

City of Chattanooga
Department of Public Works
Water Quality Program Rate Study
Contract S-16-010



DRAFT Executive Summary Final Report

Prepared by:



April 26, 2018

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I. INTRODUCTION

The City of Chattanooga hired the team of HDR, Environmental Rate Consultants, Inc. (ERC), and SCM Engineering (consultant team) to successfully perform a legally defensible business plan and cost of service based financial analysis and rate study for the Water Quality (WQ) program. This analysis is based on the City of Chattanooga WQ program historical data including Fund 6030 actual financial reports, City Council approved budget information, and existing WQ rate schedules for fiscal years 2013 (FY – 13) through FY – 17. This rate study was performed utilizing a similar process and approach used with the previous rate study performed by members of this consultant team in 2007 through 2009.

The current WQ fee was set in 2009 at \$9.60 per month per Equivalent Residential Unit or ERU. An ERU is a standard measure of impervious area set by each utility. Each residential customer is billed one ERU and other customers (commercial, industrial, etc.) are billed based on the calculated number of ERU's for each property. Fees are assessed on annual property tax bills.

This Executive Summary Final Report provides a full overview of the financial analysis and rate study, and a summary of the results. The body of the report provides a summary of each of the seven policy papers that detail each major topic of the rate study. The seven completed policy papers are included in the Appendix.

Each of the seven policy papers were developed by the consultant team and reviewed, discussed and approved by the Technical Advisory Committee (TAC). The TAC was comprised of City staff and the consultant team working together to develop the WQ financial recommendation included in section X (Roman numeral 10) of this document.

The TAC made the determination to project and forecast monthly and annual water quality rates for FY - 19 through FY – 28, a ten year forecast and analysis, with emphasis on the following two five year periods as follows:

- FY – 19 through FY – 23
- FY – 24 through FY – 28

Furthermore, the TAC used the following key rate model assumptions to develop the WQ program rate study results and into four scenarios with various options for each scenario. Scenario 1 is the base assumption for the rate study with other scenarios being some variation of Scenario 1. The assumptions used to create scenario 1 are as follows:

- Increase Regulatory and Maintenance Activities
 - Increase TMDL / regulatory projects by approximately \$1.5 Million per year
 - Increase Green Infrastructure projects by \$250,000 to \$500,000 per year
 - Increase Pipe Infrastructure projects by \$500,000 to \$1 Million per year
 - Increase Maintenance of Residential Detention Ponds (SWEEP Program)
- Fund WQ Capital Improvement Projects (CIP) Based on Available Funds per Year: \$2.8M to \$11M in first 5 years
- Based on “actual” audited costs from FY–13 thru 17 and FY–18 City Council approved budget
- Based on City provided revenue projections FY–13 thru –19
- Add 22.5 new FTE's (Full Time Equivalent's) in the first 5 years
 - Note that the recommended rate scenario converts the 21.5 of the 22.5 FTE's into Operations funds designated for outside contracted services, in lieu of hiring new staff.
- Add 7 new FTE's in the second 5 years for a total of 29.5 FTEs over 10 years
 - Similarly the 7 FTE's are converted to Operations contracted services for the recommended rate scenario.
- Land Development Program
 - Reduce subsidy of Land Development Program 20% per year for 5 years from WQ rate
 - Increase Land Development fees by 20% per year, fully funded stand-alone program at year 5

- Note that Scenarios 1, 2 and 3 all consider the changes noted above. Scenario 4 takes a different approach to Land Development Fees, reviews and inspections and keeps a portion of the WQ Fee subsidy to support the program.

The WQ program rate study, based on input from the TAC, has developed rate scenarios for the following WQ “levels of service” and corresponding costs of service. The following four rate study scenarios summarize the evaluation made by the TAC to reach the recommendation:

Scenarios 1, 1A and 1B:

The following Tables illustrate Scenario 1, 1A and 1B

- **Scenario 1:** Capital Pay as You Go - A cost of service-based rate study calculating the line item chart of accounts including the following:
 - Account 610000 Salaries
 - Account 783000 Debt Service Costs
 - Account 811406 Transfers to WQ Capital
 - PLUS an annual amount added to Fund Balance available for Capital funding will be identified and compared to Gross Revenue less revenue adjustments.
 - The annual amount from previous year’s fund balance is assumed to be \$3.2 million
 - PLUS an annual addition to Fund Balance specifically to fund capital projects
 - INCLUDING an annual 9.75% rate increase per year for 5 years

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$126.48	\$138.72	\$152.28	\$167.16	\$183.48
Annual Percentage Increase	9.8%	9.7%	9.8%	9.7%	9.8%
Addition to Fund Balance Available for Capital Projects	\$2,870,000	\$3,600,000	\$6,100,000	\$7,970,000	\$11,080,000 *

** Total 5 Year Capital Budget = \$31,620,000

- **Scenario 1A:** All assumptions from Scenario 1 above with one modification, implementing a 33.33% increase in year 1. This percentage increase correlates to the Scenario 1 annual average as compared to the existing rate.

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$153.60	\$153.60	\$153.60	\$153.60	\$153.60
Annual Percentage Increase	33.3%	0%	0%	0%	0%
Addition to Fund Balance Available for Capital Projects *	\$7,650,000	\$7,380,000	\$7,090,000	\$6,810,000	\$6,520,000 *

* Total 5 Year Capital Budget = \$35,450,000

- **Scenario 1B:** All assumptions from Scenario 1 above with one modification, implementing an even 59.30% increase in year 1 only for each of the 5 years. This percentage increase correlates to the Scenario 1, 5th year rate.

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$183.48	\$183.48	\$183.48	\$183.48	\$183.48
Annual Percentage Increase	59.3%	0%	0%	0%	0%
Addition to Fund Balance Available for Capital Projects *	\$13,090,000	\$12,840,000	\$12,560,000	\$12,270,000	\$12,000,000 **

*Transfer out to WQ Capital is \$3.2M per year.

** Total 5 Year Capital Budget = \$62,760,000

Scenarios 2, 2A and 2B

- **Scenario 2:** Maintain the current level of service and only fund critical water quality capital projects. This scenario is a cost of service-based rate study calculating the basic capital improvement projects required by the Federal and State water quality mandates and requirements and activities.

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$115.20	\$119.28	\$109.92	\$120.72	\$137.40
Annual Percentage Change	0%	3%	-9%	9%	12%
Addition to Fund Balance Available for Capital Projects *	\$2,375,000	\$2,800,000	\$950,000	\$2,450,000	\$4,850,000 **

*CIP budget available for critical projects only; includes Central Ave, Patten Parkway and TMDL.

** Total 5 Year Capital Budget = \$13,425,000

Scenario 2 Assumptions:

- No changes made to the rate for FY-19 and no changes to the \$3.2M Transfer Out
- FY 2020 through FY 2023 Transfer Out decreases to \$1M per year
- No required minimum funded
- Perform only critical water quality capital projects. Does not include full request for CIP.
- No change in rate will cause lack of funding issues in Year 2 of the analysis.
- **Scenario 2A:** All assumptions from Scenario 2 implementing a 3% rate increase in year 1 only. This percentage increase correlates to the Scenario 1 annual average as compared to the existing rate.

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$118.68	\$118.68	\$118.68	\$118.68	\$118.68
Annual Percentage Increase	3.0%	0%	0%	0%	0%
Addition to Fund Balance Available for Capital Projects *	\$2,260,000	\$1,932,300	\$1,610,250	\$1,271,000	\$932,000

* Total 5 Year Capital Budget = \$8,005,550

- **Scenario 2B:** All assumptions from Scenario 2 implementing a 19% rate increase in year 1 only. This percentage increase correlates to the Scenario 2, 5th year rate.

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$137.40	\$137.40	\$137.40	\$137.40	\$137.40
Annual Percentage Increase	19.0%	0%	0%	0%	0%
Addition to Fund Balance Available for Capital Projects *	\$5,661,000	\$5,356,000	\$5,029,000	\$4,690,000	\$4,351,000

* Total 5 Year Capital Budget = \$25,087,000

Scenarios 3, 3A and 3B

- **Scenario 3:** Scenario 3 is the same as Scenario 1 above with two exceptions; removal of the Green Infrastructure and Pipe Crew assumptions.

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$116.82	\$128.89	\$137.39	\$144.23	\$148.62
Annual Percentage Change	1.40%	10.33%	6.60%	4.98%	3.04%
Addition to Fund Balance Available for Capital Projects *	\$1,610,250	\$2,983,200	\$4,027,320	\$4,678,200	\$5,616,100

* Total 5 Year Capital Budget = \$18,915,070

Assumptions:

- Includes \$3.2M per year Transfer Out
- Includes changes to the Land Development Program
- Includes changes for TMDL for regulatory requirements including staff and capital
- Includes Residential Detention Pond Maintenance (SWEEP) Program
- Excludes City Wide Services Pipe Crew & equipment
- Excludes Green Infrastructure Crews
- **Scenario 3A:** All assumptions from Scenario 3 implementing a 17.35% rate increase in year 1 only. This percentage increase correlates to the Scenario 3 annual average as compared to the existing rate.

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$135.19	\$135.19	\$135.19	\$135.19	\$135.19
Annual Percentage Increase	17.35%	0.00%	0.00%	0.00%	0.00%
Addition to Fund Balance Available for Capital Projects *	\$4,966,350	\$4,135,800	\$3,631,820	\$3,028,400	\$3,169,650

* Total 5 Year Capital Budget = \$18,932,020

- **Scenario 2B:** All assumptions from Scenario 2 implementing a 29.01% rate increase in year 1 only. This percentage increase correlates to the Scenario 3, 5th year rate.

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$148.62	\$148.62	\$148.62	\$148.62	\$148.62
Annual Percentage Increase	29.01%	0.00%	0.00%	0.00%	0.00%
Addition to Fund Balance Available for Capital Projects *	\$7,425,230	\$6,593,550	\$6,095,220	\$5,491,800	\$5,616,100

* Total 5 Year Capital Budget = \$31,221,900

Scenarios 4, 4A and 4B

- **Scenario 4:** Scenario 4 is the same as Scenario 1 with several exceptions; see the assumptions listed below the table.

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$126.49	\$138.78	\$152.33	\$167.22	\$183.54
Annual Percentage Change	9.80%	9.71%	9.77%	9.77%	9.76%
Addition to Fund Balance Available for Capital Projects *	\$3,641,731	\$3,660,929	\$5,944,083	\$7,559,861	\$10,409,734

* Total 5 Year Capital Budget = \$31,216,337

Assumption differences from Scenario 1:

- Land Development Permit (LDP) fees reduced as compared to Scenario 1. The following page displays the breakdown of LDP fees for each scenario.
- LDP fees are increased fully in year 1 and held constant for all five years, as compared to Scenario 1 where they are phased in 20% over five years.
- New hires or new FTE's included in the Green Infrastructure, SWEEP (Residential Detention Pond Maintenance), and City Wide Services Pipe Crew (21.5 FTE's total) have been converted to Operation's funds designated for outside contracting services.
- **Scenario 4A:** All assumptions from Scenario 4 except LDP fees are reduced even further as compared to Scenario 1. The following page displays the breakdown of fee changes for this scenario.

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$126.49	\$138.78	\$152.33	\$167.22	\$183.54
Annual Percentage Increase	9.80%	9.71%	9.77%	9.77%	9.76%
Addition to Fund Balance Available for Capital Projects *	\$3,485,710	\$3,504,908	\$5,788,062	\$7,403,839	\$10,253,713

* Total 5 Year Capital Budget = \$30,436,231

- **Scenario 4B:** All assumptions from Scenario 4 except LDP fees for largest number of permit types are held constant as compared to Current Level of Service (\$30/AC, min. \$100). The following page displays the breakdown of fee changes for this scenario.

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$126.49	\$138.78	\$152.33	\$167.22	\$183.54
Annual Percentage Increase	9.80%	9.71%	9.77%	9.77%	9.76%
Addition to Fund Balance Available for Capital Projects *	\$3,389,910	\$3,409,108	\$5,692,262	\$7,308,039	\$10,157,913

* Total 5 Year Capital Budget = \$29,957,231

The WQ Program needs and requirements were identified by the TAC and are provide in the business plan document. Each of the goal statements represent the water quality and water quantity (flooding and drainage) activities performed by and responsibilities of the WQ staff. These goal statement define and represent the levels of services outlined above and establish the basis for the legally defensible cost of service analysis that results in the recommend revised WQ rates. The goal statements were generated based upon input from City staff and the combined 95 years of rate setting experience of the consultant team. The consultant team has assisted municipalities with developing stormwater utility programs and financial needs over the span of three decades.

The overall WQ program rate study and final rate includes two major “stormwater management” activities / components that are segregated as follows:

- Water quality (NPDES Phase 1 regulatory, enforcement, etc.,) and
- Water quantity (flooding and drainage) aspects of the water quality program.

The TAC provided the basis for the legally defensible cost of service based rate study. At this juncture the results have been presented, reviewed and discussed with the Public Works Administration. The final step in the review and input process is to review and provide the results through face to face briefings to the elected officials (members of City Council and representatives from the Administration). This report incorporates all of the review, input and additional scenarios for the overall rate study analysis.

II. BACKGROUND

Stormwater management has many different facets that affect day to day operations of a community. This often comes in the form of major stream flooding, neighborhood drainage problems, individual homes with yard and basement flooding, storm system infrastructure deterioration, and excess inflow and infiltration into the sanitary sewer system. However, the issues that will be the most expensive in the future are the stormwater quality concerns of the EPA Municipal Separate Storm Sewer System (MS4) permits and the Total Maximum Daily Load or TMDL Program. These permits and programs are a part of the 1972 (revised in 1978) Clean Water Act and the National Pollutant Discharge Elimination System (NPDES) permit program. The MS4 water quality regulations are unfunded mandates that require Phase I Communities (population over 100,000), such as the City of Chattanooga, to develop a Stormwater Quality Program that follows the six management areas below:

- Public Education and Outreach
- Public Participation/Involvement
- Illicit Discharge Detection and Elimination
- Construction Site Runoff Control
- Post-Construction Runoff Control
- Pollution Prevention/Good Housekeeping

The management areas listed above require education and involvement of the community, mapping of the storm sewer system, a program to control and eliminate non–stormwater flows, a program to control soil erosion from construction sites, and improved operation and maintenance of the storm system, and a comprehensive monitoring program of the streams and storm infrastructure system.

Additionally, the City of Chattanooga has a TMDL established in the South Chickamauga Creek Watershed. South Chickamauga Creek is a part of the Lower Tennessee River Watershed and therefore included in the Lower Tennessee River Watershed (HUC 06020001) TMDL for siltation and habitat alteration. The City is responsible for development of a plan to improve the South Chickamauga Creek Watershed per requirements in the TMDL.

To meet these dual requirements of managing water quantity and improving water quality, there will need to be additional engineering and design, capital project construction, more regular inspection / monitoring of the system, better maintenance of the system, and comprehensive review and update of City policies concerning stormwater management.

The water quantity section consists of the planning, design, construction, and maintenance of the storm infrastructure system (both natural and man-made). There are three major areas of level and cost of service:

- Operations
 - Planning
 - Engineering & Design
 - Monitoring
 - Inspection
 - Enforcement
- Maintenance
 - Construction Crews (Pipe and related activities)
 - Ditch Maintenance Crews
 - Inspection / VAC Crews
- Capital Projects
 - Construction management
 - Construction
 - Water quality control
 - Inspection

WQ program level of services defined by the City of Chattanooga organizational chart that correspond to the annual budgeting process for Water Quality Operating Cost centers and staffing are provided in the following table:

Table 1 – Current Level of Service for Each Cost Center

Cost Center	Level of Service	No. of Staff	Level of Service Activities
K70101	WQ Inspections	27	Inspect industrial facilities, post construction stormwater infrastructure including green infrastructure for continued compliance and recurring maintenance
K70101	WQ Monitoring		Conduct monitoring, sampling, and illicit discharge investigation mandated by the City's National Pollutant Discharge Elimination System (NPDES) Permit No. TNS068063
K70101	WQ GIS		Related geographic information services
K70104	WQ Construction	96	Stormwater conveyance & Inlet cleaning, maintenance, repair and new construction
K70105	Land Development	10	Plan review, construction inspections for WQ, Stormwater, and EPSC new site compliance.
K70106	WQ Design	16	WQ 311 Inspection - Drainage investigations and design associated with Citizen Service Requests. In-house modeling, design, cost estimates, permitting for capital projects, capital/contract project management & survey services
K70107	WQ Public Outreach	1	NPDES mandated education, community outreach, training coordination

Although they seem to be different, quantity (flooding & drainage) and quality (MS4 Permit & TMDL) are dependent on one another and integrated into every activity the City of Chattanooga performs. For example, the pipe, stream restoration and the SWEEP (maintaining residential detention ponds) are all examples of maintenance activities that are both water quality and water quantity activities.

III. Policy Paper #1 – Data Collection Questionnaire

The purpose of Policy Paper #1 was to identify, organize and collect the necessary WQ data and information required by the consultant team to perform the financial analysis and legally defensible rate study. The WQ costs and functions were collected from the Departments of Public Works:

- Engineering
- Public Works/Streets/Roads
- Planning and Zoning
- Geographic Information Systems (GIS)
- Parks and Recreation
- Sewer
- Finance / Accounting
- Billing and Collection
- Customer service

A copy of the Data Collection Questionnaire document used for the analysis is included in Appendix of this document.

IV. Policy Paper # 2 – Business Plan

The purpose of the strategic business plan include “goal” statements that represent activities and responsibilities that define the level of service and establish the legal basis for the WQ Program rates and charges. Ultimately the City staff should update, maintain and use this document for planning purposes and as a management tool for the WQ program for this rate study and for future rate studies. The business plan established the City's "required minimum" levels of services over for the “current” level of service (FY – 18) and for the next nine-year period (FY - 19 through FY - 28).

The business plan document includes goal statements that provide the definition for future responsibilities and activities that equate into costs of providing those services that relate to the required minimum level of service and beyond. In addition, there are statements representing what level of services that the WQ Program will not provide and will not be responsible for. A copy of this document is included in Appendix.

V. Policy Paper # 3 – Work Order Database Analysis

The consultant team performed an evaluation and analysis of the work order database provided by City staff for the water quality rate study. This work order database contains 100% of the maintenance work performed by City Wide Services (CWS) staff for years 2013 through May 2017.

The purpose of this analysis was to evaluate the preventative maintenance activities and the 311 customer service data to utilize for the forecast of future maintenance activities as follows:

1. Evaluate the quality of the work order data;
2. Determine the usefulness of the historical work order data to project future maintenance costs for the water quality rate study.
3. Determine if the work order data can be used to calculate an average cost associated with the variety of work order types.
4. Summarize the steps used by the consultant team to manipulate the raw database into meaningful useable data for the rate study

A copy of this document is included in the Appendix.

VI. Policy Paper # 4 – Capital Project Data Analysis

This CIP evaluation and analysis was a continuation of the work order database policy paper 3. The purpose of this policy paper is as follows:

1. Collect and evaluate the past 10 years of capital projects performed by the WQ program. Identify the spending needs and the types of capital projects funded by the WQ rate;
2. Collect, evaluate and provide a future forecast for the next 10 years (two five year future forecasts) for the water quality program.
3. The evaluation and analysis of the last 10-year historical CIP program established the basis for the future forecasted capital improvements project program.

A copy of this document is included in the Appendix.

VII. Policy Paper # 5 – TMDL Project Data Analysis

This Policy Paper #5 concerns the South Chickamauga Creek TMDL for Siltation and Habitat Alteration, its relationship with private development in Chattanooga and existing development regulations, and the ongoing Water Quality (Stormwater) Rate Study. South Chickamauga Creek is a part of the Lower Tennessee River Watershed and therefore included in the Lower Tennessee River Watershed (HUC 06020001) TMDL. This paper will also address the City of Chattanooga water quality regulations that were developed because of the Siltation and Habitat Alteration TMDL

The purpose of this policy paper is as follows:

1. Collect and summarize information on the South Chickamauga Creek TMDL for Siltation and Habitat Alteration, and the current City of Chattanooga development regulations.
2. Provide a future forecast for the next 10 years policies and procedures for the TMDL.
3. Determine the future level of service and cost of service as well as impacts on the Water Quality Rate.

Section 303(d) of the Clean Water Act requires each state to list those waters within its boundaries for which technology based effluent limitations are not stringent enough to protect any water quality standard applicable to such waters. Listed waters are prioritized with respect to designated use classifications and the severity of pollution. In accordance with this prioritization, states are required to develop Total Maximum Daily Loads (TMDLs) for those water bodies that are not attaining water quality standards.

The State of Tennessee's 2004 303(d) List (TDEC, 2005) identified several water bodies in the Lower Tennessee River Watershed as not fully supporting designated use classifications due, in part, to siltation and/or habitat alteration associated with agriculture, urban runoff, land development, and bank modification.

The City of Chattanooga is the only Phase I MS4 in the Lower Tennessee River Watershed. The MS4 permit requires Chattanooga to be accountable for the discharge of pollutants and sediments within the limits of the community. The permits also contain requirements regarding control of discharges of pollutants of concern into impaired waterbodies, implementation of provisions of approved TMDLs, and description of methods to evaluate whether storm water controls are adequate to meet the requirements of approved TMDLs.

The initial plan to respond to the requirements was a change in the development regulations through Resource Rain and the Land Development Permit (LDP). This approach has been over turned and further improvements efforts to meet TMDL requirements are being implemented by a broader approach. The current approach will perform capital projects to install improvements and meet the TMDL.

A copy of the full Policy Paper #5 is included in the Appendix.

VIII. Policy Paper # 6 – Land Development Program

This policy paper concerns the Land Development Program (LDP), how it operates and is funded. The information, data, research, approach, methodology and most of the content of this paper is the result of work performed (and provided to the consultant team) by City staff.

The LDP seeks to ensure the public's health, safety, and welfare through the enforcement of adopted building, electrical, plumbing, gas and mechanical codes and the Zoning Ordinance. This enforcement promotes the economic health of the City of Chattanooga by enhancing business development, retention, and neighborhoods. The LDP selects, develops and retains qualified staff.

The purpose of this policy paper is to review and examine the City of Chattanooga's Land Development process, policies and level of service. The Land Development Office (LDO) is a critical part of Chattanooga Water Quality Program and the City of Chattanooga's daily operations. The services provided by the LDP include the following:

Development Services:

- Plans Review - Residential and Commercial / Adopted Codes / Fees
- Land Disturbing / Subdivisions / Infrastructure / Street Cuts
- Building Permits / Inspections
- Trades Permits / Inspections
- Inspection District Map

Land Use Management Services:

- Commercial Signs / Billboards / Banners
- Historic Preservation / Design Review
- Zoning Enforcement / Parking Review
- National Flood Insurance Program
- Landscaping / Urban Forestry

The City of Chattanooga currently charges \$ 30/acre (with a minimum 3-1/3 acre, or \$ 100). The current LDP fee is significantly less than needed if the LDO is to become self-sustaining. The basis for the rate study (Scenario 1) includes a change its land development policy, including the following: Starting in FY19 Land Development Fees will be increased each year for the next 5 years. With this approach, the Land Development department would move from a largely subsidized department to a fully supporting department funded by development fees.

However, the recommended alternative (Scenario 4), is an approach that moves towards a fully self-sustaining program but still includes subsidy from the WQ fee and other departments.

A copy of this document is included in the Appendix.

IX. Policy Paper # 7 – Financial Fact Sheet Analysis

The purpose of this policy paper is to provide a summary and overview of the three stormwater level of service / cost of service analyses that form the basis for the legally defensible WQ rates to meet the defined levels of service including:

- The “current” level of service and cost of stormwater service analysis
- The first “required minimum” level of service and cost of stormwater service analysis has been developed for FY – 19 (Year 1) through FY – 23 (Year 5). The rate study was perform and includes scenarios 1 through 4; and
- The second “required minimum” level of service and cost of stormwater service analysis has been developed for FY – 24 (Year 6) through FY – 28 (Year 10); and
- Develop a specific monthly rate per ERU to meet and fund each of the above levels of services.

The results, findings, and conclusions of the overall rate study process are included in this Policy Paper # 7 - Financial Fact Sheet. A copy of this document is included in the Appendix.

X. Findings, Conclusions, and Recommendations:

The consultant team's findings, conclusions and recommendations are as follows:

1. The consultant team recommends the City of Chattanooga Elected Officials review and provide comments on the content contained in this draft executive summary final report document.
2. The consultant team recommends the City of Chattanooga Elected Officials and City Staff accept the findings, conclusions and recommendations contained in this document.
3. The consultant team recommends performing a public education and involvement campaign to inform and educate the public on the results of this rate study, the benefits and rate increase recommendations of the WQ rates and LDP fees over the next 10 years.
4. The consultant team has developed a PowerPoint presentation that contains all of the findings and conclusions of the overall rate study and analysis. This presentation will be made to the stormwater Board, the City Administration and the City Council members.
5. The consultant team recommends updating and reviewing the business plan, cost of service and rate study analyses on a more frequent regular basis (every year or every two to three years) to prudently manage the WQ program in a financial sound technically proven manner.
6. The consultant team recommends that the City of Chattanooga requires that all work order data entry is completed on a daily basis. The data entry should include dates, GIS matching location address, GIS coordinates, labor by category and hours, all materials by type and amount, any equipment, tools and vehicles utilized by hour.
7. The consultant team recommends that the City of Chattanooga consider use of a work order system that is compatible with GIS and Microsoft Office Access and/or Excel for ease in analyzing the information.

XI. Action Plan:

The City of Chattanooga Elected Officials should consider a public education campaign to inform the City of Chattanooga WQ program rate payers regarding the series of WQ rate recommendations that will be implemented over the next 10 years.

Appendices

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City of Chattanooga

Water Quality Program Rate Study

Fact Sheet Brochure

April 26, 2018

Water Quality Program Components:

- MS4 Unfunded Mandates
- Drainage & Flood Protection
- Maintenance
- Capital Projects
- Legally Defensible Dedicated Funding Source for Water Quality and Storm Water Management

Storm Water Technical Advisory Committee:

- City Engineer's Office
- Water Quality
- City Wide Services
- Land Development Office
- Public Works Administration
- Consultant Team: HDR, ERC and SCM

Consultant Team:

- Over 75 years of combined rate setting experience
- Over 100 rate studies performed

Public Works Mission Statement:

To preserve and enhance the quality of the physical environment and infrastructure through prompt, cost effective and courteous delivery of services which protect the health, safety and welfare of all citizens and visitors.

Why Are We Here?

The Water Quality Program must meet and/or exceed Municipal Separate Storm Sewer System (MS4) water quality regulations. A monthly Water Quality Fee is assessed on yearly property tax bills to fund these requirements and perform other needed water quality and flooding/drainage activities. The current rates were set in 2010 and are due for evaluation to determine legally defensible rates for the next ten year period.

Program History

- 1993 – Initial Stormwater Fee
- 2007 – Level and Cost of Service Analysis
- 2010 – Implemented the current \$9.60 per Equivalent Residential Unit (ERU) per month rate (\$115.20 annually)

What is a Level of Service, Cost of Service Rate Study?

The City of Chattanooga hired the team of HDR, Environmental Rate Consultants, Inc (ERC), and SCM Engineering to perform a business plan and cost of service analysis based rate study. This financial analysis is based on historical data and rate schedules currently in place. **The rate study will project and forecast monthly water quality rates for the next ten years.**

The study identified goal statements, starting with the Mission Statement above, that represent water quality and flooding/drainage activities. These activities define the levels of services and **establish the basis for the legally defensible cost of service analysis & revised WQ rates.** The rate study is based on a "Capital Pay As You Go" scenario where revenue from annual rates pays for all the costs of the program, assuming no future debt.

Where do we go from here?

Rate changes require adoption by City Council. A summary of the study results, in draft form, is provided below. At this time the Technical Advisory Committee is seeking review and input from the Administration and Elected Officials.



Rate Study Period (Two five year periods)

- FY – 19 through FY – 23
- FY – 24 through FY – 28

Increase Regulatory and Maintenance Activities

- Increase TMDL / regulatory projects by an average of \$1.5 Million per year for four years
- Increase Green Infrastructure projects by \$0.25 Million to \$0.5 Million per year
- Increase Pipe Infrastructure projects by \$0.5 Million to \$1 Million per year
- Increase Maintenance of Residential Detention Ponds (SWEEP Program)

Fund WQ Capital Improvement Projects (CIP) Based on Available Funds per Year

- \$2.8M to \$11M in first 5 years (Scenario 1)

Rate Study Assumptions

- Based on “actual” audited costs from FY–13 thru 17 and FY–18 City Council approved budget
- Based on City provided revenue projections FY–13 thru –19
- Add 22.5 new FTE’s (Full Time Equivalent’s) in the first 5 years
- Add 7 new FTE’s in the second 5 years for a total of 29.5 FTEs over 10 years

Land Development Program

- Reduce subsidy of Land Development Program 20% per year for 5 years from WQ rate
- Increase Land Development fees by 20% per year, fully funded stand-alone program at year 5

Current Land Development Fees	
Description	Fee
Current Fee	\$30/Acre (min \$100)

Rate Study Assumption*	
Description	Fee**
Simple Residential – One House	\$695.00
Simple Residential – Two Houses	\$1,390.00
Complex – under 1 acre	\$2,785.00
Complex – over 1 acre	\$5,975.00

*Abbreviated list of fees shown, see Policy Paper 4 for full list.
 **Fees at Year 5

Land Development Expenses & Funding					
Land Development	FY2019	FY2020	FY2021	FY2022	FY2023
Projected Annual Expenses	\$869,000	\$903,000	\$938,000	\$976,000	\$1,015,000
Amount Funded by Land Devel.	<u>\$174,000</u>	<u>\$361,000</u>	<u>\$563,000</u>	<u>\$781,000</u>	<u>\$1,015,000</u>
Amount Funded by WQ Rates	\$695,000	\$542,000	\$375,000	\$195,000	\$0

Summary of Proposed Rate Increase Per Year, First Five Years, Scenario 1

Monthly Rates	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023
Current Rate/ERU/Year	\$115.20					
Calculated Rate/ERU/Year		\$126.48	\$138.72	\$152.28	\$167.16	\$183.48
Annual Percentage Increase		9.8%	9.7%	9.8%	9.7%	9.8%

Water Quality Program Cash Flow Analysis based on Scenario 1

	FY2019	FY2020	FY2021	FY2022	FY2023
Gross Revenue	\$23,040,000	\$25,320,000	\$27,830,000	\$30,590,000	\$33,620,000
Less: Operating Expenses	-\$16,970,000	-\$18,520,000	-\$18,530,000	-\$19,420,000	-\$19,340,000
Less: Transfer To WQ Capital	<u>-\$3,200,000</u>	<u>-\$3,200,000</u>	<u>-\$3,200,000</u>	<u>-\$3,200,000</u>	<u>-\$3,200,000</u>
Addition to Fund Balance Available For Capital Projects	\$2,870,000	\$3,600,000	\$6,100,000	\$7,970,000	\$11,080,000



Minimum Required Level of Service – Analysis Assumptions (Apply for Scenario 1)

Note that Level of Service Assumptions for Scenarios 2, 3, and 4 include various changes as described in each specific section.

Land Development Program:

- Reduce water quality funding from the WQ Enterprise fund by 20% per year with a goal to be self-funded by fees by end of FY – 23.
- Increase fees 20% per year for 5 years
- Add 1.5 FTE's in FY – 19 (Year 1)
- Add 1.0 FTE in FY – 20 (Year 2)
- Add 1.0 FTE in FY – 21 (Year 3)

TMDL: In-house and capital TMDL projects to meet regulatory changes

- Add 1.0 FTE (Engineering Tech) in FY – 20 (Year 2)
- Add 1.0 FTE (Specialist II) FY – 22 (Year 4)
- Begin funding for TMDL projects in year 1
 - FY – 19 (Year 1) = \$1,000,000
 - FY – 20 (Year 2) = \$1,550,000
 - FY – 21 (Year 3) = \$1,350,000
 - FY – 22 (Year 4) = \$2,300,000
- Allocate and fund 80% by Capital Budget
- Allocate and fund 20% by WQ rate/fund (Operating Budget for K70101 Cost Center)

Green Infrastructure Crews:

- Add new 3-person crew in FY – 20 (Year 2) – Housed in Parks Department funded by WQ rate/fund
- Add a new 3-person crew in FY-22 (Year 4) – Housed in Parks Department funded by WQ rate/fund

City Wide Services (CWS) Pipe Crew:

- Add new 7-person Pipe Crew in FY – 20 (Year 2).

SWEEP: Residential Detention Pond Maintenance

- Currently City performs maintenance on six (6) ponds per year
- The effort will slowly build a program dedicating City forces to improve residential detention ponds across the City to meet current regulatory requirements.
- Total estimated number of existing residential ponds in the City is 150
- The SWEEP program goals are to address regulatory residential detention pond requirements for water quality and flooding. Improving the aesthetics of ponds is not the goal but may be a side benefit in some cases.
- New FTE's
 - Add new 3-person crew in FY – 20 (Year 2)
 - Add new 1 FTE in FY – 23 (Year 5)
 - Add new 3-person crew in FY – 24 (Year 6)
 - Add new 3-person crew in FY – 26 (Year 8)
 - Add new 1 FTE in FY – 26 (Year 8)
 - A total of 11 FTEs over the 10-year rate period



Comparison of Alternate Rate Adjustment Scenarios

- Current FY-2018 WQ Fee is **\$115.20** per ERU per Year or \$9.60 per month per ERU

Scenario 1: Increase the Level & Cost of Service over 5 years

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$126.48	\$138.72	\$152.28	\$167.16	\$183.48
Annual Percentage Increase	9.8%	9.7%	9.8%	9.7%	9.8%
Addition to Fund Balance Available for Capital Projects *	\$2,870,000	\$3,600,000	\$6,100,000	\$7,970,000	\$11,080,000 **

*Transfer out to WQ Capital is \$3.2M per year.

** Total 5 Year Capital Budget = \$31,620,000

Scenario 1A: Same increase in Level of Service as Scenario 1, increase rates 33.3% at year 1, hold rates flat thereafter (Equals 5 year average of Scenario 1)

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$153.60	\$153.60	\$153.60	\$153.60	\$153.60
Annual Percentage Increase	33.3%	0%	0%	0%	0%
Addition to Fund Balance Available for Capital Projects *	\$7,650,000	\$7,380,000	\$7,090,000	\$6,810,000	\$6,520,000 **

*Transfer out to WQ Capital is \$3.2M per year.

** Total 5 Year Capital Budget = \$35,450,000

Scenario 1B: Same increase in Level of Service as Scenario 1, increase rates 59.3% at year 1, hold rates flat thereafter (Match Scenario 1, 5th year rate)

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$183.48	\$183.48	\$183.48	\$183.48	\$183.48
Annual Percentage Increase	59.3%	0%	0%	0%	0%
Addition to Fund Balance Available for Capital Projects *	\$13,090,000	\$12,840,000	\$12,560,000	\$12,270,000	\$12,000,000 **

*Transfer out to WQ Capital is \$3.2M per year.

** Total 5 Year Capital Budget = \$62,760,000



Scenario 2: Keep the Current Level of Service, perform only critical capital projects on a year by year basis

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$115.20	\$119.28	\$109.92	\$120.72	\$137.40
Annual Percentage Change	0%	3%	-9%	9%	12%
Addition to Fund Balance Available for Capital Projects *	\$2,375,000	\$2,800,000	\$950,000	\$2,450,000	\$4,850,000 **

*CIP budget available for critical projects only; includes Central Ave, Patten Parkway and TMDL.

** Total 5 Year Capital Budget = \$13,425,000

Assumptions:

- No changes made to the rate for FY-19 and no changes to the \$3.2M Transfer Out
- FY 2020 through FY 2023 Transfer Out decreases to \$1M per year
- No required minimum funded
- Perform only critical water quality capital projects. Does not include full request for CIP.
- No change in rate will cause lack of funding issues in Year 2 of the analysis.

Scenario 2A: Keep the Current Level of Service, perform only critical capital projects on a year by year basis,
 Increase rate 3.0% the first year and keep flat thereafter (5 year average of Scenario 2)

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$118.68	\$118.68	\$118.68	\$118.68	\$118.68
Annual Percentage Increase	3.0%	0%	0%	0%	0%
Addition to Fund Balance Available for Capital Projects *	\$2,260,000	\$1,932,300	\$1,610,250	\$1,271,000	\$932,000

* Total 5 Year Capital Budget = \$8,005,550

Scenario 2B: Keep the Current Level of Service, perform only critical capital projects on a year by year basis,
 Increase rate 19.0% the first year and keep flat thereafter (Match Scenario 2, 5th year rate)

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$137.40	\$137.40	\$137.40	\$137.40	\$137.40
Annual Percentage Increase	19.0%	0%	0%	0%	0%
Addition to Fund Balance Available for Capital Projects *	\$5,661,000	\$5,356,000	\$5,029,000	\$4,690,000	\$4,351,000

* Total 5 Year Capital Budget = \$25,087,000



Scenario 3: Increase the Level of Service the same as Scenario 1, exclude the City Wide Services Pipe Crew and Green Infrastructure Crews.

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$116.82	\$128.89	\$137.39	\$144.23	\$148.62
Annual Percentage Change	1.40%	10.33%	6.60%	4.98%	3.04%
Addition to Fund Balance Available for Capital Projects *	\$1,610,250	\$2,983,200	\$4,027,320	\$4,678,200	\$5,616,100

* Total 5 Year Capital Budget = \$18,915,070

Assumptions:

- Includes changes to the Land Development Program
- Includes changes for TMDL regulatory requirements including staff and capital
- Includes Residential Detention Pond Maintenance (SWEEP) Program
- Excludes CWS Pipe Crew
- Excludes Green Infrastructure Crews

Scenario 3A: Same additional Level of Service as Scenario 3, Increase rate 17.35% the first year and keep flat thereafter (5 year average of Scenario 3)

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$135.19	\$135.19	\$135.19	\$135.19	\$135.19
Annual Percentage Increase	17.35%	0.00%	0.00%	0.00%	0.00%
Addition to Fund Balance Available for Capital Projects *	\$4,966,350	\$4,135,800	\$3,631,820	\$3,028,400	\$3,169,650

* Total 5 Year Capital Budget = \$18,932,020

Scenario 3B: Same additional Level of Service as Scenario 3, Increase rate 29.01% the first year and keep flat Thereafter (Match Scenario 3, 5th year rate).

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$148.62	\$148.62	\$148.62	\$148.62	\$148.62
Annual Percentage Increase	29.01%	0.00%	0.00%	0.00%	0.00%
Addition to Fund Balance Available for Capital Projects *	\$7,425,230	\$6,593,550	\$6,095,220	\$5,491,800	\$5,616,100

* Total 5 Year Capital Budget = \$31,221,900



Scenario 4: Scenario 4 is the same as Scenario 1 with several exceptions; see the assumptions listed below the table.

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$126.49	\$138.78	\$152.33	\$167.22	\$183.54
Annual Percentage Change	9.80%	9.71%	9.77%	9.77%	9.76%
Addition to Fund Balance *	\$3,641,731	\$3,660,929	\$5,944,083	\$7,559,861	\$10,409,734
Available for Capital Projects *					

* Total 5 Year Capital Budget = \$31,216,337

Assumption differences from Scenario 1:

- Land Development Permit (LDP) fees reduced as compared to Scenario 1. The following page displays the breakdown of LDP fees for each scenario.
- LDP fees are increased fully in year 1 and held constant for all five years, as compared to Scenario 1 where they are phased in 20% over five years.
- New hires or new FTE's included in the Green Infrastructure, SWEEP (Residential Detention Pond Maintenance), and City Wide Services Pipe Crew (21.5 FTE's total) have been converted to Operation's funds designated for outside contracting services.

Scenario 4A: All assumptions from Scenario 4, except LDP fees are reduced even further as compared to Scenario 1. See following page.

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$126.49	\$138.78	\$152.33	\$167.22	\$183.54
Annual Percentage Increase	9.80%	9.71%	9.77%	9.77%	9.76%
Addition to Fund Balance *	\$3,485,710	\$3,504,908	\$5,788,062	\$7,403,839	\$10,253,713
Available for Capital Projects *					

* Total 5 Year Capital Budget = \$30,436,231

Scenario 4B: All assumptions from Scenario 4, except LDP fees for the largest number of permit types are held constant as compared to Current Level of Service (\$30/AC, min. \$100), other various permits and review fees are held constant from Scenario 4A. See following page.

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$126.49	\$138.78	\$152.33	\$167.22	\$183.54
Annual Percentage Increase	9.80%	9.71%	9.77%	9.77%	9.76%
Addition to Fund Balance *	\$3,389,910	\$3,409,108	\$5,692,262	\$7,308,039	\$10,157,913
Available for Capital Projects *					

* Total 5 Year Capital Budget = \$29,957,231



Land Development Permit Fees

Revised fees for the various scenarios are listed in the table below.

Description	Projected # Performed	Scenarios 1 & 3	Scenario 4	Scenario 4A	Scenario 4B
		Revised Fee	Revised Fee	Revised Fee	Revised Fee
<i>Simple Residential - One House</i>	353	\$695	\$200	\$100	\$100*
<i>Simple Residential - Two Houses</i>	118	\$1,390	\$275	\$100	\$100*
<i>Complex - under 1 acre</i>	154	\$2,785	\$300	\$165	\$100*
<i>Complex - over 1 acre</i>	63	\$5,975	\$1,500	\$750	\$150*
<i>Bonds/Letters of Credit (each)</i>	20	\$675	\$675	\$675	\$675
<i>Revisions after 2nd review (each)</i>	25	\$3,950	\$1,000	\$650	\$100
<i>Post-issued revisions (each)</i>	53	\$1,995	\$1,000	\$650	\$100
<i>Variance Request (each)</i>	3	\$1,375	\$1,375	\$1,375	\$1,375
<i>Driveway Tile/Culvert Sized By City</i>	50	\$675	\$675	\$675	\$675
<i>As-Built Review (Storm or Sanitary)</i>	63	\$675	\$675	\$675	\$675
<i>Grading Only Permit (5 acres min.)</i>	4	\$2,785	\$1,500	\$750	\$150
<i>Timber Removal Permit</i>	3	\$995	\$995	\$995	\$995
<i>Tree Ordinance Permit Review</i>	51	\$995	\$500	\$500	\$500
<i>Site Dev. Review Fee (FBC or Zoning)</i>	5	\$2,995	\$1,000	\$650	\$100
<i>Inspection Violations/Penalties</i>	20	\$500	\$500	\$500	\$500
TOTAL PROJECTED ANNUAL REVENUE		\$ 1,602,726	\$465,116	\$309,095	\$213,235

*Current \$30 per acre, \$100 min. fee.

Notes:

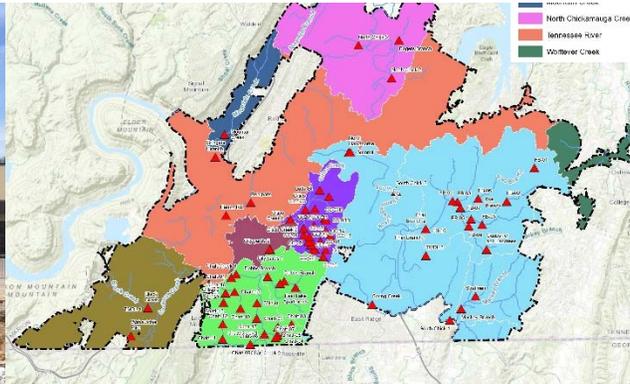
1. The “Current Level of Service” (FY-18) LDP fee for all types of projects is **\$30 per acre with a \$100 min. fee.**
2. The Current Level of Service LDP fee revenue is approximately \$100,000 per year.
3. Scenario 2 and 4B both include fees based of the Current Level of Service, however 4B does expand the fees to include the full list above.



Top Water Quality Fee Properties

Property	Address	ERU	Current Annual Bill	Annual Billing, 5 Year Rate			
			\$115.20 / ERU / Year	Scenario 1 & 1B \$183.48 / ERU / Year	Difference	Scenario 1A \$153.60 / ERU / Year	Difference
Volkswagen	8001 Volkswagen Dr	5083	\$585,562	\$932,629	\$347,067	\$780,749	\$195,187
Covenant Transport	900 Birmingham Hwy	831	\$95,731	\$152,472	\$56,741	\$127,642	\$31,910
Enterprise South	Hwy 58	807	\$92,966	\$148,068	\$55,102	\$123,955	\$30,989
Enterprise South	8015 Volkswagen Dr	745	\$85,824	\$136,693	\$50,869	\$114,432	\$28,608
Amazon	7380 Volkswagen Dr	742	\$85,478	\$136,142	\$50,664	\$113,971	\$28,493
Eastgate	5600 Brainerd Rd	672	\$77,414	\$123,299	\$45,884	\$103,219	\$25,805
Komatsu	409 Signal Mtn Rd	526	\$60,595	\$96,510	\$35,915	\$80,794	\$20,198
LKQ Pick Your Part	400 Workman Rd	498	\$57,370	\$91,373	\$34,003	\$76,493	\$19,123
Hixson Mall	5000 Hixson Pike	455	\$52,416	\$83,483	\$31,067	\$69,888	\$17,472
Enterprise South	Bonny Oaks Dr	438	\$50,458	\$80,364	\$29,907	\$67,277	\$16,819
Kordsa Inc	4501 N Access Rd	426	\$49,075	\$78,162	\$29,087	\$65,434	\$16,358
Hamilton Place Mall	2100 Hamilton Place Blvd	446	\$51,379	\$81,832	\$30,453	\$68,506	\$17,126
Covenant Transport	400 Birmingham Hwy	402	\$46,310	\$73,759	\$27,449	\$61,747	\$15,437
McCallie School	500 Dodds Ave	396	\$45,619	\$72,658	\$27,039	\$60,826	\$15,206
Mueller Co	1401 Mueller Ave	355	\$40,896	\$65,135	\$24,239	\$54,528	\$13,632
Fed Ex	Ooltewah Harrison Rd	332	\$38,246	\$60,915	\$22,669	\$50,995	\$12,749

Appendix B – Elected Official Educational PowerPoint Presentation



Water Quality Program Level & Cost of Service Rate Study

Educational Session

City of Chattanooga
Stormwater Regulations Board



Today's Agenda

- Stormwater Regulations Board Responsibilities
- Water Quality Program Historical Review
- Sources of Revenue & Expenditures
- Overview of the Level and Cost of Service Study
- Schedule for Adoption



Stormwater Regulations Board Responsibilities Relative to the WQ Fee

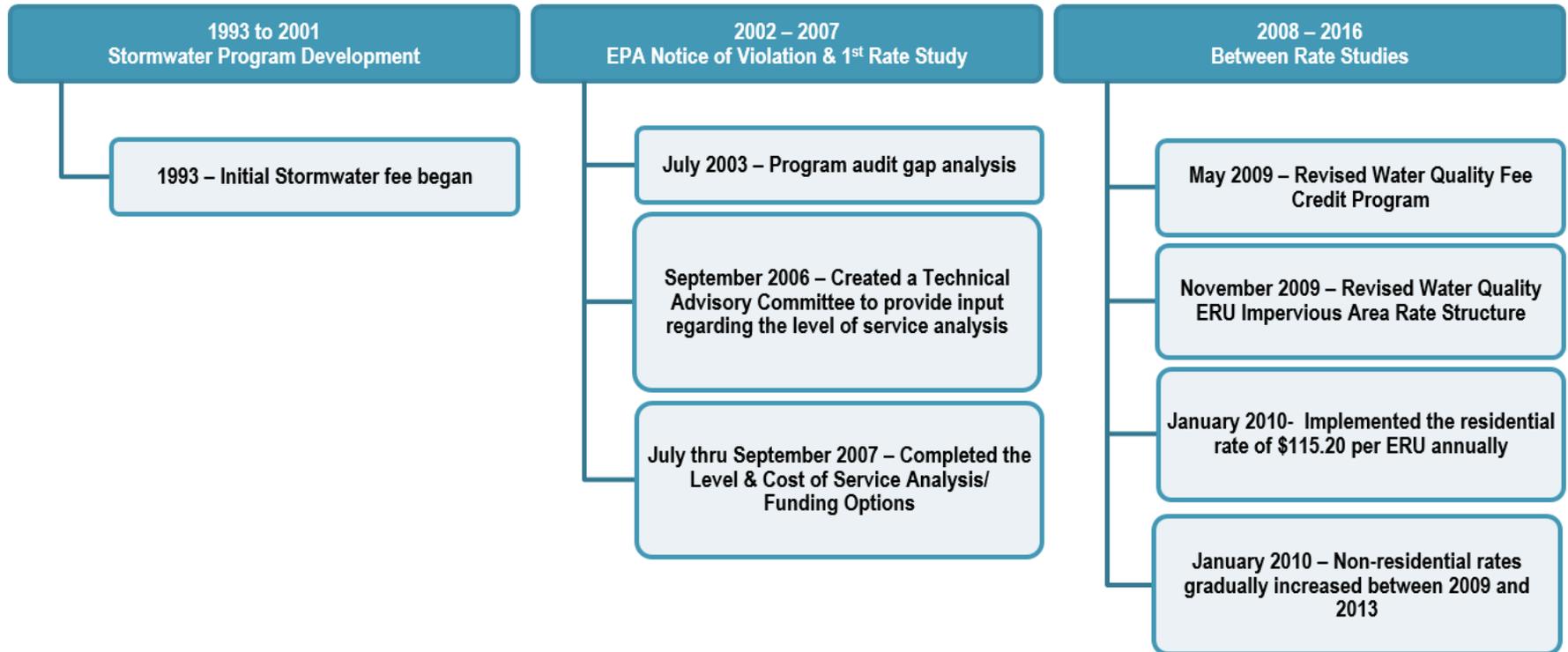
- Make Recommendations to the Mayor and City Council to Assure rates are **fair and adequate to fund the Stormwater Program**
- Review and Provide Constructive Comments to the Stormwater Management Staff Relative to **Development and Implementation of a Level of Stormwater Service Acceptable to the Rate Payers**



Water Quality Program Historical Review

1973 to Present

City of Chattanooga



Consultant Team Introductions

		
<p>Justin Bolender, P.E. Project Manager</p> <ul style="list-style-type: none"> ◆ Engineering, Consulting, and Environmental Services ◆ Local Chattanooga Staff & Experience ◆ Storm Water Management ◆ Water/Sewer/Stormwater Rate Studies ◆ Geographic Information Systems ◆ NPDES MS4 Compliance ◆ Stormwater Modeling 	<p>John F. Damico, President Al Damico, Vice President</p> <ul style="list-style-type: none"> ◆ Over 50 Successful Storm Water Utility Implementations ◆ Over 100 water/sewer/storm rate studies performed ◆ Expert Witness Testimony (9 cases) ◆ City of Lancaster, OH Litigation – Stormwater program challenged in court and upheld ◆ ERC and Steven McKinley have worked together since 1987 regarding stormwater financing 	<p>Steven C. McKinley, P.E. Certified MS4 Specialist Water Resources</p> <ul style="list-style-type: none"> ◆ Over 100 Stormwater Program Developments ◆ Over 30 Successful Storm Water Utility Implementations ◆ Watershed Management ◆ MS4 Program Implementation ◆ FEMA Flood Insurance Studies ◆ Water Resource Analysis and Design

Revenue Sources

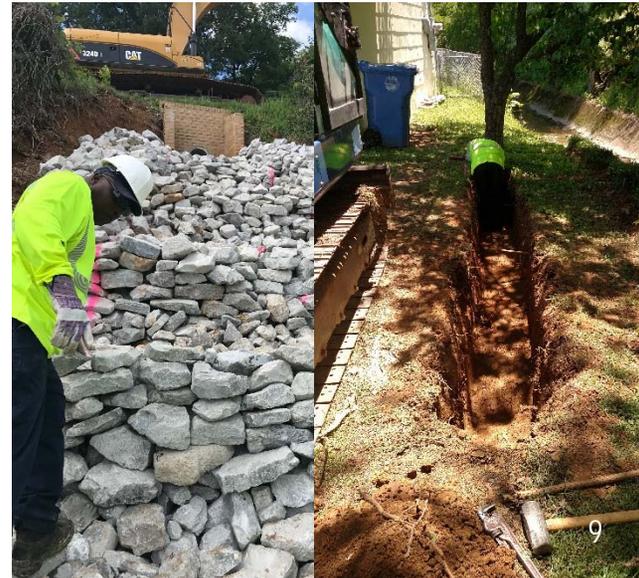
- Water Quality Fee Assessed Yearly
 - \$115.20 per ERU Annually (Equivalent Residential Unit) – Since 2009
 - Residential
 - Commercial / Industrial
 - Institutional

- Land Disturbance Permit Fees
 - \$30 per disturbed acre – Since 1993



Other Activities Funded by WQ program

- 311 Response
- Engineering & Design
 - Water Quality Issues
 - Drainage and Flood Investigations
 - Modeling
- Capital Projects
 - Construction, Management & Inspection
- Operations & Maintenance
 - Construction Crews (Pipe and related activities)
 - Ditch Maintenance Crews
 - Inspection / Vacuum Cleaning Crews



Current WQP Responsibilities Per Cost Center

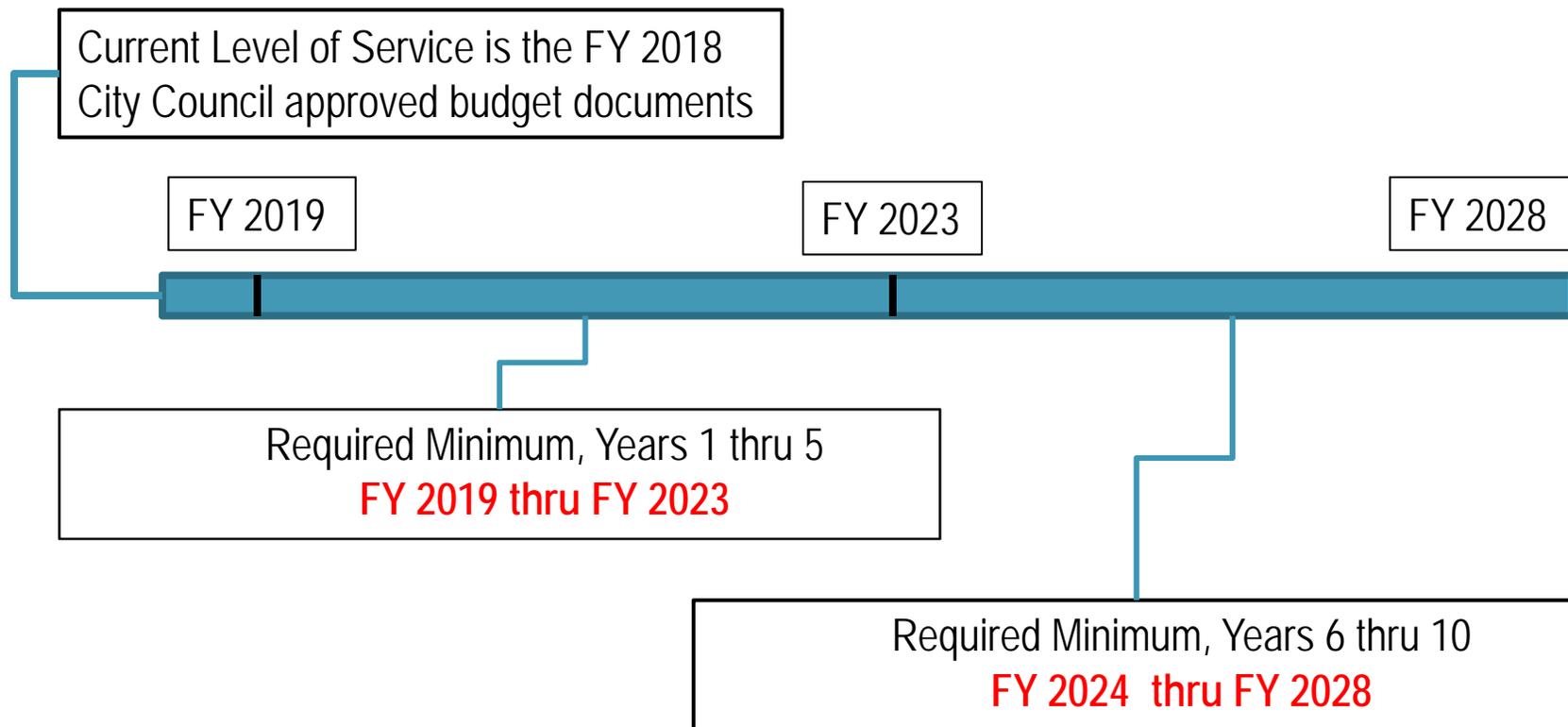
Cost Center No.	Level of Service Activities	No. of Current Staff	Activities/WQP Responsibilities
K70101	WQ Inspections	27	Industrial facilities, post construction stormwater including green infrastructure for compliance and recurring maintenance.
	WQ Monitoring		Conduct monitoring, sampling, and illicit discharge investigation.
	WQ GIS		Related geographic information services, Infrastructure Mapping.
K70104	WQ Construction & Maintenance	96	Stormwater conveyance & inlet cleaning, maintenance, repair and new construction.
K70105	Land Development	10	Plan review, construction inspections for WQ, Stormwater, EPSC new site compliance.
K70106	WQ Design & Surveying	16	WQ 311 Inspection - Drainage investigations and design. In-house modeling, design, cost estimates, permitting for capital projects, capital/contract project management & survey services.
K70107	WQ Public Outreach	1	NPDES mandated education, community outreach, training coordination.
		150	Total

What is not included in the Water Quality Fund?

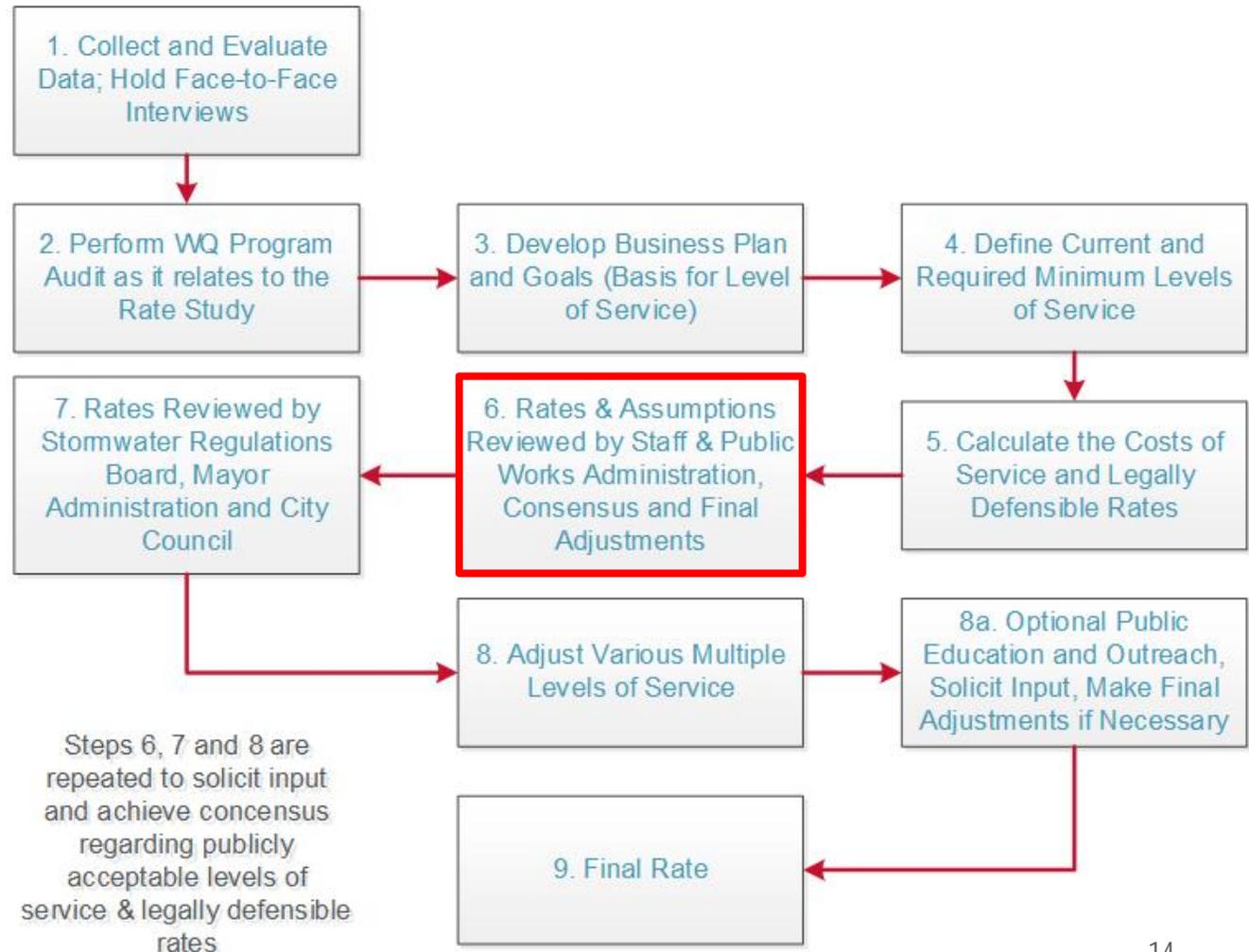
- Consent Decree Program
 - Wastewater Infrastructure
 - Combined Sewer System has some overlap, but is a separate issue
- Private Property Issues
 - Private Property Flooding
 - Failing Pipes on Private Property

Overview of the Level and Cost of Service Rate Study Process

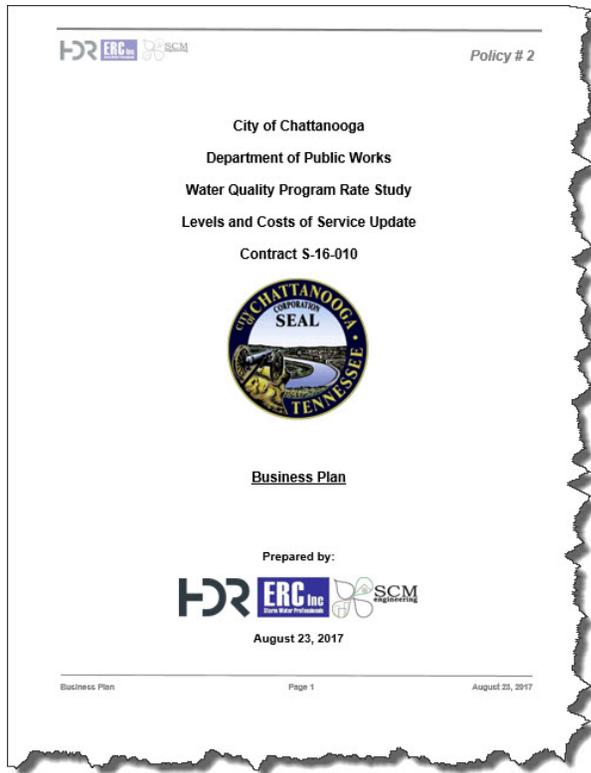
Study Period



Rate Study Process



2016 Dept. of Public Works Water Quality Program Strategic Plan



Mission & Vision

To preserve and enhance the quality of the physical environment and infrastructure through prompt, cost effective and courteous delivery of services which protect the health, safety and welfare of all citizens and visitors.

Be a world-class Public Works Department supporting our employees and our community with integrity and excellence.

Cost of Service / Rate Study Process Summary

Data Gathering and Analysis

- Data Questionnaire & In-Person Interviews
 - Organizational Charts/Employees
 - Regulatory Requirements
 - Water Quality Activities
 - Work Order Data – Citizen Requests
 - Revenue & Budgets
 - Capital Improvement Projects – Past and Future

- Developed detailed analysis and reports:
 - Work Order Data
 - Capital Improvement Projects
 - Regulatory Changes (TMDL)
 - Land Development



Cost of Service / Rate Study Process Summary Business Plan

- Develop the Business Plan Goal Statements Document
 - Basis for Levels of Service

- Define the various Levels of Services
 - Current Level of Service – “What we currently provide”
 - Required Minimum Level of Service – “What we will provide during the next 5 years”
 - Future Minimum Level of Service – “What we will provide 6 to 10 years from now”

- Cost of Service Analysis
 - Calculated for each goal statement
 - Consideration for Water Quality vs. Water Quantity (Flooding & Drainage)



Cost of Service / Rate Study Process Summary

Rate Study and Cash Flow Analysis

- Developed interactive rate model from historical and budget documents
 - Documents Include:
 - FY 2013 thru FY 2017 final financial statements
 - City Council approved FY 2018 budget

- Cash Flow Analysis
 - ERU rate and annual revenues were analyzed and projected for 10 years
 - Current Level of Service as basis
 - Considers services to meet the “Required Minimum Level of Service”
 - Legally Defensible



Cost of Service / Rate Study Process Summary

- Topics considered & accounted for in the rate model
 - Debt financing (debt/bond expenses)
 - Personnel required for the 10 year analysis
 - Capital Projects
 - Construction equipment
 - Inflation
 - Uncollectibles
 - Revenue adjustments
 - Credits



Next Steps

Next Steps

- Stormwater Regulations Board – Educational Sessions, March & April 2018
- Administration Review
- Stormwater Regulations Board – Rate Study Presentation
- City Council Review



Appendix C - Policy Paper # 1 – Data Collection Questionnaire

City of Chattanooga
Department of Public Works
Water Quality Program Rate Study
Level and Cost of Service Update
Contract S-16-010



Data Request Questionnaire

Prepared by:



March 29, 2017

POLICY: WATER QUALITY PROGRAM DATA REQUEST QUESTIONNAIRE

I. PROJECT OVERVIEW AND PROJECT SCOPE OF WORK SUMMARY

The HDR and Environmental Rate Consultants, Inc. (ERC) (The HDR/ERC Team) have been retained by the City of Chattanooga to perform a water quality program “rate study analysis” that will encompass developing a business plan and approach, reviewing and defining several levels of services and calculating the corresponding costs of services. This will be referred to as the “rate study project” for the public works department water quality program. The purpose of this document is:

- To document the means that the HDR/ERC Team is using to collect all of the data necessary to perform the rate study project;
- To provide a quick summary and understanding of the “rate study project” that can easily be forwarded to other city departments and staff members that are not closely involved with the rate study project;
- To convey an explanation and information including examples of the data and material the HDR/ERC Team is requesting to accurately perform the rate study;
- To introduce the water quality project “data request questionnaire” the HDR/ERC team is using as the instrument to identify, organize and track the minimum data needed to perform the rate study project.

The following is a summary of the scope of work and the **data request questionnaire is included in Appendix A** and examples of the **type of data** requested is provided in **Appendix B**.

A. Basic Scope of Services

Task 1 – Project Management. The purpose of this task is to manage the overall project.

Task 2 – Create a Water Quality Technical Advisory Committee (WQTAC). The purpose of this task is to organize and create a Water Quality Technical Advisory Committee (WQTAC) consisting of critical staff members and the HDR/ERC consultant team and possibly an elected official or representative from the administration. The WQTAC will develop draft water quality program policies to be reviewed as part of the additional services tasks 14 – 18 below, that will review and provide recommendations to the Elected Officials.

Task 3 – Data Collection. The purpose of this task is to identify, determine and collect all technical/engineering, financial and other relevant, pertinent data for the rate study. This Policy Paper # 1 is the document and tool used by the HDR/ERC Team to collect the appropriate data for the rate study project.

Task 4 – Water Quality Strategic Business Plan. The purpose of this task is to revise the previously developed long-term strategic business plan which includes goal statements that define the various levels of services, thus forming the basis for the legally defensible water quality program cost of service analysis, the cash flow analysis and the final recommended water quality rates and revenues.

Task 5 – Current Level and Cost of Service Analysis. The purpose of this task is to identify and determine the “current” level of service and cost of service analysis being performed by the city water quality program based on the business plan goal statements and current water quality budget. The current level of service is critical to establishing the basis and starting point for the “required minimum” and “future” (desired) levels of service that result in the basis for legally defensible water quality rates.

Task 6 – Required Minimum Level and Cost of Service Analysis. The purpose of this task is to perform a comprehensive “required minimum” level and cost of service analysis consistent with the water quality program mission statement and goal statements defined in the business plan revision process.

Task 7 – Rate Study Analysis. The purpose of this task is to perform and calculate the revenue levels and project revenue requirements for the five-year period (2018 through 2022) based on the various levels of service and various costs of service analyses performed and based on the goal statements defined in the revised business plan.

Task 8 – Cash Flow Analysis. The purpose of this task is to incorporate the business plan goal statements, the defined levels of services, the calculated costs of services and rate study revenue estimates, and calculate multiple cash flow analyses. The cash flow analysis will be developed in a user- friendly Microsoft Excel™ computer rate model.

Task 9 – City Council Meeting and Briefings. The purpose of this task is to meet with City Council members and the administration to review and solicit comment and input regarding the WQTAC draft results of the cash flow and rate study analyses recommendations prior to rolling the program out to the general public for review and input.

Task 10 – Final Report. The purpose of this task is to document the results of the overall study.

B. Additional Scope of Services (only enacted upon written approval)

Task 11 – Storm Water Program Comparison. The purpose of this task is to collect and review previous and pertinent City of Chattanooga water quality studies, research other stormwater programs in the State of Tennessee, and compare to the Chattanooga water quality and water quantity program.

Task 12 – Bonding and Debt Analysis. The purpose of this task is to work with city staff to review the current water quality debt financing program and the evaluate the feasibility of any future potential bond and debt financing for the water quality program based on reasonable debt financing assumptions meeting any and all city and outstanding bond covenants and standards.

Task 13 – Regulatory Compliance and Analysis. The purpose of this task is to review the nature and extent of current and future Federal, State of Tennessee and local regulations and their impact on stormwater quantity and quality and the overall water quality program and the development community.

Task 14 – Communications Plan and Comment Management. The purpose of this task is to develop a clear and concise communications plan to inform, educate and generate public support for the overall water quality program using project branded materials.

Task 15 – Social Media Strategy. The purpose of this task is to develop and manage social media channels and develop social media content from written approval of this supplemental task for a period up to one year.

Task 16 – Online Meeting. The purpose of this task is to create and produce an online complementary tool for the study's in-person meetings.

Task 17 – Focus Group #1 (Residential) The purpose of this task is to develop a comprehensive understanding of residential ratepayers' perspective on current and proposed water quality rates, level and cost of service.

Task 18 – Focus Group #2 (Business) The purpose of this task is to perform and develop a comprehensive understanding of business ratepayers' perspective on current and proposed water quality rates, level and cost of service.

This is the first policy paper in a series of policy papers that will identify and document the process and approach for the rate study project and will begin to establish the necessary legal documentation and basis for the water quality program rate study. The policy papers are also intended to:

- Provide guidance for the rate study analysis project approach and process;
- Establish and document the formal decision making process and body, a Water Quality Technical Advisory Committee (WQTAC) comprised of the city staff, HDR/ERC Team **and possibly a member from city council and/or a representative from the administration (appropriate after WQTAC meetings 1 & 2)**;
- The WQTAC will develop draft policies and achieve consensus regarding program decisions and solicit input from the Elected Officials prior to soliciting input from the public as part of the additional scope of services;
- The WQTAC members will review, discuss and document each policy paper and provide the policy paper topic and information to other members of their department and/or agency they are representing for further review, discussion, input and consensus;
- The WQTAC members will establish the necessary documentation for any future litigation matter as it relates to the rate study project.

Each of the policy papers will be developed by the HDR/ERC team, emailed to the WQTAC members prior to each WQTAC meeting and will be presented and discussed to solicit input from each WQTAC member.

The first step in performing the rate study analysis project is to request and collect all of the required data as follows:

II. PURPOSE

The purpose of the data collection questionnaire is to identify, organize and collect the necessary and mandatory data the HDR/ERC Team will need to perform the water quality program rate study and analysis. The HDR/ERC Team is relying on the two organizational charts provided by the water quality staff to outline the following departments financial/technical and administrative data required for the rate study including:

- Public Works (PW)
- Engineering
- Water Quality
- City Wide Services (CWS)
- Economic & Community Development
- *Water Quality Staff can provide/add additional departments and agencies that have a major and/or minor role with stormwater (water quality and water quantity) activities and costs.*

III. QUESTIONNAIRE

Please refer to the questionnaire document included in Appendix A for the information and data needed by the HDR/ERC Team.

The following are examples of the cost information the HDR/ERC Team is attempting to collect:

1. Labor / Staff - (assuming this personnel information is not specifically included in the budget documents) the following is an example on the personnel information the Team will need:
 - a. An estimate of the total number of hours each employee spends performing water quality and water quantity activities on an annual basis. There are several water quality and water quantity related activities that may be performed in the City of Chattanooga such as those in the example list below. An example of what information is needed is shown in Appendix B with the crew configuration (such as one supervisor, two laborers and one heavy equipment operator). Provide the number of times the activity is performed annually (clean catch basins four times per year), and how many hours are spent performing the activity annually (eight hours per day, two days per week for ten weeks each year). If possible, provide the equipment that is used to perform the activity (one ½ ton pickup, one end loader, one backhoe, street sweepers, etc.).
 - i. Catch basin cleaning, repair or replacement;
 - ii. Ditch, Stream and/or River cleaning/clearing;
 - iii. CCTV the system;
 - iv. Green BMP infrastructure implementation;
 - v. Green BMP infrastructure maintenance;
 - vi. Street sweeping and any associated dumping fees;
 - vii. Any MS4 permit activities performed and paid for locally;
 - viii. Retention/Detention basin maintenance, cleaning or mowing;
 - ix. Storm sewer installation, inspection, repair or cleaning;
 - x. Outfall inspection and maintenance;
 - xi. Culvert inspection, cleaning, maintenance or repair;
 - xii. Water quality and/or Economic and Community Development / site plan review;
 - xiii. Land Development Office activities;
 - xiv. Management and Administration of the program;
 - xv. Engineering studies and design;
 - xvi. High water response or inspection;
 - xvii. Taking and documenting flooding or drainage complaints;
 - xviii. Website updating (stormwater page(s));
 - xix. GIS storm sewer system and outfall mapping;
 - xx. Drainage or watershed studies;
 - xxi. Septic tank inspections, etc.

The above list is not intended to be all inclusive and is not an exhaustive list of activities. The City of Chattanooga Staff should add and/or remove activities that fit what water quality services the City is currently providing and populate a separate list of water quality activities that the City would like to provide in the future.

- b. The next step will be to segregate the estimated total hours each employee spends performing the activities into water quality versus water quantity activities.
- c. The HDR/ERC Team will ultimately develop a two component rate, a water quality rate and a water quantity rate.
- d. The HDR/ERC Team will utilize an agreed upon percentage of labor cost for equipment use (maintenance, fuel and depreciation) to account for equipment costs unless the city would prefer an actual calculation. If so, all equipment costs will need to be provided by city staff for the rate study project.
- e. The HDR/ERC Team will utilize an agreed upon percentage of labor cost for office overhead (space, computers, copy machines, insurance, office supplies, etc.) to account for these costs, unless the city would prefer an actual calculation. If so, the office overhead charges will need to be provided by city staff for the rate study project.
- f. The HDR/ERC Team will utilize an agreed upon percentage of hourly rates or salaries to calculate fringe benefit costs unless the city prefers to use the actual fringe benefit costs. If so, the city will need to provide the actual fringe benefit cost per employee for the rate study project.
- g. **An example of the cost information** required if actual costs are preferred versus the percentage based on labor:
 - i. Copies of all Water Quality Utility leases, contracts, loans etc. for any utilized space, vehicles, machinery or equipment, if applicable.
 - ii. A complete list of Water Quality Utility vehicles, machinery and equipment. Percentage of use for Water Quality if shared with other departments.

IV. WQTAC ACTION:

Approved: _____ Date: _____

V. APPENDIX A

The HDR/ERC Team is requesting a copy of the information listed below. The City should make available a copy of any existing reports, databases, and drawings relevant to the water quality program including:

1. City Organizational Chart

Status: The HDR/ERC Team had received two organizational charts. The HDR/ERC team encourages City staff to please review the two organizational charts already provided, to make sure these organizational charts accurately depict the current city wide organization and the water quality and related organizations including the number of personnel assigned to each department, etc.

2. Provide any existing reports, databases, drawings, newspaper articles, newsletters, neighborhood information or other information necessary to understand the issues, problems, and opportunities of the City water quality (stormwater) program.

3. Please list all other departments that perform any stormwater related activities and responsibilities as follows:

- a. Public Works (PW)
- b. Engineering
- c. Water Quality (K70101 = 27, K70104 = 96, K70105 = 12, K70106 = 15, K701107 = 1)
- d. City Wide Services (CWS)
- e. Economic & Community Development
- f. Water Quality Staff can provide/add additional departments and agencies that have a major and/or minor role with stormwater (water quality and water quality) activities and costs.
- g. Provide the salaries or hourly rates, fringes, equipment, material and supply estimates and/or costs, etc. associated with the employees from these departments. Actual salaries are NOT needed if this a sensitive issue. We can use generic classification or average salaries for the analysis.**

4. Fiscal year 2013, 2014, 2015 Water Quality Utility line item budget and actual results in digital format for item 3 above. It is assumed there are budgets for each of the water quality operating cost centers outlined on the Engineering/water quality flow chart (organization chart previously provided to the HDR/ERC Team). If so, please provide each cost center detail.

5. Fiscal year 2016 Water Quality Utility line item budget and year-to-date actual budget results in digital format for item 3 above.
6. Information for item 3, 4 and 5 above if applicable, is as follows:
 - a. Crew configurations
 - b. Salaries and/or salary classifications
 - c. Equipment (both dedicated and part-time)
 - d. Work Order information (digitally)
 - e. Types of maintenance activities and frequencies
 - f. Types of maintenance not being performed but should be
7. 2013, 2014, 2015 and 2016 NPDES Phase I permit plan and annual reports in digital format.
8. 2017 NPDES Phase I permit plan in digital format.
9. Digital copy of Water Quality Master Plan (if applicable).
10. Bond covenant and bond amortization schedule for all Water Quality Utility bonds.
11. Projected bonds and projected bond terms for any new bonds to be issued from 2017 – 2025, if applicable.
12. Current Capital Improvements Plan with itemized and prioritized list of projects by name by cost estimate by year if applicable.
13. Projected Capital Improvements Plan with projected projects for years 2017 – 2025, with itemized and prioritized list of projects by name by cost estimate by year if applicable.
14. Projected need for new vehicles, machinery or equipment between 2017 – 2025 including the projected cost and how the asset will be paid for (cash, lease, loan etc.).
15. A breakdown of all Water Quality Utility revenue sources for 2013 – 2016 and a projection of the same for 2017 – 2025.
16. Digital copies of Water Quality Utility work orders for 2013 – 2016 including the responsible department, the number of hours, the equipment or vehicles used and the completion date.
17. Copy of 2017 property tax billing database file (digital format) including the parcel ID number, the water quality amount billed, the water quality amount past due and the total water quality amount due.
18. Copy of the most recent City of Chattanooga aerial photography.
19. Copy of the most current GIS parcels shapefile (layer).
20. Copy of the most current GIS impervious area measurement shapefile (layer).
21. Copy of the most current GIS address point file (layer).
22. The actual number of ERUs billed in 2013, 2014, 2015 and 2016.

23. The projected number of ERUs to be billed in 2017 – 2025 and the estimated growth projections for the city and/or the source of the growth estimate projections.
24. A complete file containing all properties that are receiving a Water Quality Utility discount or credit including the percentage discount or credit by parcel ID number, and a description of the discount or credit.

VI. APPENDIX B

The following is a list of **Examples Activities**. The City of Chattanooga Staff should add and/or remove activities that fit the water quality services the City is currently providing. Future water quality activities should be broken out in a separate list. This list includes Water Quality or Water Quantity Program Activities and information the HDR/ERC Team needs by crew configuration and/or activity. The intention is to list the activities included in the water quality program and rate that provide water quality program service. The list is intended to illustrate the type of cost information requested for the rate study but is NOT intended to be all inclusive or exhaustive:

1. Ditch Maintenance Crew

- ◆ Operator
- ◆ Driver
- ◆ Tech
- ◆ Laborer
- ◆ Need hourly rates for each classification above. Will use 50% for benefits cost factor
- ◆ Need time/ hour estimate for this activity for the year

2. Preventative Maintenance Crew

- ◆ Operator
- ◆ Driver
- ◆ Tech
- ◆ Laborer
- ◆ Need hourly rates for each classification above. Will use 50% for benefits cost factor
- ◆ Need time/ hour estimate for this activity for the year

3. Rodding and Vacuum Crew

- ◆ Operator
- ◆ Driver
- ◆ Tech

- ◆ Laborer
- ◆ Need hourly rates for each classification above. Will use 50% for benefits cost factor
- ◆ Need time/ hour estimate for this activity for the year

4. Street Sweeping Crew

- ◆ 1 Operator Full Time
- ◆ Street Sweeper

5. Vegetation Spraying Crew

- ◆ 1 Operator Full Time
- ◆ Street Sweeper

6. Masonry Crew

- ◆ Operator
- ◆ Driver
- ◆ Tech
- ◆ Laborer
- ◆ Need hourly rates for each classification above. Will use 50% for benefits cost factor
- ◆ Need time/ hour estimate for this activity for the year

7. Mowing Crew (March through October)

- ◆ 6 Laborers
- ◆ 8 mowers
- ◆ Need maintenance and fuel costs for 8 mowers

8. Beaver Control

- ◆ 2 Laborers

- ◆ Driver

9. Fire Department Spill Response

- ◆ Operator
- ◆ Driver
- ◆ Staff
- ◆ Need hourly rates for each classification above. Will use 50% for benefits cost factor
- ◆ Need time/ hour estimate for this activity for the year

10. BMP Pilot Program

- ◆ Operator
- ◆ Driver
- ◆ Tech
- ◆ Laborer
- ◆ Need hourly rates for each classification above. Will use 50% for benefits cost factor
- ◆ Need time/ hour estimate for this activity for the year

11. NPDES Biological Monitoring/Sampling Program

- ◆ Operator
- ◆ Driver
- ◆ Tech
- ◆ Laborer
- ◆ Need hourly rates for each classification above. Will use 50% for benefits cost factor
- ◆ Need time/ hour estimate for this activity for the year

12. CRS Program

- ◆ Operator

- ◆ Driver
- ◆ Tech
- ◆ Laborer
- a. Need hourly rates for each classification above. Will use 50% for benefits cost factor
- b. Need time/ hour estimate for this activity for the year

13. Floodplain Preservation Program

- ◆ Operator
- ◆ Driver
- ◆ Tech
- ◆ Laborer
- ◆ Need hourly rates for each classification above. Will use 50% for benefits cost factor
- ◆ Need time/ hour estimate for this activity for the year

14a. TV Rodding / Camera Crew

- ◆ 2 traffic control Tech I – Laborers

14b. TV Rodding / Camera Crew

- ◆ 3 Tech II's (1/2 the time supporting sewer District work)
- ◆ 2 traffic control Tech I - Laborers

15. General Stormwater Maintenance

- ◆ 1 Tech III
- ◆ 1 Tech I - Laborer
- ◆ Need maintenance and fuel costs for general maintenance equipment
- ◆ Need equipment used with this crew - Pickup truck?

16. Flood Events (# events per year at a week per event)

- ◆ 15 street employees full time
- ◆ 4 Tech III's run backhoes etc
- ◆ Need maintenance and fuel costs for the flood events equipment
- ◆ Need hourly rates

17. Culvert Crew

- ◆ 2 Operator's with backhoe (\$16.00 per hour base rate)
- ◆ 2 Drivers / Laborers with various trucks (\$14.00 per hour base rate)
- ◆ Currently 1 event per month
- ◆ 3 per week in the past
- ◆ Need revised rates for each classification above. Will use 50% for benefits cost factor
- ◆ Need time/ hour estimate for this activity for the year
- ◆ Need costs of material including the culvert
- ◆ Need maintenance and fuel costs

18. Pipe Crew

- ◆ 2 Operator's with backhoe (\$16.00 per hour base rate)
- ◆ 2 Drivers / Laborers with various trucks (\$14.00 per hour base rate)
- ◆ Number of projects per month, per year
- ◆ Need revised rates for each classification above. Will use 50% for benefits cost factor
- ◆ Need time/ hour estimate for this activity for the year
- ◆ Need costs of material including the pipe
- ◆ Need maintenance and fuel costs

19. **Public Works Director “Example”** and/or clerical/administrative staff (40% Water quality (of the 40% (60% permit 40% drainage)
 - ◆ Need vehicle maintenance and fuel costs

20. **Assistance Public Works Director “Example”** (25% water quality) of the 25% (10% permit 90% drainage)
 - ◆ Need vehicle maintenance and fuel costs

21. **Street Superintendent** (50% water quality) of the 50% (100% drainage)
 - ◆ Need vehicle maintenance and fuel costs

22. **Street Foreman** (50% water quality) of the 50% (100% drainage)
 - ◆ Need vehicle maintenance and fuel costs

23. **GIS Technician** (20% water quality annually)
 - ◆ Need Hourly rate and benefits

24. **Need landfill dumping charges for street sweeping**
 - ◆ Annual dumping fee of \$000.

Appendix D - Policy Paper # 2 – Strategic Business Plan

City of Chattanooga
Department of Public Works
Water Quality Program Rate Study
Levels and Costs of Service Update
Contract S-16-010



Business Plan

Prepared by:



March 18, 2018

1. Introduction

This strategic business plan is part of the process of assuring and maintaining the legally defensible basis for the City of Chattanooga Water Quality Program (WQP). This document represents the initial steps in determining the three levels of service for the future water quality program, including:

- Defining the “current” level of service based on the current budget;
- The “required minimum” level of service that will represent the next five years of the water quality program (FY - 19 through FY - 23); and
- The “desired/future” level of service that represents the water quality program (FY - 24 through FY - 28) levels of service and costs of service analyses.

Once this process is finalized, City staff can use the information contained in this document as an on-going water quality management tool. As with our previous level of service cost of service analysis project with the City of Chattanooga (2007 thru 2009), our team recommends we create an internal decision making committee called the Water Quality Technical Advisory Committee (WQTAC) comprised of City staff, the consultants and ideally an elected official that can attend all of our WQTAC meetings. Furthermore, we also recommend additional comments and input from the City of Chattanooga citizenry through the Water Quality Advisory Committee (WQAC) comprised of a cross section of the general public and social media outreach. Discussing, understanding and reaching consensus on the content of this document, along with the information from all of the consultant team’s previous projects will accomplish this objective. This “revised” (revised and updated from the previous rate study process in 2007 and 2009) business plan includes goal statements that establish the definition for current and future responsibilities and activities that equate to costs of providing those services for the WQP for the ten year period. There are also goal statements representing what the WQP will not provide.

Discussions with City staff regarding the business plan will assist in evaluating current practices, procedures, policies and staffing necessary to meet the future needs of the program for the next ten years.

The major steps are as follows:

- Utilize the approved 2016 Department of Public Works WQP strategic plan, mission and vision statements, the values and core services, goals and performance measures and plans (taken directly from that document) that will guide our process and approach to revising and updating the existing WQP.

- Develop a series of goal statements to support and enhance the goal statements in the approved 2016 Department of Public Works WQP strategic plan mission and vision statements, the values and core services that will be the basis for the goal statements developed by the consultant team. The goal statements are the prime targets that you wish to accomplish within a specified time frame. The goal statements are the basis for and create the levels of service for the water quality program.
- Take measures to ensure that the WQTAC understand and accept the goal statements developed for the WQP strategic business plan.
- Take measures to ensure that the Stormwater Board understand and accept the mission and goal statements developed for the WQP.
- Take measures to ensure that the City Council understand and accept the goal statements developed for the revised WQP.
- Take measures to ensure that the general public understand and accept the goal statements developed for the WQP.
- Periodically evaluate the plan and the goals and make any necessary adjustments based upon the WQP.
- City Staff will review, discuss, and revise the following information to accurately describe the water quality (stormwater) program actions and goals.

2. Water Quality Program Mission Statement

The City of Chattanooga needs a foundation from which they can develop an approach to address the responsibilities and activities (the management) of water quality (stormwater) issues throughout the City. This foundation will be accomplished by utilizing the existing sound and meaningful mission statement. A mission statement provides a clear and complete summation of the comprehensive view of what needs to be accomplished. A good useful Mission Statement will provide the following:

- Purpose - Why the organization exists, and what it seeks to accomplish.
- Business - The main method or activity through which the organization tries to fulfill this purpose.
- Values - The principals or beliefs that guide the organizations and its members as they pursue the organization's purpose.

The following is the current WQP and Public Works Mission and Vision Statements from the City website and “City of Chattanooga Department of Public Works Strategic Plan FY 2017 – 2020 | Justin Holland, Administrator”:

Mission

To preserve and enhance the quality of the physical environment and infrastructure through prompt, cost effective and courteous delivery of services which protect the health, safety and welfare of all citizens and visitors.

Vision

Be a world-class public works department supporting our employees and our community with integrity and excellence.

Values

Safety, People, Excellence, Service, and Accountability.

I. Safety

We believe no job is so important that it cannot be performed safely. We will ensure that the safety and health of our employees and community is the first priority.

II. People

Our citizens are our customers. We also believe people are our most valuable resources. We will embrace innovation, invest in our employees, reward excellence, and partner with our communities to improve our city.

III. Excellence

We believe in doing it right the first time. We will be well organized to provide quality services and products efficiently and effectively.

IV. Service

We believe public service is the highest calling. We will maximize the capabilities of our resources to respond to the community’s needs promptly and effectively.

V. Accountability

We believe in being accountable for all public funds. We will hold ourselves accountable to the highest standards, work to earn and maintain the public’s trust, and be transparent.

Overall Public Works Goals (note: The goal statements below are the overall Public Works Goals. This Policy Paper #2 will develop specific goals and objectives for the WQP for developing the Level and Cost of Service for the WQP).

Water Quality is one of the six core services with the purpose to “Implement NPDES environmental mandates; manage surface water quality, flooding, and pollution related to urbanization of watersheds”.

Goals

(Note: The goals that follow are the overall goals of the Public Works Department and represent the basis for the operation of the Department. This Policy Paper will also develop several goals that are specific to the WQP for the City of Chattanooga. The purpose of these goals is to develop the basis for the Level and cost of Service for the City of Chattanooga WQP)

- I. Innovate
Create efficiencies, reward excellent performance, reduce costs, improve effectiveness, leverage technology, and research and explore possibilities.
- II. Manage Risks
Encourage and promote control measures to reduce negative consequences and increase safety in all operations.
- III. Promote Teamwork
Invest in the workforce, encourage collaboration, strengthen community relationships, and build partnerships.
- IV. Improve Customer Service
Ensure every customer interaction is positive by responding promptly, with cost effective solutions and service. Improve customer service with quality assurance and quality control programs.
- V. Promote Public Works
Promote the importance of our services and the impact that these services have throughout the community.
- VI. Ensure Sustainable Practices
Ensure an appropriate balance between the environment, the community, and fiscal responsibility in all operations and practices. This includes maintaining total compliance with all environmental and facility permits and requirements.

Performance Measures and Plans

The City of Chattanooga Department of Public Works Strategic Plan also provides performance measures and plans as follows:

- I. Effectively manage stormwater drainage system.
Evaluate, maintain, and develop drainage systems using sustainable practices.
- II. Manage surface water quality.
Analyze and develop strategic plans and processes to monitor and improve surface water quality.
- III. Increase educational outreach effectiveness.
Increase training and outreach opportunities by targeting audiences with appropriate activities.

3. Water Quality Program WQ Process

The following is the beginning of the development of goal statements for the City of Chattanooga WQP that will be used as the basis for defining the stormwater levels of service. The statements listed in this section of the document may or may not accurately represent the WQP as it exists today. There may be additional statements and action items that will be modified and added to the business plan and study throughout the process and as the study progresses. The purpose of this Policy Paper is to stimulate discussion that will lead to a level and cost of service.

The last full rate study was completed in 2007. As the WQP and initiatives have matured over time, the WQP has become costlier. City administrators and elected officials find themselves needing to evaluate operating costs, investments in capital improvements and other program elements. With this business plan document the consultant team, in conjunction with City staff, will develop a detailed written review and update of the WQP level of service / cost of service analyses, resulting in legally defensible WQP rates.

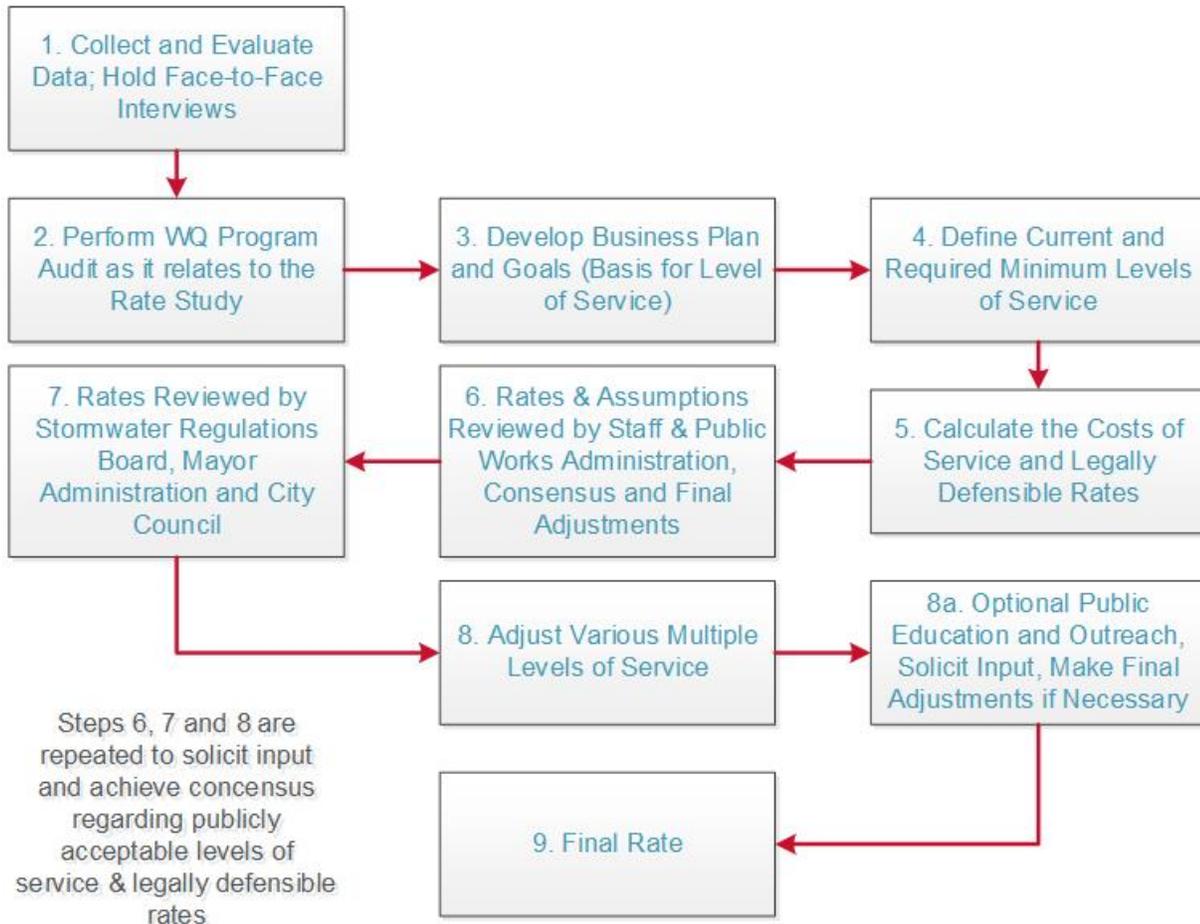
The consultant team will then compare these rates to other Tennessee NPDES Phase 1 programs, and for the next 10 years, identify and:

- Explore other financial tools;
- Review operations and maintenance programs;
- Review existing and potentially new initiatives; and
- Compile the needed data through customer outreach initiatives.

The business plan and rate study process will result in the next ten years segregated into two five year projections including;

- The required minimum level of service / cost of service first five years of the program, (FY – 19 through FY – 23) and
- The next five years level of service / cost of service future/desired program (FY – 24 through FY – 28) the second five years of the ten year analysis.
- Pertinent notes for the rate study: The updated FY – 19 WQP rates will be billed in October 2018 and so on. (Fiscal Year = July 1 through June 30).

The consultant team Business Plan approach to developing WQP rates is outlined using the following graphic:



The Business Plan approach uses the 7 steps illustrated above with steps 5, 6 and 7 repeated as needed to solicit input to achieve consensus on the final WQP. A summary of the process is provided below:

Step 1

Collect all the appropriate data included in Data Request Questionnaire Policy Paper 1 (under separate cover). Utilize the data as the basis for the face to face interview meetings with all department heads and staff that have some or any water quality responsibility.

Step 2

Perform the program audit and gap analysis that identifies the current level of service and deficiencies.

Step 3

Develop the Business Plan Policy Paper 2 document that establishes the basis for the overall level of service / cost of service analysis and rate study.

Step 4

The initial level of service will be developed in conjunction with Chattanooga WQP management and staff using the mission statement and goals developed in the Business Plan. Alternative levels of service will be developed to reflect the various scenarios that face the City.

Step 5

For each level of service the cost of service will be determined. These costs will be based on historical changes, the team's experience, current research, and consultation with City management and staff. Rates will then be developed using the ERC Rate model.

Step 6

The rates will be reviewed by the WQP staff, Public Works Administration to reach a consensus and final recommendation to the City Administration.

Step 7

The WQTAC will educate the Stormwater Regulations Board, City Council and the Administration regarding the WQP rate study process before the results are shared. Once the recommended results are reviewed and approved by the City Administration, the results will be presented to the Stormwater Regulations Boards and later to City Council for consensus, adjustments and finalization.

Step 8

The result of Step 7 will be the adjustment of the level of service, cost of service and rates as the balance of program expectations take place. This iterative process is part of the natural process of program development. Steps 6, 7 and 8 will be repeated to obtain a balance of service, costs and community expectations.

Step 8a

A public outreach campaign will be established based on recommendations from the Administration and City Council.

Step 9

Establish final rate.

4. Water Quality Program Goals

The following goal statements are critical to the understanding of the existing program level of service as well as the development of the desired level and cost of service. The goal statements are organized into groupings based on the Engineering / Water Quality Flow Chart and the Water Quality Operating Cost Centers of the City of Chattanooga WQP.

Please refer to the three organizational charts provided as appendices of this document:

- Appendix A - Organizational Chart 1 represents the overall City of Chattanooga Organization,
- Appendix B - Organizational Chart 2 provides the Engineering/Water Quality organizational structure and lastly,
- Appendix C – Organizational Chart 3 provides the Land Development Office Organization.

These charts are being used by the consultant team for developing the remaining sections and “goal statements” of this paper and the draft Goal Statements.

5. TECHNICAL

A. The purpose of the following information is to outline, identify and develop the necessary resources of program budgets, personnel, and equipment to meet the demands of the water quality and water quantity aspects of the program

I. **Public Outreach** - Cost Center K70107.

According to the City’s Website the Public Outreach program includes the following:

- Frequently asked questions and answers
 - Social Media networking (Facebook, Twitter, other social media)
 - Resource Rain (Green Grants)
 - Green infrastructure
 - SWEEP (Stormwater Enhancement and Education Program)
 - Development regulations and permits / Rainwater Management Guide
 - Credits and incentives
 - Hotline 311 call center
 - Integration with local TMDL's
 - Create a revised Frequently Asked Questions (FAQ's) and will work with City Staff to post the FAQ's on the City website to clarify this level of service costs of service rate study project.
 - NPDES mandated education
- II. Implement the following **new or enhance the existing** public outreach program activities in addition to the above existing activities as outlined below (Please update/edit/revise this list):
- Create a revised Frequently Asked Questions (FAQ's) and will work with City Staff to post the FAQ's on the City website to clarify this level of service costs of service rate study project.
 - Create a storm water program billing stuffer to be mailed to all customers sometime prior to mailings of the revised water quality rates that will be implemented as a result of this project.
 - If authorized, the consultant team will make a presentation to the elected officials with the results of the overall program and project.
 - If authorized, the consultant team will provide Online Meetings
 - If authorized, the consultant team will coordinate Focus Groups for Residential & Business groups.
- III. **Water Quality Administration** - Cost Center: K70101 WQ Inspections / Monitoring, WQ Design
- a) **Water Quality Inspections** (*Staff responses in italics*)
- Inspect industrial facilities
How many facilities involved / how many facilities per day / week / month?

0.25 ile grid / Twice per Permit Term

- Post construction stormwater infrastructure (including green infrastructure for continued compliance and recurring maintenance). Do you inspect these structures? How many how often? Who does the plan reviews for new structures?

See Owner / Operator Inspections in permit – inspections by owners once every 5 years at a minimum by engineer or landscape architect with documentation – Maintenance agreement required.

- Will the review and revision of the Post - Construction Site Runoff ordinance be necessary? Who will perform over what period of time?

See Owner / Operator Inspections in permit – inspections by owners once every 5 years at a minimum by engineer or landscape architect with documentation – Maintenance agreement required

- Will it be necessary to review, revise and update the existing (storm water) **design manual regulations (Rainwater Management Guide)** to meet the requirements of the EPA NPDES Phase I program? Who will perform? How long will it take?

It may be necessary to revise based on the results of the South Chickamauga Creek TMDL Issue (Policy Paper #5)

- Will there be a need to revise strategies for structural and/or non-structural BMP's? Who will perform over what time? How much time by who is spent reviewing plans and inspection of BMP's?

It may be necessary to revise based on the results of the South Chickamauga Creek TMDL Issue (Policy Paper #5)

- Who performs the single family residential detention pond program for long term inspections, plan review and maintenance of controls for water quality facilities? How many Facilities are affected? What is the cost for those elements? Is there a GIS layer available for these facilities?

The changes to how the City management maintenance of single family residential detention ponds have been included in the rate model. The rate model assumption details the new program called Stormwater Education and Environmental Program (SWEEP).

For privately owned single family detention ponds: See Owner / Operator Inspections in permit – inspections by owners once every 5 years at a minimum by engineer or landscape architect with documentation – Maintenance agreement required. No GIS Layer.

- Do you expect the water quality inspection program for the storm water conveyance system to increase? By how much and who will perform the effort?

Add Additional costs to rate model.

- The WQP will not assume responsibility for components of the storm sewer system that are outside the road right-of-way, but will conduct maintenance and capital improvement projects to minimize or eliminate drainage and/or flooding problems.

Yes this is a true statement, except for WPA ditches.

- Do you have an integrated pesticide/herbicide management program? Who performs this task and how many hours are needed?

This task is performed by an outside contractor. Annual cost are included in the rate model.

- Apply herbicide, at least twice a year, for weed and aquatic growth control. Is this true?

Yes.

- TMDL's - Develop a plan to link the above listed MS4 activities, management practices and controls to TMDL's streams that the City drains. Has this been done? What role does the City of Chattanooga play in this program? How many TMDL's are in Chattanooga? Are they mapped in GIS?

See TMDL Policy Paper 5.

b) **Water Quality Monitoring** - Cost Center: K70101 –

- Monitoring mandated by the City's NPDES permit # TNS068063
 - a. # of personnel involved. *For the number of personnel see rate database.*
 - b. # of Monitoring points, are they shown on GIS? How often monitoring sites visited? *This information is not in GIS, 5 land use types.*

- Smoke testing – Is this a regular operation or only in location of problem areas? - # of personnel involved? Will you need to review and revise Illicit Discharge and Detection Elimination (IDDE) ordinance? Who will perform?

Period smoke testing is performed for specific problem areas.

- Do you have an integrated storm water management system using GIS and an MS4 Geographic Information package? This could involve developing an integrated system map, asset management, and a maintenance management and work order system. The LOS GIS Map recommended in this scope is a start.

No – this is an important need. An assessment of the Water Quality GIS Need? Add Additional costs to rate model

- Do you have a Water Quality system model that serves as both a quantity and quality analysis tool?

We have separate Water Quality and Water Quantity models.

- Do you have a plan to investigate, trace, and analyze IDDE incidents as well as detect and address non-storm water discharges, including illegal dumping into the MS4?

Yes see MS4 Permit.

- Do you educate Public Works employees, businesses, and the general public about the hazards associated with illegal discharges and improper disposal of waste? How?

Yes, through the City's web site.

Such as: <http://www.chattanooga.gov/economic-community-development/neighborhood-services/code-enforcement/report-code-violations>

<http://www.chattanooga.gov/public-works/water-quality-program/44-public-works/710-main>

- Have you developed appropriate best management practices for IDDE?

Yes

- Regulations - Review, revise and update as necessary, the regulations and design manuals to meet the requirements of the EPA NPDES Phase I program.

It may be necessary to revise based on the results of the South Chickamauga Creek TMDL Issue (Policy Paper #5)

- c) **Water Quality Engineering** - Cost Center: K70106 - Note: includes 311 inspections, Design, Engineering & Survey)

- 311 Citizen Service Requests – Included in Work Order Policy Paper 3
See this website: <http://www.chattanooga.gov/311>

Calls are received by 311 service operators and placed and if valid a service request (SR) entered into the tracking system. From there depending on the topic of the request the appropriate department takes the lead on investigation or action. For example, leaf or bulk trash pickup is directed to City Wide Services, or if the call is regarding flooding or water quality it is directed to Water Quality Engineering for investigation. Ultimately the SR is either addressed directly, converted into a Work Order or possibly built into a Capital Project.

- Drainage investigations & design associated with Citizen Service Request.
- Will requirements of the Construction Site Runoff Program be reviewed and revised during the next five years? (Note: this is not just for Private Development but for all Public construction)

It may be necessary to revise based on the results of the South Chickamauga Creek TMDL Issue (Policy Paper #5).

- Site plan review procedures for water quality impacts. How many new and redevelopment reviews per year?

See LDO Policy Paper No. 6.

- Provide details and information regarding the issuance of the current Rainwater Management Guide, Resource Rain.

New policies, ordinances, and codes relating to rainwater management and water quality are in effect as of December 1, 2014 for the City of Chattanooga to comply with the provisions of the NPDES MS4 Permit from the state of Tennessee.

- Is there education and training of contractors and engineers as well as public employees, businesses, and the general public concerning Construction Site Runoff Control and service requests? Who performs this function?

Yes – Land Development office.

- d) **Design** - Cost Center: K70106 – For number of personnel / Salary / Fringe of each see the staffing information gathered as part of the TAC 2 meetings.

- Modeling -
 - ✓ Is modeling performed In-house?
 - Yes
 - ✓ Water Quality & Water Quantity?
 - Both
 - ✓ How many? How often? Do you do this for each development review?
 - Yes, modeling performed for every development.
- Design – Is design performed In-House? How many per year?

Yes, approximately 25 per year

 - ✓ Management of Consultant Design Contracts? How many per year?
 - Yes, approximately 5 per year.
 - ✓ Cost Estimates – Perform in-house construction cost estimates for every project? Yes, and we check consultant estimates?
 - ✓ Permitting for Capital Projects – Is this performed in-house or performed by consultants?
 - ✓ Large capital projects needed to coincide with other City improvements & address sewer separation and flooding:
 - a. Central Ave Area near Erlanger Hospital
 - b. Patton Parkway Improvements
 - c. Others?

- e. **Assistant City Engineer -EG** - Cost Center: K70101 – K70106 Goal: Related geographic information services, Capital / contract project management & survey service.

- **GIS** - Cost Center K70101 – Personnel: Need to get distributed numbers? For each element below we will need list of personnel & the # of personnel / Salary / Fringe of each.
 - ✓ What geographic information services do you provide? What other departments use the service?

GIS performs services for all city departments – until recently they have been managed under the Water Quality umbrella. They are now moving to their own department to better determine their distribution of services.

- ✓ Have you developed interactive stormwater Web based mapping using GIS? How many?

No

- ✓ Have you developed a Drainage Map in GIS, inventory and determine ownership of all storm drainage facilities (i.e. inlets, manhole pipes, canals ditches etc.) review and revise existing database inventories as needed?

Yes, see the summary tables below.

GIS requirements needs to be reviewed with staff

Asset Type	Qty of Segments	Liner Feet of Conveyance
Pipe	48659	3,253,175
Spillway	2284	49,808
Drain	269	7,992
Swale	4718	733,303
Paved Channel	4508	389,977
Ditch	24523	3,987,098
Improved Channel	3226	306,180
Natural Channel	1385	892,032
Lake Line	2356	371,859
Assumed Conveyance	1547	190,148
Bridge	4	365
Box Culvert	1504	93,888
Total	(LF)	10,275,826
	(Miles)	1,946

Asset Type	Qty of Structures	Asset Type	Qty of Structures
Catch basin	8,459	Trench Drain	491
Headwall	12,032	Culvert	1,211
Junction Box	874	Ditch Intersection	18,264
Weir	24	Pipe Intersection	5,199
Curb Inlet	3,761	Lake Intersection	553
Check Dam	305	Assumed Structure	2,937
Plain Pipe End	21,838	Inaccessible Structure	1,548
Flared End Section	391	Spillway	2,428
Raised Top Inlet	1,447	Sinkhole	38
Manhole	3,483	Bridge	126
Flat Top Catchbasin	8,184	Total	94,307
Control Structure	584		
Unknown	130		

- Have you performed a condition assessment of the storm system? If not do you plan to?
A full system condition assessment has not been performed at one time. The way the City approaches this is to break the area up in grids, based on a FEMA map grid, and evaluate the buried and open conveyance system on an ongoing basis. Cleaning and other maintenance activities are then identified and executed based on this rotating evaluation process. The conversion to using the FEMA map grid began in August 2016.

Based on the above understanding, the consultant team needs to know the full rotation of assessment & cleaning. For example, what percentage of the system is assessed each year? *More specific questions are shown below in the City Wide Services Section.*

- Is the maintenance management system integrated with GIS to identify and map out where maintenance activities have taken place? If so, please provide details on this program and its execution.
No GIS maintenance management system exists. CWS has recently (August 2016) converted to utilizing a tablet device to map out maintenance work in the field. These devices do utilize the GIS platform for mapping but the results and records of maintenance are not integrated and saved into the GIS database.

- Have you reviewed the GIS based inventory process of the entire storm water system?

No.

£. **Engineering & Survey** - Cost Center K70101

- ✓ Describe your role as Capital /Contract project management. Is this for more than stormwater? What % of time is spent on stormwater?

Yes, engineering and survey efforts are for the entire City outside of the Dept. of Transportation, they have their own engineering staff. Approximately 50% of K70101 time is spent on water quality and stormwater.

- ✓ Do you plan to revise, update and develop project priority identification and selection criteria for the existing capital improvement program (CIP)? Will this be based on public input into the process?

Yes an update of project priority and selection is needed by developing new policy, criteria, selection process with public and elected official input.

- ✓ The following statements refer to detention/retention systems for both residential and nonresidential areas of the community. The City Engineer and staff are considering a change in the policy and approach to residential private detention facilities and best management practices.

- o **SWEEP Program included in rate model.** For private on-site residential the City will be responsible for the detention/retention portion (flood and/or drainage storage facilities that are in an easement and regional in nature) and outlet works of the detention/retention facility. The City will not be responsible for the permanent pool and/or any of the amenities or aesthetics of a detention/retention facility.

The WQP is considering this approach.

- o The private onsite **non-residential detention/retention facilities** will not be the responsibility of the City and the owners of the facilities will be responsible for the maintenance.

This is true now and into the future.

- o The City will be responsible for the detention/retention facilities that are owned by the City and documented by an ownership deed (legal document). The City will not be responsible for the detention/retention facilities that are not owned by the City and not documented by an ownership deed (legal document) and therefore owned by a private individual or group of individuals. This is true now and into the future.
- o Review, revise and update the existing plan review and onsite inspection program for all facilities in an easement and regional in nature for new developments.

Being considered.

g. City Wide Services (CWS) Cost Center K70104

• Conveyance Construction

- ✓ Have you developed a Drainage Map in GIS, inventory and determine ownership of all storm drainage facilities (i.e. inlets, manhole pipes, canals ditches etc.) review and revise existing database inventories as needed?

An existing GIS database of the stormwater infrastructure system does exist. Staff has expressed a need to create a more complete stormwater GIS and database for stormwater management.

- ✓ Have you performed a condition assessment of the storm system? If not do you plan to?

A condition assessment has not been completed but it is recommended by the staff and consultant. Condition of infrastructure is currently managed by City Wide Services staff on an on-going basis.

• Conveyance Maintenance

- ✓ Develop a WQP operation and maintenance program (Maintenance Management System) to reduce and prevent pollution. (see the maintenance items in the Drainage Section below)

The way the City approaches this is to break the area up in grids, based on a FEMA map grid, and evaluate the buried and open conveyance system on an ongoing basis. Cleaning and other maintenance activities are then identified and executed based on this rotating evaluation process. The conversion to using the FEMA map grid began in August 2016.

- ✓ Has the City developed Storm Water Pollution Prevention Plans (SWPPP) for critical facilities (facilities with materials and chemicals that can pollute waters) such as:
 - a. *Maintenance facilities -Yes*
 - b. *Wastewater facilities -Yes*
 - c. *Water Treatment Facilities -Yes*
 - d. *Pump stations – yes*
- ✓ Develop training programs for pollution prevention and good housekeeping for the facility operators and staff, Maintenance managers and staff, as well as public employees, businesses, and the public.

Training programs include webinars, Illicit Discharge, Construction erosion, stormwater credits and credit coupons and Resource Rain

Specific Training from last year includes

- ✓ *E&SC rules, methods, application successes and failures*
- ✓ *Latest training, reporting on emerging WQ technologies, laws, and application successes & failures*
- ✓ *Training on design, rules, proven technologies, field application of WQ systems*
- ✓ *Training on SW Utility function in TN + WQ technologies*
- ✓ *Training on stream mitigation / restoration practices*
 - *TN Stormwater Association*
 - *TN AWRA*

- *WEF*
- ✓ *TNSA Quarterly meetings*

h. Economic & Community Development Administrator

- **Director Land Development Office**
- **Site Development Manager_- Cost Center: K70105**
 - ✓ See Policy Paper #5 – Land Development
- **Construction Site Inspection –**
 - ✓ See Policy Paper #5 – Land Development

6. Financial

The WQP Rate Study will address the following:

- A. Define and establish a revised level of service and corresponding water quality rates that will continue to address all stormwater problems and concerns both in the short term and long term based on public input.
- B. Develop and accept a “required minimum” level of service and corresponding rates for FY–19 (billed in October 2018) that will further address stormwater problems and concerns both in the short term and long term.
- C. Review the combination “pay-as-you-go” and “bond/debt” financing programs for the WQP to meet the CIP needs for the next ten year time line as part of the future required minimum cost of service analysis.
- D. Hold a meeting with Ms. Daisy Madison, Finance Director, after the draft final rates and debt financing has been completed. Purpose of meeting is to review the General Obligation Bond, “bond/debt,” financing for the WQP capital improvement program (CIP) needs for the next ten year time line. The meeting will not be part of the initial series of interview meetings as part of the TAC meeting 2.
- E. The WQP will set aside money for “neighborhood” maintenance projects. Consider implementing a program that awards neighborhood / subdivision properties that will provide a 50% cost share with stormwater upgrades needed in their neighborhood / subdivision areas.

- F. The WQP will set aside money for grant matching projects.
- G. The WQP will set aside money for repair and replacement projects.
- H. The WQP will utilize an equipment repair and replacement program that utilizes leasing and/or purchasing program for equipment.
- I. The City WQPs will consider “low” interest loans to neighborhood groups for small and large projects that are not high on the priority list that meet the needs of the WQP.
- J. The City will continue to fund a minimum reserve level and maintain this amount in the enterprise fund equivalent to a meet the bond covenant requirements and outstanding bond requirements.
- K. Review the annual updating of the water quality customer database procedures on an annual basis that includes new development and updating the database annually.

7. Legal

- A. Provide the necessary financial information to City legal staff regarding revising the existing WQP ordinance once the rate study is complete.

8. Billing and Billing System

- A. The consultant team could analyze the billing and collection system to identify non-payments, and issues in the existing water quality billing database (as part of an additional services and not included in the current scope of work).

Note: It is critical to show elected officials the quantity of infrastructure and maintenance performed by the City. We need their support for the potential proposed increases in maintenance activities. This list needs to include quantities of all infrastructure and an accurate account of maintenance activities. The list is something the non-technical / non-engineers can relate to. This is our approach to soliciting input from the elected officials and the general public on the number, type and amount of funding for maintenance and capital projects included in the financial and rate plan.

9. Action:

Approved: _____ Date: _____

10. Summary of Rate Model Assumptions:

SPECIAL NOTE: This paper is the DRAFT Final version for this topic and included all city staff comments to date. This paper also includes “Assumptions for rate model” that may change between now and the end of the project. The consultant team will not continue updating the “Assumptions for rate model” section of this policy paper until the rate study has been completed. The consultant team will revise the final rate model assumptions that pertain to the topic of this paper for the final report only. The overall rate model assumptions will be continually updated in the meeting agenda document for each model. The final Business Plan document will list all of the FINAL rate model assumptions in the Appendix of the Business Plan document. This will provide a consistent and simple approach to tracking all the rate model assumptions. Once all rate model assumptions and other changes have been organized the final report document, all corresponding policy papers will also be updated in the final report format.

The following rate model assumptions will be tracked and modified in the TAC Meeting agenda’s and will be finalized in this Business Plan and other corresponding policy papers for the final report

1) Final Land Development rate model assumptions

- a. 4 FTE’s continue to be funded via other non WQ funds
- b. 10 FTE’s continue to be funded via WQ rate/fund beginning in FY – 19
- c. Add 1.5 FTE’s in in FY – 19 Year 1
- d. 1.0 FTE’s in FY – 20 Year 2
- e. 1.0 FTE’s in FY – 21 Year 3
- f. Reduce water quality funding by 20% per year with a goal to be self-funded by fees by end of FY – 2023.
- g. FY – 24 (Year 6) 0 FTE’s funded by WQ rate/fund and beginning Year 6 the 13.5 FTE’s will be 100% funded by LD fees

2) Final TMDL rate model assumptions

- a. Allocate 80% funded by Capital Budget
- b. Allocate 20% funded by WQ rate/fund (K70101 cost center)
- c. Add 1 FTE (Engineering Tech) in FY – 20 (year 2) and add 1 FTE (Specialist II) FY – 22 (Year 4)
- d. Utilize the 2 FTE from item c from 2 vacant positions from K70101 cost center
- e. Use Engineering Tech and Specialist II salary / positions from K70101 cost center

3) Final Green Infrastructure rate model assumptions

- a. Add a new 3 person crew in FY – 19 (Year 1) – Housed in Parks Department funded by WQ rate/fund
 - b. Add a new 3 person crew in FY-20 (year 3) – Housed in Parks Department funded by WQ rate/fund
 - ✓ Crew Supervisor
 - ✓ 2 - Crew worker III
 - ✓ Crew Cab SUV Truck
 - ✓ Misc. tools
 - ✓ Mulch
- 4) Final rate model assumption for adding new Pipe Crew of 6 using 6 vacant positions from K70104
- 5) Draft Final SWEEP (residential ponds) rate model assumptions developed during and based on 9/6/17 conference call
- a. Currently city performs maintenance on 6 ponds per year
 - b. Use (on average) \$2,700 for expenses (materials supplies etc.) per pond (based on Jim L SFR Pond sheet)
 - c. Use (on average) \$3,000 for labor per pond (refer to FTE schedule below)
 - d. Assume on average 30 ponds maintained per year by a 3 person crew
 - e. Add new 3 person crew in FY – 20 Year 2 plus add material supplies equipment annual cost of \$81,000 for on average 30 ponds per year “installed” costs per year (costs rounded up and based on Jim L SFR Pond sheet)
 - f. Add new 3 person crew in FY – 24 Year 6
 - g. Add new 1 FTE in FY – 23 Year 5 (Supervisor Position for SWEEP) program including \$1,250 for office set up)
 - h. Add new 3 person crew in FY – 26 Year 8 plus add an increase in material supplies equipment annual cost of \$120,000 for on average 30 ponds per year “expended costs per year (costs rounded up and based on Jim L SFR Pond sheet)
 - i. Add new 1 FTE in FY – 26 Year 8 (Supervisor Position for SWEEP) program including \$1,250 for office set up)
 - j. A total of 11 FTEs over the 10 year rate period)
 - k. Assume the \$3,000 installed cost per pond per year increases to \$4,000 expended per pond per year beginning in FY – 26 Year 8
 - l. The crews and costs will be included and added in K70104 (city wide services) cost center

- 6) Final Business Plan assumptions to be used in rate model
- a. All goal statements that contain a cost of service have been accounted for in either a policy paper or identified in the following list of activity costs in the rate model
 - ✓ Consultant will prepare comparison of O & M, customer outreach,,,,,
 - ✓ Any new Public Education Outreach programs to account for and fund?
 - ✓ Any additional field inspectors needed for TMDL, permit or drainage flooding activities?
 - ✓ GIS staffing. Currently 5 GIS allocated as follows
 - General Fund 40%
 - Sanitary Sewer 30%
 - Water Quality Fund 30%
 - Additional GIS WQ funded FTE?
 - ✓ Consider implementing a maintenance management system for the WQ program
 - ✓ Are there any future plans for taking over the non-residential Ponds?
 - ✓ The WQ program rate model will included a budget that will include the following activities
 - Grant Matching funds
 - Neighborhood projects and low interest loans for matching with home owners
 - Minimum reserve fund
 - Repair and Replacement fund for equipment
- 7) Final CIP assumptions?
- a. See CIP spreadsheet provided by City Staff
 - b. Will the increase in the CIP program require additional staffing?
- 8) The following is a list of possible GIS cost of service maps (that HDR team based on the Work Order Policy paper 3 and other information / GIS data
- a. Hotspots (may need staff to provide addresses) *
 - b. Construction - pipes maintenance / replacement / installation / repair
 - c. Ditch Maintenance
 - d. Inspection / VAC

- e. Plan reviews for each year for the last three years or typical year
- f. Inspections for each year for the last three years or typical year
- g. Code Violations for each year for the last three years or typical year
- h. FEMA Flood Maps*
- i. Areas needing stream restoration*
- j. Outfall Monitoring*
- k. Stream Monitoring
- l. Pipe System Monitoring
- m. TMDL's
- n. Detention Basins*

*- We believe the data is available but may need help locating.

Appendix E - Policy Paper # 3 – Work Order Database Analysis

City of Chattanooga
Department of Public Works
Water Quality Program Rate Study
Levels and Costs of Service Update
Contract S-16-010



Policy #3: Work Order Data Evaluation

Prepared by:



August 29, 2017

**CITY OF CHATTANOOGA
WATER QUALITY PROGRAM****POLICY: WORK ORDER DATABASE EVALUATION AND ANALYSIS USED FOR THE
WQ RATE STUDY****I. OVERVIEW**

The HDR/ERC Team performed an evaluation and analysis of the work order database provided by city staff for the water quality rate study. The file name provided by city staff via the Google site “WorkOrders_Jan_1_2013_present.xls” which contained all of the work order records performed by city staff for years 2013 through year to date (May 2017). This work is related to Task 3 B.2 of the consultant scope of work. This work order database contains 100% of the maintenance work performed by city staff. The consultant team was assured by city staff that all water quality (storm water management) maintenance services performed by the city is contained in this database and therefore not included in any other database for tracking maintenance activity purposes.

II. PURPOSE

The purpose of this policy paper and analysis is to evaluate the preventative maintenance activities and the 311 customer service data provided by city staff to utilize for the future maintenance activities as follows:

1. Evaluate the quality of the work order data received from the City of Chattanooga;
2. The file name provided by city staff via the Google site “WorkOrders_Jan_1_2013_present.xls” which contained all the work order records performed by city staff for years 2013 through year to date (May 2017), see Task 3 B.2 of the consultant scope of work.
3. Determine the usefulness of the historical work order data to project future maintenance costs for the water quality rate study process performed by City Wide Services crews for the water quality program.
4. Determine if the work order data can be used to calculate an average cost associated with the variety of work order types.
5. Summarize the steps used by the consultant team to manipulate the raw database into meaningful useable data for the rate study

III. PROCESS

The process and procedures followed to analyze and evaluate the City of Chattanooga work order database is as follows:

A. Database File Analyzed

1. The HDR/ERC Team requested the entire work order database without success. The HDR/ERC Team was provided a copy of the City of Chattanooga's water quality only work order data for the period of January 2013 through May 2017. This file contains 4,603 records.
2. The water quality work order data file contains the following eighteen data fields:
 - a. "Workorderid" – the WorkorderId field contains a unique number for each entered work order. No duplicate entries exist in this field.
 - b. "Description" - this field contains a description of the type of work order entered.
 - c. "Status" – This field contains entries indicating the status of the work order.
 - d. "Actual Finish" - this field contains the data and time that the work order was completed. There are 537 records that do not have an entry in this field.
 - e. "Address" – this field contains an address or nearby address of the requested work order. There are 15 records that do not have an entry in this field.
 - f. "Location" – this field appears to contain additional address or location information. There are 2,700 records that do not contain an entry in this field.
 - g. "Category" – this field contains entries indicating the type of work order entered.

Note: The file contained 31 records without an entry in this field. ERC added the category "HOT SPOT" to 29 of those records, and the remaining two records were removed. The file also contained 20 records with a category of "STREET". These records were also removed, leaving 4,582 records.

- h. "Initiated By" and "Initiated Date" – these two fields contain the name of the person who initiated the work order and the date that the work order was initiated.
- i. "Total Cost", "Labor Cost", "Material Cost" and "Equipment Cost" – these fields contain the cost of a completed work order split out by labor, material and equipment.
- j. "Permit Cost" – the City of Chattanooga will need to provide an explanation as to the entries in this field.
- k. "Comments" – this field contains comment entries that will need to be further explained by City of Chattanooga staff.
- l. "Instructions" – this field contains notes that were most likely entered by the person who investigated the issue, and may or may not contain instructions on how to solve the issue.
- m. "Street Name" – this field does not contain any entries.
- n. "Work Order Year" – this field contains the year in which the work order was initiated. This field was created by the HDR/ERC Team.

B. Results, Analysis Performed and Information by Year

- A. 2013 Work Orders
 - a. 1,296 initiated.
 - b. 1,284 closed.
 - c. 30 initiated and closed records with no closed date.

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- B. 2013 Work Order Costs
- a. Cost = \$0 = 127 records, Cost = \$0 and Status = Closed = 120 records.
 - b. 2013 cost less than \$100 = 213 records.
 - c. 2013 cost less than \$1,000 = 447 records.
 - d. 2013 cost less than \$5,000 = 90 records.
 - e. 2013 cost less than \$10,000 = 47 records.
 - i. See the Appendix for a list of all 2013 work orders costing \$10,000 or more.
 - f. 2013 cost less than \$50,000 = 5 records.
 - g. 2013 cost less than \$100,000 = 1 record.
- C. 2014 Work Orders
- a. 1,020 initiated.
 - b. 1,016 closed.
 - c. 38 initiated and closed records with no closed date.
- D. 2014 Work Order Costs
- a. 2014 cost less than \$100 = 121 records.
 - b. 2014 cost less than \$1,000 = 394 records.
 - c. 2014 cost less than \$5,000 = 79 records.
 - d. 2014 cost less than \$10,000 = 42 records.
 - i. See the Appendix for a list of all 2014 work orders costing \$10,000 or more.
 - e. 2014 cost less than \$50,000 = 10 records.
 - f. 2014 cost less than \$100,000 = 2 records.
- E. 2015 Work Orders
- a. 867 initiated.
 - b. 833 closed.
 - c. 2 initiated and closed records with no closed date.
- F. 2015 Work Order costs
- a. 2015 cost less than \$100 = 177 records.
 - b. 2015 cost less than \$1,000 = 370 records.
 - c. 2015 cost less than \$5,000 = 98 records.
 - d. 2015 cost less than \$10,000 = 54 records.
 - i. See the Appendix for a list of all 2015 work orders costing \$10,000 or more.
 - e. 2015 cost less than \$50,000 = 12 records.
 - f. 2015 cost less than \$100,000 = 2 records.
- G. 2016 Work Orders
- a. 865 initiated
 - b. 738 closed
 - c. 0 initiated and closed records with no closed date
- H. 2016 Work Order costs
- a. 2016 cost less than \$100 = 171 records.

- b. 2016 cost less than \$1,000 = 357 records.
- c. 2016 cost less than \$5,000 = 58 records.
- d. 2016 cost less than \$10,000 = 22 records.
 - i. See the Appendix for a list of all 2016 work orders costing \$10,000 or more.
- e. 2016 cost less than \$50,000 = 3 records.
- f. 2016 cost less than \$100,000 = 1 record.

- I. Missing Entries – Address, Actual Finished Date, Location and Category
 - a. 15 records contain no address entry.
 - b. 537 records contain no actual finished date.
 - c. 2,700 records contain no location entry.

IV. STAFF ASSISTANCE AND INPUT NEEDED TO COMPLETE THE WQP RATE STUDY

- 1. The “Description” field in the table below contains a description of the type of work order performed by City Wide Services staff and which was entered into the work order system. The database for this field contains fifteen different work order historical maintenance activities. The HDR/ERC Team requested city staff provide an explanation and corresponding crew configurations for each of these fifteen maintenance activities for table 1 below.

Table 1

Description	Count of Description	Crew That Performs This Activity
CWS - Ditch Repair/Cleaning	1989	
SWM - PM_Inspection	801	
CWS - Structure Rpr/Construct	622	
SWM - PM_Cleaned	426	
CWS - Pipe Repair/Construction	392	
SWM - Vac Truck Cleaning	134	
SWM - PM_HotSpots Southside	57	
WPA Ditch Cleaned	56	
SWM - PM_HotSpots Northside	48	
CWS-Structure Cleaned	17	
GIS_Updates	17	
SWEEP	10	
CWS-Ditch Cleaned	7	
CWS-Pipe Cleaned	3	
VEGETADED CITY BMPs	3	

- The “Permit Cost” field shown below contains numbers 0 through 3. The HDR/ERC Team needs the City of Chattanooga to provide an explanation as to the entries in this field.

Table 2

Permit Cost	Count of Permit Cost	Explanation
0	3554	
1	1005	
2	21	
3	2	

Table 2 data was not provided by city staff because this information is not longer used.

- The “Status” field contains the entries in Table 3 below. Please provide an explanation of the meaning of each:

Data in Table 3 was not provided by city staff

Table 3

Status	Count of Status	Explanation
CANCEL	5	
CLOSED	4105	
ONHOLD	4	
SCHEDULD	52	
TRANSCWS	270	
UNDINV	88	
UNDRCONS	26	
WAITSCHD	32	

V. STEPS USED TO MANIPULATE AND PREPARE DATA TO USE FOR THE RATE STUDY

1. The consultant team reviewed the work order database and identified fields that needed further input and clarification from city staff including tables 1 through 3 above.
2. City staff responded to our request for crew information, included in table 4 below:

Table 4

Description	Count	Crew That Performs This Activity
CWS - Ditch Repair/Cleaning	1989	Ditch Crew
SWM - PM_Inspection	801	Inspection Crew
CWS - Structure Rpr/Construct	622	Pipe Crew, Mason Crew, Concrete Crew
SWM - PM_Cleaned	426	Rodding Crew
CWS - Pipe Repair/Construction	392	Pipe Crew, Mason Crew, Concrete Crew
SWM - Vac Truck Cleaning	134	Vac Crew
SWM - PM_HotSpots Southside	57	Rodding Crew
WPA Ditch Cleaned	56	Rodding Crew
SWM - PM_HotSpots Northside	48	Rodding Crew
CWS-Structure Cleaned	17	Vac Crew, Rodding Crew, Ditch Crew
GIS_Updates	17	Not CWS (GIS Dept.....Josh Calhoun)
SWEEP	10	Ditch Crew
CWS-Ditch Cleaned	7	Ditch Crew, Rodding Crew
CWS-Pipe Cleaned	3	Vac Truck, Ditch Crew
VEGETADED CITY BMPs	3	Ditch Crew, Rodding Crew

3. The above crew information was merged into the original work order database file that contains the 4,582 individual records.
 - a. The crew type from table 4 was matched to all 4,582 corresponding records based upon the Description field entry.
 - b. A query was performed on the data with an attempt to group records by the Description field and the newly added Crew That Performs This Activity field. The result of this query is shown Table 5 below:
 - c. Note that duplicate entries appear in the Description field and in the Crew That Performs This Activity field. Since one of our goals was to determine the average cost for an activity such as Ditch Cleaning, this query would not be useful for that purpose.

Table 5

Description	Crew That Performs This Activity	Year Initiated
CWS - Ditch Repair/Cleaning	DITCH CREW	2013
CWS - Pipe Repair/Construction	PIPE CREW, MASON CREW, CONCRETE CREW	2013
SWM - PM_HotSpots Southside	RODDING CREW	2013
WPA Ditch Cleaned	RODDING CREW	2013
CWS - Structure Rpr/Construct	PIPE CREW, MASON CREW, CONCRETE CREW	2013
SWM - PM_Cleaned	RODDING CREW	2013
SWM - PM_HotSpots Northside	RODDING CREW	2013
SWM - PM_Inspection	INSPECTION CREW	2013
SWM - Vac Truck Cleaning	VAC CREW	2013
SWM - PM_HotSpots Southside	RODDING CREW	2014
SWM - PM_HotSpots Northside	RODDING CREW	2014
SWM - PM_Cleaned	RODDING CREW	2014
CWS-Ditch Cleaned	DITCH CREW, RODDING CREW	2014
CWS - Structure Rpr/Construct	PIPE CREW, MASON CREW, CONCRETE CREW	2014
CWS - Pipe Repair/Construction	PIPE CREW, MASON CREW, CONCRETE CREW	2014
CWS - Ditch Repair/Cleaning	DITCH CREW	2014
CWS-Pipe Cleaned	VAC TRUCK, DITCH CREW	2014
SWM - PM_Inspection	INSPECTION CREW	2014
WPA Ditch Cleaned	RODDING CREW	2014
SWM - Vac Truck Cleaning	VAC CREW	2014
CWS-Structure Cleaned	VAC CREW, RODDING CREW, DITCH CREW	2015
CWS - Ditch Repair/Cleaning	DITCH CREW	2015
WPA Ditch Cleaned	RODDING CREW	2015
CWS - Pipe Repair/Construction	PIPE CREW, MASON CREW, CONCRETE CREW	2015
CWS - Structure Rpr/Construct	PIPE CREW, MASON CREW, CONCRETE CREW	2015
CWS-Ditch Cleaned	DITCH CREW, RODDING CREW	2015
SWM - PM_Cleaned	RODDING CREW	2015
CWS-Pipe Cleaned	VAC TRUCK, DITCH CREW	2015
SWEEP	DITCH CREW	2015
SWM - Vac Truck Cleaning	VAC CREW	2015
SWM - PM_HotSpots Southside	RODDING CREW	2015
SWM - PM_Inspection	INSPECTION CREW	2015
SWM - PM_HotSpots Northside	RODDING CREW	2015
CWS - Structure Rpr/Construct	PIPE CREW, MASON CREW, CONCRETE CREW	2016
WPA Ditch Cleaned	RODDING CREW	2016
SWM - PM_HotSpots Southside	RODDING CREW	2016
CWS - Ditch Repair/Cleaning	DITCH CREW	2016
CWS - Pipe Repair/Construction	PIPE CREW, MASON CREW, CONCRETE CREW	2016
VEGETATED CITY BMPs	DITCH CREW, RODDING CREW	2016

CWS-Structure Cleaned	VAC CREW, RODDING CREW, DITCH CREW	2016
SWM - PM_HotSpots Northside	RODDING CREW	2016
SWEEP	DITCH CREW	2016
SWM - Vac Truck Cleaning	VAC CREW	2016
SWM - PM_Inspection	INSPECTION CREW	2016
SWM - PM_Cleaned	RODDING CREW	2016
CWS-Ditch Cleaned	DITCH CREW, RODDING CREW	2016
CWS - Pipe Repair/Construction	PIPE CREW, MASON CREW, CONCRETE CREW	2017
SWEEP	DITCH CREW	2017
CWS - Ditch Repair/Cleaning	DITCH CREW	2017
GIS_Updates	Not CWS (GIS Dept.....Josh Calhoun)	2017
CWS-Structure Cleaned	VAC CREW, RODDING CREW, DITCH CREW	2017
CWS - Structure Rpr/Construct	PIPE CREW, MASON CREW, CONCRETE CREW	2017
SWM - PM_HotSpots Southside	RODDING CREW	2017
VEGETATED CITY BMPs	DITCH CREW, RODDING CREW	2017
SWM - PM_Inspection	INSPECTION CREW	2017
WPA Ditch Cleaned	RODDING CREW	2017
SWM - Vac Truck Cleaning	VAC CREW	2017
SWM - PM_HotSpots Northside	RODDING CREW	2017

4. The consultant team determined a further manual review of the Instructions field and Comment field was required as this further analysis of the data may provide more insight as to what activity was performed and required for the rate study. To minimize the manual review process, some records were deleted because these records contained meaningless data as it relates to the rate study:
 - a. 731 records having **no cost information** and therefore were deleted.
 - b. 261 records having **cost less than \$100.00** were deleted.
 - c. 26 records having **a cost of \$1.00** were deleted.

5. The consultant team manually reviewed the Instruction field data for the remaining 3,564 records. A new field (More Comments) to enter a description of the work activity based on the information from the Instruction field and Comment field data was created. Table 6 below illustrates the activities that we used based on that review.

Table 6

CATCH BASIN INSTALLATION
CATCH BASIN REPAIR
CATCH BASIN REPLACEMENT
CULVERT REPAIR
HEADWALL INSTALLATION
HEADWALL REPAIR
INLET INSTALLATION
INLET REPAIR
JUNCTION BOX INSTALLATION
MANHOLE INSTALLATION
PIPE INSTALLATION
PIPE REPAIR
PIPE REPLACEMENT
SEWER LINE REPAIR
DITCH REPAIR
CLEAN NORTH SIDE HOT SPOTS
CLEAN PER INSPECTION REPORT
CLEAN SOUTH SIDE HOT SPOTS
CULVERT CLEANING
DITCH CLEANING
PIPE CLEANING
INSPECTION
VAC CLEANING

6. The consultant team further determined and based on the quality of the original work order data provided by the city, for this analysis the consultant team will treat all crews the same and the assumption is each of the crews contain all approximately the costs therefore the type of crew and the activity is treated the same. (Note. This assumption is required as the data does not contain this specific data and therefore this assumption is required).
 - a. The table was sorted by year and the entries in the More Comments field were reviewed/edited so that the entries matched the above list.
 - b. A query was performed on the table by year, summing the number of activities (frequency) from the list above and summing the Labor Cost, Materials Cost, Equipment Cost and Total Cost for each.

7. The consultants then further classified and assigned one of the 3 sub departments from the PowerPoint presentation organizational chart from the City Wide Services supervisors as follows:

Table 7

Sub Departments
CONSTRUCTION (Crews)
DITCH MAINTENANCE (Crews)
INSPECTION/VAC (Crews)

8. The result of assigning Table 7 categories to each of the Table 6 maintenance activities is shown in Table 8 below. Table 8 information was generated by the consultant team and used for the basis for developing the historical trends that form the basis for the 2 five year future forecasts required for the 10 year rate study analysis:

Table 8

Activity	Based on Org Chart
CATCH BASIN INSTALLATION	CONSTRUCTION
CATCH BASIN REPAIR	CONSTRUCTION
CATCH BASIN REPLACEMENT	CONSTRUCTION
CULVERT REPAIR	CONSTRUCTION
HEADWALL INSTALLATION	CONSTRUCTION
HEADWALL REPAIR	CONSTRUCTION
INLET INSTALLATION	CONSTRUCTION
INLET REPAIR	CONSTRUCTION
JUNCTION BOX INSTALLATION	CONSTRUCTION
MANHOLE INSTALLATION	CONSTRUCTION
PIPE INSTALLATION	CONSTRUCTION
PIPE REPAIR	CONSTRUCTION
PIPE REPLACEMENT	CONSTRUCTION
SEWER LINE REPAIR	CONSTRUCTION
DITCH REPAIR	DITCH MAINTENANCE
CLEAN NORTH SIDE HOT SPOTS	DITCH MAINTENANCE
CLEAN PER INSPECTION REPORT	DITCH MAINTENANCE
CLEAN SOUTH SIDE HOT SPOTS	DITCH MAINTENANCE
CULVERT CLEANING	DITCH MAINTENANCE
DITCH CLEANING	DITCH MAINTENANCE
PIPE CLEANING	DITCH MAINTENANCE
INSPECTION	INSPECTION/VAC
VAC CLEANING	INSPECTION/VAC

9. After the above steps were performed by the consultant team to manipulate and prepare the data for analyses, the following additional steps were taken to prepare the data for each of the fiscal years FY – 13 through FY – 16:
 - a) Each fiscal year was developed at the lowest level of data (the 28 work order maintenance activities) illustrated in Table 9 below:

Table 9

	<u>MAINTENANCE ACTIVITY</u>
1	CATCH BASIN INSTALLATION
2	CATCH BASIN REPAIR
3	CATCH BASIN REPLACEMENT
4	CULVERT REPAIR
5	HEADWALL INSTALLATION
6	HEADWALL REPAIR
7	HEADWALL REPLACEMENT
8	INLET INSTALLATION
9	INLET REPAIR
10	JUNCTION BOX INSTALLATION
11	MANHOLE INSTALLATION
12	MANHOLE REPAIR
13	PIPE INSTALLATION
14	PIPE REPAIR
15	PIPE REPLACEMENT
16	SEWER LINE REPAIR
17	CATCH BASIN CLEANING
18	DITCH REPAIR
19	CLEAN NORTH SIDE HOT SPOTS
20	CLEAN PER INSPECTION REPORT
21	CLEAN SOUTH SIDE HOT SPOTS
22	CULVERT CLEANING
23	DETENTION POND CLEANING
24	DITCH CLEANING
25	PIPE CLEANING
26	INLET CLEANING
27	INSPECTION
28	VAC CLEANING

10. Further analysis was performed for each of the above 28 activities by fiscal year

- a) Total number of completed work orders performed for each of the 28 maintenance activities annually
- b) An average cost per maintenance activity was calculated based on Labor, Materials and Equipment for each fiscal year
- c) A percent to the total was calculated for each of the 28 maintenance activities based on the average calculated cost in item b
- d) Each of the 28 maintenance activities were then further allocated into the 3 organizational sub groups as follows

CONSTRUCTION (Crews)
 DITCH MAINTENANCE (Crews)
 INSPECTION/VAC (Crews)

11. These results were then tallied for each of the 2013 through 2016 fiscal years in a summary format

12. The following Table 10 contains a summary of the analysis based on average cost for each of the 28 maintenance activities by each of the 4 fiscal years 2013 through 2016.

Table 10

			COST	COST	COST	COST	FOUR YEAR	FOUR YEAR
	MAINTENANCE ACTIVITY	CATEGORY	2013	2014	2015	2016	AVERAGE	AVERAGE %
1	CATCH BASIN INSTALLATION	CONSTRUCTION	\$267,535.96	\$370,890.39	\$358,847.60	\$112,777.85	\$277,512.95	10.69%
2	CATCH BASIN REPAIR	CONSTRUCTION	\$40,462.65	\$35,242.42	\$48,173.15	\$53,919.81	\$44,449.51	1.71%
3	CATCH BASIN REPLACEMENT	CONSTRUCTION	\$9,882.65	\$9,731.57	\$3,770.25	\$0.00	\$5,846.12	0.23%
4	CULVERT REPAIR	CONSTRUCTION	\$2,728.43	\$6,927.82	\$29,050.31	\$6,930.00	\$11,409.14	0.44%
5	HEADWALL INSTALLATION	CONSTRUCTION	\$15,856.08	\$18,385.76	\$21,523.34	\$0.00	\$13,941.30	0.54%
6	HEADWALL REPAIR	CONSTRUCTION	\$20,286.62	\$51,875.77	\$31,323.84	\$31,996.00	\$33,870.56	1.30%
7	HEADWALL REPLACEMENT	CONSTRUCTION	\$0.00	\$14,250.82	\$1,086.58	\$5,986.73	\$5,331.03	0.21%
8	INLET INSTALLATION	CONSTRUCTION	\$13,523.39	\$25,398.10	\$6,917.10	\$10,793.60	\$14,158.05	0.55%
9	INLET REPAIR	CONSTRUCTION	\$27,181.33	\$46,784.83	\$31,333.27	\$62,694.34	\$41,998.44	1.62%
10	JUNCTION BOX INSTALLATION	CONSTRUCTION	\$3,892.61	\$4,343.88	\$5,949.38	\$4,902.33	\$4,772.05	0.18%
11	MANHOLE INSTALLATION	CONSTRUCTION	\$6,688.81	\$0.00	\$7,627.70	\$0.00	\$3,579.13	0.14%
12	MANHOLE REPAIR	CONSTRUCTION	\$0.00	\$0.00	\$5,581.30	\$0.00	\$1,395.33	0.05%
13	PIPE INSTALLATION	CONSTRUCTION	\$429,374.13	\$553,407.86	\$1,430,511.06	\$476,450.68	\$722,435.93	27.83%
14	PIPE REPAIR	CONSTRUCTION	\$423,098.84	\$310,141.52	\$348,868.81	\$221,552.27	\$325,915.36	12.55%
15	PIPE REPLACEMENT	CONSTRUCTION	\$47,176.71	\$0.00	\$0.00	\$6,284.70	\$13,365.35	0.51%
16	SEWER LINE REPAIR	CONSTRUCTION	\$4,640.79	\$0.00	\$0.00	\$0.00	\$1,160.20	0.04%
17	CATCH BASIN CLEANING	DITCH MAINTENANCE	\$0.00	\$377.38	\$3,863.87	\$2,895.21	\$1,784.12	0.07%
18	DITCH REPAIR	DITCH MAINTENANCE	\$502,206.91	\$339,073.78	\$389,483.04	\$366,954.35	\$399,429.52	15.39%
19	CLEAN NORTH SIDE HOT SPOTS	DITCH MAINTENANCE	\$11,318.47	\$18,561.47	\$24,950.36	\$25,524.40	\$20,088.68	0.77%
20	CLEAN PER INSPECTION REPORT	DITCH MAINTENANCE	\$117,755.18	\$128,560.79	\$40,589.57	\$13,423.93	\$75,082.37	2.89%
21	CLEAN SOUTH SIDE HOT SPOTS	DITCH MAINTENANCE	\$19,226.56	\$26,618.73	\$32,500.95	\$28,843.06	\$26,797.33	1.03%
22	CULVERT CLEANING	DITCH MAINTENANCE	\$12,161.79	\$12,055.51	\$6,061.20	\$514.01	\$7,698.13	0.30%
23	DETENTION POND CLEANING	DITCH MAINTENANCE	\$0.00	\$0.00	\$1,511.58	\$1,113.92	\$656.38	0.03%
24	DITCH CLEANING	DITCH MAINTENANCE	\$346,505.97	\$337,517.11	\$363,853.56	\$301,505.87	\$337,345.63	12.99%
25	PIPE CLEANING	DITCH MAINTENANCE	\$2,340.64	\$665.28	\$0.00	\$1,167.27	\$1,043.30	0.04%
26	INLET CLEANING	DITCH MAINTENANCE	\$0.00	\$0.00	\$0.00	\$550.72	\$137.68	0.01%
27	INSPECTION	INSPECTION/VAC	\$136,193.98	\$162,106.34	\$54,150.32	\$217,399.78	\$142,462.61	5.49%
28	VAC CLEANING	INSPECTION/VAC	\$91,731.78	\$49,844.65	\$76,591.33	\$31,206.46	\$62,343.56	2.40%
	TOTAL		\$2,551,770.28	\$2,522,761.78	\$3,324,119.47	\$1,985,387.29	\$2,596,009.71	100.00%

13. The following Table 11 contains exact summary information from the previous Table 10 sorted by the costliest activity (based on average for each fiscal year) for the 28 maintenance activities by each of the 4 fiscal years 2013 through 2016.

Table 11

	ACTIVITY	CATEGORY	COST 2013	COST 2014	COST 2015	COST 2016	FOUR YEAR AVERAGE	FOUR YEAR AVERAGE COST
1	PIPE INSTALLATION	CONSTRUCTION	\$429,374.13	\$553,407.86	\$1,430,511.06	\$476,450.68	\$722,435.93	27.83%
2	DITCH REPAIR	DITCH MAINTENANCE	\$502,206.91	\$339,073.78	\$389,483.04	\$366,954.35	\$399,429.52	15.39%
3	DITCH CLEANING	DITCH MAINTENANCE	\$346,505.97	\$337,517.11	\$363,853.56	\$301,505.87	\$337,345.63	12.99%
4	PIPE REPAIR	CONSTRUCTION	\$423,098.84	\$310,141.52	\$348,868.81	\$221,552.27	\$325,915.36	12.55%
5	CATCH BASIN INSTALLATION	CONSTRUCTION	\$267,535.96	\$370,890.39	\$358,847.60	\$112,777.85	\$277,512.95	10.69%
6	INSPECTION	INSPECTION/VAC	\$136,193.98	\$162,106.34	\$54,150.32	\$217,399.78	\$142,462.61	5.49%
7	CLEAN PER INSPECTION REPORT	DITCH MAINTENANCE	\$117,755.18	\$128,560.79	\$40,589.57	\$13,423.93	\$75,082.37	2.89%
8	VAC CLEANING	INSPECTION/VAC	\$91,731.78	\$49,844.65	\$76,591.33	\$31,206.46	\$62,343.56	2.40%
9	CATCH BASIN REPAIR	CONSTRUCTION	\$40,462.65	\$35,242.42	\$48,173.15	\$53,919.81	\$44,449.51	1.71%
10	INLET REPAIR	CONSTRUCTION	\$27,181.33	\$46,784.83	\$31,333.27	\$62,694.34	\$41,998.44	1.62%
11	HEADWALL REPAIR	CONSTRUCTION	\$20,286.62	\$51,875.77	\$31,323.84	\$31,996.00	\$33,870.56	1.30%
12	CLEAN SOUTH SIDE HOT SPOTS	DITCH MAINTENANCE	\$19,226.56	\$26,618.73	\$32,500.95	\$28,843.06	\$26,797.33	1.03%
13	CLEAN NORTH SIDE HOT SPOTS	DITCH MAINTENANCE	\$11,318.47	\$18,561.47	\$24,950.36	\$25,524.40	\$20,088.68	0.77%
14	INLET INSTALLATION	CONSTRUCTION	\$13,523.39	\$25,398.10	\$6,917.10	\$10,793.60	\$14,158.05	0.55%
15	HEADWALL INSTALLATION	CONSTRUCTION	\$15,856.08	\$18,385.76	\$21,523.34	\$0.00	\$13,941.30	0.54%
16	PIPE REPLACEMENT	CONSTRUCTION	\$47,176.71	\$0.00	\$0.00	\$6,284.70	\$13,365.35	0.51%
17	CULVERT REPAIR	CONSTRUCTION	\$2,728.43	\$6,927.82	\$29,050.31	\$6,930.00	\$11,409.14	0.44%
18	CULVERT CLEANING	DITCH MAINTENANCE	\$12,161.79	\$12,055.51	\$6,061.20	\$514.01	\$7,698.13	0.30%
19	CATCH BASIN REPLACEMENT	CONSTRUCTION	\$9,882.65	\$9,731.57	\$3,770.25	\$0.00	\$5,846.12	0.23%
20	HEADWALL REPLACEMENT	CONSTRUCTION	\$0.00	\$14,250.82	\$1,086.58	\$5,986.73	\$5,331.03	0.21%
21	JUNCTION BOX INSTALLATION	CONSTRUCTION	\$3,892.61	\$4,343.88	\$5,949.38	\$4,902.33	\$4,772.05	0.18%
22	MANHOLE INSTALLATION	CONSTRUCTION	\$6,688.81	\$0.00	\$7,627.70	\$0.00	\$3,579.13	0.14%
23	CATCH BASIN CLEANING	DITCH MAINTENANCE	\$0.00	\$377.38	\$3,863.87	\$2,895.21	\$1,784.12	0.07%
24	MANHOLE REPAIR	CONSTRUCTION	\$0.00	\$0.00	\$5,581.30	\$0.00	\$1,395.33	0.05%
25	SEWER LINE REPAIR	CONSTRUCTION	\$4,640.79	\$0.00	\$0.00	\$0.00	\$1,160.20	0.04%
26	PIPE CLEANING	DITCH MAINTENANCE	\$2,340.64	\$665.28	\$0.00	\$1,167.27	\$1,043.30	0.04%
27	DETENTION POND CLEANING	DITCH MAINTENANCE	\$0.00	\$0.00	\$1,511.58	\$1,113.92	\$656.38	0.03%
28	INLET CLEANING	DITCH MAINTENANCE	\$0.00	\$0.00	\$0.00	\$550.72	\$137.68	0.01%
	TOTAL		\$2,551,770.28	\$2,522,761.78	\$3,324,119.47	\$1,985,387.29	\$2,596,009.71	100.00%

14. The following Table 12 contains a summary of the analysis based on the number of work orders performed and completed for each of the 28 maintenance activities by each of the 4 fiscal years 2013 through 2016.

Table 12

			FREQUENCY	FREQUENCY	FREQUENCY	FREQUENCY	FOUR YEAR	FOUR YEAR
	ACTIVITY	CATEGORY	2013	2014	2015	2016	AVERAGE	AVERAGE ACTIVITY
1	CATCH BASIN INSTALLATION	CONSTRUCTION	24	18	20	22	21	2.11%
2	CATCH BASIN REPAIR	CONSTRUCTION	43	44	40	55	46	4.58%
3	CATCH BASIN REPLACEMENT	CONSTRUCTION	4	1	2		2	0.23%
4	CULVERT REPAIR	CONSTRUCTION	4	1	2	4	3	0.28%
5	HEADWALL INSTALLATION	CONSTRUCTION	5	2	2		3	0.30%
6	HEADWALL REPAIR	CONSTRUCTION	17	29	37	26	27	2.74%
7	HEADWALL REPLACEMENT	CONSTRUCTION		2	2	3	2	0.23%
8	INLET INSTALLATION	CONSTRUCTION	4	5	3	2	4	0.35%
9	INLET REPAIR	CONSTRUCTION	40	35	18	27	30	3.02%
10	JUNCTION BOX INSTALLATION	CONSTRUCTION	1	1	1	2	1	0.13%
11	MANHOLE INSTALLATION	CONSTRUCTION	1		1		1	0.10%
12	MANHOLE REPAIR	CONSTRUCTION			2		2	0.20%
13	PIPE INSTALLATION	CONSTRUCTION	22	22	41	20	26	2.64%
14	PIPE REPAIR	CONSTRUCTION	45	32	36	37	38	3.77%
15	PIPE REPLACEMENT	CONSTRUCTION	1			3	2	0.20%
16	SEWER LINE REPAIR	CONSTRUCTION	1				1	0.10%
17	CATCH BASIN CLEANING	DITCH MAINTENANCE		2	4	6	4	0.40%
18	DITCH REPAIR	DITCH MAINTENANCE	227	161	168	162	180	18.06%
19	CLEAN NORTH SIDE HOT SPOTS	DITCH MAINTENANCE	9	9	17	10	11	1.13%
20	CLEAN PER INSPECTION REPORT	DITCH MAINTENANCE	195	140	77	2	104	10.41%
21	CLEAN SOUTH SIDE HOT SPOTS	DITCH MAINTENANCE	12	15	16	11	14	1.36%
22	CULVERT CLEANING	DITCH MAINTENANCE	11	14	11	3	10	0.98%
23	DETENTION POND CLEANING	DITCH MAINTENANCE			4	1	3	0.25%
24	DITCH CLEANING	DITCH MAINTENANCE	294	259	219	219	248	24.92%
25	PIPE CLEANING	DITCH MAINTENANCE	1	3		4	3	0.27%
26	INLET CLEANING	DITCH MAINTENANCE				1	1	0.10%
27	INSPECTION	INSPECTION/VAC	254	189	80	184	177	17.78%
28	VAC CLEANING	INSPECTION/VAC	<u>44</u>	<u>35</u>	<u>50</u>	<u>41</u>	<u>43</u>	<u>4.28%</u>
	TOTAL		1,259	1,019	853	845	994	100.00%

15. The following Table 13 contains the exact summary information from Table 12 above based on the highest four-year average activity of the number of work orders performed and completed for each of the 28 maintenance activities by each of the 4 fiscal years 2013 through 2016.

Table 13

	ACTIVITY	CATEGORY	FREQUENCY 2013	FREQUENCY 2014	FREQUENCY 2015	FREQUENCY 2016	FOUR YEAR AVERAGE	FOUR YEAR AVERAGE ACTIVITY
1	DITCH CLEANING	DITCH MAINTENANCE	294	259	219	219	248	24.92%
2	DITCH REPAIR	DITCH MAINTENANCE	227	161	168	162	180	18.06%
3	INSPECTION	INSPECTION/VAC	254	189	80	184	177	17.78%
4	CLEAN PER INSPECTION REPORT	DITCH MAINTENANCE	195	140	77	2	104	10.41%
5	CATCH BASIN REPAIR	CONSTRUCTION	43	44	40	55	46	4.58%
6	VAC CLEANING	INSPECTION/VAC	44	35	50	41	43	4.28%
7	PIPE REPAIR	CONSTRUCTION	45	32	36	37	38	3.77%
8	INLET REPAIR	CONSTRUCTION	40	35	18	27	30	3.02%
9	HEADWALL REPAIR	CONSTRUCTION	17	29	37	26	27	2.74%
10	PIPE INSTALLATION	CONSTRUCTION	22	22	41	20	26	2.64%
11	CATCH BASIN INSTALLATION	CONSTRUCTION	24	18	20	22	21	2.11%
12	CLEAN SOUTH SIDE HOT SPOTS	DITCH MAINTENANCE	12	15	16	11	14	1.36%
13	CLEAN NORTH SIDE HOT SPOTS	DITCH MAINTENANCE	9	9	17	10	11	1.13%
14	CULVERT CLEANING	DITCH MAINTENANCE	11	14	11	3	10	0.98%
15	CATCH BASIN CLEANING	DITCH MAINTENANCE		2	4	6	4	0.40%
16	INLET INSTALLATION	CONSTRUCTION	4	5	3	2	4	0.35%
17	HEADWALL INSTALLATION	CONSTRUCTION	5	2	2		3	0.30%
18	CULVERT REPAIR	CONSTRUCTION	4	1	2	4	3	0.28%
19	PIPE CLEANING	DITCH MAINTENANCE	1	3		4	3	0.27%
20	DETENTION POND CLEANING	DITCH MAINTENANCE			4	1	3	0.25%
21	CATCH BASIN REPLACEMENT	CONSTRUCTION	4	1	2		2	0.23%
22	HEADWALL REPLACEMENT	CONSTRUCTION		2	2	3	2	0.23%
23	MANHOLE REPAIR	CONSTRUCTION			2		2	0.20%
24	PIPE REPLACEMENT	CONSTRUCTION	1			3	2	0.20%
25	JUNCTION BOX INSTALLATION	CONSTRUCTION	1	1	1	2	1	0.13%
26	MANHOLE INSTALLATION	CONSTRUCTION	1		1		1	0.10%
27	SEWER LINE REPAIR	CONSTRUCTION	1				1	0.10%
28	INLET CLEANING	DITCH MAINTENANCE				1	1	0.10%
	TOTAL		1,259	1,019	853	845	994	100.00%

16. The following Table 14 contains a more detailed analysis of the 3 pipe activities including the pipe installation, pipe repair and pipe replacement based on the amount of funds spent on each pipe activity as follows

Table 14

ACTIVITY	CATEGORY	COST 2013	COST 2014	COST 2015	COST 2016	FOUR YEAR AVERAGE	FOUR YEAR AVERAGE COST
PIPE INSTALLATION	CONSTRUCTION	\$429,374.13	\$553,407.86	\$1,430,511.06	\$476,450.68	\$722,435.93	68.04%
PIPE REPAIR	CONSTRUCTION	\$423,098.84	\$310,141.52	\$348,868.81	\$221,552.27	\$325,915.36	30.70%
PIPE REPLACEMENT	CONSTRUCTION	\$47,176.71	\$0.00	\$0.00	\$6,284.70	\$13,365.35	1.26%
TOTAL		\$899,649.68	\$863,549.38	\$1,779,379.87	\$704,287.65	\$1,061,716.65	100.00%

17. The following Table 15 contains a more detailed analysis of the 3 pipe activities including the pipe installation, pipe repair and pipe replacement based on the number of pipe work orders as follows

Table 15

ACTIVITY	CATEGORY	FREQUENCY	FREQUENCY	FREQUENCY	FREQUENCY	FOUR YEAR	FOUR YEAR
		2013	2014	2015	2016	AVERAGE	AVERAGE ACTIVITY
PIPE INSTALLATION	CONSTRUCTION	22	22	41	20	26	40.54%
PIPE REPAIR	CONSTRUCTION	45	32	36	37	38	57.92%
PIPE REPLACEMENT	CONSTRUCTION	1	0	0	3	1	1.54%
TOTAL		68	54	77	60	65	100.00%

18. The following Table 16 contains information regarding how the costs of the work orders by crew configuration (based on the citywide services organizational chart) are being allocated as follows

Table 16

CATEGORY	COST	COST	COST	COST	FOUR YEAR	FOUR YEAR
	2013	2014	2015	2016	AVERAGE	AVERAGE COST
CONSTRUCTION	\$1,312,329.00	\$1,447,380.74	\$2,330,563.69	\$994,288.31	\$1,521,140.44	58.60%
DITCH MAINTENANCE	\$1,011,515.52	\$863,430.05	\$862,814.13	\$742,492.74	\$870,063.11	33.52%
INSPECTION/VAC	\$227,925.76	\$211,950.99	\$130,741.65	\$248,606.24	\$204,806.16	7.89%
TOTAL	\$2,551,770.28	\$2,522,761.78	\$3,324,119.47	\$1,985,387.29	\$2,596,009.71	100.00%

19. The following Table 17 contains information regarding how the work order by crew configuration (based on the citywide services organizational chart) are being allocated as follows

Table 17

CATEGORY	FREQUENCY	FREQUENCY	FREQUENCY	FREQUENCY	FOUR YEAR	FOUR YEAR
	2013	2014	2015	2016	AVERAGE	AVERAGE ACTIVITY
CONSTRUCTION	212	192	207	201	209	20.80%
DITCH MAINTENANCE	749	603	516	419	575	57.35%
INSPECTION/VAC	298	224	130	225	219	21.85%
	1259	1019	853	845	1,003	100.00%

VI. FINDING’S AND CONCLUSION’S BASED ON THE WORK ORDER DATA CONTAINED IN THIS DOCUMENT

The consultant team has performed the analysis and has manipulated the data as such with the purpose of developing a 4-year historical trend (using FY – 2013 through FY – 2016) to identify the following:

- a) Identify how the water quality funds are spent on and what type of work orders by fiscal year based on the consultant team “calculated” on average cost for each work order by fiscal year
- b) Identify how the water quality funds are spent on and what type of work orders based on the consultant team “calculated” number of work orders by fiscal year
- c) Based on the calculations and analysis tables 14, 16 and 17 generally represent the most realistic presentation and illustration of the historical trends of what type of activity and work order the city spent time and water quality fund on.
- d) Table 16 above illustrates 58.60% of the work order budget spent using construction crew activities that include the following activities in Table 17 below:

Table 17

	<u>MAINTENANCE ACTIVITY</u>
1	CATCH BASIN INSTALLATION
2	CATCH BASIN REPAIR
3	CATCH BASIN REPLACEMENT
4	CULVERT REPAIR
5	HEADWALL INSTALLATION
6	HEADWALL REPAIR
7	HEADWALL REPLACEMENT
8	INLET INSTALLATION
9	INLET REPAIR
10	JUNCTION BOX INSTALLATION
11	MANHOLE INSTALLATION
12	MANHOLE REPAIR
13	PIPE INSTALLATION
14	PIPE REPAIR
15	PIPE REPLACEMENT
16	SEWER LINE REPAIR

- e) Table 18 illustrates a further breakdown of the construction crew activities as follows:

Table 18

ACTIVITY	CATEGORY	COST	COST	COST	COST	FOUR YEAR	FOUR YEAR
		2013	2014	2015	2016	AVERAGE	AVERAGE COST
Basin Inlet headwall other	CONSTRUCTION	\$412,679.32	\$583,831.36	\$551,183.82	\$290,000.66	\$459,423.79	30.20%
PIPE	CONSTRUCTION	\$899,649.68	\$863,549.38	\$1,779,379.87	\$704,287.65	\$1,061,716.65	69.80%
TOTAL		\$1,312,329.00	\$1,447,380.74	\$2,330,563.69	\$994,288.31	\$1,521,140.44	100.00%

Table 19

ACTIVITY	CATEGORY	COST	COST	COST	COST	FOUR YEAR	FOUR YEAR
		2013	2014	2015	2016	AVERAGE	AVERAGE COST
Basin Inlet headwall other	CONSTRUCTION	144	138	130	141	143	68.49%
PIPE	CONSTRUCTION	68	54	77	60	66	31.51%
TOTAL		212	192	207	201	209	100.00%

- f) It appears that maintaining the historical trends for funding and completing the work order activity per the last 4 fiscal years and used as the basis for the required minimum (first five years) and the second 5-year forecast would be prudent.
- g) To account for the assumed much higher costs for each pipe work order project completed as illustrated in Table 18, Table 19 appears to be a more reasonable interpretation of the work order activity and adding a new pipe crew using 6 unfilled vacant positions already accounted for in the citywide services budget for K70104 cost center would increase the number of pipe work orders performed annually to meet the future needs of the WQ program would be recommended.
- h) The data does also bear out that a second pipe crew or a new ditch crew is also recommended for the first five years (the required minimum) level of service cost of service analysis.
- i) The consultant team strongly recommends the city make significant procedural changes to the data entry for the work orders. The consultant team can make specific recommendations in the financial fact sheet for the final report if deemed appropriate by city staff.
- j) The end product of the work order data provided in this document was a result of significant interpretation manipulation and analysis performed by the consultant team with input from city staff. Therefore, further analysis will not be performed by the consultant team.
- k) The consultant team certainly reserves the right to add further recommendations after city staff reviews and provide input on the contents of this work order paper.

VII. OTHER INFORMATION

A. The HDR/ERC Team reviewed the address field and determined that some addresses (or locations) have more than one work order entered into the system each year. Those addresses are listed below for each year 2013 – 2016:

2013 Duplicate Address for Work Order	Count of Address	Year Initiated
2526 OLIVE STREET	11	2013
CYCLE 3 - STORMWATER SYSTEM MAP 168I-PA2 CLEANING	9	2013
2526 OLIVE ST	8	2013
2712 BENTON AVE	7	2013
HOT SPOTS SOUTH SIDE	5	2013
HOT SPOTS NORTH SIDE	5	2013
HOT SPOTS SOUTHSIDE	4	2013
HOT SPOTS NORTHSIDE	4	2013
BRAINERD LEVEE	4	2013
1200 WISDOM STREET	4	2013
WPA NORTH CHATTANOOGA	3	2013
WPA EAST LAKE	3	2013
WPA BRAINERD	3	2013

2014 Duplicate Address for Work Order	Count of Address	Year Initiated
HOT SPOTS SOUTHSIDE	6	2014
HOT SPOTS NORTHSIDE	6	2014
WPA NORTH CHATTANOOGA	3	2014
WPA ALTON PARK	3	2014
BRAINERD LEVEE	3	2014

2015 Duplicate Address for Work Order	Count of Address	Year Initiated
HOT SPOTS NORTHSIDE	13	2015
HOT SPOTS SOUTHSIDE	11	2015
WPA North Chattanooga	4	2015
WPA EAST LAKE	4	2015
OIL SKIMMERS NW/NE	4	2015
BRAINERD LEVEE	4	2015
WPA EAST CHATTANOOGA	3	2015
WPA BRAINERD	3	2015
WPA ALTON PARK	3	2015
HOT SPOTS SOUTH SIDE	3	2015
HOT SPOTS NORTH SIDE	3	2015

2016 Duplicate Address for Work Order	Count of Address	Year Initiated
HOT SPOTS SOUTHSIDE	8	2016
HOT SPOTS NORTHSIDE	5	2016
WPA BRAINERD	4	2016
HOT SPOTS NORTH SIDE	4	2016

APPENDIX

A. Year 2013 Work Orders Having Cost Greater Than \$10,000

Work Order Id	Description	Year Initiated	Total Cost
114253	CWS - Pipe Repair/Construction	2013	\$174,780.82
106312	CWS - Pipe Repair/Construction	2013	\$83,829.31
117223	CWS - Pipe Repair/Construction	2013	\$71,030.95
125212	CWS - Pipe Repair/Construction	2013	\$61,326.22
120429	CWS - Pipe Repair/Construction	2013	\$59,084.14
120963	CWS - Pipe Repair/Construction	2013	\$49,678.80
117594	CWS - Pipe Repair/Construction	2013	\$47,177.71
121494	CWS - Pipe Repair/Construction	2013	\$39,185.43
122853	CWS - Pipe Repair/Construction	2013	\$35,666.42
124484	CWS - Pipe Repair/Construction	2013	\$32,610.62
118087	CWS - Pipe Repair/Construction	2013	\$31,892.75
112279	CWS - Pipe Repair/Construction	2013	\$31,579.27
108769	CWS - Pipe Repair/Construction	2013	\$28,701.78
109294	CWS - Pipe Repair/Construction	2013	\$24,072.00
111757	CWS - Pipe Repair/Construction	2013	\$22,821.59
124974	CWS - Pipe Repair/Construction	2013	\$21,570.70
125393	CWS - Structure Rpr/Construct	2013	\$20,984.21
117220	CWS - Ditch Repair/Cleaning	2013	\$20,679.87
122000	CWS - Pipe Repair/Construction	2013	\$20,128.48
112155	CWS - Pipe Repair/Construction	2013	\$19,874.59
118817	CWS - Pipe Repair/Construction	2013	\$19,459.87
105779	WPA Ditch Cleaned	2013	\$19,194.92
108771	CWS - Pipe Repair/Construction	2013	\$18,925.31
111855	CWS - Ditch Repair/Cleaning	2013	\$18,329.33
115019	CWS - Pipe Repair/Construction	2013	\$18,264.77
124487	CWS - Pipe Repair/Construction	2013	\$16,608.50
111517	CWS - Pipe Repair/Construction	2013	\$16,186.25
120319	CWS - Pipe Repair/Construction	2013	\$15,457.86
111883	CWS - Pipe Repair/Construction	2013	\$15,158.44
119770	WPA Ditch Cleaned	2013	\$14,894.11
124819	CWS - Ditch Repair/Cleaning	2013	\$14,622.71
113587	CWS - Pipe Repair/Construction	2013	\$14,206.19
112554	WPA Ditch Cleaned	2013	\$14,127.86

111346	CWS - Pipe Repair/Construction	2013	\$14,102.40
120543	CWS - Structure Rpr/Construct	2013	\$12,742.95
105777	WPA Ditch Cleaned	2013	\$12,508.13
120649	CWS - Pipe Repair/Construction	2013	\$12,497.08
119475	CWS - Pipe Repair/Construction	2013	\$12,141.02
111109	CWS - Pipe Repair/Construction	2013	\$11,780.28
123708	CWS - Pipe Repair/Construction	2013	\$11,672.49
119783	CWS - Pipe Repair/Construction	2013	\$11,378.51
116586	CWS - Structure Rpr/Construct	2013	\$11,011.06
124835	CWS - Pipe Repair/Construction	2013	\$10,864.96
108679	CWS - Structure Rpr/Construct	2013	\$10,464.08
114654	WPA Ditch Cleaned	2013	\$10,374.91
106692	CWS - Pipe Repair/Construction	2013	\$10,353.25
110696	CWS - Pipe Repair/Construction	2013	\$10,329.93

B. Year 2014 Work Orders Having Cost Greater Than \$10,000

Work Order Id	Description	Year Initiated	Total Cost
137784	CWS - Pipe Repair/Construction	2014	\$158,319.42
139181	CWS - Pipe Repair/Construction	2014	\$118,929.70
126938	CWS - Pipe Repair/Construction	2014	\$76,464.71
135441	CWS - Pipe Repair/Construction	2014	\$71,527.47
139310	CWS - Pipe Repair/Construction	2014	\$63,672.23
127100	CWS - Pipe Repair/Construction	2014	\$58,496.81
140224	CWS - Pipe Repair/Construction	2014	\$58,150.83
139825	CWS - Pipe Repair/Construction	2014	\$57,395.72
135831	CWS - Pipe Repair/Construction	2014	\$52,273.29
133713	CWS - Pipe Repair/Construction	2014	\$51,611.85
136436	CWS - Pipe Repair/Construction	2014	\$42,157.48
129067	CWS - Pipe Repair/Construction	2014	\$40,608.00
131446	CWS - Structure Rpr/Construct	2014	\$39,151.51
130344	CWS - Pipe Repair/Construction	2014	\$35,416.31
133121	CWS - Structure Rpr/Construct	2014	\$26,633.72
139603	CWS - Structure Rpr/Construct	2014	\$24,438.74
134439	CWS - Pipe Repair/Construction	2014	\$23,165.15
131599	CWS - Ditch Repair/Cleaning	2014	\$21,879.04
138745	CWS - Pipe Repair/Construction	2014	\$21,237.02

140887	CWS - Structure Rpr/Construct	2014	\$18,412.69
135088	CWS - Ditch Repair/Cleaning	2014	\$18,319.92
126546	CWS - Pipe Repair/Construction	2014	\$17,610.93
128951	CWS - Pipe Repair/Construction	2014	\$16,854.41
133587	CWS - Structure Rpr/Construct	2014	\$16,816.45
131730	CWS - Structure Rpr/Construct	2014	\$15,596.73
130754	WPA Ditch Cleaned	2014	\$14,204.59
129403	CWS - Pipe Repair/Construction	2014	\$14,034.50
139881	CWS - Pipe Repair/Construction	2014	\$13,320.99
130346	SWM - PM_Cleaned	2014	\$12,946.81
137653	CWS - Pipe Repair/Construction	2014	\$12,905.33
139271	CWS - Pipe Repair/Construction	2014	\$12,790.74
139808	CWS - Pipe Repair/Construction	2014	\$12,697.01
139867	CWS - Pipe Repair/Construction	2014	\$12,622.79
138871	CWS - Structure Rpr/Construct	2014	\$12,538.91
129556	CWS - Structure Rpr/Construct	2014	\$12,501.75
128958	CWS - Ditch Repair/Cleaning	2014	\$12,360.61
127745	CWS - Ditch Repair/Cleaning	2014	\$11,753.42
130350	CWS - Pipe Repair/Construction	2014	\$11,544.85
132371	CWS - Structure Rpr/Construct	2014	\$11,493.48
130315	CWS - Pipe Repair/Construction	2014	\$11,304.13
130314	CWS - Ditch Repair/Cleaning	2014	\$10,167.36
131099	CWS - Pipe Repair/Construction	2014	\$10,137.91

C. Year 2015 Work Orders Having Cost Greater Than \$10,000

Work Order Id	Description	Year Initiated	Total Cost
148766	CWS - Pipe Repair/Construction	2015	\$363,087.20
153698	CWS - Pipe Repair/Construction	2015	\$138,084.47
146966	CWS - Pipe Repair/Construction	2015	\$93,113.24
154121	CWS - Pipe Repair/Construction	2015	\$87,650.40
145991	CWS - Pipe Repair/Construction	2015	\$82,920.68
158136	CWS - Pipe Repair/Construction	2015	\$75,924.09
152800	CWS - Pipe Repair/Construction	2015	\$75,112.86
147046	CWS - Pipe Repair/Construction	2015	\$74,560.65
155581	CWS - Pipe Repair/Construction	2015	\$66,800.61
145519	CWS - Pipe Repair/Construction	2015	\$56,185.53

144097	CWS - Pipe Repair/Construction	2015	\$54,851.56
148763	CWS - Pipe Repair/Construction	2015	\$50,414.91
146230	CWS - Pipe Repair/Construction	2015	\$49,790.01
150339	CWS - Pipe Repair/Construction	2015	\$48,467.55
150182	CWS - Pipe Repair/Construction	2015	\$44,654.89
150173	CWS - Pipe Repair/Construction	2015	\$43,788.40
150204	CWS - Pipe Repair/Construction	2015	\$40,038.52
149209	CWS - Pipe Repair/Construction	2015	\$39,358.27
146968	CWS - Pipe Repair/Construction	2015	\$38,932.74
152533	CWS - Pipe Repair/Construction	2015	\$38,539.79
152484	CWS - Pipe Repair/Construction	2015	\$36,930.96
154535	CWS - Pipe Repair/Construction	2015	\$35,892.33
147695	CWS - Pipe Repair/Construction	2015	\$33,601.50
153030	CWS - Pipe Repair/Construction	2015	\$33,504.21
145631	CWS - Pipe Repair/Construction	2015	\$33,470.72
144924	CWS - Pipe Repair/Construction	2015	\$30,677.56
146264	CWS - Pipe Repair/Construction	2015	\$29,509.79
151806	CWS - Pipe Repair/Construction	2015	\$28,909.84
145555	CWS - Pipe Repair/Construction	2015	\$27,212.79
154776	CWS - Pipe Repair/Construction	2015	\$26,871.43
152515	CWS - Structure Rpr/Construct	2015	\$25,612.99
146949	CWS - Pipe Repair/Construction	2015	\$24,729.38
143924	CWS - Pipe Repair/Construction	2015	\$22,872.71
147569	CWS - Pipe Repair/Construction	2015	\$22,704.45
142875	CWS - Pipe Repair/Construction	2015	\$21,632.33
152890	CWS - Pipe Repair/Construction	2015	\$21,383.56
152477	CWS - Pipe Repair/Construction	2015	\$20,924.06
156404	CWS - Pipe Repair/Construction	2015	\$20,082.26
155761	CWS - Structure Rpr/Construct	2015	\$19,355.69
147769	CWS - Pipe Repair/Construction	2015	\$17,971.34
155813	CWS - Pipe Repair/Construction	2015	\$16,375.07
158254	CWS - Pipe Repair/Construction	2015	\$16,346.08
152235	CWS - Ditch Repair/Cleaning	2015	\$15,074.17
148064	CWS - Pipe Repair/Construction	2015	\$14,090.63
151766	CWS - Pipe Repair/Construction	2015	\$14,024.28
149279	CWS - Ditch Repair/Cleaning	2015	\$13,325.39
149394	CWS - Pipe Repair/Construction	2015	\$13,280.18
153914	WPA Ditch Cleaned	2015	\$12,781.89

152450	CWS - Pipe Repair/Construction	2015	\$12,417.18
154182	CWS - Pipe Repair/Construction	2015	\$11,302.75
148234	SWM - PM_Cleaned	2015	\$10,927.98
152631	CWS - Ditch Repair/Cleaning	2015	\$10,867.17
148601	CWS - Pipe Repair/Construction	2015	\$10,606.27
152984	CWS - Structure Rpr/Construct	2015	\$10,478.36

D. Year 2016 Work Orders Having Cost Greater Than \$10,000

Work Order Id	Description	Year Initiated	Total Cost
167073	CWS - Pipe Repair/Construction	2016	\$361,042.27
159198	CWS - Pipe Repair/Construction	2016	\$62,794.07
161345	CWS - Ditch Repair/Cleaning	2016	\$51,577.47
164755	CWS - Pipe Repair/Construction	2016	\$45,550.99
169266	CWS - Structure Rpr/Construct	2016	\$41,717.53
164770	CWS - Pipe Repair/Construction	2016	\$40,528.68
159438	CWS - Pipe Repair/Construction	2016	\$39,719.46
163736	WPA Ditch Cleaned	2016	\$34,395.23
171650	WPA Ditch Cleaned	2016	\$33,089.99
169735	CWS - Pipe Repair/Construction	2016	\$29,870.69
167459	CWS - Structure Rpr/Construct	2016	\$26,415.25
164473	CWS - Pipe Repair/Construction	2016	\$25,178.22
159939	CWS - Pipe Repair/Construction	2016	\$22,222.83
163055	CWS - Pipe Repair/Construction	2016	\$17,708.92
167828	CWS - Pipe Repair/Construction	2016	\$17,117.36
160802	CWS - Pipe Repair/Construction	2016	\$14,944.67
161275	CWS - Pipe Repair/Construction	2016	\$13,795.69
167857	CWS - Pipe Repair/Construction	2016	\$13,417.43
165674	CWS - Pipe Repair/Construction	2016	\$11,617.77
161757	CWS - Pipe Repair/Construction	2016	\$11,260.94
172799	SWM - PM_Cleaned	2016	\$11,167.48
159974	CWS - Structure Rpr/Construct	2016	\$10,793.60

E. Work Orders by Year Having a Cost Greater Than \$100,000

Description	Year Initiated	Total Cost
CWS - Pipe Repair/Construction	2013	\$174,780.82
CWS - Pipe Repair/Construction	2014	\$118,929.70
CWS - Pipe Repair/Construction	2014	\$158,319.42
CWS - Pipe Repair/Construction	2015	\$138,084.47
CWS - Pipe Repair/Construction	2015	\$363,087.20
CWS - Pipe Repair/Construction	2016	\$361,042.27

F. Chart Showing Number of Times an Activity Was Performed and the Total Cost for Each Year 2013 – 2016 and year to date 2017:

Description	Count of Description	Year Initiated	Total Cost
CWS - Ditch Repair/Cleaning	534	2013	\$658,022.29
CWS - Pipe Repair/Construction	99	2013	\$1,273,074.21
CWS - Structure Rpr/Construct	141	2013	\$222,325.97
SWM - PM_Cleaned	195	2013	\$117,755.18
SWM - PM_HotSpots Northside	9	2013	\$11,318.47
SWM - PM_HotSpots Southside	12	2013	\$19,226.56
SWM - PM_Inspection	254	2013	\$136,193.98
SWM - Vac Truck Cleaning	23	2013	\$9,407.38
WPA Ditch Cleaned	13	2013	\$104,880.68
CWS - Ditch Repair/Cleaning	419	2014	\$500,071.00
CWS - Pipe Repair/Construction	67	2014	\$1,235,045.81
CWS - Structure Rpr/Construct	143	2014	\$366,239.32
CWS-Ditch Cleaned	2	2014	\$5,591.39
CWS-Pipe Cleaned	1	2014	\$197.91
SWM - PM_Cleaned	150	2014	\$146,022.35
SWM - PM_HotSpots Northside	9	2014	\$18,561.47
SWM - PM_HotSpots Southside	15	2014	\$26,618.73
SWM - PM_Inspection	189	2014	\$162,106.34
SWM - Vac Truck Cleaning	12	2014	\$10,084.16

WPA Ditch Cleaned	13	2014	\$52,223.30
CWS - Ditch Repair/Cleaning	383	2015	\$529,116.11
CWS - Pipe Repair/Construction	106	2015	\$2,276,676.55
CWS - Structure Rpr/Construct	129	2015	\$266,506.21
CWS-Ditch Cleaned	4	2015	\$6,085.46
CWS-Pipe Cleaned	2	2015	\$808.04
CWS-Structure Cleaned	6	2015	\$2,830.74
SWEEP	4	2015	\$1,259.38
SWM - PM_Cleaned	79	2015	\$41,406.93
SWM - PM_HotSpots Northside	17	2015	\$24,950.36
SWM - PM_HotSpots Southside	16	2015	\$32,500.95
SWM - PM_Inspection	80	2015	\$54,150.32
SWM - Vac Truck Cleaning	22	2015	\$5,303.08
WPA Ditch Cleaned	17	2015	\$82,525.34
CWS - Ditch Repair/Cleaning	371	2016	\$527,890.33
CWS - Pipe Repair/Construction	85	2016	\$822,341.87
CWS - Structure Rpr/Construct	145	2016	\$224,384.27
CWS-Ditch Cleaned	1	2016	\$811.30
CWS-Structure Cleaned	6	2016	\$1,775.70
SWEEP	4	2016	\$4,443.18
SWM - PM_Cleaned	2	2016	\$13,423.93
SWM - PM_HotSpots Northside	10	2016	\$25,524.40
SWM - PM_HotSpots Southside	11	2016	\$28,843.06
SWM - PM_Inspection	184	2016	\$217,399.78
SWM - Vac Truck Cleaning	29	2016	\$10,872.49
VEGETADED CITY BMPs	2	2016	\$1,183.54
WPA Ditch Cleaned	12	2016	\$107,676.98
CWS - Ditch Repair/Cleaning	282	2017	\$136,545.02
CWS - Pipe Repair/Construction	35	2017	\$99,063.98
CWS - Structure Rpr/Construct	64	2017	\$25,316.18
CWS-Strcuture Cleaned	5	2017	\$508.77
GIS_Updates	17	2017	\$0.00
SWEEP	2	2017	\$0.00
SWM - PM_HotSpots Northside	3	2017	\$9,263.39
SWM - PM_HotSpots Southside	3	2017	\$12,043.79

SWM - PM_Inspection	94	2017	\$50,973.26
SWM - Vac Truck Cleaning	48	2017	\$4,872.20
VEGETADED CITY BMPs	1	2017	\$0.00
WPA Ditch Cleaned	1	2017	\$0.00

G. The following chart shows the total cost of work orders for the years 2013 – 2016 and year to date 2017:

Year Initiated	Total Cost
2013	\$2,552,204.72
2014	\$2,522,761.78
2015	\$3,324,119.47
2016	\$1,986,570.83
2017	\$338,586.59

Appendix F - Policy Paper # 4 – Capital Project Data Analysis

City of Chattanooga
Department of Public Works
Water Quality Program Rate Study
Level and Cost of Service Update
Contract S-16-010



Capital Improvement Project (CIP) Data Evaluation

Prepared by:

HDR / ERC



July 21, 2017

CITY OF CHATTANOOGA WATER QUALITY PROGRAM

POLICY: CAPITAL IMPROVEMENT PROJECT (CIP) DATA EVALUATION

I. OVERVIEW

This CIP evaluation and analysis paper is a continuation of the work order database evaluation and analysis Policy Paper 3. The attached spreadsheet outlines the additional information needed for the CIP.

II. PURPOSE

The purpose of this policy paper is as follows:

1. Collect and evaluate the past 10 years (FY08 thru 17) of capital projects spending and the types of capital projects funded by the water quality rate.
2. Collect, evaluate and provide a future forecast for the next 10 years (two five year future forecasts FY18 thru 22 & FY23 thru 27).
3. The evaluation and analysis of the last 10 year historical CIP program combined with the next 10 year plan will establish the basis for the future forecasted capital improvements project program.

III. PROCESS

The process and procedure to develop the future CIP needs and requirements is to utilize the information included in the attached spreadsheet for FY 18 thru 22. We are requesting this information for the previous 10 year period (FY07 thru 17) and projected second 5 year period (FY23 thru 27). Specific notes regarding data are provided below:

1. Column A – Parcel ID or some geographic description or servicer address that will allow adding a point to the GIS map
2. Column B – General description of the work.
3. Column L – Percentage estimate of water quality project purpose.
4. Column M – Percentage estimate of flooding and drainage project purpose
5. FY07 thru 17 and FY23 thru 27 can be added to this spreadsheet by adding rows and columns or separate spreadsheets developed.
6. Note that “unhiding” columns will show other data that has been provided. This info can be provided on past and future years if available, omit if not available.

CIPP Summary Table

Fiscal Year	Total CIP Budget	Fiscal Year	Total CIP Budget
2019	\$4,625,000	2024	\$8,625,000
2020	\$5,840,000	2025	\$9,240,000
2021	\$6,764,000	2026	\$9,150,000
2022	\$7,340,000	2027	\$9,090,000
2023	\$8,170,000	2028	\$9,025,000
5-Year Total	\$32,739,000	5-Year Total	\$45,130,000

No.	Location for placement on GIS layer/Level of Service Map	General Project Description	Description	2012 Budget	2012 Cost	2013 Budget	2013 Cost	2014 Budget	2014 Cost	2015 Budget	2015 Cost	2016 Budget	2016 Cost	2017 Budget
1		City Wide Drainage Projects	K80101 Water Qual Cap - Drainage Projects	\$1,941,434	\$1,936,084	\$1,941,434	\$1,953,861	\$1,941,434	\$1,953,861	\$1,955,484	\$1,953,861	\$1,953,861	\$1,953,861	\$0.00
2		Survey, Collections	K80102 Water Qual Cap - Drainage System Inventory	\$3,254,573	\$3,462,455	\$3,254,573	\$3,935,950	\$3,254,573	\$4,189,444	\$4,698,738	\$4,480,009	\$4,698,738	\$4,480,009	\$218,728.79
3		Level Of Service	K80104 Water Qual Cap - Level of Service Analysis	\$241,500	\$219,500	\$241,500	\$219,500	\$241,500	\$219,500	\$219,500	\$219,500	\$219,500	\$219,500	\$0.00
4		Stream Sampling Units	K80106 Water Qual Cap - Samplers	\$25,000	\$0	\$25,000	\$0	\$25,000	\$0	\$25,000	\$0	\$25,000	\$0	\$25,000.00
5		GIS	K80107 Water Qual Cap - Aerial Photography	\$590,559	\$378,458	\$590,559	\$378,458	\$590,559	\$378,458	\$590,559	\$428,458	\$513,458	\$428,458	\$85,000.00
6		Converting Fee Rate to Imprevious Surface	K80108 Water Qual Cap - Fee Rate Conversion	\$521,000	\$750,064	\$521,000	\$750,064	\$778,174	\$750,064	\$750,064	\$750,064	\$750,064	\$750,064	\$0.00
7		Purchased for Stream Restoration	K80109 Water Qual Cap - Friar Branch Property	\$650,000	\$652,000	\$650,000	\$652,000	\$652,000	\$652,000	\$652,000	\$652,000	\$652,000	\$652,000	\$0.00
8		Survey, Field Collections	K80110 Water Qual Cap - Combined Sewer As-Found	\$3,177,251	\$1,011,826	\$3,177,251	\$1,072,470	\$2,177,251	\$1,072,470	\$1,072,470	\$1,072,470	\$1,072,470	\$1,072,470	\$0.00
9		On-Call Modeling	K80111 Water Qual Cap - Floodplain Modeling	\$450,000	\$0	\$700,000	\$132,184	\$700,000	\$431,785	\$700,000	\$483,785	\$1,033,816	\$483,785	\$550,031.34
10	1000 Dartmouth St., Chattanooga, TN 37405	Stormwater Infrastructure Upgrade	K80112 Water Qual Cap - 1000 Blk Dartmouth St.	\$1,000,000	\$0	\$1,000,000	\$0	\$1,000,000	\$17,802	\$975,000	\$43,942	\$975,000	\$43,942	\$931,057.75
11	3469 Brainerd Road, Chattanooga, TN 37411	Stormwater Infrastructure Upgrade	K80113 Water Qual Cap - 3469 Brainerd Rd.	\$400,000	\$7,217	\$400,000	\$7,296	\$230,250	\$7,296	\$230,250	\$7,296	\$230,250	\$7,296	\$222,953.69
12	2888 Rossville Road, Chattanooga, TN 37412	Stormwater Infrastructure Upgrade	K80114 Water Qual Cap - 2888 Rossville Ave.	\$750,000	\$14,047	\$750,000	\$243,389	\$750,000	\$243,190	\$243,190	\$243,190	\$243,190	\$243,190	\$0.00
13	180 2100 Chapman Rd, Hixson, TN 37343	Stormwater Infrastructure Upgrade	K80115 Water Qual Cap - 2100 Chapman Rd.	\$1,500,000	\$1,308,516	\$1,500,000	\$1,308,516	\$1,308,516	\$1,308,516	\$1,308,516	\$1,308,516	\$1,308,516	\$1,308,516	\$0.00
14	180 3500 Broad Rd, Hixson, TN 37343	Stormwater Infrastructure Upgrade	K80116 Water Qual Cap - 3500 Broad St.	\$500,000	\$161,103	\$1,300,000	\$383,463	\$2,300,000	\$387,863	\$11,800,000	\$581,111	\$15,952,601	\$1,099,329	#####
15	2300 Main Road, Chattanooga, TN 37416	Project dead	K80118 Water Qual Cap - 2300 Main St.	\$200,000	\$0	\$200,000	\$0	\$200,000	\$0	\$200,000	\$0			\$0.00
16	3900 Sunbeam Road, Chattanooga, TN 37417	Stormwater Infrastructure Upgrade	K80119 Water Qual Cap - 3900 Sunbeam Ave.	\$350,000	\$0	\$350,000	\$0	\$350,000	\$0	\$517,426	\$433,610	\$433,610	\$433,610	\$0.00
17	3322 Idlewild Road, Chattanooga, TN 37418	Not constructed	K80120 Water Qual Cap - 3322 Idlewild Dr.	\$375,000	\$0	\$375,000	\$0	\$375,000	\$0	\$375,000	\$0	\$112,500	\$0	\$112,500.00
18	180 Valleybrook Rd, Hixson, TN 37343	Stormwater Infrastructure Upgrade	K80121 Water Qual Cap - Valleybrook Subdivision	\$1,000,000	\$0	\$1,000,000	\$0	\$1,000,000	\$0	\$1,250,000	\$0	\$675,000	\$54,754	\$620,246.30
19		Stormwater Infrastructure Upgrade	K80122 Water Qual Cap - Levee Certification and Repairs	\$1,150,000	\$452,438	\$1,550,000	\$502,043	\$1,550,000	\$509,979	\$987,000	\$820,647	\$986,725	\$902,275	\$84,449.49
20		GIS Data	K80123 Water Qual Cap - LIDAR Topography Updates	\$300,000	\$0	\$300,000	\$0	\$300,000	\$0	\$300,000	\$0	\$24,500	\$0	\$24,500.00
21		GIS Data	K80124 Water Qual Cap - Infrared Survey	\$100,000	\$0	\$100,000	\$0	\$100,000	\$0					\$0.00
22		On-Call Modeling	K80125 Water Qual Cap - Watershed Studies	\$200,000	\$11,556	\$200,000	\$39,127	\$200,000	\$39,127	\$200,000	\$39,127	\$200,000	\$39,127	\$160,873.26
23		NPDES SEP	K80126 Water Qual Cap - Stream, Conservation, Floodplain	\$1,300,000	\$209,234	\$1,300,000	\$522,692	\$1,300,000	\$724,818	\$1,950,000	\$738,502	\$950,000	\$738,502	\$211,498.14
24	Sterling Ave, Chattanooga, TN 37405	Bank stabilization	K80127 Water Qual Cap - Sterling Ave.	\$750,000	\$859,200	\$750,000	\$859,200	\$859,200	\$859,200	\$859,200	\$859,200	\$859,200	\$859,200	\$0.00
25	Main Terrain Art Park, Chattanooga, TN 37402	CSS storage area	K80128 Water Qual Cap - Main Terrain Art Park							\$0	\$380,000	\$380,000	\$380,000	\$0.00
26		City Wide Services - Stormwater Equipment	K80129 Water Qual Cap - Heavy Equipment	\$0	\$547,765	\$0	\$547,765	\$547,765	\$547,765	\$547,765	\$547,765	\$547,765	\$547,765	\$0.00
27	35.031674, -85.321628	Stormwater Infrastructure Upgrade	K80130 Water Qual Cap - Carter Stree Outfall Pipe Rehab					\$750,000	\$15,153	\$750,000	\$40,000	\$755,000	\$737,315	\$17,685.30
28	Central Ave	Stormwater Infrastructure Upgrade	K80131 Water Qual Cap - Central Ave Ext Separation Project					\$200,000	\$0	\$400,000	\$14,268	\$395,000	\$72,434	\$322,566.21
29		Consent Decree	K80132 Water Qual Cap - Drainage System Retrofit					\$500,000	\$0	\$405,000	\$9,058	\$374,500	\$355,364	\$19,135.92
30		Water Quality project	K80133 Water Qual Cap - Mountain Creek Rd - Drainage Improv							\$860,127	\$6,700	\$1,110,127	\$11,897	\$1,098,229.91
31	1761 Dorchester Rd, Chattanooga, TN 37405	Stormwater Infrastructure Upgrade	K80134 Water Qual Cap - Concord & Golf Streets							\$867,744	\$744,684	\$867,744	\$819,650	\$48,093.65
32		Advance flood warning	K80135 Water Qual Cap - Automated Flood Warning System									\$203,000	\$0	\$203,000.00
33		Consent Decree Project, WQ	K80136 Water Qual Cap - LID Retrofit (Anderson Ave Demo Project)									\$1,800,000	\$0	\$1,800,000.00
34		Drainage works for State road imp	K80138 Water Qual Cap - US27 Downstream Improvements									\$100,000	\$0	\$100,000.00
35		Water Quality project	K80140 Water Qual Cap - Sunbeam Green Infrastructure Installation									\$250,000	\$5,198	\$244,802.50
36		City Wide Improvement	K80202 Water Qual Cap - Drainage Projs City Wide	\$1,324,204	\$1,362,091	\$1,324,204	\$1,362,091	\$1,359,927	\$1,691,931	\$1,359,927	\$1,362,091	\$1,377,218	\$1,362,091	\$15,126.66
37		Water Quality project	K80203 Water Qual Cap - Friar Branch Restoration FY09	\$500,000	\$157,247	\$500,000	\$157,247	\$409,372	\$157,355	\$157,355	\$157,355	\$157,355	\$157,355	\$0.00
38		Enhancing WQ data analysis	K80204 Water Qual Cap - Data Mgmt System FY09	\$200,000	\$24,472	\$200,000	\$73,531	\$200,000	\$77,257	\$77,257	\$77,257	\$77,257	\$77,257	\$0.00
39		Service Line Assistance for TMDL	K80205 Water Qual Cap - Private San Serv Lateral Rep FY09	\$300,000	\$130,839	\$300,000	\$164,527	\$300,000	\$194,517	\$323,280	\$250,758	\$351,483	\$269,027	\$82,455.88
40		Consent Decree	K80206 Water Qual Cap - LID Retrofit FY09	\$250,000	\$0	\$750,000	\$0	\$750,000	\$418,707	\$1,400,000	\$418,707	\$439,000	\$418,707	\$20,292.69
41		CWS	K80302 Water Qual Cap - 2013 Heavy Equipment			\$856,000	\$307,804	\$856,000	\$579,800	\$1,056,000	\$855,514	\$1,691,000	\$1,521,793	\$169,207.11
42		Stormwater Infrastructure Upgrade	K80303 Water Qual Cap - 2013 WPA System			\$600,000	\$0	\$600,000	\$163,451	\$654,000	\$484,881	\$1,104,000	\$622,598	\$481,402.25
43		Stormwater Infrastructure Upgrade	K80304 Water Qual Cap - 2013 Briarwood Circle			\$1,500,000	\$0	\$1,500,000	\$27,320	\$1,500,000	\$43,490	\$1,500,000	\$43,490	\$1,456,510.00
44		Stormwater Infrastructure Upgrade	K80305 Water Qual Cap - 2013 McCutcheon Rd.			\$750,000	\$0	\$750,000	\$0	\$1,500,000	\$3,600	\$2,250,000	\$698,277	\$1,551,722.95
				\$23,300,521	\$13,656,112	\$28,956,521	\$15,573,178	\$30,906,521	\$17,618,628	\$43,717,851	\$20,511,416	\$49,600,446	\$23,870,105	\$25,730,341

No.	GIS Location	Location for placement on GIS layer/Level of Service Map	General Project Description	Project Name	FY2018	Request FY2019	Request FY2020	Request FY2021	Request FY2022	Request FY2023	Total 5 Year Request	Drainage/Flood Control %	Water Quality %
1	Brainerd Rd. from Seminole to Tunnel Blvd.	Brainerd Rd. from Seminole to Tunnel Blvd.	Storm sewer collection system improvements	3469 Brainerd Road (K80113)	\$812,000						\$0	80%	20%
2	3499 St Elmo Ave off Broad St	3500 St Elmo Ave off Broad St	Large stormwater conveyance.	3500 St. Elmo - Big Dig (K80116)	\$3,100,000						\$0	80%	20%
3	Appling Street Between Bliss and Benton Aves.	Appling Street Between Bliss and Benton Aves.	Culvert upgrade	Appling Street	\$350,000						\$0	80%	20%
4	Riverside Dr. between Crutchfield and Latta	Riverside Dr. between Crutchfield and Latta	Culvert upgrade	Riverside Dr. (Upper Citico Creek Culvert Improvements Project)				\$173,000			\$173,000	80%	20%
5	Latta St. between Riverside Dr. and Benton Ave.	Latta St. between Riverside Dr. and Benton Ave.	Culvert upgrade	Latta St. (Upper Citico Creek Culvert Improvements Project)				\$167,000			\$167,000	80%	20%
6	Stuart St. between Bell Arbor and Freeman	Stuart St. between Bell Arbor and Freeman	Culvert upgrade	Stuart St. (Upper Citico Creek Culvert Improvements Project)				\$150,000			\$150,000	80%	20%
7	Wisdom St. between N. Bell Srbor and Freeman	Wisdom St. between N. Bell Srbor and Freeman	Culvert upgrade	Wisdom St. (Upper Citico Creek Culvert Improvements Project)						\$630,000	\$630,000	80%	20%
8	1200 Wisdom St, Chattanooga, TN 37406	Citico Creek from North of Wisdom St. to Railroad East of Riverside	Stream Restoration	Citico Creek Restoration (Upper Citico Creek Culvert Improvements Project)					\$2,290,000		\$2,290,000	20%	80%
9	1701-1723 Arden Avenue	1701-1723 Arden Avenue	Storm sewer collection system improvements	Arden Ave Drainage Improvements				\$250,000			\$250,000	100%	0
10		N/A	Automated flood warning system	Automated Flood Warning System (K80135)			\$150,000	\$150,000	\$150,000		\$450,000	100%	0
11		The Intersection of Brainerd Road and S. Howell Avenue, primarily on S. Howell between Sunbeam Ave. and Brainerd Road	Storm sewer separation project.	Brainerd & South Howell				\$964,000			\$964,000	100%	0
12		3rd and Central Ave	Storm sewer separation project.	Central Avenue Ext Separation Project (K80131)	\$1,700,000	\$325,000	\$1,300,000				\$1,625,000	40%	60%
13	526 MLK Blvd, Chattanooga, TN 37403	Combined Sewer System Separation-Central/MLK Trunk Line	Storm sewer separation project.	Central Avenue Ext Separation Project (Central Ave/MLK)						\$2,000,000	\$2,000,000	40%	60%
14		Combined Sewer System Separation-Lincoln Park Neighborhood to Central Ave. Trunk Line and Main Trunk Line Extension (Phase I)	Storm sewer separation project.	Central Avenue Ext Separation Project (Lincoln Park System-Phase II)						\$2,000,000	\$2,000,000	40%	60%
15		Elder Mountain Road - Cross Drains Improvement	Storm water conveyance system improvements	Elder Mountain Road						\$890,000	\$890,000	100%	0
16		Interchange between Cummings Hwy and I-24	Storm sewer collection system improvements	Cummings Hwy and I-24	\$450,000						\$0	100%	0
17		7602-7685 Davidson Road	Storm sewer collection system improvements	Davidson Road	\$1,000,000		\$600,000				\$600,000	100%	0
18		3000 E 34th St - District 7 City owned property	Water quality improvements to existing lake	East Lake WQ Restoration (K80143)	\$300,000	\$400,000					\$400,000	0	100%
19		N/A	Water quality improvements, Stay On Volume Coupon Bank	Green Infrastructure SOV Bank (K80144)		\$250,000		\$250,000		\$250,000	\$750,000	0	100%
20		1500 Lynnbrook Ave from E Main St to E 23rd St	Stream Restoration	Lynnbrook WPA Ditch Improvements (K80145)		\$200,000					\$200,000	0	100%
21		Various	Landscape Design	On-Call Landscape Design (K80146)		\$100,000	\$100,000		\$100,000		\$300,000	0	100%
22		Patten Pkwy between Georgia Ave and Lindsay St.	Stormwater detention facility	Patten Parkway Detention Facility (K80147)	\$3,000,000						\$0	60%	40%
23		Patten Pkwy between Georgia Ave and Lindsay St. (Increased Detention Volume and Georgia Ave Trunk Lines	Combined sewer separation	Patten Parkway Separation Project (Trunk lines in Georgia and Storage)		\$1,000,000	\$950,000		\$1,000,000		\$2,950,000	40%	60%
24		Combined sewer system separation in remaining 15 Acre Basin	Combined sewer separation	Patten Parkway Separation Project (Remaining Basin System Installation)					\$1,200,000		\$1,200,000	40%	60%
25		Combined sewer system from entrance to BCBS on MLK to Tennessee River	Combined sewer separation	Riverfront Parkway/MLK CSS Project Phase II (K80148)		\$250,000					\$250,000	40%	60%
26		Combined sewer system separation from Boynton Dr along S side MLK to Fulton St Trunk (Phase I&II)	Combined sewer separation	Riverfront Parkway/MLK CSS Project Phase III (K80148)			\$640,000				\$640,000	40%	60%
27		Combined sewer system separation along Gateway Ave. and Boynton Dr to MLK. (Phase III)	Combined sewer separation	Riverfront Parkway/MLK CSS Project Phase IV (K80148)				\$640,000			\$640,000	40%	60%
28		Various	Home buyout program	Regional Detention Buffer/Easement				\$350,000	\$350,000	\$350,000	\$1,050,000	60%	40%
29		100 Manufacturers Rd	Conveyance and water quality wetland improvements	WPA - N. Market St, Branch/ Renaissance Park WQ Improvements (K80303)				\$250,000			\$250,000	20%	80%
30		WPA SWMM Quality & Quantity Improvements	Conveyance, detention and water quality improvements	Glass Street Area : Taylor St, Dodson Ave, Crutchfield St (K80303)			\$350,000		\$1,500,000	\$1,000,000	\$2,850,000	50%	50%
31		Dartmouth St. from Five Points to Knickerbocker Ave.	Storm water conveyance system improvements	Dartmouth/Five Points Watershed SIP - Phase I (K80112)		\$350,000					\$350,000	80%	20%
32		N/A	Heavy Equipment Purchases	Heavy Equipment (K80129 or K80302)		\$700,000		\$670,000			\$1,370,000	75%	25%
33		Various	On-Call Floodplain Modeling	Floodplain Modeling (K80111)			\$200,000	\$200,000		\$200,000	\$600,000	80%	20%
34		1290 Park Avenue - CWS Yard	WQ Operations Building at City Wide Services Yard	Operations Building (K80150)			\$350,000	\$100,000			\$450,000	75%	25%
35		N/A	Pump Station Repairs	Pump Station Repairs			\$500,000	\$1,500,000	\$500,000		\$2,500,000	100%	0%
36		N/A	WQ Lab/Storage	Monitoring Lab/Storage			\$150,000	\$0	\$0		\$150,000	0%	100%
37		Projects to address TMDLs											
38		Various	Prioritizing GI Projects to address TMDLs	GI Prioritization Tool		50,000	50,000				\$100,000		100%
39		Various	Various stream restoration projects	Stream Restoration			250,000	250,000		250,000	\$750,000		100%
40		Various	Various areas of stream buffer purchased into conservation to protect streams.	Stream Buffer Conservation		50,000	100,000	100,000		200,000	\$450,000		100%
41		Combined Sewer System Separation-Tremont St. Basin from Mississippi Ave to Tennessee River	Combined sewer separation	Tremont St. Separation Project (Central Ave/MLK)							\$0	80%	20%
42		Slope Failure due to Collapsed Private system draining Granada Dr.	Storm water conveyance system improvements	Granada Dr. System Relocation (Collapsed upstream WPA connection)				350,000			\$350,000	100%	
43		TBD.	Storm water conveyance system improvements	USACE/FEMA Floodplain Culvert Replacements Projects				100,000	100,000	250,000	\$450,000	100%	
44		Avondale YFD Center	Green Infrastructure of the Avondale YFD Center	Avondale YFD GI Project		800,000					\$800,000	20%	80%
45		Various City Alleyways	Green Infrastructure of City Alleyways	Green Alley Program		150,000	150,000	150,000	150,000	150,000	\$750,000	50%	50%
		Totals			\$10,712,000	\$4,625,000	\$5,840,000	\$6,764,000	\$7,340,000	\$8,170,000	\$32,739,000		

No.	Location for placement on GIS layer/Level of Service Map	General Project Description	Project Name	Request FY2024	Request FY2025	Request FY2026	Request FY2027	Request FY2028	Total 5 Year Request	Drainage/Flood Control %	Water Quality %	
1	Orchard Knob	Conveyance, detention and water quality improvements	Orchard Knob WPA Drainage and Flood Reduction Project (80303)		\$1,500,000				\$1,500,000	80%	20%	
2	Wisdom St. between N. Bell Sbror and Freeman	Culvert upgrade	Wisdom St. (Upper Citico Creek Culvert Improvements Project)				\$630,000		\$630,000	80%	20%	
3	Bushtown - Windsor Street	Conveyance, detention and water quality improvements	Bushtown WPA Drainage Improvement Project (80303)		\$250,000				\$250,000	80%	20%	
4	Combined Sewer System Separation-Tremont St. Basin from Mississippi Ave to Tennessee River	Combined sewer separation	Tremont St. Separation Project (Central Ave/MLK)			\$3,380,000			\$3,380,000	40%	60%	
5	Oriole Drive from S. Germantown - Brainerd	Conveyance, detention and water quality improvements	Brainerd WPA Drainage Improvement - Phase I (80303)				\$3,200,000		\$3,200,000	80%	20%	
6	Dartmouth St. from Five Points to Knickerbocker Ave.	Storm water conveyance system improvements	Dartmouth/Five Points Watershed SIP - Phase I (K80112)		\$2,730,000				\$2,730,000	60%	40%	
7	Federal St. from Five Points to Liberty St.	Storm water conveyance system improvements	Dartmouth/Five Points Watershed SIP - Phase II (K80112)			2,730,000			\$2,730,000	60%	40%	
8	Summer St. to Federal St.	Storm water conveyance system improvements	Dartmouth/Five Points Watershed SIP - Phase III (K80112)				\$2,470,000		\$2,470,000	60%	40%	
9	from Knickerbocker Ave. to Curve St.	Storm water conveyance system improvements	Dartmouth/Five Points Watershed SIP - Phase IV (K80112)					\$1,250,000	\$1,250,000	60%	40%	
10	Brookfield Ave from I-24 @ N. Terrace & Marlboro Ave - Brainerd	improvements	Brainerd WPA Drainage Improvement - Phase II (80303)					\$3,800,000	\$3,800,000	60%	40%	
11	Various	Landscape Design	On-Call Landscape Design (K80146)	\$100,000			\$100,000	\$100,000	\$300,000	20%	80%	
12	St. Elmo Ave Stormwater Improvements Project	Storm sewer collection system improvements	St. Elmo Ave Stormwater Improvements Project	\$1,540,000					\$1,540,000	60%	40%	
13	Highland Dr. from Five Points to Westwood Ave.	Storm water conveyance system improvements	Dartmouth/Five Points Watershed SIP - Phase V (K80112)	\$200,000					\$200,000	60%	40%	
14	Combined Sewer System Separation-Warner Park Trunk line to Regional Detention Facility and McCaulie Ave.	Storm sewer separation project.	Central Avenue Ext Separation Project (Warner Park System-PhaseIII)	\$2,000,000					\$2,000,000	60%	40%	
15	Combined Sewer System Separation-Fortwood/Engel Stadium trunk line extension	Storm sewer separation project.	Central Avenue Ext Separation Project (Central Ave/Fortwood)	\$2,000,000					\$2,000,000	60%	40%	
16	700 Block E 11th St	Storm sewer collection system improvements	11th Street		\$2,000,000				\$2,000,000	80%	20%	
17	301 N. Holtzclaw	Combined sewer separation	Warner Park Sewer Separation (K80149)	\$100,000					\$100,000	80%	20%	
18	Various	Stream restoration projects	Various - Stream Restoration	\$250,000		\$250,000	250,000	250,000	\$1,000,000		100%	
20	Various	Various areas of stream buffer purchased into conservation to protect streams.	Stream Buffer Conservation	\$100,000		100,000		100,000	\$300,000		100%	
21	Moccasin Bend Rd	Improvements to City owned polic firing range.	CPD HC Firing Range (K80142)		\$350,000				\$350,000		100%	
22									\$0			
	Data Collections / Analysis / Dissemination									\$0		
23	Various - Contracted Modeling & Design	Floodplain Modeling / Design (K80111)	Various	\$250,000		\$250,000		\$250,000	\$750,000	80%	20%	
24	Various - Sampling / Collection Stations (stand alone & cost share)	IoT Sampling & Collection Stations & Data Acquisition	Various		\$75,000		\$75,000	\$75,000	\$225,000	20%	80%	
25	Various - Flood Warning Program (warning sys, communication, etc.)	IoT Flood Warning Systems & Data Acquisition (K80135)	Various	\$150,000		\$150,000		\$150,000	\$450,000	80%	20%	
	Existing Infrastructure Replacement - Construction									\$0		
26	Various - Culverts and Major Roads		Various	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$1,250,000	80%	20%	
27	Longitudnal Systems - SFR		Various	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$1,250,000	50%	50%	
28	Heavy Equipment Purchases	Heavy Equipment (K80129 or K80302)	Various	\$485,000	\$535,000	\$590,000	\$565,000	\$550,000	\$2,725,000	50%	50%	
	New Flood Abatement - Acquisitions & Construction									\$0		
29	Easement Acquisitions		Various	\$250,000	\$250,000	\$250,000	\$250,000	\$250,000	\$1,250,000	50%	50%	
30	Home / Business Buyouts		Various		\$250,000	\$250,000	\$250,000	\$250,000	\$1,000,000	80%	20%	
31	Regional Detention		Various	\$250,000	\$250,000	\$250,000		\$250,000	\$1,000,000	80%	20%	
	Water Quality									\$0		
32	Various - Green Infrastructure (SFR, Non-SFR Cost Share, City Properties)	Green Infrastructure SOV Bank (K80144)	Various		\$250,000	\$250,000		\$250,000	\$750,000	20%	80%	
33	GI Retrofit projects awarded under the GREEN Grant program	Retrofitting / GREEN Grant	Various	\$350,000	\$150,000		\$500,000	\$600,000	\$1,600,000	20%	80%	
34	Ditch Stabilization Projects/SWEEP	Ditch Stabilization / SWEEP	Various	\$100,000	\$150,000	\$200,000	\$300,000	\$400,000	\$1,150,000	20%	80%	
	Totals			\$8,625,000	\$9,240,000	\$9,150,000	\$9,090,000	\$9,025,000	\$45,130,000			

Appendix G - Policy Paper # 5 – TMDL Project Data Analysis

City of Chattanooga
Department of Public Works
Water Quality Program



South Chickamauga Creek TMDL Siltation and Habitat Alteration
Level of Service Development
DRAFT Final

Prepared by:

HDR / ERC / SCM



August 10, 2017

CITY OF CHATTANOOGA WATER QUALITY PROGRAM

POLICY: *South Chickamauga Creek* TMDL for Siltation and Habitat Alteration Evaluation and Analysis for the City of Chattanooga Water Quality Rate Study

I. OVERVIEW

This Policy Paper #5 concerns the South Chickamauga Creek TMDL for Siltation and Habitat Alteration, its relationship with private development in Chattanooga and existing development regulations, and the ongoing Water Quality (Stormwater) Rate Study.

South Chickamauga Creek is a part of the Lower Tennessee River Watershed and therefore included in the Lower Tennessee River Watershed (HUC 06020001) TMDL

There are three TMDL's for the Lower Tennessee River Watershed:

- Siltation and Habitat Alteration
- Dioxins and Polychlorinated Biphenyls (PCBs)
- E. Coli

The PCB's and E. Coli TMDL's have plans developed by industrial discharges, the Waste Resources Division and EPA and are not the responsibility of the City of Chattanooga Water Quality Program and are therefore not the subject of this paper. The Siltation and Habitat Alteration TMDL however, are the responsibility of the Water Quality Program and are the subject of the paper.

This paper will also address the City of Chattanooga water quality regulations that were developed because of the Siltation and Habitat Alteration TMDL

II. PURPOSE

The purpose of this policy paper is as follows:

1. Collect and summarize information on the South Chickamauga Creek TMDL for Siltation and Habitat Alteration, and the current City of Chattanooga development regulations.
2. Provide a future forecast for the next 10 years policies and procedures for the TMDL.
3. Determine the future level of service and cost of service as well as impacts on the Water Quality Rate.

III. Lower Tennessee River Watershed (HUC 06020001) TMDL

Section 303(d) of the Clean Water Act requires each state to list those waters within its boundaries for which technology based effluent limitations are not stringent enough to protect any water quality standard applicable to such waters. Listed waters are prioritized with respect to designated use classifications and the severity of pollution. In accordance with this prioritization, states are required to develop Total Maximum Daily Loads (TMDLs) for those water bodies that are not attaining water quality standards.

The State of Tennessee’s 2004 303(d) List (TDEC,2005) identified several waterbodies in the Lower Tennessee River Watershed as not fully supporting designated use classifications due, in part, to siltation and/or habitat alteration associated with agriculture, urban runoff, land development, and bank modification. Table 1 shows the 2004 303(d) stream impairment due to siltation/habitat alteration in the Lower Tennessee River Watershed for South Chickamauga Creek

Table 1 - 2004 303(d) Stream Impairment Due to Siltation/Habitat Alteration in the Lower Tennessee River Watershed for South Chickamauga Creek

Waterbody ID	Impacted Waterbody	Miles / Acres Impaired	Cause / TMDL Priority	Pollutant Source
06020001007_1000	South Chickamauga Creek	17.6	Phosphorus Physical Substrate Habitat Alterations/Escherichia coli Loss of biological integrity due to siltation	Land Development Discharges from MS4 area Channelization/Sources Outside of State

The City of Chattanooga is the only Phase I MS4 in the Lower Tennessee River Watershed. This permit requires Chattanooga to be accountable for the discharge of pollutants and sediments within the limits of the community. The permits also contain requirements regarding control of discharges of pollutants of concern into impaired waterbodies, implementation of provisions of approved TMDLs, and description of methods to evaluate whether storm water controls are adequate to meet the requirements of approved TMDLs

Table 2 shows TMDLs, WLAs for MS4s and Construction Storm Water Sites, and LAs for Nonpoint Sources for the South Chickamauga Creek.

Table 1 – TMDL / Allocations

HUC-12 Subwatershed (06020001)	Waterbody ID	Waterbody	Level IV Ecoregion	Reduction TMDL (Required Overall Load Reduction) %	WLA (MS4s and Construction SW) % Required Reduction	LA (Nonpoint Sources) % Required Reduction
0804	06020001007_1000	South Chickamauga Creek	67f	61.2	63.1	63.1

Note: Details for specific loadings and findings are located in the *TOTAL MAXIMUM DAILY LOAD (TMDL) For Siltation and Habitat Alteration In The Lower Tennessee River Watershed (HUC 06020001) prepared by the Tennessee Department of Environment and Conservation Division of Water Pollution Control.*

These permits will require the development and implementation of a Storm Water Management Plan (SWMP) that will reduce the discharge of pollutants to the "maximum extent practicable" and not cause or contribute to violations of State water quality standards.

To evaluate SWMP effectiveness and demonstrate compliance with specified WLAs, MS4s must develop and implement appropriate monitoring programs. An effective monitoring program could include:

- Effluent monitoring at selected outfalls that are representative of particular land uses or geographical areas that contribute to pollutant loading before and after implementation of pollutant control measures.
- Analytical monitoring of pollutants of concern in receiving waterbodies, both upstream and downstream of MS4 discharges, over an extended period.
- Instream biological monitoring at appropriate locations to demonstrate recovery of biological communities after implementation of storm water control measures.

The City of Chattanooga has developed and implemented the required monitoring plan described above.

The initial plan to respond to the SWMP was a change in the development regulations through Resource Rain and the Land Development Permit (LDP).

IV. City of Chattanooga Development Regulations

In response to the Lower Tennessee River Watershed TMDL for South Chickamauga Creek the city of Chattanooga Water Quality Program developed new policies, ordinances, and codes relating to rainwater management and water quality that went into effect on December 1, 2014 for the City of Chattanooga to comply with the provisions of the NPDES MS4 Permit from the state of Tennessee. These regulations and other program enhancements created stormwater management measures and methods designed to assist with the preservation and restoration of natural hydrologic regimes, to minimize combined sewer overflows and to improve the City's water quality. Basically, many new developments and re-developments should capture and infiltrate rain on site.

On November 25, 2014, the City of Chattanooga adopted Ordinance 12881 of the City Code, Chapter 31. This ordinance requires new developments and redevelopments to capture more runoff on site. Sites larger than an acre must design their site to capture and treat runoff for up to a one-inch rainstorm (which is approximately 86% of Chattanooga storms) throughout most of Chattanooga and up to 1.6 inches for new development in the South Chickamauga watershed. This design must be permitted before construction can begin. The development

and redevelopment are responsible for the rain water that lands on their site in a one inch or less storm. The stay on volume requirement is determined by site impervious area and the design must manage water for volume, water quality and peak flow rate.

The City is now reevaluating this regulation due to changes in TDEC policy and changes in the development community approach. The Chattanooga QWP is developing a SWMP to respond to Lower Tennessee River Watershed TMDL for South Chickamauga Creek which is summarized in the next section.

V. Plan to Address the Siltation and Habitat Alteration in the South Chickamauga Creek Watershed within the City of Chattanooga limits

The City of Chattanooga Water Quality Program is in the process of developing and implementing a phased plan to address the South Chickamauga Watershed (within the City boundaries) portion of the Lower Tennessee River Watershed TMDL. This plan consists of the development of a pilot program in the smaller Mountain Creek Watershed and a gradual implementation of the practices that are most efficient over a four-year period in the South Chickamauga Watershed.

The pilot program for Mountain Creek will include:

- Retrofit / Green Grant
- Stream Restoration
- Stream Buffers
- Ditch Stabilization / SWEEP

VI. Influence on the Level and Cost of Level of Service

This plan will increase the level and cost of service by approximately \$1 million per year. The table below shows the cost for each item in the TMDL plan for fiscal years 2019 through 2022.

Projects to address TMDL's	Request FY2019	Request FY2020	Request FY2021	Request FY2022
Retrofit / Green Grant	\$500,000	\$150,000	\$500,000	\$600,000
Stream Restoration	\$250,000	\$1,000,000,000	\$250,000	\$1,000,000,000
Stream Buffer Conservation	\$100,000	\$200,000	\$300,000	\$400,000
Ditch Stabilization / SWEEP	\$150,000	\$200,000	\$300,000	\$300,000
TOTAL	\$1,000,000	\$1,000,550	\$1,350,000	\$1,001,300

VII. Rate Impacts

The change in approach to the South Chickamauga Creek TMDL for Siltation and Habitat Alteration will impact the level of service and cost of service by increasing personnel, equipment and materials, and resources for the Water Quality Department. This increase in level and cost of service will also increase the rate that is part of the Water Quality Fee received from the customers in the City of Chattanooga.

The City Staff has made assumptions that will allow the above plan to be implemented. Allocation of the cost of service shown above will be 80% funded by the Capital Budget and 20% funded by the Water Quality Fund. This will require additional *Full Time Equivalents* (FTE's) as follows:

Land Development Program:

- Reduce water quality funding from the WQ Enterprise fund by 20% per year with a goal to be self-funded by fees by end of FY – 23.
- Increase fees 20% per year for 5 years
- Add 1.5 FTE's in FY – 19 (Year 1)
- Add 1.0 FTE in FY – 20 (Year 2)
- Add 1.0 FTE in FY – 21 (Year 3)

TMDL: In-house and capital TMDL projects to meet regulatory changes

- Add 1.0 FTE (Engineering Tech) in FY – 20 (Year 2)
- Add 1.0 FTE (Specialist II) FY – 22 (Year 4)
- Begin funding for TMDL projects in year 1
 - FY – 19 (Year 1) = \$1,000,000
 - FY – 20 (Year 2) = \$1,550,000
 - FY – 21 (Year 3) = \$1,350,000
 - FY – 22 (Year 4) = \$2,300,000
- Allocate and fund 80% by Capital Budget
- Allocate and fund 20% by WQ rate/fund (Operating Budget for K70101 Cost Center)

Green Infrastructure Crews:

- Add new 3-person crew in FY – 20 (Year 2) – Housed in Parks Department funded by WQ rate/fund
- Add a new 3-person crew in FY-22 (Year 4) – Housed in Parks Department funded by WQ rate/fund

City Wide Services (CWS) Pipe Crew:

- Add new 7-person Pipe Crew in FY – 20 (Year 2).

SWEEP: Residential Detention Pond Maintenance

- Currently City performs maintenance on six (6) ponds per year

- The effort will slowly build a program dedicating City forces to improve residential detention ponds across the City to meet current regulatory requirements.
- Total estimated number of existing residential ponds in the City is 150
- The SWEEP program goals are to address regulatory residential detention pond requirements for water quality and flooding. Improving the aesthetics of ponds is not the goal but may be a side benefit in some cases.
- New FTE's
 - Add new 3-person crew in FY – 20 (Year 2)
 - Add new 1 FTE in FY – 23 (Year 5)
 - Add new 3-person crew in FY – 24 (Year 6)
 - Add new 3-person crew in FY – 26 (Year 8)
 - Add new 1 FTE in FY – 26 (Year 8)
 - A total of 11 FTEs over the 10-year rate period

VIII. Summary

South Chickamauga Creek (that is located within the city limits of the of Chattanooga) is a part of the Lower Tennessee River Watershed and therefore included in the Lower Tennessee River Watershed (HUC 06020001) TMDL for Siltation and Habitat Alteration.

In response to the Lower Tennessee River Watershed TMDL for South Chickamauga Creek the City of Chattanooga Water Quality Program developed new policies, ordinances, and codes relating to rainwater management and water quality that went into effect on December 1, 2014 for the City of Chattanooga to comply with the provisions of the NPDES MS4 Permit from the state of Tennessee.

City of Chattanooga adopted Ordinance 12881 of the City Code, Chapter 31. This ordinance requires new developments and redevelopments to capture more runoff on site. Sites larger than an acre must design their site to capture and treat runoff for up to a one-inch rainstorm (which is approximately 86% of Chattanooga storms) throughout most of Chattanooga and up to 1.6 inches for new development in the South Chickamauga watershed. This design must be permitted before construction can begin. The development and redevelopment are responsible for the rain water that lands on their site in a one inch or less storm.

The City is now reevaluating this regulation due to changes in TDEC policy and changes in the development community approach. The Chattanooga QWP is developing a SWMP to respond to Lower Tennessee River Watershed TMDL for South Chickamauga Creek.

The City of Chattanooga Water Quality Program is in the process of developing and implementing a phased plan to address the South Chickamauga Watershed (within the City boundaries) portion of the Lower Tennessee River Watershed TMDL. This plan consists of the development of a pilot program in the smaller Mountain Creek Watershed and a gradual implementation of the practices that are most efficient over a four-year period in the South Chickamauga Watershed.

The Plan and its individual cost is shown in the table shown in Section IV - ***Influence on the Level and Cost of Level of Service***. The total cost to the program is approximately \$1,000,000 per year for four years from 2019 through 2022.

Appendix H - Policy Paper # 6 – Land Development Program

City of Chattanooga
Department of Public Works
Water Quality Program Rate Study
Levels and Costs of Service Update
Contract S-16-010



Policy #6: Land Development Program

Prepared by:



August 23, 2017

CITY OF CHATTANOOGA WATER QUALITY PROGRAM

POLICY: *Land Development Program*

I. OVERVIEW

This policy paper #6 concerns the Land Development Program (Land Development Office (LDO)) that is a part of the City of Chattanooga Water Quality Program. The information, data, research, approach, methodology and the majority of the content of this paper is the result of work performed (and provided to the consultant team) by Tony Kinder and the Land Development Staff. The consulting team is presenting this information in the form of a policy paper so that the WQP Staff can evaluate this issue and provide input and guidance to the Level of service /cost of service and rate study.

The Land Development Office seeks to ensure the public's health, safety, and welfare through the enforcement of adopted building, electrical, plumbing, gas and mechanical codes and the Zoning Ordinance. This enforcement promotes the economic health of the City of Chattanooga by enhancing business development, retention, and neighborhoods. We select, develop and retain qualified staff.

Development Services

- Plans Review - Residential and Commercial / Adopted Codes / Fees
- Land Disturbing / Subdivisions / Infrastructure / Street Cuts
- Building Permits / Inspections
- Trades Permits / Inspections
- Inspection District Map

Land Use Management

- Commercial Signs / Billboards / Banners
- Historic Preservation / Design Review
- Zoning Enforcement / Parking Review
- National Flood Insurance Program
- Landscaping / Urban Forestry

II. PURPOSE

The purpose of this policy paper is to review and examine the City of Chattanooga's Land Development process, policies and level of service. The Land Development Office (LDO) is a critical part of Chattanooga Water Quality Program and the City of Chattanooga's daily operations. This paper is being prepared as a result of several factors:

- After a series of meetings between the Home Builders' Association of Greater Chattanooga and the City of Chattanooga's Engineering Department, it was determined that the Land Disturbance Permit (LDP) fees charged by the Land Development Office should become more "self-sustaining," or stated differently, the fees charged should pay for the services rendered.
- The LOD is not self-sustaining;
- The current development fee appears to be too low;
- The purpose of this Policy Paper to examine a LDP fee proposal that would accomplish a self-sustaining program.
- To incorporate and include the LDO in the Level and Cost of Service analysis as a part of the Rate Study.
- Develop a definition for self-sustaining for the purposes of the LDO program
- To determine the number of FTE's the water quality rate will fund, the number of FTE's the development fee will fund and the number of FTE's other revenue sources will fund.

III. Chattanooga Land Development Office Permit Summary:

The last complete year for Land Disturbance Permits is June 2015 – July 2016. In that year, the following summary of permits is applicable:

- 714 approved applications
- 510 simple residential permits (486 E&SC plans created by City staff)
- 176 complex permits under 1 acre
- 27 complex permits over 1 acre.
- 46 Inspection and Maintenance Agreements
- 4,958 total E&SC Inspections
- 510 violations
- 265 home builders handouts distributed
- 714 BMP Manual website references

The total contract value of the work was \$ 88,819,159.52. LDO collected \$ 91,669.10 in permit fees during this time (or 0.10% of the contract value). Figure 1 below shows locations and type of Land Disturbance Permits for June 2015 through July 2016.

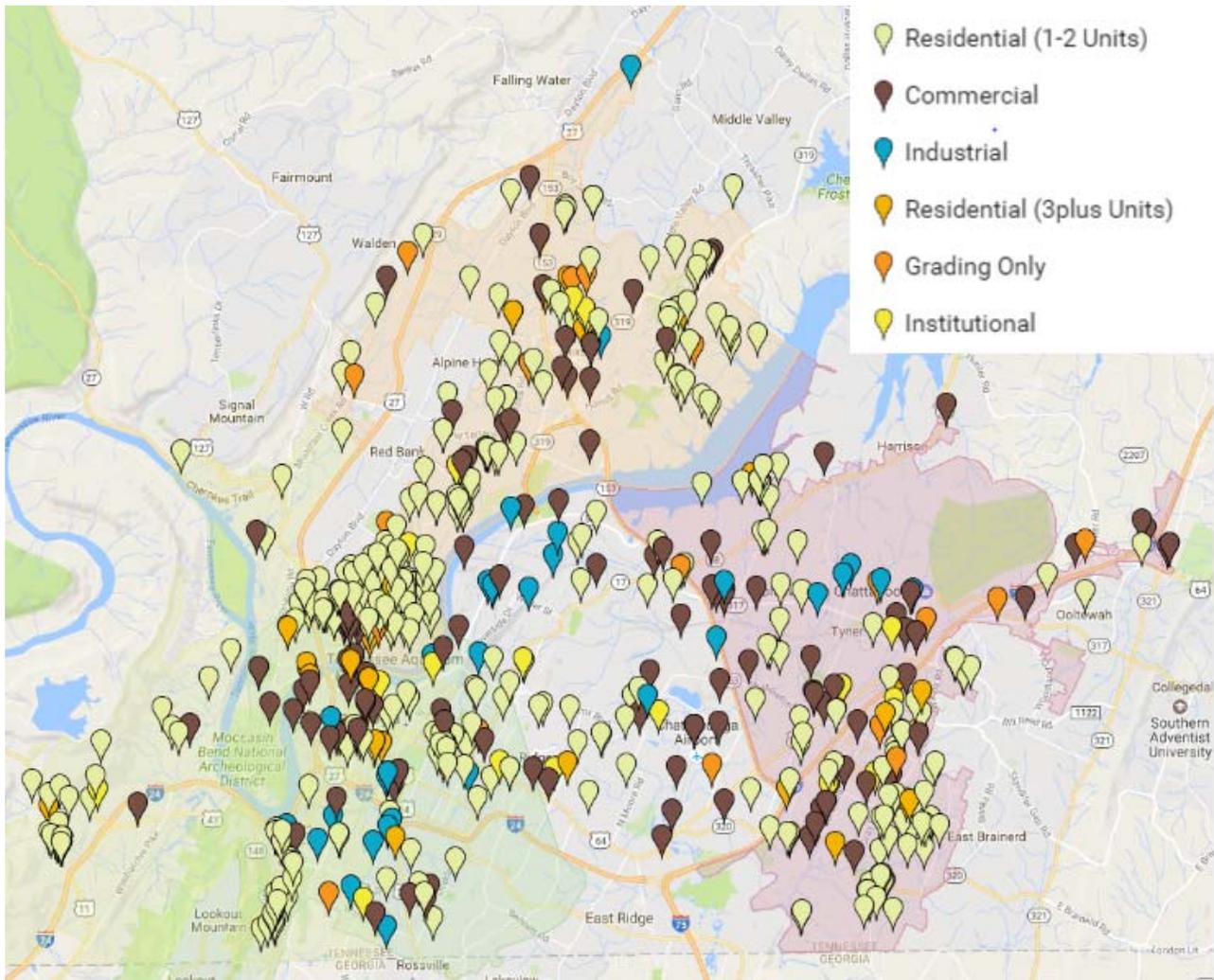


Figure 1 - FY 2016 Land Development Permit Map

IV. Chattanooga’s Current Land Development Program

Chattanooga’s Land Development Office (LDO) currently utilizes 10 people from the Water Quality Budget (see ECD WQ Site Development Cost Center K70105). The expenditures for these employees’ hourly wages is \$ 518,217.11, and total expenditures for FY 18 is proposed to be \$ 806,906.00 (or, about \$ 80,691 per employee per year).

In addition to the above personnel and numbers, LDO also has four other team members paid through other areas. Their salaries and expenditures should also be included if the LDO LDP fees are to be considered truly self-sustaining.

The City of Chattanooga currently charges \$ 30/acre (with a minimum 3-1/3 acre, for a total of \$ 100), plus a \$ 15 technology fee, for a total minimum Land Disturbance Fee of \$115.

Current staff are fully utilized, and in many cases, operating beyond their expected capacity. Additional positions are expected to be needed in the very near future to help alleviate these conditions. Likely needed positions in the future are an additional Landscape Architect 1 (to replace the one recently assigned to a different group), as well as an additional Project Engineer (due to the extreme amount of stormwater information to review with the new stormwater regulations). A third position needed very badly in LDO is a full-time transportation reviewer. Additionally, we would also strongly encourage the current application analysis, previously Joey Bullock, to be reimbursed at least partially through the LDP since approximately 50% of time for this position is for the direct benefit of WQ LDO personnel and their clients they serve.

Therefore, the following financial amounts would apply to the above three situations (using \$ 80,691 per employee per year):

Current WQ Staff Only (10 people x \$ 80,691 each):	\$ 806,906.00
Total Current LDO Staff (14 people x \$ 80,691 each):	\$ 1,129,674.00
Total Proposed LDO Staff (17.5 people x \$ 80,691 each):	\$ 1,412,092.50

If one used a “flat rate” of \$ 1,437.50 for each LDP, then the following numbers would result:

Description	Number Performed	Proposed Fee	Total Fees
Simple Residential	510	1437.5	\$ 733,125.00
Complex - under 1 acre	176	1437.5	\$ 253,000.00
Complex - over 1 acre	27	1437.5	\$ 38,812.50
Inspections	4958	0	\$ -
TOTAL			\$ 1,024,937.50

V. Survey of Land Development In Other Communities

The Land Develop office surveyed 39 Cities, including Chattanooga and asked the question: *What are your Land Disturbance, Site Plan Review and Development Inspection Fees?*

The responses included comparable data collected from 33 cities and 5 gave Non-Comparable Data. The common Fee Basis was "disturbed acreage" & "development's dollar value"

For a 5-acre development or one costing \$1M:

- 6 of 33 have lower LDP Fees than Chattanooga
- 27 of 33 have higher LDP Fees than Chattanooga
- Average fee, for the 33 cities, is 905% higher than Chattanooga's fee
- The average fee is \$1,403.74.
- Chattanooga's fee is \$165 (for a 5-acre development)

There are six Outlier Cities:

- Asheville, NC = \$4,330 or 26.24 times that of Chattooga's fee
- Charlotte/Mecklenburg County NC = \$10,450 or 63.33 times that of Chattooga's fee
- Orlando FL = \$17,000 or 103.03 times that of Chattooga's fee
- Signal Mountain, TN = \$50 or 70% less than Chattooga's fee
- Shelbyville, TN = \$100 or 39% less than Chattooga's fee
- Lenoir City, TN = \$100 or 39% less than Chattooga's fee

After these 6 Outliers are removed

- The average fee for 27 remaining cities is 410% higher than Chattanooga's fee
- The average fee is \$688.36 for similar services
- Chattanooga's fee is \$165

For a 10-acre development or one costing \$5M:

- 7 of 33 have lower LDP Fees than Chattanooga
- 26 of 33 have higher LDP Fees than Chattanooga
- Average fee, for the 33 cities, is 1,139% higher than Chattanooga's fee
- The average fee is \$3,301.28.
- Chattanooga's fee is \$315 (for a 10-acre dev)

The Outlier's under 10-acres & \$5M:

- Asheville, NC = \$7,430
- Charlotte/Mecklenburg County NC = \$11,700
- Orlando FL = \$57,000
- Berry Hill, TN = \$6,980
- Clarksville, TN = \$5,330
- Johnson City, TN = \$15,160
- Signal Mountain, TN = \$50
- Shelbyville, TN = \$100
- Lenoir City, TN = \$100

Regardless of acreage or development cost many Cities have ADDITIONAL FEES and charges for "start before permits = doubling of fee", "expedited plan review", "additional fee beyond 3 submittals", "price per inspection", "re-inspection", "plan revision" and other additional fees. These are NOT charged by Chattanooga and NOT incorporated into this comparison. Therefore, the average fees could be significantly higher than what's described above.

VI. Summary of Data from Other Nearby Areas:

The Land Development Office survey determined the current LDP rates charged by nearby cities and counties. This would allow Chattanooga to determine if its current fees are already in line with others, too high, or too low. Based on the review of data provided by the

Tennessee Stormwater Association (TNSA), as well as other publically available data from regional cities, a spreadsheet was assembled (see attached sheets). Following is a summary of the 38 nearby cities' fees as compared to Chattanooga's fees.

Acres	\$ Improvements	Chattanooga Fee Increase to Average Others
0.25	\$ 50,000	11.30 x Chatt. Fee
0.50	\$ 100,000	11.15 x Chatt. Fee
0.75	\$ 150,000	11.41 x Chatt. Fee
1.00	\$ 200,000	11.36 x Chatt. Fee
2.00	\$ 400,000	11.77 x Chatt. Fee
3.00	\$ 600,000	12.17 x Chatt. Fee
4.00	\$ 800,000	10.72 x Chatt. Fee
5.00	\$ 1,000,000	9.05 x Chatt. Fee
10.0	\$ 2,000,000	5.49 x Chatt. Fee
20.0	\$ 4,000,000	3.57 x Chatt. Fee

Based on the above summary of data for projects of various sizes, an increase of 11.5 x the current Chattanooga LDP fee seems to reflect an average for nearby cities. One acknowledged weakness with this method is that a majority of cities shown in the study are not TDEC Phase I cities and would therefore have lesser requirements than Chattanooga. Therefore, a comparable rate may be expected to be somewhat higher.

Therefore, increasing our current rate by 11.5 times, or multiplying our current rate 12.5 times would yield a similar rate to other areas. This would be $\$ 115 \times 12.5 = \$ 1,437.50$

VII. Proposed LDP Fee Structure:

Current staff are fully utilized, so an hourly appraisal of their current time was deemed unnecessary for this report. In other words, current staff are not limited to just project reviews, but also pre-submittal meetings, other meetings with the public (consultants, contractors, etc...), responding to the public through emails, telephone calls, and numerous other responsibilities.

As one option, it is possible to charge a percentage of construction costs for our LDP fee. In this case, the amount shown on page 1 of \$ 88,819,159.52 would simply be divided by the amount required for total current LDO staff of \$ 1,129,674.00, for a necessary percentage of construction cost of 1.27%.

As a second alternative, we could vary the permit fee amounts based on size and complexity of the project (since a more complex project usually takes a greater percentage of the City's time). In this case, we offer the following for our initial consideration.

- Single-family house - \$ 595.00 per house (two houses at one time would pay twice this amount)
- Complex Site Plan Under One Acre - \$ \$ 2,495.00

- Complex Site Plan Over 1 Acre - \$ 4,950 + \$ 275/acre
- Bonds and Letters of Credit - \$ 475/each
- Revisions after second review - \$ 1,250/each (Paid in advance)
- Variance Request - \$ 895 each (Paid in advance and kept regardless of City's decision)
- Driveway Tile Sized By City - \$ 475/each
- As-Built Review (Storm or Sewer) - \$ 475/each
- Grading Permit Only (5 ac. or more and necessary) - \$ 2,495 + \$ 275/acre
- Timber Removal Permit (currently \$ 65) - \$ 750/each
- Tree Ordinance Permit (currently \$ 65) - \$ 750/each
- Site Dev. Review Fee for FBC or Zoning - \$ 2,495.00/each
- Fees are Double the Above Amount for Permits Submitted After Work Has Already Started

Using the above numbers, one would expect the following results in an average year:

<u>Description</u>	<u>Number Performed</u>	<u>Proposed Fee</u>	<u>Total Fees</u>
Simple Residential - One House	340	\$ 595.00	\$ 202,300.00
Simple Residential - Two Houses	170	\$ 1,175.00	\$ 199,750.00
Complex - under 1 acre	176	\$ 2,495.00	\$ 439,120.00
Complex - over 1 acre	27	\$ 4,975.00	\$ 134,325.00
Bonds and Letters of Credit	12	\$ 475.00	\$ 5,700.00
Revisions after second review	15	\$ 1,250.00	\$ 18,750.00
Variance Request	3	\$ 895.00	\$ 2,685.00
Driveway Tile Sized By City	50	\$ 475.00	\$ 23,750.00
As-Built Review (Storm & Sewer)	30	\$ 475.00	\$ 14,250.00
Grading Only Permit	4	\$ 2,495.00	\$ 9,980.00
Timber Removal Permit	3	\$ 750.00	\$ 2,250.00
Tree Ordinance Permit Review	60	\$ 750.00	\$ 45,000.00
Site Dev. Review Fee for FBC or Zoning	15	\$ 2,495.00	\$ 37,425.00
TOTAL			\$ 1,135,285.00

This amount would approximate the amount shown on page 3 as being necessary for existing LDO staff - \$ 1,129,674. Therefore, the above numbers are assumed to represent a good starting point for discussions.

As one additional item, it is strongly encouraged that all of the above fees be collected at the time the plans are submitted to the City. This would allow the City to still be reimbursed for its time, even if the project should not be built due to circumstances beyond the City's control.

However, if this is not possible, we would recommend charging two different fees: a review fee due at the time of submittal, and a permit fee due at the time the approved permit is to be picked-up by the contractor. As a percentage, I would recommend that the amounts shown

below be broken up into an 80% Review Fee, then a 20% Permit Fee. The fees would then approximately look like the following:

Description	Number Performed	Proposed Fee	Total Fees	80% Review Fee	20% Permit Fee
Simple Residential - One House	340	\$ 595.00	\$ 202,300.00	\$ 476.00	\$ 119.00
Simple Residential - Two Houses	170	\$ 1,175.00	\$ 199,750.00	\$ 940.00	\$ 235.00
Complex - under 1 acre	176	\$ 2,495.00	\$ 439,120.00	\$ 1,996.00	\$ 499.00
Complex - over 1 acre	27	\$ 4,975.00	\$ 134,325.00	\$ 3,980.00	\$ 995.00
Bonds and Letters of Credit	12	\$ 475.00	\$ 5,700.00	N/A	N/A
Revisions after second review	15	\$ 1,250.00	\$ 18,750.00	N/A	N/A
Variance Request	3	\$ 895.00	\$ 2,685.00	N/A	N/A
Driveway Tile Sized By City	50	\$ 475.00	\$ 23,750.00	N/A	N/A
As-Built Review (Storm & Sewer)	30	\$ 475.00	\$ 14,250.00	N/A	N/A
Grading Only Permit	4	\$ 2,495.00	\$ 9,980.00	\$ 1,996.00	\$ 499.00
Timber Removal Permit	3	\$ 750.00	\$ 2,250.00	\$ 600.00	\$ 150.00
Tree Ordinance Permit Review	60	\$ 750.00	\$ 45,000.00	\$ 600.00	\$ 150.00
Site Dev. Review Fee for FBC or Zoning	15	\$ 2,495.00	\$ 37,425.00	\$ 1,996.00	\$ 499.00
TOTAL			\$ 1,135,285.00		

Partial, annual fee increases to reach this point are also advised.

Level of Service and Rate Options

VIII. Options

The current City of Chattanooga LDP fee is significantly less than needed if the LDO needs to become self-sustaining. An average increase of 12.5 times the current rate will allow the current team to likely become self-supporting. This is the cleanest option where the development community pays for a sustainable program of plan review, permitting and Inspection. .

Consideration should be given to the shifting economic environment that private development presents. When new development is robust in the community the program will have the resources to support the staff. However, if new develop decreases, fees from development will also decrease and the staffing of the department may have to be decreased.

One option would be to fund a core staff through the Stormwater Utility and other positions through Development Fees. This would insure that an experienced, well trained core of professionals would be available to serve the public and development community.

Another option would be to fund from the departments, as currently accomplished, but increase stormwater utility rates to fund all of the additionally needed positions. In addition a modest increase in development fees could pay for outside positions of part-time labor, contract workers, or consulting firms. This would insure an experienced staff along with the additional resources for high volume of development permits and plan review.

IX. Next Steps

The consulting team suggests the following steps to review and provide comment regarding the best steps to move forward and complete the water quality rate study.

1. Review this policy paper with WQP staff decision makers
2. Identify and develop a list of questions and comments that will be required to complete the water quality rate study. (see list below as the starting point for discussion).
3. Conduct a conference call between WQP management staff and the consultant that would also include LDO leaders to discuss the options available.
4. If any additions or changes are needed the WQP management staff would direct the consulting team to revise this Policy Paper.
5. As a result, the decision of the WQP management staff would develop an action plan for the Land Development Office and provide direction to the consultant team for the Level of Service / Cost of Service and Rate Study
6. The consulting team will then proceed with the Rate Study in accordance with the WQP instructions,

List of questions and issues that will need to be resolved to complete the rate study

- a. Will the current 10 LDO FTE's continue to be funded by the water quality fee?
- b. If no, how will the 10 FTE's be funded?
- c. Will the 4 LDO FTE's currently funded via other revenue sources be funded by the water quality fee?
- d. Is there a consensus that the current 14 LDO FTE's is too low?
- e. Does the current LDO FTE's need to be increased?
- f. The current LDO staff recommendation is to add three (3) new FTE's. Is there a consensus that adding three (3) new FTE's will meet the demands of the next 10 years for the LDO?
- g. If new FTE's are added, how will they be funded; by the water quality rate, the development fee or other?

Appendix I - Policy Paper # 7 – Financial Fact Sheet Analysis

City of Chattanooga
Department of Public Works
Water Quality Program Rate Study
Financial Fact Sheet
Contract S-16-010



DRAFT summary of the Policy #7: Financial Fact Sheet

Prepared by:



April 27, 2018

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I. INTRODUCTION

The City of Chattanooga hired the team of HDR Engineering, Environmental Rate Consultants, Inc (ERC), and SCM Engineering (consultant team) to successfully perform a business plan and cost of service analysis based rate study for the Water Quality (WQ) program. This overall financial analysis and WQ program rate study is based on the City of Chattanooga WQ program historical data and rate schedules currently in place and approved by Chattanooga City Council for years 2013 through 2017. The WQ program rate study will project and forecast monthly water quality rates for fiscal years (FY) - 19 through FY - 28, with emphasis on years:

- FY - 19 (Year 1 of the rate study) through
- FY - 23 (Year 5 of the rate study) and a second projection and forecast for
- FY - 24 (Year 6 of the rate study) through
- FY - 28 (Year 10 of the rate study).

The WQ program rate study has “defined” the following two water quality “levels of services” and corresponding costs of service rate study scenarios:

- **Scenario 1: Capital Pay as You Go** - A cost of service-based rate study calculating the line item chart of accounts including the following:
 - Account 610000 Salaries
 - Account 783000 Debt Service Costs
 - Account 811406 Transfers to WQ Capital
 - **PLUS** an annual amount added to Fund Balance available for Capital funding will be identified and compared to Gross Revenue less revenue adjustments.
 - The annual amount from previous year’s fund balance is assumed to be \$3.2 million
 - **PLUS** an annual addition to Fund Balance specifically to fund capital projects
 - **INCLUDING** an annual 9.75% rate increase per year
 - **NOTE:** To date the consultant team has not performed debt service coverage analysis based on actual debt information. In order to perform debt analysis, the consultant team will need bond covenant and coverage test information. Refer to data request questionnaire items 10 and 11. A Debt Covenant Test is provided in Section X of this document, however this test is based on the consultant’s past experience and not actual debt information.
- **Scenario 2: Future Debt** – To be determined later and based on city staff input discussions and results of Scenario 1 above.

The WQ Program needs and requirements are identified and outlined in the business plan with each of the goal statements that represent water quality and water quantity (flooding and drainage) activities. These activities define and represent the levels of services and establish the basis for the legally defensible cost of service analysis (cost

based) revised WQ rates. The goal statements have been generated and are based upon experience and input from city staff and the consultant team which has a combined 95 years of rate setting experience. The consultant team assisted the City of Chattanooga with a rate study in 2009, and has assisted other municipalities with developing stormwater utility programs and financial needs over the span of three decades.

The overall WQ program rate study and final rate includes two major “stormwater management” activities / components that are segregated as follows:

- Water quality (NPDES Phase 1 regulatory, enforcement, etc.,) and
- Water quantity (flooding and drainage) aspects of the water quality program.

The City of Chattanooga WQ Technical Advisory Committee (TAC) will now have the opportunity to review and provide input to the rate study analysis. The next step after WQ program staff input is to review the analysis with the Public Works Administration. The final step will be to review and provide the results of the rate study through face to face briefings to the elected officials (members of City Council and representatives from the Administration) during the approximate timeframe of March 2018 through May 2018. At that time, the elected officials will be asked to provide direction for the next steps of the rate study process. The elected officials will be asked to accept and begin the process of formally approving rate study results and recommendations, or to begin a public information and education campaign designed to solicit input from the rate payer citizenry of Chattanooga prior to approval. This report incorporates the necessary data and staff input from the TAC members dating back to the inception of the study.

1. Key Rate Study Assumptions

The WQ rate study for Scenarios 1 and 2 includes the following key rate study assumptions that meet the “various levels of service” contractual obligations agreed to by city staff and the consultant team. Furthermore, the results are based solely on the historical information provided by city staff and the approach and analyses defined in this paper. Actual results will most certainly vary over the next 10 years from the projections and forecasts used for the basis of this rate analysis; but can be achieved if all 100% of the assumptions used in the analysis come to fruition and are accurate in the future. A table summarizing all of the new Full-Time Equivalents (FTE’s) is provided at the end of this section, see Table 1.

A. Land Development Program (Land Development Office or LDO) rate model assumptions (K70105):

- Reduce water quality funding from the WQ Enterprise fund by 20% per year with a goal to be self-funded by fees by end of FY – 23.
- As the 20% reduction is implemented each year for the first five (5) years of the program, the same equivalent amount in Land Development permit fees will need

to be increased to transition the Land Development Program to be completely self-funded (zero (0) WQ Enterprise fund subsidy).

- Full Time Equivalents (FTE's):
 - 4 FTE's continue to be funded via other non-WQ funds
 - 10 FTE's continue to be funded via WQ rate/fund beginning in FY – 19
 - Add 1.5 FTE's in FY – 19 (Year 1)
 - Add 1.0 FTE in FY – 20 (Year 2)
 - Add 1.0 FTE in FY – 21 (Year 3)
- Zero (0) FTE's beginning in FY-24 (Year 6) funded by WQ rate/fund
- 13.5 FTE's beginning in FY-24 (Year 6) funded by LDO permit fees

B. TMDL rate model assumptions (K70101):

- Add 1.0 FTE (Engineering Tech) in FY – 20 (Year 2)
- Add 1.0 FTE (Specialist II) FY – 22 (Year 4)
- Utilize the 2 FTE from above for 2 vacant positions from K70101 cost center
- Use Engineering Tech and Specialist II salary / positions from K70101 cost center
- Allocate and fund 80% by Capital Budget
- Allocate 20% funded by WQ rate/fund
 - Begin funding in year 1
 - FY – 19 (Year 1) = \$200,000
 - FY – 20 (Year 2) = \$310,000
 - FY – 21 (Year 3) = \$270,000
 - FY – 22 (Year 4) = \$460,000

C. Green Infrastructure rate model assumptions (K70104)

- Add new 3-person crew in FY – 20 (Year 2) – Housed in Parks Department funded by WQ rate/fund
 - Crew Supervisor I
 - Two Crew Worker III's
 - Crew Cab SUV Truck with misc. tools & materials
- Add a new 3-person crew in FY-22 (Year 4) – Housed in Parks Department funded by WQ rate/fund
 - Crew Supervisor I
 - Two Crew Worker III's
 - Crew Cab SUV Truck with miscellaneous tools & materials

D. City Wide Services (CWS) Pipe Crew rate model assumption (K70104):

- Add new 7-person Pipe Crew in FY – 20 (Year 2).
 - One Crew Supervisor III
 - Two Crew Worker II
 - Two Crew Worker I's
 - One Equipment Operator III
 - One Equipment Operator IV
 - Crew Cab Pickup Truck
 - One Trailer

- One 12 yard Dump Truck
- Mini Excavator
- Skid Steer Loader

E. SWEEP (residential detention ponds) rate model assumptions developed during and based on 9/6/17 conference call - (K70104)

- Currently city performs maintenance on six (6) ponds per year
- The effort will slowly build a program dedicating City forces to improve residential detention ponds across the City to meet current regulatory requirements.
- Total estimated number of existing residential ponds in the City is 350 to 400
- The SWEEP program goals are to address regulatory residential detention pond requirements for water quality and flooding. Improving the aesthetics of ponds is not the goal but may be a side benefit in some cases.
- Estimated Average maintenance cost
 - \$2,700 for materials, supplies, etc. per pond,
 - Increases to \$4,000 in FY – 26 (Year 8)
 - \$3,000 for labor per pond (refer to FTE schedule below)
- Add new 3-person crew in FY – 20 (Year 2)
 - Includes material, supplies and equipment annual cost of \$81,000
- Add new 1 FTE in FY – 23 (Year 5)
 - Supervisor position for SWEEP program
 - Include \$1,250 for office set up
- Add new 3-person crew in FY – 24 (Year 6)
 - Includes material, supplies and equipment annual cost of \$81,000
- Add new 3-person crew in FY – 26 (Year 8)
 - Increase material, supplies and equipment annual cost to \$120,000
- Add new 1 FTE in FY – 26 (Year 8)
 - Supervisor position for SWEEP program
 - Include \$1,250 for office set up)
- A total of 11 FTEs over the 10-year rate period that includes the existing 3-person crew with costs included in the operations costs and not included in required minimum)
- It is assumed that after this program is fully staffed, by FY – 26 (year 8), the City (on average) can upgrade up to 30 ponds annually. This assumption will vary greatly and will be based on the type of update each individual residential pond requires. This SWEEP program analysis, as with all the assumptions included in the overall rate study and cost of service analyses, should be reviewed and updated on a regular basis or at least every 5 years.

F. Revenue projections were provided by staff for and through FY – 18.

G. Residential Equivalent Residential Units (ERU's) are assumed to increase 0.5% based on projections from city provided data (FY-11 through FY-19 provided by city staff) and Consultant Team's past experience. Non-residential ERU's are assumed to not increase. The actual changes in ERU's from the provided data showed residential ERU's increased by 0.68% and non-residential was flat or negative.

H. The inflation factor used in the model is 2%, based on the United States 10 year average inflation rate of 1.7%.

- I. Salaries are inflated at 2.5% and fringe benefit costs are escalated at a 6.5% factor.
- J. Business Plan assumptions to be used in rate model include the following:
 - All goal statements that contain a cost of service have been accounted for in either a policy paper or identified in the following list of activity costs in the rate model:
 - The Public Education Outreach programs for cost center K70107 will continue as budgeted with no additional costs to be accounted for in the rate study
 - GIS staffing currently has 5 FTE's allocated as follows
 - General Fund 40%
 - Sanitary Sewer 30%
 - Water Quality 30%

Table 1 - Additional FTE's

Fiscal Year	First Five-Years					Second Five-Years					Totals	
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028		
Cost Center & Program	Additional FTE's											
K70101 WQ Administration TMDL Program		1		1								2
K70104 City Wide Services Green Infrastructure Crews		3		3								6
K70104 City Wide Services SWEEP (Res. Dent. Ponds)		3			1	3		4				11
K70104 City Wide Services Pipe Crews		7										7
K10105 Land Devel. Office LDP Program	1.5	1	1									3.5
Totals	1.5	15	1	4	1	3	0	4	0	0		29.5

II. BACKGROUND

Stormwater management has many different facets that affect day to day operations of a community. This often comes in the form of major stream flooding, neighborhood drainage problems, individual homes with yard and basement flooding, storm system infrastructure deterioration, and excess inflow and infiltration into the sanitary sewer system. However, the issues that will be the most expensive in the future are the stormwater quality concerns of the EPA Municipal Separate Storm Sewer System (MS4) permits and the Total Maximum Daily Load or TMDL Program. These permits and programs are a part of the 1972 (revised in 1978) Clean Water Act and the National Pollutant Discharge Elimination System (NPDES) permit program. The MS4 water quality regulations are unfunded mandates that require Phase I Communities (population over 100,000), such as the City of Chattanooga, to develop a Stormwater Quality Program that follows the six management areas below:

- Public Education and Outreach
- Public Participation/Involvement
- Illicit Discharge Detection and Elimination
- Construction Site Runoff Control
- Post-Construction Runoff Control
- Pollution Prevention/Good Housekeeping

The management areas listed above require education and involvement of the community, mapping of the storm sewer system, a program to control and eliminate non–stormwater flows, a program to control soil erosion from construction sites, and improved operation and maintenance of the storm system, and a comprehensive monitoring program of the streams and storm infrastructure system.

Additionally, the City of Chattanooga has a TMDL established in the South Chickamauga Creek Watershed. South Chickamauga Creek is a part of the Lower Tennessee River Watershed and therefore included in the Lower Tennessee River Watershed (HUC 06020001) TMDL for siltation and habitat alteration. The City is responsible for development of a plan to improve the South Chickamauga Creek Watershed per requirements in the TMDL.

To meet these dual requirements of managing water quantity and improving water quality, there will need to be additional engineering and design, capital project construction, more regular inspection / monitoring of the system, better maintenance of the system, and comprehensive review and update of city policies concerning stormwater management.

The water quantity section consists of the planning, design, construction, and maintenance of the storm infrastructure system (both natural and man-made). There are three major areas of level and cost of service:

- Operations
 - Planning
 - Engineering & Design
 - Monitoring
 - Inspection
 - Enforcement
- Maintenance
 - Construction Crews (Pipe and related activities)
 - Ditch Maintenance Crews
 - Inspection / VAC Crews
- Capital Projects
 - Construction management
 - Construction
 - Water quality control
 - Inspection

WQ program level of services defined by the City of Chattanooga organizational chart that correspond to the annual budgeting process for Water Quality Operating Cost centers and staffing are provided in the following table:

Table 2 – Current Level of Service for Each Cost Center

Cost Center	Level of Service	No. of Staff	Level of Service Activities
K70101	WQ Inspections	27	Inspect industrial facilities, post construction stormwater infrastructure including green infrastructure for continued compliance and recurring maintenance
K70101	WQ Monitoring		Conduct monitoring, sampling, and illicit discharge investigation mandated by the City's National Pollutant Discharge Elimination System (NPDES) Permit No. TNS068063
K70101	WQ GIS		Related geographic information services
K70104	WQ Construction	96	Stormwater conveyance & Inlet cleaning, maintenance, repair and new construction
K70105	Land Development	10	Plan review, construction inspections for WQ, Stormwater, EPSC new site compliance.
K70106	WQ Design	16	WQ 311 Inspection - Drainage investigations and design associated with Citizen Service Requests. In-house modeling, design, cost estimates, permitting for capital projects, capital/contract project management & survey services
K70107	WQ Public Outreach	1	NPDES mandated education, community outreach, training coordination

Although they seem to be different, quantity (flooding & drainage) and quality (MS4 Permit & TMDL) are dependent on one another and integrated into every activity the City of Chattanooga performs. For example, the pipe, stream restoration and the SWEEP (maintaining residential detention ponds) are all examples of maintenance activities that are both water quality and water quantity activities.

III. PURPOSE

The purpose of this Financial Fact Sheet Policy Paper 7 is to provide a summary and overview of the three stormwater level of service / cost of service analyses that form the basis for the legally defensible WQ rates to meet the defined levels of service including:

- The “current” level of service and cost of stormwater service analysis that is based on the FY – 17 actual financial statements and the City Council approved FY – 18 budget with reasonable adjustments;
- The first “required minimum” level of service and cost of stormwater service analysis has been developed for FY – 19 (Year 1) through FY – 23 (Year 5). The rate study will perform and include scenarios 1 and 2 at this time; and
- The second “required minimum” level of service and cost of stormwater service analysis has been developed for FY – 24 (Year 6) through FY – 28 (Year 10). The rate study will perform and include scenarios 1 and 2 at this time; and

- Develop a specific monthly rate per ERU to meet and fund each of the above levels of services.

The TAC is responsible for reviewing and modifying the WQ program policies including the business plan, financial, engineering, operation, maintenance and land development policies which form the basis, draft levels of service activities and assumptions for the 10-year rate study. The results, findings, and conclusions of the overall rate study process are included in this Financial Fact Sheet Policy Paper 7.

IV. DEFINING THE LEVEL OF SERVICES USED IN THE RATE STUDY

The consultant team has used the business plan document as a tool to assist in defining the WQ program's various levels of service, which are defined as follows:

- The "current" level of service has been defined as the WQ program activities the City is "currently" providing to the rate payers;
- The two five-year "required minimum" levels of service and cost of service analysis performed for FY – 19 (Year 1) through FY – 28 (Year 10).

The two levels of stormwater service analysis are further discussed below. These identify, document and define the stormwater activities, responsibilities and duties that will be required and performed by city staff and/or other departments and agencies to meet water quality and water quantity needs of the program.

- 1. Current Level of Service** - The purpose of determining the current level of stormwater service is to establish a baseline for costs, activities and responsibilities currently being performed by the City. The generally accepted standard approach in the water resource rate setting industry is to determine a definition that represents the "current" level of stormwater services being provided to the community rate payer. The current or baseline current is typically determined by reviewing and analyzing past historical "actual" year-end costs that form the basis for an "on-average" year that should be as close to reality as possible. The consultant team analyzed the "actual" final FY – 13 through FY – 17 year end costs that were used to make minor adjustments to the City Council approved FY – 18 budget. This approach is critical in the process of forecasting and projecting into the future for accuracy and rate determination. Furthermore, this generally accepted standard in the industry requires many years of experience by the consultant team in conjunction with discussions with city staff to determine and agree to exactly what the realistic adjustments can and should be made to the FY – 18 City Council approved budget.
- 2. Required Minimum Level of Service** - The purpose of determining the "required minimum" level of service is to use the current level of service as the basis and look forward in five-year time periods to project and estimate (based on the historical analyses). An additional purpose is to identify the services that are sufficient and do not need changed, identify deficient services that require an increase and services

that are currently not being performed and need to be added. The standard approach in the industry to determine the future required minimum level of service is typically represented using historical trends (the current level of service) and estimating into the future based on the experience of city staff and the consultant team. In addition, the rate study will include two (2) required minimum five-year time periods.

3. **The Cash Flow Analysis** – Utilizes the current level of service (as defined above) and incorporates the additional increase of services to meet a required minimum level and cost of service in two five-year analyses including an inflation cost escalation factor to costs and revenue.

V. CURRENT LEVEL OF SERVICE ANALYSIS

The consultant team summarized the current level of WQ program service and corresponding costs of service. These current costs and all costs used in the WQ program analyses were provided by city staff and represent costs the city is currently incurring to manage water quality program activities. The current level of service is represented by using the FY – 18 City Council approved budget information with minor adjustments agreed upon with city staff.

VI. REQUIRED MINIMUM LEVEL OF SERVICE ANALYSIS (FY – 19 TO FY – 23)

The second step in the process of developing the cost of service analysis is to identify, determine and calculate the “required minimum” level of service cost. These costs are represented by the additional services needed that are deficient as previously defined above. These items are comprised of costs to meet minimum standards for the NPDES Phase I MS4 permit, drainage and flooding expenses and other pertinent water quality program (stormwater) costs of service. To clarify, the costs below include the current level of service costs and the additional costs to bring the system up to a more acceptable standard referred to as the required minimum level of service.

The consultant team has developed the first draft five-year required minimum analyses and projections for FY-19 through FY-23 as previously described in this paper above. Moreover, required minimum level of service stormwater costs illustrated in the tables below are based on each of the cost centers included in the approved FY – 18 City Council approved budget. This information has then been segregated into two primary cost activity categories specifically for the 10-year required minimum analyses as follows:

- Water Quality (including the NPDES Phase I Permit regulation activities) and
- Water Quantity (flooding and drainage activities)

This segregation process was ultimately created by city staff during the data collection phase, by providing staffing, salaries, and activity information segregated by water quality versus water quantity activities performed by each staff member. This process was used by all cost center supervisors except the CWS allocations. These were based on the overall crew configurations, the type of WQ program maintenance activities being performed and how CWS is currently organized. A key basis used for the CWS activities

allocation was a four slide PowerPoint presentation provided by CWS staff illustrating how the cost center is organized in combination with crew configurations and type of maintenance activity performed. An overall rate study allocation was created based on these two approaches. This is not an exact and precise calculation as subjective information was certainly used in the process. However, based on the consultant team experience, the elected officials will ultimately want to know the breakdown of expenditures between the two categories and state and federal agencies may request it in the future.

The draft “required minimum level of service stormwater costs” are based on all the rate study assumptions shown in the series of tables below and follow the cost centers and chart of accounts used for budgeting purposes.

Table 3 below illustrates the 5-year rate recommendations based on the gross revenue and gross expenditure calculations and projections for the first five-years of the WQ rate study program. The Gross Revenue is being calculated using the projected number of ERU’s (FY-11 through FY-19 provided by city staff) and then cost escalated using 0.5% cost escalation factor for residential and 0% for non-residential, as shown in the rate study assumptions.

The expenses are based on the actual budgets from (FY-13 through FY-17) using FY-18 budget as the starting point. Escalation factors are shown in the key rate study assumptions section above. Capital is flat and the \$3.2 million transfer to water quality capital is also flat.

(NOTE) All tables included in this section are subject to rounding in the plus or minus (+/-) amount of \$10,000

Table 3 – Rate Recommendations

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU	\$10.54	\$11.56	\$12.69	\$13.93	\$15.29
Gross Revenue	\$23,040,000	\$25,320,000	\$27,830,000	\$30,590,000	\$33,620,000
Gross Expenses	\$23,040,000	\$25,320,000	\$27,830,000	\$30,590,000	\$33,620,000
Net Gain/(Loss)	\$0	\$0	\$0	\$0	\$0

VII. CASH FLOW ANALYSIS SUMMARY

The "cash flow" analysis is the culmination of incorporating the following, results are included in the tables below:

- Key rate study assumptions as listed in Section I above
- Gross and net revenues listed below
- Operating expenses
- Expenditures
- Transfer to WQ capital
- Addition to fund balance
- Cost escalation factors including inflation

Table 4 illustrates the rate increases required to achieve the results provided in Table 3 above:

Table 4 – Rate Increase Per Year, First-Five Years

<i>Monthly Rates</i>	FY2018	FY2019	FY2020	FY2021	FY2022	FY2023
<i>Current Rate/ERU/Year</i>	\$115.20					
<i>Calculated Rate/ERU/Year</i>		\$126.48	\$138.72	\$152.28	\$167.16	\$183.48
<i>Annual Percentage Increase</i>		9.8%	9.7%	9.8%	9.7%	9.8%

Table 5 below illustrates the Gross Revenue projections, less the total adjustments (adjustments using staff projections for FY - 10 through FY - 17 and cost escalation factors moving forward):

Table 5 – Net Revenue

	FY2019	FY2020	FY2021	FY2022	FY2023
<i>Gross Revenue</i>	\$23,040,000	\$25,320,000	\$27,830,000	\$30,590,000	\$33,620,000
<i>Less: Total Adjustments</i>	\$2,650,000	\$2,910,000	\$3,200,000	\$3,520,000	\$3,870,000
<i>Net Revenue</i>	\$20,390,000	\$22,410,000	\$24,630,000	\$27,070,000	\$29,750,000

Table 6 below illustrates the Gross Revenue projections less “operating expenses”, less the transfer out (previous year fund balance), less the consultant team calculated addition to fund balance. This results in the funds available for Capital projects.

Table 6 – Cash Flow Analysis

	FY2019	FY2020	FY2021	FY2022	FY2023
<i>Gross Revenue*</i>	\$23,040,000	\$25,320,000	\$27,830,000	\$30,590,000	\$33,620,000
<i>Less: Operating Expenses**</i>	-\$16,970,000	-\$18,520,000	-\$18,530,000	-\$19,420,000	-\$19,340,000
<i>Less: Transfer To WQ Capital</i>	-\$3,200,000	-\$3,200,000	-\$3,200,000	-\$3,200,000	-\$3,200,000
<i>Addition to Fund Balance Available For Capital Projects</i>	\$2,870,000	\$3,600,000	\$6,100,000	\$7,970,000	\$11,080,000

* Total Expenses = Gross Revenue = (\$17.140M operating expenses) + (\$3.200M transfer out) + (\$2.700M additional capital) = (\$23.040M) corresponds to gross revenue

** Operating expenses includes salaries through debt service excluding transfer out and capital projects

Table 7 below illustrates the recommended policy change for the Land Development Office funding. This policy change will transition from a department largely subsidized by water quality fees to a fully supporting department funded by development fees by 2023, changing at a rate of 20% per year. Table 8 illustrates the following:

- Row 1: Projected expenses for the 5 year analysis
- Row 2: 20% per year increased funding by development fees

- Row 3: 20% per year decreased funding by water quality program rates to \$0 in FY-23 (Year 5)

Table 7 – Land Development Changes

Land Development	FY2019	FY2020	FY2021	FY2022	FY2023
Projected Annual Expenses	\$869,000	\$903,000	\$938,000	\$976,000	\$1,015,000
Amount Funded by Land Development Fees	<u>\$174,000</u>	<u>\$361,000</u>	<u>\$563,000</u>	<u>\$781,000</u>	<u>\$1,015,000</u>
Amount Funded by WQ Rates	\$695,000	\$542,000	\$375,000	\$195,000	\$0

VIII. THREE SCENARIOS DEVELOPED THROUGH THE PROCESS

The following section illustrates the 4 scenarios developed and based on Table 4 and 5 above.

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Comparison of Alternate Rate Adjustment Scenarios

- Current FY-2018 WQ Fee is **\$115.20** per ERU per Year or \$9.60 per month per ERU

Scenario 1: Increase the Level & Cost of Service over 5 years

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$126.48	\$138.72	\$152.28	\$167.16	\$183.48
Annual Percentage Increase	9.8%	9.7%	9.8%	9.7%	9.8%
Addition to Fund Balance Available for Capital Projects *	\$2,870,000	\$3,600,000	\$6,100,000	\$7,970,000	\$11,080,000 **

*Transfer out to WQ Capital is \$3.2M per year.

** Total 5 Year Capital Budget = \$31,620,000

Scenario 1A: Same increase in Level of Service as Scenario 1, increase rates 33.3% at year 1, hold rates flat thereafter (Equals 5 year average of Scenario 1)

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$153.60	\$153.60	\$153.60	\$153.60	\$153.60
Annual Percentage Increase	33.3%	0%	0%	0%	0%
Addition to Fund Balance Available for Capital Projects *	\$7,650,000	\$7,380,000	\$7,090,000	\$6,810,000	\$6,520,000 **

*Transfer out to WQ Capital is \$3.2M per year.

** Total 5 Year Capital Budget = \$35,450,000

Scenario 1B: Same increase in Level of Service as Scenario 1, increase rates 59.3% at year 1, hold rates flat thereafter (Match Scenario 1, 5th year rate)

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$183.48	\$183.48	\$183.48	\$183.48	\$183.48
Annual Percentage Increase	59.3%	0%	0%	0%	0%
Addition to Fund Balance Available for Capital Projects *	\$13,090,000	\$12,840,000	\$12,560,000	\$12,270,000	\$12,000,000 **

*Transfer out to WQ Capital is \$3.2M per year.

** Total 5 Year Capital Budget = \$62,760,000

Scenario 2: Keep the Current Level of Service, perform only critical capital projects on a year by year basis

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$115.20	\$119.28	\$109.92	\$120.72	\$137.40
Annual Percentage Change	0%	3%	-9%	9%	12%
Addition to Fund Balance Available for Capital Projects *	\$2,375,000	\$2,800,000	\$950,000	\$2,450,000	\$4,850,000 **

*CIP budget available for critical projects only; includes Central Ave, Patten Parkway and TMDL.

** Total 5 Year Capital Budget = \$13,425,000

Assumptions:

- No changes made to the rate for FY-19 and no changes to the \$3.2M Transfer Out
- FY 2020 through FY 2023 Transfer Out decreases to \$1M per year
- No required minimum funded
- Perform only critical water quality capital projects. Does not include full request for CIP.
- No change in rate will cause lack of funding issues in Year 2 of the analysis.

Scenario 2A: Keep the Current Level of Service, perform only critical capital projects on a year by year basis,

Increase rate 3.0% the first year and keep flat thereafter (5 year average of Scenario 2)

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$118.68	\$118.68	\$118.68	\$118.68	\$118.68
Annual Percentage Increase	3.0%	0%	0%	0%	0%
Addition to Fund Balance Available for Capital Projects *	\$2,260,000	\$1,932,300	\$1,610,250	\$1,271,000	\$932,000

* Total 5 Year Capital Budget = \$8,005,550

Scenario 2B: Keep the Current Level of Service, perform only critical capital projects on a year by year basis,

Increase rate 19.0% the first year and keep flat thereafter (Match Scenario 2, 5th year rate)

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$137.40	\$137.40	\$137.40	\$137.40	\$137.40
Annual Percentage Increase	19.0%	0%	0%	0%	0%
Addition to Fund Balance Available for Capital Projects *	\$5,661,000	\$5,356,000	\$5,029,000	\$4,690,000	\$4,351,000

* Total 5 Year Capital Budget = \$25,087,000

Scenario 3: Increase the Level of Service the same as Scenario 1, exclude the City Wide Services Pipe Crew and Green Infrastructure Crews.

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$116.82	\$128.89	\$137.39	\$144.23	\$148.62
Annual Percentage Change	1.40%	10.33%	6.60%	4.98%	3.04%
Addition to Fund Balance Available for Capital Projects *	\$1,610,250	\$2,983,200	\$4,027,320	\$4,678,200	\$5,616,100

* Total 5 Year Capital Budget = \$18,915,070

Assumptions:

- Includes changes to the Land Development Program
- Includes changes for TMDL regulatory requirements including staff and capital
- Includes Residential Detention Pond Maintenance (SWEEP) Program
- Excludes CWS Pipe Crew
- Excludes Green Infrastructure Crews

Scenario 3A: Same additional Level of Service as Scenario 3, Increase rate 17.35% the first year and keep flat thereafter (5 year average of Scenario 3)

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$135.19	\$135.19	\$135.19	\$135.19	\$135.19
Annual Percentage Increase	17.35%	0.00%	0.00%	0.00%	0.00%
Addition to Fund Balance Available for Capital Projects *	\$4,966,350	\$4,135,800	\$3,631,820	\$3,028,400	\$3,169,650

* Total 5 Year Capital Budget = \$18,932,020

Scenario 3B: Same additional Level of Service as Scenario 3, Increase rate 29.01% the first year and keep flat

Thereafter (Match Scenario 3, 5th year rate).

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$148.62	\$148.62	\$148.62	\$148.62	\$148.62
Annual Percentage Increase	29.01%	0.00%	0.00%	0.00%	0.00%
Addition to Fund Balance Available for Capital Projects *	\$7,425,230	\$6,593,550	\$6,095,220	\$5,491,800	\$5,616,100

* Total 5 Year Capital Budget = \$31,221,900

Scenario 4: Scenario 4 is the same as Scenario 1 with several exceptions; see the assumptions listed below the table.

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$126.49	\$138.78	\$152.33	\$167.22	\$183.54
Annual Percentage Change	9.80%	9.71%	9.77%	9.77%	9.76%
Addition to Fund Balance * Available for Capital Projects *	\$3,641,731	\$3,660,929	\$5,944,083	\$7,559,861	\$10,409,734

* Total 5 Year Capital Budget = \$31,216,337

Assumption differences from Scenario 1:

- Land Development Permit (LDP) fees reduced as compared to Scenario 1. The following page displays the breakdown of LDP fees for each scenario.
- LDP fees are increased fully in year 1 and held constant for all five years, as compared to Scenario 1 where they are phased in 20% over five years.
- New hires or new FTE's included in the Green Infrastructure, SWEEP (Residential Detention Pond Maintenance), and City Wide Services Pipe Crew (21.5 FTE's total) have been converted to Operation's funds designated for outside contracting services.

Scenario 4A: All assumptions from Scenario 4, except LDP fees are reduced even further as compared to Scenario 1. See following page.

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$126.49	\$138.78	\$152.33	\$167.22	\$183.54
Annual Percentage Increase	9.80%	9.71%	9.77%	9.77%	9.76%
Addition to Fund Balance * Available for Capital Projects *	\$3,485,710	\$3,504,908	\$5,788,062	\$7,403,839	\$10,253,713

* Total 5 Year Capital Budget = \$30,436,231

Scenario 4B: All assumptions from Scenario 4, except LDP fees for the largest number of permit types are held constant as compared to Current Level of Service (\$30/AC, min. \$100), other various permits and review fees are held constant from Scenario 4A. See following page.

	FY2019	FY2020	FY2021	FY2022	FY2023
Calculated Rate/ERU/Year	\$126.49	\$138.78	\$152.33	\$167.22	\$183.54
Annual Percentage Increase	9.80%	9.71%	9.77%	9.77%	9.76%
Addition to Fund Balance * Available for Capital Projects *	\$3,389,910	\$3,409,108	\$5,692,262	\$7,308,039	\$10,157,913

* Total 5 Year Capital Budget = \$29,957,231

IX. WATER QUALITY AND WATER QUANTITY ALLOCATION

The information contained in Table 8 is the rate information from Table 3 separated into a three-component rate, illustrating the water quality portion of the rate, the water quantity (flooding and drainage) portion of the rate and a third “other” component (as defined by and provided by staff).

Table 8 – Water Quality vs. Water Quantity Allocation

Program Year	Water Quality	Water Quantity	Other	Total Rate (Monthly)
FY2019	\$5.41	\$4.97	\$0.16	\$10.54
FY2020	\$5.78	\$5.61	\$0.16	\$11.56
FY2021	\$5.73	\$6.79	\$0.17	\$12.69
FY2022	\$7.28	\$6.48	\$0.18	\$13.93
FY2023	\$7.48	\$7.63	\$0.18	\$15.29
5 Year Avg Rate	\$6.34	\$6.30	\$0.18	\$12.80

X. REQUIRED MINIMUM LEVEL OF SERVICE ANALYSIS (FY – 24 TO FY – 28)

The second five-year WQ rate analysis will be added to the document after the first five year analysis is approved by city staff.

XI. ESTIMATED DEBT COVENANT TEST

The consultant team has performed a debt service calculation for the WQ rate study program contained in Table 9 below based solely on our experience with performing rate studies with other communities. Accurate debt lien calculations can and should be performed if the Bond Issuance and bond covenant information is provided to the consultant team. The large amount of fund balance collected and maintained should be enough funds to meet any bond covenant tests included in the bond issuance information, but each bond issuance does vary from one issuance to another. Therefore, only precise calculations can be performed if the appropriate bond information is provided to the consultant team.

Table 9 – Debt Covenant Test

Estimated Debt Coverage Test	FY2019	FY2020	FY2021	FY2022	FY2023
Net Revenue	\$23,040,000	\$22,410,000	\$24,630,000	\$27,070,000	\$29,750,000
Less: Operating Expenses Excluding Debt Payment	\$14,584,191	\$14,894,191	\$15,214,191	\$15,544,191	\$15,874,191
Amount Available for Debt Service	\$8,455,809	\$7,515,809	\$9,415,809	\$11,525,809	\$13,875,809
Annual Debt Service Payment	\$2,555,809	\$2,555,809	\$2,555,809	\$2,555,809	\$2,555,809
1.2 Test	3.3	2.9	3.7	4.5	5.4

XII. WQ PROGRAM RATE STUDY RECOMMENDATIONS

1. The consultant team recommends implementing the 5-year rate recommendations included in Table 3 above;
2. The consultant team recommends accepting the key rate study assumptions listed above;
3. The consultant team recommends the Department of Public Works Administrator and staff should be briefed with a summary of the results to solicit input and next steps;
4. The consultant team recommends the Administration and City Council members should be briefed with a summary of the results to solicit input and next steps.

XIII. APPENDIX

This appendix will be updated after the final rate information has been approved by the Public Works Administration and Elected Officials, or as requested. This will contain all of the financial, budget and rate information developed as part of this study.

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