# Metropolitan Welcomes the

# **CALIFORNIA AFRICAN AMERICAN WATER EDUCATION FOUNDATION**



Metropolitan Water District of Southern California Advocates for Responsible Public Policy

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA



#### California African American Water Education Foundation

# Planning for Drought & Abundance

August 9, 2023

### Metropolitan Water District's Sources of Supplies



### Southern California Water Reliability Challenges



### Changing Conditions in Lake Mead



### Historic Swings in State Water Project (SWP) Allocation



California African American Water Education Foundation



#### Intensity



### Major Improvements in Lake Oroville Following Winter Storms







### The Tale of Two Years: Drought & Abundance



August 9, 2023

California African American Water Education Foundatio

Slide 9

### Storing Supplies During Wet Years Helps to Manage Dry Years & Other Supply Challenges



#### Note: 2023 end-of-year balance is preliminary as they are subject to DWR adjustments and USBR final accounting.

Slide 10

### Metropolitan's Diversified & Expansive Storage Programs



California African American Water Education Foundation

### Integrated Water Resources Plan (IRP)

- Metropolitan's IRP is a blueprint for Southern California water reliability
  - Establishes a long-term, comprehensive water ٠ resources strategy to adapt to changing conditions
  - Identifies diversified resource portfolios
- Regional collaborative effort between  $\bullet$ Metropolitan, its Member Agencies, and community, environmental, and agricultural interests



1987-92 Drought

2004 IRP Update Colorado River Cutbacks **Planning Buffer** 

2010 IRP Update SWP Cutbacks Adaptive Management Strategy

2012-16 Recession & Drought **Emphasis on Conservation &** Local Resource Development

**2020 IRP Phase 1** 

2020-21 Drought **Scenario Planning** 

### 2020 IRP – Four Planning Scenarios



### Key Takeaways

- Southern California faces several water reliability challenges, especially in the wake of climate change
- Hydrologic conditions within the Sierra Nevada and the Upper Colorado River Basin can change quickly



• Through planning and implementation processes, Metropolitan is able to adapt to changing conditions









# Developing a Climate Adaptation Master Plan for Water

August 9, 2023

### GLOBAL WATER DISTRIBUTION

Freshwater, an essential element for sustaining life, remains an increasingly scarce commodity on a global scale. In an effort to shed light on this pressing issue, the following infographic delves into the availability of water worldwide.



### 1,386m km<sup>3</sup>

Total volume of all of the world's water supply (2019)

#### **80%** ·

of our ocean floors are unmapped and unexplored (2023)

71%

of Earth's surface is water (2023)

2.1b ---

30%

of fresh water

Ground water

(2023)

people lacked access to safe drinking water (2017)

1%

Available as drinking

water (2023)

of fresh water



1/5th of the world's population lives in water-scarce areas (2023)

On average, each person receives less than 1,000 cubic meters of water a year (2023)



#### WATER WITHDRAWALS PER CAPITA

Total water withdrawals from agricultural, industrial and municipal purposes per capita, measured in cubic meters (m³) per year. Most up to date data from ourworldindata.org.

No data

0 m\*

100 m8

200 m<sup>3</sup>

500 m<sup>3</sup>

1,000 m<sup>3</sup>

2,000 m<sup>3</sup>





As daily temperatures rise across the planet, 2023 saw the global average temperature soar to record highs from July 4–7.

The hottest day on record reached **17.2°C** on July 6, 2023.

**Daily** GLOBAL AVG. TEMPERATURES

MAR

FEB

JAN

APR

MAY

JUN

2023
 1979-2022 Avg.
 1979-2022 Range

HEAT FACTOR

JUL

Both 2023 and the previous record year (2016) saw temperature spikes due to the combined impacts of global warming and the El Niño climate pattern.

AUG

SEP

OCT

17°C

16°C

14°C

13°C

12°C

DEC

NOV

15°C

### Monthly GLOBAL AVG. TEMPERATURES



# Impacts Beyond Drought









# Challenges when Operating in a Changing Climate



System Stress



Energy Costs







Supply Chain Impacts



Water Quality Changes 2/13/23



Low and High Flow

**Operations** 

**Complex Shutdown** 

Planning



New and Emerging Regulations

Board of Directors Retreat

#### Stronger together

Metropolitan is developing a long-term Climate Adaptation Master Plan for Water (CAMP4W) to prepare Metropolitan and its Member Agencies for an uncertain future by developing a reliable and resilient supply of water and network of facilities. Founded on financial sustainability and equitable affordability, the plan will guide the region with collaboration and interconnectivity through a "stronger together" approach.

Climate Adaptation Master Plan for Water





# CAMP4W Development (2023-2024)

Define the Problem & Process	<ul> <li>Identify Climate Vulnerabilities</li> <li>Align leadership on reliability, resilience, financial sustainability &amp; affordability</li> </ul>
Assess Climate Impacts	<ul> <li>Identify water resources gap in a changing climate</li> <li>Apply scenario planning</li> <li>Develop evaluative criteria</li> </ul>
Assess Financial Impacts	<ul> <li>Assess rate impacts</li> <li>Discuss revenue models</li> <li>Address affordability</li> </ul>
Evaluate Adaptation Strategies	<ul> <li>Project and program evaluation</li> <li>Identify low regrets projects</li> </ul>
Implement, Track, Adjust	<ul> <li>Establish climate adaptation decision making framework</li> <li>Continuing evaluation and implementation</li> </ul>

Climate Adaptation Master Plan for Water

### Key Terminology & Priorities

(Supply) Reliability Ability to always meet water demands

(System & Ecosystem) Resilience Ability to withstand & recover from disruptions

(Enterprise) Financial Sustainability Revenues sufficient to cover expenses over the shortand long- term

(Customer) Affordability Relative cost burden and elastic ability to access (pay for) service

Equity (for member agencies and communities) Fair, just and inclusive

### CAMP Public Engagement Strategy Objectives

**Relationships** – Expand and deepen relationships with communities in service area, especially underserved and vulnerable communities

Information Sharing – Provide information about the purpose and goals of CAMP and how it relates to resilient water supply for local communities and customers

**Listen** – Solicit input from community members to understand community priorities and needs and use it to inform CAMP and its implementation, with particular focus on underserved communities

**Report Back** – Inform community members about how input was used in CAMP and initial CAMP implementation actions

### Round 1 Four-Pronged Collaborative Approach



# **Co-Develop Toolkits** for use with communities



Partner with Communitybased Organizations and Member Agencies to convene community meetings



Host Virtual Listening Sessions to hear input and perspectives on specific CAMP topics



Utilize Existing Engagement Channels to strengthen ties and build relationships





### Maintaining & Improving MWD Infrastructure

CAAWEF August 9, 2023 James Spicer Eric Freeman

## **Presentation Outline**

- Metropolitan's Infrastructure
- Capital Investment Plan
- Engineering Services Group
- System Maintenance & Reliability
- Infrastructure Improvements

## Metropolitan's Infrastructure











### Capital Investment Plan FY 2022/23 and FY 2023/24 (\$600M Budget)



PCCP Rehabilitation
 \$104M

System Reliability
 \$86M

 Syst Flexibility/Supply Reliability

≥ \$72M

#### **Engineering Services Group**

### Organization Chart



System Maintenance & Reliability PCCP Rehabilitation Program & Seismic Resilience

### **Pipeline Rehabilitation Program**



### Metropolitan Distribution System

#### Total: 830 miles

Steel, RCP, PCCP, CI

#### PCCP original: 163 miles

- Diameter = 42 to 201-inches
- Pressures up to 360 psi
- Constructed 1962 to mid-1980's
- Excludes 16 miles relined with steel since 2017

#### PCCP Remaining: 142 miles



### **Prestressed Concrete Cylinder Pipe**

 Made for <u>higher</u> pressures
 Susceptible to corrosion of prestressing wires



#### Broken Prestressing Wires



# Five Priority PCCP Pipelines

- Risk-based approach
- Condition criteria
  - Wire breaks
  - Repair history
  - Trends
- Consequence criteria
  - Criticality
  - Location



### PCCP Management Strategy

- Continue regular inspections and assessments
- Monitor stray currents and install drain stations where necessary
- Perform individual repairs of segments as needed
- Plan and execute long-term rehabilitation



# PCCP – Long-Term Program

- Reline and Rehab 5 PCCP Lines (100 Miles)
  - Target duration 15 to 20 years
  - Estimated cost range \$2.4 \$2.6B
- Cost & Schedule Factors
  - Valve and pipe procurement lead-times
  - Shutdown restrictions
  - Environmental restrictions
  - ROW and permits
  - Ancillary improvements
- Priority & Cost Forecasts
  - Reviewed with CIP cycles
  - Reassessed as new inspection data is received



## Seismic Resilience Program

### Seismic Resilience – Casa Loma Siphon



### Seismic Resilience – Innovation in Technology

Earthquake-Resistant Pipe

- Absorb energy during seismic events
- Allow large deformation to protect pipe & joint
- Accommodate continuous ground subsidence



### MWD Casa Loma Siphon Fault Crossing

Replace existing steel pipe with 104" (2.6 m) dia. ERDIP

- Fault Displacement: 13 ft horizontal + 3 ft vertical
- Ground Settlement: 5 ft vertical
- Full-scale testing to validate joint displacement







#### Full-scale testing in Japan

### **MWD** Casa Loma Siphon Construction

- Construction started in Feb 2022
- Notice of completion issued in July 2023
- Earthquake Resistant Ductile Iron Pipe (ERDIP) by Kubota
  - Over 50 years of experience in Japan, 10+ years in U.S. and Canada



# New Infrastructure

**Drought Mitigation Projects** 

# System-Flexibility Projects (Drought Mitigation)



# **Distribution System**



## **Distribution System**



## **Greg Avenue Pumping Plant and PCS**



## Sepulveda Feeder Reverse Flow







### Venice Pump Station – Future Rendition



- Pump Capacity
  - 30 CFS +1
  - 1200 HP Each
- New Switch Gear and Control Building

### Sepulveda Pump Station – Future Rendition



- Pump Capacity
  - 30 CFS +1
  - 2000 HP Each
- New Switch Gear and Control Building

# **Progressive Design Build - Background**

- MWD Admin Code Design-Bid-Build 1928 to present
- AB 1845 / SB 991
   Effective 01/01/23

AB 184-

- Authorizes MWD to use PDB and other collaborative project delivery method
- Up to 15 projects under each bill
- AB 1845 Pure Water and drought response projects
- SB 991 Any water/wastewater project



## **Progressive Design Build - Benefits**



- Collaborative, phased engineering and construction effort
- Brings the construction team to project at earliest stage
- Design-Build Contractor a single entity
- Emphasizes schedule performance
- Fosters innovation

## Summary

- Rehabilitate aging infrastructure to PROTECT public health, regional economy, and Metropolitan assets
- Construct new infrastructure to ADAPT to changing climate and water resources



#### Metropolitan's Five Strategic Priorities

