



# STAKEHOLDER ADVISORY GROUP

Board of Water Supply, City & County of Honolulu  
April 20, 2023  
Meeting 46

# WELCOME & INTRODUCTIONS

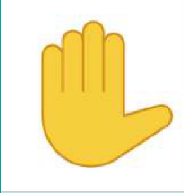
DAVE EBERSOLD, FACILITATOR

STAKEHOLDER ADVISORY GROUP MEETING 46

APRIL 20, 2023



# VIRTUAL MEETING BEST PRACTICES

- Please stay muted unless you are speaking
- Use  or meeting chat to let us know you want to ask a question
- If you don't have the "raise hand" reaction or meeting chat, unmute your mic/phone and speak
- Speak one person at a time
- Expect something to go wrong



# MEETING OBJECTIVES

- Provide update on BWS leak detection program
- Explore efficient indoor water use
- Accept notes from meeting #45
- Seek input on Cost of Service and Water Rate Study
- Provide BWS updates



# PUBLIC COMMENT ON AGENDA ITEMS





# UPDATE ON LEAK DETECTION

Jason Nikaido  
Program Administrator, Field Operations Division

April 20, 2023

[www.boardofwatersupply.com](http://www.boardofwatersupply.com)

# TRADITIONAL LEAK DETECTION

- Neighborhood by neighborhood
- Deploy loggers
- Gather data
- Evaluate data
- Correlate leaks

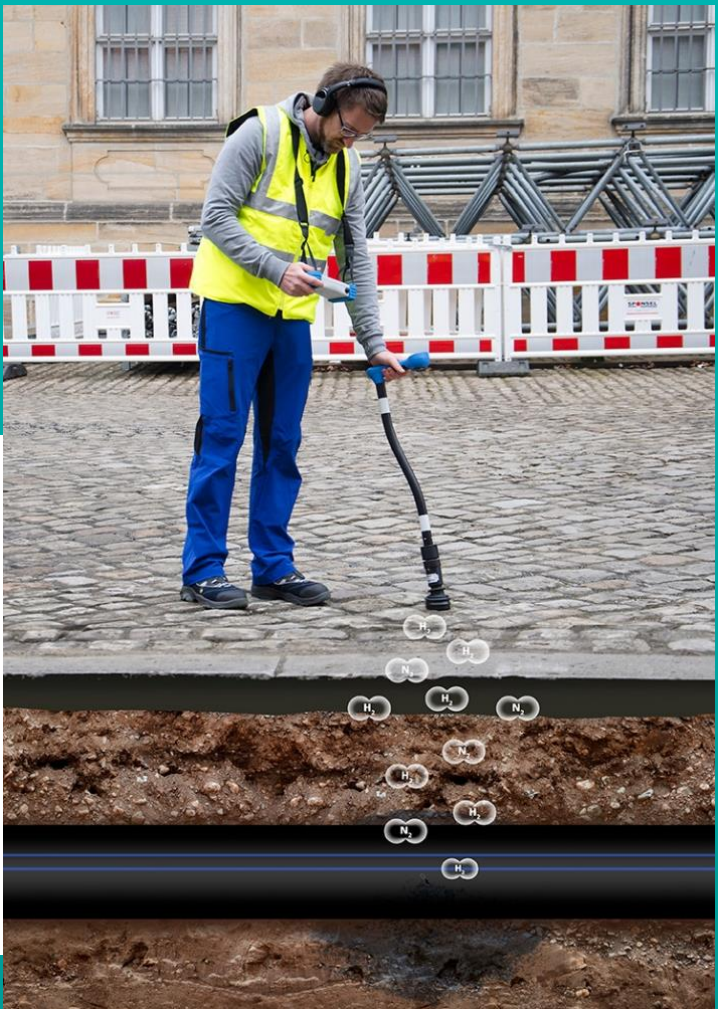


# DATA LOGGING





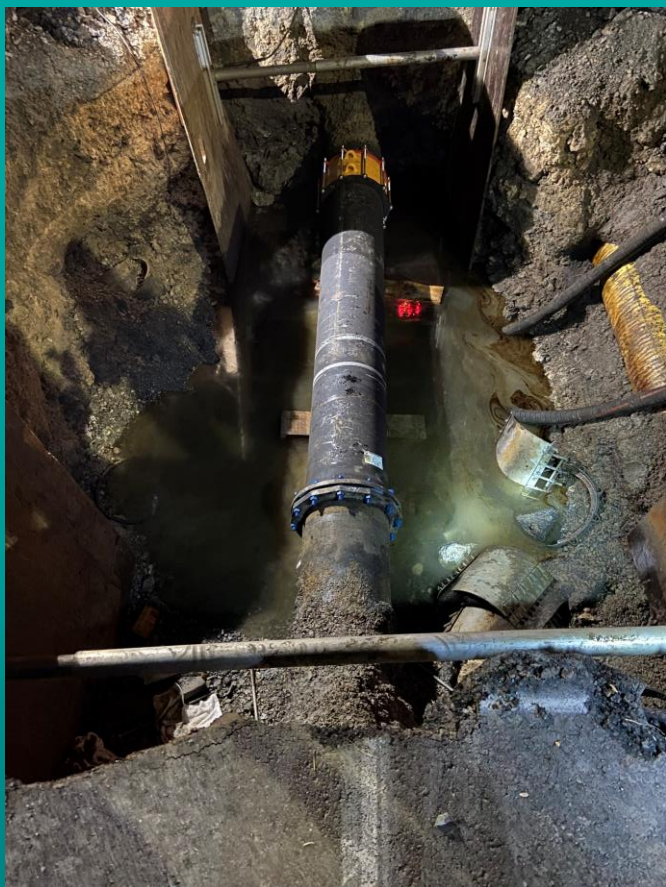
# SOUNDING



# CORRELATION



# REPAIR



# SATELLITE LEAK DETECTION

- Pilot project: 2019 to 2021
- \$307,000
- Scope of work
  - Acquire satellite imagery
  - Analyze data
  - Prepare leakage report



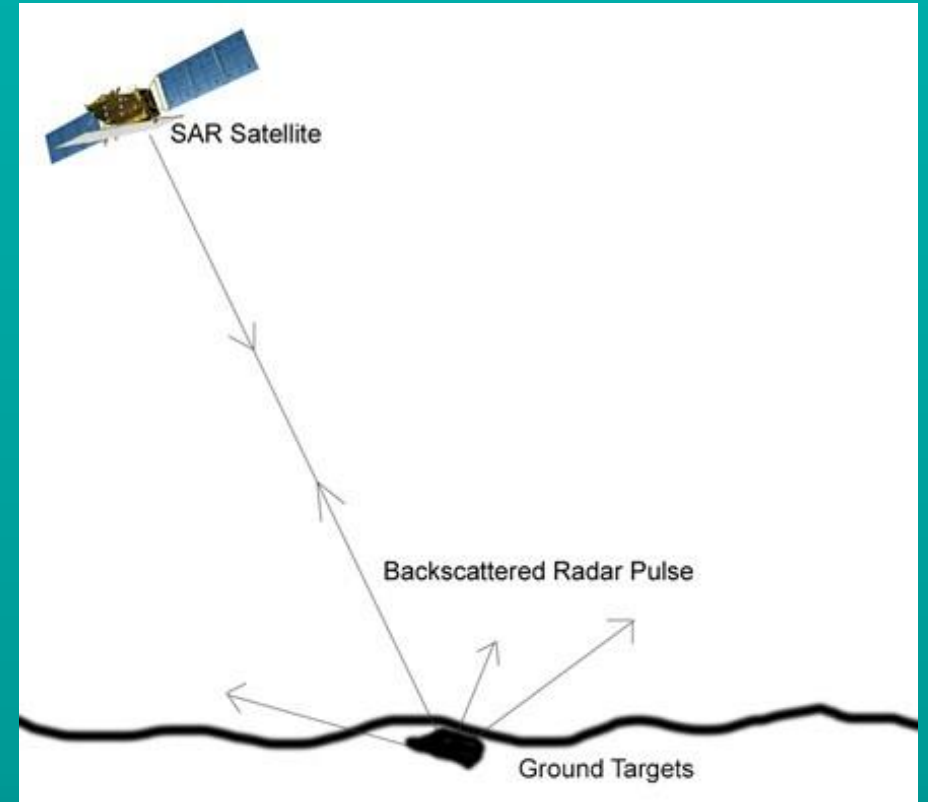
# GOALS

- Verify technology
- Reduce non-revenue water
- Increase leak detection efficiency

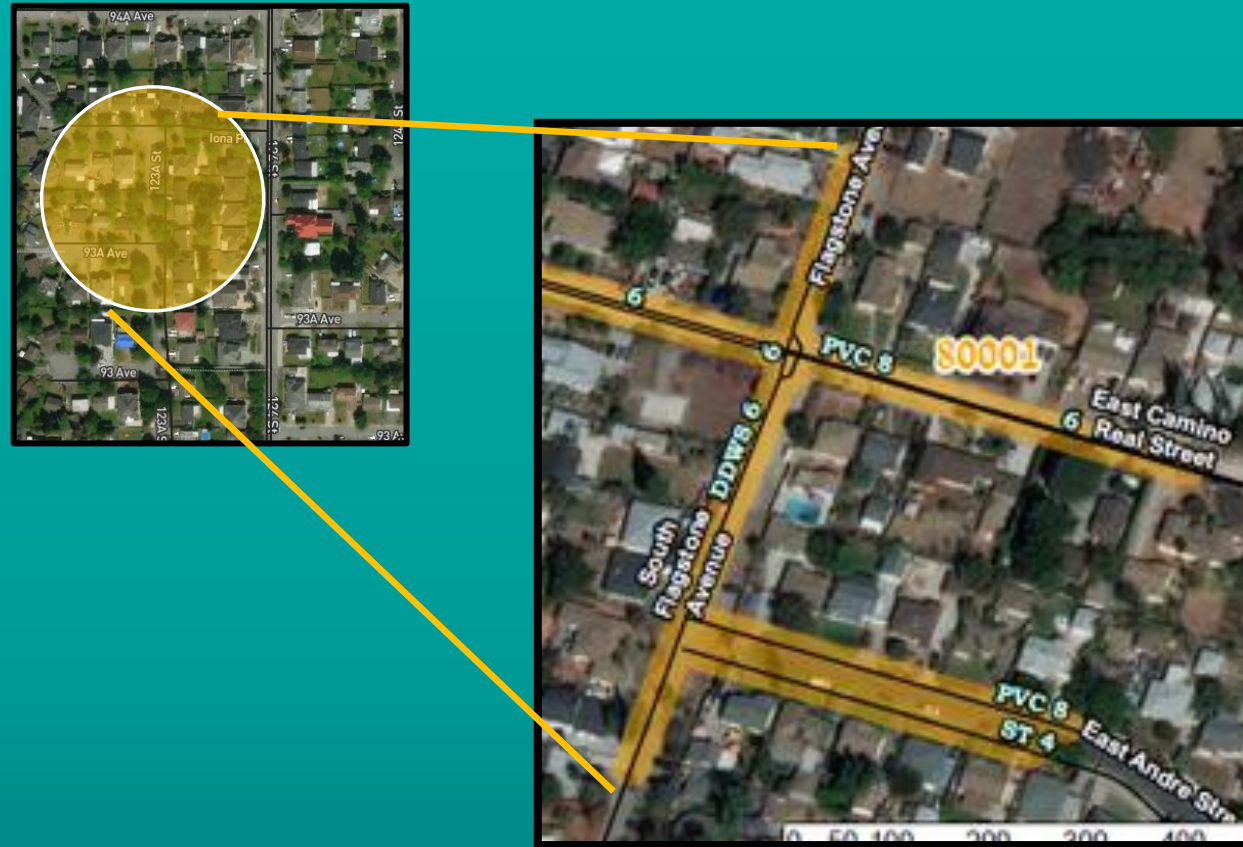


# SYNTHETIC APERTURE RADAR

- Satellite based leak detection technology
- Sensitive to dielectric properties
- Subsurface penetration
- Algorithm to determine potential leak locations

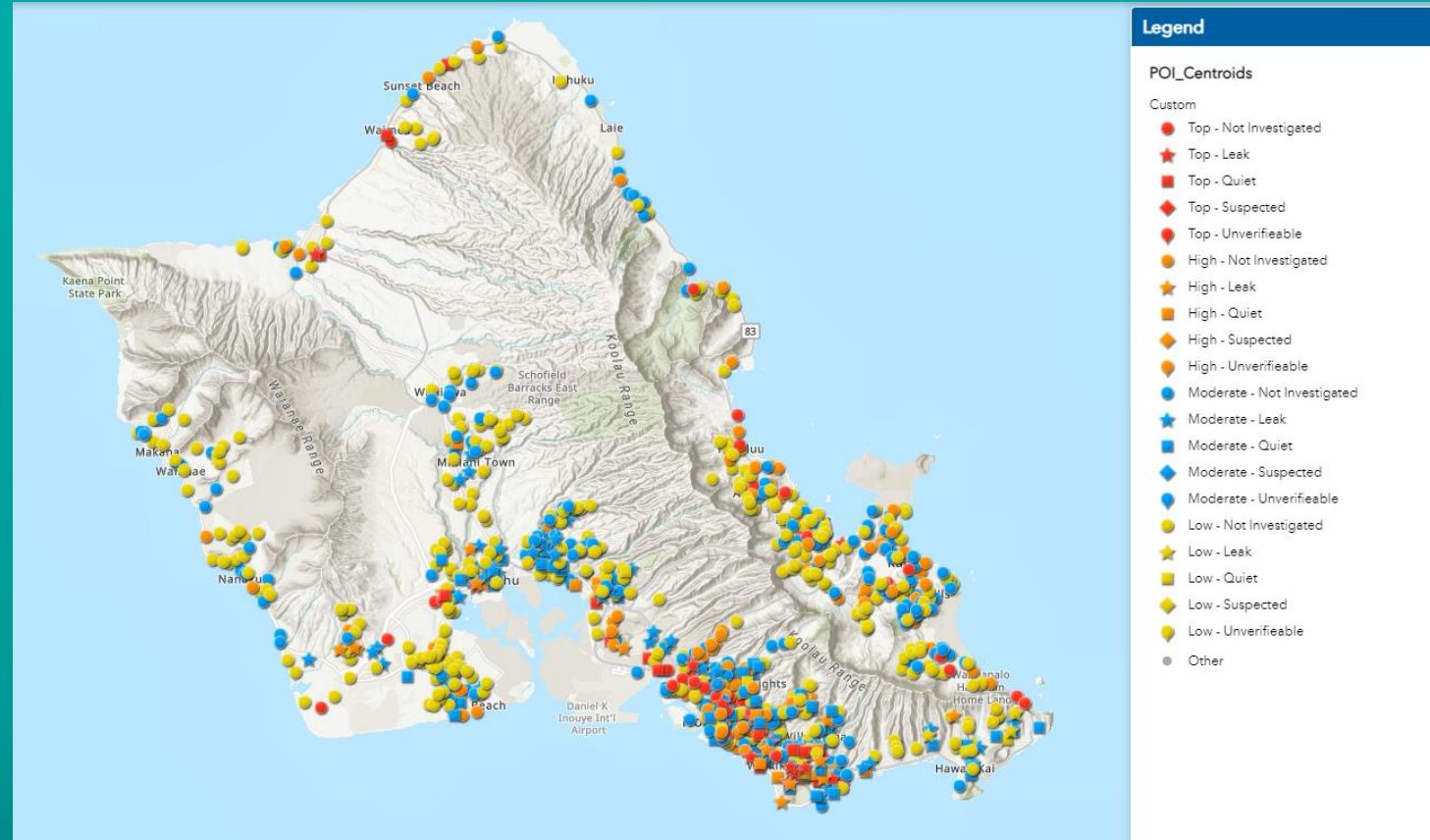


# POINT OF INTEREST (POI)



# POINT OF INTEREST (POI)

- Prioritized POIs
  - No. of main breaks
  - No. of service laterals
  - Max diameter
  - Transition main length
  - InfoMaster 2016 risk score
  - Pipe material





# RESULTS

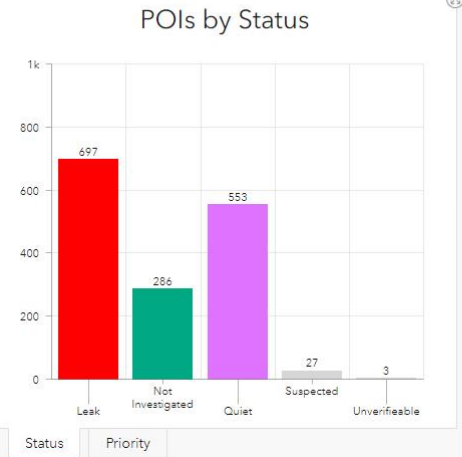
	2019 Traditional	2020 Utilis Satellite Guided
Miles investigated	358	120
Leaks Found	255	344
Leaks per Mile	0.7	2.9



# GOALS

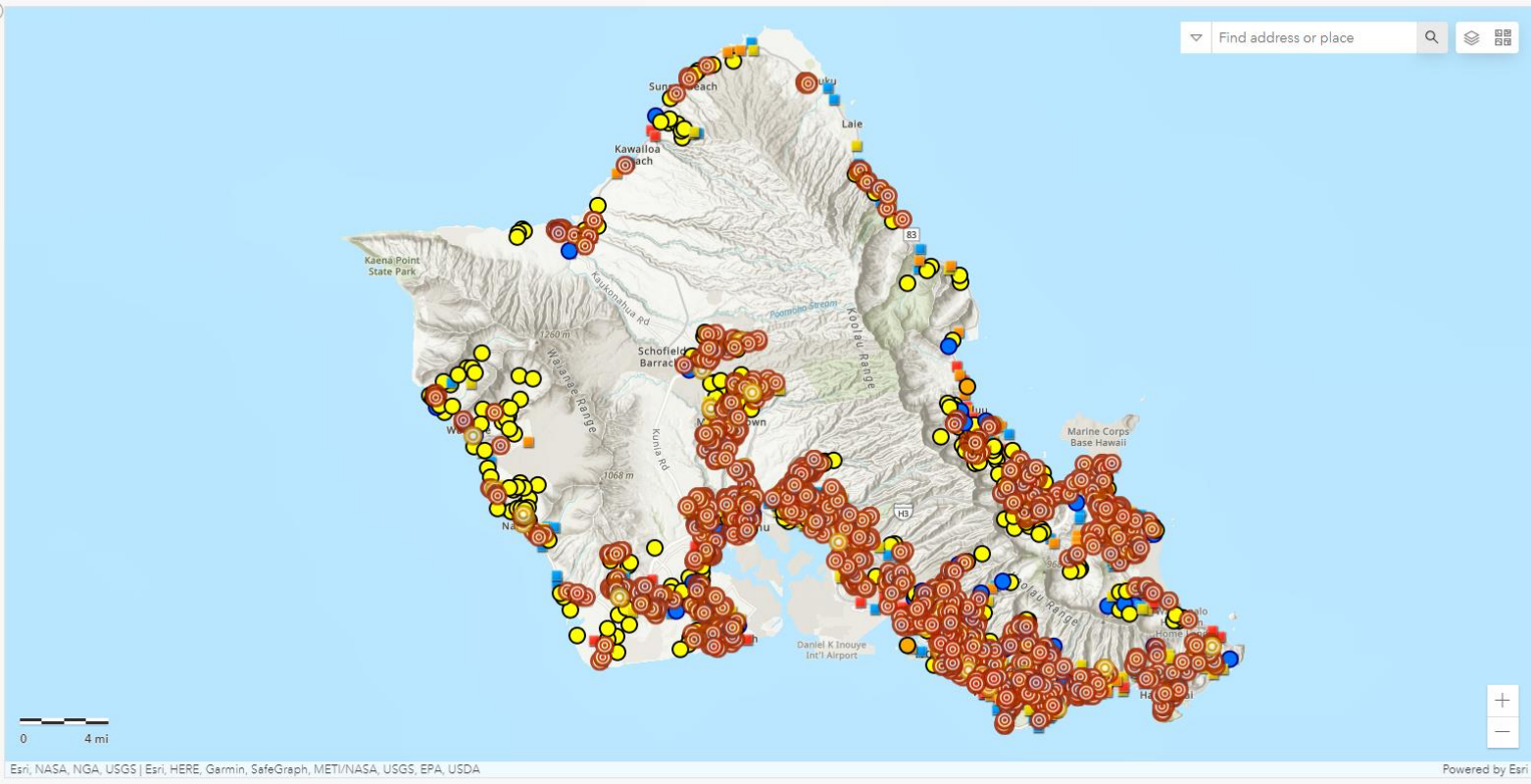
- Verify technology ✓
- Reduce non-revenue water ✓
- Increase leak detection efficiency ✓





Leaks Found **1,638**

Pipeline Inspected **476.61 mi.**



#### Leaks

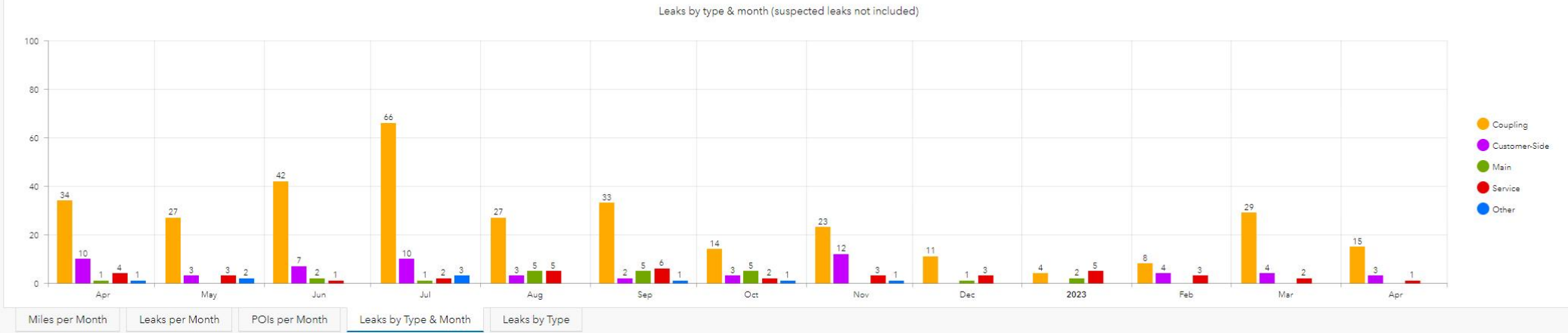
- Leak
- Suspected

#### POI Centroids

Priority - Status

- Top - Not Investigated
- Top - Leak
- Top - Quiet
- Top - Suspected
- Top - Unverifiable
- High - Not Investigated
- High - Leak
- High - Quiet
- High - Suspected
- High - Unverifiable
- Moderate - Not Investigated
- Moderate - Leak
- Moderate - Quiet
- Moderate - Suspected
- Moderate - Unverifiable
- Low - Not Investigated
- Low - Leak
- Low - Quiet

Legend Inspected POI Leaks



# NEXT STEPS

- Incorporate satellite leak detection into operations
- 2 satellite passes a year
- Increase leak detection team size



QUESTIONS?





# Mahalo!

BOARD OF  
WATER SUPPLY

Providing safe, dependable, and affordable  
drinking water, now and into the future.



# APPROVE MEETING NOTES

David Ebersold  
Facilitator

April 20, 2023

[www.boardofwatersupply.com](http://www.boardofwatersupply.com)



# EXPLORING EFFICIENT INDOOR WATER USE

David Ebersold  
Facilitator

April 20, 2023

[www.boardofwatersupply.com](http://www.boardofwatersupply.com)



# ADDING UP INDOOR WATER USE

Use	Gallons	Unit	Daily Gallons	Assumptions
Shower	2.5	per minute	12.5	5-minute shower
Toilet	1.6	per flush	8	5 per person per day
Hand washing	0.5	per wash	3	6 per person per day
Drinking	1	per day	2	2 gal per person per day
Cooking	1	per day		
Dishwasher*	4	per load	2	1 load every other day 3 people or less ADD ONE CHIP 1 per day 4-9 people ADD TWO CHIPS 2 per day 10 or greater ADD FOUR CHIPS
Clothes washer*	14	per load	7	1 load every other day 3 people or less: ADD ONE CHIP 1 loads per day 4-9 people: ADD TWO CHIPS 2 loads per day 10 or greater: ADD FOUR CHIPS

\*





# Mahalo!

BOARD OF  
WATER SUPPLY

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# WATER RATES UPDATE

Joe Cooper  
Waterworks Controller

David Ebersold  
Vice President, CDM Smith

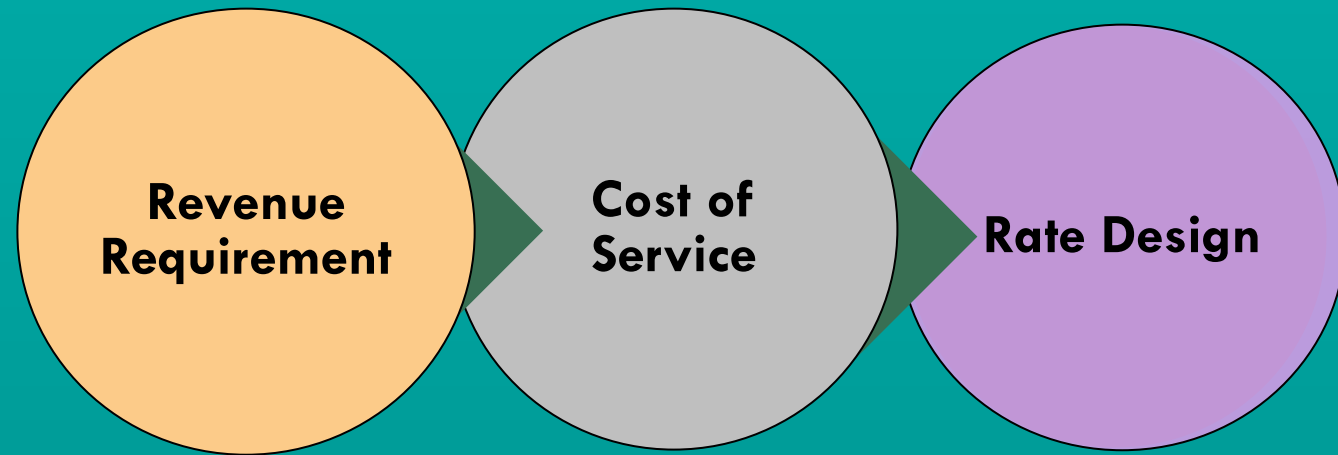
April 20, 2023  
[www.boardofwatersupply.com](http://www.boardofwatersupply.com)

# OBJECTIVES

- Are the reductions to the O&M and CIP budgets appropriate and acceptable?
- Are we in the kind of crisis that was anticipated in the Long Range Financial Plan? If so, is it acceptable to temporarily drop below our working capital targets to maintain rate affordability as we recover?
- Should we consider non-uniform rate increase across the residential rate tiers, e.g. hold Essential Needs Tier 1 to 0%?



# THREE PRIMARY STEPS OF RATE MAKING



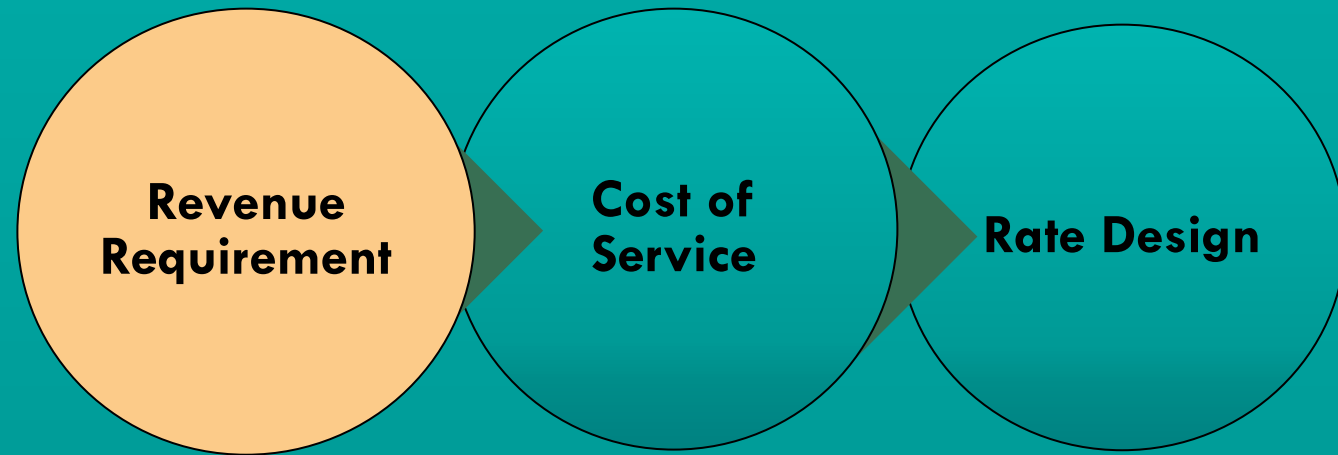
Compare revenue with operating and capital costs

Identify differences in costs to serve each of the customer classes

Consider level and structure of rate design for each class of service



# THREE PRIMARY STEPS OF RATE MAKING



Compare revenue with operating and capital costs

Identify differences in costs to serve each of the customer classes

Consider level and structure of rate design for each class of service



# 4 MAJOR DRIVERS OF REVENUE REQUIREMENT AND RATES

Operations & Maintenance

Operations and maintenance costs

Capital Expenses Paid in  
Cash vs. Debt

How the Capital Improvement Program  
is financed

Reserves and Working  
Capital

Financial policies for credit ratings  
and stability

Trends and Risks

Preparedness to respond to changing  
trends and risks



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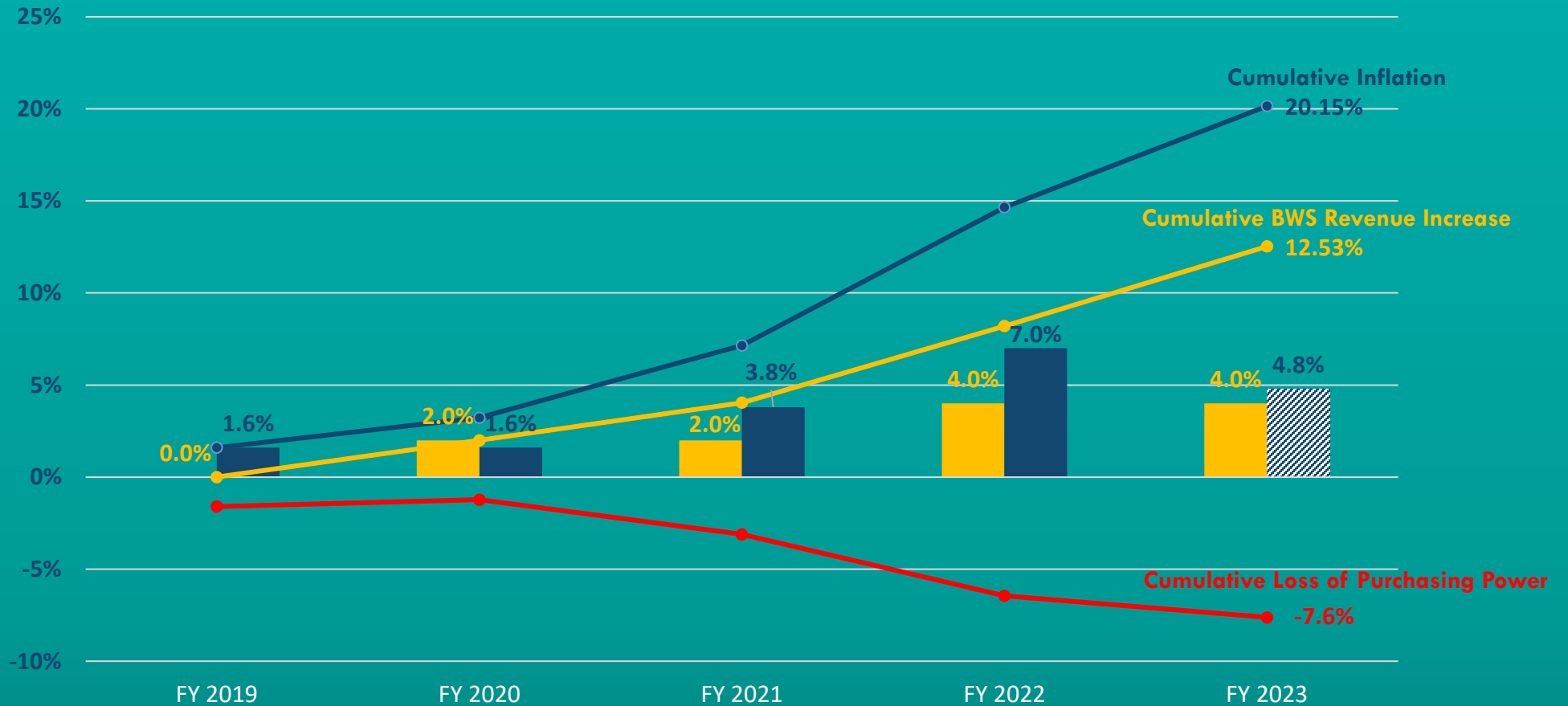
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# INFLATION'S IMPACT ON PURCHASING POWER



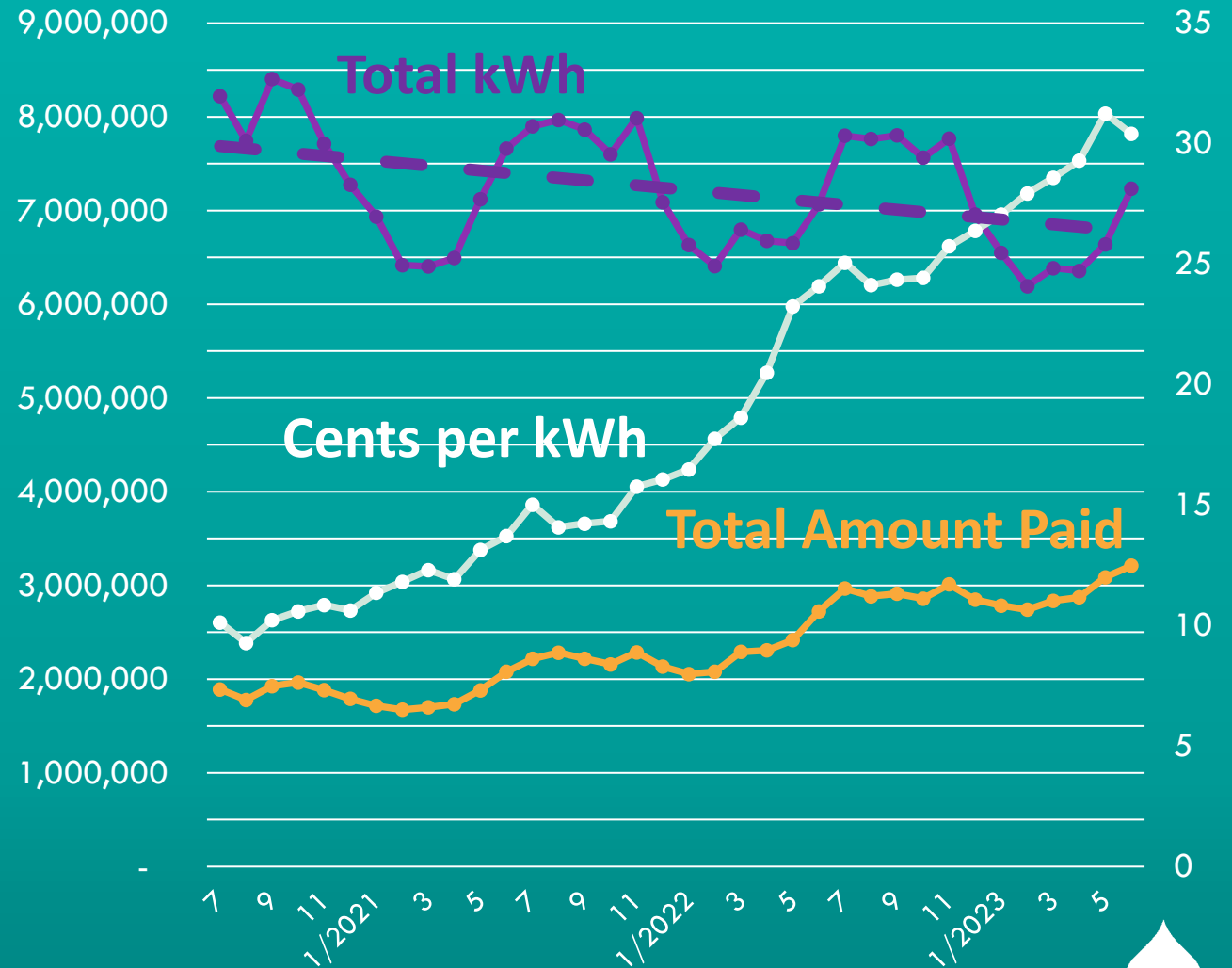
■ Annual Inflation Rate  
■ BWS Annual Revenue Increase  
Inflation data/projections from UHERO, Sept. 2022



# POWER COSTS TRENDING SHARPLY UPWARD

Per HECO, “Electricity prices in Hawaii are generally higher than on the U.S. mainland due to the cost of imported oil used to power many of the islands’ generators. **The fluctuation in the cost of fuel, which makes up roughly 50% of a typical bill, is the biggest driver.**

- Electricity costs as a percentage of total Operating Expense continues to rise.
  - FY20 – 12.9% of the Budget
  - FY21 – 12.1% of the Budget
  - FY22 – 13.4% of the Budget
  - FY23 – 15.7% of the Budget (projected)
- In FY 2023, electricity costs projected to be \$10 million over budget



# RED HILL RESPONSE REQUIRES INVESTMENTS IN NEW BWS FACILITIES IN EXCESS OF \$200 MILLION

- Monitoring wells for information on how the contamination is moving and exploratory wells to find new sources outside of its path - \$30 million
- Replace 17.5 million gallons per day of potable water well pumping capacity - \$195 million
- Potential additional capital costs yet to be determined
- Does not include any potential increases to Operations & Maintenance costs
- Cost recovery from Navy is undetermined
- BWS has requested assistance from Hawaii Congressional Delegation



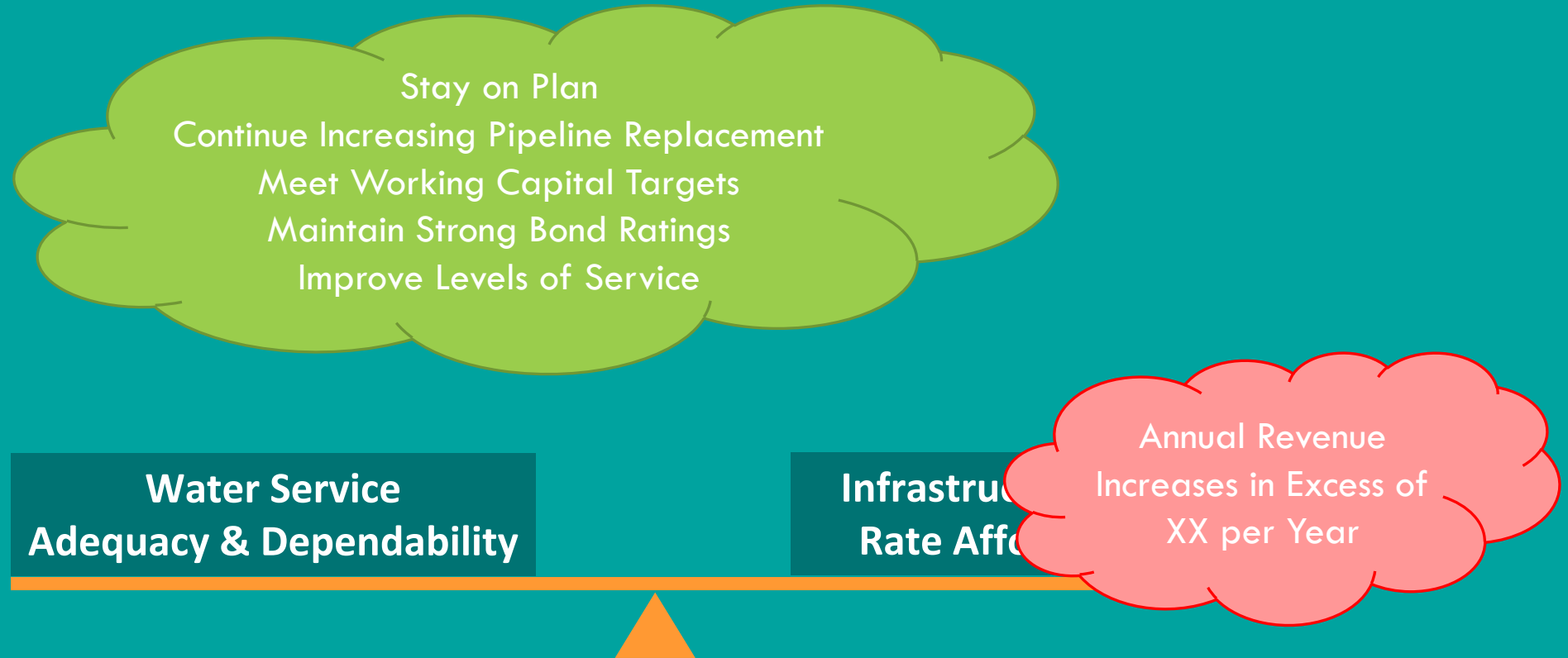
# PFAS IMPACTS TO BWS SYSTEM UNKNOWN

- Per- and polyfluoroalkyl substances (PFAS) are a large group of chemicals used since the 1940s in common household and commercial products
- Because they are used in so many everyday products, most people in the US and other industrialized countries now have PFAS in their blood
- Most people's exposure comes from diet. Drinking water and inhaling dust with PFAS are 2 other common exposures
- EPA has proposed a draft Maximum Contaminant Level
  - 4 parts per trillion (ppt) for PFOA
  - 4 ppt for PFOS
  - 1 (unitless, not 1 ppt) Hazard Index for a mixture of PFNA, PFHxS, PFBS and GenX
- BWS currently has 6 sources with detections of PFAS, all below proposed MCL

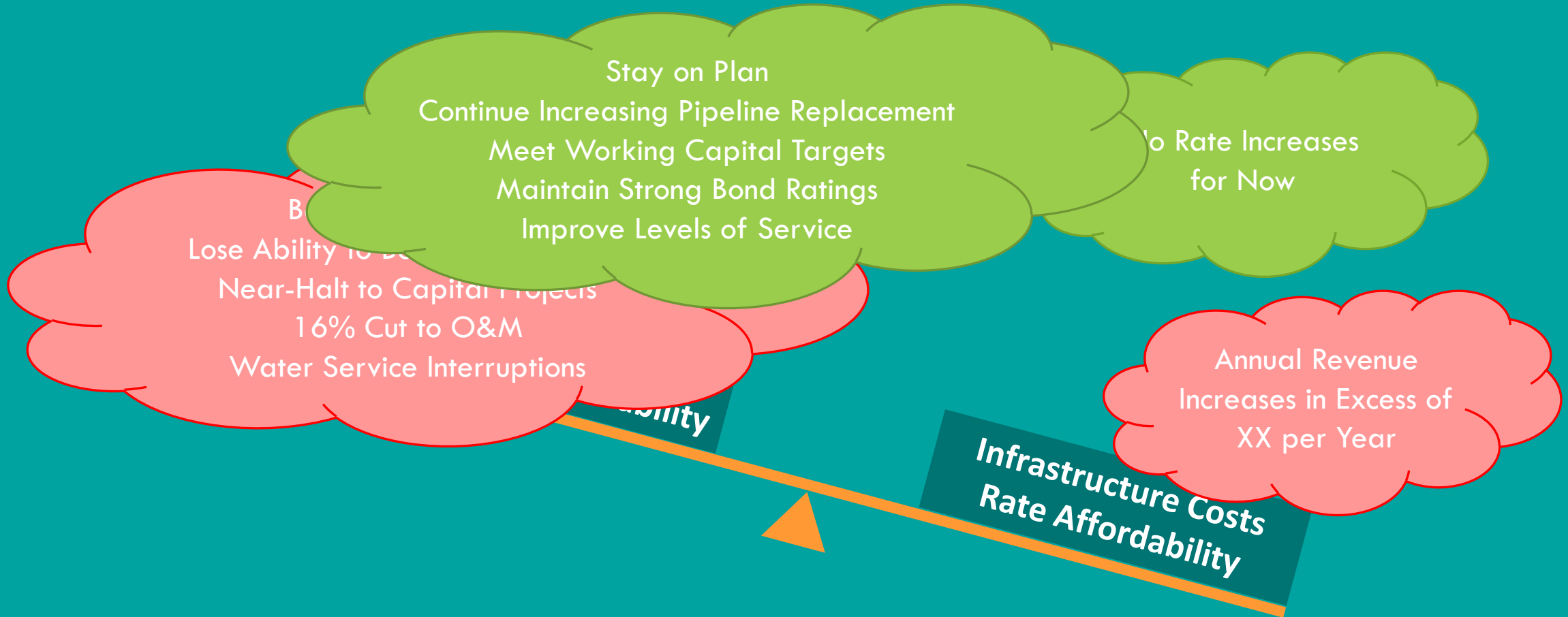


Mobile  
Persistent  
Bioaccumulative  
Toxic

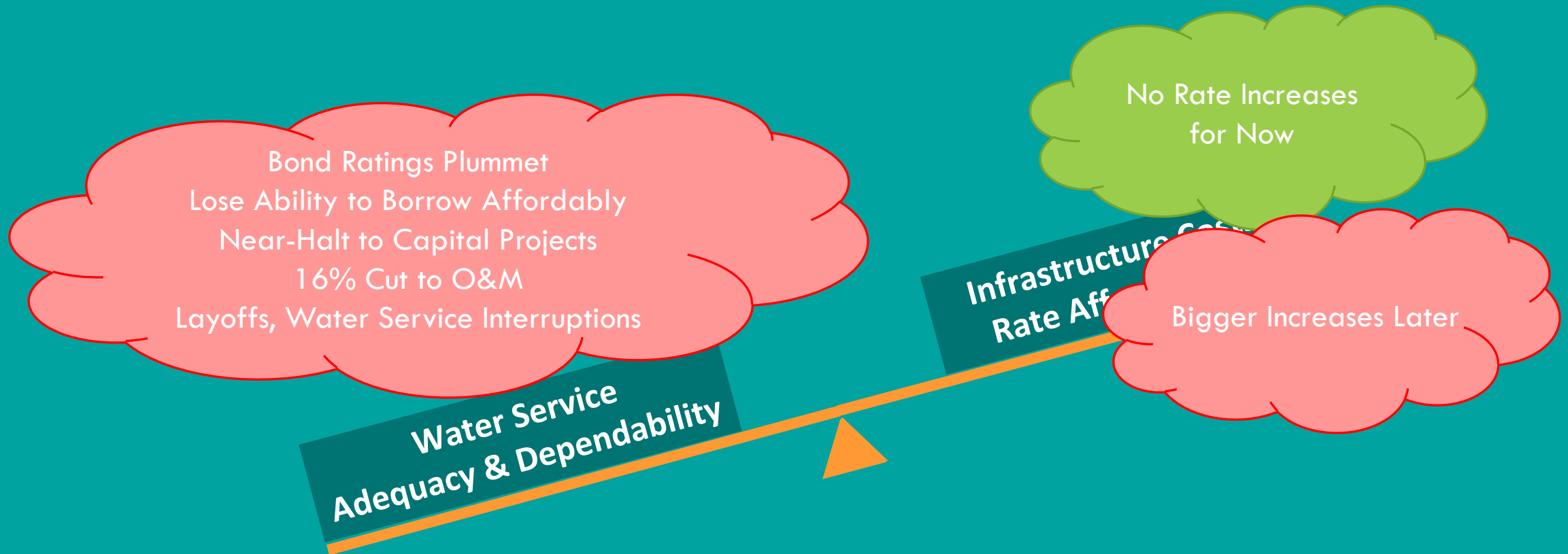
# RATE INCREASES WILL BE REQUIRED TO MAINTAIN CURRENT LEVELS OF SERVICE



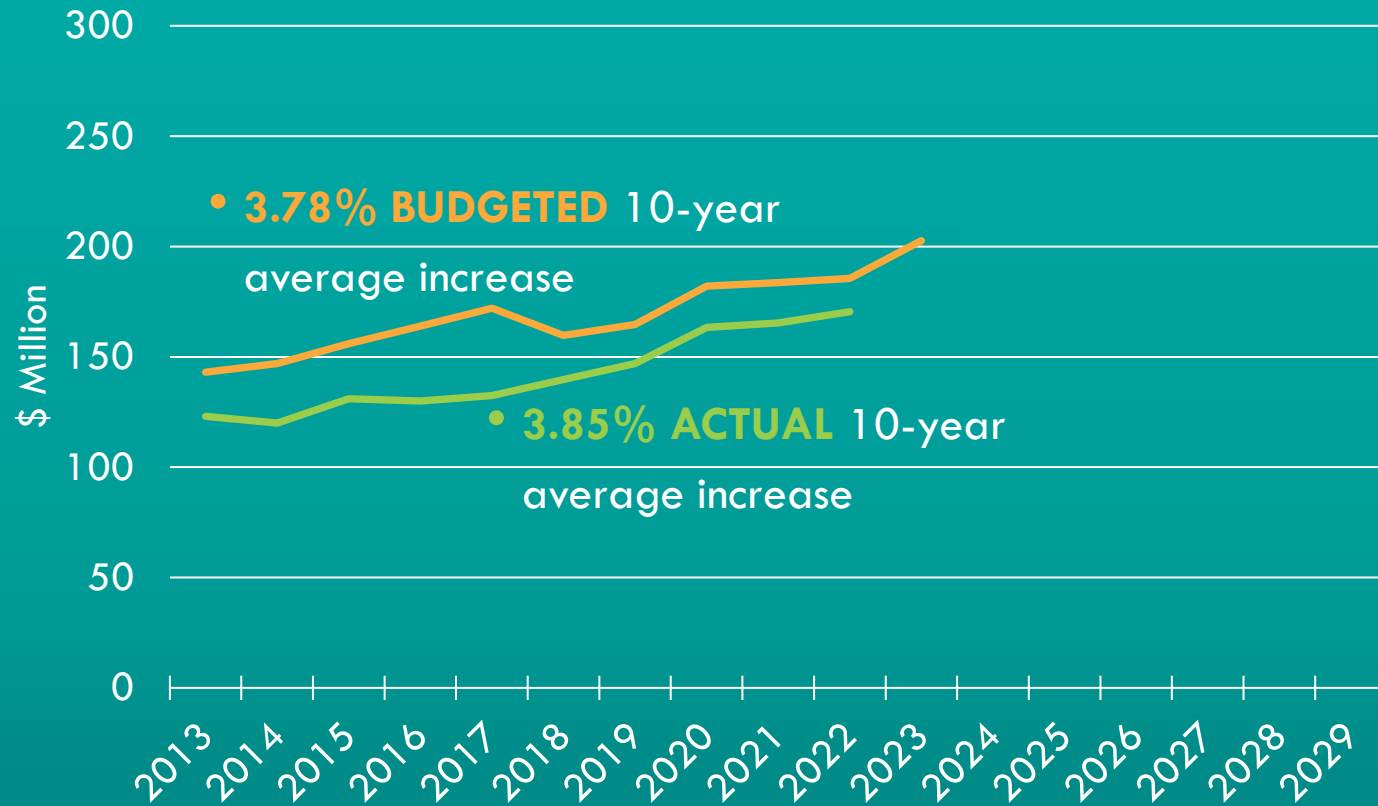
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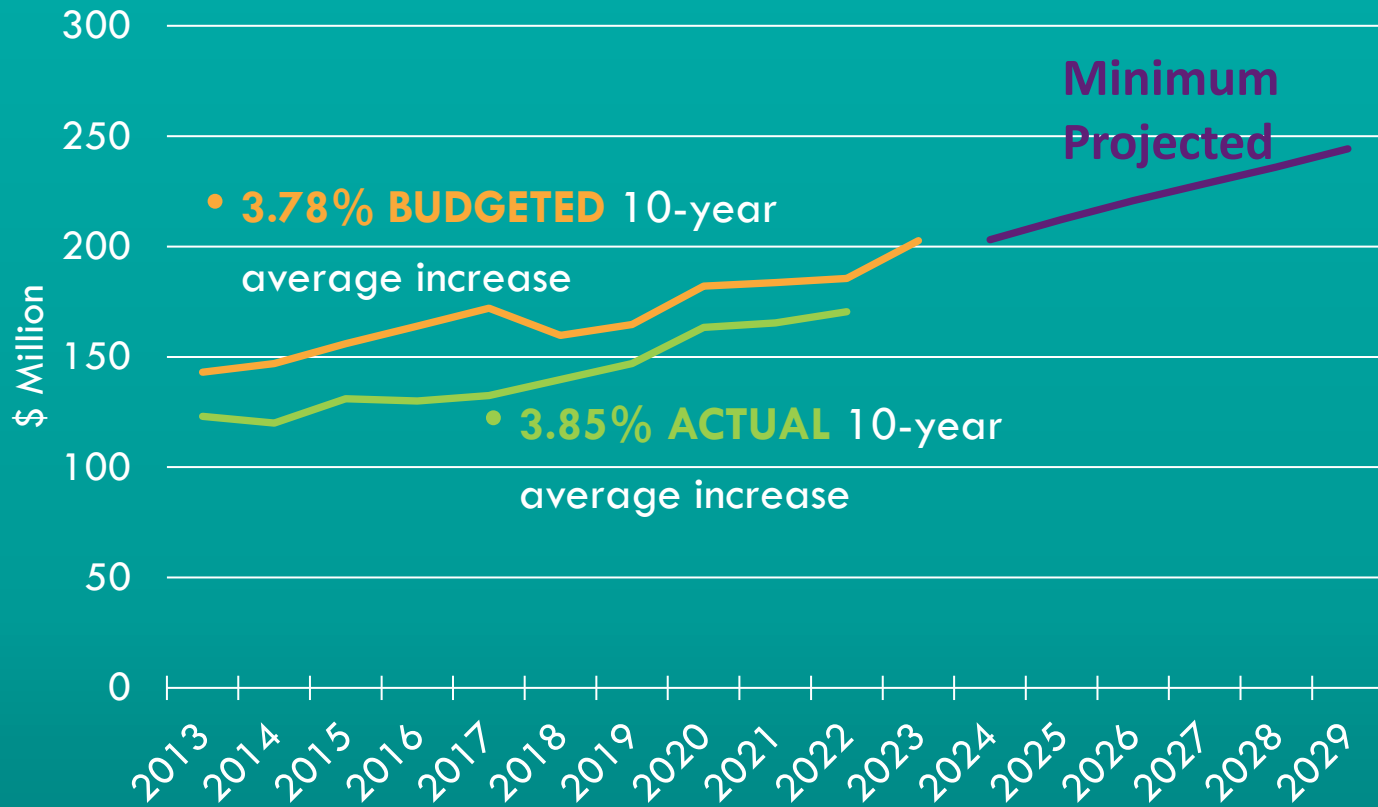


# ACTUAL AND PROJECTED OPERATIONS & MAINTENANCE COSTS (\$ MILLION)





# ACTUAL AND PROJECTED OPERATIONS & MAINTENANCE COSTS (\$ MILLION)



Year	Budgeted Increase	Estimated Inflation
2024	0.2%	5.0%
2025	4.5%	4.5%
2026	4.0%	4.0%
2027	3.5%	3.5%
2028	3.5%	3.5%



# 4 MAJOR DRIVERS OF REVENUE REQUIREMENT AND RATES

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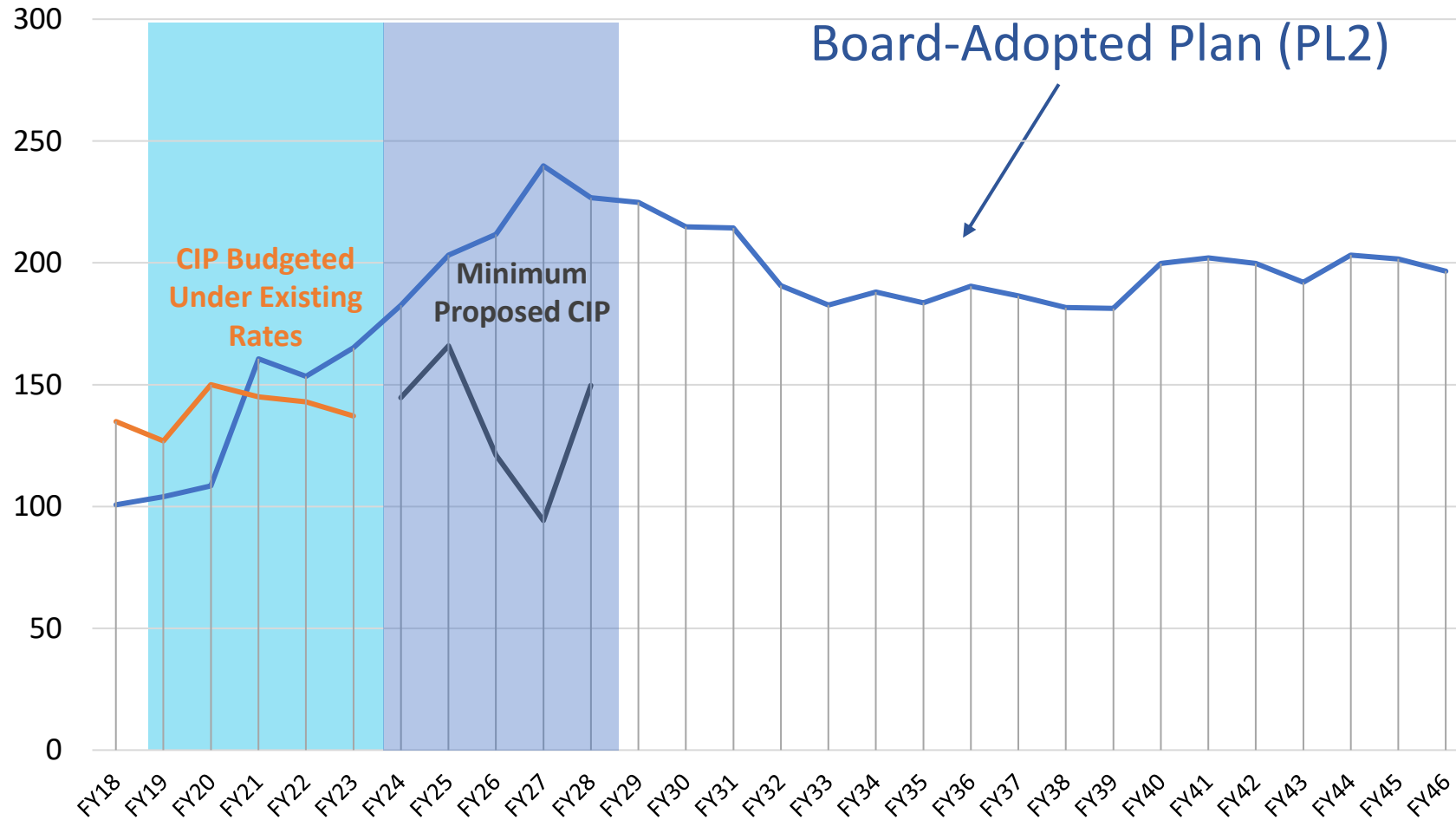
Preparedness to respond to changing  
trends and risks



# MINIMUM PROPOSED CAPITAL SPENDING (\$ INFLATED)

Source	2024	2025	2026	2027	2028
From Operating Fund (Paygo)	\$42,246,000	\$67,661,000	\$54,492,000	\$63,958,000	\$79,337,000
Bond Issuance	\$86,101,000	\$92,994,000	\$38,029,000	\$66,676,000	\$153,233,000
SRF Loans	\$5,610,000	\$29,539,000	\$20,860,000	\$7,317,000	\$0
WIFIA Proceeds	\$0	\$14,887,000	\$58,113,000	\$0	\$0
Grants	\$0	\$19,000,000	\$0	\$0	\$0
ARPA	\$25,000,000	\$0	\$0	\$0	\$0
Special Expendable Fund	\$40,750,000	\$15,188,000	\$10,279,000	\$8,282,000	\$7,979,000
<b>Capital Spending (Inflated \$)</b>	<b>\$199,707,000</b>	<b>\$239,269,000</b>	<b>\$181,774,000</b>	<b>\$146,233,000</b>	<b>\$240,550,000</b>

# 30-YEAR CAPITAL IMPROVEMENT PROGRAM (\$ MILLION 2016)



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# WORKING CAPITAL TARGET FINANCIAL POLICY

- Objective to maintain 180 days cash on hand
- Purpose is to provide funds for unplanned events such as disaster recovery and rate stabilization
- Target is to be achieved gradually over an approximately 10-year period in order to minimize rate impacts
- Maintain a minimum of 60 days cash on hand



# ALTERNATIVES EVALUATED

1. Project rate increases to maintain 60-day working capital balance requirement
2. Project rate increases without the 60-day working capital balance requirement
  - Smooth rates over 5-year period - equal annual percentage rate increases
  - Maintain positive cash balance each year for 5-year period
  - Aim for cash balance at end of 5-year period to meet 60 day working capital balance requirement



# PROJECTED RATE INCREASES

## ALTERNATIVE 1 - MAINTAIN 60 DAYS WORKING CAPITAL

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
<b>Annual Rate Increase</b>	<b>19.6%</b>	<b>3.6%</b>	<b>1.2%</b>	<b>6.6%</b>	<b>7.8%</b>
Total Expenses	\$278,252,100	\$315,362,000	\$319,184,300	\$338,502,700	\$364,320,600
Total Revenue (with Rate Increase)	\$282,029,300	\$316,864,700	\$320,580,200	\$339,772,800	\$365,635,300
Revenue Above/(Below) Expenses	\$3,777,200	\$1,502,700	\$1,395,900	\$1,270,100	\$1,314,700
<b>Operating Fund Balance</b>					
Beginning of Year Balance	\$29,615,305	\$33,392,505	\$34,895,205	\$36,291,105	\$37,561,205
Annual Increase (Decrease)	\$3,777,200	\$1,502,700	\$1,395,900	\$1,270,100	\$1,314,700
End of Year Balance	\$33,392,505	\$34,895,205	\$36,291,105	\$37,561,205	\$38,875,905
Estimated Working Capital Days	60	60	60	60	60





# PROJECTED RATE INCREASES

## ALTERNATIVE 2 – LESS THAN 60 DAYS WORKING CAPITAL

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
<b>Annual Rate Increase</b>	<b>8.4%</b>	<b>8.4%</b>	<b>8.4%</b>	<b>8.4%</b>	<b>8.4%</b>
Total Expenses	\$278,252,100	\$315,362,000	\$319,184,300	\$338,502,700	\$364,320,600
Total Revenue (with Rate Increase)	\$268,152,700	\$301,100,900	\$325,555,000	\$350,683,400	\$379,390,200
Revenue Above/(Below) Expenses	(\$10,099,400)	(\$14,261,100)	\$6,370,700	\$12,180,700	\$15,069,600
<b>Operating Fund Balance</b>					
Beginning of Year Balance	\$29,615,305	\$19,515,905	\$5,254,805	\$11,625,505	\$23,806,205
Annual Increase (Decrease)	(\$10,099,400)	(\$14,261,100)	\$6,370,700	\$12,180,700	\$15,069,600
End of Year Balance	\$19,515,905	\$5,254,805	\$11,625,505	\$23,806,205	\$38,875,805
Estimated Working Capital Days	<b>35</b>	<b>9</b>	<b>19</b>	<b>38</b>	<b>60</b>

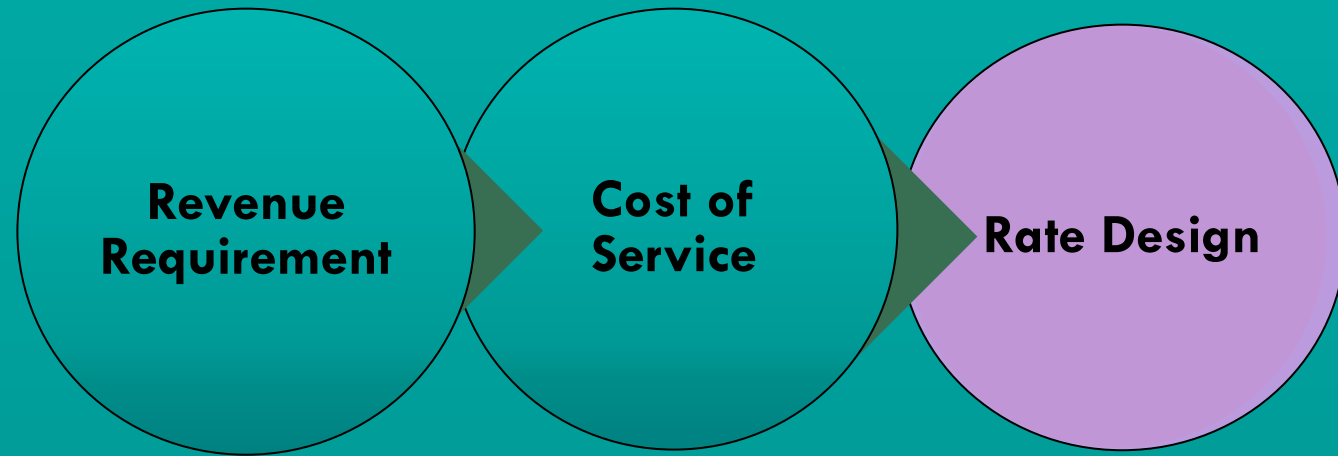


Do these reductions to the O&M and CIP budgets strike an appropriate balance between infrastructure investments and rate affordability?

As we recover from this multi-pronged crisis, is it acceptable to temporarily drop below our working capital targets to maintain rate affordability?



# THREE PRIMARY STEPS OF RATE MAKING



Compare revenue with operating and capital costs

Identify differences in costs to serve each of the customer classes

Consider level and structure of rate design for each class of service



# TIERED RESIDENTIAL WATER RATES



## Single-Family

Tier	Gallons/du/month	Current Rate
1 - EssN	0 to 2,000	\$4.46
2	2,001 to 6,000	\$5.25
3	6,001 to 30,000	\$5.85
4	More than 30,000	\$9.25

## Multi-Unit



Tier	Gallons/du/month	Current Rate
1 - EssN	0 to 2,000	\$3.77
2	2,001 to 4,000	\$4.43
3	4,001 to 10,000	\$5.03
4	More than 10,000	\$5.98

EssN – Essential needs  
Rates are in \$ per thousand gallons  
du – dwelling unit



# MONTHLY CUSTOMER CHARGE BASED ON WATER METER SIZE

8.4% Increase in Monthly Customer Charge



Meter Size	Current Charge	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
5/8"	12.09	13.11	14.21	15.40	16.69	18.10
3/4"	12.09	13.11	14.21	15.40	16.69	18.10
1"	15.28	16.56	17.95	19.46	21.10	22.87
1.5"	17.41	18.87	20.46	22.18	24.04	26.06
2"	43.45	47.10	51.06	55.34	59.99	65.03
3"	53.55	58.05	62.92	68.21	73.94	80.15
4"	101.92	110.48	119.76	129.82	140.73	152.55
6"	181.64	196.90	213.44	231.37	250.80	271.87
8"	276.78	300.03	325.23	352.55	382.17	414.27
12"	598.53	648.81	703.31	762.38	826.42	895.84



# SINGLE-FAMILY RESIDENTIAL

## 8.4% UNIFORM INCREASE

Tier	Existing Rate	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Tier 1: 0 - 2,000 gal	\$4.46	\$4.83	\$5.24	\$5.68	\$6.16	\$6.68
Tier 2: 2,001 - 6,000 gal	\$5.25	\$5.69	\$6.17	\$6.69	\$7.25	\$7.86
Tier 3: 6,001 - 30,000 gal	\$5.85	\$6.34	\$6.87	\$7.45	\$8.08	\$8.76
Tier 4: Over 30,000 gal	\$9.25	\$10.03	\$10.87	\$11.78	\$12.77	\$13.84
Monthly Customer Charge	\$12.09	\$13.11	\$14.21	\$15.40	\$16.69	\$18.10



# COMPARING BILLS – ESSENTIAL NEEDS – 10% OF **SINGLE-FAMILY RESIDENTIAL**

## Essential Needs Tier – The Low Water User (2,000 gallons per month)

Current Bill	Future Bill at Proposed Rates				
	Jan 2024	July 2024	July 2025	July 2026	July 2027
\$21.01	\$22.77	\$24.69	\$26.76	\$29.01	\$31.45



# Comparing bills – Average water user **Single-family residential**

## The Average Water User (9,000 gallons per month)

Current Bill	Future Bill at Proposed Rates				
	Jan 2024	July 2024	July 2025	July 2026	July 2027
\$59.56	\$64.56	\$69.99	\$75.87	\$82.24	\$89.15



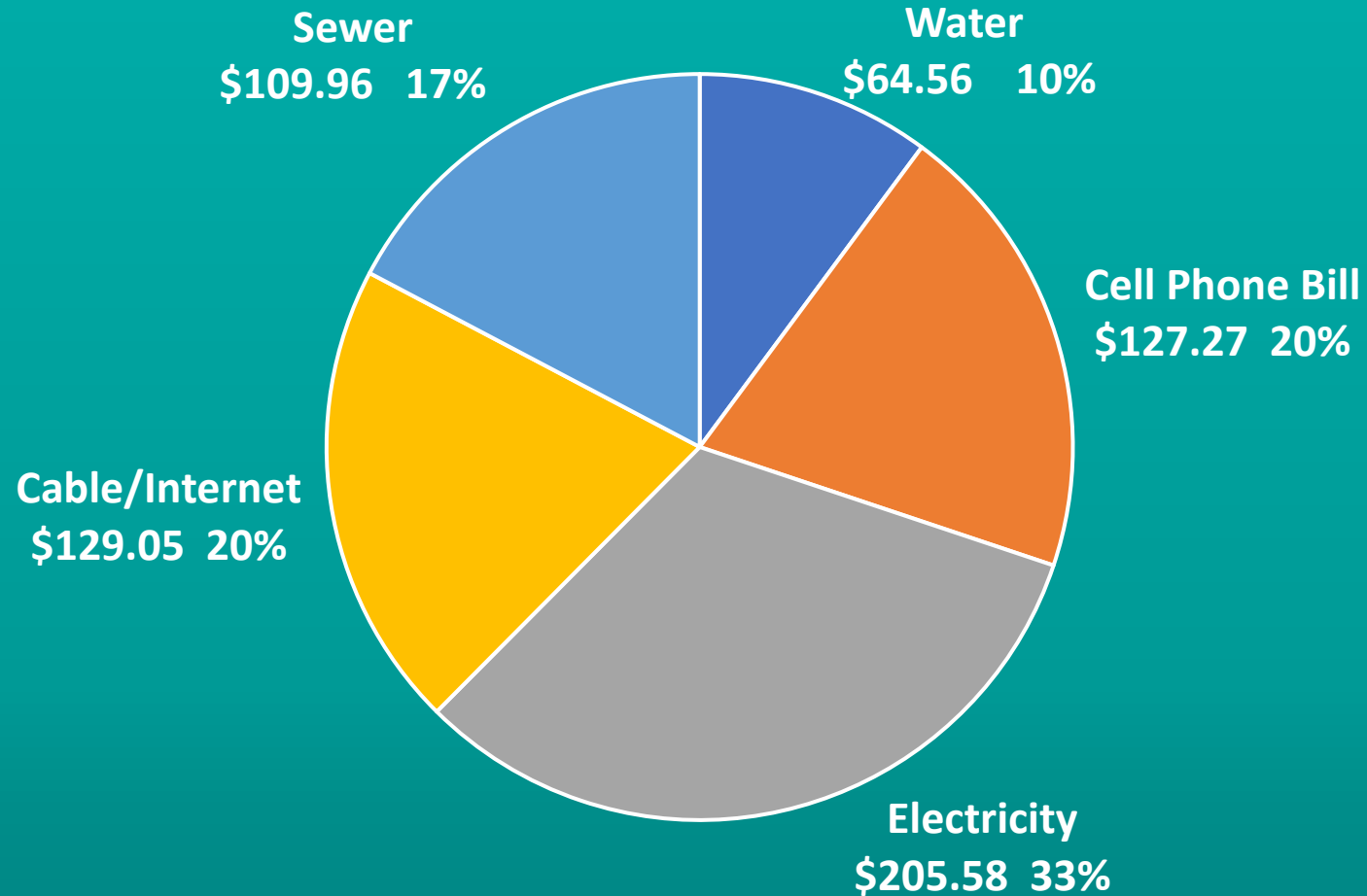


# Comparing bills – High water users – top 3% of **Single-family residential**

<b>The High Water User</b> (35,000 gallons per month)					
<b>Current Bill</b>	<b>Future Bill at Proposed Rates</b>				
	<b>Jan 2024</b>	<b>July 2024</b>	<b>July 2025</b>	<b>July 2026</b>	<b>July 2027</b>
\$228.66	\$247.87	\$268.69	\$291.26	\$315.72	\$342.24



# AVERAGE MONTHLY UTILITY BILLS



# SINGLE-FAMILY RESIDENTIAL

## NO INCREASE TO TIER 1 ESSENTIAL NEEDS, SHIFT COSTS TO TIER 4

Tier	Existing Rate	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Tier 1: 0 - 2,000 gal	\$4.46	\$4.46	\$4.46	\$4.46	\$4.46	\$4.46
Tier 2: 2,001 - 6,000 gal	\$5.25	\$5.69	\$6.17	\$6.69	\$7.25	\$7.86
Tier 3: 6,001 - 30,000 gal	\$5.85	\$6.34	\$6.87	\$7.45	\$8.08	\$8.76
Tier 4: Over 30,000 gal	\$9.25	\$11.68	\$14.31	\$17.17	\$20.26	\$23.62
Percentage Changes by Tier						
Tier 1: 0 - 2,000 gal		0.00%	0.00%	0.00%	0.00%	0.00%
Tier 2: 2,001 - 6,000 gal		8.40%	8.40%	8.40%	8.40%	8.40%
Tier 3: 6,001 - 30,000 gal		8.40%	8.40%	8.40%	8.40%	8.40%
Tier 4: Over 30,000 gal		26.27%	22.55%	19.95%	18.03%	16.56%
Monthly Bill Amount for High Water User 35,000 gallons per month						
8.4% for all Tiers	\$228.66	\$247.87	\$268.69	\$291.26	\$315.72	\$342.24
Shift Costs to Tier 4	\$228.66	\$255.38	\$284.35	\$315.75	\$349.78	\$386.68



# SINGLE-FAMILY RESIDENTIAL

## NO INCREASE TO TIER 1 ESSENTIAL NEEDS, SHIFT COSTS TO TIERS 3 AND 4

Tier	Existing Rate	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Tier 1: 0 - 2,000 gal	\$4.46	\$4.46	\$4.46	\$4.46	\$4.46	\$4.46
Tier 2: 2,001 - 6,000 gal	\$5.25	\$5.69	\$6.17	\$6.69	\$7.25	\$7.86
Tier 3: 6,001 - 30,000 gal	\$5.85	\$6.52	\$7.25	\$8.04	\$8.89	\$9.82
Tier 4: Over 30,000 gal	\$9.25	\$10.31	\$11.46	\$12.71	\$14.06	\$15.53
Percentage Changes by Tier						
Tier 1: 0 - 2,000 gal		0.00%	0.00%	0.00%	0.00%	0.00%
Tier 2: 2,001 - 6,000 gal		8.40%	8.40%	8.40%	8.40%	8.40%
Tier 3: 6,001 - 30,000 gal		11.47%	11.16%	10.88%	10.64%	10.42%
Tier 4: Over 30,000 gal		11.47%	11.16%	10.88%	10.64%	10.42%
Monthly Bill Amount for Average Water User 9,000 gallons per month						
8.4% for all Tiers	\$59.56	\$69.99	\$75.87	\$75.87	\$82.24	\$89.15
Shift Costs to Tiers 3 and 4	\$59.56	\$64.35	\$69.55	\$75.18	\$81.29	\$87.90
Monthly Bill Amount for High Water User 35,000 gallons per month						
8.4% for all Tiers	\$228.66	\$247.87	\$268.69	\$291.26	\$315.72	\$342.24
Shift Costs to Tiers 3 and 4	\$228.66	\$252.85	\$279.08	\$307.51	\$338.33	\$371.73



Should we consider non-uniform rate increase across  
the residential rate tiers, e.g. hold Essential Needs  
Tier 1 to 0%?



# QUESTIONS / DISCUSSION





MAHALO!

THERE IS NO  
SUBSTITUTE FOR PURE  
WATER!

[boardofwatersupply.com](http://boardofwatersupply.com)



# BWS UPDATES

Ernest Lau  
Manager and Chief Engineer  
April 20, 2023  
[boardofwatersupply.com](http://boardofwatersupply.com)



# BWS Funding Diversification Effort Updates

## FEDERAL FUNDING:

- ARPA Funding Commitments totaling \$50.3M (for 5 Projects)
- Three (3) Pending Requests for Congressionally Directed Spending Appropriations totaling \$15.1M
  - 30 Letters of Support received

## STATE FUNDING (through 2<sup>nd</sup> Cross Over):

- HB1511 (Grant in Aid) – Amount TBD, Dollar for Dollar Match Required
- HB300 (General Appropriations) - \$5M State, \$5M BWS Match

## LOW INTEREST LOAN PROGRAMS:

- WIFIA (Invitation to Apply) and DWSRF (ProFi \$20M)





# Mahalo!

Providing safe, dependable, and affordable drinking water, now and into the future.

# UPCOMING STAKEHOLDER ADVISORY GROUP MEETINGS

2023

- Thursday, July 20
- Thursday, October 19

