WATERSHED PROTECTION PLAN
CITY OF ROME, GEORGIA

Prepared for:

Rome Water and Sewer Division
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CITY OF ROME WATERSHED PROTECTION PLAN
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EXECUTIVE SUMMARY

The purpose of this Watershed Protection Plan (WPP) is to provide a comprehensive documentation of the City of Rome's existing and planned strategies to reduce polluted stormwater runoff and improve water quality and biological integrity of local streams. Preparation of the WPP is a regulatory requirement set forth by the Georgia Environmental Protection Division (EPD) to enable the continued operation of the City's two wastewater treatment plants – (1) Rome Water Reclamation Facility: NPDES Permit No. GA0024112; Permit Flow: Monthly Average 18.0 MGD, Weekly Maximum 22.5 MGD; and (2) Coosa Water Reclamation Facility: NPDES Permit No. GA0024341; Permit Flow: Monthly Average 2.0 MGD, Weekly Maximum 2.5 MGD. GA EPD has indicated that failure to implement an effective watershed protection program will result in violation of current NPDES permits for each plant and/or denial of authorization for future water supply and wastewater permit requests. The WPP is a living document based on an adaptive management approach that allows time to evaluate options and make decisions on the allocation of limited resources to achieve the desired results. In cases where a trend of degradation is identified, the WPP must be modified to address the cause of degradation. Meaningful progress must be made over time to ensure compliance with the WPP and associated permits.

The Watershed Protection Plan is based on the results of a comprehensive watershed assessment of regional streams in 2008-09 commissioned by the Northwest Georgia Water Resources Partnership. Study results demonstrated problems in nine of thirteen area streams studied. Most problematic was observed high fecal coliform levels in Horseleg Creek and Dozier Creek, low dissolved oxygen levels in Little Dry Creek, Big Dry Creek and Beech Creek, and pH problems in the Coosa River, the Etowah River and Beech Creek. Also documented in the watershed assessment were impacted benthic macroinvertebrate and fish communities in the majority of streams studied, especially Horseleg Creek, Big Dry Creek, Woodward Creek and Beech Creek.

This information along with consideration of current and future land use, and other potential pollutant sources to local streams was used to identify appropriate watershed-wide and site-specific best management practices (BMPs) for use in decreasing potential non-point source pollution. The recommended BMPs in this report include: public education and outreach; identification and removal of sources of problem pollutants to local streams; effective environmental ordinances; a comprehensive inspections, operations and maintenance program for the sanitary sewer system collection system; enhanced implementation of the City's stormwater management program; continued efforts in special projects as well as targeted watershed assessments to identify and eliminate specific pollutants to impaired stream segments. A long-term monitoring program for use in assessing the effectiveness of the proposed WPP is an important component of this report. If monitoring results do demonstrate a decrease in watershed health or lack of improvement of impaired streams over time, the City will revise the Plan as needed to maximize effectiveness and ensure that long-term goals will be met. An estimate of required funding for program development and implementation and a summary of potential funding sources is presented along with a proposed implementation schedule of recommended BMPs. An understanding and appreciation of this program by local officials and the general public is also vital to ensuring long-term protection of Rome's critical water resources.

I. INTRODUCTION

The continuing degradation of water bodies in urban and urbanizing watersheds remains one of the most serious environmental issues facing Georgia today. The non-point source pollutant loading of these streams, rivers, and lakes has not only affected the water quality, but has also adversely affected the quality of life of the citizens of Georgia. By not viewing these streams, rivers, and lakes as a resource to be protected, we risk forfeiting numerous economic and recreational benefits that could have otherwise been enjoyed.

Growth and development in northwest Georgia, combined with the need to preserve water quality in the region's streams and lakes, presents a challenge to local communities and water and wastewater providers. Many streams within this region are currently included on the Georgia 303(d) List for Impaired Streams for partially or not meeting their designated uses. Because of this increasing focus on water quality, the Northwest Georgia Regional Commission (NWGRC) and their member communities have supported creation of the North Georgia Water Resources Partnership (NGWRP or Partnership). The Partnership is a regional coalition of water permit holders, local governments, industry, and other interested parties in and next to the Coosa River Basin in northwest Georgia. The Partnership currently represents 22 counties located in four major watershed basins: the Coosa, Chattahoochee, Tallapoosa, and Tennessee; however, the majority is in the Coosa River Basin.

A regional approach to water management is beneficial for several reasons. The geographic boundaries of the member communities lie almost entirely within the Coosa River Basin, which is recognized as one of the most biologically diverse ecosystems in the world (University of Georgia [UGA] 2011) and is considered a priority watershed by the Georgia Environmental Protection Division (GA EPD) and the U.S. Environmental Protection Agency (USEPA). Because the members share this resource, they also share the goal of protecting and managing the Coosa Basin. Regional planning also offers an opportunity to take a broader perspective and to focus on issues that are beyond the reach of individual local governments. A cohesive water management plan will not only set forth common goals for protecting shared water resources, but will also spread the financial cost associated with implementing these goals over a larger resource pool. The work completed will also fit with the goal of GA EPD's Statewide Water Management Plan.

A comprehensive Watershed Assessment was conducted for the City of Rome and nine other local governments as part of the Northwest Georgia Water Quality Improvement Study and Implementation Plan (November 2012). The purpose of the region-wide study was to evaluate water quality conditions, identify probable causes of stream impairments, predict future growth effects on the watershed, and identify potential water quality management strategies to implement within the watershed. The study included assessment of water quality (15 sites) and biological health (7 sites) within and near the City of Rome, GA. The goal of the study was to evaluate surface water quality as it enters, moves through, and exits the various sewer service areas. Most of the sampling locations were on streams also listed on the 2012 state's 303d list of impaired waters. The results of the comprehensive Watershed Assessment are used by Partnership members to create individual Watershed Protection Plans to manage the unique challenges of each jurisdiction. Each jurisdiction is responsible for implementation of their own

Watershed Protection Plan including long-term monitoring and preparation and submittal of an Annual Report to EPD that provides EPD with an overview of watershed health and actions taken to protect and enhance watershed health per the requirements of individual NPDES permits of each city or county.

Thus, the current document serves as the "action plan" to be implemented over time to protect and preserve the critical water resources of the City of Rome and surrounding areas. Development of this Plan is a permit requirement of the City of Rome's two wastewater treatment plants. The WPP is based on the results of a comprehensive watershed assessment of local streams as well as consideration of current and future land use, sewer service areas and potential sources of pollutants to local streams. It is designed to enable the City to reduce documented impairments to local streams such as high fecal levels in Horseleg and Dozier Creeks, low dissolved oxygen levels in Little Dry Creek, Big Dry Creek and Beech Creek, and pH problems in the Coosa River, the Etowah River and Beech Creek. Also observed in the watershed assessment were impacted benthic macroinvertebrate and fish communities in the majority of streams studied, especially Horseleg Creek, Big Dry Creek, Woodward Creek and Beech Creek.

Included in this report is a description of the current state of watershed health within the watershed characterization area (WCA) of the City of Rome as well as potential causes of observed impacts to the streams in and around the City. This information was used to identify appropriate watershed-wide and site-specific best management practices (BMPs), some of which are already on-going. A long-term monitoring program for use in assessing the effectiveness of the proposed WPP is an important component of this report. If monitoring results do not demonstrate improvement of impaired streams over time, the City will revise the Plan, as needed, to maximize effectiveness so that overall goals will be met. An estimate of required funding for program development and implementation as well as a summary of potential funding sources is presented along with a proposed implementation schedule of best management practices for use in protecting local streams.

A. Background

1. Local Authority

The City of Rome Water and Sewer Division is responsible for managing municipal water supply and wastewater programs including facilitating implementation of this Plan. This department works closely with Stormwater and Community Development programs to design and implement watershed protection programs throughout the sewer service area. Funding for these programs, including implementation of the City of Rome Watershed Protection Plan, is controlled by the Rome City Commission through an annual budget planning process. The Department is located at 100 Vaughn Road (P.O. Box 1711), Rome, Georgia 30162-1711, phone (706) 236-4560. The current Director of the Water and Sewer Division is Mr. Leigh Ross who may be reached through the Department's phone number provided above.

2. Description of the Watershed

The City of Rome is in Floyd County in northwest Georgia (Figure 1). According to the Northwest Georgia Regional Watershed Assessment, the City of Rome's Watershed Characterization Area (WCA) covers approximately 226 square miles (Figure 2). Major streams within the City of Rome WCA include Oostanaula River and Etowah River which ultimately flow into the Coosa River. Other streams within the smaller sewer service area (within the larger WCA) include: Big Dry Creek; Horseleg Creek; Beech Creek; Little Dry Creek; Burwell Creek; Silver Creek; Armuchee Creek; and Dozier Creek (Figure 3).

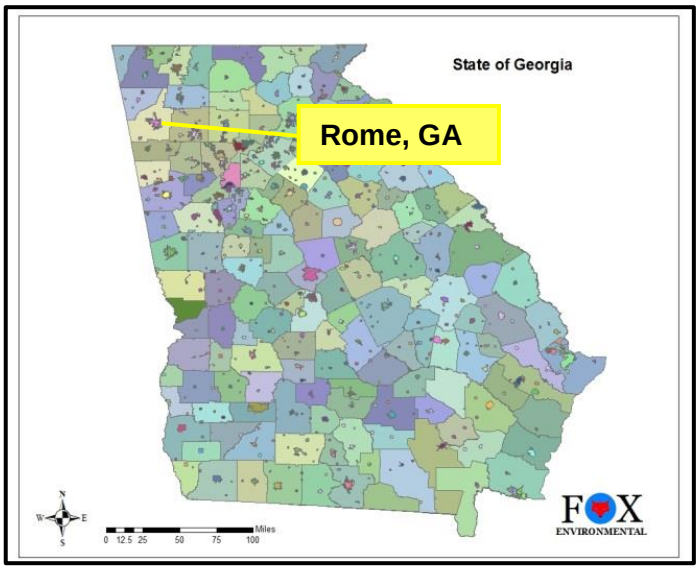

Figure 1. Location Map of Rome, GA

The City of Rome WCA is within the Level III Ridge and Valley ecoregion and primarily two Level IV subecoregions, Southern Shale Valleys (67g) and Southern Limestone/Dolomite Valleys and Low Rolling Hills (67f). The hydrology of the Ridge and Valley ecoregion consists of areas of moderate- to high-gradient landscapes and under normal conditions can sustain water flow velocities of 1 foot per second or greater. Stream substrate primarily includes fine sediment or infrequent aggregates or larger. As documented by the National Wetlands Inventory (NWI), 708 acres or about 1 percent of the area within the WCA is represented by wetlands. Several known threatened or endangered species, state or federally listed plant and animal species exist in the Rome WCA. At least 0.52 percent of the area is located within the regulated 100-year floodplain and 13.18 percent is in the 500-year floodplain. A small portion of the WCA has been identified as an area of significant groundwater recharge. The primary geologic formations within the City of Rome WCA include the Conasauga Group, Floyd Shale, Knox Group Undifferentiated, and Rome Formation.

Nineteen stream segments in the City of Rome WCA are listed as not supporting their designated use on the 2012 GA EPD 303(d) list. These segments are shown on Figure 3 and listed in Tables 1A and 1B. There are no impaired lakes located within the current or future sewer service areas. TMDL implementation plans have been developed for most of the 303(d)-listed stream segments in the City of Rome WCA due to fecal coliform, for each segment listed due to PCBs, and for mercury. The purpose of these plans is to reduce or eliminate sources of fecal coliform bacteria in these stream segments to attain water quality standards within a decade of plan approval. Full versions of the TMDLs and TMDL implementation plans developed for each stream segment are provided online. Implementation plans are not yet available for the DO-listed stream segments of the Coosa River and Beech Creek, or the biota-listed segments of Armuchee Creek, Silver Creek and Beech Creek.

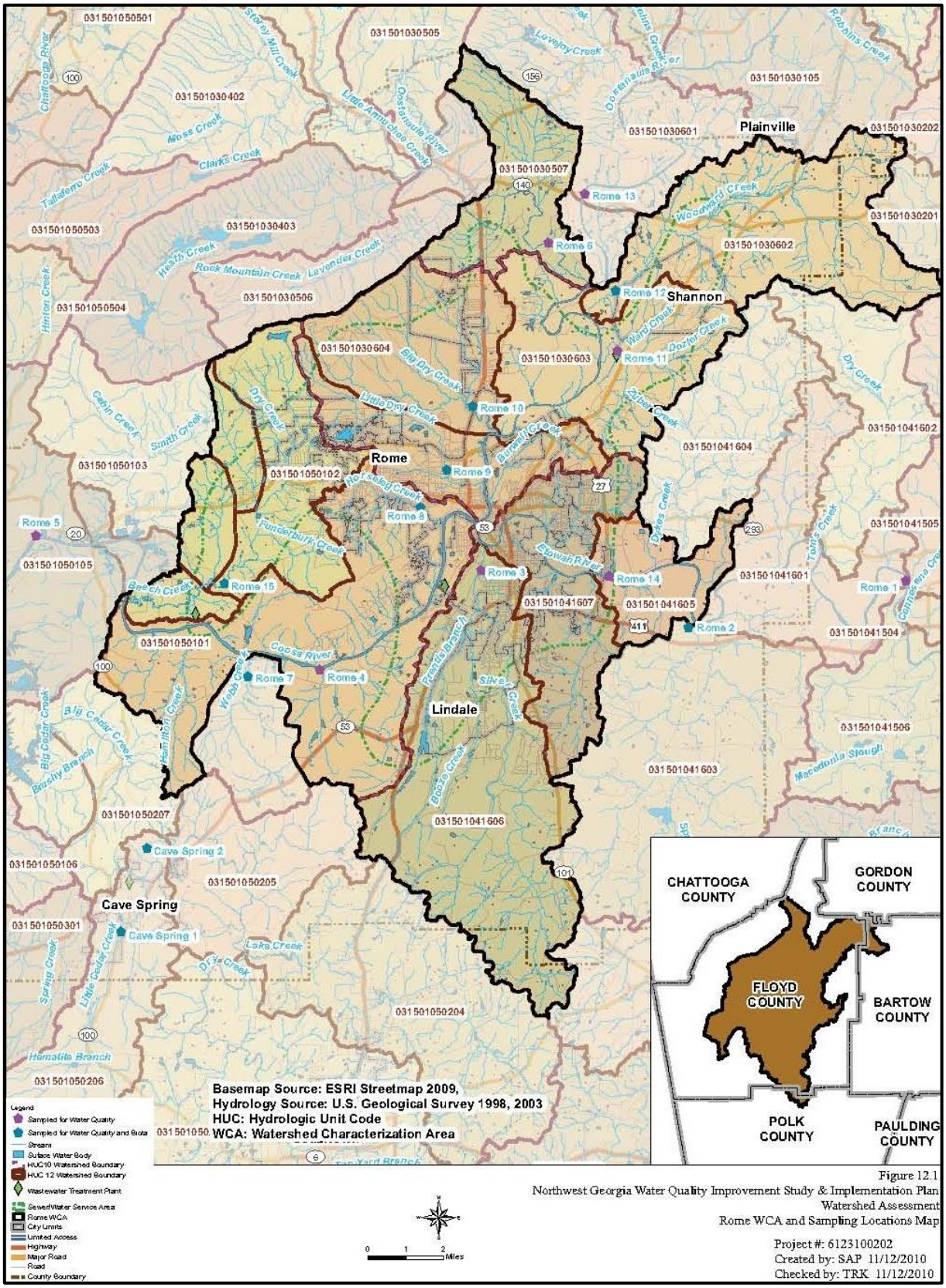

Figure 2. Watershed Characterization Area (WCA) from the Watershed Assessment

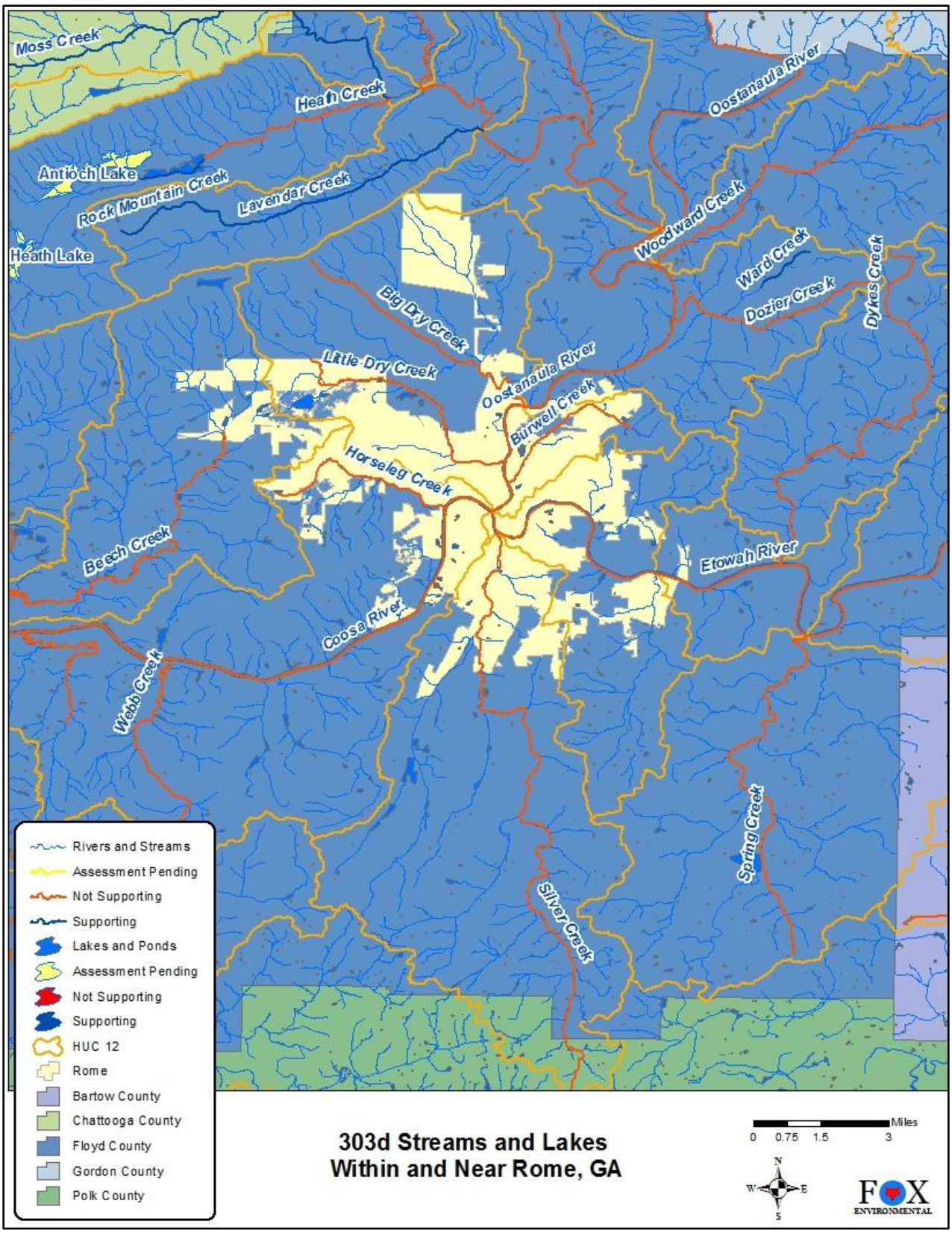

Figure 3. Impaired Streams and Lakes Within/Near, Rome, GA

Waterbody (Length)	Location	Water Use Classification	Criterion Violated	Potential Source
Etowah River Hwy (21miles)	411 to Coosa River	Fishing	CFB, FC, FCG (PCBs)	CFB, FCG(PCBs) are I2 (General Electric) and FC are NPS
Spring Creek (2 miles)	Etowah River Tributary	Fishing	CFB, Hg	Cause for Hg is NP. Causes for CFB are NP & I2 (GE).
Silver Creek (15 miles)	Headwaters to Etowah River	Fishing	CFB, FC, Bio F	Causes of CFB & Bio F are I2 (GE) & UR. Cause of FC is UR.
Coosa River (14 miles)	Rome to Beech Creek	Fishing	CFB, FCG (PCBs), FC	Causes of CFB, FCG (PCBs) are I2 & UR. Cause of FC is UR.
Coosa River (17 miles)	Beech Creek to Stateline	Fishing	CFB, FCG (PCBs), DO,	Cause for Temp is I1. Cause for other parameters is I2.
Armuchee Creek (20 miles)	Oostanaula River Tributary	Fishing	CFB	I2 (GE) and NPS
Webb Creek (4 miles)	Coosa River Tributary	Fishing	CFB	I2 (GE), NP
Horseleg Creek (4 miles)	Rome	Fishing	CFB, FC	Cause for CFB is I2. Cause for FC is NP.
Little Dry Creek (6 miles)	Rome	Fishing	CFB	I2 (GE)
Big Dry Creek (3 miles)	Rome	Fishing	CFB, FC	Cause for FC is UR. Cause for CFB is UR, I2 (GE).
Dozier Creek (3 miles)	Oostanaula River Tributary	Fishing	CFB, FC	Cause for CFB is I2 (GE). Cause for FC is NP.
Woodward Creek (8 miles)	Oostanaula River Tributary	Fishing	CFB, FC	Causes for CFB are I2 & NPS. Cause for FC is NP.

Table 1A (Cont'd on next page). **303(d) Streams and Lakes Within and Near the City of Rome, Georgia**

Waterbody (Length)	Location	Water Use Classification	Criterion Violated	Potential Source
Oostanaula River (18 miles)	Hwy 156 to Hwy. 140	Fishing	FC, FCG (PCBs)	UR
Beech Creek (10 miles)	Downstream Hicks Lake, near Rome to Coosa River	Fishing	CFB, FC, Bio F, DO	Cause for CFB is I2, NP. Cause for other criterion is NP only.
Tributary to Armuchee Creek (5 miles)	Headwaters to Armuchee Creek	Fishing	Bio F	NP
Burwell Creek (3miles)	Rome	Fishing	CFB	I2 (GE)
Hamilton Creek (5 miles)	Coosa River Tributary	Fishing	CFB	I2 (GE)

Table 1B (cont'd from previous page). **303(d) Streams and Lakes in the City of Rome WCA**
(Source: GA Environmental Protection Division 2012)

Key
FC – fecal coliform bacteria
CFB (PCBs) – commercial fishing ban due to PCBs.
Bio F – biota impacted (fish community)
DO- dissolved oxygen
HG – mercury
I2 - residual from industrial source
NP - nonpoint sources/unknown sources
UR – urban runoff
GE – General Electric

3. Community Service Area

The service area, which serves approximately 20,484 accounts, is treated by two facilities. A limited expansion of the sewer service area is anticipated in the future. The current and future sewer service areas for the City of Rome are identified in Figure 4. The current sewer service area is approximately 103,883 square miles. The future sewer service area is projected to be approximately 108,111 square miles. A community profile of the City of Rome is presented in Table 2.

Community Profile	2009
DEMOGRAPHIC	
Population (2010)	36,303
Population growth rate (2000 to 2010)	3.78%
Living At or Below Poverty (2011 data)	25.7%
Unemployment (2013 data)	11.7%
Per Capita Income	$20,126
Median Household Income	$33,548
EDUCATION	
Adults with high school diploma or higher	72.1%
Bachelor's degree or higher	22.4%
Graduate or Professional Degree	9.6%
Unemployed	11.9%
HOUSING	
Median Value of Homes in Rome	$124,100
Median Value Price Growth Since 2000	42.48%

Table 2. Community Profile Based on Leading Indicators
(Sources: USA.com and City-Data.com)

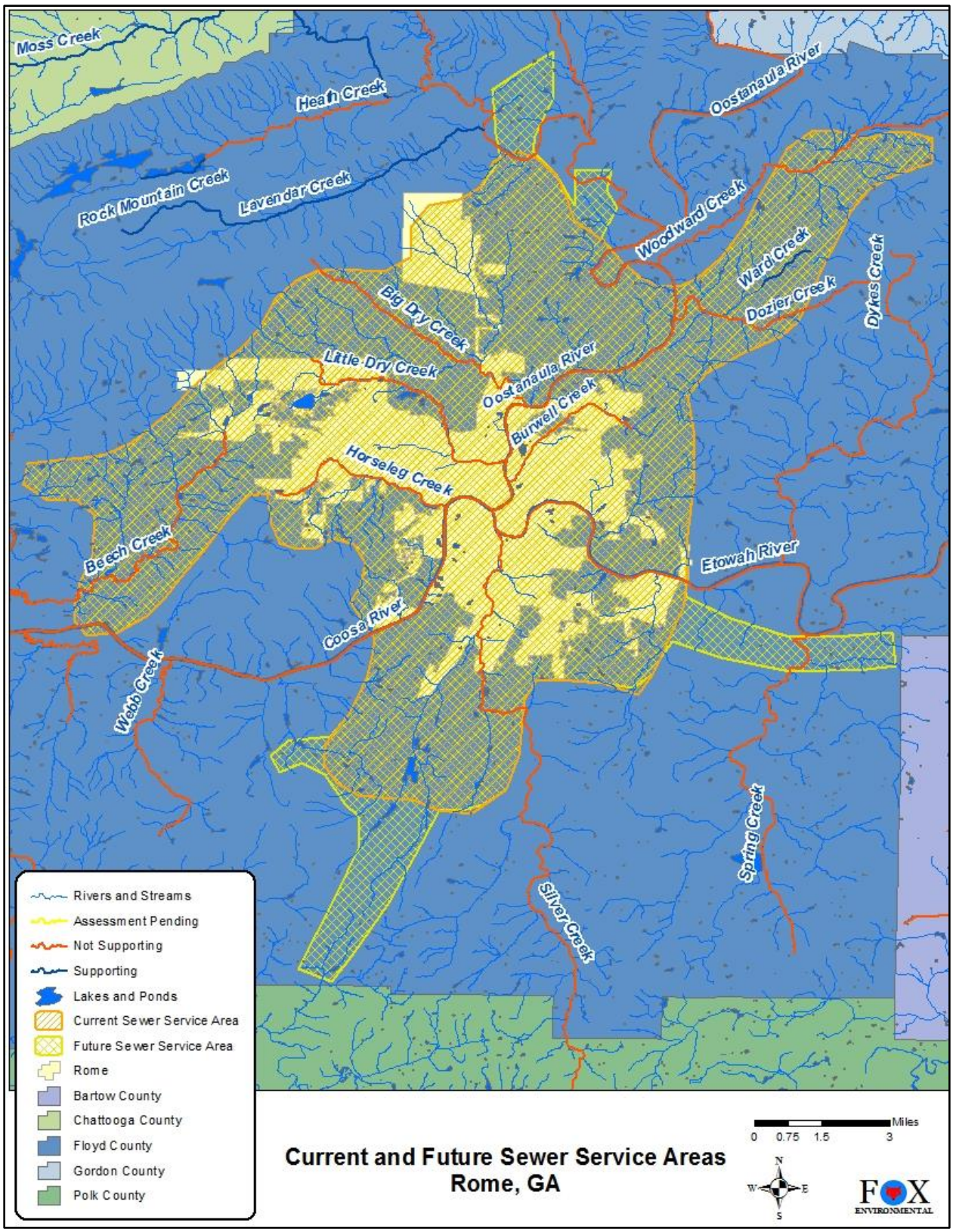

Figure 4. Current and Future Sewer Service Areas in the Rome WCA

4. Land Use

Development of a comprehensive watershed protection plan is dependent on the anticipated changes in land use. Current and future land use and the anticipated pollutant loading from the associated land use affect watershed-wide and site-specific recommendations for watershed management.

Current and future land uses are shown on Figures 5 and 6, respectively. Since 1992, many forested areas have been converted to urban, grassland/shrub, and agriculture land uses. By 2001, forested areas decreased by approximately 1,985 acres (2.5 percent change) Grassland/shrub and urban areas both increased; grassland/shrub areas increased by 945 acres (10 percent change) and urban areas increased by 1,057 acres (4 percent change). Open water areas also increased by 117 acres (7 percent), primarily from the conversion of agriculture. Barren land cover showed the largest percent change (37 percent) increasing by 107 acres. Land use type, acreage and percent of total land in the City has continued to change as presented in Table 3 below. Future Land Use is presented in Table 4.

Current Land Use	sq. mi	% of Total
Agricultural Residential	17.22	16.58
Traditional Residential	1.77	1.70
Multi-family Residential	1.65	1.59
Duplex Residential	0.85	0.82
High Density Traditional Residential	3.81	3.67
Suburban Residential	52.29	50.34
Urban Mixed Use	0.05	0.05
Central Business Commercial	0.11	0.11
Community Commercial	7.08	6.82
Neighborhood Office Commercial	0.08	0.08
Heavy Commercial	0.67	0.64
Light Industrial	4.60	4.42
Heavy Industrial	6.87	6.61
Office Institutional	6.81	6.56
Planned Development	0.01	0.01
Total	**103.88**	**100%**

Table 3. Current Land Use within the City of Rome Current Sewer Service Area
(Based on zoning data obtained 7/11/14 and current sewer service area)

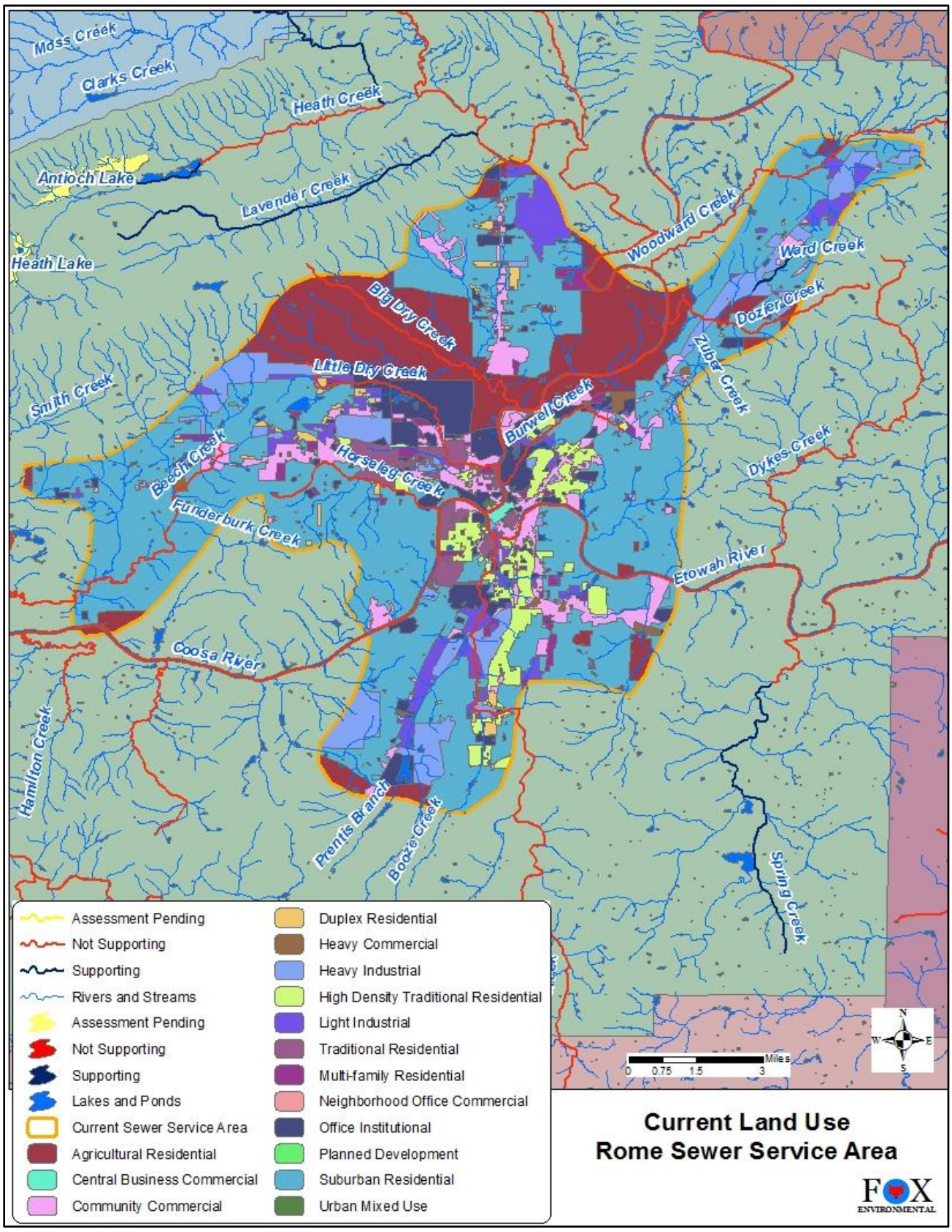

Figure 5. Current Land Use in the Rome Sewer Service Area

Future Land Use	sq. mi	% of Total
Low Density Residential	1.87	0.93
Medium Density Residential	2.83	2.62
High Density Residential	1.89	1.75
Suburban Residential	35.01	32.38
Mixed Use	0.89	0.83
Agricultural	30.08	27.82
Commercial	6.57	6.08
Conservation	6.49	6.00
Industrial	7.72	7.14
Parks	0.40	0.37
Preferential	0.42	0.39
Public/Institutional	12.24	11.32
Unclassified	1.70	1.57
Total	**108.11**	**100%**

Table 4. Future Land Use within the City of Rome Current Sewer Service Area
(Based on future land use data obtained 7/11/14 and the future sewer service area)

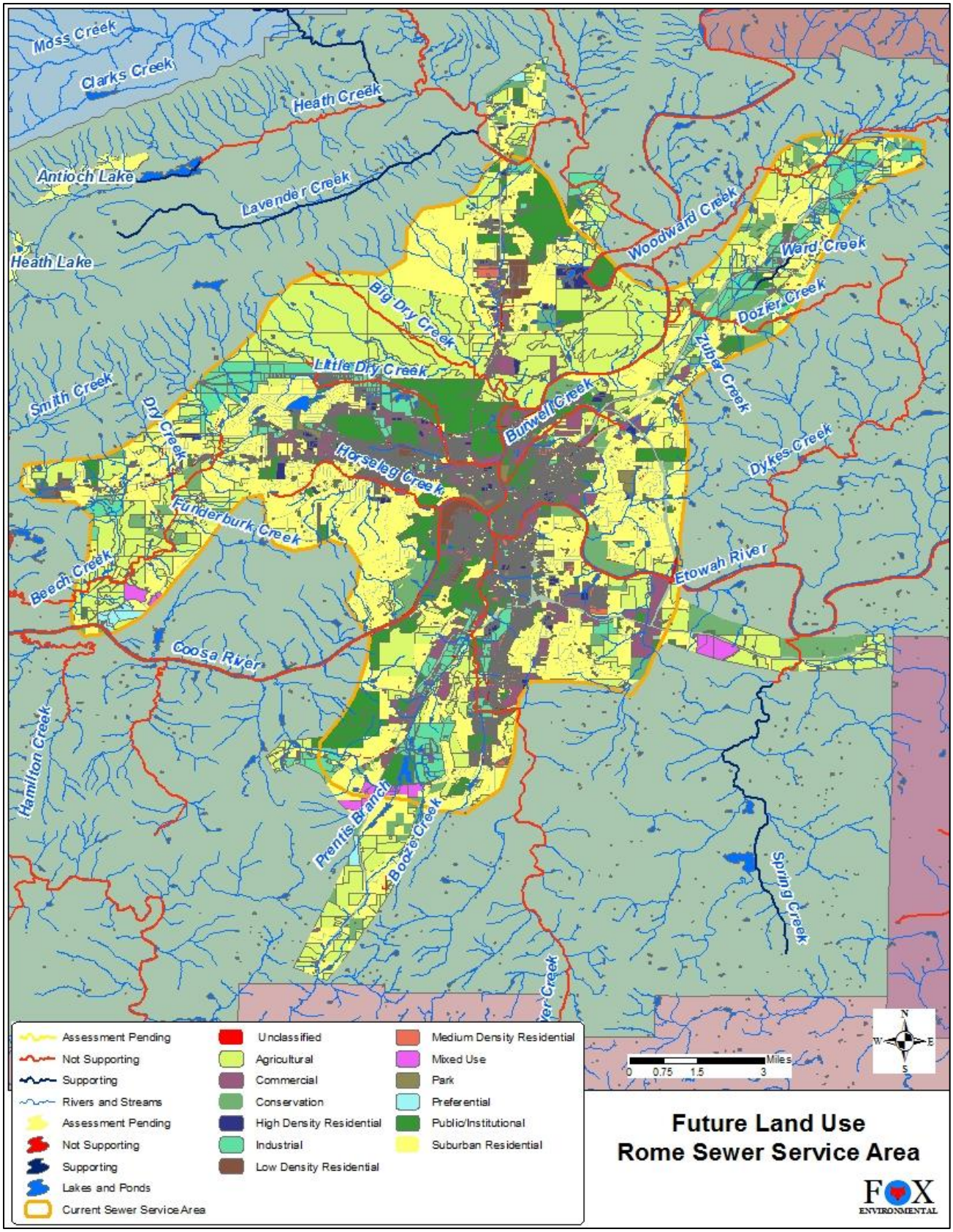

Figure 6. Future Land Use in the Rome Sewer Service Area

5. Other Potential Sources of Pollution

In the Rome Watershed Assessment, data from the Source Water Assessment for drinking water intakes from 2001 to 2003 were used to identify potential pollutant sources within the City of Rome WCA, including NPDES permitted facilities, landfills, Resource Conservation and Recovery Act (RCRA) sites, Hazardous Site Inventory (HSI) sites, Toxics Release Inventory (TRI) sites, wastewater treatment facilities, concentrated animal feeding operations (CAFOs), and mine sites. The potential pollutant sources were identified in the City of Rome WCA as shown in Figure 7. Table 5 identifies the total number of potential pollutant sources within the City of Rome WCA.

Potential Pollutant Sources	Rome WCA Total		Potential Pollutant Sources	Rome WCA Total
CERCLIS	1		Lift Station	7
CAFO	1		Mine	4
Electrical Substation	14		NPDES Permit Facility	11
Fuel Tanks	0		Poultry Facility	0
HSI	9		RCRIS	66
Industrial Bulk Facility	0		TRIS	19
Industrial Facilities Discharge	16		Wastewater Treatment Plant	3
Landfill	17		Water Treatment Facility	4
LAS	0		Water System	2

Table 5. Pollutant Sources Identified in the Watershed Assessment

Notes:
CERCLIS – Comprehensive, Environmental Response, Compensation and Liability Information System
CAFO – Concentrated Animal Feeding Operations
HSI – Hazardous Site Inventory
LAS- Land Application System
NPDES – National Pollutant Discharge Elimination System
RCRIS – Resource Conservation and Recovery Information System
TRIS – Toxic Release Inventory System
WCA – Watershed Characterization Area

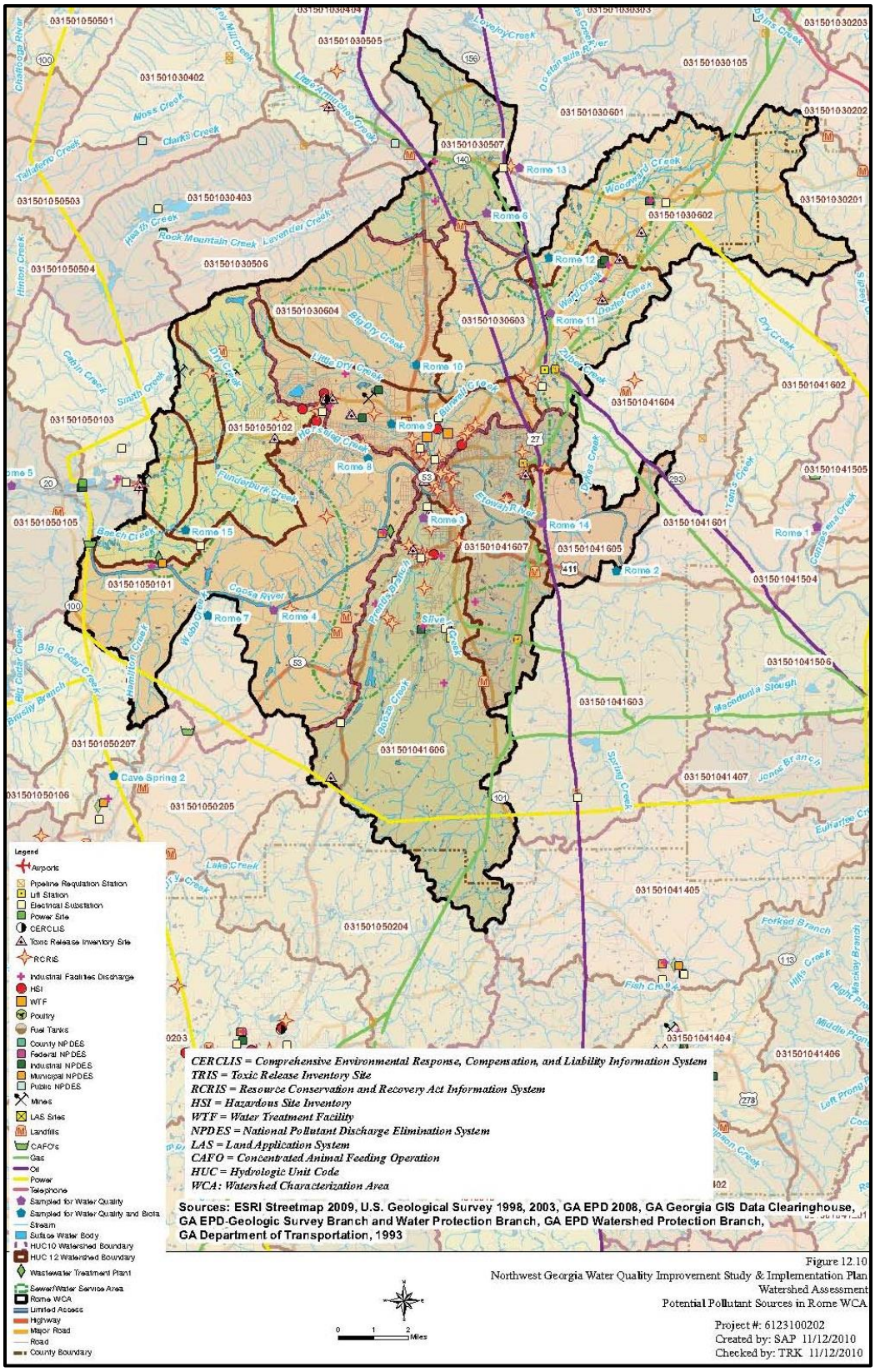

Figure 7. Potential Pollutant Sources identified in the Watershed Assessment

B. Purpose and Objectives

The purpose of this report is to present the City of Rome's overall strategy, i.e. watershed protection plan, to protect and enhance the water quality, aquatic integrity and overall appearance of streams located within the sanitary sewer service area for the future. Specific objectives include the following:

1. Describe the current conditions of watershed health in and around the City of Rome, Georgia.

2. Summarize existing and proposed programs for reducing nonpoint and point source runoff to reduce/eliminate pollutant inputs and improve the water quality and aquatic integrity.

3. Present a long-term water quality and biological monitoring program to determine effectiveness of the overall Watershed Protection Program.

4. Develop a strategy for obtaining the funding necessary to implement the City's Watershed Protection Plan recommendations.

II. OVERVIEW OF WATERSHED HEALTH

A. Historical Monitoring Studies

The City of Rome collected surface water quality data at four locations in the watershed characterization area from 1968 to 2010. Georgia EPD has collected surface water quality data within the City of Rome WCA at 15 locations. The quantity of samples collected at each site ranges from 85 to 595 over periods ranging from 4 to 34 years. Previous analysis of this data in indicated that dissolved oxygen, temperature, and pH were generally within State criteria for GA EPD monitoring stations. However, elevated levels of turbidity, fecal coliform bacteria, nitrogen and phosphorus were detected at selected monitoring locations within and outside of the City of Rome. Four locations were sampled for macroinvertebrates over the years by GA EPD with results ranging from fair to very good. GA EPD sampled two streams within the City of Rome WCA in 2001 and 2002. Spring Creek received a score of "good" whereas Silver Creek scored as "very poor."

B. Watershed Assessment Study

A comprehensive Watershed Assessment was conducted for the City of Rome and ten other local governments as part of the Northwest Georgia Water Quality Improvement Study and Implementation Plan (November 2012). The purpose of the region-wide study was to evaluate water quality conditions, identify probable causes of stream impairments, predict future growth effects on the watershed, and identify potential water quality management strategies to implement within the watershed. The study included assessment of water quality (15 sites) and biological health (7 sites) within the City of Rome's watershed characterization study area (WCA). The WCA study area extends beyond the City's current and future sanitary sewer service areas. The goal of the study was to evaluate surface water quality as it enters, moves through, and exits the various sewer service areas. Most of the sampling locations were on streams also listed on the 2012 state's 303d list of impaired waters. The sampling locations utilized in the watershed assessment are shown on Figure 8.

In 2008-09, sampling was conducted during three dry weather events and one wet weather event to represent baseline conditions (i.e., low flow). Dry weather sampling events were conducted at least 72 hours after the previous rainfall and consist of grab samples. The criteria for a wet weather event were at least 0.2 inch of rainfall and at least 72 hours since the last storm event. Samples collected were time-weighted composite samples to represent the complete hydrograph for the rain event. Water quality parameters evaluated included: water temperature; dissolved oxygen; pH; turbidity; total suspended solids; chemical oxygen demand; biological oxygen demand; ammonia; nitrate; nitrite; total kendahl nitrogen; total phosphorus; orthophosphorus; cadmium, copper, lead, zinc and bacteria (two geometric means) in accordance with the GA EPD-approved Monitoring Plan. These bacteria samples were collected at all fifteen sites regularly irrespective of weather or stream flow conditions. Biological monitoring consisted of habitat and biological assessments of benthic macroinvertebrates and fish communities at 7 of the 15 monitoring sites. Water quality and biological monitoring data at these 15 monitoring sites represents baseline conditions of watershed health within and near the City of Rome to which future monitoring can be compared.

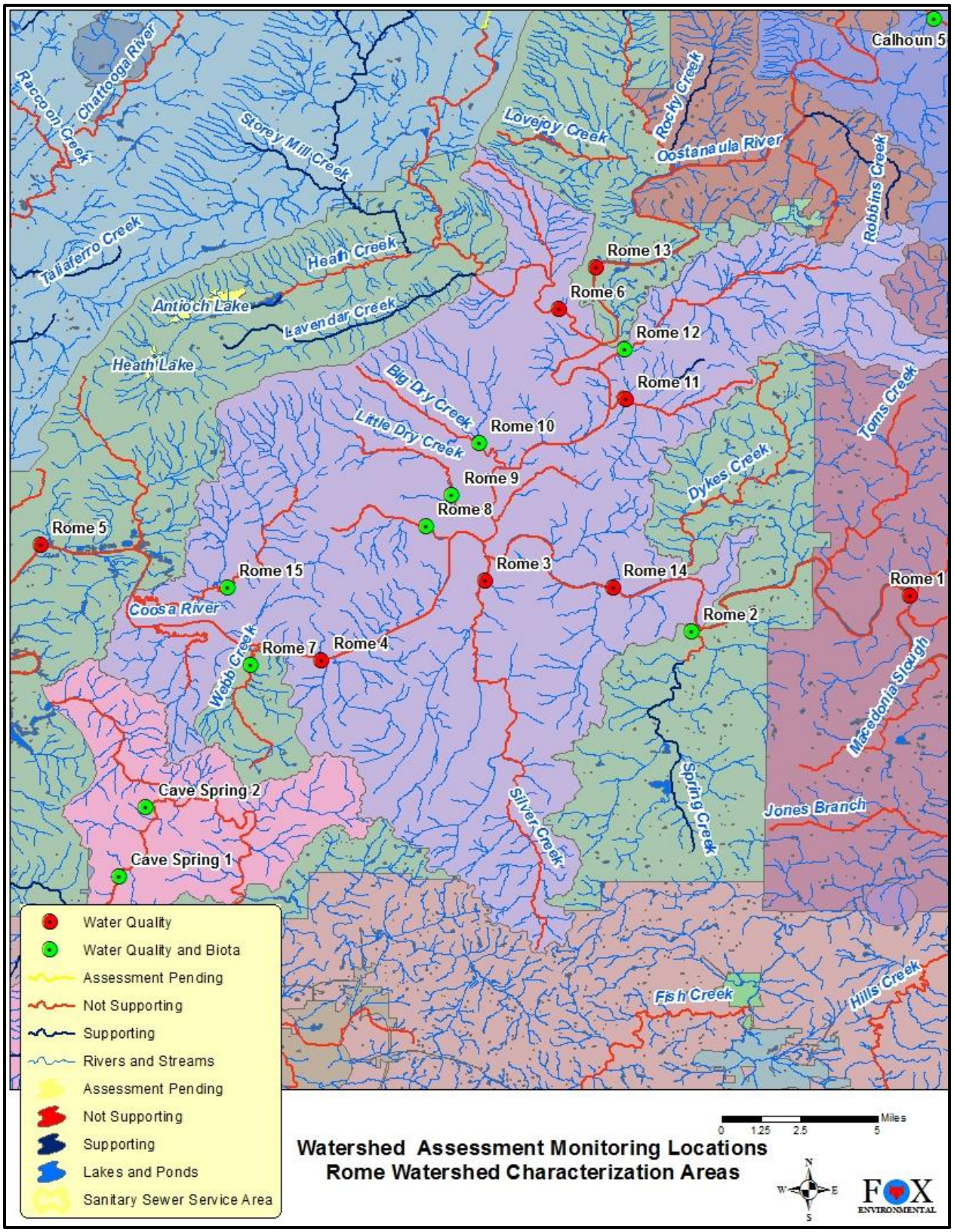

Figure 8. Monitoring Locations in the Watershed Assessment

1. Evaluation of Water Quality

A detailed description of all monitoring data collected in the 2008-09 study is presented in the Watershed Assessment Report. Study results did not demonstrate any significant impacts to study streams with respect to numerous constituents, namely water temperature, nitrogen (ammonia, TKN, nitrate and nitrite), phosphorus (total and ortho), sediment (total suspended solids and turbidity), and oxygen (biological oxygen demand and chemical oxygen demand). Elevated fecal coliform and/or decreased pH and dissolved oxygen levels were present outside of acceptable levels in ten streams as presented in the Table 6. Streams most impacted by specific pollutants were: Coosa River (low pH); Horseleg Creek (elevated fecal coliform bacteria); Little Dry Creek (low dissolved oxygen); Big Dry Creek (low dissolved oxygen); Dozier Creek (elevated fecal coliform bacteria); Etowah River (elevated pH); and Beech Creek (low dissolved oxygen).

Site	Creek Name	Date	Constituent	Constituent Value	Acceptable Criteria
Rome 2	Spring Creek	6/09	FC	208	<200
Rome 3	Silver Creek	6/09	FC	420	<200
Rome 4	Coosa River	7/09	pH	4.94	6.0-8.5
Rome 5	Coosa River	6/09	pH	5.70	6.0-8.5
Rome 8	Horseleg Creek	10/08	FC	994	<200
Rome 8	Horseleg Creek	6/09	FC	1,044	<200
Rome 9	Little Dry Creek	10/08	DO	3.00 mg/L	>5.0
Rome 9	Little Dry Creek	6/09	DO	3.51 mg/L	>5.0
Rome 9	Little Dry Creek	10/08	FC	221	<200
Rome 9	Little Dry Creek	6/09	FC	248	<200
Rome 10	Big Dry Creek	10/08	DO	2.31 mg/L	>5.0
Rome 10	Big Dry Creek	6/09	DO	3.41 mg/L	>5.0
Rome 10	Big Dry Creek	10/08	FC	216	<200
Rome 10	Big Dry Creek	6/09	FC	349	<200
Rome 11	Dozier Creek	6/09	FC	942	<200
Rome 12	Woodward Creek	6/09	FC	282	<200
Rome 14	Etowah River	10/08	pH	9.43	6.0-8.5
Rome 15	Beech Creek	8/09	DO	3.51 mg/L	>5.0
Rome 15	Beech Creek	6/09	FC	225	<200
Rome 15	Beech Creek	6/09	pH	4.91	6.0-8.5

Table 6. Summary of Water Quality Pollutants and Locations in Watershed Assessment

2. Evaluation of Biological Integrity

Benthic Macroinvertebrates Survey

Macroinvertebrate physical habitat in the City of Rome WCA was "marginal" to "suboptimal" (Table 6). Rome 12 was "marginal" for supporting a diverse aquatic community, while the remaining sampling locations within the WCA ranked as suboptimal for supporting a diverse aquatic community. The scorings for these locations were most affected by the characteristics of stream variability, vegetative protection on the stream banks, and riparian vegetation zone width. In addition, pastures and open areas were adjacent some sections of the streams, limiting the width of the vegetated riparian corridor.

As shown in Table 7, the results from the benthic macroinvertebrate collection and analysis for the City of Rome sites scored from "fair" to "very poor." Rome 2, 7, and 9 ranked as "fair," while the remaining three sites ranked as "very poor". The structure and function of resident biota is a direct measurement of the condition of the aquatic ecosystem (GA EPD 2007b). Biomonitoring is more effective than chemical/physical water quality sampling in detecting the effects of nonpoint-source pollution and intermittent pollution events (GA DNR 2005). A stream health rating of "fair" indicates that frequent monitoring is critical to detect changes in ecological status. Stream health ratings of "very poor" indicate that frequent monitoring is necessary to determine remediation needs and whether remediation has been successful. The "marginal" to "suboptimal" macroinvertebrate physical habitat rankings indicated by the macroinvertebrate physical habitat assessments are likely explanations for the macroinvertebrate sample results. "Suboptimal" physical habitat is less than desirable but satisfies expectations in most areas (GA EPD 2007b). "Marginal" physical habitat indicates moderate levels of degradation with severity at frequent intervals in the area (GA EPD 2007b). Water quality may also be a contributing factor to the benthic macroinvertebrate community results. Increased degradation of habitat and water quality will lead to a decrease in the diversity of the aquatic insect community in a stream (GA DNR 2005).

Fish Survey

The Watershed Assessment reported that the fish physical habitat in the City of Rome WCA was "marginal" to "suboptimal" (Table 8). Rome 2, 9, and 12 exhibited elevated levels of siltation compared to the other sites, and were "suboptimal," "marginal," and "marginal," respectively, for supporting a diverse aquatic community. The remaining sites ranked as "suboptimal" for supporting a diverse aquatic community. The scorings for these locations were most affected by sedimentation, the occurrence of riffles, the characteristics of vegetative protection on the stream banks, and riparian vegetation zone width. In addition, pasture and clear areas were next to some sections of the streams, limiting the width of the vegetated riparian corridor.

The State-protected burrhead shiner (*Notropis asperifrons*) at Webb Creek (Site Rome 7), and rock darter (*Etheostoma rupestre*) at Woodward Creek (Site Rome 12), and the federally protected Etowah darter (*Etheostoma etowahae*) was observed at Spring Creek (Site Rome 2).

The results of the fish collection and analysis for all seven of the City of Rome sites, based on IBI criteria, ranked as "very poor". An IBI score of "very poor" indicates that few fish, mostly generalist and *Lepomis* species, were present; the sample was dominated by unhealthy and juvenile individuals; and fish with disease, eroded fins, lesions, and tumors were common. The results of the fish collection and analysis for the City of Rome sites, based on Iwb criteria, scored from "fair" to "very poor". An Iwb score of "fair" indicates a decline in species richness and diversity as some expected species are absent; a decline in the abundance of individuals; a decline in total biomass as some levels of the food web are in low abundance or missing; and a trophic structure that is skewed toward generalist feeders and/or *Lepomis* species as the abundance of insectivorous cyprinid and benthic fluvial specialist species decreases. An Iwb score of "very poor" indicates the presence of few individuals, mainly generalist feeders and *Lepomis* species, the dominance by non-native species, and very low total biomass. Each score represents slightly differing results however the relatively low scores of both types suggests the fish population in Rome's streams are impaired at the time of the study.

C. Summary of Watershed Health

The recent watershed study illustrated that some streams are in good condition whereas others are impacted by historical and/or on-going inputs of pollutants from various sources within and near the City of Rome. Historical monitoring of stream health at fifteen study locations indicated that dissolved oxygen, temperature, and pH were generally within State criteria for GA EPD monitoring stations. However, elevated levels of turbidity, fecal coliform bacteria, nitrogen and phosphorus were detected at selected monitoring locations. GA EPD sampled two streams within the City of Rome WCA in 2001 and 2002. Spring Creek received a score of "good" whereas Silver Creek scored as "very poor."

A comprehensive watershed assessment of local streams in 2008-09 demonstrated problems in nine of thirteen streams studied. Most problematic was observed high fecal coliform levels in Horseleg Creek and Dozier Creek, low dissolved oxygen levels in Little Dry Creek, Big Dry Creek and Beech Creek, and pH problems in the Coosa River, the Etowah River and Beech Creek. This occurred in both dry and wet weather. Also documented in the watershed assessment were impacted benthic macroinvertebrate and fish communities in the majority of streams studied, especially Horseleg Creek, Big Dry Creek, Woodward Creek and Beech Creek. Often impacts to biological communities issue to habitat alteration and sediment inputs however these were not identified as significant concerns in the watershed assessment. More likely observed impacts to biological communities could be the result of low oxygen and pH levels from unidentified inputs from local industry and low stream flows.

Additional evaluation of available and future monitoring data in both wet and dry weather along targeted watershed assessments to include evaluation of adjacent land use (e.g. especially agriculture or industrial inspections) and outfall monitoring is needed to identify and eliminate pollutant inputs to impaired streams.

Site	Stream	Macroinvertebrate Scores					
		Habitat Score (benthos)	Habitat Score Category	MMI Score	Numeric Rank	MMI Category	Description
Rome 2	Spring Creek	138	Suboptimal	59	3	B	Fair
Rome 7	Webb Creek	138	Suboptimal	41	3	B	Fair
Rome 8	Horseleg Creek	119	Suboptimal	20	5	C	Very Poor
Rome 9	Little Dry Creek	102	Suboptimal	50	3	B	Fair
Rome 10	Big Dry Creek	120	Suboptimal	12	5	C	Very Poor
Rome 12	Woodward Creek	94	Marginal	27	5	C	Very Poor
Rome 15	Beech Creek	116	Suboptimal	29	5	C	Very Poor

Table 7. Summary of Macroinvertebrate Assessment Results from Watershed Assessment

Site	Stream	Fish Scores					
		IBI Score	IBI Integrity Class	Iwb Score	Iwb Integrity Class	Habitat Score (fish)	Habitat Score (Category
Rome 2	Spring Creek	22	Very Poor	7.53	Poor	156	Optimal
Rome 7	Webb Creek	20	Very Poor	8.06	Fair	128	Suboptimal
Rome 8	Horseleg Creek	22	Very Poor	8.42	Fair	109	Suboptimal
Rome 9	Little Dry Creek	11	Very Poor	3.37	Very Poor	84	Marginal
Rome 10	Big Dry Creek	12	Very Poor	6.36	Very Poor	150	Suboptimal
Rome 12	Woodward Creek	16	Very Poor	8.43	Fair	96	Marginal
Rome 15	Beech Creek	12	Very Poor	6.60	Very Poor	133	Suboptimal

Table 8. Summary of Fish Assessment Results from Watershed Assessment

III. SUMMARY OF CURRENT BEST MANAGEMENT PRACTICES

A. Regulatory Requirements

Figure 2. Rome Water Reclamation Facility

As discussed previously, the City of Rome was required to complete a watershed assessment as one of several conditions for permission to meet the NPDES permit requirements for the City's two wastewater treatment plants. The purpose of the watershed assessment was to characterize the current state of water quality and biological health of streams within Rome's current and future sanitary sewer service area. The City met this requirement when EPD approved the Northwest Georgia Watershed Assessment on February 21, 2013. Also required is the development of this Watershed Protection Plan that describes various activities (i.e. best management practices or BMPs) that the City will implement to decrease pollutant loadings and protect local water resources. These activities are focused on identifying and eliminating both point and non-point sources of pollution to local streams.

In addition, the City of Rome must also meet requirements established by the EPD for all designated Municipal Storm Sewer System (MS4) Phase II communities. The MS4 requirements focus on six categories of BMPs designed to prevent polluted stormwater runoff from entering the City's storm sewer system as well as local streams. Many of these requirements overlap with watershed protection BMPs identified in this Watershed Protection Plan to ensure cost-effective protection and preservation of the City of Rome's Watershed Protection Program.

B. Wastewater Management

1. Sewer Use Ordinance

The City of Rome's Sewer Use Ordinance was adopted on July 22, 1996. The ordinance regulates the use of public and private sewers and drains, private wastewater disposal (e.g., septic tanks), the installation and connection of building sewers, and the treatment and discharge of waters and waste into the public sewer system. The sewer use ordinance also provides for inspections as well as procedures and penalties for violations of these guidelines, e.g. release of hazardous materials into the sewer system.

2. Sewage Collection and Treatment System

The City of Rome has conducted a Georgia Environmental Protection Division approved Industrial Pretreatment Program since 1987. Currently, fifteen industries are permitted through Rome's Program.

Rome also operates a contractor-based Grease Trap Program to ensure local food service establishments are effectively managing fats, oils and grease. The City does have a FOG related ordinance that was amended in 2004. The ordinance was amended to authorize the City to establish a contractor-based grease trap program. As specified in the 2009 Grease Trap Program Guidelines, grease traps must adhere to specific design standards, maintenance and waste removal standards. The Rome/Floyd County Sewer System has 216 grease traps. The program currently utilizes a single grease trap pumping/processing provider paid and managed by the City to pump all traps. Individual user services for pumping are billed monthly to each account in the Water & Sewer bill.

The City's sanitary sewer collection system consists of 400 miles of sewer mains and 45 sewer lift stations. Two separate systems are operated by the City: The Coosa system has 6,325 connections and the Rome system has 14,159 connections. The City of Rome has only one of four collection systems recognized under a Capacity, Management, Operations, and Maintenance (CMOM) agreement by the Georgia Environmental Protection Division. This Agreement recognizes the City's commitment to operate and maintain the collections systems in a responsible manner. The CMOM program emphasizes proper operation and maintenance of the collection system, focusing on safety, manhole maintenance, inspection, the SCADA system, root control, hydraulic cleaning, etc. Capital improvement projects over the past decade have resulted in major upgrades to the Rome and Coosa Water Reclamation Facilities, sewer pipelines and lift stations. These improvements have been made at a cost exceeding $60,000,000. The funds have come from local revenue, GEFA loans, ARC grants, SPLOST issues, and bonds. The City has a 10-year CIP Program and a twenty-year Master Plan. The City has in place and utilizes procedures to issue and track work orders. Warehousing has a computerized inventory control system and is audited on a routine basis. Customer complaints are resolved promptly.

3. Septic Tank Management

Septic tanks located within the City of Rome and the surrounding Sewer Service Area are regulated by Floyd County Environmental Health (FCEH). These services include septic tank permits, repair permits, existing system evaluations, site evaluations, and subdivision plan reviews. Inspections are also required on both septic tank permits and repair permits. Each inspection is performed by an Environmental Health Specialist according to the Rules and Regulations for On-Site Sewage Management Systems (Chapter 290-5-26). These inspections help to ensure correct installation and proper repair of domestic on-site sewage management systems. Through regulating the installation and repair of on-site sewage systems, our department helps to protect Georgia's groundwater, drinking water, and surface water from harmful organisms and chemicals. The Floyd County Health Department inspected a total 446 septic system repairs from January1, 2010 to August 15, 2013.

C. Stormwater Management

As previously discussed, the City of Rome is required to design and implement a comprehensive stormwater management program designed to reduce non-point source inputs to local streams. The program includes a host of activities organized in the six categories presented below. These programs are subject to change based on regulatory requirements, available funding and public interest.

1. Public Education and Outreach

The City hosts a Residential & Commercial Developer Training Program to residential and commercial developers each year. Participation varies in part due to current economic conditions and the extent of on-going development.

Project WET water resources education curriculum is presented to over 750 students at the Rome-Floyd ECO River Education Center. The educational programs take place at 11 different area schools and at community events on an annual basis.

2. Public Involvement

Rome sponsors at least one river clean up each year. In 2012, the City held two successful cleanups. Radio and newspaper advertising was conducted in March and April for the "Renew Our Rivers" event, and public announcements were made inviting the public to attend. For the October/November events, flyers were distributed prior to the "Rivers Alive" event and announcements were made at public meetings prior to the events (including City/County Joint Oversight Committee meetings, Coosa River Basin Initiative meetings, Keep Rome-Floyd Beautiful meetings, and the Trout Unlimited Chili Cook-off event) and a River Clean-up was as held. Radio advertisement spots were also purchased that helped ensure the event was success.

Flyers are distributed throughout Floyd County to interested groups and individuals inviting them to participate in the City's Adopt-a-Stream Program each year. The flyers were distributed through personal delivery, kiosks in public buildings, teacher workshops, and through a local watershed protection non-profit group. Chemical and biological training workshops have been conducted at Berry College. The City plans to continue partnership with the Coosa River Basin Initiative/Upper Coosa River-keeper to assist with training and data collection.

3. Preventing Illicit Discharges and Illegal Connections

Rome adopted an Illicit Discharge and Illegal Connection Ordinance on February 5th 2007. A minimum of twenty percent of all known outfalls are required to be screened every year to identify potential illicit discharges. The City also implements a business inspection program All inspections are documented and all problems addressed through education and/or enforcement, as needed.

4. New Development and Redevelopment Programs

Sediment is one of the primary reasons why streams fail to meet their designated uses in Georgia. Eroding construction sites have been identified to be a leading contributor of sediment to streams resulting in increased flooding problems, lower property values, and poor aquatic integrity. Section IV of General Permit (No. GAR10000), Authorization to Discharge Under the NPDES Stormwater Discharges Associated with Construction Activity, mandates the preparation and implementation of an Erosion, Sedimentation and Pollution Control Plan (Plan) and a Comprehensive Monitoring Program (Program) for construction activity on sites greater than 1 acre, or part of a common development greater than 1 acres.

The City of Rome has an active development program that ensures all construction plans are reviewed and approved prior to issuance of a land disturbance permit. The current Soil Erosion and Sediment Control Ordinance was adopted on September 20, 2010 with previous state-mandated versions adopted prior to this date. An Erosion and Sediment Control Affidavit is utilized for one and two family residential construction sites. This form must be completed prior to obtaining a building permit. Adequate erosion control measures must be present on the site in order to receive approval of required inspections of foundations, plumbing, electrical, HVAC and final for occupancy. All construction sites are inspected by City staff to insure compliance with the approved Stormwater Management Plans and best management construction site practices. All complaints received are tracked and responded to in a timely manner.

The Post-development Stormwater Management Ordinance defines requirements for a stormwater management plan for new development and redevelopment in the City of Rome. This plan must contain details of how the development will address post-development stormwater runoff quality and quantity impacts from the development. Also specified by the ordinance are technical performance criteria for managing runoff quality and quantity through the use of structural stormwater controls and nonstructural practices (such as greenspace preservation). Ongoing inspection and maintenance provisions are provided. The majority of technical criteria and standards may be adopted by reference through the use of the Georgia Stormwater Management Design Manual, aka the "Blue Book." Long-term maintenance of required structural BMPs is mandated through this ordinance.

Building Inspection with the assistance of the Public Works and Engineering Departments of the City of Rome and Floyd County ensure the completion of stormwater facilities on new construction by withholding Certificates of Occupancy until such structures are completed, inspected, and approved. Maintenance agreements for each private stormwater management facilities are obtained from each developer prior to issuance of the Land Disturbance Permit. Periodic site inspections are conducted by the City to evaluate operation and maintenance. Public ponds are maintained by the City as needed.

Stream buffer protection is designed to protect the public health, safety, environment and general welfare and to minimize public and private losses due to erosion, siltation and water pollution. The City adheres to the state required stream buffer setbacks. Within source water protection areas, the stream buffer includes all lands within 100 feet of each major river and 40 feet of each river tributary, inclusive of any islands, as measured horizontally from the uppermost part of the river bank. Outside the source water protection areas, all land development activity maintains

an undisturbed natural vegetative buffer of 50 feet for trout streams and 25 feet for streams without this designation.

The City has a Conservation Subdivision Ordinance in Section 6.20 of the Rome-Floyd County Unified Land Development Code. It is the purpose and intent of that Section to encourage the preservation of open space within residential development; to protect culturally and environmentally critical resources; to provide flexibility to allow creative developments; to provide for a permanent, interconnected open space network; to encourage efficient development that minimizes removal of vegetation, disturbance of soil, and encroachment into environmentally sensitive areas while reducing the need for infrastructure construction; to encourage street design that decreases traffic speed; to encourage neighborhood interaction; and to promote construction of convenient and accessible trails and sidewalks within a subdivision and connecting to adjacent communities, businesses and other facilities in order to reduce reliance on automobiles. Other than this regulation, there is no active Greenspace/Land Acquisition Program in place at this time.

The City currently does not have a formal green infrastructure/low-impact development program in place to facilitate the design and implementation of green infrastructure and/or low-impact development. The new NPDES Phase II Permit regulations now require additional activities in this area and so the City will meet this requirement over the next five years.

5. Code Enforcement

Often the final destination of litter is streams, rivers and lakes. By definition, litter means any organic or inorganic waste material, rubbish, refuse, garbage, grass, weeds, metal or glass, dead animals or discarded materials of nearly every kind. The City's Litter Control Ordinance prohibits littering on public and private property and provides an enforcement mechanism with penalties for dealing with those found littering.

An illicit discharge is defined as any discharge to a municipal or county separate storm sewer system (stormwater drainage system) that is not composed entirely of stormwater runoff (except for discharges allowed under an NPDES permit or non-polluting flows). These non-stormwater discharges occur due to illegal dumping or illegal connections to the stormwater drainage system. The Illicit Discharge and Illegal Connection Ordinance provides the City of Rome with the authority to deal with illicit discharges and establishes enforcement actions for those persons or entities found to be in noncompliance or that refuse to allow access to their facilities. The City initiated screenings of outfalls to identify suspicious discharges on an annual basis. All identified discharged are eliminated as soon as possible through education and enforcement, as needed.

6. Municipal Pollution Prevention Programs

Beginning in May 2003, many facilities owned by local governments were required to meet federal and state industrial stormwater requirements. Specific permit requirements were finalized in 2006 and a permit issued that requires submittal of an Notice of Intent and monitoring requirements for government-owned facilities located within one mile of 303(d) streams, especially if the regulated facility has the potential to discharge specific pollutants of concern. A new Industrial General Permit was issued in April 2012. The City of Rome recently developed and submitted to EPD separate Notice of Intents for a number of municipal facilities. Stormwater Pollution Prevention Plans are being implemented at all affected facilities.

Failure to provide effective maintenance can reduce the hydraulic capacity and pollutant removal efficiency of stormwater controls and conveyance systems. The City has an ongoing inspections, operations and maintenance program of the stormwater drainage, control, and conveyance systems.

City inspectors, maintenance personnel, and/or public works staff receive training on the need for and effective implementation of the best management practices at least once each year. Training topics include: pollution prevention; erosion and sediment control; storm sewer system inspections and maintenance activities; finding and eliminating illicit discharges; among others.

The success of the City of Rome's Watershed Protection Plan is highly dependent upon the support of City Officials, City staff, as well as the general public. Therefore, responsible City officials will also receive regular program updates so they understand the requirements of this Plan and provide the necessary budget to ensure that these commitments can be met.

IV. IMPROVING IMPACTED AREAS OF CONCERN

New stormwater regulations and requirements set forth by EPD required the City of Rome to design and implement a host of best management practices (BMPs) to reduce identified impacts to local water resources. Several of recommendations for improving impacted areas of concern are designed to reduce input of problem contaminants (e.g., fecal coliform, sediment and phosphorus) to impacted streams and lakes. Some BMPs, such as the continued implementation of a preventive maintenance program for the collection system, will help prevent sewer spills that can cause significant impact to impacted stream segments. Other BMPs included in the City's Stormwater Management Program will reduce polluted stormwater runoff on a City-wide and site-specific basis. An important component of the City of Rome's Watershed Protection Plan will be an increased focus on identifying and eliminating sources of problem pollutants to local streams – both those already identified on the current 303(d) list, as well as other streams identified as impacted through more recent monitoring efforts. Long-term monitoring will enable the City to gauge whether or not the Watershed Protection Plan is effective and what additional measures, if any, must be implemented to ensure required goals are met.

A. Identification and Elimination Sources of Problem Pollutants

Seventeen stream segments included in the Rome WCA are currently listed as impaired due to elevated fecal coliform, PCBs, mercury and/or sediment. Many of these streams were assessed in the 2008-09 watershed assessment. The results indicated that nine of fifteen streams studied exhibited diminished water quality and/or poor biological health. Documented impacts in the recent study included high fecal levels in Horseleg and Dozier Creeks, low dissolved oxygen levels in Little Dry Creek, Big Dry Creek and Beech Creek, and pH problems in the Coosa River, the Etowah River and Beech Creek. Also observed in the watershed assessment were impacted benthic macroinvertebrate and fish communities in the majority of streams studied, especially Horseleg Creek, Big Dry Creek, Woodward Creek and Beech Creek. Of note is that the issues identified in the watershed assessment were somewhat inconsistent with the current 303d listing of local streams – some impacted streams were not identified as 303d streams whereas others identified as such did not exhibit problems in the watershed assessment.

Based on the TMDL implementation plans, the likely sources of fecal coliform are a combination of agricultural, wildlife, animal access to the stream, livestock management, urban development, leaking septic facilities, and land application systems and landfills. The fish consumption bans were based on PCBs and mercury in the listed streams. The likely sources listed in the TMDL implementation plans were poorly maintained hazardous waste sites, illegal/improper dumping of electrical transformer fluids and PCB-containing fluids, and other mercury- and PCB-containing products. Agricultural practices, a power plant, commercial industries, and trash and other debris were observed within the City of Rome WCA and near the sampled reaches. The locations of federally permitted industries were discussed as potential sources of pollutants in the watershed assessment.

Although useful as background to identify general sources of current watershed health concerns, specific sources of problem pollutants need to be identified and controlled to the greatest extent possible. For example, the watershed assessment reported that samples collected on the Coosa River upstream from City limits (Rome 1) exhibited good water quality however samples collected downstream at Rome 4 and 5 measured pH levels lower than acceptable levels. Thus it is reasonable to assume that discharges from unknown sources within the City are contributing significant amounts of pollution to the Coosa River.

In addition to water quality and biological monitoring, the City will conduct a targeted watershed assessment (TWA) of each stream segment in which a monitoring site is located, to identify sources of problem pollutants observed as a result of the water quality and biological studies. The comprehensive stream assessments shall include, but not limited to: land use characterizations, stream walks, dry weather outfall screening activities and in-situ water quality monitoring. These assessments will be completed by a trained professional (with possible assistance from the general public) using EPD recommended Adopt-a-Stream Forms, in-situ monitoring equipment, etc. Educational activities and enforcement will be used, as appropriate, to reduce/eliminate all pollutant point and non-point sources identified during the TWAs. TWAs will be performed along each stream at least once every five years. Technical results will be used along with other data to identify site-specific follow-up actions such as education of local farmers on the importance of stream buffer protection, inspections of selected industries and/or enforcement, where needed to reduce/eliminate inputs of problem pollutants to impaired stream segments. In some cases, additional regulation such as increased stream buffers may be needed to facilitate implementation of recommended solutions to improve watershed health.

B. Continued Implementation of the CMOM Program

A CMOM Program is a program to assure that a sewage system is properly managed, operated and maintained at all times; has adequate capacity to convey peak flows; and all feasible steps are taken to eliminate excessive infiltration and inflow from the system. A CMOM Program must mitigate the impact of overflows on waters of the state, the environment and public health. The City of Rome implements a comprehensive CMOM Program for approximately 400 miles of sewer mains and 45 sewer lift stations. The CMOM program emphasizes proper operation and maintenance of the collection system, focusing on safety, manhole maintenance, inspection, the SCADA system, root control, hydraulic cleaning, etc. Capital improvement projects over the past decade have resulted in major upgrades to the Rome and Coosa Water Reclamation Facilities, sewer pipelines and lift stations. These improvements have been made at a cost exceeding $60,000,000. The City will continue to implement this program as an important component of this Watershed Protection Plan.

C. Continued Implementation of the NPDES MS4 Phase II Program

In order to meet current regional and state regulatory mandates as well as to improve water quality and restore habitat in the Rome watershed, the City of Rome will continue to plan and implement an effective stormwater management program. Urbanization of undeveloped land accelerates stormwater runoff rates and peak discharges that increase velocities above natural levels. The increased discharge peaks and velocities accelerate erosion and generate increased

sediment loads that contribute to the degradation of aquatic habitat and low oxygen levels in the receiving streams as evidenced in the habitat and biological data presented previously. This problem common to all developing communities will be addressed through careful plan reviews, regular inspections, and enforcement, as needed to ensure compliance with recently adopted stormwater management ordinances. If variances are allowed by the ordinances, complete applications and decision-making by the City of Rome will adhere to all requirements. Exposed soils from construction sites also contribute to the high-suspended solids loads that can be generated during heavy rainfall events. Often fecal coliform is carried into the stream along with sediment.

Public education and outreach to local farmers can help reduce pollutant inputs to local streams. Dry weather outfall screenings, business inspections and stream walks will help identify potential sources of fecal coliform to local streams and the storm sewer system. Continued coordination with Floyd County Environmental Health is resulting in more rapid response to leaking septic systems and mandatory connection to the City's sanitary sewer system of located within 200 feet of an existing sewer line. The Illicit Discharge Detection and Elimination Ordinance enables the City to enforce fines up to $1,000 per day for any discharge that poses a risk to human health and the environment. Continued training of City staff and regular self-inspections of municipal facilities and operations will ensure that the City is not contributing to polluted stormwater runoff.

D. Special Projects

1. WaterFirst Community

The Department of Community Affairs' community water initiative, WaterFirst is a voluntary partnership between local governments, state agencies and other organizations working together to increase the quality of life in communities through the wise management and protection of water resources. It is a proactive approach to water resources that makes the connection between land use and water quality and quantity. It involves pursuing and rewarding environmental excellence beyond what is required by law in the management and protection of water resources. The components are:

- Watershed Assessment;
- Stormwater Master Planning;
- Water Supply Planning;
- Water Supply Protection;
- Water Conservation;
- Wastewater Treatment Systems and Management;
- Residual Biosolids; and
- Water Reclamation and Reuse.

2. Silver Creek Implementation Project

This project is intended to implement portions of the Silver Creek Watershed Management Plan, completed in 2011 by the Northwest Georgia Regional Commission. Silver Creek violated the Fecal Coliform and Biota Impacted – Fish Community criteria, and is listed as non-supportive for fishing. Specific elements of the project include: (a) Water quality monitoring (fecal, fluoride and turbidity) before, during, and after project activities; (b) Implementation of

agricultural best management practices to address fecal Coliform and sediment; and (c) Development of a failing septic system remediation grant program. The grant totaled $508,978 (federal amount $305,387 and local match $203,591).

The City is hopeful that continued implementation of effective wastewater, water supply and stormwater management programs along with special projects will provide long-term protection to local streams and lakes for many years to come. The long-term monitoring program discussed in the next section will provide information on the effectiveness of the proposed approach. Should BMPs need to be revised and/or additional measures implemented (e.g., stormwater management pond retrofits and/or stream restoration activities), these activities will be designed and implemented in a large part based on future monitoring data.

V. LONG-TERM MONITORING PROGRAM

The City of Rome Watershed Protection Plan includes a comprehensive long-term monitoring program to document trends in the health of watersheds located within the City of Rome and that portion of Floyd County located within the City's sewer service area. The information will be used to evaluate the effectiveness of the City's comprehensive Watershed Protection Plan. If watershed health does not improve over time, the results will be used to identify additional BMPs that may be used to improve in-stream conditions.

A. Purpose and Objectives

The purpose of the Long-term Monitoring Program is to assess the effectiveness of the City of Rome Watershed Protection Plan and provide information for use in adjusting the plan, as needed, to ensure sustainable protection and preservation of local water resources. The specific objectives are as follows:

1. To detect long-term trends in the health of the Rome WCA streams and watersheds;
2. To identify potential water quality problems in a proactive manner;
3. To identify stream segments requiring further action to reduce pollutant inputs;
4. To provide the basis for improvements in the Watershed Protection Plan;
5. To obtain long-term monitoring data for submittal to EPD as required per the NPDES Discharge Permits for the City of Rome's WWTPs.

Monitoring is a critical component of any overall strategy for watershed management. It is also expensive and resource intensive. The monitoring strategy must meet the City's objectives, State regulatory requirements, and provide a picture of whether streams are improving or degrading over time. The City of Rome is responsible for successful implementation of the Watershed Protection Plan, including the long-term monitoring program. The proposed plan is designed to meet the Georgia EPD's requirements for watershed monitoring and is condition of Rome's WWTPs.

B. Sampling Locations

The sites selected for long-term monitoring were chosen based on a number of factors, including: historical data; water quality and biological integrity results from the watershed assessment; current and future land use; size of the drainage areas; and 303(d) listed stream segments. The proposed monitoring sites in this study are a subset of the fifteen sites utilized in the 2011 watershed assessment. The reduction of number is because the City wished to focus its resources in locations within the City's sanitary sewer service area, and also gain an improved understanding of watershed health immediately before and after streams flowed to and from of the sewer service area. Water quality assessment will be conducted at a total of ten monitoring sites with biological assessment also proposed to take place at six of the ten locations. These proposed long-term monitoring locations are depicted in Figure 9. Rationale for selection of each station is presented in Tables 9A-9C.

C. Water Quality Assessment

The proposed long-term monitoring plan is designed to meet all requirements of EPD's Watershed Protection Branch for Long-term Monitoring as required per the City's two WWTP NPDES Discharge Permits. City representatives hope to develop a monitoring data sharing agreement with the County to resulting in increased understanding of the nature and extent of impacts to local streams, identification and elimination of pollutant sources, and implementation of more cost-effective approaches for regulatory compliance.

As previously discussed, water quality assessment will be conducted on an annual basis at ten locations in accordance with the most current EPD protocols and approved test procedures set forth in 40 CFR Part 136. Recommended methods and detection limits are presented in Table 9. Proposed sampling locations are presented in Figure 9 and Tables 10A-C. The assessments will include collection of all listed water quality parameters at each location during three dry weather events and one wet weather event each year. The dry samples will be collected via the grab technique. The wet weather event will be collected using a grab/composite approach that covers the complete hydrograph. Dry weather criterion is a period of at least 72 hours since the last rainfall. The wet weather criterion is at least 0.2 inches of rainfall and at least 72 hours since the last storm event. Rainfall will be tracked using real-time data from the USGS 02388525 monitoring location at Oostanaula River at US 27 in the City of Rome (http://waterdata.usgs.gov/ga/nwis/rt). Stream flow will be measured at each sampling event. If the stream is dry or there is no flow at the monitoring site, water quality measurements and samples will not be collected, and this will be noted in the field notes and Annual Report.

As required per EPD, key parameters will include:

- Temperature (water and air)
- Field pH
- Dissolved oxygen
- Conductivity
- Turbidity
- Biological oxygen demand (BOD5) (to a detection limit of 2.0 mg/L; laboratory bench sheets may need to be requested for laboratories who do not report below 5.0 mg/L)
- Chemical oxygen demand (COD)
- Total suspended solids (TSS)
- Phosphorus (total and ortho)
- Nitrogen (Total Kjeldahl Nitrogen, Ammonia, NO2, NO3)
- Metals (Cd, Cu, Pb, Zn) (wet weather only)
- Hardness
- Alkalinity (fish sampling only)
- Fecal coliform
- E. coli
- Any criteria violated on a 303(d) listed stream segment, if applicable

In order to determine if water quality standards are truly being met, both *Fecal Coliform* and *E. Coli* sampling will be measured at all sampling locations. A minimum of two fecal coliform geometric means must be calculated for the period from May to October. The fecal coliform standard is a geometric mean based on at least four samples collected within a 30-day period at intervals not less than 24 hours. The samples will be collected on a regular schedule, regardless of the weather. No sample will be collected within 24 hours of another sample.

Water quality samples will generally be collected from mid-stream and in the middle of the water column in visibly flowing water. Water samples will be placed on ice immediately upon collection and transported in a cooler to an EPD-approved laboratory. Average stream flow, air temperature, and in-situ water quality (i.e., *pH, dissolved oxygen, water temperature, conductivity*, and *turbidity*) will be measured at each sampling location. Significant activities observed in the watershed during the sampling event will also be noted, such as: the presence of animals; dry weather runoff from parking lots; odors; foam; discoloration; leaking pipes; etc.

If metals are detected at levels above federally defined acute and chronic water-quality standards, all subsequent water quality sampling will be performed using "clean" techniques (*Office of Water Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria*, USEPA, October 1, 1993).

Constituent	Analytical Method	Detection Limits
Biochemical Oxygen Demand (CBOD5)	EPA 405.1	2.0 mg/L
Chemical Oxygen Demand (COD)	EPA 410.2	5 mg/L
Total Suspended Solids (TSS)	EPA 160.2	4.0 mg/L
Total Phosphorus/Orthophosphate	EPA 365.2 or EPA 365.3	0.01 mg/L
Nitrate + Nitrite Nitrogen	EPA 353.1 or EPA 353.2 or EPA 353.3	0.10 mg/L or 0.05 mg/L or 0.01 mg/L
Total Kjeldahl Nitrogen (TKN)	EPA 351.1 or EPA 351.2 or EPA 351.3 or EPA 351.4	0.05 mg/L or 0.1 mg/L or 0.05 mg/L or 0.03 mg/L
Ammonia (NH3)	EPA 350.1 or 350.3	0.01 mg/L or 0.1 mg/L
Total Hardness	EPA 130.2	10 mg/L
Total Recoverable Zinc	EPA 200.7 or 200.8 or 200.9	0.002 mg/L
Total Recoverable Cadmium	EPA 200.7 or 200.8 or 200.9	0.001 mg/L
Total Recoverable Lead	EPA 200.7 or 200.8 or 200.9	0.005 mg/L
Total Recoverable Copper	EPA 200.7 or 200.8 or 200.9	0.002 mg/L
Fecal Coliform	SM 9221 E or 9222D	2 MPN/100 ml or 1 cfu/100 ml
E. coli	SM 9221 E or 9222D	2 MPN/100 ml

Table 9. Recommended Analysis Methods & Detection Limits

D. Habitat and Biological Assessment

Biological communities integrate the cumulative effects of changes in not only water quality but also all other activities in the watershed. Under the proposed long-term monitoring plan, biological monitoring for habitat and benthic macroinvertebrate communities will take place at six designated sampling sites located within and near Rome's sanitary sewer service area (Tables 9A-9C). The frequency of the habitat and benthic macroinvertebrate studies will be a minimum of once every four years beginning with the approval of the long-term monitoring program by EPD. Fish surveys are not currently required as a component of long-term monitoring but may be done at the option of the City. All available information will be used to detect trends in biotic integrity and assess the streams' status relative to the "fishing" use designation. The biological studies will include:

- Field Reconnaissance;
- Water quality sampling including: total suspended solids, TKN; total phosphorus; ortho-phosphorus; ammonia; nitrite-nitrate; hardness; metals (cadmium, copper, lead, zinc); alkalinity; and salinity.
- In-situ measurements including: air and water temperature, dissolved oxygen (DO), pH, turbidity, and conductivity;
- Discharge/cross section measurements;
- Physical habitat assessment (including pebble count); and,
- Aquatic macroinvertebrate community assessment;

Biological monitoring of study sites will be conducted under methods outlined in the *Georgia Standard Operating Procedures: Freshwater Macroinvertebrate Biological Assessment* (latest edition). The latest edition of this document may be found on the GA EPD's web site.

During the macroinvertebrate sampling events, chemical parameters will be collected immediately before the biological sampling occurs. At a minimum, these parameters will include: ortho and total phosphorus; TKN; ammonia; nitrate-nitrite nitrogen; alkalinity; as well as in-situ parameters of pH; dissolved oxygen; specific conductance; temperature; turbidity and stream flow. This sampling event may be used for one of the dry weather water quality monitoring events previously described in Section C. Alkalinity sampling will also occur during fish collection per the WRD fish standard operation procedures. Fish assessments are not currently required by EPD.

It is important to note that the fish and macroinvertebrate assessments should be conducted at least two weeks apart. Reconnaissance for fish must be conducted at least 1 day prior to conducting the fish assessment and no more than two weeks in advance. The fish assessment should not be performed until turbidity has returned to pre-reconnaissance conditions. Stream should not be sampled where active beaver dams are present. If the beaver dam is at least 100 meters downstream of the reach and it can be demonstrated the reach is not being affected by the beaver dam, then the location may be okay for sampling. This should be discussed with GAEDP prior to initiation of sampling. For macroinvertebrates a minimum of 2 people and for fish a minimum of 3 people are to conduct habitat assessments, but all individuals conducting the assessments should conduct the habitat assessment as well. Each person should complete a

habitat assessment form for both macroinvertebrates and fish assessments. Sampling for macroinvertebrate assessments should be performed from October through the end of February. Sampling for fish assessments should be performed from April through the end of September.

E. Targeted Watershed Assessments

In addition to water quality and biological monitoring, the City will conduct a targeted watershed assessment (TWA) of each stream segment in which a monitoring site is located to identify specific problem areas and sources of problem pollutants to local streams. TWAs will be performed along each stream at least once every five years. The comprehensive stream assessments shall include, but not limited to: land use characterizations, stream walks, dry weather outfall screening activities and in-situ water quality monitoring. These assessments will be completed by a trained professional (with possible assistance from the general public) using EPD recommended Adopt-a-Stream Forms, in-situ monitoring equipment, etc. Educational activities and enforcement will be used, as appropriate, to reduce/eliminate all pollutant point and non-point sources identified during the TWAs.

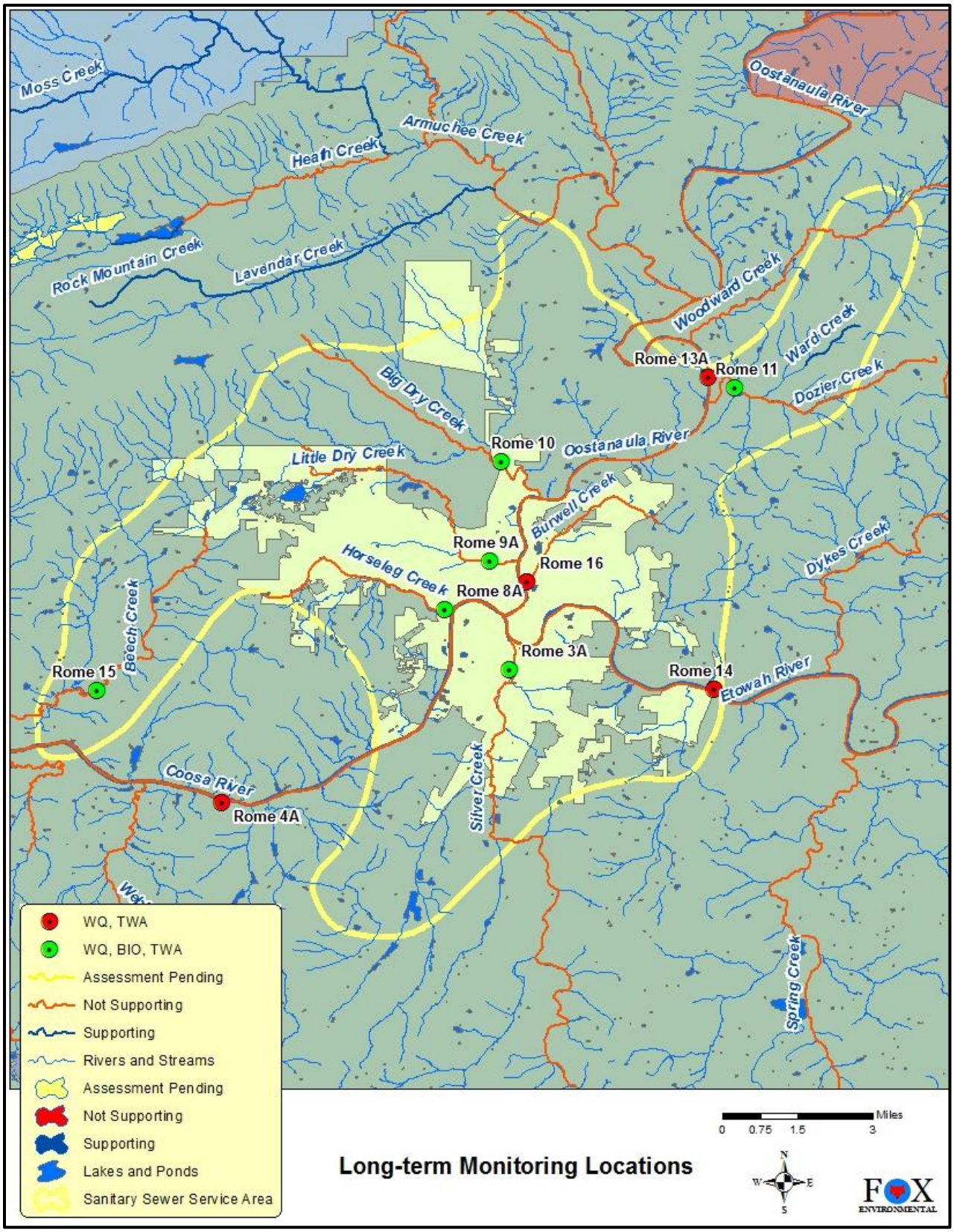

Figure 9. Long-term Monitoring Locations

SITE	LOCATION	RATIONALE FOR SELECTION
Rome 3A *WQ, BIO, TWA*	***Silver Creek*** *(-85.175933 34.235769 DD)*	Indicator of the water quality of Silver Creek before it enters the Etowah River inside the current/future sewer service area. This site is slightly downstream from Site Rome 3 that was assessed in the Watershed Assessment. Lies downstream of 2 HSI sites, 5 industrial facilities discharge sites, 1 landfill, 1 NPDES permit facility, 10 sites on the Resource Conservation and Recovery Information System (RCRIS) and 1 site on the Toxics Release Inventory System (TRIS). Not supporting for fecal coliform and PCB-related impairments. Elevated fecal coliform levels measured in 2008-09. Water quality will be conducted at this site every year, habitat and benthic macroinvertebrate assessment conducted every four years (Ecoregion 67g), and a Targeted Watershed Assessment once every five years.
Rome 4A *WQ, TWA*	***Coosa River*** *(-85.258820 34.199849 DD)*	Indicator of the water quality of the Coosa River as it leaves the City of Rome and after it confluences with the Oostanaula River and the Etowah River downstream from most of the current/future sewer service area. This site is slightly downstream from Site Rome 4 that was assessed in the Watershed Assessment. Lies downstream of 6 TRIS sites, 29 RCRIS sites, 5 industrial facilities discharge sites, 2 wastewater treatment plants (WWTPs), 3 water systems, 5 sites on the GA HSI, one site on the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS), 1 industrial bulk facility, 5 landfills, one land application site, 1 lift station, 1 mine, 3 NPDES permitted facilities, and 1 poultry farm. Older sanitary sewer lines are located nearby. Not supporting for fecal coliform and PCB-related impairments. This site is slightly downstream of the previous site in the 2008-09 study in which low pH levels were reported. Water quality monitoring will be conducted at this site every year and a Targeted Watershed Assessment once every five years.
Rome 8A *WQ, BIO, TWA*	***Horseleg Creek*** *(-85.193528 34.256181 DD)*	Indicator of the water quality of Horseleg Creek before it enters the Coosa River within the current/future sewer service area. This site is slightly downstream from Site Rome 8 that was assessed in the Watershed Assessment. Lies downstream of four RCRIS sites and one site on the GA HIS. Not supporting for fecal coliform and PCB-related impairments. High fecal coliform levels and suboptimal habitat, very poor macroinvertebrate and very poor (IBI)/poor (Iwb) fish communities were reported at a site just upstream from this site in 2008-09. Water quality will be conducted at this site every year, habitat and benthic macroinvertebrate assessment conducted every four years (Ecoregion 67g), and a Targeted Watershed Assessment once every five years.

Table 10A Cont'd**. Long-term Monitoring Sites (1 of 3)**

SITE	LOCATION	RATIONALE FOR SELECTION
Rome 9A *WQ, BIO, TWA*	***Little Dry Creek*** *(-85.181353 34.269805 DD)*	Indicator of the water quality of Little Dry Creek before it enters the Oostanaula River within the current/future sewer service area. This site is slightly downstream from Site Rome 9 that was assessed in the Watershed Assessment. Lies downstream of one site on the CERCLIS, one site on the GA HSI, one NPDES permitted facility, one industrial facilities discharge, one site on the RCRIS, and a mine. Not supporting for PCB-related impairments. Lower dissolved oxygen and slightly elevated fecal coliform levels, suboptimal/marginal habitat, fair macroinvertebrate and very poor (IBI)/(Iwb) fish communities were identified at a site approximately one block upstream in 2008-09. Water quality assessment will be conducted at this site every year, habitat and benthic macroinvertebrate assessment conducted every four years (Ecoregion 67g), and a Targeted Watershed Assessment once every five years.
Rome 10 *WQ, BIO, TWA*	***Big Dry Creek*** *(-85.177273 34.298317 DD)*	Indicator of the water quality of Big Dry Creek before it enters the Oostanaula River within the current/future sewer service area. No pollutant sources were identified upstream of this site in 2008-09. Not supporting for PCB-related impairments. This location is further downstream of the site monitored in the 2008-09 study. The previous site demonstrated lower dissolved oxygen and slightly elevated fecal coliform levels and suboptimal habitat, very poor macroinvertebrate and very poor (IBI)/(Iwb) fish communities were documented in 2008-09. Water quality assessment will be conducted at this site every year, habitat and benthic macroinvertebrate assessment conducted every four years (Ecoregion 67g), and a Targeted Watershed Assessment once every five years.
Rome 11 *WQ, BIO, TWA*	***Dozier Creek*** *(-85.109546 34.320030 DD)*	Indicator of the water quality of Dozier Creek before it enters the Oostanaula River within the current/future sewer service area. Lies downstream of two NPDES permitted facilities, four sites on the RCRIS, three TRIS facilities; Not supporting for PCB-related impairments. High fecal coliform levels in watershed assessment. Water quality assessment will be conducted at this site every year, habitat and benthic macroinvertebrate assessment conducted every four years (Ecoregion 67g), and a Targeted Watershed Assessment once every five years.

Table 10B Cont'd**. Long-term Monitoring Sites (2 of 3)**

SITE	LOCATION	RATIONALE FOR SELECTION
Rome 13A *WQ, TWA*	***Oostanaula River*** *(-85.117579 34.322273 DD)*	Indicator of the water quality of the Oostanaula River before it enters the city limits at the edge of the current/future sewer service area. This site is slightly downstream from Site Rome 13 that was assessed in the Watershed Assessment. Not supporting for PCB-related impairments. Good water quality measured at a site upstream of this site in 2008-09. Water quality assessment will be conducted at this site every year and a Targeted Watershed Assessment every five years.
Rome 14 *WQ, TWA*	***Etowah River*** *(-85.115286 34.233235 DD)*	Indicator of the water quality of the Etowah River before it enters the city limits just inside the current/future sewer service area. No potential pollutant sources were identified upstream of this site in 2008-09. Not-supporting for fecal coliform and PCB-related impairments. Elevated pH levels measured in 2008-09. Water quality assessment will be conducted at this site every year and a Targeted Watershed Assessment once every five years.
Rome 15 *WQ, BIO, TWA*	***Beech Creek*** *(-85.294345 34.232896 DD)*	Indicator of the water quality of Beech Creek before it enters the Coosa River within the current/future sewer service area. Lies downstream of two RCRIS sites, two mines, one landfill, one TRIS site, and one site on the GA HIS. Not-supporting for dissolved oxygen and PCB-related impairments. Low dissolved oxygen, lower pH and slightly elevated levels fecal coliform levels and suboptimal habitat, very poor macroinvertebrate and very poor (IBI)/(Iwb) fish communities in 2008-09. Water quality assessment will be conducted at this site every year, habitat and benthic macroinvertebrate assessment conducted every four years (Ecoregion 67g), and a Targeted Watershed Assessment once every five years.
Rome 16 *WQ, TWA*	***Burwell Creek*** *(-85.169818 34.263777 DD)*	Indicator of the water quality of Burwell Creek before it enters the Oostanaula River within the current/future sewer service area. Lies downstream of five RCRIS sites, one landfill and the Rome Public Works facility. Not-supporting PCB-related impairments to fish. This is a new site. Water quality assessment will be conducted at this site every year and a Targeted Watershed Assessment once every five years.

Table 10C Cont'd**. Long-term Monitoring Sites (3 of 3)**

VI. ANNUAL REPORTING REQUIREMENTS

Once the Watershed Protection Plan is approved by EPD, the City of Rome will submit to the State the following information by June 30th of each year:

1. Annual certification of WPP implementation

2. Electronic submittal that includes:

    a. Long-term trend water quality monitoring data using EPD's Excel template, available at: *http://epd.georgia.gov/watershed-assessment-and-protection plan-guidance-documents*;

    b. Stream walk documentation (when performed), including photos and field notes

    c. Macroinvertebrate Assessments
        1) Macroinvertebrate Field and Laboratory sheets, photos, including:
            - Water Body Reconnaissance Form
            - Habitat Assessment Forms (for each investigator)
            - Habitat Assessment Average Form
            - Physical Characterization and WQ Data Sheet
            - *In-Situ* and Grab Sample Water Chemistry Field Sheet
            - Benthic Macroinvertebrate Field Data Sheet
            - Channel Cross-Section Field Sheet and/or Velocity/Discharge Field Sheet
            - Pebble Count Field Sheet
            - Macroinvertebrate Level of Effort Subsampling Sheet
            - Sample site photos
        2) Macroinvertebrate Taxa list, which includes: site name, date of collection, lowest possible/practicable identification, latitude and longitude, number of specimens, habit, functional feeding group, tolerance values, and North Carolina Tolerance Values (NCTV, when applicable). Use the Habit and FFG abbreviations found in the EPD taxa list.
        3) Excel table for the macroinvertebrate assessment water quality data results
        4). Excel Macroinvertebrate Multimetric Index spreadsheets with calculated MMI scores for the appropriate subecoregions

3. Progress Report that includes:
    a. Discussion of the monitoring data and results;
    b. An evaluation of what the data shows in terms of water quality, the health of the biological communities, and any trends that are being shown by the data;
    c. Specific actions or BMPs that have been implemented; and,
    d. Summary of any changes and/or revisions to the Watershed Protection Plan, if necessary.

VII. COST ESTIMATES AND FUNDING SOURCES

The Watershed Protection Plan must have adequate financial and political support to successfully protect watersheds within and surrounding the City of Rome. This section of the report provides cost estimates for many of the recommended best management practices as well as a description of various sources of funding that may be used to implement the City of Rome Watershed Protection Plan.

A. Program Cost Estimates

Table 11 provides a listing and preliminary budget estimate for recommended Watershed Protection Plan BMPs over the next five years. The success of the Plan will depend on securing funding to support various best management practices such as:

- Coordination with the State to obtain regulatory approvals for program elements;
- Hiring of additional staff to oversee and implement the various BMPs;
- Continued technical support to assist in Program Planning and Implementation;
- Implementation of a Business Education and Inspection Program;
- Inspection and maintenance of the City's storm sewer system;
- Litter Removal Program;
- Stormwater Management Facility (e.g., ponds) Inspection and Maintenance Program
- Right-of-way acquisitions;
- Construction of new publicly-owned stormwater management facilities and infrastructure;
- Retrofit of existing publicly-owned stormwater management facilities and infrastructure structures;
- Stream restoration of impacted stream segments; and/or,
- Other programs and associated costs to be determined.

ELEMENT	DESCRIPTION	COST BASIS	COST ESTIMATE
Public Education and Outreach	Brochures, web site, workshops, etc.	Staff and Contract Support	$2,500
Sanitary Sewer System Inspections, Operations and Maintenance Program	Continue inspections and maintenance of sanitary sewer collections system	Staff and Contract Support	Minimum $25,000 (annual)
Development Review Program	Increase site plan reviews and field inspections of stormwater BMPs (during and after construction)	Staff	$20,000 (annual)
Training Program	Attend annual training sessions for City Officials and Staff	Staff and Contract Support	$3,000 (annual)
Storm Sewer System Inspections, Operations and Maintenance Program	Continue inspections, operations and maintenance of the City's storm sewer system.	Staff and Contract Support	Minimum $20,000 (annual)
Illicit Discharge Detection and Elimination Program	Conduct dry weather outfall screening, illegal dumping and business education and inspection program, also coordination with Floyd County Environmental Health Program	Staff and Contract Support	$6,000 (annual)
Long-Term Monitoring	Conduct annual water quality monitoring and bi-annual biological monitoring studies	$2,500 to $4,000 per Site	$25,000 to $40,000 (annual)
Storm Sewer System Capital Improvement Projects	Retrofit public ponds; repair and/or replace storm sewer pipes, outfalls, etc. as needed	Varies	As needed
Compliance Reporting	Annual Reports to GA EPD	Staff and Contract Technical Support	$5,000 (annual)

Table 11. Preliminary Program Implementation Budget

B. Funding Options

This Watershed Protection Plan was developed with efficient yet effective BMP implementation in mind. However, the efficient tools and integrated approaches proposed can reduce, but not eliminate, the need for additional funding. In particular, funding will be needed for developing new ordinances, ensuring proper implementation of the requirements for new development, improving affected areas, and long-term monitoring. It is important to also consider and quantify the ongoing operation, maintenance, inspection, staffing, and replacement costs associated with stormwater management in general and watershed protection specifically. These costs should be considered in developing the long-term funding needs of an effective watershed management program.

There is no single source of funding for this program that can be relied on, and financing will necessitate funding from several different sources. Below is a brief summary of internal and external funding sources that have been used in the past for improved management of stormwater runoff.

- *Revenue Bonds* - Revenue bonding is the most common form of financing significant capital improvements for water and wastewater utilities in Georgia. Revenue bonds for water and wastewater system projects rely on the revenues from water sales and wastewater services to repay the bondholders. Municipal governments are able to raise funds at advantageous rates due to tax-exempt status of interest earnings from municipal bonds.

- *General Obligation Bonds* - General obligation bonds would have applicability to capital improvements projects in the watershed protection plan. The general resources of the community, including revenues from taxes, fines, fees, back general obligation bonds and other sources not previously obligated. General obligation bonds normally receive a better credit rating than revenue bonds, resulting in even lower interest costs to the community.

- *Sales Tax Revenues* - Georgia law permits a special sales tax to be imposed by local referendum and to be collected in a defined area for defined uses. Some of this revenue may be available for infrastructure improvements as part of a Watershed Protection Plan if it is specified in the enabling referendum. However, the legal requirements for using sales tax revenues include approval by voters through a referendum.

- *Cost Sharing* - A government's cost of capital improvements may be shared with businesses or other governmental entities that stand to gain substantial benefits from the improvement. It is not uncommon for manufacturing enterprises to provide partial capital funding for improvements designed to provide services to their facilities. The City should be alert to the potential for opportunities to share costs with local governments (e.g., county), manufacturing facilities, and developments.

- *Direct Loans* - Low-interest loans are available through the Georgia Environmental Facilities Authority (GEFA) and Georgia's State Revolving Fund (SRF). Low-interest loans could reduce the overall cost of utility projects and also make funding capacity available for other projects. In addition, banks sometimes lend money at favorable rates to local governments for projects that will improve the community and its economy. In many cases, such loans are secured by pledges of revenues—the same method used for revenue bonds.

- *Grants* - Grant programs can provide funding for small projects, often as demonstration projects, economic development projects, or projects that benefit disadvantaged neighborhoods. Various federal agencies have grants for monitoring environmental conditions, enhancing habitat, encouraging community programs, and other specific programs. The State of Georgia has special grants, such as the Governor's Emergency Grant Program and small grants from Keep Georgia Beautiful. Eligible programs and projects include: KAB program certification; litter prevention; waste recycling; school programs; special events; waste reduction; and water quality.

- *Ad Valorem Taxes* - Ad valorem taxes have provided funding for public works projects in the past. One advantage of ad valorem taxes for citizens is that such taxes are deductible on federal and state income taxes, whereas utility services charges are not, and so result in lower total expenditures for property owners.

- *Assessments* - Georgia law permits governments to place assessments on selected parcels of property to collect funds for a particular capital project that will benefit the identified parcels. Georgia law specifies the procedures for instituting assessments on properties for public works projects, which requires that the benefit of the capital improvement must be linked to those who will pay the assessment.

- *Stormwater Management (User Fee) Enterprise Fund (Stormwater Utility)* - A stormwater management enterprise fund is frequently considered an equitable source of funding. Activities that could be funded by the enterprise fund include the control of stormwater runoff, restoration of streams, water quality monitoring, etc. Property owners would pay a fee based on the stormwater services required of the City due to runoff from their properties as measured by the amount of impervious area they own. Billing is typically divided into two categories: residential properties and nonresidential properties with credits offered under certain conditions.

- *Enterprise Fund User Fees*—A portion of the user fees collected from an established enterprise fund, such as water and sewer fees, can be allocated to meet needs within the Watershed Protection Plan. The interdependence of NPDES permitting for enterprise fund facilities and the implementation of a WPP justifies such allocation. Activities suitable for funding include inspections, O&M programs, training, long-term monitoring, and compliance reporting.

VIII. BMP IMPLEMENTATION SCHEDULE

The City of Rome is committed to developing an effective watershed management program that meets all federal and state requirements, and preserves the city's vital water resources to meet current and future uses. This study has indicated that the City is engaged in many activities that will result in improved watershed health over time. Additional emphasis should also be taken to identify and eliminate sources of problem contaminants to local streams, particularly those identified as impaired on the State's 303(d) list and in the 2008-09 watershed study.

Major categories of watershed protection activities include:

- *Identification and elimination of sources of fecal coliform bacteria, pH, low dissolved oxygen and sediment (on-going with additional activities planned for the future)*
- *Continued implementation of a comprehensive inspections, operations, and maintenance program for the City's sanitary sewer collections system (on-going).*
- *Promoting more public and business education and outreach opportunities (on-going).*
- *Enforcing recently adopted ordinances to detect and reduce polluted stormwater runoff (on-going).*
- *Conducting comprehensive stormwater plan review and site inspection procedures to ensure effective erosion and sediment control, and proper construction of stormwater management facilities and infrastructure (on-going).*
- *Inspection and maintenance of private and public stormwater management facilities and infrastructure (on-going).*
- *Training staff and responsible officials about the importance of ensuring all municipal facilities and operations incorporate pollution prevention best management practices (on-going).*
- *Design and implementation of an effective industrial facilities education and inspection program (initiate activities within one year of WPP approval by EPD).*
- *Long-term monitoring to monitor effectiveness and adjust BMPs, as needed (initiate activities within 3 months of WPP approval by EPD).*
- *Design and construction of structural storm sewer system improvements, as needed (on-going).*
- *Establishment of a stream restoration and pond retrofit program, as needed (initiate activities within three years of WPP approval by EPD).*

The majority of the activities listed above are currently being implemented to varying degrees by City staff and representatives. Additional efforts will be made in the next year and beyond to focus on identifying and eliminating problem pollutants (e.g. fecal coliform) to local streams and obtaining additional information on the health of the biological communities, as well as continuation of the City's collection system management, operations and maintenance (CMOM) and stormwater management programs. A dedicated funding source(s) will also need to be identified to ensure long-term implementation of the City of Rome Watershed Protection Plan and annual reporting to EPD.