YMIDDD/CAGR D Pilot Fallowing Program

Good for Business
Good Water Management
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CAGRD Water Supply Program
What is the CAGRD?

- New development in Arizona’s large metropolitan areas must comply with Assured Water Supply Program requirements that are among the most stringent in the county.

- Membership in the CAGRD provides one mechanism for meeting this requirement.

- The CAGRD is a part of CAWCD (same legal entity) and responsible for replenishing members' groundwater pumping.
CAGRD’s Water Supply Program

- CAGRD’s Water Supply Program (WSP) is responsible for acquiring water supplies to meet its member’s replenishment obligation.

- 21 water supply acquisitions to date: Long-Term Storage Credits, effluent, CAP M&I and NIA-priority water, plus Quartzsite lease and YMIDD pilot fallowing program.

- Current replenishment obligation slightly less than supply of approximately 37,000 AF/YR; projected 2034 obligation 86,900 AF/YR.
# 2017/2018 CAGRD Member Land Assessment Rate

## Acre-Foot Assessment Rate Components (Phoenix AMA)

<table>
<thead>
<tr>
<th>Component</th>
<th>Rate ($/AF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water &amp; Replenishment</td>
<td>$214</td>
</tr>
<tr>
<td>Administrative</td>
<td>$36</td>
</tr>
<tr>
<td>Infrastructure &amp; Water Rights</td>
<td>$353</td>
</tr>
<tr>
<td>Replenishment Reserve</td>
<td>$101</td>
</tr>
<tr>
<td><strong>Total Assessment ($/AF)</strong></td>
<td><strong>$704</strong></td>
</tr>
</tbody>
</table>

## Annual Membership Due ($/Lot)

<table>
<thead>
<tr>
<th>AMA</th>
<th>Rate ($/Lot)</th>
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</thead>
<tbody>
<tr>
<td>Phoenix AMA</td>
<td>$22.63</td>
</tr>
<tr>
<td>Pinal AMA</td>
<td>$14.88</td>
</tr>
<tr>
<td>Tucson AMA</td>
<td>$23.58</td>
</tr>
</tbody>
</table>
Typical CAGRD Subdivision
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Distribution of CAGRD Parcel Water Use (2014)
Yuma Mesa Irrigation & Drainage District ("YMDD") Pilot Rotational Fallowing Program
Fallowing Water Conservation

- Entitlement holder voluntarily agrees to conserve the use of a portion of the approved annual consumptive use of Colorado River water.

- Conservation savings quantified based upon the foregone beneficial water use that would otherwise have occurred.
YMIDD History: Reclamation Demonstration Program

- 2008 – 2010 YMIDD participated in a Reclamation Demonstration Program for System Conservation of Colorado River water
  - Federal budget issues
  - “Baseline” issues
  - Could not measure/confirm water savings
YMIDD & CAGRD Pilot Program

- September 2013: CAWCD Board approves the pilot program
- 2-3 year terms; re-evaluate at year 3
- Farmers paid to fallow lands that would otherwise be farmed
- Conserved water saved in Lake Mead
- Total fallowed acres approximately 1,500; approximately 10% of current irrigated acres within YMIDD
“Qualified Land” must have produced crops in 4 of the last 5 years, at least 5 contiguous acres, would be irrigated if not enrolled in the program.

Enrollment capped at 15.7% of total irrigated acres for most landowners (approx. 10% for large landowners).

Base Price = $750/AC; District Reimbursement = $21.36/AC; District Administration - $10,000/YR

Approximate $/AF = $160
Pilot Program Objectives

- Develop data, methodologies and processes to inform a future longer-term water supply fallowing program
- Quantify water savings
- Prove that mutually beneficial, willing seller/willing buyer, temporary agriculture to urban water transfers are possible (i.e., proof of concept)
Quantify the Volume of Water Savings

- Forgone Consumptive Crop Water Use:
  - Crop mapping: Develop crop mapping from years 2010 - 2013; visited the district and recorded field and crop information using a GPS and current satellite imagery.
  - Determine consumptive crop water use by the crops identified in the mapping.
Quantify the Volume of Water Savings

- Forgone Consumptive Crop Water Use:
  - The south Yuma AZMET station was used for daily reference evapotranspiration (Eto) values for the years of interest
  - Crop coefficients and durations of growth stages were taken from chapter 6 of FAO Irrigation and Drainage Paper No. 56
  - Irrigation efficiencies, distribution uniformity and conveyance losses assumed based on in field observations and published documentation, i.e., University of Arizona publications, extension bulletins, etc.
Pilot Program Benefits

- Provides a stable revenue stream for YMIDD farmers with limited impact on current farming operations
- Avoids permanent loss of productive agricultural land and avoids or minimizes any adverse local economic impact
- Enhances existing rotational farming practices
- Serves an agronomic benefit by allowing a longer rest-rotation than normal practice; reduced soil pests and increased yields
Pilot Program Benefits

- Allows CAGRD to develop data, methodologies and processes to inform a future longer-term water supply following program

- Develops relationships with on-river entitlement holders

- Conserved water supply retained in Lake Mead will help to minimize or avoid shortages to water users in Arizona and the Lower Basin
Conclusions

- Previous year’s cropping pattern is the best indicator of “baseline” conditions.
- May require adjustment for drought or significant change in crop market conditions.
- 2014 calculated water savings of 6,827 AF or an average of 4.9 AF/acre.
- 2015 calculated water savings of 7,180 AF or an average of 5.1 AF/acre.
- 2016 calculated water savings of 7,509.04 AF or 5.36 AF/acre.
- Values compared with “conservative” initial estimate of potential water savings of 9,000 acre-feet.