Watauga River	RESERVOIR	TN06010103001-1000	JCEFO	10	10					
WATAU011.5WN	Watauga River	TISSUE	TN06010103001-1000	JCEFO	10	10					
WATAU015.6WN	Watauga River	303(d)	TN06010103001-1000	JCEFO	10	10					
WATAU016.0WN	Watauga River	303(d)	TN06010103001-1000	JCEFO				1			
WATAU020.1CT	Watauga River	303(d)	TN06010103008-1000	JCEFO	10	10		1			
WATAU023.4CT	Watauga River	303(d)	TN06010103008-2000	JCEFO	10	10		1			
WATAU024.7CT	Watauga River	303(d)	TN06010103008-2000	JCEFO	10	10		1			
WATAU028.3CT	Watauga River	303(d)	TN06010103008-2000	JCEFO				1			

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
WATAU031.5CT	Watauga River	303(d)	TN06010103008-3000	JCEFO	10	10		1			
WATAU036.6CT	Watauga River Reserv	RESERVOIR	TN06010103020-1000	JCEFO							
ADAIR001.1MN	Adair Branch	Watershed	TN08010205012_0300	JEFO				1		1	
ALLEN001.0MN	Allen Creek	Watershed	TN08010205018_0910	JEFO				1		1	
ANDER000.5MN	Anderson Branch	303(d)	TN08010205012_0600	JEFO	5/30					1	
BEAR000.7CK	Bear Creek	303(d)	TN08010205031_0200	JEFO						1	
BEAR001.0MN	Bear Creek	Watershed	TN08010205018_0900	JEFO				1		1	
BEAR002.0MN	Bear Creek	Watershed	TN08010205028_0300	JEFO				1		1	
BEECH010.0DE	BEECH RIVER	Ambient	TN06040001802-1000	JEFO	4	4					

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
BELL002.0HE	Bell Branch	Watershed	TN08010205028_0500	JEFO				1		1	
BLACK001.6CK	Black Creek	303(d)	TN08010205031_1000	JEFO	12	12		1		1	
BOND001.0MN	Bond Creek	303(d)	TN08010205012_0700	JEFO	12	12				1	
BROWN000.7MN	Brown Creek	Watershed	TN08010205028_0150	JEFO							
BSAND015.3BN	BIG SANDY RIVER - EMBAYMENT	Ambient	TN06040005027-1000	JEFO	4	4					
BUSHE000.2MC	Bushel Branch	Watershed	TN08010205023_0310	JEFO				1		1	
CANE002.0MN	Cane Creek	Watershed	TN08010205012_0800	JEFO				1		1	
CENTR000.5MN	Central Creek	303(d)	TN08010205012_0500	JEFO	5/30					1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
CGROV001.6MN	Cotton Grove Creek	Watershed	TN08010205028_0210	JEFO				1		1	
CLARK001.5CS	Clarks Creek	Watershed	TN08010205018_0500	JEFO				1		1	
CONNE002.4MN	Connley Creek	Watershed	TN08010205012_0200	JEFO				1		1	
CUB002.0MN	Cub Creek	Watershed	TN08010205012_1250	JEFO				1		1	
CYPRE002.0MN	Cypress Creek	Watershed	TN08010205012_1300	JEFO						1	
CYPRE003.0MN	Cypress Creek	Watershed	TN08010205012_1300	JEFO				1		1	
DRY000.8CS	Dry Branch	303(d)	TN08010205023_0110	JEFO				1		1	
ECO65E08	Harris Creek	Ecoregion	TN08010205028_0200	JEFO	4	4	2	2	1	2	
ECO65E19	Trace Creek	Ecoregion	TN08010205028_0220	JEFO	4	4	2	2	1	2	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
ECO65J04	Pompeys Branch	Ecoregion	TN06030005560_1000	JEFO	4	4	2	2	1	2	
ECO65J05	Dry Creek	Ecoregion	TN06030005566_1000	JEFO	4	4	2	2	1	2	
FECO65E06	Little Sugar Creek Unnamed Tributary	FECO	TN08010205022_0210	JEFO	4	4	2	2	1	2	
FECO65J01	Haw Branch	FECO		JEFO	4	4	2	2	1	2	
FINGE000.8CS	Finger Creek	Watershed	TN08010205018_0300	JEFO				1		1	
HALLS001.2LE	Halls Creek	303(d)	TN08010205036_1000	JEFO	12	12		1		1	
HATCH126.9HR	HATCHIE RIVER	Ambient	TN08010208001-3000	JEFO	4	4					
HICKS1.0T0.1MN	UNT to Hicks Creek	Watershed	TN08010205012_0900	JEFO				1		1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
HOGWA001.8MC	Hoggwallow Cr.	Watershed	TN08010205023_0330	JEFO				1		1	
HORSE002.0CS	Horse Creek	Watershed	TN08010205023_0400	JEFO				1		1	
HUGGI003.3MC	Huggins Creek	Watershed	TN08010205023_0300	JEFO				1		1	
HUNTE001.8MN	Hunters Creek	Watershed	TN08010205018_1100	JEFO				1		1	
JOHNS001.4MN	Johnson Creek	303(d)	TN08010205012_1100	JEFO				1		1	
JONES001.1MN	Jones Creek	Watershed	TN08010205028_0230	JEFO				1		1	
JONES001.4CS	Jones Creek	Watershed	TN08010205018_0400	JEFO				1		1	
JONES002.0MN	Jones Creek	Watershed	TN08010205018_0100	JEFO				1		1	
LNIXO002.9HY	Little Nixon Creek	303(d)	TN08010205005_0100	JEFO	12	12		1		1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
LOST002.1HY	Lost Creek	303(d)	TN08010205005_0400	JEFO				1		1	
MARLI002.1MN	Marlin Creek	Watershed	TN08010205028_0800	JEFO				1		1	
MCHAN001.5HE	Mchaney Branch	Watershed	TN08010205028_0410	JEFO				1		1	
MELTO001.3CS	Melton Branch	Watershed	TN08010205022_0300	JEFO				1		1	
MERID001.0MN	Meridian Creek	Watershed	TN08010205017_1000	JEFO				1		1	
MERID001.7HY	Meridian Creek	303(d)	TN08010205005_0200	JEFO		12		1		1	
MERID006.5MN	Meridian Creek	303(d)	TN08010205017_2000	JEFO							1
MFOBI004.5WY	MIDDLE FORK OBION RIVER	Ambient	TN08010203015-1000	JEFO	4	4					

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
MFORK001.7HE	Middle Fork Creek	Watershed	TN08010205028_0700	JEFO				1		1	
MILL001.1LE	Mill Creek	303(d)	TN08010205001_0200	JEFO	12	12				1	
MOORE001.3MN	Moore Branch	Watershed	TN08010205018_0200	JEFO				1		1	
NFFDE001.4MN	North Fork Of South Fork Forked Deer River	Watershed	TN08010205028_1000	JEFO				1		1	
NFFDE005.3DY	NORTH FORK FORKED DEER RIVER	Ambient	TN08010204001-1000	JEFO	4	4					

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
NFFDE17.9T1.8T0.3HE	North Fk South Fk Forked Deer River Unnamed Tributary To Unnamed Tributary	303(d)	TN08010205028_0600	JEFO				1		1	
NFOBI005.9OB	NORTH FORK OBION RIVER	Ambient	TN08010202009-1000	JEFO	4	4					
NFOBI010.7OB	NORTH FORK OBION RIVER	Ambient	TN08010202009-2000	JEFO	4	4					
NIXON002.2HY	Nixon Creek	303(d)	TN08010205005_1000	JEFO	12	12		1		1	
PANTH001.9MN	Panther Creek	303(d)	TN08010205012_1400	JEFO	12	12	1			1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
POND4.2T0.5HY	Pond Creek Unnamed Tributary	303(d)	TN08010205005_0310	JEFO				1		1	
SANDY000.5CS	Sandy Creek	Watershed	TN08010205023_0120	JEFO				1		1	
SANDY000.5MN	Sandy Creek	303(d)	TN08010205012_0400	JEFO	5/30					1	
SFFDE003.3DY	South Fork Forked Deer River	303(d)	TN08010205001_1000	JEFO	12	12		1		1	
SFFDE013.5LE	South Fork Forked Deer River	303(d)	TN08010205003_1000	JEFO	12	12		1		1	
SFFDE027.7HY	South Fork Forked Deer River	Ambient	TN08010205010_1000	JEFO	4	4					

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
SFFDE040.2MN	South Fork Forked Deer River	303(d)	TN08010205012_1000	JEFO	12	12		1		1	
SFFDE049.8MN	South Fork Forked Deer River	303(d)	TN08010205012_1000	JEFO	12	12		1		1	
SFFDE062.9MN	South Fork Forked Deer River	Watershed	TN08010205018_1000	JEFO	12	12		1		1	
SFFDE066.6CS	South Fork Forked Deer River	Watershed	TN08010205018_1000	JEFO	12	12		1		1	
SFFDE19.8T0.2HY	UNT to South Fork Forked Deer River	Watershed	TN08010205003_0100	JEFO						1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
SFFDE54.1T0.7MN	South Fork Forked Deer River Unnamed Tributary	Watershed	TN08010205018_1200	JEFO				1		1	
SFOBI005.8OB	SOUTH FORK OBION RIVER	Ambient	TN08010203001-1000	JEFO	4	4					
SPENC001.2HE	Spencer Creek	Watershed	TN08010205028_0400	JEFO				1		1	
SPRIN001.4CS	Spring Creek	Watershed	TN08010205023_0130	JEFO				1		1	
SUGAR001.8CS	Sugar Creek	Watershed	TN08010205022_1000	JEFO				1		1	
TAR003.0CS	Tar Creek	Watershed	TN08010205023_0200	JEFO				1		1	
TENNE066.3HN	TENNESSEE RIVER	Ambient	TN06040005020-1000	JEFO	4	4					

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
TISDA005.1LE	Tisdale Creek (Halls Creek)	303(d)	TN08010205036_0100	JEFO						1	
TISDA4.2T1.3LE (will be replaced)	Tisdale Creek (Halls Creek) Unnamed Tributary	303(d)	TN08010205036_0110	JEFO	12	12				1	
TURKE001.0CS	Turkey Creek	Watershed	TN08010205018_0600	JEFO				1		1	
WEBB002.0CS	Webb Branch	Watershed	TN08010205022_0100	JEFO				1		1	
BACON000.1LO	Bacon Creek	303d	TN06010201015-0100	KEFO	12	12		1			
BITTE000.2MG	Bitter Creek	Watershed	TN06010208041-0100	KEFO	5/30		1				
BLACK003.3RO	Black Creek	303d	TN06010201040-0600	KEFO	12	12		1			

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
BLACK006.4RO	Black Creek	303d	TN06010201040-0600	KEFO	12	12		1			
CANEY004.3RO	Caney Creek	303d	TN06010201621-1000	KEFO	5/30			1			
CARDI000.6RO	Cardiff Creek	303d	TN06010201620-1000	KEFO	12	12		1			
CLEAR009.0MG	Clear Creek	303d	TN06010208008-2000	KEFO				1			
CLEAR010.1MG	Clear Creek	303d	TN06010208008-2000	KEFO				1			
CLIFT000.2MG	Clifty Creek	Watershed	TN06010208021-1000	KEFO			1				
CLINC010.0RO	Clinch River	Ambient	TN06010207001-1000	KEFO	4	4					
CROOK004.2MG	Crooked Fork	303d	TN06010208004-1000	KEFO	12	12		1			
CROOK006.3MG	Crooked Fork	303d	TN06010208004-1000	KEFO	12	12					

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
CROOK016.9MG	Crooked Fork	303d	TN06010208004-2000	KEFO	12	12		1			
ECO66G05	Little River	Ecoregion/ SEMN	TN06010201032-3000	KEFO	4	4	2	2	1		
ECO67F06	Clear Creek	Ecoregion/ SEMN	TN06010207019-0100	KEFO	4	4	2	2	1		
ECO67F13	White Creek	Ecoregion/ SEMN	TN06010205001T-0300	KEFO	4	4	2	2	1		
ECO68A08	Clear Creek	Ecoregion	TN06010208008-1000	KEFO	4	4	2	2	1		
ECO68A26	Daddys Creek	Ecoregion	TN06010208015-1000	KEFO	4	4	2	2	1		
ECO68A27	Island Creek	Watershed	TN06010208005-0100	KEFO	4	4	2	2	1		
ECO68A28	Rock Creek	Ecoregion	TN06010208005-0400	KEFO	4	4	2	2	1		
ECO69D03	Flat Fork	Ecoregion	TN06010208004-0250	KEFO	4	4	2	2	1		

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
EFPOP001.7RO	East Fork Poplar Creek	303d	TN06010207026-1000	KEFO	12						
EFPOP003.9RO	East Fork Poplar Creek	303d	TN06010207026-1000	KEFO	12						
EFPOP006.9RO	East Fork Poplar Creek	303d	TN06010207026-1000	KEFO	12						
EFPOP008.6AN	East Fork Poplar Creek	303d	TN06010207026-1000	KEFO	12						
EFPOP010.9AN	East Fork Poplar Creek	303d	TN06010207026-1000	KEFO	12						
EMORY018.3MG	Emory River	303d	TN06010208001-4000	KEFO	12	12					
EMORY022.0MG	Emory River	Watershed	TN06010208001-5000	KEFO			1				
EMORY027.7MG	Emory River	Watershed	TN06010208005-1000	KEFO	12	12	1				
EMORY041.4MG	Emory River	Watershed	TN06010208005-1000	KEFO			1				

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
FBROA003.8KN	French Broad River	Ambient	TN06010107001-1000	KEFO	4	4					
FECO67F05	Cave Spring Branch	Ecoregion	TN06010201070-0100	KEFO	4	4	2	2	1		
FECO68A01	Douglas Branch	Ecoregion	TN06010208008-0431	KEFO	4	4	2	2	1		
FLAT000.7MG	Flat Fork	303d	TN06010208004-0200	KEFO	12	12		1			
GREAS000.5MG	Greasy Creek	Watershed	TN06010208005-0500	KEFO	5/30		1				
GREAS000.5MO	Greasy Branch	303d	TN06010201013-0200	KEFO	5/30						
HINES002.7LO	Hines Creek	303d	TN06010201087-1000	KEFO	5/30			1			
LCLEAR002.3MG	Little Clear Creek	Watershed	TN06010208008-0500	KEFO	5/30		1				
LEMOR004.5MG	Little Emory River	Watershed	TN06010208041-2000	KEFO			1				

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
MAMMY000.1CU	Mammys Creek	Watershed	TN06010201040-0520	KEFO			1				
MUD000.7MG	Mud Creek	303d	TN06010208004-0100	KEFO				1			
MUD001.9MO	Mud Creek	303d	TN06010201013-0100	KEFO	5/30						
OBED009.2MG	Obed River	Watershed	TN06010208007-2000	KEFO			1	1			
PINEY000.2RO	Piney Creek	Watershed	TN06010201040-0500	KEFO			1				
POLEC001.4LO	Polecat Creek	303d	TN06010201149-1000	KEFO	12	12		1			
POND002.3LO	Pond Creek	303d	TN06010201013-1000	KEFO	5/30			1			
POND008.3LO	Pond Creek	303d	TN06010201013-1000	KEFO	5/30						
POND013.9MO	Pond Creek	303d	TN06010201013-2000	KEFO	12	12		1			

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
PROCK003.1RO	Paint Rock Creek	303d	TN06010201011-1000	KEFO	5/30						
RILEY003.7RO	Riley Creek	303d	TN06010201009-1000	KEFO	5/30			1			
STAMP003.0RO	Stamp Creek	303d	TN06010201064-1000	KEFO	5/30						
STEEK000.7LO	Steekee Creek	303d	TN06010201065-1000	KEFO	5/30						
SWEET003.1LO	Sweetwater Creek	303d	TN06010201015-1000	KEFO	5/30			1			
SWEET010.4LO	Sweetwater Creek	303d	TN06010201015-2000	KEFO	12	12		1			
SWEET018.7MO	Sweetwater Creek	303d	TN06010201015-2000	KEFO	12	12		1			
SWEET019.4MO	Sweetwater Creek	303d	TN06010201015-3000	KEFO	12	12		1			
TBD	Wolf Creek UT	Watershed	TN06010201070-1000	KEFO	5/30						

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
TBD	Wolf Creek UT	Watershed	TN06010201070-1000	KEFO	5/30						
TBD	Wolf Creek UT	Watershed	TN06010201070-1000	KEFO	5/30						
TBD (u/s 27)	Crooked Fork	303d	TN06010208004-2000	KEFO				1			
TENNE568.2RO	Watts Bar Reservoir	303d	TN06010201001-1000	KEFO	12	12					
TENNE602.0LO	Watts Bar Reservoir	303d	TN06010201001-2000	KEFO	12	12					
TENNE643.3KN	Tennessee River	Ambient	TN06010201020-1000	KEFO	4	4					
TOWN000.5LO	Town Creek	303d	TN06010201038-1000	KEFO	5/30			1			
TOWN0002.1LO	Town Creek	303d	TN06010201038-1000	KEFO				1			
WHITE004.2MG	White Creek	Watershed	TN06010208008-0400	KEFO			1				

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
WOLF002.7RO	Wolf Creek	Watershed	TN06010201070-1000	KEFO	5/30						
WOLF003.2RO	Wolf Creek	Watershed	TN06010201070-1000	KEFO	5/30						
CYPRE001.2SH	Cypress Creek	303(d)	TN08010210032-1000	MEFO	4						
CYPRE001.82SH	Cypress Creek	303(d)	TN08010210032-1000	MEFO	4						
CYPRE006.2SH	Cypress Creek	303(d)	TN08010210032-1000	MEFO	4						
HATCH009.1TI	Hatchie River	Ambient	TN08010208001-1000	MEFO	4	4					
LOOSA005.0SH	Loosahatchie River	Ambient	TN08010209001-1000	MEFO	4	4					
LOOSA1C28.6SH	Loosahatchie River	Ambient	TN08010209004-1000	MEFO	4	4					
LOOSA1C53.6FA	Loosahatchie River	Ambient	TN08010209011-2000	MEFO	4	4					

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
NONCO015.3T0.5SH	Un.Trib.to Nonconnah	303(d)	TN08010211007 20-0100	MEFO	12	12		1		1	
NONCO017.0SH	Nonconnah Creek	303(d)	TN08010211007 20-1000	MEFO	12	12		1		1	
NONCO017.7T0.1SH	Un.Trib.to Nonconnah	303(d)	TN08010211007 20-0200	MEFO	12	12					
NONCO018.3T0.9SH	Un.Trib.to Nonconnah	303(d)	TN08010211007 20-0500	MEFO	12	12		1		1	
NONCO020.9SH	Nonconnah Creek	303(d)	TN08010211007 20-2000	MEFO	12	12		1		1	
NONCO023.2T0.1T0.3SH	Un. Trib. To Nonconnah	303(d)	TN08010211007 20-0410	MEFO	12	12		1		1	
NONCO023.2T0.4SH	Un.Trib. to Nonconnah	303(d)	TN08010211007 20-0300	MEFO	12	12		1		1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
NONCO025.2SH	Nonconnah Creek	303(d)	TN08010211007 20-3000	MEFO	12	12		1		1	
NONCO027.2T0.3S H	Un.Trib. to Nonconnah	303(d)	TN08010211007 20-0300	MEFO	12	12		1		1	
WOLF000.7SH	Wolf River	Ambient	TN08010210001-1000	MEFO	4	4					
WOLF031.4SH	Wolf River	Ambient	TN08010210003-1000	MEFO	4	4					
WOLF072.6FA	Wolf River	Ambient	TN08010210009-2000	MEFO	4	4					
BEECH000.2CA	Beech Fork	Watershed	TN05130104037_ 0600	MS		4					
BUFFA000.1CL	Buffalo Creek	Watershed	TN05130104044_ 1000	MS		4					
BUFFA004.2SC	Buffalo Creek	Watershed	TN05130104044_ 1000	MS		4					

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
CLEAR030.5CA	Clear Fork	Ambient	TN05130101015_2000	MS		4					
CLEAR037.3CL	Clear Fork	Ambient	TN05130101015_	MS		4					
ECO68A03	Laurel Fork of Station Camp Creek	SEMN	TN05130104016_0100	MS		4	2	2	1	2	
FECO69D01	New RV 1UT	FECO/Surface mining	TN05130104037_1300	MS		4	1	1	1	2	
FMILL000.2MG	Fagon Mill Creek	303(d)	TN06010208020_0500	MS		1	1				
GOLLI000.1MG	Golligher Creek	303(d)	TN06010208020_0400	MS		1	1				
INDIA001.0AN	Indian Fork	Watershed	TN05130104037_1600	MS		4					
LIGIA000.5AN	Ligias Fork	Watershed	TN05130104037_0700	MS		4					

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
LLAUR000.2MG	Little Laurel Creek	303(d)	TN06010208020_0600	MS		1	1				
MONTG000.5SC	Montgomery Fork	Watershed	TN05130104037_0400	MS		4					
NEW008.8SC	New River	Watershed	TN05130104037_1000	MS		4					
NEW045.0AN	New River	Watershed	TN05130104037_2000	MS		4					
PROCK001.0SC	Paint Rock Creek	Watershed	TN05130104037_0300	MS		4					
ROSE000.1CA	Rose Creek	Watershed	TN05130101015_0300	MS		4					
SMITH000.2MG	Smith Branch	303(d)	TN06010208020_0100	MS		1	1				
SMOKY000.8SC	Smoky Creek	Watershed	TN05130104037_1800	MS		4					
STRAI000.1CL	Straight Creek	Watershed	TN05130101015_0700	MS		4					

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
STRAI001.9SC	Straight Fork	303(d)	TN05130104044_0500	MS		4					
SUMME000.7MG	Summers Branch	303(d)	TN06010208004_1000	MS		1	1				
TACKE000.5CA	Tackett Creek	Ambient	TN05130101015_0800	MS		4					
TRACY000.2CL	Tracy branch	Watershed	TN05130101015_0500	MS		4					
VALLE000.1CL	Valley Creek	Watershed	TN05130101015_0600	MS		4					
ARKAN000.1WI	Arkansas Creek	303(d)	TN05130204010_0720	NEFO	5						
ARRIN001.8WI	Arrington Creek	Watershed	TN05130204016_0800	NEFO	12	12		1		1	
BEAVE000.3DI	Beaverdam Creek	Watershed	TN05130204006_1200	NEFO	12	12		1		1	
BEDFO000.6WI	Bedford Creek	Watershed	TN05130204010_0600	NEFO							

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
BEECH000.4WI	Beech Creek	303(d)	TN05130204021_0400	NEFO				1		1	
BEECH000.7DA	Beech Creek	303(d)	TN05130204009_1100	NEFO				1		1	
BROWN000.1WI	Brown Creek	303(d)	TN05130204009_0700	NEFO				1		1	
BRUSH000.5CH	Brush Creek	Watershed	TN05130204009_1200	NEFO				1		1	
BTURN007.1WI	Big Turnbull Creek	Watershed	TN05130204006_2000	NEFO							
BUFFA000.8DA	Buffalo Creek	Watershed	TN05130204009_0300	NEFO							
BURNS000.1WI	Burns Branch	Watershed	TN05130204013_0830	NEFO							
CAYCE000.1WI	Cayce Branch	303(d)	TN05130204013_0720	NEFO				1		1	
CFORK001.4WI	Caney Fork Creek	Watershed	TN05130204010_0800	NEFO							

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
CHEAT000.1RU	Cheatham Branch	303(d)	TN05130204018_0400	NEFO				1		1	
CONCO0.2T0.5RU	Unnamed Trib to Concord Creek	303(d)	TN05130204018_0220	NEFO				1		1	
CONCO002.1RU	Concord Creek	303(d)	TN05130204018_0200	NEFO				1		1	
CREEC_G0.1DI	Creech Hollow Branch	303(d)	TN05130204002_0410	NEFO	5			1		1	
CREEC_G0.7DI	Creech Hollow Branch	Watershed	TN05130204002_0415	NEFO	12						
CUMBE075.0ST	Barkley Reservoir	303(d)	TN05130205015_1000	NEFO	2						
CUMBE124.8MT	Barkley Reservoir	Watershed	TN05130205015_2000	NEFO	2						
CUMBE158.2CH	Cheatham Reservoir	Watershed	TN05130202001_1000	NEFO	2						

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
CUMBE174.5DA	Cheatham Reservoir	Ambient	TN05130202001_2000	NEFO	4	4					
CUMBE189.0DA	Cheatham Reservoir	303(d)	TN05130202001_3000	NEFO	2						
CUMBE191.0DA	Cheatham Reservoir	Watershed	TN05130202001_4000	NEFO	2						
CUMBE215.7DA	Cheatham Reservoir	Watershed	TN05130202001_5000	NEFO	2						
CUMBE262.9WS	Cumberland River	Ambient	TN05130201001_1000	NEFO	4	4					
DONEL000.5WI	Donelson Creek	303(d)	TN05130204016_1400	NEFO				1		1	
ECO71F12	South Harpeth Creek	Watershed	TN05130204010_0700	NEFO							
ECO71F32	Turner Creek	Ecoregion	TN05130204009_0100	NEFO	4	4	2	2	1	2	
ECO71I15	Harpeth River	Watershed	TN05130204018_1000	NEFO	12						

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
EFORK000.6DA	East Fork Creek	Watershed	TN05130204010_0500	NEFO				1		1	
FECO71F05	Kelley Creek	Ecoregion	TN05130204010_0730	NEFO	4	4	2	2	1	2	
FIVEM000.8WI	Fivemile Creek	303(d)	TN05130204016_1300	NEFO	5			1		1	
FIVEM002.2WI	Fivemile Creek	303(d)	TN05130204016_1350	NEFO	5			1		1	
FLAT000.7DA	Flat Creek	303(d)	TN05130204009_0400	NEFO				1		1	
FLATR001.4WI	Flatrock Branch	Watershed	TN05130204009_1211	NEFO							
FLATR001.6WI	Flatrock Branch	Watershed	TN05130204009_1212	NEFO							
GARRI000.4WI	Garrison Creek	Watershed	TN05130204013_0840	NEFO							
GUM000.1DI	Gum Branch	Watershed	TN05130204006_1230	NEFO							

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
HALL000.1DI	Hall Branch	Watershed	TN05130204002_1310	NEFO							
HARPE009.7CH	Harpeth River	Watershed	TN05130204001_1000	NEFO	12			1		1	
HARPE040.5CH	Harpeth River	Ambient	TN05130204009_1000	NEFO	4	4		1		1	
HARPE044.0CH	Harpeth River	303(d)	TN05130204009_2000	NEFO	12	12		1		1	
HARPE065.6WI	Harpeth River	303(d)	TN05130204009_3000	NEFO	12	12		1		1	
HARPE079.8WI	Harpeth River	303(d)	TN05130204016_1000	NEFO	12	12		1		1	
HARPE085.5WI	Harpeth River	303(d)	TN05130204016_2000	NEFO	12	12		1		1	
HARPE087.8T0.4WI	Unnamed Trib to Harpeth River	303(d)	TN05130204016_0400	NEFO				1		1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
HARPE091.3WI	Harpeth River	303(d)	TN05130204016_3000	NEFO	12	12		1		1	
HARPE100.1WI	Harpeth River	303(d)	TN05130204016_4000	NEFO	12	12		1		1	
HARPE110.7WI	Harpeth River	303(d)	TN05130204018_2000	NEFO	12	12		1		1	
HARPE114.5RU	Harpeth River	303(d)	TN05130204018_3000	NEFO	12	12		1		1	
HARPE26.0T0.2CH	Unnamed trib to Harpeth River	303(d)	TN05130204001_0600	NEFO							1
HARPE72.1T0.2WI	Unnamed trib to Harpeth River	303(d)	TN05130204009_0800	NEFO				1		1	
HARPE88.6T0.4WI	Unnamed Trib to Harpeth River	303(d)	TN05130204016_1500	NEFO				1		1	
HCAMP000.2WI	Hunting Camp Creek	Watershed	TN05130204010_1100	NEFO	12						

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
HSPRI001.2WI (should be? HSPRI000.8WI	Hatcher Spring Creek	303(d)	TN05130204013_0100	NEFO				1		1	
JONES003.3DI	Jones Creek	Watershed	TN05130204002_1000	NEFO	12			1		1	
JONES014.4DI	Jones Creek	303(d)	TN05130204002_2000	NEFO	12	12		1		1	
JONES019.8DI	Jones Creek	303(d)	TN05130204002_3000	NEFO	12	12		1		1	
JONES23.1T0.1DI	Unnamed trib to Jones Creek	303(d)	TN05130204002_0600	NEFO				1		1	
JONES7.0T1.6DI	Unnamed Trib to Jones Creek	303(d)	TN05130204002_0200	NEFO							1
KELLE000.3RU	Kelley Creek	303(d)	TN05130204018_0300	NEFO	5			1		1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
KENNE000.1WI	Kennedy Creek	303(d)	TN05130204013_0500	NEFO				1		1	
LEATH001.3CH	Leatherwood Creek	Watershed	TN05130204001_0800	NEFO	12			1		1	
LEIPE002.0WI	Leipers Fork	Watershed	TN05130204013_0800	NEFO	12			1		1	
LEIPE003.0WI	Leipers Fork	Watershed	TN05130204013_0800	NEFO							
LHARP000.6DA	Little Harpeth River	303(d)	TN05130204021_1000	NEFO	5			1		1	
LHARP008.2WI	Little Harpeth River	303(d)	TN05130204021_2000	NEFO				1		1	
LHARP009.7T0.1WI	Unnamed Trib to Little Harpeth River	303(d)	TN05130204021_0200	NEFO				1		1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
LHARP11.3T0.2WI	Unnamed Trib to Little Harpeth River	303(d)	TN05130204021_0300	NEFO				1		1	
LIBER000.1WI	Liberty Creek	303(d)	TN05130204016_0300	NEFO	12	12		1		1	
LJONE002.4DI	Little Jones Creek	Watershed	TN05130204002_1100	NEFO	12			1		1	
LTURN000.6DI	Little Turnbull Creek	Watershed	TN05130204006_0200	NEFO	12						
LYNNW000.7WI	Lynnwood Creek	303(d)	TN05130204016_0100	NEFO	12	12		1		1	
MAYES000.8WI	Mayes Creek	Watershed	TN05130204016_0600	NEFO	12	12		1		1	
MCCRO000.6WI	McCrory Creek	Watershed	TN05130204016_0900	NEFO	12	12		1		1	
MOUND000.3CH	Mound Creek	Watershed	TN05130204001_0400	NEFO							

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
MURFR001.0WI	Murfrees Fork	303(d)	TN05130204013_0700	NEFO	5						
MURRA000.1WI	Murray Branch	303(d)	TN05130204009_0600	NEFO				1		1	
new station	Murfrees Fork	303(d)	TN05130204013_0750	NEFO	12	12		1		1	
new station	Liberty Creek	303(d)	TN05130204016_0350	NEFO				1		1	
new station	Sharps Branch	303(d)	TN05130204016_1600	NEFO				1		1	
new station	Nelson Creek	Watershed	TN05130204018_0100	NEFO	12			1		1	
OAKLE001.0DI	Oakley Branch	Watershed	TN05130204001_0900	NEFO							
OTTER000.8DA	Otter Creek	303(d)	TN05130204021_0100	NEFO	12	12		1		1	
OVERA000.7WI	Overall Creek	Watershed	TN05130204018_0500	NEFO	12			1		1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
PAIGE000.3WI	Paige Branch	303(d)	TN05130204016_0810	NEFO				1		1	
PARKE000.5DI	Parker Creek	Watershed	TN05130204006_0800	NEFO				1		1	
PINEW000.4WI	Pinewood Branch	Watershed	TN05130204013_0860	NEFO	12						
POLK000.8WI	Polk Creek	303(d)	TN05130204013_0200	NEFO	5			1		1	
RATTL000.1WI	Rattlesnake Branch	303(d)	TN05130204013_0710	NEFO	12	12		1		1	
SFORK002.5DI	Sulphur Fork Creek	Watershed	TN05130204002_1200	NEFO				1		1	
SHARP000.1WI	South Harpeth Creek	Watershed	TN05130204010_0700	NEFO	12						
SHARP003.0CH	South Harpeth River	Watershed	TN05130204010_1000	NEFO	12	12		1		1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
SHARP6.0T0.1DA	Unnamed Trib to South Harpeth River	303(d)	TN05130204010_0200	NEFO							1
SHARP6.7T0.4DA	Unnamed trib to South Harpeth River	Watershed	TN05130204010_1200	NEFO							
SHARP7.2T0.3DA	Unnamed Trib to South Harpeth River	303(d)	TN05130204010_0300	NEFO				1		1	
SPENC000.0WI	Spencer Creek	303(d)	TN05130204016_0200	NEFO	5			1		1	
SPENC000.8WI	Spencer Creek	303(d)	TN05130204016_0200	NEFO				1		1	
SPICE000.9DI	Spicer Branch	303(d)	TN05130204002_0700	NEFO				1		1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
SPSPE001.2WI	South Prong Spencer Creek	303(d)	TN05130204016_0210	NEFO				1		1	
STARN000.6WI	Starnes Creek	Watershed	TN05130204016_1100	NEFO	12	12					
STONE003.9DA	Stones River	Ambient	TN05130203001_1000	NEFO	4	4					
SULLI000.1CH	Sullivan Branch	Watershed	TN05130204006_1300	NEFO							
TOWN001.7DI	Town Branch	303(d)/Watershed	TN05130204002_1300	NEFO	5						
TRACE000.4WI	Trace Creek	303(d)	TN05130204009_0900	NEFO				1		1	
TRACE003.5DI	Trace Creek	303(d)	TN05130204001_0700	NEFO	5						
TURNB000.2CH	Turnbull Creek	Watershed	TN05130204006_1000	NEFO	12			1		1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
TURNI000.6CH	Turnipseed Creek	Watershed	TN05130204001_0200	NEFO							
WATSO001.0WI	Watson Branch	303(d)	TN05130204016_0500	NEFO				1		1	
WFBRU000.1CH	West Fork Brush Creek	Watershed	TN05130204009_1210	NEFO	12	12					
WFSTO006.2RU	West Fork Stones River	Ambient	TN05130203018_1000	NEFO	4	4					
WHALL000.1DI	Will Hall Creek	303(d)	TN05130204002_0400	NEFO	5						
WHARP000.3WI	West Harpeth River	Watershed	TN05130204013_1000	NEFO	12	12					
WHARP013.2WI	West Harpeth River	303(d)	TN05130204013_2000	NEFO	5			1		1	

DWR STATION ID	NAME	PROJECT NAME	WATERBODY ID	EFO	BACT FREQ	CHEM FREQ	BENTH BR FREQ	BENTH SQSH FREQ	ALGAE FREQ	HAB FREQ	Aerial Survey
WHARP18.1T0.7WI	Unnamed Trib to West Harpeth River	303(d)	TN05130204013_0600	NEFO				1		1	
WHARP19.9T0.9WI	Unnamed Trib to West Harpeth River	303(d)	TN05130204013_0300	NEFO				1		1	
WHARP21.5T0.5WI	Unnamed Trib to West Harpeth River	303(d)	TN05130204013_0400	NEFO				1		1	
WILDC_G1.2DI	Wildcat Hollow Branch	303(d)	TN05130204002_0411	NEFO							1
WPMUR000.3WI	West Prong Murfrees Fork	303(d)	TN05130204013_0730	NEFO	5						

APPENDIX B:

COMPLIANCE MONITORING FACILITY INSPECTION SCHEDULE

Facility Inspections for 2016-2017

Permit No	Inspecttype	Permittee Name	EFO Name	County	Permit Type
TN0067539	CEI	AUB - North Mouse Creek STP	Chattanooga	McMinn	Individual
TN0067539	SSO NS	AUB - North Mouse Creek STP	Chattanooga	McMinn	Individual
TN0024201	CEI	AUB-Oostanaula Creek STP	Chattanooga	McMinn	Individual
TN0074462	CEI	Big Creek WTP	Chattanooga	Grundy	WTP
TN0073521	CEI	Big Fiery Gizzard WTP	Chattanooga	Grundy	WTP
TN0078263	CEI	Bledsoe County Correctional Campus (fomerly Taft Youth Development Center)	Chattanooga	Bledsoe	WTP
TN0079952	CEI	Carpenter Spring Water Treatment Plant	Chattanooga	Bradley	WTP
TNR053705	CEI	Central Asphalt, Inc.	Chattanooga	Bradley	TMSP
TN0081817	CEI	City of Dayton WTP	Chattanooga	Rhea	WTP
TNR050295	CEI	Cleveland Foundry & Mfg Co Inc	Chattanooga	Bradley	TMSP
TN0004642	CEI	Cleveland Utilities Water Treatment Plant	Chattanooga	Bradley	Individual
TNR051680	CEI	Clonts Used Auto Parts	Chattanooga	Bradley	TMSP
TNR051237	CEI	Coca-Cola Refreshments USA, Inc.	Chattanooga	Bradley	TMSP
TN0073024	CEI	Coker Millwrights Landfill	Chattanooga	McMinn	Individual
TN0024449	CEI	Copperhill STP	Chattanooga	Polk	Individual
TNR054322	CEI	Custom Mechanical Contractors	Chattanooga	Bradley	TMSP
TNR059044	CEI	Daus Mountain Quarry	Chattanooga	Grundy	TMSP
TNR059081	CEI	E & E Manufacturing of TN, LLC	Chattanooga	McMinn	TMSP
TN0074152	CEI	Eaves Spring WTP	Chattanooga	Meigs	WTP
TN0021938	CEI	Englewood STP	Chattanooga	McMinn	Individual
TN0063771	CEI	Etowah STP	Chattanooga	McMinn	Individual
TN0063771	SSO NS	Etowah STP	Chattanooga	McMinn	Individual
TN0080143	CEI	Etowah Utilities Board WTP	Chattanooga	McMinn	WTP
TNR054454	CEI	Evans Lumber	Chattanooga	Polk	TMSP
TN0081680	CEI	Farr Dairy	Chattanooga	McMinn	CAFO-Individual

Permit No	Inspecttype	Permittee Name	EFO Name	County	Permit Type
TNR059185	CEI	Flag and Fieldstone USA, Inc. - Prigmore Operations	Chattanooga	Marion	TMSP
TNR059020	CEI	Frostbite Stone	Chattanooga	Bledsoe	TMSP
TN0079839	CEI	General Shale Brick, Inc.	Chattanooga	Rhea	Mining
TN0079863	CEI	General Shale Brick, Inc.	Chattanooga	Rhea	Mining
TN0081761	CEI	Haley Lane Water Plant	Chattanooga	Rhea	WTP
TNR053619	CEI	Honeywell International, Inc. - Cleveland Landfill (Closed)	Chattanooga	Bradley	TMSP
TNR054598	CEI	J B K Enterprises Inc	Chattanooga	Bradley	TMSP
TN0001996	CEI	J.M. Huber Corporation	Chattanooga	McMinn	Individual
TNR058529	CEI	Keasler, Inc.	Chattanooga	Bradley	TMSP
TNR051412	CEI	Mayfield Dairy	Chattanooga	McMinn	TMSP
TNR053938	CEI	Maytag C. C. P. Plant # 2	Chattanooga	Bradley	TMSP
TNR053746	CEI	Mueller Co. - Cleveland	Chattanooga	Bradley	TMSP
TNR054154	CEI	Omni Service, Inc.	Chattanooga	McMinn	TMSP
TNR050036	CEI	Pasco Products, Inc.	Chattanooga	Bradley	TMSP
TNR058259	CEI	PI, Inc.	Chattanooga	McMinn	TMSP
TN0078581	CEI	Pikeville Water Treatment Plant	Chattanooga	Bledsoe	WTP
TNR059067	CEI	Pocket Creek Operations	Chattanooga	Marion	TMSP
TNR053606	CEI	Polartec Tennessee Manufacturing, LLC	Chattanooga	Bradley	TMSP
TNR053037	CEI	Precision Southeast Service Center	Chattanooga	Bradley	TMSP
TNR058800	CEI	Republic Plastics - K2	Chattanooga	Hamilton	TMSP
TN0002356	CEI	Resolute FP US Inc.	Chattanooga	McMinn	Individual
TNR059066	CEI	RLF Soak Creek Properties, LLC	Chattanooga	Bledsoe	TMSP
TNR059072	CEI	S & M Construction Company, Inc.	Chattanooga	Marion	TMSP
TN0066346	CEI	S & S Rock, Inc.	Chattanooga	Polk	Mining
TN0081001	CEI	Savannah Valley Utility District	Chattanooga	Hamilton	WTP
TNR050327	CEI	Seaton Auto Parts	Chattanooga	McMinn	TMSP
TNR058881	CEI	Seaton Enterprises, LLC	Chattanooga	McMinn	TMSP
TNR051679	CEI	Sequatchie Concrete Service - Cleveland	Chattanooga	Bradley	TMSP

Permit No	Inspecttype	Permittee Name	EFO Name	County	Permit Type
TNR059035	CEI	Steve Williams Borrow Pit	Chattanooga	Bradley	TMSP
TNR056944	CEI	Stone Sales & Service	Chattanooga	Bledsoe	TMSP
TNR056843	CEI	Swing Transport	Chattanooga	Bradley	TMSP
TNR056676	CEI	Talley Construction Co., Inc./ dba Southeastern Materials Inc.	Chattanooga	Bradley	TMSP
TNR059069	CEI	Tennessee Natural Stone, LLC	Chattanooga	Bledsoe	TMSP
TNR050603	CEI	Thomas and Betts	Chattanooga	McMinn	TMSP
TN0020168	CEI	TVA - Watts Bar Nuclear Plant	Chattanooga	Rhea	Individual
TN0030155	CEI	TVA Apalachia Hydro Plant	Chattanooga	Polk	Individual
TN0027499	CEI	TVA Ocoee #1 Hydro Plant	Chattanooga	Polk	Individual
TN0027502	CEI	TVA Ocoee #2 Hydro Plant	Chattanooga	Polk	Individual
TN0005479	CEI	TVA Ocoee #3 Hydro Plant	Chattanooga	Polk	Individual
TNR059187	CEI	United Stone, LLC - Sewanee Gulf Rock Harvesting Site	Chattanooga	Grundy	TMSP
TN0081311	CBI	Wacker Polysilicon North America, LLC	Chattanooga	Bradley	Individual
TNR051242	CEI	Wampler's Used Auto Parts	Chattanooga	Bradley	TMSP
TN0076015	CEI	Waupaca Foundry, Inc. - Plant 6	Chattanooga	McMinn	Individual
TNR051238	CEI	West Auto Sales & Parts	Chattanooga	Bradley	TMSP
TNR051718	CEI	WestRock Cleveland Recycle Fiber	Chattanooga	Bradley	TMSP
TN0081159	CEI	WTP-Ocoee Utility District	Chattanooga	Bradley	WTP
TNG110118	CEI	Abernathy Concrete Co., Inc.	Columbia	Giles	RMCP
TNR055909	Stormwater	All-Star Auto Salvage	Columbia	Lawrence	TMSP
TN0003751	PAI	Arnold Engineering Development Complex	Columbia	Franklin	Individual
TNR056820	Stormwater	AZZ Galvanizing Services, Lyles Plant (North American Galvanizing Company)	Columbia	Hickman	TMSP
TNR056540	Stormwater	Baxter Enterprises	Columbia	Franklin	TMSP
TNR051563	Stormwater	Cedar Ridge Landfill, Inc.	Columbia	Marshall	TMSP
TN0064670	CEI	Chapel Hill STP	Columbia	Marshall	Individual
TN0067423	CEI	Clifton STP #2	Columbia	Wayne	Individual
TNS075248	CEI	Columbia	Columbia	Maury	MS4

Permit No	Inspecttype	Permittee Name	EFO Name	County	Permit Type
TN0004375	CEI	Columbia Water System WTP	Columbia	Maury	WTP
TNR054240	Stormwater	Davie R. Ashley Sawmill	Columbia	Lincoln	TMSP
TN0020508	CEI	Decherd Water Works STP	Columbia	Franklin	Individual
TNR058054	Stormwater	Elk Valley Hardwoods, LLC	Columbia	Lawrence	TMSP
TN0076007	CEI	Elkton STP	Columbia	Giles	Individual
TN0074837	CEI	Estill Springs Water Treatment Plant	Columbia	Franklin	WTP
TN0004979	CEI	Fayetteville Public Utilities	Columbia	Lincoln	WTP
TN0021814	CBI	Fayetteville STP	Columbia	Lincoln	Individual
TN0063151	CEI	Franklin Industrial Minerals dba Lhoist North America	Columbia	Franklin	Mining
TNR050514	Stormwater	Freeman Lumber Company	Columbia	Hickman	TMSP
TN0001872	CEI	GrafTech International Holdings Inc.	Columbia	Lawrence	Individual
TN0058939	CEI	Highland Rim School	Columbia	Lincoln	Individual
TN0074853	CEI	Huntland WTP	Columbia	Franklin	WTP
TNG110277	CEI	imi TN Inc. FAYETTEVILLE	Columbia	Lincoln	RMCP
TNG110061	CEI	imi TN Inc. MANCHESTER	Columbia	Coffee	RMCP
TN0022551	PAI	Lawrenceburg STP	Columbia	Lawrence	Individual
TN0022888	CEI	Lewisburg STP	Columbia	Marshall	Individual
TN0066176	CEI	Lincoln County Highway Department	Columbia	Lincoln	Mining
TN0020818	CEI	Lobelville STP	Columbia	Perry	Individual
TNR051463	Stormwater	Magotteaux Inc.	Columbia	Giles	TMSP
TNR050536	Stormwater	Modine Manufacturing Company, Remke Ave - Lawrenceburg	Columbia	Lawrence	TMSP
TNR058475	Stormwater	Park City Recycling	Columbia	Lincoln	TMSP
TN0021687	CBI	Pulaski STP	Columbia	Giles	Individual
TN0072273	CEI	Rogers Group, Inc.	Columbia	Hickman	Mining
TN0066630	CEI	Rogers Group, Inc. - Pottsville Quarry	Columbia	Marshall	Mining
TNR056623	Stormwater	Rolling Frito-Lay Sales, LP - Lawrenceburg Bin	Columbia	Lawrence	TMSP
TNR051246	Stormwater	Rose Moon Inc. d/b/a Moon Products	Columbia	Marshall	TMSP

Permit No	Inspecttype	Permittee Name	EFO Name	County	Permit Type
TNR058591	Stormwater	Scivally Truck Parts	Columbia	Lincoln	TMSP
TN0079723	CEI	Sherwood Mining Company, LLC Sherwood Rock Quarry	Columbia	Franklin	Mining
TNG110117	CEI	Smyrna Ready Mix Concrete LLC - Shelbyville	Columbia	Bedford	RMCP
TNG110250	CEI	Smyrna Ready Mix Concrete, LLC - Spencer Mill Road (formerly Metro Ready Mix Concrete, LLC)	Columbia	Hickman	RMCP
TN0056545	CEI	Summertown High School	Columbia	Lawrence	Individual
TNR058587	Stormwater	Surface Elements, Inc.	Columbia	Lawrence	TMSP
TNR053596	Stormwater	TE Connectivity	Columbia	Coffee	TMSP
TNR051481	Stormwater	The Car Shoppe	Columbia	Lincoln	TMSP
TN0069507	CEI	Tinsley Asphalt Products	Columbia	Franklin	Mining
TNR056400	Stormwater	Tony's Auto Sales	Columbia	Lawrence	TMSP
TN0065498	CEI	Unity School	Columbia	Lincoln	Individual
TN0076244	CEI	Vulcan Construction Materials, LLC	Columbia	Giles	Mining
TNR053236	Stormwater	WestRock CP, LLC	Columbia	Marshall	TMSP
TNR055041	CEI	ABC INOAC Exterior Systems, LLC	Cookeville	Overton	TMSP
TN0069302	CEI	American Sand Company LLC	Cookeville	Putnam	Mining
TN0066231	CEI	American Sand Company LLC	Cookeville	Putnam	Mining
TN0066249	CEI	American Sand Company LLC	Cookeville	Putnam	Mining
TNR053907	CEI	Bon L Manufacturing Co	Cookeville	Smith	TMSP
TNR053210	CEI	Bridgestone Americas Tire Operations, LLC - Warren	Cookeville	Warren	TMSP
TNG110033	CEI	Builders Supply Company	Cookeville	Putnam	RMCP
TN0024198	CEI	City of Cookeville WWTP	Cookeville	Putnam	Individual
TNS079987	CEI	City of Crossville MS4	Cookeville	Cumberland	MS4
TN0055719	CEI	Cumberland Property and Investment Group, LLC d/b/a Deer Run Property Management, Inc.	Cookeville	Cumberland	Individual

Permit No	Inspecttype	Permittee Name	EFO Name	County	Permit Type
TNR053623	CEI	Cummins Filtration	Cookeville	Putnam	TMSP
TNR054405	CEI	Dunn & Bybee Tool Co Inc	Cookeville	White	TMSP
TNR054312	CEI	Durable Products, Inc.	Cookeville	Cumberland	TMSP
TNR054140	CEI	Fairfield Glade Farm Site Soil Borrow	Cookeville	Cumberland	TMSP
TN0078727	CEI	Flip Fest Properties, LLC	Cookeville	Cumberland	Individual
TN0055981	CEI	Holiday Out R.V. Park-Lake Tansi	Cookeville	Cumberland	Individual
TN0062634	CBI	Jamestown STP	Cookeville	Fentress	Individual
TNR057093	CEI	L & C Stone Company	Cookeville	White	TMSP
TNG110287	CEI	Livingston Ready Mix, L.L.C.	Cookeville	Overton	RMCP
TN0076333	CEI	LoJac Enterprises, Inc.	Cookeville	Putnam	Mining
TN0069779	CEI	LoJac Enterprises, Inc.	Cookeville	Overton	Mining
TN0023591	CEI	McMinnville STP	Cookeville	Warren	Individual
TNR054055	CEI	Mizkan Americas, Inc	Cookeville	Cumberland	TMSP
TN0064688	CEI	Monterey WWTP	Cookeville	Putnam	Individual
TN0080489	CEI	Nestle Waters North America, Inc.	Cookeville	Macon	Individual
TN0064289	CEI	Nyrstar Tennesse Mines Gordonsville, LLC	Cookeville	Smith	Mining
TN0029360	CEI	Nyrstar Tennessee Mines	Cookeville	Smith	Mining
TN0004227	CEI	Nyrstar Tennessee Mines - Gordonsville, LLC	Cookeville	Smith	Mining
TNR054387	CEI	Pelletizing Company, Inc.	Cookeville	Smith	TMSP
TN0027618	CEI	Pleasant Hill Housing Project	Cookeville	Cumberland	Individual
TNR058913	CEI	Pritchetts LLC	Cookeville	Fentress	TMSP
TN0063509	CEI	Rogers Group, Inc.	Cookeville	White	Mining
TN0066320	CEI	Rogers Group, Inc.	Cookeville	DeKalb	Mining
TN0063461	CEI	Rogers Group, Inc.	Cookeville	Warren	Mining
TN0063487	CEI	Rogers Group, Inc.	Cookeville	Putnam	Mining
TNR056632	CEI	Rolling Frito-Lay Sales, LP - Cookeville Bin	Cookeville	Putnam	TMSP
TN0065358	CBI	Smithville STP	Cookeville	DeKalb	Individual
TNR056693	CEI	Stonepeak Ceramics, Inc.	Cookeville	Cumberland	TMSP
TNR051146	CEI	Turner Auto Salvage	Cookeville	Warren	TMSP

Permit No	Inspecttype	Permittee Name	EFO Name	County	Permit Type
TNR053189	CEI	TVA - Hartsville Maintenance Facility	Cookeville	Smith	TMSP
TNR053551	CEI	United Parcel Service - Cookeville	Cookeville	Putnam	TMSP
TN0055531	CEI	Uplands Retirement Village	Cookeville	Cumberland	Individual
TNR056958	CEI	Walker Stone	Cookeville	Overton	TMSP
TN0025372	CEI	West Warren- Viola Utility District STP	Cookeville	Warren	Individual
TN0062367	CEI	Brownsville Energy Authority WWTP	Jackson	Haywood	Individual
TN0004740	CEI	Camden Water Treatment Plant	Jackson	Benton	WTP
TN0077917	CEI	City of Bolivar STP	Jackson	Hardeman	Individual
TN0062545	CEI	City of Martin Wastewater Treatment Plant	Jackson	Weakley	Individual
TN0041106	CEI	Ergon Asphalt and Emulsions, Inc.	Jackson	Decatur	Individual
TNG110185	CEI	Federal Materials Company, LLC	Jackson	Henry	RMCP
TN0042072	CEI	First Utility District of Hardin County	Jackson	Hardin	WTP
TN0057291	CEI	Halls Lagoon	Jackson	Lauderdale	Individual
TN0000221	CEI	HEXPOL Compounding Colonial Rubber Works	Jackson	Dyer	Individual
TN0062588	CEI	Humboldt Board of Public Utilities STP	Jackson	Gibson	Individual
TN0078379	CEI	IRM Utility, Inc - Riverstone Estates Wastewater Treatment Plant	Jackson	Decatur	Individual
TNG110020	CEI	Mid-Way Materials, Inc.	Jackson	Benton	RMCP
TN0062111	CEI	Newbern STP	Jackson	Dyer	Individual
TNS088340	MS4	Paris MS4	Jackson	Henry	MS4
TN0074985	CEI	Replogle Enterprises	Jackson	Henry	Individual
TN0081191	CEI	Scotts Hill Turnbo Creek Water Treatment Plant	Jackson	Decatur	WTP
TN0062308	CEI	Selmer STP	Jackson	McNairy	Individual
TN0062031	CEI	Sharon Lagoon	Jackson	Weakley	Individual
TNG110011	CEI	Southern Concrete Products, Inc.	Jackson	Chester	RMCP
TN0001139	CEI	Titan Tire Corporation of Union City	Jackson	Obion	Individual
TN0064025	CEI	Toone STP	Jackson	Hardeman	Individual
TN0062120	CEI	Trimble STP	Jackson	Dyer	Individual

Permit No	Inspecttype	Permittee Name	EFO Name	County	Permit Type
TN0027511	CEI	TVA Pickwick Hydro Plant	Jackson	Hardin	Individual
TN0073563	CEI	Tyson Farms, Inc.	Jackson	Obion	Individual
TN0081060	CEI	West Camden Sanitary Landfill	Jackson	Benton	Individual
TN0026590	CEI	Whiteville STP	Jackson	Hardeman	Individual
TN0057983	CEI	Aerojet Ordnance Tennessee	Johnson City	Washington	Individual
TNR051099	CEI	Aerojet Ordnance Tennessee	Johnson City	Washington	TMSP
TN0066010	CEI	Aggregates USA (Locust Mount), LLC	Johnson City	Washington	Mining
TN0001775	CEI	Aggregates USA (Watauga), LLC	Johnson City	Carter	Mining
TNR051621	CEI	American Water Heater Company	Johnson City	Washington	TMSP
TNR050114	CEI	Auto Truck Salvage	Johnson City	Sullivan	TMSP
TN0003671	CEI	BAE Systems Ordnance Systems Inc. (Holston) (HSAAP)	Johnson City	Hawkins	Individual
TNR053962	CEI	BAE Systems Ordnance Systems, Inc.	Johnson City	Hawkins	TMSP
TN0063932	CEI	Baileyton STP	Johnson City	Greene	Individual
TNR053941	CEI	Bell Helicopter Textron, Inc.	Johnson City	Sullivan	TMSP
TN0076201	CEI	Berry Hills Corporation	Johnson City	Hawkins	Mining
TN0068659	CEI	Big Springs WTP	Johnson City	Carter	WTP
TNS075183	Stormwater MS4 Audit	Bristol	Johnson City	Sullivan	MS4
TNR053148	CEI	Ceradyne, Inc., a 3M company (formerly Minco, Inc.)	Johnson City	Greene	TMSP
TNR050778	CEI	Delfasco of Tennessee	Johnson City	Greene	TMSP
TNR052011	CEI	East TN Iron & Metal	Johnson City	Hawkins	TMSP
TN0023515	CEI	Elizabethton STP	Johnson City	Carter	Individual
TN0061336	CEI	First Utility District Hawkins County	Johnson City	Hawkins	WTP
TN0080551	CEI	First Utility District of Hawkins County, WTP	Johnson City	Hawkins	WTP
TNS075710	Stormwater MS4 Audit	Greeneville	Johnson City	Greene	MS4
TNR056382	CEI	Hale's Salvage Storage Lot & Used Parts	Johnson City	Sullivan	TMSP
TNR054381	CEI	Henard Metal Fabricators Inc.	Johnson City	Sullivan	TMSP

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TNR055963	CEI	Hexpol Compounding, Burton Rubber Processing	Johnson City	Washington	TMSP
TN0002330	CEI	Holliston, LLC	Johnson City	Hawkins	Individual
TNR056163	CEI	Holston Valley Auto Salvage	Johnson City	Sullivan	TMSP
TN0028789	CEI	Johnson City Regional WWTP	Johnson City	Washington	Individual
TN0024236	CEI	Johnson City-Knob Creek STP	Johnson City	Washington	Individual
TNR058444	CEI	Kingsport Energy Yard	Johnson City	Sullivan	TMSP
TNR058917	CEI	La Quesera Mexicana	Johnson City	Greene	TMSP
TNR050003	CEI	Lectro Chem Metal Finishing Company	Johnson City	Greene	TMSP
TN0059366	CEI	Lick Creek Valley (Mosheim) Wastewater Treatment Plant	Johnson City	Greene	Individual
TNR055064	CEI	Manitowoc Foodservice - Kysor Panel Systems	Johnson City	Sullivan	TMSP
TN0062057	CEI	Mount Carmel STP	Johnson City	Hawkins	Individual
TN0024945	CBI	Mountain City STP	Johnson City	Johnson	Individual
TNR051127	CEI	NN Ball & Roller Inc.	Johnson City	Unicoi	TMSP
TN0020672	CEI	Rogersville STP	Johnson City	Hawkins	Individual
TNR056620	CEI	Rolling Frito-Lay Sales, LP - Greenville Bin	Johnson City	Greene	TMSP
TNR056639	CEI	Rolling Frito-Lay Sales, LP - Piney Flats DC	Johnson City	Sullivan	TMSP
TNG110249	CEI	Ross Prestressed Concrete Co., Inc.	Johnson City	Sullivan	RMCP
TNR058278	CEI	Royal Mouldings	Johnson City	Sullivan	TMSP
TNR050262	CEI	Sam Dong, Inc.	Johnson City	Hawkins	TMSP
TN0054291	CEI	Short Mountain Silica Company	Johnson City	Hawkins	Mining
TN0071919	CEI	Short Mountain Trucking, Inc.	Johnson City	Hawkins	Mining
TNR054010	CEI	Star Building Systems	Johnson City	Carter	TMSP
TNR058241	CEI	Stowers Machinery Corp	Johnson City	Sullivan	TMSP
TNR051048	CEI	Summers Taylor Watauga Asphalt Plant #2	Johnson City	Carter	TMSP
TNR058534	CEI	Summers Taylor, Inc. - Blountville Asphalt Plant 1	Johnson City	Sullivan	TMSP

Permit No	Inspecttype	Permittee Name	EFO Name	County	Permit Type
TNR051046	CEI	Summers-Taylor Asphalt Plant	Johnson City	Greene	TMSP
TNR056883	CEI	Summers-Taylor Blountville Asphalt Plant #1	Johnson City	Sullivan	TMSP
TNR056882	CEI	Summers-Taylor Blountville Asphalt Plant #2	Johnson City	Sullivan	TMSP
TNG110145	CEI	Summers-Taylor Blountville Concrete Plant	Johnson City	Sullivan	RMCP
TNG110164	CEI	Summers-Taylor Erwin Concrete Plant	Johnson City	Unicoi	RMCP
TNG110162	CEI	Summers-Taylor Johnson City Concrete Plant	Johnson City	Washington	RMCP
TNR051902	CEI	Summers-Taylor Unicoi Asphalt	Johnson City	Unicoi	TMSP
TNR058893	CEI	Superior Carriers	Johnson City	Sullivan	TMSP
TN0002640	CEI	Tennessee Operations, Eastman Chemical Company	Johnson City	Sullivan	Individual
TNR058480	CEI	The Robinette Company	Johnson City	Sullivan	TMSP
TNR058479	CEI	The Robinette Company	Johnson City	Sullivan	TMSP
TNR054427	CEI	TI Group Automotive Systems	Johnson City	Greene	TMSP
TN0002666	CEI	Treadway Circle Water & Sewer	Johnson City	Hancock	Individual
TNR050273	CEI	Tri City Plating Company, Inc.	Johnson City	Carter	TMSP
TNR053496	CEI	Tri-Cities Regional Airport Authority	Johnson City	Sullivan	TMSP
TNR053325	CEI	Tri-City Auto Parts II	Johnson City	Sullivan	TMSP
TNR058558	CEI	Tri-City Extrusion, Inc.	Johnson City	Sullivan	TMSP
TN0027391	CEI	TVA - Boone Hydro Plant	Johnson City	Sullivan	Individual
TN0027448	CEI	TVA Fort Patrick Henry Hydro Plant	Johnson City	Sullivan	Individual
TN0027529	CEI	TVA South Holston Hydro Plant	Johnson City	Sullivan	Individual
TN0064106	CEI	Unisys Corp. - Earhart Site	Johnson City	Sullivan	Individual
TNR051100	CEI	Valley Equipment Company Inc.	Johnson City	Washington	TMSP
TN0068896	CEI	Vulcan Construction Materials, LLC	Johnson City	Greene	Mining
TN0066681	CEI	Vulcan Construction Materials, LLC	Johnson City	Greene	Mining
TN0027910	CEI	Vulcan Construction Materials, LLC	Johnson City	Hawkins	Mining
TN0064157	CEI	Vulcan Construction Materials, LLC	Johnson City	Sullivan	Mining

Permit No	Inspecttype	Permittee Name	EFO Name	County	Permit Type
TN0060879	CEI	Vulcan Construction Materials, LLC	Johnson City	Greene	Mining
TN0072303	CEI	Vulcan Construction Materials, LLC	Johnson City	Greene	Mining
TN0066362	CEI	Vulcan Construction Materials, LLC	Johnson City	Sullivan	Mining
TNS075787	Stormwater MS4 Audit	Washington County	Johnson City	Washington	MS4
TNR056463	CEI	Washington Farmers Cooperative	Johnson City	Washington	TMSP
TNR058139	CEI	West Main Recycling	Johnson City	Greene	TMSP
TNR053458	CEI	W-L Construction & Paving, Inc. Kingsport Plant	Johnson City	Sullivan	TMSP
TNR053459	CEI	W-L Construction & Paving, Inc. Kingsport Shop	Johnson City	Sullivan	TMSP
TNR056006	CEI	131 Automotive Parts	Knoxville	Union	TMSP
TN0004987	CEI	Aggregates USA, LLC	Knoxville	Knox	Mining
TNR056803	CEI	AirCel	Knoxville	Blount	TMSP
TNR053763	CEI	Alcoa/Maryville/Blount County Landfill	Knoxville	Blount	TMSP
TNR052034	CEI	American Appliance Products	Knoxville	Cocke	TMSP
TNR050990	CEI	American Centrifuge Manufacturing, LLC	Knoxville	Anderson	TMSP
TNR054549	CEI	Anderson Truss Co Inc	Knoxville	Blount	TMSP
TNR053465	CEI	APAC - Atlantic Harrison Division/Mascot Asphalt	Knoxville	Knox	TMSP
TNR058459	CEI	APAC - Atlantic Inc. / Borrow Pit	Knoxville	Knox	TMSP
TNR058448	CEI	APAC - Atlantic, Inc / Borrow Site	Knoxville	Knox	TMSP
TNR058449	CEI	APAC - Atlantic, Inc / Borrow Site	Knoxville	Knox	TMSP
TNR051213	CEI	APAC Atlantic, Inc. Harrison Division/Cinder Lane	Knoxville	Knox	TMSP
TNR055906	CEI	APAC Atlantic, Inc. Harrison Division/John Deere Drive	Knoxville	Union	TMSP
TNR053460	CEI	APAC Atlantic, Inc. Harrison Division/Knoxville Shop and Harrison Construction Company	Knoxville	Knox	TMSP

Permit No	Inspecttype	Permittee Name	EFO Name	County	Permit Type
TNR051819	CEI	ArcelorMittal LaPlace, LLC	Knoxville	Roane	TMSP
TNR053639	CEI	Arvin Meritor	Knoxville	Hamblen	TMSP
TNR055944	CEI	Asphalt Plant #1	Knoxville	Sevier	TMSP
TNR054058	CEI	Asphalt Plant #3	Knoxville	Sevier	TMSP
TNR055895	CEI	Austin Powder Company	Knoxville	Campbell	TMSP
TNR053964	CEI	B & F Hot Mix Asphalt, Inc.	Knoxville	Claiborne	TMSP
TNR058828	CEI	BAM Inc.	Knoxville	Knox	TMSP
TNR056487	CEI	Barnes Recycling, Inc	Knoxville	Jefferson	TMSP
TNR050035	CEI	Blalock Operation Center (BOC)	Knoxville	Sevier	TMSP
TNR055942	CEI	Blue Ridge Paper Products, Inc.	Knoxville	Campbell	TMSP
TNR054373	CEI	Brown Truss Co Inc	Knoxville	Blount	TMSP
TNR054265	CEI	BSH Home Appliance Corporation	Knoxville	Campbell	TMSP
TNR053414	CEI	Burkhart Enterprises, Inc.	Knoxville	Knox	TMSP
TNR050362	CEI	Bush Brothers & Company, Inc.	Knoxville	Jefferson	TMSP
TNR054388	CEI	Bushline Inc	Knoxville	Claiborne	TMSP
TNR058438	CEI	Butler's Wrecker Service & Auto, LLC	Knoxville	Blount	TMSP
TNR051700	CEI	Campos Foods LLC	Knoxville	Campbell	TMSP
TN0069388	CEI	Cedar Hill Construction and Supply Company, Inc.	Knoxville	Campbell	Mining
TNR050503	CEI	CF Group	Knoxville	Hamblen	TMSP
TNR051248	CEI	Chestnut Ridge Landfill and Recycling Center	Knoxville	Anderson	TMSP
TNR051823	CEI	Clayton Homes - Appalachia	Knoxville	Anderson	TMSP
TNR053205	CEI	Clayton Homes - Rutledge	Knoxville	Grainger	TMSP
TNR051802	CEI	Clayton Supply of Tennessee / Classic Panel of Tennessee	Knoxville	Hamblen	TMSP
TNR050259	CEI	Clinch River Casting Inc	Knoxville	Campbell	TMSP
TN0066613	CEI	Cocke County Highway Dept.	Knoxville	Cocke	Mining
TNR056870	CEI	Colgate-Palmolive Company	Knoxville	Hamblen	TMSP
TN0048895	CEI	CONSOL Mining Company, LLC	Knoxville	Claiborne	Mining

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TNR053322	CEI	CoorsTek	Knoxville	Anderson	TMSP
TNR058134	CEI	Creekmore Lumber Company, Inc.	Knoxville	Campbell	TMSP
TNR054194	CEI	Custom Foods of America	Knoxville	Knox	TMSP
TNR056646	CEI	D & D Enterprises	Knoxville	Claiborne	TMSP
TNR050075	CEI	Denso Manufacturing Tennessee, Inc.	Knoxville	Blount	TMSP
TNR050321	CEI	Diversified Scientific Service, Inc.	Knoxville	Roane	TMSP
TNR053252	CEI	Downtown Island Airport	Knoxville	Knox	TMSP
TN0072567	CEI	DRC Coal LLC (Formerly Mountainside Coal Company)	Knoxville	Claiborne	Mining
TN0069167	CEI	DRC Coal, LLC	Knoxville	Campbell	Mining
TNR056393	CEI	DTR Tennessee, Inc. Plant 2	Knoxville	Claiborne	TMSP
TNR050016	CEI	Eagle Bend Manufacturing Inc.	Knoxville	Anderson	TMSP
TNR050083	CEI	East Tennessee Auto Center	Knoxville	Sevier	TMSP
TNR058057	CEI	Eddie's Auto Parts # 2	Knoxville	Union	TMSP
TNR052028	CEI	EnergySolutions, LLC	Knoxville	Roane	TMSP
TNR051628	CEI	EnergySolutions, LLC - Bear Creek Facility	Knoxville	Roane	TMSP
TNR050792	CEI	Enterprise Oil Company	Knoxville	Knox	TMSP
TNR051398	CEI	Evans Honda Specialists	Knoxville	Cocke	TMSP
TNR051884	CEI	Exedy America	Knoxville	Knox	TMSP
TNR055905	CEI	Federal Express - Alcoa-TYSRT (FedEx)	Knoxville	Blount	TMSP
TNR058482	CEI	Flex-N-Gate Rockford, LLC	Knoxville	Blount	TMSP
TNR053928	CEI	Forest Products Inc.	Knoxville	Claiborne	TMSP
TNR050694	CEI	Fox Auto Salvage	Knoxville	Anderson	TMSP
TNR054528	CEI	Geri's Used Parts & Cars	Knoxville	Cocke	TMSP
TNR058007	CEI	Giles Industries	Knoxville	Claiborne	TMSP
TNR050068	CEI	Glenn's Auto Parts	Knoxville	Roane	TMSP
TNR058859	CEI	Goodwill Material Recovery Facility	Knoxville	Hamblen	TMSP
TNR051804	CEI	Hardwoods of Morristown, Inc.	Knoxville	Hamblen	TMSP
TNR051581	CEI	Headrick's New & Used Truck Parts, LLC	Knoxville	Blount	TMSP
TNR056155	CEI	Hillbilly Auto Parts, Inc.	Knoxville	Sevier	TMSP

Permit No	Inspecttype	Permittee Name	EFO Name	County	Permit Type
TNR058682	CEI	Hilltop Recycling, Inc.	Knoxville	Union	TMSP
TN0072885	CEI	Hommel Construction Company	Knoxville	Cocke	Mining
TNR050607	CEI	I-75 Auto Parts & Recycling, Inc.	Knoxville	Campbell	TMSP
TNR051534	CEI	International Paper Company	Knoxville	Hamblen	TMSP
TN0063347	CEI	Jefferson County Hwy Dept	Knoxville	Jefferson	Mining
TNR054583	CEI	Jimmy's Automotive	Knoxville	Union	TMSP
TNR050447	CEI	Johnson Matthey, Inc.	Knoxville	Sevier	TMSP
TNR050290	CEI	JR's Valley Auto Parts	Knoxville	Campbell	TMSP
TNR054492	CEI	Koide Tennessee, Inc.	Knoxville	Blount	TMSP
TNR053607	CEI	Lakeside Wood Products, Inc.	Knoxville	Campbell	TMSP
TNR050614	CEI	Lambert Auto Parts	Knoxville	Anderson	TMSP
TNR050861	CEI	Lamberts Pick-a-Part, LLC	Knoxville	Knox	TMSP
TNR058436	CEI	Lisega, Inc.	Knoxville	Sevier	TMSP
TNR051780	CEI	MacDermid Printing Solutions	Knoxville	Hamblen	TMSP
TNR050388	CEI	Manufacturing Sciences Corp	Knoxville	Anderson	TMSP
TNR056871	CEI	Marathon Petroleum Company LP	Knoxville	Knox	TMSP
TNR058056	CEI	Maynard's Auto Parts	Knoxville	Campbell	TMSP
TNR051350	CEI	Mid-Lakes Corporation	Knoxville	Knox	TMSP
TNR054574	CEI	Midland Powder, LLC	Knoxville	Blount	TMSP
TNR051337	CEI	Miller's Auto Parts & Repair	Knoxville	Grainger	TMSP
TNR059101	CEI	Monster Tower	Knoxville	Blount	TMSP
TNR056160	CEI	Morgans Auto Recycling	Knoxville	Blount	TMSP
TNR053520	CEI	Morristown Iron & Metal	Knoxville	Hamblen	TMSP
TNR056501	CEI	MPLX Terminals LLC - Knoxville Terminal	Knoxville	Knox	TMSP
TN0076376	CEI	National Coal, LLC	Knoxville	Campbell	Mining
TN0079502	CEI	National Coal, LLC Mine 14	Knoxville	Campbell	Mining
TNR058981	CEI	Nelson Global Products, Inc.	Knoxville	Anderson	TMSP
TNR056482	CEI	New Era Enterprises, Inc.	Knoxville	Sevier	TMSP

Permit No	Inspecttype	Permittee Name	EFO Name	County	Permit Type
TNR058676	CEI	Newell Rubbermaid - Sanford Maryville Facility	Knoxville	Blount	TMSP
TNR055947	CEI	Norris Homes (CMH Mfg)	Knoxville	Grainger	TMSP
TNR054360	CEI	Oak Ridge Hardwoods, Inc.	Knoxville	Anderson	TMSP
TNR053196	CEI	Oak Ridge Hauling	Knoxville	Anderson	TMSP
TNR058732	CEI	Oak Ridge Main Post Office	Knoxville	Roane	TMSP
TNR058209	CEI	Old Dominion Freight Line, Inc.	Knoxville	Jefferson	TMSP
TNR054263	CEI	Parker Trutec, Inc.	Knoxville	Sevier	TMSP
TNR050816	CEI	Pemberton Truck Lines Inc	Knoxville	Knox	TMSP
TNR054491	CEI	Petoskey Plastics Inc	Knoxville	Hamblen	TMSP
TN0079529	CEI	Premium Coal Company, Inc.	Knoxville	Anderson	Mining
TN0079570	CEI	Premium Coal Company, Inc.	Knoxville	Campbell	Mining
TN0069159	CEI	Premium Coal Company, Inc.	Knoxville	Anderson	Mining
TNR059206	CEI	ProImage Wholesale Signs	Knoxville	Campbell	TMSP
TNR050898	CEI	Proton Power, Inc.	Knoxville	Roane	TMSP
TNR054310	CEI	Quality Machine & Welding Co	Knoxville	Knox	TMSP
TNR058739	CEI	Rarity Mountain Rock Storage	Knoxville	Campbell	TMSP
TNR050291	CEI	Red Johnson Auto Parts	Knoxville	Anderson	TMSP
TNR051755	CEI	Roane Metals Group, LLC	Knoxville	Roane	TMSP
TNR053160	CEI	Rogers Group, Inc - Caryville Asphalt	Knoxville	Campbell	TMSP
TNR050707	CEI	Rogers Group, Inc - Roane County Asphalt	Knoxville	Roane	TMSP
TNR053533	CEI	Rogers group, Inc - Tazewell Asphalt	Knoxville	Claiborne	TMSP
TN0071676	CEI	Rogers Group, Inc.	Knoxville	Monroe	Mining
TNR056642	CEI	Rolling Frito-Lay Sales, LP - Knoxville DC	Knoxville	Knox	TMSP
TNR056610	CEI	Rolling Frito-Lay Sales, LP - Lafollette Bin	Knoxville	Campbell	TMSP
TNR056617	CEI	Rolling Frito-Lay Sales, LP - Morristown Bin	Knoxville	Hamblen	TMSP
TNR056622	CEI	Rolling Frito-Lay Sales, LP - Newport Bin	Knoxville	Cocke	TMSP
TNR056627	CEI	Rolling Frito-Lay Sales, LP - Tazewell Bin	Knoxville	Claiborne	TMSP

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TNR050560	CEI	Royal Metal Powders Inc. & Smoky Mountain Metals	Knoxville	Blount	TMSP
TNR054061	CEI	S.E.G.I.	Knoxville	Blount	TMSP
TNR053226	CEI	Safety-Kleen Systems, Inc.	Knoxville	Knox	TMSP
TNR051677	CEI	Seven Wheels, Inc.	Knoxville	Hamblen	TMSP
TN0066214	CEI	Sevier County Highway Department	Knoxville	Sevier	Mining
TNR054050	CEI	Sevier Solid Waste Compost Facility	Knoxville	Sevier	TMSP
TNR056277	CEI	Sexton Auto Salvage, Inc.	Knoxville	Union	TMSP
TNR054111	CEI	Shamrock Organics	Knoxville	Knox	TMSP
TNR050768	CEI	SI Group, Inc.	Knoxville	Cocke	TMSP
TNR053617	CEI	Skier's Choice, Inc.	Knoxville	Blount	TMSP
TNR055894	CEI	Sonoco Products Company	Knoxville	Cocke	TMSP
TNR051643	CEI	Southeast Auto Parts	Knoxville	Claiborne	TMSP
TNR050674	CEI	Strange Auto Parts	Knoxville	Jefferson	TMSP
TNR056492	CEI	Swaggerty Sausage Company, Inc.	Knoxville	Sevier	TMSP
TNR058407	CEI	Sysco Knoxville, LLC	Knoxville	Knox	TMSP
TNR050280	CEI	Tate & Lyle Ingredients Americas LLC, Loudon	Knoxville	Loudon	TMSP
TN0072745	CEI	Tennessee Marble Company, Inc.	Knoxville	Knox	Mining
TNR053601	CEI	The Carlstar Group	Knoxville	Anderson	TMSP
TNR050304	CEI	Timken-Rail Bearing Service Corporation	Knoxville	Knox	TMSP
TNR051031	CEI	Toho Tenax America, Inc.	Knoxville	Roane	TMSP
TNR053960	CEI	Transport Service Company	Knoxville	Loudon	TMSP
TNR058152	CEI	Trelleborg Coated Systems US, Inc.	Knoxville	Hamblen	TMSP
TN0079898	CEI	Triple H Coal, LLC	Knoxville	Campbell	Mining
TNR058256	CEI	TRW Fuji Valve Inc	Knoxville	Sevier	TMSP
TNR053185	CEI	TVA Bull Run Fossil Plant	Knoxville	Anderson	TMSP
TNR056845	CEI	UFP Morristown, LLC	Knoxville	Hamblen	TMSP
TNR053563	CEI	United Parcel Service - Maryville	Knoxville	Blount	TMSP

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TNR053561	CEI	United Parcel Service - Morristown	Knoxville	Hamblen	TMSP
TNR053559	CEI	United Parcel Service - Oliver Springs	Knoxville	Roane	TMSP
TNR056751	CEI	Viskase Corporation	Knoxville	Loudon	TMSP
TN0065994	CEI	Vulcan Construction Materials, LLC	Knoxville	Hamblen	Mining
TNR053024	CEI	WestRock Converting Company - Knoxville Folding Carton	Knoxville	Knox	TMSP
TNR059102	CEI	Xtreme Tower Products	Knoxville	Blount	TMSP
TNR054572	CEI	Allied Uniking Corporation, Inc.	Memphis	Shelby	TMSP
TNR058516	CEI	American Snuff Co.	Memphis	Shelby	TMSP
TNR053404	CEI	APAC Tennessee, Inc. - Meridian Facility	Memphis	Shelby	TMSP
TN0078603	PAI	Arlington STP (11150 Highway 70)	Memphis	Shelby	Individual
TNB066800	CEI	Bartlett STP	Memphis	Shelby	Biosolids
TN0066800	CEI	Bartlett STP No. 1	Memphis	Shelby	Individual
TNR059145	CEI	Blues City Brewery, LLC	Memphis	Shelby	TMSP
TNR051374	CEI	Builders Transportation Co.	Memphis	Shelby	TMSP
TNG830222	CEI	Bull Market #17 Service Station	Memphis	Fayette	UST
TN0064092	CBI	City of Rossville STP	Memphis	Fayette	Individual
TN0020982	CEI	Covington STP	Memphis	Tipton	Individual
TNR056694	CEI	Cummins Memphis Distribution Center	Memphis	Shelby	TMSP
TNR056470	CEI	Darling Ingredients Inc.	Memphis	Shelby	TMSP
TNR050469	CEI	Delta Foremost Chemical Corp	Memphis	Shelby	TMSP
TN0055069	CEI	Dogwood Village-Arlington	Memphis	Shelby	Individual
TNR058936	CEI	Durham School Services, LP	Memphis	Shelby	TMSP
TNR053894	CEI	Envirogen Technologies, Inc.	Memphis	Shelby	TMSP
TNR050717	CEI	Excel TSD of Tennessee, L.L.C.	Memphis	Shelby	TMSP
TN0081027	CEI	Fayette County - Arlington Mobile Home Park	Memphis	Fayette	Individual
TNG110419	CEI	Ferrell Park Plant, Metro Materials	Memphis	Shelby	RMCP
TN0062138	CEI	Gallaway STP	Memphis	Fayette	Individual
TNR051973	CEI	GMW, Inc.	Memphis	Shelby	TMSP

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TNR058907	CEI	Heavy Machines, Inc.	Memphis	Shelby	TMSP
TNR058522	CEI	Industrial Lubricants, Inc.	Memphis	Shelby	TMSP
TNR050930	CEI	Jordan Aluminum Extrusion Company, LLC	Memphis	Shelby	TMSP
TNR054531	CEI	Kirk Trucking & Mulch Inc	Memphis	Shelby	TMSP
TN0027600	CEI	Meeman-Shelby State Park	Memphis	Shelby	Individual
TNG110311	CEI	Memphis Ready Mix Malone Road Plant	Memphis	Shelby	RMCP
TNG110142	CEI	Memphis Ready Mix Pidgeon Roost Mix Plant(Buzzi Unicem Ready Mix, LLC)	Memphis	Shelby	RMCP
TNG110041	CEI	Memphis Ready Mix Walker Street Plant	Memphis	Shelby	RMCP
TN0079375	CEI	Memphis Stone & Gravel Co. Duke Estate	Memphis	Shelby	Mining
TN0063185	CEI	Memphis Stone & Gravel Company	Memphis	Shelby	Mining
TN0079821	CEI	Memphis Stone & Gravel Company	Memphis	Tipton	Mining
TN0020729	CEI	Memphis-TE Maxson STP South Plant	Memphis	Shelby	Individual
TNR058987	CEI	MetoKote Corporation Plant 8	Memphis	Shelby	TMSP
TNG110208	CEI	Metro Materials, Inc. - Malone Road	Memphis	Shelby	RMCP
TNG110177	CEI	MMC Materials, Inc. - Memphis	Memphis	Shelby	RMCP
TNG110389	CEI	MMC Materials, Inc. - Riverport Plant	Memphis	Shelby	RMCP
TN0062499	CEI	Munford Sewer Department Lagoon	Memphis	Tipton	Individual
TN0080403	CEI	Nucor Steel Memphis, Inc.	Memphis	Shelby	Individual
TNR059097	CEI	Pemko Manufacturing Co.	Memphis	Shelby	TMSP
TN0000078	CBI	Penn A Kem, LLC	Memphis	Shelby	Individual
TN0061433	CEI	Pine Lake Cooperative	Memphis	Fayette	Individual
TN0081396	CEI	PMC Biogenix, Inc.	Memphis	Shelby	WTP
TN0068527	CEI	PMC Biogenix, Inc., formerly Chemtura Corporation	Memphis	Shelby	Individual
TNR058034	CEI	Pull-A-Part of Memphis, LLC	Memphis	Shelby	TMSP
TNR051419	CEI	Rayloc Div. of Genuine Parts Company	Memphis	Shelby	TMSP
TNR055088	CEI	Republic Services Hauling Facility	Memphis	Shelby	TMSP
TNR056353	CEI	Rozelle Plant	Memphis	Shelby	TMSP
TNG110372	CEI	Safety-Quip Getwell Plant	Memphis	Shelby	RMCP

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TNG830198	CEI	SEMS, Inc. - Former Collierville Amoco	Memphis	Shelby	UST
TNR058864	CEI	Signature Flight Support	Memphis	Shelby	TMSP
TN0021652	CEI	Somerville Lagoon	Memphis	Fayette	Individual
TNR051331	CEI	Southern Systems Inc.	Memphis	Shelby	TMSP
TN0054496	CEI	Standard Construction Company, Inc.	Memphis	Shelby	Mining
TNR058716	CEI	Steel Warehouse of Memphis	Memphis	Shelby	TMSP
TNR059166	CEI	Sysco Memphis, LCC	Memphis	Shelby	TMSP
TN0000451	CEI	The Troxel Company	Memphis	Fayette	Individual
TN0005355	CEI	TVA - Allen Fossil Plant (ALF)	Memphis	Shelby	Individual
TNR051984	CEI	Union Pacific Railroad	Memphis	Shelby	TMSP
TNR052101	CEI	YRC, Inc.(T431)	Memphis	Shelby	TMSP
TNR055940	SW NCNS	Abernathy Truck Salvage, Inc.	Nashville	Davidson	TMSP
TNR059137	SW NCNS	Adams Products an Oldcastle Company	Nashville	Montgomery	TMSP
TNR056026	SW NCNS	All State Auto Parts, Inc.	Nashville	Davidson	TMSP
TN0020737	CEI	Ashland City STP	Nashville	Cheatham	Individual
TNR058721	SW NCNS	Berry Plastics Corporation	Nashville	Rutherford	TMSP
TNR058639	SW NCNS	BFI Waste Services of TN, LLC - AAA MSW Transfer Station	Nashville	Davidson	TMSP
TN0057975	CEI	Bill Rice Ranch, Inc.	Nashville	Rutherford	Individual
TN0063908	CSI	BNA Fuel Company, LLC	Nashville	Davidson	Individual
TN0057797	CEI	Buchanan Elementary School	Nashville	Rutherford	Individual
TN0067865	CEI	Buffalo Wastewater Treatment Plant	Nashville	Humphreys	Individual
TN0068144	CEI	Cheatham Hydro Power Plant	Nashville	Dickson	Individual
TN0078417	CSI	City of Lebanon Landfill	Nashville	Wilson	Individual
TN0024643	CEI	Clarksville Montgomery County School System - Montgomery Central High School	Nashville	Montgomery	Individual
TN0020656	CEI	Clarksville STP	Nashville	Montgomery	Individual
TN0020656	CSO NS	Clarksville STP	Nashville	Montgomery	Individual
TNR059131	SW NCNS	CSX - Murfreesboro Yard	Nashville	Rutherford	TMSP
TN0064955	CEI	CSX Transportation, Inc.	Nashville	Davidson	Individual

Permit No	Inspecttype	Permittee Name	EFO Name	County	Permit Type
TNR053048	SW NCNS	Dickson County Landfill	Nashville	Dickson	TMSP
TNR053980	SW NCNS	E. I. DuPont De Nemours & Co., Inc. - Old Hickory	Nashville	Davidson	TMSP
TN0002259	CEI	E. I. DuPont De Nemours, Inc.	Nashville	Davidson	Individual
TNR050202	SW NCNS	Eubank, LLC	Nashville	Montgomery	TMSP
TN0028827	PAI	Franklin Water Reclamation Facility (WRF)	Nashville	Williamson	Individual
TN0020141	CSI	Gallatin STP	Nashville	Sumner	Individual
TNR050678	SW NCNS	Hoeganaes Corporation	Nashville	Sumner	TMSP
TN0059455	CEI	Hoover, Inc.	Nashville	Rutherford	Mining
TNR050060	SW NCNS	Innophos, Inc.	Nashville	Davidson	TMSP
TN0068152	CEI	J. Percy Priest Hydro Power Plant	Nashville	Davidson	Individual
TNR058900	SW NCNS	Jacob Holm Opco Inc.	Nashville	Davidson	TMSP
TNR055999	SW NCNS	January Environmental Services, Inc.	Nashville	Davidson	TMSP
TNR058938	SW NCNS	LKQ of Tennessee	Nashville	Davidson	TMSP
TNR053269	SW NCNS	Lojac Danley Plant	Nashville	Davidson	TMSP
TN0080178	CEI	Love's Travel Stop and Country Store	Nashville	Dickson	Individual
TN0064041	CEI	Metro Nashville Airport Authority	Nashville	Davidson	Individual
TNR056220	SW NCNS	Metro Salvage, Inc.	Nashville	Davidson	TMSP
TN0028550	CEI	Metro Water Services-J.P.Priest Lake Hamilton Creek Rec Area	Nashville	Davidson	Individual
TN0022586	CEI	Murfreesboro-Sinking Creek STP	Nashville	Rutherford	Individual
TNR058703	SW NCNS	Music City Pick A Part, LLC	Nashville	Davidson	TMSP
TN0024970	CEI	Nashville Whites Creek STP	Nashville	Davidson	Individual
TN0062006	CEI	New Johnsonville Lagoon	Nashville	Humphreys	Individual
TNR058687	SW NCNS	North American Stamping Group, LLC	Nashville	Sumner	TMSP
TN0029157	CEI	Nyrstar Clarksville, Inc.	Nashville	Montgomery	Individual
TN0081361	CEI	Occidental Chemical Corporation (OxyChem)	Nashville	Humphreys	Individual
TN0061301	CEI	Pilot Travel Centers LLC	Nashville	Rutherford	Individual
TN0075922	CEI	Pilot Travel Centers LLC #053	Nashville	Humphreys	Individual

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TNR058750	SW NCNS	RE-EL Topsoil, LLC	Nashville	Cheatham	TMSP
TNR054581	SW NCNS	River Cement Sales Co dba Buzzi Unicem USA	Nashville	Davidson	TMSP
TNR053058	SW NCNS	River Hills MRF	Nashville	Davidson	TMSP
TNR058691	SW NCNS	Rivergate MRF	Nashville	Davidson	TMSP
TNR058737	SW NCNS	Rock Harbor Marine	Nashville	Davidson	TMSP
TNR058110	SW NCNS	Rogers Group, Inc - Nashville Resale Yard	Nashville	Davidson	TMSP
TNR050886	SW NCNS	Rogers Group, Inc. - Whites Creek Asphalt	Nashville	Davidson	TMSP
TNR058998	SW NCNS	Rolling Frito Lay Sales LP - Waverly Bin	Nashville	Humphreys	TMSP
TNR053764	SW NCNS	Rutherford County Landfill	Nashville	Rutherford	TMSP
TNR058041	SW NCNS	SanGravl Company, Inc	Nashville	Humphreys	TMSP
TNR053500	SW NCNS	Servitech Industries, Inc.	Nashville	Davidson	TMSP
TNR058950	SW NCNS	Siskin Steel and Supply Company	Nashville	Davidson	TMSP
TN0020541	CBI	Smyrna STP	Nashville	Rutherford	Individual
TN0070041	CEI	Southern Land Company, LLC	Nashville	Williamson	Mining
TNR059112	SW NCNS	Speedway Store No. 7148	Nashville	Wilson	TMSP
TNR056426	SW NCNS	Springfield Wastewater Treatment Plant	Nashville	Robertson	TMSP
TN0002488	CEI	State Industries Inc.	Nashville	Cheatham	Individual
TNR058610	SW NCNS	Steel Technologies LLC	Nashville	Rutherford	TMSP
TN0060232	CBI	Tanasi Shores WWTP	Nashville	Sumner	Individual
TN0058220	CEI	TDEC - Bledsoe Creek State Park	Nashville	Sumner	Individual
TNR058818	SW NCNS	Tennsco Corporation Plant 2/3	Nashville	Dickson	TMSP
TN0001465	CEI	The Chemours Company FC LLC (E. I. DuPont De Nemours - New Johnsonville)	Nashville	Humphreys	Individual
TN0055964	CSI	Trane U.S. Inc	Nashville	Montgomery	Individual
TNR059062	SW NCNS	Universal Environmental Services, LLC	Nashville	Rutherford	TMSP
TNR053918	SW NCNS	Vi-Jon, Inc	Nashville	Rutherford	TMSP
TN0003549	CEI	Vulcan Construction Materials, LLC	Nashville	Davidson	Mining
TN0062332	CBI	Water Authority of Dickson County - Fairview STP	Nashville	Williamson	Individual

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TN0066958	CEI	Water Authority of Dickson County - Jones Creek STP	Nashville	Dickson	Individual
TN0078808	CEI	Waverly Lagoon	Nashville	Humphreys	Individual
TNR051899	SW NCNS	West Nashvlle Auto Recycling Inc.	Nashville	Davidson	TMSP
TN0020460	CEI	White Bluff STP	Nashville	Dickson	Individual
TN0059404	CEI	White House STP	Nashville	Robertson	Individual
TNR053177	SW NCNS	Williamson County Landfill	Nashville	Williamson	TMSP
TNR058754	SW NCNS	XPO Logistics	Nashville	Davidson	TMSP

Counts toward inspection commitment:

CBI = Compliance Biomonitoring Inspection	CEI = Compliance Evaluation Inspection	SW = Stormwater
CSI = Compliance Sampling Inspection	CSIX = A CSI Toxic	SW NCNS Stormwater Non-Construction Non-Sampling
RMCP = ready mix concrete plant	PAI = Performance Audit Inspection	CSO NS CSO Inspection Non-Sampling
	TMSP Tennessee Multi-Sector General Permit	SSO NS Sanitary Sewer Overflow non-sampling