Information Item:
Wastewater Reuse

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Environment Committee: December 8, 2015

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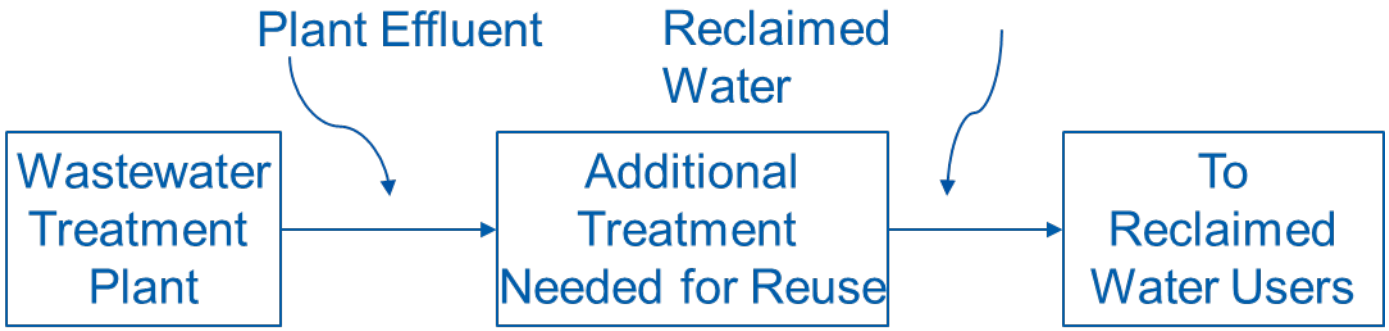
Definition

Using treated municipal wastewater for a number of potential purposes



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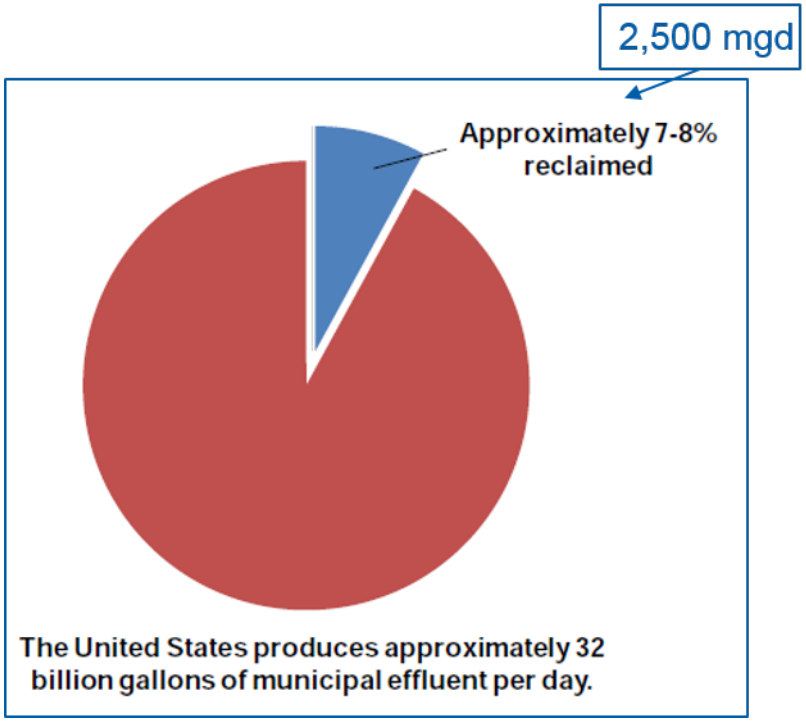
Reclaimed Water Use in U.S.



Typical drivers:

- Conserve potable water, avoid new water source development
- Mitigate salt water intrusion, land subsidence, etc. due to declining groundwater levels
- Support/augment wetlands, other surface features

Source: *2012 Guidelines for Water Reuse*, U.S. EPA

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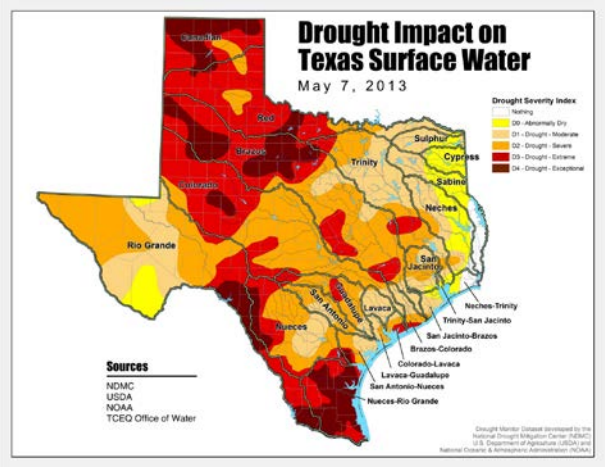
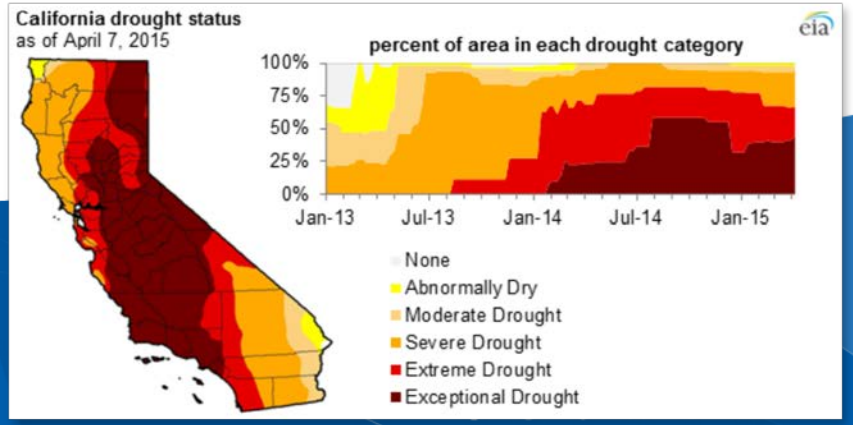
Wastewater Reuse Increasing and Evolving Across North America

- Past: 90% of wastewater reuse occurred in CA, AZ, TX, FL
- New projects in NJ, NY and Ontario: industrial cooling, other non-potable uses
- Tidewater area, VA: groundwater recharge
- Drought in TX and CA and cost of dual piping fostering movement to potable (sometimes direct potable) reuse





Wastewater Reuse in Minnesota

- City of Mankato-Calpine Energy
  - Cooling water for power plant
  - 6.2 million gallons per day (mgd)
- MCES' East Bethel Water Reclamation Facility
  - Groundwater replenishment
  - 0.41 mgd initial capacity
- Golf course irrigation
  - Multiple locations
  - 0.2 mgd
- Shakopee Mdewakanton Sioux Community
  - Wetland enhancement
  - Approximately 1 mgd
- Numerous spray irrigation applications

Mankato Water Reclamation Plant

East Bethel Water Reclamation Facility

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MCES' Wastewater Reuse Drivers

- Alleviate interceptor capacity constraints (satellite water reclamation facilities)
- Conserve & supplement groundwater
  - Shift non-potable groundwater use to reclaimed water
  - Replenish groundwater (enhanced groundwater recharge)
- Help meet receiving water waste load allocations

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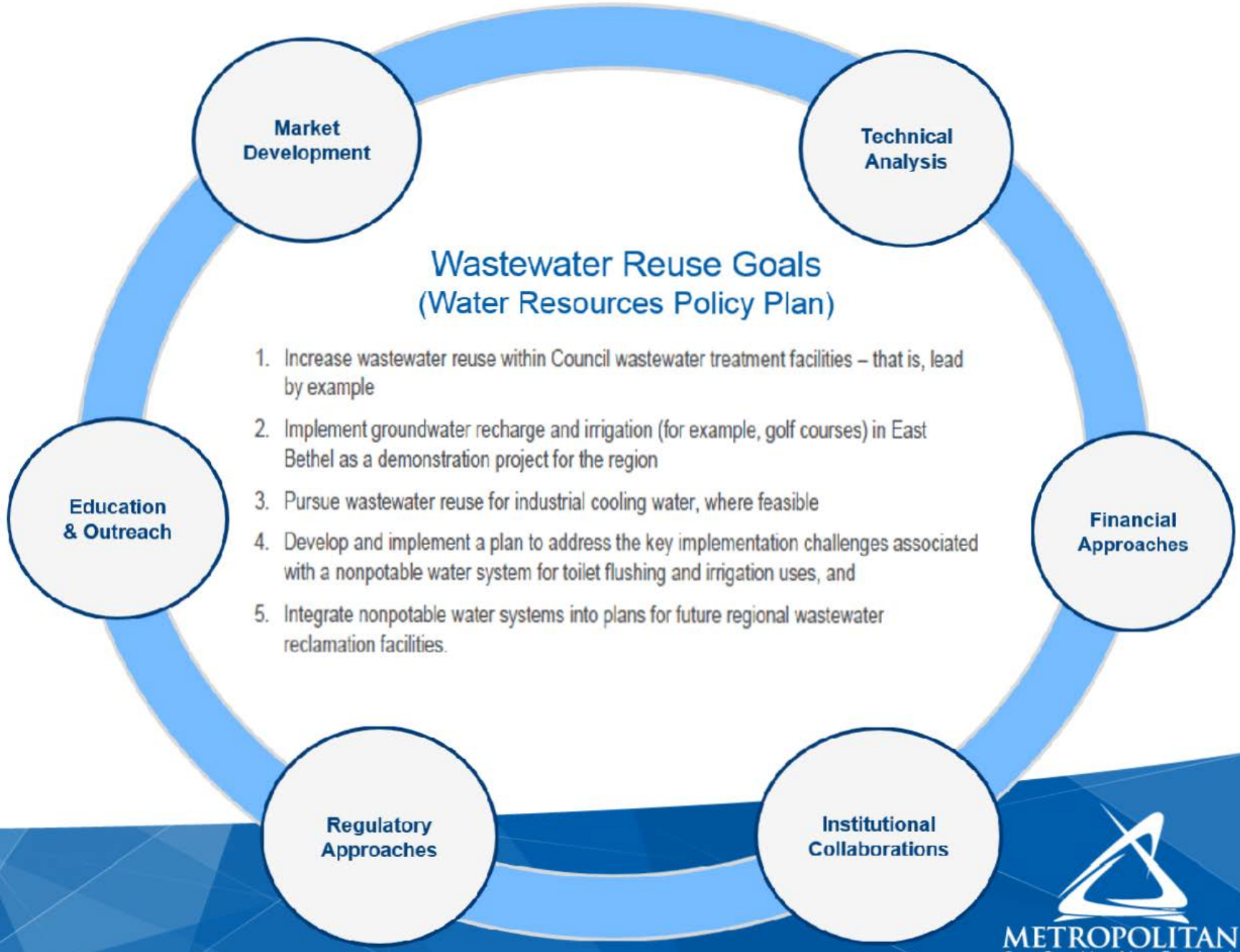

Wastewater Reuse Goals
(Water Resources Policy Plan)

1. Increase wastewater reuse within Council wastewater treatment facilities – that is, lead by example
2. Implement groundwater recharge and irrigation (for example, golf courses) in East Bethel as a demonstration project for the region
3. Pursue wastewater reuse for industrial cooling water, where feasible
4. Develop and implement a plan to address the key implementation challenges associated with a nonpotable water system for toilet flushing and irrigation uses, and
5. Integrate nonpotable water systems into plans for future regional wastewater reclamation facilities.

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MCES' Wastewater Reuse Progress

- Industrial Reuse Study produced (with Legislative-Citizen Commission on Minnesota Resources (LCCMR) funding) in 2007
- East Bethel water reclamation facility in operation since July 2014
- Sub-regional studies: assessments & support of water supply planning (e.g., Southeast Metro reuse scenario)
- In-plant evaluation of water reuse & conservation at MCES wastewater treatment plants
- Collaborating with specific expressions of interest (e.g., City of Eagan)

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Findings

1. Additional treatment of constituents normally found in wastewater treatment plant effluent drives reuse treatment cost
2. Location of potential users/uses drives reuse distribution system costs
3. Reuse incremental cost estimate: $5 – $10 per 1,000 gallons (Twin Cities potable water rates: $1 - $5 per 1,000 gallons)
4. Comparisons among water management alternatives needed

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Conclusions and Next Steps

- Collaboration
  - Reclaimed water feasibility studies
  - Salts
    - Concern for water utilities
    - High impact on wastewater reuse
  - Comparison among water management alternatives
- MCES outreach
  - Local communities/MCES wastewater customers
  - Regulatory agencies
  - Potential users & partners (e.g., large groundwater users)

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Questions

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