SOURCE WATER ASSESSMENT PLAN:

Assessment and Risk for Potential Pollution of Surface Drinking Water Supply Sources for Metro Atlanta

Prepared by the Metropolitan North Georgia

Water Planning District

March 5th, 2020

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Source Water Assessment Overview

INTRODUCTION

The 1996 Amendments to the Federal Safe Drinking Water Act (SDWA) brought about new pollution prevention and protection measures to help ensure clean and safe drinking water by assessing potential contamination and promoting protection of States' drinking water sources. These amendments direct states to enact Source Water Protection Programs to protect their drinking water sources from contamination. The initial step in the development of the program was to prepare an inventory and assessment of each water supply watershed in the state. This step was called the Source Water Assessment Plan (SWAP).

In accordance with the Federal SDWA and in response to EPA's national goal, the Atlanta Regional Commission (ARC) submitted the Division's Source Water Assessment and Implementation Plan to the EPA on March 28, 2000. At that time, the Georgia Environmental Protection Division (EPD) contracted with the Atlanta Regional Commission (ARC) to coordinate and complete SWAPs for 28 Metro Atlanta public drinking water systems.

In June 2017, the Metropolitan North Georgia Water Planning District (the District) adopted its integrated Water Resource Management Plan (WRMP) that takes a comprehensive approach to water resources management planning, where water supply and water conservation, wastewater management, watershed management, and public education planning overlap. Georgia EPD enforces the WRMP through an auditing and permitting process for all members of the District. Action Item INTEGRATED-6 of the 2017 WRMP requires local water providers to develop a source water protection plan that delineates raw water sources and identifies the potential sources of contamination to the drinking water supply by January 1, 2020.

In an effort to provide implementation support to its jurisdictions, the District contracted with the Georgia Environmental Finance Authority (GEFA) and EPD to complete the update/creation of SWAPs for 42 public drinking water intakes within the 15-county metropolitan Atlanta region. Specifically, the District will develop a SWAP for each surface water withdrawal location within the region by performing the following tasks:

1. Delineate the watershed area for each public drinking water source
2. Conduct an inventory of potential sources of contamination within that watershed
3. Determine the susceptibility of the water supply to contamination within the watershed assessment area
4. Provide the assessment results to the public water system jurisdiction for development of local SWPPs

Then local water providers are required to:

1. Publish the results of the source water assessment in the Consumer Confidence Report (CCR)

2. Integrate this information into the Local Emergency Water Plan (2017 WRMP, Action Item INTEGRATED-3)
3. Update the SWAP every 10 years thereafter

METHODOLOGY

SWAP Task Force

The Metropolitan North Georgia Water Planning District and technical temporary employees lead the effort in providing the source water assessment plan update with the assistance, input, and technical direction of EPD, Atlanta Regional Commission, and water suppliers. Water suppliers from every watershed were consulted periodically throughout the update for data, verification, and system specific information necessary for the implementation of specific tasks. Appendix S-A contains a comprehensive list of the SWAP Task Force Members.

Determination of Assessment Areas

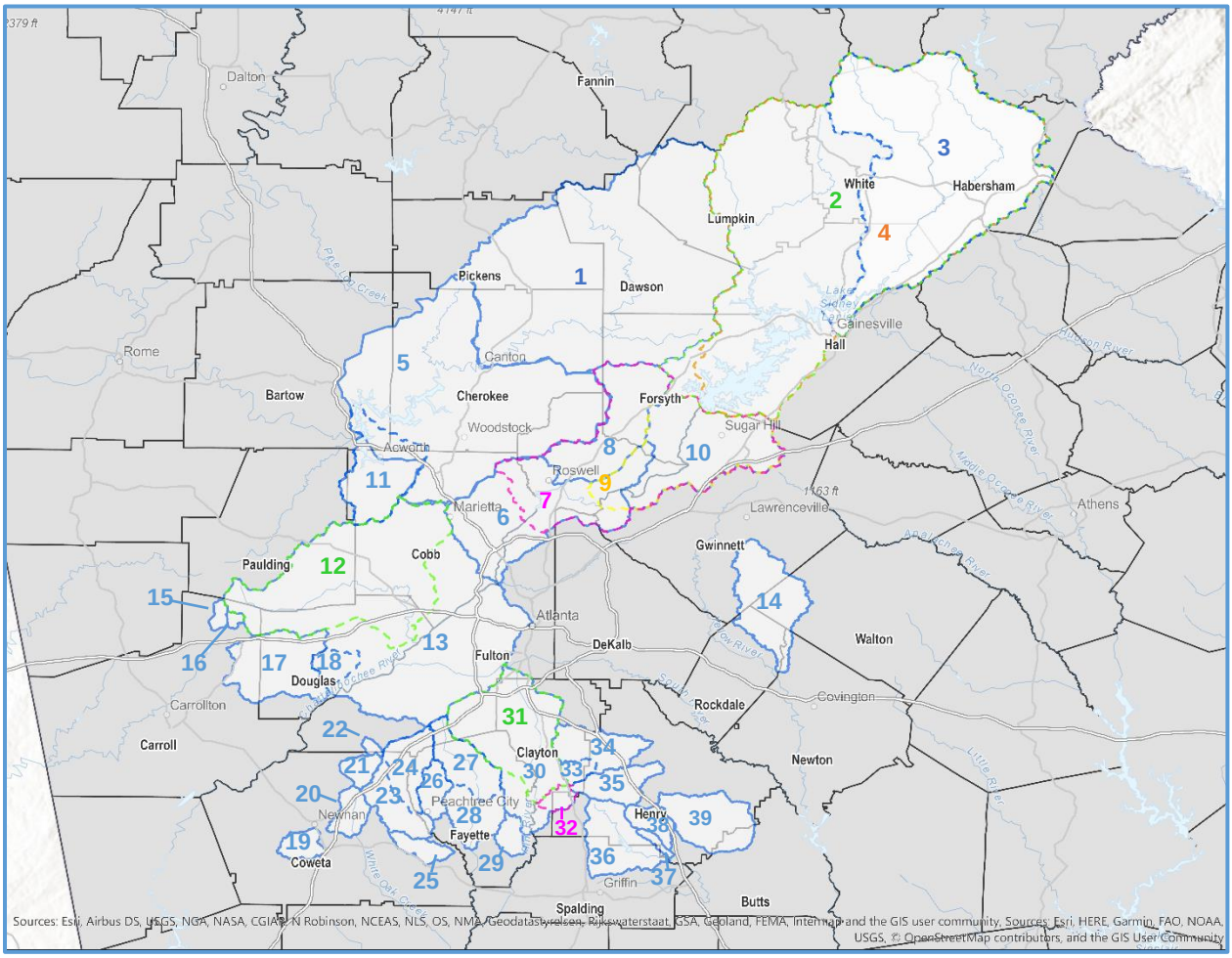
Watersheds were acquired from EPD or delineated by District staff using geographic information system (GIS) software or ArcGIS Pro 2.4.1 that referenced USGS National Elevation Datasets and then clipped to relevant Hydrologic unit code (HUC) 10/12 boundaries. Once the watersheds were delineated, the assessment areas or zones were determined using EPD criteria. The Inner Management Zone (IMZ) extends seven miles upstream from the intake. This area requires the most stringent identification and analysis of potential pollutant sources. The Outer Management Zone (OMZ) extends from the IMZ boundary to an additional twenty miles upstream within the watershed. In this area, EPD guidance requires fewer facilities be identified and analyzed. Outside of the OMZ is the Non-Management Zone (NMZ), and includes the remainder of the watershed area beyond the delineated 20-mile OMZ boundary.

Table S-1 lists the water systems participating in the Metro Atlanta Source Water Assessment Update. These watersheds include areas of the counties of Bartow, Butts, Carroll, Cherokee, Clayton, Cobb, Coweta, Dawson, DeKalb, Douglas, Fannin, Fayette, Forsyth, Fulton, Gwinnett, Habersham, Hall, Henry, Lumpkin, Newton, Paulding, Pickens, Rockdale, Spalding, Walton, and White (Figure S-1).

Table S-1. List of all participating water systems

Water System	Water Source
Atlanta-Fulton County Water Resource Commission	Chattahoochee River
City of Atlanta Department of Watershed Management	Chattahoochee River
City of Buford	Lake Sidney Lanier
City of Canton Water and Sewer Department	Etowah River
City of Cartersville Water Department	Allatoona Lake
Clayton County Water Authority	Flint River
Clayton County Water Authority	Pates Creek stored in Edgar Blalock Jr. Reservoir
Clayton County Water Authority	Shoal Creek stored in J.W. Smith Reservoir
Clayton County Water Authority	Little Cotton Indian Creek
Cobb County - Marietta Water Authority	Chattahoochee River
Cobb County - Marietta Water Authority	Allatoona Creek
Coweta County Water and Sewerage Authority	Alexander Creek stored in BT Brown Reservoir
Cumming Utilities	Lake Sidney Lanier
DeKalb County Department of Watershed Management	Chattahoochee River
Douglasville-Douglas County Water and Sewer Authority	Bear Creek
Douglasville-Douglas County Water and Sewer Authority	Dog River
City of East Point Water and Sewer Department	Sweetwater Creek
Fayette County Water System	Whitewater Creek
Fayette County Water System	Line Creek
Fayette County Water System	Horton Creek
Fayette County Water System	Flint River
Fayette County Water System	Flat Creek stored in Lake Kedron & Lake Peachtree
City of Fayetteville Water and Sewer Department	Whitewater Creek
Forsyth County Department of Water and Sewer	Lake Sidney Lanier
City of Gainesville Department of Water Resources	Lake Sidney Lanier
City of Gainesville Department of Water Resources	Chattahoochee River stored in Lake Sidney Lanier
Gwinnett County Department of Water Resources	Lake Sidney Lanier
Henry County Water Authority	Towaliga River
Henry County Water Authority	Long Branch Creek
Henry County Water Authority	Indian Creek
Henry County Water Authority	Tussahaw Creek
City of McDonough Water Department	Walnut Creek stored in John Fargarson Reservoir
Newnan Utilities	Line Creek
Newnan Utilities	White Oak Creek
Newnan Utilities	Brown/Sandy Creeks
City of Palmetto Water Department	Old Cedar Creek & New Cedar Creek
Rockdale County Department of Water Resources	Big Haynes Creek
City of Roswell Water Utility Department	Big Creek
City of Senoia Water System	Hutchinson Lake
South Fulton Municipal Regional Water and Sewer Authority	Chattahoochee River
City of Villa Rica Public Works Department	Lake Fashion
City of Villa Rica Public Works Department	Cowan's Lake

Figure S-1. Metro Atlanta water supply watersheds (Management Zones)



Water System - Water Source	
1. City of Canton WSD - Etowah River	19. Newnan Utilities - Brown/Sandy Creeks
2. City of Buford - Lake Sidney Lanier	20. Newnan Utilities - White Oak Creek
2. City of Gainesville DWS - Lake Sidney Lanier	21. Coweta County WSA - Alexander Creek
2. Gwinnett County DWS - Lake Sidney Lanier	22. City of Palmetto WD - Old Cedar Creek & New Cedar Creek
3. City of Gainesville DWS - Chattahoochee River	23. Fayette County WS - Line Creek
4. Cumming Utilities - Lake Sidney Lanier	24. Newnan Utilities - Line Creek
4. Forsyth County DWS - Lake Sidney Lanier	25. City of Senoia WS - Hutchinson Lake
5. City of Cartersville WD - Allatoona Lake	26. Fayette County WS - Flat Creek
6. City of Atlanta DWM - Chattahoochee River	27. City of Fayetteville WSA - Whitewater Creek
7. Cobb County - Marietta WA - Chattahoochee River	28. Fayette County WS - Whitewater Creek
8. City of Roswell WUD - Big Creek	29. Fayette County WS - Horton Creek
9. DeKalb County DWM - Chattahoochee River	30. Fayette County WS - Flint River
10. Atlanta-Fulton County WRC - Chattahoochee River	31. Clayton County WA - Flint River

11. Cobb County - Marietta WA - Allatoona Creek	32. Clayton County WA - Shoal Creek
12. City of East Point WSA - Sweetwater Creek	33. Clayton County WA - Pates Creek
13. South Fulton Municipal Regional WSA - Chattahoochee River	34. Clayton County WA - Little Cotton Indian Creek
14. Rockdale County DWS - Big Haynes Creek	35. City of McDonough WD - Walnut Creek
15. City of Villa Rica PWD - Lake Fashion	36. Henry County WA - Towaliga River
16. City of Villa Rica PWD - Cowan's Lake	37. Henry County WA - Long Branch Creek
17. Douglasville-Douglas County WSA - Dog River	38. Henry County WA - Indian Creek
18. Douglasville-Douglas County WSA - Bear Creek	39. Henry County WA - Tussahaw Creek

Inventory of Potential Pollutant Sources

This assessment focused primarily on updating potential pollutant sources identified from the previous SWAP conducted by the ARC in 2000 and the Source Water Assessment Implementation Plan published by the EPD, with the addition of more potential pollutant sources that were not included in the past SWAP. Table 1 lists potential pollution sources that must be evaluated in each of the three management zones, according to EPD guidance. A more stringent assessment of sources is conducted in the IMZ and OMZ than in the NMZ due to the larger distance from the NMZ to the intake, which is greater than 20 miles upstream. A complete list of the types of facilities characterized by each potential pollutant source is provided in Appendix A.

After developing an updated potential pollutant sources list, the District reviewed information sources to locate available data listing specific information about those sources. The data source summary is located in Appendix S-B.

Once the data was acquired and mapped, the District sampled a statistically significant (a randomized selection of 100 points or 10% of data, whichever set was larger) set of data points from each potential pollutant source dataset. This included conducting aerial verification using the statewide imagery at 6-inch resolution provided by the Georgia Geospatial Information Office (GIO) of which suspect data points were identified. If suspect points could not be corrected or verified through information systems available, the District compiled the points onto a list as suspect points in addition to other nearby validated data points. District staff then conducted on-site field verification. All potential pollutant sources located in the field and not already mapped were also recorded and added to the database and maps. After an extensive data verification process of aerial and field validation, the District met individually with each water supplier to review preliminary results and provide a final verification of the points in their respective water supply watershed.

Table 1. Potential Pollution Sources for Surface Water

IMZ (7-mile Radius)	OMZ (20-mile radius)	NMZ (Non-Management Zone)
Located, Identified, Inventoried, and Assessed	*Located, Identified, Inventoried, and Assessed*	*Located, Identified, and Inventoried*
• Agriculture: -AFOs -CAFOs -Dairy Operations -Manure Handlers -Poultry Operations -Waste Lagoons	• Agriculture: -AFOs -CAFOs -Dairy Operations -Manure Handlers -Poultry Operations -Waste Lagoons	
• Airports		
• Asphalt Plants	• Asphalt Plants	• Asphalt Plants
• Fuel Facilities (Underground Storage Tanks)	• Fuel Facilities (Underground Storage Tanks)	
• Garbage Transfer Stations		
• Hazardous Waste Facilities	• Hazardous Waste Facilities	
• Junk, Scrap, and Salvage Yards	• Junk, Scrap, and Salvage Yards	• Junk, Scrap, and Salvage Yards
• Landfills: -Operating -In closure -Closed	• Landfills: -Operating -In closure -Closed	• Landfills: -Operating -In closure -Closed
• Large Industries w/ Bulk Chemical Storage	• Large Industries w/ Bulk Chemical Storage	
• Large Industries w/ Federal Categorical Standards	• Large Industries w/ Federal Categorical Standards	
• Large Industries w/ Hazardous Chemicals	• Large Industries w/ Hazardous Chemicals	
• LAS Permit Holders	• LAS Permit Holders	• LAS Permit Holders
• Lift Stations	• Lift Stations	
• Marinas		
• Military Bases		
• NPDES Permit Holders	• NPDES Permit Holders	• NPDES Permit Holders
• Power Plants	• Power Plants	
• Recycling	• Recycling	
• Substations		
• Surface Mines	• Surface Mines	• Surface Mines
• Wastewater Treatment Facilities	• Wastewater Treatment Facilities	
• Water Treatment Facilities	• Water Treatment Facilities	

Individual Source

To identify the potential impact of individual sources of pollution, District staff reviewed State and Federal regulatory programs, which issue permits to these facilities. All occurrences of facilities within the watershed were mapped and analyzed. District staff also conducted field surveys, contacted local water providers for data/verification, and identified facilities not listed in the reviewed data sets. The inventory identifies those sources of potential pollution and does not indicate that a problem exists or that contamination is occurring from the site. Data sources from which facility information was obtained may be found in Appendix B.

Non-Point Source

Percent impervious surface and land use/land cover (LULC) estimates were used to identify the potential impact of non-point sources of pollution on the drinking water intake. This data was derived from the USGS National Land Cover Database 2016 (NLCD2016), for which LULC dataset was reclassified from twenty into eight classes: open water, barren land, shrub/scrub, hay/pasture/cultivated crops, wetlands, forest, developed – open space/low intensity, and developed – medium/high intensity. For a description of each land cover class visit: https://www.mrlc.gov/data/legends/national-land-cover-database-2016-nlcd2016-legend. Where data on agricultural and forest best management practices are unavailable, values of impervious areas are used. Other metrics considered included: effective impervious area (EIA), land in transition (Barren land), area sewered vs non-sewered, sewer lines >10' crossing streams, railroads crossing streams, major transportation corridors crossing streams, and impaired streams within the watershed. EIA is defined as the impervious area for which the runoff enters the surface water system. The EIA was determined using a mathematical model developed by Sutherland for EPA, selected for its validity at relatively low levels of impervious area.

Susceptibility Determination

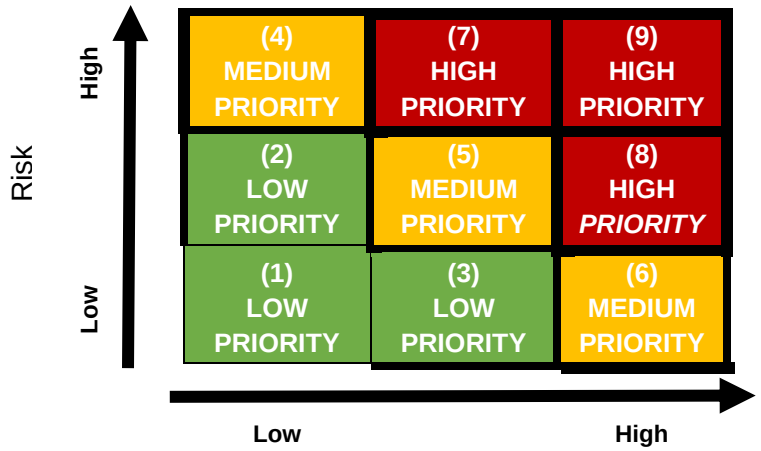
Drinking water intakes are susceptible to two different types of pollution – individual source and non-point source. Individual source pollution involves actual facilities, which have contaminants on site and can pose a potential health risk if humans consume those contaminants. Non-point source pollution is caused by development and everyday activities that take place in residential, commercial, and rural areas and is carried by stormwater runoff to streams and lakes. Non-point source pollutants include sediment, bacteria, heavy metals, oil and grease, herbicides and pesticides, nutrients, and temperature increases.

Individual Source Susceptibility Determination

To determine the potential degree of risk of the potential pollutant sources, EPD criteria for susceptibility ranking was used with adaptations made by the District. First, all facilities were ranked as either high, medium or low for potential individual source of pollution. This ranking is based on the potential of contaminant release and the potential risk to the surface water intake. The factors considered in ranking the potential for release are: distance from surface water, volume of release, duration of release and ease of transport/travel. The factors considered for risk are: distance to intake and toxicity. Detailed methodology for the determination of distance to surface water, distance to intake and ease of transport/travel can be found in Appendix C.

Both potential release and risk are ranked individually and then the two scores are combined to get an overall facility ranking using the EPD designated matrix (Figure 1). Release potential and potential risk were assigned a ranking based on the facility type represented by each potential pollutant source, supplemental information provided by local water providers, and information provided from EPD. More specifically, generalized rankings are assigned for volume of release, duration of release, and toxicity based on the individual source pollution type, and can be found in Appendix D.

Figure 1: Individual Source Susceptibility Determination



The following steps in determining individual source susceptibility were updated from EPD's implementation guidance by the District by removing the percentage thresholds in order to most accurately assess the overall watershed risk and ranking to contamination, made possible through advancements in GIS techniques and available data. After all the sources were charted on the matrix, the overall watershed is a weighted ranking based on the priority of the potential pollution source shown in figure 1: low priority sources appear in grid squares 1,2,3, medium priority sources appear in grid squares 4, 5,6 , and high priority sources appear in grid squares 7,8,9 after a weight of low (1), medium (2), high (3) is applied. The value is then divided by the size of the watershed in square miles for individual source susceptibility and can be represented by the following equation:

$$\frac{((\#\ of\ low\ priority \times 1) + (\#\ of\ medium\ priority \times 2) + (\#\ of\ high\ priority \times 3))}{Watershed\ size\ in\ Sq.Mi.}$$

The ranking is then determined based on thresholds of all District region watersheds assessed, a summary of district individual source rankings can be found in Table S-2 and thresholds outlined in Table 2:

Table S-2. Metro Atlanta individual source index summary

Water System	Water Source	Individual Source Index
Atlanta-Fulton County Water Resource Commission	Chattahoochee River	8.7
City of Atlanta Department of Watershed Management	Chattahoochee River	6.6
City of Buford	Lake Sidney Lanier	1.7
City of Canton Water and Sewer Department	Etowah River	1.6
City of Cartersville Water Department	Allatoona Lake	3.8
Clayton County Water Authority	Flint River	12.6
Clayton County Water Authority	Pates Creek	2.6
Clayton County Water Authority	Shoal Creek	4.5
Clayton County Water Authority	Little Cotton Indian Creek	9.2
Cobb County - Marietta Water Authority	Chattahoochee River	6.2
Cobb County - Marietta Water Authority	Allatoona Creek	7.0
Coweta County Water and Sewerage Authority	Alexander Creek	0.2
Cumming Utilities	Lake Sidney Lanier	1.5
DeKalb County Department of Watershed Management	Chattahoochee River	7.7
Douglasville-Douglas County Water and Sewer Authority	Bear Creek	4.1
Douglasville-Douglas County Water and Sewer Authority	Dog River	2.4
City of East Point Water and Sewer Department	Sweetwater Creek	4.9
Fayette County Water System	Whitewater Creek	3.4
Fayette County Water System	Line Creek	4.7
Fayette County Water System	Horton Creek	0.5
Fayette County Water System	Flint River	10.2
Fayette County Water System	Flat Creek	8.6
City of Fayetteville Water and Sewer Department	Whitewater Creek	5.8
Forsyth County Department of Water and Sewer	Lake Sidney Lanier	1.5
City of Gainesville Department of Water Resources	Lake Sidney Lanier-Lakeside	1.9
City of Gainesville Department of Water Resources	Lake Sidney Lanier-Riverside	2.1
Gwinnett County Department of Water Resources	Lake Sidney Lanier	1.6
Henry County Water Authority	Towaliga River	1.2
Henry County Water Authority	Long Branch Creek	1.4
Henry County Water Authority	Indian Creek	8.5
Henry County Water Authority	Tussahaw Creek	1.3
City of McDonough Water Department	Walnut Creek	3.9
Newnan Utilities	Line Creek	6.4
Newnan Utilities	White Oak Creek	13.1
Newnan Utilities	Brown/Sandy Creeks	4.8
City of Palmetto Water Department	Old Cedar Creek & New Cedar Creek	2.6
Rockdale County Department of Water Resources	Big Haynes Creek	2.0
City of Roswell Water Utility Department	Big Creek	10.4
City of Senoia Water System	Hutchinson Lake	1.4
South Fulton Municipal Regional Water and Sewer Authority	Chattahoochee River	5.4
City of Villa Rica Public Works Department	Lake Fashion	1.6
City of Villa Rica Public Works Department	Cowan's Lake	0.4

Table 2: Threshold Ranking Criteria

Low	**< 3.0**
Medium	**3.0 - 8.0**
High	**8.0 <**

Non-Point Source Susceptibility Determination

To evaluate non-point source pollution in the watersheds, an estimate of impervious surface area was calculated based on land use categories. Impervious surfaces collect and accumulate pollutants deposited from a variety of sources including: dust and dirt form the air, leaks from vehicles, animal wastes, yard pesticides and fertilizers, leaky sewer lines and construction and barren soil areas. During storms, accumulated pollutants can be washed off, and rapidly delivered to rivers and lakes. According to the Center for Watershed Protection, studies have consistently indicated that urban pollutant loads are directly related to the amount of impervious surface in the watershed.

The impervious surface area was estimated in conjunction with the LULC dataset, where the area for each of the eight classes of the LULC was determined. The Zonal statistics tool in ArcGIS Pro was used to obtain the mean Percent Developed Impervious (PDI) associated with each LULC class. Both were multiplied and divided by the area of the watershed.

Overall non-point source susceptibility was determined based on percentage of impervious surface in the watershed. For this assessment, greater than 20% impervious surface area was ranked as high, between 10-20% was ranked as medium and less than 10% was ranked as low susceptibility (Table 3).

Table 3: Non-Point Source Susceptibility Rankings

Impervious Area (%)	Ranking
< 10	**Low**
10 – 20	**Medium**
> 20	**High**

SOURCE WATER ASSESSMENT RESULTS

Metro Atlanta Summary Results

Overall, of the 42 Metro Atlanta Source Water Assessments, 4 ranked highly susceptible to potential sources of pollution (PPS), 5 were ranked medium, 7 as medium-high , 7 as low-medium, and 19 as low (Table S-2). Factors considered in this ranking included the individual facilities susceptibility ranking combined with the overall non-point source susceptibility ranking.

Water System	Water Source	# of PPS	Watershed Area (sq. mi)	Ind. Ranking	Non-Point Ranking	Overall Watershed Ranking
Atlanta-Fulton County Water Resource Commission	Chattahoochee River	536	138	High	Medium	Medium-High
City of Atlanta Department of Watershed Management	Chattahoochee River	1337	419	Medium	High	Medium-High
City of Buford	Lake Sidney Lanier	849	1035	Low	Low	Low
City of Canton Water and Sewer Department	Etowah River	525	614	Low	Low	Low
City of Cartersville Water Department	Allatoona Lake	850	450	Medium	Medium	Medium
Clayton County Water Authority	Flint River	842	128	High	High	High
Clayton County Water Authority	Little Cotton Indian Creek	176	50	High	Medium	Medium-High
Clayton County Water Authority	Pates Creek	10	9.2	Low	Low	Low
Clayton County Water Authority	Shoal Creek	14	9.2	Medium	Low	Low-Medium
Cobb County - Marietta Water Authority	Chattahoochee River	1002	336	Medium	High	Medium-High
Cobb County - Marietta Water Authority	Allatoona Creek	262	81	Medium	Medium	Medium
Coweta County Water and Sewerage Authority	Alexander Creek	1	13	Low	Low	Low
Cumming Utilities	Lake Sidney Lanier	774	1014	Low	Low	Low
DeKalb County Department of Watershed Management	Chattahoochee River	592	164	Medium	High	Medium-High
Douglasville-Douglas County Water and Sewer Authority	Bear Creek	26	17	Medium	Low	Low-Medium
Douglasville-Douglas County Water and Sewer Authority	Dog River	82	78	Low	Low	Low
City of East Point Water and Sewer Department	Sweetwater Creek	639	263	Medium	Medium	Medium
City of Fayetteville Water and Sewer Department	Whitewater Creek	97	42	Medium	Low	Low - Medium

Fayette County Water System	Flat Creek	58	19	High	Medium	Medium-High
Fayette County Water System	Horton Creek	2	13	Low	Low	Low
Fayette County Water System	Flint River	818	159	High	High	High
Fayette County Water System	Line Creek	149	70	Medium	Low	Low-Medium
Fayette County Water System	Whitewater Creek	127	77	Medium	Low	Low-Medium
Forsyth County Department of Water and Sewer	Lake Sidney Lanier	774	1014	Low	Low	Low
City of Gainesville Department of Water Resources	Lake Sidney Lanier - Lakeside	966	1035	Low	Low	Low
City of Gainesville Department of Water Resources	Lake Sidney Lanier - Riverside	576	476	Low	Low	Low
Gwinnett County Department of Water Resources	Lake Sidney Lanier	801	1035	Low	Low	Low
Henry County Water Authority	Indian Creek	50	17	High	Medium	Medium-High
Henry County Water Authority	Long Branch Creek	2	4.3	Low	Low	Low
Henry County Water Authority	Tussahaw Creek	33	59	Low	Low	Low
Henry County Water Authority	Towaliga River	27	57	Low	Low	Low
City of McDonough Water Department	Walnut Creek	43	31	Medium	Low	Low - Medium
Newnan Utilities	White Oak Creek	86	19	High	Medium	Medium-High
Newnan Utilities	Line Creek	97	37	Medium	Medium	Medium
Newnan Utilities	Brown/Sandy Creeks	26	15	Medium	Low	Low - Medium
City of Palmetto Water Department	Old Cedar Creek & New Cedar Creek	3	3.4	Low	Low	Low
Rockdale County Department of Water Resources	Big Haynes Creek	90	82	Low	Low	Low
City of Roswell Water Utility Department	Big Creek	464	99	High	High	High
City of Senoia Water System	Hutchinson Lake	11	15	Low	Low	Low
South Fulton Municipal Regional Water and Sewer Authority	South Fulton Water System	1511	545	Medium	Medium	Medium
City of Villa Rica Public Works Department	Lake Fashion	2	3.1	Low	Low	Low
City of Villa Rica Public Works Department	Cowan's Lake	1	5.6	Low	Low	Low