

CITIZENS' WATER ADVISORY COMMITTEE (CWAC)

Technical/Planning and Policy Subcommittee

Wednesday, September 23, 2015, 12:00 p.m.

Director's Conference Room

Tucson Water, 3rd Floor

310 W. Alameda Street, Tucson, Arizona



Legal Action Report

1. Roll Call/Call to Order

The meeting was called to order by Subcommittee Chair, Mark Murphy, at 12:15 p.m. Those present and absent were:

Present:

Mark Murphy	Chairperson-Representative, Mayor
Brian Wong	Representative, City Manager
Mitch Basefsky	Representative, City Manager
Chuck Freitas	Representative, City Manager
Placido dos Santos	Representative, City Manager

Absent:

Kelly Lee	Representative, Ward 6
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Tucson Water Staff Present:

Melodee Loyer	Water Administrator
Sandy Elder	Deputy Director
Britt Klein	Water Administrator
Andrew Greenhill	Intergovernmental Affairs Manager
Fernando Molina	Water Program Superintendent
Wally Wilson	Chief Hydrologist
Daniel Ransom	Water Conservation Supervisor
Tom Arnold	Lead Management Analyst
Dean Trammel	Civil Engineer
Candice Rupprecht	Public Information Specialist
Johanna Hernandez	Staff Assistant
Kris Lafleur	Staff Assistant

Others Present:

Mark Taylor	Representative, City Manager (not a member of Subcommittee)
Albert Lannon	Avra Valley Coalition

- Announcements** – Member Basefsky announced the upcoming Water Forum presented by CAP and WRRC at the Leo Rich Theater on November 6, 2015 at 7:30 a.m. Member Wong announced that there is one opening on TPP. Tucson Water staff announced that the conference room is newly hard wired for recording; the microphones are sensitive and will catch whispered conversations.
- Call to Audience** – Chairman Murphy deferred the Call to the Audience to Item 6. Mr. Albert Lannon spoke during Item 6, after being recognized the Chairperson Murphy. Mr. Lannon spoke on behalf of the Avra Valley Coalition regarding the use of glyphosate to control buffelgrass on properties owned by Tucson Water.

Citizens' Water Advisory Committee, Technical/Planning and Policy Subcommittee

Legal Action Report

September 23, 2015

4. **Review & Approval of June 24, 2015 Legal Action Report and Meeting Minutes** – Member Freitas motioned to approve the Legal Action Report and Meeting Minutes of June 24, 2015. Member Basefsky seconded. Motion passed unanimously by a voice-vote of 5-0.

5. **Alternative Infrastructure Assessment** – Tucson Water staff member Melodee Loyer, along with CH2M Hill consultants Tom McLean and Fair Yeager, presented the preliminary results of the Alternative Infrastructure Assessment (AIA) Study. The AIA Study was undertaken as a result of rising costs for the Avra Valley Transmission Main (AVTM) Program. The intention of the Study was to evaluate and assess the Utility's infrastructure and determine how best to achieve the redundancy of the planned AVTM with the most efficient use of funds. Multiple portfolios were considered, evaluated, and compared to one another. The final evaluation included five portfolios: maintain business as usual; proceed with a 66" AVTM; enhance the Santa Cruz well field; enhance the Santa Cruz well field along with a 48" AVTM; and enhance the Santa Cruz well field along with the development of Indirect Potable Reuse, and a 48" AVTM. CH2M Hill spoke as to their methods, assumptions, and results. An extensive evaluation of the relative risk, cost, and benefits of each portfolio resulted in findings and recommendations. The Study recommended that the Utility would benefit from focusing on maintaining the current infrastructure, expanding the Santa Cruz well field, and continuing investment in system reliability. Ms. Loyer discussed the implications of the recommendations to Tucson Water's CIP. Current projections may push the need for the AVTM out to 2025 or possibly beyond. The Subcommittee recommends an abridged presentation for the full CWAC in October.

6. **Staff Report – Glyphosate Use on Tucson Water Property** – Tucson Water staff member Johanna Hernandez discussed the staff report prepared for the Subcommittee on the aerial application of Glyphosate on Tucson Water property. Glyphosate is being used to control the presence and spread of invasive and noxious weeds, such as buffelgrass. These weeds pose extreme fire hazards and threaten habitat diversity. Timely abatement and eradication are required by county and state regulations. A background of the development of the City's aerial herbicide spraying program was discussed. Regional efforts by the City, County, Parks and Recreation, U.S. Bureau of Land Management, U.S. Forest Service, and the U.S. National Park Service result in the widespread use of glyphosate to control and eradicate noxious weeds. The specific safety measures taken when using glyphosate were discussed, including methods to reduce drift outside of the spray area. The existing U.S. EPA risk assessment and the recent International Agency for Research of Cancer (IARC) label of glyphosate were discussed. A video by toxicologist Andrew Maynard explaining the meaning of the recent label by the IARC was played. Tucson Water is developing a communications plan to inform area residents of when and where spraying will occur. This plan includes physical flagging of the area planned for spraying as well as posted and electronic notice of the time frames in which spraying might occur. All possible safety measures will continue to be taken. The U.S. EPA is expected to release a new risk assessment later this year. The new risk assessment, along with emerging research, will be taken under consideration in the continued execution of the City's aerial herbicide spraying program. Tucson Water will include information regarding sensitive areas into the memo and will forward it to the full Committee for review.

7. **Future Meetings/Agenda Items** – See projected agenda for further information.

8. **Adjournment** – Meeting adjourned at 2:01 p.m.

Alternative Infrastructure Assessment (AIA)

AIA results presented to CWAC TPP
September 23, 2015

Presenters:

- Melodee Loyer PE, Planning Administrator, Tucson Water
- Tom McLean PE, Project Manager, CH2M Hill
- Fair Yeager PE, Project Engineer, CH2M Hill

Purpose

Share the results of the Alternative Infrastructure Assessment that will allow the Citizens Water Advisory Committee to provide informed recommendations to Tucson Water and the City Council

Bottom Line

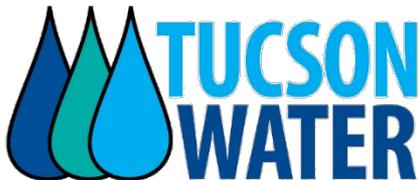
The AIA results suggests that sustaining capacity in the Central Well Field and expanding the Santa Cruz Well field while investing in the existing system's reliability will allow for the Avra Valley Transmission Main to be reduced in size and constructed much further into the future and substantially reduce interim capital cost.

Agenda

- Background: AVTM route study & costs
- Brainstorming Alternatives
- AIA Process, Highlights, & Results
- How AIA relates to TW's Strategic Plan

The AVTM Program Included

TW CIP	Project Description	Estimated Project Cost
W570	Country Club Reservoir and Zone Booster	\$22.5M
W144	Drexel PRV	\$0.15M
W795	Hayden-Udall Prime Reservoir and Booster Station	\$13.86M
W410	Avra Valley TM Augmentation Phase I	\$44.95M
W762	Avra Valley TM Augmentation Phase II	\$20.0M
W080	Avra Valley TM Augmentation Phase III	\$17.0M
W067	Country Club C-Zone Augmentation Transmission Main	\$13.75M
W068	Park Ave B Zone Augmentation Main	\$9.95M
W142	SW Turnout PRV	\$0.35M
W143	Augmentation Surge Protection Facility	\$0.8M
W145	3rd Ave PRV	\$0.6M
	Total	\$143.9M



Original AVTM Schedule *

ID	Task Name	Duration	Start	Finish	2015				2016				2017				2018				2019				2020				2021			
					Q3	Q4	Q1	Q2	Q3	Q4																						
1	Phase I Design	305 days	Mon 10/6/14	Fri 12/4/15	█																											
2	Bid/Award	60 days	Mon 8/14/17	Fri 11/3/17									█																			
3	Construction	295 days	Mon 11/13/17	Fri 12/28/18									█																			
4																																
5	Phase II Design	262 days	Mon 8/20/18	Tue 8/20/19													█															
6	Bid/Award	60 days	Mon 9/30/19	Fri 12/20/19																	█											
7	Ph II Construction	270 days	Mon 1/6/20	Fri 1/15/21																	█											
8																																
9	Phase III Design	240 days	Mon 11/25/19	Fri 10/23/20																	█											
10	Bid/Award	60 days	Mon 11/9/20	Fri 1/29/21																					█							
11	Phase III Construction	240 days	Mon 2/1/21	Fri 12/31/21																					█							

* Project schedule based on 2050 plan, using 130 gpcd

Brainstorming Alternatives - Scenario Planning

- Central Well Field
- SCWF - PMRRP
- Recycled Water Master Plan (DPR, IPR, SHARP)
- Carbon Fiber 96"
- "Spencer" Interconnect
- Plant 9 to C1 - 42" Valencia Main
- Silverbell GWTP (PCE, MTBE,...)

Alternatives Infrastructure Assessment (AIA) – Scope of Work

a.k.a. Making sure we are spending funding wisely & providing the needed redundancy

Some Possible Options:

- Maintain/Enhance Central Wellfield production capability?
- Increase Santa Cruz Wellfield capacity?
- Increase capacity through Plant 9?
- Implement Recycled Master Plan (Indirect Potable) sooner?

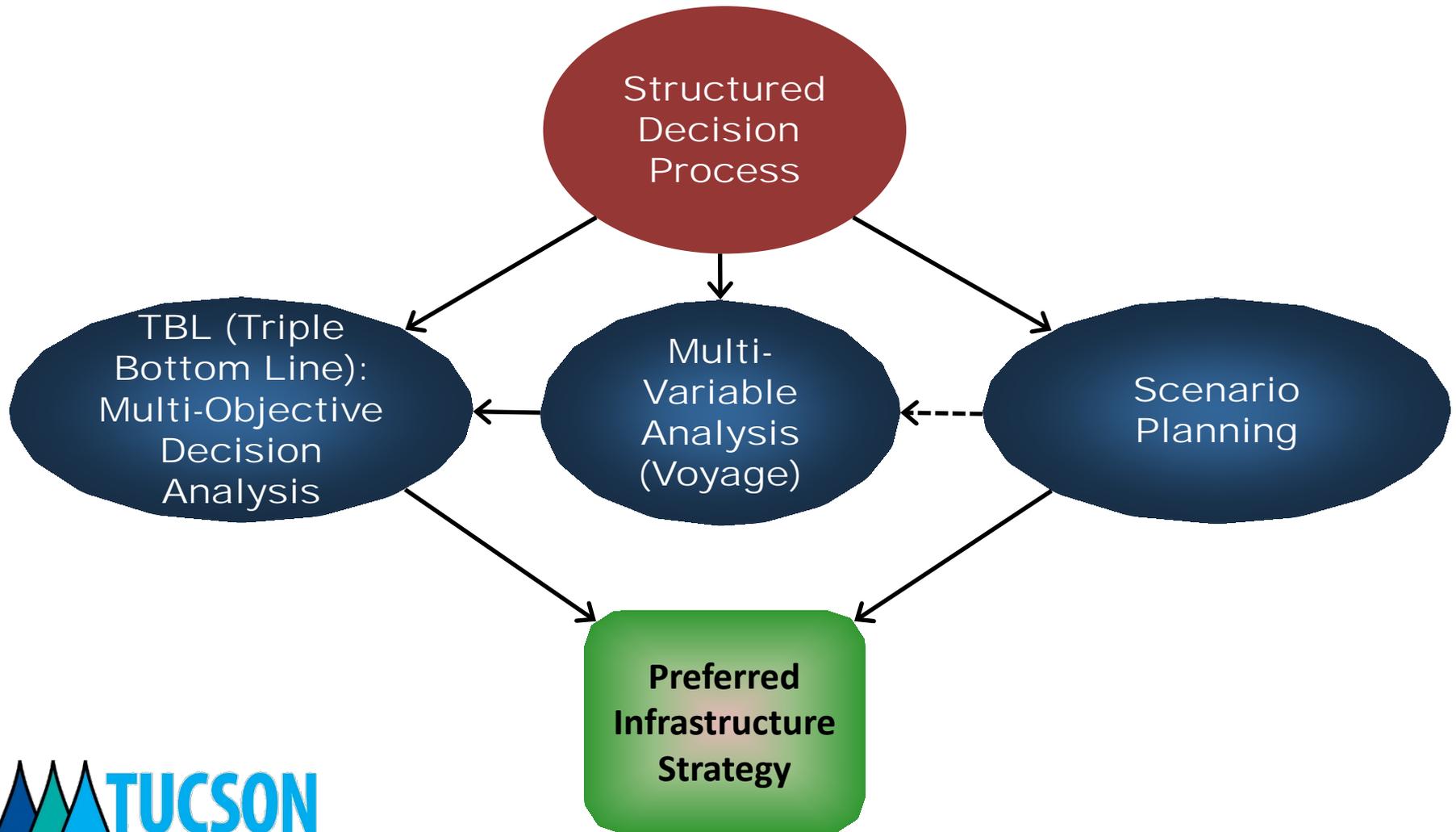
AIA Project Purpose

This project will include evaluations and assessments of key infrastructure which will require a multi faceted approach and a multi-variable analysis to determine the most optimal solutions or options that are available for implementation.

Project Workshops

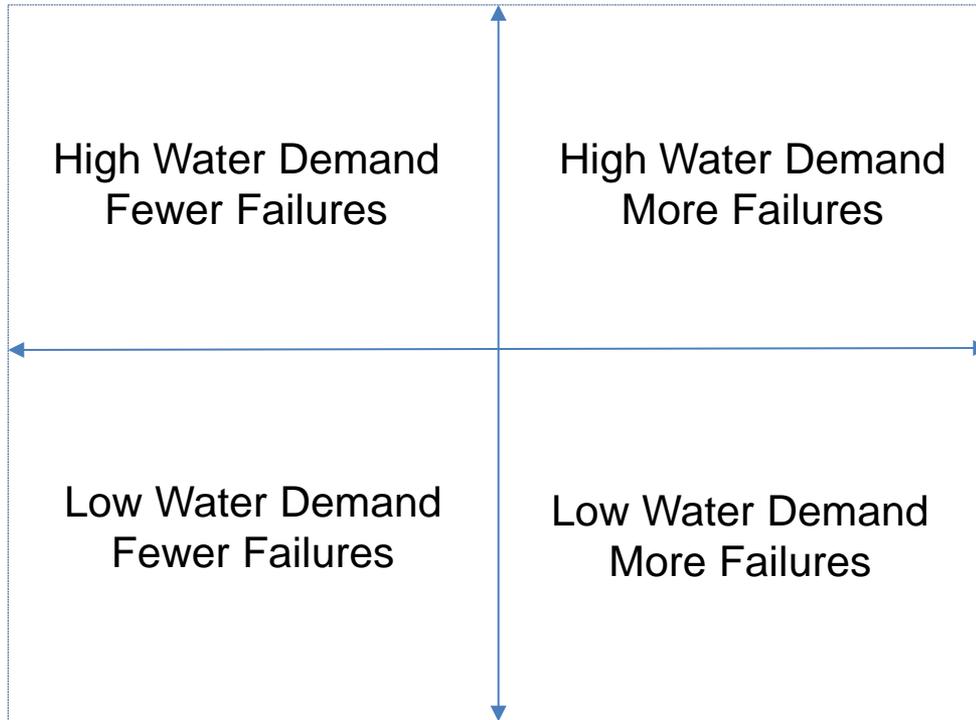
Workshop	Objective
Decision Chartering	Define roles, responsibilities, stakeholders, assumptions, critical success factors.
Workshop 1 Scenario Planning	Brainstorm critical uncertainties and driving forces. Evaluate Water Demand Projections. Prepare scenario grid.
Workshop 2 Risk Evaluation	Confirm categories, develop relative weightings, confirm CoF and LoF matrix and prepare risk scoring.
Workshop 3 System Alternatives	Finalize development of system alternatives and evaluation criteria.
Workshop 4 Multi Variable Modeling	Present Voyage modeling results. Conduct multi-objective decision analysis criteria weighting.
Workshop 5 MODA Evaluation	Review multi-objective decision analysis results, discuss and select preferred alternative.

AIA Analytic Framework



Scenario Planning: Four possible futures

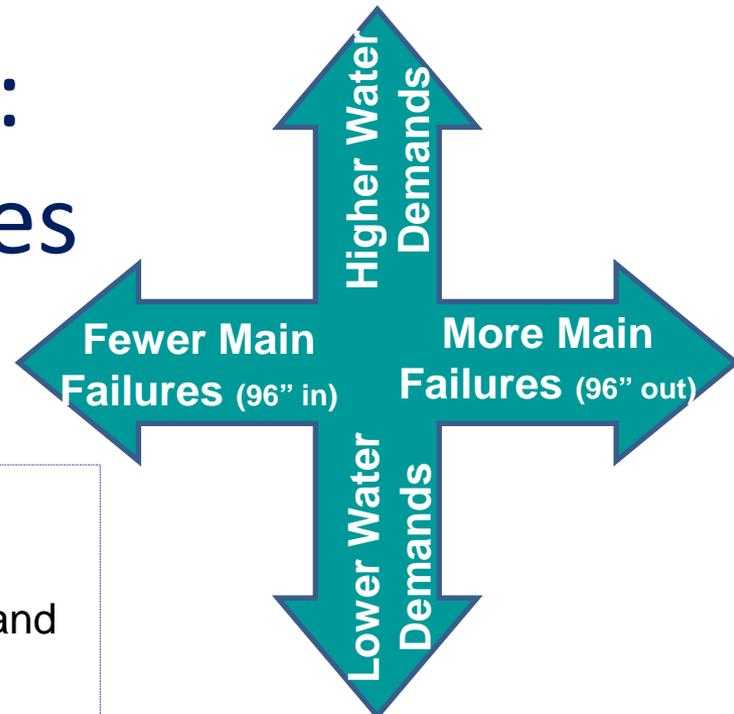
Potable Water Demand Higher than Expected



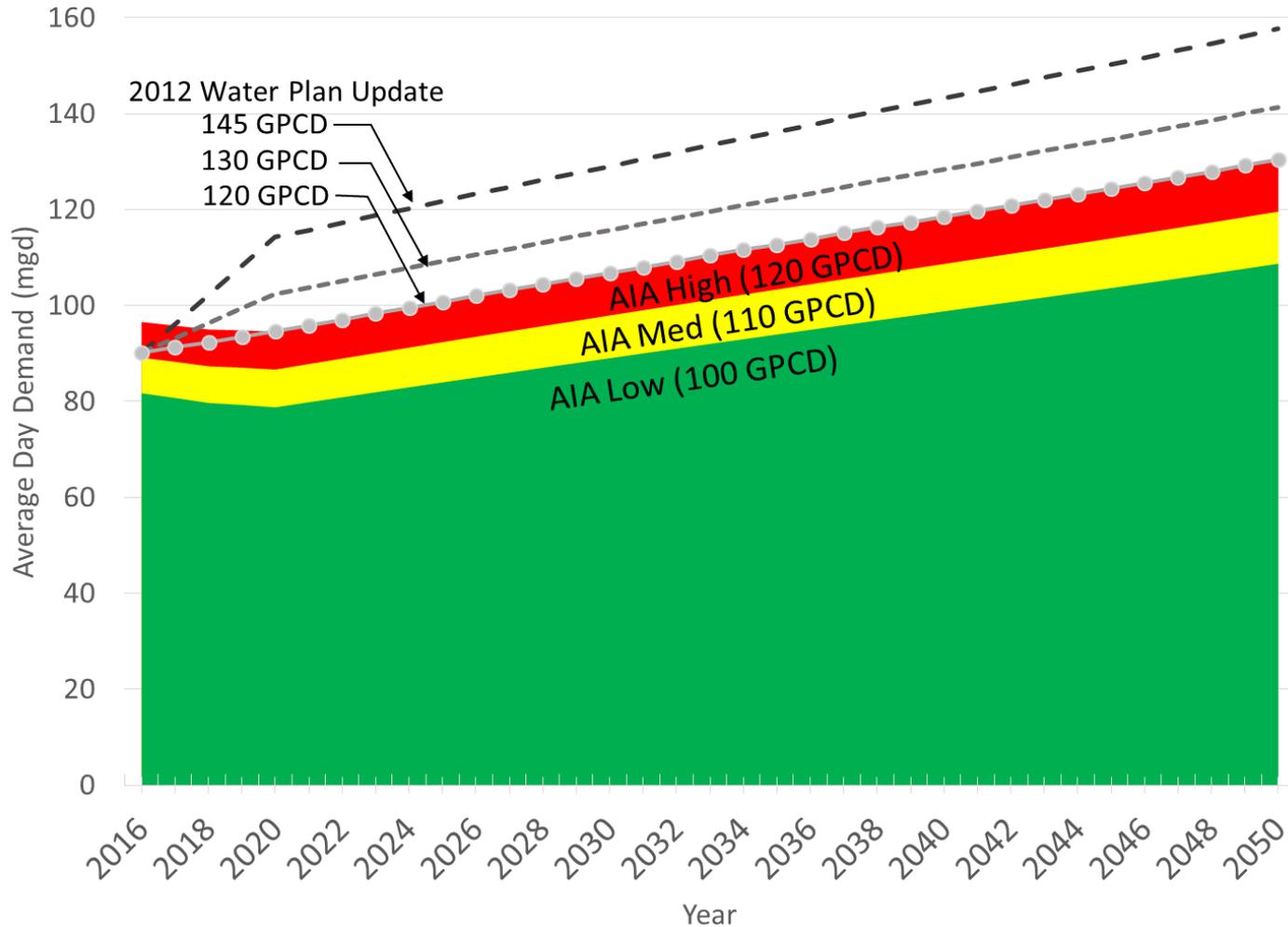
Fewer Critical Transmission Main Failures than Expected

More Critical Transmission Main Failures than Expected

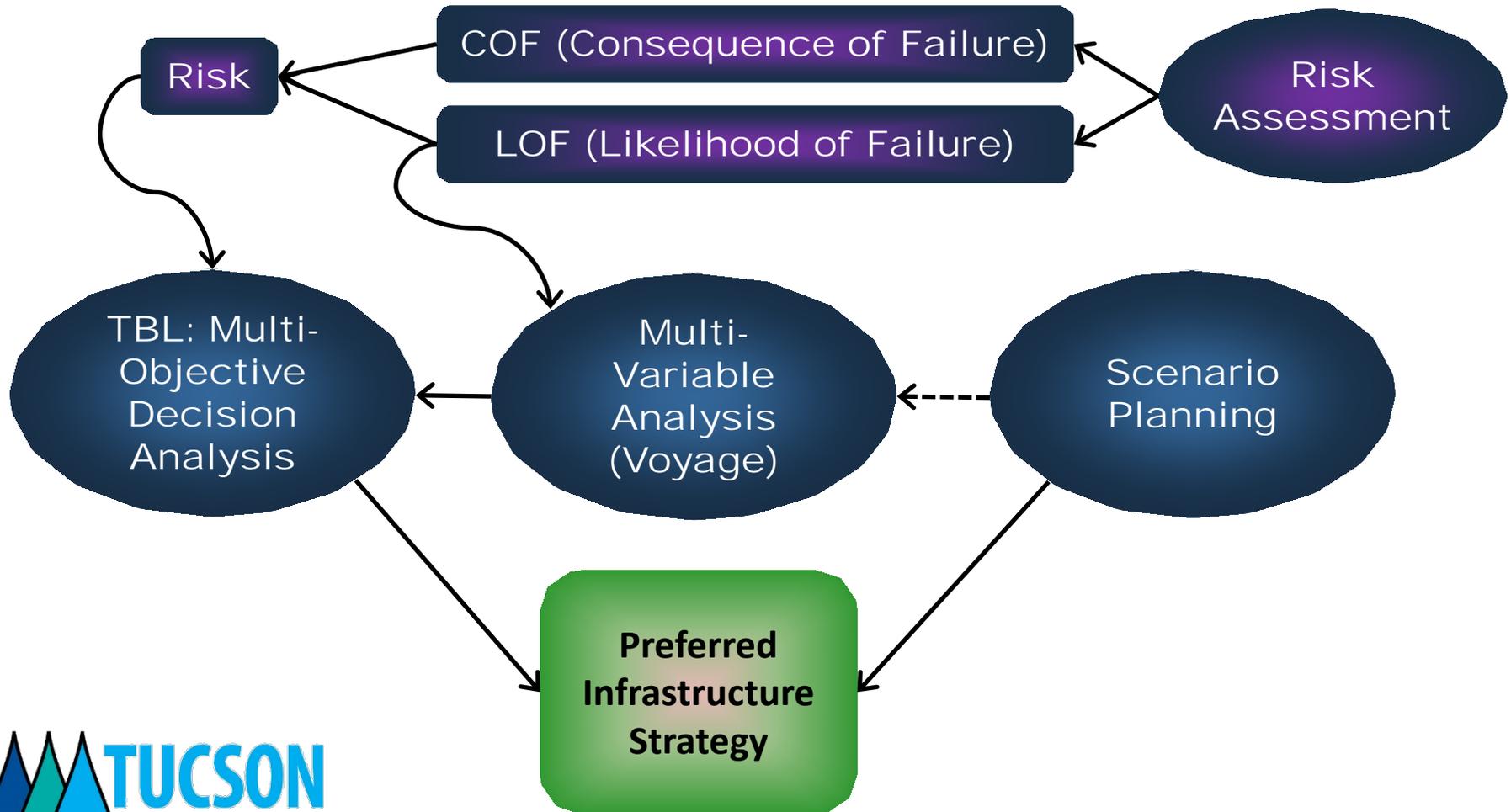
Potable Water Demand Lower than Expected



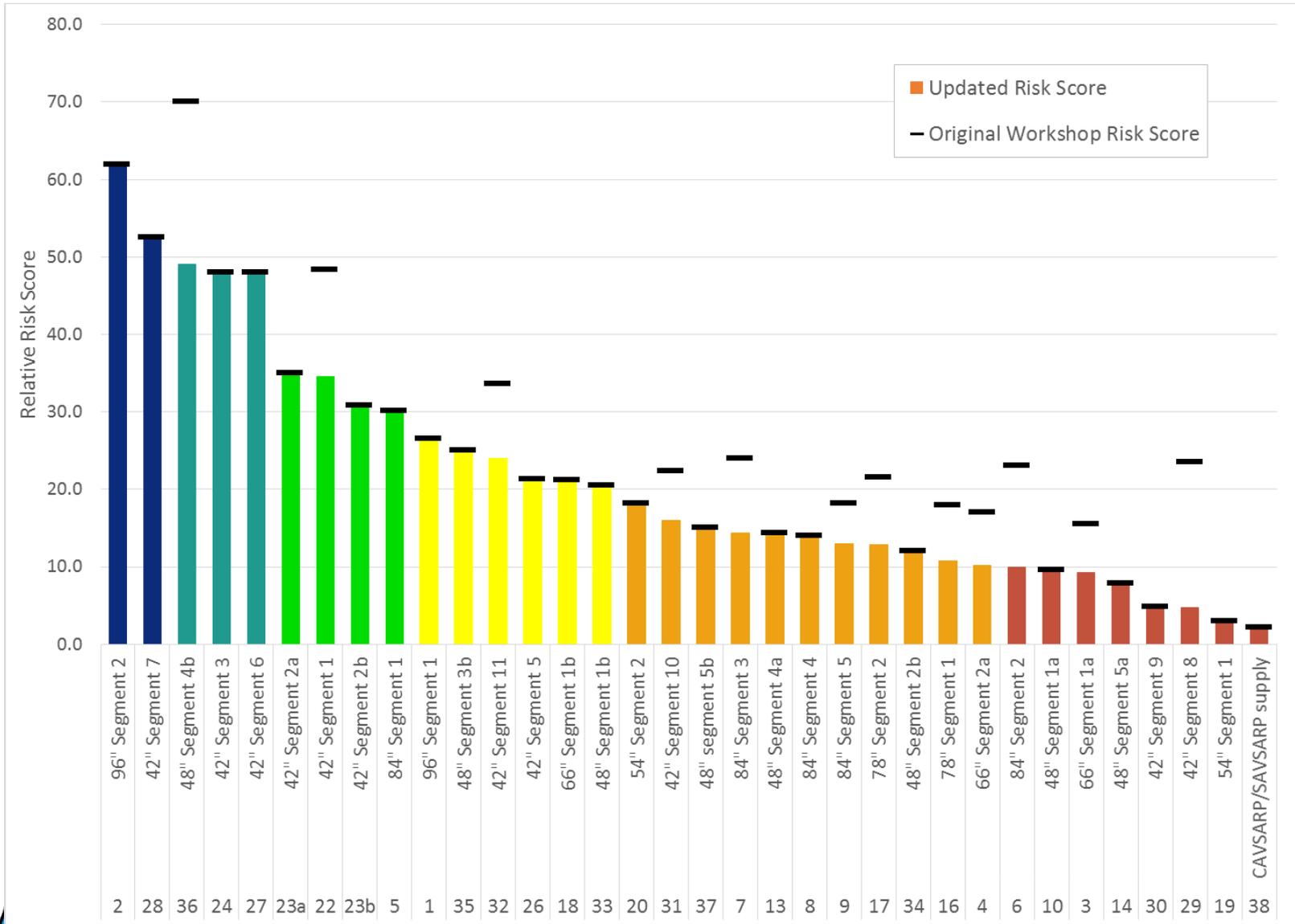
Declining Potable Demands impact Infrastructure Needs



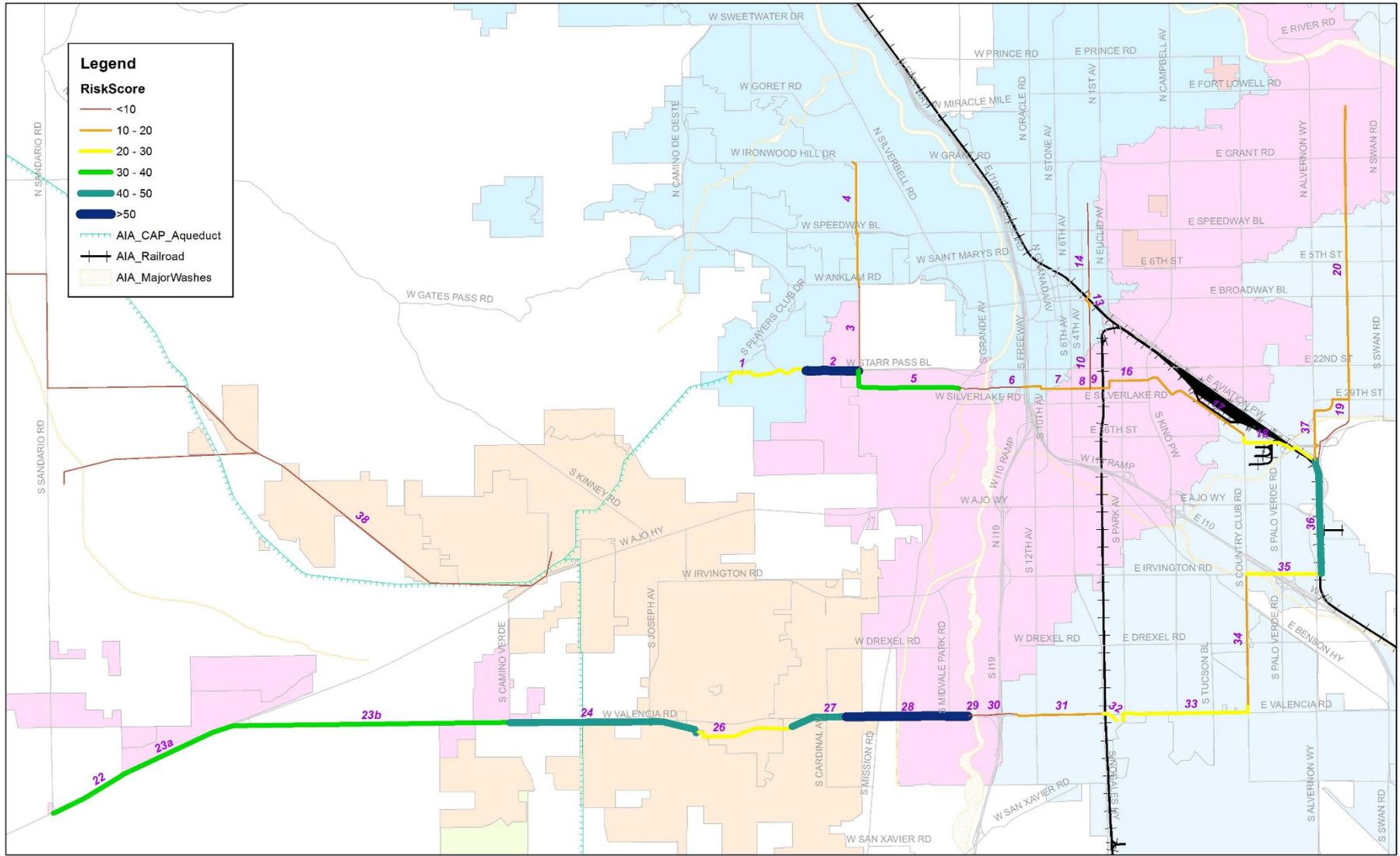
Risk Analysis of Large Diameter Transmission Mains



Relative Risk



Relative Risk



System Alternative Development: Initial Strategy Table

AVTM	Santa Cruz	Central Well Field	42" Valencia Main	IPR
No action	No action	No action (maintain existing capacity)	Remain at 20 mgd	No action
Smaller capacity	New recovery wells	Reequip wells	Increase to 30 mgd	11.6 mgd to 96" or A Zone
Build 66"		Construct new super wells (ASR)		
		Reequip wells and construct new super wells (ASR)		

Scenarios

Low Demand and 96" in

High Demand and 96" in

Low Demand and 96" out

High Demand and 96" out



System Alternatives Development: Revised Strategy Table

Scenarios

AVTM	Santa Cruz	Central Well Field	42" Valencia Main	IPR
No action	No action	Maintain existing capacity	No action (Remain at 28 mgd)	No action
Smaller capacity	New recovery wells			11.6 mgd to 96" or A Zone
Build 66"				



Low Demand and 96" in
High Demand and 96" in
Low Demand and 96" out
High Demand and 96" out

Portfolio Review

Portfolio	Description
1 – BAU	Business as Usual
2 – AVTM 66	AVTM 66”
3 – SC	Santa Cruz wellfield enhancement
4 – SC/AVTM 48	Santa Cruz plus AVTM 48”
5 – SC/IPR/AVTM 48	Santa Cruz plus IPR and AVTM 48”

Water Balance Results

The combination of scenario (X) and portfolio (Y) = One simulation (X-Y)

		Scenario			
		1 – Hi/In	2 –Hi/Out	3 – Low/In	4-Low/Out
Portfolio	1 – BAU		2020		2036
	2 – AVTM 66"	AVTM 66" not needed		AVTM 66" not needed	
	3 – SC		2025		2042
	4 – SC/AVTM 48"	AVTM 48" not needed	2049	AVTM 48" not needed	
	5 – SC/IPR/AVTM 48"	AVTM 48" not needed		AVTM 48"/IPR not needed	

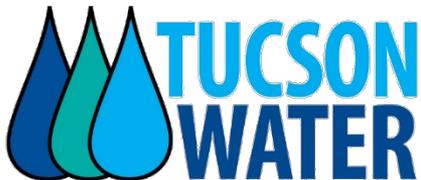
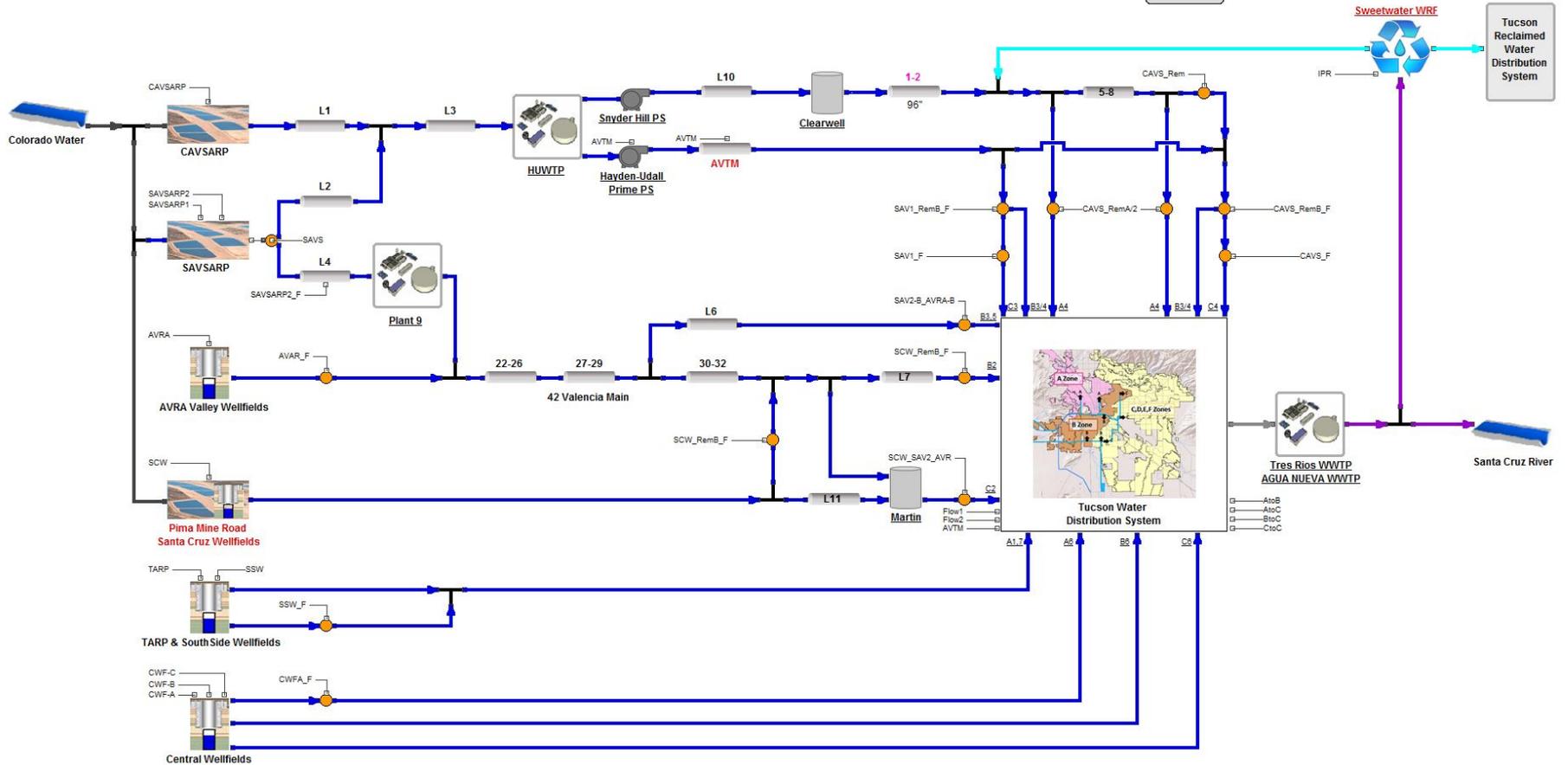
Multi-variable Modeling (Voyage)



Tucson Water Alternative Infrastructure Assessment Project

Scenario Manager

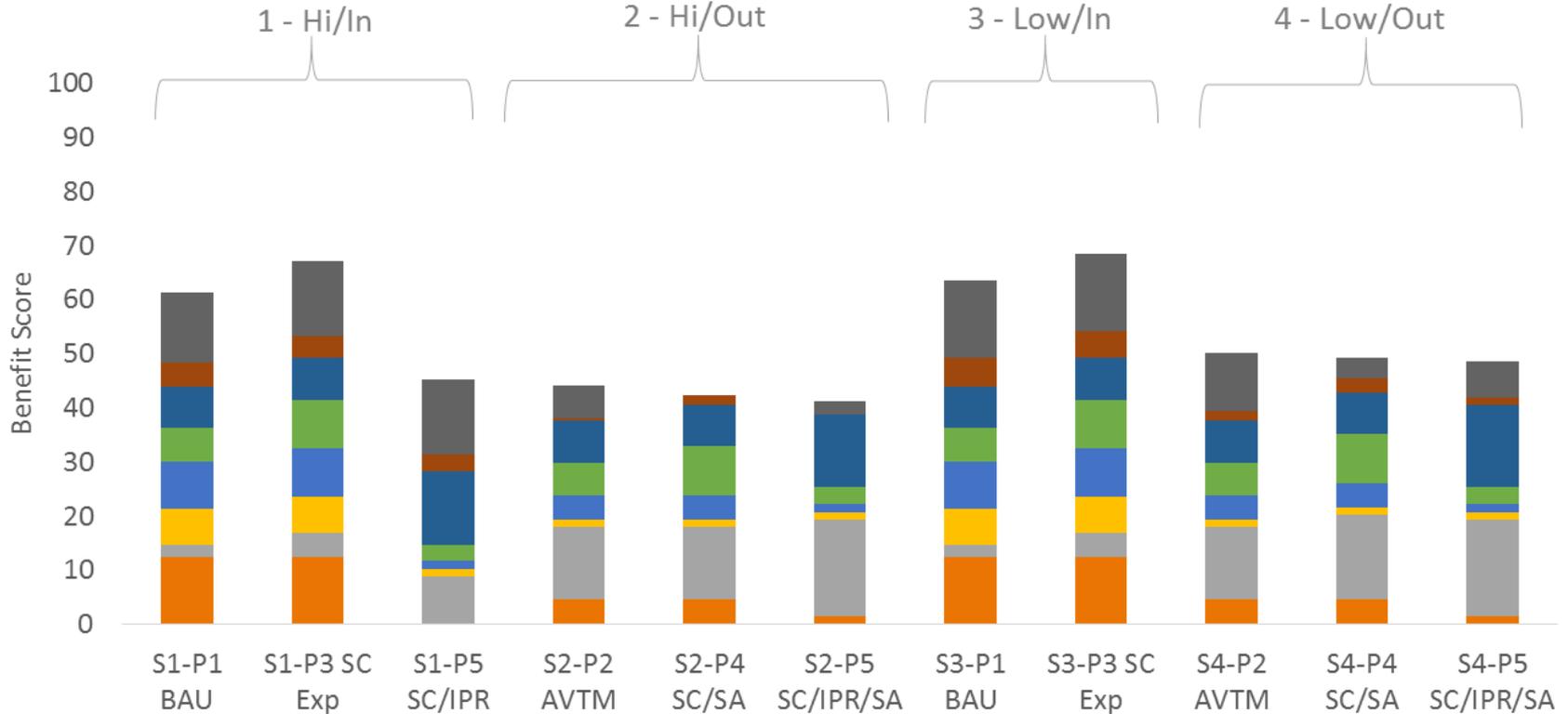
Data Import Export



Non-Monetary Criteria

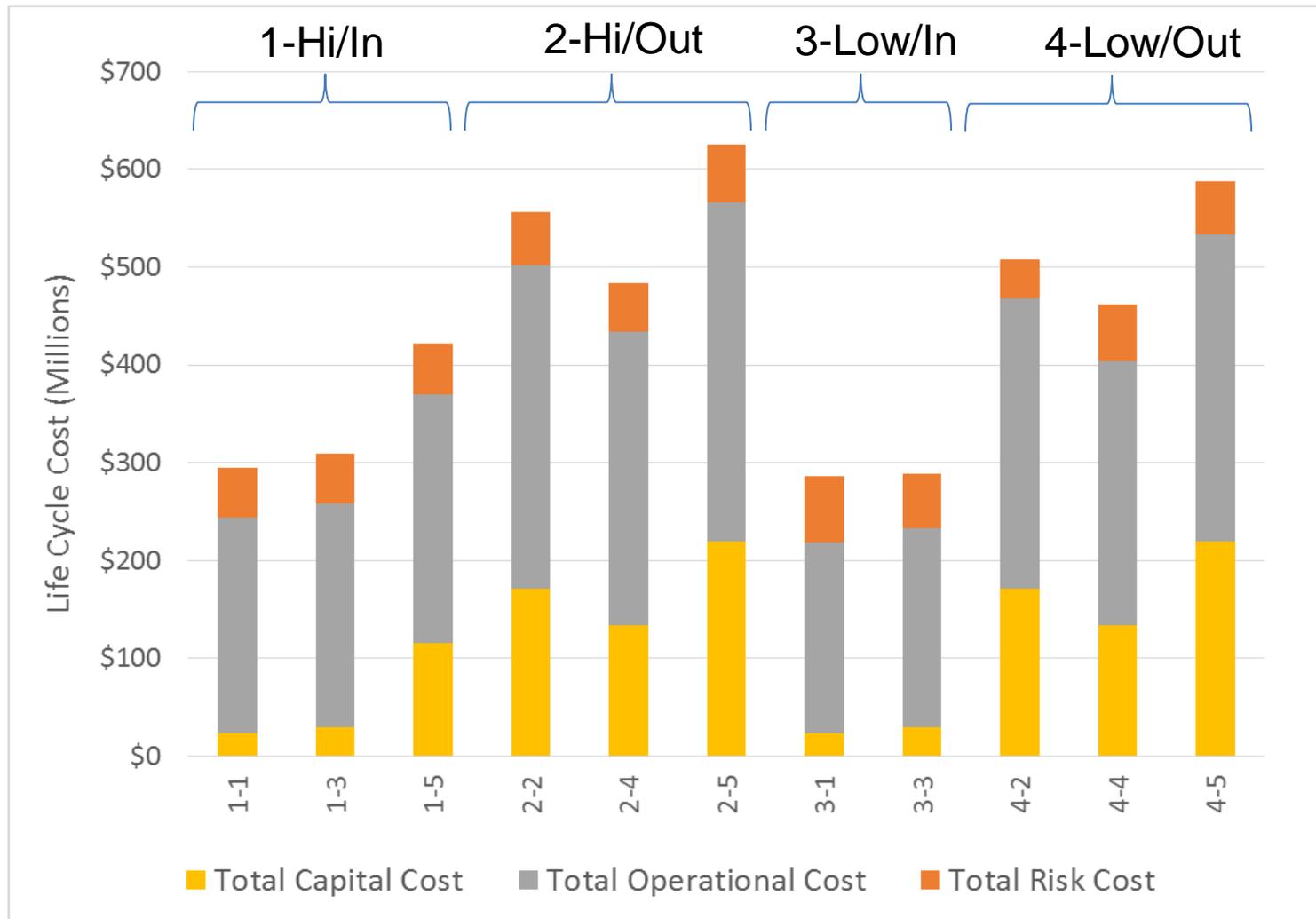
- Stakeholder Support
- Simple to Operate
- Meet Future Regulatory Requirements
- Low Energy Consumption
- Reliability
- Simple to Maintain
- Adaptable to Shortages
- Use Renewable Supplies

Non-Monetary Benefits of Portfolios



- Stakeholder support
- Simple to operate
- Meet future regulatory requirements
- Low energy consumption
- Reliability
- Simple to maintain
- Adaptable to shortages
- Use renewable supplies

Life Cycle Costs of Portfolios



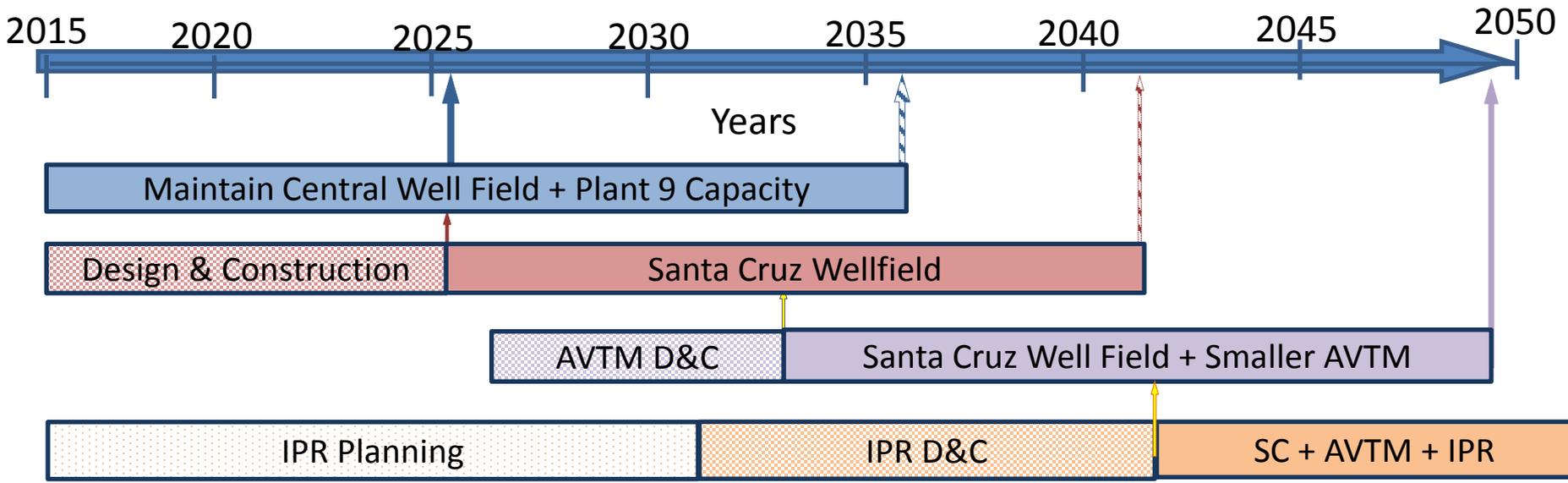
Cost/Benefit of Portfolios



Findings and Recommendations

- Water demand forecasts for this study are substantially lower than prior projections.
- Under these forecasts, the choice of the preferred solution is unaffected by water demand.
- Actions common to all scenarios:
 - Sustain Central Well field capacity
 - Santa Cruz Well Field Expansion
- Continued investment in existing system reliability will be less costly than building the AVTM, with the same overall value
 - Risk Assessment results suggest that a comprehensive large diameter pipeline management program would enhance system reliability.

AIA Outcome



Sound Planning and Appropriate Investment in Water and Infrastructure



Water **Reliability**

Questions / Comments

- **Melodee Loyer, PE – Planning Administrator**
 - Melodee.Loyer@tucsonaz.gov, 520-850-8950
- **Tom McLean, PE – Project Manager, CH2M Hill**
 - Tom.McLean@ch2m.com, 480-377-6239
- **Fair Yeager, PE – Project Engineer, CH2M Hill**
 - Fair.Yeager@ch2m.com, 480-377-6249
- **Dean Trammel, PE – Civil Engineer**
 - Dean.Trammel@tucsonaz.gov, 520-837-2221



MEMORANDUM

DATE: September 23, 2015

TO: Technical Planning and Policy Subcommittee **FROM:** Sandy Elder
Deputy Director, Tucson Water

SUBJECT: Aerial Application of Glyphosate on Tucson Water (TW) Property

In response to the recent listing of glyphosate by the International Agency for Research of Cancer (IARC) as a “Group 2A – probably carcinogenic,” TW began receiving inquiries regarding the application of an herbicide known as glyphosate on its retired farm properties in Avra Valley. Subsequently, the Citizens’ Water Advisory Committee (CWAC) has been addressed by members of the public multiple times on the use of glyphosate on TW property, specifically the aerial application of glyphosate. At the Committee’s request, TW has prepared this response.

Background:

TW owns 22,000 acres of land in Avra Valley, purchased for their water rights. Of those lands, about 40-45% are currently covered in buffelgrass, a highly invasive, noxious weed that has negative impacts to its environment.

By regulation, property owners are required to control buffelgrass because it adds to the rangeland’s fuel load, and also poses an extreme threat to habitat diversity. Pima County Code (Section 1, Title 7, Chapter 33) and State Statute (48-2997.E) require the timely abatement and eradication of noxious weeds, including buffelgrass, subject to penalties.

TW uses aerial spraying of glyphosate to control buffelgrass because it is most cost effective given the large number of acres. Treatment must be applied consistently in order to maintain control of the buffelgrass

Other management methods include physical removal of the weed, manual application of herbicide, and grazing. These methods are generally impractical for large areas and are cost prohibitive when compared to aerial spraying.

The City of Tucson developed an aerial herbicide spraying program in consultation with the National Park Service, Forest Pesticide Coordinators (FPC), and TW’s contracted land managers: BKW. The FPC is a branch of subject matter experts that analyzes, completes risk assessments, trains, and advises the USDA Forest Service on the use of pesticides within the National Forest System. The program is based on the risk assessment of glyphosate by the US EPA. It is designed to target the noxious weed during its green up phase when it is most susceptible to treatment. The City conducted aerial herbicide spraying to manage buffelgrass in 2009, 2010, 2013, 2014, and 2015 on selected Avra/Altar Valley lands.

The City’s program relies on the use of glyphosate because it quickly dries upon application and it degrades rapidly in the soil. The glyphosate that falls onto the ground during aerial spraying binds tightly with soil particles. The bound herbicide particles will not runoff into drainages even if precipitation occurs within hours of application. The concentrations of glyphosate are diluted to follow manufacturer’s label ratings for aerial application to minimize potential impact on non-target vegetation. As an added precaution, the herbicide is only applied when there is no precipitation forecasted for at least seven days. Furthermore, whenever wind speed exceeds four miles per hour, aerial applications are terminated to minimize the potential for spray drift. When judiciously applied, the use of glyphosate is a common and often preferred choice in buffelgrass abatement.

The City takes great measures to ensure the safe use of glyphosate on its properties. There are several factors that affect drift of applied herbicide to non-target areas, mainly droplet size, wind speed, release height and weather conditions. When said conditions are controlled for, studies show substantial drift is contained to 75 feet. The City's licensed contractors mitigate drift by controlling for as many of these variables as possible. In addition, glyphosate is the only herbicide that is used by the Tucson in buffelgrass management efforts.

Glyphosate:

Glyphosate has been determined to be environmentally safe when applied according to guidelines approved by the manufacturer and the U.S. Environmental Protection Agency (EPA). A primary reference commonly used to establish product safety parameters and guide application considerations is the body of research summarized in the report *Glyphosate-Human Health and Ecological Risk Assessment* that was prepared for the U.S. Department of Agriculture and the U.S. Forest Service. Use of any chemical herbicide can be controversial and glyphosate is no exception. Only through extensive research and evaluation of mainstream scientific reports was the decision made to use glyphosate. Studies can be found that bring into question the safety of glyphosate. These studies need to be carefully reviewed to ascertain their specific scope and purpose, to evaluate their scientific rigor, and to determine their actual applicability to real world exposure conditions.

The recent listing of glyphosate by the IARC as a "Group 2A – probably carcinogenic" is based on a different interpretation of the same research that was used to determine the current US EPA classification of "D – Not classifiable as to human carcinogenicity." Being classified as Group 2A indicates that the evidence of carcinogenicity is not conclusive, and one should take care with use of the product to mitigate possible negative consequences. A new risk assessment from the US EPA is expected this year. All new information and classification changes will be fully considered in the continued execution of the City's aerial herbicide spraying program.

What Does "Probably Causes Cancer" Actually Mean? By Andrew Maynard, a toxicologist and Director of the University of Michigan's Risk Science Center

<https://www.youtube.com/watch?v=CbBkB81ySxQ>

Next Steps:

TW is coordinating a communications plan regarding the noxious weed abatement schedule with our land managers. The communications plan includes physically flagging the area intended for aerial spraying, and an electronic and print notification reflecting the time-line for aerial spraying. To ensure the safe and effective application of the herbicide it is imperative that those applying it be responsive to changes in the environment in which they are spraying. As aerial spraying is dependent upon whether conditions up to the actual application, no specific dates can be provided or guaranteed.

Summary:

The coordination of multiple agencies is required if the greater Tucson area has any chance to successfully manage buffelgrass. The collective efforts of the City of Tucson, Pima County Natural Resources, Parks and Recreation, the U.S. Bureau of Land Management, the U.S. Forest Service, the U.S. National Park Service, and the University of Arizona work to control both the presence and dispersion of buffelgrass.

There are many factors to bear in mind when considering mitigation of buffelgrass on TW's retired farm properties. Amongst those factors are: safety of the product/process, rehabilitation of the land, effectiveness and efficiency of treatment, effects to the surrounding area, and associated costs. TW has considered alternatives for the mitigation of buffelgrass on its properties, such as grazing, but has yet to find a viable alternative. The Utility is open to suggestions, and have reviewed any alternative solutions proposed for the mitigation of buffelgrass.

As in all things, safety is our top priority. TW will continue to consider all of the variables associated with the treatment of buffelgrass and proceed in the manner best suited for the safe and effective mitigation of this highly invasive noxious weed.



**Citizens' Water Advisory Committee
Technical Planning, Policy Subcommittee
Projected Agenda**



Meeting Date/Agenda Items

Materials Deadline

October 28, 2015

October 23, 2015

- **The Impact of Emerging Contaminants on Water Sustainability**
– Shane Snyder

November 18, 2015

November 13, 2015

- **FICO Infrastructure and Plans – Tim Campbell**
- **Risk Communication – Dr. Marti Lindsey**

December 16, 2015

December 11, 2015

- **2016 Meeting Schedule**

Future Agenda Items without a Date:

- Reclaimed Plant (Wally)*
- Cogeneration (Bruce)*
- Watershed Management Group, Tools for Evaluation of RWH Benefits (Mark)*
- Reclaimed Water, Customer Groups, Annual Deliveries, Revenue, Special Contract Terms, Costs of Output, total production, total recharge, Potential for capturing/using more effluent and time frame (Chuck)*
- Retirement of Pools as a Conservation Incentive*
- Subsidence in Tucson and Avra Basins*