

March 20, 2018

Ms. Tiffany Riggs
Finance Director
Onslow Water and Sewer Authority
228 Georgetown Road
Jacksonville, NC 28540

Subject: System Development Fee Study

Dear Ms. Riggs:

Raftelis has completed its assignment to develop cost-justified water and wastewater system development fees for consideration by the Onslow Water and Sewer Authority (“Authority”). This letter documents the results of the analysis which is based on a cost justified approach for establishing system development fees as set forth in North Carolina General Statute 162A Article 8 “System Development Fees”.

Raftelis is a financial professional firm that has provided rate and financial consulting to public water and wastewater utilities since 1993, has edited or contributed content for the Seventh Edition of the American Water Works Association “Principles of Water Rates, Fees and Charges M-1 Manual” (AWWA M-1 Manual), and has calculated system development fees for utilities in North Carolina and across the country since 1993 using generally accepted methodologies as provided in the AWWA M-1 Manual and other water/sewer industry publications. Raftelis is qualified to perform system development fee calculations for water and wastewater utilities in North Carolina.

Background

System development fees are defined as one-time charges assessed to new water and wastewater customers, or developers and builders, to recover a proportional share of capital costs incurred to provide service availability and capacity for new utility customers. Typically, the cost basis for setting system development fees is based on the major system components, or core system assets, that are necessary to serve, and that provide benefit to, all customers. These components typically include water treatment plants, storage tanks, major water transmission lines, wastewater treatment plants, pumping stations, and major wastewater interceptors.

Raftelis recommends that system development fees should be consistent with the common legal standard in setting system development fees in the water and wastewater industry – the Rational Nexus Test. The Rational Nexus test requires that: 1) the need for capacity is a result of new development; 2) the costs are identified to accommodate new development; and 3) the appropriate

apportionment of that cost to new development is in relation to the benefit the new development reasonably receives.¹

There are three approaches, as described below, for calculating water and wastewater system development fees that are recognized in the industry as cost-justified² (that meet the requirement of the Rational Nexus standard), and as set forth in North Carolina general statute 162A Article 8 “System Development Fees”.

Buy-In Approach

The Capacity 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 asset 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.

Calculation of System Development Fees

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

-) Water and wastewater fixed asset data;
-) Outstanding utility debt and associated debt service;

¹ See the AWWA M-1 7th Edition Manual –System Development Charges, Chapter VII.2; pp.324.

² See the AWWA M-1 Manual –System Development Charges, Chapter VII.2; pp.329-330.

-) Construction work in progress (“CWIP”);
-) Contributed capital;
-) Capacity in water and sewer systems;
-) Capital improvement plan;
-) Daily water production data;
-) Inflow and infiltration data; and
-) History of system development fees collected.

The Buy-In Approach was chosen as the most appropriate method to calculate the Authority’s system development fees. At the time of this report the Authority was developing its 10-year capital improvement plan. The capital projects for the water system did not include any projects that would expand treatment capacity. The capital projects for the sewer system did include projects that would expand treatment capacity. However, since the capital improvement plan was not finalized as of the time of this study, it was determined that the Buy-In Approach was the most appropriate methodology to use.

Buy-In Calculations

Using the Capacity Buy-In approach, Raftelis calculated the estimated cost, or investment in, the current capacity available to provide utility services to new and existing customers. This analysis was based on a review of fixed asset records and other information as of June 30, 2017. The depreciated value of the assets was 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 escalated using the Handy Whitman Index of Public Utility Construction Costs (for the South Atlantic Region). The RCNLD value of the water assets includes water supply, treatment, storage, and distribution facilities, but excludes small equipment, vehicles, and meters. The RCNLD value of the sewer assets includes wastewater collection facilities but excludes small equipment and vehicles.

Several adjustments were then made to the RCNLD value, which were as follows:

-) *Subtraction of contributed assets* - Assets contributed by or paid for by developers were deducted from the calculation since these costs were not “paid” by the existing customers.
-) *Debt Service Credit* - 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 was deducted from the system development fee calculation. This proportional amount was estimated by comparing the historical annual amount of revenues collected

from system development fees with the respective annual amount of principal payments. Since the Authority applies revenues from system development fees to offset outstanding debt service, and since the Authority's bond ordinance allows the inclusion of system development fees to be used in meeting debt service coverage requirements, the amount of the debt credit was calculated as the principal amount of outstanding debt less the proportion of the principal amount estimated to be paid for with system development fee revenues. The revenues from water system development fees represent approximately 76% of total revenues from system development fees. However, the amount of annual principal debt is almost equally split between the water and wastewater system. As a result, the revenues from water system development fees cover 100% of annual principal debt for the water system. However, the revenues from wastewater system development fees do not cover the annual principal debt for the wastewater system. Therefore, a debt credit is required only for the wastewater system, as shown below..

The adjusted RCNLD value was then converted to a unit cost of capacity by dividing the RCNLD value by a basic unit measure of cost per gallon per day (GPD) for water and wastewater capacity, as shown in Exhibit 1.

Exhibit 1 – Cost per GPD of Core Utility Assets

	Water	Sewer
	RCNLD	RCNLD
Assets	\$ 75,892,355	\$ 119,823,278
Less: Meters	\$ (1,291,637)	\$ -
Less: Vehicles	(286,641)	(105,738)
Less: Easements	(25,729)	(126,135)
Less: Other Non-Core Assets	(376,288)	(87,188)
Less: Contributed Capital	\$ (8,190,448)	\$ (5,715,572)
Total: Net Assets Eligible for Inclusion	\$ 65,721,612	\$ 113,788,645
Plus: Construction in Progress	2,062,876	991,537
Less: Outstanding Principal Debt Paid Through Rates	-	(50,252,981)
Net Value	\$ 67,784,488	\$ 64,527,201
Total Capacity (Gallons per Day)	12,900,000	5,801,000
Net Cost per Gallon per Day	\$ 5.25	\$ 11.12

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.

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 often estimated using wastewater design flow rates as specified by the North Carolina Administrative Code Title 15A (Department of Environment and Natural Resources) Subchapter 2T, which states that the sewage from dwelling units is 120 gallons per day per bedroom. Recent census data indicates the number of persons per household is 2.76 in Onslow County. As a result, an ERU was assumed to be the average of a two and three-bedroom home, which is 300 gallons per day. Since the ERU of 300 gallons per day represents average use, to estimate the peak day water use for the Authority's customers, a peaking factor (based on daily water production records) was applied to derive an adjusted ERU of 387 gallons per day, as shown in Exhibit 2. An inflow and infiltration factor (based on data provided by the Authority) was also applied to the ERU of 300 gallons per day to derive an adjusted ERU of 369 gallons per day for the wastewater system, as shown below.

Exhibit 2: Water and Wastewater Demand per Residential ERU

	Water Gal./Day/ERU	Wastewater Gal./Day/ERU
A. GPD per ERU	300	300
B. Peaking Factor	1.29	n/a
C. Inflow and Infiltration Factor	n/a	1.23
Adjusted ERU (A*B or C)	387	369

Assessment Methodology

The analysis provides a maximum cost-justified level of system development fees that can be assessed by the Authority. For residential customers, the calculation of the system development fee is based on the cost per gallon per day multiplied times the number of gallons per day required to serve each ERU, as shown below in Exhibit 3.

Exhibit 3 – Calculated Maximum Residential Capacity Fee

	Water	Wastewater
A. Weighted Average Cost per GPD	\$5.25	\$11.12
B. Per ERU Consumption	387	369
Capacity Fee Per ERU (A*B)	\$2,032	\$4,103

For non-residential customers, the fees for the smallest residential meter can be used and then scaled up by the flow ratios for each meter size, as specified in the AWWA M-1 Manual³, the results of which are shown in Exhibit 4. This method provides a straightforward approach that is simple to administer and reasonably equitable for most new customers.

Exhibit 4 shows the resulting maximum cost-justified 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.

³ See the AWWA M-1 Manual – Appendix B- Equivalent Meter Ratios; pp.326

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

Meter Size	Existing		Maximum Cost Justified	
	Water	Wastewater	Water	Wastewater
¾"	\$2,400	\$3,700	\$2,032	\$4,103
1"	\$4,000	\$6,167	\$3,386	\$6,839
1 ½"	\$8,000	\$12,333	\$6,773	\$13,678
2"	\$12,800	\$19,733	\$10,836	\$21,884
3"	\$25,600	\$39,467	\$21,672	\$43,768
4"	\$40,000	\$61,667	\$33,863	\$68,388
6"	\$80,000	\$123,333	\$67,725	\$136,776
8"	\$128,000	\$197,333	\$108,360	\$218,842
10"	\$184,000	\$283,667	\$162,540	\$328,262

The Authority may elect to charge a cost per gallon that is less than the maximum cost justified cost per gallon per day that is documented in this report. If the Authority elects to charge a fee that is less, all customers must be treated equally, meaning the same reduced cost per gallon per day must be used for all customers.

We appreciate the opportunity to assist the Onslow Water and Sewer Authority with this important engagement. Should you have questions, please do not hesitate to contact me at (704) 373-1199.

Very truly yours,
RAFTELIS FINANCIAL CONSULTANTS, INC.



Elaine Conti, Senior Manager