



UPDATE

Water Rate Evaluation Dudley MA

February 2, 2022

WATER RATE FUNDAMENTALS

Rate Setting Principals & Goals

1

Recover full cost of service



All Requirements
Met



Fully
Staffed



Proactive
Repair & Maintenance

2

Distribute costs equitably



Residential
- VS -
Non-Residential



Large Households
- VS -
Small Households



Essential Use
- VS -
Discretionary Use

3

Provide revenue stability & resource protection



Usage
Trends



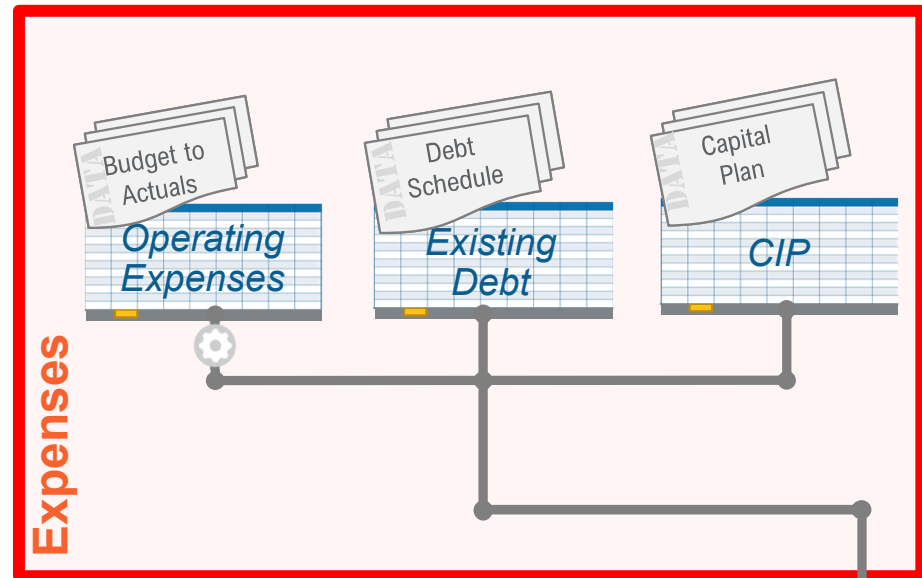
Rate
Design



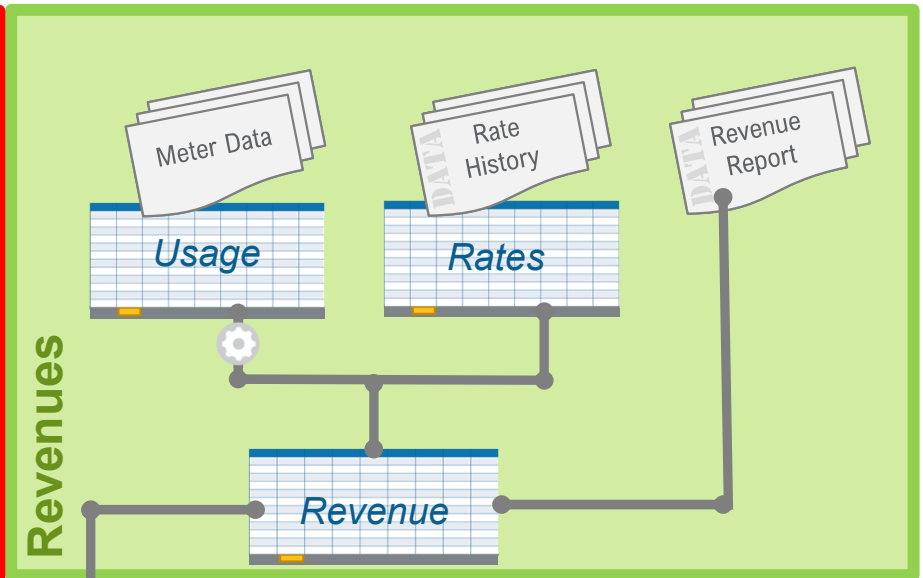
Permit
Limits

EVALUATING WATER RATES

1. Project expenses



2. Project revenues



3. Calculate net revenue

4. Adjust rates to maintain fund balance

5. Calculate user costs

6. Evaluate equity

7. Evaluate affordability

WATER SYSTEM STATUS AND NEEDS

Town currently gets all of its water from two well stations, No. 3 and No. 6, the Town would not be able to meet daily demands if either station went down. This has also prevented the Town from being able to add customers. Recently, PFAS was detected above the newly developed regulatory limit. The water system needs significant capital investment to maintain the existing level of service and provide for the needs of the Town.

Key projects (by number):

1,4 & 7 Brings third source shut down years ago back on-line and other key system improvements.

3 Combines two sources to allow temporary use of the new well until a PFAS treatment plant is built.

2 & 11 Design and construction of water treatment plant to treat PFAS from all Water Sources

Capital Improvement Plan

No.	Description	Funding Source	Estimated Cost	Fiscal Year	Term
1	PS #1 and PS#3 well improvements	Rate	\$500,000	2020	1
2	PFAS Water Treatment Plant - Preliminary Design	Rate	\$200,000	2020	1
3	Interim PFAS Water Main Project	Debt	\$1,000,000	2021	20
4	SRF Project - Design	Debt	\$500,000	2021	5
5	SRF Project - Water Asset Management Plan	Rate	\$40,000	2021	1
6	Truck 1	Rate	\$40,000	2021	2
7	SRF Project - Construction	SRF	\$4,535,300	2022	20
8	PFAS Water Treatment Plant - Final Design	Debt	\$400,000	2022	20
9	Water Meter Replacement - Phase 1	Rate	\$188,333	2024	1
10	Risk, Vulnerability Assessment and Subsequent ERP	Rate	\$30,000	2022	1
11	PFAS Water Treatment Plant - Construction	SRF	\$6,000,000	2023	20
12	Delaney Avenue Area Water Main	SRF	\$3,270,000	2026	20
13	Water Meter Replacement - Phase 2	Rate	\$188,333	2026	1
14	New Well Water Source	SRF	\$3,000,000	2025	20
15	Truck 2	Rate	\$40,000	2025	1
16	Konkel Avenue Area Water Main	SRF	\$2,860,000	2028	20
17	Water Meter Replacement - Phase 3	Rate	\$188,333	2028	1
18	Jaybee Avenue Area Water Main	SRF	\$3,250,000	2030	20
TOTAL			\$26,230,300		

ORIGINAL
MAY 6, 2020

Town is considering funding projects 8 & 11 as a debt exclusion.

i PFAS: A group of once common man-made chemicals that have recently become regulated due to growing concern over human health impacts.

WATER SYSTEM STATUS AND NEEDS

ORIGINAL
MAY 6, 2020

Capital Improvement Plan				
No.	Description	Funding Source	Estimated Cost	Fiscal Year
1	PS #1 and PS#3 well improvements	Rate	\$500,000	2020
2	PFAS Water Treatment Plant - Preliminary Design	Rate	\$200,000	2020
3	Interim PFAS Water Main Project	Debt	\$1,000,000	2021
4	SRF Project - Design	Debt	\$500,000	2021
5	SRF Project - Water Asset Management Plan	Rate	\$40,000	2021
6	Truck 1	Rate	\$40,000	2021
7	SRF Project - Construction	SRF	\$4,533,300	2022
8	PFAS Water Treatment Plant - Final Design	Debt	\$400,000	2022
9	Water Meter Replacement - Phase 1	Rate	\$188,333	2024
10	Risk, Vulnerability Assessment and Subsequent ERP	Rate	\$30,000	2022
11	PFAS Water Treatment Plant - Construction	SRF	\$6,000,000	2023
12	Delaney Avenue Area Water Main	SRF	\$3,270,000	2026
13	Water Meter Replacement - Phase 2	Rate	\$188,333	2026
14	New Well Water Source	SRF	\$3,000,000	2025
15	Truck 2	Rate	\$40,000	2025
16	Konkel Avenue Area Water Main	SRF	\$2,860,000	2028
17	Water Meter Replacement - Phase 3	Rate	\$188,333	2028
18	Jaybee Avenue Area Water Main	SRF	\$3,250,000	2030
TOTAL			\$26,230,300	

✓ Completed

✓ Completed \$200K Grant

✓ Completed

✓ Underway \$982K Grant

See Updated CIP

UPDATED CIP

Capital Improvement Plan

No.	System	Description	Funding Source	Interest Rate	Estimated Cost	Escalated Cost	Fiscal Year	Term
10	Enterprise	Risk, Vulnerability Assessment and Subsequent ERP	Rate	--	\$ 30,000			2
19	Treatment	New Project Temporary PFAS Treatment at Well 7	Debt	3.0%	\$ 400,000			10
20	Treatment	New Project Temporary PFAS Treatment at Well 1	Debt	3.0%	\$ 600,000			10
8	Treatment	PFAS Water Treatment Plant - Final Design	Debt	3.0%	\$ 700,000			5
5	Enterprise	SRF Project - Water Asset Management Plan	Rate	--	\$ 30,000	\$ 32,000	2023	1
21	Treatment	Potash Brook Culvert Replacement at Well 6	Debt	3.0%	\$ 600,000	\$ 670,000	2025	20
9	Distribution	Water Meter Replacement - Phase 1	Rate	--	\$ 188,333	\$ 217,000	2024	1
22	Source	New Well Water Source Preliminary	Rate	--	\$ 150,000	\$ 150,000	2024	3
11	Treatment	PFAS Water Treatment Plant - Construction	SRF	0.0%	\$ 9,223,000	\$ 9,223,000	2025	20
15	Enterprise	Truck 2	Rate	--	\$ 40,000	\$ 48,000	2025	1
12	Distribution	Delaney Avenue Area Water Main	SRF	2.0%	\$ 3,270,000	\$ 4,020,000	2026	20
13	Distribution	Water Meter Replacement - Phase 2	Rate	--	\$ 188,333	\$ 232,000	2026	1
14	Source	New Well Water Source Design	Debt	3.0%	\$ 500,000	\$ 536,000	2027	5
22	Source	New Well Water Source Construction	SRF	2.0%	\$ 2,000,000	\$ 2,300,000	2028	20
16	Distribution	Konkel Avenue Area Water Main	SRF	2.0%	\$ 2,860,000	\$ 3,767,000	2028	20
17	Distribution	Water Meter Replacement - Phase 3	Rate	--	\$ 188,333	\$ 248,000	2028	1
18	Distribution	Jaybee Avenue Area Water Main	SRF	2.0%	\$ 3,250,000	\$ 4,745,000	2031	20
Total					\$ 24,218,000	\$ 26,188,000		

What changed?

PFAS was originally discovered at 1 of the Town's 2 active well sites, so the first phase was to connect the two well sites to blend the water together to reduce PFAS that is supplied to the water system to under the regulatory limit A Permanent PFAS WTP was included in the 2020 CIP for 1 well site.

Since then, PFAS levels were found at all 3 Town well site. With fluctuating PFAS levels, a Temporary PFAS Treatment System was needed to tide the Town over at Well 7 until the Permanent WTP was constructed. In addition, the WTP project was increased to treat all Town Well sites which required additional water main to be added to the PFAS WTP Project. The 1 PFAS filter currently under construction at Well 7 will eventually be relocated to the Permanent WTP. The Town has received a \$178K grant for the pilot study of the PFAS WTP and anticipates a minimum grant amount of 19.8% (\$2.3M) on the PFAS WTP construction which will go out to bid in Spring 2022. Therefore, Project 11 for the WTP Construction which was appropriated at \$11.5M is shown as \$9.2M project above.

WATER ENTERPRISE – PROJECTED EXPENSES

Dudley Water

	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
Operating Expenses										
labor	\$352,787	\$433,627	\$428,622	\$443,623	\$459,150	\$475,220	\$491,853	\$509,068	\$526,885	\$545,326
Operation & Maintenance	\$198,315	\$258,000	\$373,000	\$386,055	\$399,567	\$413,552	\$428,026	\$443,007	\$458,512	\$474,560
Indirects- Fringes	\$127,594	\$130,200	\$140,600	\$145,521	\$150,614	\$155,886	\$161,342	\$166,989	\$172,833	\$178,882
Supplies	\$143,200	\$146,000	\$150,000	\$155,250	\$160,684	\$166,308	\$172,128	\$178,153	\$184,388	\$190,842
Indirects- Admin	\$85,661	\$87,186	\$89,000	\$92,115	\$95,339	\$98,676	\$102,130	\$105,704	\$109,404	\$113,233
Miscellaneous	\$10,000	\$7,900	\$5,900	\$6,107	\$6,320	\$6,541	\$6,770	\$7,007	\$7,253	\$7,506
Technical Services			\$50,000							
Subtotal	\$917,558	\$1,062,912	\$1,237,122	\$1,228,671	\$1,271,674	\$1,316,183	\$1,362,249	\$1,409,928	\$1,459,276	\$1,510,350
CIP/ Debt										
Capital	\$25,000	\$25,000	\$35,000	\$267,000	\$98,000	\$282,000	\$0	\$248,000	\$0	\$0
Debt	\$164,000	\$405,000	\$436,725	\$786,772	\$767,703	\$627,884	\$610,065	\$408,496	\$399,427	\$390,358
New Debt Service	\$0	\$0	\$0	\$184,460	\$554,041	\$780,841	\$880,307	\$1,283,438	\$1,256,918	\$1,256,918
Subtotal	\$189,000	\$430,000	\$471,725	\$1,238,232	\$1,419,744	\$1,690,725	\$1,490,373	\$1,939,934	\$1,656,345	\$1,647,276
TOTAL EXPENSES	\$1,106,558	\$1,492,912	\$1,708,847	\$2,466,903	\$2,691,419	\$3,006,908	\$2,852,622	\$3,349,862	\$3,115,621	\$3,157,627

Debt Associated with PFAS Treatment Plant

Project	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
WTP Design (Part of \$1.795 Issue)	\$ -	\$ -	\$ 35,000	\$ 210,000	\$ 201,250	\$ 201,250	\$ 192,500	\$ -	\$ -	\$ -
PFAS Water Treatment Plant - Construction	\$ -	\$ -	\$ -	\$ 184,460	\$ 509,007	\$ 468,692	\$ 468,692	\$ 468,692	\$ 468,692	\$ 468,692
Total	\$ -	\$ -	\$ 35,000	\$ 394,460	\$ 710,257	\$ 669,942	\$ 661,192	\$ 468,692	\$ 468,692	\$ 468,692

Three Rate Alternatives were evaluated

- A - 0%** PFAS Debt Exclusion (Water Rates pay for 100% of the new WTP and related water main construction)
- B - 100%** PFAS Debt Exclusion (General Fund pays for 100% of the new WTP and related water main construction)
- C – 50%** PFAS Debt Exclusion (General Fund and Water Rates each pay for 50% of the new WTP and related water main construction)

WATER ENTERPRISE – PROJECTED RATES

ALTERNATIVE A

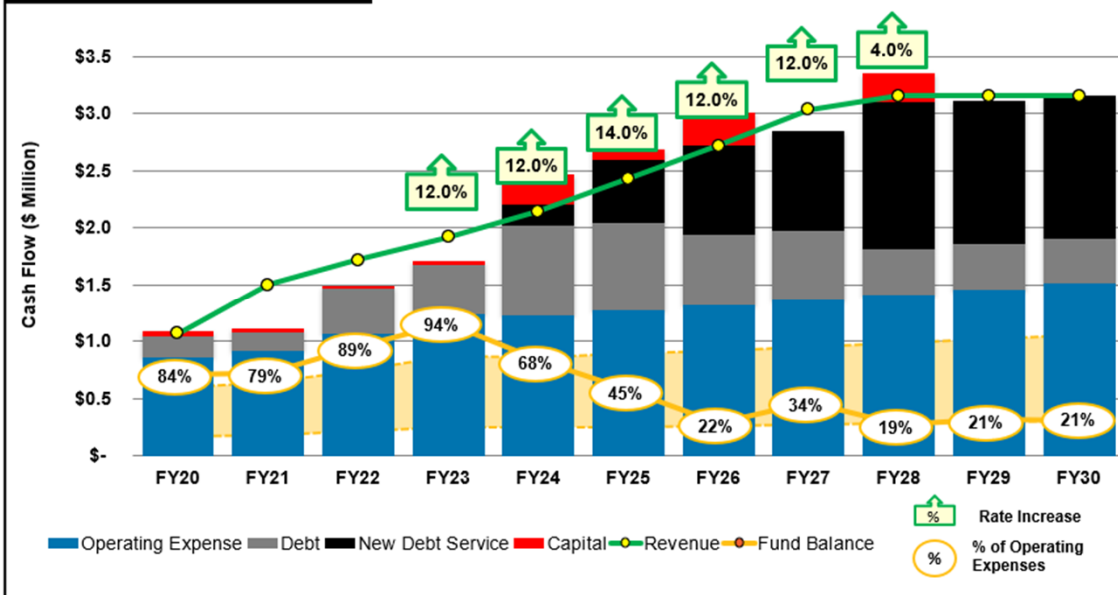
100% WATER RATES FOR PFAS WTP & WM CONSTRUCTION

	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
Revenue			12.0%	12.0%	14.0%	12.0%	12.0%	4.0%		
Rate Revenue	\$ 1,238,497	\$ 1,572,619	\$ 1,761,333	\$ 1,972,693	\$ 2,248,870	\$ 2,518,735	\$ 2,820,983	\$ 2,933,822	\$ 2,933,822	\$ 2,933,822
Non-Rate Revenue	\$ 261,488	\$ 146,189	\$ 156,651	\$ 168,369	\$ 183,681	\$ 198,643	\$ 215,400	\$ 221,656	\$ 221,656	\$ 221,656
Total Revenue	\$ 1,499,985	\$ 1,718,808	\$ 1,917,985	\$ 2,141,063	\$ 2,432,552	\$ 2,717,378	\$ 3,036,383	\$ 3,155,478	\$ 3,155,478	\$ 3,155,478

Delta previous (Rate Revenue)

Net Revenue (Revenue-Expense)	\$ 393,427	\$ 225,895	\$ 209,138	\$ (325,840)	\$ (258,867)	\$ (289,530)	\$ 183,761	\$ (194,383)	\$ 39,857	\$ (2,148)
Fund Balance	\$723,157	\$949,052	\$1,158,190	\$832,350	\$573,483	\$283,953	\$467,714	\$273,331	\$313,188	\$311,040
Retained Earnings as Percent of Operating Expenses	79%	89%	94%	68%	45%	22%	34%	19%	21%	21%

Alternative A - No Debt Exclusion



Description	Type	Rate Increase	
		FY22	FY23
5/8" Base Charge	Quarterly Fee	\$56.29	\$63.04
>5/8" Base Charge	Usage	\$281.45	\$315.22
Tier 1	Usage	\$4.07	\$4.56
Tier 2	Usage	\$6.10	\$6.83
Tier 3	Usage	\$12.20	\$13.66

WATER ENTERPRISE – PROJECTED RATES

ALTERNATIVE B

100% DEBT EXCLUSION FOR PFAS WTP & WM CONSTRUCTION

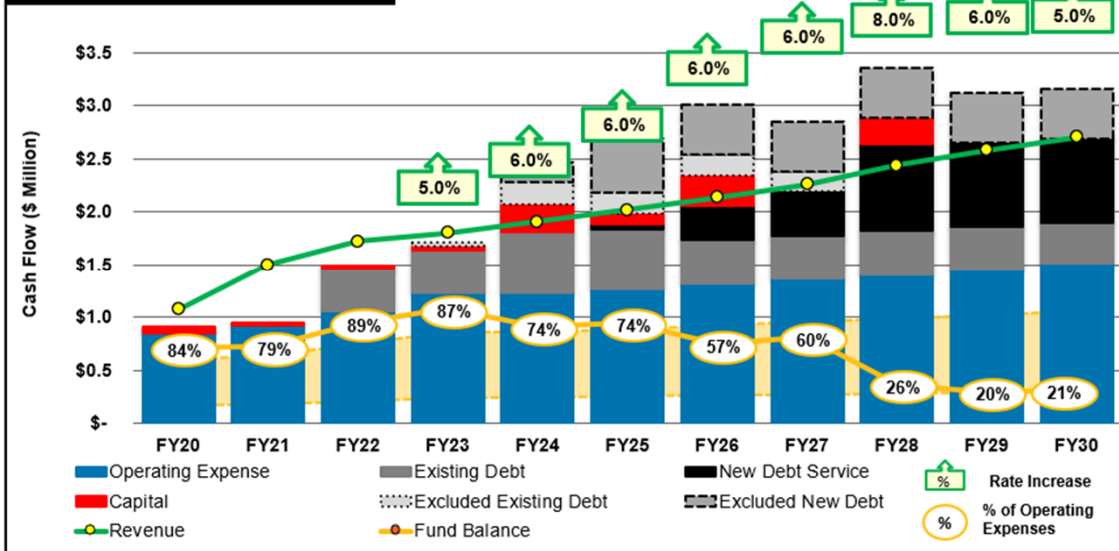
Revenue - Alt. B

	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
			5.0%	6.0%	6.0%	6.0%	6.0%	8.0%	6.0%	5.0%
Rate Revenue	\$ 1,238,497	\$ 1,572,619	\$ 1,651,250	\$ 1,750,325	\$ 1,855,345	\$ 1,966,665	\$ 2,084,665	\$ 2,251,438	\$ 2,386,525	\$ 2,505,851
Non-Rate Revenue	\$ 261,488	\$ 146,189	\$ 150,548	\$ 156,041	\$ 161,863	\$ 168,035	\$ 174,577	\$ 183,824	\$ 191,313	\$ 197,929
Total Revenue	\$ 1,499,985	\$ 1,718,808	\$ 1,801,798	\$ 1,906,366	\$ 2,017,208	\$ 2,134,700	\$ 2,259,242	\$ 2,435,262	\$ 2,577,838	\$ 2,703,779
delta previous	\$ 288,175	\$ 334,122	\$ 78,631	\$ 99,075	\$ 105,020	\$ 111,321	\$ 118,000	\$ 166,773	\$ 135,086	\$ 119,326

Net Revenue (Revenue-Expense)

	\$ 393,427	\$ 225,895	\$ 127,952	\$ (166,077)	\$ 36,046	\$ (202,266)	\$ 67,813	\$ (445,908)	\$ (69,091)	\$ 14,845
Retained Earnings Balance	\$723,157	\$949,052	\$1,077,004	\$910,927	\$946,973	\$744,707	\$812,520	\$366,612	\$297,520	\$312,365
Retained Earnings as Percent of Operating Expenses	79%	89%	87%	74%	74%	57%	60%	26%	20%	21%

Alternative B -100% Debt Exclusion



Rate Increase

5%

Description	Type	FY22	FY23
5/8" Base Charge	Quarterly Fee	\$56.29	\$59.10
>5/8" Base Charge	Usage	\$281.45	\$295.52
Tier 1	Usage	\$4.07	\$4.27
Tier 2	Usage	\$6.10	\$6.41
Tier 3	Usage	\$12.20	\$12.81

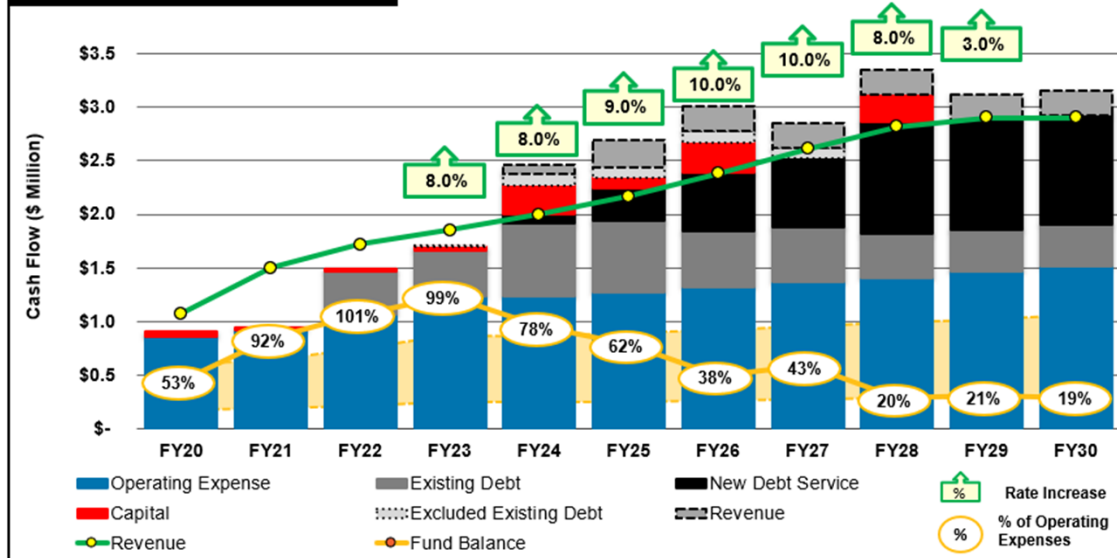
WATER ENTERPRISE – PROJECTED RATES

ALTERNATIVE C

500% WATER RATES / 50% DEBT EXCLUSION FOR PFAS WTP & WM CONSTRUCTION

	FY21	FY22	FY23	FY24	FY25	FY26	FY27	FY28	FY29	FY30
Revenue - Alt C			8.0%	8.0%	9.0%	10.0%	10.0%	8.0%	3.0%	
Total Rate Revenue	\$ 1,238,497	\$ 1,572,619	\$ 1,698,429	\$ 1,834,303	\$ 1,999,390	\$ 2,199,329	\$ 2,419,262	\$ 2,612,803	\$ 2,691,187	\$ 2,691,187
Non-Rate Revenue	\$ 261,488	\$ 146,189	\$ 153,164	\$ 160,697	\$ 169,850	\$ 180,935	\$ 193,128	\$ 203,858	\$ 208,204	\$ 208,204
Total Revenue	\$ 1,499,985	\$ 1,718,808	\$ 1,851,592	\$ 1,995,000	\$ 2,169,240	\$ 2,380,264	\$ 2,612,390	\$ 2,816,661	\$ 2,899,391	\$ 2,899,391
delta previous	\$ 288,175	\$ 334,122	\$ 125,810	\$ 135,874	\$ 165,087	\$ 199,939	\$ 219,933	\$ 193,541	\$ 78,384	\$ -
Net Revenue (Revenue-Expense)	\$ 393,427	\$ 225,895	\$ 160,246	\$ (274,673)	\$ (167,051)	\$ (291,673)	\$ 90,364	\$ (298,855)	\$ 18,116	\$ (23,890)
Retained Earnings Balance	\$842,893	\$1,068,788	\$1,229,034	\$954,361	\$787,310	\$495,637	\$586,001	\$287,146	\$305,262	\$281,373
Retained Earnings as Percent of Operating Expenses	92%	101%	99%	78%	62%	38%	43%	20%	21%	19%

Alternative C - 50% Debt Exclusion

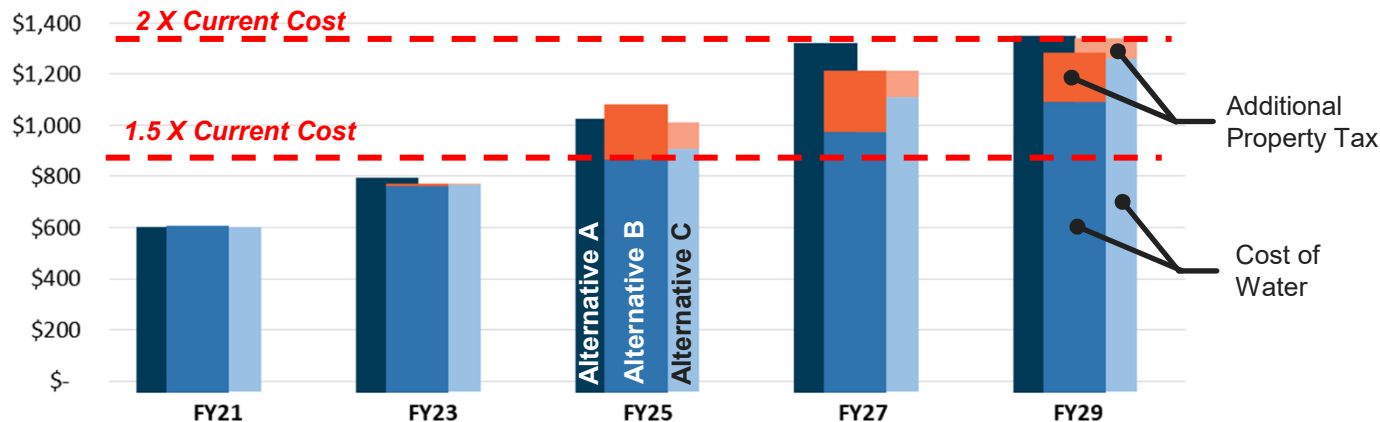


		Rate Increase	
		8%	
Description	Type	FY22	FY23
5/8" Base Charge	Quarterly Fee	\$56.29	\$60.79
>5/8" Base Charge		\$281.45	\$303.97
Tier 1	Usage	\$4.07	\$4.40
Tier 2	Usage	\$6.10	\$6.59
Tier 3		\$12.20	\$13.18

CUSTOMER IMPACTS

Annual Cost of Water						Total FY23-FY30
Scenario	FY21	FY23	FY25	FY27	FY29	
Alternative A - No Debt Exclusion						
Water Cost	\$ 619	\$ 819	\$ 1,046	\$ 1,312	\$ 1,364	\$ 9,356
Additional Property Tax						
Total	\$ 619	\$ 819	\$ 1,046	\$ 1,312	\$ 1,364	\$ 9,356
<i>Annual Increase</i>	<i>\$ 110</i>	<i>\$ 88</i>	<i>\$ 128</i>	<i>\$ 141</i>	<i>\$ -</i>	
Alternative B -100% Debt Exclusion						
Water Cost	\$ 619	\$ 768	\$ 863	\$ 969	\$ 1,110	\$ 7,649
Additional Property Tax		\$ 9	\$ 211	\$ 231	\$ 186	\$ 1,335
Total	\$ 619	\$ 777	\$ 1,073	\$ 1,200	\$ 1,296	\$ 8,983
<i>Annual Increase</i>		<i>\$ 46</i>	<i>\$ 150</i>	<i>\$ 69</i>	<i>\$ 73</i>	
Alternative C - 50% Debt Exclusion						
Water Cost	\$ 619	\$ 790	\$ 930	\$ 1,125	\$ 1,251	\$ 8,436
Additional Property Tax		\$ 5	\$ 104	\$ 109	\$ 85	\$ 632
Total	\$ 619	\$ 794	\$ 1,033	\$ 1,234	\$ 1,336	\$ 9,068
<i>Annual Increase</i>		<i>\$ 58</i>	<i>\$ 77</i>	<i>\$ 102</i>	<i>\$ 36</i>	

Excluding the debt cost of the PFAS plant essentially shifts this cost from the water enterprise to the General Fund. This results in a proportional increase in the Mill Rate and subsequently, an increase in property taxes. See next page for assumptions.



Water costs based upon a family of 4 each using 50 gallons per day each.
Additional Property Tax based upon single family home with average assessed value

TAX INCREASE CALCULATIONS AND ASSUMPTIONS

	FY23	FY25	FY27	FY29
Total Levy (2.5%)	\$ 14,914,416	\$ 15,669,459	\$ 16,462,725	\$ 17,296,150

100% Debt exclusion

Annual Excluded Debt	\$ 35,000	\$ 710,257	\$ 661,192	\$ 468,692
Annual Excluded Debt as % of Levy	0.23%	4.53%	4.02%	2.71%
Mill Rate (\$/1,000)	\$ 11.70	\$ 12.03	\$ 13.10	\$ 14.00
Increase in mill rate due to excluded debt	\$ 0.03	\$ 0.55	\$ 0.53	\$ 0.38
Average Home Valuation	\$ 334,393	\$ 386,462	\$ 438,530	\$ 490,599
Estimated Single Family Tax Bill	\$ 3,912	\$ 4,649	\$ 5,745	\$ 6,871
Increase in Tax Bill	\$ 9.18	\$ 210.73	\$ 230.72	\$ 186.18

50% Debt exclusion

Annual Excluded Debt	\$ 17,500	\$ 355,128	\$ 330,596	\$ 234,346
Annual Excluded Debt as % of Levy	0.12%	2.27%	2.01%	1.35%
Mill Rate (\$/1,000) STATIC	\$ 11.70	\$ 11.86	\$ 12.39	\$ 12.81
Increase in mill rate due to excluded debt	\$ 0.01	\$ 0.27	\$ 0.25	\$ 0.17
Average Home Valuation	\$ 334,393	\$ 386,462	\$ 438,530	\$ 490,599
Estimated Single Family Tax Bill	\$ 3,912	\$ 4,585	\$ 5,432	\$ 6,285
Increase in Tax Bill	\$ 4.59	\$ 103.92	\$ 109.08	\$ 85.16

CUSTOMER IMPACTS & AFFORDABILITY



Measuring Affordability. Affordability, like temperature, is highly subjective. To determine whether or not water and sewer costs represents a financial burden we use the two most common and appropriate indicators. **In both cases the income used to calculate affordability is not escalated and is based on 2018 data.**

***The Residential Indicator.** Adopted from EPA guidance developed in the late 90's to determine the cost impacts of federal regulatory programs, this indicator divides the total annual cost of water and sewer by the median household income. A score of 4% or more is considered to be a financial burden.*

Residential Indicator Annual Cost as %MHI					
Scenario	FY21	FY23	FY25	FY27	FY29
Alternative A - No Debt Exclusion	1.9%	2.5%	2.8%	3.2%	3.4%
Alternative B -100% Debt Exclusion	1.9%	2.4%	2.8%	3.0%	3.3%
Alternative C - 50% Debt Exclusion	1.9%	2.4%	2.8%	3.1%	3.3%

***The Household Burden Indicator.** Introduced in 2019, this indicator is based the lowest quintile income (the lowest 20%), which is more representative of household financial status, is used. The second component, the Poverty Prevalence Indicator determines what percentage of the community is below 200% of the Federal Poverty Level. The burden is determined by using the chart below.*

Housefold Burden Indicator (HBI)					
Scenario	FY21	FY23	FY25	FY27	FY29
Alternative A - No Debt Exclusion	4.4%	5.9%	6.6%	7.6%	8.0%
Alternative B -100% Debt Exclusion	4.4%	5.7%	6.7%	7.2%	7.8%
Alternative C - 50% Debt Exclusion	4.4%	5.8%	6.6%	7.4%	7.9%

Dudley Income Data (US Census)

Median Household Income: \$69,071

Lowest Quintile Income: \$29,052

Poverty Prevalence Indicator: 24%

Household Burden Indicator	Poverty Prevalence Indicator		
	>= 35%	20% to 35%	<20%
> = 10%	Very High Burden	High Burden	Moderate – High Burden
7% to 10%	High Burden	Moderate – High Burden	Moderate - Low Burden
<7%	Moderate - High Burden	Moderate - Low Burden	Low Burden

Dudley