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2.3.2 Water Use

This section describes surface water and groundwater uses that could affect or be affected by the construction or operation of two AP1000 units (VEGP Units 3 and 4) at the VEGP site. Included are descriptions of the types of consumptive and non-consumptive water uses, identification of their locations, and quantification of water withdrawals and returns.

2.3.2.1 Surface Water

The surface water bodies that are within the hydrologic system in which the VEGP site is located and that may affect or be affected by the construction and operation of VEGP Units 3 and 4, include streams and surface water bodies in the Savannah River basin, which extends a length of over 350 mi. The major rivers in the Savannah River basin watershed area include the Tugaloo River, Keowee River, Seneca River, Savannah River, Broad River, two Little Rivers (one in Georgia and one in South Carolina), Stephens Creek, Brier Creek, Horse Creek, and Ebenezer Creek. A number of reservoirs and lakes are also located within the river basin on the Savannah River and its major tributaries **(USGS 1990a; USACE 1993; USACE 1996)**. Among these reservoirs and lakes, three large federal multipurpose projects on the Savannah River—Hartwell Lake and Dam, Richard B. Russell Lake and Dam, and J. Strom Thurmond (also known as Clarks Hill) Lake and Dam—maintain the maximum influence on the river discharge downstream from the J. Strom Thurmond Dam. These reservoirs are respectively located approximately 138, 108, and 71 River Miles upstream from the VEGP site. Figure 2.3.2-1 presents a mosaic of satellite images, and Figure 2.3.2-2 illustrates the major rivers, along with the locations of major reservoirs in the Savannah River basin.

The Savannah River, which is the principal surface water system in the basin, defines the state boundary between Georgia and South Carolina, and nearly all of the river basin area is shared by the two states. The agencies with important roles in the watershed include the US Army Corps of Engineers (USACE), Savannah District, which is responsible for managing the three dams and the in-stream reservoirs of the Savannah River, and the US Environmental Protection Agency (USEPA) in cooperation with the Georgia Environmental Protection Division (EPD) and the South Carolina Department of Health and Environmental Control (SCDHEC), the organizations responsible for maintaining water quality in the basin. Counties located within 50 mi of the VEGP site and within the Savannah River basin are shown in Figure 2.3.2-3 and listed in Table 2.3.2-1.

EPD and SCDHEC maintain the records of surface water and groundwater withdrawals within the river basin for the states of Georgia and South Carolina, respectively. The water withdrawal types defined by EPD and SCDHEC in maintaining state water use databases differ. EPD defines water withdrawals as public supply, domestic and commercial, industrial and mining, irrigation, livestock, thermoelectric power generation, navigation, recreation, fish and wildlife, waste assimilation, and environmental water demand **(Fanning 2003)**. SCDHEC water withdrawal categories are specified as aquaculture, golf course irrigation, hydroelectric,

industrial, irrigation, mining process, other use, thermoelectric, and water supply **(SC DHEC 2005)**.

Among the water use categories specified by EPD and SCDHEC, hydroelectric water use, navigation, fish (aquaculture) and wildlife, and environmental water demand constitute non-consumptive water usage. The remaining categories constitute consumptive water use, which is considered lost from the immediate surface water environment. Consumptive water uses have been identified from the water use database maintained by EPD **(Georgia DNR 2006)** and from the water use report by SCDHEC **(SC DHEC 2005)**. EPD's water use database includes users whose average daily withdrawal during any single month exceeds 100,000 gallons per day (gpd) **(Fanning 2003)**. SCDHEC maintains records of registered water use that withdraws water in excess of 3 million gallons in any given month from a single groundwater well or surface water intake, or multiple wells or surface water intakes under common ownership **(SC DHEC 2005)**.

As of September 2005, 46 intake facilities in Georgia were registered for surface water withdrawal activities within the Savannah River basin **(Georgia DNR 2006)**. This excludes the permits identified in the EPD database as suspended, revoked, or expired. In South Carolina, 55 facilities were registered (with 71 intake locations) in 2004; an additional 5 facilities registered for dual surface water and groundwater withdrawals **(SC DHEC 2005)**. Figure 2.3.2-4 shows the locations of the surface water intakes in the Savannah River basin within 50 miles of the VEGP site. Table 2.3.2-2 identifies the surface water user, the water body from which withdrawals are made, and the permitted maximum volume of surface water withdrawals within the Savannah River basin in Georgia. County-wide surface water uses within the South Carolina part of the river basin are presented in Table 2.3.2-3.

These data indicate that the use of water in thermoelectric power generation constitutes the largest consumptive use of surface water in the Savannah River basin. Surface water withdrawal from the Savannah River by the existing VEGP Units 1 and 2 for cooling purposes is one of the major consumptive uses in the basin. The combined GPC surface water withdrawals from the Savannah River, at several locations in Chatham and Effingham counties in Georgia, constitute the largest water use downstream from the VEGP site.

Upstream, thermoelectric water use in Oconee County, South Carolina, which is in the headwaters of the Savannah River in the Blue Ridge Mountains, constitutes the largest water use in the basin. However, this water is used in the once-through cooling system of the Oconee Nuclear Power Plant, most of which is immediately returned to the Savannah River basin surface water system.

The other major water uses in the Savannah River basin include public water supply for the cities of Augusta, Port Wentworth, and Savannah in Georgia, and the counties of Beaufort and Jasper in South Carolina. Major industrial users include International Paper and PCS Nitrogen Fertilizer in Richmond County, Georgia.

Approximately 80 percent of all surface water used in the basin is returned back to the river system **(USACE 2006)**.

2.3.2.1.1 Local and Onsite Water Use

Surface water bodies within a 6-mile radius of the VEGP site include the Savannah River and several small tributaries. The tributaries in the site vicinity include Beaverdam Creek, Daniel's Branch, and Newberry Creek on the west bank of the Savannah River, and Fourmile Branch and Pen Branch on the east bank, as illustrated in Figure 2.3.2-5. Major consumptive uses of surface water within the 6-mile area include VEGP and the Savannah River Site (SRS) including the D-Area power house. No surface water is withdrawn for municipal water supply from this river reach. Further upstream from the VEGP site, SCE&G withdraws water from the Savannah River for its Urquhart power station in South Carolina. Monthly water uses from these facilities in recent years are presented in Table 2.3.2-4.

Current non-consumptive use of Savannah River water includes hydroelectric power generation, minimum stream flow requirements for navigation and environmental maintenance, fish and wildlife water demand, and recreation. Water use classification for the Savannah River within 6 miles of the VEGP site shows that the river is classified as fishing, the non-consumptive use category for fish and wildlife **(Georgia DNR 2001)**. The only section of the Savannah River classified by EPD as impaired under Sections 305(b) and 303(d) of the Federal Clean Water Act is the reach from J. Strom Thurmond Lake to the Stevens Creek Dam, upstream of Augusta, Georgia **(Georgia EPD 2006)**. Although improved navigation from Augusta to Savannah was included in the project objectives for the Hartwell and J. Strom Thurmond Dams, except for occasional freight transport, regular commercial navigation between Savannah and Augusta ceased operation in 1979 **(USACE 1989)**. No information on recreational use of the river within 6 miles from the VEGP site is available; however, public boat landings are located just downstream of VEGP; at Jackson, SC, upstream of VEGP; and below Steel Creek, downstream of VEGP on the South Carolina side of the river.

Compilation of water use data for Georgia between 1980 and 2000 indicates that surface water and groundwater withdrawal rates remained nearly unchanged during this period **(Fanning 2003)**. However, for Burke County, where the VEGP site is located, the total increase in future water demand for combined surface water and groundwater usage is estimated to be over 50 percent by 2035 **(Rutherford 2000)**. For South Carolina, combined water demand for industry, public supply, irrigation, and domestic use is projected to increase by nearly 50 percent by 2045 **(SC DNR 2004)**. This future water use estimate also includes water use for power generation.

Most water users in the Savannah River basin depend primarily on surface water to satisfy current and future demands. Many groundwater users in the lower basin will be required to replace groundwater use with surface water due to concerns about salt water intrusion into groundwater. Because of increased saltwater intrusion in the lower basin, Georgia and South

Carolina capped current groundwater use at specified levels, directing that future coastal water supply be met with surface water from the Savannah River **(USACE 1999)**.

The USACE, Savannah District, along with Georgia and South Carolina, are developing an updated comprehensive water resources management plan to determine water supply allocations, including future demands in the Savannah River basin. The study will also examine flood control, drought contingency, hydropower, water quality, habitat, aquatic plant control, and recreation issues **(USACE 2006)**. As part of their comprehensive water management scenarios, a revised drought management plan is now actively considered, which would increase the low flow release through J. Strom Thurmond Dam under some drought conditions **(USACE 2006c)**.

2.3.2.1.2 Surface Water Use for VEGP Units 3 and 4

VEGP Units 3 and 4 will use Westinghouse AP1000 (AP1000) reactor plants for power generation. The only use of water from the Savannah River for the AP1000 units will be for the circulating water system/turbine plant cooling water system makeup, where river water will be required to replace cooling tower evaporative water losses, drift losses, and blowdown discharge. Under normal operating conditions and design ambient conditions, river water demand for the two AP1000 units will be 82.9 cfs (37,224 gpm). The maximum water requirement for plant operation will be 128.7 cfs (57,784 gpm) for the two units. Depending on the cycles of concentration at which the cooling tower is operated, approximately 50-75 percent of the cooling tower makeup flow will be to replace water lost to evaporation. The total cooling tower blowdown volume would likely vary between approximately 25 and 50 percent of the makeup flow. Further detailed discussion on plant water use for VEGP Units 3 and 4 is provided in Section 3.3.1. Water use diagrams for the new VEGP units are shown in Figure 3.3-1 and Figure 3.3-2. Components of the conceptually-designed intake system are described in Section 3.4.2.

As described in ESP SSAR Section 2.4.13, accidental radionuclide release to surface water would be through the groundwater system moving northward to Mallard Pond, which drains to the Savannah River northeast of the VEGP site. The proposed VEGP Units 3 and 4 will have a grade elevation of approximately 220 ft msl. The AP1000 radiological effluent holdup tanks will be located at the lowest level of the auxiliary building. The base elevation of the auxiliary building is approximately 180.5 ft msl, which is approximately 20 to 25 ft above the water table. Consequently, direct release of radiological effluents in to the surface water system is very unlikely. The nearest surface water users downstream from the VEGP site on the Savannah River include Fort James Operating Company and GPC located in Effingham County, Georgia, approximately 106 River Miles from the VEGP site, as shown in Table 2.3.2-2.

Non-radiological effluents from VEGP Units 3 and 4 will consist of cooling tower blowdown and other wastewater streams and will be discharged into the Savannah River through a pipe at a location downstream from the discharge location for existing VEGP Units 1 and 2. The discharge

system described in Section 3.4 will be designed to meet federal, state and USACE regulatory and design guidelines for effluent discharge and navigation and maintenance criteria. The nearest users of surface water downstream from the effluent discharge location include Fort James Operating Company and GPC approximately 106 River Miles from the VEGP site, as shown in Table 2.3.2-2.

2.3.2.2 Groundwater Use

The majority of Georgia's groundwater use occurs in the Coastal Plain Physiographic Province. Groundwater is withdrawn from both unconfined, shallow aquifer systems and deeper, confined aquifer systems. These aquifers are recharged principally in their outcrop areas along the western boundary of the province and from localized infiltration of precipitation within the province. Precipitation migrates downward and laterally through the unconsolidated surficial materials for discharge to nearby streams and low areas, or percolates vertically downward into the deeper unconsolidated and consolidated material. The thickness and areal extent of the Coastal Plain sediments result in a storage capacity for groundwater that exceeds that of any other physiographic province in Georgia **(Miller 1990)**.

Within the Savannah River basin, as of September 2005, 72 facilities were registered for groundwater withdrawal activities in Georgia **(Georgia DNR 2006)**. Table 2.3.2-5 identifies the permitted groundwater users, permitted withdrawal rates, number of wells, and source aquifers within 50 mi of the VEGP site in Georgia, excluding those for irrigation use. In South Carolina, 43 facilities consisting of 158 groundwater wells were registered in 2004 **(SC DHEC 2005)**. The water withdrawal locations for groundwater wells within the Savannah River basin and within 50 mi of the VEGP site are shown in Figure 2.3.2-6. County-wide groundwater use data within the river basin in South Carolina are presented in Table 2.3.2-6 for 2004 for the counties within 50 mi of the VEGP site. A county-wide summary of groundwater use for irrigation is provided in Table 2.3.2-7 for Georgia within 50 mi of the VEGP site. The table also shows the range of groundwater well depths and diameters, and total permitted withdrawal rates in the counties. There were no permitted irrigation water wells in Glascock County.

No sole-source aquifers are designated within the 200-mi radius of the site **(EPA 2006a)**.

2.3.2.2.1 Local Use

Present groundwater uses within 25 mi of the VEGP site are primarily municipal, industrial, and agricultural. Most of the groundwater wells withdraw water from the Cretaceous aquifer. Apart from water withdrawals for VEGP Units 1 and 2, the immediate area near the VEGP site has mainly domestic users, with no other nearby large groundwater users. The nearest domestic well is located just west of the VEGP site across River Road.

The Georgia EPD issues permits for industrial, municipal and agricultural wells having average daily withdrawals that exceed 100,000 gpd during any single month. Table 2.3.2-8 lists the

permitted groundwater users, aquifer and withdrawal rates, and annual average withdrawal rates for municipal and industrial wells within 25 mi of the VEGP site and permitted by the Georgia EPD. Table 2.3.2-9 lists similar data for agricultural wells within 25 mi of the VEGP site and permitted by the Georgia EPD. The Safe Drinking Water Information System (SDWIS) maintained by the US EPA lists community, non-transient non-community, and transient non-community water systems that serve the public. Community water systems are defined as those that serve the same people year-round (e.g., in homes or businesses). Non-transient non-community water systems are those that serve the same people, but not year-round (e.g., schools that have their own water system). Transient non-community water systems are those that do not consistently serve the same people (e.g., rest stops, campground, gas stations). Table 2.3.2-10 lists the community, non-transient non-community, and transient non-community water systems using groundwater as their primary water source within 25 mi of the VEGP site.

The locations of the agricultural, industrial, and municipal wells permitted by the Georgia EPD along with the public water system wells listed in the SDWIS database within 25 mi of the VEGP site are shown in Figure 2.3.2-7. (Note that wells currently serving existing VEGP Units 1 and 2 are not shown on Figure 2.3.2-7; these wells are discussed in Section 2.3.2.2.2, Onsite Use.) These data indicate the nearest permitted agricultural well (William Hatcher, A-28 to be about 3.4 mi northwest of the VEGP site, while the nearest permitted industrial well (International Paper, I-1) is about 8.5 mi northwest of the site. The nearest municipal well (City of Waynesboro, M-1) is seen to be about 14.5 mi west-southwest of the VEGP site. The nearest SDWIS-listed well (Delaigle Mobile Home Park, C-6) is about 4.9 mi southwest of the VEGP site. These wells are sufficiently distant from the VEGP site such that pumping these wells would have no effect on groundwater levels at the VEGP site. The recharge areas for the source aquifers for the nearest Georgia EPD-permitted wells are in their outcrop areas located up-gradient of the VEGP site and beyond the influence of the new units.

Regionally, projected overall water use is expected to increase through 2035 for Burke County. Surface water usage is also increasing; however, it is increasing at a much slower rate than groundwater usage, approximately 5 percent versus 17 percent. Burke County's water usage, including both surface and groundwater, is projected to be 100 to 120 mgd for 2035 **(Fanning et al. 2003)**. Projections for Burke County total water demand are provided in the Comprehensive Water Supply Management Plan for Burke County and its Municipalities **(Rutherford 2000)**. Assuming current water use usage patterns, daily water demands are projected to nearly double between 2000 and 2050 with 2050 demands projected to be 10.94 mgd for domestic use, 14.73 mgd for industrial use, and 40.96 mgd for agricultural use, which totals 66.63 mgd **(Rutherford 2000)**.

2.3.2.2.2 Onsite Use

Local groundwater use includes domestic wells and wells supplying water to existing VEGP Units 1 and 2. Operating plant uses include makeup process water, utility water, potable water, and

supply for the fire protection system. Table 2.3.2-11 lists these wells, while Figure 2.3.2-8 identifies their location. Current permitted withdrawal rates are a monthly average of 6 mgd and an annual average of 5.5 mgd, as permitted by the Georgia EPD. Three of the wells are in the Cretaceous aquifer at depths varying from 851 to 884 ft, with design yields of 1,000 to 2,000 gpm. These wells provide makeup water for the plant processes. The remaining six wells extend into the Tertiary aquifer, range in depth from 200 to 370 ft, and have design yields of 20 to 150 gpm. Average annual usage levels for 1999 to 2004 from all wells excluding SEC are from 0.79 to 1.44 mgd **(SNC 2005b)**. The SEC well was added in 2005 and will be included in water usage data for 2006. Recent groundwater usage from June 2005 to December 2005 is in Table 2.3.2-12.

Table 3.3-1 in Section 3.3 and Table 2.3.2-13 show projected groundwater use for two AP1000 units with normal and maximum usage values. Service water system make-up, potable water system, demineralized water system, fire protection system, and miscellaneous users are the intended uses. Groundwater needed to supply VEGP Units 3 and 4 will be obtained from two 1,500 gpm wells installed in the Cretaceous aquifer. The maximum case water demand is conservatively based on several plant operating modes that are not expected to operate concurrently. During normal operation, only one pump will be required to run approximately 50 percent of the time to supply the plant water needs. Based on the wells that currently supply makeup water for plant processes for the existing Units 1 and 2 (MU-1 and MU-2A), the proposed wells will extend to a depth of approximately 850 ft below the ground surface and will be open to selected aquifer zones within the Cretaceous aquifer. The proposed locations of the new wells are shown in Figure 2.3.2-9. SNC's groundwater use permit **(SNC 2005a)** will be modified accordingly.

Table 2.3.2-1 List of Counties Located in the Savannah River Basin and Within 50 Miles of the VEGP Site

Counties within the Savannah River Basin		
Georgia	**South Carolina**	**Comments**
McDuffie		
Glascock		A small area is within the river basin
Columbia		
Jefferson		A small area is within the river basin
Richmond		
Burke		
Jenkins		A small area is within the river basin
Screven		
Effingham		A small area is within 50-mi radius
	McCormick	A small area is within 50-mi radius
	Edgefield	
	Aiken	
	Barnwell	
	Allendale	
	Hampton	
	Jasper	A small area is within the river basin and 50- mi radius

Table 2.3.2-2 Registered Surface Water Uses in the Savannah River Basin Within the State of Georgia

Serial No.	County	Facility	Municipal/ Industrial[1]	Source Water	Max Daily Withdrawal (mgd)[2]	Monthly Average (mgd)	Approximate Location
1	Banks	Banks County Board of Commissioners	M	Mtn. Cr. Res. Strctr 11	1.00	1.00	Tributary to the Broad River[a]
2	Burke	Southern Nuclear Operating Co., Inc.	I	Savannah River	127.00	85.00	River Mile 151.1
3	Burke	Waynesboro, City of	M	Brier Creek	1.50	1.00	The Brier Creek[b]
4	Chatham	International Paper Corporation	I	Savannah River	58.00	50.00	Between River Miles 8.0 and 29.0
5	Chatham	Kerr-McGee Chemical, LLC	I	Savannah River	30.00	20.00	Between River Miles 8.0 and 29.0
6	Chatham	Georgia Power Co-Riverside	I	Savannah River	174.00	174.00	Between River Miles 8.0 and 29.0
7	Chatham	Georgia Power Co-Pt Wentworth	I	Savannah River	267.00	267.00	Between River Miles 8.0 and 29.0
8	Chatham	Weyerhauser Company	I	Savannah River	30.50	27.50	Between River Miles 8.0 and 29.0
9	Chatham	Weyerhauser Company	I	Savannah River	60.00	30.00	Between River Miles 8.0 and 29.0
10	Columbia	Columbia County Water System	M	J.S. Thurmond[3] Reservoir	8.00	8.00	From J.S. Thurmond Reservoir[c]
11	Columbia	Columbia County Water System	M	Stevens Creek Reservior	31.00	31.00	Approximate River Mile 210.0
12	Effingham	Fort James Operating Company	I	Savannah River	35.00	35.00	Approximate River Mile 45.0
13	Effingham	Georgia Power Co-McIntosh	I	Savannah River	130.00	130.00	Approximate River Mile 45.0
14	Effingham	Savannah Ind. & Domestic Water	M	Abercorn Creek	55.00	50.00	Aabercorn Creek[d]
15	Elbert	Elberton, City of	M	Beaverdam Creek	2.20	1.70	Beaverdam Creek[e]
16	Elbert	Elberton, City of	M	Lake Russell	4.10	3.70	Beaverdam Creek[e]
17	Franklin	Lavonia, City of	M	Crawford Creek	1.50	1.50	Tributary to the Broad River[a]
18	Franklin	Lavonia, City of	M	Lake Hartwell	3.00	3.00	Hartwell Reservoir[f]
19	Franklin	Royston, City of	M	N Fork of Broad River	1.00	1.00	The Broad River[a]
20	Greene	Union Point, City of	M	Sherrill Cr Reservoir	0.45	0.33	Tributary to the Little River, GA[g]
21	Hart	Hartwell, City of	M	Lake Hartwell	4.50	3.50	Hartwell Reservoir[f]
22	Jackson	Commerce, City of	M	Grove Creek	4.50	4.20	Tributary to the Broad River[a]

Table 2.3.2-2 (cont.) Registered Surface Water Uses in the Savannah River Basin Within the State of Georgia

Serial No.	County	Facility	Municipal/ Industrial[1]	Source Water	Max Daily Withdrawal (mgd)[2]	Monthly Average (mgd)	Approximate Location
23	Jefferson	J M Huber Corp - Reedy Creek	I	Reedy Creek	5.80	4.00	Tributary to the Brier Creek[b]
24	Lincoln	Lincolnton, City of	M	J.S. Thurmond Reservoir	0.63	0.63	J.S. Thurmond Reservoir[c]
25	Madison	Turner Concrete Company, Incorporated	I	Broad River	0.60	0.30	The Broad River[a]
26	McDuffie	Thomson-McDuffie County W/S Commission	M	J.S. Thurmond Reservoir	3.00	2.00	J.S. Thurmond Reservoir[c]
27	McDuffie	Thomson-McDuffie County W/S Commission	M	Usry's Lake	2.00	1.50	Tributary to the Brier Creek[b]
28	Oglethorpe	Crawford, City of	M	Trib To Long Creek	0.43	0.25	Tributary to the Broad River[a]
29	Rabun	Clayton-Rabun Co. Water & Sewer Authority	M	Lake Rabun	2.00	2.00	Close to the border with North Carolina
30	Richmond	Augusta-Richmond County	M	Augusta Canal	50.00	45.00	Between River Miles 187 and 210
31	Richmond	Augusta-Richmond County	M	Savannah River	21.00	15.00	Between River Miles 187 and 210
32	Richmond	Avondale Mills - Augusta Canal	I	Augusta Canal	1.44	0.65	Between River Miles 187 and 210
33	Richmond	DSM Chemicals Augusta, Inc.	I	Savannah River	8.20	6.80	Between River Miles 187 and 210
34	Richmond	Fort Gordon - Butler Creek	I	Butler Creek	5.40	5.00	Between River Miles 187 and 210
35	Richmond	Fort Gordon - Cow Branch	I	Cow Branch	0.70	0.60	Between River Miles 187 and 210
36	Richmond	Fort Gordon - Lietner Lake	I	Lietner Lake	0.50	0.40	Between River Miles 187 and 210
37	Richmond	Fort Gordon - Union Mill Pond	I	Union Mill Pond	0.25	0.20	Between River Miles 187 and 210
38	Richmond	General Chemical Corp., Augusta Plant	I	Savannah River	5.65	5.30	Between River Miles 187 and 210
39	Richmond	International Paper - Augusta Mill	I	Savannah River	79.00	72.00	Between River Miles 187 and 210
40	Richmond	PCS Nitrogen Fertilizer, L.P	I	Savannah River	21.60	10.80	Between River Miles 187 and 210
41	Stephens	Toccoa, City of	M	Lake Yonah	6.00	6.00	Tributary to the Tugaloo River[h]
42	Stephens	Toccoa, City of - Lake Toccoa	M	Lake Toccoa	9.00	9.00	Tributary to the Tugaloo River[h]
43	Warren	J M Huber Corp -Brier Creek	I	Brier Creek	5.00	2.50	The Brier Creek[b]
44	Warren	Thiele Kaolin Company	I	Newsome's Mill Pond	0.75	0.50	Tributary to the Brier Creek[b]

Table 2.3.2-2 (cont.) Registered Surface Water Uses in the Savannah River Basin Within the State of Georgia

Serial No.	County	Facility	Municipal/ Industrial[1]	Source Water	Max Daily Withdrawal (mgd)[2]	Monthly Average (mgd)	Approximate Location
45	Wilkes	Washington, City of - Clarks Hill	M	J.S. Thurmond Reservoir	2.20	2.00	J.S. Thurmond Reservoir[c]
46	Wilkes	Washington, City of - Old Plant	M	Little Beaverdam Cr	2.20	1.80	Tributary to the Little River, GA[g]

[1] M = Municipal; I =Industrial
[2] (mgd) million gallons per day
[3] J. Strom Thurmond
[a] Confluence of the Broad River with the Savannah River is at River Mile 269.6
[b] Confluence of the Brier Creek with the Savannah River is at River Mile 102.5
[c] J. Storm Thurmond Dam located at River Mile 221.6
[d] Abercorn Creek mouth at River Mile 29.0
[e] The Beaverdam Creek is tributary to Richard B. Russell Reservoir; the Richard B. Russell Dam is located at River Mile 259.1
[f] Hartwell Dam located at River Mile 288.9
[g] Mouth of the Little River at River Mile 223.4
[h] Tugaloo River fork at River Mile 312.1
Location Source: Georgia DNR 2006; Fanning 2003; and USACE 1996

Source: Georgia DNR 2006

Table 2.3.2-3 County-Wide Surface Water Withdrawals, in Million Gallons Per Day (mgd), for Different Consumptive Surface Water Use Categories Within the State of South Carolina for 2004

Serial No.	County	Agriculture	Golf Course	Industrial	Water Supply	Thermo-electric	Total	Comments
1	Greenville	0.00	0.00	0.00	18.89	0.00	18.89	
2	Pickens	0.00	0.19	8.32	3.26	0.00	11.77	
3	Oconee	0.09	0.28	1.84	9.78	5891.37	5,903.36	Thermoelectric water use is for once-through cooling in the Oconee Nuclear Power Plant
4	Anderson	0.00	0.25	0.16	18.34	0.80	19.54	
5	Abbeville	0.00	0.00	0.00	2.78	0.00	2.78	
6	Greenwood	0.00	0.06	0.00	0.00	0.00	0.06	
7	McCormick	0.00	0.11	0.00	1.15	0.00	1.26	
8	Edgefield	0.19	0.12	0.00	4.22	0.00	4.53	
9	Aiken	0.00	0.49	3.42	3.99	0.00	7.90	
10	Barnwell	0.00	0.00	0.00	0.00	0.00	0.00	
11	Allendale	0.00	0.00	0.00	0.00	0.00	0.00	
12	Hampton	0.04	0.00	0.00	0.00	0.00	0.04	
13	Jasper	0.00	0.00	0.00	0.00	0.00	0.00	
14	Beaufort	0.00	0.00	0.00	19.62	0.00	19.62	

Note: mgd values are obtained from the reported annual total water use.

Source: SC DHEC 2005

Table 2.3.2-4 Annual Surface Water Use Within 6 Miles of the VEGP Site

Location	VEGP (mgd)				SRS (mgd)	D-Area Power house (mgd)				Urquhart Station (mgd)			
Year	2004		2003		2004	2004		2005		2004		2005	
Month	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.	Monthly Avg.	Daily Max.
January	63.4	63.4	63.4	63.4	2.9			37.3	40.1			96.0	190.0
February	64.0	75.6	63.3	66.3	2.9			45.6	55.6			78.0	78.0
March	64.5	70.8	63.8	70.0	2.9			49.1	58.8			70.0	78.0
April	66.8	80.6	64.0	71.0	2.9			56.6	66.6			78.0	78.0
May	64.1	68.9	65.2	75.6	2.9			47.1	63.3			78.0	78.0
June	63.5	67.3	63.9	67.0	2.9	60.8	65.0			80.0	134.0		
July	64.1	68.8	65.0	74.8	2.9	43.1	53.6			103.0	190.0		
August	64.3	71.3	55.2	76.2	2.9	36.3	37.5			91.0	190.0		
September	63.8	71.9	67.6	78.1	2.9	38.5	43.3			83.0	190.0		
October	63.4	65.7	63.4	63.5	2.9	36.2	38.8			82.0	134.0		
November	63.8	69.8	63.8	70.5	2.9	42.6	53.6			75.0	134.0		
December	64.3	74.2	63.4	63.4	2.9	37.4	40.7			75.0	78.0		

Table 2.3.2-5 Registered Groundwater Users in the Savannah River Basin Within 50 Miles of the VEGP Site in Georgia

Serial No.	COUNTY	PERMIT USER NAME	PERMIT EXPN. DATE	PERMITTED MONTHLY AVG W/D (mgd)[1]	PERMITTED YEARLY AVG W/D (mgd)	# OF WELLS	PERMITTED AQUIFER
1	Burke	Waynesboro, City of	21-Dec-07	4.00	3.50	3	Cretaceous Sand
2	Burke	Southern Nuclear Operating Co-Plant Vogtle	6-Aug-10	6.00	5.50	8	Cretaceous Sand
3	Burke	International Paper - McBean Woodyard	2-Oct-08	0.95	0.95	2	Cretaceous Sand
4	Burke	Sardis, City of	31-Oct-13	0.40	0.40	2	Cretaceous Sand
5	Columbia	Harlem, City of	21-Dec-14	0.28	0.25	4	Crystalline Rock
6	Columbia	Grovetown, City of	18-Apr-15	0.90	0.90	4	Crystalline Rock
7	Columbia	Columbia County Water Department	22-Dec-06	0.58	0.58	1	Crystalline Rock
8	Columbia	Southern Beverage Packers, Inc	10-Nov-12	0.14	0.14	7	Crystalline Rock
9	Effingham	Rincon, City of	31-Dec-05[a]	1.25	0.87	4	Floridan
10	Effingham	Springfield, City of	31-Dec-05[a]	0.40	0.38	2	Floridan
11	Effingham	Georgia Power Co - Plant McIntosh	31-Dec-05[a]	0.55	0.45	2	Floridan
12	Effingham	Fort James Operating Company	31-Dec-05[a]	4.00	3.00	5	Floridan
13	Effingham	Lost Plantation Golf Course	31-Dec-05[a]	0.40	0.40	1	Floridan
14	Effingham	Springfield, City of - Effingham county Industrial Development Authority	31-Dec-05[a]	0.40	0.40	2	Floridan
15	Effingham	Coastal Water & Sewerage Company	31-Dec-05[a]	0.30	0.30	2	Floridan
16	Effingham	Effingham County Board of Commissioners	31-Dec-05[a]	0.12	0.12	3	Floridan
17	Glascock	Thiele Kaolin Co - Reedy Creek Plant	23-Jan-15	0.10	0.10	2	Barnwell (Eocene Age)
18	Jefferson	J.M. Huber Corp - Wrens Plant	26-Sep-14	1.87	1.69	4	Dublin - Midville
19	Jefferson	Wrens, City of	21-Aug-15	0.80	0.65	4	Cretaceous Sand
20	Jefferson	J.M. Huber Corp - Wrens Plant	10-Mar-11	0.70	0.60	2	Cretaceous Sand
21	Richmond	Prayon, Inc	29-Aug-14	0.42	0.38	2	Cretaceous Sand
22	Richmond	Hephzibah, City of	1-Oct-10	1.20	1.20	3	Cretaceous Sand
23	Richmond	Augusta-Richmond Utilities Department	29-Jan-05[b]	18.40	17.40	31	Cretaceous Sand

Table 2.3.2-5 (cont.) Registered Groundwater Users in the Savannah River Basin Within 50 Miles of the VEGP Site in Georgia

Serial No.	COUNTY	PERMIT USER NAME	PERMIT EXPN. DATE	PERMITTED MONTHLY AVG W/D (mgd)[1]	PERMITTED YEARLY AVG W/D (mgd)	# OF WELLS	PERMITTED AQUIFER
24	Richmond	East Central Regional Hospital - Gracewood Campus	19-Mar-06	0.50	0.40	4	Cretaceous Sand
25	Richmond	Olin Corporation	25-Apr-15	1.22	1.22	2	Cretaceous Sand
26	Richmond	Thermal Ceramics, Inc.	6-Mar-15	0.90	0.90	5	Cretaceous Sand
27	Richmond	Pine Hill W&S / Bought by Richmond County	12-Dec-99[b]				Cretaceous Sand
28	Richmond	Procter & Gamble Manufacturing Company	21-Mar-08	0.70	0.70	2	Cretaceous Sand
29	Richmond	Olin Corporation - Corrective Action Wells	23-Jul-06	0.91	0.91	15	Cretaceous Sand, KT-3, KT-1
30	Richmond	Alternate Energy Resources, Inc	27-Sep-07	0.43	0.43	15	Cretaceous Sand (Upper)
31	Richmond	Southern Wood Piedmont Company	13-Nov-10	0.65	0.65	12	Cretaceous Sand (Gaillard)
32	Richmond	Fort Gordon - Department of the Army	12-Oct-11	0.15	0.15	12	Crystalline Rock, Cretaceous Sand
33	Screven	Sylvania, City of	7-Jan-07	1.50	1.30	4	Floridan

[1] (mgd) million gallons per day

[a] Information updated as of September 2005

[b] Water used not specified as expired

Source: Georgia DNR 2006