Prepared for
Paulding County, Georgia

Source Water Assessment Plan
Richland Creek Reservoir
Water Supply Program

August 15, 2017

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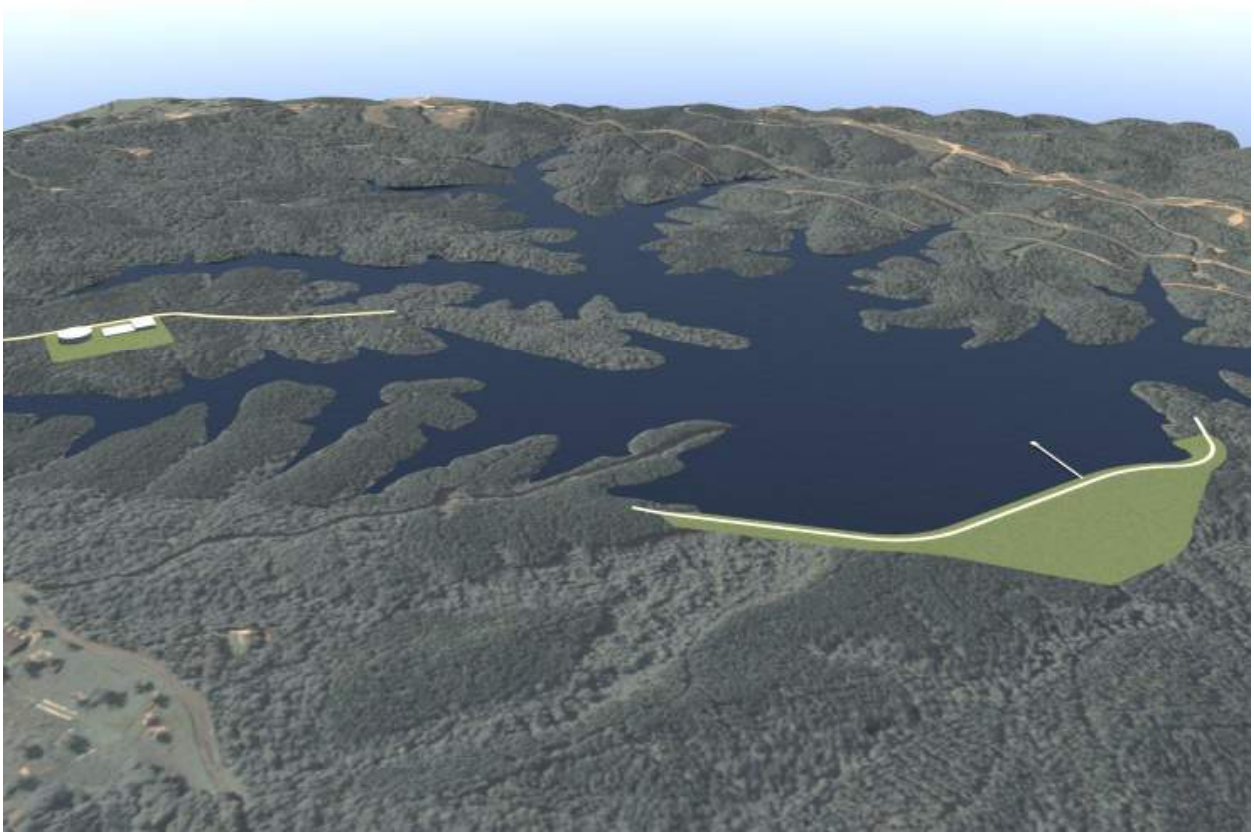
RICHLAND CREEK RESERVOIR



Source Water Assessment Plan for Paulding County Richland Creek Reservoir Water Supply Program

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Paulding County Water, Paulding County, Georgia
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Table of Contents

List of Figures

List of Tables

List of Abbreviations

ACT	Alabama-Coosa-Tallapoosa
BMP	best management practice
CAFO	confined animal feedlot operation
CCMWA	Cobb County-Marietta Water Authority
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
DO	dissolved oxygen
EPA	Environmental Protection Agency
GA EPD	Georgia Environmental Protection Division
FC	fecal coliform
FCG	fish consumptive guidance
FRS	Facility Registry Service
GIS	geographic information system
hp	horsepower
HSI	Hazardous Site Inventory
IFD	industrial facility discharge
IMZ	inner management zone
LAS	land application system
mgd	million gallons per day
NMZ	non-management zone
NPDES	National Pollution Discharge Elimination System
OMZ	outer management zone
PCB	polychlorinated biphenyl
RCRA	Resource Conservation and Recovery Act
SARA	Superfund Amendments and Reauthorization Act of 1986
SDWA	Safe Drinking Water Act
SSO	sanitary sewer overflow
SWAP	Source Water Assessment Plan
SWPP	Source Water Protection Plan
TMDL	total maximum daily load
TRI	Toxic Release Inventory
TSD	treatment, storage, or disposal
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
WTP	water treatment plant
WWTP	wastewater treatment plant

Executive Summary

Paulding County has long relied on the Cobb County-Marietta Water Authority for its water supply. With the area's population expected to double over the next 25 years, the County is implementing the Richland Creek Reservoir Water Supply Program to secure a new, independent water supply for future generations of residents.

New infrastructure constructed through the Richland Creek Reservoir Water Supply Program includes a dam, reservoir, water treatment plant, two major pump stations, and approximately 15 miles of pipeline. The Water Supply Program will withdrawal water from the Etowah River, which is then pumped and stored in the new water supply storage reservoir along Richland Creek. This Source Water Assessment Plan (SWAP) identifies potential sources of pollution within the Etowah River and Richland Creek watersheds and assesses the susceptibility of these pollutants on the quality of the County's new drinking water supply.

Information from this assessment was used to development recommendations to prevent and protect Paulding County's public water supply from contamination of upstream sources such as urban and agricultural runoff, accidental spills and releases from businesses, and direct discharges to waterways.

Assessment Process

The source water assessment was conducted through the following steps:

1. **Define watersheds.** The watershed areas that can impact the quality of the source water at the new water supply intakes were defined. Topography, hydrology, and road locations were also established within each area.
2. **Collect Water Quality Data.** Numerous sources of available water quality data were documented to understand water quality concerns within each water supply watershed and establish a baseline of water quality. Data was gathered from Georgia Environmental Protection Division's (GA EPD) lists of impaired waters, Etowah River monitoring stations located near the raw water intake, and raw and treated water quality data from Lake Allatoona.
3. **Inventory Potential Sources.** Potential point (direct discharges to a water body) and non-point (indirect runoff to a water body) pollution and contaminant sources were compiled, categorized, and evaluated. A more rigorous evaluation of sources was conducted on area closest to the drinking water intake—the inner management zone (IMZ), within a 7-mile radius from the intakes, and the outer management zone (OMZ) within a 20-mile radius from the intakes.
4. **Determine Susceptibility of Intakes.** The potential for a pollutant to be released into surface water and its associated risk to the water supply at the Richland Creek Reservoir and Etowah River was assessed and ranked.
5. **Provide Data to Utilities and Public.** Assessment results will be made available to the population served by the public water system, and may be used to develop prevention and protection strategies as part of local planning efforts.

Source Water Assessment Area

Two watershed areas upstream from the drinking water intake and reservoir can impact the quality of the County's new source water supply—the watershed draining to the water supply storage

reservoir on Richland Creek, and the watershed draining to the raw water intake pump station on the Etowah River that will supply the reservoir.

- **Reservoir Watershed**. The 305-acre pump storage water supply reservoir will be constructed on Richland Creek, a tributary to the Etowah River. The reservoir footprint covers the majority of this 2.5-square-mile watershed, which also includes woods and sparse residential areas. The entire watershed lies within the IMZ.
- **Raw Water Intake Watershed.** The raw water intake, which will augment the reservoir with up to 47 mgd each day, will be constructed on the Etowah River in Bartow County. The watershed at the intake measures approximately 1,290 square miles, reaching from Lumpkin County in the northeast to Paulding County in the southwest. Portions of the watershed span the IMZ, OMZ, and the non-management zone (NMZ), which is the area beyond a 20-mile radius from the intake.

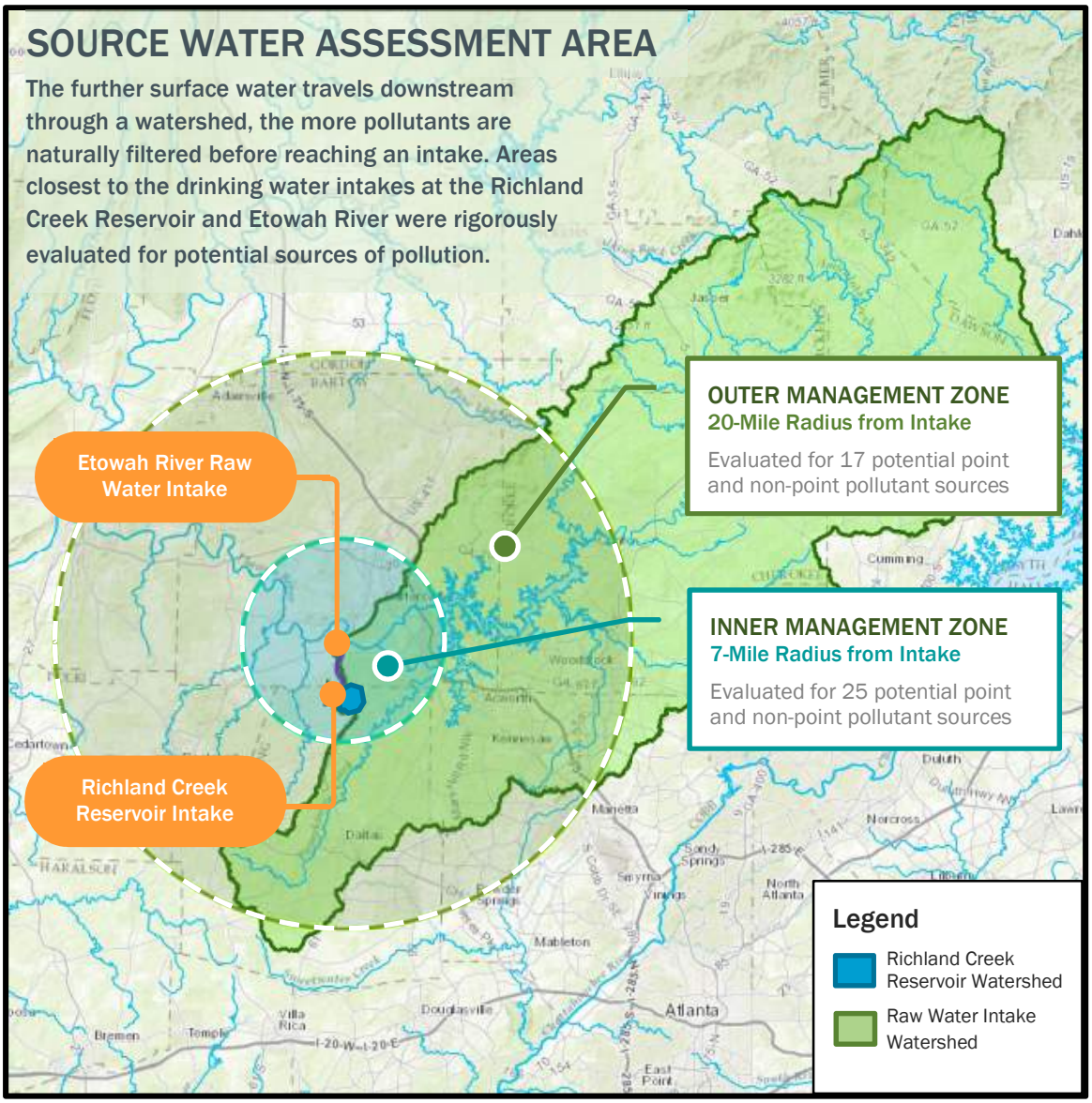

Figure ES-1. Source Water Assessment Area

Drinking Water Susceptibility

Overall, the Richland Creek Reservoir watershed's susceptibility to pollutants is low, and the Etowah River raw water intake watershed's is medium.

Reservoir Watershed

Potential non-point source pollution sources identified include roadways and non-sewer (septic) areas. No primary roads cross surface waters within the reservoir watershed. Several roads form the boundary of the watershed; however, their distance from the reservoir pose a low risk of pollutants reaching the water within the reservoir.

The homes within the watershed boundary are assumed to be on septic systems, and non-sewer areas pose risks of the presence of pathogens leaching from failing systems. However, there are very few homes, and all located far from the reservoir. The potential of pollutants reaching the source water at the reservoir is low due to the distance of the homes from the reservoir, the small potential volume and duration of a septic release, and by the path pathogens must take through soil and groundwater to reach surface water supplies.

No point source potential pollution sources were identified with the Richland Creek Reservoir watershed.

Raw Water Intake Watershed

Potential point and non-point pollutant sources were identified in the Etowah River raw water intake watershed. Non-point sources identified include dense populations of livestock, use of agricultural chemicals, and urban areas with more than 20 percent impervious surface area. Houses with septic tanks are also located in the watershed; however, due to the lack of data for areas serviced by septic tanks, and typical controls in place for those tanks, the risk of pollutants reaching the source water at the raw water intake is assumed to be low.

Potential point sources include sewer pipelines; roadways and railroads crossing streams, which pose a risk of in the event of a spill; and the Bartow County SR 294 landfill, which has a history of groundwater contamination and is located near the Etowah River; and other sites with potential for spills including wastewater treatment plants (WWTP) and lift stations.

Closer proximity of the potential pollutant source to the raw water intake raises the susceptibility ranking. It is important to remember that ranking a facility as high risk does not reflect on management, but rather its potential for contamination that can be addressed through preventive planning. For example, facilities that store large volumes of chemicals also typically have secondary containment onsite, which mitigates the release of pollutants.

Recommendations

Non-point source pollution can be prevented or addressed through a variety of methods including education and outreach programs, urban runoff controls such as street sweeping and storm sewer inspections, enforcement of stream buffer requirements for small source water watersheds, and other programs targeted at each category of land use. With the large industrial and manufacturing base in the area, the higher risk to water quality posed by point source pollutants such as railroad and road crossings is an opportunity to ensure that emergency response plans to effectively address spills are up to date.

Specific efforts to prevent and protect the County's drinking water supply watersheds from potential pollutant sources may include:

- Presenting SWAP results to local community groups, emphasizing the need to protect water quality within the water supply watershed.
- Distributing flyers to businesses in the drinking water supply watershed (especially in the IMZ) with a map of the watershed and information about who to contact in case of a spill.
- Verifying that businesses in the watershed (especially in the IMZ) have secondary containment and up-to-date spill prevention and emergency response plans in place.
- Managing types of growth and new development that occurs within the watershed and proximity to the drinking water intakes.
- Encouraging urban stormwater ordinances and controls, where necessary.
- Working with local farmers, the Natural Resources Conservation Service, and Farm Bureau representatives to ensure that stream buffers and agricultural best practices are being followed.
- Developing an emergency response plan for handling an accident with a spill along major corridors that cross these drinking water supply watersheds.
- Develop operational plans for monitoring of water quality and action to be taken in the event that water quality is jepordized by contamination.
- Developing water protection measures with cooperation from the counties and other municipalities within the watershed.

Additionally, planning for development should be considered, especially in each watershed's IMZ, to continue to ensure a safe, reliable drinking water supply. Roadway expansion, new road construction, industry relocation, and residential subdivisions throughout the area will need to be effectively planned, managed, and routed to keep from posing significant risks to the water quality in these watersheds.

Section 1

Project Overview

This SWAP was prepared for the Paulding County Richland Creek Reservoir in accordance with Georgia's Source Water Assessment and Protection Implementation Plan for Public Drinking Water Sources, effective May 1, 2000. This SWAP evaluates two watersheds: the watershed for the water supply storage reservoir on Richland Creek, and the watershed for the raw water intake pump station on the Etowah River that will supply the reservoir. The overall source water susceptibility scores are as follows:

- Richland Creek watershed: **low** source water susceptibility
- Etowah River watershed: **medium** source water susceptibility

The assessment concluded that susceptibility for drinking water supplies can be grouped into three categories:

- Landfills that have had permit violations; WWTPs, lift stations, and land application systems close to surface water
- Sewer pipelines along primary and secondary roads that cross streams and have a potential for spills
- Non-point source pollution from urban areas

This report is organized into four sections: background information, source water assessment methodology, results for each supply watershed, and summary and recommendations. Appendices provide greater detail for the susceptibility rankings.

1.1 Background Information

This section presents background information on the Richland Creek Reservoir Water Supply Program, water withdrawal permits, water supply watersheds, public involvement activities, and relevant regulatory requirements related to source water assessments.

1.1.1 Richland Creek Reservoir Water Supply Program

Access to reliable, safe drinking water is essential to any community. Paulding County, one of the only counties in the metro Atlanta region without an independent water supply, has long relied on the Cobb County-Marietta Water Authority to supply its water. With Paulding County's population projected to double over the next 25 years, an abundant, secure, and independent supply of water is needed to support a healthy, thriving community.

Paulding County is committed to meeting this essential need and is implementing the Richland Creek Reservoir Water Supply Program to secure an independent water supply for future generations of county residents. Efforts began in 1999 when the citizens of Paulding County approved development of a new water supply reservoir, a process that often takes up to 20 years. Since that time, and after significant efforts involving numerous federal and state governmental agencies including the U.S. Army Corps of Engineers (USACE), the County was granted a 404 permit in October 2015 that allows construction of the Richland Creek Reservoir Water Supply Program. Over the next 3 years, a new dam, reservoir, water treatment plant (WTP), two major pump stations, 20 miles of

pipeline, and other distribution system improvements will be constructed to secure a new sustainable water supply source for Paulding County.

The Richland Creek Reservoir Water Supply Program consists of the following five main components, as shown in Figure 1-1.

1. **Raw water intake and pump station.** The reservoir will be filled using a pump station on the Etowah River. Three intake screens located in the river will feed the pump station. The station includes four large 1,500-horsepower (hp) pumps capable of pumping up to 47 million gallons per day (mgd) into the reservoir. The pumps operate based on the level of the Etowah River, pumping more during higher river flows and less during dry periods.
2. **Raw water pipeline.** The Etowah River Intake and Pump Station will deliver water to the Richland Creek Reservoir through a 3.5-mile-long steel pipeline.
3. **Reservoir.** The reservoir is being created by constructing an earthen embankment dam, approximately 2,965 feet long and 125 feet high at its highest point. At its normal water level, the reservoir will measure approximately 305 acres and hold approximately 3.5 billion gallons of water. The dam also includes an outlet structure to receive storm flows and maintain the right flows downstream in Richland Creek during dry periods.
4. **Reservoir pump station and water treatment plant.** The Reservoir Intake and Pump Station will deliver water from the reservoir through a 1-mile-long pipeline to the WTP. The pump station will include three 400-hp pumps to deliver up to 18 mgd to the WTP, and is designed to easily add more pumps in the future as the County's water demands increase.

   At the treatment plant, water from the reservoir will be treated by a number of processes including coagulation, flocculation, dissolved air flotation, and filtration. The WTP also includes granular activated carbon to further treat the water when needed. Four 800-hp pumps deliver clean water to the distribution system for use by County residents. The WTP will treat up to 18 mgd, and is designed for future expansion as water demands increase.
5. **Distribution system improvements.** Water produced at the WTP will be conveyed by a new 12-mile-long pipeline to Dallas, where a booster pump station will pump up to 18 mgd to pressurize flows to the appropriate level. From the pump station, a pipeline will carry the water approximately 1/2 mile to connect to the existing water distribution system. The new Macland ground storage tank will also be installed to provide 1 million gallons of storage for proper system operation.

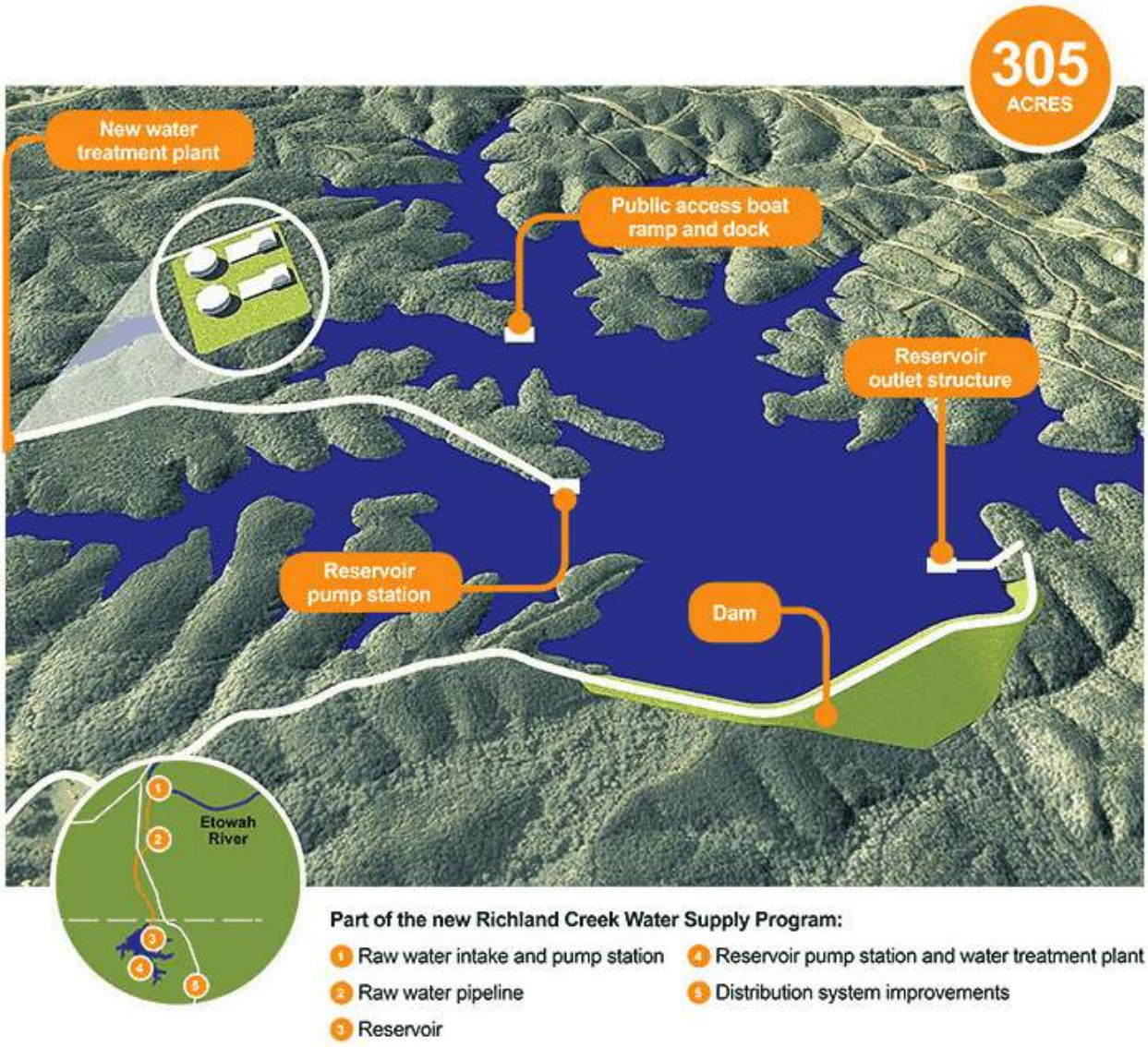

Figure 1-1. Richland Creek Reservoir Water Supply Program Main Components

1.1.2 Water Withdrawal Permits

Two water withdrawal permits are being developed by the Georgia Departement of Natural Resources Environmental Protection Division (GA EPD). These permits include:

- **Permit #110-1424-01 from Richland Creek Reservoir** with limits of 56 mgd (maximum day) / 42 mgd (monthly average) / 35 mgd (annual average)
- **Permit #110-1424-02 from Etowah River** with limits of 47 mgd (maximum day) / 47 mgd (monthly average)

1.1.3 Water Supply Watershed Description

This SWAP evaluates the watershed for the water supply storage reservoir along Richland Creek, and the watershed for the raw water intake on the Etowah River that will supply the reservoir. The locations of these watersheds are shown in Figure 1-2.

1.1.3.1 Reservoir Watershed

The new 305-acre water supply reservoir will be constructed on Richland Creek, which is a tributary to the Etowah River. The water supply watershed (i.e., area at the reservoir outlet) is located in northern Paulding County and measures approximately 2.5 square miles. The watershed area is predominantly wooded, and contains sparse residential areas along Dallas Highway to the east and along Cochran Road to the south. This watershed is shown in Figure 1-3.

1.1.3.2 Raw Water Intake Watershed

Storage in the proposed reservoir will be augmented by daily uptake of up to 47 mgd from a raw water intake on the Etowah River in Bartow County, approximately 8 miles downstream of the Lake Allatoona dam in Cartersville. The water supply watershed at the intake measures approximately 1,290 square miles, reaching from Lumpkin County in the northeast to Paulding County in the southwest. This watershed is shown in Figure 1-4.

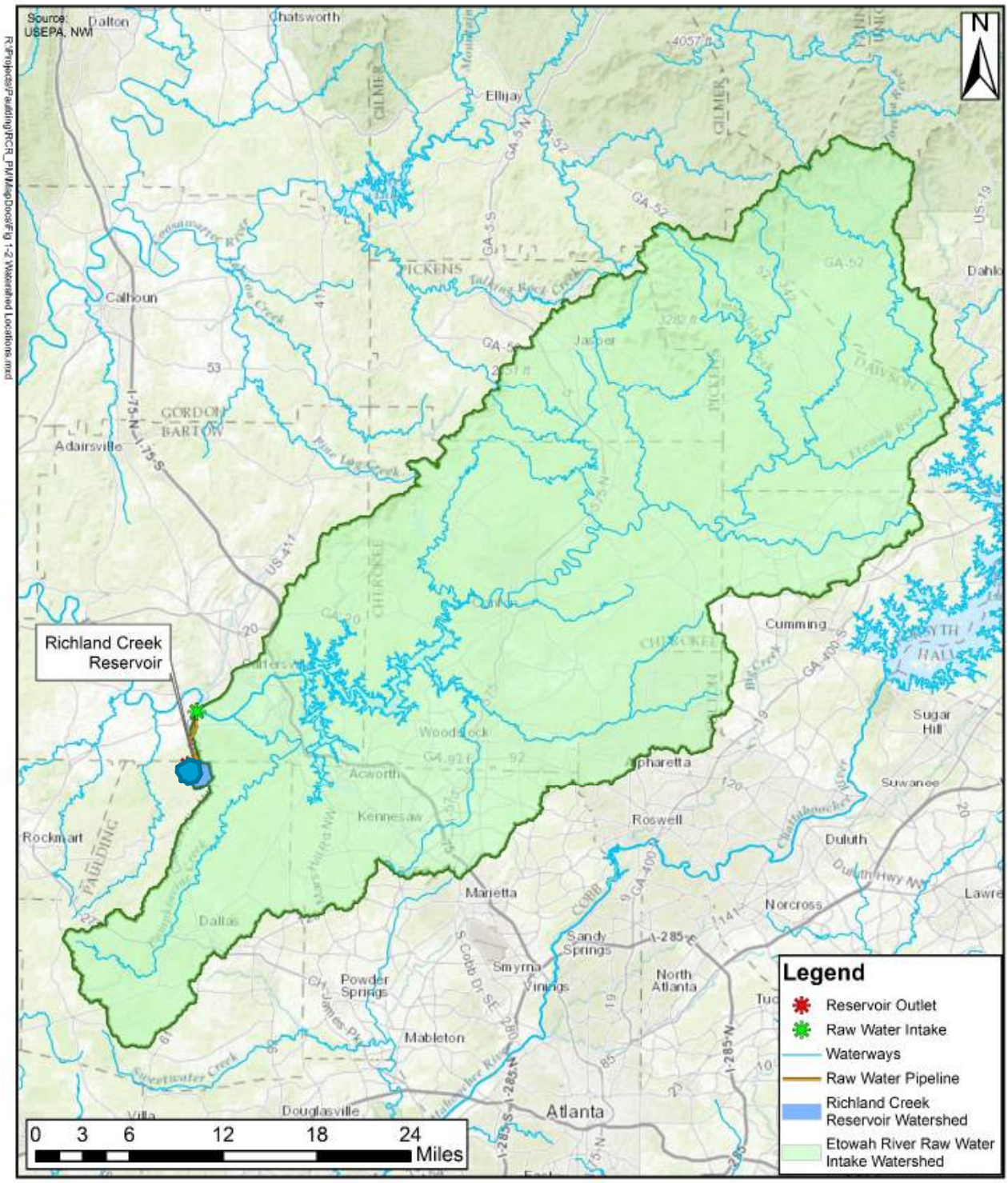

Figure 1-2. Watershed Locations

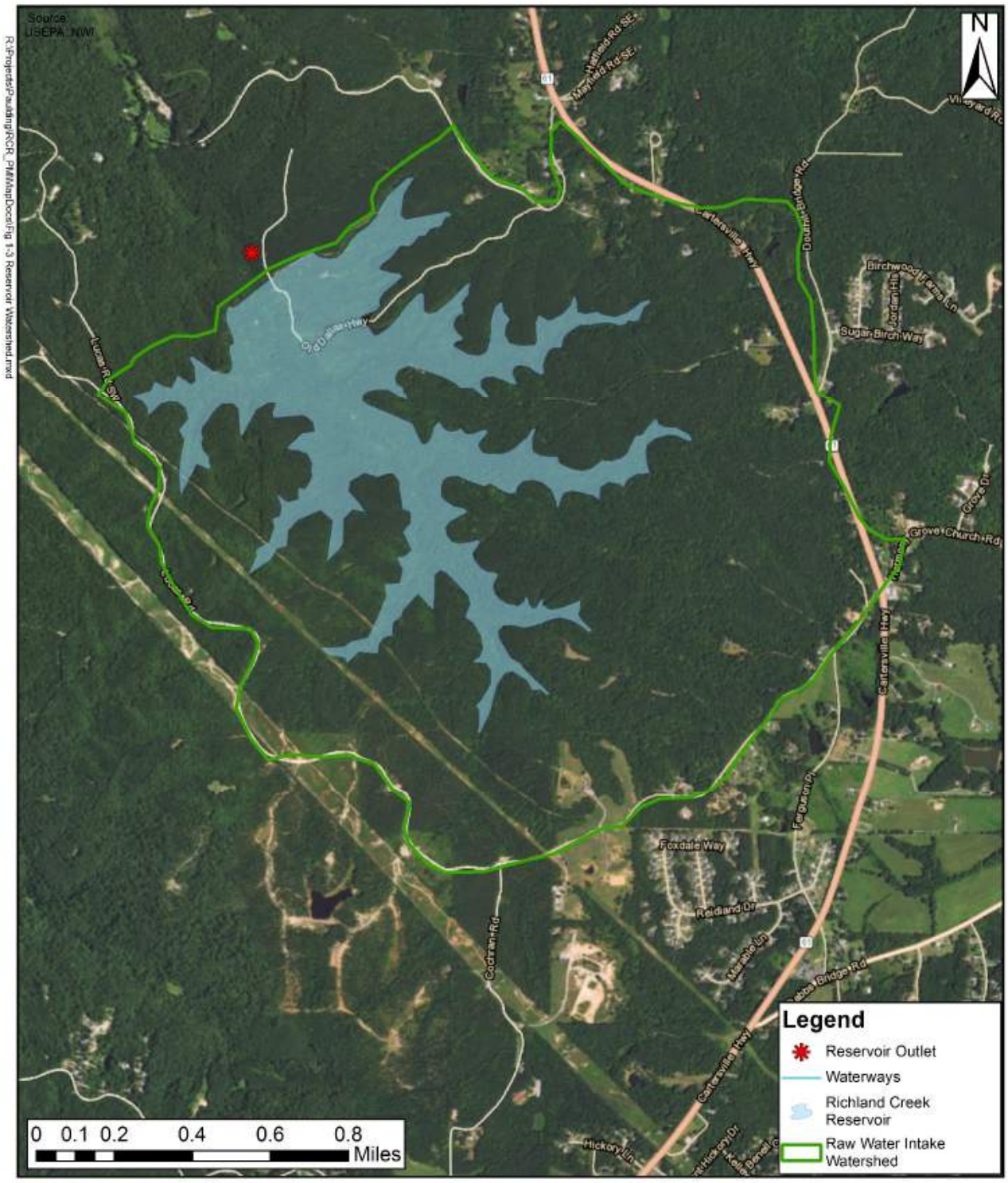

Figure 1-3. Reservoir Watershed

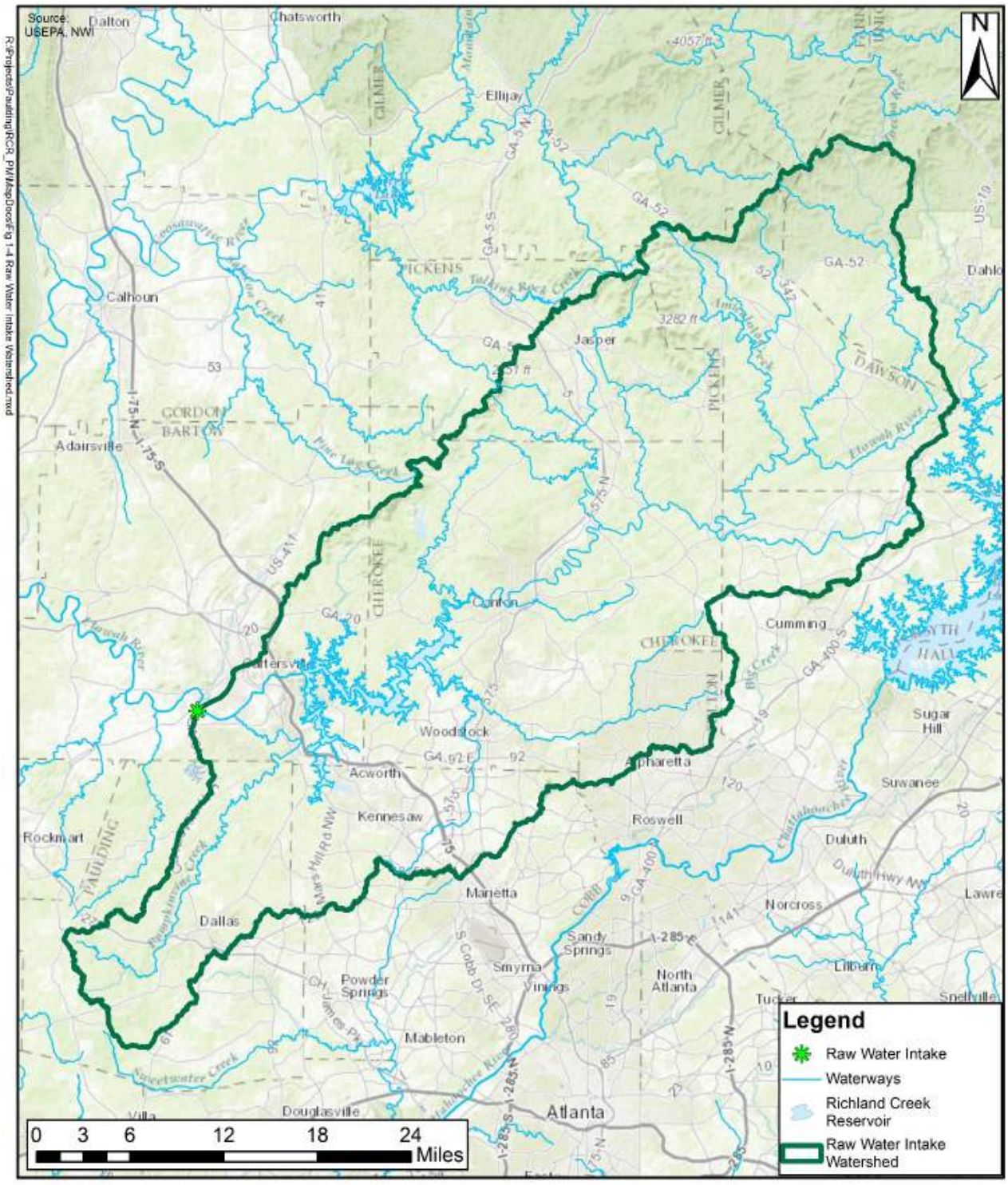

Figure 1-4. Raw Water Intake Watershed

1.2 Distributing Plan to Public

This SWAP will be made available to the public at GA EPD's Atlanta office and Paulding County's water system office at 240 Constitution Boulevard, 1st Floor, Dallas, Georgia 30132. The SWAP will also be posted on the project website, www.rcrwater.com, and announced in a public notice that will be posted in the official legal organ of Paulding County, The Dallas New Era. Public availability of the SWAP will be announced at a Paulding County Board of Commissioners Work Session, which is open to the public.

1.3 Regulatory Requirements for Source Water Assessment Plans

The 1996 amendments to the Safe Drinking Water Act (SDWA) require states to perform source water assessments for all water supply watersheds within state boundaries. The goal of the SDWA is the development and implementation of prevention and protection strategies to address potential threats to the water supply system identified through the assessment process. This law represents a movement towards a more preventive approach of avoiding contamination of public water supply systems.

The statute requires that states submit an Implementation Plan to the EPA for conducting the assessments. Georgia submitted such a plan to the EPA on January 29, 1999. The plan was approved on April 24, 2000, and became effective on May 1, 2000.

1.3.1 Responsibility for Conducting Source Water Assessments

The new SDWA requirements apply to public water systems that obtain water from surface water supplies. Surface water systems that supply water to at least 50,000 people are given primary responsibility for developing and implementing an assessment and protection plan for their system. However, these systems may request from EPD technical assistance and funding. EPD will have primary responsibility for conducting assessments for all surface water systems supplying water to less than 50,000 people. As such, EPD has generally funded this project through the Regional Development Centers. Paulding County elected to conduct their own assessment for the Richland Creek Reservoir Water Supply Program.

1.3.2 Assessment Area

The entire watershed draining to the water intake is within the protection area; however, the EPA has given states flexibility to identify and assess smaller areas or segments of the watershed for a cost- and time-effective assessment. Georgia's plan is based on protection distances defined in the EPD Rules of Environmental Planning Criteria, as part of the Georgia Planning Act of 1989. The plan identifies three assessment zones within the water supply watershed upstream from a given drinking water intake:

- The inner management zone (IMZ) – within a 7-mile radius above the intake
- The outer management zone (OMZ) – radius between 7 and 20 miles of the intake
- The non-management zone (NMZ) – remainder of watershed above the OMZ.

Figure 1-5 shows the assessment area for this SWAP and the assessment zones.

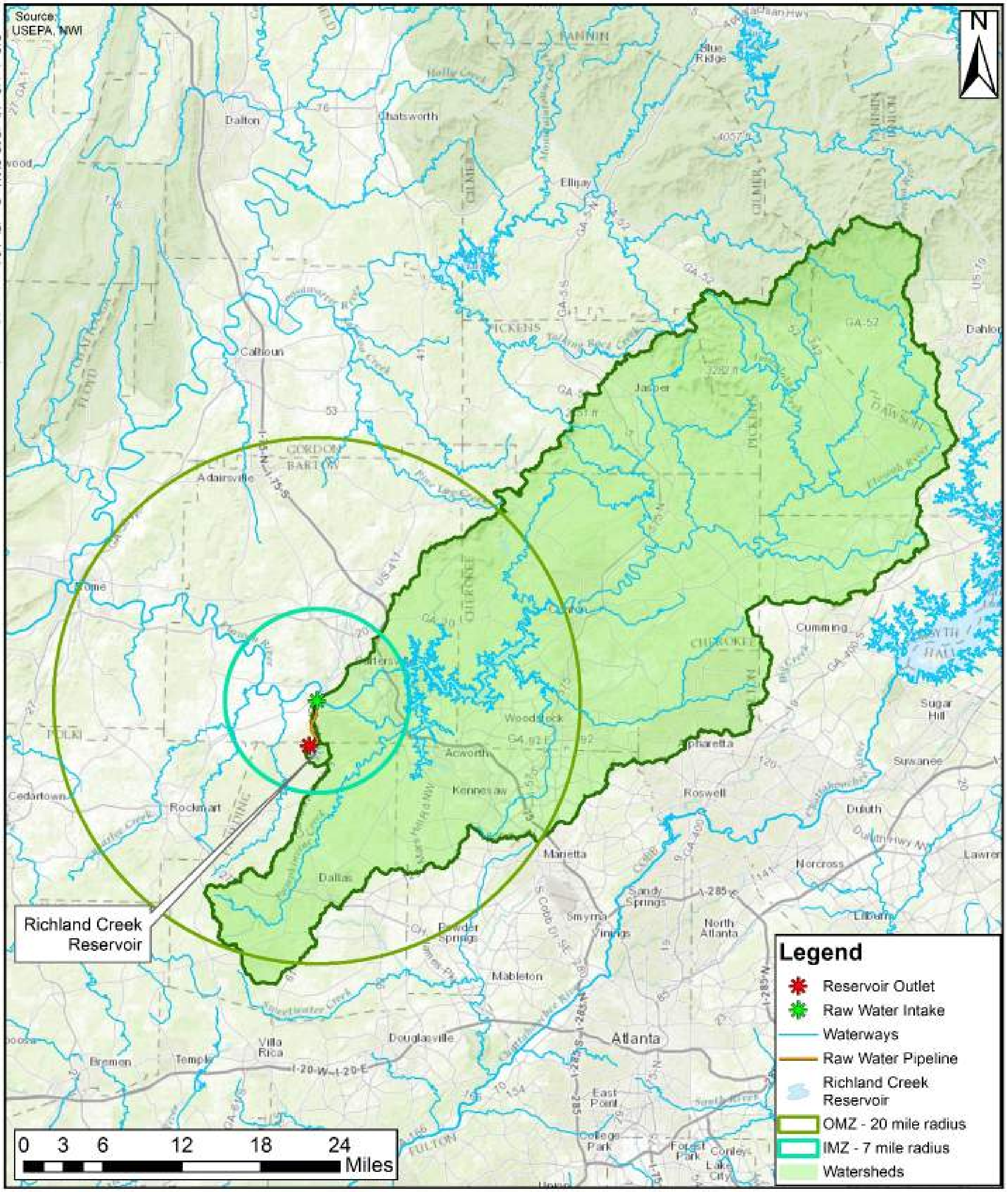

Figure 1-5. Assessment Area

1.3.3 Assessment Requirements

Each assessment must include a delineation of the drinking water supply watershed that drains to the intake location, documentation of available water quality data, inventory of potential pollution and contaminant sources, determination of the susceptibility of the drinking water source to potential contamination, and a final report. The susceptibility analysis is based on the potential for contaminants to be released into the environment, and the associated risk to the drinking water supplies. In addition, assessment results must be made available to the population served by the public water system. This information may then be used for developing source water protection plans as part of local comprehensive planning.

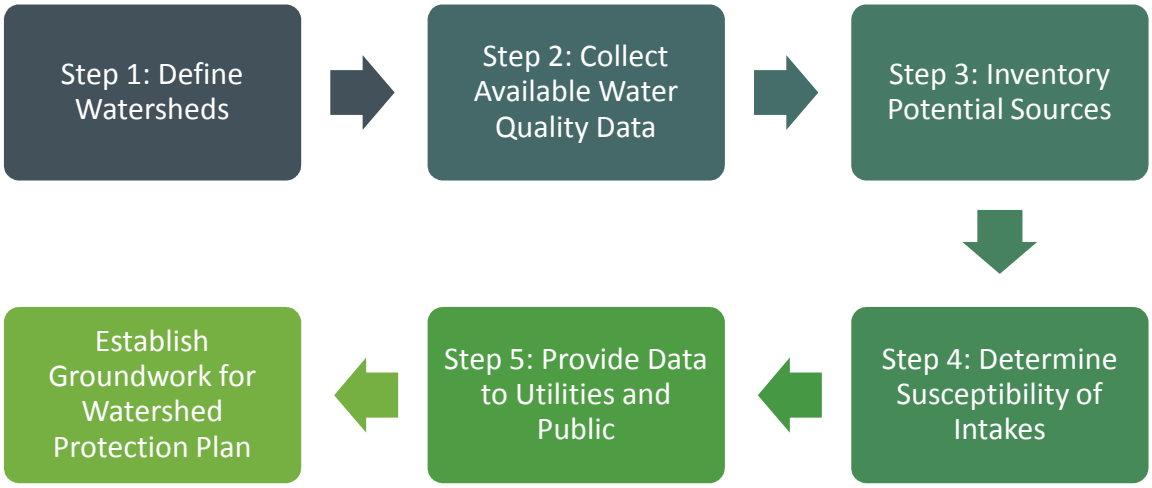

Figure 1-6. Assessment Requirements

Section 2

Source Water Assessment Methodology

This section describes the methodology used for the source water assessment of the Richland Creek Reservoir and raw water intake. The assessment followed the guidelines outlined in Georgia's Source Water Assessment and Implementation Plan, effective May 28, 2000.

Source water assessments are conducted using a systematic, phased approach for each of the surface water intakes. Each assessment must include a delineation of the drinking water supply watershed, collection of water quality data, inventory of potential pollution and contaminant sources, determination of the susceptibility of the drinking water source to potential contamination, and a final report. Information from the assessment may be used to develop source water protection plans as part of local comprehensive planning efforts.

2.1 Watershed Delineation

Each assessment must include a delineation of the drinking water supply watershed that drains to the intake location. Topography, hydrology, and placement of roads help to determine the water supply watershed delineations. The delineation draws a boundary around the area that can impact the quality of the source water. Activities within the delineated area can impact the water supply intake. For instance, certain business practices, land use activities, accidental spills, and stormwater runoff from the delineated area have the potential to flow downstream and impact the water supply.

This SWAP evaluates two watersheds: one for the water supply storage reservoir along Richland Creek, and the second for the raw water intake on the Etowah River. The location of the reservoir outlet and raw water intake is shown in Figure 2-1.

2.1.1 Reservoir Watershed

A 305-acre pump storage water supply reservoir will be constructed on Richland Creek, which is a tributary to the Etowah River. The water supply watershed (i.e., area at the reservoir outlet) is located in northern Paulding County and measures approximately 2.5 square miles. The watershed is predominantly wooded, and contains sparse residential areas along Dallas Highway to the east and Cochran Road to the south. The small watershed lies entirely within the IMZ, and the OMZ does not apply.

2.1.2 Raw Water Intake Watershed

The reservoir's storage will be augmented by daily uptake of up to 47 mgd from a raw water intake on the Etowah River in Bartow County, located approximately 8 miles downstream of Lake Allatoona dam in Cartersville. The water supply watershed at the intake measures approximately 1,290 square miles, reaching from Lumpkin County in the northeast to Paulding County in the southwest in northern Georgia, approximately 40 miles northwest of Atlanta.

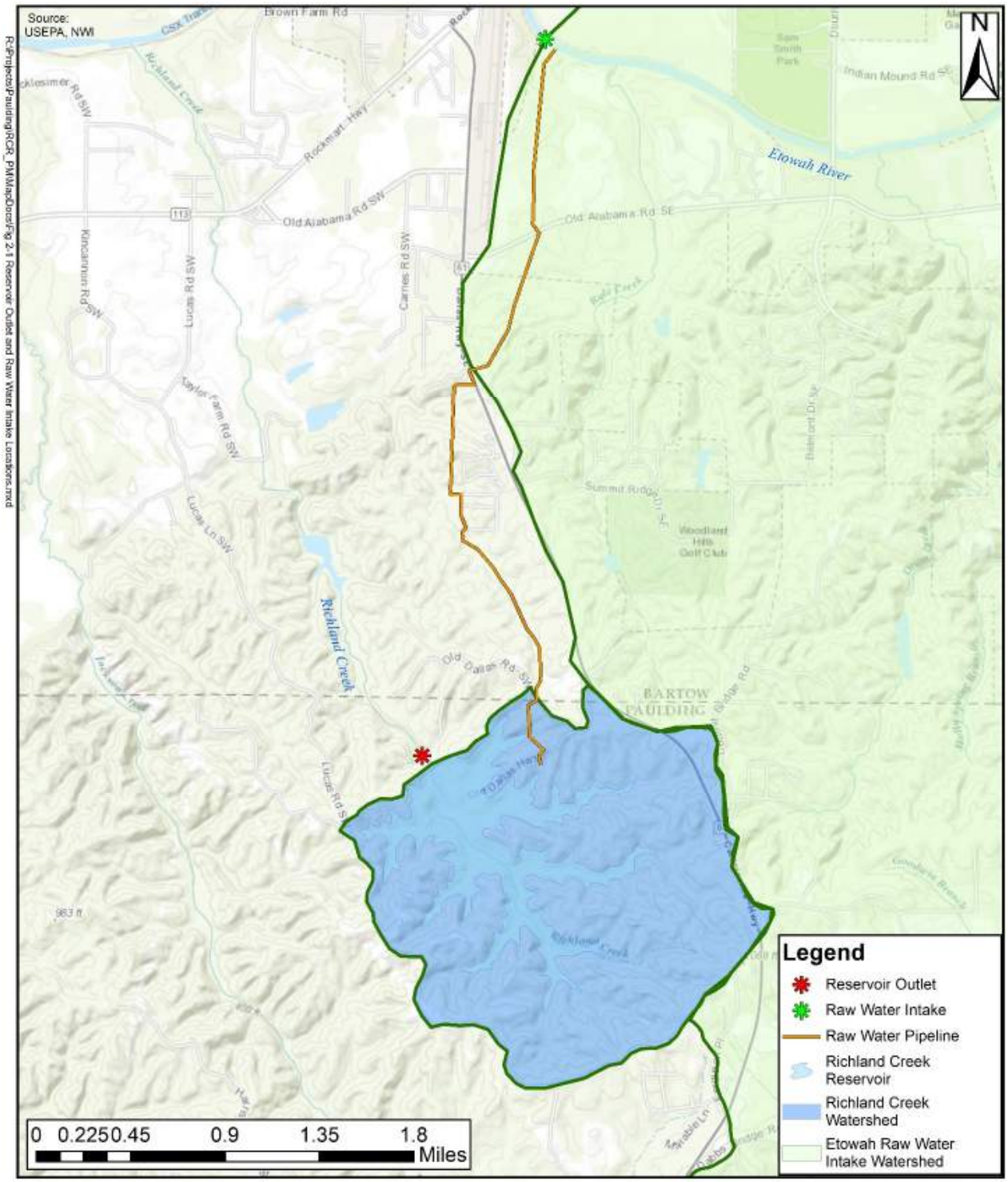

Figure 2-1. Reservoir Outlet and Raw Water Intake Locations

Both watersheds lie within the Coosa River Basin, which is part of the Alabama-Coosa-Tallapoosa (ACT) River basin that drains into Alabama and down to Mobile Bay. The headwaters of the Etowah River raw water intake watershed originate in Lumpkin County near Dahlonega, and form a network of streams and tributaries that discharge to the Etowah River. The upper Etowah River, which comprises the portion of the river upstream of Lake Allatoona, serves as the main channel of the watershed that flows southwest to its confluence with Lake Allatoona (Lake Allatoona/ Upper Etowah River Watershed Partnership, 2009). Downstream of Lake Allatoona, the Etowah River flows approximately 8 miles until its confluence with Richland Creek, just downstream of the raw water intake location. The IMZ includes the area downstream of Lake Allatoona, which includes mostly Paulding and Bartow Counties. The OMZ reaches just upstream of Lake Allatoona. This area is shown in Figure 1-5.

2.2 Available Water Quality Data

Evaluating the numerous sources of available data in the region is important to understand water quality concerns within each water supply watershed and to establish a baseline of water quality. As part of the source water assessment, water quality data were gathered from EPD's 305(b) and 303(d) lists of impaired waters and a variety of publicly available sources.

2.2.1 303(d) Listed Waters

Every two years, the State of Georgia prepares and submits to EPA a water quality report in accordance with Section 305(b) of the Clean Water Act. The report is a primary assessment of the state's water quality, and includes an integrated list of waters that are both supporting and not supporting their designated uses such as fishing, drinking water, and recreation. Different water quality standards apply for different designated uses. The 303(d) list of waters not supporting designated uses contains pollutants causing impairments and the cause or source of impairment.

2.2.1.1 Raw Water Intake Watershed

According to Georgia's 2014 and Draft 2016 Integrated 305(b)/303(d) list of streams, the raw water intake watershed contains many miles of waters that support designated uses. However, five segments within the 7-mile IMZ and 20-mile OMZ radius do not support designated uses and are included in the 303(d) list. The 303(d) listed waters segments are shown in Figure 2-2.

Within the IMZ, the 7-mile segment of the Etowah River from Pumpkinvine Creek to Richland Creek (GAR031501041310) is on the 305(b)/303(d) list of streams for not supporting the designated use of fishing and drinking water. The cause of not meeting the fishing designated use is a Fish Consumption Guideline (FCG) for polychlorinated biphenyl (PCBs). PCBs were used in industry and manufacturing in the region but banned in the late 1970s. PCBs have been persistent in the environment, especially sediment, for many years; however, measured levels of PCBs are decreasing over time.

GA EPD has issued FCG to help the public understand safe levels of fish to consume in all river basins in Georgia. According to GA EPD, FCG are conservative and intended to protect children and adults from harmful effects of eating fish with potential contaminants over a 30-year period. In the IMZ, several species of fish have no restrictions and two species of fish have a recommended restriction of one meal a week due to historic PCBs in the environment.

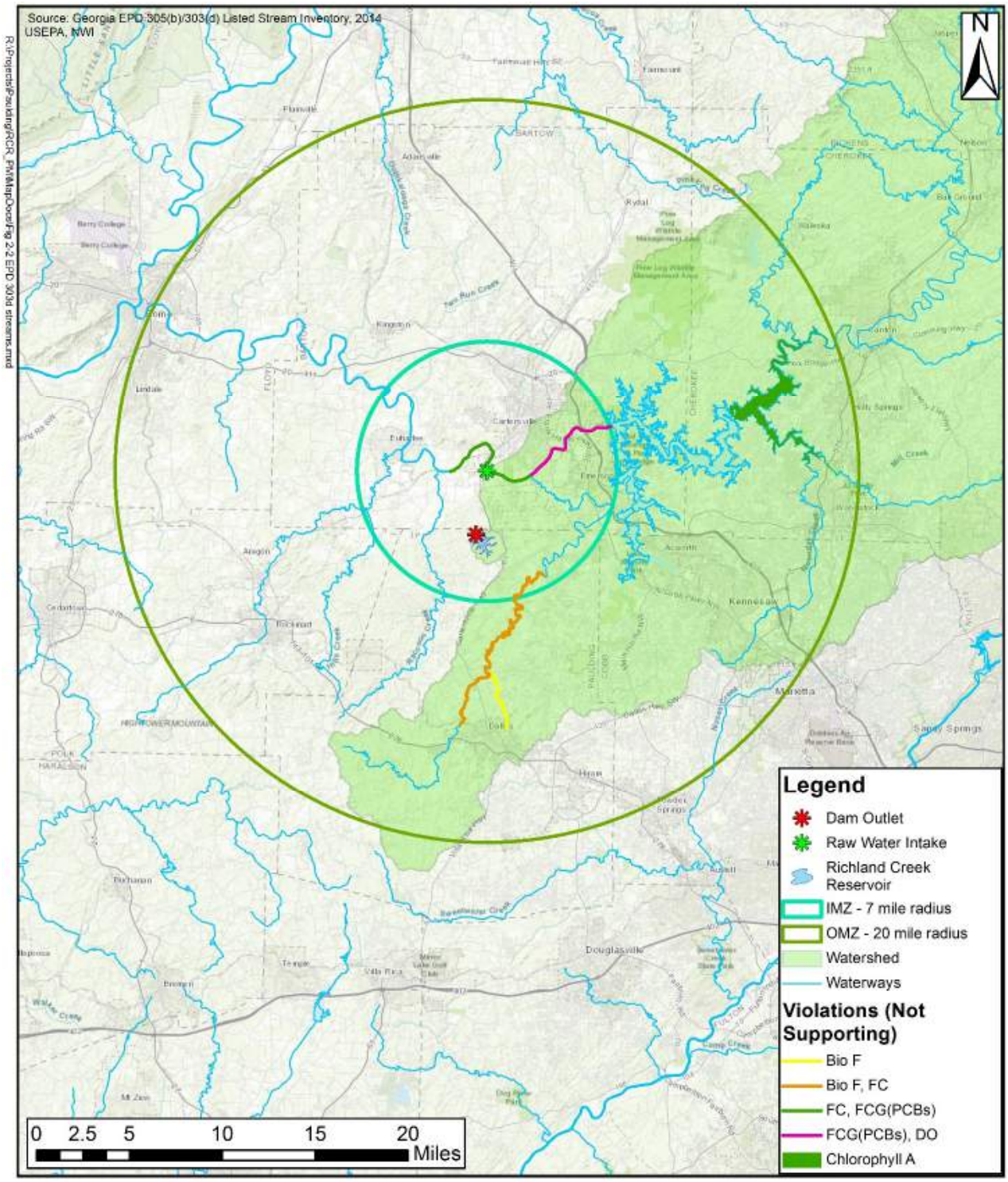

Figure 2-2. Georgia EPD 305(b)/303(d) Listed Stream Inventory, 2014

FCG for PCBs applies to the fishing designated use, while the fecal coliform cause of impairment applies to both fishing and drinking water designated uses. The source of both of these pollutants are non-point sources. Fecal Coliform is a bacteria that is found naturally in soils and also as a result of human and wildlife activity in an area. The water from the Etowah River is completely safe for drinking water uses once properly treated at a water treatment facility. In addition, plans are in place to address these pollutants, called Total Daily Maximum Loads (TMDLs). TMDLs were completed for fecal coliform in 2004 and for FCG (PCBs) in 2005 (revised 2009 and 2014).

Upstream of this segment, the 6-mile segment of the Etowah River from Lake Allatoona to Pumpkinvine Creek (GAR031501041309) is listed for not supporting the designated use of drinking water for pH, dissolved oxygen (DO), and FCG (PCBs) resulting from non-point sources. Pumpkinvine Creek within the 7-mile IMZ is listed as not supporting for biota-impacted (Fish Community) Bio F and fecal coliform.

Within the OMZ, Griffin/Lawrence Creek, a tributary to Pumpkinvine Creek, is listed for biota-impacted (Fish Community) Bio F. An assessment is pending on part of Lake Allatoona at the Little River Embayment because the growing season average for chlorophyll a exceeded the criteria once in the last 5 years. TMDLs were completed for chlorophyll a (2004 and 2013), fecal coliform (FC) (2004), and FCG (PCBs) (1998).

GA EPD tracks water quality issues to help ensure safe resources are available for all designated uses. The Etowah River is an abundant and safe drinking water source for the residents of Paulding County.

2.2.1.2 Reservoir Watershed

The reservoir watershed does not include any 303(d) listed streams. Richland Creek is not listed.

2.2.2 Cryptosporidium and Giardia

Giardia and cryptosporidium have been identified as a leading cause of waterborne diseases in the United States. Cryptosporidium and giardia sampling has not been conducted on the Richland Creek Reservoir since construction is still underway. Once the reservoir is complete and filled, water will be pumped from the reservoir to the WTP, where the raw water will be treated by a number of processes including coagulation, flocculation, dissolved air flotation, and filtration. Paulding County will perform permit-required water quality testing at the WTP.

2.2.3 Other Water Quality Data

During the basis of design effort for the WTP, a key component of the Richland Creek Reservoir Water Supply project, a water quality benchmarking assessment was completed. This assessment included gathering and reviewing water quality data from the Etowah River and Lake Allatoona. Water quality information sources included data from GA EPD, Etowah River monitoring stations (2008–2012) located within approximately 10-miles from the new raw water intake, raw water quality data from Lake Allatoona (2007–2012), and data from CCMWA's Wyckoff WTP Intake (2009–2012), which takes water from Lake Allatoona. Existing data in the Etowah River near the new intake is somewhat limited; therefore, limited monitoring was conducted near the new intake site to gather additional data. Further details of the water quality data can be found in the Richland Creek Reservoir WTP Master Plan and Preliminary Basis of Design Report from 2014.

2.3 Potential Pollution and Contaminant Source Inventory

An inventory of potential point (direct discharges to a water body) and non-point (indirect runoff to a water body) pollution and contaminant sources within a water supply watershed is compiled and classified according to SWAP categories. Table 2-1 lists potential pollution sources that must be evaluated in each of the three management zones, according to EPD guidance. As seen in the table, a more rigorous evaluation of sources is conducted in the IMZ and OMZ than in the NMZ. This is simply due to the distance of the NMZ from the intake, which is greater than 20 miles upstream.

Table 2-1. Potential Pollution Sources for Surface Water

IMZ (7-Mile Radius)	OMZ (20-Mile Radius)	NMZ (Non-Management Zone)
		• Referenced by River Basin Management Plan
• Agricultural waste lagoons	• Agricultural waste lagoons	
• Airports		
• Confined animal feedlots		
• Garbage transfer stations		
• Hazardous waste facilities	• Hazardous waste facilities	
• Land application system (LAS) permit holders	• LAS permit holders	• LAS Permit Holders
• Landfills	• Landfills	• Landfills
• Large industries that use hazardous chemicals	• Large industries that use hazardous chemicals	
• Large industries with bulk chemical and petroleum storage	• Large industries with bulk chemical and petroleum storage	
• Large industries with federal categorical standards	• Large industries with federal categorical standards	
• Large quantity generators		
• Lift stations	• Lift stations	
• Marinas		
• Military bases		
• Mining	• Mining	
• NPDES permit holders	• NPDES permit holders	• Mining
• Non-sewer areas		• NPDES permit holders
• Oil pipelines	• Oil pipelines	
• Power plants	• Power plants	
• Railways adjacent to or crossing streams	• Railways adjacent to or crossing streams	
• Roads adjacent to or bridges crossing streams	• Roads adjacent to or bridges crossing streams	
• Sewer pipelines adjacent to or crossing streams	• Sewer pipelines adjacent to or crossing streams	
• Sewer areas		
• WWTPs	• WWTPs	
• WTPs	• WTPs	

Potential pollutant and contaminant source data are obtained and cross-checked against other resources to verify that data are as current as possible and relevant to the source water assessment. The inventory of contaminant sources is conducted by individual intake, based on the watershed delineation already completed. It is important to note that including businesses or other activities in

this list does not necessarily indicate that a problem exists or that contamination is occurring from the site. The inventory merely identifies those sources of *potential* pollution.

Potential pollution and contaminant source data were downloaded from the Georgia GIS (geographic information system) Data Clearinghouse. These data included sites listed in EPD guidance classifications, including the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), Resource Conservation and Recovery Act (RCRA), Industrial Facility Discharge (IFD), Toxic Release Inventory (TRI), Hazardous Site Inventory (HSI), NPDES, etc. Metadata and other date/source references for the data were also obtained. Classification or listing of a potential source can provide general information helpful for assessing release and risk potential in the susceptibility analysis.

EPA and GA EPD web sites were inventoried to obtain outstanding data not available at the Georgia GIS Data Clearinghouse sites. Various web sites were queried to obtain more detailed information and verify that data were up to date. Information was obtained such as the possible type of potential pollutant (e.g., specific hazardous waste/chemicals or type of agricultural waste lagoon), volume of potential pollutant (e.g., <1,000 gallons or >10,000 gallons), and/or history of spills. Businesses or facilities no longer in existence or operation, or those removed from the above-listed categories, were eliminated from the contaminant inventory.

The following agencies were contacted to supplement the national databases:

- Bartow County GIS Department
- Paulding County GIS Department

2.3.1 Land Cover

Land coverage was obtained to help assess non-point source influences to water quality in water supply watersheds. Satellite imagery was used to identify agricultural waste lagoons and confined animal feedlots.

The land cover categories include:

- Water – includes open bodies of water and major rivers
- Agricultural – includes row crops, pastureland, and orchards
- Forest – includes coniferous, deciduous, and mixed forests
- Urban – includes residential, commercial, industrial, and other urban land use types
- Wetland – includes forested wetlands (swamps) and non-forested wetlands (marshes, bogs)
- Traditional mines, quarries, and exposed rock/soil – includes quarries, clear-cut areas, and new urban construction.

2.4 Susceptibility Determination

After the pollutant source inventory was completed for each intake, a determination was made of how prone the drinking water source is to potential contamination from each point and non-point source. This step—the susceptibility analysis—is based on the potential for contaminants to be released into the environment and the associated risk to drinking water supplies, and is conducted using methods established by EPD. A qualitative measure (high, medium, low) is used to rank the likelihood of a contaminant's release to a surface water (release potential) and the risk of that contaminant to the drinking water supply intake (risk potential).

2.4.1 Point Sources

Potential point sources of pollutants include agricultural waste lagoons, confined animal feedlot operations, industries and businesses that generate hazardous wastes or store chemicals on site, NPDES permit holders, land application systems, mining operations, pump stations, airports, landfills, garbage transfer stations, WWTPs and WTPs, power plants, marinas, military bases, and stream crossings near roads, railroads, and pipelines. Factors that impact the likelihood of a release from a point source include distance from surface water, volume of release, duration of release, and topography or ease of transport. Risk factors for point sources include distance to surface water intake and toxicity.

GIS technology was used to calculate the distance from the surface water intake, distance from surface water, and topography or ease of transport for each potential pollutant source. Toxicity and volume of release were based on facility-specific information regarding type and quantity of chemicals, petroleum products, and other substances stored on-site. This information was obtained through the EPA Envirofacts Database, SARA Title III Tier II reports, and best professional knowledge and judgment. The volume of release was based on past releases from individual facilities, and potential for future or ongoing releases to surface waters (i.e., a catastrophic event or regulated NPDES discharges). Facility-specific plans or control measures were not reviewed as part of this assessment. Table 2-2 outlines EPD's guidance for the ranking of the risk and release factors described above.

Table 2-2. EPD Guidance for Ranking Potential Pollutant Sources

Ranking Factors	Ranking Criteria
Release Factors	
Distance from surface water	High = within 500 feet Low = farther than 500 feet
Volume of release	High = greater than 10,000 gallons Medium = between 1,000 and 10,000 gallons Low = less than 1,000 gallons
Duration of release	High = ongoing unpermitted releases, high likelihood of catastrophic event Medium = ongoing permitted releases, chronic small events, likelihood of continued releases Low = little likelihood of a release, no reported releases
Topography/Ease of Travel	High = hilly topography, overland flow very likely Medium = moderate topography, overland flow likely Low = flat topography, overland flow not likely
Risk Factors	
Distance from surface water intake	High = within 7 miles upstream Medium = between 7 and 15 miles upstream Low = more than 15 miles upstream
Toxicity	High = acute, pathogens Medium = chronic, chemicals Low = secondary, taste, odor

For **regulated point sources**, EPD provides supplemental guidance that may be incorporated into risk and release potential rankings. Supplemental guidance is provided for landfills and dumps; hazardous waste large quantity generators, treatment storage or disposal (TSD) facilities, and Superfund sites; and NPDES and LAS permit holders. After each factor is ranked high, medium, or low, and the supplemental guidance is factored in for certain facilities, the rankings are averaged.

This average provides an overall ranking for release potential and risk potential for each potential pollutant source. Table 2-3 outlines the supplemental guidance for ranking regulated point sources.

Table 2-3. Supplemental Guidance for Regulated Pollutant Sources

Point Source	Potential	Risk
Landfills, Dumps	High = abandoned/closed landfills, history of groundwater contamination, uncharacterized waste Medium = open dumps, inert waste, no groundwater contamination Low = contained landfills, no groundwater contamination, in compliance	Based on waste categorization
Hazardous Waste Large Quantity Generators and/or TSD Facilities, Superfund Sites	High = history of spills, unremediated sites, not following corrective action plan Medium = periodic noncompliance, partly remediated sites, generators or sites with permits (even in compliance) Low = compliance with regulations, few or no releases, fully remediated sites	Based on type of operation and volume of materials handled
NPDES Permit Holders, LAS Permit Holders	High = chronic permit violations, waste lagoons (especially unlined), chronic sewer overflows and/or bypasses Medium = periodic permit violations, moderate number of sewer overflows and/or bypasses Low = compliance with permit conditions, few sewer overflows and/or bypasses	Based on regulated pollutants

For the **non-point source pollution categories** of agriculture, forestry, and urban land uses, EPD provides supplemental guidance to rank potential contaminants. The potential for release includes factors such as density of an activity in the watershed, best management practice (BMP) use, buffer zones, and topography. Risk factors include proximity to water, volume of release, and toxicity. Table 2-4 outlines EPD's supplemental guidance for non-point sources.

Table 2-4. Supplemental Guidance for Non-Point Sources

Non-Point Source	Potential	Risk
Agriculture, Urban, Forestry	High = no BMP, high pesticide use, high livestock density, high density of forestry activities, high percentage of impervious surface, hilly topography, abandoned mines, visible signs of erosion or other water quality violations Medium = BMP in place but not always properly implemented, moderate livestock density, moderate density of forestry activities, moderate percentage of impervious surface, moderate topography, some buffers in place Low = BMP in place and properly implemented, low livestock density, low density of forestry activities, low percentage of impervious surface, generally flat topography, buffers in place	High = Immediate proximity of surface water, high toxicity and/or volume Medium = Near main stem or major tributary, moderate volume and/or toxicity Low =No surface water in close proximity, low or little volume and/or toxicity

2.4.2 Overall Susceptibility Ranking

Once individual sources are ranked, these sources are charted on a matrix based on their release and risk potential, as shown in Figure 2-3. The matrix is based on GA EPD's guidance document and provides a visual summary of watershed sources that provide the highest concern regarding the intake's contamination susceptibility. Sources that rank in the top-right corner of the matrix indicate a high priority of concern for the intake, those that rank down the diagonal middle indicate a medium priority of concern, and those that rank in the bottom-left indicate a low priority of concern.

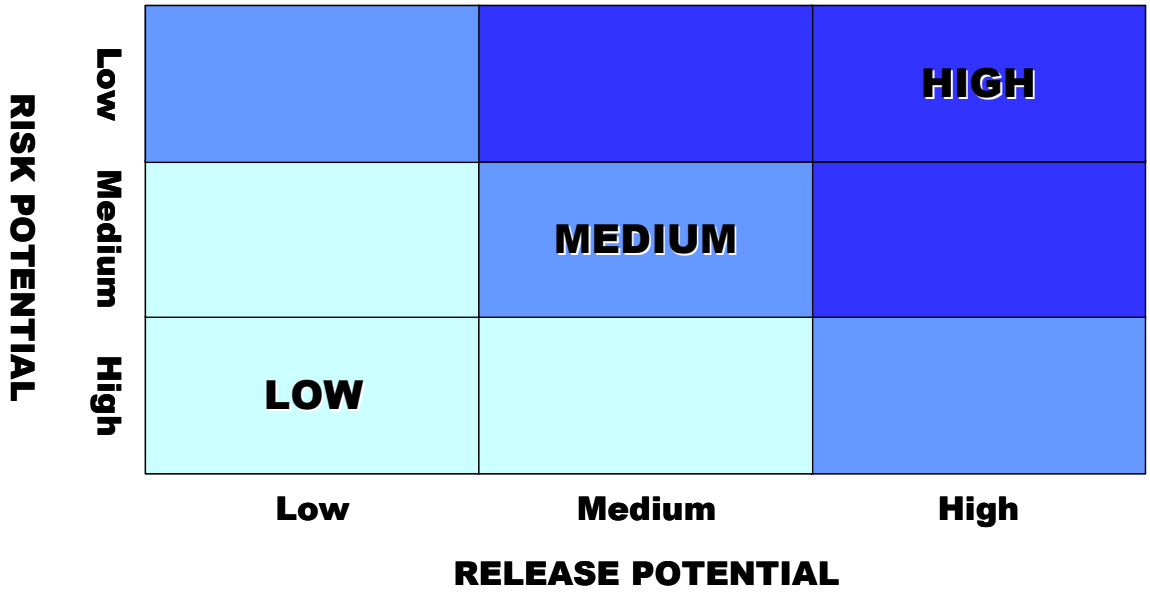

Figure 2-3. Overall contamination susceptibility ranking matrix

The overall susceptibility of the intake can be determined after plotting on the matrix all potential point and non-point pollutant sources for its water supply watershed. The basic guidelines to make this determination are based on GA EPD guidance outlined in Table 2-5.

Table 2-5. Guidelines for Determining Overall Susceptibility

Breakdown of Sources in Matrix	Susceptibility Ranking for Watershed
20 percent or less of the sources plot in the high priority area and 20-40 percent plot in the medium priority area of the matrix	Low susceptibility
20-40 percent of the sources plot in the high priority area and 40 percent or more plot in the medium priority area of the matrix	Medium susceptibility
40 percent or more of the sources plot in the high priority area of the matrix	High susceptibility

If the breakdown of priority sources does not meet one of the requirements in Table 2-5, the watershed is ranked based on where the average would be located. For instance, if one-third of the potential sources fell in each of the categories, the ranking would be medium since the average of one high, one low, and one medium number results in a medium average.

Section 3 summarizes the assessment results for each watershed, including specific categories of potential pollutant sources and each intake's overall susceptibility to drinking water supplies.

2.5 Assessment Assumptions

Assumptions used in the source water assessment are described in the following sections.

2.5.1 General Assumptions

General assumptions used in the assessment include the following:

- The distance from surface water, ease of travel/transport, and distance from surface water intake are assessed based on analysis using the GIS of the watershed areas.

- When assigning values for the overall release and risk potentials, the individual high, medium, and low rankings are typically averaged. However, the toxicity determination typically carries more weight than the distance from surface water intake in the overall risk potential for a facility. For example, if a low toxicity pollutant is in close proximity to a surface water intake (i.e., medium risk), the overall risk potential is usually assigned a low value.

2.5.2 Industrial Point Sources

Assumptions used in the assessment regarding industrial point sources include the following:

- Release volume is estimated by gathering data from the SARA Title III Tier II reports provided by the GA EPD, which indicate amount and types of chemicals stored at facilities. Best professional judgment is used where Tier II data are not available. Data on release duration, release volume, and toxicity are also obtained through information available on EPD's Hazardous Site Inventory.
- Release duration is determined by reviewing violations and noncompliance reports available at GA EPD's Land Protection Branch, which indicate releases to the environment, and databases available on the GA EPD website, which indicate where environmental releases and spills have occurred over the past 10 years. If a facility does not exist on GA EPD's TRI reporting of releases or other data sources indicating environmental spills and releases, it is assumed that no reported releases have occurred at the site and the release duration is ranked low.
- Toxicity is determined by reviewing information from TRI reports, 312 Tier II data (EPCRA Section 312), NPDES permit parameters, spill information, and best professional judgment to understand types of hazards stored on site. Fecal coliform (FC) is typically included on this list because, without proper treatment, FC can pose a risk to human health. Flammable or explosive substances (e.g., petroleum distillates) and other types of chemicals that may have serious but less immediate impacts are ranked as medium toxicity.
- Satellite imagery was used to determine the presence of secondary containment measures. Field visits were not made during this assessment to inspect specific sites.

2.6 Non-Point Pollution Sources Assessed

According to EPD's guidance document, four categories of non-point source runoff should be considered for the assessment: agriculture, forestry, urban areas, and non-sewer areas (areas served by septic tanks). Sewer areas were assessed together with urban areas due to the overlap of these two categories. Assumptions for the four non-point categories evaluated for the management zones of each water supply watershed are documented below.

2.6.1 Agriculture

Non-point runoff from agricultural areas was assessed for each intake and management zone. Land use and land cover files from GIS databases were used to determine relative density of agricultural lands. Agricultural uses generally cover grazing lands, row crops, poultry, and other livestock operations. Agricultural non-point source pollution is considered a low to medium risk to source waters in all management zones. Risk factors include livestock density, chemical application buffers, and proximity to surface waters. Two specific categories of agriculture are confined animal feedlot operations (CAFOs) and agriculture waste lagoons, which are discussed below as potential point sources.

2.6.2 Forestry

Forestry activities pose limited risk to water supplies. Sediment is the main pollutant associated with forestry, which poses a risk to water supplies when forestry activities are conducted on steeper slopes or adjacent to streams.

2.6.3 Urban

Urban areas constitute a potential contaminant source for source waters from commercial and industrial stormwater runoff, road runoff, runoff from fertilizers and pesticides applied to lawns, and other types of stormwater runoff. In addition, stormwater velocities are higher in urban streams due to more impervious surfaces, which increases in-stream erosion.

2.6.4 Non-Sewer (Septic)

Septic tanks pose a risk to drinking water supplies when systems fail. National studies have determined that approximately 5 to 10 percent of septic systems are failing at any one time. The potential presence of pathogens presents a high toxicity risk. Transport through soil to surface waters generally mitigates the overall risk with a low or medium release potential. Information on non-sewer (septic) areas was limited and areas not covered by sewer are assumed to be septic areas. Some areas were assumed to have a lower population density than others, which lowered the overall release potential.

2.7 Point Pollution Sources Assessed

Assumptions were made during the susceptibility analysis that were specific to the type of point source assessed. The following sections describe the assumptions made for a variety of potential pollutant point sources.

2.7.1 Agricultural Waste Lagoons

Agricultural waste lagoons present a potential risk to drinking water supplies if a lagoon dam breaks and releases high concentrations of nutrients, bacteria, and other materials to nearby streams. The volume associated with such a release would be more than 10,000 gallons, indicating a high ranking for release volume. Release duration would be rated low, as the possibility of its occurrence is not very likely. The distance from surface water intake, distance from surface water, and ease of transport are calculated individually for each lagoon located through GIS. The toxicity is assumed to be medium to high due to the high concentrations of bacteria and potential pathogens in the lagoons.

2.7.2 Confined Animal Feedlot Operations

Row houses were delineated based on aerial photography, and were assumed to contain poultry unless otherwise indicated.

Distances to surface waters and from water intakes were calculated for CAFO. Release potential was determined based on distance to a waterbody and topography. Volume and duration of potential releases are considered low because the animals are under cover. Toxicity is considered medium because poultry wastes have the potential to carry pathogens, but are typically dry products and not readily transported to surface waters.

2.7.3 Airports

Airports can present a potential risk to drinking water supplies due to highly flammable aviation fuel stored on site. The airports within the assessment area are smaller fields; therefore, release volume is estimated to be medium, between 1,000 and 10,000 gallons. The toxicity is ranked medium due to the presence of jet fuel on site. Storage tanks are assumed to be double-walled underground tanks, reducing the possibility of accidental release. In addition, release duration is estimated to be low, since the likelihood of a spill occurrence is low due to the containment required for fuel storage areas.

2.7.4 Industries, Manufacturing Facilities, and Businesses

Several industries, manufacturing facilities, and other businesses that store and handle potential contaminants are located within the water supply watersheds. These facilities include large industries that store, use, or generate hazardous chemicals, bulk petroleum products, or chemicals on site. Also included in this category are facilities with NPDES permits and facilities on EPD's HSI.

2.7.4.1 NPDES Facilities

NPDES facilities have a permit to discharge directly to a receiving stream. These facilities are therefore designated with a medium risk for release duration since they have ongoing, permitted releases. NPDES permits in Georgia for municipal wastewater and industrial stormwater dischargers were reviewed.

2.7.4.2 RCRA Facilities

Small quantity generators and conditionally exempt small quantity generators, as designated in the RCRA Information database in EPA's Envirofacts system, were not evaluated for this assessment unless additional data from the SARA Title III Tier II reports indicated additional storage of chemicals and other substances on site. Large quantity generators typically store more wastes onsite and warrant a medium volume ranking.

2.7.5 Landfills and Garbage Transfer Stations

Abandoned, closed, and operating landfills are a potential pollutant source for water supplies, with the degree of impact depending upon type of waste collected at the site and design of the landfill (i.e., lined versus unlined, leachate collection system, landfill cap design, etc.). In addition, garbage transfer stations can be a source of pollution due to liquids leaching from the waste haulers.

For landfills, release volume is low if the site is closed or capped. Release volume is medium if the site is open, since the majority of the release is due to percolation of stormwater through the wastes. Similarly, release duration is low if the landfill is closed and no evidence of groundwater contamination is present. Release duration is medium if the site is open and operating (and subject to direct stormwater influence) or if evidence of groundwater contamination is present. The toxicity ranking depends upon landfill type—low if the site is an open and operating municipal solid waste landfill, and medium if it is a closed and non-operating municipal, industrial, or construction and demolition solid waste landfill. The toxicity ranking is high if the site has a history of groundwater contamination and toxic chemicals have been identified.

2.7.6 Lift Stations

Municipal lift stations (i.e., pumping stations) transfer sanitary sewer flows from one location within the wastewater collection system to another location, generally at a higher elevation. These facilities can pose a risk to surrounding water bodies during storm events or when operational problems exist, causing sanitary sewer overflows (SSOs) in the vicinity of the station or in the upstream collection system. The size of the SSO depends upon how quickly existing problems at the station are corrected and the duration and size of the storm event. The risk from these stations is based on a high toxicity since SSOs are spills of raw sewage.

2.7.7 Land Application Systems

Operations with LASs and permits can impact surface water. Release volume is based on the permitted capacity or size of the operation or facility that the LAS serves. Release duration is medium because there are ongoing releases from the LAS. The toxicity is typically medium since pathogens may be present, but the waste has been treated prior to application.

2.7.8 Mining

Surface mines can affect surface water quality, primarily through transport of sediments and metals via stormwater runoff. In addition, some mines may have washing operations for cleaning mined ore that can impact surface water. Both existing and past producers are included in the susceptibility analysis for the assessment area.

The risk and release potential is based on the type of mining conducted at the sites. Based on the type of mining done in the watershed, suspended sediments and metals are the key pollutants of concern, indicating a low to medium toxicity value. Since runoff from washing operations and stormwater is the main concern, release volume is estimated to have a low potential. Release duration for currently producing mines is estimated to be medium, which accounts for ongoing washing operations that may be taking place. The past producing or closed mines are ranked low, since stormwater runoff is the only discharge of concern.

2.7.9 Roadways

Primary road crossings over streams and rivers present a potential for contamination through spills. The materials being transported vary greatly; however, to gauge potential risk, hazardous materials are assumed to be transported on roads. Release volume is estimated to be between 1,000 and 10,000 gallons (due to potential from tractor-trailers) and is considered a medium release ranking. Release duration is likely to be a one-time unanticipated release or medium release possibility. The toxicity risk is assumed to be medium, consisting of hazardous chemicals from transport trucks.

Table 2-6 outlines the supplemental guidance developed and used by Brown and Caldwell to standardize the ranking of roads within a watershed area including primary, secondary paved, and secondary unpaved roads.

Table 2-6. Supplemental Guidance to Rank Roads Within a Watershed Area

Release Potential	Risk Potential
Primary Roads (interstates and highways)	
>10 road crossings, **High**	Large transport trucks, **Medium**
5–10 road crossings, **Medium**	Large transport trucks, **Medium**
<5 road crossings, **Low**	Large transport trucks, **Medium**
Secondary Roads, Paved	
>100 road crossings, **High**	Large transport trucks, **Medium**
50–100 road crossings, **Medium**	Large transport trucks, **Medium**
<50 road crossings, **Low**	Large transport trucks, **Medium**
Secondary Roads, Unpaved	
>100 road crossings, **High**	No large transport trucks, **Low**
50–100 road crossings, **Medium**	No large transport trucks, **Low**
<50 road crossings, **Low**	No large transport trucks, **Low**

2.7.10 Railways

Railroad crossings over streams and rivers present a potential for contamination through spills. As with roadways, the materials transported vary greatly. Hazardous materials are assumed to be transported on railroads, and the release volume assumed to be greater than 10,000 gallons, which results in a high ranking. Release duration is assumed to be high, with a likelihood of a one-time unanticipated release. The toxicity is assumed to medium.

The supplemental guidance used for primary roads was also used for railroad crossings, accounting for density of crossings within each management zone. Table 2-7 outlines the supplemental guidance used for railroad crossings.

Table 2-7. Supplemental Guidance to Rank Railroad Crossings Within a Watershed Area

Release Potential	Risk Potential
Primary Roads (interstates and highways)	
>10 railroad crossings, **High**	Tanker cars, **High**
5–10 railroad crossings, **Medium**	Tanker cars, **High**
<5 railroad crossings, **Low**	Tanker cars, **High**

2.7.11 Sewer Pipelines Adjacent to or Crossing Streams/Sewer Areas

Sewer pipelines over streams and rivers present a potential for contamination through spills. The toxicity is assumed to be high due to the presence of pathogens.

The supplemental guidance used for sewer pipeline crossings accounted for density of crossings within each management zone, and is outlined in Table 2-8.

Table 2-8. Supplemental Guidance to Rank Sewer Pipelines Adjacent to or Crossing Streams/Sewer Areas Within a Watershed Area

Release Potential	Risk Potential
Primary Roads (interstates and highways)	
>10 pipeline crossings, **High**	Pathogens, **High**
5–10 pipeline crossings, **Medium**	Pathogens, **High**
<5 pipeline crossings, **Low**	Pathogens, **High**

2.7.12 Oil and Gas Pipelines Adjacent to or Crossing Streams

Oil and gas pipelines over streams and rivers present a potential for contamination through spills. The volume of possible releases is assumed to be high, since a possible release could be greater than 10,000 gallons. Release duration is assumed to be medium, with little likelihood of release and engineering controls that would indicate a release. The toxicity is assumed to be medium due to chemicals associated with petroleum products.

The supplemental guidance used for pipeline crossings accounted for density of crossings within each management zone, and is outlined in Table 2-9.

Table 2-9. Supplemental Guidance to Rank Oil Pipelines Adjacent to or Crossing Streams Within a Watershed Area	
Release Potential	Risk Potential
Primary Roads (interstates and highways)	
>10 pipeline crossings, **High**	Chemical substances, **Medium**
5–10 pipeline crossings, **Medium**	Chemical substances, **Medium**
<5 pipeline crossings, **Low**	Chemical substances, **Medium**

Section 3

Susceptibility Results

The susceptibility of the water supply to various point and non-point sources was evaluated using GA EPD's source water methodology, which aims to balance risk and release potential. The following section summarizes specific categories of potential pollutants for the Richland Creek Reservoir watershed and raw water intake watershed. Appendix A provides a complete list of sites included in the susceptibility analysis, and susceptibility rankings and support information for each potential point and non-point pollutant sources in the raw water intake watershed, broken down by management zones (IMZ, OMZ, and NMZ).

Susceptibility rankings and support information for each potential point and non-point pollutant sources in the assessment area are provided in the following paragraphs. The overall susceptibility ranking is low for the Richland Creek Reservoir watershed and medium for the raw water intake watershed.

3.1 Reservoir Watershed

The Richland Creek Reservoir watershed, located in northern Paulding County, is relatively small (i.e., area at the reservoir outlet is approximately 2.5 square miles). The reservoir watershed is predominantly wooded, and contains sparse residential areas along Dallas Highway to the east and Cochran Road to the south. Once constructed, the reservoir will occupy 305 acres.

The categories of potential pollutants identified in the reservoir watershed include roadways and non-sewer areas (septic). No point source potential pollutant sources were identified.

3.1.1 Roadways

No primary roads cross surface waters within the reservoir watershed; however, several roads form the boundary of the watershed including Cartersville Highway to the east, Cochran Road to the south, and Lucas Road to the west. These roadways are shown in Figures 3-7 and 3-8.

3.1.2 Non-Sewer Areas (Septic)

Non-sewer areas present high potential risk due to the possible presence of pathogens leaching from failing systems. However, the release is tempered by transport through soil and groundwater to reach surface water supplies. Very few homes are located within the watershed boundary—these homes are concentrated near the watershed boundaries along the roads and assumed to be on septic systems. Based on the distance of these homes from the surface water (edge of reservoir), potential release volume, potential release duration, and the flow's path primarily through soil or via groundwater, the release potential is low in the IMZ.

3.2 Raw Water Intake Watershed

The raw water intake watershed is relatively large (approximately 1,290 square miles at the intake), reaching from Lumpkin County in the northeast to Paulding County in the southwest in northern Georgia, approximately 40 miles northwest of Atlanta. The categories of potential pollutants from point and non-point sources in the raw water intake watershed are described in the following sections.

3.2.1 Non-Point Source Assessment

According to EPD's guidance document, four categories of non-point source runoff are considered in the assessment of non-point sources: agriculture, forestry, non-sewer areas, and urban areas.

3.2.1.1 Agriculture

Within the raw water intake watershed, agriculture factors that present medium risk to water supplies include livestock density, moderate topography, use of agricultural chemicals, and risks associated with chemicals, animals, and waste products. Agricultural areas ranked as medium risk and release potential in the IMZ and OMZ and are shown in Figures 3-1 and 3-2.

3.2.1.2 Forestry

Forestry activities pose limited risk to the raw water intake watershed. Within the IMZ, a small section of land is managed by the Georgia Department of Natural Resources. Within the OMZ upstream from the raw water intake, Lake Allatoona is managed by the USACE. A small area of land southeast of the raw water intake is owned by the National Park Service, which includes Kennesaw Mountain National Battlefield Park and the Chattahoochee River National Recreation Area.

Limited forestry activities are assumed to occur in the watershed's IMZ and OMZ, and release potential for all sites was assumed to be low. Risk potential was assigned based on proximity to surface water. Sites near main stems or major tributaries were assigned a medium risk potential, and sites with no surface water in close proximity were assigned a low risk potential. Forestry sites are shown in Figures 3-3 and 3-4.

3.2.2 Urban

City limits were used to represent urban areas. Urban areas with greater than 20 percent impervious surface were assigned a high release potential and urban areas with less than 10 percent impervious surface were assigned a low release potential. Percent impervious surface for each urban area was determined based on professional judgment by viewing 2016 Bing aerial maps within city limits. City boundaries are shown in Figures 3-5 and 3-6.

3.2.3 Non-Sewer (Septic)

Non-sewer areas present high potential risk due to the possible presence of pathogens leaching from failing systems. However, the release is tempered by transport through soil and groundwater to reach surface water supplies. All areas not covered by sewer pipelines were assumed to be serviced by septic tanks. Septic tanks are a primary concern for groundwater contamination; however, they may affect surface water where they are in close proximity. Due to the lack of data for areas serviced by septic tanks, and typical controls in place for septic tanks, the risk and release potential is assumed to be low.

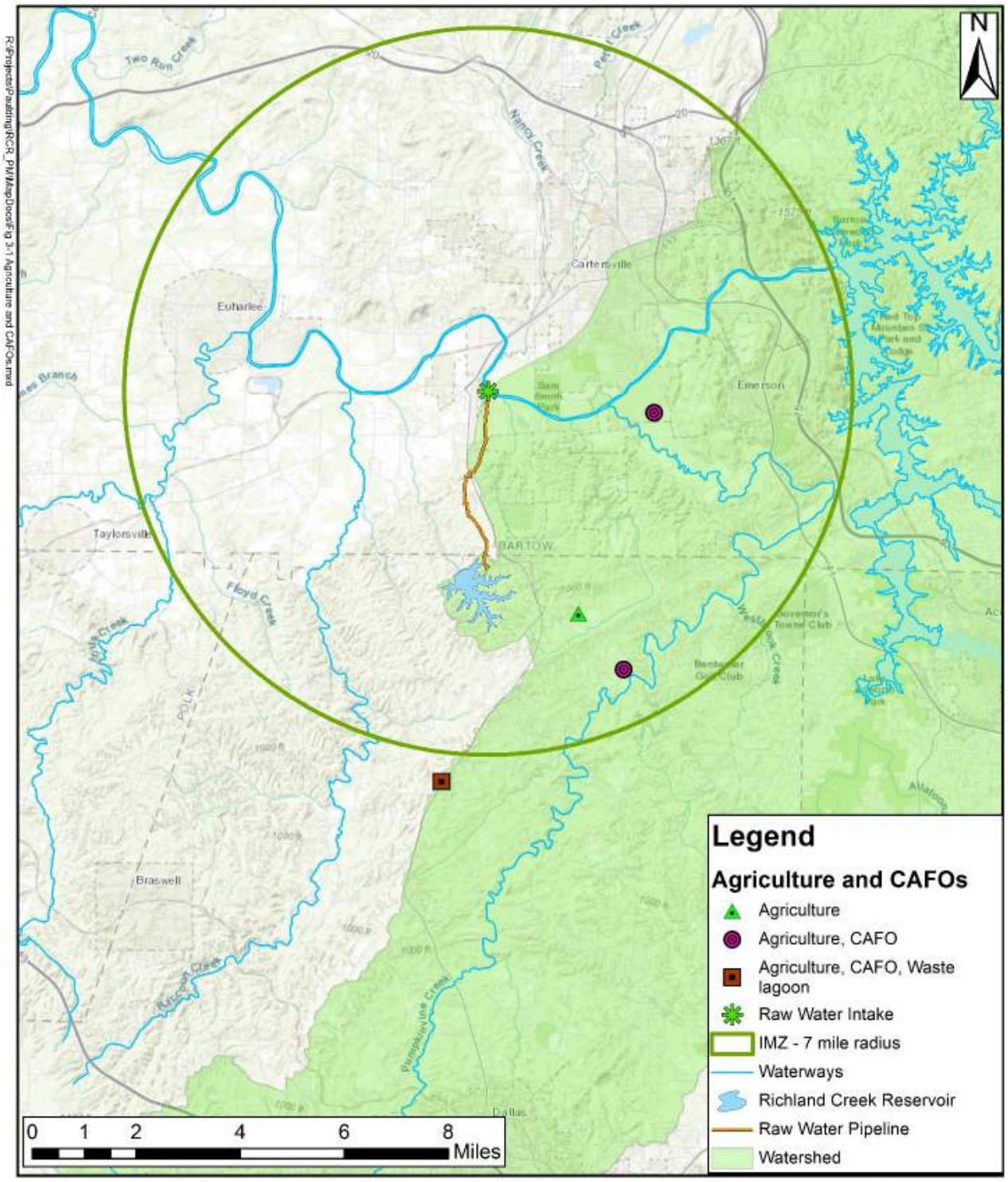

Figure 3-1. Agriculture, Agricultural Waste Lagoons, and CAFOs (7-Mile Radius /IMZ)

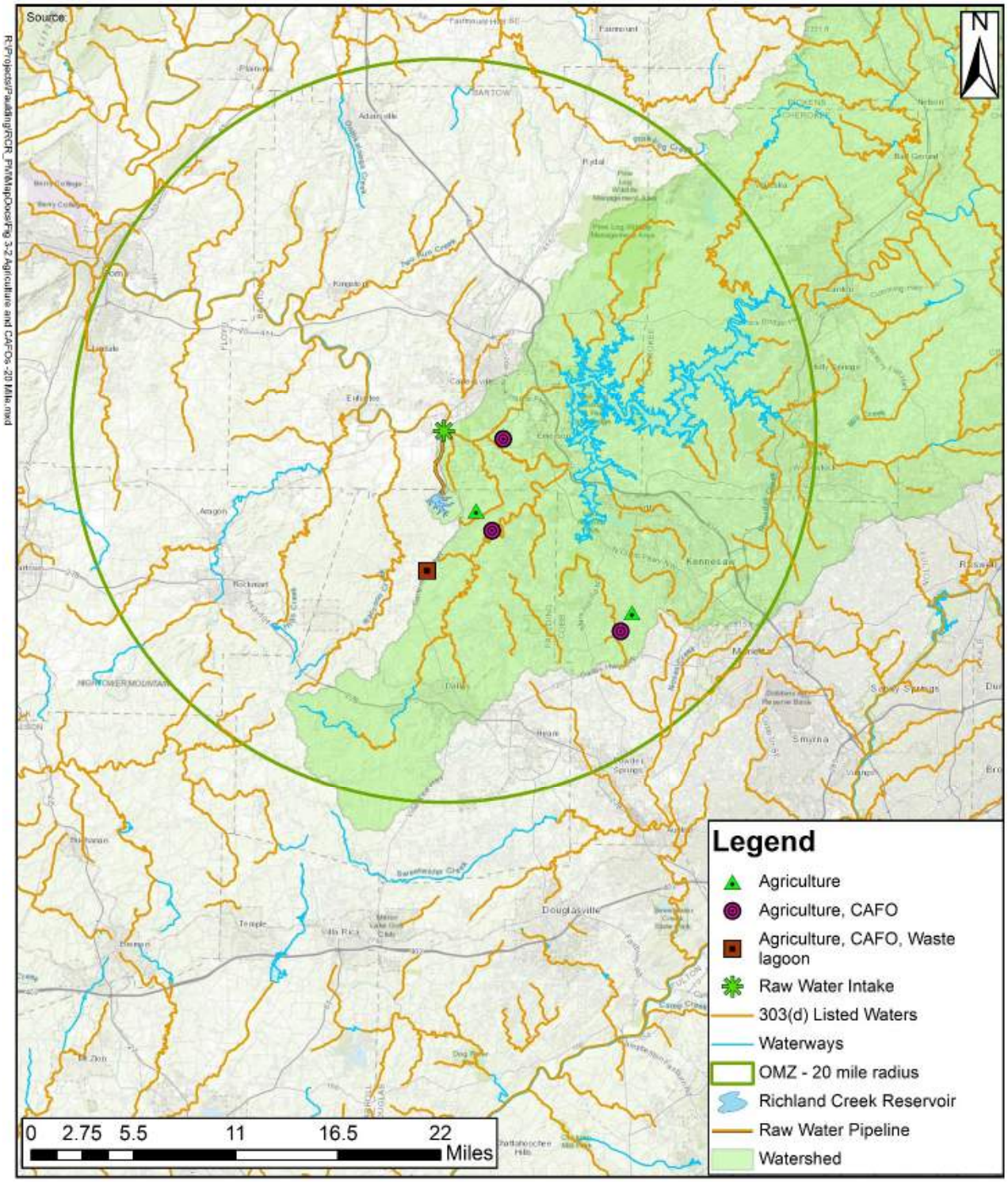

Figure 3-2. Agriculture, Agricultural Waste Lagoons, and CAFOs (20-Mile Radius/OMZ)

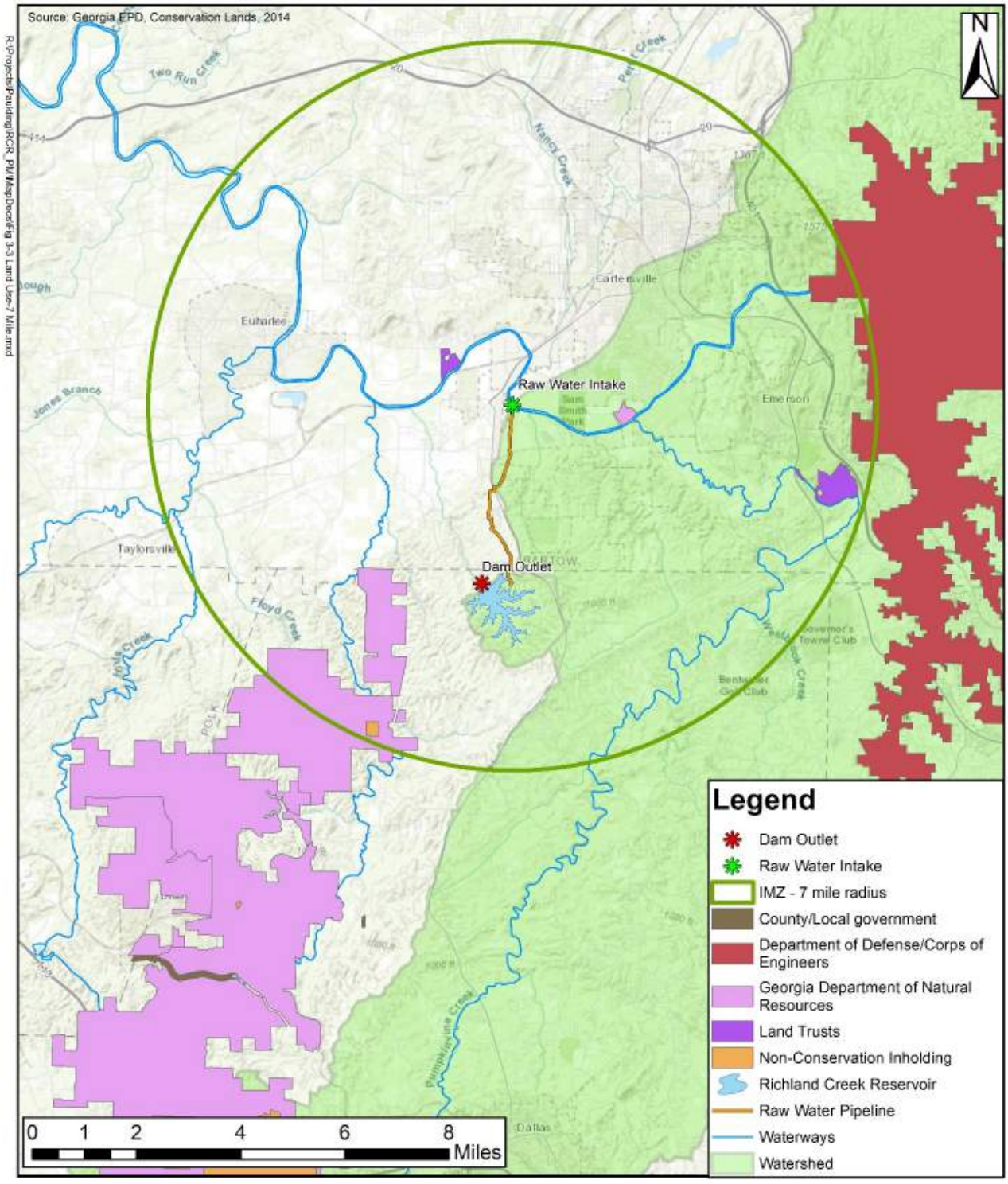

Figure 3-3. Land Use Management (7-Mile Radius/IMZ)

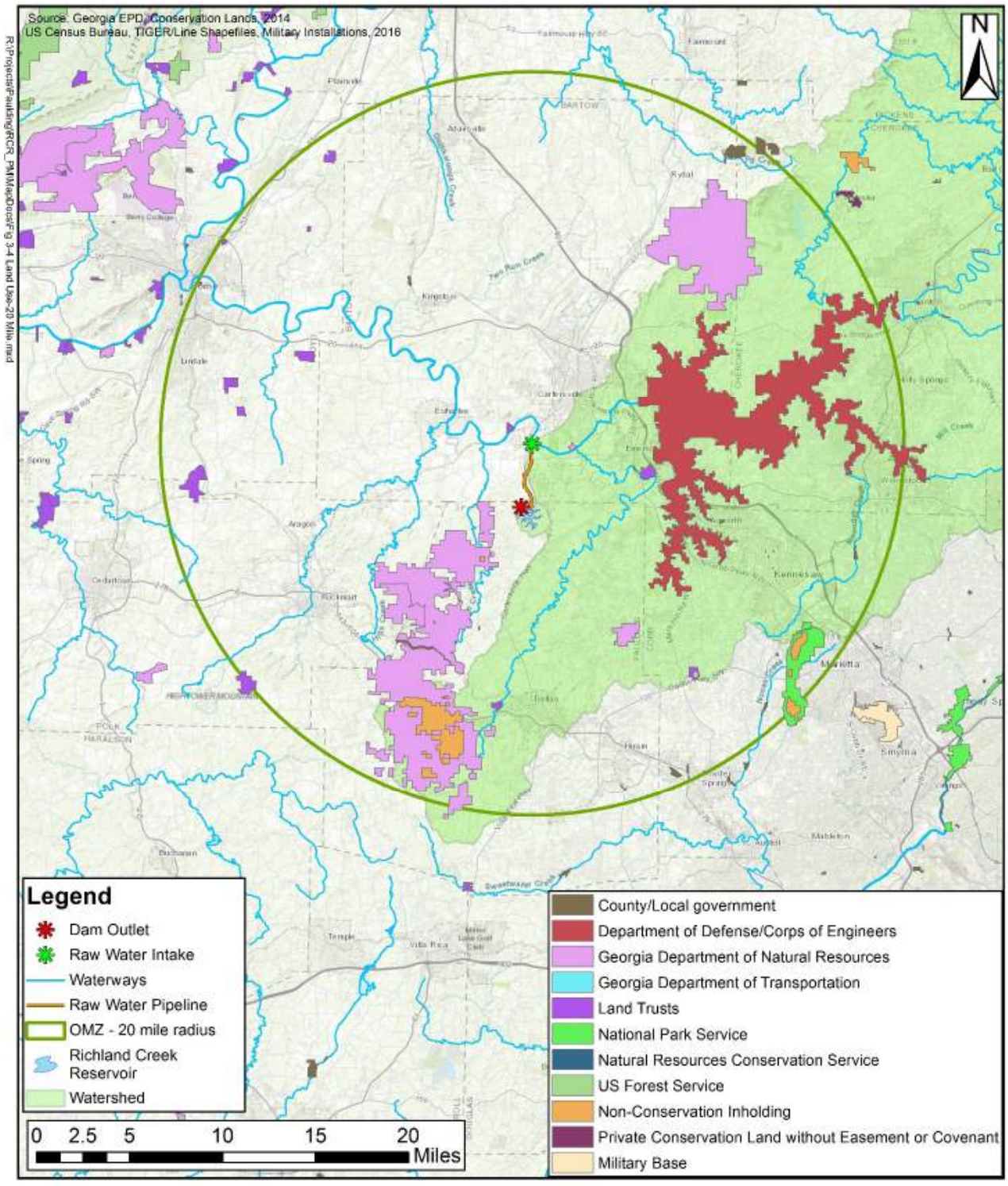

Figure 3-4. Land Use Management (20-Mile Radius/OMZ and NMZ)

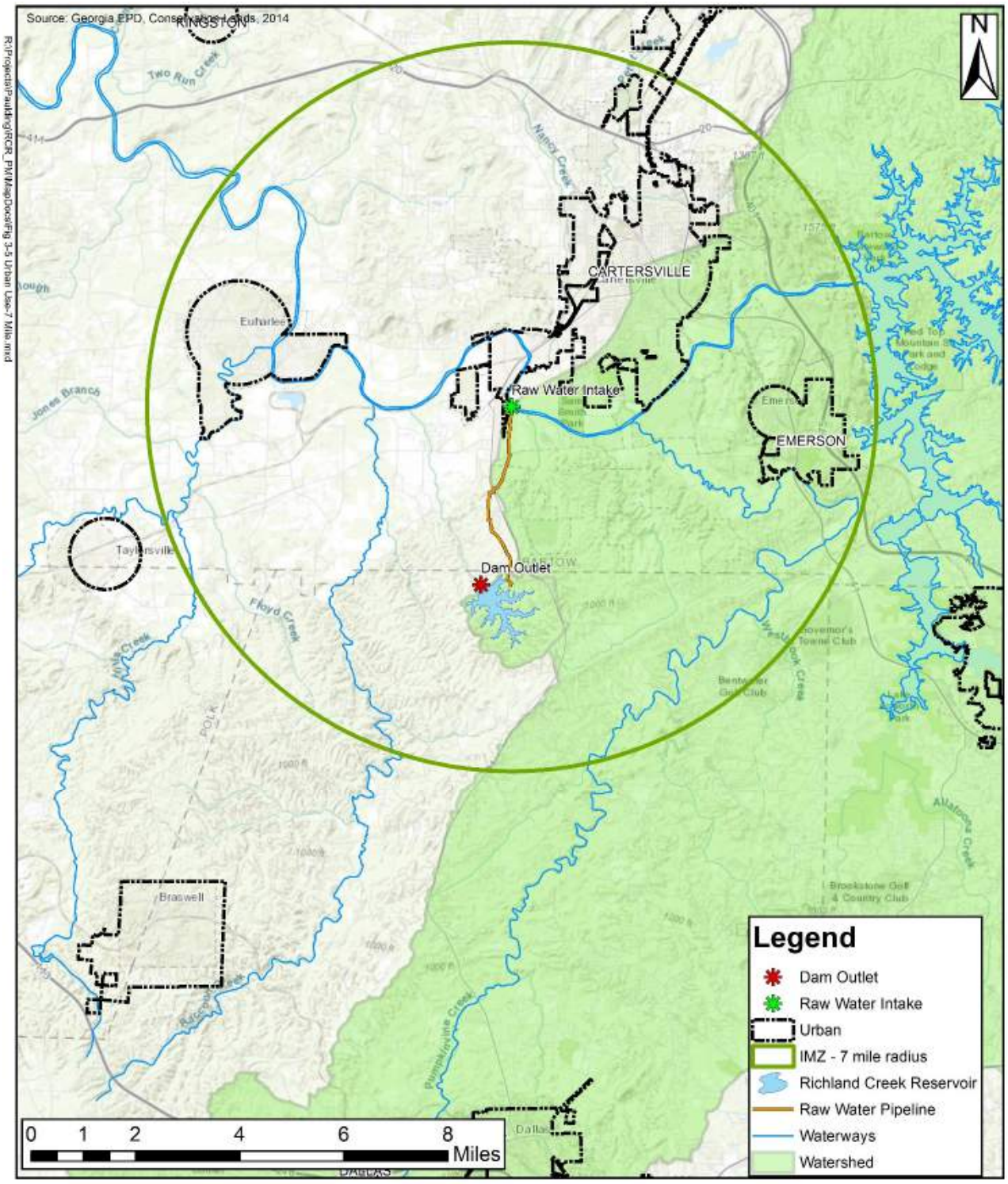

Figure 3-5. Urban Use (7-Mile Radius/IMZ)

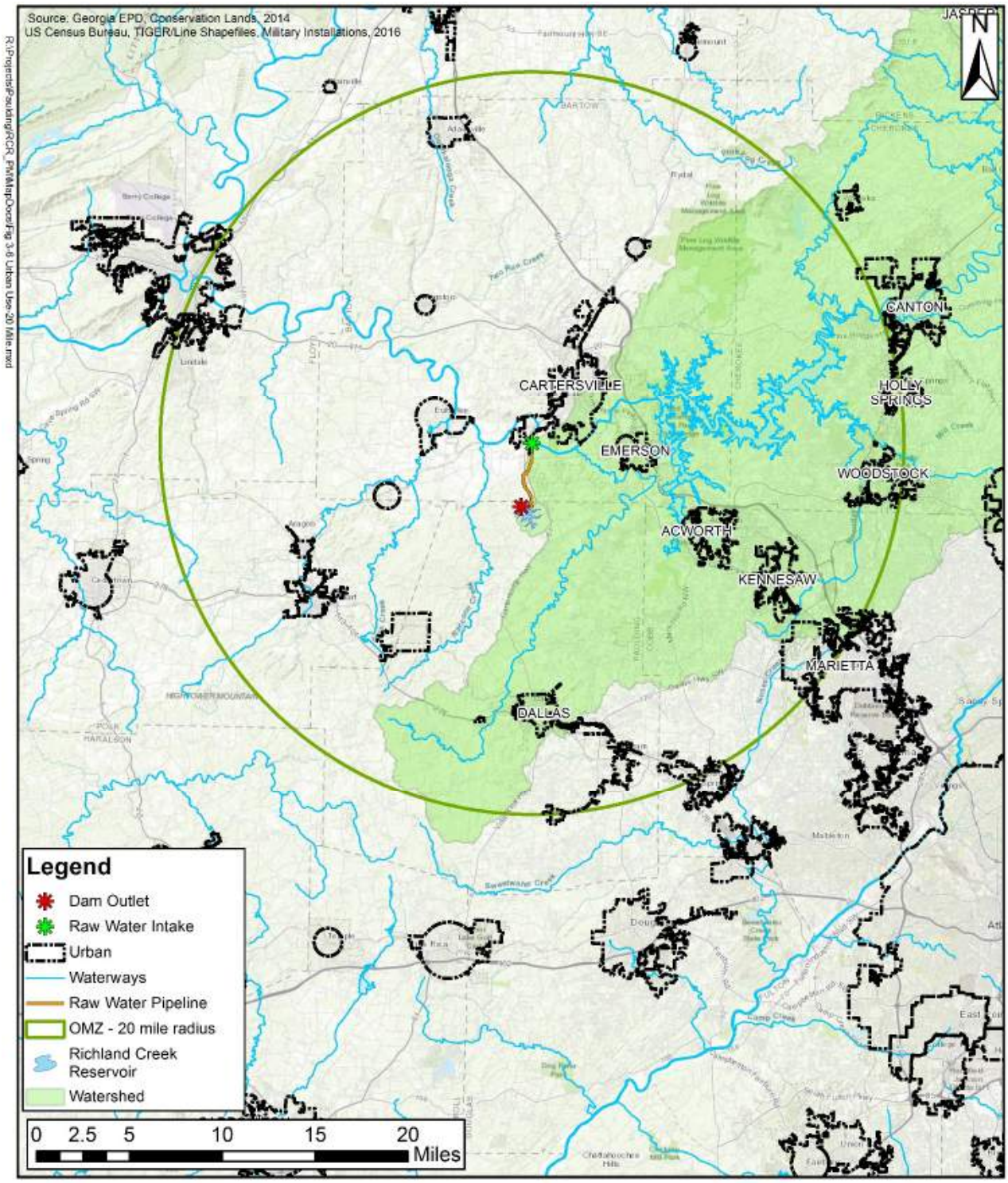

Figure 3-6. Urban Use (20-Mile Radius/OMZ and NMZ)

3.3 Point Source Assessment

3.3.1 Confined Animal Feedlot Operations

In the raw water intake watershed, two CAFO areas exist within both the IMZ and OMZ. Assuming these are chicken houses, the risk and release factors are low to medium due to the dry nature of animal wastes and general practice of hauling litter away from the site. These areas were identified by analyzing existing aerial photography and are shown in Figures 3-1 and 3-2.

3.3.2 Agricultural Waste Lagoons

In the raw water intake watershed, one agricultural waste lagoon was identified in the OMZ. This area was identified by analyzing existing aerial photography and is shown in Figure 3-2. No agricultural waste lagoons were identified within the IMZ.

3.3.3 Airports

Two airports within the OMZ are located within the raw water intake watershed and are shown in Figures 3-7 and 3-8. Data for airports were acquired from the Georgia Clearinghouse GIS Database.

3.3.4 Roadways

Primary roads that cross surface waters within the watershed's IMZ are shown in Figure 3-7 and include the following:

- Interstate 185
- Georgia State Route 106
- Georgia State Route 112
- Georgia State Route 120
- Georgia State Route 144
- Georgia State Route 145
- Georgia State Route 230
- Georgia State Route 257
- Georgia State Route 26
- Georgia State Route 27
- Georgia State Route 41
- Georgia State Route 5
- Georgia State Route 53
- Georgia State Route 56
- Georgia State Route 57
- U.S. Route 221
- U.S. Route 25
- U.S. Route 280
- U.S. Route 29
- U.S. Route 78

Primary roads that cross surface waters within the watershed's OMZ are shown in Figure 3-8 and include the following:

- Georgia State Route 1
- Georgia State Route 10
- Georgia State Route 124
- Georgia State Route 15
- Georgia State Route 20
- Georgia State Route 204
- Georgia State Route 23
- Georgia State Route 25
- Georgia State Route 257
- Georgia State Route 31
- Georgia State Route 404
- Georgia State Route 411
- Georgia State Route 5
- Georgia State Route 520
- Georgia State Route 7
- Georgia State Route 81
- Georgia State Route 90
- U.S. Route 129
- U.S. Route 27
- U.S. Route 319
- U.S. Route 341
- U.S. Route 80

Road crossings were not evaluated individually. Instead, the entire stretch of highway within a particular management zone was evaluated for overall release and risk potential. Secondary roads that cross streams within the watershed are not included in this list. Data for roadways were acquired from the US Census Bureau, TIGER/Lines GIS Database, 2016.

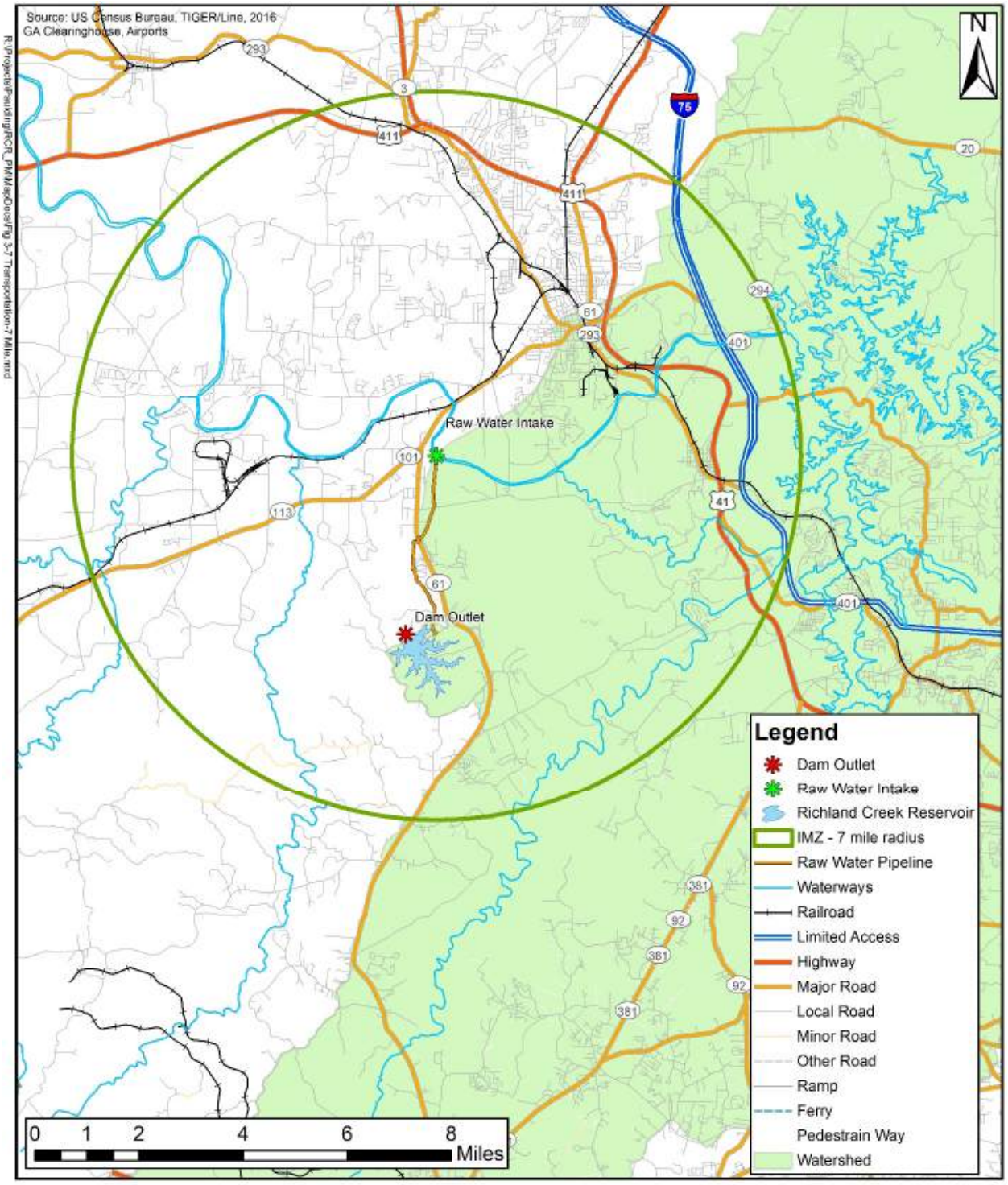

Figure 3-7. Transportation (7-Mile Radius/IMZ)

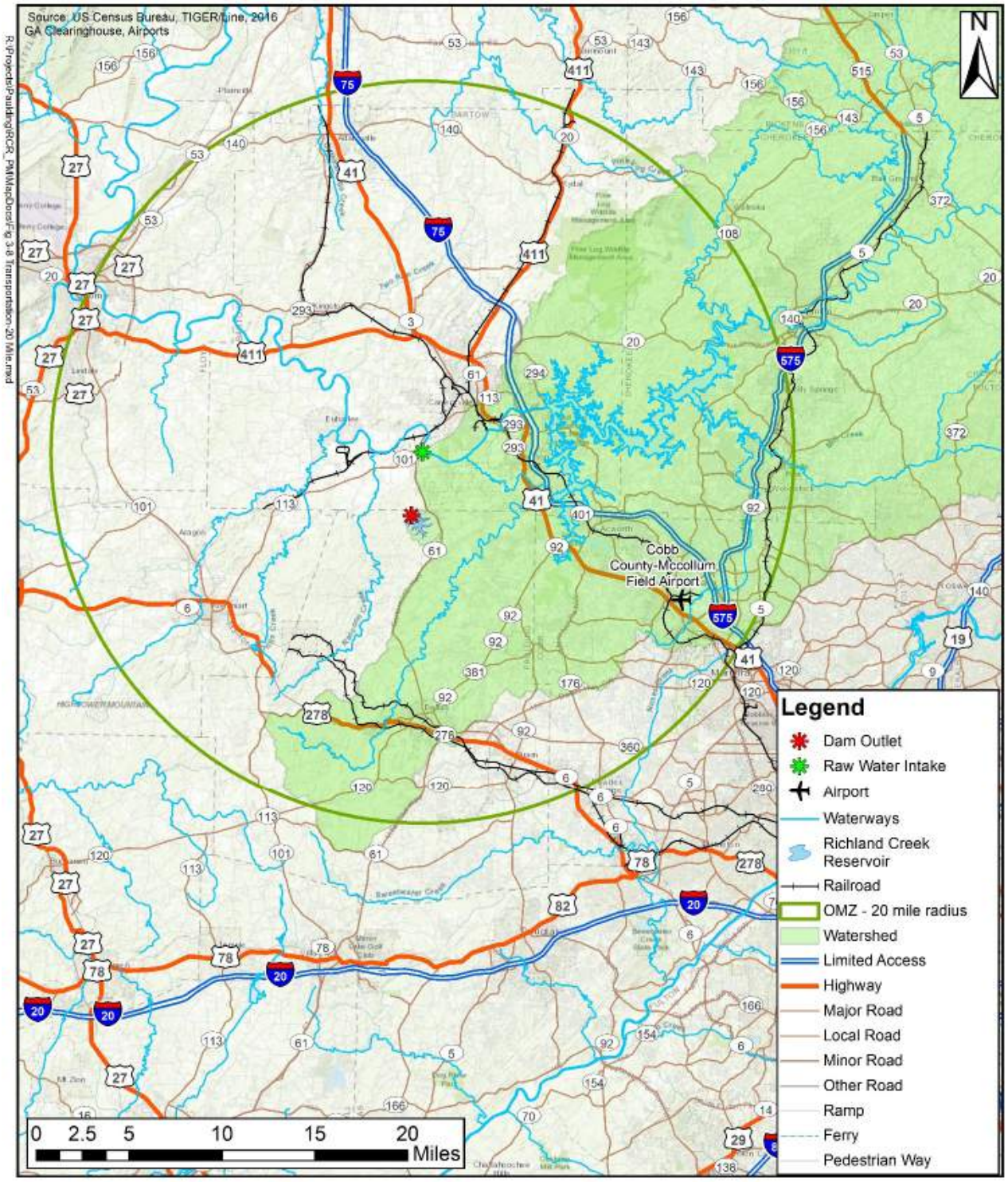

Figure 3-8. Transportation (20-Mile Radius/OMZ and NMZ)

3.3.5 Railways

The Norfolk Southern Railroad and CSX Transportation both have railways that cross streams in the watershed at multiple locations within the IMZ and OMZ, as shown in Figures 3-7 and 3-8. As with roads, these crossings are not evaluated individually. The railroad's overall impact is assessed by management zone. Data for railways were acquired from the US Census Bureau, TIGER/Lines GIS Database, 2016.

3.3.6 Industries, Manufacturing and Businesses

Several industries, manufacturing facilities, and other businesses that store and handle potential contaminants are located within the raw water intake watershed. These are included in Appendix A.

3.3.6.1 NPDES

There are 14 NPDES-permitted sites within the IMZ and 39 NPDES-permitted sites within the OMZ, for a total of 53 NPDES-permitted sites within the watersheds. These sites are shown in Figures 3-9 and 3-10 and a list of the sites is provided in Appendix A. Only individual wastewater and stormwater NPDES sites are mapped. NPDES permittees covered under the industrial general permit are included on Appendix A. Data for NPDES sites were acquired from the GA Facility Registry Service (FRS), 2016, and from the GA EPD's list of NPDES Permits for Stormwater Discharges from Industrial Activities.

3.3.6.2 Business and Industry

Business and industry includes the Georgia HSI and potential producers of pollution from the GA FRS within the watershed. This includes power plants, dry cleaners, manufacturing facilities, and other associated companies. Three HSI sites are located within the IMZ and three within the OMZ. Two large quantity generators and three large industries are located within the IMZ and one large quantity generator and four large industries are within the OMZ. Data for business and industry were acquired from the GA FRS, 2016 and GA EPD HSI, March 9, 2017.

Business and industry located in the raw water intake watershed's IMZ includes:

- Chemical Products Corporation (aka First Brands Corporation)
- ATCO Rubber Products, Inc.
- ZEP Commercial
- Chemical Products Technologies
- Southern Color North America, Inc.
- Amrep, Inc.
- Bartow County SR 294 Emerson Landfill
- Metropolitan Sandblasting Site

Business and industry located in the raw water intake watershed's OMZ includes:

- BASF Construction Chemicals, Inc.
- ITW Chemtronics
- Polyone Corporation
- Domino's DC (aka AGFA Corporation Kennesaw Warehouse)
- WW Henry Company, Inc.
- Cheatham Road Landfill
- Paulding County Gulledge Road Landfill
- HTC Group, LLC

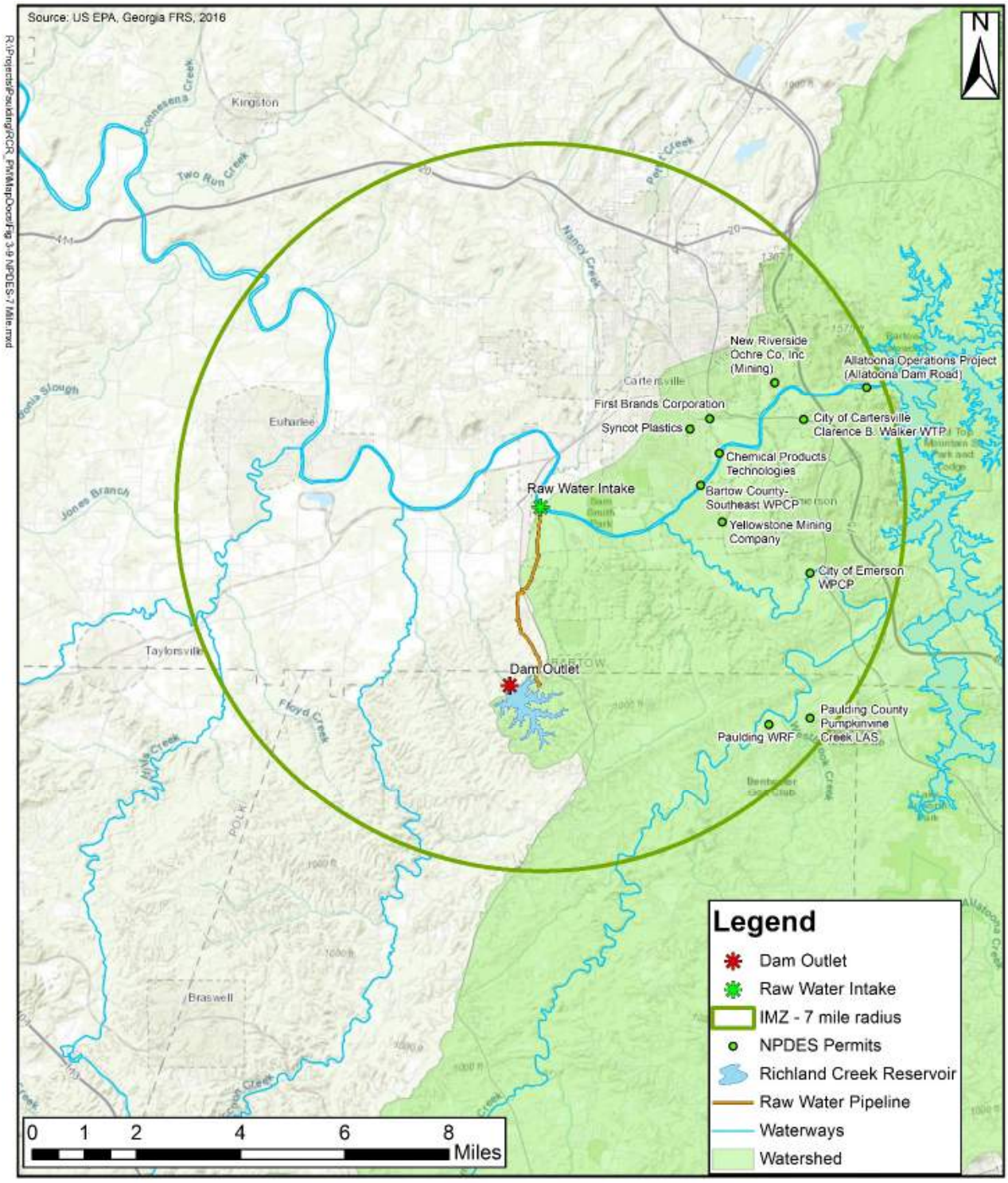

Figure 3-9. NPDES Permits (Individual) (7-Mile Radius/IMZ)

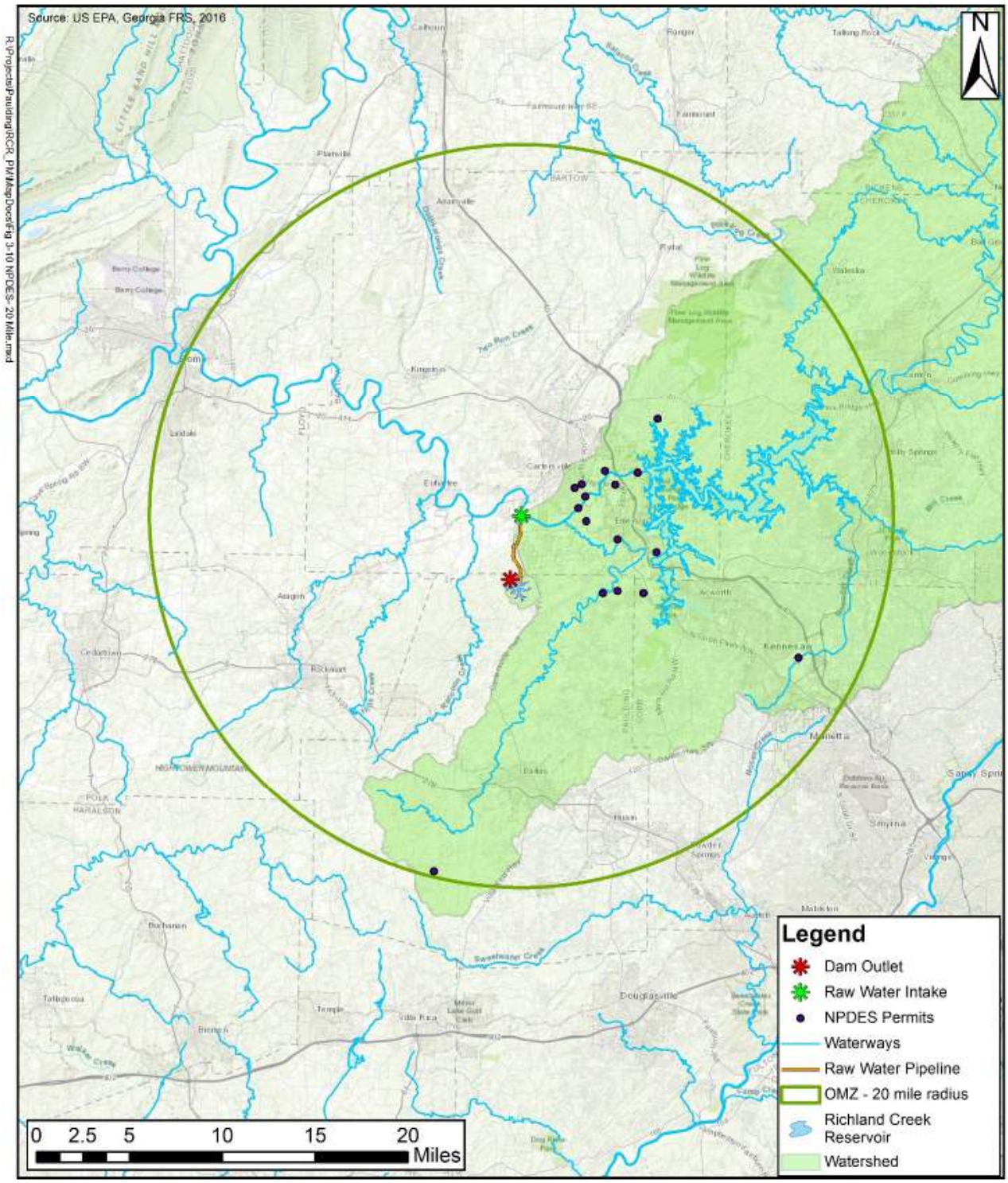

Figure 3-10. NPDES Permits (Individual) (20-Mile Radius/OMZ)

3.3.7 Landfills, Garbage Transfer Stations, and Land Application Systems

Five landfills, one garbage transfer station, and one LAS are located within the raw water intake watershed. Locations of these facilities are shown in Figures 3-11 and 3-12.

Facilities located within the IMZ include:

- Bartow County – SR294 Emerson Landfill
- Chemical Products Corp Industrial Landfill
- Paulding County – Pumpkinvine Creek LAS

Facilities located within the OMZ include:

- Cheatham Road Landfill (Phase 2 Cobb County)
- Paulding County – County Services Lane Municipal Solid Waste Landfill

Data for landfills, garbage transfer stations, and LAS were acquired from the USEPA GA FRS, 2016, and GA EPD HSI, 2016.

3.3.8 Lift Stations

There are 46 lift stations located within the raw water intake watershed that are maintained and operated by Paulding and Bartow counties (other county lift station data was not accessible).

The following 19 lift stations are located within the IMZ:

- Bartow County Landfill Sewer Pump Station at 40 Allatoona Dam Road
- Carter Grove S/D Sewer Pump Station No. 1 at 36 Grove Point Way
- Carter Grove S/D Sewer Pump Station No. 2 at 600 Carter Grove Boulevard
- Carter Grove S/D Sewer Pump Station No. 3 at 24 Ashwood Court
- Carter Grove S/D Sewer Pump Station No. 4 at 17 Greencliff Way
- Carter Grove S/D Sewer Pump Station No. 5 at 1426 Douthit Ferry Road
- River Shoals S/D Sewer Pump Station at 480 Old Alabama Road
- Riverside Plantation S/D Sewer Pump Station at Riverside Plantation S/D
- Woodland High School Sewer Pump Station at 800 Old Alabama Road
- Capitols E/One System
- Edenwood
- Golf course
- Lost Creek
- McEvers
- North Paulding High
- Silvercrest Lakes
- Thunder Ridge
- Westbrooke No. 1
- Winding Creek

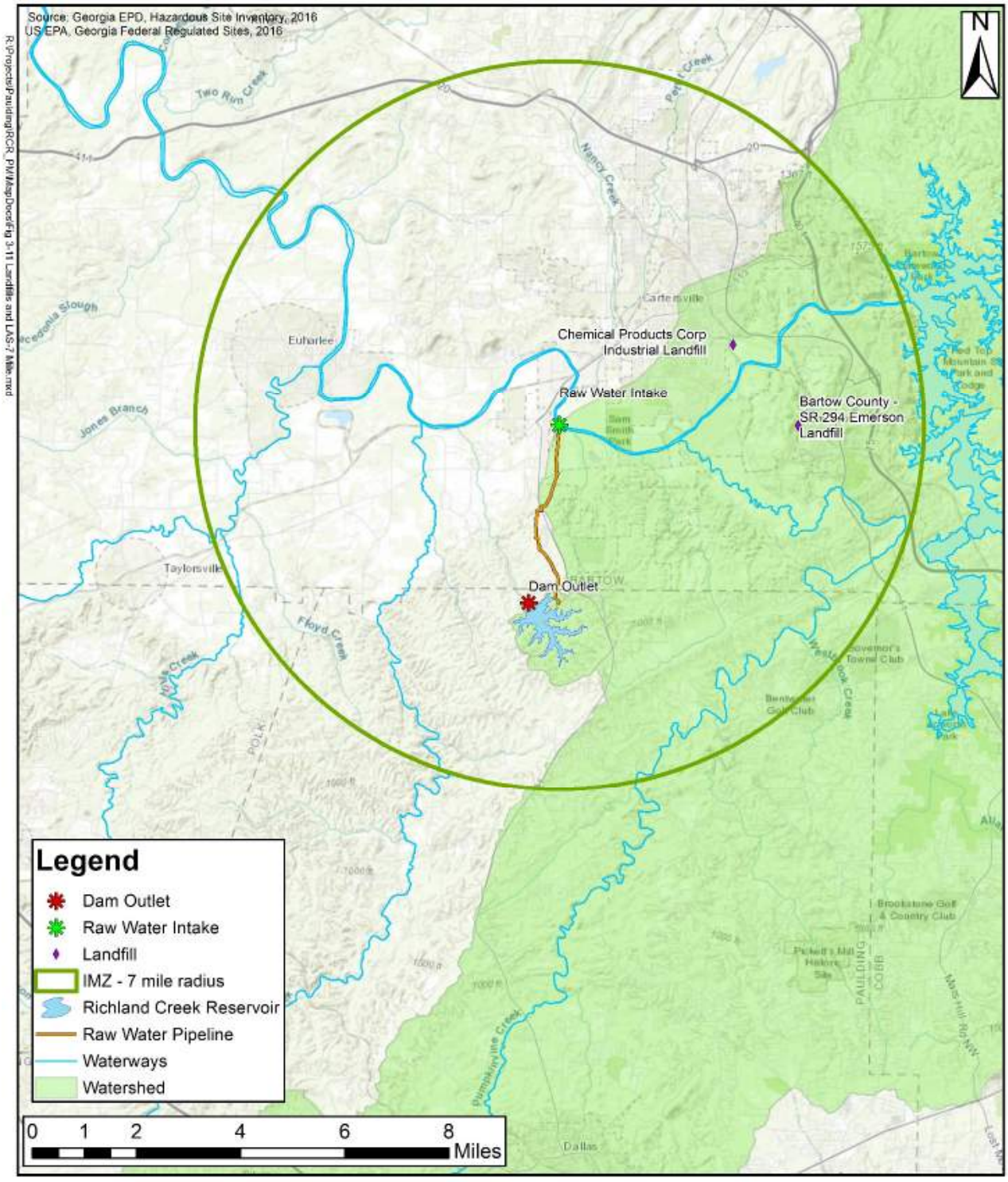

Figure 3-11. Landfills and LASs (7-Mile Radius/IMZ)

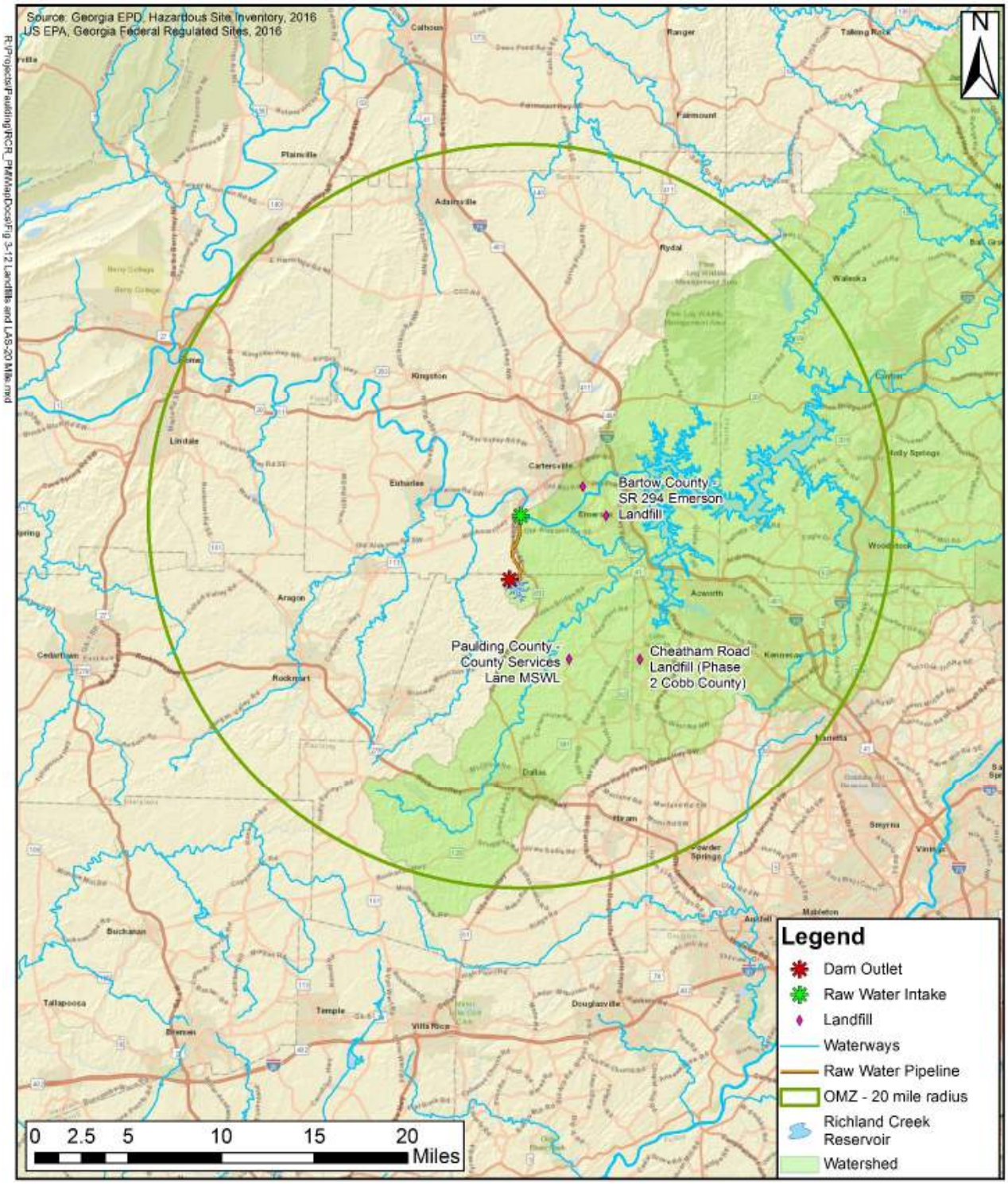

Figure 3-12. Landfills and Land Application Sites (20-Mile Radius/OMZ)

The following lift stations are located within the OMZ (46 lift stations total, including IMZ):

- Apache Woods Pump Station No. 1
- Apache Woods Pump Station No. 2
- Bartow County Landfill Sewer Pump Station at 40 Allatoona Dam Road
- Glade Road Area Collection Sewer Pump Station No. 1 at 6505 Glade Road (Proposed)
- Glade Road Area Collection Sewer Pump Station No. 2 at 5888 Glade Road (Proposed)
- Glade Road Area Collection Sewer Pump Station No. 3 at 5650 Glade Road (Proposed)
- Northpoint Parkway Sewer Pump Station at 50 Hopson Drive
- Unnamed at Old 41 Hwy
- Cedarcrest Village
- Crossroads Private
- Due West
- East Paulding
- Hwy 41
- Naturewalk
- Oakleigh Point
- Paintball
- Possum Creek
- Private New Hope
- Raper Creek
- Riverwood
- Rosewood Park
- Seven Hills
- Shady Glen
- Somerset
- Timberlands
- Westbrooke No. 2
- Westbrooke No. 3

Lift station locations are shown in Figures 3-13 and 3-14. Lift stations rank as a high risk due to the presence of possible pathogens and close proximity to surface waters.

3.3.9 Water and Wastewater Treatment Plants

Multiple WTPs and WWTPs are located within the IMZ and OMZ of the raw water intake watershed, as shown in Figures 3-13 and 3-14.

Treatment facilities located within the IMZ include:

- Cartersville Water Pollution Control Plant
- Emerson Pond WWTP
- Bartow County Water Pollution Control Plant
- City of Emerson WTP
- City of Cartersville Clarence B. Walker WTP
- Paulding Water Reclamation Facility

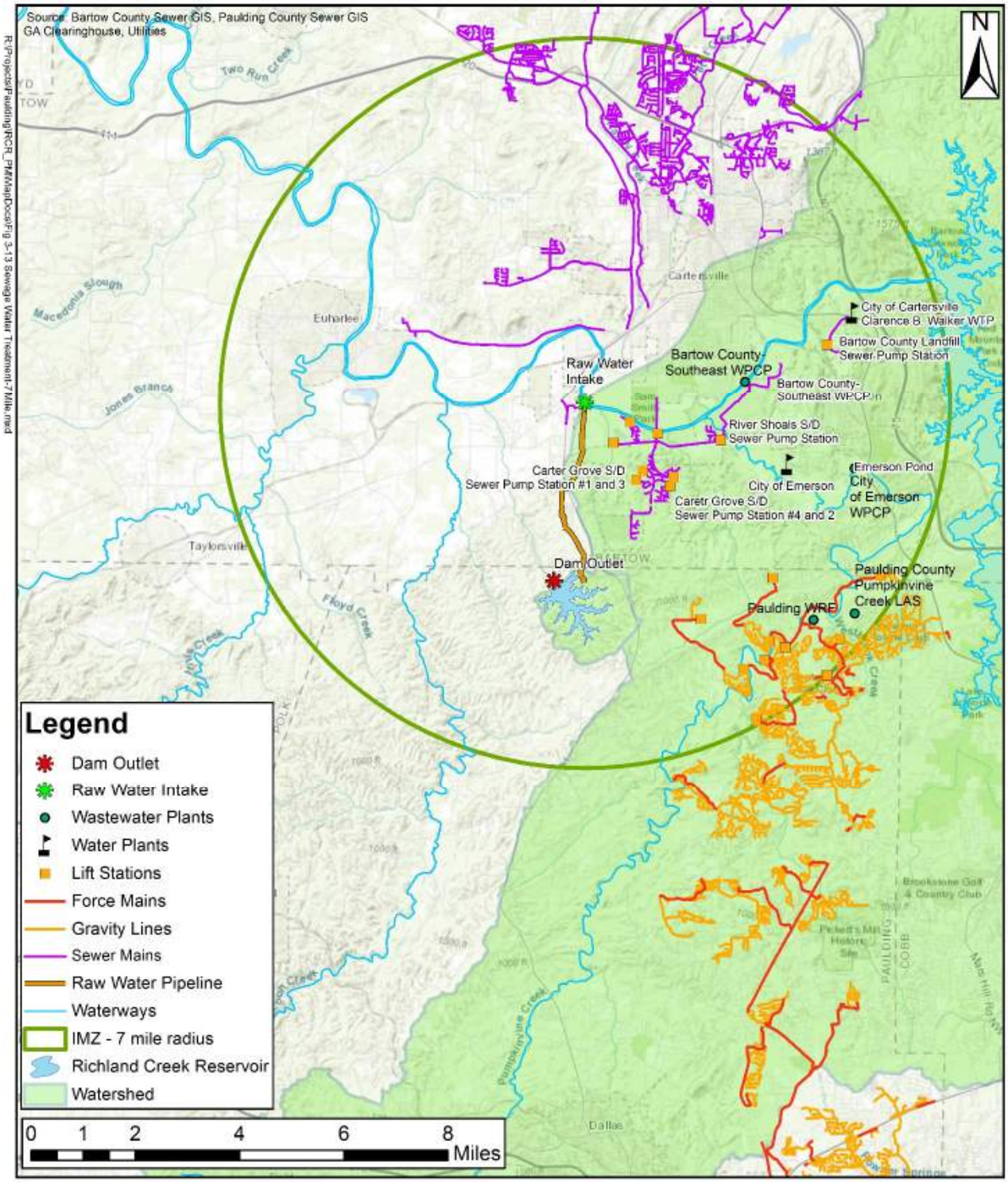

Figure 3-13. Lift Stations, WTPs, and WWTPs (7-Mile Radius/IMZ)

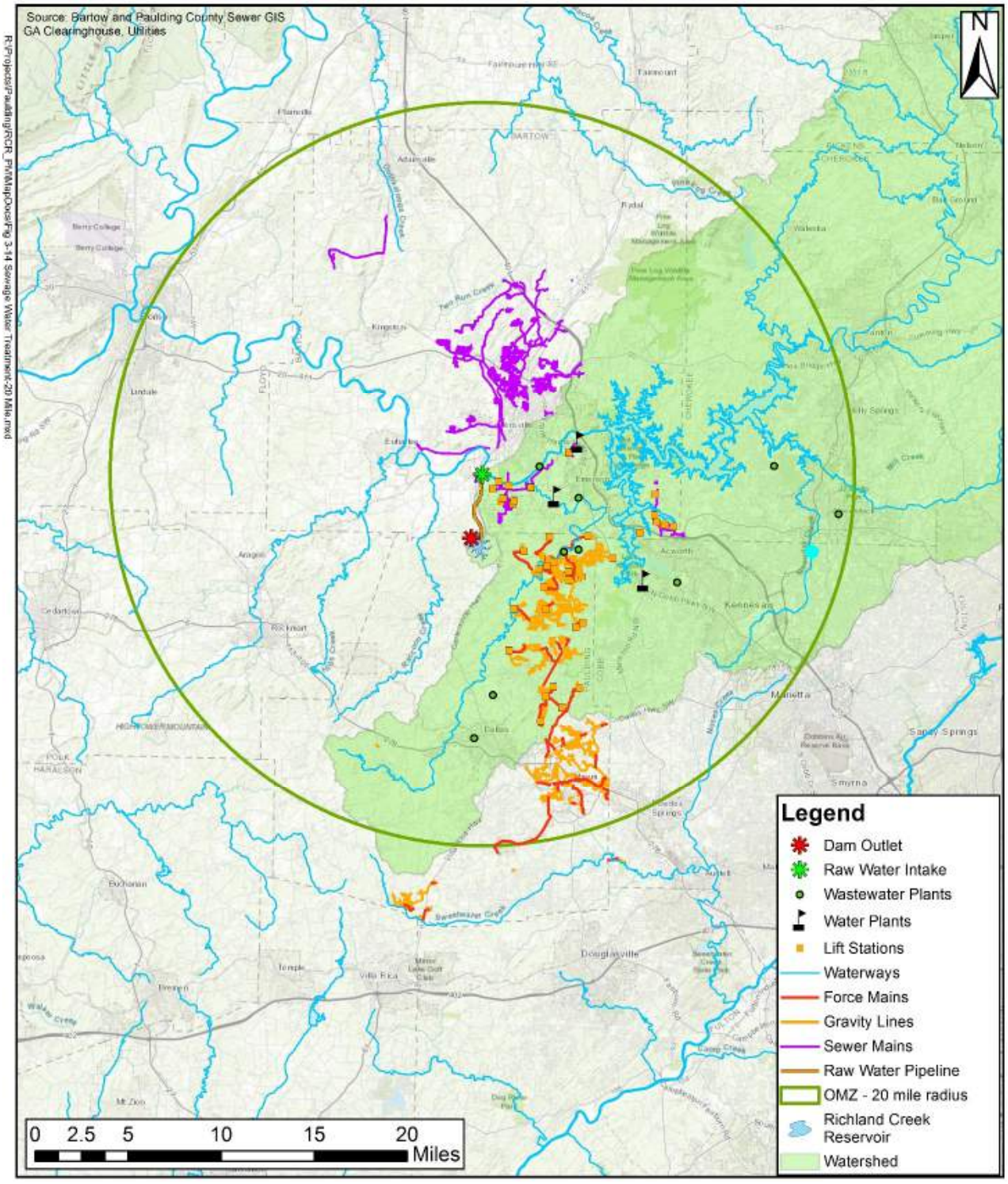

Figure 3-14. Lift Stations, WTPs, and WWTPs (20-Mile Radius/OMZ)

Treatment facilities located within the OMZ include:

- Cartersville Allatoona WWTP
- Cartersville WTP
- Cobb County Marietta Chattahoochee River WTP
- Cobb County Marietta Acworth Water Filtration Plant
- Cherokee County Reuse WWTP
- Cherokee County Rose Creek Water Pollution Control Plant
- Cherokee County Water and Sewer WWTP
- Cobb County Wyckoff WTP
- Cobb County – Northwest WPCP
- Cobb County – Noonday Creek WRF
- Dallas North WPCP
- Dallas West WPCP
- Woodstock WPCP

Data for water and wastewater were acquired from the Georgia Clearinghouse GIS Database and County GIS databases.

3.3.10 Military

No military establishments are located within the NMZ. Data for the military areas were acquired from US Census Bureau, TIGER/Lines, 2016.

3.3.11 Mining

Five active mining operations are located in the watershed. These mines, along with past, developed, and prospect mines, are shown in Figures 3-9 and 3-10 along with sites that hold a NPDES permit.

Active mining operations located within the IMZ include:

- Yellowstone Mining Company
- New Riverside Ochre, Inc.

Active mining operations located within the OMZ include:

- Vulcan Bartow Quarry – crushed stone
- Vulcan Kennesaw Quarry – crushed stone
- Martin Marietta Aggregates, Paulding Quarry – crushed stone

Data for mines were acquired from the USEPA GA FRS.

3.3.12 Oil and Gas Pipelines

An oil pipeline owned by Colonial Pipeline Company and a gas pipeline owned by Atlanta Gas Light company run through Bartow and Paulding County. These pipeline cross streams within the IMZ and OMZ including tributaries of the RCR Reservoir. As with road and railroad crossings, potential impacts from the entire pipeline are evaluated, rather than each individual crossing. Since GIS data was not available, analysis was performed through the public map viewer available in the National Pipeline Mapping System web site (https://www.npms.phmsa.dot.gov/).

3.3.13 Sewer Pipelines Adjacent to or Crossing Streams/Sewer Areas and Non-Sewer Areas

Bartow and Paulding Counties both have sewer and trunk lines that cross streams in the watershed at multiple locations within the IMZ and OMZ, as shown in Figures 3-13 and 3-14. As with roads, these crossings were not evaluated individually—the sewers' overall impact is assessed by management zone. Data for sewer was acquired from Bartow and Paulding County GIS databases.

Septic tanks in non-sewer areas may be a potential source of pollutants. Areas not covered by sewer pipelines were assumed to be serviced by septic tanks. Septic tanks are a primary concern for groundwater contamination; however, they may affect surface water where in close proximity. Due to the lack of data for areas serviced by septic tanks, and typical controls in place for septic tanks, the risk and release potential area assumed to be low.

3.4 Susceptibility Results

The IMZ measures approximately 58 square miles and the OMZ measures approximately 465 square miles. The EPD source water assessment guidance for surface source water was used to rank individual potential pollution sources according to their potential for release and potential risk to source water. Appendix A provides a complete inventory of contaminants and individual rankings for the release and risk potential along with a justification for each.

Overall, the Richland Creek watershed was ranked as a low risk and the Etowah River watershed ranked as a medium risk. The reservoir will cover a majority of the 2.5-square-mile watershed. The only potential pollution sources identified within the watershed were the colonial and AGL pipelines and its source water susceptibility to contamination was determined to be low.

Point and non-point sources of concern were identified in the Etowah River raw water intake watershed. The only point sources to rank in the high risk/high release category include sewer pipelines and railroads, due to large number of stream crossings with potential of pathogens or chemicals associated with spills, and the Bartow County SR 294 landfill, due to its close proximity to the Etowah River and history of groundwater contamination. The other point source that poses a high risk/medium release is primary and secondary roads, due to their potential to transmit chemicals associated with spills and relative proximity to the surface water. Other categories of potential pollutants ranking higher in this assessment include sites listed in the HSI, WWTPs, and lift stations with potential for spills.

EPD's source water assessment guidance was used to calculate the relative percent of occurrence of contaminants within each priority zone and overall susceptibility. Sources occurring in both the IMZ and OMZ were weighted separately for overall susceptibility. The largest number of potential sources (52 percent) was ranked as low priority. Medium and high priority contaminants represent 32 and 22 percent, respectively, of the total. The overall susceptibility of the intake is rated medium based on this analysis.

Table 3-1 summarizes the susceptibility to contamination of the Richland Creek reservoir and Etowah River raw water intake watersheds.

Table 3-1. Susceptibility Summary for the Richland Creek Reservoir and Etowah River Raw Water Intake Watersheds

RISK	LOW	MEDIUM	HIGH
HIGH	1 Private landfill, large industry, NPDES permit holder (IMZ) 2 Large industry, NPDES permit holder (IMZ) 1 Large industry (IMZ) 1 NPDES permit holder (IMZ) 1 WWTP (IMZ)	Lift stations adjacent to stream crossings (IMZ and OMZ) 1 LAS permit holder (IMZ) 3 WWTP (IMZ) 1 WWTP (OMZ) 1 Large quantity generator and NPDES permit holder (IMZ) Railroads crossing streams (IMZ) 1 HSI (IMZ)	1 Urban area (IMZ) 4 Urban areas (OMZ) 1 NPDES and HSI site (IMZ) Sewer pipelines adjacent to stream crossing (IMZ and OMZ) Railroads crossing streams (OMZ)
MEDIUM	1 Forestry (IMZ) 6 Forestry (OMZ) CAFOs (IMZ and OMZ) 1 NPDES permit holder and Mining site (IMZ) 4 NPDES permit holders (IMZ) 2 Water plants (IMZ) 1 Water plant (OMZ) 1 Agricultural waste lagoon (OMZ) 1 Airport (OMZ) 2 Large industry with bulk chemical storage (OMZ) 8 NPDES permit holder (OMZ) 1 Large quantity generator (OMZ)	Agricultural areas 2 Urban areas (OMZ) 1 Mining and NPDES site (IMZ and OMZ) 1 NPDES permit holder (IMZ) 1 Airport (OMZ) 2 Landfill and HSI site (OMZ) 1 Large industry with bulk petroleum storage and NPDES permit holder (OMZ) 1 Large industry which utilize hazardous chemical and NPDES permit holder (OMZ) 2 Airport and NPDES permit holder (OMZ) 6 WWTPs (OMZ) 1 Power Plant (OMZ) Lift stations adjacent to stream crossings (OMZ) 2 Marinas (OMZ)	Primary and secondary roads crossing streams (IMZ and OMZ) 1 HSI site (IMZ) 1 HSI site (OMZ)
LOW	1 Urban (IMZ) Non-sewer areas (OMZ) Secondary roads crossing streams (IMZ) Oil pipelines (IMZ) 16 NPDES permit holders (OMZ) 1 NPDES permit holder and mining site (OMZ) 1 Garbage transfer station (OMZ)	1 Urban area (OMZ) 1 Mining and NPDES permit holder (OMZ) 1 NPDES permit holder (OMZ) Secondary roads crossing streams (OMZ)	Oil and Gas pipelines
	LOW	MEDIUM	HIGH
	RELEASE POTENTIAL		

Section 4

Summary and Recommendations

The susceptibility of the water supply to various point and non-point sources was evaluated using the GA EPD source water methodology, which aims to balance risk and release potential. Specific categories or sites of high risk are outlined below. Engineering controls, such as raw water storage facilities that provide an off-source backup if a spill or contamination reaches drinking water sources, are also considered when evaluating overall susceptibility.

The overall susceptibility of the Paulding County reservoir was determined to be low, while the Etowah River intake's susceptibility was determined to be medium.

The highest priority pollutant sources to drinking water supplies generally include:

- sewer pipelines
- railroads crossing creeks
- urban areas
- primary and secondary road crossings
- WWTPs
- lift stations

In all cases, closer proximity to the intake raises the susceptibility ranking. It is important to remember that ranking a facility as a high risk does not reflect on management, but rather potential for contamination that can be addressed through preventive planning. In addition, facilities that store large volumes of chemicals should have secondary containment onsite, which mitigates release potential.

The relatively high risk ranking of railroad and road crossings presents an opportunity to ensure that emergency response plans are up to date. Given the large industrial and manufacturing base in the area, transportation corridors have larger than average volumes of potential pollutants at risk for spills. Emergency response plans should include time of transport from bridge crossings to drinking water supply intakes. Details of an emergency response plan could include contact names and numbers for emergency response officials and laboratory personnel, among others.

Non-point source pollution can be addressed through a variety of methods including education and outreach programs, implementation of urban runoff controls such as street sweeping and storm sewer inspections, enforcement of stream buffer requirements for small source water watersheds, and other programs targeted towards each category of land use.

Section 5

Limitations

This document was prepared solely for Paulding County in accordance with professional standards at the time the services were performed and in accordance with the contract between Paulding County and Brown and Caldwell dated May 15, 2014. This document is governed by the specific scope of work authorized by Paulding County Water System; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by Paulding County Water System and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

This document sets forth the results of certain services performed by Brown and Caldwell with respect to the property or facilities described therein (the Property). Paulding County recognizes and acknowledges that these services were designed and performed within various limitations, including budget and time constraints. These services were not designed or intended to determine the existence and nature of all possible environmental risks (which term shall include the presence or suspected or potential presence of any hazardous waste or hazardous substance, as defined under any applicable law or regulation, or any other actual or potential environmental problems or liabilities) affecting the Property. The nature of environmental risks is such that no amount of additional inspection and testing could determine as a matter of certainty that all environmental risks affecting the Property had been identified. Accordingly, THIS DOCUMENT DOES NOT PURPORT TO DESCRIBE ALL ENVIRONMENTAL RISKS AFFECTING THE PROPERTY, NOR WILL ANY ADDITIONAL TESTING OR INSPECTION RECOMMENDED OR OTHERWISE REFERRED TO IN THIS DOCUMENT NECESSARILY IDENTIFY ALL ENVIRONMENTAL RISKS AFFECTING THE PROPERTY.

Further, Brown and Caldwell makes no warranties, express or implied, with respect to this document, except for those, if any, contained in the agreement pursuant to which the document was prepared. All data, drawings, documents, or information contained this report have been prepared exclusively for the person or entity to whom it was addressed and may not be relied upon by any other person or entity without the prior written consent of Brown and Caldwell unless otherwise provided by the Agreement pursuant to which these services were provided.

Section 6

References

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GA Federal Registered Sites, 2016.

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US Geological Survey for Active Mines and Mineral Processing Plants, 2005.

Appendix A: Surface Source Water Susceptibility Analysis

Appendix A

Surface Source Water Susceptibility Analysis

Potential Non-Point Pollutant Sources

Richland Creek Reservoir and Etowah River Intake – IMZ (7-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Non-Point Source: AGRICULTURAL AREAS 3 areas identified	Using supplemental guidance for Non-Point Sources: • BMP in place, but may not be properly implemented, medium livestock density, moderate topography, some buffers in place (medium) Overall Release Potential = MEDIUM	Using supplemental guidance for Non-Point Sources: • Near main stem or major tributary, moderate volume and/or toxicity (medium) Overall Risk Potential = MEDIUM
Non-Point Source: FORESTRY Private conservation land with easement or covenant (Manager: Atlanta Coast Conservancy)	Using supplemental guidance for Non-Point Sources: • Low density of forest activity **(low)** • Adequate buffers **(low)** Overall Release Potential = LOW	Using supplemental guidance for Non-Point Sources: • Near main stem or major tributary **(medium)** Overall Risk Potential = MEDIUM
Non-Point Source: URBAN Cartersville	Using supplemental guidance for Non-Point Sources: • High percentage of impervious surface **(high)** Overall Release Potential = HIGH	Using supplemental guidance for Non-Point Sources: • Immediate proximity of surface water **(high)** Overall Risk Potential = HIGH
Non-Point Source: URBAN Emerson	Using supplemental guidance for Non-Point Sources: • Low percentage of impervious surface **(low)** Overall Release Potential = LOW	Using supplemental guidance for Non-Point Sources: • No surface water in close proximity **(low)** Overall Risk Potential = LOW
Non-Point Source: NON-SEWER	• Release is tempered by transport through soil and groundwater to reach surface water supplies **(low)** Overall Release Potential = LOW	• Controls typically in place **(low)** Overall Risk Potential = LOW

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Non-Point Source: AGRICULTURAL AREAS 3 additional areas identified	Using supplemental guidance for Non-Point Sources: • BMP in place, but may not be properly implemented, medium livestock density, moderate topography, some buffers in place **(medium)** Overall Release Potential = MEDIUM	Using supplemental guidance for Non-Point Sources: • Near main stem or major tributary, moderate volume and/or toxicity **(medium)** Overall Risk Potential = MEDIUM
Non-Point Source: FORESTRY Red Top Mountain State Park (Manager: GaDNR)	Using supplemental guidance for Non-Point Sources: • Low density of forest activity **(low)** • Adequate buffers **(low)** Overall Release Potential = LOW	Using supplemental guidance for Non-Point Sources: • Near main stem or major tributary **(medium)** Overall Risk Potential = MEDIUM
Non-Point Source: FORESTRY Pine Mountain Wildlife Management Area (Manager: GaDNR)	Using supplemental guidance for Non-Point Sources: • Low density of forest activity **(low)** • Adequate buffers **(low)** Overall Release Potential = LOW	Using supplemental guidance for Non-Point Sources: • Near main stem or major tributary **(medium)** Overall Risk Potential = MEDIUM
Non-Point Source: FORESTRY Lake Allatoona (Manager: Corps of Engineers)	Using supplemental guidance for Non-Point Sources: • Low density of forest activity **(low)** • Adequate buffers **(low)** Overall Release Potential = LOW	Using supplemental guidance for Non-Point Sources: • Near main stem or major tributary **(medium)** Overall Risk Potential = MEDIUM
Non-Point Source: FORESTRY Allatoona Wildlife Management Area (Manager: GaDNR)	Using supplemental guidance for Non-Point Sources: • Low density of forest activity **(low)** • Adequate buffers **(low)** Overall Release Potential = LOW	Using supplemental guidance for Non-Point Sources: • Near main stem or major tributary **(medium)** Overall Risk Potential = MEDIUM

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Non-Point Source: FORESTRY Kennesaw Mountain National Battlefield Park (Manager: National Park Service)	Using supplemental guidance for Non-Point Sources: • Low density of forest activity **(low)** • Adequate buffers **(low)** Overall Release Potential = LOW	Using supplemental guidance for Non-Point Sources: • No surface water in close proximity **(low)** Overall Risk Potential = LOW
Non-Point Source: FORESTRY Paulding Forest Wildlife Management Area (Manager: GaDNR)	Using supplemental guidance for Non-Point Sources: • Low density of forest activity **(low)** • Adequate buffers **(low)** Overall Release Potential = LOW	Using supplemental guidance for Non-Point Sources: • Near main stem or major tributary **(medium)** Overall Risk Potential = MEDIUM
Non-Point Source: FORESTRY Pine Log Wildlife Management Area (Manager: GaDNR)	Using supplemental guidance for Non-Point Sources: • Low density of forest activity **(low)** • Adequate buffers **(low)** Overall Release Potential = LOW	Using supplemental guidance for Non-Point Sources: • No surface water in close proximity **(low)** Overall Risk Potential = LOW
Non-Point Source: URBAN Acworth	Using supplemental guidance for Non-Point Sources: • High percentage of impervious surface **(high)** Overall Release Potential = HIGH	Using supplemental guidance for Non-Point Sources: • Immediate proximity of surface water **(high)** Overall Risk Potential = HIGH
Non-Point Source: URBAN Canton	• Using supplemental guidance for Non-Point Sources: Moderate percentage of impervious surface **(medium)** Overall Release Potential = MEDIUM	Using supplemental guidance for Non-Point Sources: • Near main stem or major tributary **(medium)** Overall Risk Potential = MEDIUM
Non-Point Source: URBAN Dallas	Using supplemental guidance for Non-Point Sources: • Moderate percentage of impervious surface **(medium)** Overall Release Potential = MEDIUM	Using supplemental guidance for Non-Point Sources: • Near main stem or major tributary **(medium)** Overall Risk Potential = MEDIUM

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Non-Point Source: URBAN Holly Springs	Using supplemental guidance for Non-Point Sources: • Moderate percentage of impervious surface **(medium)** Overall Release Potential = MEDIUM	Using supplemental guidance for Non-Point Sources: • No surface water in close proximity **(low)** Overall Risk Potential = LOW
Non-Point Source: URBAN Kennesaw	Using supplemental guidance for Non-Point Sources: • High percentage of impervious surface **(high)** Overall Release Potential = HIGH	Using supplemental guidance for Non-Point Sources: • Immediate proximity of surface water **(high)** Overall Risk Potential = HIGH
Non-Point Source: URBAN Marietta	Using supplemental guidance for Non-Point Sources: • High percentage of impervious surface **(high)** Overall Release Potential = HIGH	Using supplemental guidance for Non-Point Sources: • Immediate proximity of surface water **(high)** Overall Risk Potential = HIGH
Non-Point Source: URBAN Woodstock	Using supplemental guidance for Non-Point Sources: • High percentage of impervious surface **(high)** Overall Release Potential = HIGH	Using supplemental guidance for Non-Point Sources: • Immediate proximity of surface water **(high)** Overall Risk Potential = HIGH
Non-Point Source: NON-SEWER	• Release is tempered by transport through soil and groundwater to reach surface water supplies **(low)** Overall Release Potential = LOW	• Controls typically in place **(low)** Overall Risk Potential = LOW

Potential Point Pollutant Sources

Richland Creek Reservoir and Etowah River Intake – IMZ (7-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: CONFINED ANIMAL FEED LOTS 2 locations identified	• Distance from surface water - Less than 500 feet **(high)** • Volume of release – Assumed to be less than 1,000 gallons **(low)** • Duration of release – Little likelihood of a release **(low)** • Ease of travel - Overland flow not likely since they are covered **(low)** Overall Release Potential = LOW	• Greater than 20 miles upstream from surface water intake **(low)** • Toxicity - Pathogens **(high)** Overall Risk Potential = MEDIUM
Point Source: LANDFILLS – Operating NPDES PERMIT HOLDER HIS Bartow County - SR 294 Emerson Landfill (Phase 1 - Construction and Demolition Landfill, Phase 2 - Municipal Solid Waste Landfill)	• Distance from surface water - further than 500 feet, but within 1,500 feet of Etowah River **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – ongoing, chronic small events, likelihood of continued releases **(medium)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(medium)** • Supplemental Guidance for Regulated Sources - Has history of groundwater contamination, uncharacterized waste **(high)** Overall Release Potential = HIGH	• Within 7 miles upstream of intake **(high)** • Municipal Solid Waste Landfill, Construction and Demolition Landfill - Chronic, chemicals **(medium)** Overall Risk Potential = HIGH
Point Source: LANDFILLS - Operating Private Industrial Landfill LARGE Industry NPDES PERMIT HOLDER Chemical Products Corporation (aka First Brands Corporation)	• Distance from surface water - further than 500 feet **(low)** • Volume of release – only release would be associated with stormwater, all storage indoors – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography, overland flow potential, 2,500 feet to Etowah River, engineering controls in place **(medium)** • Supplemental Guidance for Regulated Sources - compliance with permit conditions, no known releases **(low)** Overall Release Potential = LOW	• within 7 miles upstream **(high)** • plastics and rubber products manufacturing, potential for chronic chemicals **(medium)** Overall Risk Potential = HIGH

Richland Creek Reservoir and Etowah River Intake – IMZ (7-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: LAS PERMIT HOLDERS Paulding Co Pumpkinvine Creek	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – ongoing, permitted releases, chronic small events, likelihood of continued releases **(medium)** • Ease of travel - generally flat topography, travel primarily through soil or groundwater, highly volatile substance or substances that adhere to soils, overland flow not likely and structure controls on place **(low)** • Supplemental Guidance for Regulated Sources - Compliance with permit conditions, few sewer overflows and/or bypasses **(low)** Overall Release Potential = MEDIUM	• Between 7 and 15 miles upstream of intake **(medium)**Acute, pathogens **(high)** Overall Risk Potential = HIGH
Point Source: WASTEWATER PLANTS Paulding Pumpkinvine Creek WRF	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – ongoing, permitted releases, chronic small events, likelihood of continued releases **(medium)** • Ease of travel - generally flat topography, travel primarily through soil or groundwater, highly volatile substance or substances that adhere to soils, overland flow not likely and structure controls on place **(low)** • Supplemental Guidance for Regulated Sources - Compliance with permit conditions, few sewer overflows and/or bypasses **(low)** Overall Release Potential = MEDIUM	• Between 7 and 15 miles upstream of intake **(medium)** • Acute, pathogens **(high)** Overall Risk Potential = HIGH
Point Source: LARGE Industry ATCO Rubber Products Inc.	• Distance from surface water - further than 500 feet **(low)**Volume of release – only release would be associated with stormwater, all storage indoors – less than 1,000 gallons **(low)** Duration of release – little likelihood of release, no reported releases **(low)**Ease of travel - moderate topography, overland flow potential, 3000 ft to Etowah River, engineering controls in place **(medium)** Overall Release Potential = LOW	• within 7 miles upstream **(high)**ink, plastics, box manufacturing, potential for chronic chemicals **(medium)** Overall Risk Potential = HIGH

Richland Creek Reservoir and Etowah River Intake – IMZ (7-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: LARGE Industry Large Quantity Generator NPDES PERMIT HOLDER ZEP Commercial	• Distance from surface water - further than 500 feet **(low)** • Volume of release –greater than 10,000 gallons **(high)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography, overland flow potential, 1.5 miles to Etowah River, engineering controls in place **(medium)** • Supplemental Guidance for Regulated Sources - compliance with permit conditions, no known releases **(low)** Overall Release Potential = LOW	• within 7 miles upstream **(high)** • pesticides and detergent manufacturing, potential for chronic chemicals **(medium)** Overall Risk Potential = HIGH
Point Source: LARGE QUANTITY GENERATORS NPDES PERMIT HOLDER Chemical Products Technologies	• Distance from surface water - further than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – ongoing, likelihood of continued releases **(medium)** • Ease of travel - moderate topography, overland flow potential, 2,500 feet to Etowah River, engineering controls in place **(medium)** • Supplemental Guidance for Regulated Sources - periodic noncompliance - RCRA **(medium)** Overall Release Potential = MEDIUM	• Within 7 miles upstream **(high)** • Large Quantity Generator, chemical storage, chronic chemicals **(medium)** Overall Risk Potential = HIGH
Point Source: MINING NPDES PERMIT HOLDER New Riverside Ochre, Inc.	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – Little likelihood of a release, no reported releases **(low)** • Ease of travel - moderate topography, overland flow potential, 2,500 feet to Etowah River, engineering controls in place **(medium)** • Supplemental Guidance for Regulated Sources - periodic noncompliance - RCRA **(low)** Overall Release Potential = MEDIUM	• Within 7 miles upstream **(high)** • Chemical and fertilizer mineral mining - Secondary, taste, odor **(low)** Overall Risk Potential = MEDIUM

Richland Creek Reservoir and Etowah River Intake – IMZ (7-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: LARGE Industry NPDES PERMIT HOLDER Southern Color North America, Inc.	• Distance from surface water - further than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - travel primarily through soil or via groundwater, overland flow not likely and structural controls in place **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Within 7 miles upstream **(high)** • Dye manufacturing, indoor - Chronic, chemicals **(medium)** Overall Risk Potential = HIGH
Point Source: MINING NPDES PERMIT HOLDER Yellowstone Mining Company	• Distance from surface water - greater than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - travel primarily through soil or via groundwater, overland flow not likely and structural controls in place **(low)** • Supplemental Guidance for Regulated Sources - periodic noncompliance - RCRA **(medium)** Overall Release Potential = LOW	• Within 7 miles upstream **(high)** • Quarrying (granite), aggregate - Secondary, taste, odor **(low)** Overall Risk Potential = MEDIUM
Point Source: NPDES PERMIT HOLDER Brooks Auto Salvage, Inc.	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – Little likelihood of a release, no reported releases **(low)** • Ease of travel - moderate topography, overland flow potential, 2,500 feet to Etowah River, engineering controls in place **(medium)** • Supplemental Guidance for Regulated Sources - compliance with regulations, assumed no releases **(low)** Overall Release Potential = MEDIUM	• Within 7 miles upstream **(high)** • Auto salvage yard - Secondary, taste, odor **(low)** Overall Risk Potential = MEDIUM

Richland Creek Reservoir and Etowah River Intake – IMZ (7-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: NPDES PERMIT HOLDER TI Group Automotive Systems	• Distance from surface water - greater than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - travel primarily through soil or via groundwater, overland flow not likely and structural controls in place **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, assumed no releases **(low)** Overall Release Potential = LOW	• Within 7 miles upstream **(high)** • Secondary, taste, odor **(low)** Overall Risk Potential = MEDIUM
Point Source: NPDES PERMIT HOLDER TI Automotive	• Distance from surface water - greater than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - travel primarily through soil or via groundwater, overland flow not likely and structural controls in place **(low)** • Supplemental Guidance for Regulated Sources - periodic noncompliance - RCRA **(low)** Overall Release Potential = LOW	• Within 7 miles upstream **(high)** • Secondary, taste, odor **(low)** Overall Risk Potential = MEDIUM
Point Source: NPDES PERMIT HOLDER Huntsman Pigments Americas, LLC	• Distance from surface water - greater than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - travel primarily through soil or via groundwater, overland flow not likely and structural controls in place **(low)** • Supplemental Guidance for Regulated Sources - periodic noncompliance - RCRA **(low)** Overall Release Potential = LOW	• Within 7 miles upstream **(high)** • Dye manufacturing, indoor - Chronic, chemicals **(medium)** Overall Risk Potential = HIGH

Richland Creek Reservoir and Etowah River Intake – IMZ (7-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: NPDES PERMIT HOLDER Crest Auto Parts	• Distance from surface water - greater than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - travel primarily through soil or via groundwater, overland flow not likely and structural controls in place **(low)** • Supplemental Guidance for Regulated Sources - periodic noncompliance - RCRA **(low)** Overall Release Potential = LOW	• Within 7 miles upstream **(high)** • Secondary, taste, odor **(low)** Overall Risk Potential = MEDIUM
Point Source: NPDES PERMIT HOLDER Cartersville Concrete Plant	• Distance from surface water - less than 1500 feet from Etowah River **(medium)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Within 7 miles upstream **(high)** • Concrete, aggregates - Secondary, taste, odor **(low)** Overall Risk Potential = MEDIUM
Point Source: WASTEWATER PLANTS Bartow County Southeast WPCP	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – ongoing, permitted releases, chronic small events, likelihood of continued releases **(medium)** • Ease of travel - generally flat topography, travel primarily through soil or groundwater, highly volatile substance or substances that adhere to soils, overland flow not likely and structure controls on place **(low)** • Supplemental Guidance for Regulated Sources - Compliance with permit conditions, few sewer overflows and/or bypasses **(low)** Overall Release Potential = MEDIUM	• Within 7 miles upstream of intake **(high)** • Acute, pathogens **(high)** Overall Risk Potential = HIGH

Richland Creek Reservoir and Etowah River Intake – IMZ (7-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: WASTEWATER PLANTS City of Emerson WPCP	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – ongoing, permitted releases, chronic small events, likelihood of continued releases **(medium)** • Ease of travel - generally flat topography, travel primarily through soil or groundwater, highly volatile substance or substances that adhere to soils, overland flow not likely and structure controls on place **(low)** • Supplemental Guidance for Regulated Sources - Compliance with permit conditions, few sewer overflows and/or bypasses **(low)** Overall Release Potential = MEDIUM	• Within 7 miles upstream of intake **(high)** • Acute, pathogens **(high)** Overall Risk Potential = HIGH
Point Source: WASTEWATER PLANTS NPDES PERMIT HOLDER Cartersville Water Pollution Control Plant	• Distance from surface water - greater than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – ongoing, permitted releases, chronic small events, likelihood of continued releases **(medium)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Within 7 miles upstream **(high)** • Acute, pathogens **(high)** Overall Risk Potential = HIGH
Point Source: WATER PLANTS City of Emerson WTP	• Distance from surface water - further than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - generally flat topography, travel primarily through soil or groundwater, highly volatile substance or substances that adhere to soils, overland flow not likely and structure controls on place **(low)** Overall Release Potential = LOW	• Within 7 miles upstream of intake **(high)** • Secondary, taste, odor **(low)** Overall Risk Potential = MEDIUM

Richland Creek Reservoir and Etowah River Intake – IMZ (7-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: WATER PLANTS City of Cartersville - Clarence B Walker WTP	• Distance from surface water - further than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - generally flat topography, travel primarily through soil or groundwater, highly volatile substance or substances that adhere to soils, overland flow not likely and structure controls on place **(low)** Overall Release Potential = LOW	• Between 7 and 15 miles upstream of intake **(medium)** • Secondary, taste, odor **(low)** Overall Risk Potential = MEDIUM
Point Source: PRIMARY ROADS Hwy 293, I 75, Cartersville Hwy, Joe Frank Harris Pkwy, Old Alabama Rd, Red Top Mountain Rd Connector, Main St, Hwy 41	> 10 road crossings Overall Release Potential = HIGH	• Large Transport Trucks Overall Risk Potential = MEDIUM
Point Source: SECONDARY ROADS Paved (355 crossings)	> 100 road crossings Overall Release Potential = HIGH	• Large Transport Trucks Overall Risk Potential = MEDIUM
Point Source: SECONDARY ROADS Unpaved (12 crossings)	< 50 road crossings Overall Release Potential = LOW	• Large Transport Trucks Overall Risk Potential = LOW
Point Source: RAILROADS (5 crossings)	5 - 10 railroad crossings Overall Release Potential = MEDIUM	• Tanker Cars Overall Risk Potential = HIGH
Point Source: OIL PIPELINE (1 crossing)	< 5 pipeline crossings Overall Release Potential = LOW	• Volatile Substances Overall Risk Potential = LOW

Richland Creek Reservoir and Etowah River Intake – IMZ (7-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: LIFT STATIONS • Bartow County Landfill Sewer Pump Station @ 40 Allatoona Dam Road • Capitol E/One Systems • Golf Course	• Distance from surface water - Greater than 500 feet **(low)** • Volume of release – Assumed between 1,000 gallons and less than 10,000 gallons **(medium)** • Duration of release – Assumed to be chronic small events **(medium)** • Ease of Travel - Assumed moderate topography, overland flow likely, use of some structural controls **(medium)** Overall Release Potential = MEDIUM	• Within 7 miles upstream from surface water intake **(high)** • Pathogens and chemicals **(high)** Overall Risk Potential = HIGH
Point Source: LIFT STATIONS 16 lift stations	• Distance from surface water - Less than 500 feet **(high)** • Volume of release – Assumed between 1,000 gallons and less than 10,000 gallons **(medium)** • Duration of release – Assumed to be chronic small events **(medium)** • Ease of Travel - Assumed moderate topography, overland flow likely, use of some structural controls **(medium)** Overall Release Potential = MEDIUM	• Within 7 miles upstream from surface water intake **(high)** • Pathogens and chemicals **(high)** Overall Risk Potential = HIGH
Point Source: SEWER PIPELINES ADJACENT TO CROSSING STREAMS	> 10 pipeline crossings Overall Release Potential = HIGH	• Pathogens Overall Risk Potential = HIGH
Point Source: HIS Metropolitan Sandblasting Site	• Distance from surface water - Further than 500 feet **(low)** • Volume of release – Assumed to be less than 1,000 gallons **(low)** • Duration of release – Known release of Methyl ethyl ketone in soil **(high)** • Ease of travel - Overland flow likely, few or no controls in place **(high)** • Supplemental Guidance for Regulated Sources - Site has unlimited access to regulated substance, history of spills **(high)** Overall Release Potential = HIGH	• Between 7 and 15 miles upstream from surface water intake **(medium)** • Toxicity - Chemicals **(medium)** Overall Risk Potential = MEDIUM

Richland Creek Reservoir and Etowah River Intake – IMZ (7-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: HSI Amrep Inc. Cartersville	• Distance from surface water - Further than 500 feet **(low)** • Volume of release – Assumed to be less than 1,000 gallons **(low)** • Duration of release – Known release of Vinyl Chloride in groundwater **(high)** • Ease of travel - Overland flow likely, use of some structural controls **(medium)** • Supplemental Guidance for Regulated Sources - History of spills **(high)** Overall Release Potential = MEDIUM	• Within 7 miles upstream from surface water intake **(high)** • Toxicity - Chemicals **(medium)** Overall Risk Potential = HIGH

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: AGRICULTURAL WASTE LAGOONS 1 location identified	• Distance from surface water - Further than 500 feet **(low)** • Volume of release – Assumed to be less than 1,000 gallons **(low)** • Duration of release – Little likelihood of a release **(low)** • No known or reported releases **(low)** Overall Release Potential = LOW	• Greater than 20 miles upstream from surface water intake **(low)** • Toxicity - Pathogens **(high)** Overall Risk Potential = MEDIUM
Point Source: AIRPORTS NPDES PERMIT HOLDER Hawthorne Atlanta Cobb County Airport	• Distance from surface water - Further than 500 feet **(low)** • Volume of release – Assumed to have greater than 1,000 gallons and less than 10,000 gallons of fuel storage **(medium)** • Duration of release – Little likelihood of a release because of the containment required for fuel storage areas **(low)** • Aviation fuel is highly volatile substance or adheres to soil easily, overland flow not likely and structure controls in place **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Greater than 20 miles upstream from surface water intake **(low)** • aviation fuel poses a chemical risk **(medium)** Overall Risk Potential = MEDIUM

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: AIRPORTS NPDES PERMIT HOLDER Paulding County Airport	• Distance from surface water - less than 500 feet **(high)** • •Volume of release – greater than 1,000 gallons and less than 10,000 gallons **(medium)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = MEDIUM	• Between 15 and 20 miles upstream of intake **(low)** • Airport, fuel - Chronic, petroleum products, chemicals **(medium)** Overall Risk Potential = MEDIUM
Point Source: CONFINED ANIMAL FEED LOTS 2 locations identified	• Distance from surface water - Less than 500 feet **(high)** • Volume of release – Assumed to be less than 1,000 gallons **(low)** • Duration of release – Little likelihood of a release **(low)** • Ease of travel - Overland flow not likely since they are covered **(low)** Overall Release Potential = LOW	• Greater than 20 miles upstream from surface water intake **(low)** • Toxicity - Pathogens **(high)** Overall Risk Potential = MEDIUM
Point Source: LANDFILLS - Closed HSI Cheatham Road Landfill	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – ongoing, permitted releases, chronic small events, likelihood of continued releases **(medium)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(medium)** • Supplemental Guidance for Regulated Sources - Has history of groundwater contamination **(high)** Overall Release Potential = MEDIUM	• Between 15 and 20 miles upstream of intake **(low)** • Municipal Solid Waste Landfill - Chronic, chemicals **(medium)** Overall Risk Potential = MEDIUM

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: LANDFILLS - Operating HSI Paulding Co - Gulledge Rd N Tract 1 Construction and Demolition Landfill	• Distance from surface water - further than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – Known release of Vinyl Chloride in groundwater **(medium)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(medium)** • Supplemental Guidance for Regulated Sources - Has history of groundwater contamination **(medium)** Overall Release Potential = MEDIUM	• Between 15 and 20 miles upstream of intake **(low)** • Municipal Solid Waste Landfill - Chronic, chemicals **(medium)** Overall Risk Potential = MEDIUM
Point Source: LARGE INDUSTRIES WHICH HAVE BULK CHEMICAL STORAGE BASF Construction Chemicals, Inc.	• Distance from surface water - further than 500 feet **(low)** • Volume of release – potential for greater than 10,000 gallons (high) • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - travel primarily through soil or via groundwater, overland flow not likely and structural controls in place **(low)** Overall Release Potential = LOW	• Between 7 and 15 miles upstream of intake **(medium)** • Paint and coating manufacturing with outdoor chemical storage - Chronic, chemicals **(medium)** Overall Risk Potential = MEDIUM
Point Source: LARGE INDUSTRIES WHICH HAVE BULK PETROLEUM STORAGE NPDES PERMIT HOLDER ITW Chemtronics	• Distance from surface water - further than 500 feet **(low)** • Volume of release – potential for greater than 10,000 gallons **(high)** • Duration of release –potential for release based on outside storage, controls in place **(medium)** • Ease of travel - moderate topography, small lake 800 feet from site, overland flow likely, some structural controls in place **(medium)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = MEDIUM	• Between 15 and 20 miles upstream of intake **(low)** • pesticide manufacturer and storage - Chronic, chemicals **(medium)** Overall Risk Potential = MEDIUM

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: LARGE INDUSTRIES WHICH UTILIZE HAZARDOUS CHEMICALS NPDES PERMIT HOLDER Polyone Corporation	• Distance from surface water - further than 500 feet **(low)** • Volume of release – greater than 1,000 gallons and less than 10,000 gallons **(medium)** • Duration of release –potential for release based on outside storage, controls in place **(medium)** • Ease of travel - moderate topography, small lake 800 feet from site, overland flow likely, some structural controls in place **(medium)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = MEDIUM	• Between 15 and 20 miles upstream of intake **(low)** • rubber products manufacturer and storage - Chronic, chemicals **(medium)** Overall Risk Potential = MEDIUM
Point Source: NPDES PERMIT HOLDER Pandel Inc.	• Distance from surface water - further than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - travel primarily through soil or via groundwater, overland flow not likely and structural controls in place **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 15 and 20 miles upstream of intake **(low)** • Plastics manufacturing, indoor - Chronic, chemicals **(medium)** Overall Risk Potential = MEDIUM
Point Source: NPDES PERMIT HOLDER LARGE QUANTITY GENERATORS Domino's DC (a.k.a. AGFA Corporation Kennesaw Warehouse)	• Distance from surface water - further than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - travel primarily through soil or via groundwater, overland flow not likely and structural controls in place **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 15 and 20 miles upstream of intake **(low)** • Large Quantity Generator, Graphics materials warehouse - Chronic, chemicals **(medium)** Overall Risk Potential = MEDIUM

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: MINING NPDES PERMIT HOLDER Vulcan - Kennesaw Quarry	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(medium)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = MEDIUM	• Between 15 and 20 miles upstream of intake **(low)** • Quarrying (granite), aggregate - Secondary, taste, odor **(low)** Overall Risk Potential = LOW
Point Source: NPDES PERMIT HOLDER Vulcan - Kennesaw Ready-Mix	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(medium)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = MEDIUM	• Between 15 and 20 miles upstream of intake **(low)** • Concrete, aggregate - Secondary, taste, odor **(low)** Overall Risk Potential = LOW
Point Source: LARGE INDUSTRIES WHICH HAVE BULK CHEMICAL STORAGE WW Henry Company Incorporated	• Distance from surface water - further than 500 feet **(low)** • Volume of release – potential for greater than 10,000 gallons **(high)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - travel primarily through soil or via groundwater, overland flow not likely and structural controls in place **(low)** Overall Release Potential = LOW	• Between 15 and 20 miles upstream of intake **(low)** • Adhesives manufacturing with outdoor chemical storage - Chronic, chemicals **(medium)** Overall Risk Potential = MEDIUM

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: NPDES PERMIT HOLDER TUG Technologies Corporation	• Distance from surface water - further than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(medium)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 15 and 20 miles upstream of intake **(low)** • Tractor Parts - Secondary, taste, odor **(low)** Overall Risk Potential = LOW
Point Source: NPDES PERMIT HOLDER Ready Mix USA - Dallas Plant	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(medium)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 7 and 15 miles upstream of intake **(medium)** • Concrete, aggregate - Secondary, taste, odor **(low)** Overall Risk Potential = LOW
Point Source: NPDES PERMIT HOLDER Ready Mix USA - Woodstock Plant	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 15 and 20 miles upstream of intake **(low)** • Concrete, aggregate - Secondary, taste, odor **(low)** Overall Risk Potential = LOW

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: NPDES PERMIT HOLDER International Marble Industries	• Distance from surface water - Greater than 500 feet **(low)** • Volume of release – greater than 1,000 gallons and less than 10,000 gallons **(medium)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 15 and 20 miles upstream of intake **(low)** • Marble, aggregate - Secondary, taste, odor **(low)** Overall Risk Potential = LOW
Point Source: NPDES PERMIT HOLDER Bartow Asphalt Plant	• Distance from surface water - greater than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 7 and 15 miles upstream of intake **(medium)** • Concrete, aggregate - Secondary, taste, odor **(low)** Overall Risk Potential = MEDIUM
Point Source: AIRPORTS NPDES PERMIT HOLDER Paulding County Airport	• Distance from surface water - less than 500 feet **(high)** • •Volume of release – greater than 1,000 gallons and less than 10,000 gallons **(medium)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(medium)** Overall Release Potential = MEDIUM	• Between 15 and 20 miles upstream of intake **(low)** • Airport, fuel - Chronic, petroleum products, chemicals **(medium)** Overall Risk Potential = MEDIUM

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: NPDES PERMIT HOLDER BASF Corp.	• Distance from surface water - greater than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 7 and 15 miles upstream of intake **(medium)** • Storage Warehouse - Secondary, taste, odor **(low)** Overall Risk Potential = MEDIUM
Point Source: WASTEWATER PLANTS NPDES PERMIT HOLDER West Wastewater Treatment Plant	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – ongoing, permitted releases, chronic small events, likelihood of continued releases **(medium)** • Ease of travel - generally flat topography, travel primarily through soil or groundwater, highly volatile substance or substances that adhere to soils, overland flow not likely and structure controls on place **(low)** • Supplemental Guidance for Regulated Sources - Compliance with permit conditions, few sewer overflows and/or bypasses **(low)** Overall Release Potential = MEDIUM	• Between 15 and 20 miles upstream of intake **(medium)** • Acute, pathogens **(high)** Overall Risk Potential = HIGH
Point Source: MINING NPDES PERMIT HOLDER Martin Marietta Aggregates - Paulding Quarry	• Distance from surface water - greater than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(medium)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 15 and 20 miles upstream of intake **(low)** • Quarrying (granite), aggregate - Secondary, taste, odor **(low)** Overall Risk Potential = LOW

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: NPDES PERMIT HOLDER Magnum Products	• Distance from surface water - greater than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 7 and 15 miles upstream of intake **(medium)** • Secondary, taste, odor **(low)** Overall Risk Potential = MEDIUM
Point Source: NPDES PERMIT HOLDER ReWorx @ Tommy Nobis Center	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 15 and 20 miles upstream of intake **(low)** • Concrete, aggregate - Secondary, taste, odor **(low)** Overall Risk Potential = LOW
Point Source: NPDES PERMIT HOLDER Kennesaw Bin	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 15 and 20 miles upstream of intake **(low)** • Secondary, taste, odor **(low)** Overall Risk Potential = LOW

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: NPDES PERMIT HOLDER ProBuild South	• Distance from surface water - greater than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 15 and 20 miles upstream of intake **(low)** • Secondary, taste, odor **(low)** Overall Risk Potential = LOW
Point Source: NPDES PERMIT HOLDER FedEx Ground	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 15 and 20 miles upstream of intake **(low)** • Shipping - Secondary, taste, odor **(low)** Overall Risk Potential = LOW
Point Source: NPDES PERMIT HOLDER J.M. Huber Corporation	• Distance from surface water - greater than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 15 and 20 miles upstream of intake **(low)** • Secondary, taste, odor **(low)** Overall Risk Potential = LOW

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: NPDES PERMIT HOLDER Crete Carrier Corporation	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 15 and 20 miles upstream of intake **(low)** • Warehouse - Secondary, taste, odor **(low)** Overall Risk Potential = LOW
Point Source: NPDES PERMIT HOLDER Oldcastle Precast	• Distance from surface water - greater than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 7 and 15 miles upstream of intake **(medium)** • Concrete, aggregate - Secondary, taste, odor **(low)** Overall Risk Potential = MEDIUM
Point Source: NPDES PERMIT HOLDER Ernst - Kennesaw Plant	• Distance from surface water - greater than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 15 and 20 miles upstream of intake **(low)** • Concrete, aggregate - Secondary, taste, odor **(low)** Overall Risk Potential = LOW

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: NPDES PERMIT HOLDER UPS Freight - Marietta	• Distance from surface water - greater than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 15 and 20 miles upstream of intake **(low)** • Concrete, aggregate - Secondary, taste, odor **(low)** Overall Risk Potential = LOW
Point Source: NPDES PERMIT HOLDER Kennesaw Asphalt Plant	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 15 and 20 miles upstream of intake **(low)** • Asphalt, aggregate - Secondary, taste, odor **(low)** Overall Risk Potential = LOW
Point Source: AIRPORTS NPDES PERMIT HOLDER Cobb County Airport - McCollum Field	• Distance from surface water - less than 500 feet **(high)** • Volume of release – greater than 1,000 gallons and less than 10,000 gallons **(medium)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(medium)** Overall Release Potential = MEDIUM	• Between 15 and 20 miles upstream of intake (low) • Airport, fuel - Chronic, petroleum products, chemicals (medium) Overall Risk Potential = MEDIUM

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: NPDES PERMIT HOLDER Thomas Concrete of Georgia	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 15 and 20 miles upstream of intake **(low)** • Concrete, aggregate - Secondary, taste, odor **(low)** Overall Risk Potential = LOW
Point Source: NPDES PERMIT HOLDER United Parcel Service (UPS) - Acworth	• Distance from surface water - greater than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 7 and 15 miles upstream of intake **(medium)** • Shipping - Secondary, taste, odor **(low)** Overall Risk Potential = MEDIUM
Point Source: NPDES PERMIT HOLDER American Disposal Services	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 7 and 15 miles upstream of intake **(medium)** • Warehouse - Secondary, taste, odor **(low)** Overall Risk Potential = MEDIUM

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: NPDES PERMIT HOLDER Williams Brothers - Acworth	• Distance from surface water - greater than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 7 and 15 miles upstream of intake **(medium)** • Secondary, taste, odor **(low)** Overall Risk Potential = MEDIUM
Point Source: NPDES PERMIT HOLDER GARBAGE TRANSFER STATIONS Woodstock Transfer Station	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 15 and 20 miles upstream of intake **(low)** • Waste Transfer Station - Secondary, taste, odor **(low)** Overall Risk Potential = LOW
Point Source: NPDES PERMIT HOLDER International Thermocast Corporation	• Distance from surface water - greater than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 15 and 20 miles upstream of intake **(low)** • Secondary, taste, odor **(low)** Overall Risk Potential = LOW

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: NPDES PERMIT HOLDER Ball Ground Borrow Area	• Distance from surface water - greater than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(low)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = LOW	• Between 15 and 20 miles upstream of intake **(low)** • Secondary, taste, odor **(low)** Overall Risk Potential = LOW
Point Source: MINING NPDES PERMIT HOLDER Vulcan - Bartow County Quarry	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - moderate topography or number of runoff conveyances, overland flow likely, use of some structural controls **(medium)** • Supplemental Guidance for Regulated Sources - compliance with regulations, no releases **(low)** Overall Release Potential = MEDIUM	• Between 7 and 15 miles upstream of intake **(medium)** • Quarrying (granite), aggregate - Secondary, taste, odor **(low)** Overall Risk Potential = MEDIUM
Point Source: WASTEWATER PLANTS Dallas West WPCP	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – ongoing, permitted releases, chronic small events, likelihood of continued releases **(medium)** • Ease of travel - generally flat topography, travel primarily through soil or groundwater, highly volatile substance or substances that adhere to soils, overland flow not likely and structure controls on place **(low)** • Supplemental Guidance for Regulated Sources - Compliance with permit conditions, few sewer overflows and/or bypasses **(low)** Overall Release Potential = MEDIUM	• Further than 20 miles upstream of intake **(low)** • Acute, pathogens **(high)** Overall Risk Potential = MEDIUM

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: WASTEWATER PLANTS Dallas North WPCP	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – ongoing, permitted releases, chronic small events, likelihood of continued releases **(medium)** • Ease of travel - generally flat topography, travel primarily through soil or groundwater, highly volatile substance or substances that adhere to soils, overland flow not likely and structure controls on place **(low)** • Supplemental Guidance for Regulated Sources - Compliance with permit conditions, few sewer overflows and/or bypasses **(low)** Overall Release Potential = MEDIUM	• Further than 20 miles upstream of intake **(low)** • Acute, pathogens **(high)** Overall Risk Potential = MEDIUM
Point Source: WASTEWATER PLANTS Cobb County Northwest WPCP	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – ongoing, permitted releases, chronic small events, likelihood of continued releases **(medium)** • Ease of travel - generally flat topography, travel primarily through soil or groundwater, highly volatile substance or substances that adhere to soils, overland flow not likely and structure controls on place **(low)** • Supplemental Guidance for Regulated Sources - Compliance with permit conditions, few sewer overflows and/or bypasses **(low)** Overall Release Potential = MEDIUM	• Further than 20 miles upstream of intake **(low)** • Acute, pathogens **(high)** Overall Risk Potential = MEDIUM

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: WASTEWATER PLANTS Cobb County Noonday Creek WPCP	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – ongoing, permitted releases, chronic small events, likelihood of continued releases **(medium)** • Ease of travel - generally flat topography, travel primarily through soil or groundwater, highly volatile substance or substances that adhere to soils, overland flow not likely and structure controls on place **(low)** • Supplemental Guidance for Regulated Sources - Compliance with permit conditions, few sewer overflows and/or bypasses **(low)** Overall Release Potential = MEDIUM	• Further than 20 miles upstream of intake **(low)** • Acute, pathogens **(high)** Overall Risk Potential = MEDIUM
Point Source: WASTEWATER PLANTS Cherokee County Water and Sewer - Rose Creek	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – ongoing, permitted releases, chronic small events, likelihood of continued releases **(medium)** • Ease of travel - generally flat topography, travel primarily through soil or groundwater, highly volatile substance or substances that adhere to soils, overland flow not likely and structure controls on place **(low)** • Supplemental Guidance for Regulated Sources - Compliance with permit conditions, few sewer overflows and/or bypasses **(low)** Overall Release Potential = MEDIUM	• Further than 20 miles upstream of intake **(low)** • Acute, pathogens **(high)** Overall Risk Potential = MEDIUM

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: WASTEWATER PLANTS Woodstock WPCP	• Distance from surface water - less than 500 feet **(high)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – ongoing, permitted releases, chronic small events, likelihood of continued releases **(medium)** • Ease of travel - generally flat topography, travel primarily through soil or groundwater, highly volatile substance or substances that adhere to soils, overland flow not likely and structure controls on place **(low)** • Supplemental Guidance for Regulated Sources - Compliance with permit conditions, few sewer overflows and/or bypasses **(low)** Overall Release Potential = MEDIUM	• Further than 20 miles upstream of intake **(low)** • Acute, pathogens **(high)** Overall Risk Potential = MEDIUM
Point Source: WATER PLANTS Cobb Co - Wyckoff WTP	• Distance from surface water - further than 500 feet **(low)** • Volume of release – only release would be associated with stormwater – less than 1,000 gallons **(low)** • Duration of release – little likelihood of release, no reported releases **(low)** • Ease of travel - generally flat topography, travel primarily through soil or groundwater, highly volatile substance or substances that adhere to soils, overland flow not likely and structure controls on place **(low)** Overall Release Potential = LOW	• Between 7 and 15 miles upstream of intake **(medium)** • Secondary, taste, odor **(low)** Overall Risk Potential = MEDIUM

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: PRIMARY ROADS Interstate-75, Cobb Pkwy, Lake Acworth Dr, Philip Landrum Memorial Pkwy, Dallas Hwy, Can Rd Connector, Cherokee Rd, I 575, Fincher Rd, Knox Bridge Hwy, Alabama Rd, Hwy 293, SR 20, SR 41, SR 294, US 41, Buchanan Hwy, Cartersville Hwy, Dallas Acworth Hwy, Hiram Acworth Hwy, Merchants Dr, Nathan Deal Blvd, North Confederate Ave, Rockmart Hwy, Scoggins Rd, Villa Rica Hwy, West Memorial Dr, Joe Frank Harris Pkwy, Old Alabama Rd, Main St, Hwy 41	> 10 road crossings Overall Release Potential = HIGH	• Large Transport Trucks Overall Risk Potential = MEDIUM
Point Source: SECONDARY ROADS Paved (3017 crossings)	> 100 road crossings Overall Release Potential = HIGH	• Large Transport Trucks Overall Risk Potential = MEDIUM
Point Source: SECONDARY ROADS Unpaved (35 crossings)	50 - 100 road crossings Overall Release Potential = MEDIUM	• Large Transport Trucks Overall Risk Potential = LOW
Point Source: RAILROADS (53 crossings)	> 10 railroad crossings Overall Release Potential = HIGH	• Tanker Cars Overall Risk Potential = HIGH
Point Source: OIL PIPELINE (11 crossings)	> 10 pipeline crossings Overall Release Potential = HIGH	• Volatile Substances Overall Risk Potential = LOW

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: POWER PLANT Lake Allatoona Hydroelectric Power	• Distance from surface water - Less than 500 feet **(high)** • Volume of release – Assumed low due to size and proximity of receiving stream **(low)** • Duration of release – Little likelihood of a release because of the containment requirements **(low)** • Moderate topography, overland flow likely, use of some structural controls **(medium)** Overall Release Potential = MEDIUM	• Within 7 miles upstream from surface water intake **(high)** • Likely negligible pathogens and chemicals **(low)** Overall Risk Potential = MEDIUM
Point Source: LIFT STATIONS • Cedarcrest Village • Paintball	• Distance from surface water - Greater than 500 feet **(low)** • Volume of release – Assumed between 1,000 gallons and less than 10,000 gallons **(medium)** • Duration of release – Assumed to be chronic small events **(medium)** • Ease of Travel - Assumed moderate topography, overland flow likely, use of some structural controls **(medium)** Overall Release Potential = MEDIUM	• Between 7 and 15 miles upstream from surface water intake **(medium)** • Pathogens and chemicals **(high)** Overall Risk Potential = HIGH

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: LIFT STATIONS • Apache Woods Pump Station #1 • Apache Woods Pump Station #2 • Glade Road Area Collection Sewer Pump Station #1 @ 6505 Glade Road (Proposed) • Glade Road Area Collection Sewer Pump Station #2 @ 5888 Glade Road (Proposed) • Glade Road Area Collection Sewer Pump Station #3 @ 5650 Glade Road (Proposed) • Northpoint Parkway Sewer Pump Station @ 50 Hopson Drive • Unnamed @ Old 41 Hwy • Crossroads Private • East Paulding • Hwy 41 • Private New Hope • Riverwood • Rosewood Park • Somerset	• Distance from surface water - Greater than 500 feet **(low)** • Volume of release – Assumed between 1,000 gallons and less than 10,000 gallons **(medium)** • Duration of release – Assumed to be chronic small events **(medium)** • Ease of Travel - Assumed moderate topography, overland flow likely, use of some structural controls **(medium)** Overall Release Potential = MEDIUM	• Between 15 and 20 miles upstream from surface water intake **(low)** • Pathogens and chemicals **(high)** Overall Risk Potential = MEDIUM
Point Source: LIFT STATIONS 29 lift stations	• Distance from surface water - Less than 500 feet **(high)** • Volume of release – Assumed between 1,000 gallons and less than 10,000 gallons **(medium)** • Duration of release – Assumed to be chronic small events **(medium)** • Ease of Travel - Assumed moderate topography, overland flow likely, use of some structural controls **(medium)** Overall Release Potential = MEDIUM	• Between 15 and 20 miles upstream from surface water intake **(low)** • Pathogens and chemicals **(high)** Overall Risk Potential = MEDIUM
Point Source: SEWER PIPELINES ADJACENT TO CROSSING STREAMS	> 10 pipeline crossings Overall Release Potential = HIGH	• Pathogens Overall Risk Potential = HIGH

Richland Creek Reservoir and Etowah River Intake – OMZ (20-MILE RADIUS)		
POTENTIAL SOURCE	**RELEASE POTENTIAL**	**RISK POTENTIAL**
Point Source: MARINAS Glade Marina	• Distance from surface water - Less than 500 feet **(high)** • Volume of release – Assumed low due to size and proximity of receiving stream **(low)** • Duration of release – Little likelihood of a release because of the containment requirements **(low)** • Moderate topography, overland flow likely, use of some structural controls **(medium)** Overall Release Potential = MEDIUM	• Between 7 and 15 miles upstream from surface water intake **(medium)** • Chemicals **(medium)** Overall Risk Potential = MEDIUM
Point Source: MARINAS Little River Marina	• Distance from surface water - Less than 500 feet **(high)** • Volume of release – Assumed low due to size and proximity of receiving stream **(low)** • Duration of release – Little likelihood of a release because of the containment requirements **(low)** • Moderate topography, overland flow likely, use of some structural controls **(medium)** Overall Release Potential = MEDIUM	• Between 15 and 20 miles upstream from surface water intake **(low)** • Chemicals **(medium)** Overall Risk Potential = MEDIUM
Point Source: HSI HTC Group LLC	• Distance from surface water - Less than 500 feet **(high)** • Volume of release – Assumed to be less than 1,000 gallons **(low)** • Duration of release – Known release of Tetrachloroethene in groundwater **(high)** • Ease of travel - Overland flow likely, assumed few structural controls in place **(high)** • Supplemental Guidance for Regulated Sources - History of spills **(high)** Overall Release Potential = HIGH	• Between 15 and 20 miles upstream from surface water intake **(low)** • Toxicity - Chemicals **(medium)** Overall Risk Potential = MEDIUM