TENNESSEE VALLEY AUTHORITY
River Operations and Renewables

Water Use in the Tennessee Valley for 2010 and Projected Use in 2035

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July 2012

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ACKNOWLEDGMENTS

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EXECUTIVE SUMMARY

WATER USE IN 2010

In 2004, the U.S. Geological Survey (USGS) in cooperation with the Tennessee Valley Authority (TVA) published a report on water use in the Tennessee River watershed based on 2000 water use data. These data were used by TVA in the development of a new reservoir operating policy and to identify potential areas of water supply concerns throughout the watershed. Because of the importance of water supply planning, TVA in cooperation with the USGS prepared another report on water use in the watershed based on 2005 data. This report is the third in the water use series and is based on the 2010 water use data.

Off-stream water use in the Tennessee River watershed is estimated for 2010. Water use is categorized as thermoelectric power, industrial, public supply, and irrigation. Water use is summarized by source of water (surface water or groundwater) and location of withdrawal (state, county, hydrologic unit code, and reservoir catchment area). Water returns to the watershed are used to estimate consumptive use. A projection of water use for 2035 is also provided.

Total water withdrawals during 2010 were estimated to average 11,951 million gallons per day (mgd) for off-stream uses. The 2010 total withdrawal was about four percent lower than it was in 2005. This was in large measure due to a reduction in thermoelectric withdrawal of about 5 percent as a result of lower energy generation in the watershed compared to 2005.

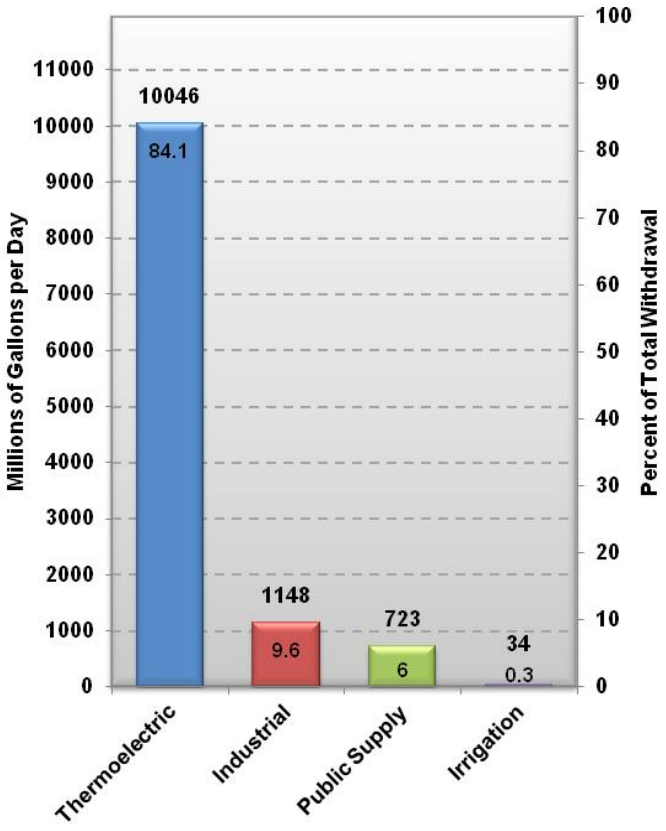

Figure ES-1: Water withdrawals in 2010

Water withdrawals by category, as shown in Figure ES-1, are:

- Thermoelectric - 10,046 mgd (84.1 percent of total use)
- Industrial - 1,148 mgd (9.6 percent of total use)
- Public supply - 723 mgd (6 percent of total use)
- Irrigation - 34 mgd (less than 1 percent of total use)

The return flow was estimated at 11,480 mgd or 96.1 percent of the water withdrawn. Net water demand (total withdrawal minus total return) accounts for the other 3.9 percent of total withdrawal, or 471 mgd.

As shown in Figure ES–2, water returns to the river system were estimated as:

- Thermoelectric - 9,994 mgd (99.5 percent of thermoelectric withdrawal, 87.1 percent of total return)
- Industrial - 1,073 mgd (93.5 percent of industrial withdrawal, 9.3 percent of total return)
- Public supply - 413 mgd (57.2 percent of public supply withdrawal, 3.6 percent of total return)
- Irrigation - 0 mgd

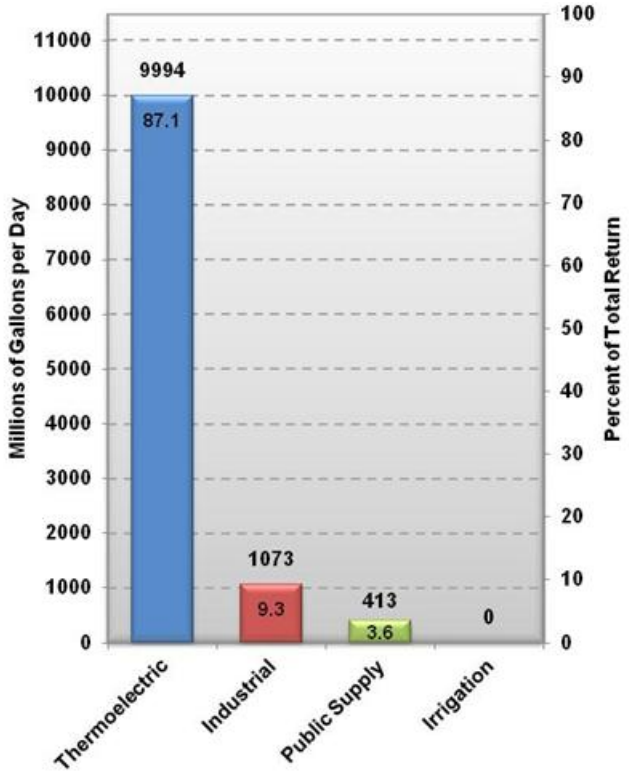

Figure ES-2: Water returns in 2010

Water that evaporates, transpires, is incorporated into products or crops, or is consumed by humans or livestock is consumptive use. The net water demand is used as an estimate of consumptive use. The net water demands for each category as shown in Figure ES-3 were estimated as:

- Thermoelectric - 52 mgd (11.1 percent of total net water demand)
- Industrial - 75 mgd (15.9 percent of total net water demand)
- Public supply - 310 mgd (65.7 percent of total net water demand)
- Irrigation - 34 mgd (7.2 percent of total net water demand)

Surface water withdrawals were 11,747 mgd or 98.3 percent of total withdrawal with groundwater accounting for the remaining 1.7 percent of total withdrawals or 204 mgd.

PROJECTED WATER USE IN 2035

By 2035 water withdrawals are projected to decline about 21 percent to 9,449 mgd. By category, water withdrawals are projected to change as follows: industrial will increase by 31 percent to 1,502 mgd, public supply will increase by 30 percent to 938 mgd, and irrigation will increase by 35 percent to 46 mgd. Thermoelectric water withdrawal is expected to decline by 31 percent to 6,963 mgd, reflecting changes in both generating and cooling technologies for power plants. These are shown in Figure ES-4.

Although total withdrawals are expected to decrease, total net water demand will rise by 51 percent to 712 mgd. This is in large measure due to projected changes in the use of thermolectric generation and power plant cooling technolgies.

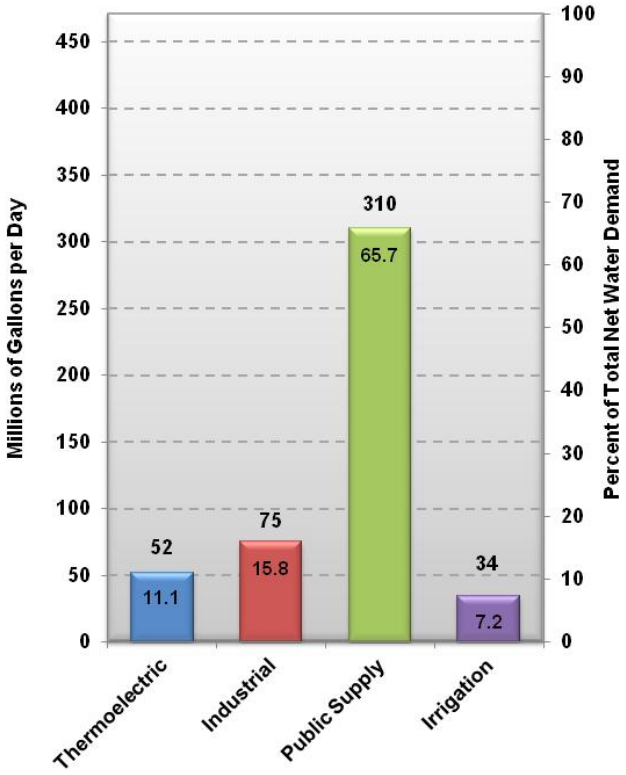

Figure ES-3: Net water demand in 2010

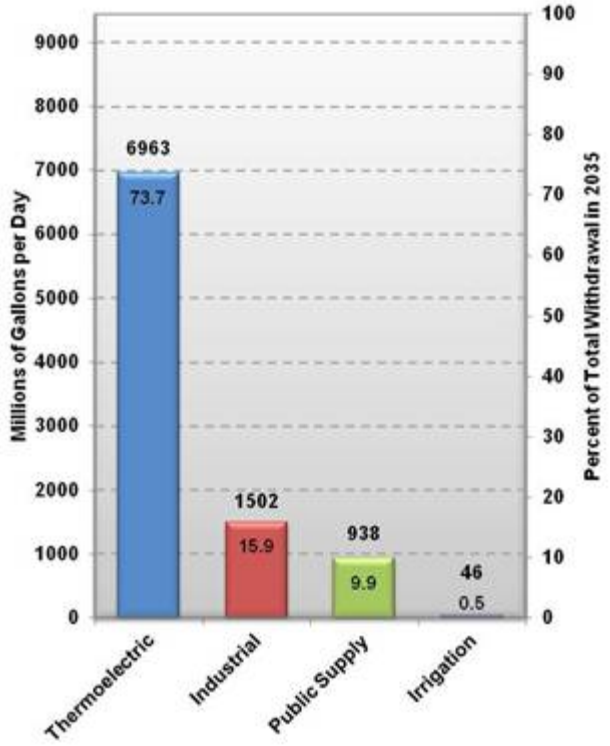

Figure ES-4: Projected withdrawal in 2035

1 INTRODUCTION

BACKGROUND

The Tennessee River system is the fifth largest river system in the United States. The Tennessee River watershed drains 40,910 square miles, including portions of Alabama, Georgia, Kentucky, Mississippi, North Carolina, Tennessee and Virginia as shown in Figure 1–1.

In 2004, the U.S. Geological Survey (USGS) and the Tennessee Valley Authority (TVA) prepared a water use estimate for the Tennessee River watershed based on data collected in 2000 (Hutson and others, 2004). Utilizing these data, water use estimates were projected to 2030 to aid in the water supply analyses associated with TVA's Reservoir Operations Study (ROS). The ROS was a study conducted by TVA to examine alternative reservoir operations policies in an effort to increase overall public value of the reservoir system. The ROS developed a new operating policy that was implemented by TVA in 2004 (Tennessee Valley Authority, 2004). The 2000 water use data were also used by TVA in 2004 to identify areas with potential concerns regarding water supply (Bohac and Koroa, 2004). A second estimate of water use was prepared by Bohac and McCall (2008) using 2005 data.

PURPOSE AND SCOPE

The purpose of this report is to present water use estimates for the Tennessee River watershed based on 2010 data with water use projections to 2035. Water use estimates focus on four categories of off-stream water use: thermoelectric power, industrial, public supply, and irrigation.

HYDROLOGIC SETTING

The Tennessee River system is regulated by a series of dams and reservoirs managed by TVA. TVA operates the Tennessee River system to provide year-round navigation, flood-damage reduction, power generation, improved water quality, water supply, recreation and economic growth.

Average yearly rainfall over the Tennessee River watershed is approximately 51 inches. Subsequent average runoff of 22 inches per year usually provides enough water to meet the off-stream water use demands on the Tennessee River system. However, periodic droughts may severely limit the ability of the Tennessee River system to meet all of these competing demands, particularly in unregulated portions (streams or rivers without dams) of the Tennessee River system.

Recognizing that annual hydrology will impact the trends in off-stream water use demands, it is important to consider the variability in hydrology since 2000 for this report. In 2000 and 2005, the watershed received 76 percent and 79 percent of average rainfall respectively. The rainfall in 2010 was 40.99 inches or 80 percent of average.

Figure 1-1: Tennessee River watershed

DATA SOURCES AND ANALYSIS METHODS

Similar to the water use estimates prepared for 2000 and 2005, the data for this report are stored in the TVA Water Use Data System. Each record in the database is labeled as a withdrawal or return flow water use transaction. Each water use transaction for a site in the database is assigned to a Water Use Tabulation Area (WUTA), Reservoir Catchment Area (RCA), Hydrologic Unit Code (HUC), state, and county. The RCA, as defined by Hutson and others (2004), is a natural drainage area truncated by a dam. The WUTA groups RCAs to account for the complete site-specific, water use transactions between adjoining RCAs and is used to estimate consumptive use on a large scale.

The database contains industrial, public supply, and irrigation water use data for 2010 collected by the seven Tennessee Valley states and provided to the USGS for its National Water Use Information Program. Most data for Alabama were obtained directly from the Alabama Department of Water Resources. Thermoelectric data were obtained from internal TVA sources, particularly those data submitted to the U. S. Department of Energy for EIA-923: Steam-Electric Plant Operation and Design Report (U.S. Department of Energy, 2010).

The U.S. Environmental Protection Agency, National Pollutant Discharge Elimination System Program, Permit Compliance System (U. S. Environmental Protection Agency, 2011) provided return flow data for municipalities, industry (including mining), and thermoelectric plants.

Estimates of population and future water use were made using data provided by Woods and Poole Economics Inc. (Woods and Poole, 2011) and the U.S. Census.

The appendix of this report summarizes the source and type of withdrawal data for Alabama, Georgia, Kentucky, Mississippi, North Carolina, Tennessee and Virginia.

Water use numerical data presented in this report are the daily quantities averaged over the year. Although irrigation data are applied seasonally at a rate higher than annual average daily quantities, the application rates were averaged over the year to make them compatible with the other data.

In Chapter 2 of this report, entries for Tables 2–1 through 2–24 contain two decimal places and totals are shown as integers. All numbers were rounded independently. Therefore, the sums of independently rounded numbers may not equal the totals (expressed as integers) in the report.

2 WATER USE

INTRODUCTION

Information is presented by source of water, category of use, and type of transaction. Water sources are surface water and groundwater. Use categories are public supply, industrial (including mining), thermoelectric, and irrigation. Transactions are either withdrawals or returns. Returns are water discharges from thermoelectric power plants, industries, and municipal wastewater treatment plants.

Water use in 2010 is organized in three ways.

The first presentation, as illustrated by Table 2–1, is a summary based on Water Use Tabulation Area (WUTA) and Reservoir Catchment Area (RCA). Figure 2–1 shows the Tennessee River watershed divided into RCAs. The Water Use Tabulation Area (WUTA) groups RCAs to account for the complete site-specific water use transactions between adjoining RCAs and is used to determine consumptive use at a large scale. Table 2–1 shows the WUTAs in bold type with the RCAs comprising the WUTAs listed below.

The second spatial summary is by hydrologic unit code (HUC), and the third spatial summary is by state and county. Figure 2–2 shows the HUCs, and Figure 2–3 shows the counties comprising the Tennessee River watershed.

Hutson and others (2004) define net water demand as the quantitative difference between water withdrawals and return flow. Consumptive use is that part of the water withdrawn that is evaporated, transported, incorporated into products or crops, consumed by humans or livestock, or otherwise removed from the immediate environment.

The difference between withdrawal and return is the net water demand at the RCA level. As in the case of Hutson and others (2004), the net water demand is accumulated at the downstream boundary of the WUTA to calculate an estimate of total consumptive use for the watershed. Cumulative net water demand was calculated at key junctures of the WUTAs (Fort Loudoun, Watts Bar-Chickamauga, Nickajack, Guntersville, Wheeler-Wilson, Pickwick and Kentucky) in the river system and estimates a sum of consumptive use in the watershed to that juncture. The net water demand accumulated at Kentucky Dam is the estimate for total consumptive use for the watershed.

In this report, 100 percent of the water used for irrigation is considered to be net water demand.

Figure 2-1: Tennessee River watershed divided into reservoir catchment areas

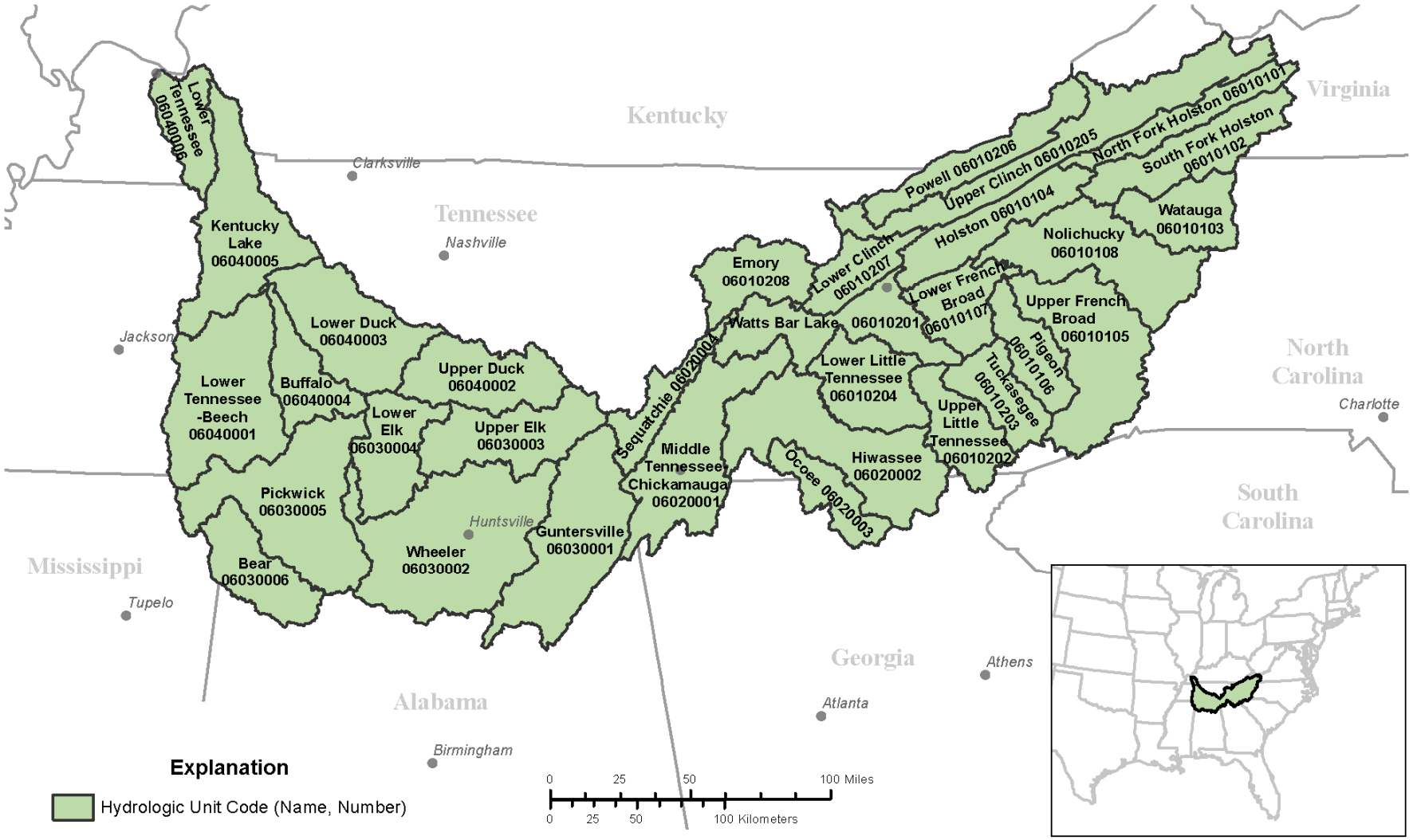

Figure 2-2: The 8-digit hydrologic unit codes of the Tennessee River watershed

Figure 2-3: States and counties within the Tennessee River watershed

OFF-STREAM WATER USE

Total Off-stream Water Use

Total off-stream water use for 2010 by WUTA is shown in Table 2-1.

Total withdrawal was 11,951 million gallons per day (mgd) of which 98.3 percent or 11,747 mgd came from surface water. Groundwater supplied the remaining 1.7 percent or 204 mgd. Return flow totaled 11,480 mgd or 96.1 percent of total withdrawal. Total net water demand was 471 mgd or 3.9 percent of total withdrawal.

Figure 2–4 shows the cumulative net water demand at major WUTA junctures and net water demand for reservoir catchment areas.

The Wheeler-Wilson WUTA had the largest withdrawal, at 3,089 mgd (Table 2-1), or 26 percent of the total withdrawal, followed by Watts Bar-Chickamauga at 2,613 mgd, which is 22 percent of total withdrawal. In 2005, the order of these two WUTAs was reversed with Watts Bar-Chickamauga having the largest withdrawal. The reversal was due to the return to service of Unit 1 at Browns Ferry Nuclear Power Plant on Wheeler Reservoir.

Table 2–2 shows total off-stream water use by HUC. The Wheeler HUC (06030002) had the largest withdrawal, at 3,020 mgd or 25 percent of total withdrawal, followed by the Middle Tennessee-Chickamauga HUC (06020001) at 1,690 mgd, or 14 percent of the total withdrawal.

For 2010, the total watershed intensity of water use by area was 0.292 mgd per square mile. Table 2–2 shows the intensity of per capita water use by HUC.

As shown in Table 2–3, Tennessee had the largest state withdrawal, at 5,949 mgd or 50 percent of the total withdrawal, while Alabama had the next largest total withdrawal, at 5,486 mgd or 46 percent of the total withdrawal. Tennessee comprises about 50 percent of the Tennessee River watershed, while Alabama comprises about 22 percent of the watershed. The largest county withdrawal is Limestone County, Ala., which had a total withdrawal of 2,774 mgd.

Water Use Summarized by Category

Table 2-4 presents total water use by category and WUTA.

Thermoelectric water use was the category with the largest total withdrawal, at 10,046 mgd or 84.1 percent of total withdrawal. Total industrial withdrawal was 1,148 mgd or 9.6 percent of total withdrawal, total public supply withdrawal was 723 mgd or 6 percent of total withdrawal, and total irrigation withdrawal was 34 mgd, which was less than 1 percent of total withdrawal.

Of the total return flow of 11,480 mgd, thermoelectric return was 9,994 mgd or 87.1 percent of the total return, industrial return was 1,073 mgd or 9.3 percent of total return, and public supply return

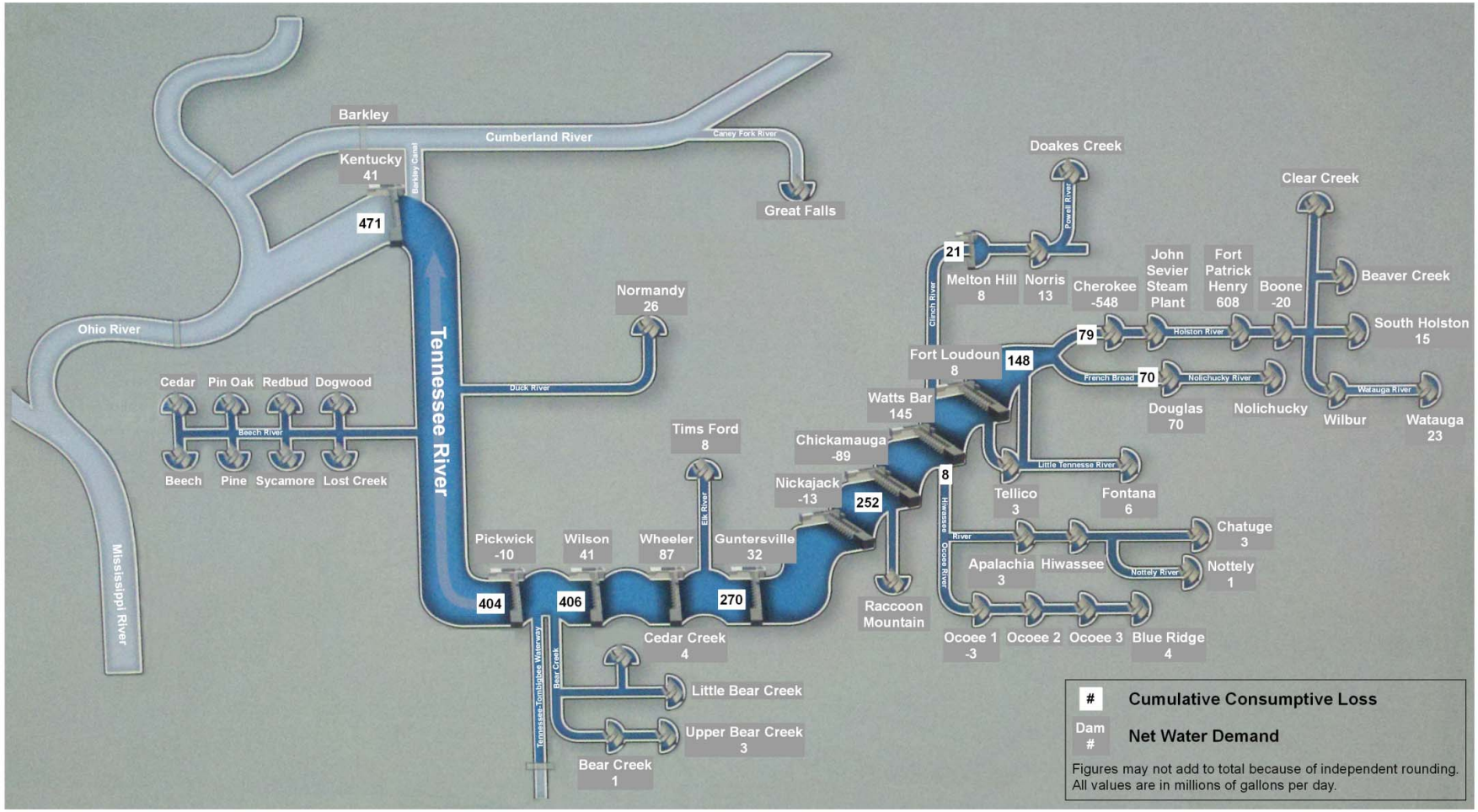

Figure 2-4: Cumulative net water demand at major water use tabulation area junctures and for reservoir catchment areas in the Tennessee River watershed

was 413 mgd, or 3.6 percent of total return. It was assumed that there was no irrigation return flow.

Total water use by category and HUC is shown in Table 2-5.

The HUC with the largest thermoelectric water use (2,757 mgd) is Wheeler (06030002). Wheeler also has the largest public supply withdrawal (120 mgd) and irrigation withdrawal (8.1 mgd). The largest industrial water withdrawal (592 mgd) is from South Fork Holston River (06010102).

Table 2-6 shows total water use by state and county.

The largest thermoelectric water withdrawal (2,750 mgd) was in Limestone County, Alabama. Limestone County also had the highest irrigation withdrawal, at 4 mgd. Sullivan County, Tennessee, had the largest industrial withdrawal, at 592 mgd. Knox County and Hamilton County, Tennessee, were in a dead heat with Madison County, Alabama, for the largest public supply withdrawal. Knox's withdrawal was 67.0 mgd, Hamilton's was 65.5 mgd, and Madison's withdrawal was 65.6 mgd.

Water Use Summarized by Source

Tables 2–7 through 2–12 summarize surface water and groundwater withdrawals by category, by WUTA, by HUC, and by state and county. Total withdrawal was 11,747 mgd for surface water (Table 2-7) and 204 mgd for groundwater (Table 2-10).

Surface water supplied all of the thermoelectric withdrawal of 10,046 mgd. Surface water was the source for 1,116 mgd or of 97.1 percent of the industrial withdrawal, 558 mgd or 77.2 percent of the public supply withdrawal, and 27 mgd or 79.4 percent of the irrigation withdrawal.

Wheeler-Wilson was the WUTA with the highest surface withdrawal, at 3,039 mgd (Table 2-7), and highest groundwater withdrawal, at 50 mgd (Table 2-10). HUC 6030002 (Wheeler) had the highest surface withdrawal, at 2,974 mgd, and also the highest groundwater withdrawal, at 45 mgd.

Tennessee withdrew 5,855 mgd of surface water, which is 49.8 percent of total surface water withdrawal. Alabama withdrew 5,433 mgd or 46.2 percent of total surface water withdrawal. Limestone County, Alabama, had the largest total surface water withdrawal, at 2,761 mgd, almost all of which was for thermoelectric use. Hamilton County, Tennessee, had the next highest surface water withdrawal, at 1,599 mgd, which was also mostly for thermoelectric use. Industry used more surface water (592 mgd) in Sullivan County, Tenn., than in any other county, while public supply use (67 mgd) was highest in Knox County, Tenn. Surface water withdrawal for irrigation (3 mgd) was highest in Limestone County, Ala.

Tennessee withdrew 94 mgd of groundwater, which is 46 percent of total groundwater withdrawal. Alabama withdrew 52 mgd, or 25.5 percent of total groundwater. Madison County, Ala., had the largest total groundwater withdrawal, at 29 mgd, most of which was used for public supply. Hamilton County, Tenn., had the next highest total withdrawal at 19 mgd. Hamilton County used more groundwater (8 mgd) for industry than any other county. Limestone County and Madison County,

both in Alabama, had the highest groundwater use for irrigation, which was 1 mgd for each county.

Groundwater withdrawal for industry was 32 mgd, which was 2.8 percent of total industrial withdrawal; for public supply groundwater withdrawal was 165 mgd or 22.8 percent of total public supply use, and for irrigation it was 7 mgd or 20.6 percent of total irrigation use.

Water Use Described by Category

Thermoelectric

Total thermoelectric withdrawal was 10,046 mgd of which 9,994 mgd or 99.5 percent was returned.

Table 2–13 shows thermoelectric withdrawal by WUTA. The largest WUTA withdrawal was 2,757 mgd from the Wheeler-Wilson WUTA. The largest withdrawal (2,750 mgd) was Browns Ferry Nuclear Plant in Limestone County, Ala., and its location is shown in Figure 2–5. All the plants shown on Figure 2-5 are TVA's except Asheville, Clinch River, and Decatur.

As shown on Table 2-14, five HUCs had withdrawals ranging from 1,045 mgd to 2,757 mgd. All of these HUCs include segments of the main stem of the Tennessee River.

Table 2–15 shows Alabama's thermoelectric withdrawal was 5,067 mgd, or 50 percent of total thermoelectric withdrawal. Tennessee's total thermoelectric withdrawal was 4,704 mgd, which was 46.8 percent of the total thermoelectric withdrawal. Alabama's withdrawal was used to generate 38,989 million kilowatt hours of electricity, or 44.5 percent of total power generated. Tennessee's thermoelectric withdrawal was used to generate 44,657 million kilowatt hours of electricity, or 51 percent of total power generated. Alabama's thermoelectric withdrawal was a higher percentage of total thermoelectric withdrawal and its generation was a higher percentage of total generation in 2010 than 2005. The difference is the result of Browns Ferry Nuclear Plant's Unit 1 return to service in 2007.

Industrial

Table 2–16 shows that the total industrial withdrawal was 1,148 mgd, or 9.6 percent of total withdrawal. Industrial return flow was 1,073 mgd, and total net water demand was 75 mgd or 6.5 percent of the industrial withdrawal. Surface water supplied 97.1 percent, or 1,116 mgd, of the water for industrial use.

Cherokee was the WUTA with the highest industrial withdrawal (Table 2-16), which was 605 mgd. The Wheeler-Wilson withdrawal of 163 mgd was the next highest.

HUC 6010102 (South Fork Holston), shown on Table 2-17, had the highest industrial withdrawal of 592 mgd and also the highest net water demand of 23 mgd.

The Tennessee industrial withdrawal, as Table 2-18 shows, was 824 mgd, or 71.8 percent of the

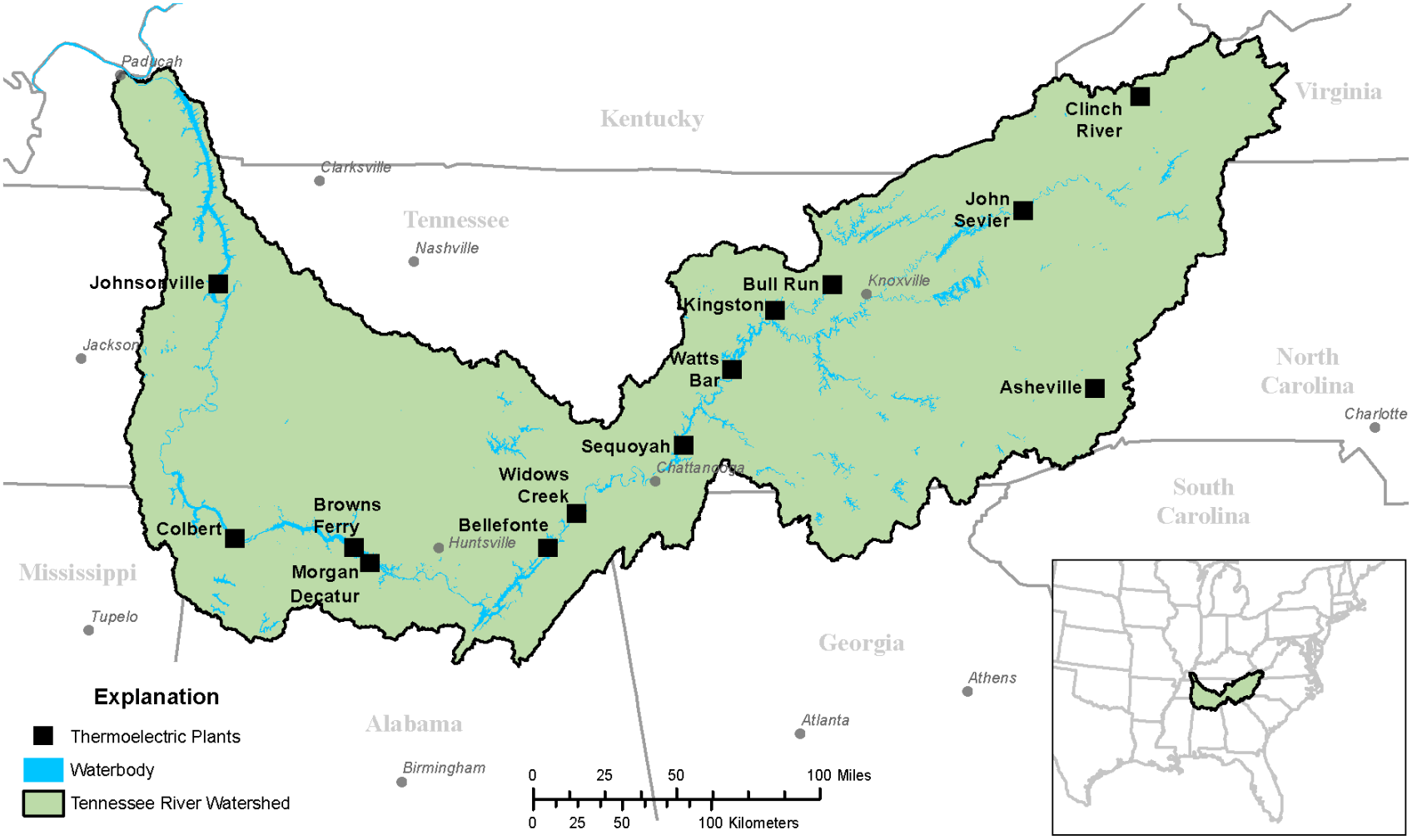

Figure 2-5: Location of thermoelectric power plants in the Tennessee River watershed

total industrial withdrawal of 1,148 mgd. Almost 72 percent of Tennessee's industrial withdrawal was from Sullivan County. Alabama had the next largest industrial withdrawal, at 213 mgd, or 18.6 percent of total industrial withdrawal.

Public Supply

Withdrawal for public supply use was 723 mgd as shown in Table 2–19, which was 6 percent of total water withdrawal. Public supply net water demand was the highest of the four uses, and totaled 310 mgd. This was 42.8 percent of total public supply withdrawal. Surface water supplied 558 mgd, or 77.2 percent of withdrawal for public supply use.

Wheeler-Wilson was the WUTA with the highest public supply withdrawal, at 157 mgd, and it also had the highest net water demand at 83 mgd.

HUC 6030002, Wheeler, had the highest public supply withdrawal, at 120 mgd as shown in Table 2-20. The HUC's net water demand was also the highest at 55 mgd.

Tennessee's public supply withdrawal of 407 mgd was the highest (Table 2-21), and over twice Alabama's withdrawal of 193 mgd, which was the next highest. Tennessee's withdrawal was 56.3 percent of total public supply withdrawal and Alabama's withdrawal was 26.7 percent of the total.

In 2010 the per capita public supply use was 145 gallons per day.

Irrigation

Table 2–22 shows that surface water supplied 27 mgd, or 79.4 percent of the total withdrawal for irrigation use. Once again, the Wheeler-Wilson WUTA had the highest withdrawal at 12 mgd.

As seen in Table 2-23, the largest withdrawal for irrigation use, 8.1 mgd, came from the Wheeler HUC (6030002).

The total irrigation withdrawal in Tennessee was 13.8 mgd (Table 2-24), and was about 40.6 percent of the watershed irrigation withdrawal. Alabama had the next highest irrigation withdrawal of 12.7 mgd, or about 37 percent of the watershed total.

Whereas groundwater supplied only 1.7 percent of the total withdrawal for the watershed for all uses, groundwater supplied 7 mgd or 20.6 percent of the withdrawal for irrigation.

Table 2-1. Total off-stream water use by water use tabulation area in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

Water use tabulation area Reservoir Catchment Area	Withdrawals Surface water	 Groundwater	 Total water	Total return flow	Net water demand
Cherokee					
Watauga	15.30	9.62	24.92	1.84	23.08
South Holston	16.56	5.69	22.25	6.80	15.45
Boone	0.05	3.53	3.58	23.55	-19.97
Ft Patrick Henry	607.94		607.94		607.94
Cherokee	647.14	16.24	663.38	1,211.37	-547.99
WUTA total	***1,286.99***	***35.09***	***1,322.08***	***1,243.56***	***78.52***
Cumulative	*1,287*	*35*	*1,322*	*1,244*	*79*
Douglas					
Douglas	396.28	24.56	420.85	350.91	69.94
WUTA total	***396.28***	***24.56***	***420.85***	***350.91***	***69.94***
Cumulative	*1,683*	*60*	*1,743*	*1,594*	*148*
Fort Loudoun					
Fort Loudoun	84.02	2.72	86.74	79.05	7.69
WUTA total	***84.02***	***2.72***	***86.74***	***79.05***	***7.69***
Cumulative	*1,767*	*62*	*1,830*	*1,674*	*156*
Fontana-Tellico					
Fontana	35.16	4.68	39.84	34.32	5.52
Santeetlah	0.51	0.25	0.76		0.76
Tellico	4.50	0.18	4.68	2.07	2.60
WUTA total	***40.16***	***5.12***	***45.27***	***36.39***	***8.88***
Cumulative	*1,807*	*67*	*1,875*	*1,710*	*165*
Norris					
Norris	28.40	2.55	30.95	17.92	13.03
Melton Hill	456.82	1.33	458.15	449.72	8.43
WUTA total	***485.22***	***3.88***	***489.11***	***467.65***	***21.46***
Cumulative	*2,293*	*71*	*2,364*	*2,178*	*186*
Hiwassee-Ocoee					
Chatuge	2.01	1.30	3.31	0.16	3.16
Nottely	0.93	0.69	1.62	0.32	1.30
Hiwassee	0.91	0.97	1.89	2.30	-0.41
Apalachia	3.06		3.06	0.01	3.05
Blue Ridge	4.25	0.33	4.58	0.34	4.24
Ocoee	0.04	0.16	0.20	3.30	-3.11
WUTA total	***11.20***	***3.46***	***14.66***	***6.43***	***8.23***
Cumulative	*2,304*	*75*	*2,379*	*2,184*	*195*
Watts Bar-Chickamauga					
Watts Bar	895.57	1.19	896.76	751.28	145.48
Chickamauga	1,689.47	26.72	1,716.19	1,804.74	-88.55
WUTA total	***2,585.04***	***27.91***	***2,612.95***	***2,556.02***	***56.94***
Cumulative	*4,889*	*103*	*4,992*	*4,740*	*252*
Nickajack					
Nickajack	46.90	8.00	54.90	67.97	-13.07
WUTA total	***46.90***	***8.00***	***54.90***	***67.97***	***-13.07***
Cumulative	*4,936*	*111*	*5,047*	*4,808*	*239*

Table 2-1. Total off-stream water use by water use tabulation area in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

Water use tabulation area Reservoir catchment area	Withdrawals Surface water	 Groundwater	 Total water	 Total return flow	 Net water demand
Guntersville					
Guntersville	1,091.91	7.36	1,099.26	1,067.75	31.51
WUTA total	***1,091.91***	***7.36***	***1,099.26***	***1,067.75***	***31.51***
Cumulative	*6,028*	*118*	*6,146*	*5,876*	*270*
Tims Ford					
Tims Ford	27.43	3.16	30.59	22.25	8.34
WUTA total	***27.43***	***3.16***	***30.59***	***22.25***	***8.34***
Cumulative	*6,055*	*121*	*6,176*	*5,898*	*278*
Wheeler-Wilson					
Wheeler	2,991.17	45.86	3,037.03	2,950.32	86.71
Wilson	48.03	3.81	51.83	10.82	41.02
WUTA total	***3,039.20***	***49.67***	***3,088.87***	***2,961.14***	***127.73***
Cumulative	*9,094*	*171*	*9,265*	*8,859*	*406*
Pickwick					
Pickwick	1,308.83	4.21	1,313.04	1,322.67	-9.63
Cedar Creek	3.49	0.28	3.77		3.77
Upper Bear Creek	2.86		2.86		2.86
Bear Creek	0.66		0.66	0.11	0.55
WUTA total	***1,315.84***	***4.50***	***1,320.34***	***1,322.78***	***-2.45***
Cumulative	*10,410*	*175*	*10,586*	*10,182*	*404*
Normandy					
Normandy	26.00	2.23	28.22	2.25	25.98
WUTA total	***26.00***	***2.23***	***28.22***	***2.25***	***25.98***
Cumulative	*10,436*	*178*	*10,614*	*10,184*	*430*
Kentucky					
Kentucky	1,310.50	26.59	1,337.09	1,296.35	40.75
WUTA total	***1,310.50***	***26.59***	***1,337.09***	***1,296.35***	***40.75***
Cumulative	*11,747*	*204*	*11,951*	*11,480*	*471*

Table 2-2. Total off-stream water use by hydrologic unit code in 2005

[Figures may not add to totals because of independent rounding. All values are in million gallons per day except for Gross per capita use, which are gallons per person per day]

			Withdrawals				
Hydrologic unit code	**Population**	**Gross per capita use gal/person/d**	**Surface**	**Ground**	**Total withdrawals**	**Total return**	**Net water demand**
6010101	32,203	209.63	4.86	1.89	6.75	2.79	3.97
6010102	246,955	2,552.13	624.54	5.73	630.26	592.83	37.43
6010103	176,748	160.88	15.32	13.12	28.44	14.11	14.33
6010104	196,142	3,357.70	644.23	14.35	658.58	646.36	12.22
6010105	391,545	832.20	317.94	7.90	325.84	298.84	27.00
6010106	79,609	479.96	37.21	1.00	38.21	32.54	5.67
6010107	129,429	152.31	17.98	1.74	19.71	8.72	10.99
6010108	178,688	212.52	23.18	14.79	37.97	19.01	18.97
6010201	478,243	504.65	238.60	2.75	241.35	73.74	167.61
6010202	42,334	510.17	19.63	1.97	21.60	19.40	2.20
6010203	51,039	340.30	15.52	1.85	17.37	14.92	2.45
6010204	56,413	89.38	4.62	0.43	5.04	1.85	3.19
6010205	146,153	168.20	23.14	1.44	24.58	14.72	9.86
6010206	67,949	93.72	5.26	1.11	6.37	2.67	3.69
6010207	198,273	2,316.59	457.59	1.72	459.32	1,183.51	-724.20
6010208	80,844	9,136.79	738.64	0.01	738.65	2.83	735.82
6020001	508,727	3,321.93	1,658.60	31.36	1,689.95	1,795.53	-105.57
6020002	227,757	399.45	83.55	7.42	90.98	79.93	11.05
6020003	29,898	159.92	4.29	0.49	4.78	3.68	1.10
6020004	32,632	199.93	4.85	1.67	6.52	1.21	5.31
6030001	156,590	6,984.24	1,088.33	5.33	1,093.66	1,066.49	27.18
6030002	587,353	5,141.21	2,974.44	45.26	3,019.70	2,944.15	75.55
6030003	77,082	425.97	29.69	3.14	32.83	25.60	7.23
6030004	51,095	306.13	14.97	0.67	15.64	2.86	12.78
6030005	205,378	6,639.72	1,357.33	6.32	1,363.65	1,329.03	34.62
6030006	40,396	230.53	7.32	1.99	9.31	4.56	4.75
6040001	81,644	432.25	31.08	4.21	35.29	30.53	4.76
6040002	110,788	287.77	29.64	2.24	31.88	11.73	20.15
6040003	136,530	62.97	8.48	0.12	8.60	10.20	-1.60
6040004	23,977	127.53	1.21	1.85	3.06	1.95	1.11
6040005	69,672	18,005.40	1,247.72	6.75	1,254.47	1,243.91	10.56
6040006	89,964	339.69	16.91	13.65	30.56	0.27	30.29
Watershed total	**4,982,047**	**2,399**	**11,747**	**204**	**11,951**	**11,480**	**471**

Table 2-3. Total off-stream water use by county in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

State County	Withdrawals Surface	Ground	Total	Total return	Net water demand
Alabama					
Blount	0.01	0.01	0.01		0.01
Colbert	1,342.88	1.30	1,344.18	1,315.46	28.73
Cullman	0.00	0.02	0.02		0.02
Dekalb	0.19	0.47	0.66	0.81	-0.15
Etowah	0.00	0.00	0.00		0.00
Franklin	4.19	1.13	5.32	4.30	1.02
Jackson	1,063.75	0.69	1,064.44	1,056.72	7.71
Lauderdale	11.12	1.51	12.62	6.86	5.76
Lawrence	69.19	0.37	69.56	58.53	11.02
Limestone	2,760.97	13.49	2,774.45	2,745.82	28.63
Madison	40.35	28.74	69.09	42.28	26.80
Marion	2.86	0.01	2.87	0.14	2.73
Marshall	22.83	4.39	27.22	9.52	17.70
Morgan	115.14	0.03	115.17	97.88	17.29
State total	**5,433.47**	**52.15**	**5,485.62**	**5,338.34**	**147.28**
Georgia					
Catoosa	0.35	5.35	5.70	0.32	5.38
Dade	2.09	0.03	2.12	0.30	1.83
Fannin	1.80	0.09	1.89	0.34	1.55
Gilmer	0.00		0.00		0.00
Rabun	0.41	0.18	0.59	1.29	-0.70
Towns	1.19	0.25	1.45	0.29	1.16
Union	0.93	0.69	1.63	0.32	1.31
Walker	0.59	4.89	5.48	1.17	4.31
Whitfield	0.01		0.01		0.01
State total	**7.39**	**11.49**	**18.88**	**4.03**	**14.85**
Kentucky					
Calloway	0.70	4.60	5.30	0.00	5.30
Graves	0.27	0.06	0.33	0.06	0.27
Livingston	3.67	2.23	5.89	0.25	5.64
Lyon	0.00	0.02	0.03	0.01	0.02
Marshall	12.25	6.70	18.95	0.15	18.79
McCracken	0.01	0.42	0.43		0.43
Trigg	0.04		0.04		0.04
State total	**16.93**	**14.03**	**30.96**	**0.48**	**30.49**
Mississippi					
Alcorn	0.01	0.00	0.01	2.96	-2.95
Prentiss	0.00	0.33	0.33		0.33
Tishomingo	0.04	2.36	2.40	0.97	1.43
State total	**0.06**	**2.69**	**2.75**	**3.93**	**-1.19**
North Carolina					
Avery	1.96	0.96	2.92	2.23	0.69
Buncombe	293.22	4.61	297.83	283.38	14.45

Table 2-3. Total off-stream water use by county in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

State / County	Withdrawals: Surface	Withdrawals: Ground	Withdrawals: Total	Total return	Net water demand
North Carolina					
Cherokee	1.51	0.92	2.42	2.06	0.36
Clay	0.05	1.06	1.11	0.11	1.00
Graham	18.06	0.27	18.33	17.69	0.64
Haywood	36.95	1.00	37.95	29.38	8.57
Henderson	9.21	2.57	11.78	3.30	8.49
Jackson	1.85	1.27	3.11	1.14	1.98
Macon	1.91	1.77	3.68	1.10	2.58
Madison	0.33	0.81	1.14	0.79	0.36
Mitchell	6.38	1.13	7.51	4.57	2.94
Swain	13.79	0.59	14.37	13.79	0.58
Transylvania	10.19	3.13	13.32	11.41	1.91
Watauga	0.64	1.18	1.82	0.34	1.48
Yancey	1.14	0.96	2.10	0.55	1.56
State total	**397.19**	**22.23**	**419.41**	**371.84**	**47.58**
Tennessee					
Anderson	444.35	0.22	444.58	440.87	3.70
Bedford	9.27	0.94	10.22	7.45	2.76
Benton	2.00	1.55	3.55	0.69	2.85
Bledsoe	0.99	0.49	1.48	0.19	1.29
Blount	14.15	0.21	14.35	16.28	-1.92
Bradley	14.74	2.65	17.39	12.54	4.85
Campbell	2.31	0.67	2.98	1.56	1.42
Carroll	0.22	0.83	1.05	0.15	0.90
Carter	0.05	7.55	7.60	2.42	5.17
Chester	0.00		0.00		0.00
Claiborne	2.90	0.10	2.99	0.55	2.44
Cocke	5.14	0.21	5.34	2.97	2.38
Coffee	28.75	0.52	29.27	23.00	6.27
Cumberland	6.04	0.02	6.06	2.09	3.96
Decatur	1.77	0.03	1.80	0.58	1.23
Dickson	5.06		5.06	0.10	4.96
Fentress	0.00		0.00		0.00
Franklin	2.81	2.45	5.25	1.51	3.74
Giles	3.77	0.48	4.25	2.31	1.94
Grainger	0.18	4.03	4.21	4.10	0.11
Greene	10.29		10.29	5.88	4.41
Grundy	0.98		0.98	0.22	0.75
Hamblen	7.69	1.74	9.43	5.72	3.71
Hamilton	1,599.37	18.94	1,618.31	1,599.05	19.26
Hancock	0.20	0.00	0.21	0.17	0.04
Hardin	26.25	2.47	28.72	27.60	1.12
Hawkins	628.91	1.71	630.62	627.92	2.69
Henderson	3.26	0.43	3.69	1.46	2.23
Henry	0.42	2.75	3.17	2.00	1.17

Table 2-3. Total off-stream water use by county in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

State County	Withdrawals Surface	Ground	Total	Total return	Net water demand
Tennessee					
Hickman	2.46		2.46	0.51	1.96
Houston	0.01	0.13	0.13		0.13
Humphreys	1,245.01	0.99	1,246.00	1,241.36	4.65
Jefferson	4.84	8.54	13.38	4.03	9.35
Johnson	1.00	0.96	1.96	0.88	1.08
Knox	69.35	1.16	70.51	60.92	9.59
Lawrence	2.19	2.66	4.85	1.91	2.94
Lewis	0.09	1.50	1.59	0.91	0.69
Lincoln	3.83	2.03	5.85	1.25	4.61
Loudon	17.45	0.81	18.26	12.85	5.41
Marion	3.08	1.26	4.34	0.84	3.50
Marshall	3.50	0.17	3.66	1.92	1.74
Maury	11.23	1.06	12.30	9.47	2.83
McMinn	65.10	1.85	66.95	64.61	2.34
McNairy	0.06	1.05	1.12	0.51	0.60
Meigs	0.09	0.76	0.86	0.33	0.53
Monroe	4.92	0.75	5.67	2.20	3.47
Moore	1.16	0.19	1.35	2.06	-0.71
Morgan	1.13		1.13	0.65	0.48
Perry	0.69		0.69	0.45	0.24
Polk	2.52	0.40	2.91	3.34	-0.42
Rhea	211.55	0.98	212.53	194.41	18.12
Roane	734.78	1.28	736.06	731.38	4.69
Sequatchie	0.74		0.74	0.54	0.20
Sevier	12.62	0.19	12.81	8.13	4.68
Stewart	0.04	0.12	0.16		0.16
Sullivan	614.90	0.26	615.16	584.43	30.73
Unicoi	0.03	9.02	9.04	5.38	3.66
Union	0.02	0.42	0.45	0.36	0.09
Washington	17.90	3.79	21.69	11.45	10.24
Wayne	1.01	0.35	1.36	0.70	0.66
Williamson	0.00	0.05	0.05		0.05
State total	**5,855.17**	**93.72**	**5,948.89**	**5,737.16**	**211.73**
Virginia					
Lee	1.58	0.88	2.46	0.80	1.67
Russell	9.43	0.32	9.76	5.61	4.14
Scott	3.10	0.07	3.17	2.92	0.25
Smyth	2.86	3.92	6.77	4.94	1.83
Tazewell	3.54	0.02	3.56	4.12	-0.56
Washington	8.31	2.47	10.78	2.28	8.50
Wise	7.58	0.26	7.84	4.03	3.81
Wythe	0.09		0.09		0.09
State total	**36.49**	**7.94**	**44.43**	**24.71**	**19.72**

Table 2-3. Total off-stream water use by county in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

State County	Withdrawals			Total return	Net water demand
	Surface	Ground	Total		
Watershed total	**11,747**	**204**	**11,951**	**11,480**	**471**

Table 2-4. Total water use by category and water use tabulation area in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

Water use tabulation area	Thermoelectric		Industrial		Public		Irrigation	Total	
Reservoir catchment area	Withdrawal	Return	Withdrawal	Return	Withdrawal	Return	Withdrawal	Withdrawal	Return
Cherokee									
Watauga			0.20	0.02	24.08	1.82	0.64	24.92	1.84
South Holston				2.45	21.83	4.35	0.42	22.25	6.80
Boone			0.10		3.41	23.55	0.07	3.58	23.55
Ft Patrick Henry			591.85		16.10			607.94	0.00
Cherokee	625.29	624.97	12.50	569.56	24.94	16.84	0.66	663.38	1,211.37
WUTA total	***625.29***	***624.97***	***604.65***	***572.03***	***90.35***	***46.56***	***1.79***	***1,322.08***	***1,243.56***
Cumulative	*625*	*625*	*605*	*572*	*90*	*47*	*2*	*1,322*	*1,244*
Douglas									
Douglas	266.82	261.86	58.82	49.74	90.04	39.31	5.16	420.85	350.91
WUTA total	***266.82***	***261.86***	***58.82***	***49.74***	***90.04***	***39.31***	***5.16***	***420.85***	***350.91***
Cumulative	*892*	*887*	*663*	*622*	*180*	*86*	*7*	*1,743*	*1,594*
Fort Loudoun									
Fort Loudoun			8.86	17.22	77.57	61.84	0.31	86.74	79.05
WUTA total			***8.86***	***17.22***	***77.57***	***61.84***	***0.31***	***86.74***	***79.05***
Cumulative	*892*	*887*	*672*	*639*	*258*	*148*	*7*	*1,830*	*1,674*
Fontana-Tellico									
Fontana			29.31	29.86	9.72	4.45	0.81	39.84	34.32
Santeetlah					0.76			0.76	0.00
Tellico			0.19	0.11	4.15	1.97	0.34	4.68	2.07
WUTA total			***29.50***	***29.97***	***14.63***	***6.42***	***1.14***	***45.27***	***36.39***
Cumulative	*892*	*887*	*702*	*669*	*273*	*154*	*8*	*1,875*	*1,710*
Norris									
Norris	8.73	4.78	2.55	0.92	19.06	12.22	0.61	30.95	17.92
Melton Hill	430.18	429.57	0.52	5.39	26.86	14.76	0.59	458.15	449.72
WUTA total	***438.91***	***434.35***	***3.07***	***6.31***	***45.92***	***26.98***	***1.19***	***489.11***	***467.65***
Cumulative	*1,331*	*1,321*	*705*	*675*	*319*	*181*	*10*	*2,364*	*2,178*
Hiwassee-Ocoee									
Chatuge					3.28	0.16	0.04	3.31	0.16
Nottely					1.59	0.32	0.03	1.62	0.32
Hiwassee			0.02		1.54	2.30	0.32	1.89	2.30
Apalachia					3.06	0.01		3.06	0.01
Blue Ridge			2.36		2.16	0.34	0.06	4.58	0.34
Ocoee				2.98	0.15	0.33	0.04	0.20	3.30
WUTA total			***2.38***	***2.98***	***11.78***	***3.45***	***0.49***	***14.66***	***6.43***
Cumulative	*1,331*	*1,321*	*707*	*678*	*330*	*185*	*10*	*2,379*	*2,184*
Watts Bar-Chickamauga									
Watts Bar	883.18	727.41	0.01	4.09	12.78	19.77	0.78	896.76	751.28
Chickamauga	1,591.37	1,724.21	66.50	64.19	57.42	16.34	0.90	1,716.19	1,804.74
WUTA total	***2,474.55***	***2,451.62***	***66.51***	***68.28***	***70.21***	***36.11***	***1.68***	***2,612.95***	***2,556.02***
Cumulative	*3,806*	*3,773*	*774*	*747*	*401*	*221*	*12*	*4,992*	*4,740*

Table 2-4. Total water use by category and water use tabulation area in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

Water use tabulation area	Thermoelectric		Industrial		Public		Irrigation	Total	
Reservoir catchment area	Withdrawal	Return	Withdrawal	Return	Withdrawal	Return	Withdrawal	Withdrawal	Return
Nickajack									
Nickajack			13.75	14.81	40.85	53.16	0.30	54.90	67.97
WUTA total			***13.75***	***14.81***	***40.85***	***53.16***	***0.30***	***54.90***	***67.97***
Cumulative	*3,806*	*3,773*	*788*	*761*	*441*	*274*	*12*	*5,047*	*4,808*
Guntersville									
Guntersville	1,045.00	1,042.88	8.99	7.78	44.04	17.09	1.24	1,099.26	1,067.75
WUTA total	***1,045.00***	***1,042.88***	***8.99***	***7.78***	***44.04***	***17.09***	***1.24***	***1,099.26***	***1,067.75***
Cumulative	*4,851*	*4,816*	*797*	*769*	*485*	*291*	*13*	*6,146*	*5,876*
Tims Ford									
Tims Ford			23.41	17.12	4.94	5.13	2.24	30.59	22.25
WUTA total			***23.41***	***17.12***	***4.94***	***5.13***	***2.24***	***30.59***	***22.25***
Cumulative	*4,851*	*4,816*	*820*	*786*	*490*	*296*	*16*	*6,176*	*5,898*
Wheeler-Wilson									
Wheeler	2,757.13	2,741.93	134.47	140.22	135.67	68.17	9.77	3,037.03	2,950.32
Wilson			28.70	5.50	21.15	5.32	1.98	51.83	10.82
WUTA total	***2,757.13***	***2,741.93***	***163.17***	***145.72***	***156.82***	***73.49***	***11.75***	***3,088.87***	***2,961.14***
Cumulative	*7,608*	*7,558*	*983*	*932*	*647*	*370*	*27*	*9,265*	*8,859*
Pickwick									
Pickwick	1,264.79	1,263.35	41.01	42.50	6.22	16.82	1.03	1,313.04	1,322.67
Cedar Creek					3.77			3.77	0.00
Upper Bear Creek					2.86			2.86	0.00
Bear Creek					0.66	0.11		0.66	0.11
WUTA total	***1,264.79***	***1,263.35***	***41.01***	***42.50***	***13.51***	***16.94***	***1.03***	***1,320.34***	***1,322.78***
Cumulative	*8,872*	*8,821*	*1,024*	*974*	*661*	*386*	*28*	*10,586*	*10,182*
Normandy									
Normandy					27.34	2.25	0.89	28.22	2.25
WUTA total			***0.00***		***27.34***	***2.25***	***0.89***	***28.22***	***2.25***
Cumulative	*8,872*	*8,821*	*1,024*	*974*	*688*	*389*	*29*	*10,614*	*10,184*
Kentucky									
Kentucky	1,173.75	1,173.14	123.35	98.64	35.17	24.56	4.82	1,337.09	1,296.35
WUTA total	***1,173.75***	***1,173.14***	***123.35***	***98.64***	***35.17***	***24.56***	***4.82***	***1,337.09***	***1,296.35***
Cumulative	*10,046*	*9,994*	*1,148*	*1,073*	*723*	*413*	*34*	*11,951*	*11,480*

Table 2-5. Total water use by category and hydrologic unit code in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

Hydrologic unit code	Thermoelectric		Industrial		Public supply		Irrigation	Totals	
	Withdrawal	Return	Withdrawal	Return	Withdrawal	Return	Withdrawal	Withdrawal	Return
6010101			4.28	1.96	2.31	0.83	0.16	6.75	2.79
6010102			591.85	568.69	37.93	24.14	0.49	630.26	592.83
6010103			0.30	0.02	27.49	14.08	0.65	28.44	14.11
6010104	625.29	624.97	10.17	10.38	22.63	11.01	0.49	658.58	646.36
6010105	266.82	261.86	13.80	11.24	42.62	25.75	2.61	325.84	298.84
6010106			30.68	26.25	6.54	6.30	0.98	38.21	32.54
6010107			2.50		16.89	8.72	0.33	19.71	8.72
6010108			11.85	12.26	24.86	6.75	1.27	37.97	19.01
6010201	155.10		6.92	12.26	78.27	61.47	1.06	241.35	73.74
6010202			17.51	18.20	3.85	1.20	0.24	21.60	19.40
6010203			11.80	11.66	5.01	3.25	0.56	17.37	14.92
6010204			0.19	0.11	4.69	1.75	0.16	5.04	1.85
6010205	8.73	4.78	2.51	0.86	12.93	9.08	0.41	24.58	14.72
6010206			0.04	0.06	6.13	2.62	0.19	6.37	2.67
6010207	430.18	1,156.98	0.52	5.42	28.03	21.11	0.59	459.32	1,183.51
6010208	728.08			0.01	10.38	2.82	0.19	738.65	2.83
6020001	1,591.37	1,724.21	14.49	14.81	82.93	56.50	1.17	1,689.95	1,795.53
6020002			65.78	64.18	24.80	15.75	0.40	90.98	79.93
6020003			2.36	2.98	2.31	0.70	0.10	4.78	3.68
6020004				0.00	6.30	1.21	0.22	6.52	1.21
6030001	1,045.00	1,042.88	8.99	7.78	38.47	15.83	1.21	1,093.66	1,066.49
6030002	2,757.13	2,741.93	134.47	137.63	120.02	64.60	8.09	3,019.70	2,944.15
6030003			23.39	18.90	6.92	6.71	2.53	32.83	25.60
6030004			0.02	0.81	13.71	2.05	1.91	15.64	2.86
6030005	1,264.79	1,263.35	69.71	48.00	26.67	17.68	2.49	1,363.65	1,329.03
6030006					8.77	4.56	0.55	9.31	4.56
6040001			25.00	24.54	9.18	5.99	1.12	35.29	30.53
6040002			3.61	4.87	27.34	6.87	0.94	31.88	11.73
6040003			0.12	2.91	7.56	7.29	0.92	8.60	10.20
6040004			0.05		2.89	1.95	0.11	3.06	1.95
6040005	1,173.75	1,173.14	73.00	66.24	6.88	4.53	0.84	1,254.47	1,243.91
6040006			21.57	0.09	7.89	0.18	1.10	30.56	0.27
Watershed total	**10,046**	**9,994**	**1,148**	**1,073**	**723**	**413**	**34**	**11,951**	**11,480**

Table 2-6. Total water use by category and county in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

State / County	Thermoelectric		Industrial		Public supply		Irrigation	Total	
	Withdrawal	Return	Withdrawal	Return	Withdrawal	Return	Withdrawal	Withdrawal	Return
Alabama									
Blount							0.01	0.01	0.00
Colbert	1,264.79	1,263.35	69.71	48.00	8.39	4.11	1.30	1,344.18	1,315.46
Cullman							0.02	0.02	0.00
Dekalb				0.10	0.35	0.72	0.31	0.66	0.81
Etowah							0.00	0.00	0.00
Franklin					5.23	4.30	0.09	5.32	4.30
Jackson	1,045.00	1,042.88	8.90	7.68	10.15	6.17	0.38	1,064.44	1,056.72
Lauderdale					12.05	6.86	0.58	12.62	6.86
Lawrence			60.09	57.32	7.69	1.22	1.78	69.56	58.53
Limestone	2,749.90	2,741.00			20.59	4.82	3.96	2,774.45	2,745.82
Madison				4.08	65.61	38.20	3.48	69.09	42.28
Marion					2.86	0.14	0.01	2.87	0.14
Marshall			0.08		26.58	9.52	0.56	27.22	9.52
Morgan	7.23	0.93	74.38	76.23	33.37	20.72	0.19	115.17	97.88
State total	**5,066.92**	**5,048.16**	**213.16**	**193.40**	**192.86**	**96.78**	**12.68**	**5,485.62**	**5,338.34**
Georgia									
Catoosa				0.01	5.66	0.31	0.04	5.70	0.32
Dade				0.01	2.09	0.29	0.03	2.12	0.30
Fannin					1.84	0.34	0.05	1.89	0.34
Gilmer							0.00	0.00	0.00
Rabun			0.39	1.20	0.15	0.09	0.05	0.59	1.29
Towns					1.44	0.29	0.01	1.45	0.29
Union					1.59	0.32	0.03	1.63	0.32
Walker			0.72	0.00	4.65	1.17	0.11	5.48	1.17
Whitfield							0.01	0.01	0.00
State total			**1.11**	**1.22**	**17.43**	**2.81**	**0.34**	**18.88**	**4.03**
Kentucky									
Calloway			1.04		3.53	0.00	0.72	5.30	0.00
Graves					0.05	0.06	0.28	0.33	0.06
Livingston			5.89	0.14		0.11	0.00	5.89	0.25
Lyon					0.02	0.01	0.00	0.03	0.01
Marshall			14.64		4.27	0.15	0.04	18.95	0.15
McCracken					0.40		0.03	0.43	0.00
Trigg							0.04	0.04	0.00

Table 2-6. Total water use by category and county in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

State County	Thermoelectric		Industrial		Public supply		Irrigation	Total	
	Withdrawal	Return	Withdrawal	Return	Withdrawal	Return	Withdrawal	Withdrawal	Return
Kentucky									
State total			**21.57**	**0.14**	**8.28**	**0.34**	**1.11**	**30.96**	**0.48**
Mississippi									
Alcorn			0.00		0.00	2.96	0.01	0.01	2.96
Prentiss					0.33		0.00	0.33	0.00
Tishomingo					2.36	0.97	0.04	2.40	0.97
State total			**0.00**		**2.69**	**3.93**	**0.06**	**2.75**	**3.93**
North Carolina									
Avery			1.57	1.44	0.90	0.79	0.45	2.92	2.23
Buncombe	266.82	261.86	3.33	1.17	26.70	20.35	0.98	297.83	283.38
Cherokee					2.33	2.06	0.10	2.42	2.06
Clay			0.02		1.05	0.11	0.04	1.11	0.11
Graham			17.36	17.27	0.96	0.42	0.01	18.33	17.69
Haywood			30.52	26.05	6.54	3.33	0.89	37.95	29.38
Henderson			0.44	0.05	10.47	3.25	0.87	11.78	3.30
Jackson			0.14		2.56	1.14	0.41	3.11	1.14
Macon			0.01		3.49	1.10	0.17	3.68	1.10
Madison				0.44	1.01	0.35	0.13	1.14	0.79
Mitchell			4.97	4.23	2.33	0.34	0.21	7.51	4.57
Swain			11.77	11.66	2.45	2.13	0.15	14.37	13.79
Transylvania			10.03	9.61	2.80	1.81	0.49	13.32	11.41
Watauga			0.18	0.02	1.59	0.32	0.05	1.82	0.34
Yancey			0.45	0.04	1.53	0.50	0.11	2.10	0.55
State total	**266.82**	**261.86**	**80.78**	**71.98**	**66.73**	**37.99**	**5.08**	**419.41**	**371.84**
Tennessee									
Anderson	430.18	429.57	0.52	4.46	13.42	6.85	0.46	444.58	440.87
Bedford			3.45	4.57	6.59	2.89	0.17	10.22	7.45
Benton			2.04		1.49	0.69	0.01	3.55	0.69
Bledsoe					1.22	0.19	0.26	1.48	0.19
Blount				7.77	14.00	8.50	0.35	14.35	16.28
Bradley			3.81	3.45	13.52	9.08	0.06	17.39	12.54
Campbell					2.95	1.56	0.03	2.98	1.56
Carroll			0.67		0.28	0.15	0.11	1.05	0.15
Carter			0.08		7.46	2.42	0.05	7.60	2.42
Chester							0.00	0.00	0.00

Table 2-6. Total water use by category and county in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

State County	Thermoelectric		Industrial		Public supply		Irrigation	Total	
	Withdrawal	Return	Withdrawal	Return	Withdrawal	Return	Withdrawal	Withdrawal	Return
Tennessee									
Claiborne					2.98	0.55	0.02	2.99	0.55
Cocke			0.21		4.85	2.97	0.29	5.34	2.97
Coffee			22.61	17.42	5.74	5.58	0.91	29.27	23.00
Cumberland				0.01	5.84	2.09	0.22	6.06	2.09
Decatur			0.00	0.11	1.48	0.46	0.32	1.80	0.58
Dickson					5.04	0.10	0.02	5.06	0.10
Fentress							0.00	0.00	0.00
Franklin					4.35	1.51	0.91	5.25	1.51
Giles				0.76	3.58	1.56	0.68	4.25	2.31
Grainger			3.98	3.98		0.12	0.23	4.21	4.10
Greene			1.05	1.72	8.95	4.16	0.29	10.29	5.88
Grundy					0.83	0.22	0.14	0.98	0.22
Hamblen				1.01	9.24	4.71	0.19	9.43	5.72
Hamilton	1,538.56	1,532.81	13.67	14.85	65.47	51.38	0.60	1,618.31	1,599.05
Hancock					0.20	0.17	0.01	0.21	0.17
Hardin			25.00	24.43	3.17	3.18	0.55	28.72	27.60
Hawkins	625.29	624.97	0.60	1.36	4.63	1.59	0.10	630.62	627.92
Henderson					3.61	1.46	0.08	3.69	1.46
Henry					2.53	2.00	0.63	3.17	2.00
Hickman					2.43	0.51	0.03	2.46	0.51
Houston					0.13		0.01	0.13	0.00
Humphreys	1,173.75	1,173.14	70.29	66.19	1.94	2.02	0.03	1,246.00	1,241.36
Jefferson			6.12	2.32	7.11	1.71	0.15	13.38	4.03
Johnson			0.00		1.91	0.88	0.05	1.96	0.88
Knox			3.20	3.14	66.99	57.78	0.31	70.51	60.92
Lawrence					4.57	1.91	0.29	4.85	1.91
Lewis					1.50	0.91	0.09	1.59	0.91
Lincoln					4.01	1.25	1.85	5.85	1.25
Loudon			5.66	4.00	12.03	8.85	0.57	18.26	12.85
Marion			0.10	0.00	4.20	0.84	0.05	4.34	0.84
Marshall					3.04	1.92	0.63	3.66	1.92
Maury			0.12	2.91	11.96	6.56	0.21	12.30	9.47
McMinn			61.95	60.73	4.86	3.88	0.14	66.95	64.61
McNairy					0.99	0.51	0.13	1.12	0.51

Table 2-6. Total water use by category and county in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

State County	Thermoelectric		Industrial		Public supply		Irrigation	Total	
	Withdrawal	Return	Withdrawal	Return	Withdrawal	Return	Withdrawal	Withdrawal	Return
Tennessee									
Meigs					0.76	0.33	0.09	0.86	0.33
Monroe				0.07	5.65	2.13	0.02	5.67	2.20
Moore			0.75	1.78	0.59	0.28	0.01	1.35	2.06
Morgan					1.13	0.65	0.00	1.13	0.65
Perry					0.64	0.45	0.05	0.69	0.45
Polk			2.36	2.98	0.48	0.36	0.07	2.91	3.34
Rhea	207.91	191.40			4.38	3.01	0.24	212.53	194.41
Roane	728.08	727.41		0.96	7.93	3.00	0.05	736.06	731.38
Sequatchie					0.73	0.54	0.01	0.74	0.54
Sevier			0.03		12.59	8.13	0.19	12.81	8.13
Stewart					0.12		0.04	0.16	0.00
Sullivan			591.86	566.24	23.21	18.19	0.09	615.16	584.43
Unicoi			3.82	3.81	5.19	1.57	0.03	9.04	5.38
Union					0.42	0.36	0.02	0.45	0.36
Washington				0.01	21.07	11.45	0.63	21.69	11.45
Wayne			0.05		1.22	0.70	0.09	1.36	0.70
Williamson					0.05		0.00	0.05	0.00
State total	**4,703.77**	**4,679.30**	**824.00**	**801.03**	**407.28**	**256.83**	**13.84**	**5,948.89**	**5,737.16**
Virginia									
Lee			0.04	0.03	2.26	0.77	0.16	2.46	0.80
Russell	8.73	4.78	0.11	0.24	0.84	0.60	0.08	9.76	5.61
Scott			1.84	2.24	1.20	0.68	0.13	3.17	2.92
Smyth			2.45	2.57	4.32	2.37	0.00	6.77	4.94
Tazewell			0.05	0.18	3.40	3.94	0.11	3.56	4.12
Washington				0.00	10.44	2.28	0.34	10.78	2.28
Wise			2.36	0.07	5.44	3.96	0.04	7.84	4.03
Wythe							0.09	0.09	0.00
State total	**8.73**	**4.78**	**6.83**	**5.32**	**27.91**	**14.60**	**0.95**	**44.43**	**24.71**
Watershed total	**10,046**	**9,994**	**1,148**	**1,073**	**723**	**413**	**34**	**11,951**	**11,480**

Table 2-7. Surface water withdrawals by water use category and water use tabulation area in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

Water use tabulation area Reservoir catchment area	Thermoelectric	Industrial	Public supply	Irrigation	Total water withdrawals
Cherokee					
Watauga		0.20	14.61	0.50	15.30
South Holston			16.29	0.27	16.56
Boone		0.01		0.04	0.05
Ft Patrick Henry		591.85	16.10		607.94
Cherokee	625.29	5.46	15.81	0.58	647.14
WUTA total	***625.29***	***597.52***	***62.80***	***1.38***	***1,286.99***
Cumulative	*625*	*598*	*63*	*1*	*1,287*
Douglas					
Douglas	266.82	52.03	72.89	4.55	396.28
WUTA total	***266.82***	***52.03***	***72.89***	***4.55***	***396.28***
Cumulative	*892*	*650*	*136*	*6*	*1,683*
Fort Loudoun					
Fort Loudoun		7.72	76.15	0.15	84.02
WUTA total		***7.72***	***76.15***	***0.15***	***84.02***
Cumulative	*892*	*657*	*212*	*6*	*1,767*
Fontana-Tellico					
Fontana		29.21	5.15	0.79	35.16
Santeetlah			0.51		0.51
Tellico		0.19	4.03	0.28	4.50
WUTA total		***29.40***	***9.68***	***1.07***	***40.16***
Cumulative	*892*	*687*	*222*	*7*	*1,807*
Norris					
Norris	8.73	2.49	16.59	0.59	28.40
Melton Hill	430.18	0.52	25.54	0.58	456.82
WUTA total	***438.91***	***3.01***	***42.13***	***1.16***	***485.22***
Cumulative	*1,331*	*690*	*264*	*8*	*2,293*
Hiwassee-Ocoee					
Chatuge			1.98	0.03	2.01
Nottely			0.90	0.03	0.93
Hiwassee		0.01	0.63	0.28	0.91
Apalachia			3.06		3.06
Blue Ridge		2.16	2.06	0.03	4.25
Ocoee				0.04	0.04
WUTA total		***2.17***	***8.62***	***0.41***	***11.20***
Cumulative	*1,331*	*692*	*272*	*9*	*2,304*
Watts Bar-Chickamauga					
Watts Bar	883.18		11.63	0.76	895.57
Chickamauga	1,591.37	66.24	31.33	0.53	1,689.47
WUTA total	***2,474.55***	***66.24***	***42.97***	***1.29***	***2,585.04***
Cumulative	*3,806*	*758*	*315*	*10*	*4,889*
Nickajack					
Nickajack		5.93	40.78	0.20	46.90
WUTA total		***5.93***	***40.78***	***0.20***	***46.90***
Cumulative	*3,806*	*764*	*356*	*10*	*4,936*

Table 2-7. Surface water withdrawals by water use category and water use tabulation area in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

Water use tabulation area Reservoir catchment area	Thermoelectric	Industrial	Public supply	Irrigation	Total water withdrawals
Guntersville					
Guntersville	1,045.00	8.90	37.01	1.00	1,091.91
WUTA total	***1,045.00***	***8.90***	***37.01***	***1.00***	***1,091.91***
Cumulative	*4,851*	*773*	*393*	*11*	*6,028*
Tims Ford					
Tims Ford		22.60	2.93	1.90	27.43
WUTA total		***22.60***	***2.93***	***1.90***	***27.43***
Cumulative	*4,851*	*796*	*396*	*13*	*6,055*
Wheeler-Wilson					
Wheeler	2,757.13	134.47	92.26	7.32	2,991.17
Wilson		28.49	18.24	1.30	48.03
WUTA total	***2,757.13***	***162.96***	***110.49***	***8.62***	***3,039.20***
Cumulative	*7,608*	*958*	*506*	*22*	*9,094*
Pickwick					
Pickwick	1,264.79	41.01	2.42	0.61	1,308.83
Cedar Creek			3.49		3.49
Upper Bear Creek			2.86		2.86
Bear Creek			0.66		0.66
WUTA total	***1,264.79***	***41.01***	***9.43***	***0.61***	***1,315.84***
Cumulative	*8,872*	*999*	*516*	*22*	*10,410*
Normandy					
Normandy			25.31	0.69	26.00
WUTA total		***0.00***	***25.31***	***0.69***	***26.00***
Cumulative	*8,872*	*999*	*541*	*23*	*10,436*
Kentucky					
Kentucky	1,173.75	115.55	16.97	4.23	1,310.50
WUTA total	***1,173.75***	***115.55***	***16.97***	***4.23***	***1,310.50***
Cumulative	*10,046*	*1,116*	*558*	*27*	*11,747*

Table 2-8. Surface water withdrawals by water use category and hydrologic unit code for 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

Hydrologic unit code	Thermoelectric	Industrial	Public supply	Irrigation	Total water withdrawals
6010101		4.28	0.42	0.16	4.86
6010102		591.85	32.39	0.30	624.54
6010103		0.21	14.61	0.50	15.32
6010104	625.29	3.13	15.39	0.42	644.23
6010105	266.82	12.10	36.60	2.42	317.94
6010106		30.68	5.55	0.98	37.21
6010107		1.26	16.44	0.28	17.98
6010108		7.99	14.31	0.89	23.18
6010201	155.10	5.77	76.85	0.88	238.60
6010202		17.41	1.98	0.24	19.63
6010203		11.80	3.17	0.55	15.52
6010204		0.19	4.31	0.11	4.62
6010205	8.73	2.49	11.53	0.39	23.14
6010206		0.00	5.07	0.19	5.26
6010207	430.18	0.52	26.31	0.58	457.59
6010208	728.08		10.38	0.18	738.64
6020001	1,591.37	6.41	60.12	0.70	1,658.60
6020002		65.77	17.45	0.34	83.55
6020003		2.16	2.06	0.07	4.29
6020004			4.64	0.21	4.85
6030001	1,045.00	8.90	33.46	0.97	1,088.33
6030002	2,757.13	134.47	76.86	5.99	2,974.44
6030003		22.60	4.91	2.18	29.69
6030004			13.42	1.56	14.97
6030005	1,264.79	69.50	21.43	1.61	1,357.33
6030006			7.01	0.31	7.32
6040001		25.00	5.14	0.94	31.08
6040002		3.59	25.31	0.74	29.64
6040003		0.12	7.47	0.89	8.48
6040004			1.11	0.11	1.21
6040005	1,173.75	71.12	2.32	0.53	1,247.72
6040006		15.72	0.16	1.04	16.91
Watershed total	**10,046**	**1,116**	**558**	**27**	**11,747**

Table 2-9. Surface water withdrawals by water use category and county in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

State County	Thermoelectric	Industrial	Public supply	Irrigation	Total water withdrawals
Alabama					
Blount				0.01	0.01
Colbert	1,264.79	69.50	7.82	0.78	1,342.88
Cullman				0.00	0.00
Dekalb			0.00	0.19	0.19
Etowah				0.00	0.00
Franklin			4.15	0.04	4.19
Jackson	1,045.00	8.90	9.48	0.36	1,063.75
Lauderdale			10.91	0.21	11.12
Lawrence		60.09	7.69	1.42	69.19
Limestone	2,749.90		8.11	2.95	2,760.97
Madison			38.01	2.34	40.35
Marion			2.86		2.86
Marshall			22.27	0.56	22.83
Morgan	7.23	74.38	33.37	0.17	115.14
State total	**5,066.92**	**212.87**	**144.67**	**9.02**	**5,433.47**
Georgia					
Catoosa			0.32	0.03	0.35
Dade			2.09	0.00	2.09
Fannin			1.78	0.02	1.80
Gilmer				0.00	0.00
Rabun		0.29	0.07	0.05	0.41
Towns			1.19	0.00	1.19
Union			0.90	0.03	0.93
Walker		0.48		0.11	0.59
Whitfield				0.01	0.01
State total		**0.77**	**6.35**	**0.27**	**7.39**
Kentucky					
Calloway				0.70	0.70
Graves				0.27	0.27
Livingston		3.67		0.00	3.67
Lyon				0.00	0.00
Marshall		12.05	0.16	0.04	12.25
McCracken				0.01	0.01
Trigg				0.04	0.04
State total		**15.72**	**0.16**	**1.06**	**16.93**
Mississippi					
Alcorn				0.01	0.01
Prentiss				0.00	0.00
Tishomingo				0.04	0.04
State total		**0.00**		**0.06**	**0.06**
North Carolina					
Avery		1.57	0.01	0.38	1.96
Buncombe	266.82	3.28	22.33	0.79	293.22

Table 2-9. Surface water withdrawals by water use category and county in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

State County	Thermoelectric	Industrial	Public supply	Irrigation	Total water withdrawals
North Carolina					
Cherokee			1.41	0.10	1.51
Clay		0.01		0.04	0.05
Graham		17.36	0.70	0.01	18.06
Haywood		30.52	5.55	0.89	36.95
Henderson		0.44	7.90	0.87	9.21
Jackson		0.14	1.31	0.40	1.85
Macon		0.01	1.72	0.17	1.91
Madison			0.20	0.13	0.33
Mitchell		4.91	1.26	0.21	6.38
Swain		11.77	1.86	0.15	13.79
Transylvania		8.38	1.32	0.49	10.19
Watauga		0.18	0.41	0.05	0.64
Yancey		0.45	0.57	0.11	1.14
State total	**266.82**	**79.02**	**46.54**	**4.80**	**397.19**
Tennessee					
Anderson	430.18	0.52	13.20	0.45	444.35
Bedford		3.45	5.81	0.02	9.27
Benton		0.63	1.36	0.01	2.00
Bledsoe			0.73	0.26	0.99
Blount			14.00	0.15	14.15
Bradley		3.81	10.89	0.03	14.74
Campbell			2.28	0.03	2.31
Carroll		0.22			0.22
Carter				0.05	0.05
Chester				0.00	0.00
Claiborne			2.88	0.02	2.90
Cocke			4.85	0.29	5.14
Coffee		22.19	5.69	0.88	28.75
Cumberland			5.84	0.20	6.04
Decatur		0.00	1.48	0.29	1.77
Dickson			5.04	0.02	5.06
Fentress				0.00	0.00
Franklin			2.34	0.47	2.81
Giles			3.09	0.68	3.77
Grainger				0.18	0.18
Greene		1.05	8.95	0.29	10.29
Grundy			0.83	0.14	0.98
Hamblen			7.57	0.12	7.69
Hamilton	1,538.56	5.83	54.78	0.21	1,599.37
Hancock			0.20	0.01	0.20
Hardin		25.00	0.77	0.48	26.25
Hawkins	625.29	0.60	2.92	0.10	628.91
Henderson			3.18	0.08	3.26
Henry				0.42	0.42
Hickman			2.43	0.03	2.46

Table 2-9. Surface water withdrawals by water use category and county in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

State County	Thermoelectric	Industrial	Public supply	Irrigation	Total water withdrawals
Tennessee					
Houston				0.01	0.01
Humphreys	1,173.75	70.27	0.96	0.03	1,245.01
Jefferson		1.84	2.92	0.08	4.84
Johnson			0.96	0.04	1.00
Knox		2.07	66.99	0.29	69.35
Lawrence			1.94	0.26	2.19
Lewis				0.09	0.09
Lincoln			1.98	1.85	3.83
Loudon		5.65	11.23	0.57	17.45
Marion		0.10	2.96	0.03	3.08
Marshall			2.87	0.63	3.50
Maury		0.12	10.94	0.17	11.23
McMinn		61.95	3.06	0.10	65.10
McNairy				0.06	0.06
Meigs				0.09	0.09
Monroe			4.90	0.02	4.92
Moore		0.55	0.59	0.01	1.16
Morgan			1.13	0.00	1.13
Perry			0.64	0.05	0.69
Polk		2.16	0.28	0.07	2.52
Rhea	207.91		3.42	0.22	211.55
Roane	728.08		6.65	0.04	734.78
Sequatchie			0.73	0.01	0.74
Sevier			12.43	0.19	12.62
Stewart				0.04	0.04
Sullivan		591.86	22.98	0.06	614.90
Unicoi		0.02		0.00	0.03
Union				0.02	0.02
Washington			17.66	0.25	17.90
Wayne			0.94	0.07	1.01
Williamson				0.00	0.00
State total	**4,703.77**	**799.90**	**340.27**	**11.24**	**5,855.17**
Virginia					
Lee			1.42	0.16	1.58
Russell	8.73	0.10	0.52	0.08	9.43
Scott		1.84	1.13	0.13	3.10
Smyth		2.45	0.41	0.00	2.86
Tazewell		0.03	3.40	0.11	3.54
Washington			8.09	0.22	8.31
Wise		2.36	5.18	0.04	7.58
Wythe				0.09	0.09
State total	**8.73**	**6.77**	**20.15**	**0.83**	**36.49**
Watershed total	**10,046**	**1,116**	**558**	**27**	**11,747**

Table 2-10. Groundwater withdrawals by water use tabulation area in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

Water use tabulation area Reservoir catchment area	Industrial	Public	Irrigation	Total water withdrawals
Cherokee				
Watauga	0.00	9.47	0.15	9.62
South Holston		5.54	0.15	5.69
Boone	0.08	3.41	0.03	3.53
Ft Patrick Henry				0.00
Cherokee	7.04	9.13	0.07	16.24
WUTA total	***7.13***	***27.55***	***0.40***	***35.09***
Cumulative	*7*	*28*	*0*	*35*
Douglas				
Douglas	6.79	17.16	0.61	24.56
WUTA total	***6.79***	***17.16***	***0.61***	***24.56***
Cumulative	*14*	*45*	*1*	*60*
Fort Loudoun				
Fort Loudoun	1.13	1.42	0.16	2.72
WUTA total	***1.13***	***1.42***	***0.16***	***2.72***
Cumulative	*15*	*46*	*1*	*62*
Fontana-Tellico				
Fontana	0.10	4.57	0.01	4.68
Santeetlah		0.25		0.25
Tellico		0.13	0.06	0.18
WUTA total	***0.10***	***4.95***	***0.07***	***5.12***
Cumulative	*15*	*51*	*1*	*67*
Norris				
Norris	0.06	2.47	0.02	2.55
Melton Hill		1.32	0.01	1.33
WUTA total	***0.06***	***3.79***	***0.03***	***3.88***
Cumulative	*15*	*55*	*1*	*71*
Hiwassee-Ocoee				
Chatuge		1.30	0.00	1.30
Nottely		0.69		0.69
Hiwassee	0.01	0.92	0.05	0.97
Apalachia				0.00
Blue Ridge	0.20	0.10	0.03	0.33
Ocoee		0.15	0.00	0.16
WUTA total	***0.21***	***3.16***	***0.08***	***3.46***
Cumulative	*15*	*58*	*1*	*75*
Watts Bar-Chickamauga				
Watts Bar	0.01	1.15	0.03	1.19
Chickamauga	0.26	26.09	0.37	26.72
WUTA total	***0.28***	***27.24***	***0.39***	***27.91***
Cumulative	*16*	*85*	*2*	*103*
Nickajack				
Nickajack	7.82	0.07	0.10	8.00
WUTA total	***7.82***	***0.07***	***0.10***	***8.00***
Cumulative	*24*	*85*	*2*	*111*

Table 2-10. Groundwater withdrawals by water use tabulation area in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

Water use tabulation area Reservoir catchment area	Industrial	Public	Irrigation	Total water withdrawals
Guntersville				
Guntersville	0.08	7.03	0.24	7.36
WUTA total	***0.08***	***7.03***	***0.24***	***7.36***
Cumulative	*24*	*92*	*2*	*118*
Tims Ford				
Tims Ford	0.80	2.01	0.35	3.16
WUTA total	***0.80***	***2.01***	***0.35***	***3.16***
Cumulative	*24*	*94*	*2*	*121*
Wheeler-Wilson				
Wheeler	0.00	43.41	2.45	45.86
Wilson	0.21	2.91	0.69	3.81
WUTA total	***0.21***	***46.32***	***3.14***	***49.67***
Cumulative	*25*	*141*	*6*	*171*
Pickwick				
Pickwick	0.00	3.80	0.41	4.21
Cedar Creek		0.28		0.28
Upper Bear Creek				0.00
WUTA total	***0.00***	***4.08***	***0.41***	***4.50***
Cumulative	*25*	*145*	*6*	*175*
Normandy				
Normandy		2.03	0.20	2.23
WUTA total	***0.00***	***2.03***	***0.20***	***2.23***
Cumulative	*25*	*147*	*6*	*178*
Kentucky				
Kentucky	7.80	18.20	0.59	26.59
WUTA total	***7.80***	***18.20***	***0.59***	***26.59***
Cumulative	*32*	*165*	*7*	*204*

Table 2-11. Groundwater withdrawals by water use category and hydrologic unit code for 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

Hydrologic unit code	Industrial	Public supply	Irrigation	Total water withdrawals
6010101		1.89	0.00	1.89
6010102		5.54	0.18	5.73
6010103	0.09	12.88	0.15	13.12
6010104	7.04	7.24	0.07	14.35
6010105	1.69	6.02	0.19	7.90
6010106		1.00	0.00	1.00
6010107	1.24	0.45	0.04	1.74
6010108	3.86	10.55	0.38	14.79
6010201	1.15	1.42	0.18	2.75
6010202	0.10	1.86	0.00	1.97
6010203		1.84	0.01	1.85
6010204		0.38	0.05	0.43
6010205	0.02	1.40	0.02	1.44
6010206	0.04	1.07	0.00	1.11
6010207		1.71	0.01	1.72
6010208			0.01	0.01
6020001	8.09	22.80	0.47	31.36
6020002	0.01	7.35	0.06	7.42
6020003	0.20	0.25	0.03	0.49
6020004		1.66	0.01	1.67
6030001	0.08	5.01	0.23	5.33
6030002	0.00	43.16	2.09	45.26
6030003	0.78	2.01	0.35	3.14
6030004	0.02	0.29	0.36	0.67
6030005	0.21	5.24	0.87	6.32
6030006		1.76	0.23	1.99
6040001		4.04	0.17	4.21
6040002	0.02	2.03	0.20	2.24
6040003		0.08	0.03	0.12
6040004	0.05	1.79	0.01	1.85
6040005	1.87	4.56	0.31	6.75
6040006	5.85	7.73	0.06	13.65
Watershed total	**32**	**165**	**7**	**204**

Table 2-12. Groundwater withdrawals by water use category and county in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

State County	Industrial	Public supply	Irrigation	Total water withdrawals
Alabama				
Blount			0.01	0.01
Colbert	0.21	0.57	0.52	1.30
Cullman			0.02	0.02
Dekalb		0.35	0.12	0.47
Etowah			0.00	0.00
Franklin		1.08	0.05	1.13
Jackson		0.67	0.02	0.69
Lauderdale		1.14	0.37	1.51
Lawrence			0.37	0.37
Limestone		12.48	1.01	13.49
Madison		27.60	1.14	28.74
Marion			0.01	0.01
Marshall	0.08	4.31		4.39
Morgan	0.00		0.03	0.03
State total	**0.30**	**48.19**	**3.66**	**52.15**
Georgia				
Catoosa		5.34	0.01	5.35
Dade			0.03	0.03
Fannin		0.06	0.03	0.09
Rabun	0.10	0.08		0.18
Towns		0.25	0.00	0.25
Union		0.69		0.69
Walker	0.24	4.65		4.89
State total	**0.34**	**11.08**	**0.07**	**11.49**
Kentucky				
Calloway	1.04	3.53	0.02	4.60
Graves		0.05	0.01	0.06
Livingston	2.23			2.23
Lyon		0.02		0.02
Marshall	2.59	4.11		6.70
McCracken		0.40	0.02	0.42
State total	**5.85**	**8.12**	**0.05**	**14.03**
Mississippi				
Alcorn	0.00	0.00		0.00
Prentiss		0.33		0.33
Tishomingo		2.36		2.36
State total	**0.00**	**2.69**		**2.69**
North Carolina				
Avery		0.89	0.07	0.96
Buncombe	0.05	4.37	0.19	4.61
Cherokee		0.92		0.92
Clay	0.01	1.05		1.06
Graham		0.27		0.27

Table 2-12. Groundwater withdrawals by water use category and county in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

State County	Industrial	Public supply	Irrigation	Total water withdrawals
North Carolina				
Haywood		1.00		1.00
Henderson		2.57		2.57
Jackson		1.25	0.01	1.27
Macon		1.77		1.77
Madison		0.81		0.81
Mitchell	0.06	1.07		1.13
Swain		0.59		0.59
Transylvania	1.64	1.49		3.13
Watauga		1.18		1.18
Yancey		0.96		0.96
State total	**1.77**	**20.19**	**0.28**	**22.23**
Tennessee				
Anderson		0.22	0.00	0.22
Bedford		0.79	0.16	0.94
Benton	1.41	0.14		1.55
Bledsoe		0.49		0.49
Blount			0.21	0.21
Bradley		2.63	0.02	2.65
Campbell		0.67		0.67
Carroll	0.45	0.28	0.11	0.83
Carter	0.08	7.46		7.55
Claiborne		0.10		0.10
Cocke	0.21			0.21
Coffee	0.42	0.06	0.04	0.52
Cumberland			0.02	0.02
Decatur		0.00	0.03	0.03
Franklin		2.01	0.43	2.45
Giles		0.48		0.48
Grainger	3.98		0.06	4.03
Hamblen		1.67	0.07	1.74
Hamilton	7.85	10.70	0.39	18.94
Hancock			0.00	0.00
Hardin		2.40	0.07	2.47
Hawkins		1.71		1.71
Henderson		0.43		0.43
Henry		2.53	0.22	2.75
Houston		0.13		0.13
Humphreys	0.01	0.98		0.99
Jefferson	4.27	4.19	0.08	8.54
Johnson	0.00	0.95	0.00	0.96
Knox	1.13		0.02	1.16
Lawrence		2.63	0.03	2.66
Lewis		1.50		1.50
Lincoln		2.03		2.03
Loudon	0.01	0.80		0.81

Table 2-12. Groundwater withdrawals by water use category and county in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

State County	Industrial	Public supply	Irrigation	Total water withdrawals
Tennessee				
Marion	0.00	1.24	0.01	1.26
Marshall		0.17		0.17
Maury		1.02	0.04	1.06
McMinn		1.81	0.04	1.85
McNairy		0.99	0.06	1.05
Meigs		0.76		0.76
Monroe		0.75		0.75
Moore	0.19			0.19
Polk	0.20	0.19	0.00	0.40
Rhea		0.96	0.02	0.98
Roane		1.28	0.00	1.28
Sevier	0.03	0.15	0.00	0.19
Stewart		0.12		0.12
Sullivan	0.00	0.23	0.03	0.26
Unicoi	3.80	5.19	0.02	9.02
Union		0.42		0.42
Washington		3.41	0.38	3.79
Wayne	0.05	0.28	0.02	0.35
Williamson		0.05	0.00	0.05
State total	**24.11**	**67.01**	**2.60**	**93.72**
Virginia				
Lee	0.04	0.84		0.88
Russell	0.00	0.32		0.32
Scott		0.07		0.07
Smyth		3.92		3.92
Tazewell	0.02	0.00		0.02
Washington		2.35	0.12	2.47
Wise	0.00	0.26		0.26
State total	**0.06**	**7.76**	**0.12**	**7.94**
Watershed total	**32**	**165**	**7**	**204**

Table 2-13. Thermoelectric power withdrawals by water use tabulation area in 2010

[Figures may not add to totals because of independent rounding. Values in million gallons per day; KWh, kilowatt hours]

Water use tabulation area Reservoir catchment area	**Surface water withdrawals**	**Return flow**	**Net water demand**	**Power generated, in million KWh**
Cherokee				
Cherokee	625.29	624.97	0.32	3,840
WUTA total	***625.29***	***624.97***	***0.32***	**3,840**
Cumulative	*625*	*625*	*0*	3,840
Douglas				
Douglas	266.82	261.86	4.96	2,383
WUTA total	***266.82***	***261.86***	***4.96***	**2,383**
Cumulative	*892*	*887*	*5*	6,223
Norris				
Norris	8.73	4.78	3.95	1,500
Melton Hill	430.18	429.57	0.61	3,874
WUTA total	***438.91***	***434.35***	***4.56***	**5,374**
Cumulative	*1,331*	*1,321*	*10*	11,597
Watts Bar-Chickamauga				
Watts Bar	883.18	727.41	155.77	12,640
Chickamauga	1,591.37	1,724.21	-132.84	18,001
WUTA total	***2,474.55***	***2,451.62***	***22.93***	**30,641**
Cumulative	*3,806*	*3,773*	*33*	42,238
Guntersville				
Guntersville	1,045.00	1,042.88	2.12	5,702
WUTA total	***1,045.00***	***1,042.88***	***2.12***	**5,702**
Cumulative	*4,851*	*4,816*	*35*	47,940
Wheeler-Wilson				
Wheeler	2,757.13	2,741.93	15.20	27,252
WUTA total	***2,757.13***	***2,741.93***	***15.20***	**27,252**
Cumulative	*7,608*	*7,558*	*50*	75,192
Pickwick				
Pickwick	1,264.79	1,263.35	1.44	6,035
WUTA total	***1,264.79***	***1,263.35***	***1.44***	**6,035**
Cumulative	*8,872*	*8,821*	*52*	81,227
Kentucky				
Kentucky	1,173.75	1,173.14	0.61	6,302
WUTA total	***1,173.75***	***1,173.14***	***0.61***	**6,302**
Cumulative	*10,046*	*9,994*	*52*	87,529

Table 2-14. Thermoelectric power withdrawals by hydrologic unit code in 2010

[Figures may not add to totals because of independent rounding. Values in million gallons per day; KWh, kilowatt hours]

Hydrologic unit code	Surface withdrawal	Return	Net water demand	Power generated, (million KWh)
6010104	625.29	624.97	0.32	3,840
6010105	266.82	261.86	4.96	2,383
6010201	155.10		155.10	9,738
6010205	8.73	4.78	3.95	1,500
6010207	430.18	1,156.98	-726.80	3,874
6010208	728.08		728.08	2,902
6020001	1,591.37	1,724.21	-132.84	18,001
6030001	1,045.00	1,042.88	2.12	5,702
6030002	2,757.13	2,741.93	15.20	27,252
6030005	1,264.79	1,263.35	1.44	6,035
6040005	1,173.75	1,173.14	0.61	6,302
Watershed total	**10,046**	**9,994**	**52**	**87,529**

Table 2-15. Thermoelectric power withdrawals by county in 2010

[Figures may not add to totals because of independent rounding. Values in million gallons per day; KWh, kilowatt hours]

State County	Surface withdrawal	Return	Net water demand	Power generated (million KWh)
Alabama				
Colbert	1,264.79	1,263.35	1.44	6,035
Jackson	1,045.00	1,042.88	2.12	5,702
Limestone	2,749.90	2,741.00	8.90	24,771
Morgan	7.23	0.93	6.30	2,481
State total	**5,066.92**	**5,048.16**	**18.76**	**38,989**
North Carolina				
Buncombe	266.82	261.86	4.96	2,383
State total	**266.82**	**261.86**	**4.96**	**2,383**
Tennessee				
Anderson	430.18	429.57	0.61	3,874
Hamilton	1,538.56	1,532.81	5.75	18,001
Hawkins	625.29	624.97	0.32	3,840
Humphreys	1,173.75	1,173.14	0.61	6,302
Rhea	207.91	191.40	16.51	9,738
Roane	728.08	727.41	0.67	2,902
State total	**4,703.77**	**4,679.30**	**24.47**	**44,657**
Virginia				
Russell	8.73	4.78	3.95	1,500
State total	**8.73**	**4.78**	**3.95**	**1,500**
Watershed total	**10,046**	**9,994**	**52**	**87,529**

Table 2-16. Industrial withdrawals by source and water use tabulation area in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

Water use tabulation area Reservoir catchment area	Withdrawals Ground	 Surface	 Total	 Return	 Net water demand
Cherokee					
Watauga	0.00	0.20	0.20	0.02	0.18
South Holston			0.00	2.45	-2.45
Boone	0.08	0.01	0.10		0.10
Ft Patrick Henry		591.85	591.85		591.85
Cherokee	7.04	5.46	12.50	569.56	-557.06
WUTA total	***7.13***	***597.52***	***604.65***	***572.03***	***32.61***
Cumulative	*7*	*598*	*605*	*572*	*33*
Douglas					
Douglas	6.79	52.03	58.82	49.74	9.07
WUTA total	***6.79***	***52.03***	***58.82***	***49.74***	***9.07***
Cumulative	*14*	*650*	*663*	*622*	*42*
Fort Loudoun					
Fort Loudoun	1.13	7.72	8.86	17.22	-8.36
WUTA total	***1.13***	***7.72***	***8.86***	***17.22***	***-8.36***
Cumulative	*15*	*657*	*672*	*639*	*33*
Fontana-Tellico					
Fontana	0.10	29.21	29.31	29.86	-0.55
Santeetlah			0.00		0.00
Tellico		0.19	0.19	0.11	0.08
WUTA total	***0.10***	***29.40***	***29.50***	***29.97***	***-0.47***
Cumulative	*15*	*687*	*702*	*669*	*33*
Norris					
Norris	0.06	2.49	2.55	0.92	1.63
Melton Hill		0.52	0.52	5.39	-4.87
WUTA total	***0.06***	***3.01***	***3.07***	***6.31***	***-3.24***
Cumulative	*15*	*690*	*705*	*675*	*30*
Hiwassee-Ocoee					
Chatuge			0.00		0.00
Nottely			0.00		0.00
Hiwassee	0.01	0.01	0.02		0.02
Apalachia			0.00		0.00
Blue Ridge	0.20	2.16	2.36		2.36
Ocoee			0.00	2.98	-2.98
WUTA total	***0.21***	***2.17***	***2.38***	***2.98***	***-0.59***
Cumulative	*15*	*692*	*707*	*678*	*29*
Watts Bar-Chickamauga					
Watts Bar	0.01		0.01	4.09	-4.08
Chickamauga	0.26	66.24	66.50	64.19	2.31
WUTA total	***0.28***	***66.24***	***66.51***	***68.28***	***-1.77***
Cumulative	*16*	*758*	*774*	*747*	*27*
Nickajack					
Nickajack	7.82	5.93	13.75	14.81	-1.06
WUTA total	***7.82***	***5.93***	***13.75***	***14.81***	***-1.06***
Cumulative	*24*	*764*	*788*	*761*	*26*

Table 2-16. Industrial withdrawals by source and water use tabulation area in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

Water use tabulation area Reservoir catchment area	Withdrawals Ground	 Surface	 Total	 Return	 Net water demand
Guntersville					
Guntersville	0.08	8.90	8.99	7.78	1.21
WUTA total	***0.08***	***8.90***	***8.99***	***7.78***	***1.21***
Cumulative	*24*	*773*	*797*	*769*	*27*
Tims Ford					
Tims Ford	0.80	22.60	23.41	17.12	6.29
WUTA total	***0.80***	***22.60***	***23.41***	***17.12***	***6.29***
Cumulative	*24*	*796*	*820*	*786*	*34*
Wheeler-Wilson					
Wheeler	0.00	134.47	134.47	140.22	-5.75
Wilson	0.21	28.49	28.70	5.50	23.20
WUTA total	***0.21***	***162.96***	***163.17***	***145.72***	***17.45***
Cumulative	*25*	*958*	*983*	*932*	*51*
Pickwick					
Pickwick	0.00	41.01	41.01	42.50	-1.49
Cedar Creek			0.00		0.00
Upper Bear Creek			0.00		0.00
WUTA total	***0.00***	***41.01***	***41.01***	***42.50***	***-1.49***
Cumulative	*25*	*999*	*1,024*	*974*	*50*
Normandy					
Normandy			0.00		0.00
WUTA total			***0.00***		***0.00***
Cumulative	*25*	*999*	*1,024*	*974*	*50*
Kentucky					
Kentucky	7.80	115.55	123.35	98.64	24.70
WUTA total	***7.80***	***115.55***	***123.35***	***98.64***	***24.70***
Cumulative	*32*	*1,116*	*1,148*	*1,073*	*75*

Table 2-17. Industrial withdrawals by source and hydrologic unit code in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

Hydrologic unit code	Withdrawals			Return	Net water demand
	Ground	Surface	Total		
6010101		4.28	4.28	1.96	2.33
6010102		591.85	591.85	568.69	23.16
6010103	0.09	0.21	0.30	0.02	0.28
6010104	7.04	3.13	10.17	10.38	-0.21
6010105	1.69	12.10	13.80	11.24	2.56
6010106		30.68	30.68	26.25	4.43
6010107	1.24	1.26	2.50		2.50
6010108	3.86	7.99	11.85	12.26	-0.41
6010201	1.15	5.77	6.92	12.26	-5.35
6010202	0.10	17.41	17.51	18.20	-0.69
6010203		11.80	11.80	11.66	0.14
6010204		0.19	0.19	0.11	0.08
6010205	0.02	2.49	2.51	0.86	1.65
6010206	0.04	0.00	0.04	0.06	-0.02
6010207		0.52	0.52	5.42	-4.90
6010208			0.00	0.01	-0.01
6020001	8.09	6.41	14.49	14.81	-0.32
6020002	0.01	65.77	65.78	64.18	1.60
6020003	0.20	2.16	2.36	2.98	-0.62
6020004			0.00	0.00	0.00
6030001	0.08	8.90	8.99	7.78	1.21
6030002	0.00	134.47	134.47	137.63	-3.16
6030003	0.78	22.60	23.39	18.90	4.49
6030004	0.02		0.02	0.81	-0.79
6030005	0.21	69.50	69.71	48.00	21.71
6040001		25.00	25.00	24.54	0.46
6040002	0.02	3.59	3.61	4.87	-1.26
6040003		0.12	0.12	2.91	-2.78
6040004	0.05		0.05		0.05
6040005	1.87	71.12	73.00	66.24	6.76
6040006	5.85	15.72	21.57	0.09	21.48
Watershed total	**32**	**1,116**	**1,148**	**1,073**	**75**

Table 2-18. Industrial withdrawals by source and county in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

State / County	Withdrawals: Ground	Withdrawals: Surface	Withdrawals: Total	Return	Net water demand
Alabama					
Colbert	0.21	69.50	69.71	48.00	21.71
Dekalb			0.00	0.10	-0.10
Jackson		8.90	8.90	7.68	1.22
Lawrence		60.09	60.09	57.32	2.77
Madison			0.00	4.08	-4.08
Marshall	0.08		0.08		0.08
Morgan	0.00	74.38	74.38	76.23	-1.85
State total	**0.30**	**212.87**	**213.16**	**193.40**	**19.76**
Georgia					
Catoosa			0.00	0.01	-0.01
Dade			0.00	0.01	-0.01
Rabun	0.10	0.29	0.39	1.20	-0.81
Walker	0.24	0.48	0.72	0.00	0.72
State total	**0.34**	**0.77**	**1.11**	**1.22**	**-0.11**
Kentucky					
Calloway	1.04		1.04		1.04
Livingston	2.23	3.67	5.89	0.14	5.75
Marshall	2.59	12.05	14.64		14.64
State total	**5.85**	**15.72**	**21.57**	**0.14**	**21.43**
Mississippi					
Alcorn	0.00		0.00		0.00
State total	**0.00**		**0.00**		**0.00**
North Carolina					
Avery		1.57	1.57	1.44	0.13
Buncombe	0.05	3.28	3.33	1.17	2.16
Clay	0.01	0.01	0.02		0.02
Graham		17.36	17.36	17.27	0.09
Haywood		30.52	30.52	26.05	4.46
Henderson		0.44	0.44	0.05	0.39
Jackson		0.14	0.14		0.14
Macon		0.01	0.01		0.01
Madison			0.00	0.44	-0.44
Mitchell	0.06	4.91	4.97	4.23	0.75
Swain		11.77	11.77	11.66	0.11
Transylvania	1.64	8.38	10.03	9.61	0.42
Watauga		0.18	0.18	0.02	0.15
Yancey		0.45	0.45	0.04	0.41
State total	**1.77**	**79.02**	**80.78**	**71.98**	**8.80**
Tennessee					
Anderson		0.52	0.52	4.46	-3.93
Bedford		3.45	3.45	4.57	-1.12
Benton	1.41	0.63	2.04		2.04

Table 2-18. Industrial withdrawals by source and county in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

State / County	Withdrawals: Ground	Withdrawals: Surface	Withdrawals: Total	Return	Net water demand
Tennessee					
Blount			0.00	7.77	-7.77
Bradley		3.81	3.81	3.45	0.36
Carroll	0.45	0.22	0.67		0.67
Carter	0.08		0.08		0.08
Cocke	0.21		0.21		0.21
Coffee	0.42	22.19	22.61	17.42	5.20
Cumberland			0.00	0.01	-0.01
Decatur		0.00	0.00	0.11	-0.11
Giles			0.00	0.76	-0.76
Grainger	3.98		3.98	3.98	0.00
Greene		1.05	1.05	1.72	-0.67
Hamblen			0.00	1.01	-1.01
Hamilton	7.85	5.83	13.67	14.85	-1.18
Hardin		25.00	25.00	24.43	0.57
Hawkins		0.60	0.60	1.36	-0.77
Humphreys	0.01	70.27	70.29	66.19	4.09
Jefferson	4.27	1.84	6.12	2.32	3.80
Johnson	0.00		0.00		0.00
Knox	1.13	2.07	3.20	3.14	0.07
Loudon	0.01	5.65	5.66	4.00	1.66
Marion	0.00	0.10	0.10	0.00	0.10
Maury		0.12	0.12	2.91	-2.78
McMinn		61.95	61.95	60.73	1.22
Monroe			0.00	0.07	-0.07
Moore	0.19	0.55	0.75	1.78	-1.03
Polk	0.20	2.16	2.36	2.98	-0.62
Roane			0.00	0.96	-0.96
Sevier	0.03		0.03		0.03
Sullivan	0.00	591.86	591.86	566.24	25.62
Unicoi	3.80	0.02	3.82	3.81	0.01
Washington			0.00	0.01	-0.01
Wayne	0.05		0.05		0.05
State total	**24.11**	**799.90**	**824.00**	**801.03**	**22.97**
Virginia					
Lee	0.04		0.04	0.03	0.01
Russell	0.00	0.10	0.11	0.24	-0.13
Scott		1.84	1.84	2.24	-0.40
Smyth		2.45	2.45	2.57	-0.12
Tazewell	0.02	0.03	0.05	0.18	-0.13
Washington			0.00	0.00	0.00
Wise	0.00	2.36	2.36	0.07	2.29
State total	**0.06**	**6.77**	**6.83**	**5.32**	**1.51**
Watershed total	**32**	**1,116**	**1,148**	**1,073**	**75**

Table 2-19. Public supply water use by water use tabulation area in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

Water use tabulation area Reservoir catchment area	Withdrawals Ground	 Surface	 Total	Return	Net water demand
Cherokee					
Watauga	9.47	14.61	24.08	1.82	22.26
South Holston	5.54	16.29	21.83	4.35	17.48
Boone	3.41		3.41	23.55	-20.14
Ft Patrick Henry		16.10	16.10		16.10
Cherokee	9.13	15.81	24.94	16.84	8.10
WUTA total	***27.55***	***62.80***	***90.35***	***46.56***	***43.80***
Cumulative	*28*	*63*	*90*	*47*	*44*
Douglas					
Douglas	17.16	72.89	90.04	39.31	50.74
WUTA total	***17.16***	***72.89***	***90.04***	***39.31***	***50.74***
Cumulative	*45*	*136*	*180*	*86*	*95*
Fort Loudoun					
Fort Loudoun	1.42	76.15	77.57	61.84	15.73
WUTA total	***1.42***	***76.15***	***77.57***	***61.84***	***15.73***
Cumulative	*46*	*212*	*258*	*148*	*110*
Fontana-Tellico					
Fontana	4.57	5.15	9.72	4.45	5.26
Santeetlah	0.25	0.51	0.76		0.76
Tellico	0.13	4.03	4.15	1.97	2.19
WUTA total	***4.95***	***9.68***	***14.63***	***6.42***	***8.21***
Cumulative	*51*	*222*	*273*	*154*	*118*
Norris					
Norris	2.47	16.59	19.06	12.22	6.84
Melton Hill	1.32	25.54	26.86	14.76	12.10
WUTA total	***3.79***	***42.13***	***45.92***	***26.98***	***18.94***
Cumulative	*55*	*264*	*319*	*181*	*137*
Hiwassee-Ocoee					
Chatuge	1.30	1.98	3.28	0.16	3.12
Nottely	0.69	0.90	1.59	0.32	1.27
Hiwassee	0.92	0.63	1.54	2.30	-0.76
Apalachia		3.06	3.06	0.01	3.05
Blue Ridge	0.10	2.06	2.16	0.34	1.82
Ocoee	0.15		0.15	0.33	-0.17
WUTA total	***3.16***	***8.62***	***11.78***	***3.45***	***8.33***
Cumulative	*58*	*272*	*330*	*185*	*146*
Watts Bar-Chickamauga					
Watts Bar	1.15	11.63	12.78	19.77	-6.99
Chickamauga	26.09	31.33	57.42	16.34	41.09
WUTA total	***27.24***	***42.97***	***70.21***	***36.11***	***34.10***
Cumulative	*85*	*315*	*401*	*221*	*180*
Nickajack					
Nickajack	0.07	40.78	40.85	53.16	-12.31
WUTA total	***0.07***	***40.78***	***40.85***	***53.16***	***-12.31***
Cumulative	*85*	*356*	*441*	*274*	*168*

Table 2-19. Public supply water use by water use tabulation area in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

Water use tabulation area Reservoir catchment area	Withdrawals Ground	 Surface	 Total	Return	Net water demand
Guntersville					
Guntersville	7.03	37.01	44.04	17.09	26.94
WUTA total	***7.03***	***37.01***	***44.04***	***17.09***	***26.94***
Cumulative	*92*	*393*	*485*	*291*	*194*
Tims Ford					
Tims Ford	2.01	2.93	4.94	5.13	-0.19
WUTA total	***2.01***	***2.93***	***4.94***	***5.13***	***-0.19***
Cumulative	*94*	*396*	*490*	*296*	*194*
Wheeler-Wilson					
Wheeler	43.41	92.26	135.67	68.17	67.50
Wilson	2.91	18.24	21.15	5.32	15.83
WUTA total	***46.32***	***110.49***	***156.82***	***73.49***	***83.33***
Cumulative	*141*	*506*	*647*	*370*	*278*
Pickwick					
Pickwick	3.80	2.42	6.22	16.82	-10.60
Cedar Creek	0.28	3.49	3.77		3.77
Upper Bear Creek		2.86	2.86		2.86
Bear Creek		0.66	0.66	0.11	0.55
WUTA total	***4.08***	***9.43***	***13.51***	***16.93***	***-3.42***
Cumulative	*145*	*516*	*661*	*386*	*274*
Normandy					
Normandy	2.03	25.31	27.34	2.25	25.09
WUTA total	***2.03***	***25.31***	***27.34***	***2.25***	***25.09***
Cumulative	*147*	*541*	*688*	*389*	*299*
Kentucky					
Kentucky	18.20	16.97	35.17	24.56	10.61
WUTA total	***18.20***	***16.97***	***35.17***	***24.56***	***10.61***
Cumulative	*165*	*558*	*723*	*413*	*310*

Table 2-20. Public supply water use by hydrologic unit code in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

Hydrologic unit code	Withdrawals			Return	Net water demand
	Ground	Surface	Total		
6010101	1.89	0.42	2.31	0.83	1.48
6010102	5.54	32.39	37.93	24.14	13.78
6010103	12.88	14.61	27.49	14.08	13.41
6010104	7.24	15.39	22.63	11.01	11.62
6010105	6.02	36.60	42.62	25.75	16.87
6010106	1.00	5.55	6.54	6.30	0.25
6010107	0.45	16.44	16.89	8.72	8.17
6010108	10.55	14.31	24.86	6.75	18.11
6010201	1.42	76.85	78.27	61.47	16.80
6010202	1.86	1.98	3.85	1.20	2.65
6010203	1.84	3.17	5.01	3.25	1.75
6010204	0.38	4.31	4.69	1.75	2.95
6010205	1.40	11.53	12.93	9.08	3.84
6010206	1.07	5.07	6.13	2.62	3.52
6010207	1.71	26.31	28.03	21.11	6.91
6010208		10.38	10.38	2.82	7.56
6020001	22.80	60.12	82.93	56.50	26.42
6020002	7.35	17.45	24.80	15.75	9.05
6020003	0.25	2.06	2.31	0.70	1.62
6020004	1.66	4.64	6.30	1.21	5.09
6030001	5.01	33.46	38.47	15.83	22.64
6030002	43.16	76.86	120.02	64.60	55.42
6030003	2.01	4.91	6.92	6.71	0.21
6030004	0.29	13.42	13.71	2.05	11.66
6030005	5.24	21.43	26.67	17.68	8.99
6030006	1.76	7.01	8.77	4.56	4.20
6040001	4.04	5.14	9.18	5.99	3.19
6040002	2.03	25.31	27.34	6.87	20.47
6040003	0.08	7.47	7.56	7.29	0.26
6040004	1.79	1.11	2.89	1.95	0.95
6040005	4.56	2.32	6.88	4.53	2.35
6040006	7.73	0.16	7.89	0.18	7.71
Watershed total	**165**	**558**	**723**	**413**	**310**

Table 2-21. Public supply water use by county in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

State County	Withdrawals Ground	Surface	Total	Return	Net water demand
Alabama					
Colbert	0.57	7.82	8.39	4.11	4.28
Dekalb	0.35	0.00	0.35	0.72	-0.37
Franklin	1.08	4.15	5.23	4.30	0.93
Jackson	0.67	9.48	10.15	6.17	3.99
Lauderdale	1.14	10.91	12.05	6.86	5.18
Lawrence		7.69	7.69	1.22	6.47
Limestone	12.48	8.11	20.59	4.82	15.77
Madison	27.60	38.01	65.61	38.20	27.41
Marion		2.86	2.86	0.14	2.72
Marshall	4.31	22.27	26.58	9.52	17.06
Morgan		33.37	33.37	20.72	12.65
State total	**48.19**	**144.67**	**192.86**	**96.78**	**96.08**
Georgia					
Catoosa	5.34	0.32	5.66	0.31	5.35
Dade		2.09	2.09	0.29	1.80
Fannin	0.06	1.78	1.84	0.34	1.50
Rabun	0.08	0.07	0.15	0.09	0.06
Towns	0.25	1.19	1.44	0.29	1.15
Union	0.69	0.90	1.59	0.32	1.27
Walker	4.65		4.65	1.17	3.48
State total	**11.08**	**6.35**	**17.43**	**2.81**	**14.61**
Kentucky					
Calloway	3.53		3.53	0.00	3.53
Graves	0.05		0.05	0.06	-0.01
Livingston			0.00	0.11	-0.11
Lyon	0.02		0.02	0.01	0.02
Marshall	4.11	0.16	4.27	0.15	4.12
McCracken	0.40		0.40		0.40
State total	**8.12**	**0.16**	**8.28**	**0.34**	**7.95**
Mississippi					
Alcorn	0.00		0.00	2.96	-2.96
Prentiss	0.33		0.33		0.33
Tishomingo	2.36		2.36	0.97	1.39
State total	**2.69**		**2.69**	**3.93**	**-1.24**
North Carolina					
Avery	0.89	0.01	0.90	0.79	0.11
Buncombe	4.37	22.33	26.70	20.35	6.35
Cherokee	0.92	1.41	2.33	2.06	0.26
Clay	1.05		1.05	0.11	0.94
Graham	0.27	0.70	0.96	0.42	0.55
Haywood	1.00	5.55	6.54	3.33	3.22
Henderson	2.57	7.90	10.47	3.25	7.23
Jackson	1.25	1.31	2.56	1.14	1.43
Macon	1.77	1.72	3.49	1.10	2.39
Madison	0.81	0.20	1.01	0.35	0.66

Table 2-21. Public supply water use by county in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

State / County	Withdrawals: Ground	Withdrawals: Surface	Withdrawals: Total	Return	Net water demand
North Carolina					
Mitchell	1.07	1.26	2.33	0.34	1.99
Swain	0.59	1.86	2.45	2.13	0.32
Transylvania	1.49	1.32	2.80	1.81	1.00
Watauga	1.18	0.41	1.59	0.32	1.27
Yancey	0.96	0.57	1.53	0.50	1.03
State total	**20.19**	**46.54**	**66.73**	**37.99**	**28.74**
Tennessee					
Anderson	0.22	13.20	13.42	6.85	6.57
Bedford	0.79	5.81	6.59	2.89	3.71
Benton	0.14	1.36	1.49	0.69	0.80
Bledsoe	0.49	0.73	1.22	0.19	1.03
Blount		14.00	14.00	8.50	5.50
Bradley	2.63	10.89	13.52	9.08	4.44
Campbell	0.67	2.28	2.95	1.56	1.39
Carroll	0.28		0.28	0.15	0.12
Carter	7.46		7.46	2.42	5.04
Claiborne	0.10	2.88	2.98	0.55	2.43
Cocke		4.85	4.85	2.97	1.88
Coffee	0.06	5.69	5.74	5.58	0.16
Cumberland		5.84	5.84	2.09	3.75
Decatur	0.00	1.48	1.48	0.46	1.02
Dickson		5.04	5.04	0.10	4.94
Franklin	2.01	2.34	4.35	1.51	2.84
Giles	0.48	3.09	3.58	1.56	2.02
Grainger			0.00	0.12	-0.12
Greene		8.95	8.95	4.16	4.79
Grundy		0.83	0.83	0.22	0.61
Hamblen	1.67	7.57	9.24	4.71	4.53
Hamilton	10.70	54.78	65.47	51.38	14.09
Hancock		0.20	0.20	0.17	0.03
Hardin	2.40	0.77	3.17	3.18	0.00
Hawkins	1.71	2.92	4.63	1.59	3.04
Henderson	0.43	3.18	3.61	1.46	2.15
Henry	2.53		2.53	2.00	0.53
Hickman		2.43	2.43	0.51	1.93
Houston	0.13		0.13		0.13
Humphreys	0.98	0.96	1.94	2.02	-0.08
Jefferson	4.19	2.92	7.11	1.71	5.40
Johnson	0.95	0.96	1.91	0.88	1.03
Knox		66.99	66.99	57.78	9.21
Lawrence	2.63	1.94	4.57	1.91	2.66
Lewis	1.50		1.50	0.91	0.59
Lincoln	2.03	1.98	4.01	1.25	2.76
Loudon	0.80	11.23	12.03	8.85	3.18
Marion	1.24	2.96	4.20	0.84	3.36

Table 2-21. Public supply water use by county in 2010

[Figures may not add to totals because of independent rounding. All values in million gallons per day]

State / County	Withdrawals			Return	Net water demand
	Ground	**Surface**	**Total**		
Tennessee					
Marshall	0.17	2.87	3.04	1.92	1.11
Maury	1.02	10.94	11.96	6.56	5.40
McMinn	1.81	3.06	4.86	3.88	0.99
McNairy	0.99		0.99	0.51	0.48
Meigs	0.76		0.76	0.33	0.43
Monroe	0.75	4.90	5.65	2.13	3.52
Moore		0.59	0.59	0.28	0.31
Morgan		1.13	1.13	0.65	0.48
Perry		0.64	0.64	0.45	0.20
Polk	0.19	0.28	0.48	0.36	0.12
Rhea	0.96	3.42	4.38	3.01	1.37
Roane	1.28	6.65	7.93	3.00	4.93
Sequatchie		0.73	0.73	0.54	0.19
Sevier	0.15	12.43	12.59	8.13	4.46
Stewart	0.12		0.12		0.12
Sullivan	0.23	22.98	23.21	18.19	5.02
Unicoi	5.19		5.19	1.57	3.62
Union	0.42		0.42	0.36	0.06
Washington	3.41	17.66	21.07	11.45	9.62
Wayne	0.28	0.94	1.22	0.70	0.52
Williamson	0.05		0.05		0.05
State total	**67.01**	**340.27**	**407.28**	**256.83**	**150.45**
Virginia					
Lee	0.84	1.42	2.26	0.77	1.50
Russell	0.32	0.52	0.84	0.60	0.24
Scott	0.07	1.13	1.20	0.68	0.52
Smyth	3.92	0.41	4.32	2.37	1.95
Tazewell	0.00	3.40	3.40	3.94	-0.54
Washington	2.35	8.09	10.44	2.28	8.16
Wise	0.26	5.18	5.44	3.96	1.48
State total	**7.76**	**20.15**	**27.91**	**14.60**	**13.31**
Watershed total	**165**	**558**	**723**	**413**	**310**

Table 2-22. Irrigation withdrawals by source and water use tabulation area in 2010

[Figures may not add to totals because of independent rounding. Water values in million gallons per day]

Water use tabulation area Reservoir catchment area	Groundwater	Surface water	Total
Cherokee			
Watauga	0.15	0.50	0.64
South Holston	0.15	0.27	0.42
Boone	0.03	0.04	0.07
Ft Patrick Henry			0.00
Cherokee	0.07	0.58	0.66
WUTA total	***0.40***	***1.38***	***1.79***
Cumulative	*0*	*1*	*2*
Douglas			
Douglas	0.61	4.55	5.16
WUTA total	***0.61***	***4.55***	***5.16***
Cumulative	*1*	*6*	*7*
Fort Loudoun			
Fort Loudoun	0.16	0.15	0.31
WUTA total	***0.16***	***0.15***	***0.31***
Cumulative	*1*	*6*	*7*
Fontana-Tellico			
Fontana	0.01	0.79	0.81
Santeetlah			0.00
Tellico	0.06	0.28	0.34
WUTA total	***0.07***	***1.07***	***1.14***
Cumulative	*1*	*7*	*8*
Norris			
Norris	0.02	0.59	0.61
Melton Hill	0.01	0.58	0.59
WUTA total	***0.03***	***1.16***	***1.19***
Cumulative	*1*	*8*	*10*
Hiwassee-Ocoee			
Chatuge	0.00	0.03	0.04
Nottely		0.03	0.03
Hiwassee	0.05	0.28	0.32
Apalachia			0.00
Blue Ridge	0.03	0.03	0.06
Ocoee	0.00	0.04	0.04
WUTA total	***0.08***	***0.41***	***0.49***
Cumulative	*1*	*9*	*10*
Watts Bar-Chickamauga			
Watts Bar	0.03	0.76	0.78
Chickamauga	0.37	0.53	0.90
WUTA total	***0.39***	***1.29***	***1.68***
Cumulative	*2*	*10*	*12*
Nickajack			
Nickajack	0.10	0.20	0.30
WUTA total	***0.10***	***0.20***	***0.30***
Cumulative	*2*	*10*	*12*

Table 2-22. Irrigation withdrawals by source and water use tabulation area in 2010

[Figures may not add to totals because of independent rounding. Water values in million gallons per day]

Water use tabulation area Reservoir catchment area	Groundwater	Surface water	Total
Guntersville			
Guntersville	0.24	1.00	1.24
WUTA total	***0.24***	***1.00***	***1.24***
Cumulative	*2*	*11*	*13*
Tims Ford			
Tims Ford	0.35	1.90	2.24
WUTA total	***0.35***	***1.90***	***2.24***
Cumulative	*2*	*13*	*16*
Wheeler-Wilson			
Wheeler	2.45	7.32	9.77
Wilson	0.69	1.30	1.98
WUTA total	***3.14***	***8.62***	***11.75***
Cumulative	*6*	*22*	*27*
Pickwick			
Pickwick	0.41	0.61	1.03
Cedar Creek			0.00
Upper Bear Creek			0.00
Bear Creek			0.00
WUTA total	***0.41***	***0.61***	***1.03***
Cumulative	*6*	*22*	*28*
Normandy			
Normandy	0.20	0.69	0.89
WUTA total	***0.20***	***0.69***	***0.89***
Cumulative	*6*	*23*	*29*
Kentucky			
Kentucky	0.59	4.23	4.82
WUTA total	***0.59***	***4.23***	***4.82***
Cumulative	*7*	*27*	*34*

Table 2-23. Irrigation withdrawals by hydrologic unit code in 2010

[Figures may not add to totals because of independent rounding. Water values in million gallons per day]

Hydrologic unit code	Groundwater	Surface water	Total
6010101	0.00	0.16	0.16
6010102	0.18	0.30	0.49
6010103	0.15	0.50	0.65
6010104	0.07	0.42	0.49
6010105	0.19	2.42	2.61
6010106	0.00	0.98	0.98
6010107	0.04	0.28	0.33
6010108	0.38	0.89	1.27
6010201	0.18	0.88	1.06
6010202	0.00	0.24	0.24
6010203	0.01	0.55	0.56
6010204	0.05	0.11	0.16
6010205	0.02	0.39	0.41
6010206	0.00	0.19	0.19
6010207	0.01	0.58	0.59
6010208	0.01	0.18	0.19
6020001	0.47	0.70	1.17
6020002	0.06	0.34	0.40
6020003	0.03	0.07	0.10
6020004	0.01	0.21	0.22
6030001	0.23	0.97	1.21
6030002	2.09	5.99	8.09
6030003	0.35	2.18	2.53
6030004	0.36	1.56	1.91
6030005	0.87	1.61	2.49
6030006	0.23	0.31	0.55
6040001	0.17	0.94	1.12
6040002	0.20	0.74	0.94
6040003	0.03	0.89	0.92
6040004	0.01	0.11	0.11
6040005	0.31	0.53	0.84
6040006	0.06	1.04	1.10
Watershed total	**7**	**27**	**34**

Table 2-24. Irrigation withdrawals by county in 2010

[Figures may not add to totals because of independent rounding. Water values in million gallons per day]

State County	Groundwater	Surface water	Total
Alabama			
Blount	0.01	0.01	0.01
Colbert	0.52	0.78	1.30
Cullman	0.02	0.00	0.02
Dekalb	0.12	0.19	0.31
Etowah	0.00	0.00	0.00
Franklin	0.05	0.04	0.09
Jackson	0.02	0.36	0.38
Lauderdale	0.37	0.21	0.58
Lawrence	0.37	1.42	1.78
Limestone	1.01	2.95	3.96
Madison	1.14	2.34	3.48
Marion	0.01		0.01
Marshall		0.56	0.56
Morgan	0.03	0.17	0.19
State total	**3.66**	**9.02**	**12.68**
Georgia			
Catoosa	0.01	0.03	0.04
Dade	0.03	0.00	0.03
Fannin	0.03	0.02	0.05
Gilmer		0.00	0.00
Rabun		0.05	0.05
Towns	0.00	0.00	0.01
Union		0.03	0.03
Walker		0.11	0.11
Whitfield		0.01	0.01
State total	**0.07**	**0.27**	**0.34**
Kentucky			
Calloway	0.02	0.70	0.72
Graves	0.01	0.27	0.28
Livingston		0.00	0.00
Lyon		0.00	0.00
Marshall		0.04	0.04
McCracken	0.02	0.01	0.03
Trigg		0.04	0.04
State total	**0.05**	**1.06**	**1.11**
Mississippi			
Alcorn		0.01	0.01
Prentiss		0.00	0.00

Table 2-24. Irrigation withdrawals by county in 2010

[Figures may not add to totals because of independent rounding. Water values in million gallons per day]

State County	Groundwater	Surface water	Total
Mississippi			
Tishomingo		0.04	0.04
State total		**0.06**	**0.06**
North Carolina			
Avery	0.07	0.38	0.45
Buncombe	0.19	0.79	0.98
Cherokee		0.10	0.10
Clay		0.04	0.04
Graham		0.01	0.01
Haywood		0.89	0.89
Henderson		0.87	0.87
Jackson	0.01	0.40	0.41
Macon		0.17	0.17
Madison		0.13	0.13
Mitchell		0.21	0.21
Swain		0.15	0.15
Transylvania		0.49	0.49
Watauga		0.05	0.05
Yancey		0.11	0.11
State total	**0.28**	**4.80**	**5.08**
Tennessee			
Anderson	0.00	0.45	0.46
Bedford	0.16	0.02	0.17
Benton		0.01	0.01
Bledsoe		0.26	0.26
Blount	0.21	0.15	0.35
Bradley	0.02	0.03	0.06
Campbell		0.03	0.03
Carroll	0.11		0.11
Carter		0.05	0.05
Chester		0.00	0.00
Claiborne		0.02	0.02
Cocke		0.29	0.29
Coffee	0.04	0.88	0.91
Cumberland	0.02	0.20	0.22
Decatur	0.03	0.29	0.32
Dickson		0.02	0.02
Fentress		0.00	0.00
Franklin	0.43	0.47	0.91

Table 2-24. Irrigation withdrawals by county in 2010

[Figures may not add to totals because of independent rounding. Water values in million gallons per day]

State County	Groundwater	Surface water	Total
Tennessee			
Giles		0.68	0.68
Grainger	0.06	0.18	0.23
Greene		0.29	0.29
Grundy		0.14	0.14
Hamblen	0.07	0.12	0.19
Hamilton	0.39	0.21	0.60
Hancock	0.00	0.01	0.01
Hardin	0.07	0.48	0.55
Hawkins		0.10	0.10
Henderson		0.08	0.08
Henry	0.22	0.42	0.63
Hickman		0.03	0.03
Houston		0.01	0.01
Humphreys		0.03	0.03
Jefferson	0.08	0.08	0.15
Johnson	0.00	0.04	0.05
Knox	0.02	0.29	0.31
Lawrence	0.03	0.26	0.29
Lewis		0.09	0.09
Lincoln		1.85	1.85
Loudon		0.57	0.57
Marion	0.01	0.03	0.05
Marshall		0.63	0.63
Maury	0.04	0.17	0.21
McMinn	0.04	0.10	0.14
McNairy	0.06	0.06	0.13
Meigs		0.09	0.09
Monroe		0.02	0.02
Moore		0.01	0.01
Morgan		0.00	0.00
Perry		0.05	0.05
Polk	0.00	0.07	0.07
Rhea	0.02	0.22	0.24
Roane	0.00	0.04	0.05
Sequatchie		0.01	0.01
Sevier	0.00	0.19	0.19
Stewart		0.04	0.04
Sullivan	0.03	0.06	0.09
Unicoi	0.02	0.00	0.03

Table 2-24. Irrigation withdrawals by county in 2010

[Figures may not add to totals because of independent rounding. Water values in million gallons per day]

State County	Groundwater	Surface water	Total
Tennessee			
Union		0.02	0.02
Washington	0.38	0.25	0.63
Wayne	0.02	0.07	0.09
Williamson	0.00	0.00	0.00
State total	**2.60**	**11.24**	**13.84**
Virginia			
Lee		0.16	0.16
Russell		0.08	0.08
Scott		0.13	0.13
Smyth		0.00	0.00
Tazewell		0.11	0.11
Washington	0.12	0.22	0.34
Wise		0.04	0.04
Wythe		0.09	0.09
State total	**0.12**	**0.83**	**0.95**
Watershed total	**7**	**27**	**34**

3 COMPARISON TO PREVIOUS UPDATES, INTER-BASIN TRANSFERS, AND DIVERSIONS

COMPARISON TO PREVIOUS UPDATES

The Tennessee River watershed is the only watershed in the nation that has continuous trend data since 1995. Table 3-1 compares water use in 2010 to 2005, 2000 and 1995. All of the line numbers in the following discussion refer to Table 3-1. The 1995 data were provided by the USGS and are contained in the 2000 water use report (Hutson and others, 2004).

Total withdrawal grew by 22 percent from 1995 to 2000 as the result of major power plant additions in the watershed peaking in 2005. 2010 total withdrawal was 3.9 percent below 2005 total withdrawal (line 2). This was the result of a reduction in thermoelectric withdrawal of 485 mgd (line 11), which was caused by less power generation in 2010 compared to 2005 (line 20). Industrial and irrigation use were also down slightly in 2010 compared to 2005 (lines 29 and 47), but public supply use continued its upward trend in 2010 (line 38). Total withdrawal excluding thermoelectric was only 1 mgd less in 2010 than it was in 2005 (line 23).

Although there was a decreasing trend in groundwater use from 1995 to 2005, 2010 showed an increase in groundwater use compared to 2005 (line 5). Of course, surface water continued to supply most of the water used in the watershed in 2010 (98.3 percent, line 4).

As has been the case since return flow data were first collected in 2000, most of the water withdrawn is returned to the river system with 96.1 percent of the withdrawal returned in 2010 (line 8).

Net water demand increased about 9 percent from 2005 to 2010 (line 9) and increased from 3.5 to 3.9 percent of total withdrawal from 2005 to 2010 (line 10). As discussed in the 2005 water use report (Bohac and McCall, 2008), the relatively large reduction in net water demand between 2000 and 2005 was due to reported reductions in 10 large industrial withdrawals while reported returns for those industries increased.

The average percent of total withdrawal for thermoelectric use between 2000 and 2010 was 84.3 percent (line 13). Even though thermoelectric withdrawal was lower than it was in 2000 and 2005, the percent of total withdrawal in 2010 was 84.1 percent, almost the average (line13). As in the past, more than 99 percent of the water withdrawn for thermoelectric use is returned (line 15). In 2010 thermoelectric net water demand was 11.1 percent of total net water demand.

The thermoelectric unit water requirement for power generation rose slightly from 39 gal/KWh in 2000 and 2005 to 42 gal/KWh in 2010 (line 21). This was the result of thermoelectric water use not being reduced proportionately with the downturn in generation. While about 12 percent less energy was generated in 2010 than in 2005 (line 20), the reduction in thermoelectric withdrawal between 2000 and 2010 was only 4.6 percent (line 11).

Industrial withdrawal in 2010 was 2.7 percent lower than in 2005 and about 5 percent lower than in 2000 (line 29), but its percent of total withdrawal remained about the same at 9.6 percent (line 30). Industrial net water demand was 15.9 percent of total net water demand, which was lower than it was in 2000 and 2005 (line 37).

Public supply has been increasing since 1995 (line 38), and was 5.6 percent higher in 2010 than it was in 2005 (line 40), which closely follows the 5.8 percent increase in watershed population (line 87). Public supply net water demand is the largest component of total net water demand at 65.7 percent in 2010 (line 46). Public supply's net water demand as a percentage of total net water demand has been steadily increasing since 2000 (line 46), largely because of the declining contribution of industrial use to the total net water demand (line 37). Public supply's net water demand as a percent of public supply withdrawal has been fairly constant ranging from 43.1 percent to 39.9 percent between 2000 and 2010 (line 45).

Irrigation declined from 69 mgd in 2000 to 43 mgd in 2005 to 34 mgd in 2010. However, it was 48 mgd in 1995. The 2005 water use report (Bohac and McCall, 2008) stated that irrigation in Alabama was overstated in the 2000 water use report (Hutson and others, 2004). Irrigation's contribution to total net water demand has declined from 2000 to 2010 (line 51).

The Wheeler-Wilson WUTA was once again the WUTA with the largest net water demand (129 mgd) in 2010 (line 63).

In 2010, surface water supplied 100 percent of the thermoelectric withdrawal, 97.2 percent of the industrial withdrawal, 77.2 percent of the public supply withdrawal, and 79.4 percent of the irrigation withdrawal (lines 71, 73, 75, and 77). These percentages are little changed over the 2000 to 2010 period.

The watershed population has increased by 18.7 percent from 1995 to 2010 (line 87).

Table 3-1. Comparing 2010 water use statistics with previous years

	Units are mgd or as noted	1995	2000	2005	2010
1	Total withdrawal	10,008	12,211	12,437	11,951
2	Percent change		22.0	1.9	-3.9
3	Total surface water withdrawal	9,750	11,996	12,247	11,747
4	Percent of total withdrawal	97.4	98.2	98.5	98.3
5	Total groundwater withdrawal	258	215	190	204
6	Percent of total withdrawal	2.6	1.8	1.5	1.7
7	Total return flow		11,562	12,005	11,480
8	Percent of total withdrawal		94.7	96.5	96.1
9	Net water demand (consumptive use)		649	432	471
10	Percent of total withdrawal		5.3	3.5	3.9
11	Total thermoelectric withdrawal	8,010	10,276	10,531	10,046
12	Percent change		28.5	2.5	-4.6
13	Percent of total withdrawal	80	84.2	84.7	84.1
14	Total thermoelectric return		10,244	10,498	9,994
15	Percent of thermoelectric withdrawal		99.7	99.7	99.5
16	Percent of total return		88.6	87.4	87.1
17	Total thermoelectric net water demand		32	33	52
18	Percent of thermoelectric withdrawal		0.3	0.3	0.5
19	Percent of total net water demand		4.9	7.6	11.1
20	Power generated (million KWh)		96,343	99,519	87,529
21	Total thermoelectric unit water requirement (gal/KWh)		39	39	42
22	Consumptive thermoelectric unit water requirement (gal/KWh)		0.1	0.1	0.2
23	Total withdrawal excluding thermoelectric	1,998	1,935	1,906	1,905
24	Percent of total withdrawal	20.0	15.8	15.3	15.9
25	Percent change		-3.2	-1.5	0.0
26	Total returns excluding thermoelectric		1,318	1,507	1,486
27	Percent change			14.3	-1.4
28	Net water demand excluding thermoelectric		617	399	419
29	Total industrial withdrawal	1,030	1,205	1,179	1,148
30	Percent of total withdrawal	10.3	9.9	9.5	9.6
31	Percent change		17.0	-2.2	-2.6
32	Total industrial return		942	1,097	1,073
33	Percent of total return		8.1	9.1	9.3
34	Percent of industrial withdrawal		78.2	93.0	93.5
35	Industrial net water demand		263	82	75
36	Percent of industrial withdrawal		21.8	7.0	6.5
37	Percent of total net water demand		40.5	19.0	15.9
38	Public supply total withdrawal	574	662	684	723

Table 3-1. Continued

	Units are mgd or as noted	1995	2000	2005	2010
39	Percent of total withdrawal	5.7	5.4	5.5	6.0
40	Percent change		15.3	3.3	5.6
41	Total public supply return		377	411	413
42	Percent of total return		3.3	3.4	3.6
43	Percent of public supply withdrawal		56.9	60.1	57.2
44	Public supply net water demand		285	273	310
45	Percent of public supply withdrawal		43.1	39.9	42.8
46	Percent of total net water demand		43.9	63.2	65.7
47	Irrigation total withdrawal	48	69	43	34
48	Percent of total withdrawal	0.5	0.6	0.3	0.3
49	Percent change		43.8	-37.7	-20.9
50	Irrigation net water demand	48	69	43	34
51	Percent of total net water demand		10.6	10.0	7.2
52	Net water demand by WUTA, lines 53-67				
53	Cherokee		88	90	79
54	Douglas		65	53	70
55	Fort Loudoun		23	1	8
56	Fontana-Tellico		7	7	9
57	Norris		45	28	21
58	Hiwassee-Ocoee		16	10	8
59	Watts Bar-Chickamauga		45	40	57
60	Nickajack		12	-3	-13
61	Guntersville		16	30	32
62	Tims Ford		21	8	8
63	Wheeler-Wilson		196	112	129
64	Pickwick		29	-13	-2
65	Normandy		26	25	26
66	Kentucky		60	43	41
67	Total net water demand, lines 53-66		649	431	473
68	Diversions to the Tennessee-Tombigbee Waterway		200	190	200
69	Surface water withdrawal, lines 70-77				
70	Thermoelectric		10,276	10,531	10,046
71	Percent of total thermoelectric		100	100	100
72	Industrial		1,134	1,149	1,116
73	Percent of total industrial		94.1	97.5	97.2
74	Public supply		526	534	558
75	Percent of total public supply		79.5	78.1	77.2
76	Irrigation		61	32	27
77	Percent of total irrigation		88.4	74.4	79.4

Table 3-1. Continued

	Units are mgd or as noted	1995	2000	2005	2010
78	Groundwater withdrawal, lines 79-86				
79	Thermoelectric		0	0	0
80	Percent of total thermoelectric		0	0	0
81	Industrial		71	30	32
82	Percent of total industrial		5.9	2.5	2.8
83	Public supply		136	150	165
84	Percent of total public supply		20.5	21.9	22.8
85	Irrigation		7.6	11	7.0
86	Percent of total irrigation		11.0	25.6	20.6
87	Watershed population (1000s)	4,198	4,506	4,705	4,982

INTER-BASIN TRANSFERS

An inter-basin transfer (IBT), in the context of this report, is a transfer of water across the Tennessee River watershed boundary. Although there are other transfers between river basins within the Tennessee River watershed, an IBT as discussed below refers only to a transfer across the watershed boundary.

IBTs from the Tennessee River watershed are of concern because of the following:

1. After the water is transferred, no water is returned to the Tennessee River for reuse.
2. Impacts may not occur at the point of withdrawal, but on reservoirs far from the point of withdrawal.
3. IBTs could impair TVA's ability to carry out mandated responsibilities for managing the Tennessee River system depending on when and where IBTs occur and the volume that is transferred.
4. IBTs will reduce hydrogeneration and may reduce water availability for cooling power plants.
5. IBTs at some locations would create environmental conflicts with in-stream uses such as for fish and aquatic life.
6. IBTs are sensitive issues in all watershed states and are sources of potential conflict among the states.

IBTs existing in 2010 are shown in Table 3-2 and Table 3-3. The values shown are average annual transfers. The net water leaving the Tennessee River watershed (Table 3-2 total minus Table 3-3 total) in 2010 was 5.9 mgd. The Crossville Lake Tansi IBT was not active in 2010, but it is permitted for a maximum of 5 mgd (2.5 mgd annual average). The Corinth IBT was also not active, but it is permitted for a maximum of 16.5 mgd (annual average of 9 mgd). It will be active in August 2012. The Spring City IBT is to the Bledsoe Correctional facility and other,

Table 3-2. Inter-basin transfers from the Tennessee River watershed in 2010

Transfer from			Transfer to			2010
System	State	Basin	System	State	Basin	mgd
Fort Payne	AL	Tennessee	Fort Payne	AL	Coosa	0
Upper Bear Creek	AL	Tennessee/ Bear Creek	Haleyville	AL	Tombigbee	1.58
Albertville	AL	Tennessee	Albertville Service Area & Boaz	AL	Black Warrior	4.51
Arab	AL	Tennessee	Joppa	AL	Black Warrior	0.45
Franklin Co. WSA	AL	Tennessee	Franklin Co. WSA Service Area	AL	Tombigbee	0.4
Hendersonville	NC	Tennessee/ French Broad	Saluda	NC	Broad	0.12
Highlands	NC	Tennessee/ Little Tennessee	Highlands Service Area	NC	Savannah	0.01
Eastside UD	TN	Tennessee/ Hiwassee	Dalton Utilities	GA	Coosa/ Conasauga	1.92
Cleveland Utilities	TN	Tennessee/ Hiwassee	Ocoee UD		Coosa/ Conasauga	0.23
City of Spring City	TN	Tennessee/ Clinch/ Emory		TN	Upper Cumberland	0
Crossville (Lake Tansi)	TN	Tennessee/ Clinch/ Emory	Crossville (Meadow Park Lake)	TN	Upper Cumberland	0
City of Lexington	TN	Tennessee Western Valley	Jackson Energy Authority	TN	Mississippi/ Forked Deer	0.1 Est
Plateau UD	TN	Tennessee/ Clinch/ Emory	Sun Bright	TN	Upper Cumberland/ Obed/Caney Fork	0.2
Tennessee American	GA	Tennessee	Walker County	GA	Coosa	1.8
Corinth	MS	Tennessee	Corinth Service Area	MS	Tombigbee	0
Total leaving Tennessee River watershed						**11.32**

Table 3-3. Inter-basin transfers into the Tennessee River watershed in 2010

Transfer from			Transfer to			2010
System	State	Basin	System	State	Basin	mgd
Clayton-Rabun Co. W&SA - Lake Rabun	GA	Savannah	Clayton-Rabun Co. W&SA Service Area	GA	Tennessee/ Little Tennessee	0.1 Est
Crossville	TN	Upper Cumberland	Crossville	TN	Tennessee/ Clinch/ Emory	3.07
Cleveland Utilities	TN	Coosa/ Conasauga	Cleveland Utilities	TN	Tennessee/ Hiwassee	1.09
	TN	Cumberland	Duck River UD	TN	Tennessee/ Duck	0
Huntsville UD	TN	Upper Cumberland	Sunbright Service Area	TN	Tennessee/ Clinch/ Emory	0.06
Ocoee UD	TN	Coosa/ Conasauga	Ocoee UD	TN	Tennessee/ Hiwassee	0.8
City of Selmer	TN	Mississippi/ Little Hatchie	Michie	TN	Tennessee Western Valley	0
West Warren-Viola UD	TN	Lower Cumberland	West Warren-Viola Service Area	TN	Tennessee Western Valley	0.3 Est
Total Coming Into Tennessee River Watershed						**5.42**

as yet, undetermined use in the Cumberland Basin (total will eventually be 1 mgd). The correctional facility will be completed in 2012.

The estimated values in Table 3-2 and Table 3-3 (Est) are based on state permit limits.

DIVERSIONS

Under agreement with the U.S. Army Corps of Engineers (USACE), an average of 200 mgd in 2010 was diverted from Pickwick Reservoir on the Tennessee River to the Tennessee-Tombigbee Waterway to support its operations.

In western Kentucky at the northwest tip of Land Between the Lakes, the Barkley Canal connects the Tennessee River to the Cumberland River. Historic reservoir operations have resulted in a net flow of Tennessee River water through the Barkley Canal. This averages about 3,900 mgd and provides electrical generating capacity during peak power demands for

USACE's Barkley Dam. The operation is authorized through agreements between TVA and USACE. In 2010, the flow averaged 1,636 mgd from Kentucky Reservoir to Barkley Reservoir.

4 PROJECTED WATER USE

INTRODUCTION

Projections of water use for 2035 were prepared for the four use categories of thermoelectric, industrial, public supply, and irrigation. The projection methods used for each category of use are described below.

THERMOELECTRIC WATER USE

Projected water use was based on an estimate of future power generation and the generation technology used to provide it. Table 4-1 shows electrical energy generated by the TVA system for fiscal years 2009, 2010 and 2011 by generation type. Approximately 69 percent of TVA's coal-fired and nuclear generation (thermoelectric) comes from the Tennessee River watershed.

Table 4-1. Power supply from TVA-operated generation facilities for the years ended September 30

	2011		2010		2009	
Coal-fired	74,583	52%	74,590	51%	76,794	53%
Nuclear	49,562	34%	53,339	36%	53,047	37%
Hydroelectric	12,706	9%	14,013	9%	11,421	8%
Natural gas- and/or oil-fired	6,809	5%	5,475	4%	3,481	2%
Renewable resources (non-hydro)	14	<1%	4	<1%	29	<1%

Units are millions of KWh

Source: Tennessee Valley Authority (2011a)

Thermoelectric water use for 2035 was estimated based on TVA's proprietary power supply plan. The plan considers the most economical mix of generating facilities to meet the power demand in the TVA region based on factors such as fuel prices, air quality constraints, and unit-operating efficiency. Power supply options include generation from existing and new TVA units, purchases from existing and new merchant plants, and purchases from other utilities. The

projection includes all thermoelectric generating units in the Tennessee River watershed, and not just those owned or leased by TVA.

After more than two years of development, TVA completed its Integrated Resource Plan in 2011. This plan and the associated Environmental Impact Statement are the result of extensive analysis and collaboration with TVA partners and stakeholders. It is a comprehensive study of options and strategies and their potential economic and environmental outcomes. The plan was shaped by input from the businesses, industries, and regional leaders, as well as the ordinary people, whose lives and livelihoods depend on the electricity supplied by Tennessee Valley Authority (2011b).

Table 4-2 shows recommendations developed by the Integrated Resource Plan to help guide TVA's future generation portfolio.

Table 4-2. Recommendations from the Integrated Resource Plan

Recommendation	Component	Guideline MW[2] range	Window of time
Expand energy efficiency	EEDR[1]	3,600 - 5,100	By 2020
Pursue cost effective renewable energy	Renewable additions	1,500 - 2,500	By 2020
Consider idling coal-fired capacity	Coal-fired capacity idled	2,400 - 4,700	By 2017
Add pumped-storage capacity	Energy storage	840	2020 - 2024
Increase contribution of nuclear generation	Nuclear additions	1,150 - 5,900	2012 - 2029
Preserve option of generation with carbon capture	Coal additions	0 - 900	2025 - 2029
Utilize natural gas as an intermediate supply source	Natural gas additions	900 - 9,300	2012 - 2029

[1]Energy Efficiency and Demand Response, or measures to reduce overall electricity consumption without degrading the services provided (energy efficiency) or to shift the use of electricity from high demand to low demand times (demand response).

[2]Megawatts

The implications of the Integrated Resource Plan recommendations are that EEDR and renewables such as wind power will slow the need for new water for thermoelectric use. Idling of coal-fired plants will substantially reduce thermoelectric withdrawal because all the coal-fired plants in the watershed use once-through (open-cycle) cooling. Although the nuclear and

natural gas additions will represent new withdrawals of cooling water, these new plants will use closed-cycle cooling (cooling towers), which will result in substantially less withdrawal than if the cooling mode was open-cycle. However, the difference between the withdrawal and return for the new closed-cycle cooled plants will be larger than for the open-cycle plants they replace and hence the net water demand will increase.

INDUSTRIAL AND PUBLIC SUPPLY

As was the case for the 2000 and 2005 water use reports (Hutson and others, 2004; Bohac and McCall, 2008), water for mining use was reported as industrial use.

For the industrial (including mining) and public supply categories, the 2010 water use estimates serve as the basis for the 2035 projections. Economic and demographic data at the county level projected to 2035 (Woods and Poole Economics Inc., 2011) were used to project water use to 2035. The change in population was used to project public supply withdrawal and return flow, and changes in manufacturing and mining earnings were used for the industrial withdrawal and return flow projections. The county-specific projection factor, or multiplier for the population and industrial and mining earnings, was applied to each water use record in the 2010 water use database to produce estimates of 2035 water use.

IRRIGATION

Irrigation water use is reported as essentially two types: agricultural irrigation and nonagricultural irrigation (primarily golf course irrigation). Nonagricultural irrigation was projected using the public supply projection factors while agricultural irrigation was projected using the trends in increasing acres of irrigated farmland (U.S. Department of Agriculture, 2003, 2008).

TRANSFERS FROM THE WATERSHED

In 2010, 23 public supply IBTs resulted in a net loss of 5.9 mgd from the Tennessee River watershed. The projection for 2035 is that this volume will increase at the same rate that water withdrawal for public supply increases. In addition, TVA has permitted three public supply IBTs that were not operational in 2010. By 2035 these three IBTs would withdraw an estimated 12.5 mgd, which is added to the estimated increase of the 2010 volume.

TVA estimated the increase in diversions to the Tennessee-Tombigbee Waterway based on a projection of the increase in commercial lockages between the waterway and the Tennessee River. The estimated diversions to the waterway by 2035 range from 300 to 500 mgd with a midpoint of 400 mgd.

Water transfer from Kentucky Reservoir to Barkley Reservoir in 2035 is assumed to be the long-term average of 3,900 mgd.

PROJECTED WATER USE IN 2035

Total withdrawal for 2035 is projected to be 9,449 mgd with net water demand projected as 712 mgd, as shown in Table 4-3.

Table 4-3: Trends of estimated water use in the Tennessee River watershed 1995 to 2035

Off-stream use (mgd)	1995	2000	2005	2010	2035	Percent change 2010-2035
Total withdrawals	10,008	12,211	12,437	11,951	9,449	-21
Thermoelectric	8,010	10,276	10,531	10,046	6,963	-31
Industrial	1,030	1,205	1,179	1,148	1,502	31
Public supply	574	662	684	723	938	30
Irrigation	48	69	43	34	46	35
Source of water						
Surface	9,750	11,996	12,237	11,747		
Ground	258	215	200	204		
Net water demand (consumptive use)		649	432	471	712	51
Transfers						
To the Tennessee-Tombigbee		200	190	200	400	100
To Barkley Reservoir		4,524	4,246	1,636	3,900	

Table 4-3 shows that the projected 2035 withdrawal will decrease by 21 percent compared to 2010. This is the result of a 31 percent decline in thermoelectric water withdrawal brought about by the idling of coal-fired power plants that have high withdrawal rates to supply their open-cycle cooling systems. Net water demand increases by 51 percent because of increased withdrawal for industrial, public supply, and irrigation, and because new power plants will use closed-cycle cooling resulting in higher evaporative losses through the new cooling systems compared to those in use in 2010. The 2035 net water demand by category is projected to be: thermoelectric, 142 mgd or 20 percent of the total; industrial, 110 mgd or 15 percent of the total; public supply, 414 mgd or 58 percent of the total; and irrigation, 46 mgd or 7 percent of the total.

5 SUMMARY AND CONCLUSIONS

WATER USE IN 2010

Water withdrawals during 2010 were estimated to average 11,951 mgd for off-stream uses or 3.9 percent less than the 2005 withdrawals. Return flow was estimated to be 11,480 mgd or 96.1 percent of the water withdrawn in 2010. Net water demand, which is an estimate of consumptive use, was 471 mgd, and accounted for the remaining 3.9 percent of withdrawal.

In 2010, thermoelectric withdrawals were 10,046 mgd, which was 84.1 percent of total withdrawal. As a percentage of total withdrawal, this was little changed from its 2005 value of 84.7 percent. Thermoelectric withdrawal declined for the first time since 1995, down 4.6 percent from 2005. This was the result of about 12 percent less electrical power generation in 2010 compared to 2005. Because of the preponderance of once-through cooling in use during 2010, net water demand was only 52 mgd, which was 0.5 percent of thermoelectric withdrawal (99.5 percent of the withdrawal was returned), but it was 11.1 percent of the total net water demand.

Although thermoelectric withdrawals were down from 2005, the total of all other withdrawals was 1,905 mgd, which is essentially unchanged from 2005 (1,906 mgd), and little changed from 2000 (1935 mgd). Total returns excluding thermoelectric were 1,486 mgd in 2010 or about 1.4 percent lower than they were in 2005, when the returns totaled 1,507 mgd.

Withdrawals for industrial use in 2010 were 1,148 mgd, which was slightly reduced from the withdrawals in 2005 (1,179 mgd) and in 2000 (1,205). From 2000 to 2010, industrial withdrawals have ranged from 9.5 to 9.9 percent of total withdrawal. Industrial net water demand was 75 mgd in 2010 or 6.5 percent of total industrial withdrawal. This was a little lower than in 2005 when it was 7.0 percent of total withdrawal. Industrial net water demand in 2010 was 15.9 percent of the total net water demand.

Public supply withdrawals in 2010 totaled 723 mgd, which was up 5.6 percent from 2005. 2010 public supply withdrawal was 6 percent of total withdrawal, which was up slightly from 2000 (5.4 percent) and 2005 (5.5 percent). Public supply net water demand was 310 mgd in 2010, 65.7 percent of total net water demand, and was the largest component of total net water demand. This was slightly larger than in 2005 when it was 63.2 percent of total net water demand.

Irrigation withdrawal was 34 mgd in 2010, or 0.3 percent of total withdrawal. From 1995 through 2010, irrigation has always been below one percent of total withdrawal. However, because there is no return flow from irrigation, irrigation's 2010 net water demand was 7.2 percent of the total net water demand, a little smaller than its contribution in 2000 and 2005, when it was 10.6 percent and 10.0 percent respectively.

Once again, almost all the water was surface-supplied. In 2010, 98.3 percent of the total withdrawal came from surface water, which was about the same percentage as it was in 2005

(98.5 percent) and in 2000 (98.2 percent). As has always been the case, all the water for thermoelectric use came from surface water. In 2010 surface water supplied 97.1 percent of the industrial withdrawal (97.5 percent in 2005), 77.2 percent of the public supply withdrawal (78.1 percent in 2005), and 79.4 percent of the irrigation withdrawal (74.4 percent in 2005).

Diversions to the Tennessee-Tombigbee Waterway were 200 mgd in 2010, essentially unchanged for the past 10 years. The diversions through the Barkley Canal were 1,636 mgd in 2010.

PROJECTED WATER USE FOR 2035

Total water withdrawals in 2035 are projected to decrease by 2,502 mgd, 21 percent from the 2010 withdrawal. This is the result of the anticipated decrease of 3,083 mgd in thermoelectric withdrawal brought about by the retirement of old power plants, which utilize once-through cooling, and the introduction of new plants using closed-cycle cooling. Water use by industry is projected to increase by 31 percent or 354 mgd, to 1,502 mgd. Public supply use is projected to increase by 30 percent or 215 mgd, to 938 mgd. A 35 percent increase in irrigation is anticipated to 46 mgd, up from 34 mgd in 2010.

Although a large reduction in total withdrawal will occur, net water demand is projected to increase by 51 percent, or 241 mgd. Thermoelectric use accounts for 90 mgd, about 37 percent, of this increase, resulting from the switch in thermoelectric generation and cooling technology. The rest of the increase is due to the over 30 percent increase in non-thermoelectric water use.

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APPENDIX

2010 WATER USE DATA SOURCES FOR THE TENNESSEE RIVER WATERSHED

Water use category	Data sources	Data type
Thermoelectric		
Tennessee River watershed	TVA data submission to DOE NIA 923 database	WD, RT
	Discharge Monitoring Reports(DMR) for NPDES permits	RT
	TVA data submission to DOE NIA 923 database	Gen
	DOE NIA 923 database	WD, RT, Gen
Industry and public supply		
Alabama	AL DWR	WD
	EPA DMR and EPA ECHO	RT
Georgia	USGS	WD
	EPA DMR	RT
Kentucky	USGS	WD
	EPA DMR	RT
Mississippi	USGS	WD
	EPA Envirofacts	RT
North Carolina	USGS	WD
	NC DWR Local Water Supply Plans	WD, RT
	NC DWR Water Withdrawal and Transfer Registration	WD, RT
	EPA Envirofacts	RT
Tennessee	USGS	WD
	EPA DMR and EPA ECHO	RT
Virginia	USGS	WD
	TVA personal communication with water purveyors	WD
	EPA Envirofacts	RT
Irrigation		
Alabama	AL DWR, USGS	WD
Other states	USGS	WD

WD - withdrawal data
RT - return data
Gen - thermoelectric power generation data

The U.S. Department of Energy's Energy Information Administration (EIA) collects information from electric power plants in the United States. The data collected include electric power generation (Gen in the above table), fuel consumption, operational cooling water data, and many other data. The Form EIA-923 is a mandatory report for all electric power plants for units greater the one MW. The EIA makes the data accessible at their website: http://www.eia.gov/cneaf/electricity/page/eia423.html.

All who discharge wastewater into waters of the United States must have a National Pollutant Discharge Elimination System (NPDES) permit. The U.S. Environmental Protection Agency (EPA) is authorized to implement the NPDES program. EPA has authorized all the states in the Tennessee River watershed to implement the program in their own states. One of the requirements of an NPDES permit is to monitor the discharge and submit reports to state environmental agencies administering the permit programs. The report is called the Discharge Monitoring Report (DMR). EPA provides access to the data contained in the reports through two systems: Envirofacts, http://www.epa.gov/enviro/facts/pcs-icis/search.html, and ECHO, http://www.epa-echo.gov/echo/compliance_report_water.html. EPA is discontinuing the PCS database on Envirofacts and transitioning the data to the ICIS-NPDES database in ECHO. Both the PCS and the ICIS databases are available through ECHO.

When the 2010 return data were collected, data for Alabama, Georgia, Kentucky and Tennessee were caught up in the transition from Envirofacts to ECHO and were not available in either system. As a result, EPA supplied the missing data directly to TVA. These data are designated as “EPA DMR” in the above table.

Every five years the U.S. Geological Survey (USGS) collects data for its “Estimated Use of Water in the United States” report. This is done by the USGS Science Center in each state. This data source is designated as “USGS”

All the Alabama public supply, industrial, and golf course irrigation withdrawal data were provided by the Alabama Department of Water Resources (AL DWR) from its water withdrawal certification reporting system. Additional data were obtained from online reports provided by the North Carolina Division of Water Resources: www.ncwater.org.

Demographic data were supplied by Woods and Poole Economics Inc. and the 2010 U.S. Census.

GLOSSARY, TERMS AND ABBREVIATIONS

Cooling water	Water used for industry and thermoelectric power generation. There are two general types of cooling technology: open-cycle and closed-cycle.
Closed-cycle cooling	The use of evaporation for cooling (the changing of water from a liquid to a vapor with a very large transfer of heat from the water to the atmosphere)
Consumptive use	Water that is evaporated, transpired, or incorporated into crops or manufactured products, metabolized by humans or livestock, or otherwise removed from the immediate water environment
EEDR	Energy efficiency and demand response
Evapotranspiration	A collective term that includes water discharged to the atmosphere as a result of evaporation from the soil and surface water bodies, and as a result of plant transpiration
Groundwater	Generally, all subsurface water as distinct from surface water; specifically, water stored in pores of soil or rock saturated with water
Industrial water use	Water used for industrial purposes such as fabrication, processing, washing, and cooling, in industries including steel, chemical and allied products, paper and allied products, mining, and petroleum refining. The water may be obtained from a public supply or be self-supplied.
Inter-basin transfer	The act of moving water across a watershed boundary to another watershed
Irrigation water use	Artificial application of water on lands to assist in the growing of crops and pastures or to maintain vegetative growth in recreational lands such as parks and golf courses
Hydrologic unit code	The major drainage regions in the United States are subdivided into 2,149 drainage basins, each represented by an 8-digit hydrologic unit code.
Kilowatt-hour (KWh)	A unit of energy equivalent to one thousand watt-hours
Million gallons per day (mgd)	A rate of flow of water sufficient for the daily public supply needs of 6,900 people in the Tennessee River watershed
Mining water use	Water used for the extraction of minerals occurring naturally, including solids such as coal or ores, liquids such as crude

	petroleum, and gases such as natural gas. Also includes uses associated with quarrying, well operations (dewatering), milling (crushing, screening, washing, floatation, etc.), and other preparations customarily done at the mine site or as part of a mining activity. Does not included water used in processing, such as smelting, refining petroleum, or slurry pipeline operations; these uses are included in industrial water use.
Net water demand	The quantitative difference between water withdrawals and return flow
Off-stream use	Water withdrawn or diverted from a groundwater or surface water source for thermoelectric, industrial, public supply or irrigation use
Per capita use	The average amount of water used per person during a standard time period, generally per day
Public supply water use	Water withdrawn by public and private water suppliers and delivered to users for residential, domestic, commercial, industrial and municipal (firefighting, street washing, parks, swimming pools, etc.) purposes
Return flow	The water that reaches a surface water source after release from the point of use and thus becomes available for reuse
Reservoir catchment area	The drainage area for a reservoir extending from the watershed boundary to a dam or the reservoir drainage area between the dam and an upstream dam
Surface water	An open body of water, such as a stream, lake or reservoir
Thermoelectric power use	Water used in the generation of thermoelectric power
Transpiration	The process by which water is absorbed by plants, usually through the roots, and evaporated into the atmosphere from the plant surface
Wastewater	Water that carries wastes from homes, businesses, and industries
Wastewater treatment	The processing of wastewaters for the removal or reduction of contained solids or other undesirable constituents
Wastewater treatment return flow	Water returned to the hydrologic system by wastewater treatment facilities
Water resources region	The designated natural drainage basin or hydrologic area that contains either the drainage area of a major river or the combined drainage areas of two or more rivers; there are 18 designated water

	resources regions in the conterminous United States
Water resources subregion	The 18 designated regions are divided into subregions. Each subregion includes that area drained by a river system or a reach of a river and its tributaries in that reach
Water use	Water that is actually used for a specific purpose, such as for domestic use, irrigation, industrial processing, or thermoelectric power generation
Water use tabulation area	The boundaries of a water use tabulation area are determined by the natural drainage area to account for water availability and the water use transactions that occur within that drainage area. For this report, the water use tabulation area accounts for the complete site-specific, water use transactions between adjoining reservoir catchment areas and is used to determine net water demand (consumptive use) on a large scale
Water use transaction	A water use activity that is a water withdrawal, water delivery, water release, return flow, water transfer, or withdrawal
Withdrawal	Water removed from the ground or diverted from a surface water source for use
Sources: Hutson and others (2004) , Bohac and McCall (2008)	