



# Merced Irrigation-Urban Groundwater Sustainability Agency

Stakeholder Guidance Committee Meeting #2

# Today's Agenda

## 1:00-3:00 pm

- Welcome / Introductions / “Parking Lot”
- SGC #1 Recap
- Flexibility vs. Certainty (Breakout Session 1)
- Additional Examples from Mature Allocation Programs
- Break
- Allocation Program Components (Breakout Session 2)
- Municipal Water Use under GSP
- Wrap Up

## 3:00-5:00 pm

- Optional discussion time with the project team

# Parking Lot

- GSP implementation progress in other GSA's
- Enhanced recharge project possibility
  - Wintertime flooding on ag fields
- Urban water users – update on this later

# Sustainable Groundwater Management Act

1

Form  
Agencies:  
MIUGSA  
formed in 2017

2

Develop Plans: MIUGSA developed a joint groundwater sustainability plan (GSP) with the Merced Subbasin GSA and the Turner Island GSA (submitted to DWR in 2020 for review, pending approval by January 2022)

3

Implement  
Plans:  
Purpose of this meeting

4

Achieve  
Sustainability:  
By 2040



An aerial photograph showing a large concrete dam in the foreground, with a reservoir of greenish water below it. A river flows through a dry, hilly landscape with sparse vegetation and winding roads. The text 'Water Supply Evaluation' is overlaid in large white letters across the center of the image.

# Water Supply Evaluation

# Merced Sub-basin Water Supplies



Precipitation: Limited and variable



Surface Water: MID

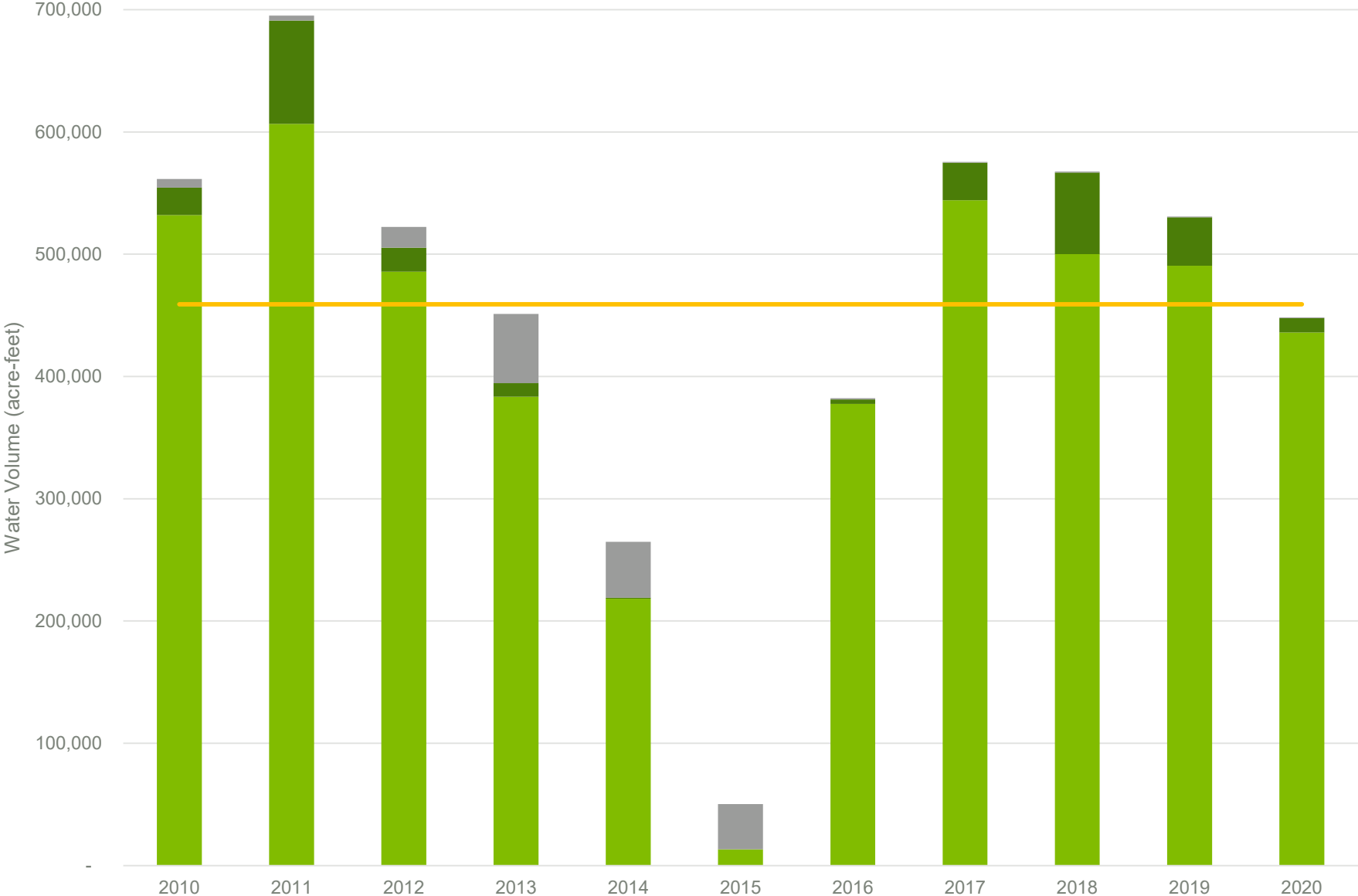


Native Groundwater: Naturally occurring



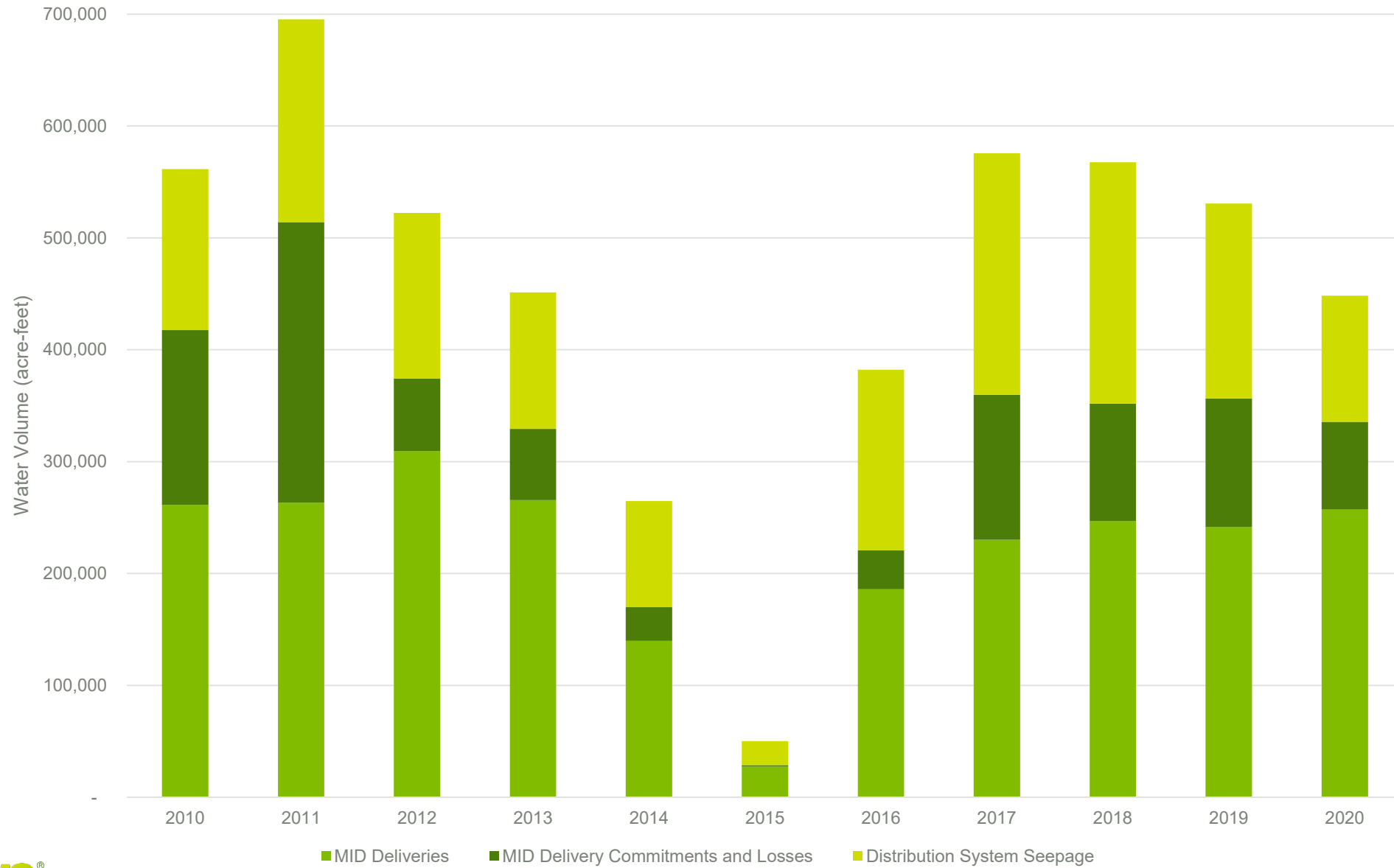
Developed Supply: Seepage from imported surface water (canals and deep percolation)

# Total MID Supplies



Merced River Diversions    Tributary Inflows    MID Groundwater Pumping    Average with MID Pumping

## Fate of MID Supplies

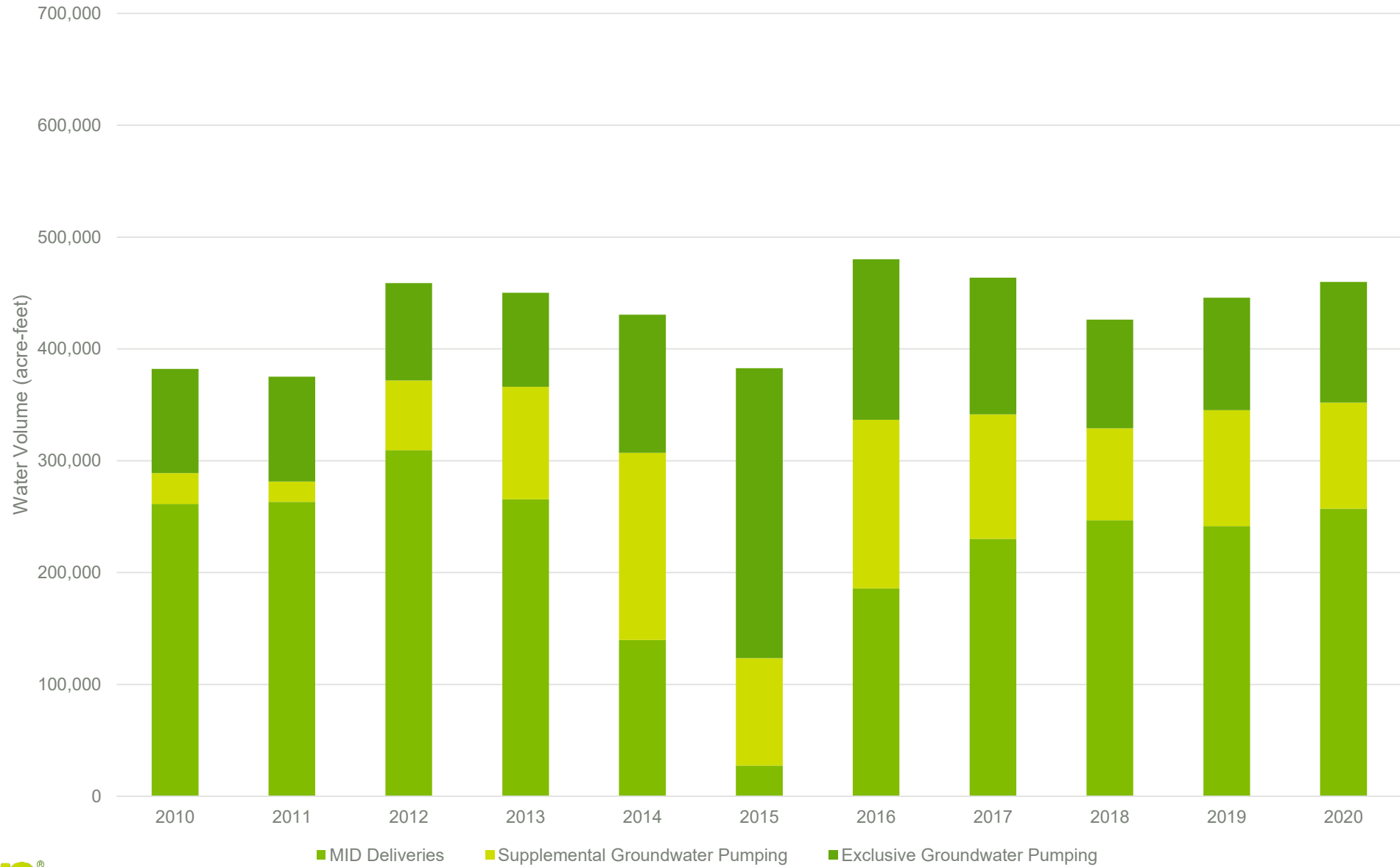




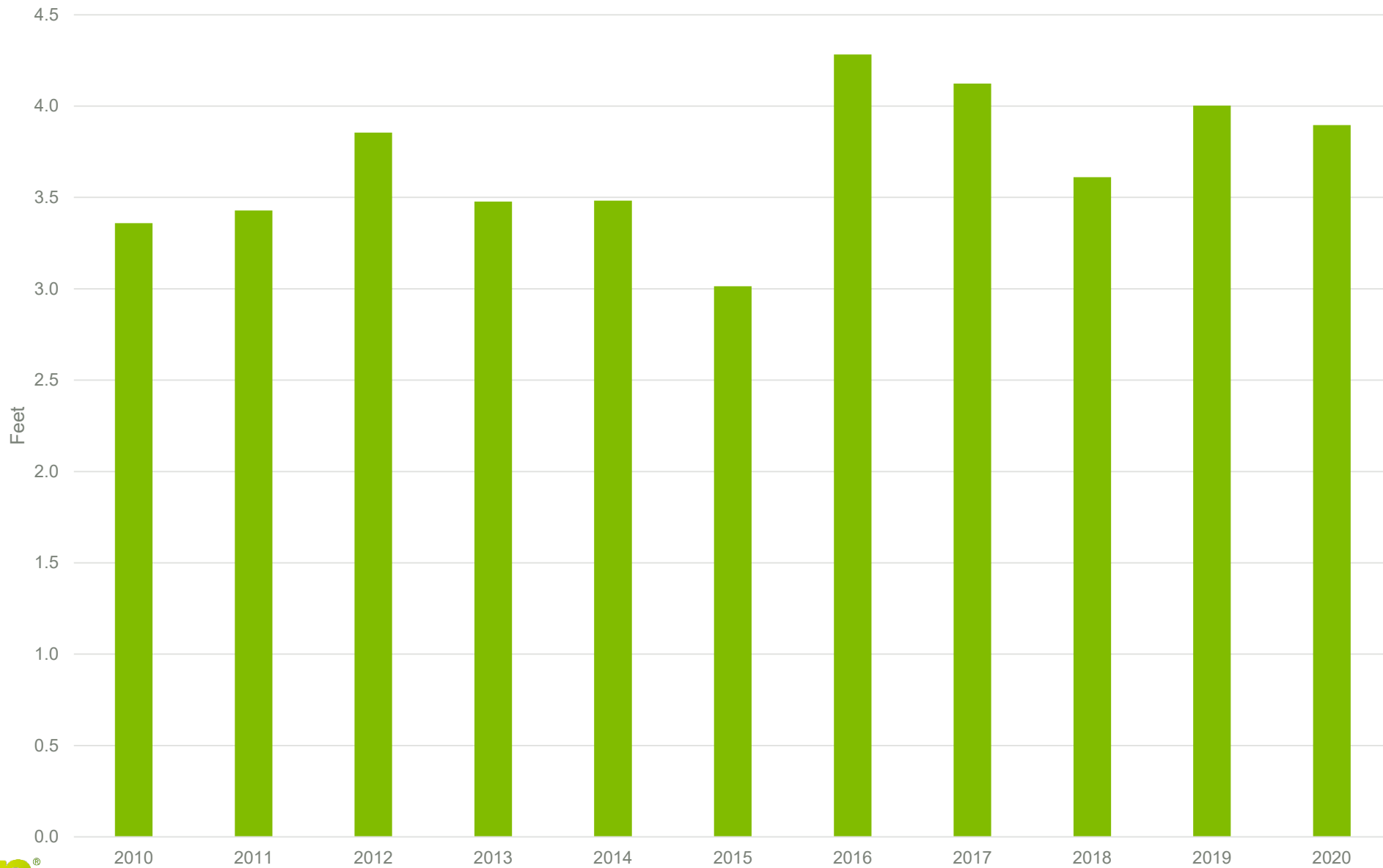
# Private Groundwater Pumping Terms

- **Supplemental** Private Groundwater Pumping: Groundwater irrigation that supplements MID deliveries.
- **Exclusive** Private Groundwater Pumping: Groundwater irrigation that is not supplementing MID delivers.

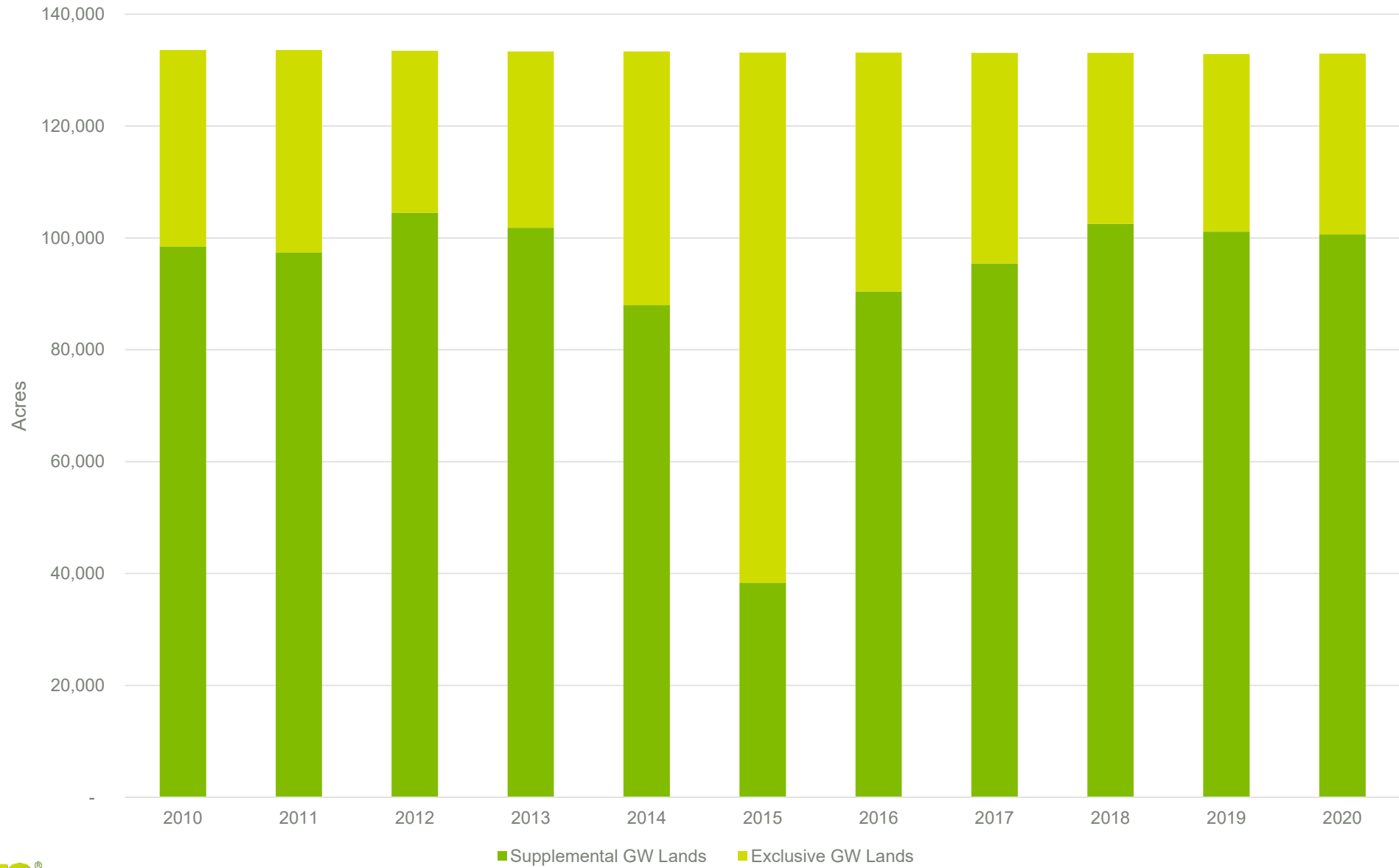
# MIUGSA Irrigation Supplies



# Total Irrigation Depth

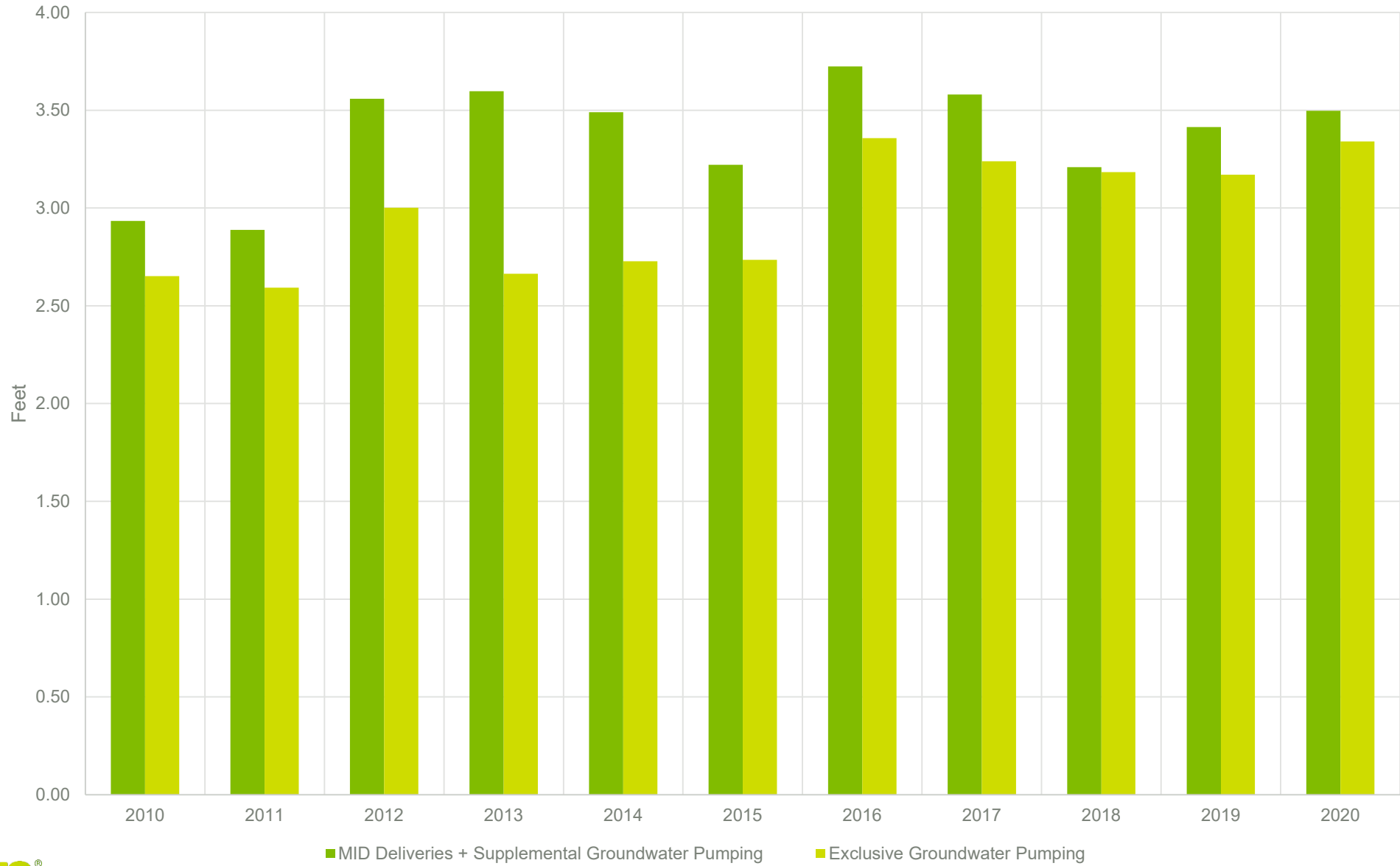


# Irrigated Acres

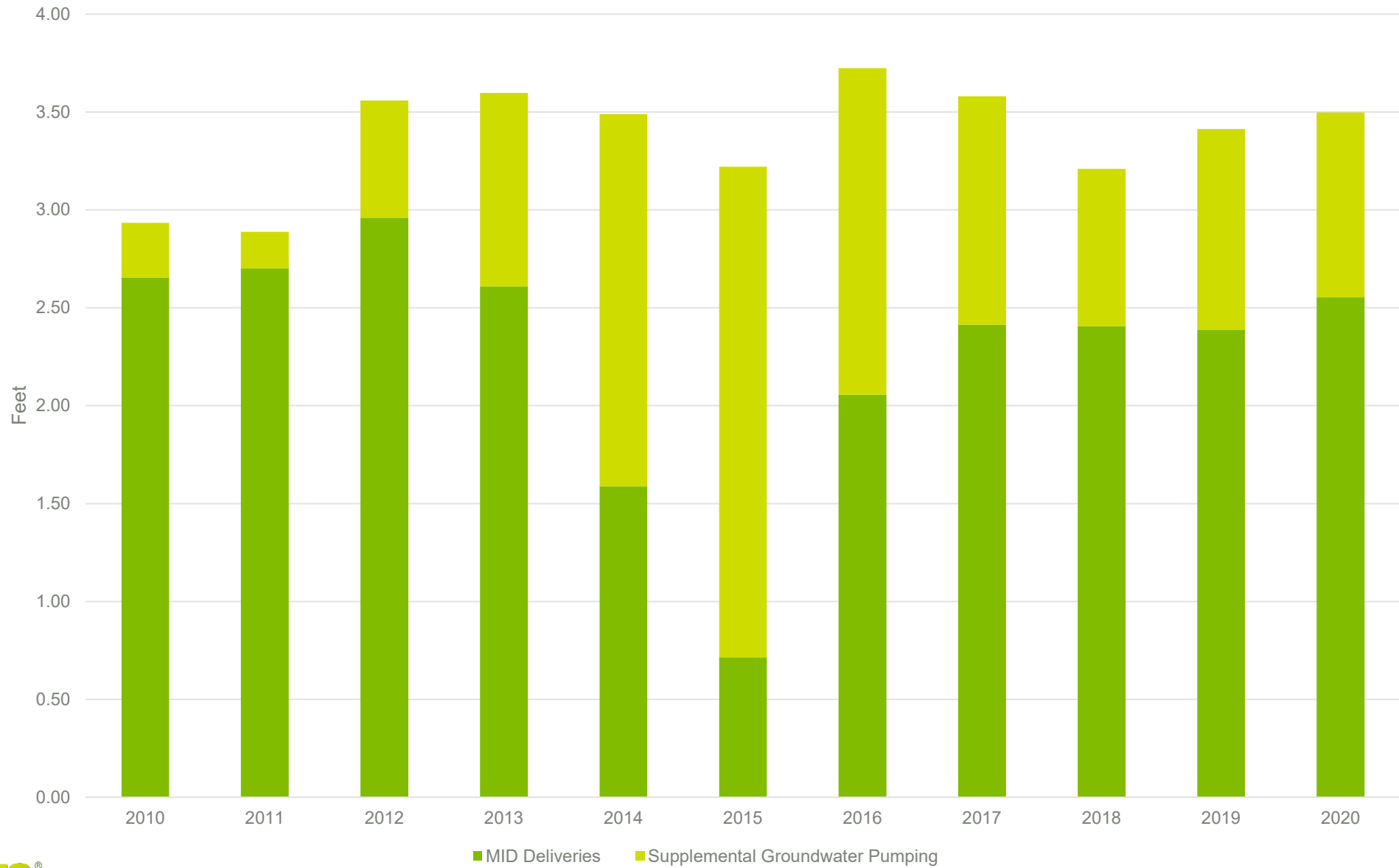




# Irrigation Depth



## Water Use in MID



# Groundwater Use Comparison (2010-2020)

- Pumping Depth – Supplemental GW Users (feet)

- Minimum = 0.19
- Maximum = 2.51
- **Average = 1.1**

- Total Acres – Supplemental GW Users

- Minimum = 38,321
- Maximum = 104,480
- Average = 92,596

- Pumping Depth – Exclusive GW Users (feet)

- Minimum = 2.59
- Maximum = 3.36
- **Average = 2.97**

- Total Acres – Exclusive GW Users

- Minimum = 28,966
- Maximum = 94,813
- Average = 40,629

# Groundwater Management Examples

## Rosedale Rio-Bravo Water Storage District

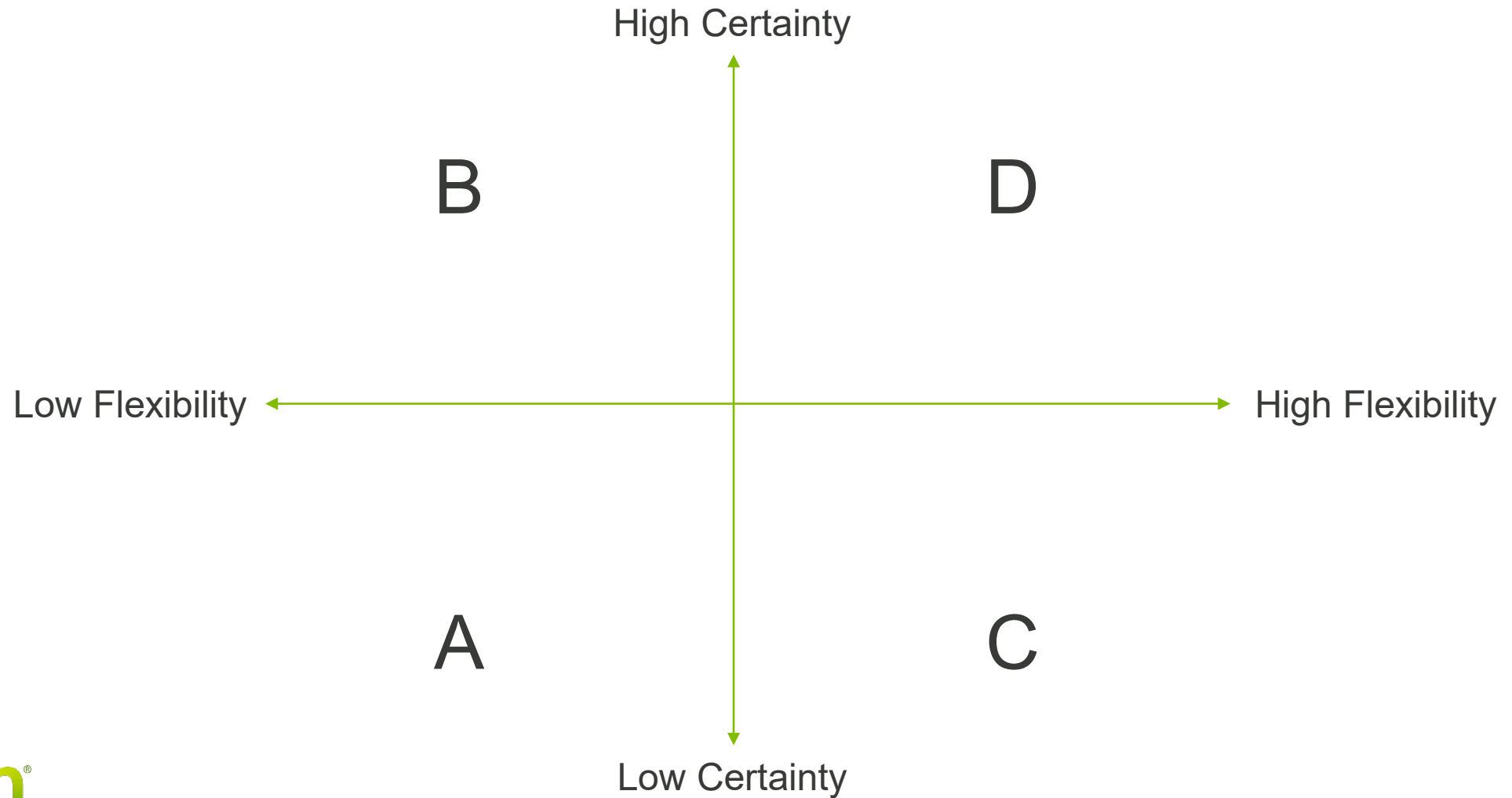
- Kern County, CA

## Upper Republican Natural Resources District

- Southwest Nebraska



# Flexibility vs. Certainty Quadrant Map



## **Quadrant A: Low Flexibility, Low Certainty**

---

Initial allocation can start higher, but may need to be lowered over time

---

Generally looking at few to no opportunities to move water between years or tracts

---

Generally simpler to implement

## **Quadrant B: Low Flexibility, High Certainty**

---

Initial allocation needs to be set conservatively low.

---

Generally looking at few to no opportunities to move water between years or tracts

---

Generally simpler to implement

## **Quadrant C: High Flexibility, Low Certainty**

---

Initial allocation can start higher, but may need to be lowered over time

---

Many opportunities to move water between years or tracts

---

Can require significant resources to implement, depending on sources of flexibility



## Quadrant D: High Flexibility, High Certainty

---

Initial allocation needs to be set conservatively low.

---

Many opportunities to move water between years or tracts

---

Can require significant resources to implement, depending on sources of flexibility

# Breakout Sessions



## Discussion item one:

Flexibility vs. Certainty

# Report Out

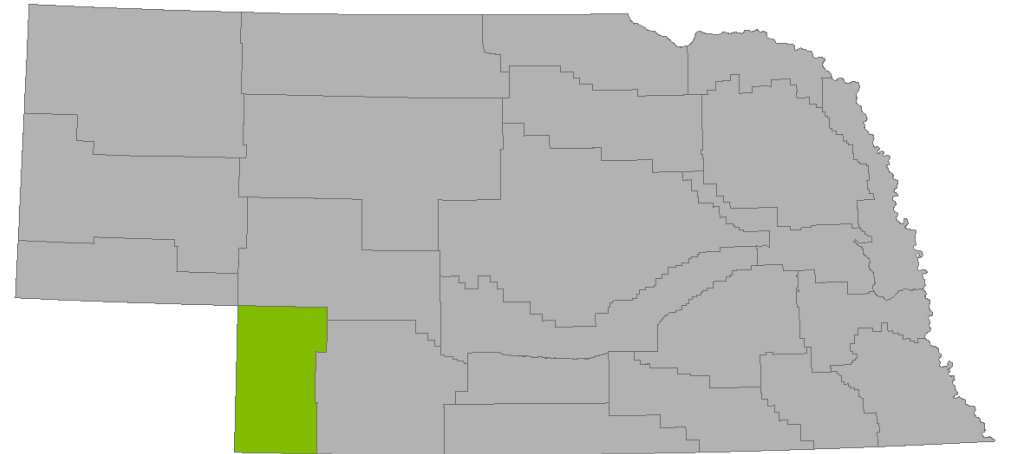
# Terms & Definitions

- **Borrow-ahead:** using a portion of next allocation to supplement current allocation
- **Carry-over:** unused portion of current allocation that can be used in the next allocation period
- **Dry-year considerations:** special regulations that activate during dry years (e.g. max annual use)
- **Length of allocation period:** length of time over which an allocation can be applied
- **Penalties:** actions that can be taken against a producer that exceeds their allocation
- **Pooling:** grouping separate parcels together so that they are considered one unit under the allocation
- **Trading:** buying or selling water between farmers or other entities



# Upper Republican Natural Resources District

- Approximately 1.7 million acres in southwest Nebraska
- Approximately 450,000 irrigated acres



# Current URNRD Allocations

**65 inches from 2018-2022:** can be used in any way over the five-year period

**Carry-over:** Up to 7.5 inches can be carried over from one allocation period to the next (this used to be unlimited)

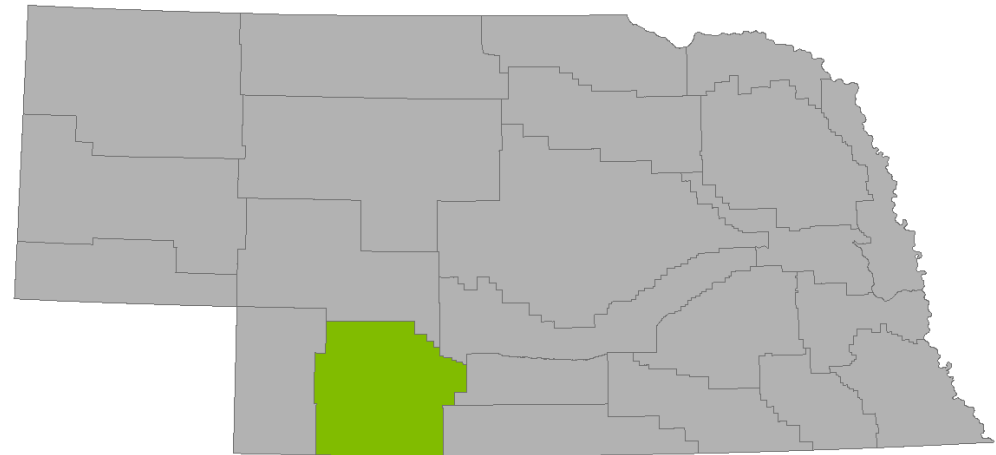
**Pooling:** The pooling of certified acres is allowed under certain conditions (floating township)

**Overuse:** results in a penalty in the next allocation period – producers lose two inches for every inch of overuse

**Cease and desist:** If allocation is exceeded before year five, producer receives a cease-and-desist order (violation of order punishable under Nebraska law)

# Middle Republican Natural Resources District

- Approximately 2.5 million acres in south-central Nebraska
- Approximately 300,000 irrigated acres



# Current MRNRD Allocations

**60 inches from 2018-2022:** can be used in any way over the five-year period

**Carry-over:** Up to 7.5 inches can be carried over from one allocation period to the next (this used to be unlimited)

**Pooling:** Pooling is generally allowed.

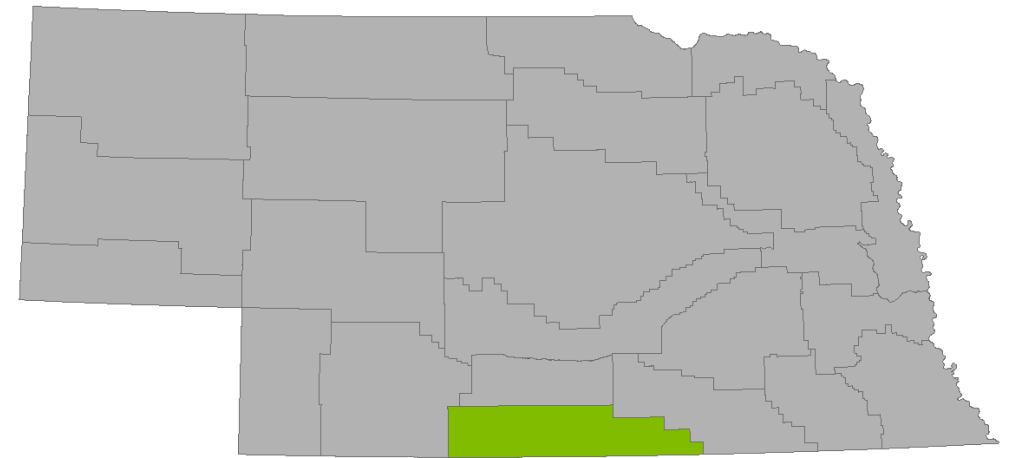
**Maximum Annual Use:** 15 acre-inches per acre

**Overuse:** penalty applied to next allocation period, 1 inch for first 3 inches overuse, 2 inches per inch overuse after that, additional inch per inch of overuse of annual maximum

**Surface Water:** The allocation used to effectively apply to all groundwater *and* surface water use

# Lower Republican Natural Resources District

- Approximately 1.5 million acres in south-central Nebraska
- Approximately 335,000 irrigated acres



# Current LRNRD Allocations

**45 inches from 2018-2022:** can be used in any way over the five-year period

**Carry-over:** Up to 12 inches can be carried over from one allocation period to the next

**Pooling:** Pooling is generally allowed. Limited to same county or adjoining county. Board may deny if they believe the pooling will impact groundwater levels

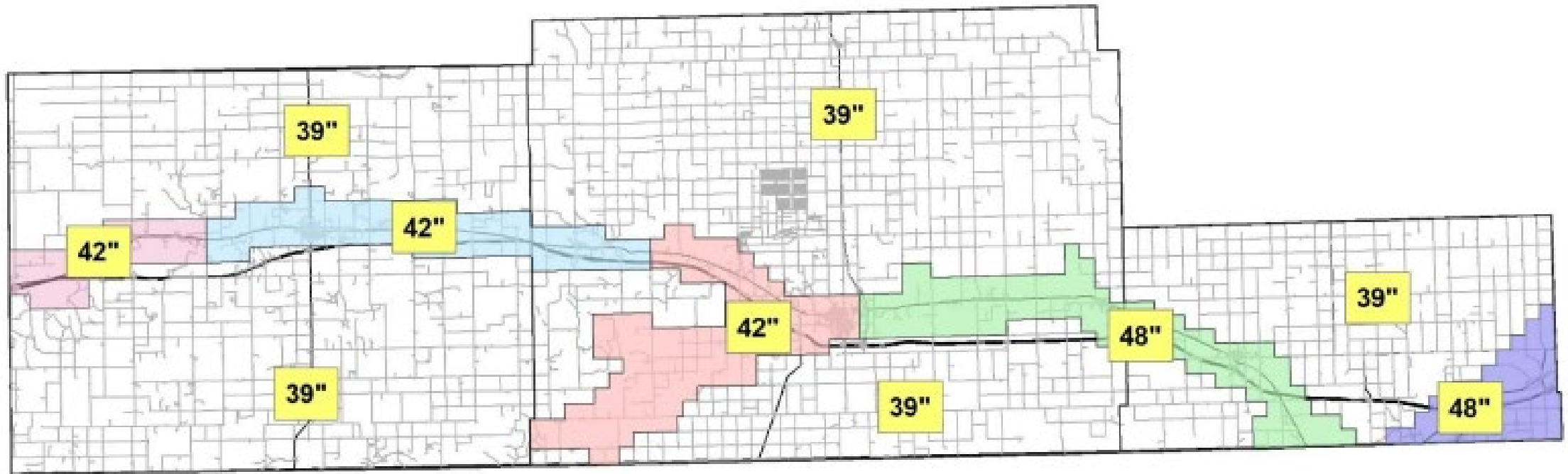
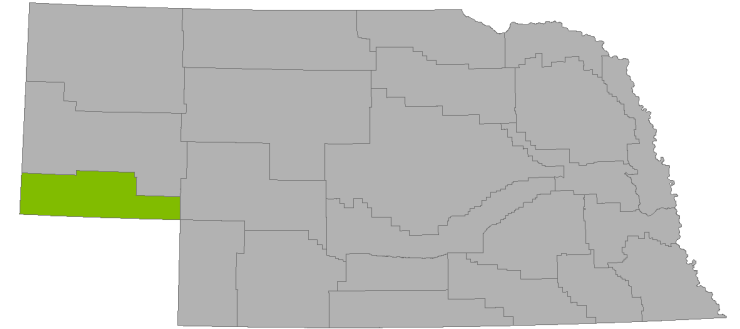
**Maximum Annual Use:** 13 acre-inches per acre during dry years

**Overuse:** penalty applied to next allocation period, 1 inch for first 3 inches overuse, 2 inches per inch overuse after that, additional inch per inch of overuse of annual maximum

**Additional Penalties:** The Board may apply additional penalties for violations including additional reduction of allocation, reduction of certified acres, or well decommissioning

# South Platte Natural Resources District

- Approximately 1.5 million acres in western Nebraska
- Approximately 130,000 irrigated acres



# Current SPNRD Allocations

**Variable by Sub-area:** can be used in any way over the three-year period

**Carry-over:** Up to 10 inches can be carried over from one allocation period to the next (cannot accumulate more than 10 acre-inches)

**Pooling:** Pooling is allowed in same county, same sub-area, and same floating township

**Maximum Annual Use:**  
None

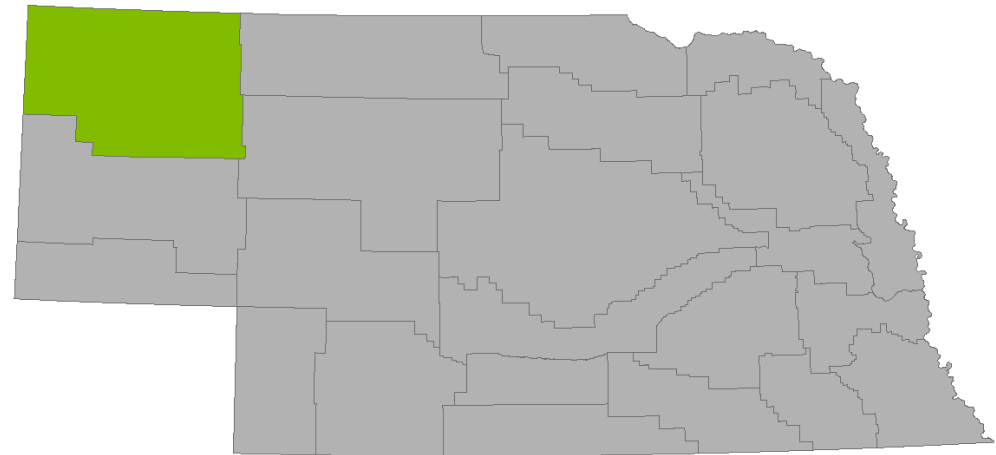
**Overuse:** penalty applied to next allocation period, 1 inch for first 3 inches overuse, 2 inches per inch overuse after that, additional inch per inch of overuse of annual maximum

**Additional Pooling Restrictions:** A parcel cannot be placed into a pool if it has zero allocation, pools are not approved until at least 50% of water is used



# Upper Niobrara-White Natural Resources District

- Approximately 4.5 million acres in northwest Nebraska
- Approximately 250,000 irrigated acres



# Current UNWNRD Allocations

**65 inches from 2018-2022:** can be used in any way over the five-year period

**Carry-over:** Up to 50% of current allocation can be carried over from one allocation period to the next

**Pooling:** Pooling is not allowed.

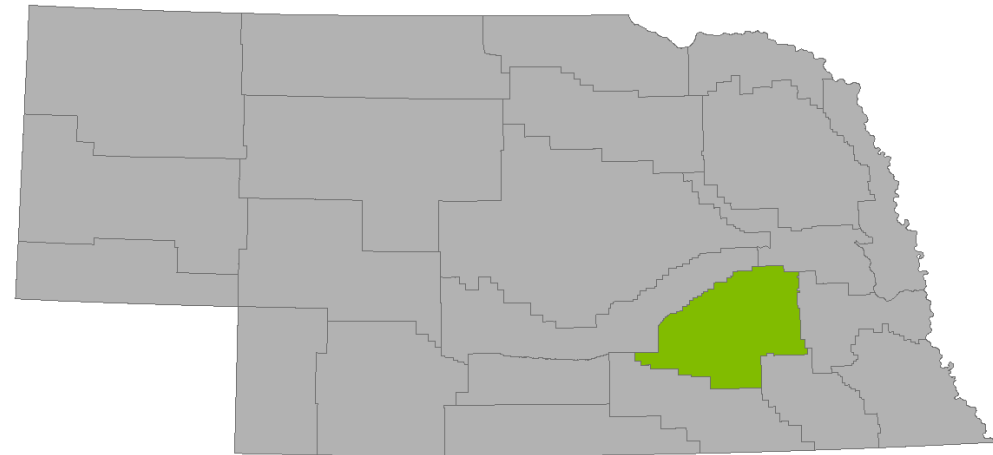
**Borrow-ahead:** May borrow up to 2 acre-inches per acre from next allocation period without penalty

**Overuse:** penalty applied to next allocation period, after borrowing 2 inches, each additional inch counts as three inches toward next allocation period

**Other Allocations:** Also have specific allocation for water consumption for cattle, swine, sheep, horses, and poultry

# Upper Big Blue Natural Resources District

- Approximately 1.8 million acres in eastern Nebraska
- Approximately 1.2 million irrigated acres



# UBBNRD Allocation Rules

**30 inches for future 3-year period:** second allocation period is five years, 45 inches

**Carry-over:** No provisions for carry-over

**Pooling:** Tracts are automatically created based on common owner-operator, or common well

**Allocation Trigger:** Based on average water levels across the district, when trigger reached, allocation automatically begins

**Flow-meter:** Currently required on all wells since 2010 when first water level trigger was surpassed, penalties for failure to comply

**Other Pooling:** Agreement pools can be created at any time for any number of tracts as long as all owner-operators sign off





# Questions?





**Break**



# Breakout Sessions



## Discussion item two:

Allocation Program Components

Length of allocation period, pooling, carry-over, borrow-ahead, penalties, trading, dry-year considerations

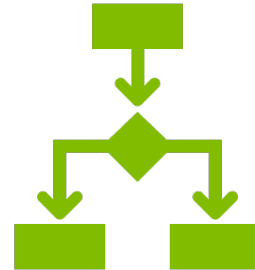
# Report Out



# Next Steps



Review your recommendations



Begin formulating some options  
for the allocation program



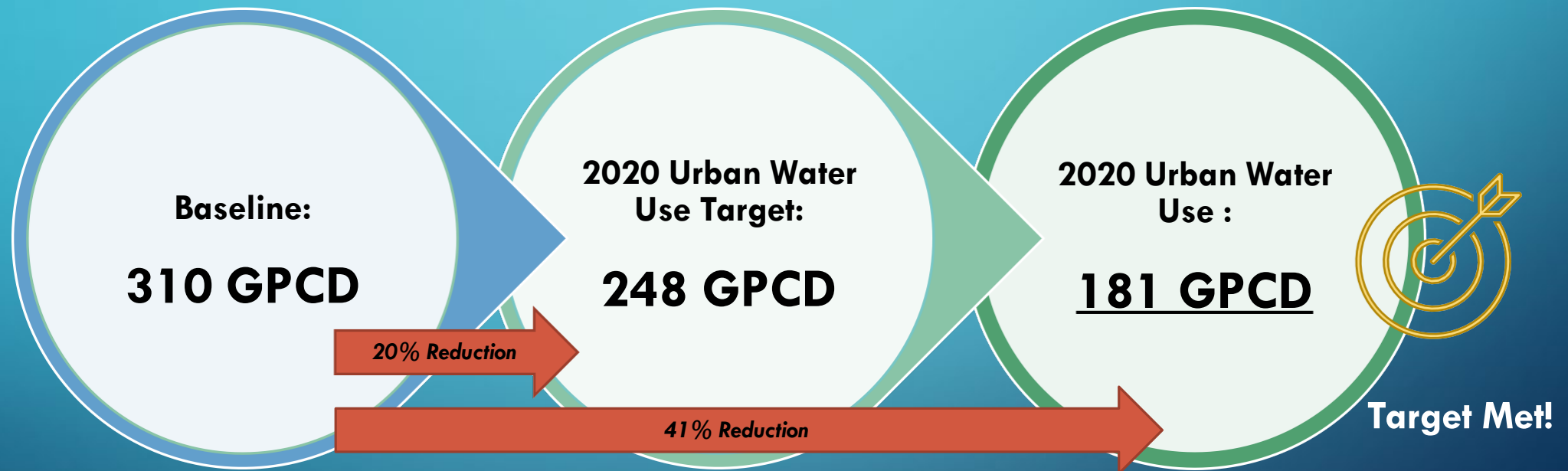
Dive into the details

# Update on Urban Water Use

- Sustainable Yield estimated by modeling a percent reduction in per-capita water use equal to the percent reduction in agricultural use.
  - In the Merced GSP, urban use includes industrial and commercial users.
- Municipal Water Use in the Merced GSP:
  - Sustainable Scenario required approximately 40% reduction from ag and urban uses (accounting for future growth, and without projects); approximately 10% reduction from ag and urban uses with projects
  - Urban - Municipal historical conditions pumping: 44,000 AFY
  - Pumping in WY 2020 (per WY2020 Annual Report): 41,000 AF.
- Municipalities experience mandates and requests to reduce water use, beyond the Sustainable Groundwater Management Act of 2014.

# CONSERVATION TARGET COMPLIANCE (SB X7-7)

## WATER USE REDUCTION



- Baseline daily per capita water use
- Average from 1996-2005

- 20% reduction from baseline daily per capita water use

GPCD include entire volume pumped including UCM

# URBAN USE TRENDING DOWNWARD



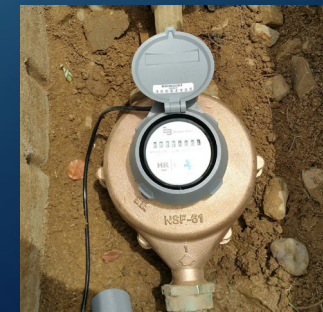
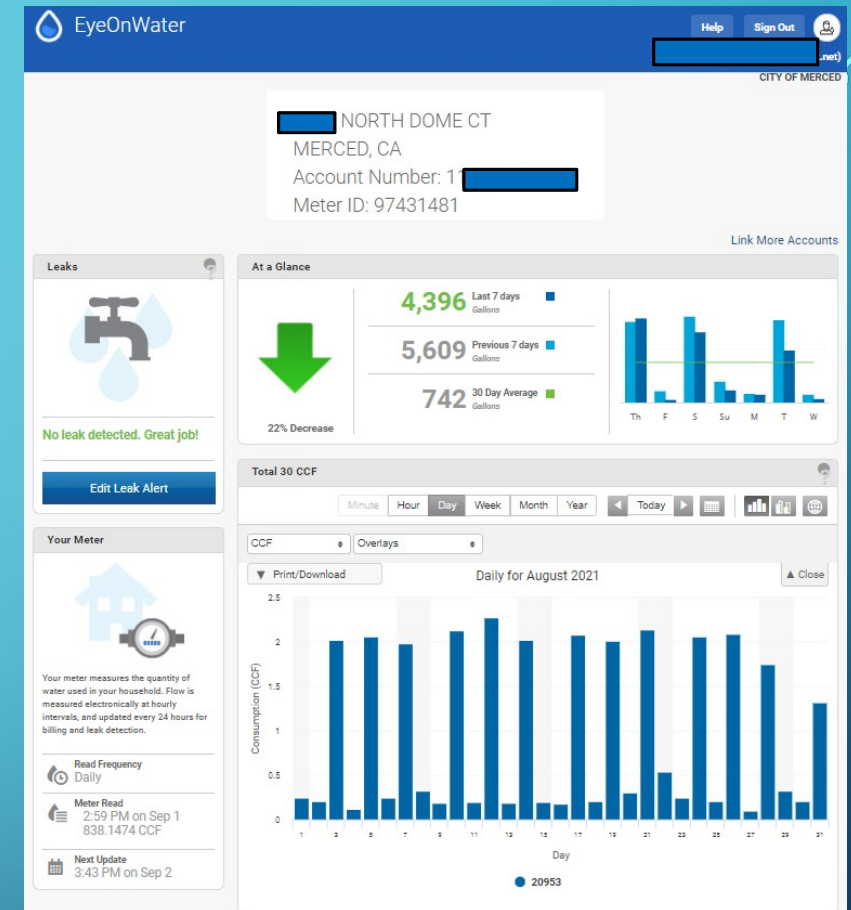
**35% Reduction Required in 2015 from 2013  
Merced met & surpassed this requirement too**

**GPCD is for City only, Not including UCM**

Year	Annual Production AFY	Merced City Population Only	Per Capita Water Use, GPCD
1999	23,903	62,799	340
2000	22,209	63,330	313
2001	23,633	65,363	323
2002	23,658	66,059	320
2003	22,427	67,610	288
2004	23,977	69,805	296
2005	22,538	73,610	271
2006	22,166	76,225	255
2007	24,379	79,715	271
2008	24,164	80,608	269
2009	23,304	80,542	258
2010	23,659	80,985	263
2011	23,117	78,986	257
2012	25,899	79,328	288
<b>2013</b>	<b>27,470</b>	<b>80,599</b>	<b>277</b>
2014	25,232	81,130	253
<b>2015</b>	<b>17,855</b>	<b>81,722</b>	<b>177</b>
2016	17,811	83,962	172
2017	18,692	84,464	179
2018	19,487	83,316	189
2019	18,931	83,676	183
2020	20,076	88,120	183

# HOW URBAN USE CHANGED

- Drought
- 100% Metered Services
- City Ordinance
  - Reduce Water Waste
  - Levels of Conservation
  - Notices, then Penalties for Wasting Water
- Water Rate Structure
- Outreach in the Community
- MWELO – New Buildings follow Model Water Efficient Landscape Ordinance
- Conservation Mindset
- Eye On Water





# MANDATORY VS. ACTUAL CONSERVATION

- **20% Mandatory Reduction by the Year 2020**
  - 248 GPCD
- **15% Requested Reduction by Gov. Newsom**
  - 201 GPCD
- **41% Actual Conservation by City of Merced**
  - 181 GPCD
- **The City of Merced consistently surpassed mandates and requests**





# Questions?