I. Welcome and Introductions
II. Committee Updates

Long Term Water Augmentation Committee

Desalination Committee
Long Term Water Augmentation Committee update

Chairman: Wade Noble
“Evaluation of the Feasibility of Water Augmentation Options to Assist Planning Areas within Arizona”

<table>
<thead>
<tr>
<th>Water Augmentation Opportunities</th>
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<tbody>
<tr>
<td>Ocean Desalination</td>
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<td>Brackish Groundwater Desalination</td>
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<td>Groundwater Extraction from the Harquahala and Butler Valleys</td>
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<td>Best Practices that Improve Water Utilization</td>
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<td>---------------------------------------------</td>
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<tr>
<td>Agricultural Water Conservation</td>
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<tr>
<td>Enhancing Aquifer Storage</td>
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<tr>
<td>Reclaimed Water Utilization</td>
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<tr>
<td>Municipal Water Conservation</td>
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</tbody>
</table>
Processes that may be needed within an Augmentation or Best Practices option

**Augmentation Ideas Embedded in other Water Augmentation Options**

<table>
<thead>
<tr>
<th>Regulatory Revisions</th>
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<tbody>
<tr>
<td>Groundwater and Surface Water Exchanges</td>
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<td>Groundwater and Surface Water Transfers</td>
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<tr>
<td>Water Banking</td>
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<td>Aquifer Recharge</td>
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## Projects to improve utilization

### Projects and Practices Between Willing Parties that Improve Water Utilization

<table>
<thead>
<tr>
<th>Project Description</th>
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<tbody>
<tr>
<td>Firm Water Supply for lower priority Colorado River Water Users</td>
</tr>
<tr>
<td>Modify Operation of the Roosevelt Dam to use the Flood Control Space</td>
</tr>
<tr>
<td>SRP-CAP Interconnect Facility</td>
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</tbody>
</table>
Needs further development

Water Augmentation Concepts
Requiring Further Development

Cloud Seeding

Phreatophyte Management

Watershed Management
Impediments to Augmentation

Impediments to Water Augmentation

Indian Water Right Settlements

Little Colorado River and Gila River Water Rights Adjudications

Groundwater Management Planning
LTWA Committee
Next Steps

1. Tuesday, June 25, 2019, LTWA Committee meeting to complete report.

2. Wednesday, August 21, 2019 (or before) deliver completed report to GWAICCC.

3. Thursday, September 12, 2019, present report to the Council.
Desalination Committee

Chairman: Philip Richards

Committee members:

John Kmiec            Warren Tenney            Bill Plummer
Bruce Hallin          Trevor Baggeri          Glenn Hamer
Chuck Cullom           Jamie Kelley           Wade Noble
Bill Garfield

First meeting of the new Committee:
June 28, 2019
10:00-11:30 a.m.
ADWR
III. M36 Water Loss Program Phase II update
GOAL: Reduce Water Loss in Arizona

Train water utility staff on comprehensive water audits to help them determine:
- magnitude of water loss, and
- disaggregate loss by subcomponents.
Phase II: extend to more water systems

Partners

WIFA

$400,000

Consultant

CAVANAUGH

$25,000
Phase II – 25 Participating Systems

• 9 systems outside AMAs
• 16 systems within AMAs
Non-Revenue Sub-Components Identified – example

Total Volume of NRW = 184 acre-ft/yr

Total Cost of NRW = $89,607

Key: Non-Revenue Water Components (Volume and Value)

- Unbilled metered (valued at Var. Prod. Cost)
- Unbilled unmetered (valued at Var. Prod. Cost)
- Unauthorized consumption
- Customer Metering inaccuracies
- Systematic Data handling errors
- Real Losses (valued at Var. Prod. Cost)
### REAL LOSS: Key Results – 25 Systems – 2017-2018

- Overall, 11% of total water supplied was real loss
- Total annual cost of real losses approximately $1.5 million

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<thead>
<tr>
<th></th>
<th>Total</th>
<th>Range</th>
<th>Median</th>
</tr>
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<tbody>
<tr>
<td>TOTAL CONNECTIONS</td>
<td>129,336</td>
<td>303 - 20,298</td>
<td>3,500</td>
</tr>
<tr>
<td>WATER SUPPLIED</td>
<td>52,403 AF</td>
<td>161 – 8,299 AF</td>
<td>1,682 AF</td>
</tr>
<tr>
<td></td>
<td>(17.1 BG)</td>
<td>(52 MG – 2.7 BG)</td>
<td>(548 MG)</td>
</tr>
<tr>
<td>REAL WATER LOSSES</td>
<td>5,841 AF</td>
<td>17 – 883 AF</td>
<td>189 AF</td>
</tr>
<tr>
<td></td>
<td>(1.9 BG)</td>
<td>(6 – 288 MG)</td>
<td>(61 MG)</td>
</tr>
<tr>
<td>REAL WATER LOSS as % of VOLUME SUPPLIED</td>
<td>11%</td>
<td>3% – 27%</td>
<td>7%</td>
</tr>
<tr>
<td>ANNUAL COST OF REAL LOSSES</td>
<td>$1,455,846</td>
<td>$1,050 - $247,963</td>
<td>$23,747</td>
</tr>
</tbody>
</table>

Real water loss = physical leakage  
(data from “Arizona M36 Water Loss Technical Assistance Program, Phase 2 “, Cavanaugh)
Arizona M36 Water Loss Technical Assistance Program

Phase 2 Summary Report

Prepared for:

WIFA

ARIZONA DEPARTMENT OF WATER RESOURCES

FINAL
MAY 30, 2019

Prepared by:
CAVANAUGH
Stewardship Through Innovation
IV. AMA Management Plans
Contents

* What are the Management Plans?
* Water Management Progress in the AMAs
* Current Status of the Management Plans
* Recommendations for the Remaining 4MPs
* 5th Management Plans and Beyond
What are the Management Plans?
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
Regulatory Structure

- Registration of all wells
- Adequate Water Supply
- Community Water Systems Documentation
  - Expansion of irrigated acres is prohibited
  - Monitoring and Reporting
  - Assured Water Supply
  - Management Goals, Plans, & Conservation Programs
  - Withdrawal Fees

Statewide

INA

AMA
Active Management Areas (AMA) & Irrigation Non-Expansion Areas (INA)

Five AMAs
- Prescott AMA
- Phoenix AMA
- Pinal AMA
- Tucson AMA
- Santa Cruz AMA

Three INAs
- Joseph City INA
- Harquahala INA
- Douglas INA
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
Structure and Components of Management Plans

Structure

* 3MP & 4MP Regulatory Chapters
  * Chapter 4: Agricultural
  * Chapter 5: Municipal
  * Chapter 6: Industrial
  * Chapter 8: Storage & Recovery

* Supporting Information
  * Hydrology
  * Quality
  * Water Budgets and Projections
  * Water Management Assistance Program

Components

* Regulatory language (*italicized, at the end of relevant chapters*)
  * Legal language including the details for conservation requirements

* Non-regulatory language
  * Background and History
  * Historical Data
  * Projections
  * Analysis
  * Water Management Strategy
  * Future Considerations
A.R.S. § 45-563(A): “...The plans shall include a continuing mandatory conservation program for all persons withdrawing, distributing or receiving groundwater designed to achieve reductions in withdrawals of groundwater.”

* Programs for Three Sectors:
  * Agricultural (Chapter 4)
    * Base Program
    * Historic Cropping Program
    * Best Management Practices Program (BMP)
  * Municipal (Chapter 5)
    * GPCD Program
    * Non-Per Capita Program (NPCCP)
  * Industrial (Chapter 6)
    * General Requirements
    * Specific Subsector Programs

* Conservation Programs include:
  * Regulatory requirements related to water use
  * Reporting requirements
  * Conservation targets
  * Flexibility provisions
  * Compliance provisions
Water Management Progress in the AMAs
Arizona’s Water Management Success

CREATION OF ARIZONA DEPARTMENT OF WATER RESOURCES

$ BILLION


WATER USE (ACRE-FEET)

POPULATION

ARIZONA GROSS DOMESTIC INCOME

MILLION (ACRE-FEET OR PEOPLE)

SOURCE: ADWR, 2018
* Incremental tightening of conservation requirements under successive Management Plans
* Phoenix AMA Municipal GPCD
  * 1985-1990: 307
  * 2010-2017: 230
  * ~25% decline
ARS § 45-563(A): “… The plans shall include a continuing mandatory conservation program for all persons withdrawing, distributing or receiving groundwater designed to achieve reductions in withdrawals of groundwater.”
* 4.3 MAF of water in underground storage by AWBA
* 11.8 MAF of water in underground storage by other entities
Progress toward the Goals

**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))
As a part of the 4MP, ADWR will periodically publish an analysis of each AMA’s progress toward its goal.

* Expand scope of report required under A.R.S. § 45-563.01 to include:
  * Effectiveness of Conservation Programs in all 3 sectors
  * Progress toward the goal in each of the 5 AMAs

* Transparency
  * Communicating success or need for improvement
  * Tracking and ensuring progress of each AMA toward its goal
  * Sharing underlying data and methodology
Current Status of the Management Plans

* Prescott and Tucson AMAs have adopted 4th Management Plans (4MPs).

* The 3rd Management Plans (3MPs) remain effective for Phoenix, Pinal, and Santa Cruz AMAs.
  * ADWR is working to complete the 4MPs for these AMAs.
* Target: Complete the remaining 4MPs in 2 years.
  * Phoenix: Summer 2020
  * Pinal: Winter 2020
  * Santa Cruz: Fall 2021

* Work to draft the 5MPs will begin immediately after the last 4MP is adopted.
Recommendations for the Remaining 4th Management Plans
Recommendations for the Remaining 4MPs

* Criteria:
  * Changes to all 3 sectors
  * Incremental adjustments to existing programs

* Recommendations include:
  * Changes to BMP points for Agricultural and Municipal Sectors
  * Extending turfed acreage caps to more turf facilities
  * Changes to turf allotment calculations
  * Adjustment of highest 25% of Water Duties (A.R.S. § 45-567(A)(1))

Additional details will be presented at the first Management Plans Work Group meeting on 7/9
5th Management Plan and Beyond
* Work Group
  * The MPWG is an ADWR-led stakeholder forum for the development of the Fifth Management Plans
* Goals:
  * Assess existing conservation programs
  * Update existing management strategies
  * Develop new management strategies

* First meeting: 1pm on July 9, 2019 at ADWR
  * Will include detailed discussion of 4MP Recommendations
  * Focus on development of 5MP
Questions?

Natalie Mast
nlmast@azwater.gov

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

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

* Water Duty (WD)*: Amount of water in acre-feet per acre that is reasonable to apply to irrigated land in a farm unit during the accounting period
  * Water Duty = Irrigation Requirement / Assigned Irrigation Efficiency

* Water Duty Acres (WDAc)**: The highest number of acres in the farm which were legally irrigated during any one year from 1975-1979.

* Irrigation Acre*: an acre of land to which an irrigation grandfathered right is appurtenant.

* Allotment: the maximum amount of groundwater which may be used for the farm unit.
  * Allotment = Water Duty * Water Duty Acres

*Definition from A.R.S. § 45-402.
**Definition from from A.R.S. § 45-465.
“... In setting the irrigation water duty or intermediate water duties for the fourth management period, the director may adjust the highest twenty-five per cent of the final irrigation water duties established within an area of similar farming conditions pursuant to section 45-566 by reducing each water duty in an amount up to ten per cent, except that, in making the adjustment, no water duty may be reduced to an amount less than the greater of the following:

(a) The highest water duty within the lowest seventy-five per cent of the water duties computed within the area of similar farming conditions for the fourth management period

(b) A water duty computed for the farm unit under this paragraph using an irrigation efficiency of eighty per cent.”
V. Discussion of New Committees/Working Groups
Groundwater Committee

To address groundwater concerns outside the AMAs
AMAs Post 2025
VI. Closing Remarks and next meetings

September 12, 2019
10-11:30 a.m.
ADWR Room 3175

December 3, 2019
10-11:30 a.m.
ADWR Room 3175
Cyndi Ruehl
cruehl@azwater.gov

ADWR /GWAICCC web page:
www.azwater.gov/gwaicc