RAFTELIS

January 22, 2025

Mr. Ken Griffin
Public Utilities Director
Currituck County

Subject: System Development Fee Study Update

Dear Mr. Griffin:

Raftelis Financial Consultants, Inc. ("Raftelis") has completed an evaluation to develop cost-justified water and sewer system development fees for consideration by Currituck County ("County") for its five applicable water and sewer systems. This report documents the results of the analysis, which was based on an approach for establishing system development fees set forth in North Carolina General Statute 162A Article 8 – "System Development Fees." The purpose of this report is to summarize Raftelis' conclusion related to cost-justified water and sewer system development fees.

The preparation of this report was developed by Raftelis for the County based on a specific scope of work agreed to by both parties. The scope of Raftelis' work consisted of completing a calculation of cost justified water and sewer system development fees using common industry practices and industry standards. We provide no opinion on the legality of the system development fees implemented by the County. It is the responsibility of the County to ensure compliance of the system development fees with North Carolina General Statute 162A Article 8 – "System Development Fees.". The scope of work does did not include any additional work other than the calculation associated with the system development fees, such as opinions or recommendations on the administration of these fees, the timing and use application of revenues from the collection of these fees, etc., as that is the responsibility of the County.

In developing the conclusions contained within this report, Raftelis has relied on certain assumptions and information provided by the County, who is most knowledgeable of the water and sewer systems, its finances, etc. Raftelis has not independently verified the accuracy of the information provided by the County. We believe such sources are reliable and the information obtained to be reasonable and appropriate for the analysis undertaken and the conclusions reached. The conclusions contained in this report are as of the stated date, for a specific use and purpose, and made under specific assumptions and limiting conditions. The reader is cautioned and reminded that the conclusions presented in this report apply only to the effective date indicated. Raftelis makes no warranty, expressed or implied, with respect to the opinions and conclusions contained in this report. Any statement in this report involving estimates or matters of opinion, whether or not specifically designated, are intended as such, and not as a representation of fact.

Background

System development fees are one-time charges assessed to new water and/or sewer customers for their use of system capacity and serve as an equitable method by which to recover up-front system capacity costs from those using the capacity. North Carolina General Statute 162A Article 8 ("Article 8") provides for the uniform authority to implement system development fees for public water and sewer systems in

North Carolina and was passed by the North Carolina General Assembly and signed into law on July 20, 2017, and has been modified several times. According to the statute, system development fees are required to be adopted in accordance with the conditions and limitations of Article 8, and the fees are required to 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 methods 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 interim 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 five years, nor more than 20 years.
- Use the gallons per day per service unit that the local government unit applies to its water or sewer system engineering for planning purposes for water or sewer, as appropriate, in calculating the system development fee.

This letter report documents the results of the calculation of water and sewer system development fees in accordance with these requirements. In general, system development fees are calculated based on (1) a cost analysis of the existing or planned infrastructure that is in place, or will be constructed, to serve new capacity demands, and (2) the existing or additional capacity associated with these assets. Article 8 is relatively explicit in the identification of infrastructure assets that may be included as part of the system development fee calculation, as the Article defines allowable assets to include the following types, as provided in Section 201:

> *"A water supply, treatment, storage, or distribution facility, or a wastewater collection, treatment, or disposal facility providing a general benefit to the area that facility serves and is owned or operated, or to be owned or operated, by a local governmental unit. This shall include facilities for the reuse or reclamation of water and any land associated with the facility."*

Therefore, the method used to calculate system development fees for the County included system facility assets that satisfied this definition.

Article 8 references three methodologies that could 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 is included in the following paragraphs:

Capacity Buy-In Method:

Under the Capacity Buy-In Method, a system development fee is calculated based on the proportional cost of each user's share of existing system capacity. This approach is typically used when existing facilities can provide adequate capacity to accommodate future growth. The cost of capacity is derived by dividing the estimated value of existing facilities by the current capacity provided by existing facilities. Adjustments to the value of existing facilities are made for developer contributed assets, grant funds, and outstanding debt.

Incremental Cost Method:

Under the Incremental Cost (or Marginal Cost) Method, a system development fee is calculated based on a new customer's proportional share of the incremental future cost of system capacity. This approach is typically used when existing facilities have limited or no capacity to accommodate future growth. The cost of capacity is calculated by dividing the total cost of growth-related capital investments by the additional capacity provided as a result of the investments.

Combined Method:

Under the Combined Method, a system development fee is calculated based on the blended value of both the existing and expanded system capacity. As such, it is a combination of the Capacity Buy-In and Incremental Cost methods. This method is typically used when existing facilities provide adequate capacity to accommodate a portion of the capacity needs of new customers, but significant investment in new facilities to address a portion of the capacity needs of future growth is also anticipated, or where some capacity is available in parts of the existing system, but incremental capacity will be needed for other parts of the system to serve new customers at some point in the future.

It should be noted the County has three water systems and two sewer systems which include the following: Ocean Sands Water and Sewer District ("OSW&SD"), Southern Outer Banks Water System ("SOBWS"), Mainland Water System, and the Mainland Sewer System. The OSW&SD is comprised of a water distribution system and sewer treatment/collection system. The OSW&SD systems and the SOBWS are located on the Outer Banks, whereas the other systems are located on the mainland. A system development fee has been calculated for each system.

The Buy-In method was used to calculate the water and sewer system development fees for the County for all systems (except for Mainland Water), since the facilities have enough capacity to accommodate anticipated future growth over the near term. Mainland Water is currently undergoing projects that are increasing the capacity of the system that need to be captured in the SDF calculation and the Combined Method was used for the fee calculation. The following steps were completed to calculate the fees:

1. The replacement value of existing system facilities was calculated, and adjustments were made to derive a net replacement value estimate in accordance with Article 8. Adjustments to the calculated replacement value included deducting accumulated depreciation, developer contributions/grant funded assets, and a portion of outstanding debt.
    a. For the Mainland Water system, which uses the Combined Method, the Total System Value was calculated by adding the net value of the existing system *and* the net value of the future expansion related projects identified in the County's capital improvement plan ("CIP").

2. The unit cost of system capacity was estimated by dividing the calculated system value from step 1 by the total treatment capacity of the system.
3. The amount of capacity assumed to be demanded by one service unit of new development was identified. One equivalent residential unit ("ERU") was defined as the smallest service unit of new development.
4. The system development fee for one service unit of development was calculated by multiplying the cost per unit of system capacity by the capacity associated with one ERU, as defined below.
5. The calculated system development fee for one ERU was scaled for different categories of demand.

Calculation of System Development Fees

Step 1 – Estimate the Systems Values and Apply Adjustments

A listing of fixed assets provided by the County for the different systems, as of June 30, 2023, was reviewed and each individual asset was categorized into one of the categories shown in Table 1 and Table 2. General assets, such as those related to administrative buildings, certain vehicles, and certain equipment items were not directly attributable to a specific category. As a result, these assets were categorized as "Non-Core Assets." These assets were excluded from the calculation of system value as these assets were not specifically identified as allowable under Article 8.

Table 1. Fixed Asset Categories by Water System

Ocean Sands Water Distribution System	Southern Outer Banks Water System	Mainland Water System
Tank	Tank	Tank
Plant	Plant	Plant
Well	Pumps	Pumps
Meters	Meters	Meters
Lines	Lines	Lines
Hydrants	Hydrants	Building
Non-Core Assets such as vehicles, equipment, etc.	Outfall	Non-Core Assets such as vehicles, equipment, etc.
	Wells	
	Land	
	Non-Core Assets such as vehicles, equipment, etc.	

Table 2. Fixed Asset Categories by Sewer System

Ocean Sands Sewer Distribution System	Mainland Sewer System
Tank	Plant
Plant	Meters
Well	Lift Station
Meters	Pumps
Lines	Lines
Hydrants	Land
Non-Core Assets such as vehicles, equipment, etc.	Non-Core Assets such as vehicles, equipment, etc.

Next, the replacement value of existing assets in allowable categories was estimated. Each asset's original cost, as contained in the fixed asset listing provided by the County, was escalated to 2024 dollars based on the year the asset was purchased and the corresponding escalation factor for that year. Escalation factors for each year were developed using the Handy-Whitman Index ("HWI") for the South Atlantic Region, which provides an annual index value representing the relative change in costs for each year from 1908 to 2024. Using the HWI to estimate an asset's current replacement cost is an industry accepted method by which to value system facilities.

The replacement costs of the assets were adjusted by their indexed accumulated depreciation to derive the replacement cost new less accumulated depreciation ("RCNLD") amounts. The estimated RCNLD values for water and sewer system assets allowable under Article 8 are summarized in Table 3 and Table 4.

The County also has construction work-in-progress for several plant expansions that were completed as of the date of this report, but the assets had not yet been reflected in the fixed assets data for the period ending June 30, 2023. The construction work-in-progress for these capacity-related projects was added to the RCNLD for the following systems:

- Mainland Water System plant expansion completed in May 2024 which added 750,000 gallons per day of capacity
- A package plant was recently completed at the Mainland Sewer System to replace the original wastewater plant, which has now been taken offline. However, the original influent tank, effluent tank, bar screen, and digesters from the old plant are still currently being used.
- Southern Outer Banks Water plant expansion completed in May 2024 which added 750,000 gallons per day

As shown in Table 3 and Table 4, the RCNLD value of the Ocean Sands Water Distribution System and Sewer System was estimated to be approximately $1.5 million and $16.7 million respectively, the RCNLD of the SOBWS was estimated to be $45.9 million, and the RCNLD of the Mainland Water and Sewer systems were approximately $36.2 million and $15.6 million respectively. Several additional adjustments were made to the estimated water and sewer system RCNLD values in accordance with Article 8, which included adjustments for non-core assets, developer contributed assets, grant funded assets, and a portion of outstanding debt, as described below.

Growth Related Capital Improvement Plan:

For Mainland Water, the growth-related CIP was incorporated into the net system value, as well as the added capacity associated with the CIP growth-related spending.

Non-Core and Developer Contributed / Grant Funded Assets:

Assets such as meters and vehicles are not allowable under Article 8, and as such are excluded from the total system value used in the fee calculation. Additionally, the listing of fixed assets was reviewed to identify assets that were contributed, or paid for, by developers or grant funded. In particular, the Mainland Sewer system has approximately $4.8M of Grants/Contributed Capital for the Walnut Creek System which was donated to the County. The total RCNLD value of the non-core and contributed water and sewer system assets are shown in the corresponding tables below.

Debt Credit

Article 8 specifies that the buy-in calculation should be determined using generally accepted methods, including the consideration of debt credits and other generally accepted valuation adjustments. The debt credit is applied to reflect that a portion of the outstanding debt associated with the system facilities will be repaid with water and sewer user charges and a portion will be repaid with system development fee revenues. An adjustment was made to prevent recovering the cost of the assets twice, once when assessing system development fees for new customers, and then again when these customers pay user charges.

The amount of the credit was calculated by first identifying the amount of existing outstanding debt attributable to both the water and sewer systems that funded qualifying assets. The total outstanding principal for each system was then deducted from the system value as a credit. The Mainland Water System and Ocean Sands Wastewater system are the only systems with outstanding debt currently, for a total outstanding principal of $7.2M and $4.8M that are removed from each system value respectively.

Under the combined methodology in North Carolina, the debt credit must equal a minimum of 25% of the total net assets eligible for inclusion. An additional credit of approximately $3M was applied to the Mainland Water system to achieve the 25% requirement, as shown in Table 3.

The resulting adjustments to the water and sewer system values are shown in Table 3 and Table 4.

Table 3. Calculation of Net Water Systems Value

Description	Ocean Sands Water Distribution System	Southern Outer Banks Water System	Mainland Water System
System Facilities RCNLD	$1,533,881	$45,937,912	$36,198,827
Plus: Growth-Related CIP	$ 0	$ 0	$5,647,587
Less: Contributed Assets	$ 0	$ 0	$ 0
Less: Non-Core Assets	$ (103,196)	$ (205,673)	$ (875,748)
Less: Debt Credit/Revenue Credit	$ 0	$ 0	$ (7,215,000)
Less: Credit for 25% Requirement	$ 0	$ 0	$ (3,027,666)
Net System Value	**$1,430,684**	**$45,732,239**	**$30,727,999**

Table 4. Calculation of Net Sewer Systems Value

Description	Ocean Sands Sewer System	Mainland Sewer System
System Facilities RCNLD	$16,675,947	$15,610,050
Less: Contributed Assets	$ 0	$ (4,841,976)
Less: Part of plant taken offline (1)		$(4,246,768)
Less: Non-Core Assets	$ (135,747)	$(284,589)
Less: Debt Credit/Revenue Credit	$ (4,750,000)	$ 0
Net System Value	**$11,790,200**	**$6,236,717**

(1) As mentioned earlier, the original sewer plant was replaced by a package plant. The County is still using the original influent tank, effluent tank, bar screen, and digesters and therefore 15% of the original plant is included in the value to reflect the use of these assets in providing wastewater capacity.

Step 2 – Calculate the Unit Cost of System Capacity

The cost per unit of system capacity was calculated by dividing the adjusted system values (derived in Step 1) by the water and sewer system capacities. The treatment capacity of the water and sewer systems are shown in million gallons per day ("MGD"). The treatment capacities reflect the assets associated with the construction work-in-progress described previously. Under the combined method, the Mainland Water System capacity includes both the current system capacity, and the additional capacity expected from expansionary CIP projects. The cost per unit of system capacity for each system was calculated by dividing the Net System Value by the system capacity, which generates a cost per gallon per day.

Table 5. Calculation of Water System Development Fees Unit Cost

Description	Ocean Sands Water Distribution System (1)	Southern Outer Banks Water System	Mainland Water System
Net System Value	$1,430,684	$45,732,239	$30,727,999
System Capacity (MGD)	0.821	3.658	2.638
Plus: CIP Added Capacity (MGD)			0.750
Total System Capacity (MGD)	**0.821**	**3.658**	**3.388**
Unit Cost of Capacity ($ / gallon per day)	**$1.74**	**$12.50**	**$9.07**

*(1) Represents the cost per gallon per day of the **distribution** system only for the Ocean Sands Water Distribution System.*

Table 6. Calculation of Sewer System Development Fees Unit Cost

Description	Ocean Sands Sewer System	Mainland Sewer System
Net System Value	$11,790,200	$6,236,717
System Capacity (MGD)	0.600	0.259
Unit Cost of Capacity ($ / gallon per day)	**$19.65**	**$24.08**

It should be noted the Ocean Sands Water Distribution System receives treated water from the SOBWS. The calculation for the water system development fee for the Ocean Sands Water Distribution System shown in Table 5 includes the cost per gallon per day for the water distribution system only. To recognize the SOBWS water treatment plant assets used to produce treated water, the cost per gallon per day for the SOBWS treatment plant assets were calculated and added to the cost per gallon per day for distribution assets of the Ocean Sands Water Distribution System, as shown in Exhibit 7.

Table 7. Calculation of Ocean Sands Water Distribution System

Calculation of Ocean Sands Water Distribution System Total Cost per Gallon per Day	
Ocean Sands Water Distribution System only Cost per Unit of Capacity ($/gallon per day) -	**$1.74**
PLUS:	
SOBWS *Treatment Plant only* RCNLD Adjusted Value	$31,538,947
SOBWS Treatment System Capacity (MGD)	3.658
Unit Cost of **Treatment Plant** Capacity ($ / gallon per day)	**$8.62**
TOTAL Ocean Sands Water System Cost per Unit of Capacity ($/gallon per day)	**$10.36**

Step 3 – Estimate the Amount of Capacity Per Service Unit of New Development

Section 205 of Article 8 states that the system development fee calculation "*…use the gallons per day per service unit that the local governmental unit applies to its water or sewer system engineering for planning purposes for water or sewer, as appropriate, in calculating the system development fee.*" When planning for future growth and the capacity required to meet growth, the County uses different methods for estimating residential demand which is specific to each system. The water and sewer use associated with the County's water and sewer systems that are located on the mainland is very different than the water and sewer use associated with the systems located in the Outer Banks. First, residents living on the mainland are typically present year-round. In contrast, the Outer Banks has a high tourist population and therefore the population, and water and sewer use, peaks during the warmer months. Second, many homes on the Outer Banks are vacation rentals with a large number of bedrooms, as compared to the homes on the mainland that typically have two to three bedrooms. As such, water demand per unit on the Outer Banks can be more than twice as high as water demand on the mainland. The capacity in the Outer Banks must be sized to meet both the larger water demand per unit and the seasonal water demand. Because of the contrast in water use between the mainland and the Outer Banks service areas, the County uses actual water flow data and number of customers to determine the required gallons per day per residential household for the water systems located on the Outer Banks. For determining the level of residential demand for the systems on the Mainland, the County uses wastewater design flow rates as specified by the North Carolina Administrative Code 15A NCAC 02T.0114 to define the level of demand associated with a typical, or average, residential customer, which is 75 gallons per day per bedroom. As such, for the Mainland water and sewer systems, the calculated level of service is 225 gallons per day (75 gallons per day times an average 3-bedroom home). For calculating the sewer flow for the Ocean Sands Wastewater

District, the County uses the state guidelines and assumes a 4-bedroom average home (which results in an ERU of 300 gallons per day).

Step 4 – Calculate the System Development Fee for One ERU

The system development fee for one ERU was calculated by multiplying the unit cost of capacity from Step 2 by the capacity demanded by one ERU from Step 3. The calculations are provided in Table 8 for a standard equivalent residential unit or ¾" residential meter.

Table 8. Calculation of SDF Fees for One ERU

System	Level of Service (per ERU)	Cost per GPD	SDF Fee per ERU
Water Systems			
Ocean Sands Water Distribution System	391	$10.36	$4,054
Southern Outer Banks Water System	750	$12.50	$9,376
Mainland Water System	225	$9.07	$2,041
Sewer Systems			
Ocean Sands Sewer System	300	$19.65	$5,895
Mainland Sewer System	225	$24.08	$5,418

Step 5 – Scale the System Development Fees for Various Categories of Demand

For non-residential customers, system development fees are scaled up by the flow ratios for each meter size, as specified in the AWWA M-1 Manual[1], the results of with are shown in Exhibit 9.

Table 9. Maximum Cost-Justified Water and Sewer SDF

Meter Size	AWWA Ratio	OSWSD-Water	OSWSD-Sewer	SOBWS-Water	Mainland Water	Mainland Sewer
5/8"	1.0	**$4,054**	**$5,895**	**$9,376**	**$2,041**	**$5,418**
1"	2.5	$10,135	$14,738	$23,441	$5,102	$13,545
1 1/2"	5.0	$20,270	$29,475	$46,882	$10,203	$27,090
2"	8.0	$32,432	$47,161	$75,012	$16,325	$43,344
3"	16.0	$64,865	$94,322	$150,024	$32,651	$86,688
4"	25.0	$101,351	$147,377	$234,412	$51,017	$135,450
6"	50.0	$202,702	$294,755	$468,824	$102,034	$270,900
8"	80.0	$324,323	$471,608	$750,119	$163,254	$433,440
10"	120.0	$486,484	$707,412	$1,125,178	$244,881	$650,160

The water and sewer system development fees shown in Table 9 represent the maximum cost-justified level of system development fees that can be assessed by the County per Article 8. If the County chooses to

[1] Manual of Water Supply Practices (M1), Principles of Water Rates, Fees, and Charges, American Water Works Association, 7th Edition, Table VII.2-5 on p. 338.

assess fees that are less than those shown in the tables, the adjustments need to be reflected consistently across all categories of demand.

We appreciate the opportunity to assist the County with this important engagement. Should you have questions, please do not hesitate to contact me at (704) 936-4436.

Very truly yours,

RAFTELIS FINANCIAL CONSULTANTS, INC.

Elaine Conti
Executive Vice President