#### Supply & Demand -Scenario Development Discussion

EMS Basin Study Supply & Demand Team Meeting #4 May 21, 2019

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YOUR WATER. YOUR FUTURE.

### **Goals of Today's Meeting**

- ★ Follow up water provider maps and supply portfolios
- Provide an overview of the factors affecting water supply and demand
  - Discuss principal factors and provide examples of how they drive supply and demand
- ★ Scenario development
  - Discuss the process
  - Group Activity Factor ranking







#### A Reminder...



- CAP sent out supply utilization tables and water provider maps along with a memo requesting input from the group
- Are there any questions /concerns/comments?
- If edits are needed to any of the materials please email us or mark up a physical copy and return



#### Example





# **Housing Units Outside WP Boundary**

- CAP: SAM will generate housing units outside existing WP boundaries
- Is there a preferred method for how we deal with these units?
  - Served through exempt groundwater wells?
  - Assumed to be served by new water providers?
  - Expanded boundaries of existing water providers?





### **Key Supply and Demand Factors**





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### **Municipal Growth**





AZ Department of Administration (Low, Med, High Series)





#### **Spatial Distribution**





Faster Growth + 75,000 Housing Units



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# **Housing Units**



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## **Housing Units**







### **GPHUD Factors in CAP:SAM**







#### Municipal Demand SXCP Hub



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### **Effect of GPHUD**

#### A Conservation Ethos:



#### Limited Conservation:







■ Effluent ■ CAP M&I ■ CAP LTSCs ■ GW Non-Replenished ■ GW Excess

**KNOW YOUR WATER.** 



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## **Key Supply and Demand Factors**





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#### **Observations and Proposed Process for Land** Fallowing

- Acres that have not been farmed intensely in previous years represent less productive land (marginal soils, poor water quality, etc)
- Farm systems/operations are optimized for particular flow rates. There may be enough capacity to pump groundwater but there may not be enough CAP water to match flow rates and meet peak demand
- Groundwater pumping capacity vs capability. Where is the tipping point? What happens when pumping is capped?









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### **MSIDD Example**



■ Unaccounted For/Non-IGFR ■ Groundwater ■ CAP

#### <u>Scenario</u>

- CAP supply reduced by 20%
- Groundwater pumping increased by 20%
- No change in overall volume
- No change in acreage



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#### **Crop Replacement**



#### Settings and Scenarios Calculate Demands Municipal Demand Institutional Demand Agricultural Demand Other Demand Other Demand Available Supplies Request Supplies Fulfill Requests



#### Agricultural Demand > Parameters





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## **Key Supply and Demand Factors**





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# **Supply Shortages**







# **Supply Shortages**





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### **Scenario Development**

- Incorporate the principal driving forces into a handful of model scenarios
- The goal is to evaluate and compare a large (but plausible) range of alternatives
- What factors go together in support of a particular narrative?





### **Factor Ranking Activity**

Rank E	ach by How Interesting/Useful/Important (1 = High)
First rank t	the categories, then rank within the categories
Deve	elopment on Ag Land
	Incentives to develop on Ag land
	Disincentives to develop on Ag land
Irrig	ation District pumping
	Pumping constrained to current levels
	Pumping constrained to 150 % of current levels
	Pumping unconstrained
Ag V	Vater Use Factors
	Substitution from higher to lower water use crops
	Extensive adoption of new irrigation technology
	Higher leaching due to WQ
Grov	vth Rate
	High population growth
	I ow population growth
	and behavior. Breath
Grov	vth Pattern
	Official growth pattern
	Infill/redevelopment
	Local industrial growth
	Constrained local development
Mun	i Conservation Ethic
	Stronger muni conservation ethic
	Current muni conservation ethic
Futu	re Climate
	Hotter & drier
	Warmer & wetter
	Historic climate
Othe	er

- First rank the categories
- Then rank within categories





#### Ranking Activity Results

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# Questions?

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### **Example Scenario Development**

	(	Growth	ו	Climate Change		ge	AG Urbanization		
Scenario	Low	Med	High	None (Historic)	Hot∕ Dry	Warm/ Wet	Low	Med	High
А	Х				Х			Х	
В		Х			Х			Х	
С			Х		Х				Х
D		Х		Х				Х	
E			Х			Х		Х	



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#### **Example Scenario Development**

Factor	Scenario A	Scenario B	Scenario C		
Growth Rate					
Growth Pattern					
GPHUD Trend					
Crop Substitution	Moderate "Pacalina"	"Slow Compact"	"Popid Outword"		
Land Fallowing	Moderate	Low	High		
Irrigation Efficiency					
CAP Shortages					
SRP Shortages					
Crop ET					

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