EAST BAY MUNICIPAL UTILITY DISTRICT

DATE: January 8, 2026

MEMO TO: Board of Directors

THROUGH: Clifford C. Chan, General Manager CCC

FROM: Serge V. Terentieff, Director of Engineering and Construction SVT

SUBJECT: October 28, 2025 Infrastructure Workshop – Follow-up

SUMMARY

At the October 28, 2025 Infrastructure Workshop, the Board requested additional information regarding specific elements of the District's Capital Improvement Program (CIP) and long-term infrastructure investment needs for major water and wastewater system projects for Fiscal Year (FY) 2026 through FY 2035. This memorandum provides the requested information.

DISCUSSION

Provide details on the long-term plan for Mokelumne Aqueduct No. 1 rehabilitation and the projects alignment with the longer-term Delta plan

Approximately 90 percent of the District's water supply is conveyed to the East Bay through the three Mokelumne Aqueducts – Mokelumne Aqueduct No. 1 (MOK1) built in 1927, Mokelumne Aqueduct No. 2 (MOK2) built in 1942, and Mokelumne Aqueduct No. 3 (MOK3) built in 1963. While most of the 83 miles of aqueducts are buried, 10 miles traverse the Sacramento - San Joaquin Delta (Delta) above ground. This Delta reach is vulnerable to settlement, flooding, and seismic hazards. The above ground portion of MOK3 was seismically retrofitted in 2000.

In 2007, the Board accepted the findings of the Strategy for Protecting the Mokelumne Aqueducts in the Delta study, which recommended short- and long-term options to mitigate hazards and risks in the 10-mile elevated sections of the aqueducts across the Delta. Short-term recommendations included maintaining the existing aqueducts and constructing interconnections between all three aqueducts on each side of the Delta. This work was completed in 2013 and improved operational flexibility and maximized hydraulic capacity in the event of damage to MOK1 or MOK2 in the Delta. The long-term recommendation is to construct the Mokelumne Aqueducts Resiliency Project (MARP), a deep tunnel across the Delta from Stockton to Bixler to reduce the risk of failure of all three Mokelumne Aqueducts.

The plan for MOK1 includes both ongoing maintenance and upgrades including:

- Biennial settlement monitoring
- Temperature anchor and bent replacements
- Recoating program

These investments allow MOK1 to remain in operation while the District considers the need for the MARP. The near-term rehabilitation work complements MARP by maintaining operational reliability until a tunneled Delta crossing is implemented, ensuring the District's continued ability to deliver safe and reliable water to its customers under a range of future conditions.

Provide timeline for projects in each ward

Figures 1 through 7 in Attachment 1 lists the projects scheduled for construction in the 10-year CIP by ward. The list and timeline of projects by ward does not include recurring work or work that takes place in all wards, such as infrastructure renewal projects under Pipeline Rebuild, distribution transmission and tank cathodic protections, fire protection at occupied facilities, hydrant installations, new service installations, pipeline relocations, pipeline system extensions and improvements, and electric vehicle charging stations. Capital improvement projects outside of the District's service area are also excluded.

Provide information on community amenities planned for the Central Reservoir and renderings of the site from the surrounding areas

The District has been planning to replace Central Reservoir for decades, and the plans and any community amenities have been guided by feedback during public outreach activities and the California Environmental Quality Act (CEQA) process. Amenities may include, for example, public paths and landscaping.

The District considers limited path installation to publicly accessible areas when: (1) neighbors support the project, (2) installation is feasible, and (3) the path either remedies a lack of sidewalk for pedestrian safety or is required as part of a landscape plan to mitigate project impacts. This approach balances community interest with District needs. Some neighbors (including Redwood Day School and the homes bordering the site) and City of Oakland staff, expressed concerns about privacy, vandalism, trash, and safety around the site; therefore, a path was not added. In addition, Ardley Avenue and East 29th Street already includes a sidewalk and construction of a trail would have conflicted with the new berm and landscaping designed to screen the new tanks.

Public recreation opportunities remain available adjacent to Central Reservoir. A 3.2-acre portion of the Central Reservoir site was sold by the District to the City of Oakland in 1973, and the city converted that portion of the site into the publicly accessible Central Reservoir Recreation Area. Attachment 2 shows the Central Reservoir Recreation Area located to the east of the existing Central Reservoir. Attachment 3 includes a visual rendering of the site before and

after Project construction (5 years) from the Central Reservoir Recreation Area, which was not included in the Project Environmental Impact Report (EIR).

To address the aesthetics of the site, the District incorporated natural landscaping (i.e., berms, trees, and shrubs) that directs the eye toward the natural setting at the perimeter of the site. Landscaping at the perimeter of the site, closest to public views, is the most effective way to screen the tanks. Once the landscaping matures, usually five to ten years after construction, the tanks will be mostly screened. Attachment 4 shows the site plan from the EIR including proposed site landscaping; Attachment 5 shows visual renderings of the site before and after Project construction (i.e., 5 and 10 years) from critical viewpoints. Consistent with other District projects, the landscaping along Ardley Avenue (i.e., the most affected viewpoint) will be installed towards the beginning of construction to ensure optimal screening and landscaping growth while construction is occurring. Additional post-EIR aesthetic and landscaping features will also be incorporated as part of the project, including installation of four benches along Ardley Avenue and planting of 22 additional trees in the southwest portion of the project site, providing additional screening for residences located adjacent to the Central Reservoir site.

Compare the pipeline replacement rate and main breaks in the past 10 years

Launched in FY 2015, the Pipeline Rebuild Program's goal is to renew the District's water distribution infrastructure. The program's primary objective is to establish a sustainable, long-term replacement rate that reduces pipeline failures and water loss. Pipeline replacement priorities are determined using Likelihood of Failure (LOF) and Consequence of Failure (COF) criteria. LOF factors include main break history, pipe age, material, and exposure to geohazards such as fault crossings, landslides, and liquefaction zones. COF factors include proximity to waterways, critical customers, major transportation corridors, and pipeline diameter.

Since the program's inception, the District has replaced approximately 214 miles of distribution mains. Of this total, approximately 112 miles (52 percent) were replaced in Oakland, Berkeley, and Richmond, which collectively accounted for over half of all main breaks since FY 2015. Approximately 50 miles were replaced in Lafayette, Walnut Creek, Orinda, Albany, San Leandro, and Kensington, where main breaks have also been high. Within these areas, the program prioritized the replacement of cast iron and asbestos cement mains which account for 68 and 22 percent of all breaks, respectively.

Attachment 6 shows a 10-year comparison between the total miles of pipelines replaced within each ward and the normalized annual main break rate over that same 10-year period within those wards. As shown in this bar graph, the Pipeline Rebuild Program – over the 10-year period from 2015 to 2025 – has been effective in reducing the overall normalized main break rates (number of breaks/100 miles/year) in five out of the District's seven wards (Wards 1, 2, 3, 4, and 6), resulting in an overall reduction in main break rates ranging from 25 percent (Ward 2) to 47 percent (Ward 3). While the annual main break rates in Wards 5 and 7 have increased over that same 10-year period, the overall normalized main break rates across all of the District's wards are now in the range of 17 to 27 breaks/100 miles/year in 2025, down from a range of 13 to 48

breaks/100 miles/year in 2015. While these overall trends are encouraging, it should be noted that they reflect specific snapshots in time comparing break rates between only two years – 2015 when the Pipeline Rebuild Program was first launched – with the District's current break rates in 2025; the District's overall annual break rate, as shared with the Board during prior annual Pipeline Rebuild Program updates, has varied significantly from year to year, over the past few decades. Future break rates in 2026 and 2027 will provide valuable data to help assess longer-term trends and overall impacts of the District's pipeline replacement program.

As shown on Attachment 7, this approach also corresponds to an overall reduction in the main break rate for cast iron mains from 72 to 38 breaks per 100 miles between 2015 and 2025 (47 percent reduction) and reduced the main break rate for asbestos cement mains from 20 to 16 breaks per 100 miles during the same period (19 percent reduction). In addition, the District's overall main break rate has decreased from 28 to 20 breaks per 100 miles per year.

While main break rates between FY 2015 and FY 2025 have demonstrated a net decrease for certain Wards and materials as shown in Attachments 6 and 7, the annual normalized main break rates have fluctuated up and down from year to year, reflecting variability associated with environmental conditions and pipeline material performance in the distribution system.

The District has focused its pipeline replacements – both in the past decade as summarized in Attachment 6 and for recently completed (2020 to present) and active main replacements as illustrated in the pipeline project replacement map, Attachment 8 – in older and/or more hilly portions of the District's service area where the normalized main break rates are generally higher.

Consider options for additional coordination with cities to align Pipeline Rebuild Program with local projects and the potential to accelerate or decelerate projects

The District maintains active and ongoing coordination with cities, counties, and other utilities to ensure that pipeline and infrastructure projects are efficiently planned and executed. These routine coordination efforts include:

- Pipeline Work Plan: each year, the District provides cities and counties with a summary of upcoming Pipeline Rebuild Program projects. This information allows local agencies to identify potential conflicts with their planned street improvement projects and helps align construction schedules.
- Coordination Meetings with Cities, Counties, and Utilities: the District conducts quarterly meetings with cities, counties, and utilities to review planned street work, discuss upcoming projects, and resolve potential conflicts early in the process.
- Utility Coordination Memo: twice a year, the District distributes a utility coordination memo to cities and counties regarding upcoming street improvements and the importance of early coordination. The memo outlines the District's plan review, design, and construction processes and reinforces the need for sufficient advance notice to facilitate effective collaboration.

- District Project Construction Website: project information for planned and active projects is available at all times on https://www.ebmud.com/about-us/construction-and-maintenance/construction-my-neighborhood

In addition, the District engages directly with local agency staff on specific construction projects. This includes pre-construction meetings to review project scope and field visits with city or county inspectors to address project details. Coordination with cities, counties, and utilities is an ongoing effort, and staff will continue to work proactively with partner agencies to improve project coordination to minimize community impacts.

Provide additional information on how projects are designed to avoid fault zones

Movement within the fault zone can be a sudden slip during an earthquake or slower movement (fault creep). The District incorporates specific design strategies to avoid fault zones whenever possible and mitigate impacts where avoidance is not feasible.

Where relocation outside of the fault zone is not viable, the District replaces or upgrades pipes using seismically resilient materials and design measures. These include replacing existing pipes with seismically resilient pipeline materials, such as high-density polyethylene (HDPE) pipe or earthquake resistant ductile iron pipe or implementing other design measures to accommodate ground movement.

The Summit Pressure Zone South Pipeline Replacement Project demonstrates the integrated use of all three strategies. The existing pipeline was within the Hayward Fault zone. In Phase 1, completed in 2023, the District relocated approximately 5,000 feet of 24-inch transmission pipeline outside of the fault zone. The section of the pipeline that had to cross the fault zone was replaced with HDPE pipe to accommodate the ongoing fault creep. In addition, the District in collaboration with U.C. Berkeley, installed fiber optic cables on this pipe to monitor pipe strain and provide real time pipeline performance monitoring at the fault crossing. Lastly, emergency bypass connections were installed on either side of the fault zone in the event the HDPE pipe fails.

Consider the aesthetics for the facility upgrades at the Main Wastewater Treatment Plant

The Wastewater Department will consider integrating public art and architectural enhancements into future capital projects whenever feasible. In addition, maintenance staff will evaluate options for repainting and increasing the frequency of power washing the exterior walls of the digesters and other structures that are most visible to the public.

CCC:SVT

Attachments: 1: Figures 1-7: Schedule of Construction Projects by Ward, Wards 1-7
2: Central Reservoir Recreation Area
3: Visual Renderings from Central Reservoir Recreation Area

4: Central Reservoir Site Plan
5: Central Reservoir Visual Renderings
6: 10-Year Comparison of Pipeline Replacements & Annual Break Rate by Ward
7: 10-Year Comparison of Annual Break Rate/100 Miles, by Material
8: Recently Completed & Active Pipeline Replacement Project Map by Ward

Schedule of Construction Projects by Ward

Figure 1. Schedule of Construction Projects, Ward 1

CIP Project Name	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035
Sustainable Groundwater Management Act (SGMA) Compliance Program										
Richmond Advanced Recycled Water (RARE) Routine Capital Equipment Replacement (RCER)										
Crockett Aqueduct Relocation										
Maloney Reservoir Valve Pit Repair										
North Richmond Water Recycling Project (NRWRP) Improvements, Phase 3										
Wildcat Pumping Plant (PP)										
Welle Reservoir Replacement, Rolph and Welle PP and Rolph Reservoir Demolition										

Figure 2. Schedule of Construction Projects, Ward 2

CIP Project Name	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035
Happy Valley and Sunnyside Pumping Plants (PP), and Happy Valley Pipelines Phase 2 Improvements	■									
Lafayette Water Treatment Plant (WTP) Control Systems Improvements	■									
East of the Hills Facilities Demolition and Improvements	■	■								
Fay Hill, Rheem, and Scenic East PPs; Fay Hill Reservoir and Right-of-Way (R/W) 3363 Pipeline; Ridgewood Regulator, PP, and Pressure Tank	■	■								
Lafayette Reservoir Outlet Tower Seismic Retrofit	■	■								
Dublin San Ramon Service District (DSRSD) - EBMUD Recycled Water Authority (DERWA) EBMUD Share Capital Projects	■	■	■							
Walnut Creek WTP Control Systems Refresh	■	■	■							
WTPs Chemical Safety Improvements	■	■	■	■						
San Ramon Valley (SRV) Customer Retrofits	■	■	■	■	■	■				
Walnut Creek WTP Filters Improvements		■	■	■	■					
Castenada PP Standby Generator			■	■	■					
Knight, Oakmont Memorial Park, and Overhill Regulators			■	■	■					
Bryant No. 1 and No. 2 PPs			■	■	■	■				
EBMUD/SRV Distribution Pipelines			■	■	■	■				
Withers Reservoir Service Relocations				■						
Water Quality Research Facility				■	■					
Fleet Maintenance East Upgrades				■	■	■	■			
Lafayette Aqueduct No. 1 Relining				■	■	■	■			
Walnut Creek Raw Water PP No. 3 Rehabilitation and Upgrades					■	■	■	■		
Walnut Creek WTP Pretreatment Project					■	■	■	■	■	
Sobrante and Lafayette WTPs ADA[1] Upgrade						■				
Larkey PP						■	■			
Leland Reservoir Replacement										■

[1] Americans with Disabilities Act

Figure 3. Schedule of Construction Projects, Ward 3

CIP Project Name	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035
Happy Valley and Sunnyside Pumping Plants (PP), and Happy Valley Pipelines Phase 2 Improvements										
Painted Pony Regulator Rehabilitation										
East 10th Street, Hegenberger Road and Summit Pressure Zone (PZ) Transmission, Phase 2A										
Fay Hill, Rheem, and Scenic East PPs; Fay Hill Res and R/W 3363 Pipeline; Ridgewood Regulator, PP, and Pressure Tank										
Madrone and Palo Seco PPs										
SGMA Compliance Program										
Carter Reservoir Rehabilitation, Arroyo PP Improvement, and Arroyo Reservoir Replacement										
Orinda WTP Disinfection and Chemical Systems Safety Improvements										
Westside PP Relocation, Encinal Regulator Installation, Encinal Reservoir and PP Demo										
WTPs Chemical Safety Improvements										
Knight, Oakmont Memorial Park, and Overhill Regulators										
Swainland Reservoir and Montclair PP Replacements and 82nd Ave Rate Control Station (RCS) Rehabilitation										
Joaquin Miller PP Landslide Repair and Access Road										
Lafayette Aqueduct No. 1 Relining										
Circle and Orion Regulators Rehabilitation										
Sobrante and Lafayette WTPs ADA Upgrade										
Terminal Reservoir Emergency Drain Tunnels										
Montana Pipeline										
San Pablo Dam Seismic Valve										
Dos Osos Reservoir Replacement and Dos Osos PP Rehab										
Briones Reservoir Isolation Valve Relocation										
Terminal Spillway Improvements										
Donald PP										
Stott PP										
Sequoia Aqueduct Pipeline										

Schedule of Construction Projects by Ward

Figure 4. Schedule of Construction Projects, Ward 4

CIP Project Name	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035
East 10th Street, Hegenberger Road and Summit PZ Transmission, Phase 2A										
(SGMA Compliance Program										
Summit PZ Transmission, Phase 2B										
Summit West, Berryman West, and Aqueduct PPs Rehabilitation										
Emeryville Distribution										
Genoa No. 1, Genoa No. 2, and Hollis RCSs										

Schedule of Construction Projects by Ward

Figure 5. Schedule of Construction Projects, Ward 5

CIP Project Name	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035
Administration Building (AB) Fiber Optic Backbone Cabling Replacement										
Adeline Maintenance Center (AMC) AB HVAC[2] System Improvements										
East 10th Street, Hegenberger Road and Summit PZ Transmission, Phase 2A										
East Bayshore Estuary Pipeline										
Oakland AB Roofing Systems Rehabilitation										
SGMA Compliance Program										
Oakport Site Development										
San Leandro Channel, Alameda Crossing No. 2										
East Bayshore Alameda Distribution and Customer Retrofits										
New Central Area Service Center										
East Bayshore - Upgrades to improve water quality										
Customer Retrofits, Phase 1A										
Circle and Orion Regulators Rehabilitation										
AB Safety and Security Improvements										
AB Fire Wall Repairs										
AMC Buildings Roof Repairs										
AB HVAC System Upgrade and Follow-on Work										
AB Major Capital Renewals										
AB Space Reconfiguration										
AB Electrical Systems Upgrade										

[2] Heating, Ventilation and Air Conditioning

Schedule of Construction Projects by Ward

Figure 6. Schedule of Construction Projects, Ward 6

CIP Project Name	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035
Regulator Rehabilitation, Campus Bundle										
East 10th Street, Hegenberger Road and Summit PZ Transmission, Phase 2A										
Madrone and Palo Seco Pumping Plants (PP)										
SGMA Compliance Program										
Upper San Leandro Water Treatment (WTP) Plant Reliability Improvements										
WTPs Chemical Safety Improvements										
Central Reservoir Replacement										
Swainland Reservoir and Montclair PP Replacements and 82nd Ave RCS Rehabilitation										
Central Reservoir Mixing System										
Chabot Golf Course Service Relocation										
Church Street, Golf Links, Victoria, Ney, 73rd Ave and Dunsmuir RCSs										
Montana Pipeline										
South 54 Pipeline										
Terminal Spillway Improvements										
Fontaine PP Relocation										
Sequoia Aqueduct Pipeline										

Schedule of Construction Projects by Ward

Figure 7. Schedule of Construction Projects, Ward 7

CIP Project Name	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035
Regulator Rehabilitation, Campus Bundle										
SGMA Compliance Program										
Church Street, Golf Links, Victoria, Ney, 73rd Ave and Dunsmuir RCSs										
Terminal Reservoir Emergency Drain Tunnels										
Upper San Leandro Dam Outlet Improvements										
Almond Reservoir and Proctor Pumping Plant (PP) Replacements and Cull Creek Reservoir Rehabilitation										
Terminal Spillway Improvements										
Quarry PP										

Central Reservoir Recreation Area

EBMUD Central Reservoir Replacement Project – Existing Reservoir Site

Source: ESRI Imagery, 2018; ESA, 2018

ATTACHMENT 3

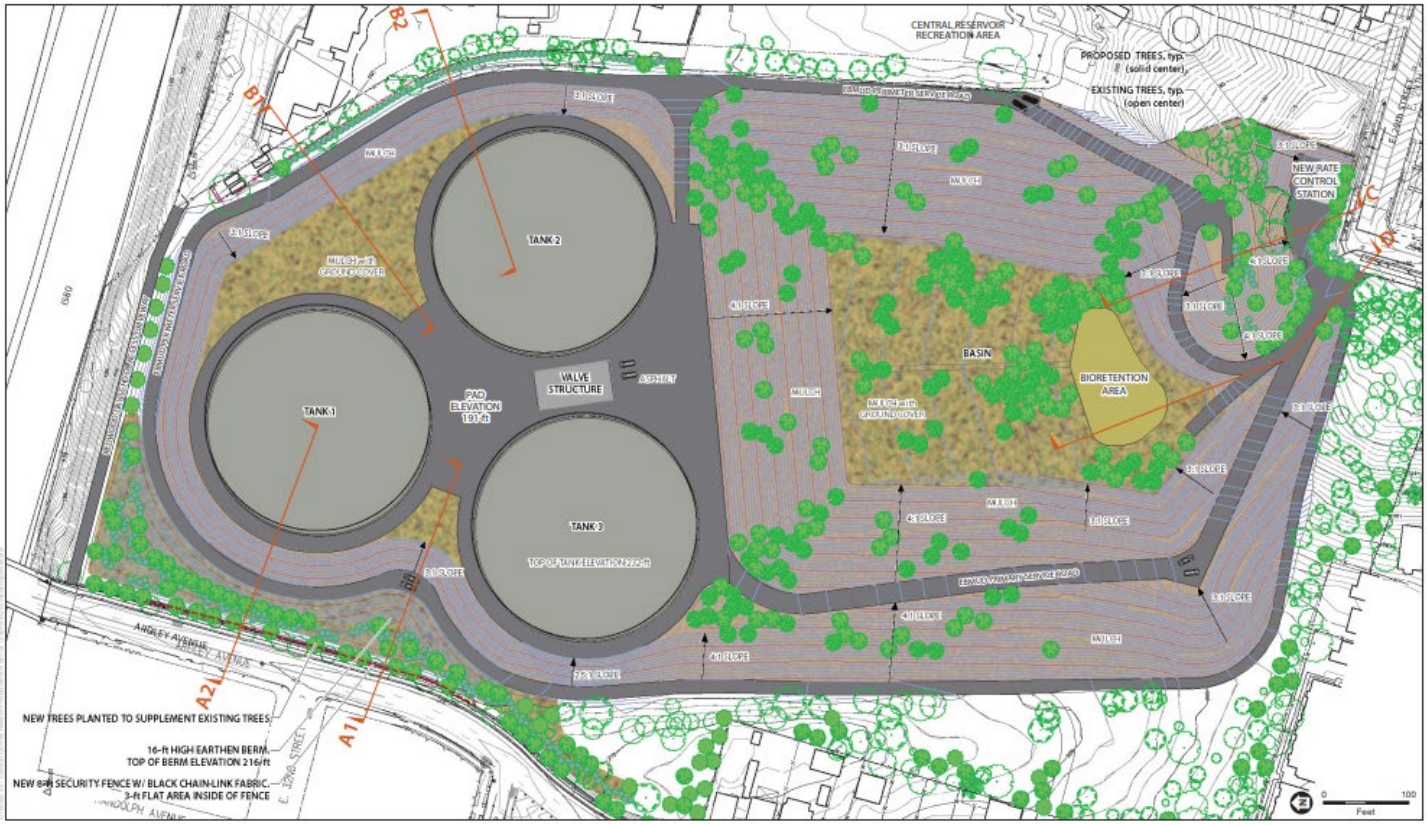
Central Reservoir Visual Renderings from Central Reservoir Recreation Area

Existing View – Central Reservoir Recreation Area looking west

Visual Simulation – 5 years

ATTACHMENT 4

Central Reservoir Site Plan



EBMUD Central Reservoir Replacement Project – Proposed Site Plan

Source: EBMUD, 2018; Dillingham Associates, 2018

Central Reservoir Visual Renderings

EBMUD Central Reservoir Replacement Project – Visual Simulation from Ardley Avenue at 23rd Avenue, Looking North

Source: Environmental Vision, 2018

Central Reservoir Visual Renderings

EBMUD Central Reservoir Replacement Project – Visual Simulation from Ardley Avenue at 23rd Avenue, Looking Southeast

Source: Environmental Vision, 2018

Central Reservoir Visual Renderings

Existing View - East 32nd Street near Ardley Avenue looking south

Visual Simulation - 5 years after construction

Visual Simulation - 10 years after construction

EBMUD Central Reservoir Replacement Project – Visual Simulation from East 32nd Street near Ardley Avenue, Looking East

Source: Environmental Vision, 2018

Central Reservoir Visual Renderings

Existing View - 25th Avenue near East 29th Street looking north (Photo 3)

Visual Simulation - 5 years

Visual Simulation - 10 years

EBMUD Central Reservoir Replacement Project – Visual Simulation from 25th Avenue near East 29th Street, Looking North

Source: Environmental Vision, 2018

Central Reservoir Visual Renderings

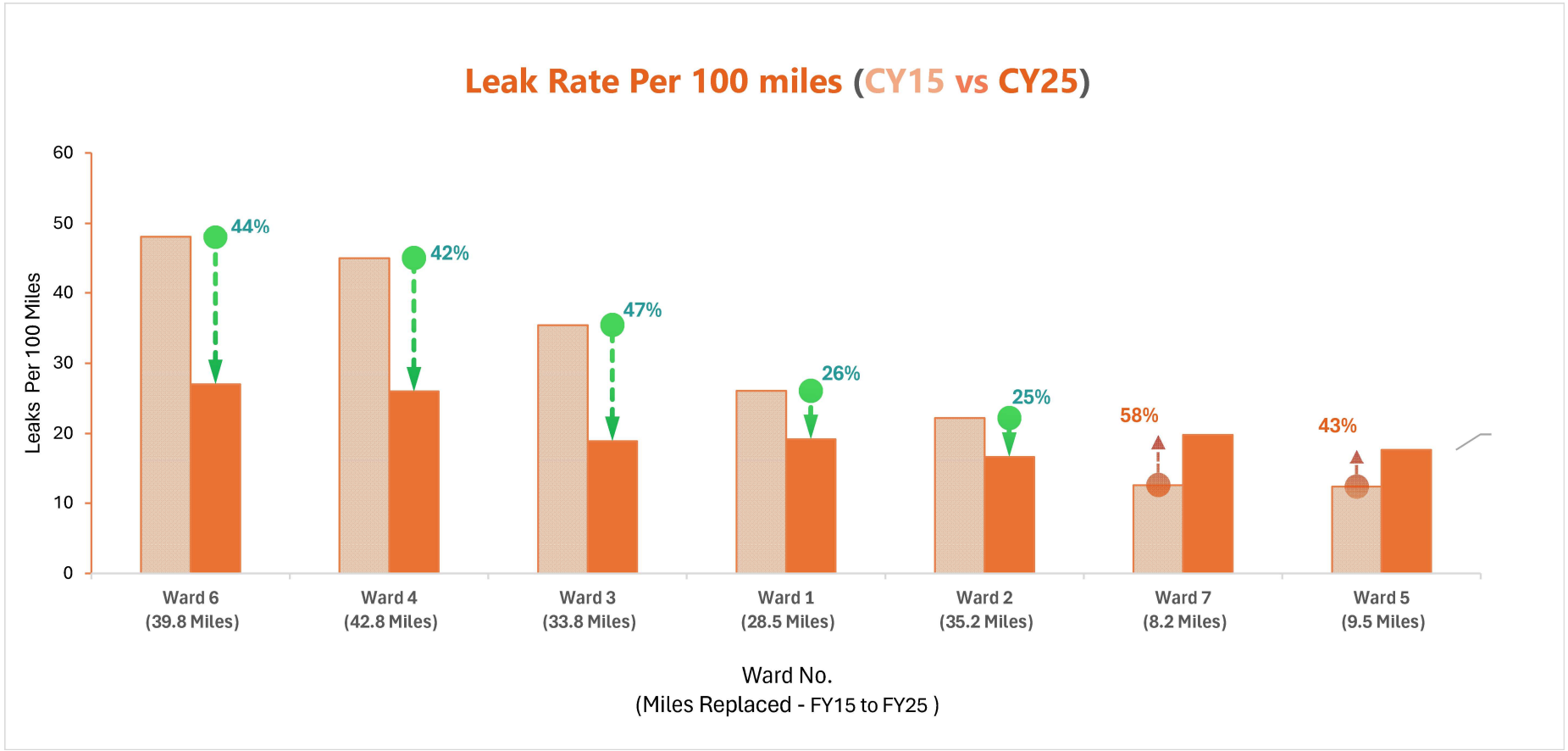
Existing View – Redwood Day School Looking West

Visual Simulation – 5 years

Visual Simulation – 10 years

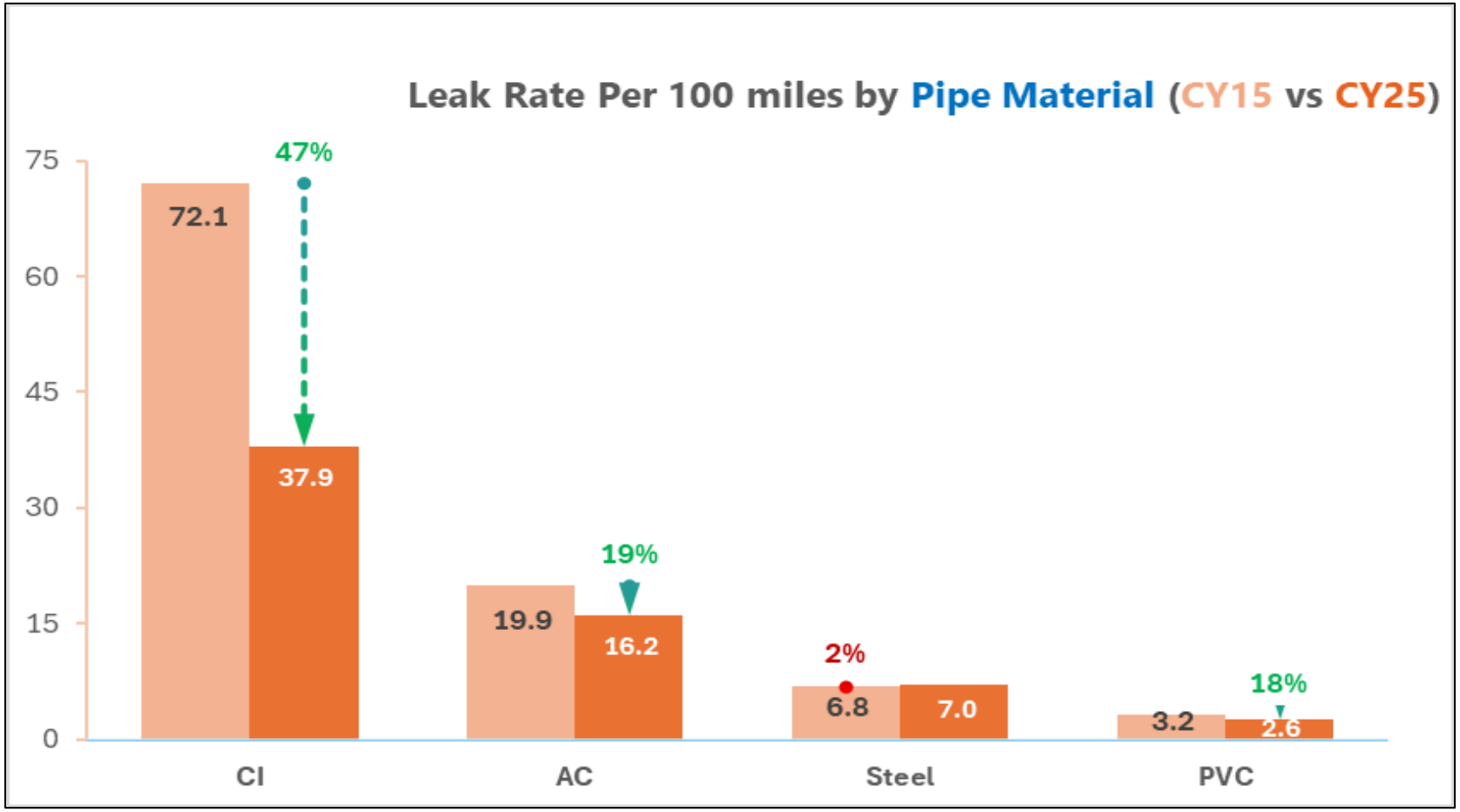
EBMUD Central Reservoir Replacement Project – Visual Simulation from Redwood Day School Looking West

Source: Environmental Vision, 2018*t*


Leak Rate Per 100 miles (CY15 vs CY25)
Leaks Per 100 Miles
60
50
40
30
20
10
0
44%
42%
47%
26%
25%
58%
43%
Ward 6
(39.8 Miles)
Ward 4
(42.8 Miles)
Ward 3
(33.8 Miles)
Ward 1
(28.5 Miles)
Ward 2
(35.2 Miles)
Ward 7
(8.2 Miles)
Ward 5
(9.5 Miles)
Ward No.
(Miles Replaced - FY15 to FY25)

ATTACHMENT 7

10-Year Comparison of Annual Break Rate/100 Miles, by Material



Pipeline Replacement Project Map by Ward