

DRAFT REPORT

COST- JUSTIFIED WATER AND SEWER SYSTEM DEVELOPMENT FEES REPORT

TOWN OF BANNER ELK

AVERY COUNTY, NC

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EXECUTIVE SUMMARY and PURPOSE STATEMENT

Executive Summary:

The North Carolina General Assembly passed House Bill 436 (HB 436) in July 2017 amending Chapter 162A of the General Statutes by adding “Article 8, System Development Fees.” This amendment was enacted as “An Act to Provide for Uniform Authority to Implement System Development Fees for Public Water and Sewer Systems in North Carolina and to Clarify the Applicable Statute of Limitations” which requires compliance with designated calculation methodology.

In response to the HB 436, the Town of Banner Elk has retained McGill Associates (McGill) to complete a system development fee analysis. The Town of Banner Elk’s development fee is dependent on a combination of existing system capacity and planned capital improvements to expand capacity. The development fee, in accordance with HB 436 rules for an Equivalent Residential Unit (ERU) for water and sewer, was calculated to be \$7,622. ERU is defined as the water and sewer capacities required to serve the most typical user type, which is a three-bedroom single-family dwelling.

The fee for other types of development can be calculated by applying the calculated cost of capacity per gallon of flow per day to the water demands for various uses as defined by NC Administrative Code 15A NCAC 18C .0409 and 15A NCAC 02T .0114 using the following table:

Table 0.0.1 – System Development Fee Calculation: Cost per Gallon per Day (\$/GPD)

Banner Elk System Development Fees: Equivalent Residential Unit Calculation				
Item	Cost-Justified System Development Fee Calculation	Cost of Capacity \$ / GPD	Customer Demand GPD	Cost per Unit Capacity
1	Water System	\$ 8.84	400	\$ 3,536
2	Sewer System	\$ 11.35	360	\$ 4,086

Purpose Statement:

This report documents the results of the approach, methodology and calculations for establishing system development fees in accordance with North Carolina General Statute 162A, Article 8 “System Development Fees”. Through HB 436, the General Assembly of North Carolina established a uniform approach and associated methodology required for local governmental units to calculate and implement System Development Fees (SDF) for public water and sewer systems. The SDF must be determined by a qualified engineer or financial professional using industry standard practices. A copy of HB 436 is included in the Appendix.

The existing fees that were collected beginning October 1st, 2017 for the purpose of offsetting capital costs of facilities that serve new development (typically defined as impact fees, capital recovery fees, capacity charges, etc.) are required to be conformed to HB 436 no later than July 1, 2018 in order to become valid. Fees that remain non-conforming after July 1, 2018 are considered invalid and revenues collected are at risk to be refunded.

The Town of Banner Elk retained McGill August 22, 2019 to review and make recommendations for revisions as necessary to conform water and sewer system SDFs with HB 436. The approach, methodology and calculations are based on American Water Works Association (AWWA) Manual of Water Supply Practices – M1, Principles of Water Rates, Fees, and Charges, Seventh Edition.

McGill is qualified in engineering disciplines and financial analysis and has the expertise and experience to determine system development fees. The firm has a long history of working with cities, towns, counties and special districts to provide professional advice on the development of fees, water and sewer master plans, capital improvement programs and asset management plans.

Banner Elk has made significant investments in its water and sewer system capital assets that provide capacity that is, and will be, available for new development. The Town also desires to use System Development Fees to recover a portion of the costs associated with providing capacity.

The overall result of this effort will be establishing the maximum cost-justified System Development Fees allowable under HB 436. Banner Elk may elect to implement fees of lesser value; however, any adjustment must be calculated on a cost per unit volume basis.

This report does not constitute a recommendation of any SDF amount. The Town Council has full authority to charge any amount, up to the maximum, provided it is applied to the relative demands of new development proportionally.

System Development Fees are defined as a charge imposed on each new customer or development that generally offsets the incremental cost of replacing existing and/or constructing new capital assets to provide capacity that will continue to meet the demands placed on the system by each new customer or development. Since water system capacity must, without exception, exceed customer demands, the major infrastructure components providing this capacity, such as water treatment plants, reservoirs, wells, pump stations, etc., must be planned and constructed well in advance and in large enough increments to keep pace with anticipated demand on the available system capacity.

AWWA methodology cites legal consideration for determining SDF. A Rational Nexus, or reasonable relationship, must be established between the fee charged and the cost associated with providing capacity to new customers. The Rational Nexus Test consists of three elements: 1) a review of available planning documents to verify general alignment between capacity demands driven by projected development patterns and planned capital improvements that will be needed to provide the required capacity; 2) a determination of the proportionate share of costs to be borne by new development through appropriate methodology and calculation and 3) establishing a reasonable apportionment of the cost to new development in relation to the benefits the new development will reasonably receive through appropriate methodology and calculations.

The first element of the Rational Nexus Test was determined to be favorable based on a review of the Town's Land Use Plan 2010 - 2030, municipal populations posted by the North Carolina State Demographer, Banner Elk's available water and sewer capacities, and capital improvements plan. NC State Demographer reports the 2010 population at 1,028, and 2018 population at 1,158. These data points translate into a growth rate of approximately 1.5% per year.

Population growth projections are typically viewed as a general indication of future water and sewer system demands; however, changes in customer base (types of users) may shift future system demands above or below the rate of population growth. With no anticipated changes in customer use patterns, a 2% annual increase in water and sewer system demand is a reasonable and conservative projection.

Corresponding projections for water and sewer system demand and available capacities are presented in Table 1.0.1.

Table 1.0.1 – Banner Elk System Capacity Availability Projection (MGD)

Banner Elk System Capacity Availability Projection (MGD)				
Item	Existing Water and Sewer System Infrastructure	Year 2019	Year 2030	Year 2040
W1	Water Capacity	0.366	0.446	0.446
W2	Water Demand	0.210	0.256	0.312
	Available Water Capacity	0.156	0.190	0.134
S1	Sewer Capacity	0.600	0.600	0.600
S2	Sewer Flow	0.272	0.332	0.404
	Available Sewer Capacity	0.328	0.268	0.196

The Town’s Capital Improvements Plan includes the addition of a groundwater supply well to be constructed in FY25, providing additional capacity to the water system that will allow available water capacity to keep pace with sewer system capacity over the long-term.

Planned capacity-related capital projects are therefore in general alignment with projected capacity needs which demonstrates a rational nexus between the projection of development-driven demands and planned capacity-related capital projects that will address these demand projections.

The remaining elements of the Rational Nexus Test are 2) determining proportionate share of costs to be borne by new development and 3) establishing a reasonable cost to new development in relation to the benefits received by the new development. These elements will be determined through appropriate methodology and calculations in the following sections.

Three methods for calculating SDF meet the definition of HB 436 and will satisfy the Rational Nexus Test:

Buy-In Method

The Buy-In Method is used where existing system capacity is available to provide service to new development. New customers essentially “buy” their proportionate share of system capacity from the current customer base (“system owners”) at the current cost or value of the existing facilities. HB 436 requires appropriate adjustments to be made to the replacement cost such as “debt credits, grants, and other generally accepted valuation adjustments.”

Incremental Cost Method

The Incremental Cost (or Marginal Cost) Method is used to assign new development the incremental cost of capital assets required for preserving and/or providing additional system capacity. This method should include supporting details that identify construction costs, scheduling, financing, funding source(s), etc., tied to a capital improvements plan (CIP), utilities master plan, and/or other approved planning document(s) that cover a planning horizon of 10 to 20 years. HB 436 requires a revenue credit to be applied “against the projected aggregate cost of water or sewer capital improvements.”

Combined Method

The Combined Approach is a combination of the Buy-In and Incremental Cost Methods. It is used where existing assets provide some system capacity to accommodate new development and applicable capital plan(s) also identify significant capital investment proposed to add infrastructure required to address future growth and capacity needs.

3.0

CALCULATION of SYSTEM DEVELOPMENT FEES

The *Combined Method* is the appropriate approach to calculating Banner Elk's system development fees. Existing system capacity is available to provide service to new customers. Future capacity-related projects in the Capital Improvements Plan require incremental cost calculations. Therefore, calculating SDF will require the combined method.

3.1 Existing System Capacity Availability

Water and sewer system design capacities are determined using average day demands and incorporate appropriate peaking factors and wet weather flows that will adequately address maximum flow conditions that occur during high water use and inflow/infiltration conditions. The water and sewer systems have current available capacities as follows:

Table 3.1.1– Banner Elk Water and Sewer Systems Available Capacity

Banner Elk Water and Sewer System Available Capacity				
Item	System Capacity - Million Gallons Per Day (MGD)	Design Capacity	Average Day	Available Capacity
1	Water System	0.366	0.206	0.160
2	Sewer System	0.600	0.267	0.333
Source: North Carolina DWR Local Water Supply Plan				

3.2 Buy-In Calculation

After demonstrating that capacity is available, the value per gallon is calculated to determine the cost per gallon that will be applied to reimburse existing customers for constructing and maintaining available capacity in advance.

The preferred AWWA valuation approach is “replacement cost new less depreciation” (RCNLD). This approach is based on the premise that System Development Fees reflect the value of providing any given amount of new capacity at the cost of constructing the assets at the time the new customer is connected. This fairly compensates existing customers for carrying the costs of constructing and maintaining capacity built into the system in advance of when the new customers connect.

Replacement cost in the RCNLD calculation used the RS Means Historical Cost Index. RS Means has been publishing a construction cost index for over 70 years, collecting data from all facets of the industry to accurately track costs directly related to building and construction. This allows the present value (replacement cost new) of capital construction projects to be calculated on data provided by a very reliable, long-time industry leader. Depreciation assigned by the Town's

fixed asset inventory uses the straight-line method, typically based on 10 to 50-year assignments of useful life for major capital assets, to represent a general decline in value over time.

Replacement Cost New (RCN) is therefore determined by applying the RS Means index to the original cost then deducting the accumulated depreciation to reach RCNLD.

Assets included in the buy-in valuation are those that provide the available capacity of the system, are “owned” by the ratepayers, and therefore provide a benefit to all customers. Typically, these assets are water supply, treatment, pump stations, storage, transmission and distribution mains, wastewater treatment, lift stations and collection systems.

Assets contributed by or paid for by others, including grants, loan principal forgiveness and capital assets contributed by developers are deducted from the calculation since these costs were not “paid” by the existing customers. Non-capacity related assets such as vehicles, computers and software are also excluded from the calculation.

Table 3.2.1– Water System Cost per GPD of Existing Utility Assets Providing Available Capacity

Banner Elk Water System Development Fee Buy-In Valuation				
Item	System Asset Description	RCNLD	Excluded	Amount Eligible
Water System Assets				
W1	Land	\$ 86,431	\$ -	\$ 86,431
W2	Water System Infrastructure	\$ 3,614,970	\$ 1,422,706	\$ 2,192,263
W3	Vehicles and Equipment	\$ 39,395	\$ 39,395	\$ -
Subtotal - Water System Assets		\$ 3,740,796	\$ 1,462,101	\$ 2,278,695
Less Revenue Credit: Outstanding Debt Principal				\$ -
Equals: Net Water System Value				\$ 2,278,695
Divide by: Water System Capacity (MGD)				0.366
Equals: Unit Valuation of Water System (\$/MGD)				\$ 6,225,942
Divide by: 1,000,000 gallons (\$/GPD)				\$ 6.23

Table 3.2.2– Sewer System Cost per GPD of Existing Utility Assets Providing Available Capacity

Banner Elk Sewer System Development Fee Buy-In Valuation				
Item	System Asset Description	RCNLD	Excluded	Amount Eligible
Sewer System Assets				
S1	Land	\$ -	\$ -	\$ -
S2	Sewer System Infrastructure	\$ 6,556,164	\$ -	\$ 6,556,164
S3	Vehicles and Equipment	\$ 92,878	\$ 92,878	\$ -
Subtotal - Sewer System Assets		\$ 6,649,042	\$ 92,878	\$ 6,556,164
Less Revenue Credit: Outstanding Debt Principal				\$ -
Equals: Net Sewer System Value				\$ 6,556,164
Divide by: Sewer System Capacity (MGD)				0.6000
Equals: Unit Valuation of Sewer System (\$/MGD)				\$ 10,926,940
Divide by: 1,000,000 gallons (\$/GPD)				\$ 10.93

3.3 Incremental Cost Calculation

Value of future capacity to be available to new customers through capital construction projects considered in the Town’s Capital Improvements Plan (CIP) or similar master planning document.

Assigning value to future capacity-related assets requires a determination of cost in present-day dollars and a clearly defined capacity that the assets will provide. Engineers typically assign project costs and capacity needs developed through a conceptual design process and adjust costs to the scheduled year of construction in the CIP. Present-day value can therefore be obtained using the same assumptions for inflation and then applied to the incremental cost calculation.

Table 3.3.1 - Cost per GPD for Incremental (Future) Capacity Related Water System Assets

Banner Elk Water System Development Fee Incremental Valuation				
CIP Item	System Asset Description	Cost	Capacity Related %	SDF Component Valuation
Water System Assets				
WI 1	Water rehab phase 4, new additional well and chem feed	\$ 278,200	100%	\$ 278,200
<u>Valuation Adjustments and Calculation of Cost-Justified Fee</u>				
Less Revenue Credit: 25% project cost per HB436				\$ (69,550)
Less Revenue Credit: Contributions from other sources				\$ -
Equals: Adjusted Valuation				\$ 208,650
Divided by: Capacity (MGD)				0.08
Equals: Unit Valuation of Capacity (\$/MGD)				\$ 2,608,125
Divided by: 1,000,000 gallons (\$/GPD)				\$ 2.61

Table 3.3.2 - Cost per GPD for Incremental (Future) Capacity Related Sewer System Assets

Banner Elk Water System Development Fee Incremental Valuation				
CIP Item	System Asset Description	Cost	Capacity Related %	SDF Component Valuation
Sewer System Assets				
SI 1	New secondary Clarifier to supplement existing clarifier	\$ 334,800	100%	\$ 334,800
Valuation Adjustments and Calculation of Cost-Justified Fee				
	Less Revenue Credit: 25% project cost per HB436			\$ (83,700)
	Less Revenue Credit: Contributions from other sources			\$ -
	Equals: Adjusted Valuation			\$ 251,100
	Divided by: Capacity (MGD)			0.60
	Equals: Unit Valuation of Capacity (\$/MGD)			\$ 418,500
	Divided by: 1,000,000 gallons (\$/GPD)			\$ 0.42

3.4 Valuation Adjustments

The above system valuations include applicable credit adjustments for revenues anticipated from user charges, donated infrastructure, grants and funding from other (non-rate payer) sources.

HB 436 requires revenue credits to be applied to existing debt that was issued to construct water and sewer system assets that provide capacity for potential customers and are repaid by retail rates and charges. To ensure that repayment for this debt is not collected twice from new customers; once through the SDF and again through retail rates and charges, the remaining outstanding debt principal amount is required to be applied as a credit against the projected aggregate cost of the capital improvements in the SDF calculation. Contributed capital provided by new development in excess of the development's proportionate share of connecting facilities, shall also be credited. Contributed capital is identified as part of fixed asset review and included in the summary of assets excluded in the buy-in valuation calculation.

Revenue credits are also required to be applied to incremental (future) capacity-related assets. The present value of revenue generated by the approved rate structure over the course of the planning horizon (minimum 10 years, maximum 20 years) to repay future debt service is considered revenue credit and required to be excluded from the incremental valuation. The potential for existing rate structures to offset future capital needs was discussed with the Town. Staff concluded that water and sewer rates do not consider revenue generation specific to offsetting any incremental capacity costs and therefore revenue credits from this potential source are not applicable.

HB 436 assumes rate-generated revenues projected through the capital planning horizon will provide a minimum of 25% of the funding required to construct incremental assets. Therefore, a revenue credit of 25% is applied to the incremental valuation calculation.

3.5 Cost per Unit Volume

Dollar valued that can be applied uniformly to all potential customer.

This measure becomes the starting point for determining the maximum cost-justified system development fee. 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.

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4.0 SERVICE UNIT CALCULATIONS: EQUIVALENT RESIDENTIAL UNITS

HB 436 requires SDF calculations to be applied to various categories of customer demands based on service units or ERU's. An ERU is defined as the water and sewer capacities required to serve the most typical user type which is a three-bedroom single-family dwelling. North Carolina Division of Water Resources (DWR) design standards for constructing water and sewer systems, NC Administrative Code 15A NCAC 18C .0409 and 15A NCAC 02T .0114 respectively, establish daily flow requirements based this type of service connection. An ERU can therefore be defined as 400 gallons per day for water and 360 gallons per day for sewer.

Table 4.0.1– System Development Fees: Equivalent Residential Unit, Water and Sewer

Banner Elk System Development Fees: Equivalent Residential Unit Calculation				
Item	Cost-Justified System Development Fee Calculation	Cost of Capacity \$ / GPD	Customer Demand GPD	Cost per Unit Capacity
1	Water System	\$ 8.84	400	\$ 3,536
2	Sewer System	\$ 11.35	360	\$ 4,086
	Total ERU			\$ 7,622

5.0 APPLICATION of SYSTEM DEVELOPMENT FEES and SERVICE UNIT EQUIVALENCY

NC Administrative Code 15A NCAC 18C .0409 and 15A NCAC 02T .0114, included in the Appendix, further define other service connection types and the associated water system demands and sewer system flows on a per gallon per day basis. Therefore, these tables serve as an equivalency or conversion for use in determining applicable SDF for various categories of demand.

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McGill has calculated costs for water and sewer system capacity on a per gallon per day basis for the Town of Banner Elk. This calculation was performed using the Combined Method to account for the Town's combination of existing capacity, current improvements under construction and future capacity-related projects. This calculation resulted in a development fee ceiling of \$7,622 for an ERU. An ERU is defined as the water and sewer capacities required to serve the most typical user type which is a three-bedroom single-family dwelling. The fee for other types of development can be calculated by applying the calculated cost of capacity per gallon of flow per day to the water demands for various uses as defined by NC Administrative Code 15A NCAC 18C .0409 and 15A NCAC 02T .0114.

Using NC Administrative Code 15A NCAC 18C .0409 and 15A NCAC 02T .0114 ensures that the same standard used to plan, design, construct and finance capital assets is applied as the same cost recovery basis to be applied to new development.

Appendix

House Bill 436

NC Administrative Code 15A NCAC 18C .0409

NC Administrative Code 15A NCAC 02T .0114

2013 Comprehensive Plan: Population Projection Section

2013 Comprehensive Plan: Water and Sewer Section

Banner Elk Capital Improvements – Eligible Capacity Related Assets

RS Means Historical Cost Index