

Actuarial Valuation of
Other Post-Employment Benefits
January 1, 2024

Massachusetts Water
Resources Authority



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May 15, 2024

Mr. William Kibaja
Controller
Massachusetts Water Resources Authority
100 First Avenue, Building 39
Charlestown Navy Yard
Boston, MA 02129

Dear Mr. Kibaja:

Stone Consulting, Inc. has performed a January 1, 2024 actuarial valuation of the Massachusetts Water Resources Authority Other Post-employment Benefits (OPEB) Plan. The valuation and this report were prepared using generally accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board.

We are pleased to present these exhibits. If the Massachusetts Water Resources Authority has any questions on the content of this report, we would be glad to respond. Please note that this report is meant to be used in its entirety. Use of excerpts of this report may result in a misleading or inaccurate understanding of the results.

Stone Consulting, Inc. is completely independent of the Massachusetts Water Resources Authority or the Massachusetts Water Resources Authority OPEB Trust, including any of their officers and key personnel. Neither we or anyone else closely associated with us has any relationship with the Massachusetts Water Resources Authority or the Massachusetts Water Resources Authority OPEB Trust which would impair our independence, other than this or related assignments.

The undersigned are consultants for Stone Consulting, Inc. and members of the American Academy of Actuaries and meet the Qualification Standards of the American Academy of Actuaries to render the actuarial opinion contained herein.

Respectfully submitted,
STONE CONSULTING, INC.



Joan H. Moreau, ASA, FCA
Member, American Academy of Actuaries



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SECTION I – ACTUARIAL RESULTS

Summary of Results

This report presents the results of the actuarial valuation of the Massachusetts Water Resources Authority Other Post-Employment Benefit (OPEB) Plan as of January 1, 2024. The valuation was performed at the request of the Massachusetts Water Resources Authority for the purpose of determining the contribution requirement for Fiscal Year 2025 and beyond. As of January 1, 2024, the Plan is 44.1% funded at a discount rate of 6.75%.

Actuarial results from the January 1, 2024 valuation are summarized in the following table.

Actuarial Results	01/01/2024 (6.75%)
1. Actuarial Accrued Liability (AAL)	
Actives	81,396,115
Retirees, Beneficiaries, Vesteds and Survivors	<u>89,836,835</u>
Total AAL	171,232,950
2. Actuarial Value of Assets (Market Value)	75,459,884
3. Total Unfunded AAL (1. – 2.)	95,773,066
4. Funded Percent (2. ÷ 1.)	44.1%
5. Actuarially Determined Contribution (ADC) FY 2025	
Amortization of Unfunded Liabilities	6,203,233
Normal Cost	<u>4,358,379</u>
Total ⁽¹⁾	10,561,612
6. Projected Benefit Payments	7,787,268

⁽¹⁾ Assumes payment at the beginning of the fiscal year, July 1. See Table on page 7.

Liabilities increased 53.9% from the prior valuation. The change in liabilities is broken down on page 8.

Actuarial values in this letter were calculated using a 6.75% discount rate. The 6.75% discount rate represents the expected rate of return for a funded plan with a longer-term investment horizon. This rate has been chosen by the Massachusetts Water Resources Authority Irrevocable OPEB Trust Board of Trustees based on a review of the Trustees' investment policy and guidance from the Plan's asset manager. The OPEB liability is extremely sensitive to this assumption.

Summary of Results (continued)

Assets are invested in an irrevocable trust, the Massachusetts Water Resources Authority Irrevocable OPEB Trust (the "Trust") established under Mass. Gen. Laws c. 32B, §20.

Contribution requirements are based on the financial condition of the system as of December 31, 2023, as well as actuarial liability results, which are based on:

- The benefit provisions of M.G.L. Chapter 32B and related statutes;
- The demographics of members in the system (i.e., active and inactive participants, retirees and beneficiaries as of January 1, 2024);
- Economic assumptions regarding medical trends and investment earnings; and
- Other actuarial assumptions (e.g., withdrawals, retirement, death, etc.)

Plan Update

Actuarial results for the January 1, 2024, valuation show a funded percent of 44.1%, a decrease from the funded percent of 59.6% as of January 01, 2022. This increase is largely the result of increases in family and spouse utilization.

Asset returns were lower than expected over the two-year period from the prior valuation. Premium increases for the last year were higher than expected.

Details of these changes are given below.

- **Family and Spouse Utilization**

Weighted average annual retiree contribution amounts for non-Medicare plans used in the prior report suggest a proportion of family plans significantly below the 50% proportion calculated from the January 1, 2024 census data for pre-65 retirees. Since this proportion is used as an assumption for future retirees, the change had a significant impact on Plan liabilities.

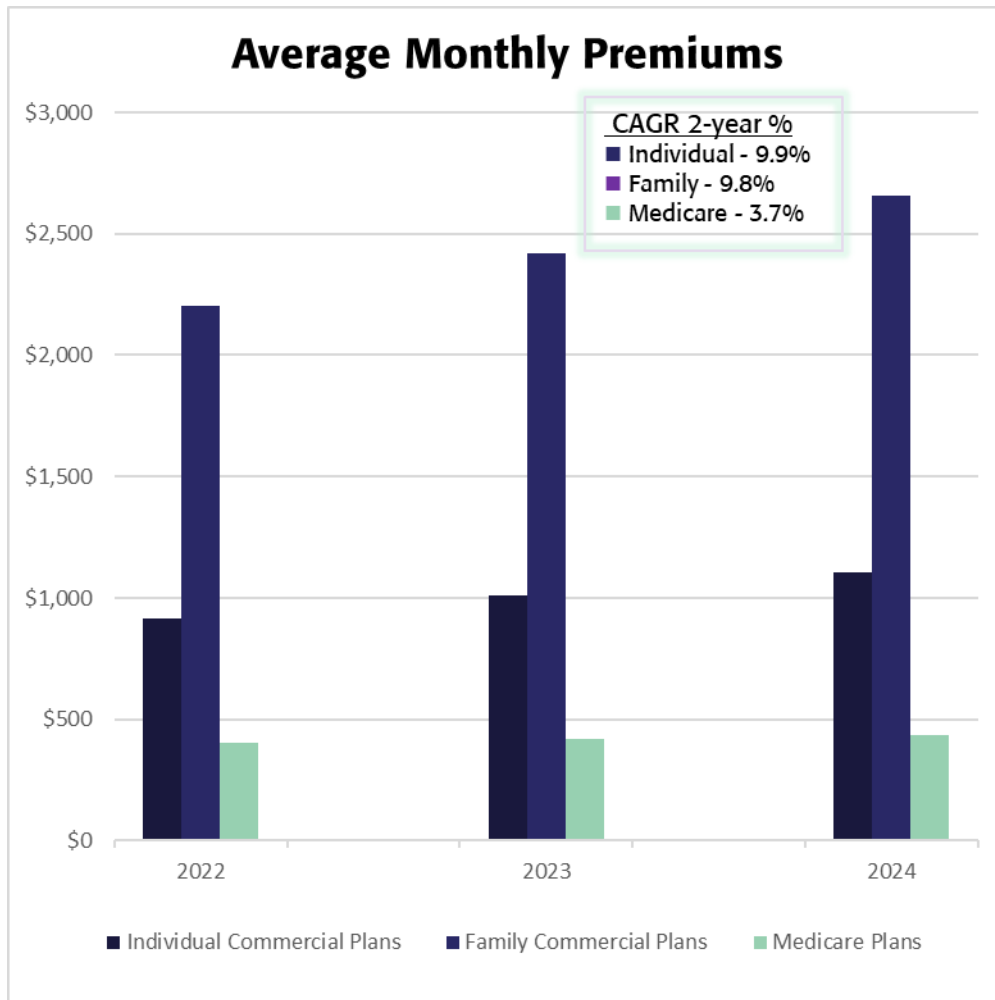
- **Asset performance in 2022 and 2023.**

For the one-year ended December 31, 2023, the PRIT Fund was up 11.4%. For the one-year ended December 31, 2022, the PRIT Fund was down -10.8%. The expected return for both years was 6.75%.

Plan Update (continued)

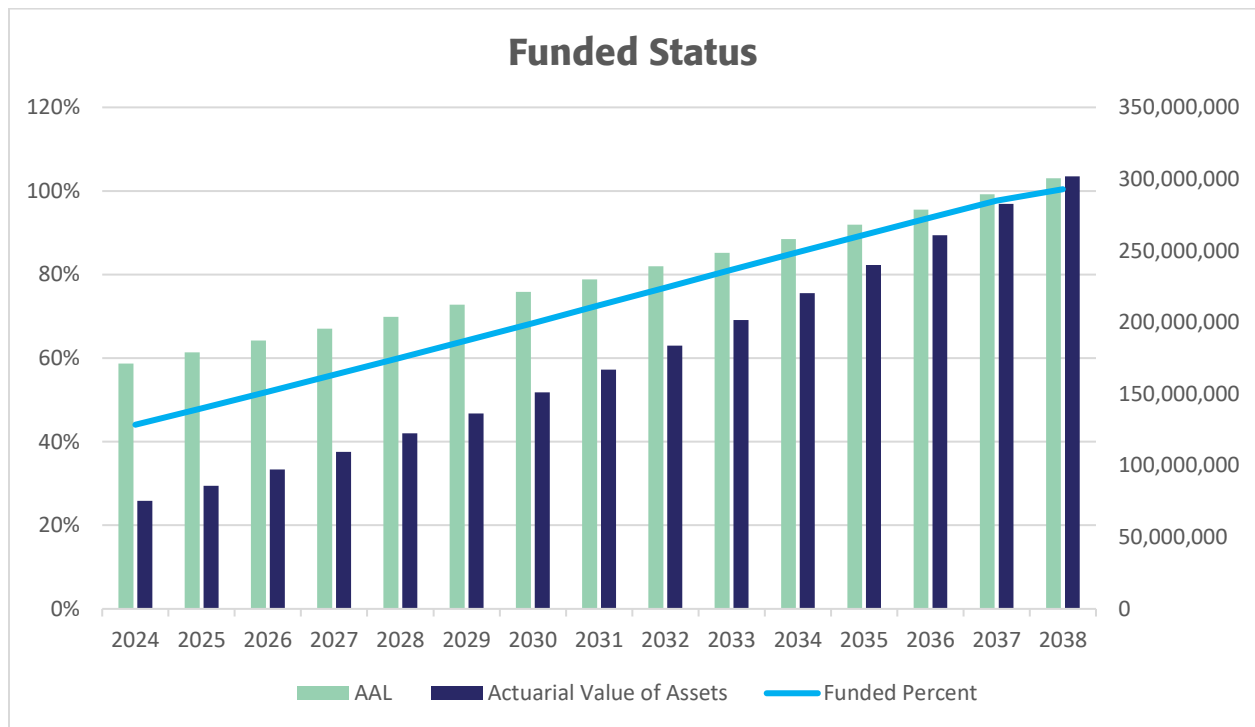
- Plan experience.

Medical renewals have increased commercial premiums by approximately 21% over the past two years versus an expected 14%. Medicare premiums have increased about 8% over the same period, similar to the 8% expected. Annual growth rates are illustrated in the graph below.



Funded Status

Assuming the Authority contributes according to the funding schedule on page 7, the Plan is expected to fully fund past liabilities in Fiscal Year 2038. Once full funding is achieved, the ongoing cost of the plan is the annual service accruals for active members, or Normal Cost. The following graph illustrates the projected funded status of the Plan prior to full funding.



Fiscal Year 2025 Contribution

The Actuarially Determined Contribution (ADC) is an amount to cover the Normal Cost for the year plus an amortization of the Unfunded Accrued Actuarial Liability. Calculation of the ADC for Fiscal Year 2025 is as follows.

6.75%, 3.0% annual increases in amortization bases

1. Normal Cost, with interest to 7/1	4,358,379
2. Amortization of Unfunded Actuarial Accrued Liability (23 years from 7/1/2024)	6,203,233
	<u>10,561,612</u>

The Massachusetts Water Resources Authority has chosen to make annual cash contributions of 50% of the ADC. The below table breaks down the total contribution for Fiscal Year 2025 by cash funding and benefit costs consisting of retiree premiums and Implicit Subsidy.

Fiscal Year	Actuarially Determined Contribution (ADC) Payable July, 2024		
	Cash Contribution	Benefit Costs ¹	Total Funding (Cash + Benefit Costs)
2025	5,280,806	7,888,156	13,168,962

¹ Includes retiree premiums and Implicit Subsidy. Implicit Subsidy is the difference between retirees' actual incurred costs for medical coverage and the total premiums charged for such coverage. In group insurance, premiums for younger active employees are implicitly overstated to subsidize the higher utilization by retirees, and this overstatement is considered a contribution to the Plan.

These numbers assume that the Massachusetts Water Resources Authority makes cash contributions in July 2024. The length of the funding period, as well as other assumptions, are chosen at the discretion of the Board of Trustees. Funding schedules assume a static active population, including new entrants, and should be updated regularly to account for changes in employee demographics, premium rates, and asset performance.

A complete funding schedule is presented on page 7.

Future Considerations and Risks

In general, OPEB Plans are more susceptible to liability swings due to gains and losses. Actual premium increases have varied substantially and will likely do so in the future. In addition, effects of the Inflation Reduction Act of 2022 on Medicare-coordinated health costs may contribute to increased volatility in healthcare trends over the next several years. Healthcare cost trends assumed in the valuation continue to recognize this volatility by using select and ultimate trend rates.

The actuary continues to monitor key experience-related assumptions as the amount of data-driven experience grows. Participation for the plan is 82.5%, which is about average for a municipal plan. Pre-65 retirees are 85% in managed care plans while about 92.5% of post-65 retirees are in indemnity plans. These percentages are in line with what we see with other municipal clients. An anticipated 7/1/24 premium increase of 11.6% in the GIC commercial indemnity plan premium scheduled for 7/1/24 is expected to continue the population shift towards commercial managed care plans for those under 65.

Family plan election rose significantly from what was assumed in the prior valuation and this had a major impact on the liability calculations. We would expect this figure to stabilize and not cause significant unexpected changes in future valuations. In general, we would expect stable participant behavior in the future that results in relatively minor actuarial gains and losses due to retirement, withdrawal and disability.

Contribution risk, the potential of actual future employer contributions deviating from expected recommended future contributions, has not been addressed in this letter and we do not believe it to be material.

As stated previously, the Massachusetts Water Resources Authority has been funding the Plan on an actuarial basis since April 2015. It continues to demonstrate its commitment to funding the Plan through consistent, actuarially determined contributions.

A funding schedule is shown on the following page.

Funding Schedule

Funding Schedule at 6.75% with 3.00% amortization increases; All figures are as of July 1, beginning-of-fiscal-year, unless noted

Authority Fiscal Year	Normal Cost + Expenses ¹ (1)	Amortization ² (2)	Actuarially Determined Contribution (3)=(1)+(2)	Unfunded AAL (middle-of-fiscal-year) (4)	Annual Benefit Cost ³ (5)	Implicit Subsidy (6)	Cash Contribution July 1 (7)	Total Contribution (8)=(5)+(7)
2025	\$4,358,379	\$6,203,233	\$10,561,612	\$93,130,824	\$7,888,156	\$1,196,969	\$5,280,806	\$13,168,962
2026	\$4,489,130	\$6,209,237	\$10,698,368	\$89,935,894	\$8,312,579	\$1,261,372	\$5,349,184	\$13,661,762
2027	\$4,623,804	\$6,184,453	\$10,808,258	\$86,021,451	\$8,879,627	\$1,347,417	\$5,404,129	\$14,283,756
2028	\$4,762,518	\$6,114,196	\$10,876,715	\$81,375,020	\$9,436,494	\$1,431,918	\$5,438,357	\$14,874,851
2029	\$4,905,394	\$5,992,804	\$10,898,198	\$76,014,718	\$9,955,656	\$1,510,697	\$5,449,099	\$15,404,755
2030	\$5,052,556	\$5,815,706	\$10,868,262	\$69,945,603	\$10,453,278	\$1,586,207	\$5,434,131	\$15,887,408
2031	\$5,204,132	\$5,576,069	\$10,780,201	\$63,015,168	\$11,085,585	\$1,682,155	\$5,390,101	\$16,475,686
2032	\$5,360,256	\$5,252,133	\$10,612,389	\$55,300,102	\$11,631,842	\$1,765,046	\$5,306,194	\$16,938,036
2033	\$5,521,064	\$4,837,195	\$10,358,259	\$46,895,358	\$12,082,804	\$1,833,476	\$5,179,130	\$17,261,934
2034	\$5,686,696	\$4,323,780	\$10,010,476	\$37,846,017	\$12,496,721	\$1,896,284	\$5,005,238	\$17,501,958
2035	\$5,857,297	\$3,696,542	\$9,553,839	\$28,134,478	\$12,944,905	\$1,964,293	\$4,776,919	\$17,721,824
2036	\$6,033,016	\$2,928,112	\$8,961,128	\$17,685,713	\$13,495,505	\$2,047,843	\$4,480,564	\$17,976,069
2037	\$6,214,006	\$1,974,810	\$8,188,816	\$6,625,722	\$13,971,052	\$2,120,003	\$4,094,408	\$18,065,460
2038	\$6,400,426	\$800,292	\$7,200,718	\$0	\$14,448,128	\$2,192,396	\$0	\$14,448,128
2039	\$6,592,439	\$0	\$6,592,439	\$0	\$2,269,220	\$2,269,220	\$4,323,219	\$6,592,439

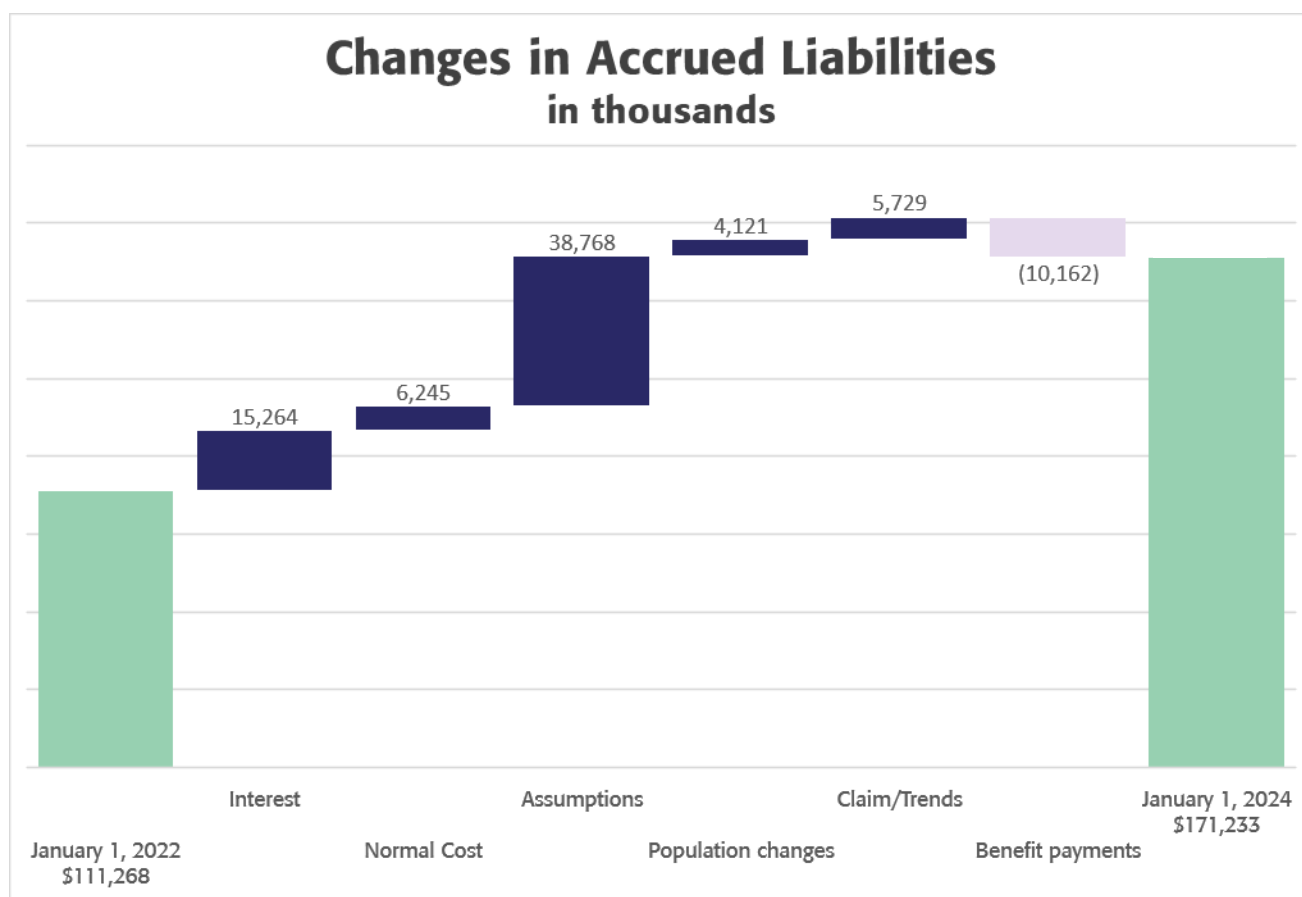
⁽¹⁾ Assumes a 3.00% annual increase in normal cost and a static group of actives.

⁽²⁾ Assumes 3% annual increases in amortization payments. The unfunded AAL is re-amortized annually.

⁽³⁾ The Annual Benefit Cost, or Pay-As-You-Go amount, is for the current group of actives and retirees. It does not include any future hires. It is not directly comparable to the funding contribution but is included for illustrative purposes only. It does illustrate, in the short-term, the estimated amount of claims costs for retirees. Premium costs may be estimated by subtracting Implicit Subsidy. Annual Benefit Cost is expected to grow as new employees retire or become disabled.

Changes Since Prior Valuation

Normal Cost and Interest Cost	+19.3%
Differences between expected and actual experience	
• Changes in claims and trends	5.2%
• Changes in Actuarial Assumptions	34.8%
• Other population changes	3.7%
• Total	43.7%
Release of Liability due to Payment of Benefits	-9.1%



Disclosures

The valuation was based on participant data as of January 1, 2024 supplied by the Massachusetts Water Resources Authority. The provisions reflected in the valuation are based on Chapter 32B of the General Laws of the Commonwealth of Massachusetts and related statutes and the benefits provided by the Authority.

This actuarial valuation involves estimates about the probabilities of events as well as the projection of amounts far into the future. Our figures should be considered a reasonable estimate of future events and not a prediction. As such, actual results are likely to depart from these results. All amounts determined in this valuation will be subject to continual review as actual results are compared to past estimates and new estimates are made about future events.

The valuation was performed for the purpose of measuring the actuarial accrued liabilities associated with these benefits, calculating an ADC, and producing a funding schedule.

Population Projection Methodology

Normal Cost, including new entrants, is assumed to increase at 3.00% per year. Projected Annual Benefit Cost (retiree premiums plus implicit subsidy) is based on the current population only.

SECTION II - ACTUARIAL VALUATION DETAILS

Population Data as of Valuation Date (January 1, 2024)

MEMBER DATA		January 1, 2024
1. Active Members		
a. Number		1,061
b. Average Attained Age		49.9
c. Average Past Service		14.9
2. Retired Members, Spouses, and Beneficiaries		
a. Number		1,056
b. Average Medical Premium		\$7,746
c. Average Age		71.5
3. Terminated Vested Members		
a. Number		21
b. Average Age		61.5

A. DISTRIBUTION BY AGE: RETIREES, BENEFICIARIES, SURVIVORS AND TERMINATED VESTEDS (Includes retirees who are receiving medical, dental and/or life coverage in addition to beneficiaries with separate policies, and survivors with medical coverage.)

Age	Total
0-19	0
20-24	0
25-29	0
30-34	0
35-39	0
40-44	0
45-49	3
50-54	4
55-59	25
60-64	114
65-69	292
70-74	247
75-79	238
80-84	99
85-89	45
90-94	9
95-99	1
100+	0
TOTAL	1,077

B. ACTIVE PARTICIPANTS

Current Plan	Mandatory Medicare Eligible	Pre-Mandatory Medicare Eligible *	Total
No Medical/ Unknown	178	0	178
Indemnity	61	0	61
Managed Care	820	2	822
TOTAL	1059	2	1,061

* "Pre-Mandatory Medicare eligible" means hired March 31, 1986 or before. "Mandatory Medicare eligible" means hired after March 31, 1986. Employees hired March 31, 1986 or before do not contribute to Medicare.

C. PLAN DEFINITION TABLE ⁽¹⁾

Name of Plan	Type of Plan	Ind Rate	Retirees Enrolled	Fam Rate	Retirees Enrolled	EE Cont % ⁽²⁾
Harvard Pilgrim Access America	Commercial Managed Care	\$1,176.87	6	\$2,621.18	6	20%
Harvard Pilgrim Explorer	Commercial Managed Care	\$973.50	58	\$2,405.64	37	20%
Harvard Pilgrim Quality	Commercial Managed Care	\$719.17	2	\$1,823.77	1	20%
Health New England	Commercial Managed Care	\$732.80	1	\$1,752.35	0	20%
MGB Health Plan Complete	Commercial Managed Care	\$889.83	4	\$2,345.38	1	20%
Unicare Community Choice	Commercial Managed Care	\$674.72	1	\$1,664.17	4	20%
Unicare Plus	Commercial Managed Care	\$881.35	18	\$2,091.70	9	20%
Unicare Total Choice	Commercial Indemnity	\$1,344.40	16	\$2,974.26	11	20%
Health New Eng Medicare Supplement Plus	Medicare Managed Care	\$429.00	3	\$429.00	NA	20%
Tufts Medicare Preferred	Medicare Managed Care	\$351.69	49	\$351.69	NA	20%
Harvard Pilgrim Medicare Enhance	Medicare Indemnity	\$420.58	268	\$420.58	NA	20%
Unicare Medicare Extension	Medicare Indemnity	\$423.84	479	\$423.84	NA	20%
Harvard Pilgrim Access America	Commercial Managed Care	\$1,176.87	6	\$2,621.18	6	20%
Life Insurance	Life	\$6.50	681			20%

⁽¹⁾ Rates at 01/01/2024. Only plans with retiree enrollment shown.

⁽²⁾ 20% for retirees who filed for retirement after 10/1/2009; 15% for retirees who retired after 7/1/1994 and who filed for retirement on or before 10/1/2009; 10% for retirees who retired on or before 7/1/1994 and for survivors.

C. DISTRIBUTION BY AGE AND SERVICE: ACTIVE PARTICIPANTS

Age Group	0-4	5-9	10-15	15-19	20-24	25-29	30-34	35-39	40+	Total
0-19	2	0	0	0	0	0	0	0	0	2
20-24	16	0	0	0	0	0	0	0	0	16
25-29	54	11	0	0	0	0	0	0	0	65
30-34	44	35	7	0	0	0	0	0	0	86
35-39	31	39	19	5	0	0	0	0	0	94
40-44	20	31	16	14	0	0	0	0	0	81
45-49	23	23	14	20	13	1	1	0	0	95
50-54	20	18	16	18	16	29	14	2	0	133
55-59	22	26	15	16	13	33	51	37	1	214
60-64	14	21	11	14	11	26	54	35	2	188
65-69	4	10	3	11	5	12	15	5	1	66
70-74	1	1	1	1	1	3	4	1	1	14
75-79	0	0	1	1	2	0	1	2	0	7
80-84	0	0	0	0	0	0	0	0	0	0
85-89	0	0	0	0	0	0	0	0	0	0
90-94	0	0	0	0	0	0	0	0	0	0
95-99	0	0	0	0	0	0	0	0	0	0
100+	0	0	0	0	0	0	0	0	0	0
TOTAL	251	215	103	100	61	104	140	82	5	1,061

SECTION III – APPENDICES

Actuarial methods and assumptions were selected by the Massachusetts Water Resources Authority, other than those required by statute or by GASB statements, with guidance from Stone Consulting, Inc. This report was prepared using our proprietary valuation model and OPEVS version 5.26. In our professional judgment, this software has the capability to provide results which are consistent with the purposes of the valuation. Output from the software is tested to ensure that the model reasonably represents that which is intended to be modeled. The valuation output is prepared and analyzed using proprietary spreadsheets followed by a final review by a qualified actuary.

Actuarial Methods

Actuarial Cost Method

Costs are attributed between past and future service using the Entry Age Normal cost method. For attribution purposes, benefits are assumed to accrue over all employee service until decrement.

Asset Valuation Method

Market value of assets with payables and receivables.

Actuarial Assumptions

Valuation Date

January 1, 2024

Interest Rate / Discount Rate

- 6.75% per year net of investment expenses.
- 6.75% per year as of prior valuation.

Salary Scale

Years of Service	
0	5.75%
1-2	5.25%
3-4	5.00%
5-6	4.50%
7-8	4.25%
9+	4.00%

Actuarial Assumptions (Continued)

Inflation

- CPI-U of 2.50% per year.

Mortality

- **Actives:** The PUB-2010 Headcount-weighted Mortality Tables, sex-distinct, for Employees projected using generational mortality and scale MP-2021.
- **Retirees:** The PUB-2010 Headcount-weighted Mortality Tables, sex-distinct, for Healthy Retirees and Contingent Survivors projected using generational mortality and scale MP-2021. Set forward 2 years for disabled retirees.

No additional mortality projection is assumed other than as described above.

Eligibility for Vested Post-Retirement Medical Benefits upon Withdrawal

10 years of Service; assumed that individuals who withdraw prior to age 40 will elect a return of pension contributions and therefore be ineligible for retiree medical coverage.

Withdrawal Prior to Retirement

Based on years of service. Same for both pre- and post-April 1, 2012 (Tier 1 and Tier 2) hires.

Years of Service	Groups 1 and 2
0	15.00%
1	12.00%
2	10.00%
3	9.00%
4	8.00%
5	7.60%
6	7.50%
7	6.70%
8	6.30%
9	5.90%
10	5.40%
11	5.00%
12	4.60%
13	4.10%
14	3.70%
15	3.30%
16-20	2.00%
21-29	1.00%
30+	0.00%

Actuarial Assumptions (Continued)

Disability Prior to Retirement

The rates shown at the following sample ages illustrate the assumption regarding the incidence of disability. Disability is assumed to be 55% ordinary and 45% accidental.

Age	Groups 1 and 2
20	0.01%
25	0.02%
30	0.03%
35	0.06%
40	0.10%
45	0.15%
50	0.19%
55	0.24%
60	0.28%

Medicare Eligibility

- **Employees:** 100% if hired March 31, 1986 or after; 85% if hired pre-March 31, 1986.
- **Spouses:** 100%

Actuarial Assumptions (Continued)

Rates of Retirement

Based on gender, group, and hire date.

	Hired Post-April 1, 2012		Hired Post-April 1, 2012	
Age	Groups 1 and 2 Male	Groups 1 and 2 Female	Groups 1 and 2 Male	Groups 1 and 2 Female
50	0.75%	1.125%	-	-
51	0.75%	1.125%	-	-
52	0.75%	1.50%	-	-
53	0.75%	1.825%	-	-
54	1.50%	1.875%	-	-
55	1.50%	4.125%	-	-
56	1.875%	4.875%	-	-
57	1.875%	4.875%	-	-
58	3.75%	4.875%	-	-
59	4.875%	4.875%	-	-
60	9.00%	3.75%	15.00%	6.25%
61	15.00%	9.75%	15.00%	9.75%
62	22.50%	11.25%	22.50%	11.25%
63	18.75%	9.375%	18.75%	9.375%
64	16.50%	13.50%	16.50%	13.50%
65	30.00%	11.25%	30.00%	11.25%
66	18.75%	15.00%	18.75%	15.00%
67	18.75%	15.00%	18.75%	15.00%
68	22.50%	18.75%	22.50%	18.75%
69	22.50%	15.00%	22.50%	15.00%
70	100.00%	100.00%	100.00%	100.00%

Actuarial Assumptions (Continued)

Plan Enrollment Rates

These are the rates which retirees select medical plans, given that they enroll in a medical plan. The selection patterns follow the table below.

Participant Behavior at Key Ages

Status	Age	Pre-65 Retirement	65+ Retirement
Active	Under 65	Commercial Managed Care: 85% Commercial Indemnity: 15%	Medicare Managed Care: 8% Medicare Indemnity: 92% Commercial Managed Care: <1%
Active	65+	NA	Medicare Managed Care: 8% Medicare Indemnity: 92% Commercial Managed Care: <1%
Retired	Under 65	Current Plan	Medicare Managed Care: 8% Medicare Indemnity: 92% Commercial Managed Care: <1% Or Actual Plan if already in Medicare
Retired	65+	NA	Current Plan

Sample Claim Costs

Age-graded claim rates are derived using valuation demographics and aging curves from Health Care Costs – From Birth to Death, published by the Society of Actuaries in June, 2013.

Age	Commercial Managed Care Individual	Commercial Managed Care Blended ⁽¹⁾	Commercial Indemnity Individual	Commercial Indemnity Blended ⁽¹⁾	Medicare Managed Care	Medicare Indemnity
55	\$11,205.27	\$18,662.72	\$13,352.25	\$21,405.11	\$3,072.52	\$4,459.92
60	\$14,166.10	\$23,550.50	\$16,765.81	\$26,877.41	\$3,072.52	\$4,459.92
65	\$17,737.96	\$21,838.83	\$20,904.23	\$25,316.86	\$3,072.52	\$4,459.92
70	\$21,452.41	\$26,411.99	\$25,281.45	\$30,618.06	\$3,605.05	\$4,894.85
75	\$25,947.24	\$31,945.69	\$30,576.35	\$37,030.66	\$4,337.46	\$5,272.06
80	\$30,839.29	\$37,968.74	\$36,341.54	\$44,012.80	\$5,144.41	\$5,542.53
85	\$30,839.29	N/A	\$36,341.54	N/A	\$6,021.18	\$5,632.86

⁽¹⁾ Blended rates below 65 are 50% Family and 50% Individual. Blended rates 65 and higher are 17.5% Family and 82.5% Individual. Individual rates are used for all participants 81 and higher.

Actuarial Assumptions (Continued)

Trend Rates by Plan

Year	Commercial Managed Care	Commercial Indemnity	Medicare Indemnity	Medicare Managed Care
2024	9.15%	11.55%	4.17%	3.06%
2025	8.50%	9.50%	6.60%	5.90%
2026	8.50%	9.50%	6.60%	5.90%
2027	7.70%	8.40%	6.40%	5.80%
2028	7.40%	8.00%	6.10%	5.60%
2029	6.70%	7.10%	5.90%	5.60%
2030	6.40%	6.80%	5.60%	5.30%
2031	5.80%	5.90%	5.40%	5.30%
2032	5.50%	5.60%	5.10%	5.00%
2033+	5.00%	5.00%	5.00%	5.00%

Trend assumptions are based on the Society of Actuaries' Getzen model of medical inflation but have been modified by Stone Consulting to account for the cost-shifting which happens from Medicare to commercial plans and from managed care to indemnity plans.

Expenses

Administrative expenses are included in the per capita medical cost assumption.

Actuarial Assumptions (Continued)

Participation Rates

Current retirees and spouses are assumed to continue the same coverage they have as of the valuation date. No future election of coverage is assumed for those retirees and spouses who currently have not elected coverage.

Medical All Retirees: 82.5% of the active Massachusetts Water Resources Authority employees eligible for post-employment medical benefits are assumed to elect Medical Coverage immediately upon retirement. 50% of pre-65 retirees and 17.5% of post-65 retirees are assumed to elect family plans.

Life All Retirees: 92.5% of active Massachusetts Water Resources Authority employees eligible for post-employment medical benefits are assumed to elect Life Insurance coverage immediately upon retirement.

For all Retirees: For the Massachusetts Water Resources Authority plans 57.5% of spouses are assumed to participate pre-65 and 65% of spouses are assumed to participate post-65.

Participants with no or unknown current coverage (e.g. active employees who do not currently participate in Massachusetts Water Resources Authority's medical plans) are assumed to elect retiree coverage at the same rates as currently covered active employees. Medicare-eligible retirees currently under age 65 are assumed to elect a Medicare plan option at age 65.

Principal Plan Provisions Recognized in Valuation

ELIGIBILITY FOR BENEFITS

Current retirees, beneficiaries and spouses of Massachusetts Water Resources Authority are eligible for medical benefits, as are current employees or spouses who retire with a benefit from the Massachusetts Water Resources Authority. Survivors of Massachusetts Water Resources Authority employees and retirees are also eligible for medical benefits.

MEDICAL BENEFITS

Various medical plans offered by Massachusetts Water Resources Authority to its own employees.

LIFE INSURANCE

Massachusetts Water Resources Authority retirees are eligible for a \$5,000 life insurance benefit. Retirees pay 20% of the \$6.50 cost.

RETIREE CONTRIBUTIONS

Based on data provided by Massachusetts Water Resources Authority.

Glossary

- **Actuarial Assumptions:** Assumptions as to the occurrence of future events affecting Other Post-Employment Benefits such as: mortality rates, disability rates, withdrawal rates, and retirement rates, the discount assumption, and the trend rates.
- **Actuarial Cost Method:** A procedure for determining the actuarial present value of total projected benefits and for developing an actuarially equivalent allocation of such value to time periods, usually in the form of a Service Cost and a Total OPEB Liability.
- **Amortization Payment:** The portion of the OPEB contribution designed to pay interest and to amortize the Unfunded Actuarial Accrued Liability.
- **Actuarial Accrued Liability:** The portion, as determined by a particular Actuarial Cost Method, of the present value of benefits which is not provided for by future Service Costs. Referred to as the Actuarial Accrued Liability in funding valuations.
- **Actuarially Determined Contribution (ADC):** The employer's periodic contributions to a defined benefit OPEB plan, calculated in accordance with the Actuarial Standards of Practice.

- **Commercial Plans:** Plans designed to cover the medical expenses of those not otherwise covered by Medicare.
- **GASB:** The Governmental Accounting Standards Board is the organization that establishes financial reporting standards for state and local governments.
- **Implicit Subsidy:** The difference between retirees' actual incurred costs for medical coverage and the total premiums charged for such coverage. In group insurance, premiums for younger active employees are implicitly overstated to subsidize the higher utilization by retirees, and this overstatement is considered a contribution to the Plan.
- **Investment return Assumptions (Discount Rate):** The rate used to adjust a series of future benefit payments to reflect the time value of money.
- **Healthcare Cost Trend Rate:** The rate of change in per capita health claims costs over time as a result of factors such as medical inflation, utilization of healthcare services, the intensity of the delivery of services, technological developments, and cost-shifting.
- **Medicare Plans:** Medical plans sold to those over 65 who are also covered by Medicare. These plans are supplemental to the Medicare plan, which is considered primary.
- **Normal Cost:** The portion of the Actuarial Present value of plan benefits that is allocated to a valuation year by the Actuarial Cost Method. Referred to as Service Cost in GASB valuations.
- **OPEB:** Other Post-Employment Benefits, other than pensions. This does not include plans such as severance plans or sick-time buyouts.
- **Pay-As-You-Go:** The value of benefits (claims) paid out to plan participants during the year. This is estimated using premium amounts and age-related claim costs from *Health Care Costs – From Birth to Death*, published by the Society of Actuaries in June 2013.
- **Per Capita Claims Cost:** The current average annual cost of providing postretirement health care benefits per individual.
- **Service Cost:** The portion of the Actuarial Present value of plan benefits that is allocated to a valuation year by the Actuarial Cost Method. Referred to as Normal Cost in funding valuations.
- **Unfunded Accrued Actuarial Liability:** The portion of the Accrued Actuarial Liability that is not covered by plan assets.
- **Valuation Date:** The point from which all future plan experience is projected and as of which all present values are calculated.