Durham Wastewater – Regulatory CIP Model - Key Assumptions and Sources

- O&M Cost Projections for FY 2011 through FY 2016 are taken from the Rate Model and then are assumed to increase by 3% annually after FY 2016.
- Revenue Offsets, Usage, and Accounts projections for FY 2011 through FY 2016 are taken from the Rate Model and then are assumed to increase 1% annually after 2016.
- Total CIP after 2016 is the sum of Regulatory CIP and a baseline CIP value of $24,573,500, which is the average of the annual capital investment for FY 2011 through FY 2016 from the City's most recent CIP.
- Regulatory CIP:
    - Project costs are taken from Hazen & Sawyer estimates. Phase one carries an estimated cost of $80,000,000 in current dollars, to be spread evenly over six years starting in 2023. Phase two carries an estimated cost of $240,000,000 in current dollars, to be spread evenly over eight years starting in 2029.
    - Current dollar cost estimates are escalated to future dollars using a 4% inflation factor.
- Regulatory O&M is taken from Falls Lake Fiscal Analysis; Page 207: Table D.3.
- Average Residential Customer is defined as a customer with a 5/8" meter with a monthly bill for 6.41 CCF.

Revenue Requirements

Usage Related Expenses - O&M (2)	FY 2011	FY 2016	FY 2021	FY 2026	FY 2031	FY 2036	Escalation
Finance Department	$ 87,546	$ 103,845	$ 120,384	$ 139,558	$ 161,786	$ 187,555	3%
Water Management Administration	708,575	803,945	931,993	1,080,435	1,252,521	1,452,015	3%
Regulatory Affairs	709,680	849,092	984,330	1,141,108	1,322,857	1,533,554	3%
Laboratory Services	408,106	479,471	555,839	644,370	747,001	865,979	3%
Wastewater NDWRF	2,832,886	3,285,478	3,808,770	4,415,408	5,118,668	5,933,940	3%
Wastewater SDWRF	2,609,350	3,842,028	4,453,964	5,163,365	5,985,755	6,939,130	3%
County Sewer Treatment Services	2,700,000	2,700,000	3,130,040	3,628,574	4,206,512	4,876,500	3%
Plant Maintenance	2,033,867	2,473,106	2,867,008	3,323,648	3,853,019	4,466,705	3%
System Maintenance & Construction	4,532,945	5,399,015	6,258,938	7,255,824	8,411,489	9,751,221	3%
System Rehabilitation	602,925	724,893	840,350	974,196	1,129,360	1,309,238	3%
PW Administrative Allocation	20,700	24,585	28,501	33,040	38,303	44,403	3%
Systems Engineering	1,060,812	1,260,775	1,461,584	1,694,377	1,964,247	2,277,100	3%
Indirect Expenses Exclusive of Rate Funded CIP	2,916,731	3,059,356	3,546,632	4,111,519	4,766,377	5,525,538	3%
General Fund Services	2,148,757	2,431,121	2,818,335	3,267,223	3,787,607	4,390,875	3%
Incremental Usage Expense from CIP - O&M (3)	$ -	$ 1,543,425	$ 5,806,072	$ 13,057,483	$ 26,668,295	$ 29,282,223	
NPV (4) $ 85,648,537							
Usage Related Expenses - Capital (5)							
Rate Funded Capital	$ 4,555,153	$ 5,595,093	$ 7,140,914	$ 9,113,817	$ 11,631,797	$ 14,845,447	
Debt Service	8,960,009	7,349,482	13,698,253	21,059,896	40,037,993	60,772,257	
Service Related - O&M (2)							
Finance Department	$ 21,886	$ 25,961	$ 30,096	$ 34,890	$ 40,447	$ 46,889	3%
Water Management Administration	177,144	200,986	232,998	270,109	313,130	363,004	3%
Customer & Billing Services	949,126	1,111,859	1,288,949	1,494,245	1,732,240	2,008,141	3%
Laboratory Services	102,026	119,868	138,960	161,092	186,750	216,495	3%
Plant Maintenance	508,467	618,277	716,752	830,912	963,255	1,116,676	3%
System Maintenance & Construction	503,661	599,891	695,438	806,203	934,610	1,083,469	3%
System Meter Reading & Maintenance	1,183,387	1,450,300	1,681,296	1,949,083	2,259,521	2,619,404	3%
System Rehabilitation	66,992	80,544	93,372	108,244	125,484	145,471	3%
PW Administrative Allocation	5,175	6,146	7,125	8,260	9,576	11,101	3%
Systems Engineering	265,203	315,194	365,396	423,594	491,062	569,275	3%
Indirect Expenses Exclusive of Rate Funded CIP	2,236,160	2,345,506	2,719,085	3,152,165	3,654,223	4,236,246	3%
General Fund Services	455,031	514,826	596,824	691,883	802,082	929,832	3%
Service Related - Capital (5)							
Rate Funded Capital	$ 1,138,788	$ 1,398,773	$ 1,785,229	$ 2,278,454	$ 2,907,949	$ 3,711,362	
Debt Service	2,240,002	1,837,370	3,424,563	8,570,348	12,807,897	15,631,926	
Revenue Offsets - Offsetting O&M (6)							
Consumption Offsets	$ (926,595)	$ (945,465)	$ (993,693)	$ (1,044,381)	$ (1,097,655)	$ (1,153,647)	1%
Service Offsets	$ (561,170)	$ (617,162)	$ (648,644)	$ (681,731)	$ (716,506)	$ (753,056)	1%

Total Wastewater Revenue Requirements	FY 2011	FY 2016	FY 2021	FY 2026	FY 2031	FY 2036	Escalation
Usage Charge - O&M	22,446,282	28,034,672	36,619,047	48,885,748	68,316,143	77,682,329	
Usage Charge - Capital	13,515,162	12,944,575	20,839,167	30,173,713	51,669,789	75,617,705	
Service Charge - O&M	5,913,087	6,772,195	7,917,647	9,248,947	10,795,872	12,592,946	
Service Charge - Capital	3,378,790	3,236,144	5,209,792	10,848,802	15,715,846	19,343,288	
Total Revenue Requirements	45,253,321	50,987,586	70,585,653	99,157,210	146,497,650	185,236,268	
% Change		*-10.5%*	*11.1%*	*12.9%*	*16.0%*	*4.2%*	
Usage Charge	35,961,444	40,979,247	57,458,214	79,059,461	119,985,932	153,300,034	
Service Charge	9,291,877	10,008,339	13,127,438	20,097,750	26,511,718	31,936,234	
Service Account Requirement	561,884	694,235	807,265	1,235,901	1,630,324	1,963,902	
Service Meter Requirement	8,729,993	9,314,104	12,320,173	18,861,849	24,881,393	29,972,332	
Acct / Total Service Cost Ratio	6.05%	6.94%	6.15%	6.15%	6.15%	6.15%	
Coverage	1.51	1.76	1.52	1.38	1.28	1.24	
Rate Funded Capital	$ 5,693,941	$ 6,993,866	$ 8,926,143	$ 11,392,271	$ 14,539,746	$ 18,556,809	
Projected Demographic Statistics							
Projected Usage (6)							
Inside City	8,094,047	8,422,698	8,852,340	9,303,898	9,778,490	10,277,292	1%
Outside City	660,763	687,592	722,666	759,530	798,273	838,993	1%
Equivalent Units	9,415,572	9,797,882	10,297,673	10,822,958	11,375,037	11,955,278	
Accounts (6)							
Number of Accounts - Bills	1,008,058	1,114,047	1,170,874	1,230,601	1,293,374	1,359,349	1%
Number of Equivalent Meters - Bills	1,364,087	1,499,579	1,576,073	1,656,469	1,740,965	1,829,772	1%
Inside City Rates	$ 3.28	$ 4.69	$ 5.58	$ 7.30	$ 10.55	$ 12.82	
Monthly 5/8" Residential Service Charge	$ 6.25	$ 7.97	$ 8.51	$ 12.39	$ 15.55	$ 17.83	
Average Monthly Bill for 5/8" Customer	$ 27.27	$ 38.00	$ 44.27	$ 59.21	$ 83.17	$ 100.02	
Projected Increase		0.0%	10.0%	11.7%	14.8%	3.2%	
Compounded Rate of Growth (FY 2011 - FY 2036)	**5.34%**						

(1) All numbers in Light Green taken from current Rate Model projections for 2011-2016.
(2) Current O&M expenses are projected to increase 3% annually for 2017-2036, excluding additional O&M from regulatory requirements.
(3) Additional O&M from regulatory requirements; taken from Falls Lake Fiscal Analysis; Page 207, Table D.3.
(4) Regulatory O&M NPV is discounted at a 6% cost of capital.
(5) Capital Requirements developed with a baseline CIP of $24,573,500 plus Regulatory Capital Requirements.
(6) Revenue Offsets, Accounts, and Usage all projected to increase 1% annualyy for 2017-2036.

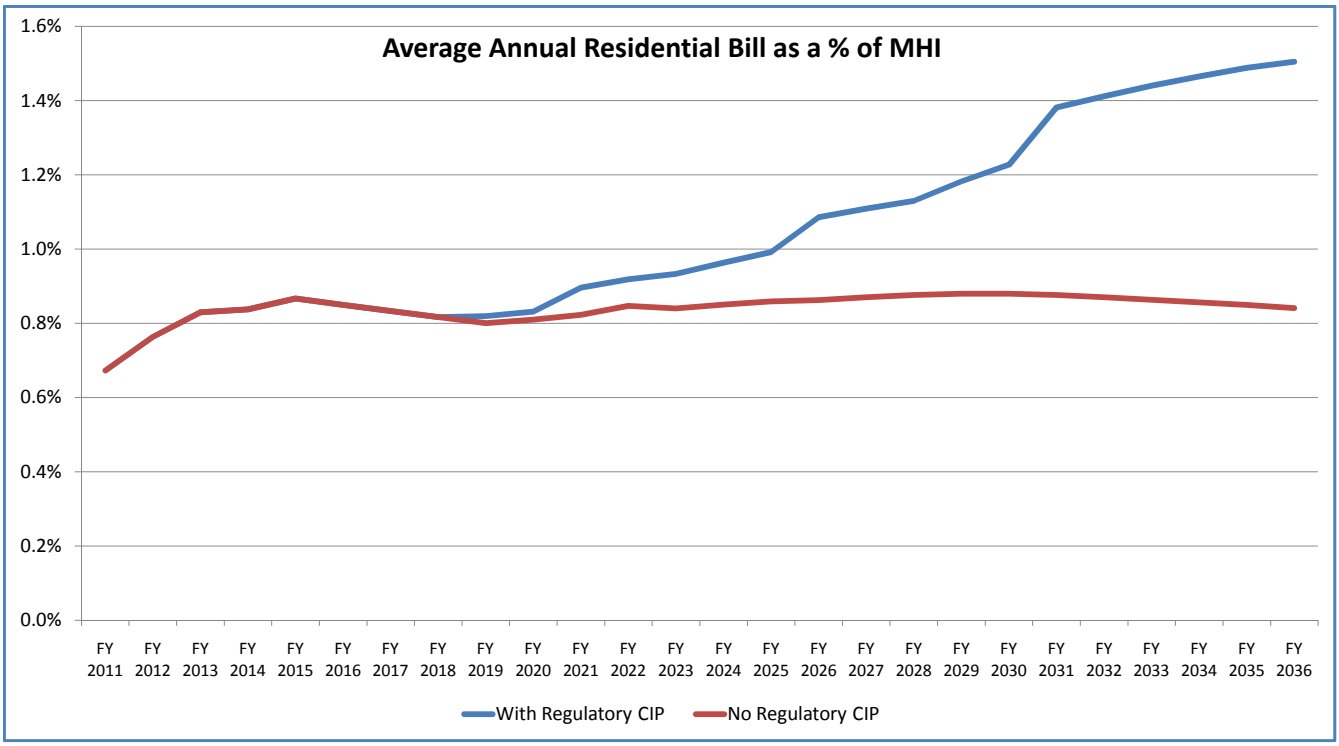
Debt Buildup Sheet

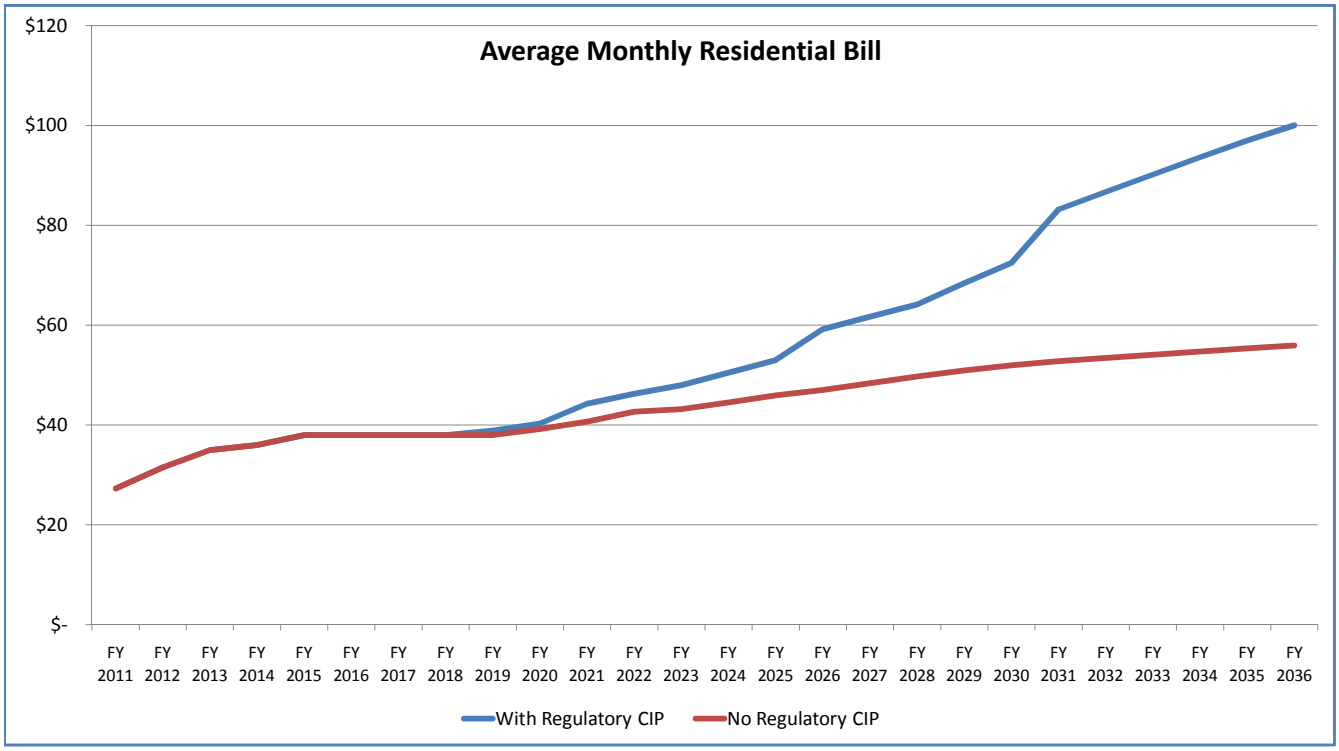
CIP	2011	2016	2021	2026	2031	2036
Wastewater Projects (1)	$ 21,001,000	$ 35,295,000	$ 24,573,500	$ 45,920,596	$ 85,347,995	$ 85,347,995
NPV Regulatory CIP	$ 261,554,917					
Rate Funded Capital (2)	$ 5,693,941	$ 6,993,866	$ 8,926,143	$ 11,392,271	$ 14,539,746	$ 18,556,809
Debt Issued per Year (3)			$ 15,647,357	$ 34,528,325	$ 70,808,250	$ 66,791,186
Additional Debt Service from New Debt			$ 7,174,391	$ 20,815,913	$ 45,383,494	$ 75,233,885

2017 Baseline CIP (4)	$	24,573,500
Regulatory Projects (5)	Phase 1	
Years		6
Start Date		2023
Real Cost (2011 $)	$	80,000,000
Inflation Rate		4.00%
Inflated Cost	$	128,082,577
Regulatory Projects (5)	Phase 2	
Years		8
Start Date		2029
Real Cost (2011 $)	$	240,000,000
Inflation Rate		4.00%
Inflated Cost	$	486,195,964
Debt Financing (3)		
Interest Rate		6%
Maturity		20

Capital Inflation to 2017	0.0%
Future Baseline CPI Growth	0.0%
Rate Funded Capital Growth Rate (2)	5.0%

(1) 2011-2016 CIP is taken from the Rate Model. 2017-2036 CIP is a combination of Baseline CIP and Regulatory CIP.
(2) Rate Funded Capital is escalated at 5% annually from the 2016 projected value from the Rate Model.
(3) Debt is issued to fund the remaining capital needs after the projected Rate Funded Capital. Issuance is assuming a 20 year term at a 6% interest rate.
(4) Calculated as the average of CIP for 2011-2016.
(5) Regulatory Projects are inflated from their current costs, provided by Hazen & Sawyer, out to their expected start dates at a 4% annual rate.





(1) Average monthly residential customer has a 5/8" meter and gets billed 6.41 CCF monthly at the inside-city rate.
(2) 2011 Durham MHI of $48,597 is estimated based on 2005 MHI escalated by the Southern CPI factor. Future MHI is assumed to escalate at a 2% annual rate.