EAST BAY MUNICIPAL UTILITY DISTRICT

Recycled Water Master Plan Update:

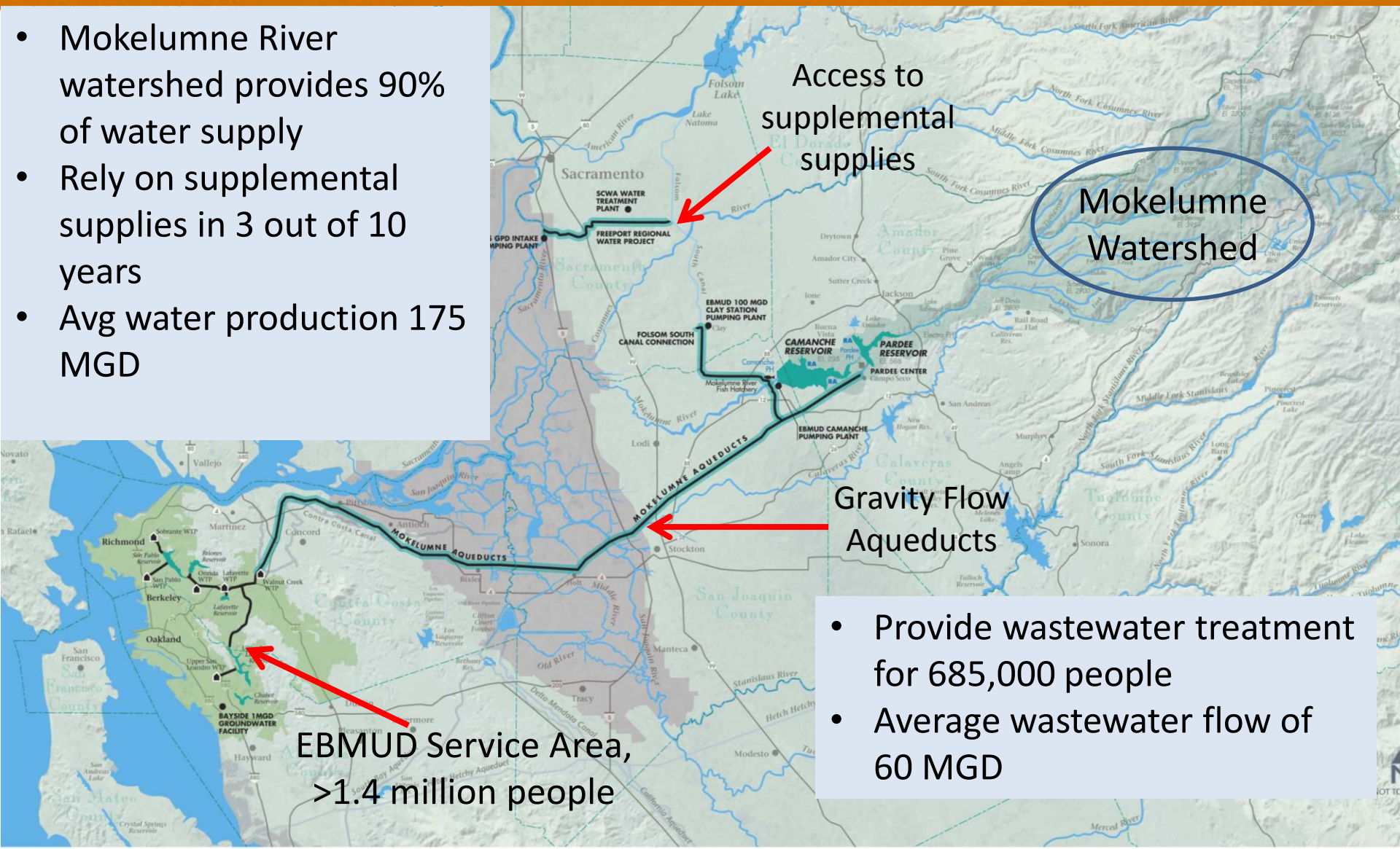
To Drink or Not to Drink?

Potable vs. Non-Potable Reuse

Northern California WateReuse Chapter Meeting
March 1, 2019

About EBMUD

- Mokelumne River watershed provides 90% of water supply
- Rely on supplemental supplies in 3 out of 10 years
- Avg water production 175 MGD



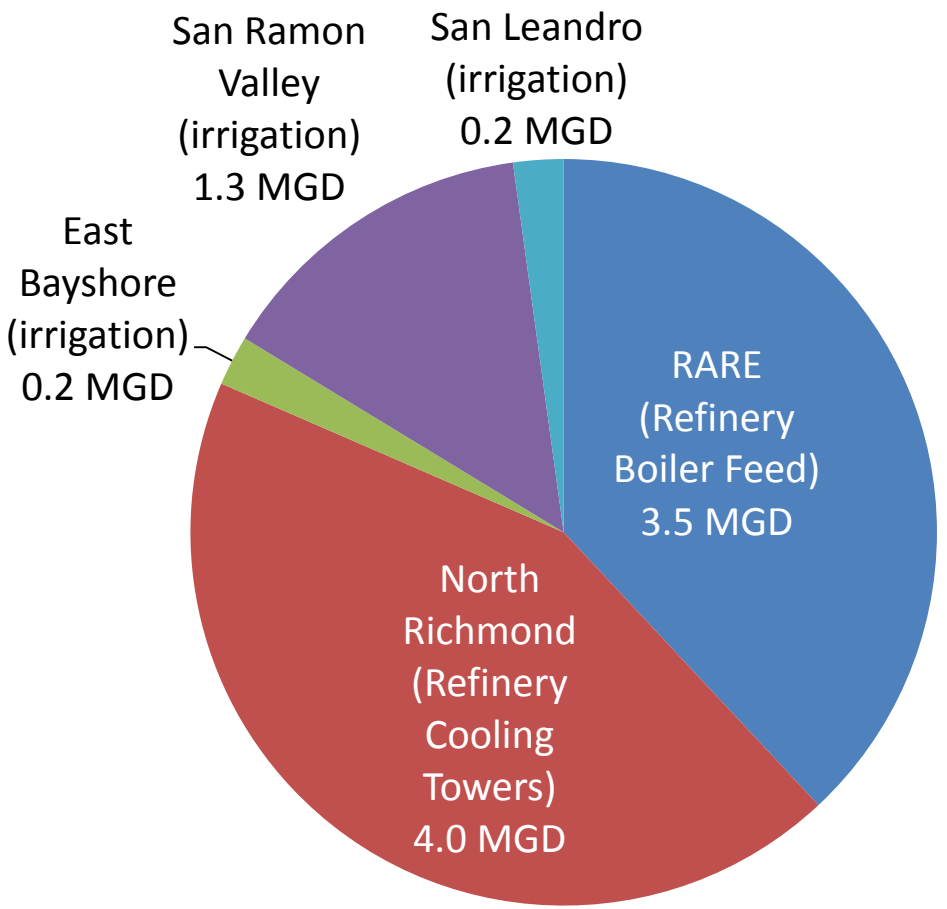
- Provide wastewater treatment for 685,000 people
- Average wastewater flow of 60 MGD

EBMUD's Recycled Water History

- 1970s – recycled water for irrigation & in-plant processes at main WWTP
- 1980s – multiple landscape irrigation
- 1990s - first Water Recycling Master Plan, 1993 goal of 14 MGD by 2020
- 1996 & 2010 – partnership with refinery
- 2006 & 2008 – additional irrigation projects
- 2012 - recycling goal of 20 MGD by 2040
- 2018 - Recycled Water Master Plan Update to consider both non-potable & potable reuse

Current Recycled Water Program

- 5 non-potable projects
- Production capacity of 9.2 MGD
- Goal of 20 MGD by 2040
- ~$250 million invested
- >80% of capacity serves a single industrial customer



Challenges of Non-potable Reuse

- Supply limitation, low wastewater flows
- Limited demands in urban setting
- Challenging water quality: Ammonia, TDS, aging water in distribution system
- Extensive distribution systems and site retrofits
- Single user project, risk of stranded assets

EBMUD Recognizes Advances in Potable Reuse

- Key potable reuse projects:
  - Groundwater augmentation - Orange County (2008)
  - Groundwater augmentation - Pure Water Monterey (expected 2019)
  - Reservoir augmentation - Pure Water San Diego (expected 2023)
  - Bay Area - Santa Clara Valley Water District in planning stages for groundwater augmentation

Questions for EBMUD Master Plan:

- How could Potable Reuse fit into the District's Recycled Water Program?
- Should Potable Reuse be added to the District's Recycled Water program at this time?

Master Plan Evaluation

1. Identify Non-Potable Reuse Alternatives

2. Identify Potable Reuse Alternatives

3. Cost Evaluation

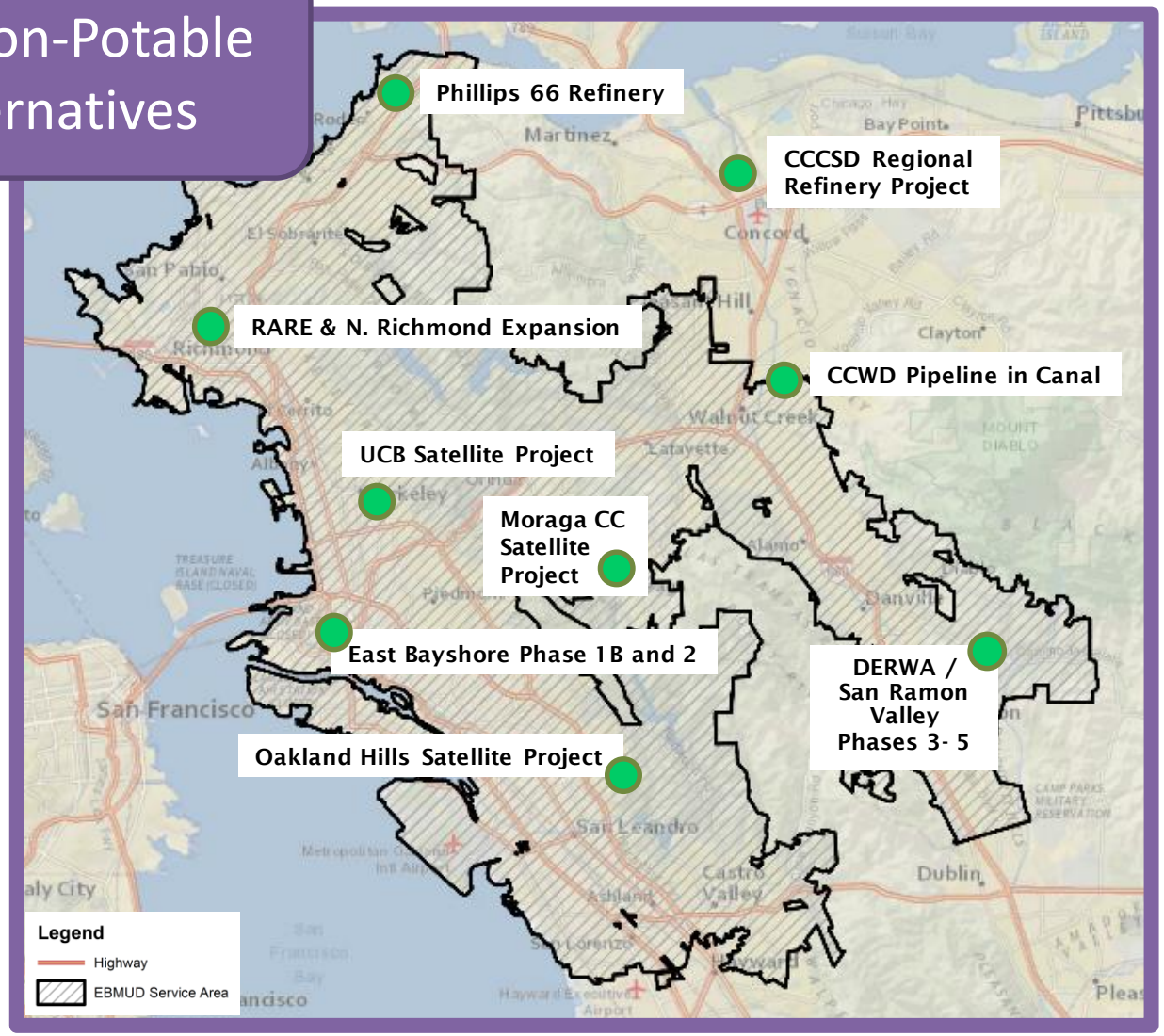
4. Non-Cost Evaluation

5. Economic Evaluation

Recommended Projects

Master Plan Evaluation

1. Identify Non-Potable Reuse Alternatives



Master Plan Evaluation

2. Identify Potable Reuse Alternatives

Sources

East Bay WWTPs

Advanced Treatment

Targets

Link to EBMUD Potable Water System

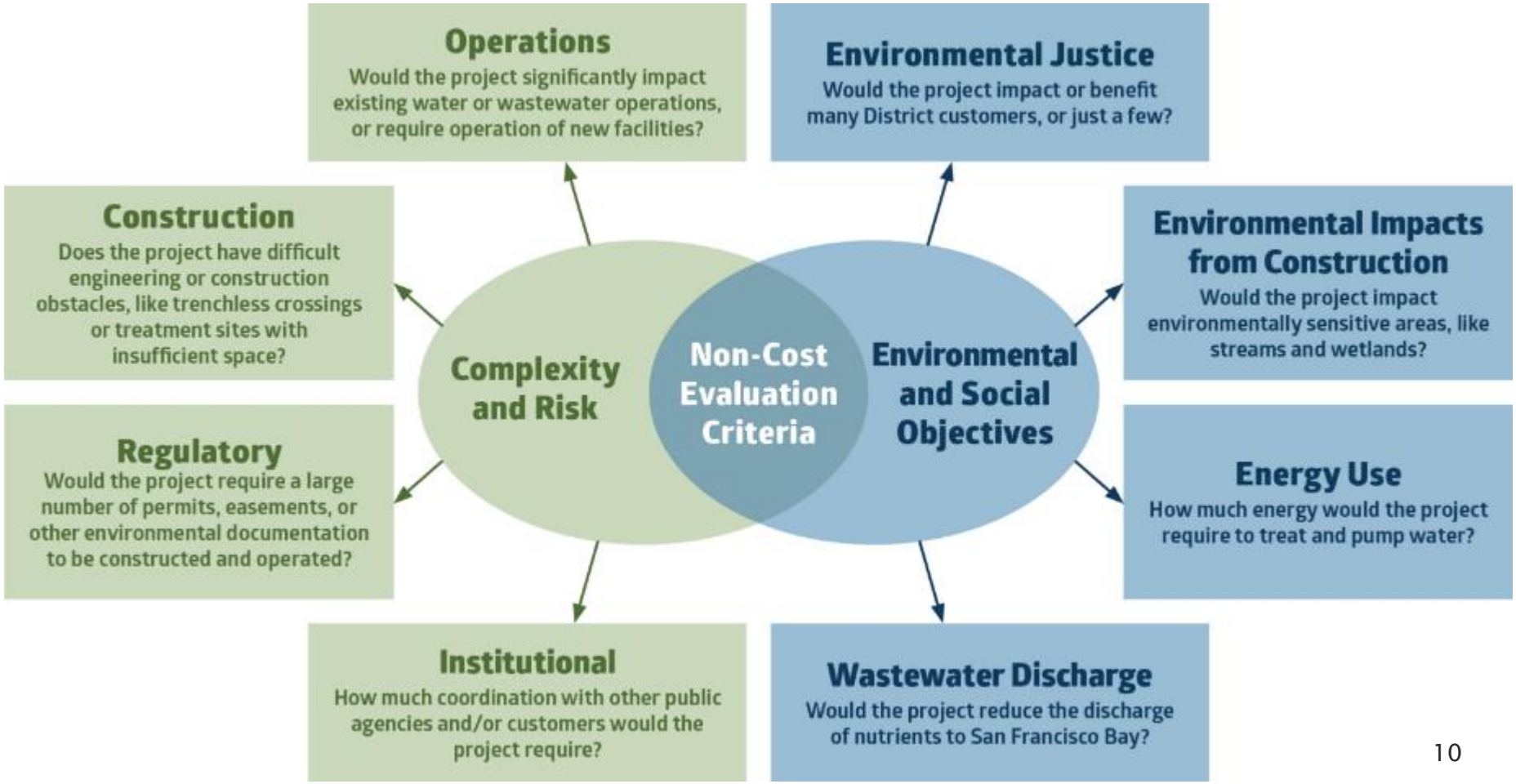
3. Cost Evaluation

Capital Cost

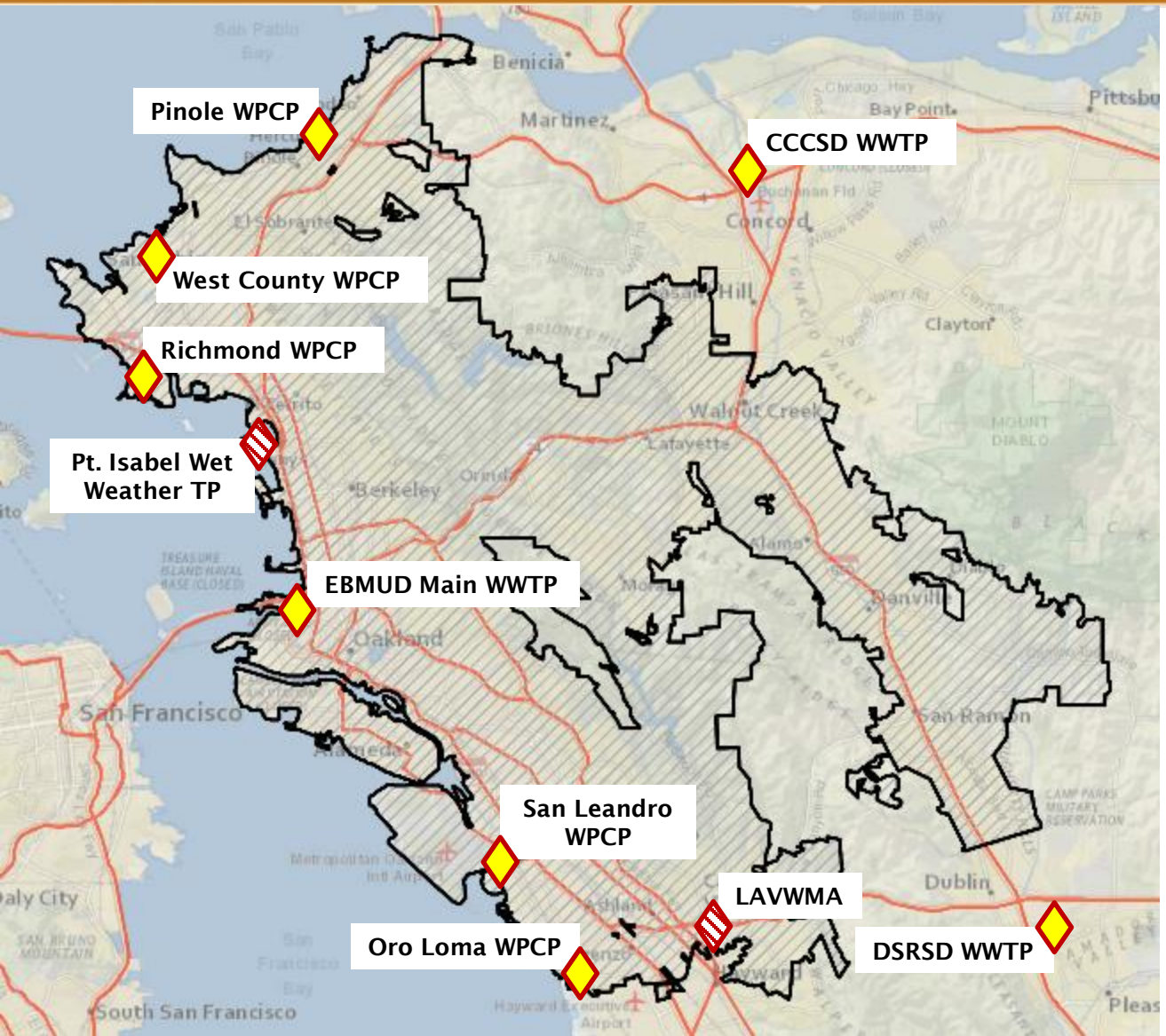
Unit Cost

Non-Cost Factors

4. Non-Cost Evaluation



Potential Sources for Potable Reuse



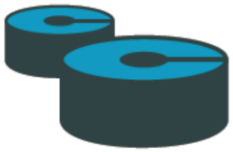
Potable Projects

- **Municipal WWTPs:**
  - > 1 MGD dry weather flow
  - Inside or near District's water service area
- More than 80 MGD available in region
- **Satellite locations also considered**
  - Pt. Isabel
  - LAVWMA Pipeline

Potential Potable Reuse for EBMUD

Groundwater Augmentation:
East Bay Plain Groundwater Basin

Reservoir Augmentation:
Briones, San Pablo, & Upper San Leandro Reservoirs

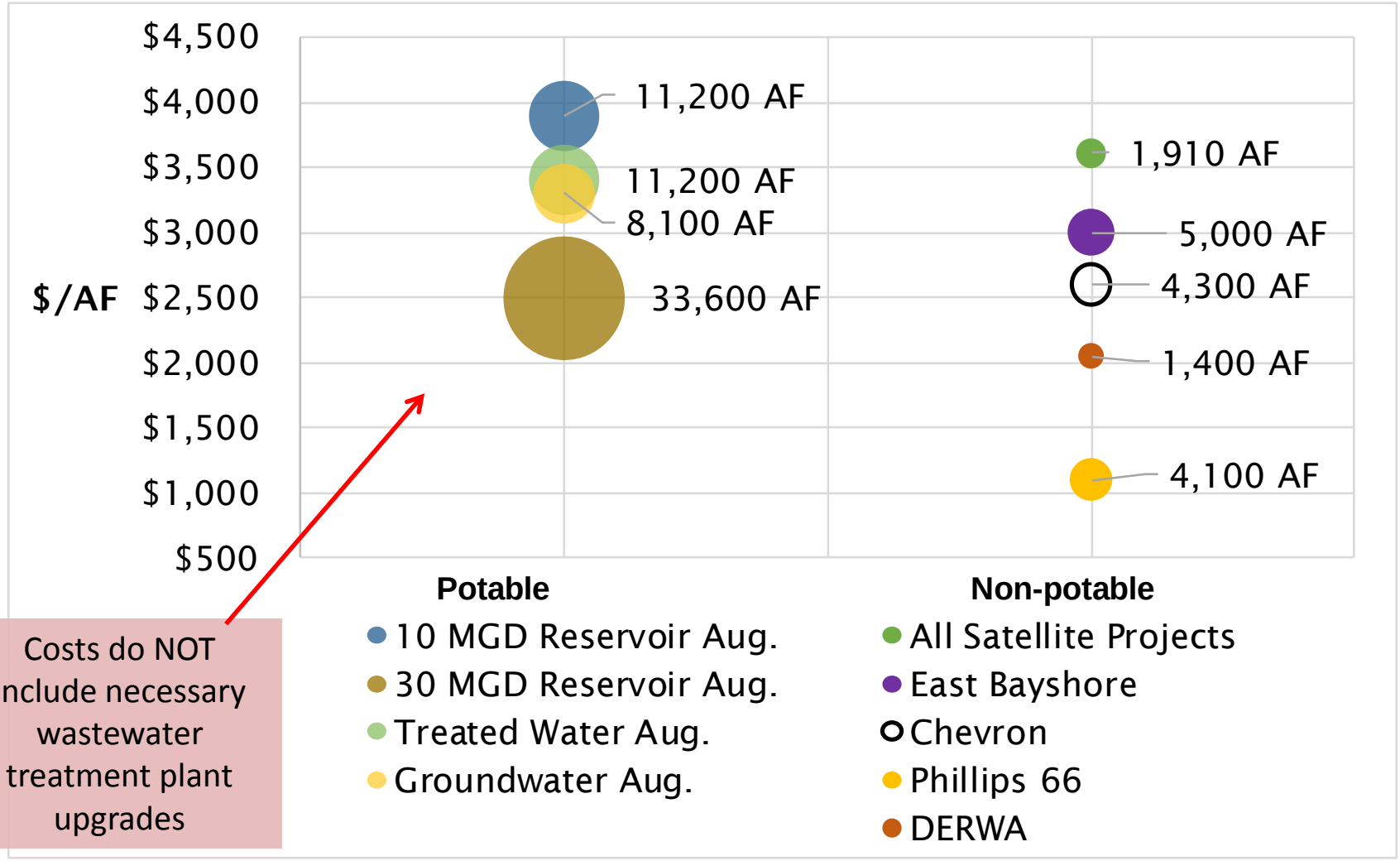


Raw Water Augmentation:
Orinda WTP, Sobrante WTP, Upper San Leandro WTP, and Mokelumne Aqueduct to Walnut Creek WTP

Treated Water Augmentation:
Treated Water Distribution System

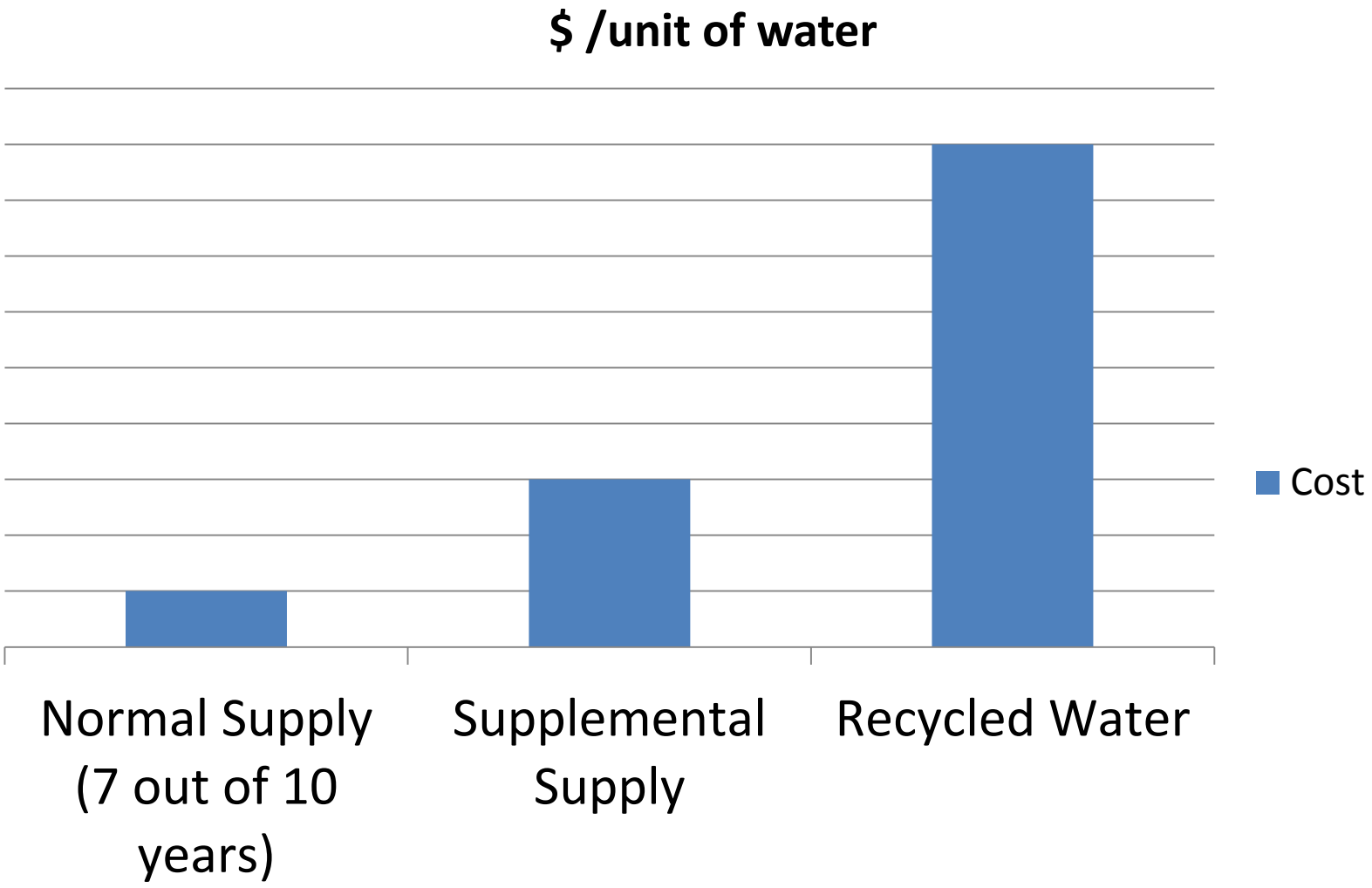
Highest Scoring Potable Reuse Alternatives

Cost of Potable vs Non-Potable



Costs do NOT include necessary wastewater treatment plant upgrades

Relative Cost of Recycled Water



Pros & Cons of Potable Reuse

PROS

- No need for dual distribution system
- Reduced risk of stranded assets
- Single project can yield >20 MGD
- Economies of scale

CONS

- Large size, significant up front capital costs
- Significant $/AF, especially as compared to cost of supplemental drought year supplies
- Customer acceptance not yet certain

Master Plan Evaluation Summary

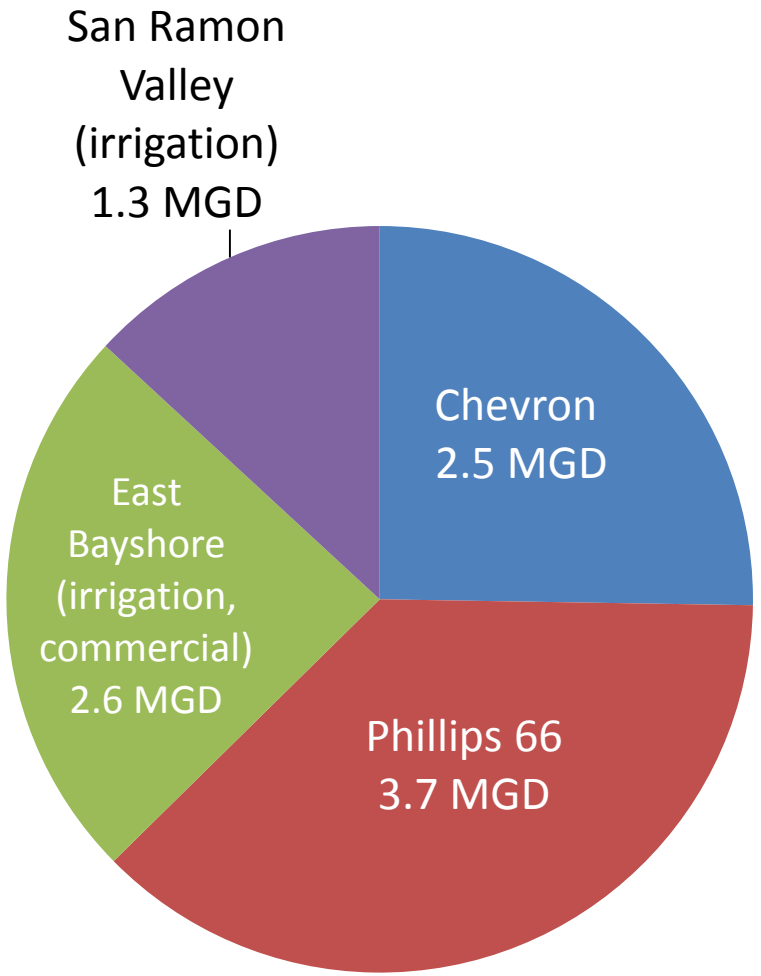
- No projects are economically advantageous at this time
- No driver to increase current 20 MGD goal
  - Water supply needs can be met by less costly alternative sources, especially given limited dry year needs
- District's Recycled Water Program driven by social and environmental more than economic factors

Conclusions of the Master Plan Update

- Maintain 20 MGD goal for 2040
- Implement Recommended Non-Potable Reuse projects
- Continue to track regulations and other projects
- Monitor & identify changing water supply conditions
- Re-Evaluate Potable Reuse in approximately 5 years

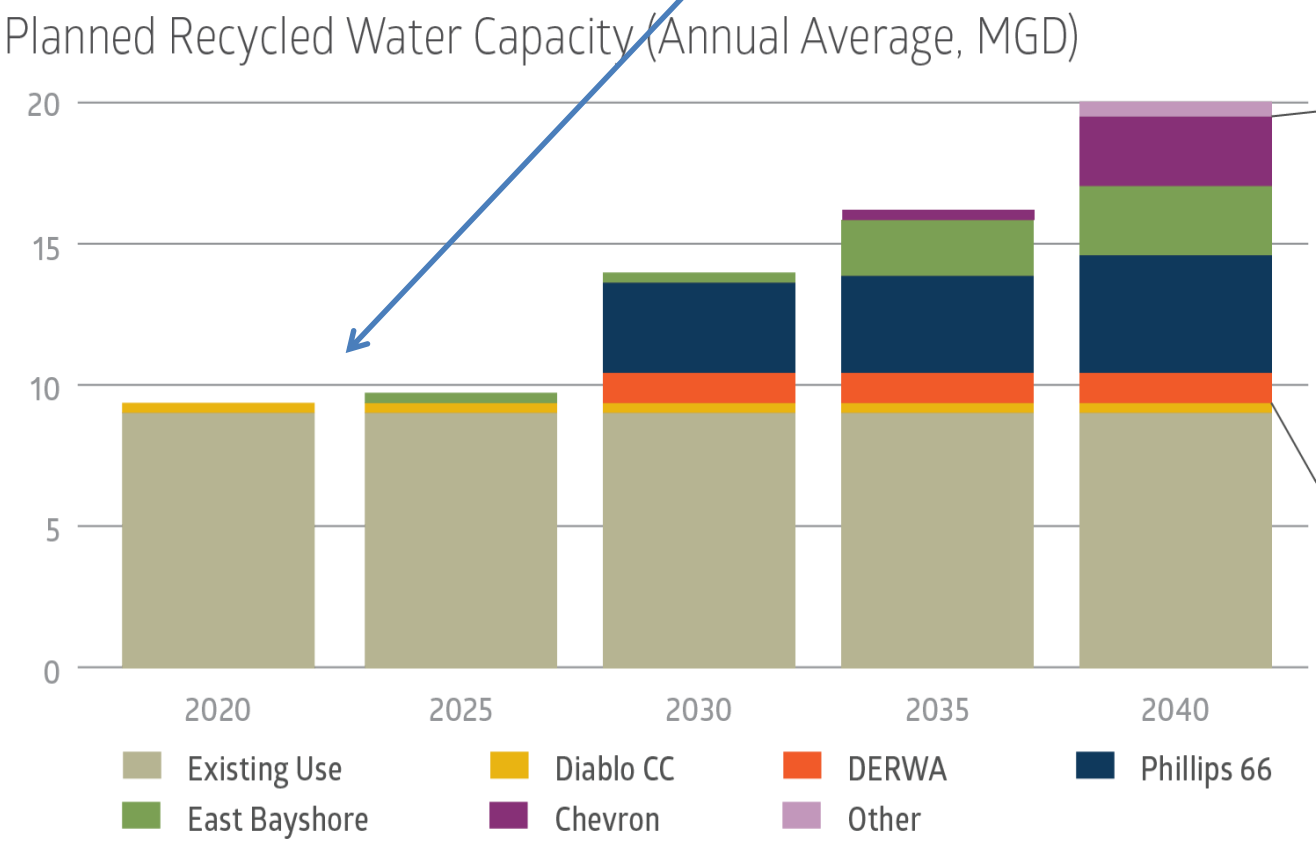
Recommended Non-Potable Projects

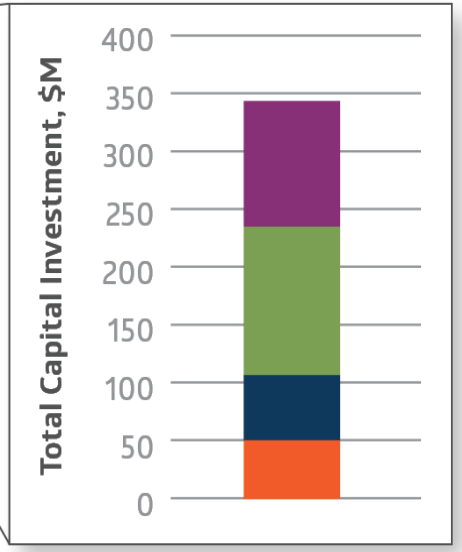
- 1 new project
- 3 expansions
- Support on-site reuse
- 10+ MGD new capacity
- > $300 million in capital costs over 20 years



Estimated Project Phasing

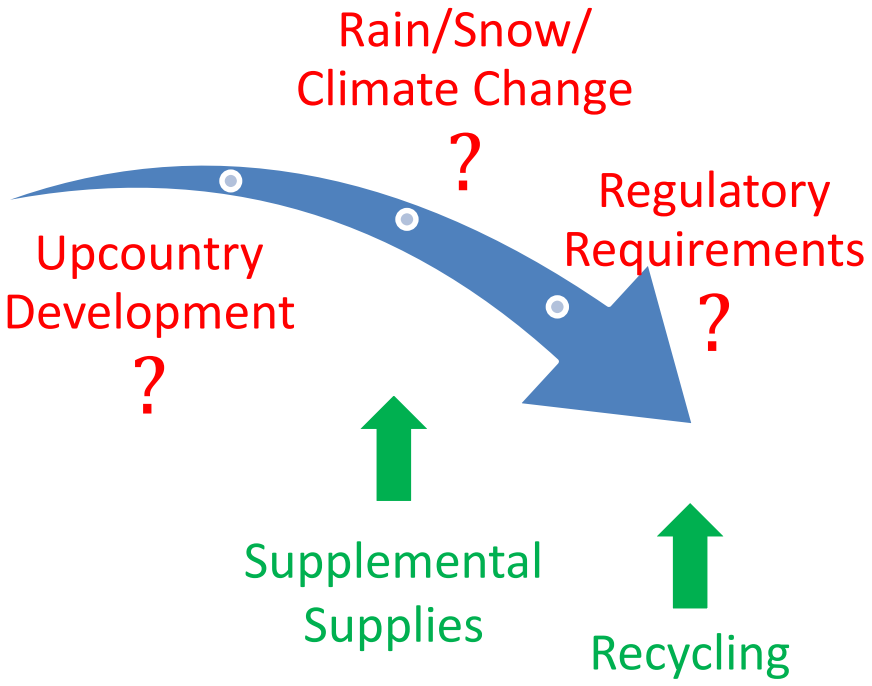
2024 – Re-evaluate Potable Reuse



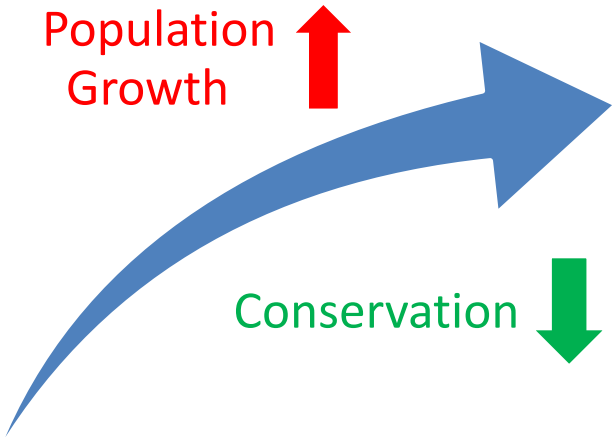


Potential Triggers for Potable Reuse

Supply



Demand



Potable reuse may be a future tool to provide long-term water supply reliability.

Final Master Plan Update 2019

- July 2018 - Board workshop
- October 2018 - January 2019: Outreach and meetings with stakeholders (agencies, cities, customers, environmental groups)
- January 2019 - Release of draft report and public workshop
- February 2019 - Completed master plan update
- **https://ebmud.com/recycledwater**

Comments/Questions?