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April 19, 2018

Mr. David Hughes
Assistant Town Manager
Town of Apex
PO Box 250
Apex, NC 27502

Dear Mr. Hughes:

Raftelis has completed an evaluation to develop cost-justified water and wastewater system development fees for consideration by the Town of Apex (Town). This letter documents the results of the analysis, which is based on an approach for establishing system development fees set forth in North Carolina General Statute 162A Article 8 – "System Development Fees." As one of the largest and most respected utility financial, rate, management, and operational consulting firms in the U.S., and having prepared system development fee calculations for utilities in North Carolina and across the U.S. since 1993, Raftelis is qualified to perform system development fee calculations for water and wastewater utilities in North Carolina.

Background

System development fees are one-time charges assessed to new water and/or wastewater customers, or developers or builders, to recover a proportional share of capital costs incurred to provide service availability and capacity for new customers. North Carolina General Statute 162A Article 8 (Article 8) provides for the uniform authority to implement system development fees for public water and wastewater systems in North Carolina, and was recently passed by the North Carolina General Assembly and signed into law on July 20, 2017. According to the statute, system development fees must be adopted in accordance with the conditions and limitations of Article 8, and must conform to the requirements set forth in the Article no later than July 1, 2018. In addition, the system development fees must also be prepared by a financial professional or licensed professional engineer, qualified by experience and training or education, who, according to the Article, shall:

- Document in reasonable detail the facts and data used in the analysis and their sufficiency and reliability.
- Employ generally accepted accounting, engineering, and planning methodologies, including the buy-in, incremental cost or marginal cost, and combined cost approaches for each service, setting forth appropriate analysis to the consideration and selection of an approach appropriate to the circumstances and adapted as necessary to satisfy all requirements of the Article.

- Document and demonstrate the reliable application of the methodologies to the facts and data, including all reasoning, analysis, and calculations underlying each identifiable component of the system development fee and the aggregate thereof.
- Identify all assumptions and limiting conditions affecting the analysis and demonstrate that they do not materially undermine the reliability of conclusions reached.
- Calculate a final system development fee per service unit of new development and include an equivalency or conversion table for use in determining the fees applicable for various categories of demand.
- Consider a planning horizon of not less than 10 years, nor more than 20 years.

This letter report documents the results of the calculation of water and wastewater system development fees for the Town in accordance with these requirements.

Article 8 references three methodologies that can be used to calculate system development fees. These include the buy-in method, the incremental cost method, and the combined cost method. A description of each of these methods follows:

Buy-In Approach

The System Buy-In Approach calculates a system development fee based upon the proportional cost of each user's share of existing system capacity, and is most appropriate in cases where the existing system assets provide adequate capacity to provide service to new customers. The cost of the facilities is based on fixed assets records and can include escalation of the depreciated value of those assets to current dollars, or "replacement costs" as identified in the general statute. The general statute also identifies adjustments to be made to the replacement cost such as "debt credits, grants, and other generally accepted valuation adjustments."

Incremental Cost Approach

The Incremental Cost (or Marginal Cost) Approach calculates a system development fee based upon a new customer's proportional share of the incremental future cost of system capacity. This approach focuses on the cost of adding additional facilities to serve new customers. It is most appropriate when existing facilities do not have adequate capacity to provide service to new customers, and the cost for new capacity can be tied to an approved capital improvement plan (CIP) that covers at least a 10-year planning period. Per the general statute, a revenue credit must be applied "against the projected aggregate cost of water or sewer capital improvements."

Combined Approach

The Combined Approach is a combination of the Buy-In and Incremental Cost approaches, and is appropriate to be used when the existing assets provide some capacity to accommodate new customers, but where the capital improvement plan also identifies significant capital investment to add additional infrastructure to address future growth and capacity needs.

Summary of Results

Raftelis requested and was provided with the following data from Town staff to complete the system development fee calculation:

- Water and wastewater fixed asset data, as of June 30, 2016;
- Outstanding utility debt and associated debt service;
- Proposed capital projects and construction work in progress ("CWIP") related to assets necessary to maintain existing capacity and/or expand capacity;
- Contributed capital;
- Capacity in Apex plants and capacity owned in Town of Cary's plants
- History of system development fees collected; and,
- System peaking information for the water system.

When Raftelis was engaged to conduct this study, the Town was currently undergoing water plant expansion projects but the additional capacity was not yet available to existing customers. Furthermore, the Town has identified treatment plant expansion projects in the Town's 10-year capital improvement plan. Therefore, the Combined Approach was used to calculate the water system development fees. The capacity of the wastewater system was recently expanded and there are not any treatment expansion projects identified in the Town's 10-year capital improvement plan. Therefore, the Buy-In approach was used to calculate the Town's sewer system development fees.

Buy-In Calculation

Using the Capacity Buy-In approach, Raftelis calculated the estimated cost, or investment in, the current capacity available to provide water and wastewater utility services to existing and new customers. This analysis was based on a review of fixed asset records and other information as of June 30, 2016. The depreciated value of the assets is first adjusted to reflect an estimated replacement cost to determine the "replacement cost new less depreciation" (RCNLD) value for the assets. The asset values were adjusted using the Handy Whitman Index of Public Utility Construction Costs.

Several adjustments to the RCNLD value are necessary to ensure compliance with the Rational Nexus test, which were as follow:

- *Construction in Progress Credit* - The analysis includes improvements for certain core facilities already under construction but not yet booked to fixed assets for the wastewater system such as pump stations and effluent pipelines. (These assets were funded by debt service). It should be noted the construction work in progress for the water system was included in the Combined Approach since the additional treatment capacity provided by the projects was not yet available.
- *Subtraction of Contributed Assets* - All assets contributed by or paid for by developers, or assets that were grant funded are excluded from the calculation since these costs were not ultimately "paid" by the existing customers.

- *Subtraction of Outstanding Principal Debt* - Utilities often borrow funds to construct assets, and revenues from retail rates and charges can be used to make the payments on these borrowed funds. To ensure that new customers are not being double charged for these assets, once through the system development fee and again through retail rates and charges, the proportion of the outstanding debt principal amount that is anticipated to be paid for through retail rates and charges is typically deducted from the system development fee calculation. This proportional amount is estimated by comparing the historical annual amount of revenues collected from system development fees with the respective annual amount of principal payments. Historically, the Town has generated sufficient revenue from system development fees to offset debt service principal payments entirely. Therefore, no debt service was adjusted for the calculations.

At the end of the analysis, the cost or investment in core system assets is reduced down to a basic unit measure of cost per gallon per day (GPD) for water and wastewater capacity. As shown in Exhibit 1, the adjusted replacement cost new less depreciation for investment in core assets for each system is divided by the total capacity in each system. Additional details on how this value was calculated are provided in the Schedules from the System Development Fee Model in the Appendix.

Exhibit 1 – Cost per GPD of Core Utility Assets for Buy-In Approach

	Water	Sewer
Adjusted RCNLD	$50,476,715	$108,032,226
Total Capacity	9,200,000	8,820,000
Cost per Gallon per Day	**$5.49**	**12.25**

Incremental Calculation

Using the Incremental Cost approach, Raftelis identified the cost of capital improvements for the water system relative to the increased capacity that they would provide. The starting point for the Incremental approach is the total cost of all expansion-related capital projects included in the Town's capital improvement plan which covers a planning horizon of 10 years. The total expansion related projects identified in the Town's 10-year capital improvement plan total $21,106,000 related to the expansion of the Cary/Apex treatment facility from 12.88 MGD to 14.72 MGD (the Town's capacity only). In addition, the Town has incurred $15,480,731 in construction work in progress for the expansion of the Cary/Apex treatment plant from 9.2 MGD to 12.88 MGD (the Town's capacity only). Because the capacity associated with this project is not yet available, these project costs were included in the Incremental Approach (as well as the additional capacity by these projects).

The aggregate project costs must be reduced by a revenue credit according to the North Carolina General Statute 126A-207 "Minimum requirements" of Article 8. The credit shall reflect a deduction of either the outstanding principal debt or the present value of projected revenues received by the local governmental unit for the capital improvements. The credit must be no less than 25% of the aggregate cost of these capital improvements. The revenue credit is applied to ensure that new customers are not paying twice for the capacity (once through the system development fee and then again through rates which are used to pay debt service issued for the projects that provided capacity). Since the Town has indicated that the water project costs will be paid for by fund balance[1], the revenue credit was calculated by taking 25% of the total project costs ($9.15 million) and subtracting this amount from the aggregate project costs to derive the net project costs of approximately $27.4 million.

Exhibit 2– Cost per GPD of Core Utility Assets for Incremental Approach

	Water
Total Cost of Capital Improvements	$36,586,731
Less: Revenue Credit	-$9,146,683
Net Cost of Capital Improvements	$27,440,048
Additional Capacity Provided by Projects	5,520,000
Cost per Gallon per Day	**$4.97**

Combined Cost Calculation

The Combined Cost method requires a weighted average of the respective cost per GPD numbers calculated under the Buy-In and Incremental approaches as illustrated in Exhibit 3.

Exhibit 3 – Weighted Cost/gallon/day for Combined Approach

	Water System Cost per GPD	
	A. Net Assets / Projects	B. Capacity
Buy-In	$50,476,715	9,200,000
Incremental	$27,440,048	5,520,000

[1] The Town's unrestricted fund balance in the Water and Sewer Enterprise Fund as of June 30, 2017 was $40,583,369. (Refer to Exhibit 6 on page 29 of the Town's 2017 Comprehensive Annual Financial Report).

Total	**$77,916,764**	**14,720,000**
Weighted Average Cost per Day (A/B)	**$5.29**	

This measure becomes the basic building block or starting point for determining the *maximum cost-justified level* of the water and wastewater system development fees. Fees for different types of customers are based on this cost of capacity multiplied by the amount of capacity needed to serve each type or class of customer.

Equivalent Residential Unit (ERU) Calculation and Assessment of Fee

The next step is to define the level of demand associated with a typical, or average, residential customer, often referred to as an Equivalent Residential Unit, or ERU. The level of demand associated with a typical residential customer is built up based on a number of factors or assumptions, as shown in Exhibit 4.

Exhibit 4: Water and Wastewater Demand per Single-Family ERU

Usage per ERU	Water	Wastewater
Gallons per day per ERU	213	300
Water Peaking Factor	1.58	N/A
Adjusted GPD per ERU	**337**	**300**

The Town uses a planning number in determining water treatment capacity, which is 73.5 gallons of water per person. The Town has a median household size of 2.9 people which results in 213 gallons per residential unit. However, a peaking factor (based on historic information) was provided by Town staff and was applied to determine the adjusted gallons per day per household. For the wastewater system, the Town uses the wastewater design flow rates as specified by the North Carolina Administrative Code Title 15A (Department of Environment and Natural Resources) Subchapter 2T (refer to Supporting Schedule 5), which states that the sewage from dwelling units is 120 gallons per day per bedroom. The Town uses the average gallons per day of a two and three-bedroom home (or 300 gallons per day) for the wastewater equivalent residential unit. The calculation of the system development fee is based on the cost per gallon per day multiplied by the number of gallons per day required to serve each customer.

Exhibit 5 – Calculated Maximum Residential System Development Fees

Single-Family	Water	Wastewater
Cost per GPD	$5.29	$12.25
GPD per ERU	337	300
Calculated System Development Fee per ERU	$1,783	$3,675
Existing System Development Fee per ERU	$3,268	$3,517

For non-residential customers with larger meters, the fees for the smallest residential meter are used and then scaled up by the flow ratios for each meter size, as specified in the AWWA M-1 Manual[2]. Exhibit 6 shows the resulting system development fees by meter size for meters ranging from 3/4 inches to 12 inches. For these calculations, the system development fees have been rounded to the nearest dollar.

Exhibit 4 – Calculated Maximum System Development Fees for Non-Residential Customers

	EXISTING		PROPOSED	
Meter Size	Water	Wastewater	Water	Wastewater
¾”	$3,268	$3,517	$1,783	$3,675
1”	$5,447	$5,862	$2.972	$6,124
1.5”	$10,894	$11,723	$5,943	$12,249
2”	$17,430	$18,757	$9,509	$19,598
3”	$34,861	$37,514	$19,019	$39,195
4”	$54,470	$58,616	$29,717	$61,243
6”	$108,940	$117,231	$59,433	$122,486
8”	$174,304	$187,570	$95,093	$195,977
10”	$261,455	$281,355	$249,620	$514,439
12”	$577,381	$621,326	$314,997	$649,173

[2] See the AWWA M-1 Manual – Appendix B- Equivalent Meter Ratios; pp.326

Please contact me at your convenience if you have any questions regarding this report. We appreciate the opportunity to assist the Town of Apex with this important engagement.

Very truly yours,

RAFTELIS FINANCIAL CONSULTANTS, INC.

Elaine Conti

Appendix

Supporting Schedules
From the
System Development Fee Model

Schedule 1 – Buy-In Approach for Water System

Gross Water Assets		
Category	**Description**	**RCNLD**
WTR LAND	Land	15,658,816
WTR LAND IMPR	Land improvement	-
WTR BLDG IMPR	Building improvement	8,057,471
WTR EQUIP	Equipment	484,441
WTR VEH	Vehicles	230,847
WTR UTIL IMPR	Improvements	53,454,813
Total RCNLD Value of Gross Water Assets (1)		**$ 77,886,389**

Adjustments		
Less: Equipment	$	(484,441)
Less: Vehicles		(230,847)
Less: Meters		(1,202,661)
Less: Contributed Capital		(25,568,289)
Less: Outstanding Principal (2)		-
Plus: Developer Reimbursements		76,565
Net Assets Eligible for Inclusion	**$**	**50,476,715**
Total Capacity (gal) in Cary/Apex WTP - Apex's share only (3)		9,200,000
Net Cost per Gallon per Day	**$**	**5.49**
Average Daily Consumption per ERU		**213**
System Peaking Factor		**1.58**
Adjusted Average Daily Consumption per ERU (4)		**337**
Maximum Water Capacity Fee per ERU	**$**	**1,849**
Current Water SDC for Single-Family	$	3,268

(1) Fixed asset information was provided by the Town and the net book value was escalated to 2017 to calculate the replacement cost new less depreciation (RCNLD)
(2) The Town uses system development fees to pay debt service, which covers core water assets. Since debt service is paid completely by system development fees, then a debt service credit should not be subtracted.
(3) This reflects Apex's share of the Cary/Apex Water Treatment Plant
(4) Average daily consumption per ERU and peaking factor was provided by the Town.

Schedule 2 – Buy-In Approach for Wastewater System

Gross Sewer Assets			
Category	**Description**		**RCNLD**
SWR EQUIP	Equipment	$	804,484
SWR VEH	Vehicles		178,821
SWR LAND	Land		16,684,511
SWR BLDG IMPR	Building improvement		-
SWR UTIL IMPR	Improvements		102,840,414
SWR INTGBL			-
Total RCNLD Value of Gross Sewer Assets (1)		**$**	**120,508,230**
Adjustments			
Less: Vehicles		$	(178,821)
Less: Contributed Capital			(33,120,726)
Less: Outstanding Principal (2)			-
Plus: Construction in Progress			20,705,079
Plus: Developer Reimbursements			118,464
Net Assets Eligible for Inclusion		$	108,032,226
Total Capacity (gal) in Cary/Apex WWTP - Apex's share only and Apex WWTP (3)			**8,820,000**
Cost per Gallon per Day		**$**	**12.25**
Average Daily Consumption per ERU (4)			**300**
Maximum Sewer Capacity Fee per ERU		**$**	**3,675**
Current Sewer SDC for Single-Family		**$**	**3,517**

(1) Fixed asset information was provided by the Town and the net book value was escalated to 2017 to calculate the replacement cost new less depreciation (RCNLD)
(2) The Town uses system development fees to pay debt service. The debt service covers core assets. Since debt service is paid completely by system development fees, then a debt service credit should not be subtracted from core assets.
(3) Western Wake Regional Water Reclamation Facility capacity is 6.12. Although the rated capacity of the Middle Creek Water Reclamation Facility is 3.6, the functional capacity is only 2.7.

(4) The average daily consumption is based on NCAC 02T.0114, which states that the average wastewater permitted capacity design flow rates are 120 gallons per bedroom per day. An average of 2 and 3 bedrooms per ERU was assumed for this analysis.

Note 4: Calculation of ERU			**STATE RULE**
	Wastewater permitted capacity design flow rates (4)		
	120 gallons per day per bedroom		120
	240 gallons per day for 2 bedrooms		240
	360 gallons per day for 3 bedrooms		360
	Estimated gallons per day per household (5) - average of 2 and 3 bedrooms		***300***

Schedule 3 – 10-Year Capital Improvement Plan for Water and Wastewater Systems

Capital Improvement Plan	Total Project Cost (2017 - 2028)	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Water CIP												
Cary/Apex Water Treatment Facililty - Phase IV Expansion	$ 21,106,000									$ 406,000	$ 4,600,000	$ 16,100,000
Sewer CIP												
Town of Cary CIP Contribution	$ 713,490	$ -	$ -	$ 23,800	$ 48,960	$ 48,960	$ 56,440	$ 158,440	$ 286,280	$ 38,760	$ 30,600	
Commerce Street - Sewer Replacement	$ 125,000											
Total: Sewer CIP		$ -	$ -	$ 23,800	$ 48,960	$ 48,960	$ 56,440	$ 158,440	$ 286,280	$ 38,760	$ 30,600	$ -

Schedule 4 – Incremental and Combined Approach for Water System

Marginal Incremental Calculation	Water
Expansion-Related Projects	
Capital Improvement Projects - 10-year CIP	$ 21,106,000
Construction Work in Progress	$ 15,480,731
Subtotal:	$ 36,586,731
Adjustments - the Greater of:	
A) Revenue Credit (1)	-
B) 25% of Projects	(9,146,683)
Total Adjustment	(9,146,683)
Net Value of Capital Projects	$ 27,440,048
Additional Capacity from Projects	5,520,000
Cost per Gallon per Day	$ 4.97
Average Daily Consumption per ERU	337
Maximum System Development Fee per ERU	**$ 1,675**
Current System Development Fee	3,268

Water	System Buy-In	Marginal Incremental	Combined
Net RCNLD	$ 50,476,715	$ 27,440,048	$ 77,916,764
Capacity (gallons)	9,200,000	5,520,000	14,720,000
Cost per Gallon per Day	$ 5.49	$ 4.97	$ 5.29
Fee per ERU	**$ 1,849**	**$ 1,675**	**$ 1,783**
Existing			3,268