I. Welcome
II. 5th Management Plans Work Group Objectives and Timeline
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   C. Industrial Subgroup
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   D. Safe-Yield Technical Subgroup
IV. Demand Management Discussion
V. Other Opportunities for Public Participation
VI. Closing Remarks
5th Management Plans Work Group
Objectives and Timeline
Timeline

4MP
- Phoenix AMA Adoption
- Pinal AMA Adoption
- Santa Cruz AMA Adoption

2019

MPWG

2021

Drafting Plans

2022

Adopting Plans

2023

5MP
A.R.S. § 45-563 (A)

“The director shall develop a management plan for each initial active management area for each of five management periods... and shall adopt the plans only after public hearings... The plans shall include a continuing mandatory conservation program... designed to achieve reductions in withdrawals of groundwater.”

ADWR-led stakeholder forum for the development of the 5th Management Plans

Goals:

* Assess existing conservation programs
* Update existing management strategies
* Develop new management strategies
Estimated 5MP Timeline

2020
- MPWG
  - Program Analysis
  - Program Development

2021
- Drafting
  - Document Structure & Content
  - Implementation & Strategy

2022
- Promulgation
  - Present to GUACs and stakeholders
  - Conservation Programs become effective 1/1/2025
**Next Steps**

- **Data Gaps**
  - Additional analyses for consideration
  - Future data needs (studies, reporting)

- **Response to Data**
  - Updates to existing programs/requirements
  - Concepts for any new programs
MPWG Subgroups

{ All meeting info is available at new.azwater.gov/5MP }
Subgroup Meetings Update

Agricultural Subgroup

Next Meeting: 3/3 at 10am
Agricultural Conservation Programs

Components of the Base Program:

* Allotment-based program
  * Allotments calculated based on historic crops and acreage

* Each IGFR in the Base Program also has a flexibility account in which they can accrue credits or debits based on annual water use.

Best Management Practices (BMP) Program:

* Farm operator agrees to implement approved BMPs related to water conveyance, irrigation systems, and efficient water & soil management practices.

* “...The program shall be designed to achieve conservation that is at least equivalent to that required under [the Base Program]”
  (A.R.S. § 45-568.02(G))
## Agricultural Conservation Programs

<table>
<thead>
<tr>
<th>AF/Irrigation Acre</th>
<th>% Total Irrigation Acres</th>
<th>% of Total Ag Water Use</th>
</tr>
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<tbody>
<tr>
<td><strong>Base</strong></td>
<td><strong>BMP</strong></td>
<td><strong>% difference</strong></td>
</tr>
<tr>
<td>Phoenix AMA</td>
<td>4.7</td>
<td>5.1</td>
</tr>
<tr>
<td>Pinal AMA</td>
<td>3.1</td>
<td>4.0</td>
</tr>
<tr>
<td>Total All AMAs</td>
<td>3.7</td>
<td>4.3</td>
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</table>
Agricultural Conservation Programs

Base Program Water Use and Allotments

- Values
  - Sum of Quantity (AF)
  - Sum of Allotment
  - Sum of Irrigation Acres

BMP Program Water Use and Allotments

- Values
  - Sum of Quantity (AF)
  - Sum of Allotment
  - Sum of Irrigation Acres
Implemented BMPs

Top Implemented BMPs:

4.1 – Crop rotation

4.2 – Crop residue management

3.10 – Measure flow rates to determine water applied

3.1 – Laser touch-up

3.11 – Soil moisture monitoring
Subgroup Meetings Update

Municipal Subgroup

Next Meeting: 1/7 at 10am
GPCD Program

* Uses a formula to set a GPCD target for each provider.
* Limited to large designated providers
* Statutory language is relatively vague
  * “Reasonable reductions in per capita use”
  * “Additional conservation requirements for non-irrigation uses”

<table>
<thead>
<tr>
<th>AMA</th>
<th># of providers</th>
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<tbody>
<tr>
<td>Phoenix AMA</td>
<td>9</td>
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<tr>
<td>Pinal AMA</td>
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<td>Prescott AMA</td>
<td>1</td>
</tr>
<tr>
<td>Santa Cruz AMA</td>
<td>1</td>
</tr>
<tr>
<td>Tucson AMA</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>16</td>
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</table>
Tiered BMP point system.

Large Designated Providers may elect to be regulated under the NPCCP, opting-in with each Management Plan.

Large Undesignated Providers must be regulated under NPCCP.

Current BMPs are detailed in Appendix 5C in each AMA’s plan.

BMPs must be reasonably relevant to the provider’s existing service area and water use characteristics.

<table>
<thead>
<tr>
<th></th>
<th>Tier 1</th>
<th>Tier 2</th>
<th>Tier 3</th>
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<tr>
<td>Phoenix AMA</td>
<td>17</td>
<td>10</td>
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<td>4</td>
<td>2</td>
<td>0</td>
<td>6</td>
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<td>1</td>
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<td>3</td>
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<td>5</td>
<td>0</td>
<td>19</td>
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<td><strong>Total</strong></td>
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<td><strong>19</strong></td>
<td><strong>5</strong></td>
<td><strong>61</strong></td>
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Subgroup Meetings Update

Industrial Subgroup

Next Meeting: TBD
All Industrial Users
Conservation Program Requirements

Industrial Subsectors
* Turf-Related Facilities (≥ 10 acres)
* Sand & Gravel Facilities (>100 AF)
* Metal Mining Facilities (>500 AF)
* Large Scale Power Plants (>25 Megawatts)
* Large Scale Cooling Facilities (≥ 1,000 tons)
* Dairy Operations
* (monthly avg ≥ 100 lactating cows/day)
* Cattle Feedlots Operations
* (monthly avg ≥ 100 cattle/day)
* New Large Landscape Users
* (> 10,000 sq ft of water-intensive landscape)
* New Large Industrial Users
* (> 100 acre-feet/year)

Conservation Requirements
* Avoid waste, make diligent efforts to reuse and recycle water
* Avoid single pass cooling or heating unless water is reused
* Use low flow plumbing fixtures
* Use low water use plants where feasible, use efficient irrigation systems
Subgroup Meetings Update

Turf Breakout

Next Meeting: 1/23 at 10am
Distribution of Turf Acres per Hole (Phx AMA)
New Turf/Planted Acres Application Rate Calculation:

\[
AF \text{ Per Acre} = \left( \frac{\text{Maximum AF Per Hole}}{5^x \text{ Acres Per Hole}} \right) \times \frac{\text{Actual Acres Per Hole}^x}{\text{Actual Acres Per Hole}}
\]

* Formula which makes the application rate a function of the acres per hole:
  * Less acres per hole translates to a higher application rate.
  * \(x\) is a factor which determines the rate at which the application rate changes as the actual acres per hole changes.
Example: Phoenix AMA
Max AF per Hole = 23.75
\[ x = 0.75 \]

<table>
<thead>
<tr>
<th>Acres / Hole</th>
<th>3MP AF / Acre</th>
<th>4MP AF / Acre</th>
<th>4MP AF / Acre</th>
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<tr>
<td>0.5</td>
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</tr>
<tr>
<td>1.5</td>
<td>6.42</td>
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<tr>
<td>2</td>
<td>5.97</td>
<td></td>
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</tr>
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<td>5.65</td>
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<td>4</td>
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<td>4.5</td>
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<td>5</td>
<td>4.75</td>
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Safe-Yield Technical Subgroup

Next Meeting: 2/4 at 10am
A.R.S. § 45-561(12):

“A groundwater management goal which attempts to achieve and thereafter maintain a long-term balance between the annual amount of groundwater withdrawn in an active management area and the annual amount of natural and artificial recharge in the active management area.”
Annual Calculation

Inflows

* Natural
  * Groundwater Inflow
  * Streambed Recharge
  * Mountain-front Recharge
* Artificial
  * Incidental Recharge
    * Agricultural
    * Municipal
    * Industrial
  * Canal Seepage
  * Cut to the Aquifer
  * CAGRD Replenishment

Outflows

* Natural
  * Groundwater Outflow
  * Riparian Demand
* Artificial
  * Sector Demands
    * Agricultural
    * Municipal
    * Industrial
    * Indian
  * Remediated Groundwater
  * Poor Quality Groundwater
Water Demand

Tucson AMA

Prescott AMA
Water Supply

Tucson AMA

Prescott AMA

Thousands

Groundwater  Surface Water  Colorado River  Reclaimed
Tucson AMA
Annual Overdraft – Inflows & Outflows

Recharge | AF | Overdraft

Inflows | Outflows | Overdraft

-500000
-400000
-300000
-200000
-100000
0
100000
200000
300000

Prescott AMA
Annual Overdraft & Trendlines

Recharge | AF | Overdraft

Year

Overdraft
Linear (Overdraft)
Linear (Overdraft-20 year)
Prescott AMA
Annual Overdraft & Running Average
Pinal AMA
Annual Overdraft & Running Average

Recharge | AF | Overdraft

Overdraft
Running Average Overdraft
MPWG Safe-Yield Technical Subgroup

Goals

* Consensus on methodology and definitions
  * Assessing each component
  * Identifying a general approach for assessing long-term status
  * Consistency across AMAs
* Clear communication of status of each AMA

Meeting Information

* Previous presentation and recordings available at new.azwater.gov/5MP
* Next Meeting: February 4 at 10am in 3175
Demand Management Discussion
Created Arizona Department of Water Resources

Goals of the Act

• Control severe groundwater depletion
• Provide the means for allocating Arizona's limited groundwater resources
• Improve Arizona’s groundwater supplies through conservation and development of additional water supplies

Former Arizona Governor and Interior Secretary Bruce Babbitt signing the GMA
A.R.S. § 45-563 (A)

“The director shall develop a management plan for each initial active management area for each of five management periods... and shall adopt the plans only after public hearings... The plans shall include a continuing mandatory conservation program... designed to achieve reductions in withdrawals of groundwater.”
Management Goals
(A.R.S. § 45-562)

Safe-yield:
“A groundwater management goal which attempts to achieve and thereafter maintain a long-term balance between the annual amount of groundwater withdrawn in an active management area and the annual amount of natural and artificial recharge in the active management area.”
(A.R.S. § 45-561(12))

Prescott, Phoenix, and Tucson AMAs:
Safe-yield by the year 2025

Pinal AMA:
To allow development of non-irrigation uses and to preserve existing agricultural economies in the AMA for as long as feasible, consistent with the necessity to preserve future water supplies for non-irrigation uses.

Santa Cruz AMA:
To maintain a safe-yield condition in the AMA and to prevent local water tables from experiencing long term declines
Annual Calculation

**Inflows**

* Natural
  * Groundwater Inflow
  * Streambed Recharge
  * Mountain-front Recharge

* Artificial
  * Incidental Recharge
    * Agricultural
    * Municipal
    * Industrial
  * Canal Seepage
  * Cut to the Aquifer
  * CAGRD Replenishment

**Outflows**

* Natural
  * Groundwater Outflow
  * Riparian Demand

* Artificial
  * Sector Demands
    * Agricultural
    * Municipal
    * Industrial
    * Indian
  * Remediated Groundwater
  * Poor Quality Groundwater
Prescott AMA
Annual Overdraft – Inflows & Outflows
Water Management

Supply Side

Meeting demand with new resources

* Colorado River water delivered through the CAP
* Effluent
* Recharge/Recovery

Demand Side

Managing demand to postpone/avoid the need to develop additional resources or to bring use in line with available resources

* “reductions in withdrawals of groundwater”
Demand Management

Conservation

Reducing total use

- “…reductions in withdrawals of groundwater.”

Efficiency

Minimizing waste

- Efficiency can coincide with conservation, but must be designed to reduce total use to also be conservation
Demand Management

* Long-term reductions v. Short-term curtailment
  * Looking for strategy around using water wisely, not for short-term restriction/reduction

* Benefits
  * Progress toward the goals/long-term supply resiliency
  * Balancing supply/demand to allow for growth within resource availability
  * Reducing demand → Long-term reduction in costs
Demand Management in Conservation Programs

- Existing components
- How might we consider using demand management as a principle for designing conservation programs going forward?
  - Focus on long-term
  - Focus on elimination of waste
  - Focus on “reductions in withdrawals of groundwater” on the AMA scale
  - Moving beyond simple “efficiency”
Additional Opportunities for Public Engagement
GUAC Structure

* GUAC for each AMA
* Represents water users from different sections
* Consists of 5 members appointed by the Governor for a 6-year term

GUAC Duties & Responsibilities

* Advise the ADWR Director and the Area Director for the AMA
* Comment to the ADWR Director and the Area Director on draft management plans before they are promulgated
* Make recommendations on groundwater management programs and policies
* Make recommendations to the ADWR Director on withdrawal fees & funding projects and programs with withdrawal fee monies collected
Water Management Assistance Program (WMAP)

* Provides financial & technical resources for:
  * Conservation Programs
  * Augmenting and utilizing renewable water supply
  * Research & assessment of hydrologic conditions and water availability

* Funded primarily from groundwater withdrawal fees

* GUAC review WMAP proposals & make funding recommendations

* Examples of WMAP Projects:
  * Water Conservation education for students (Project WET), Farmers (IMS, WCMP), Landscapers (Smartscape)
  * Streamflow and aquifer water level Monitoring
  * Water demand studies and models
Groundwater Conservation Grant

* $2,000,000 for groundwater conservation in the AMAs
* Distributed among the AMAs on a per-capita basis
* Grant Notice of Funding Opportunity Now Open

* Important Dates:
  * December 10th – Grant Application Workshop
  * February 14th – Deadline to submit applications
  * May 29th – Selected projects announced

* WMAP Webpage: https://new.azwater.gov/ama/wmap
Governor’s Water Augmentation, Innovation & Conservation Council

* Jan. 31, 2019 - Governor Ducey formed the Governor’s Water Augmentation, Innovation and Conservation Council (GWAICCC)

* Investigates long-term augmentation, and strategies for conservation and innovation in pursuit of more sustainable water supplies

* Chaired by ADWR Director, includes 38 members appointed by the Governor, plus 4 legislators

* The Council meets quarterly at ADWR, all meetings are open to the public.
GWAICC Committees

Council

Committees

Desalination 1/16/2020
Long-Term Augmentation 1/8/2020
Non-AMA Groundwater 2/7/2020
Post-2025 AMAs 12/9/2019

Subcommittee

Legal & Regulatory
Questions?

managementplans@azwater.gov

Management Plans Work Group:
new.azwater.gov/5MP

Full Text of Management Plans:
new.azwater.gov/ama/management-plans