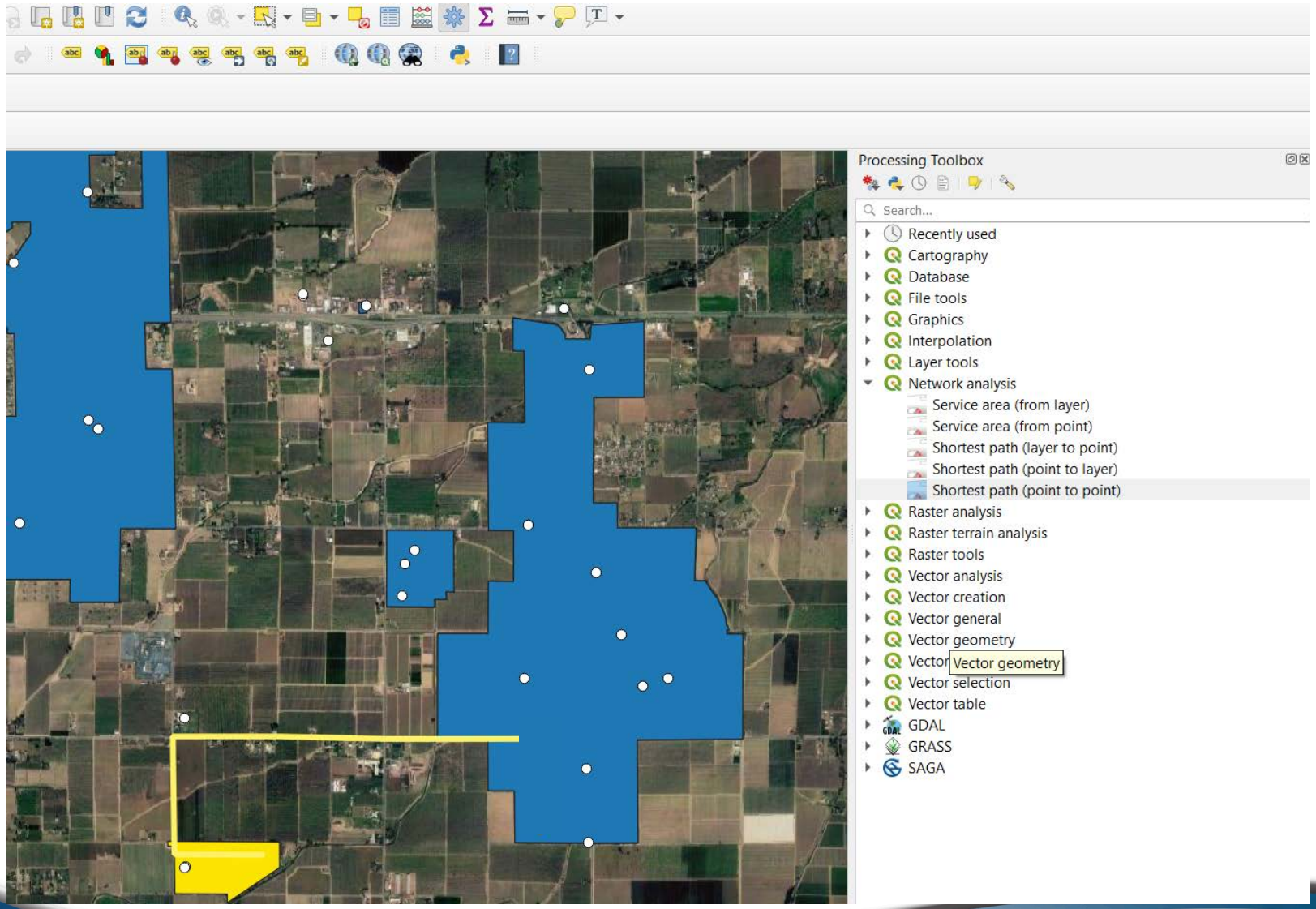
# Consolidation Project

May 10, 2019

# Consolidation

- **Primary Audience:** Legislature
- **Objective:** Rapidly examine feasibility to discern order of magnitude costs to physically consolidate of out of compliance systems with in compliance systems
- **Approach:**
    1. Categorize systems
        1. In/out of compliance
        2. System size: Population and connections
    2. Use GIS utility boundary and area roadway layers to discern physical consolidation feasibility
    3. Assign costs based upon size and distance categories

# Example


Processing Toolbox
Search...
Recently used
Cartography
Database
File tools
Graphics
Interpolation
Layer tools
Network analysis
Service area (from layer)
Service area (from point)
Shortest path (layer to point)
Shortest path (point to layer)
Shortest path (point to point)
Raster analysis
Raster terrain analysis
Raster tools
Vector analysis
Vector creation
Vector general
Vector geometry
Vector
Vector geometry
Vector selection
Vector table
GDAL
GRASS
SAGA

# Proposition 50 Funded Nitrate Treatment Project

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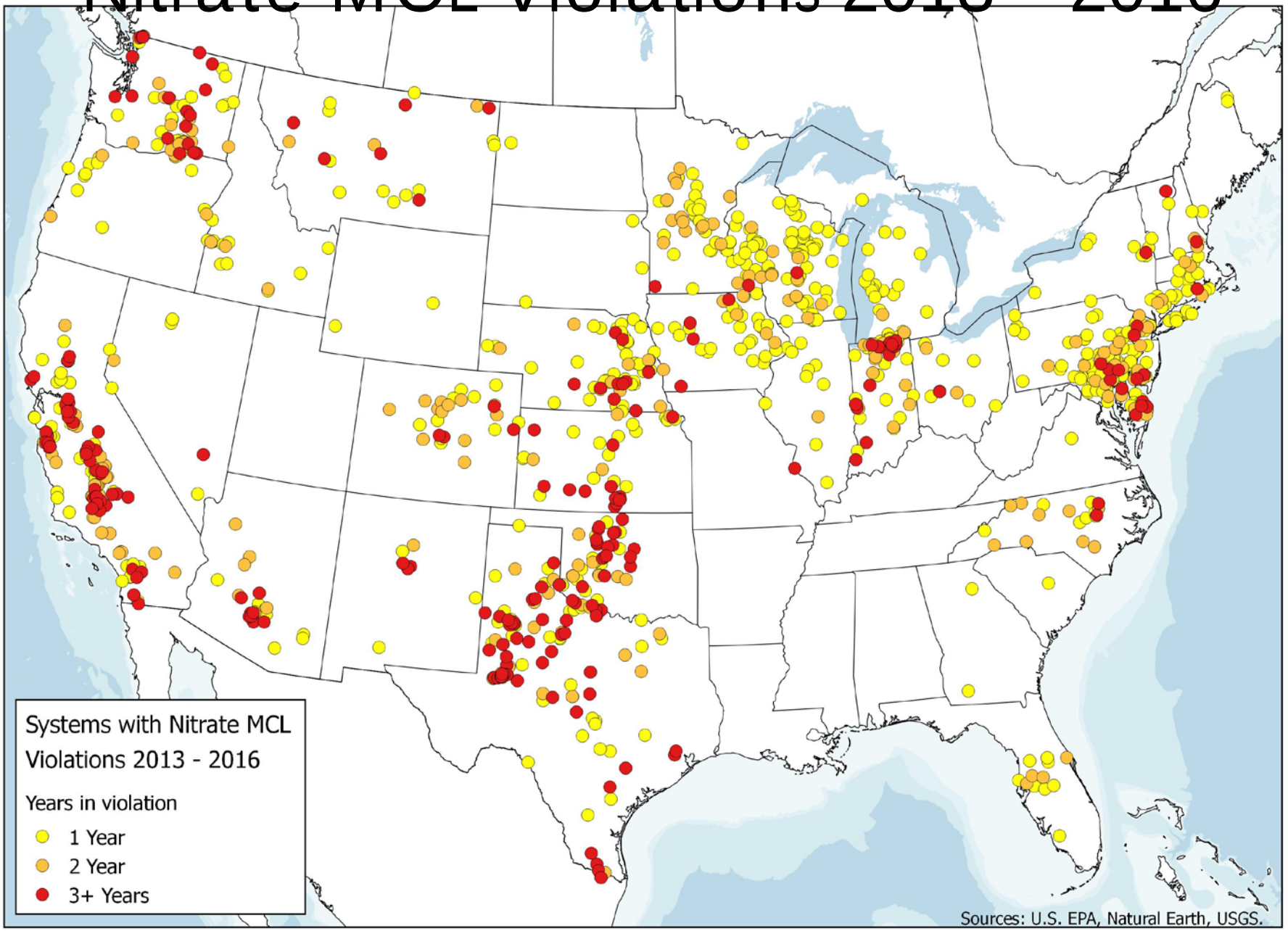
**May 10, 2019**

# Problem Statement

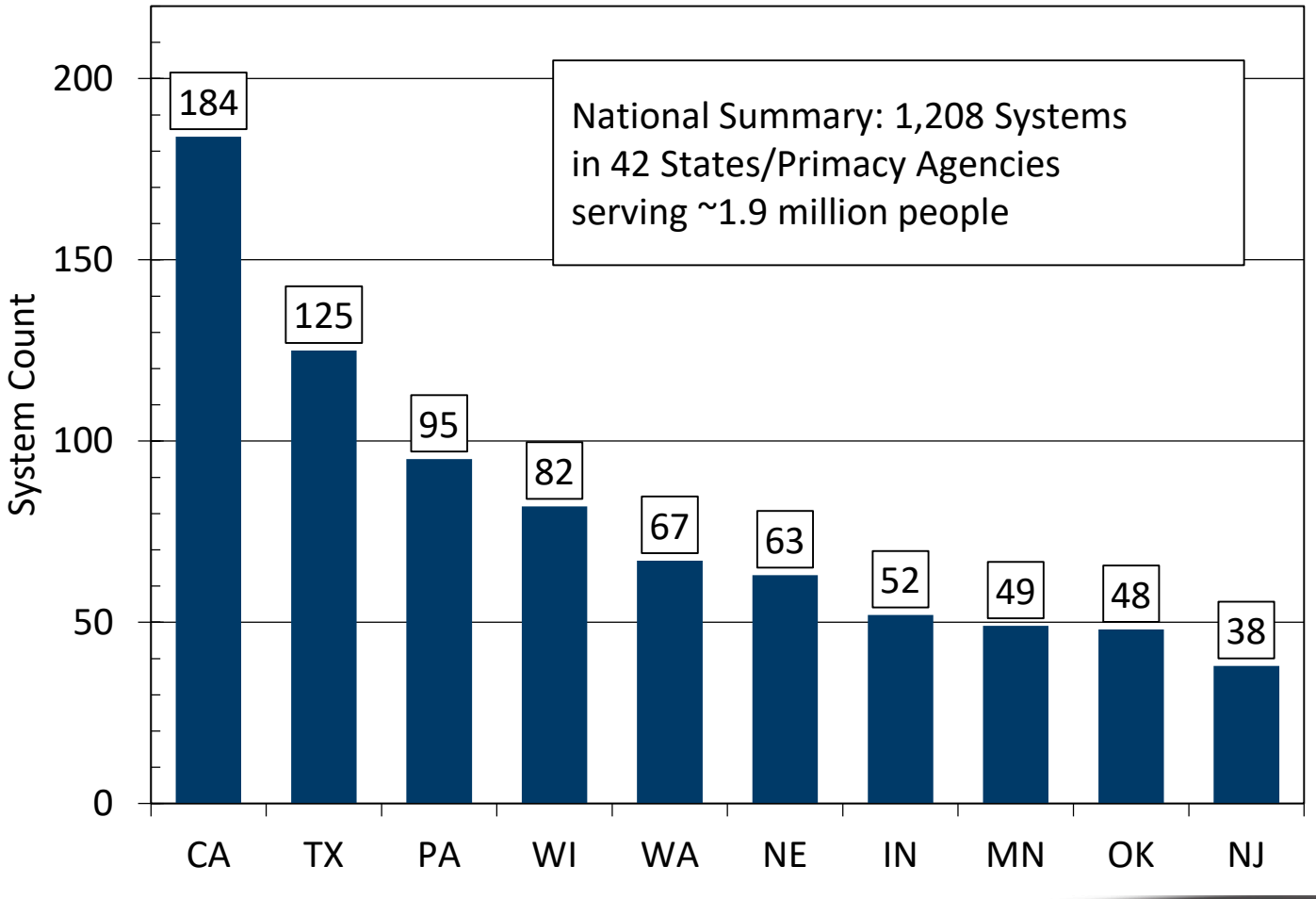
- Nitrate is a persistent non-compliance issue
- Ongoing operations and maintenance is expensive
- Could managerial consolidation make nitrate treatment more feasible and/or cost effective?

# Nitrate MCL Violations 2013 – 2016

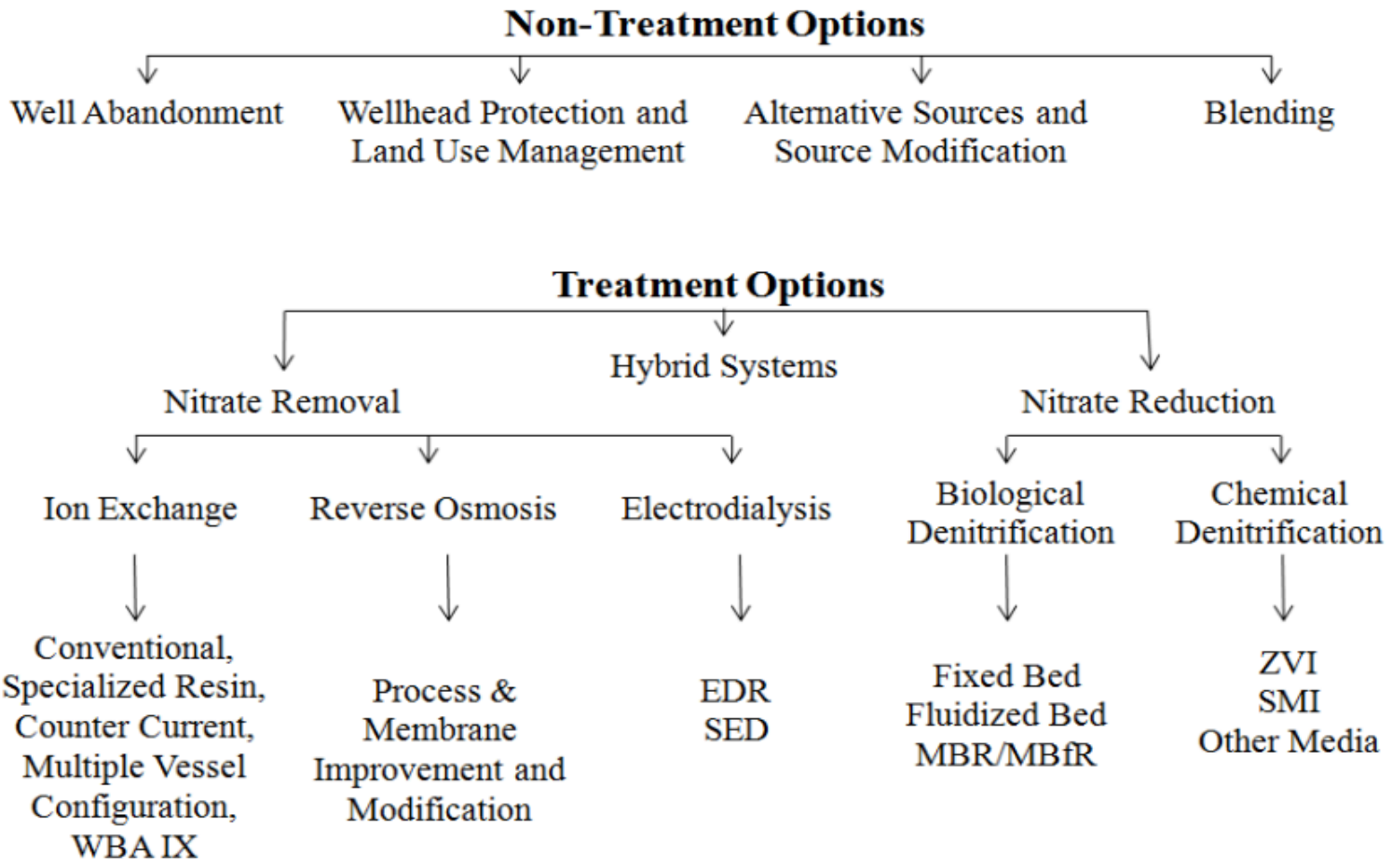



USEPA SDWIS Data

# Nitrate MCL Violations 2013 – 2016 USEPA SDWIS Data

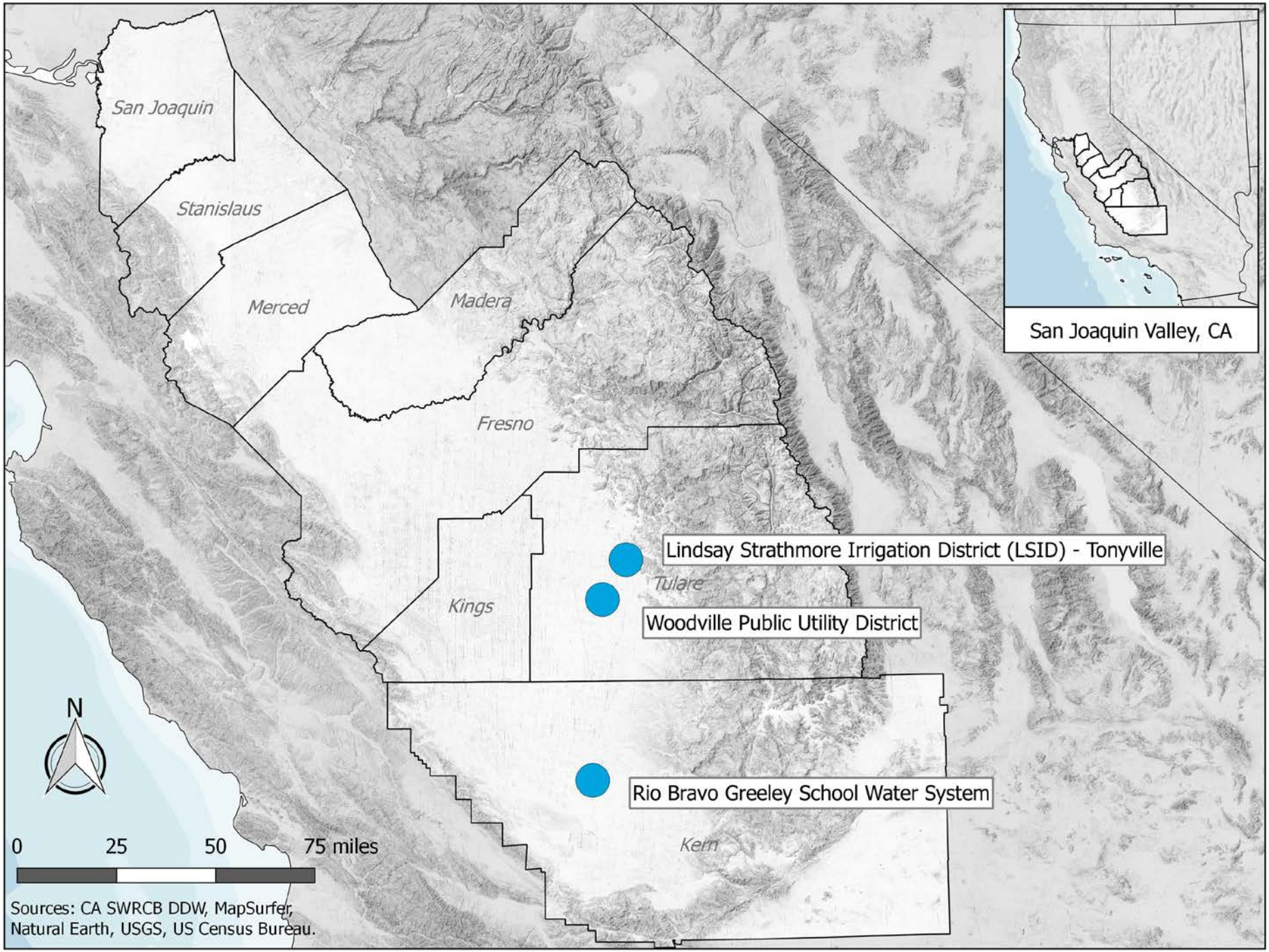


# Nitrate Treatment

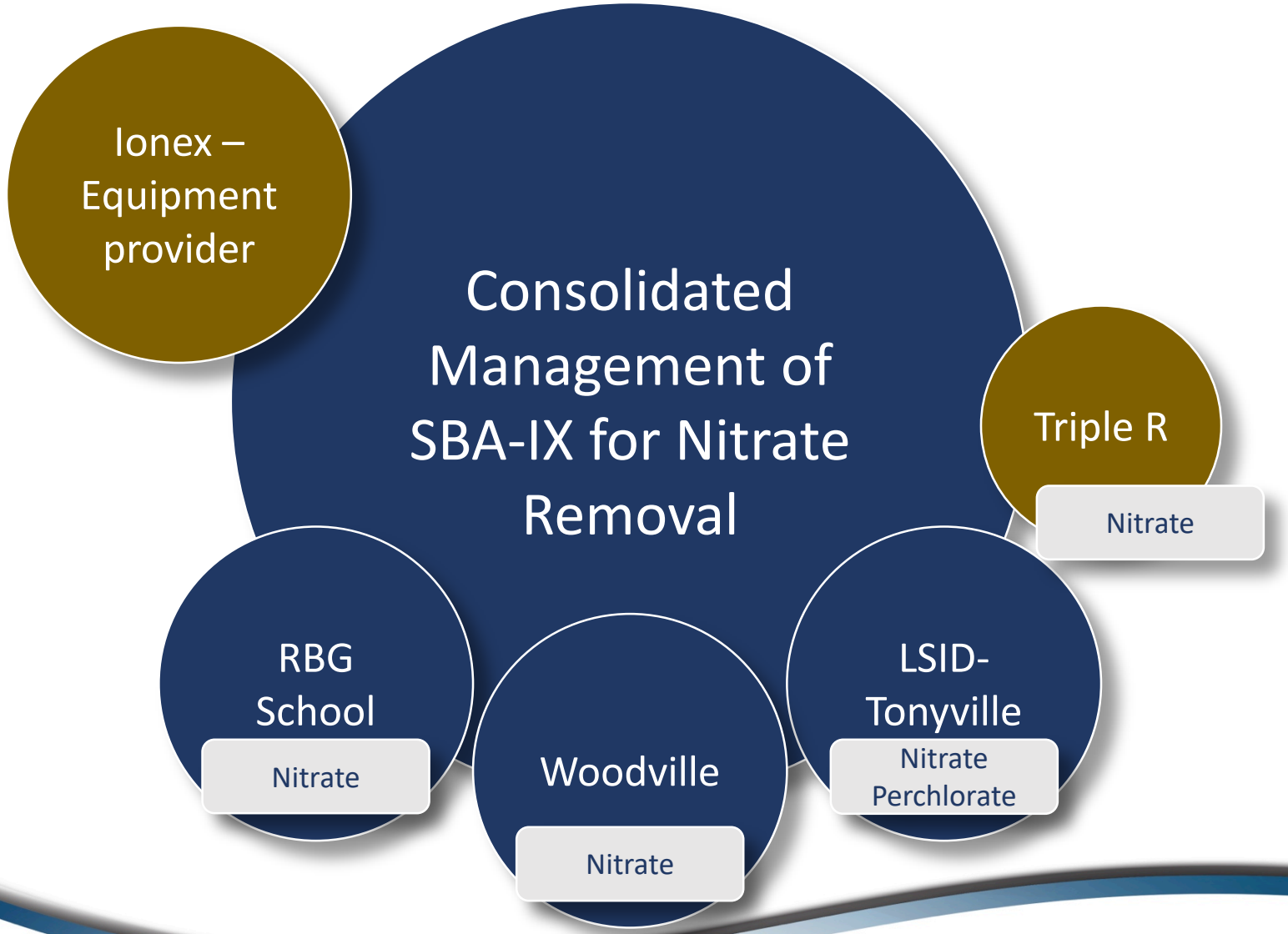


# Proposition 50 Project - Objectives

- $5M in grant funds to install and operate strong base anion exchange (SBA-IX) systems over a three-year period
- Minimize O&M costs by sharing:
  - Operations
  - Brine disposal
  - Salt delivery


San Joaquin
Stanislaus
Merced
Madera
Fresno
Kings
Tulare
Kern
Lindsay Strathmore Irrigation District (LSID) - Tonyville
Woodville Public Utility District
Rio Bravo Greeley School Water System
San Joaquin Valley, CA
N
0
25
50
75 miles
Sources: CA SWRCB DDW, MapSurfer, Natural Earth, USGS, US Census Bureau.

# Initial Project



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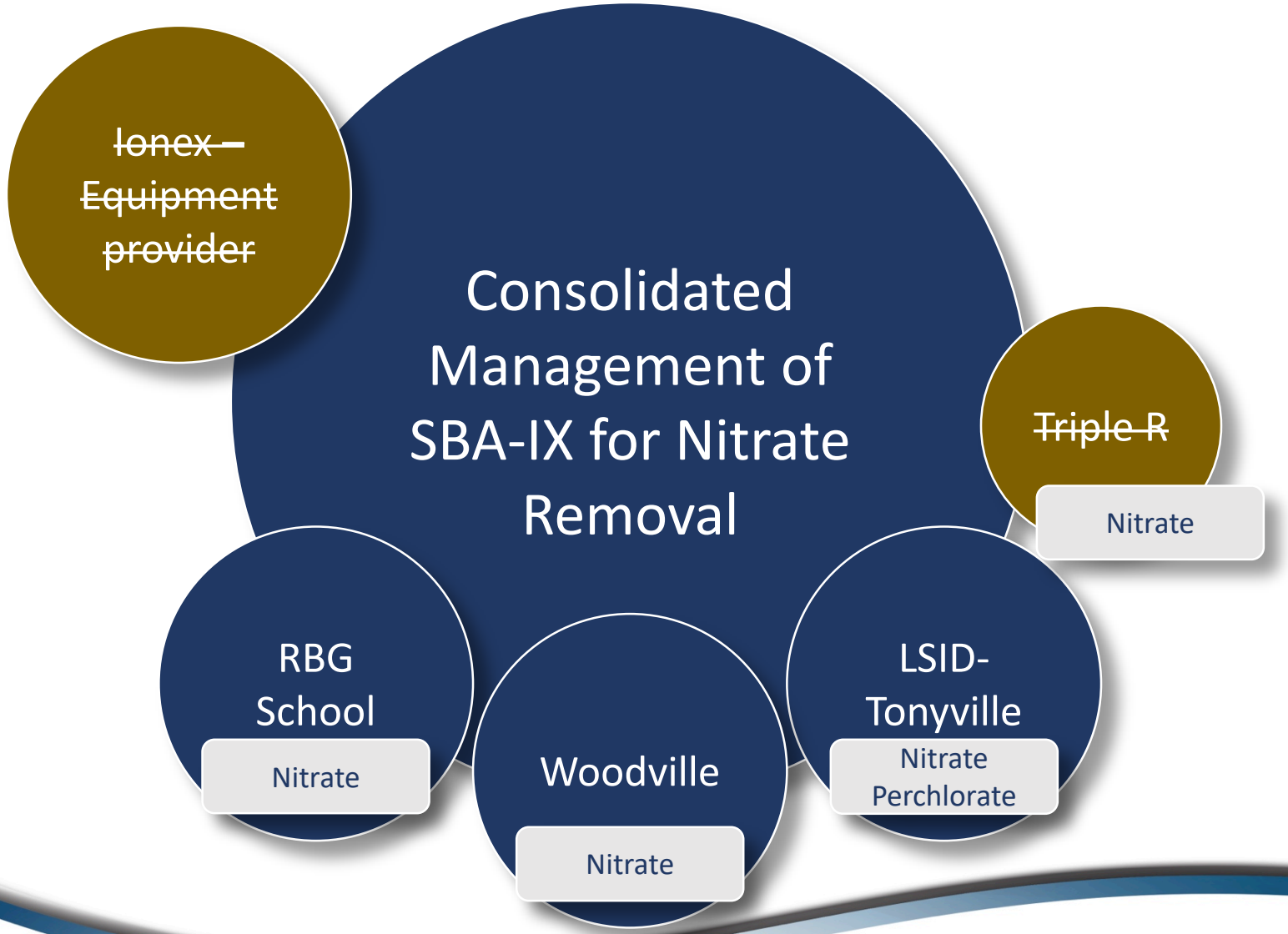
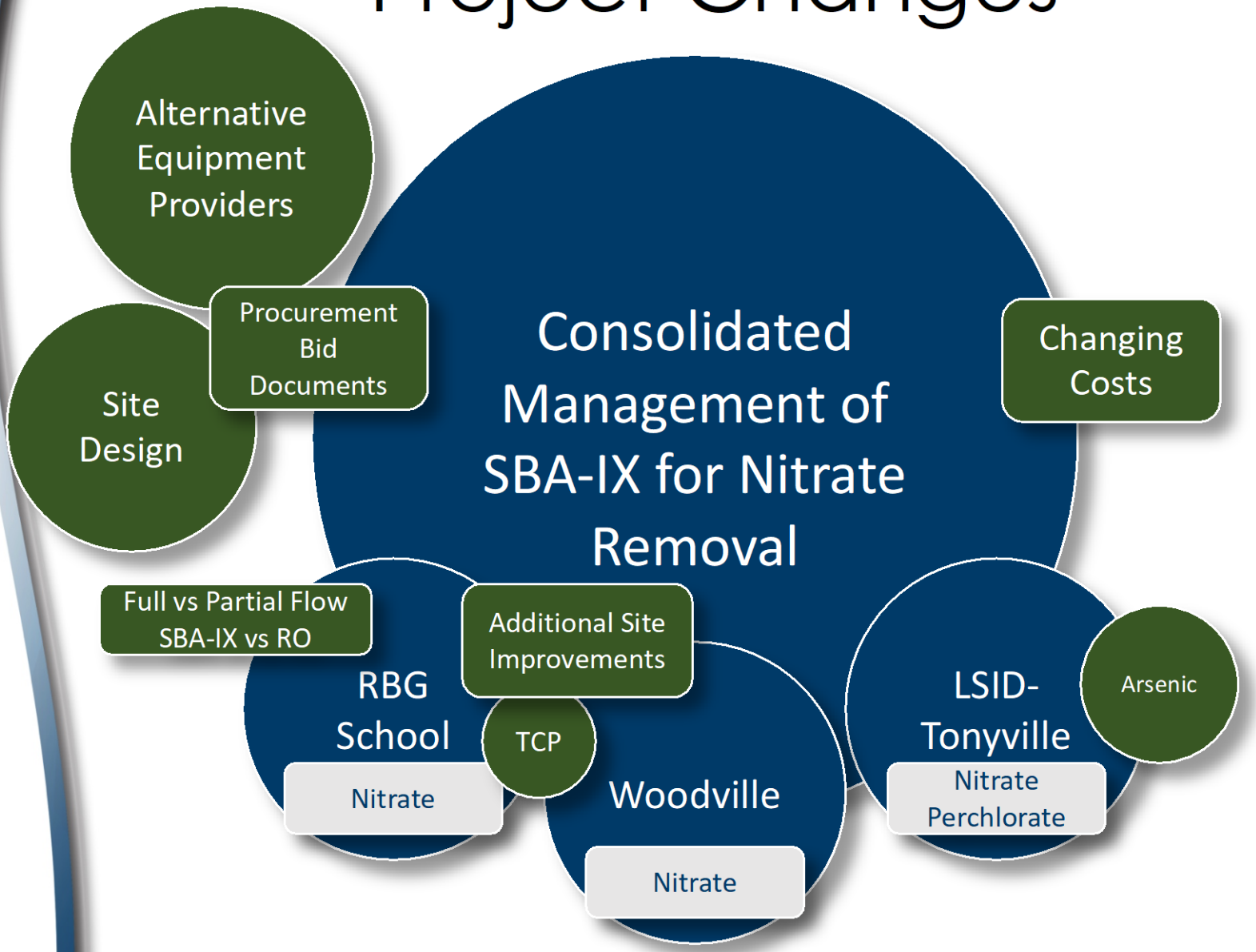


# Project Changes



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# System Improvements
## LSID – Tonyville

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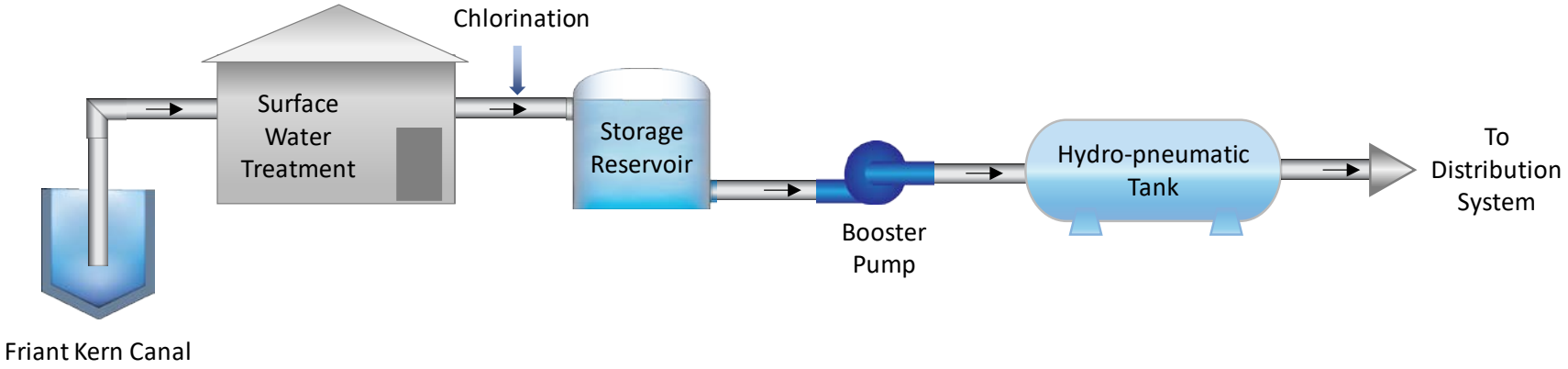
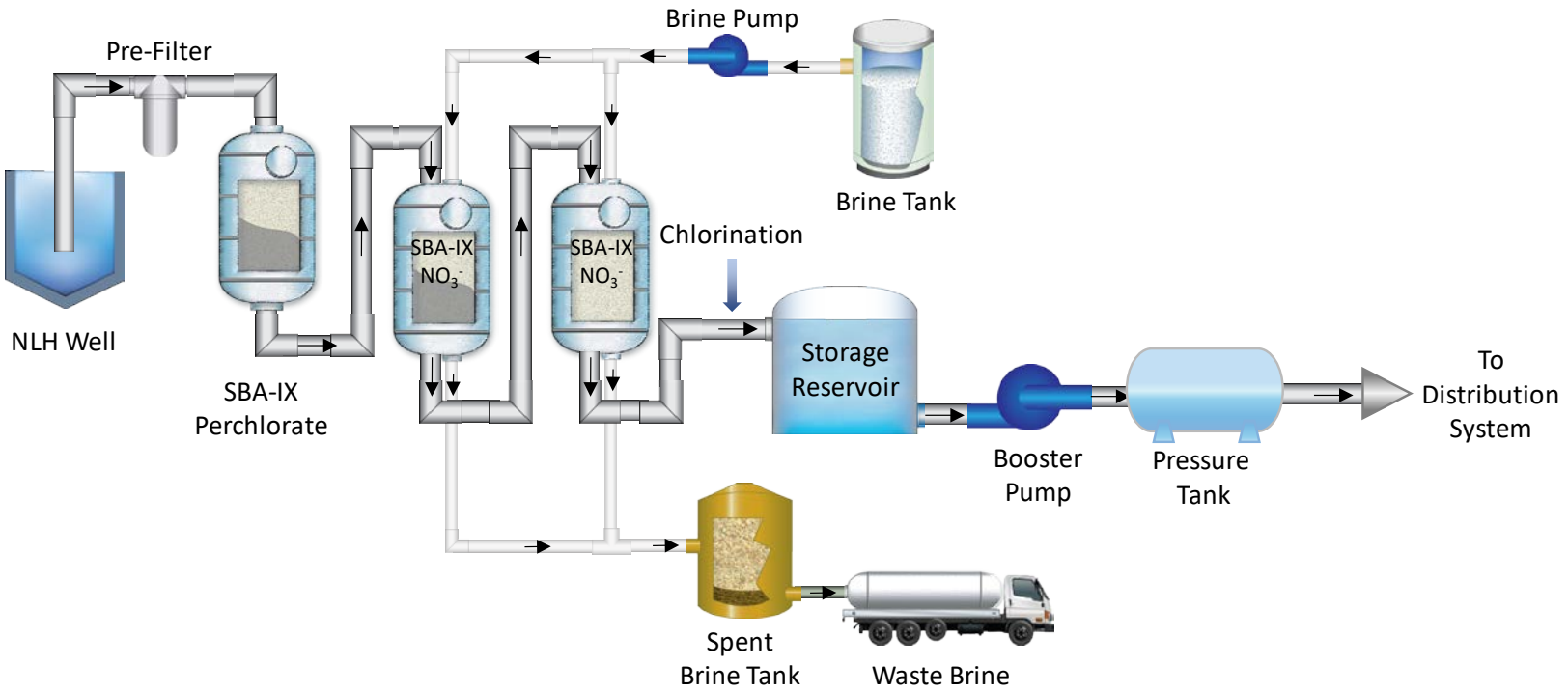
### Current System Configuration



# System Improvements
## LSID – Tonyville

### Proposed System Configuration Option 1



# System Improvements
## LSID-Tonyville

- Unique challenges
  - Existing surface water is of relatively high quality but groundwater treatment is still required
    - Largely due to periodic dry up of the Friant Kern Canal
  - Cost to treat is significantly more than that of surface water
  - Perchlorate and potentially arsenic in brine can limit disposal and comingling possibilities

# Reminders and Lessons Learned

- Smaller ≠ simpler
- The needs are unique and therefore so is the right solution
- If details are not carefully considered the proposed solution may create long term water quality or operational challenges
- A balance is needed between treatment system sophistication and operational requirements
- There is a real need for continued improvement and innovation with nitrate treatment approaches

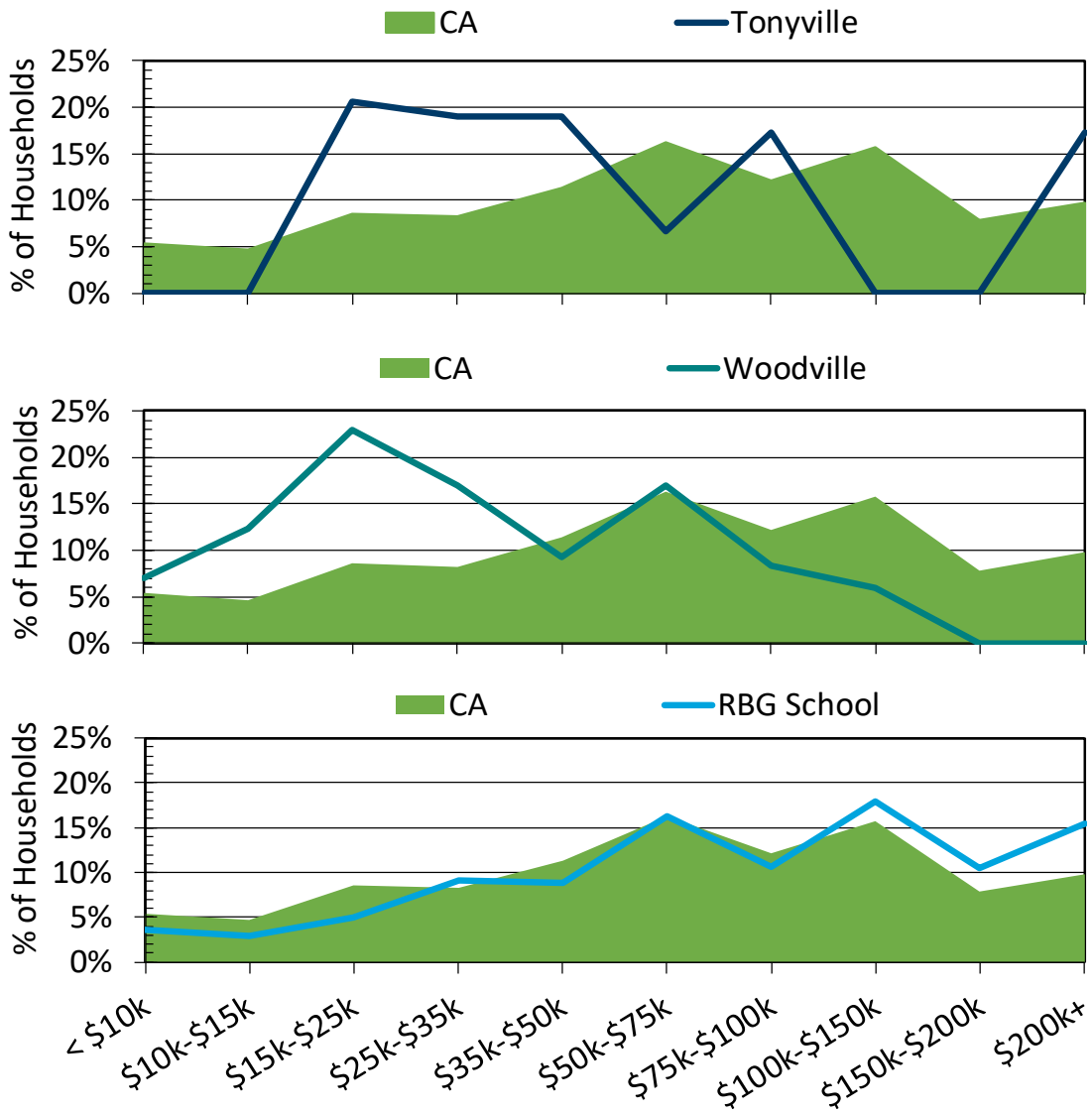
# Affordability: What Does it Mean?

- Affordability is a subjective concept
  - It is normative; it involves judgment
  - There is no bright line; there is a continuum
- Affordability concerns large as well as small systems
- Affordability is a growing concern
  - Water bills already rising at pace > CPI
  - Real incomes of the poor are going down

# System Basics

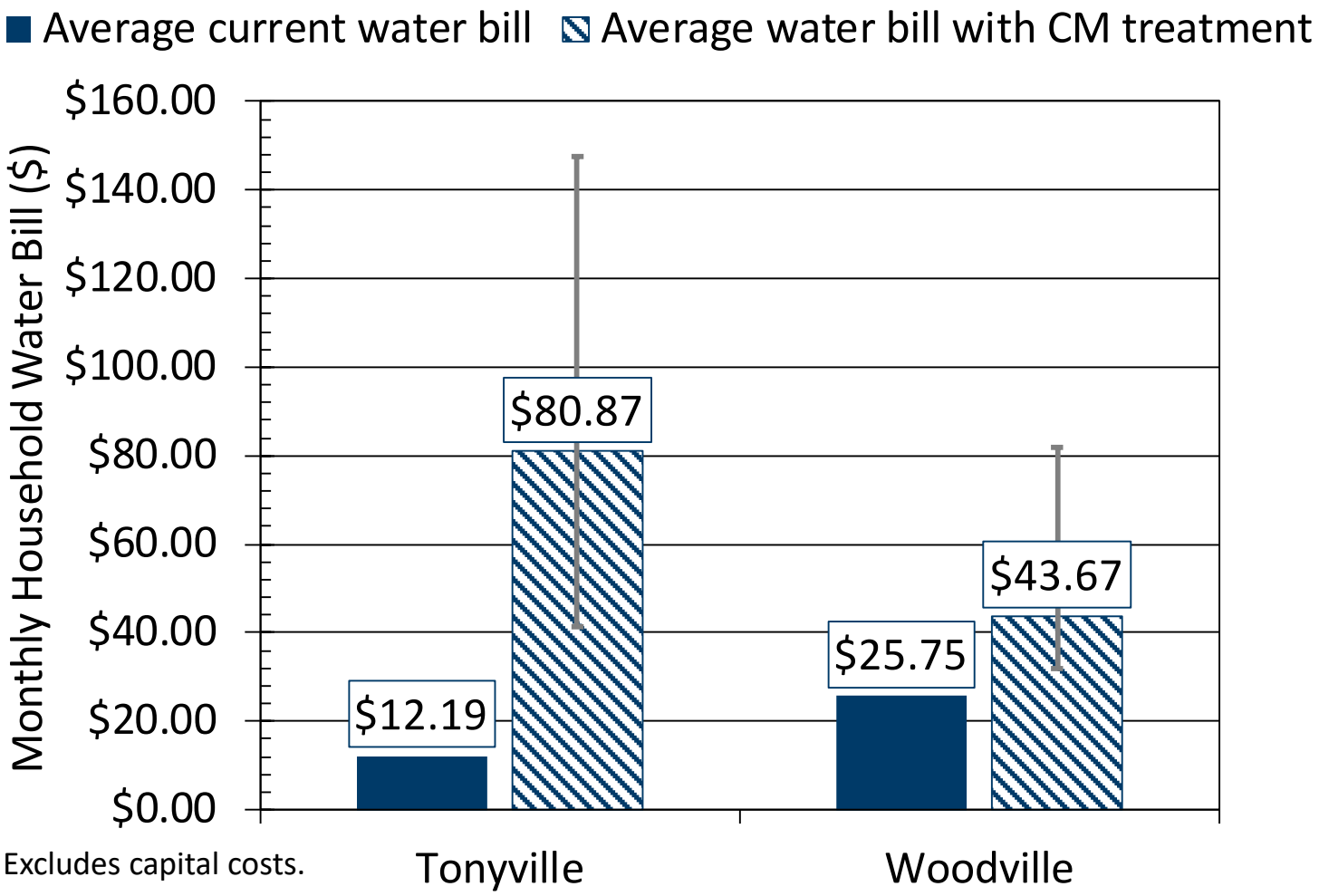
| | Rio Bravo | Tonyville | Woodville | CA |
|---|---|---|---|---|
| County | KERN | TULARE | TULARE | - |
| Population Served | 887 | 500 | 1673 | - |
| Connections | 16 | 50 | 467 | - |
| Households | N/A | 100 | 446 | - |
| **Census Data** | | | | |
| Census Data Basis | School district | Tonyville CDP | Woodville CDP | State |
| Census CDP Population | 4,451 | 684 | 1,770 | 38,982,847 |
| # Housing Units | 1,466 | 121 | 453 | 12,888,128 |
| MHI | $94,048 | $48,859 | $28,508 | $67,169 |
| 20th Percentile Household Income[2] | $34,702 | $24,920 | $15,191 | $26,498 |
| Unemployment Rate | 9.8% +/- 5.6 | 10.4% +/- 12.0 | 12.7% +/- 5.0 | 7.7% +/- 0.1 |

# Income Distribution



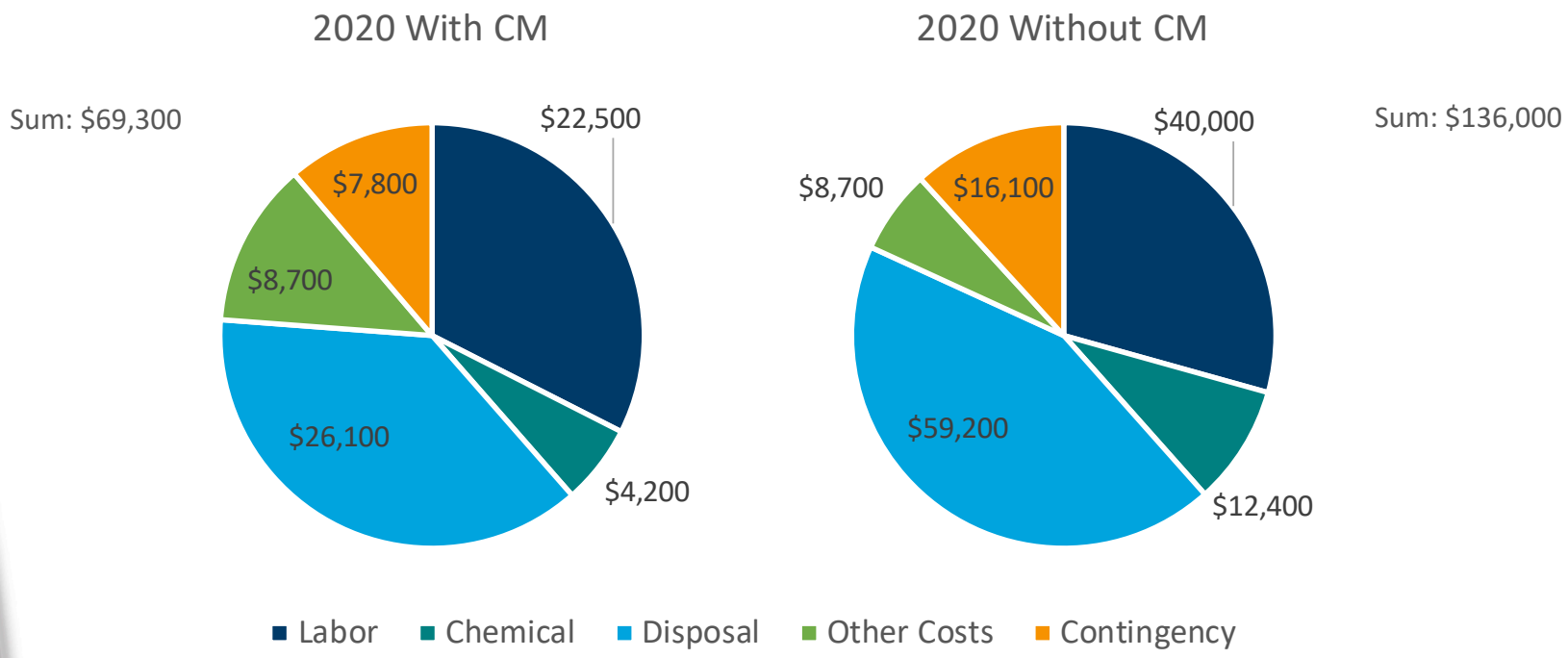

From the 2017 U.S. Census ACS 5 Yr (2013 – 2017)

# Treatment Costs




Excludes capital costs.

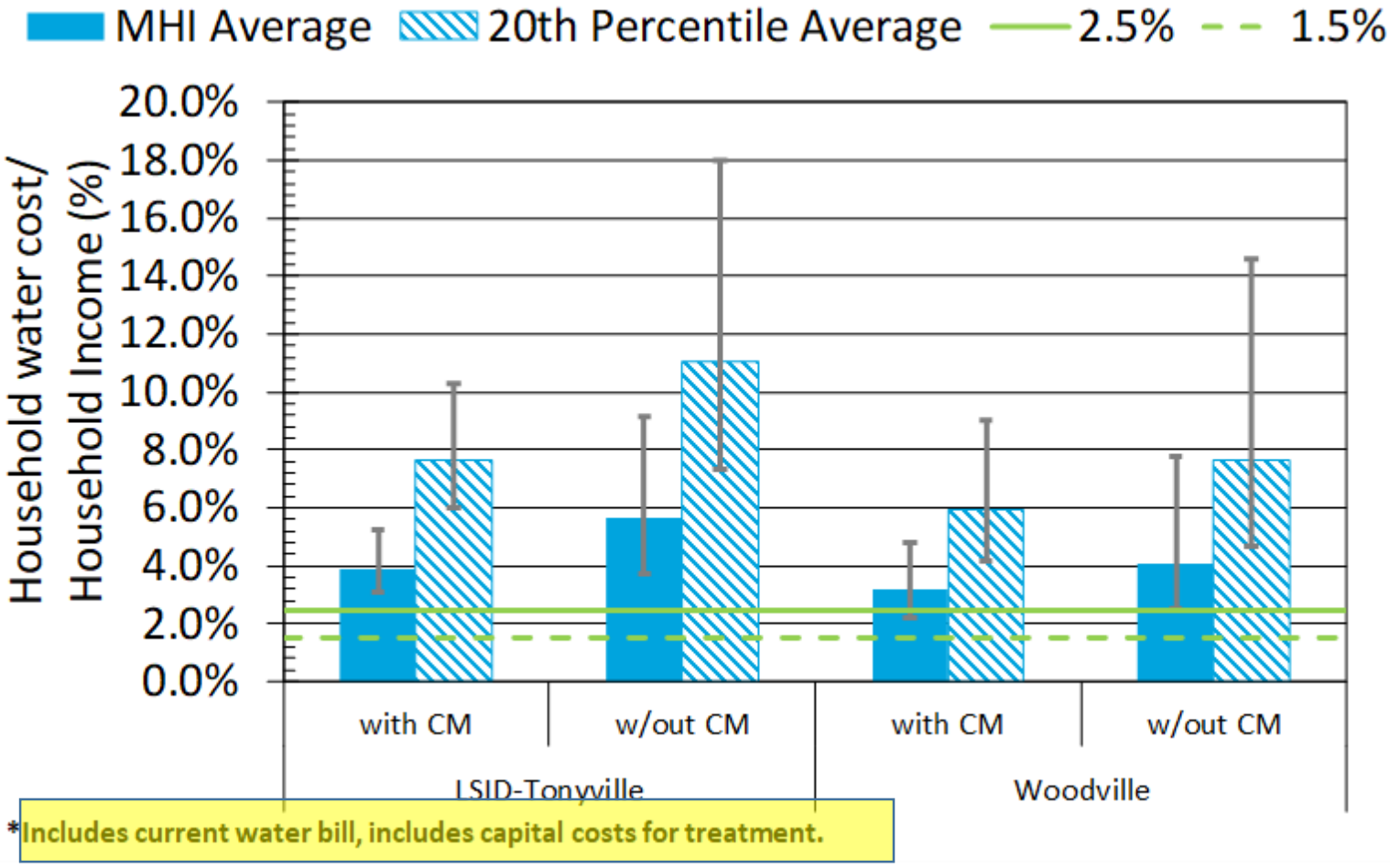
# Estimated O&M Costs Tonyville



# Affordability Metrics

| Threshold | Water Services | Organization |
|---|---|---|
| 1.5% of MHI | Drinking Water | CA SWRCB (SWRCB 2016) |
| 2.5% of MHI | Drinking Water | US EPA (US EPA 2002) |
| 3% of MHI | Drinking Water | United Nations (UNDP 2014) |
| 2% of MHI | Wastewater | US EPA (US EPA 1997) |
| 4.5% of MHI | Drinking Water and Wastewater | US EPA (US EPA 2002)<br>US EPA (US EPA 1997) |
| 7% – 10% of LQI | Drinking Water and Wastewater | AWWA, NACWA, WEF (Draft Report 2019) |

# Affordability Without Grant



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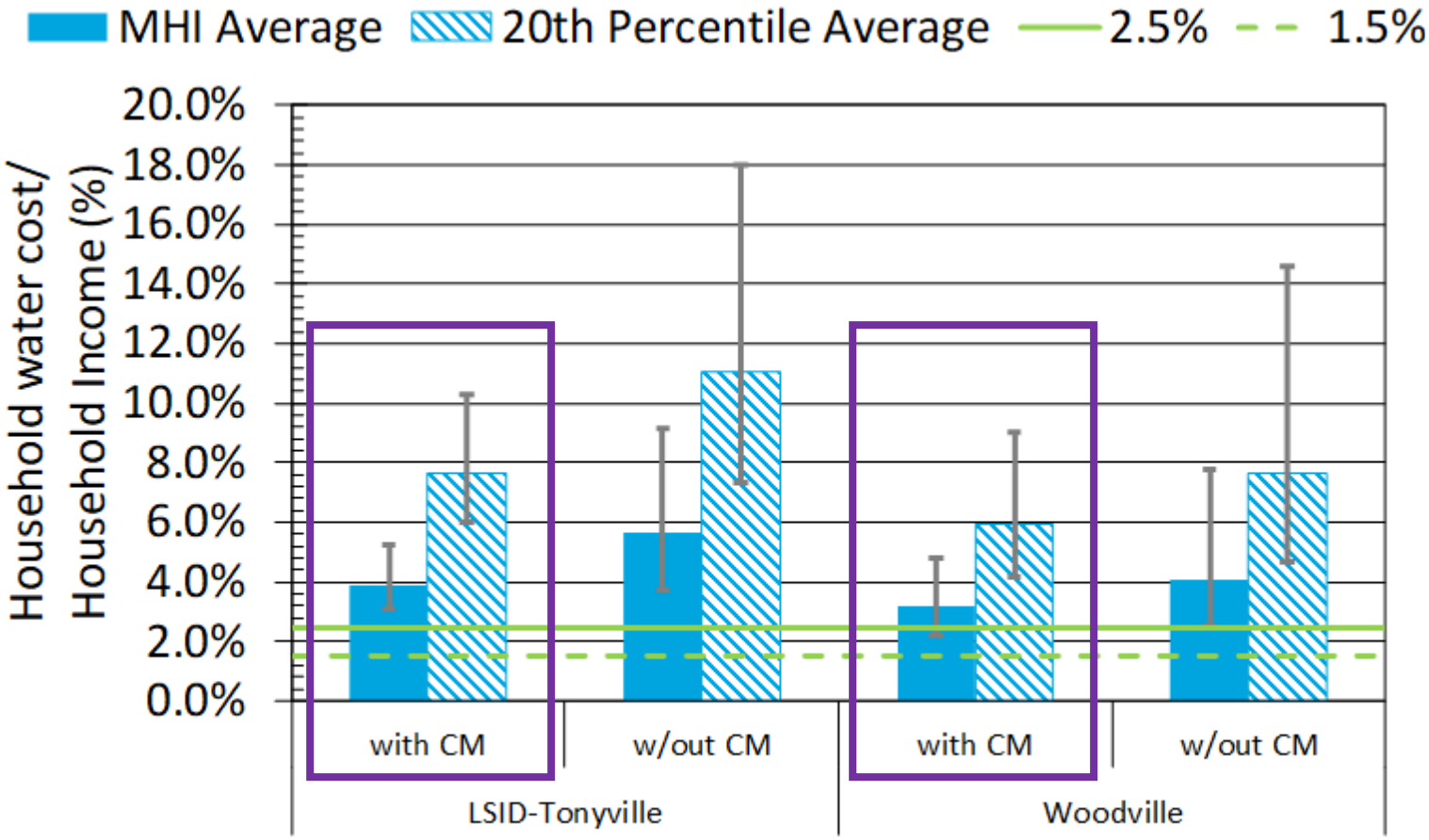


*Includes current water bill, includes capital costs for treatment.

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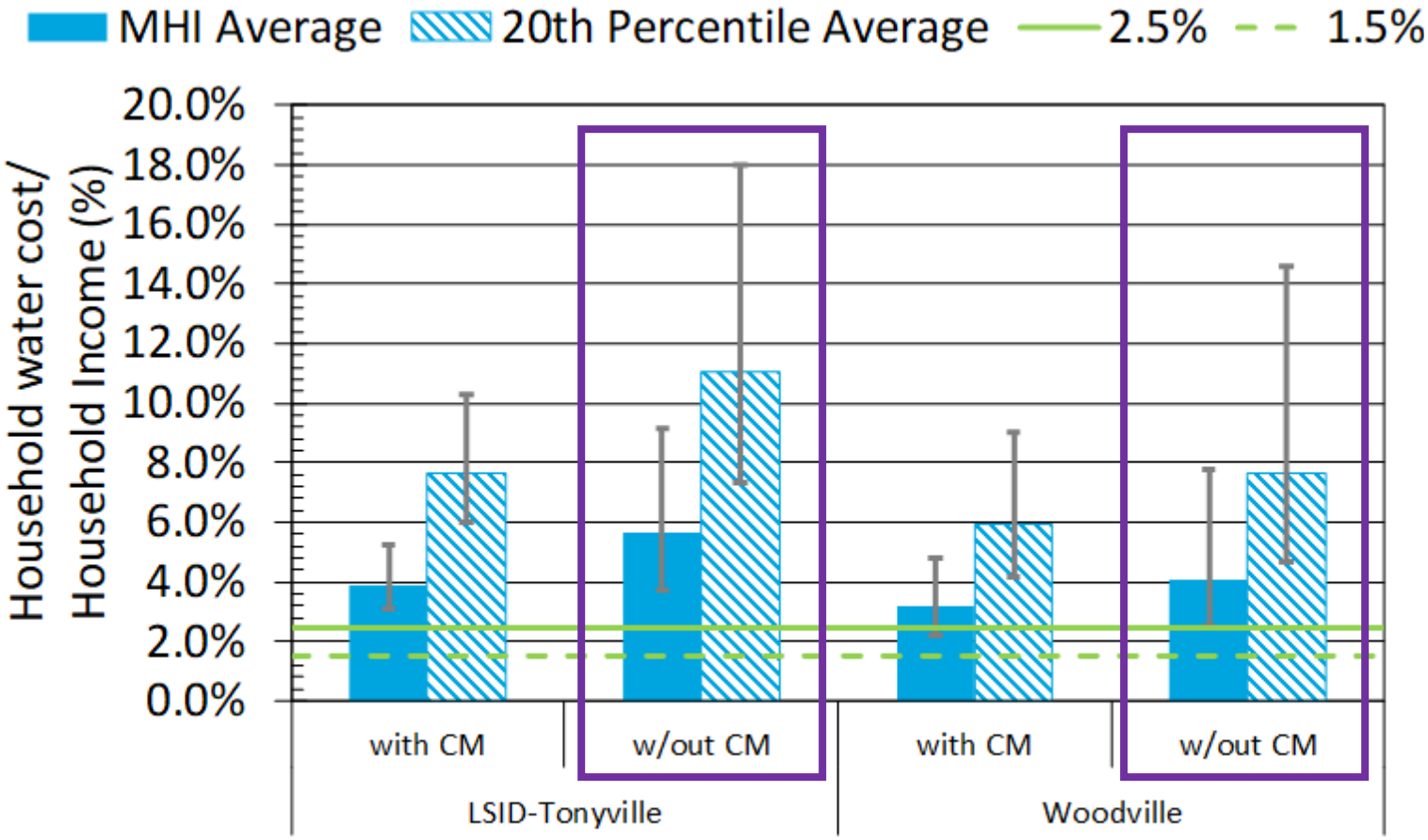


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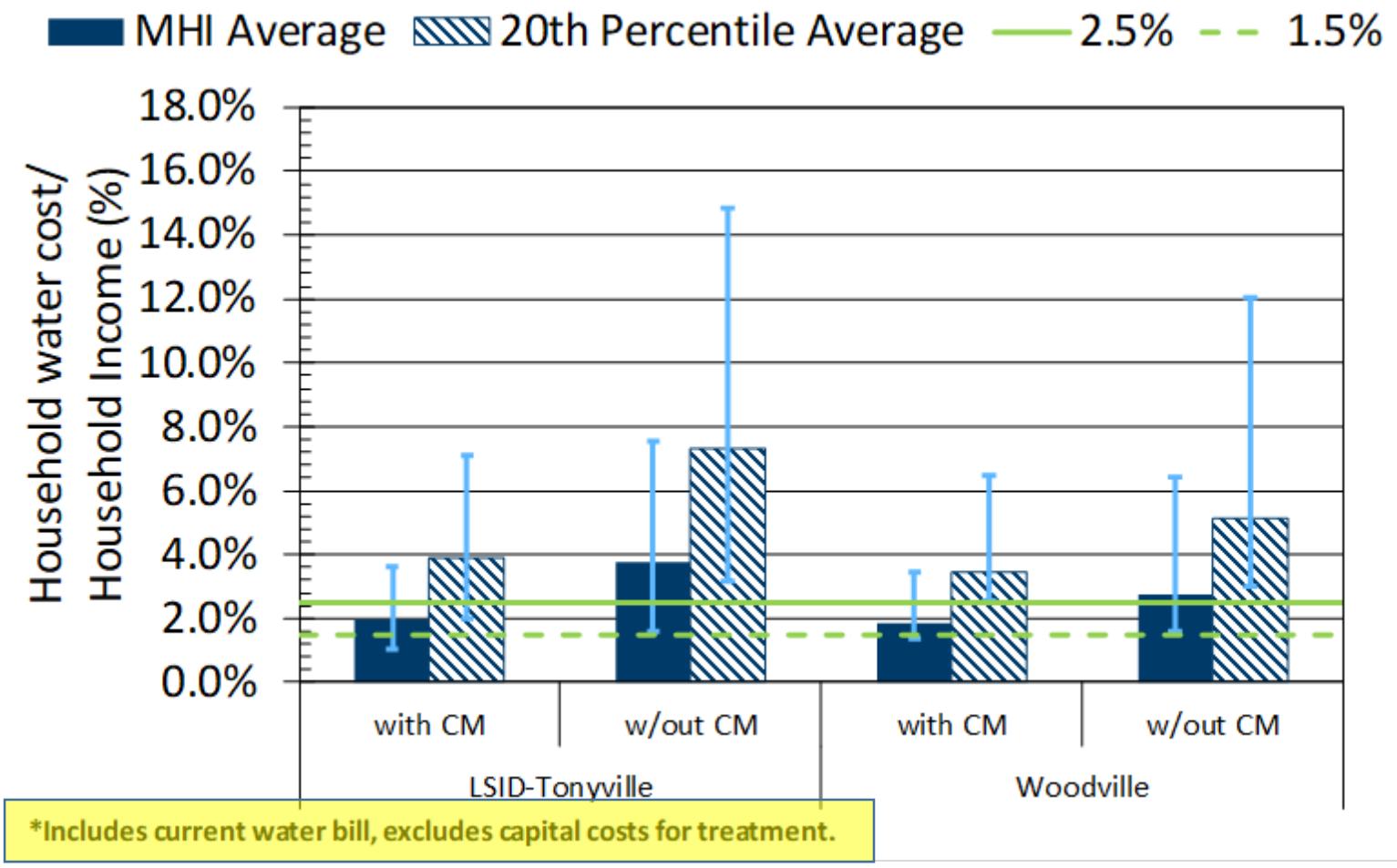

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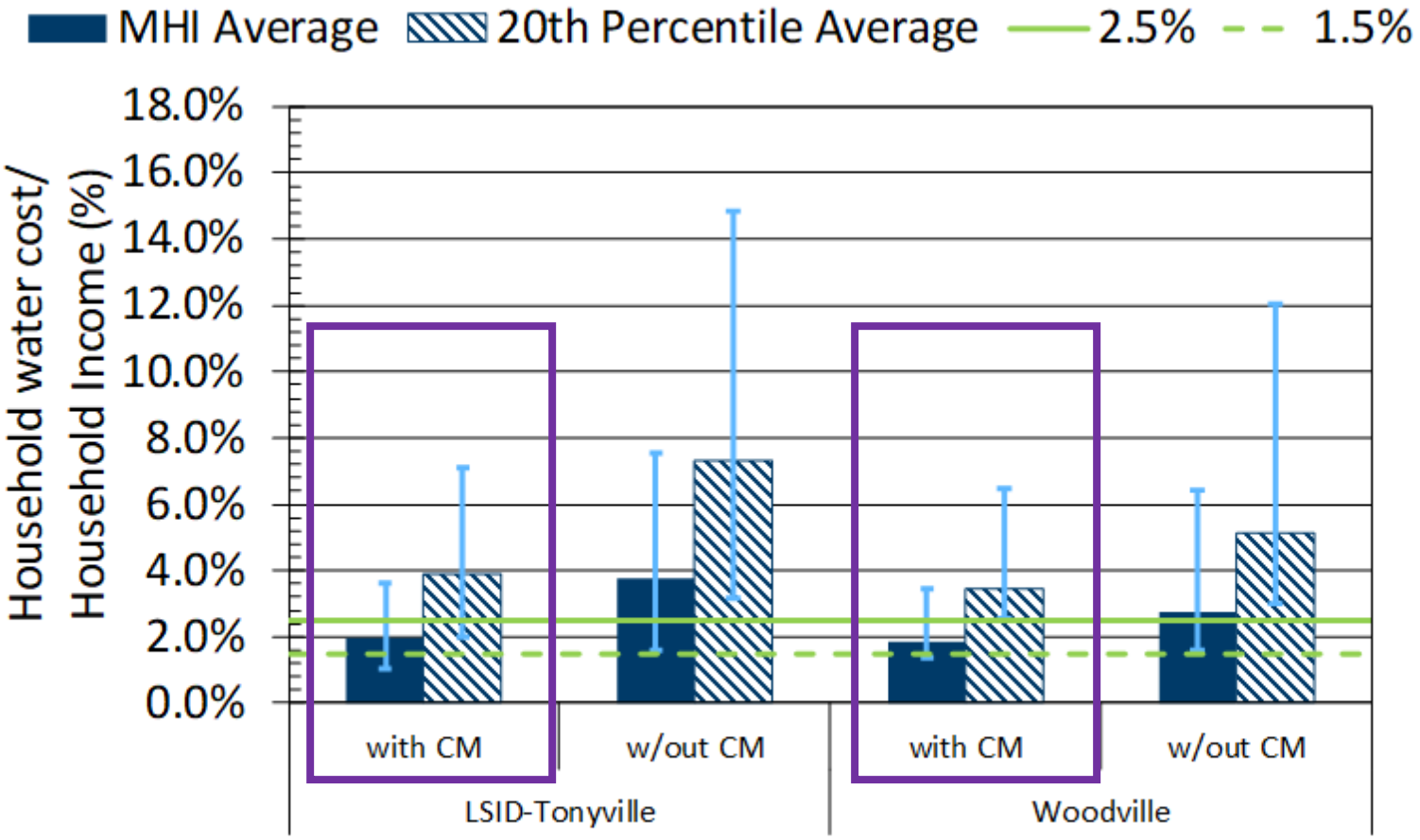


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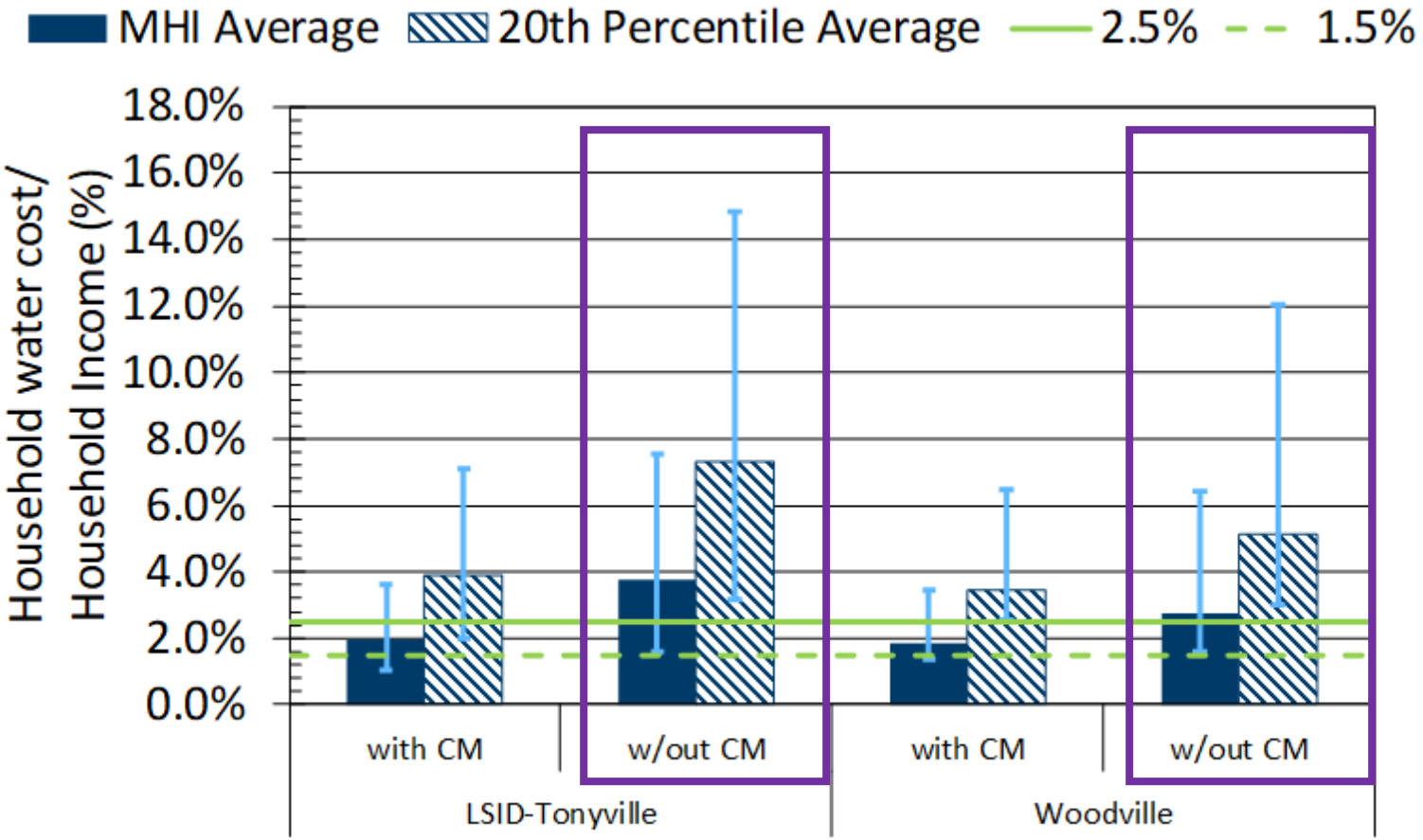


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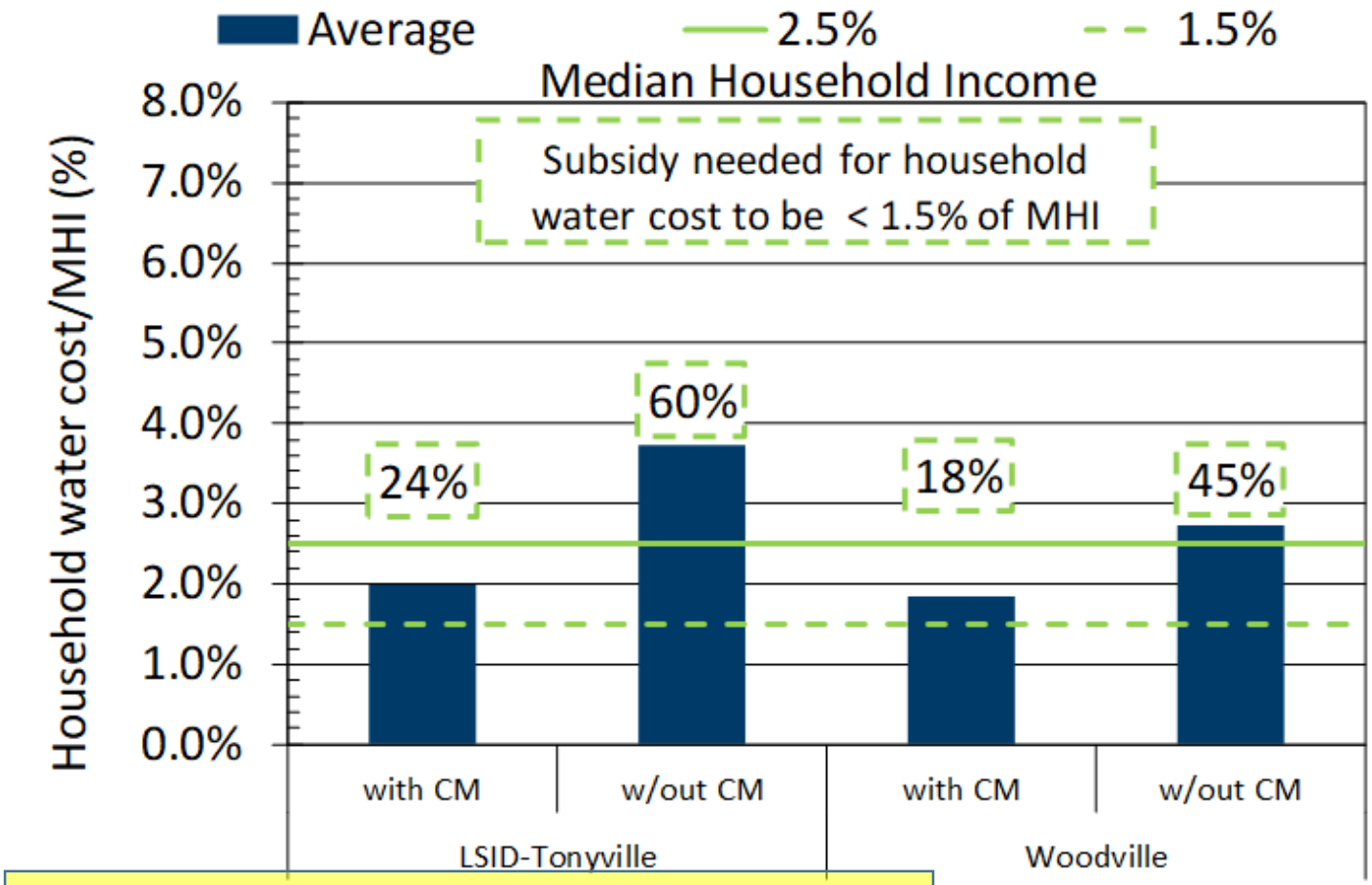

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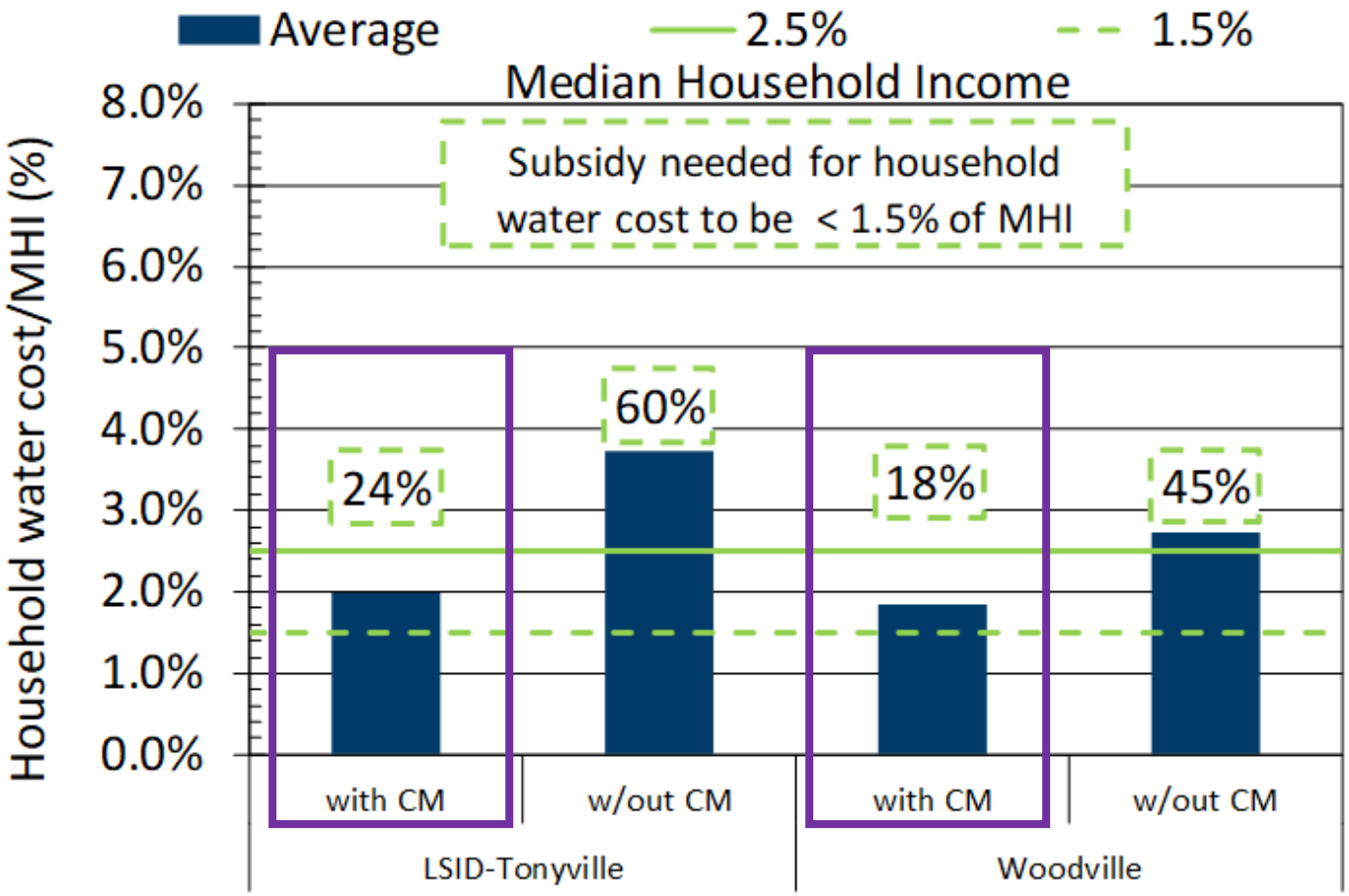


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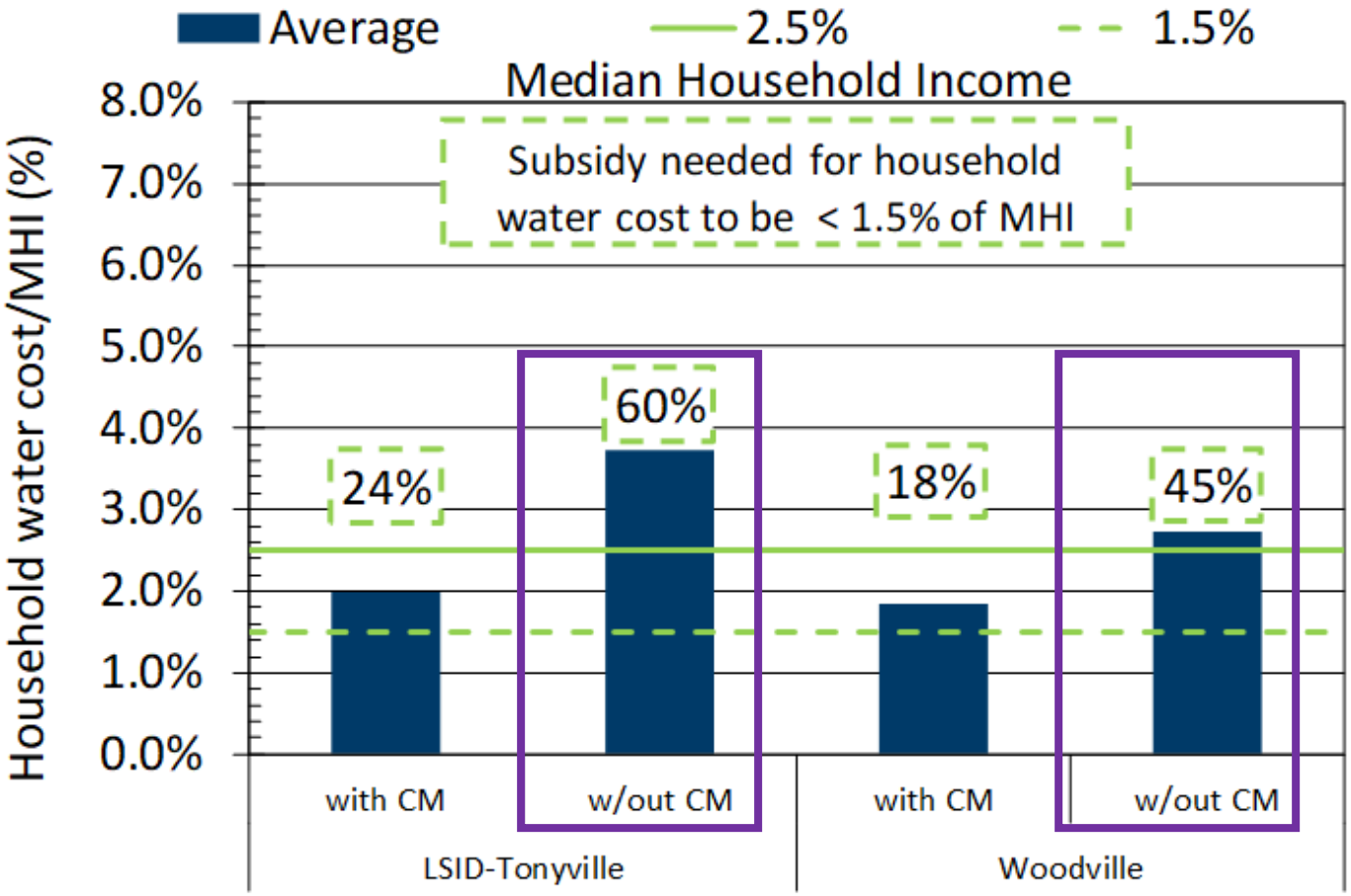


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# Summary

- The grant to pay for capital is critical to affordability
- Nitrate treatment market place needs further development
- Consolidated management is expected to lower O&M costs
- Even with a capital grant and consolidated management the ongoing operation and maintenance is not affordable

# Acknowledgements


- UC Davis – Dr. Jeannie Darby
- Corona - Vivian Jensen, Craig Gorman, Chad Seidel
- Rio Bravo Greely Unified School
- Lindsay Strathmore Irrigation District
- Woodville Public Utilities District
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- DWR – Steve Giambrone, Mally Vue

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