



**WASHINGTON SUBURBAN SANITARY COMMISSION
EMPLOYEES' RETIREMENT PLAN**

**ACTUARIAL VALUATION
AS OF
JUNE 30, 2022**



June 2023

CONTENTS

EXECUTIVE SUMMARY.....	2
SECTION 1: SUMMARY OF VALUATION RESULTS	4
1.1: Plan Assets	5
1.2: Development of Unfunded Actuarial Accrued Liability	12
1.3: Development of Experience Gain/Loss	13
1.4: Actuarially Determined Employer Contribution	14
1.5: Present Value of Plan Benefits	15
1.6: Present Value of Accumulated Plan Benefits (PVAB)	16
1.7: Change in Present Value of Accumulated Plan Benefits.....	17
SECTION 2: BASIS OF VALUATION	18
2.1: Summary of Plan Provisions.....	19
2.2: Demographic Information.....	24
2.3: Actuarial Assumptions and Methods	30
SECTION 3: PROJECTIONS OF PLAN FUNDING	33
3.1: 15-Year Projection of Cash Flows	34
3.2: 15-Year Projection of Funding Progress.....	35
RISK ASSESSMENT.....	36

EXECUTIVE SUMMARY

This report contains the results of an actuarial valuation of the Washington Suburban Sanitary Commission Employees' Retirement Plan (the Plan) as of June 30, 2022. The contents of this report reflect generally accepted actuarial principles.

This study relies on the following information supplied by WSSC Water: data on plan participants, plan provisions, the amount of contributions, and a reconciliation of the plan's assets from the prior year.

Boomershine Consulting Group did not audit the participant data or financial information used in this report. Based on our review of this information, we believe that it is sufficiently complete and reliable, and that it is appropriate for the purposes intended.

It is our understanding that WSSC Water currently maintains a 16.9% of covered payroll employer contributions to the Plan. This rate is slightly lower than the Actuarially Determined Employer Contribution Rate as defined in Section 1.3 (i.e., with 20-year amortization of Unfunded Liability).

The funding ratio is now 82.3% (AVA basis), and is expected to remain near that level before eventually improving, as shown in Section 3.2. Section 1 contains the results of the valuation, including evaluation of the contribution rate, per the Actuarial Funding Policy. The funding ratio using the market value of assets is 77.0% (i.e., recognizing all investment losses immediately).

Plan experience since the prior valuation includes the following:

Favorable Experience (Gains)

Mortality. There were 76 deaths among retirees including disabled retirees and beneficiaries, for the plan year, compared to 53 expected. There were 21 new beneficiaries associated with these deaths.

- *Compensation.* This year's total payroll for continuing active employees increased by 1.38% over the prior valuation, which is less than assumed.
- *Employee Turnover.* The number of active participants who terminated during the plan year for reasons other than retirement, disability, death or leave of absence was 127, which is more than the expected 59 terminations.

The experience gains from these items decreased the actuarial cost and liability of the Plan.

Unfavorable Experience (Losses)

- *Cost-of-Living Adjustments – Closed Plan.* Benefits were increased by 3.569% effective February 1, 2022 and 3.697% effective June 1, 2022 for non-active participants in the closed group, which is greater than the assumed 2.50% cost-of-living increase.
- *Cost-of-Living Adjustments – Open Plan.* Benefits were increased by 7.036% effective March 1, 2022 for non-active participants in the open group. This is greater than the assumed 2.50% cost-of-living increase for the open group.
- *Investment Return.* On a market-value basis, the Plan's return was -10.89% for the year ended June 30, 2022, compared to the assumed rate of 7.00%.

- *Retirements.* The number of active participants who retired during the plan year totaled 71, compared to the expected 66 retirements.

The experience losses from above increased the actuarial cost and liability of the Plan.

The net impact of the experience gains and losses for the prior Plan year is an increase in actuarial cost as a percentage of payroll, from 14.8% to 17.2%.

New Entrants. The number of active participants decreased by 3.09% from 1,651 as of June 30, 2021 to 1,600 as of June 30, 2022. This included the net impact of exits and new entrants.

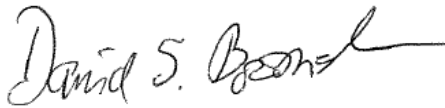
Section 2 describes the basis of the valuation. That section summarizes the plan provisions, as well as the actuarial assumptions and methods used to develop the figures herein.

To the best of our knowledge, the information contained in this report is complete and accurate. The undersigned are available to provide further information and answer any questions with respect to this report.

The first two undersigned are members of the American Academy of Actuaries, and meet the qualification standards required to render the actuarial opinions presented herein.



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SECTION 1: SUMMARY OF VALUATION RESULTS

1.1: Plan Assets

An adjusted market value of assets, or Actuarial Value of Assets (AVA), is used for the valuation to gradually recognize investment gains and losses. This method reflects five-year smoothing, such that 20% of each gain or loss is recognized per year until the entire amount has been recognized.

To ensure that the adjusted market value of assets remains reasonably close to the market value, a corridor is applied that requires the adjusted market value of assets be no less than 80% and no more than 120% of the market value.

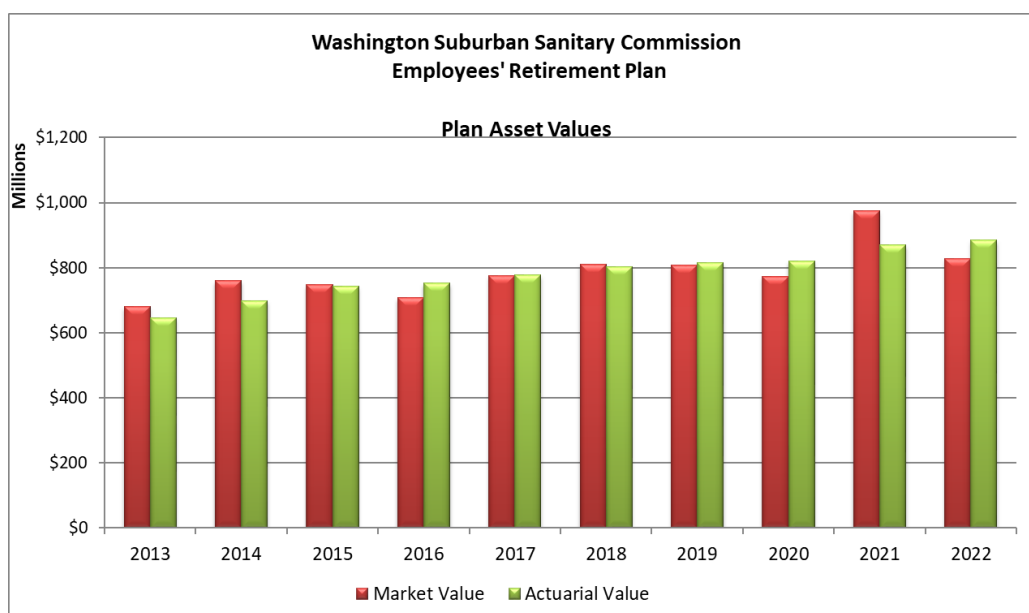
Historical Values

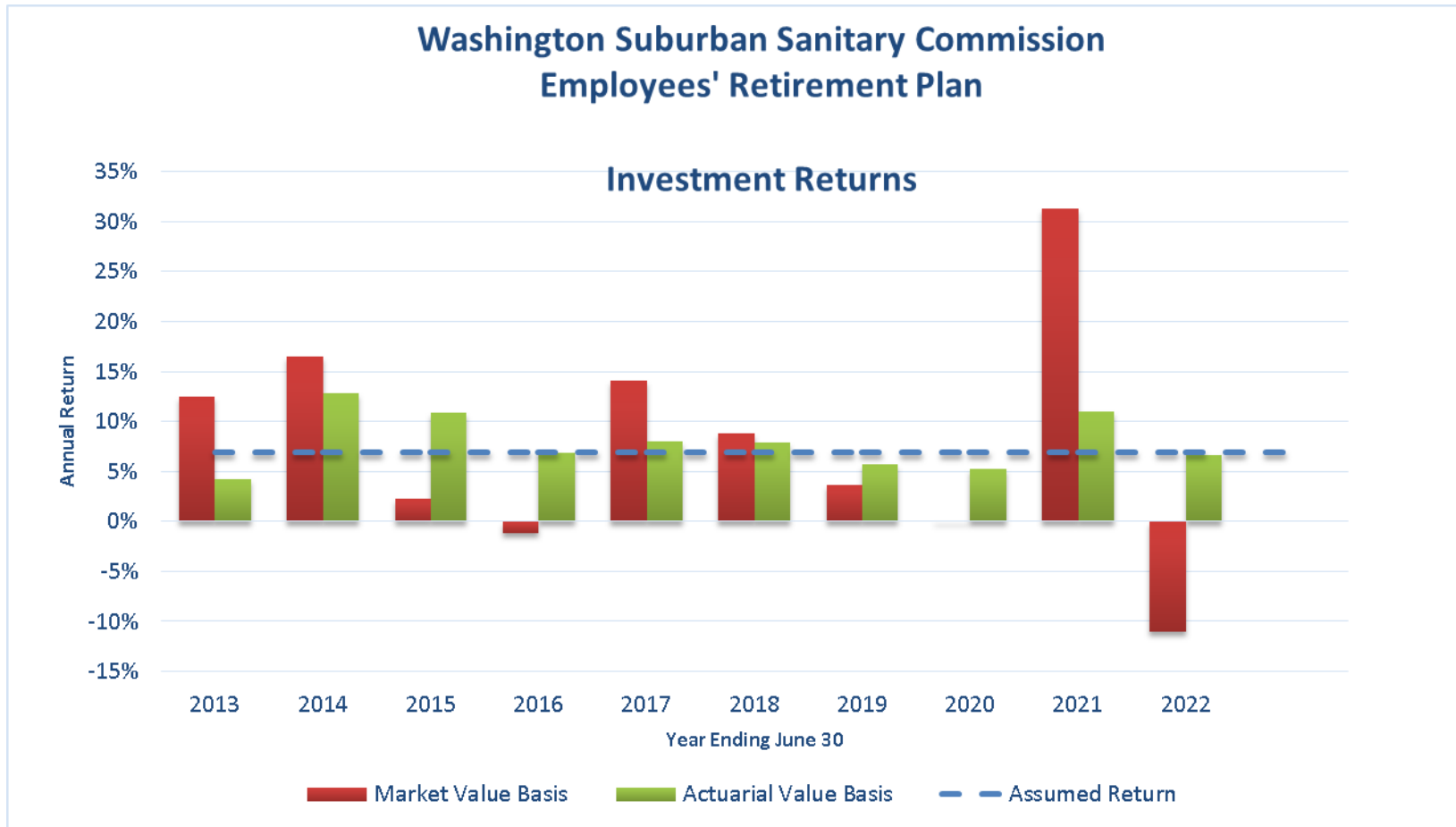
The following table shows the most recent five years of market values as well as smoothed asset values, and the accompanying annual returns.

Year Ending June 30	Market Value		Actuarial Value	
	Value	Annual Return	Value	Annual Return
2018	\$ 810,937,596	8.79%	\$804,356,892	7.89%
2019	807,675,683	3.67%	814,596,098	5.75%
2020	773,168,364	0.02%	819,689,860	5.27%
2021	974,626,269	31.25%	870,314,780	10.97%
2022	829,319,365	-10.98%	885,515,619	6.69%
Five Year Compound Return		7.30%		5.72%

As expected, some years the Actuarial Value is greater than the Market Value, and some years it is less. Therefore, the smoothing method has had the intended effect.

Included in the remainder of this section are: the reconciliation of the market value of assets from June 30, 2021 to June 30, 2022; development of the actuarial value of assets; a comparative summary of assets; and summary of historical returns and experience.





Earnings Experience for Fund on Plan Year Basis

	Plan Year Ending			
	<u>6/30/2019</u>	<u>6/30/2020</u>	<u>6/30/2021</u>	<u>6/30/2022</u>
Market Basis				
Net Investment Income*	\$ 13,595,076	\$ 19,880,955	\$ 20,836,736	\$ 15,538,423
Capital Gains (Losses)	<u>15,535,021</u>	<u>(19,751,831)</u>	<u>215,321,418</u>	<u>(120,364,083)</u>
Total Income	\$ 29,130,097	\$ 129,124	\$ 236,158,154	\$(104,825,660)
Average Mean Market Value of Assets**	\$ 794,741,591	\$ 790,357,462	\$ 755,818,240	\$ 954,385,647
Rate of Return*				
Net Investment Income	1.71%	2.52%	2.75%	1.63%
Capital Gains (Losses)	1.95%	-2.50%	28.49%	-12.61%
Total Investment Return	3.67%	0.02%	31.25%	-10.98%

* Net of investment expenses

** [Beginning of Year Value + End of Year Value - Total Income] divided by 2

Note: Percentages may not sum to total due to rounding.

Annual Compounded Market Value Rate of Investment Return

Period Beginning <u>July 1</u>	Period Ending on June 30									
	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>
2012	12.47%	14.49%	10.29%	7.32%	8.65%	8.67%	7.95%	6.92%	9.38%	7.15%
2013		16.56%	9.21%	5.66%	7.71%	7.94%	7.21%	6.15%	9.00%	6.58%
2014			2.33%	0.60%	4.92%	5.87%	5.43%	4.52%	7.96%	5.39%
2015				-1.11%	6.26%	7.09%	6.22%	4.95%	8.93%	5.84%
2016					14.12%	11.43%	8.79%	6.52%	11.06%	7.04%
2017						8.79%	6.23%	4.11%	10.31%	5.68%
2018							3.67%	1.83%	10.83%	4.92%
2019								0.02%	14.57%	5.33%
2020									31.25%	8.13%
2021										-10.98%

Statement of Plan Assets (Market Value Basis)

	<u>June 30, 2022</u>	<u>June 30, 2021</u>
1. Cash	\$0	\$0
2. Investment	<u>829,866,942</u>	<u>975,207,069</u>
3. Subtotal (1 + 2)	\$ 829,866,942	\$ 975,207,069
4. Accrued Contributions		
a. Employer	0	0
<u>b. Employee</u>	<u>267,809</u>	<u>278,584</u>
c. Total	267,809	278,584
5. Accrued Income	<u>546,196</u>	<u>574,753</u>
6. Total Assets (3 + 4c + 5)	\$ 830,680,947	\$ 976,060,406
7. Accrued Liabilities	(1,361,582)	(1,812,551)*
8. Net Plan Assets (6 + 7)	\$ 829,319,365	\$ 974,247,855

*Has been adjusted by (\$378,414).

Statement of Receipts and Disbursements of Plan Assets

	<u>Year ending June 30, 2022</u>	<u>Year ending June 30, 2021</u>
Market Value as of the beginning of the year	\$ 974,247,855	\$ 773,168,364
Receipts		
Contributions:		
Employer Basic Contributions	\$27,292,400	\$27,281,954
Employer (Restoration Plan)	20,618	50,000
<u>Employees</u>	<u>4,620,918</u>	<u>4,733,960</u>
Subtotal	\$31,933,936	\$ 32,065,914
Investment Income:		
Interest and Dividends	\$17,098,202	\$23,729,354
Investment Expenses	(1,559,779)	(2,892,618)
<u>Capital Gain (Loss)</u>	<u>(120,364,081)</u>	<u>215,321,418</u>
Net Investment Income	(\$104,825,660)	\$236,158,154
Total Additions	\$(72,891,724)	\$ 268,224,068
Disbursements and Deferrals		
Benefit Payments and Refunds of Employee Contributions	\$71,267,466	\$66,016,120
Administrative Expenses	<u>769,300</u>	<u>750,044</u>
Total Disbursements	\$72,036,766	\$66,766,164
Market Value as of the end of the year	\$829,319,365	\$974,626,269
Adjustment for Accrued Liabilities	0	(378,414)
Adjusted Market Value	\$829,319,365	\$974,247,855

Development of Actuarial Value of Assets

The Actuarial Value of Assets equals the Market Value of Assets, adjusted for unrecognized gains and losses from prior years. Investment gains and losses are determined by calculating the expected asset return based on Plan assumptions and subtracting the actual Plan return. Each gain/loss is phased in 20% per year over a 5-year period. The Actuarial Value of Assets is adjusted, if necessary, to fall within a corridor of 80% to 120% of the Market Value of Assets on the valuation date.

	Year Ending <u>6/30/2022</u>	Year Ending <u>6/30/2021</u>
1. Market Value of Assets as of beginning of year Before adjustment for administrative expenses	\$974,247,855	\$773,168,364
2. Total Contributions for the year	31,933,936	32,065,914
3. Total Disbursements during the year	72,036,766	66,766,164
4. Expected Return	67,748,985	53,172,683
5. Actual Return for the year	(104,825,660)	236,158,154
6. Investment Gain/(Loss)	(172,574,645)	182,985,471
7. Gains/(Losses): Unrecognized Amounts:		
Current Year	(138,059,716)	146,388,377
First Prior Year	109,791,283	(33,673,636)
Second Prior Year	(22,449,091)	(10,957,460)
<u>Third Prior Year</u>	<u>(5,478,730)</u>	<u>2,554,208</u>
Total Unrecognized Gains/(Losses)	\$ (56,196,254)	\$ 104,311,489
8. Market Value of Assets as of end of year	\$829,319,365	\$974,626,269
9. Actuarial Value of Assets as of end of year: [(8) - (7)]	885,515,619	870,314,780
10. Final Actuarial Value of Assets (AVA) with 80% - 120% Corridor Limitation Applied	\$885,515,619	\$870,714,780
Ratio of Actuarial Value to Market Value	106.8%	89.3%

1.2: Development of Unfunded Actuarial Accrued Liability

	<u>June 30, 2022</u>	<u>June 30, 2021</u>
1. Actuarial Accrued Liability (AAL)		
a. Active Participants		
(i) Retirement (Immediate Pension)	\$249,831,660	\$262,227,402
(ii) Vested Termination (Deferred to Normal Retirement)*	(862,474)	(764,450)
(iii) Death - Spouse's Benefit*	4,437,057	4,811,486
(iv) <u>Disability*</u>	<u>2,287,165</u>	<u>2,535,578</u>
(v) Total Active Participants	\$255,793,408	\$268,810,016
b. Retired and Disabled Participants Receiving Benefits	809,519,047	749,723,985
c. Terminated Participants with Deferred Benefits **	10,389,135	10,381,816
d. Refunds		
(i) Accumulated Employee Contributions Credited to Account of Terminated Participants and Beneficiaries of Deceased Participants who have not received a refund	\$777,675	\$455,415
(ii) <u>Nonvested Participants on Leave of Absence or Military Leave</u>	<u>48,201</u>	<u>17,408</u>
(iii) Total Refunds	\$825,876	\$472,823
e. Total Actuarial Accrued Liability	\$1,076,527,466	\$1,029,388,640
2. Actuarial Value of Assets	885,515,619	870,314,780
3. Funding Ratio (2 / 1e)	82.3%	84.5%
4. Unfunded Actuarial Accrued Liability (UAAL) (1e - 2)	\$191,011,847	\$159,073,860

*Including liability for refund of employee contributions for Active Participants.

**Including liability for vested Participants on Leave of Absence or Military Leave. Nonvested Participants who are on a Leave of Absence or Military Leave are included with Refunds in line 1d(ii)

1.3: Development of Experience Gain/Loss

1. Unfunded actuarial accrued liability as of June 30, 2021		\$159,073,860
2. Change due to contributions:		
(a) Employer Normal Cost, beginning of year	\$9,078,975	
(b) Interest on (1) and (a)	11,770,698	
(c) Expected Employer Contribution, end of year	<u>(26,449,752)</u>	
(d) Net change [(a) + (b) + (c)]	(\$5,600,079)	
3. Expected unfunded actuarial accrued liability as of June 30, 2022 [(1) + (2)]		\$153,473,781
4. Change since prior year:		
(a) Non-investment experience (gain)/loss	\$35,125,405	
<u>(b) (Gain)/loss from assets/contributions</u>	<u>2,412,661</u>	
(c) Net change [(a) + (b)]	\$37,538,066	
5. Unfunded actuarial accrued liability before changes [(3) + (4c)]		\$191,011,847
6. Change in actuarial assumptions		0
7. Change in plan provisions		0
8. Changes in actuarial methods		0
9. Unfunded actuarial accrued liability as of June 30, 2022 [(5) + (6) + (7) + (8)]		\$191,011,847

1.4: Actuarially Determined Employer Contribution

	<u>June 30, 2022</u>	<u>June 30, 2021</u>
1. Total Normal Cost, with Expenses	\$13,208,402	\$13,781,174
As a percentage of payroll	8.88%	8.81%
2. 20-Year Level Dollar Amortization of Unfunded Actuarial Accrued Liability	16,850,623	14,033,128
3. Expected Employee Contributions	4,462,995	4,702,199
4. Actuarially Determined Employer Contribution [(1) + (2) - (3)]	\$25,596,030	\$23,112,103
5. Expected Payroll for the Year	148,686,933	156,507,410
6. Net Employer Cost as a % of Payroll [(4) / (5)]	17.21%	14.77%
7. Fixed WSSC Water Contribution Rate, % of Payroll	16.90%	16.90%
Equivalent Amortization Years Implied by Fixed Rate:		
Level Dollar	21.3	15.1
Level Percent of Payroll	15.0	11.5
Fixed Contribution Adequate to cover Actuarial Cost:	NO	YES
Estimated Additional Contribution to satisfy ADEC as computed above:	\$466,248 (0.31% of payroll)	N/A

The calculation above is based on WSSC Water's current Actuarial Funding Policy for the Retirement Plan.

History of Equivalent Amortization Years

Valuation Year	Equivalent Years - Level Dollar	Equivalent Years - Level % of Payroll
2015	16.3	12.2
2016	14.2	11.0
2017	13.0	10.3
2018	12.4	9.9
2019	12.2	9.8
2020	18.7	13.3
2021	15.1	11.5
2022	21.3	15.0

1.5: Present Value of Plan Benefits

	<u>June 30, 2022</u>	<u>June 30, 2021</u>
Number of Plan Participants		
Active Participants	1,600	1,651
Retired and Disabled Participants Receiving Benefits	1,705	1,678
Terminated Participants with Deferred Benefits or Refunds Due	139	126
<u>Participants on Leave of Absence or Military Leave</u>	<u>13</u>	<u>14</u>
Total Participants	3,457	3,469
Total Annual Earnings of Active Participants	\$ 151,190,586	\$ 158,887,302
Total Annual Benefits of Retired and Disabled Participants	73,624,954	68,014,757
 Present Value of Plan Benefits (PVB)		
1. Active Participants		
a. Retirement (Immediate Pension)	\$ 336,383,432	\$ 353,660,018
b. Vested Termination (Pension Deferred to Normal Retirement)*	11,255,379	12,010,462
c. Death - Spouse's Benefit*	6,308,015	6,797,893
<u>d. Disability*</u>	<u>5,451,132</u>	<u>5,829,595</u>
e. Total Active PVB (a + b + c + d)	\$ 359,487,958	\$ 378,297,968
2. Retired and Disabled Participants Receiving Benefits	809,519,047	749,723,985
3. Terminated Participants with Deferred Benefits**	10,389,135	10,381,816
4. Refunds		
a. Accumulated Employee Contributions Credited to Account of Terminated Participants and Beneficiaries of Deceased Participants who have not received a refund	777,675	455,415
b. <u>Nonvested Participants on Leave of Absence or Military Leave</u>	<u>48,201</u>	<u>17,408</u>
c. Total Refunds (a + b)	\$ 825,876	\$ 472,823
Total Present Value of Benefits (1e + 2 + 3 + 4c)	\$ 1,180,222,016	\$ 1,138,876,592

*Including liability for refund of employee contributions for Active Participants.

**Including liability for vested Participants on Leave of Absence or Military Leave. Non-vested Participants who are on a Leave of Absence or Military Leave are included with Refunds in line 4.

1.6: Present Value of Accumulated Plan Benefits (PVAB)

	<u>June 30, 2022</u>	<u>June 30, 2021</u>
1. Actuarial present value of vested benefits (PVVB)		
a. Participants currently receiving payments (retired and disabled participants and beneficiaries)	\$809,519,047	\$749,723,985
b. Other participants		
i. Active participants	190,304,778	203,968,106
ii. <u>Deferred vested participants/refunds</u>	<u>11,215,011</u>	<u>10,854,639</u>
iii. Total	201,519,789	214,822,745
c. Total PVVB (a. + b.)	\$1,011,038,836	\$964,546,730
2. Actuarial present value of non-vested benefits	10,419,382	6,098,176
3. Total actuarial present value of accumulated plan benefits (PVAB) (1.c. + 2.)	\$1,021,458,218	\$970,644,906
4. Market value of assets	829,319,365	974,626,269
5. Ratio of Assets to PVAB (4. ÷ 3.)	81.2%	100.4%

The calculation of the actuarial present value of accumulated plan benefits is based on the unit credit cost method (which is based on no future service or salary increases) and the actuarial assumptions shown in Section 2.3.

1.7: Change in Present Value of Accumulated Plan Benefits

1. Actuarial present value of accumulated plan benefits (PVAB) as of July 1, 2021	\$ 970,635,906
2. Change due to plan amendments	0
3. Change due to changes in assumptions and/or methods	0
4. Change due to passage of time	65,450,152
5. Change due to benefits paid	(71,267,466)
6. Change due to benefits accumulated and plan experience	56,639,626
7. Actuarial present value of accumulated plan benefits (PVAB) as of June 30, 2022: (1 + 2 + 3 + 4 + 5 + 6)	\$ 1,021,458,218

SECTION 2: BASIS OF VALUATION

2.1: Summary of Plan Provisions

The salient features of the retirement plan are presented below.

1. Effective date May 1, 1967. The most recent amendment was adopted in April, 2019.
2. Closed version Closed version means the retirement plan in effect on June 30, 1978. Membership in this version is mandatory for employees hired prior to July 1, 1978 who did not elect to transfer membership to the open version.
3. Participation Each permanent full-time employee automatically becomes a participant on his hire date. A contract employee may be excluded by contractual agreement.
4. Gross compensation Gross compensation is defined as total compensation paid to the employee by WSSC Water excluding merit bonuses, lump sum pay awards, and General Manager's awards, plus any amounts of compensation for which the employee has entered into a deferred compensation agreement and/or employer pick-up contributions. It does not include the employee's final pay period unless he receives compensation for the full pay period.
5. Final average monthly compensation Final average monthly compensation is defined as an amount equal to the participant's gross compensation during each of the three years prior to termination which were the highest (to include 78 pay periods), divided by 36 months.
6. Credited service Credited service means the years and fractional years (measured to the nearest month) of an employee's latest period of continuous service but excludes periods of non-military leaves of absence without pay which are not otherwise purchased. Additional "purchased" years of WSSC Water service, military service, prior agency service and authorized leave(s) of absence are added.

Credited service includes accumulated unused sick leave that counts at the rate of .000481 year's credited service for each hour of unused sick leave.

For purposes of computing benefits, credited service, excluding credit for unused sick leave, is limited to a maximum of 36 years.
7. Closed version credited service Closed version credited service means all credited service earned by an employee hired prior to July 1, 1978 until the date he transfers his membership to the open version. Also included is purchased service if the employee is a member at the time of purchase.

8. Open version credited service Open version credited service means all credited service earned by an employee hired after June 30, 1978. Any employee hired prior to July 1, 1978 who transfers his membership to the open version shall have all credited service earned after his transfer counted as open version credited service. Also included is purchased service if the employee is a member at the time of purchase.

9. Employee contributions Mandatory: Each participant in the closed version is required to contribute 6% of his gross compensation with respect to each pay period. Each participant in the open version is required to contribute 3% of his gross compensation with respect to each pay period. All contributions are credited with 5% interest per annum.

10. Normal retirement Eligibility: A participant in the closed version is eligible to retire upon the earlier of (i) attainment of age 60 and completion of one year credited service and (ii) the completion of 30 years of credited service.

A participant in the open version hired before March 31, 1994 is eligible to retire upon the earlier of (i) attainment of age 62 and completion of three years credited service, and (ii) the date on which he has completed at least 30 years credited service and the sum of his credited service and attained age total at least 85.

A participant in the open version hired after March 31, 1994 is eligible to retire upon the earlier of (i) attainment of 65 and completion of five years credited service, and (ii) the date on which he has completed at least 30 years credited service and the sum of his credited service and attained age total at least 85.

Monthly benefit amount: $2.1\% \times \text{final average monthly compensation} \times \text{closed version credited service}$ plus $1.4\% \times \text{final average monthly compensation} \times \text{open version credited service}$.

11. Early retirement Any employee in the closed version may retire early provided he has completed 15 or more years of credited service and has attained age 45, and further provided that the sum of his age and credited service at termination total at least 65.

Any employee in the open version may retire early provided he has completed 15 or more years of credited service and has attained age 50.

Early Retirement
(continued)

Monthly benefit amount: The annual monthly benefit is determined in accordance with the normal retirement formula but using final average monthly compensation and credited service at the time of termination. This benefit is reduced to reflect early commencement. The percentage payable is as follows (provided, however, that the Open Version reductions for years 13, 14 and 15 shall be effective only with respect to Employees hired on and after January 21, 2009):

Years <u>Early</u>	Percentage of Benefit Payable	
	<u>Closed Version</u>	<u>Open Version</u>
1	98%	95%
2	95%	90%
3	91%	85%
4	86%	80%
5	80%	75%
6	74%	70%
7	68%	65%
8	62%	60%
9	56%	55%
10	50%	50%
11	44%	45%
12	38%	40%
13	32%	35%
14	26%	30%
15	20%	25%

If a participant defers the commencement of benefits, his benefit will be adjusted by any cost-of-living increases made effective during the deferral period.

12. Temporary supplemental benefit

Any participant in the Open Version whose benefit commencement date is prior to age 62 shall receive a benefit equal to 0.6% of his final average monthly compensation at termination multiplied by his Open Version credited service at termination, reduced to reflect early commencement, if applicable. The percentage of benefit payable is determined in accordance with the percentages in the previous table. The benefit is payable through the month in which he attains age 62 or dies, if earlier.

13. Disability retirement

Eligibility: A participant is eligible for a disability benefit if he has one year of credited service and is found by the Social Security Administration to be disabled under its criteria for a period of at least 24 months.

Disability Retirement
(continued)

Monthly benefit amount: The disability benefit is determined under the normal retirement formula using credited service and final average monthly compensation at the time of termination. This benefit is subject to a minimum of 35% of final average monthly compensation, or 50% of final average monthly compensation if disabled as a result of a job-related accident.

14. Deferred vested retirement

Eligibility: Any participant of the plan who terminates after completing five years of credited service is eligible for a deferred vested benefit beginning on his normal retirement date.

Monthly benefit amount: The deferred vested benefit is determined using the normal retirement formula based on final average monthly compensation and credited service at the time of termination.

In lieu of this benefit the participant may elect a withdrawal benefit and thereby forfeit his deferred vested benefit.

15. Withdrawal benefit

Eligibility: Each participant, who terminates before becoming eligible for a normal, early, disability or deferred retirement benefit, automatically receives a withdrawal benefit. Any participant eligible for a normal, early, disability or deferred vested retirement benefit, which will not commence within one month of termination, may elect a withdrawal benefit.

Amount: The withdrawal benefit shall be the sum of all contributions made by the employee which have not been withdrawn previously, plus credited interest.

16. Pre-retirement death

If any employee completes at least 15 years of Credited Service, the spouse if named as beneficiary will receive a spousal benefit equal to the benefit payable had the participant retired on a joint and 100% survivor option on the day before death. Alternatively, the spouse may elect a refund of contributions and interest.

If not married at date of death, the sum of all contributions made by the employee plus credited interest will be paid to the employee's designated beneficiaries.

17. Consumer Price Index increase

All benefits payable to pensioners and beneficiaries retired under the Closed Version shall be increased following two months during which the Consumer Price Index is at least 3% higher than the Consumer Price Index of the base month.

All benefits payable to pensioners and beneficiaries retired under the Open Version shall be increased each March 1 following retirement in accordance with increases in the Consumer Price Index from the prior calendar year. In the event the participant retired during the preceding calendar year, a pro rata increase to reflect the partial year during which he was retired will be provided.

18. Normal and optional forms of payment

Pensions are normally payable for the life of the participant; however, a participant may elect to receive any other form of benefit provided under the plan which is actuarially equivalent in value. The following optional forms of payment are available under the plan:

- A reduced pension which is payable during the lifetime of the pensioner and continues to the surviving spouse at a rate equal to 100%, 75%, 66-2/3% or 50% of the reduced initial pension.
- A reduced pension which is payable as long as both the pensioner and the spouse are surviving. In addition, if the spouse survives the pensioner, a lifetime pension will continue to the spouse at a rate equal to 100%, 75%, 66-2/3% or 50% of the reduced initial pension. However, if the pensioner survives the spouse, the lifetime benefit will be increased to the original standard form of pension.
- A reduced pension to the participant during his lifetime with benefit payments guaranteed for at least 120 months or 180 months.

If a participant marries following his Benefit Commencement Date, the Participant may revoke any existing election and in its place elect a joint and contingent survivor option, provided such election is made within one year of the date of marriage and the Participant names his spouse as contingent annuitant.

A pensioner who elects a joint and contingent survivor option and subsequently divorces may revoke the existing election. After such revocation, a lifetime pension will continue to the pensioner at a rate equal to the unreduced initial pension.

There have been no changes in Plan provisions since the prior valuation.

2.2: Demographic Information

Participant Summary

	<u>June 30, 2022</u>	<u>June 30, 2021</u>
1. Closed Plan Active Participants		
a. Number	4	4
b. Average Age	71.24	70.24
c. Average Years of Service	47.18	46.18
d. Total Pay	\$557,115	\$557,576
e. Average Pay	139,279	139,394
2. Open Plan Active Participants		
a. Number	1,596	1,647
b. Average Age	47.68	47.68
c. Average Years of Service	11.70	11.91
d. Total Pay	\$145,044,784	\$ 152,328,226
e. Average Pay	90,880	92,488
3. All Active Participants		
a. Number	1,600	1,651
b. Average Age	47.74	47.73
c. Average Years of Service	11.79	11.94
d. Total Pay	\$145,601,899	\$ 152,885,802
e. Average Pay	91,001	92,602
4. Retired Participants and Beneficiaries		
a. Number	1,665	1,635
b. Average Age	71.51	71.38
c. Total Annual Pension	\$72,757,326	\$ 67,150,321
d. Average Annual Pension	43,698	41,071
5. Disabled Participants		
a. Number	40	43
b. Average Age	66.86	65.60
c. Total Annual Pension	867,628	\$ 863,849
d. Average Annual Pension	21,691	20,085
6. Deferred Vested Participants		
a. Number	148 *	137 *
b. Average Age	51.39	51.98
c. Total Annual Pension	\$1,590,137	\$ 1,448,044
d. Average Annual Pension	10,744	10,570

*Including vested Participants on Leave of Absence or Military Leave (11 for 2021 and 9 for 2022). Non-vested Participants who are on a Leave of Absence or Military Leave are not shown above (3 for 2021 and 4 for 2022).

Reconciliation of Closed Plan Participants

	<u>Active</u>	<u>Inactive</u>	<u>Retired and Beneficiaries</u>	<u>Deferred Vested</u>	<u>Disabled</u>	<u>Total</u>
Census as of June 30, 2021	4	0	718	0	4	726
Retired	0	0	0	0	0	0
Disabled	0	0	0	0	0	0
Died:						
With Beneficiary	0	0	-12	0	0	-12
Without Beneficiary	0	0	-37	0	0	-37
Refund Paid to Beneficiary	0	0	0	0	0	0
Refund Payable to Beneficiary	0	0	0	0	0	0
DRO stopped	0	0	-1	0	0	-1
Beneficiaries Added	0	0	12	0	0	12
Alternate Payees Added	0	0	0	0	0	0
Terminated						
Vested	0	0	0	0	0	0
Non-vested: Refund Paid	0	0	0	0	0	0
Non-vested: Refund Payable	0	0	0	0	0	0
Vested and Paid Employee Contributions	0	0	0	0	0	0
Added	0	0	0	0	0	0
Went on Leave	0	0	0	0	0	0
Returned from Leave	0	0	0	0	0	0
Reinstated	0	0	0	0	0	0
Adjustments	0	0	0	0	0	0
Census as of June 30, 2022	4	0	680	0	4	688

Reconciliation of Open Plan Participants

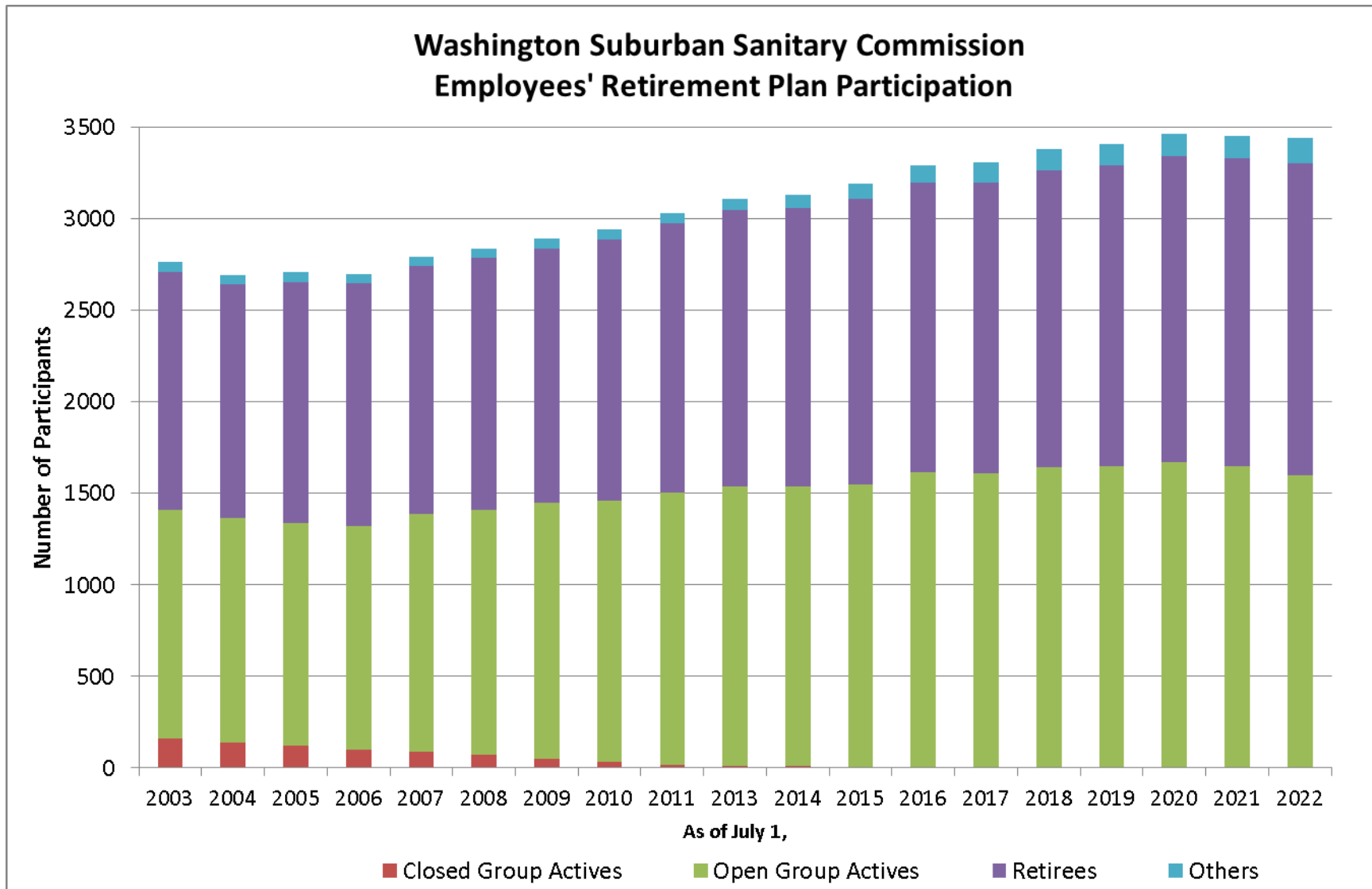
	<u>Active*</u>	<u>Inactive</u>	<u>Retired and Beneficiaries</u>	<u>Deferred Vested</u>	<u>Disabled</u>	<u>Total</u>
Census as of June 30, 2021	1,647	14	917	126	39	2,743
Retired	-71	0	77	-6	0	0
Disabled	0	-1	0	0	1	0
Died:						
With Beneficiary	-1	0	-6	0	-2	-9
Without Beneficiary	0	0	-17	0	-1	-18
Refund Paid to Beneficiary	-2	0	-1	0	0	-3
Refund Payable to Beneficiary	0	0	0	0	0	0
DRO Stopped	0	0	0	0	0	0
Beneficiaries Added	1	0	6	0	2	9
Alternate Payees Added	0	0	4	0	0	4
Terminated						
Vested	-25	-1	0	26	0	0
Non-vested: Refund Paid	-33	0	0	0	0	-33
Non-vested: Refund Payable	-58	-1	0	0	0	-59
Vested and Paid Employee Contributions	-11	0	0	-6	0	-17
Added	148	0	0	0	0	148
Went on Leave	-10	10	0	0	0	0
Returned from Leave	8	-8	0	0	0	0
Reinstated	4	0	0	-1	0	3
Adjustments**	0	0	2	0	-1	1
Census as of June 30, 2022	1,596	13	985	139	36	2,769

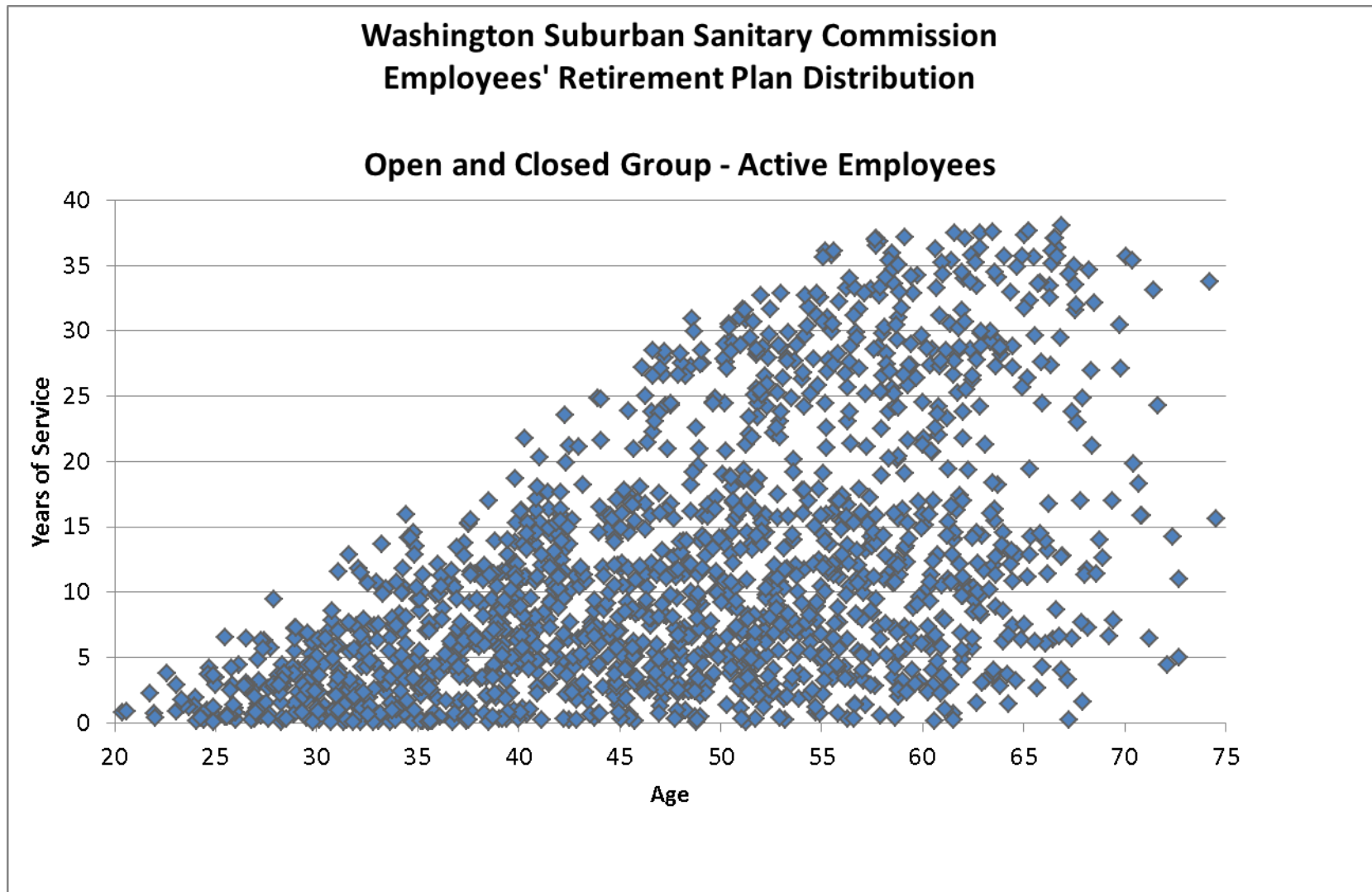
*Those with retiree payments stopped while reemployed are included in the active count.

** Changed record for Alternate Payee of deceased participant from Disabled to Beneficiary. Added second record for one participant who retired again.

Active Participant Age/Service Distribution

Age Group	SERVICE LEVEL									Total
	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40+	
MALE										
0 - 19	0	0	0	0	0	0	0	0	0	0
20 - 24	18	0	0	0	0	0	0	0	0	18
25 - 29	65	13	0	0	0	0	0	0	0	78
30 - 34	68	38	12	1	0	0	0	0	0	119
35 - 39	49	49	25	5	0	0	0	0	0	128
40 - 44	29	47	44	24	4	2	0	0	0	150
45 - 49	31	44	33	19	10	14	2	0	0	153
50 - 54	27	36	28	26	11	26	12	0	0	166
55 - 59	26	25	36	18	7	22	19	7	0	160
60 - 64	11	15	31	11	7	12	12	6	1	106
65 - 69	6	9	14	3	2	4	9	10	2	59
70+	1	1	0	3	3	0	1	1	3	13
Total	331	277	223	110	44	80	55	24	6	1,150
FEMALE										
0 - 19	0	0	0	0	0	0	0	0	0	0
20 - 24	0	0	0	0	0	0	0	0	0	0
25 - 29	10	0	0	0	0	0	0	0	0	10
30 - 34	23	6	2	0	0	0	0	0	0	31
35 - 39	17	19	8	0	0	0	0	0	0	44
40 - 44	12	19	12	3	3	0	0	0	0	49
45 - 49	25	15	11	8	4	2	0	0	0	65
50 - 54	12	22	13	11	6	8	4	0	0	76
55 - 59	8	12	11	10	8	6	9	7	0	71
60 - 64	10	13	7	10	6	15	7	6	0	74
65 - 69	1	3	1	1	2	3	3	4	4	22
70+	0	1	2	1	0	1	2	1	0	8
Total	118	110	67	44	29	35	25	18	4	450





8. Salary Increases The total pay increase assumption, including wage growth and career increases, is:

<u>Years of Service</u>	<u>Increase</u>
Up to 4	7.50%
5+	2.75%

9. Mortality tables for employees and annuitants For non-disability annuitant mortality, the Pub2010G(B) mortality tables (Employees rates up to age 49, and Healthy Retiree rates thereafter) projected with Scale SSA generationally. Mortality for pre-retirement deaths is 50% of the annuitant mortality for males and females.

For disability retirement pension mortality, the Pub2010G Disabled Retiree tables, projected with Scale SSA (2022 intermediate long-term) generationally.

A 109% factor is applied to female rates in each case.

10. Rates of age retirement

<u>Age</u>	<u>Rate</u>
50-54	7.0%
55-60	11.0%
61-64	7.0%
65-69	20.0%
70+	100%

11. Withdrawal Rates

<u>Years of Service</u>	<u>Male</u>	<u>Female</u>
0	11.0%	13.8%
1	9.4%	11.7%
2	7.9%	9.9%
3	6.8%	8.4%
4	5.7%	7.2%
5	4.9%	6.1%
6	4.1%	5.2%
7	3.5%	4.4%
8	3.0%	3.7%
9	2.5%	3.2%
10	2.2%	2.7%
11	1.8%	2.3%
12	1.6%	2.0%
13	1.3%	1.7%
14	1.1%	1.4%
15+	1.0%	1.2%

As shown above, female rates are equal to 125% of male rates.

12. Disability rates

The assumed rates of disability are illustrated by the following table:

<u>Age</u>	<u>Rate</u>	<u>Age</u>	<u>Rate</u>
40	0.01%	53	0.14%
41	0.02%	54	0.15%
42	0.03%	55	0.16%
43	0.04%	56	0.17%
44	0.05%	57	0.18%
45	0.06%	58	0.19%
46	0.07%	59	0.20%
47	0.08%	60	0.21%
48	0.09%	61	0.22%
49	0.10%	62	0.23%
50	0.11%	63	0.24%
51	0.12%	64	0.25%
52	0.13%	65+	0.00%

13. Marital status

It is assumed that 70% of the participants are married. Husbands are assumed to be three years older than their wives.

14. Option election

It is assumed that one-half of retiring participants will elect a joint and two-thirds survivor pension.

15. Sick Leave credit

It is assumed that an active participant will earn an additional 0.018 years of service credit for sick leave each year.

There are no changes in methods and assumptions since the prior valuation, except the update of the mortality projection scale.

SECTION 3: PROJECTIONS OF PLAN FUNDING

3.1: 15-Year Projection of Cash Flows

Based on 16.9% of Payroll Level Contribution Rate							
Plan Year Beginning July 1	MVA at Beginning of Year	AVA at Beginning of Year	Contributions		Benefit Payments/Expenses	Estimated Investment Income*	Net Increase in Fund
			WSSC Water	Employee			
2022	\$ 829,319,365	\$ 885,515,619	\$ 25,129,782	\$ 4,460,908	\$ 76,695,624	\$ 56,431,567	\$ 9,326,633
2023	838,645,998	872,759,836	26,134,973	4,639,344	77,109,131	57,110,930	10,776,116
2024	849,422,114	876,258,898	27,180,372	4,824,918	78,144,959	57,871,972	11,732,303
2025	861,154,417	891,938,693	28,267,587	5,017,915	79,482,340	58,691,266	12,494,428
2026	873,648,845	871,783,518	29,398,290	5,218,631	80,831,698	59,565,259	13,350,482
2027	886,999,328	886,999,328	30,574,222	5,427,377	82,329,246	60,495,909	14,168,262
2028	901,167,589	901,167,589	31,797,191	5,644,472	83,857,364	61,484,658	15,068,956
2029	916,236,546	916,236,546	33,069,078	5,870,251	85,188,759	62,545,206	16,295,775
2030	932,532,321	932,532,321	34,391,841	6,105,061	86,635,861	63,689,711	17,550,752
2031	950,083,073	950,083,073	35,767,515	6,349,263	87,851,988	64,932,156	19,196,946
2032	969,280,019	969,280,019	37,198,216	6,603,234	89,015,864	66,293,862	21,079,447
2033	990,359,467	990,359,467	38,686,144	6,867,363	90,182,848	67,789,554	23,160,213
2034	1,013,519,679	1,013,519,679	40,233,590	7,142,057	91,134,241	69,440,730	25,682,137
2035	1,039,201,816	1,039,201,816	41,842,934	7,427,740	91,856,797	71,278,822	28,692,699
2036	1,067,894,515	1,067,894,515	43,516,651	7,724,849	92,539,198	73,331,643	32,033,946

*Assuming 7.00% returns each year.

MVA = Market Value of Assets

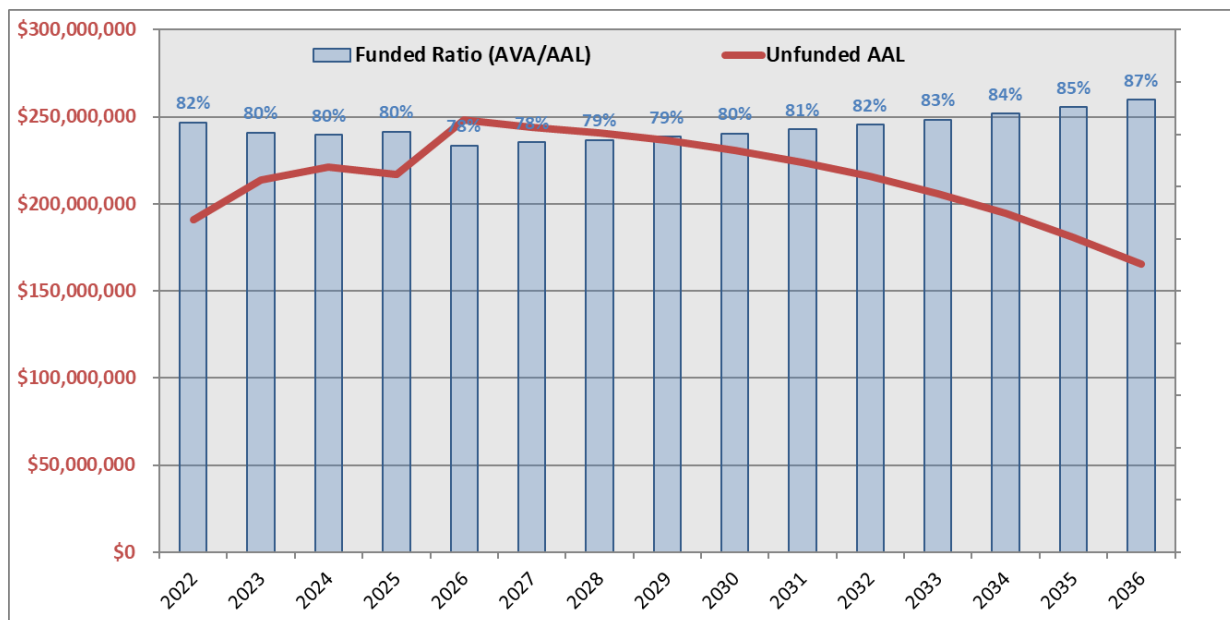
AVA = Actuarial Value of Assets

Additional Assumptions for Projections:

The cost of future entrants is estimated by projecting total payroll at 4% per year, and assuming the current normal cost rate applies to future measurements.

3.2: 15-Year Projection of Funding Progress

Plan Year Beginning July 1	AVA at Beginning of Year	Entry Age Actuarial Accrued Liability (AAL)	Funded Ratio (AVA/AAL)	Unfunded AAL	Present Value of Future Benefits (PVFB)	Percent of PVFB Funded
2022	\$ 885,515,619	\$ 1,076,527,466	82%	\$ 191,011,847	\$ 1,180,222,016	70%
2023	872,759,836	1,086,647,216	80%	213,887,380	1,188,693,099	71%
2024	876,258,898	1,097,570,133	80%	221,311,236	1,197,357,405	71%
2025	891,938,693	1,108,729,607	80%	216,790,914	1,205,626,840	71%
2026	871,783,518	1,119,852,004	78%	248,068,485	1,213,182,241	72%
2027	886,999,328	1,130,944,944	78%	243,945,617	1,219,962,046	73%
2028	901,167,589	1,141,876,589	79%	240,709,000	1,225,768,703	74%
2029	916,236,546	1,152,628,476	79%	236,391,930	1,230,504,538	74%
2030	932,532,321	1,163,416,943	80%	230,884,622	1,234,284,774	76%
2031	950,083,073	1,174,151,310	81%	224,068,237	1,236,930,660	77%
2032	969,280,019	1,185,094,216	82%	215,814,196	1,238,586,084	78%
2033	990,359,467	1,196,342,909	83%	205,983,443	1,239,232,226	80%
2034	1,013,519,679	1,207,945,331	84%	194,425,651	1,238,795,432	82%
2035	1,039,201,816	1,220,180,188	85%	180,978,372	1,237,408,316	84%
2036	1,067,894,515	1,233,360,639	87%	165,466,124	1,235,225,581	86%



RISK ASSESSMENT

There are a number of risks inherent in managing a pension plan/trust. Some of the most substantial risks are (not an all-inclusive list):

- **Investment Return Risk:** Future investment returns may be unfavorable compared to what is assumed for Plan funding purposes.
- **Investment Volatility Risk:** Investment returns will vary from year to year and over time, with a possible single or multiple year significant drop in plan assets. This impacts contribution amounts as well as compound returns.
- **Longevity Risk:** Plan members and beneficiaries may live longer than projected, and thus be entitled to additional years of benefit payments versus what had been expected.
- **Other Demographic Risks:** Future demographic experience may be unfavorable compared to expected rates of retirement, termination, and disability. Future salary increases may also be higher than expected, thereby increasing the liability of pay-related benefits.

The following examples quantify several of these risks. In the first table, we can see that a lower investment return would have a significant impact on funding and plan costs. The second table illustrates the impact of plan participants living longer than expected. In general, each 10% lower rate of mortality entails one additional year of life expectancy. A 20-year level dollar amortization is used in each case.

1. Investment Return Risk

<i>As of 6/30/2022 (\$ mm)</i>	Current Return Assumption (7.00%)	6.00% Return Assumption
Actuarial Liability	\$1,076.5	\$1,188.1
Plan Assets	885.5	885.5
Unfunded Liability	\$191.0	\$302.6
Funding Ratio	82%	75%
Actuarially Determined Employer Contribution	\$25.6	\$39.0
% of Payroll	17.2%	26.2%

2. Longevity Risk

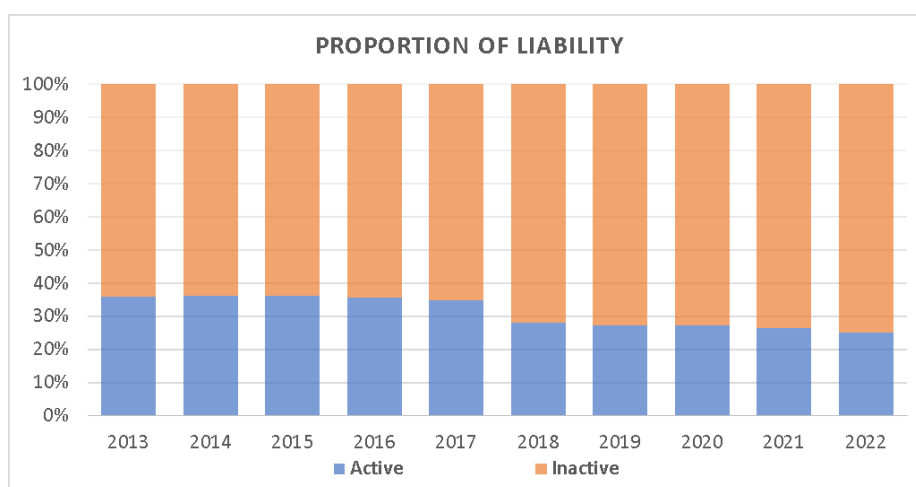
<i>As of 6/30/2022 (\$ mm)</i>	Current Mortality Assumption	10% Lower Mortality Rates
Actuarial Liability	\$1,076.5	\$1,087.5
Plan Assets	885.5	885.5
Unfunded Liability	\$191.0	\$202.0
Funding Ratio	82%	81%
Actuarially Determined Employer Contribution	\$25.6	\$26.9
% of Payroll	17.2%	18.0%

Plan Maturity

Another challenging risk faced by many pension plans is the maturing of the plan over time. This can be seen in the number of inactive (retirees, beneficiaries, etc.) versus the number of active employees in the plan population, as well as the liability of each group. As the plan matures risks emerge, including:

- Higher ratio of assets to payroll, which leads to a greater degree of contribution rate volatility.
- Negative cash flow (disbursements exceeding contributions), which exacerbates the impact of an economic downturn.
- Greater degree of longevity risk (as illustrated above).

The following graphs illustrate some of these plan maturity measures in recent years, showing how the plan is maturing over time. Over the past decade, the percentage of participants has remained fairly consistent and is about 54% inactive (by headcount) as of June 30, 2022. However, as shown in the graph below, the Plan liability has increased from about 65% inactive in 2013 to 76% in 2022, indicating continued maturing/aging.



The fund has experienced negative cash flow (disbursements greater than contributions) of approximately \$30 million per year over the last decade, with a higher amount in the most recent year. This is another indication of a very mature plan. As the Plan's funding approaches 100% and the contribution rate remains higher than the actuarial rate, this is not a concern, because investment returns are used to finance benefit payments.

