



## **WATER FORWARD**

INTEGRATED WATER RESOURCE PLAN

### **Austin Integrated Water Resource Planning Community Task Force**

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**July 7, 2017**

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**Austin Integrated Water Resource Planning Community Task Force**  
**July 11, 2017 – 6:00 p.m.**  
**Waller Creek Center, Room 104**  
**625 East 10<sup>th</sup> Street**  
**Austin, Texas 78701**

**For more information go to:**  
**[Austin Integrated Water Resource Planning Community Task Force](#)**

## **AGENDA**

### **Voting Members:**

Sharlene Leurig - Chair	Marianne Dwight	Sarah Richards
Jennifer Walker – Vice Chair	Diane Kennedy	Lauren Ross
Todd Bartee	Perry Lorenz	Robert Mace
Clint Dawson	Bill Moriarty	

### **Ex Officio Non-Voting Members:**

Austin Water: Greg Meszaros  
Austin Energy: Kathleen Garrett  
Austin Resource Recovery: Sam Angoori  
Neighborhood Housing and Community Development: Rebecca Giello  
Office of Innovation: Kerry O'Connor  
Office of Sustainability: Lucia Athens  
Parks and Recreation: Sara Hensley  
Watershed Protection: Mike Personett

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### **1. CALL TO ORDER – July 11, 2017, 6:00 p.m.**

### **2. CITIZEN COMMUNICATION**

The first 10 speakers signed up prior to the meeting being called to order will each be allowed a three-minute allotment to address their concerns regarding items not posted on the agenda.

### **3. APPROVAL OF MEETING MINUTES**

- a. Approval of the meeting minutes from the June 6, 2017 Task Force meeting (5 minutes)

**4. STAFF BRIEFINGS, PRESENTATIONS, AND OR REPORTS**

- a. Public Outreach Update – City Staff (10 minutes)
  - i. Task Force Discussion and Input
- b. Presentation of revised IWRP sub-objectives weighting survey - City Staff (20 minutes)
  - i. Task Force Discussion and Input
- c. Presentation on revised needs analysis – City Staff and Consultant (30 minutes)
  - i. Task Force Discussion and Input
- d. Presentation on supply options screening – City Staff and Consultant Team (40 minutes)
  - i. Task Force Discussion and Input

**5. SUBCOMMITTEE REPORTS**

**6. VOTING ITEMS FROM TASK FORCE**

**7. FUTURE AGENDA ITEMS**

**8. ADJOURN**

Note: Agenda item sequence and time durations noted above are subject to change.

The City of Austin is committed to compliance with the American with Disabilities Act. Reasonable modifications and equal access to communications will be provided upon request. Meeting locations are planned with wheelchair access. If requiring Sign Language Interpreters or alternative formats, please give notice at least 2 days (48 hours) before the meeting date. Please call Austin Integrated Water Resource Planning Community Task Force, at 512-972-0194, for additional information; TTY users route through Relay Texas at 711.

For more information on the Austin Integrated Water Resource Planning Community Task Force, please contact Marisa Flores Gonzalez at 512-972-0194.

# MINUTES





**The Austin Integrated Water Resource Planning Community Task Force convened in a Special Called Meeting on June 6, 2017 at Waller Creek Center, Conference Rm 104, 625 E 10<sup>th</sup> Street, in Austin, Texas.**

**Members in Attendance:**

Sharlene Leurig - Chair  
Jennifer Walker – Vice Chair  
William Moriarty

Diane Kennedy  
Perry Lorenz  
Robert Mace

Clint Dawson  
Lauren Ross

**Ex-Officio Members in Attendance:**

Kathleen Garrett, Mike Personett

**Staff in Attendance:**

Daryl Slusher, Kevin Critendon, Teresa Lutes, Marisa Flores Gonzalez, Joe Smith, Katherine Jashinski, Ginny Guerrero, Nancy Rumbo, Drema Gross, Mark Jordan

**Additional Attendees:**

Tina Petersen, Chris Kurtz

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**1. CALL TO ORDER**

Sharlene Leurig, Chair, called the meeting to order at 6:06 p.m.

**2. CITIZEN COMMUNICATION: GENERAL**

Jerry Roane shared information with the Task Force about the Water Beads project.

**3. APPROVAL OF MEETING MINUTES**

The meeting minutes from the April 18, 2017 Austin Integrated Water Resource Planning Community Task Force regular meeting were approved on Member Ross's motion and Member Walker's second on a 7-0-1-3 vote with Member Moriarty abstaining and Members Dwight, Richards, and Bartee absent.

The meeting minutes from the May 2, 2017 Austin Integrated Water Resource Planning Community Task Force regular meeting were approved on Member Mace's motion and Member Walker's second on a 7-0-1-3 vote with Members Dwight, Richards, and Bartee absent.

**4. STAFF BRIEFINGS, PRESENTATIONS, AND/OR REPORTS**

- a. A Public Outreach Update was provided by Ginny Guerrero, Community Engagement Specialist, Austin Water and Marisa Flores Gonzalez, Senior Planner, Austin Water. This briefing was followed by a Task Force discussion including questions and answers.
- b. A presentation on preliminary screening of supply options was provided by Chris Kurtz and Tina Petersen of CDM Smith. This briefing was followed by a Task Force discussion including questions and answers.
- c. A presentation of Task Force responses to IWRP sub-objectives weighting survey was provided by Marisa Flores Gonzalez, Senior Planner, Austin Water. This briefing was followed by a Task Force discussion including questions and answers.

**5. SUBCOMMITTEE REPORTS**

None

**6. VOTING ITEMS FROM TASK FORCE**

None

**10. FUTURE AGENDA ITEMS**

None

Chair Leurig adjourned the meeting at 8:15 pm.

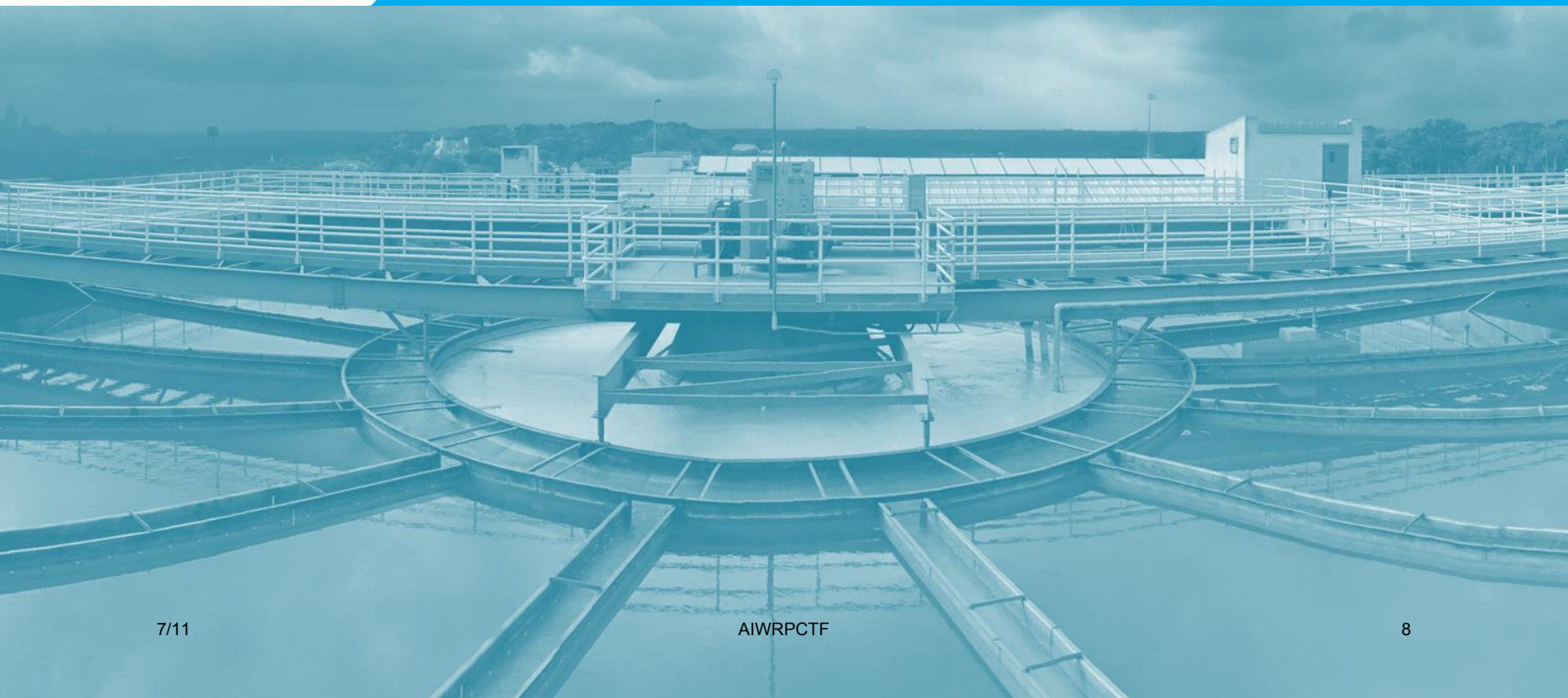
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# **PRESENTATION**



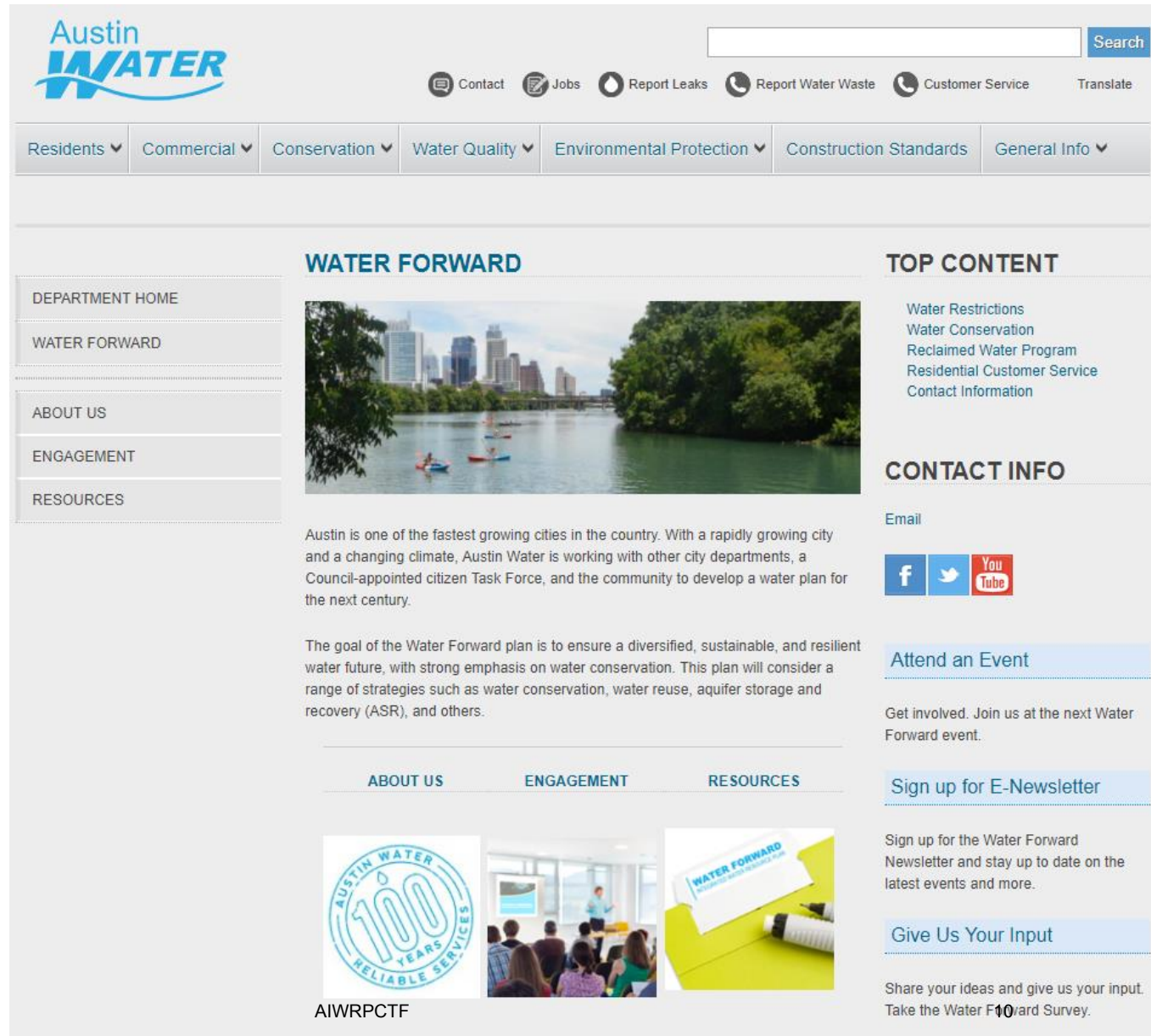
# Water Forward Austin's Integrated Water Resources Plan Task Force Meeting

July 11, 2017



# Public Outreach Update

# Visit our Updated Website



The screenshot displays the Austin Water website's 'Water Forward' section. At the top, the Austin Water logo is on the left, and a search bar and navigation links (Contact, Jobs, Report Leaks, Report Water Waste, Customer Service, Translate) are on the right. Below the logo is a horizontal menu with dropdowns for Residents, Commercial, Conservation, Water Quality, Environmental Protection, Construction Standards, and General Info. The main content area features a large banner image of a river with kayakers and the Austin skyline. To the left of the banner is a sidebar with links: DEPARTMENT HOME, WATER FORWARD, ABOUT US, ENGAGEMENT, and RESOURCES. To the right of the banner is a 'TOP CONTENT' section with links to Water Restrictions, Water Conservation, Reclaimed Water Program, Residential Customer Service, and Contact Information. Below this is a 'CONTACT INFO' section with an Email link and social media icons for Facebook, Twitter, and YouTube. Further down is an 'Attend an Event' section with a link to 'Get involved. Join us at the next Water Forward event.' Below that is a 'Sign up for E-Newsletter' section with a link to 'Sign up for the Water Forward Newsletter and stay up to date on the latest events and more.' At the bottom right is a 'Give Us Your Input' section with a link to 'Share your ideas and give us your input. Take the Water Forward Survey.' The bottom of the page features a row of three images: a circular seal for 'Austin Water 100 Years Reliable Services', a photo of a presentation, and a photo of a 'Water Forward' sign. The text 'AIWRPCTF' is centered below these images.

**Water Forward**

Austin is one of the fastest growing cities in the country. With a rapidly growing city and a changing climate, Austin Water is working with other city departments, a Council-appointed citizen Task Force, and the community to develop a water plan for the next century.

The goal of the Water Forward plan is to ensure a diversified, sustainable, and resilient water future, with strong emphasis on water conservation. This plan will consider a range of strategies such as water conservation, water reuse, aquifer storage and recovery (ASR), and others.

**ABOUT US**   **ENGAGEMENT**   **RESOURCES**

**TOP CONTENT**

- Water Restrictions
- Water Conservation
- Reclaimed Water Program
- Residential Customer Service
- Contact Information

**CONTACT INFO**

Email

[f](#) [t](#) [You Tube](#)

**Attend an Event**

Get involved. Join us at the next Water Forward event.

**Sign up for E-Newsletter**

Sign up for the Water Forward Newsletter and stay up to date on the latest events and more.

**Give Us Your Input**

Share your ideas and give us your input. Take the Water Forward Survey.

AIWRPCTF



# Water Forward Summer Series

Join us as we  
visit all ten  
Council districts

**WATER FORWARD**

## SUMMER SERIES

### Coming to a Library Near You!

Austin Water is collaborating with other city departments, a Citizen Task Force and the community to develop a water plan for the next century. The 100-year plan will recommend strategies to best manage Austin's water supply now and in the future.

Please join us at one of our Summer Series events. Our team will be out in all ten Council Districts this summer to share more about Water Forward and listen to you!

And what's the summer without water and popsicles? Please enjoy a cool treat at every location.

**\*Children's activities will be available. Must be accompanied by an adult.**

For more information about Water Forward and to sign up for our electronic newsletter, visit [austintexas.gov/waterforward](http://austintexas.gov/waterforward).

**See you this summer!**

**SAT 7/8** 11:30 am - 1:00 pm  
Southeast Branch Library  
District 2

**SAT 7/15** 2:30 pm - 4:00 pm  
Milwood Branch Library  
District 7

**MON 7/17** 6:00 pm - 7:30 pm  
Spicewood Springs Branch Library  
District 6

**WED 7/19** 6:00 pm - 7:30 pm  
Twin Oaks Branch Library  
District 9

**SAT 7/22** 2:00 pm - 3:30 pm  
Little Walnut Creek Branch Library  
District 4

**SAT 7/29** 2:00 pm - 3:30 pm  
Ruiz Branch Library  
District 3

**MON 7/31** 6:30 pm - 8:00 pm  
Old Quarry Branch Library  
District 10

**SAT 8/5** 2:00 pm - 3:30 pm  
Hampton Branch Library  
District 8

**TUE 8/8** 6:00 pm - 7:30 pm  
Manchaca Branch Library  
District 5

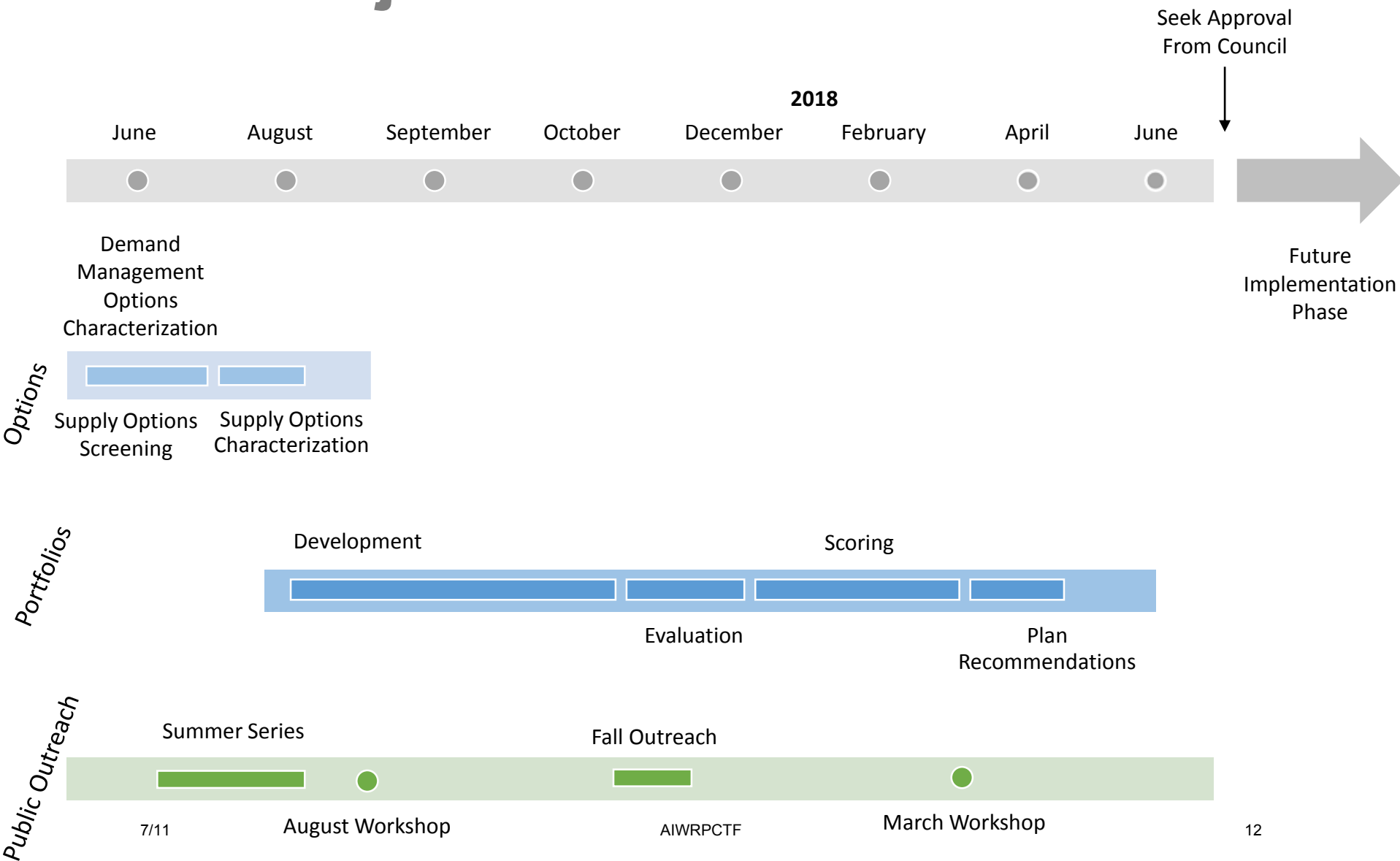
**SAT 8/12** 11:00 am - 12:30 pm  
Windsor Park Branch Library  
District 1

AIWRPCTF

Austin  
**WATER**

**WATER FORWARD**  
INTEGRATED WATER RESOURCE PLAN

# IWRP Project Timeline





# Questions and Discussion

# Draft Weightings For Objectives And Sub-objectives

# Finalized Objectives and Sub-objectives Weighting

Water Forward: Finalized Integrated Water Resources Plan Objectives

Primary Objective	OLD Objective Weight	NEW Objective Weight	Sub-Objective	OLD Sub-Objective Weight	NEW Sub-Objective Weight	Defining Question	Performance Measure	OLD	NEW
Water Supply Benefits	30%	35%	Maximize Water Reliability	50%	57%	PLACEHOLDER – TO BE REFINED How does the portfolio perform in terms of reliability (how often is there shortage), vulnerability (how large is the shortage), recovery (how fast is the recovery from shortages) under various hydrologic conditions, including climate change scenarios?	PLACEHOLDER – TO BE REFINED Water Supply Index (0 to 1) based on WAM modeling results	15%	20%
			Maximize Local Control	25%	21.5%	To what extent does AW have control over the quantity and storage of water and operation of options (especially during drought periods) included in the portfolio?	Proportion of total supply yield from locally controlled sources	7.5%	7.5%
			Maximize Supply Diversification	25%	21.5%	How many independent water supply and demand-side management options above a minimum yield threshold are included in the portfolio?	# of supply/demand-side management sources (above minimum yield threshold)	7.5%	7.5%
Economic Impacts	20%	20%	Maximize Cost-Effectiveness	75%	75%	What is the total capital (construction) and operations/maintenance costs of all projects/programs in the portfolio over the lifecycle, divided by the sum of all water yield produced by the portfolio?	Unit cost (\$/AF) expressed as a present value sum of all costs over the lifecycle, including utility and customer costs.	15%	15%
			Maximize Advantageous External Funding	25%	25%	Does the portfolio have an opportunity for advantageous external funding from Federal, State, local, and private sources?	External Funding Score (1-5), where 1 = low potential and 5 = high potential	5%	5%
Environmental Impacts	20%	20%	Minimize Ecosystem Impacts	40%	40%	To what extent does the portfolio positively or negatively impact receiving water quality (e.g., streams, river, lakes), terrestrial and aquatic habitats throughout Austin, and net streamflow effects both upstream and downstream from Austin?	Ecosystem Impact Score (1-5), where 1 = high combined negative impacts and 5 = high combined positive impacts	8%	8%
			Minimize Net Energy Use	30%	30%	What is the net energy requirement of the portfolio, considering energy generation?	Incremental net change in kWh	6%	6%
			Maximize Water Use Efficiency	30%	30%	What is the reduction in potable water use from water conservation, reuse and rainwater capture for the portfolio?	Potable per capita water use (gallon/person/day)	6%	6%
Social Impacts	15%	15%	Maximize Multi-Benefit Infrastructure/Programs	35%	20%	To what extent does the portfolio provide secondary benefits such as enhanced community livability/beautification, increased water ethic, ecosystem services, or others?	Multiple Benefits Score (1-5), where 1 = low benefits and 5 = high benefits	5.25%	3%
			Maximize Net Benefits to Local Economy	35%	20%	To what extent does the supply reliability and water investments of the portfolio protect and improve local economic vitality, including permanent job creation?	Local Economy Score (1-5), where 1 = high negative impact and 5 = high positive impact	5.25%	3%
			Maximize Social Equity and Environmental Justice	30%	60%	To what extent does the portfolio support social equity and environmental justice, with emphasis on underserved communities?	Social Equity and Environmental Justice Score (1-5), where 1 = significant support and 5 = minimal support	4.5%	9%
Implementation Impacts	15%	10%	Minimize Implementation Challenges	35%	35%	What implementation challenges will the portfolio face in terms of public acceptance, regulatory approval, and legal/institutional barriers?	Implementation Uncertainty Score (1-5), where 1 = high combined challenges and 5 = low combined challenges	5.25%	3.5%
			Maximize Scalability	35%	35%	To what extent can the portfolio be incrementally sized over time in terms of supply capacity and demand management?	Scalability Score (1-5), where 1 = small incremental sizing potential and 5 = high incremental sizing potential	5.25%	3.5%
			Minimize Technical Feasibility Challenges	30%	30%	To what extent does the portfolio rely on emerging and/or unproven technologies?	Technical Feasibility (1-5), where 1 = high reliance on emerging or unproven technologies and 5 = low reliance on emerging or unproven technologies	4.5%	3%

## Next Steps

- Team working to refine Water Reliability Subobjective metric to include reliability evaluation for supply options that are not connected to the Colorado River and Highland Lakes system
- Targeting refinement of metric by mid-August

# Questions and Discussion

# Revised Water Needs Identification

## Demand Forecast Revisions

- Baseline demand forecast now includes passive conservation plus continued best management practices
- Changes made to incorporate continued best management practices and revised water loss forecasting method
  - Demand forecast changes capture implementation of DM best practices over time. This includes the options to require or incentivize:
    - Government-recognized energy and water efficiency-labeled residential and commercial fixtures
    - Toilet, urinal, and bathroom faucet aerator efficiencies
  - Water loss forecast reflects incorporation of Infrastructure Leakage Index (ILI) - based methodology

## Demand Forecast Revisions

- Current and future indoor “efficiency” level was estimated for SF, MF, and COM and forecasted by modeling turnover of housing/commercial buildings (using building age data from TCAD)
  - All buildings forecasted to be redeveloped or remodeled to current high-efficiency standards by 2040.
  - “High-efficiency” standard continues to reflect decreasing water use through 2115 (using 2015 REUWS study benchmarks for SF).
- Revised water loss forecast methodology
  - Baseline water loss reflects average ILI from 2013 - 2015
  - Future water loss combines historical ILI plus future system assumptions such as number of connections and operational parameters



## Demand Forecast Comparison

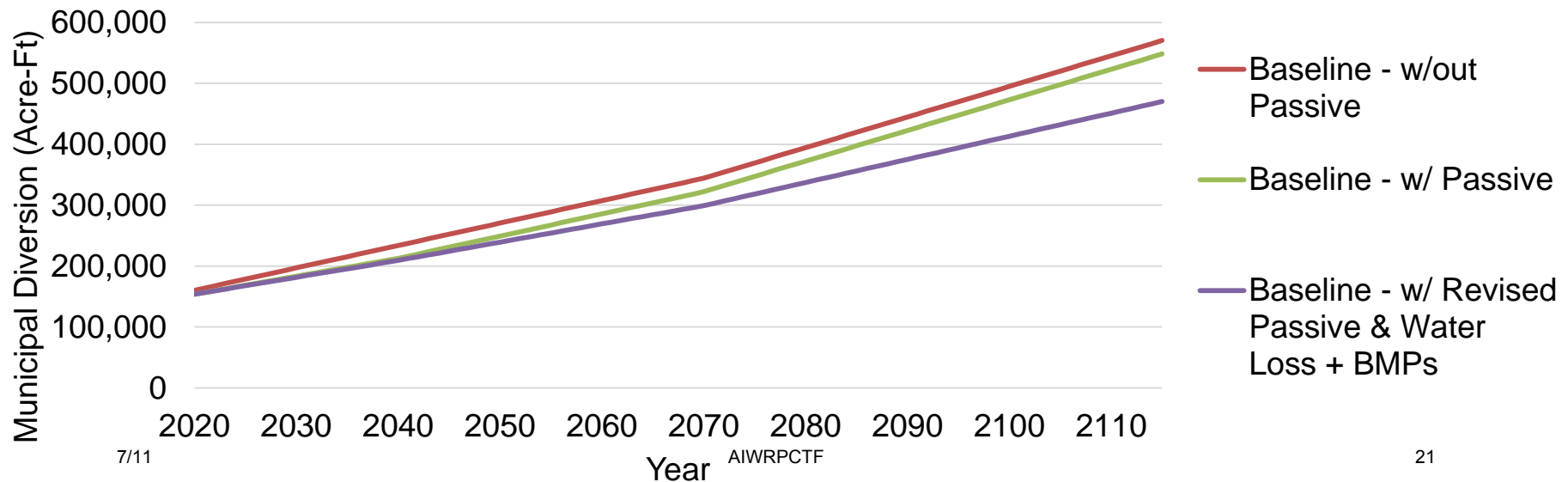
### Preliminary Estimates

Sector	2020	2040	2070	2115
SF	47,700	64,800	94,500	148,000
MF	34,000	47,500	75,100	149,000
COM	40,300	57,300	90,500	153,000
NRW	17,100	23,600	35,800	60,900

### Revised Estimates

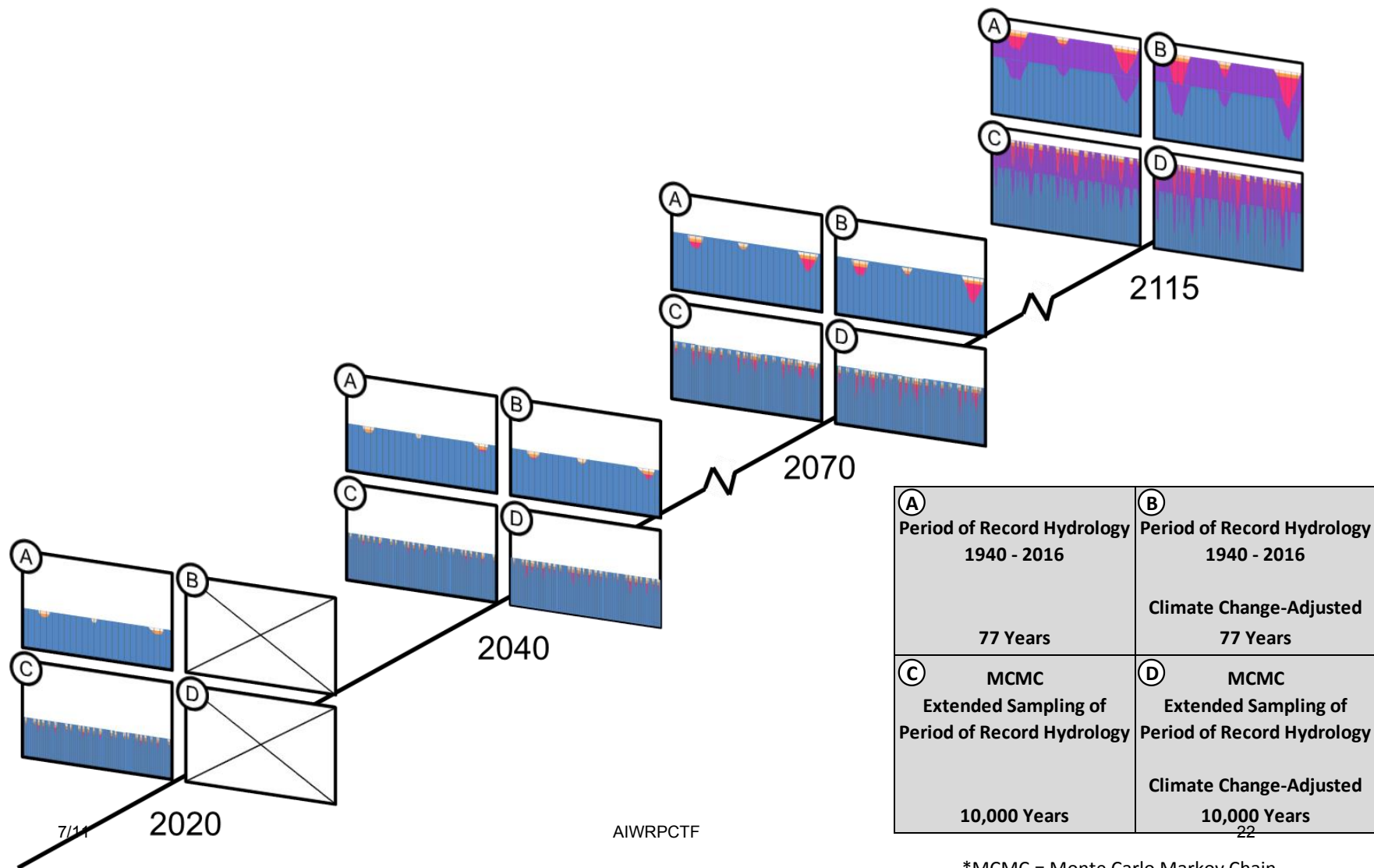
Sector	2020	2040	2070	2115
SF	47,900	61,300	86,600	129,000
MF	34,200	45,400	69,500	130,000
COM	40,400	55,300	84,700	136,000
NRW	16,400	27,800	32,600	39,800

### Comparison of Passive Conservation Estimates



## Water Forward

### Planning For Change and Uncertainties

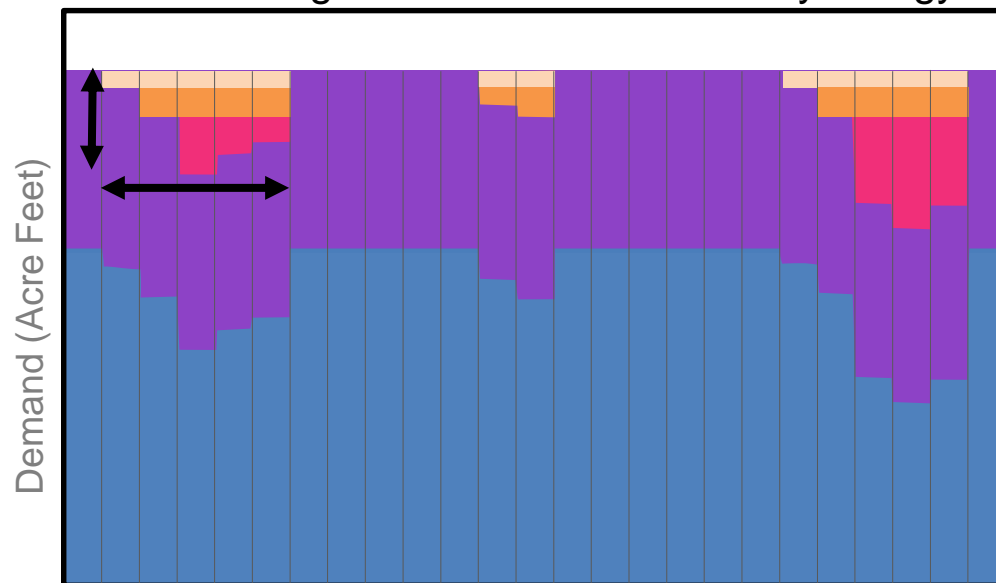


## City of Austin Needs Include

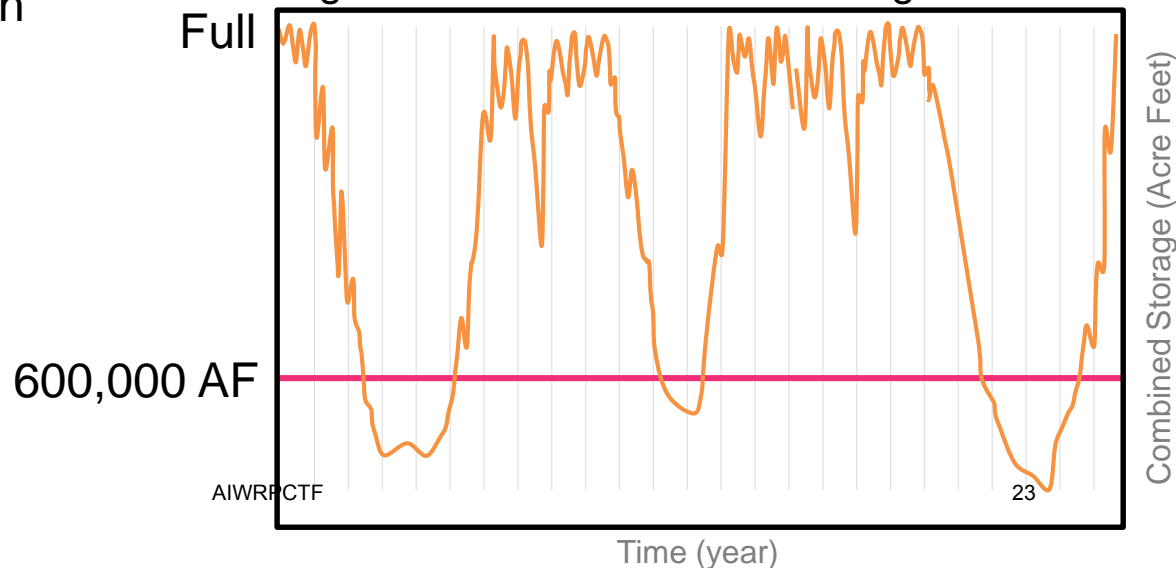
- **Needs During Prolonged Drought** = Demand reductions from implementation of Stages 3&4
- **Needs Above Current LCRA Contract** = Baseline demands above current 325,000 AF contract with LCRA

### 2115 Demands

Evaluated Against Period of Record Hydrology

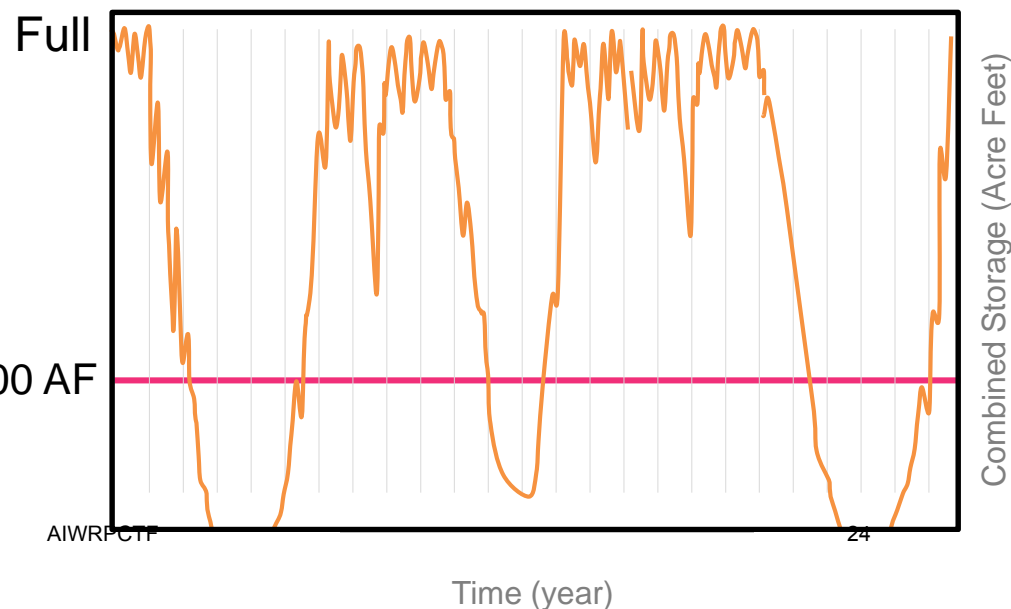
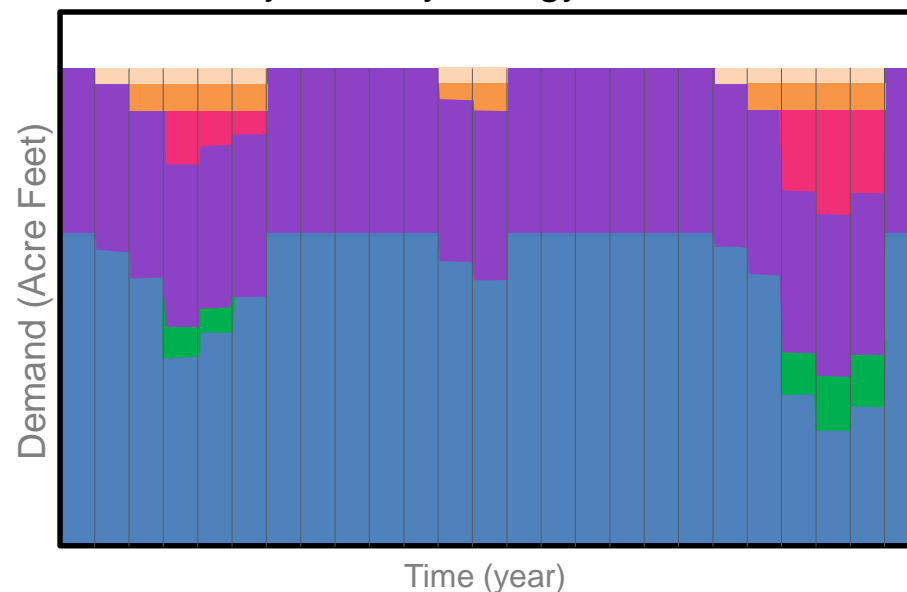


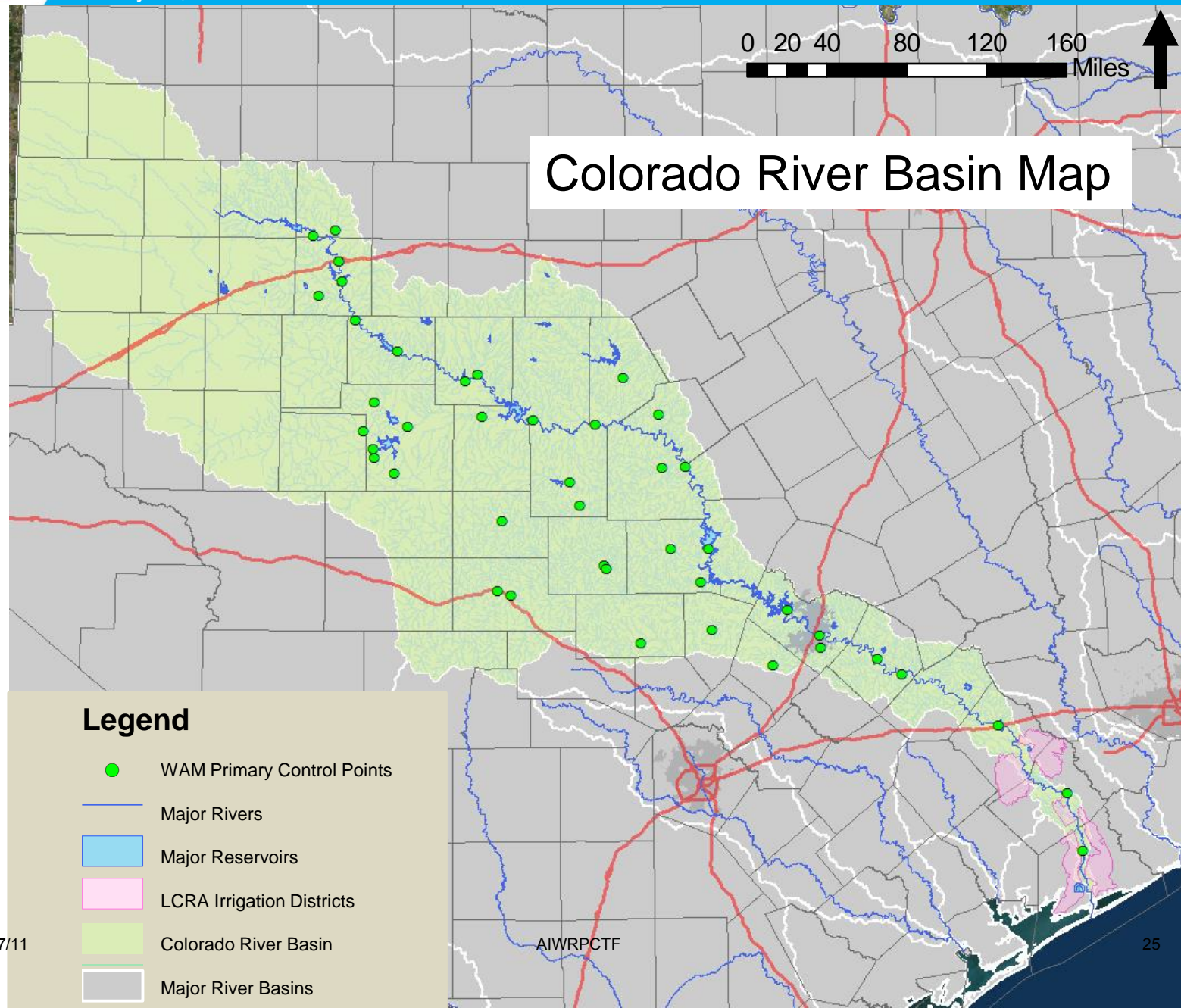
### Highland Lakes Combined Storage Levels



- **Regional Needs** = include periods when combined storage levels dip below emergency levels
- **Simulated Shortfalls** = Amounts needed to supplement supplies when model simulates reservoir storage as unavailable
- Future hydrologic scenarios may identify regional water needs
- Despite assumed cutbacks on the part of AW and others, reservoir levels may still go below emergency levels

## 2115 Demands Evaluated Against POR Climate-Adjusted Hydrology





# Assumptions for “Water Forward WAM”

- Full basin simulation based on TCEQ WAM
- Monthly time step simulation
- Modifications made to better reflect lower basin water right operations
  - Water rights above OH Ivie and Brownwood simulated first (Region K cutoff assumption)
  - Assumption for reliable flows and stored water delivery losses below Highland Lakes
- Austin’s municipal return flows added
- Austin and regional drought response demand reductions are triggered by combined storage volumes



## Assumptions for “Water Forward WAM”, continued

- Demands for firm water customers set according to 2020, 2040, and 2070 estimates
  - Austin’s average-year demands according to Disaggregated Demand Model
  - Regional firm demands informed by Region K projections
  - Agricultural demands according to 2015 WMP projections
- Regional demands for 2115 estimated from 2070 demands and other information
- Demands adjusted for climate change scenarios
  - Firm customer demand increases of 2%, 4%, and 6% in 2040, 2070, and 2115
  - Agricultural demands adjusted using equation incorporating evaporation and precipitation
- LCRA’s Lane City off-channel reservoir in all simulations
- Agricultural irrigation demands met with river supplies, LCRA interruptible stored water, and off-channel storage in 2020 and 2040. River supplies, additional on-farm storage, and other supplies used for agriculture in 2070 and 2115.

## City of Austin Needs Summary

### Needs During Prolonged Drought

Cumulative Need, ac-ft	Consecutive Number of years in Stage III or IV	Average Need per year, ac-ft	Max Need per year, ac-ft
-	-	-	-

Cumulative Need, ac-ft	Consecutive Number of years in Stage III or IV	Average Need per year, ac-ft	Max Need per year, ac-ft
-	-	-	-

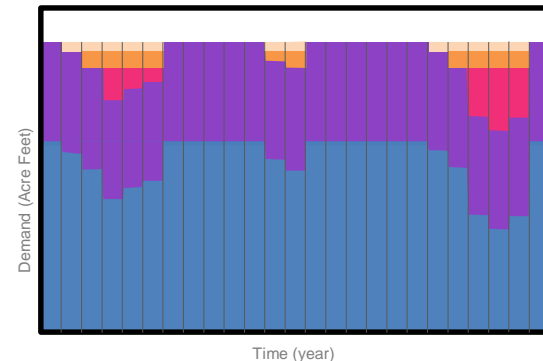
Planning Horizon Year	(C)	-	-	-	-	(D)	-	-	-	-
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- Drought of 2007-2016 used for results reporting for POR simulations
- In a February 2015 press release LCRA announced that ...“the Highland Lakes are now in a new ‘critical period’ marking the driest conditions on record, eclipsing the 1947-57 drought that until now was the worst on record for this region.”

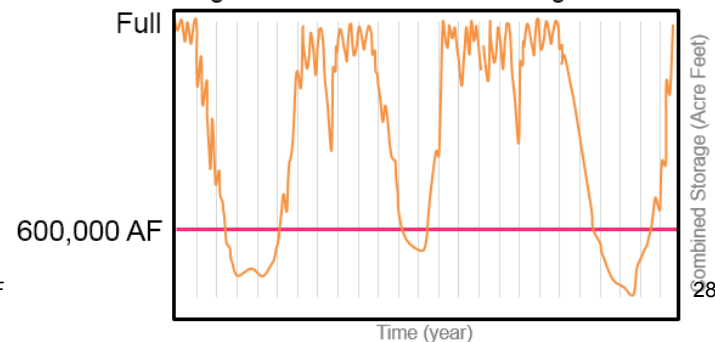
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AIWRPCTF

2115 Demands Evaluated Against POR Hydrology



Highland Lakes Combined Storage Levels



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## 2020 Needs Summary

Cumulative Need, ac-ft	Consecutive Number of years in Stage III or IV	Average Need per year, ac-ft	Max Need per year, ac-ft
0	0	na	na

Cumulative Need, ac-ft	Consecutive Number of years in Stage III or IV	Average Need per year, ac-ft	Max Need per year, ac-ft
-	-	-	0

Average Need per year, ac-ft
0

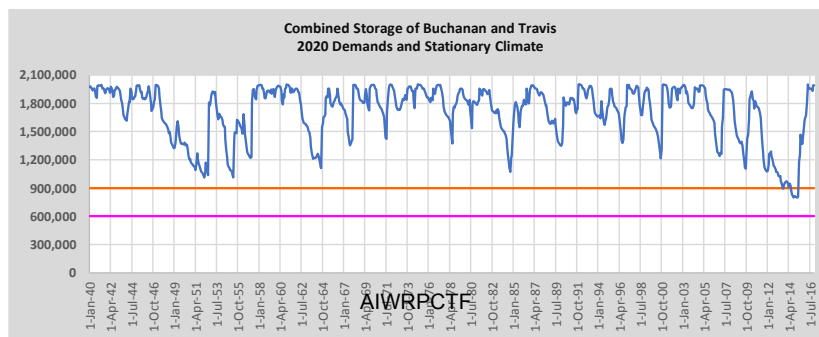
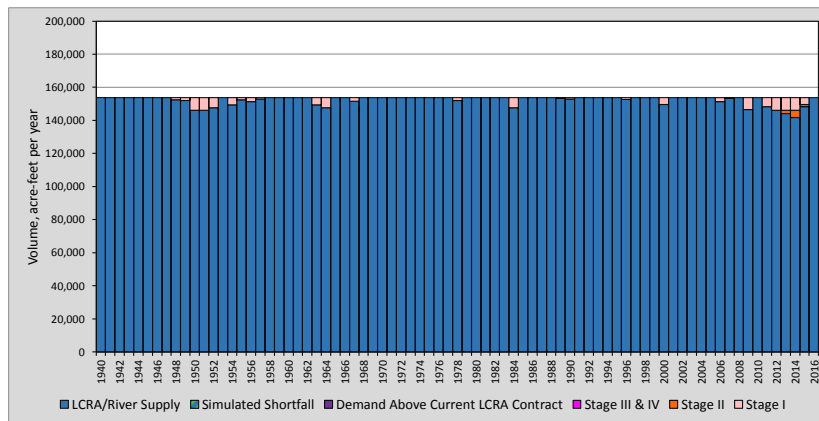
Average Need per year, ac-ft
0

2020	Needs During Prolonged Drought	(A)	0	0	na	na	(B)	No Significant Change from Period of Record
	Needs Above Current LCRA Contract		-	-	-	0		No Significant Change from Period of Record

Simulated Shortfalls	(A)	0	(B)	0
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(A)

### Period of Record (77 years)



## 2040 Needs Summary

Cumulative Need, ac-ft	Consecutive Number of years in Stage III or IV	Average Need per year, ac-ft	Max Need per year, ac-ft
17,704	0.9	17,704	17,704
-	-	-	0

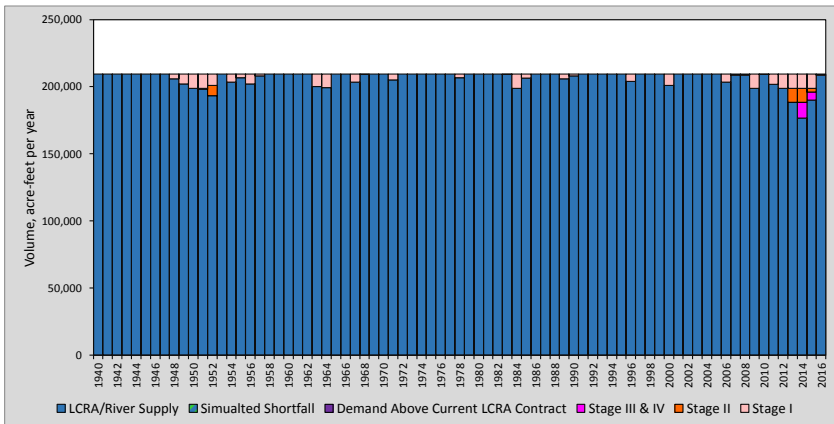
Cumulative Need, ac-ft	Consecutive Number of years in Stage III or IV	Average Need per year, ac-ft	Max Need per year, ac-ft
76,215	2.8	27,715	32,031
-	-	-	0

Average Need per year, ac-ft	Average Need per year, ac-ft
0	0

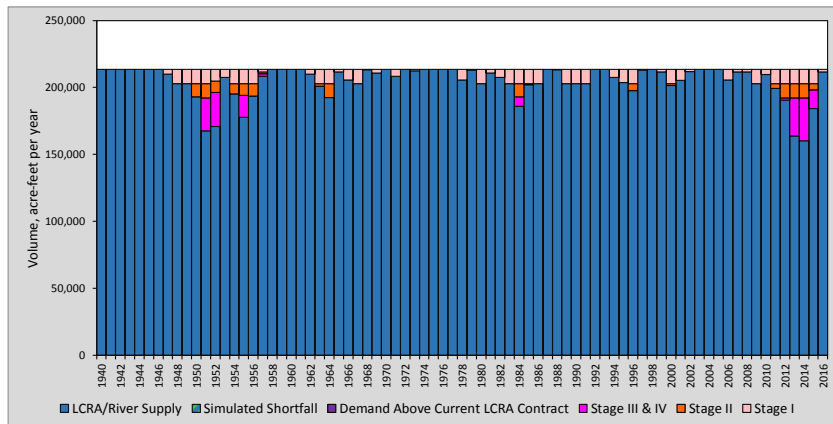
2040	Needs During Prolonged Drought Needs Above Current LCRA Contract	A				B			
		Cumulative Need, ac-ft	Consecutive Number of years in Stage III or IV	Average Need per year, ac-ft	Max Need per year, ac-ft	Cumulative Need, ac-ft	Consecutive Number of years in Stage III or IV	Average Need per year, ac-ft	Max Need per year, ac-ft
		17,704	0.9	17,704	17,704	76,215	2.8	27,715	32,031
		-	-	-	0	-	-	-	0

Simulated Shortfalls	A		B	
	Average Need per year, ac-ft	Average Need per year, ac-ft	Average Need per year, ac-ft	Average Need per year, ac-ft
	0	0	0	0

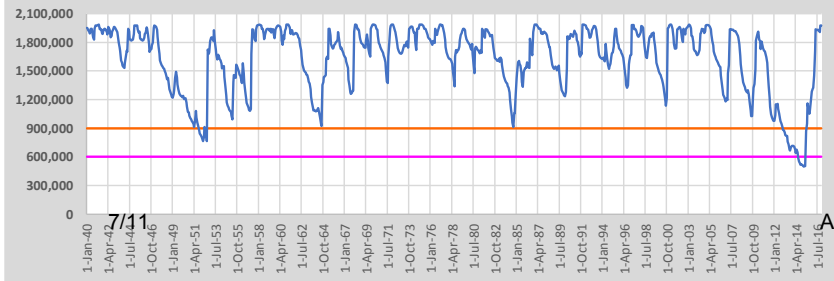
**Period of Record (77 years)**



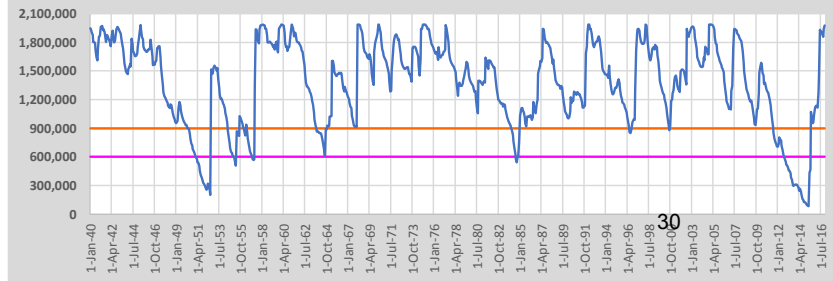
**Period of Record (77 years) Climate-Adjusted**



**Combined Storage of Buchanan and Travis  
2040 Demands and Stationary Climate**



**Combined Storage of Buchanan and Travis  
2040 Climate Adjusted Demands and RCP 8.5 Hydrology**



## 2070 Needs Summary

Cumulative Need, ac-ft	Consecutive Number of years in Stage III or IV	Average Need per year, ac-ft	Max Need per year, ac-ft
93,394	2.4	38,646	41,529
-	-	-	0

Cumulative Need, ac-ft	Consecutive Number of years in Stage III or IV	Average Need per year, ac-ft	Max Need per year, ac-ft
222,801	5.2	43,123	46,677
-	-	-	0

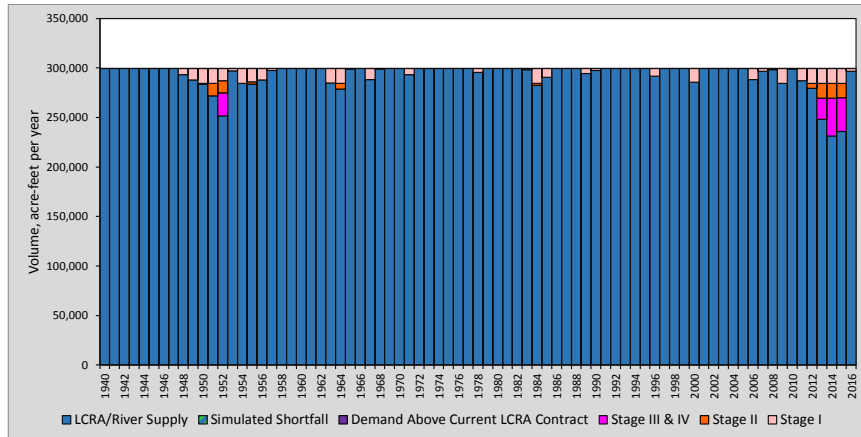
Average Need per year, ac-ft	Average Need per year, ac-ft
0	133,544

2070	Needs During Prolonged Drought Needs Above Current LCRA Contract	(A)	(B)
	93,394	2.4	38,646
	-	-	0

Simulated Shortfall	(A)	(B)
	0	133,544

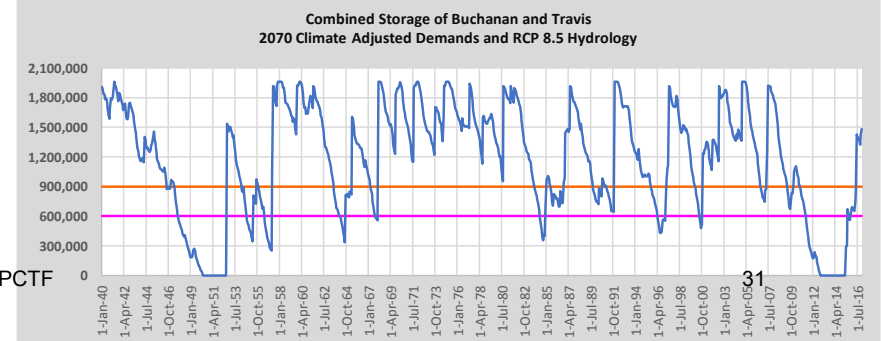
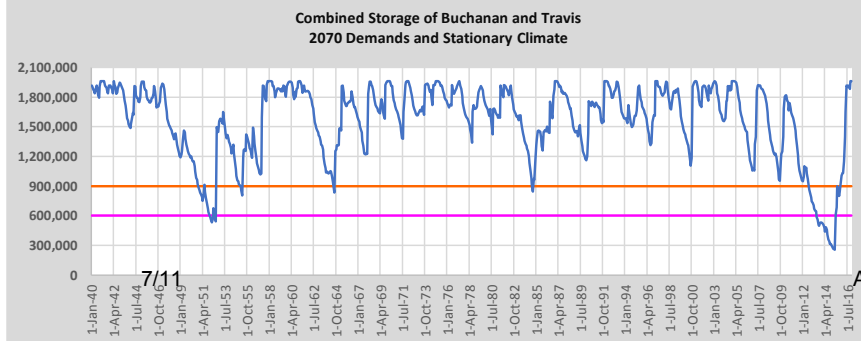
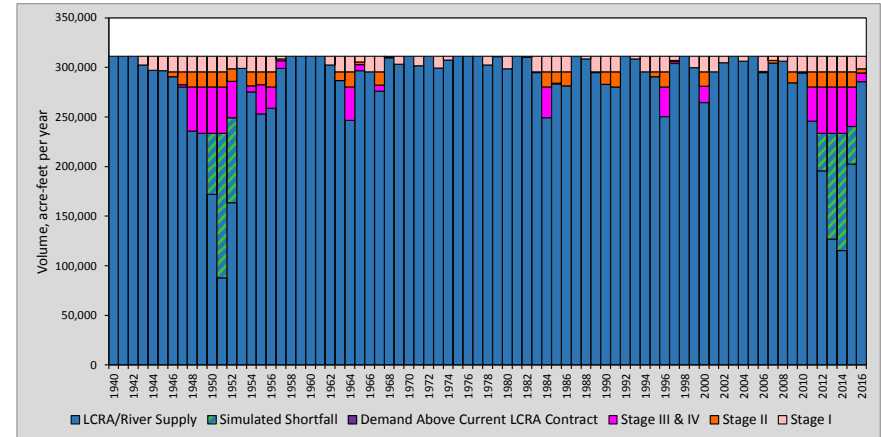
(A)

Period of Record (77 years)



(B)

Period of Record (77 years) Climate-Adjusted



## 2115 Needs Summary

Cumulative Need, ac-ft	Consecutive Number of years in Stage III or IV	Average Need per year, ac-ft	Max Need per year, ac-ft
186,166	3.3	57,282	70,507
-	-	-	145,050

Cumulative Need, ac-ft	Consecutive Number of years in Stage III or IV	Average Need per year, ac-ft	Max Need per year, ac-ft
431,755	6.7	64,763	74,738
-	-	-	173,253

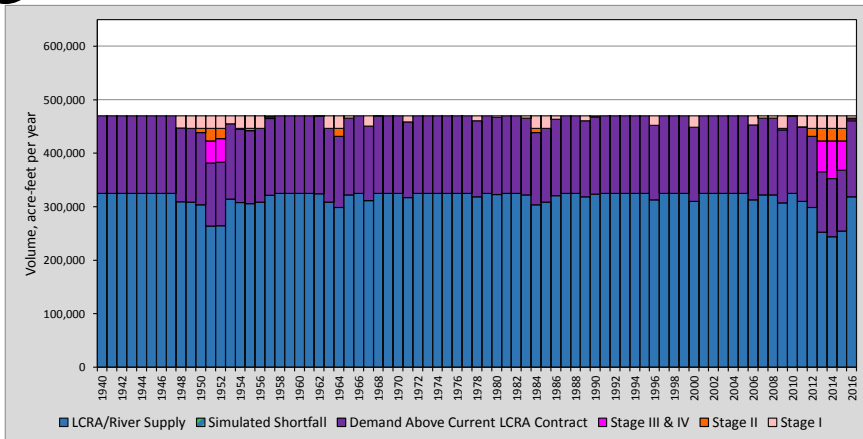
Average Need per year, ac-ft	Average Need per year, ac-ft
0	164,373

2115	Needs During Prolonged Drought Needs Above Current LCRA Contract	A	186,166	3.3	57,282	70,507	B	431,755	6.7	64,763	74,738
			-	-	-	145,050		-	-	-	173,253

Simulated Shortfall	A	0	B	164,373
		-		-

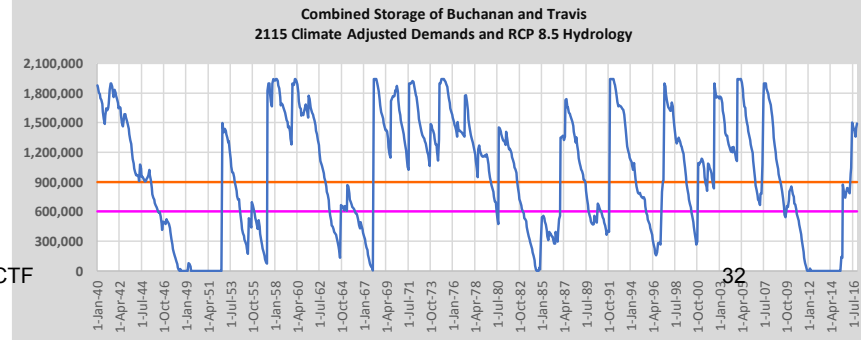
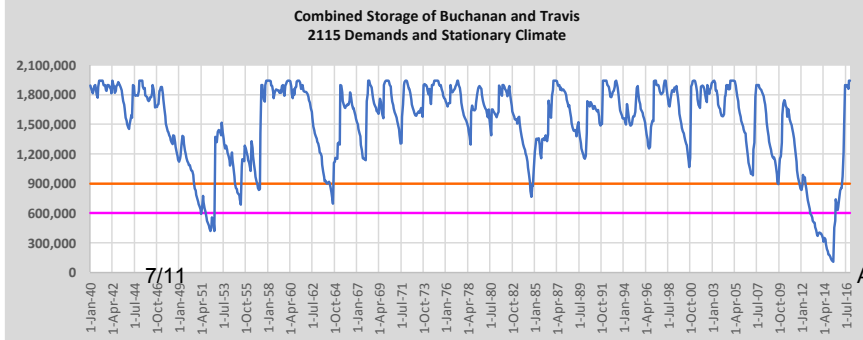
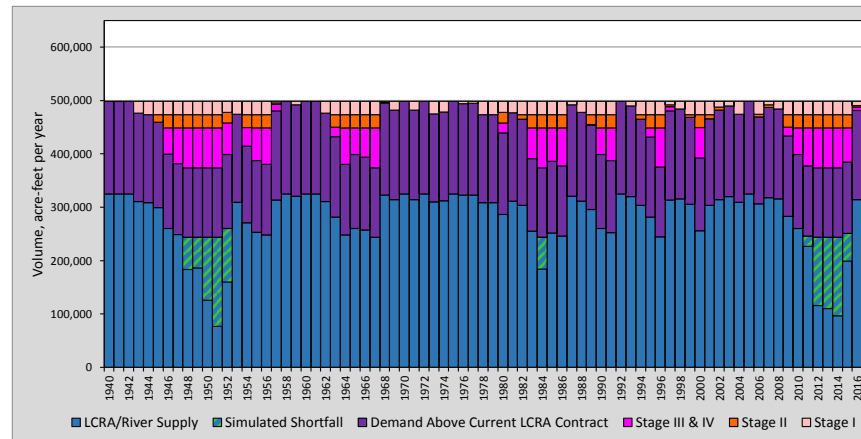
A

Period of Record (77 years)



B

Period of Record (77 years) Climate-Adjusted



AIWRPCTF

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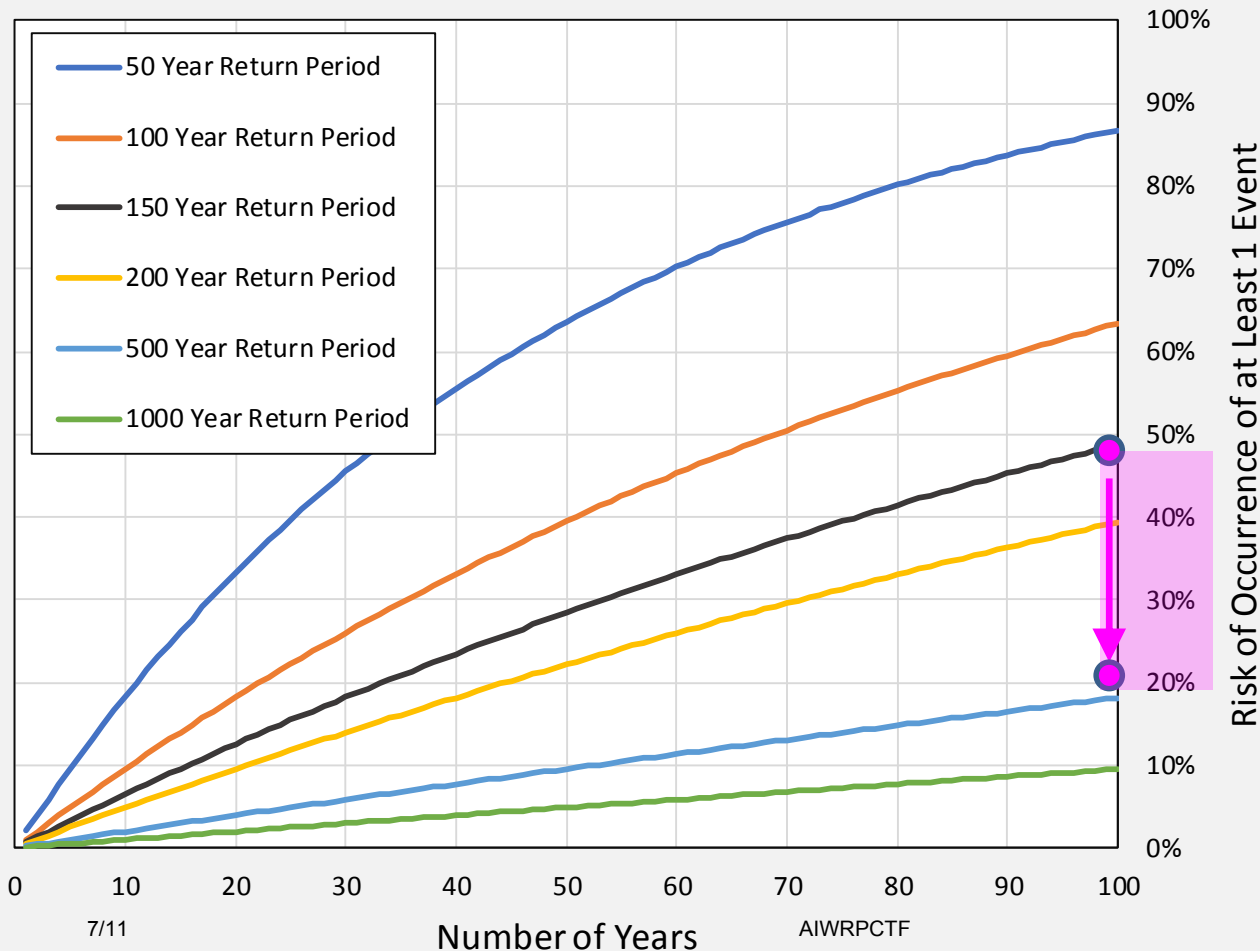
# **Monte Carlo Markov Chain – 10,000 year Simulations**

## **Droughts Worse than the Drought of 2007-2016**

- Evaluating portfolios for conditions worse than the recent drought is a key piece of the Water Forward analyses.
- The extended 10,000 year simulation is used to simulate a very long sequence of hydrologic conditions, some of which are worse than the drought of 2007-2016.
- 1,365 drought events identified between 12 and 224 months in the 10k year simulation.
- 74 of those droughts are worse than the 2007-2016 drought according to a calculation of drought return period based on inflow severity and duration.

## Return Period and Risk of Occurrence

$$\text{Risk of at Least 1 Occurrence} = 1 - \left(1 - \frac{1}{\text{Return Period}}\right)^{\text{Number of Years}}$$



Drought of 2010's has a return period of 156 years relative to the other droughts in the 10,000 year simulation.

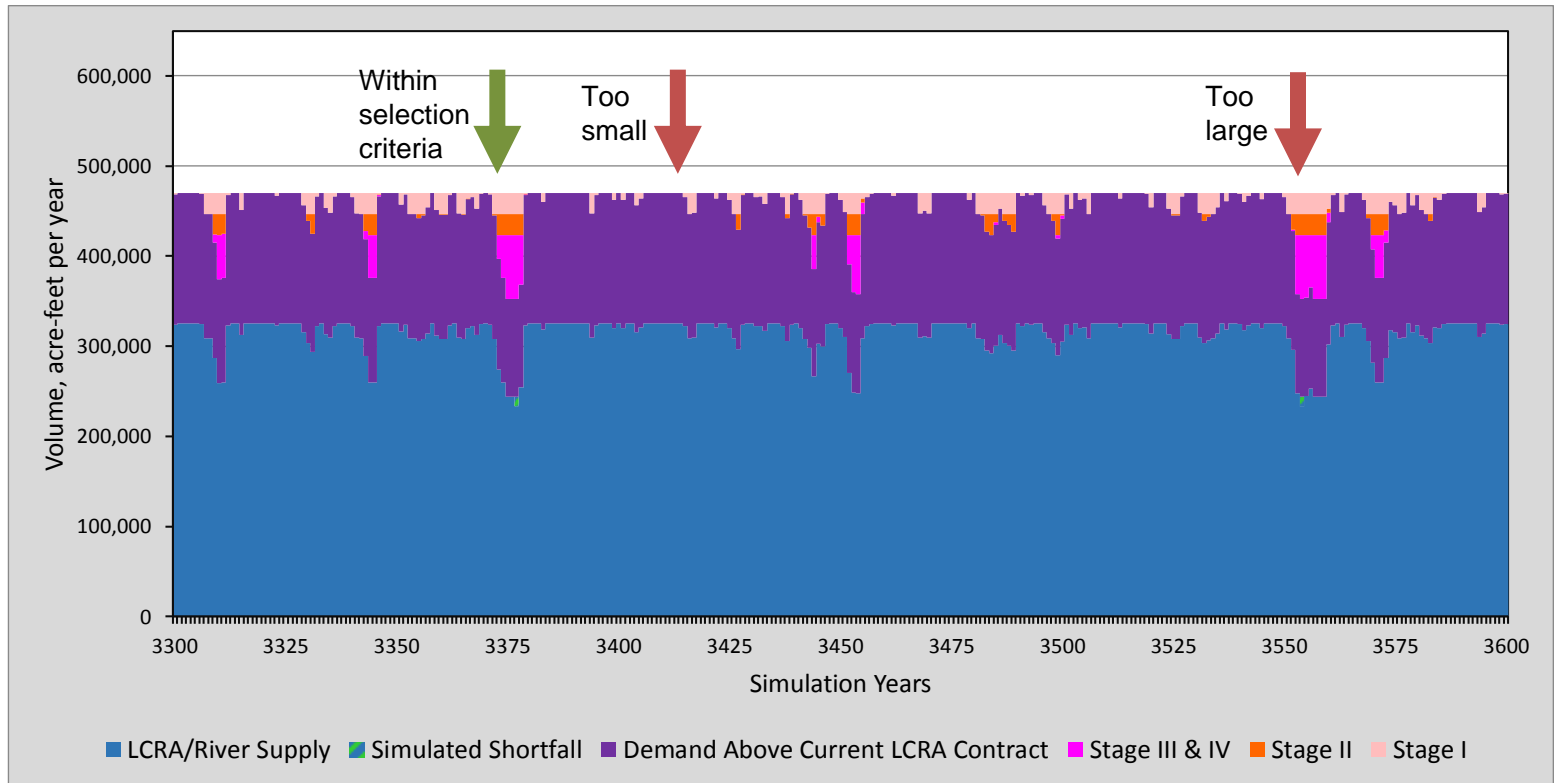
This equates to **47.3%** risk of at least 1 occurrence in 100 years.

Drought events with a lower risk of occurrence, down to 20%, were selected for analysis.

## Needs Summary

### Selecting droughts worse than the drought of record

2115 Demands, Stationary Climate



## Needs Summary

### Droughts Worse than the Drought of 2007-2016

		Cumulative Need, ac-ft	Consecutive Number of years in Stage III or IV	Average Need per year, ac-ft	Max Need per year, ac-ft		Cumulative Need, ac-ft	Consecutive Number of years in Stage III or IV	Average Need per year, ac-ft	Max Need per year, ac-ft		Average Need per year, ac-ft	Average Need per year, ac-ft
2020	Needs During Prolonged Drought Needs Above Current LCRA Contract	18,946	1.2	16,239	18,763		No Significant Change from Period of Record						
		-	-	-	0		No Significant Change from Period of Record						
2040	Needs During Prolonged Drought Needs Above Available Supply	40,214	1.8	22,154	31,403		135,841	5.0	27,301	32,031			
		-	-	-	0		-	-	-	0			
2070	Needs During Prolonged Drought Needs Above Available Supply	135,783	3.8	35,884	44,882		407,303	9.3	43,820	46,677			
		-	-	-	0		-	-	-	0			
2115	Needs During Prolonged Drought Needs Above Available Supply	274,590	4.6	59,678	70,507		830,200	11.5	71,886	74,738			
		-	-	-	145,050		-	-	-	173,253			
	Simulated Shortfall												



# Questions and Discussion

# Supply Options Screening

## Supply Option Types

#	Description	Decent.	Desal	GW	Reuse	Storage	Surface
1	ASR in Northern Edwards / Trinity (FEA 5)					●	
2	Direct non-potable reuse (purple pipe system)				●		
3	Lake Austin Operations						●
4	Stormwater Harvesting	●					
5	Rainwater Harvesting (community scale)	●					
6	Sewer mining (wastewater skimming)	●					
7	Distributed Wastewater Systems	●					
8	Capture Lady Bird Lake Inflows (FEA 4)						●
9	IPR – bed and banks				●		
10	IPR – Lady Bird Lake (FEA2)				●		
11	IPR – Alluvial Aquifer				●		
12	Direct Potable Reuse				●		
13	Brackish Groundwater Desal		●				
14	Seawater Desal		●				
15	Lake Evaporation Suppression					●	
16a	Conventional Groundwater (Developed)			●			
16b	Conventional Groundwater (Purchased)			●			
17	Additional supply from LCRA						●
18a	Carrizo-Wilcox ASR (Infiltration)					●	
18b	Carrizo-Wilcox ASR (Conventional)					●	
19	Regional partnerships						
20 7/11	Interbasin transfers	AIWRPCTF					●
21	Off Channel Reservoir					●	

# Lot-Scale Decentralized Options on Demand Management List

- All lot scale decentralized options are being characterized as Demand Management Options as part of three options:
  - Alternative water - Ordinances (Rainwater, Stormwater, Graywater, and Blackwater)
  - Alternative Water – Incentives (Rainwater and Stormwater)
  - Alternative Water Incentives (Graywater and Blackwater)
- Lot-scale Decentralized Options that will be considered for inclusion in portfolios
  - Rainwater Harvesting
  - Stormwater Harvesting
  - Blackwater Reuse
  - Graywater Reuse

# Annual Unit Cost

- **Total Annual Cost (\$/yr)** – sum of all annual capital, debt service, upfront, and O&M costs
- **Annual Unit Cost (\$/AF/yr)** – total annual cost of the option (in current dollars) divided by the new supply yield.

Annual Cost	Bin
\$0/AF to \$500 / AF	4
\$500/AF to \$2,000 / AF	3
\$2,000 / AF to \$4,000 / AF	2
\$4,000 / AF and above	1

# Yield Metric

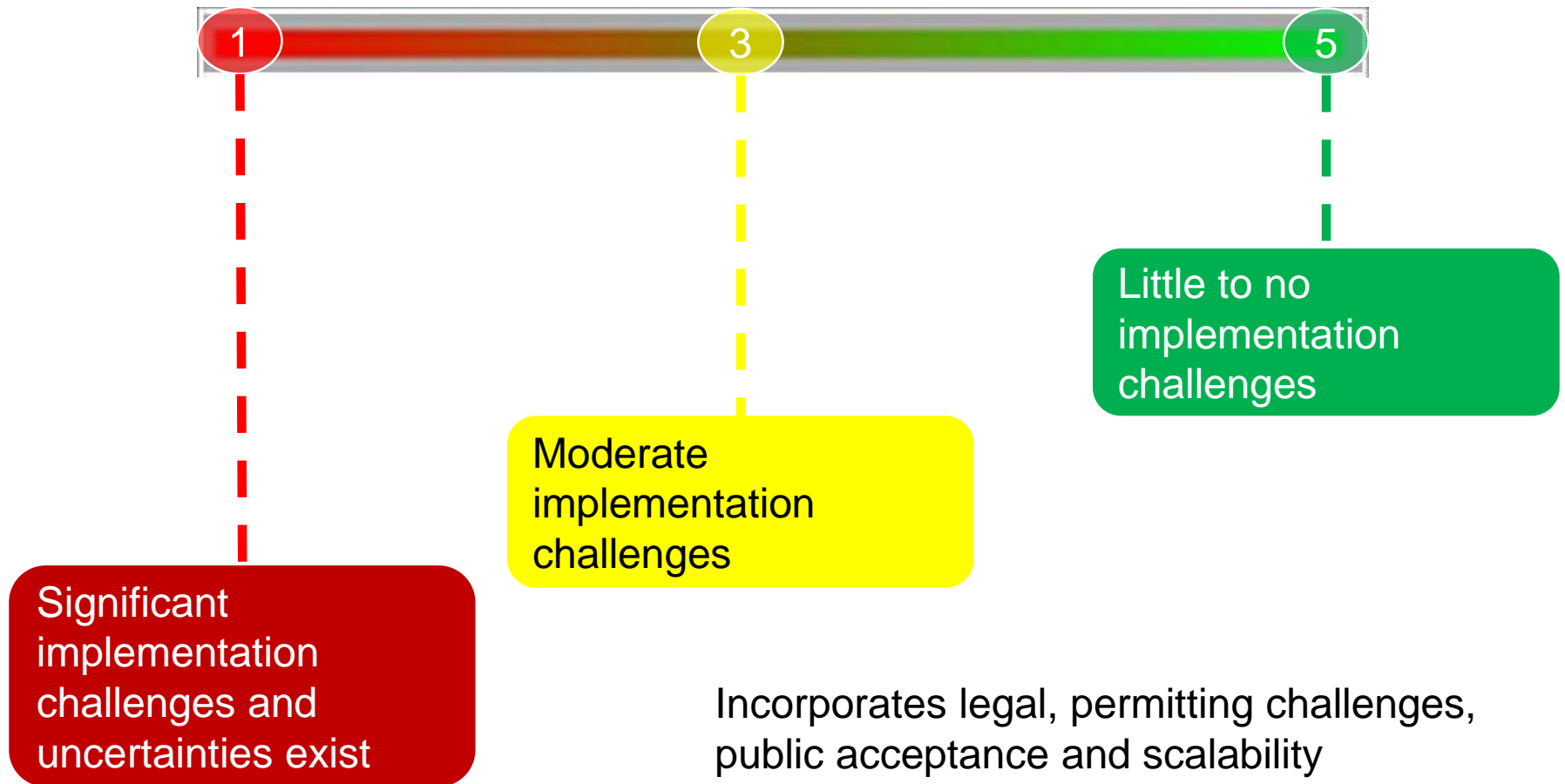
- **Yield (AF)** – the estimated incremental average annual new supply to Austin Water
- Yield bin reflects an estimated maximum potential yield for each option

Yield	Bin
0 – 10,000 AF	1
10,000 AF to 35,000 AF	2
35,000 AF and above	3

# Performance Score

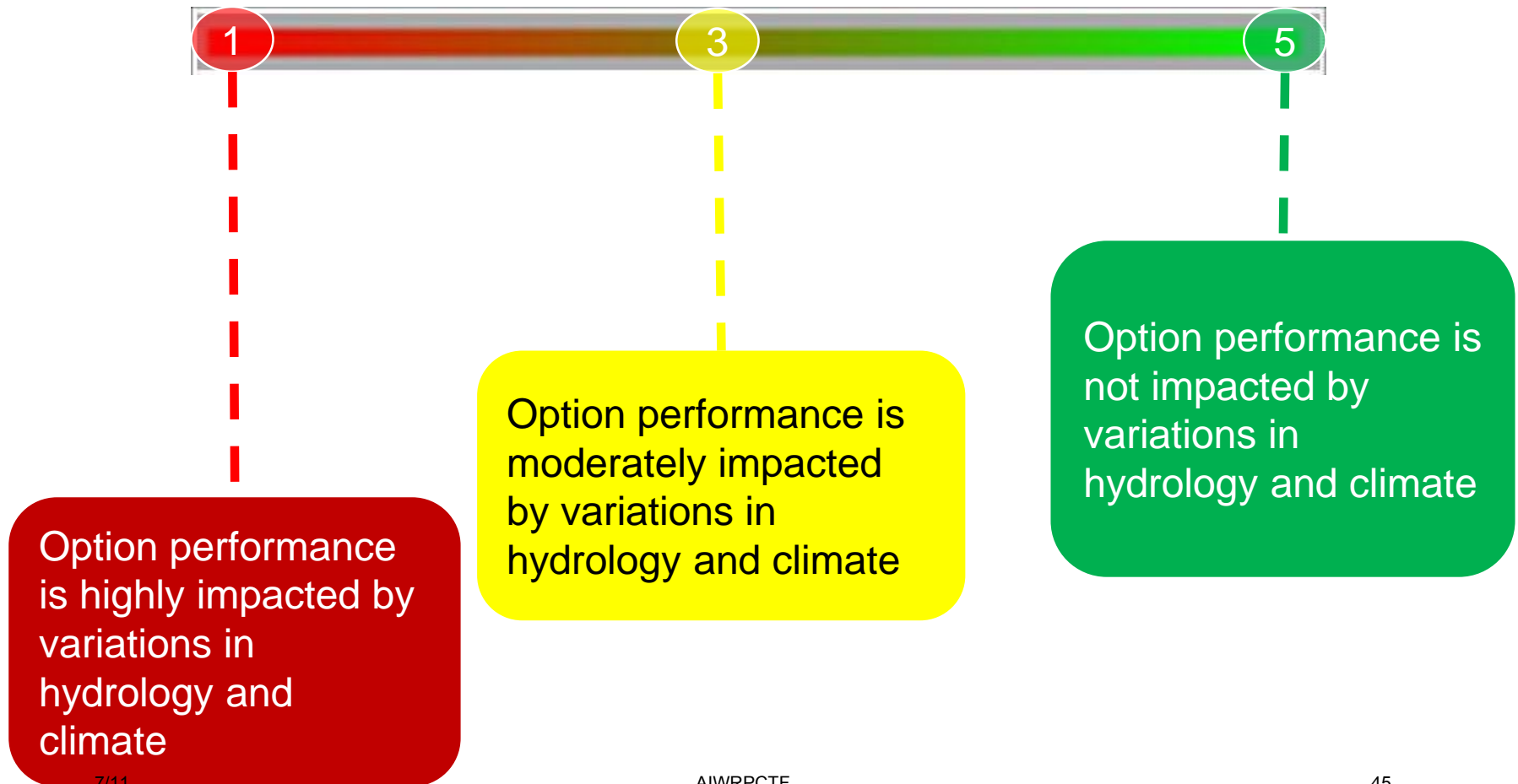
- Performance Score based on two sub-criteria
  - Implementation Challenges
  - Resiliency
- Weights have been established for each sub-criteria
  - Implementation Challenges – 50%
  - Resiliency – 50%

# Implementation Challenge Score





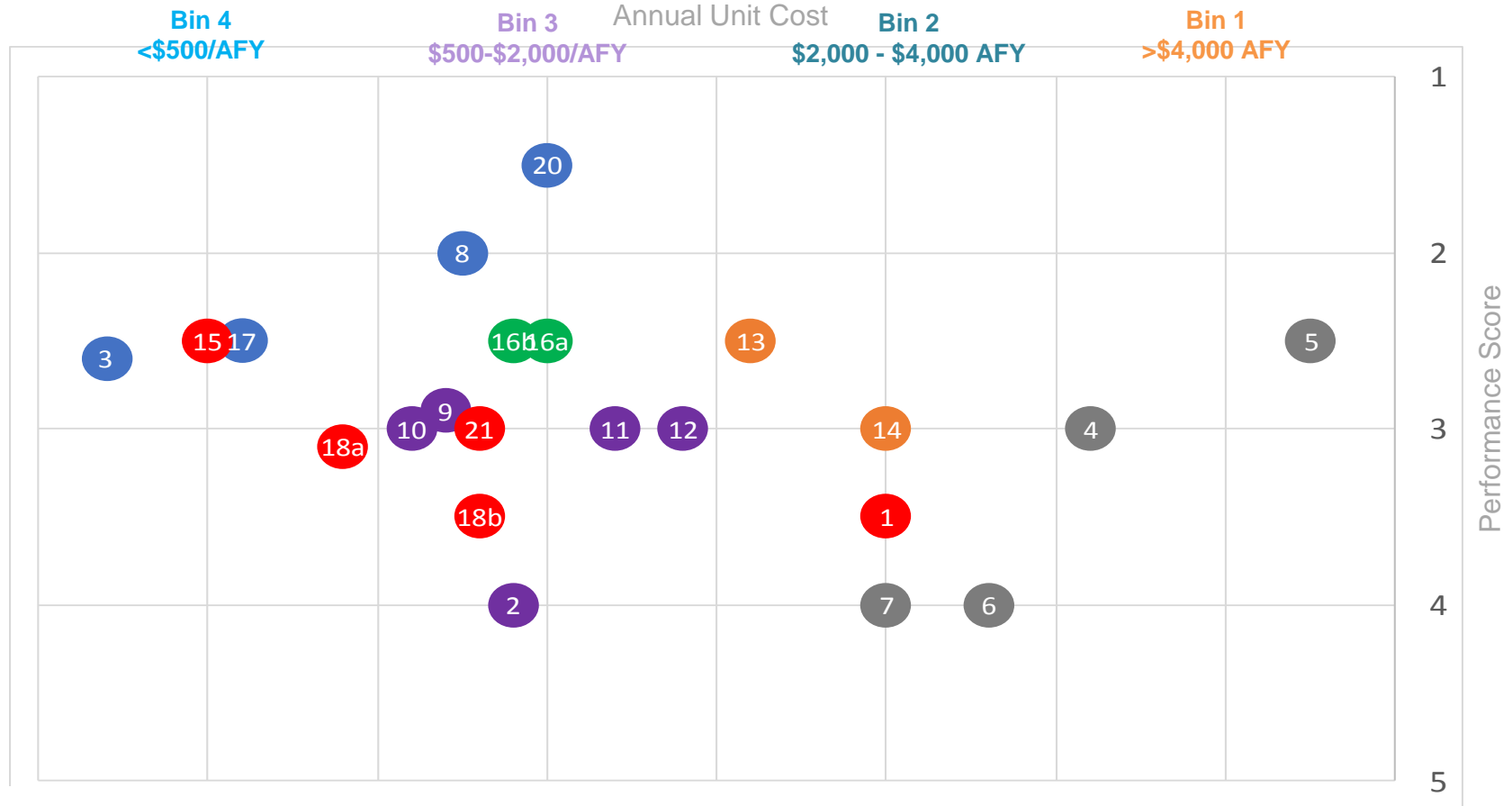
# Resiliency Score



## DRAFT Screening Summary

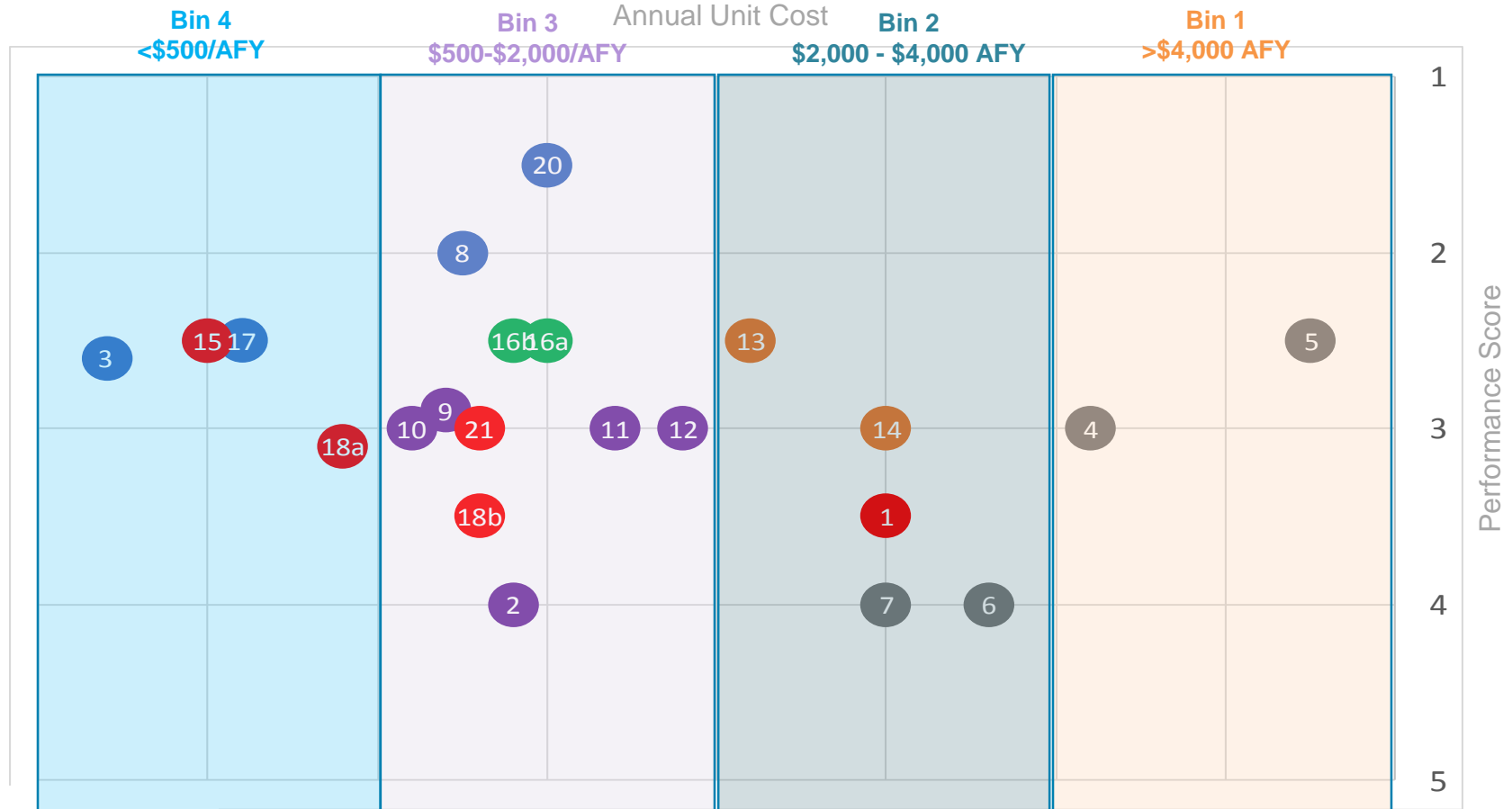
Option	Description	Cost Bin	Total Performance Score	Yield Bin - Adjusted for Maximum Potential Yield	Intended Use - Drought, Constant, or Variable	Supply Category	Screening Status
1	ASR (FEA 5)	2	3.5	2	D	Storage	Candidate (Combo - Narrative)
2	Direct non-potable reuse (purple pipe system)	3	4	3	C	Reuse	Candidate
3	Lake Austin Operations	4	2.5	1	D	Surface Water	Best Practice
4	Stormwater Harvesting	1	3	2	C	Decentralized	Candidate - Bubble
5	Rainwater Harvesting (community scale)	1	2.5	1	C	Decentralized	Deferred
6	Sewer mining (wastewater skimming)	2	4	2	C	Decentralized	Candidate - Bubble
7	Distributed wastewater systems	2	4	2	C	Decentralized	Candidate - Bubble
8	Capture Lady Bird Lake Inflows (FEA 4)	3	2	1	V	Surface Water	Candidate (Combo)
9	IPR – bed and banks	3	3	2	V	Reuse	Candidate (Combo)
10	IPR – Lady Bird Lake (FEA2)	3	3	2	D	Reuse	Candidate (Combo)
11	IPR – Alluvial Aquifer	3	3	2	V	Reuse	Candidate (Combo)
12	Direct Potable Reuse	3	3	2	V	Reuse	Candidate
13	Brackish Groundwater Desal	2	2.5	2	C	Desalination	Deferred
14	Seawater Desal	2	3	3	C	Desalination	Large Supply Candidate (Combo - Representative)
15	Lake Evaporation Suppression	4	2.5	1	D	Storage	Candidate (Combo)
16a	Conventional Groundwater (Developed)	3	2.5	3	V	Groundwater	Large Supply Candidate (Combo - Narrative)
16b	Conventional Groundwater (Purchased)	3	2.5	3	V	Groundwater	Large Supply Candidate (Combo - Narrative)
17	Additional supply from LCRA	4	2.5	3	C	Surface Water	Large Supply Candidate
18a	Carrizo-Wilcox ASR (Infiltration)	4	3	2	D	Storage	Candidate (Combo - Narrative)
18b	Carrizo-Wilcox ASR (Conventional)	3	3.5	2	D	Storage	Candidate (Combo - Representative)
19	Regional partnership with Corpus Christi	TBD	TBD	TBD	TBD	TBD	Implementation
20	Interbasin transfers	3	1.5	3	C	Surface Water	Large Supply Candidate - (Combo - Narrative)
21	Off Channel Reservoir	3	3	2	C	Storage	Candidate (Combo)

# Draft Total Performance Score vs Annual Unit Cost



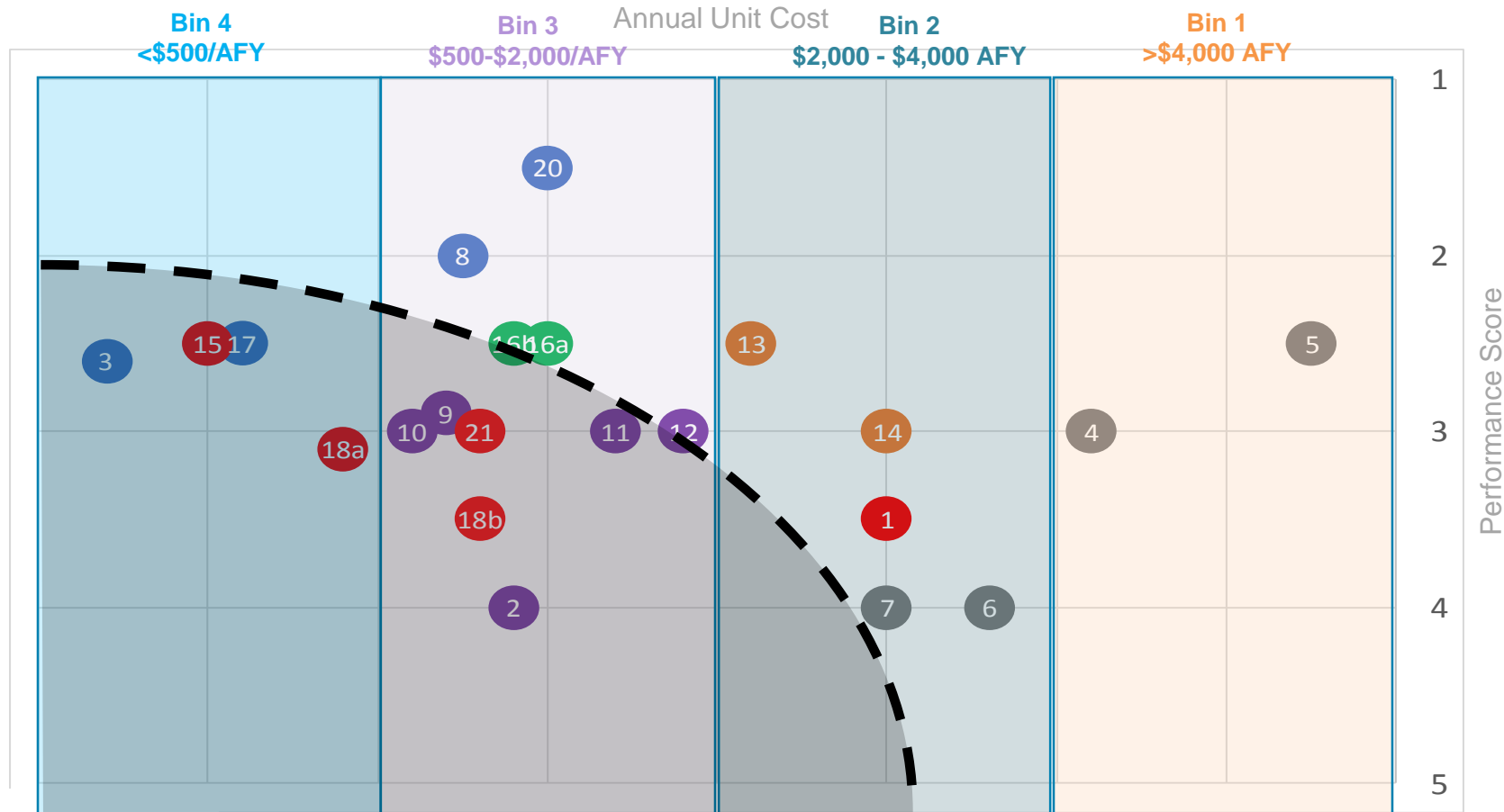
Storage  
Centralized Reuse  
Decentralized (community)  
Surface Water  
Desalination  
Groundwater

# Draft Total Performance Score vs Annual Unit Cost



Storage  
Centralized Reuse  
Decentralized (community)  
Surface Water  
Desalination  
Groundwater

# Draft Total Performance Score vs Annual Unit Cost



Storage  
Centralized Reuse  
Decentralized (community)  
Surface Water  
Desalination  
Groundwater

Bin 4	Bin 3	Annual Unit Cost	Bin 2	Bin 1
<\$500/AFY	\$500-\$2,000/AFY		\$2,000 - \$4,000 AFY	>\$4,000 AFY



## Candidates for Top Ten Supply Options

#	Description	Decent.	Desal	GW	Reuse	Storage	Surface
1/18	Aquifer Storage and Recovery (Conventional Carrizo-Wilcox to be used as representative option for analysis)					●	
2	Direct non-potable reuse - purple pipe system				●		
8/9/10/11	IPR combined with Capture Lady Bird Lake Inflows (IPR - Lady Bird Lake to be used as representative option for analysis)				●		●
12	Direct Potable Reuse				●		
15/21	New Off Channel Reservoir combined with Lake Evaporation Suppression					●	

### On the Bubble Options

4	Stormwater Harvesting	●					
6	Sewer mining - wastewater skimming	●					
7	Distributed Wastewater Systems	●					

### Large Scale Supplies

17	Additional supply from LCRA						●
14/16/20	Imported Option Category		●				
7/11	<ul style="list-style-type: none"> <li>Option 14 - Seawater Desalination (representative option used for analysis)</li> <li>Option 16 a/b - Conventional Groundwater</li> <li>Option 20 - Interbasin Transfer</li> </ul>			●			●

# Other Options

#	Description	Decent.	Desal	GW	Reuse	Storage	Surface
<b>Best Practice</b>							
3	Lake Austin Operations						●
<b>Implementation Approach</b>							
19	Regional partnerships						

<b>Deferred Options</b>							
5	Rainwater Harvesting - community scale	●					
13	Brackish Groundwater Desal		●				



# Questions and Discussion



# BACKUP MATERIALS



## MEMORANDUM

**To:** Mayor and Council

**From:** Greg Meszaros, Director, Austin Water

**Date:** June 28, 2017

**Subject:** **Water Forward – Austin’s Integrated Water Resource Plan Update**

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This memo is to provide an update on Water Forward, Austin’s 100-year Integrated Water Resource Plan. Development of the plan is being led by Austin Water with support from the Council-appointed Water Forward Task Force, which also includes ex-officio members from various City departments. The Water Forward Task Force has been meeting monthly for the past two years, since first convened in May 2015. The team is working to complete the plan by summer of 2018.

### **Background**

During the recent historic drought, Council created the Austin Water Resource Planning Task Force (2014 Task Force) to make recommendations regarding future water planning. One of the key recommendations of the 2014 Task Force was to develop an Integrated Water Resource Plan (IWRP). In December 2014, Council passed a resolution that created the Austin Integrated Water Resource Planning Community Task Force (Water Forward Task Force) to support the IWRP development process, and directed staff to hire a consultant to assist in the planning process. A table of the Council-appointed Task Force and City Department ex-officio members is attached.

In June 2016, Council approved contracting with CDM Smith and a group of sub-consultants as the main IWRP consulting team. Other consultants assisting with the plan include a climate scientist to develop data to evaluate climate change impacts and a hydrology expert to perform river system modeling analyses. These two additional consultants are working in collaboration with Austin Water and the main IWRP Consultant Team.

### **Update on the Process**

Through the plan process, the team is developing tools and methods to forecast Austin’s water needs and evaluate climate change and drought risk. Water use forecasts have been developed through the year 2115 using a new tool for estimating how water demand is different across the planning area. The projections forecast water demand for end uses like outdoor water use and water for clothes washing and toilet flushing, as examples. Using these forecasts, preliminary estimates of future water

needs were developed by running a river basin water availability model under different hydrology and climate change scenarios.

With the water demand and preliminary needs information in mind, lists of potential water supply and demand management options were created. The top 10 demand management options from the initial list have been selected through a screening process. The water supply strategies are currently being screened down to a list of 10 options.

This summer, for the 20 selected demand and supply options, additional details such as potential water savings or water supply yield, cost, and other factors will be developed. Once these options are characterized, different combinations of options will be sorted into portfolios based on themes, such as “minimize cost” or “maximize reliability”. Emerging themes have been identified based on public input thus far. Near-term efforts for gathering additional public and stakeholder feedback on portfolio themes include the upcoming Summer Series and Public Workshop #4 in mid-August. More information about the summer series and upcoming workshops is included in the following sections.

After themed portfolios are created, they will be analyzed and hybrid portfolios that combine the best aspects of multiple themes may be created. In the fall, analysis of the portfolios will center on scoring based on plan objectives, such as water supply benefits and social impacts. Ultimately, the process of evaluating portfolios of supply and demand management options will lead to plan recommendations. With input from the Task Force, stakeholders and the public, plan recommendations are expected to be complete by June 2018.

### **Public Outreach**

Public outreach and engagement continue to be key focus areas of the Water Forward planning process. Austin Water, working in collaboration with the Task Force and others, is committed to an ongoing and robust public engagement effort as part of this project. Staff and the consultant team work to implement the project’s dynamic Public Outreach Participation Plan to extend public outreach efforts in each Council district and across a wide range of demographic and interest groups.

Water Forward public outreach goals include:

- Identifying community values that should be reflected in the plan
- Seeking input from stakeholders which reflects the diversity of Austin’s population and customers
- Informing and educating the community throughout the plan development process

In addition to Task Force meetings, outreach efforts include attendance at community events, presentations at community group meetings, meetings with stakeholder groups,

and online and printed surveys. So far in the project, there have been three Water Forward public workshops conducted and three targeted stakeholder meetings held. A summary listing and location map of Water Forward public and stakeholder engagement events, to date, are included as Attachments 2 and 3.

#### Public Workshops:

##### Conducted:

- Workshop #1 – September 6: Overview of IWRP and Objectives
- Workshop #2 – February 8: Future Water Supply Needs and Strategies to Meet Them
- Workshop #3 – April 4: Future Water Supply Needs and Strategies to Meet Them – Focus on Water Supply Options

##### Planned:

- Workshop #4 – August 2017: Portfolio Themes
- Workshop #5 – Early 2018: Draft Plan Recommendations

In addition to public outreach in Austin, the project team has made several presentations to provide information sharing with regional entities, including several neighboring cities and others.

#### **Public Outreach Summer Series**

Planning is now underway for a series of public outreach meetings to be held over the summer in each City Council District across the city. These meetings are being referred to as the “Summer Series”. These meetings are planned for July and August and should be completed prior to the next planned public workshop in mid-August (an invitation flyer with the Summer Series meeting dates is included as Attachment 4). Staff will coordinate on Summer Series meetings with individual Council Offices to the extent desired.

Throughout the plan development process the project team has been gathering public input through surveys, presentations, and meetings. A key public input survey to the process is the “Community Values” survey. Through this survey, the project team has gathered community values input which was used to identify emerging themes. During the Summer Series, the project team plans to gather additional input focusing on themes to further inform the next stages in the IWRP development process, including development of plan portfolios.

Along with the Summer Series and additional community outreach and stakeholder activities, two more public workshops are planned at later stages in the project.

### **City Council Next Steps**

Austin Water is planning a briefing for Council in the December to January time-frame. At that time we will have themed portfolios developed and preliminary portfolio analysis results. Themed portfolios are combinations of different groupings of demand management and water supply options. The portfolio analysis process will support exploration of various tradeoffs and development of plan recommendations.

If you would like additional information about the Water Forward effort or have any questions please contact me.

cc: Elaine Hart, Interim City Manager  
Robert Goode, P.E., Assistant City Manager  
Daryl Slusher, Assistant Director, Austin Water  
Kevin Critendon, P.E., Assistant Director, Austin Water  
Teresa Lutes, P.E., Managing Engineer, Austin Water  
Marisa Flores Gonzalez, Senior Planner, Austin Water

### **Attachments:**

- 1) Current Water Forward Task Force Members (June 2017)
- 2) Water Forward Public and Stakeholder Engagement Events (through June 15, 2017)
- 3) Location Map of Water Forward Public and Stakeholder Engagement Events (through June 15, 2017)
- 4) Summer Series Invitation Flyer with Meeting Dates

### Attachment 1 – Current Water Forward Task Force Members (June 2017)

<b>Task Force Members</b>	<b>District</b>	<b>Appointed by (except where noted)</b>
Sharlene Leurig – Chair	District 4	Council Member Casar
Jennifer Walker – Vice Chair	District 9	Mayor Pro Tem Tovo
William Moriarty		Mayor Adler
Clint Dawson	District 1	Council Member Houston
Sarah Richards	District 2	Council Member Garza
Perry Lorenz	District 3	Council Member Renteria
Lauren Ross	District 5	Council Member Kitchen
Todd Bartee*	District 6	Council Member Flannigan
Robert Mace	District 7	Council Member Pool
Marianne Dwight	District 8	Council Member Troxclair
Diane Kennedy*	District 10	Council Member Alter

\* Task Force Members Bartee and Kennedy were appointed by Council Member Zimmerman and Council Member Gallo, respectively.

<b>Ex-Officio Members</b>	<b>Department/Office</b>
Greg Meszaros	Austin Water
Kathleen Garrett	Austin Energy
Sam Angoori	Austin Resource Recovery
Rebecca Giello	Neighborhood Housing & Community Development
Kerry O'Connor	Office of Innovation
Lucia Athens	Office of Sustainability
Sara Hensley	Parks and Recreation
Mike Personett	Watershed Protection



## WATER FORWARD

# SUMMER SERIES

## Coming to a Library Near You!

Austin Water is collaborating with other city departments, a Citizen Task Force and the community to develop a water plan for the next century. The 100-year plan will recommend strategies to best manage Austin's water supply now and in the future.

Please join us at one of our Summer Series events. Our team will be out in all ten Council Districts this summer to share more about Water Forward and listen to you!

And what's the summer without water and popsicles? Please enjoy a cool treat at every location.

***\*Children's activities will be available. Must be accompanied by an adult.***

For more information about Water Forward and to sign up for our electronic newsletter, visit [austintexas.gov/waterforward](http://austintexas.gov/waterforward).

**See you this summer!**

**SAT 7/8** 11:30 am - 1:00 pm  
Southeast Branch Library  
District 2

**SAT 7/15** 2:30 pm - 4:00 pm  
Milwood Branch Library  
District 7

**MON 7/17** 6:00 pm - 7:30 pm  
Spicewood Springs Branch Library  
District 6

**WED 7/19** 6:00 pm - 7:30 pm  
Twin Oaks Branch Library  
District 9

**SAT 7/22** 2:00 pm - 3:30 pm  
Little Walnut Creek Branch Library  
District 4

**SAT 7/29** 2:00 pm - 3:30 pm  
Ruiz Branch Library  
District 3

**MON 7/31** 6:30 pm - 8:00 pm  
Old Quarry Branch Library  
District 10

**SAT 8/5** 2:00 pm - 3:30 pm  
Hampton Branch Library  
District 8

**TUE 8/8** 6:00 pm - 7:30 pm  
Manchaca Branch Library  
District 5

**SAT 8/12** 11:00 am - 12:30 pm  
Windsor Park Branch Library  
District 1



7/11



AIWRPCTF

**WATER FORWARD**  
INTEGRATED WATER RESOURCE PLAN

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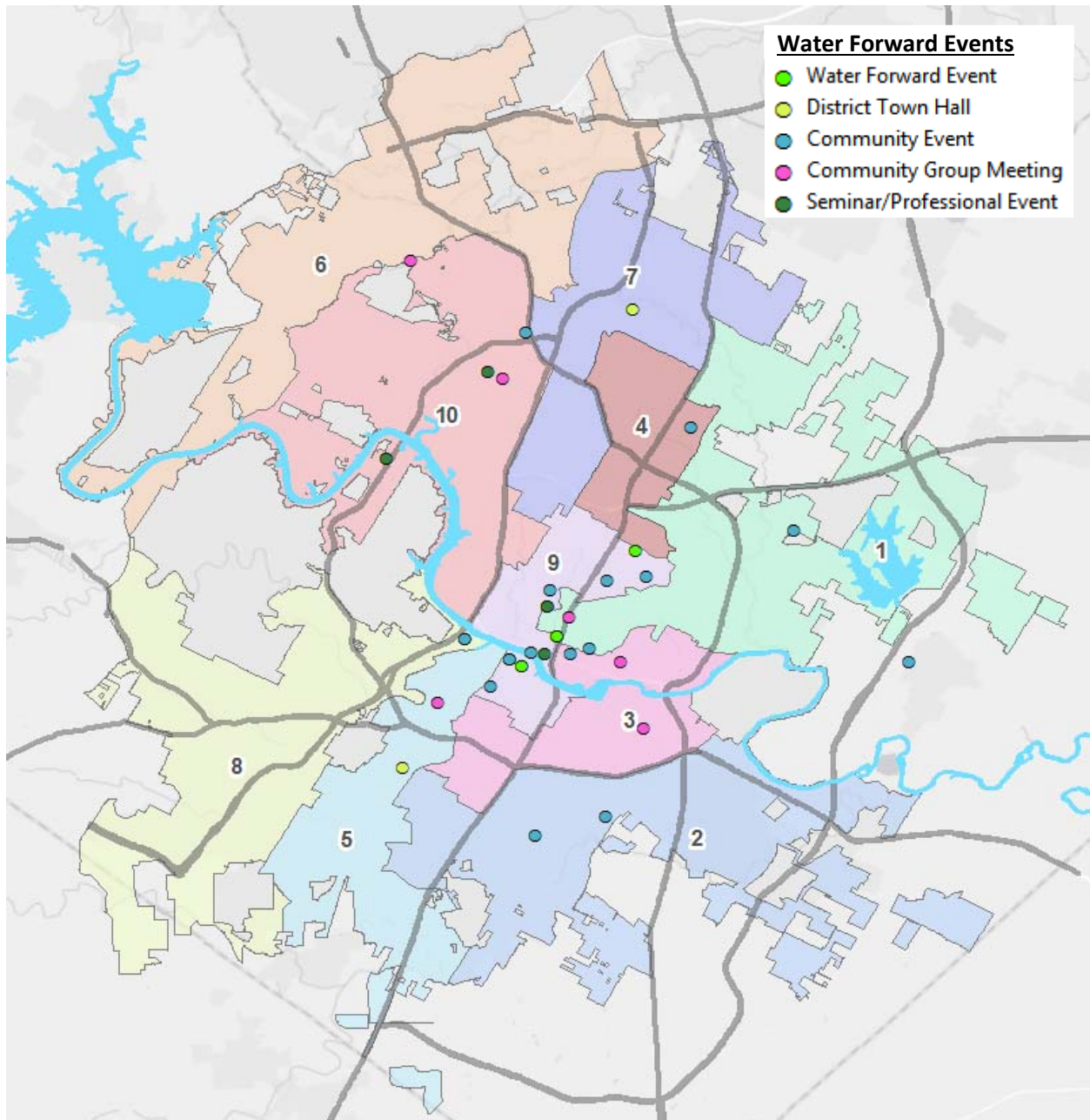
Water Forward Public and Stakeholder Engagement Events

Event Type	Event Name	Date	Location	Zip Code	District	Type	Water Forward Event Topics
Community Event	Imagine Austin Speaker Series: Water Forward - Planning for the Next 100 Years	8/3/2016	University of Texas Thompson Center	78712	1	Presentation; materials	
Water Forward Event	Public Workshop #1	9/7/2016	Waller Creek Center	78701	9	Presentation; materials	
Community Event	Planning & Zoning N. Burnet Rd. Better Block Event	9/11/2016	Burnet Road at Clay Avenue	78756	7	Booth; materials	
Community Event	AustinCorps High School Program	9/14/2016	ARR Todd Lane	78744	2	Materials	
Community Event	Carver Library Tabling	9/17/2016	Carver Library	78702	1	Booth; materials	
Seminar/Professional Event	Austin Hotel & Lodging Expo	9/28/2016	JW Marriott	78701	9	Booth; materials	
Seminar/Professional Event	Commercial Programs Technical Workshop	9/28/2016	LCRA- Dalchau Center	78744	2	Materials	
Community Event	National Night Out Kick off Party	10/1/2016	Mueller Neighborhood	78722	9	Booth; materials	
Community Group Meeting	South River City Citizen's Meeting	10/3/2016	Life In The City United Methodist Church	78704	9	Presentation; materials	
Community Event	Southeast Branch Library	10/8/2016	Southeast Branch Library	78744	2	Booth; materials	
Community Event	25th Annual Austin Arbor Day	10/22/2016	Austin Tennis Center	78724	1	Booth; materials	
Community Event	Talk Green to Me- A Gray Water Overview	10/27/2016	Twin Oaks Library	78704	9	Materials	
Community Event	UT Campus Sustainability Week Local Impact Day	10/27/2016	UT East Mall	78712	9	Booth; materials	
Community Event	AE Community Connections Resource Fair	10/29/2016	Mendez Middle School	78744	2	Booth; materials	
Community Group Meeting	Northwest Austin Neighborhood Association	11/5/2016	St. Matthew's Episcopal Church	78759	10	Materials	
Community Event	Grow Green Homeowner's Training	11/19/2016	One Texas Center	78704	9	Materials	
Community Event	Chuy's Children Giving to Children Parade	11/26/2016	Congress Avenue	78701	9	Materials	
					outside of district boundaries		
Community Event	Gilbert Elementary College and Career Fair	12/9/2016	Gilbert Elementary	78724		Materials	
Community Event	Frost Bank Home Improvement Mini- Expo	12/10/2016	Dobie Middle School	78753	4	Materials	
Community Event	Pleasant Valley Market	12/17/2016	Pleasant Valley Market	78741	3	Booth; materials	
Water Forward Event	Targeted Stakeholder Meeting #1	1/19/2017	Waller Creek Center	78701	9	Targeted Stakeholder Meeting	Demand Management Options with focus on Landscape Transformation and Irrigation Efficiency Ordinances and Incentives
Water Forward Event	Targeted Stakeholder Meeting #2	1/24/2017	Waller Creek Center	78701	9	Targeted Stakeholder Meeting	Demand Management Options with focus on Alternative Water Ordinances and Incentives that may include rainwater, gray water, and A/C condensate
Water Forward Event	Targeted Stakeholder Meeting #3	1/26/2017	Waller Creek Center	78701	9	Targeted Stakeholder Meeting	Demand Management Options with focus on: -Development-focused Water Use Estimates and Benchmarking -Commercial, Industrial, and Institutional and Non-residential Ordinances -Plumbing Codes and Ordinances and Fixture Incentives -Reclaimed Water (centralized purple pipe system) Ordinances and Incentives
Community Event	Youth Career Fest 2017	1/31/2017	Palmer Events Center	78704	9	Booth; materials	
Seminar/Professional Event	Central Texas Water Efficiency Network Symposium	2/2/2017	Austin Board of Realtors	78759	10	Materials	
Community Event	African American Heritage Network- Black History Luncheon	2/7/2017	Palmer Events Center	78704	9	Booth; materials	
Water Forward Event	Public Workshop #2	2/8/2017	AISD Performing Arts Center	78723	9	Workshop	Future Water Supply Needs and Strategies to Meet Them
Seminar/Professional Event	WaterWise Irrigation Professionals Seminar	2/21/2017	Riverbend Centre	78746	10	Materials	
Seminar/Professional Event	UT Graduate Class, Energy and Earth Resources program	2/27/2017	University of Texas	78705	9	Materials	
Community Event	Zilker Garden Festival	3/25/2017	Zilker Botanical Gardens	78746	8	Booth; materials	
Community Event	Interfaith Dialogue Event	3/26/2017	Servant Church	78722	9	Booth; materials	
Community Event	Zilker Garden Festival	3/26/2017	Zilker Botanical Gardens	78746	8	Booth; materials	



Water Forward Public and Stakeholder Engagement Events

Event Type (WF metric)	Event Name	Date	Location	Zip Code	District	Type	Water Forward Event Topics
Water Forward Event	Public Workshop #3	4/4/2017	One Texas Center	78704	9	Workshop	Future Water Supply Needs and Strategies to Meet Them
Seminar/Professional Event	University of Texas City Forum	4/6/2017	University of Texas Campus	78705	9	Presentation; materials	
Community Event	Texas Water Conference	4/12/2017	Austin Convention Center	78701	9	Materials	
Community Event	IBM Earth Day	4/18/2017		78758	7	Booth; materials	
Community Event	TX Parks and Wildlife Earth Day Event	4/20/2017	TPWD	78744	2	Booth; materials	
Community Event	IBM Earth Day	4/20/2017		78758	7	Booth; materials	
Community Event	Arboretum Plaza Earth Day	4/21/2017	Arboretum Plaza	78759	10	Booth; materials	
Community Event	Earth Day ATX	4/22/2017	Huston-Tillotson University	78702	1	Booth; materials	
Community Event	Sun Radio Earth Day	4/23/2017	The Historic Scoot Inn	78702	3	Booth; materials	
Community Event	Apartment Association Trade Show	5/4/2017	Palmer Events Center	78704	9	Booth; materials	
Community Group Meeting	Save Barton Creek Association Meeting	5/5/2017	Baker Street Pub and Grill	78704	5	Presentation; materials	
District Town Hall	District 7 Town Hall	5/13/2017	ACC Northridge Campus	78758	7	Booth; materials	
District Town Hall	Northwest Austin Coalition Meeting - District 6 Town Hall	5/22/2017	Spicewood Springs Library	78759	6	Presentation; materials	
Community Group Meeting	El Concilio - A Coalition of Mexican American Neighborhoods	5/25/2017	Cepeda Library	78702	3	Presentation; materials	
Community Group Meeting	Montopolis Neighborhood Association Meeting	5/30/2017	Montopolis Recreation Center	78741	3	Presentation; materials	
Community Event	Cool House Tour	6/11/2017	2504 Moreno Street	78723	1	Booth; materials	
Community Group Meeting	Austin Neighborhoods Council - East	6/13/2017	1601 IH 35	78702	1	Presentation; materials	
District Town Hall	District 5 Town Hall	6/13/2017	5500 Manchaca Rd.	78745	5	Presentation; materials	



Water Forward: Finalized Integrated Water Resources Plan Objectives

Primary Objective	OLD Objective Weight	NEW Objective Weight	Sub-Objective	OLD Sub-Objective Weight	NEW Sub-Objective Weight	Defining Question	Performance Measure	OLD	NEW
Water Supply Benefits	30%	35%	Maximize Water Reliability	50%	57%	PLACEHOLDER – TO BE REFINED How does the portfolio perform in terms of reliability (how often is there shortage), vulnerability (how large is the shortage), recovery (how fast is the recovery from shortages) under various hydrologic conditions, including climate change scenarios?	PLACEHOLDER – TO BE REFINED Water Supply Index (0 to 1) based on WAM modeling results	15%	20%
			Maximize Local Control	25%	21%	To what extent does AW have control over the quantity and storage of water and operation of options (especially during drought periods) included in the portfolio?	Proportion of total supply yield from locally controlled sources	7.5%	7.5%
			Maximize Supply Diversification	25%	21%	How many independent water supply and demand-side management options above a minimum yield threshold are included in the portfolio?	# of supply/demand-side management sources (above minimum yield threshold)	7.5%	7.5%
Economic Impacts	20%	20%	Maximize Cost-Effectiveness	75%	75%	What is the total capital (construction) and operations/maintenance costs of all projects/programs in the portfolio over the lifecycle, divided by the sum of all water yield produced by the portfolio?	Unit cost (\$/AF) expressed as a present value sum of all costs over the lifecycle, including utility and customer costs.	15%	15%
			Maximize Advantageous External Funding	25%	25%	Does the portfolio have an opportunity for advantageous external funding from Federal, State, local, and private sources?	External Funding Score (1-5), where 1 = low potential and 5 = high potential	5%	5%
Environmental Impacts	20%	20%	Minimize Ecosystem Impacts	40%	40%	To what extent does the portfolio positively or negatively impact receiving water quality (e.g., streams, river, lakes), terrestrial and aquatic habitats throughout Austin, and net streamflow effects both upstream and downstream from Austin?	Ecosystem Impact Score (1-5), where 1 = high combined negative impacts and 5 = high combined positive impacts	8%	8%
			Minimize Net Energy Use	30%	30%	What is the net energy requirement of the portfolio, considering energy generation?	Incremental net change in kWh	6%	6%
			Maximize Water Use Efficiency	30%	30%	What is the reduction in potable water use from water conservation, reuse and rainwater capture for the portfolio?	Potable per capita water use (gallon/person/day)	6%	6%
Social Impacts	15%	13%	Maximize Multi-Benefit Infrastructure/Programs	35%	23%	To what extent does the portfolio provide secondary benefits such as enhanced community livability/beautification, increased water ethic, ecosystem services, or others?	Multiple Benefits Score (1-5), where 1 = low benefits and 5 = high benefits	5.25%	3%
			Maximize Net Benefits to Local Economy	35%	23%	To what extent does the supply reliability and water investments of the portfolio protect and improve local economic vitality, including permanent job creation?	Local Economy Score (1-5), where 1 = high negative impact and 5 = high positive impact	5.25%	3%
			Maximize Social Equity and Environmental Justice	30%	54%	To what extent does the portfolio support social equity and environmental justice, with emphasis on underserved communities?	Social Equity and Environmental Justice Score (1-5), where 1 = significant support and 5 = minimal support	4.5%	7%
Implementation Impacts	15%	12%	Minimize Implementation Challenges	35%	33%	What implementation challenges will the portfolio face in terms of public acceptance, regulatory approval, and legal/institutional barriers?	Implementation Uncertainty Score (1-5), where 1 = high combined challenges and 5 = low combined challenges	5.25%	4%
			Maximize Scalability	35%	33%	To what extent can the portfolio be incrementally sized over time in terms of supply capacity and demand management?	Scalability Score (1-5), where 1 = small incremental sizing potential and 5 = high incremental sizing potential	5.25%	4%
			Minimize Technical Feasibility Challenges	30%	33%	To what extent does the portfolio rely on emerging and/or unproven technologies?	Technical Feasibility (1-5), where 1 = high reliance on emerging or unproven technologies and 5 = low reliance on emerging or unproven technologies	4.5%	4%

**Austin Water - Demand Assumptions for Water Forward Modeling**  
**DRAFT - SUBJECT TO CHANGE, 7/5/2017**

**Climate Adjusted Demands**

	DEMAND CATEGORY / PARAMETER All Demands in units of acre-feet per year.	Year 2020	Year 2040	Year 2070	Year 2115	Year 2040	Year 2070	Year 2115
[1]	<b>Firm Demands</b>					<b>2.0%</b>	<b>4.0%</b>	<b>6.0%</b>
[2]	City of Austin Municipal Baseline Demand (Avg Year)	153,853	209,351	299,213	470,050	213,538	311,182	498,253
[3]	City of Austin Municipal Direct Reuse (Avg Year)	3,816	3,816	3,816	3,816	3,816	3,816	3,816
[3a]	City of Austin Parks and LBL Evap	1,415	1,415	1,415	1,415	1,443	1,472	1,500
[4]	<b>City of Austin Baseline + Reclaimed + Parks + LBL Evap Demand Total</b>	<b>159,084</b>	<b>214,582</b>	<b>304,444</b>	<b>475,281</b>	<b>218,797</b>	<b>316,469</b>	<b>503,569</b>
[5]	Fayette County (Power generation downstream of lakes)	20,000	20,000	20,000	20,000	20,000	20,000	20,000
[6]	Sim Gideon / Lost Pines Demand	0	0	0	0	0	0	0
[7]	Llano County (Power generation near/upstream of lakes)	5,500	11,300	20,000	20,000	11,300	20,000	20,000
[8]	<b>LCRA - Power Plant Demand</b>	<b>25,500</b>	<b>31,300</b>	<b>40,000</b>	<b>40,000</b>	<b>31,300</b>	<b>40,000</b>	<b>40,000</b>
[9]	Fayette County	9,000	9,000	9,000	9,000	9,000	9,000	9,000
[10]	Travis County	9,000	9,500	9,500	9,500	9,500	9,500	9,500
[11]	<b>City of Austin - Power Plant Demand</b>	<b>18,000</b>	<b>18,500</b>	<b>18,500</b>	<b>18,500</b>	<b>18,500</b>	<b>18,500</b>	<b>18,500</b>
[12]	Municipal Firm Contract Demand	65,684	97,170	143,046	169,000	99,113	148,768	179,140
[13]	LCRA New Contracts (Region K Table 5-19)	2,877	19,154	33,654	45,000	19,537	35,000	47,700
[14]	Domestic lakeside use	5,000	5,000	5,000	5,000	5,000	5,000	5,000
[15]	LCRA Firm Irrigation	4,800	7,400	10,000	10,000	7,548	10,000	10,000
[16]	BRA - HB 1437 Demand	6,386	25,000	25,000	25,000	25,000	25,000	25,000
[17]	Manufacturing and Mining Demand	16,253	18,277	20,300	24,000	18,642	21,112	25,440
[18]	Other (Conveyance and Emergency Release)	5,000	5,000	5,000	5,000	5,000	5,000	5,000
[19]	<b>Other Municipal, Industrial, Misc Firm Demands</b>	<b>106,000</b>	<b>177,000</b>	<b>242,000</b>	<b>283,000</b>	<b>179,840</b>	<b>249,880</b>	<b>297,280</b>
[20]	<b>Total Firm Demand, Rows 4+8+11+19:</b>	<b>308,584</b>	<b>441,382</b>	<b>604,944</b>	<b>816,781</b>	<b>448,437</b>	<b>624,850</b>	<b>859,349</b>
[21]	STPNOC ROR + LCRA Backup	102,000	102,000	102,000	102,000	102,000	102,000	102,000
[22]	Corpus Christi Garwood Water Rights	35,000	35,000	35,000	35,000	35,000	35,000	35,000
	<b>Interruptible Agricultural Demand</b>							
[23]	Garwood Irrigation Demand (Dry - 90th Percentile)	89,700	85,300	79,200	69,300	90,369	86,546	77,258
[24]	Gulf Coast Irrigation Demand (Dry - 90th Percentile)	147,400	113,400	103,900	88,600	136,928	127,371	111,875
[25]	Lakeside Irrigation Demand (Dry - 90th Percentile)	135,500	128,100	119,300	106,700	137,464	131,580	121,074
[26]	Pierce Ranch Irrigation Demand (Dry - 90th Percentile)	27,000	25,600	24,100	22,300	26,091	25,608	24,390
[27]	<b>Total Interruptible Agricultural Demand, Rows 23+24+25+26:</b>	<b>399,600</b>	<b>352,400</b>	<b>326,500</b>	<b>286,900</b>	<b>390,852</b>	<b>371,106</b>	<b>334,597</b>

Note: All other surface water demands in the water availability model are represented at full water right authorization levels.

## DRAFT Water Supply Options Screening Process Description

A diverse, cost effective and resilient future water supply portfolio are primary objectives of the Austin Water (AW) Integrated Water Resource Plan (IWRP). The process for evaluating portfolios begins with a high-level assessment of potential demand management and water supply options. As there are many possible options, the IWRP developed a method to screen out those options that, at this time, are not recommended for more detailed study for this plan's cycle. With review and input from the public, AW and the Water Forward Task Force have identified over twenty supply options for inclusion in the IWRP screening evaluation. The purpose of Task 6 is to describe these supply options and screen them against high-level criteria including cost, yield, supply type, implementation challenges, and resiliency.

This document summarizes the supply option screening effort, which was outlined as part of Task 2 of the IWRP, and is organized in the follow way; **Section 1** introduces the screening process and associated criteria that were utilized during the screening evaluation and **Section 2** summarizes all the supply options that were screened.

### 1.0 Screening Process and Criteria

The AW IWRP supply option screening process considers multiple criteria and also relies on previously published studies and the best professional judgement of the IWRP project team. Due to the complexity of assessing and comparing various water supply options, data visualization techniques were used to convey the high-level screening information (see Section 3).

The screening process used for this effort focuses on a total of four broad qualitative criteria. In general, criteria were assessed by assigning a categorical bin (cost and yield) or score on a qualitative scale (performance score). In general, higher numbered bins or scores are more favorable to Austin Water's long-term water supply objectives. For screening, the AW IWRP is evaluating each option under its own merit and does not explicitly consider any synergies or potential conflict amongst the group of supply options. These interactions will be considered later in the IWRP process during the portfolio evaluation.

The four main criteria and associated sub-criteria are described below.

**Annual Unit Cost of Water:** The annual unit cost of water (expressed as current dollars per acre-foot) represents the capital cost, including the debt financing interest, plus annual O&M and treatment costs, divided by the average annual supply yield. Development of supply option screening level costs were based on previous work completed by the AW Resource Planning Task Force in 2014, associated feasibility studies, Texas Water Development Board (TWDB) Regional Water Plans, and other related studies that provided relevant costing information. When applicable, assumptions consistent with TWDB Unified Costing Model were applied. For the purposes of screening, supply options are categorized by a range of annual unit costs and assigned to an overall cost bin. The screening level annual unit cost bins are shown in **Table 1-1**. These annual unit costs are considered to be high-level in nature and are primarily intended to be used for comparison within the group of supply options under consideration. Costs will continue to be evaluated with more detail as the AW IWRP moves into supply option characterization and portfolio analysis.

**Table 1-1 Annual Unit Cost Screening Bins**

Annual Unit Cost	Bin
\$0/AF to \$500/AF	4
\$500/AF to \$2,000/AF	3
\$2,000/AF to \$4,000/AF	2
\$4,000/AF and above	1

**Average Annual Yield:** A primary objective of the AW IWRP is to address the quantity and reliability of AW's water resource portfolio. One way this objective is addressed at the screening level is by documenting the potential average annual yield of an option. For each supply option the potential average annual supply volume to Austin Water was estimated. As the AW IWRP moves into the portfolio evaluation step it is critical that various combinations of supply options and demand measures (a portfolio) yield supply volumes and water savings that in total are greater than the projected water needs for AW.

Like costs, supply option yields are categorized by a range and assigned to an overall potential annual yield screening bin. The yield bins are shown in **Table 1-2**. These yield estimates are considered to be high-level in nature and are primarily intended to be used for comparison within the group of supply options under consideration. Supply option yields will continue to be evolved with more detail as the AW IWRP moves into characterization and portfolio analysis.

**Table 1-2 Annual Yield Screening Bins**

Potential Annual Yield	Bin
0 AF to 10,000 AF	1
10,000 AF to 35,000 AF	2
35,000 AF and above	3

**Diversity of supply:** Another objective of the AW IWRP is to establish a future water resource portfolio that is diverse in both its demand management measures and supply sources. Supply options were categorized into one of six primary supply types which are:

- *Storage*
- *Centralized Reuse*
- *Decentralized Options*
- *Surface Water*
- *Desalination (including brackish groundwater)*
- *Groundwater*



**Performance Score:** The Task 2 technical memorandum documented the selected objectives, sub-objectives, and performance measures that will be used to evaluate IWRP portfolios. Two sub-criteria, implementation challenges and resiliency, were used to pair with the above screening criteria as a general representation of the forthcoming portfolio analysis and performance measure assessment. These sub-criteria are scored on a qualitative scale of 1 to 5, with 1 being the least favorable and 5 being the most favorable. The overall performance score is developed by weighting equally (50/50) the sub-criteria scores of implementation challenges and resiliency. For example, an option that received an implementation challenge score of 3 and a resiliency score of 4 would receive an overall performance score of 3.5. A description of how each option is qualitatively scored relative to these two sub-criteria is provided below.

- **Implementation Challenges:** This criterion provides a qualitative assessment of how difficult or easy it will be to implement a given measure. Each measure is scored numerically from 1 to 5, with 1 indicating the measure is extremely difficult to implement with many uncertainties and 5 indicating minimal implementation challenges. The implementation challenge score for each measure takes into consideration customer/stakeholder acceptance or resistance, programmatic design challenges, permitting and legal complexities, enforcement assumptions, scalability of the option, and technological hurdles.
- **Resiliency:** This criterion qualitatively assesses each option's susceptibility to future variations in hydrology and climate. Each measure is scored numerically from 1 to 5, with 1 indicating an option is highly impacted by future hydrologic and climatic variations and 5 indicating minimal impact to an option's performance.

## 2.0 Supply Options

The AW IWRP supply options list was defined through a collaborative process, with options being developed by AW staff with input from the consulting team, the current IWRP Task Force, the 2014 Water Resource Planning Task Force report, and through consideration of public input. In total, 21 supply options for screening were identified and delineated, as shown in **Table 2-1**. This table includes the option number, option name, and associated primary supply type.

**Table 2-1 List of Supply Options for Screening**

Option Number	Option Name	Supply Type
1	ASR (FEA 5)	Storage
2	Direct non-potable reuse (reclaimed water system)	Reuse
3	Lake Austin Operations	Surface Water
4	Stormwater Harvesting	Decentralized
5	Rainwater Harvesting (community scale)	Decentralized
6	Sewer mining (wastewater skimming)	Decentralized
7	Distributed wastewater systems	Decentralized
8	Capture Lady Bird Lake Inflows (FEA 4)	Surface Water
9	IPR – bed and banks	Reuse
10	IPR – Lady Bird Lake (FEA2)	Reuse

**Table 2-1 List of Supply Options for Screening (continued)**

Option Number	Option Name	Supply Type
<b>11</b>	IPR – Alluvial Aquifer	Reuse
<b>12</b>	Direct Potable Reuse	Reuse
<b>13</b>	Brackish Groundwater Desalination	Desalination
<b>14</b>	Seawater Desalination	Desalination
<b>15</b>	Lake Evaporation Suppression	Storage
<b>16a</b>	Conventional Groundwater (Developed)	Groundwater
<b>16b</b>	Conventional Groundwater (Purchased)	Groundwater
<b>17</b>	Additional supply from LCRA	Surface Water
<b>18a</b>	Carrizo-Wilcox ASR (Infiltration)	Storage
<b>18b</b>	Carrizo-Wilcox ASR (Conventional)	Storage
<b>19</b>	Regional partnership with Corpus Christi	Surface Water
<b>20</b>	Interbasin transfers	Surface Water
<b>21</b>	Off Channel Reservoir	Storage

## Public Workshop #2&3 - Dot Exercise Results Summary

Preliminary Supply Side Option Categories	Like it	Don't like it	Okay with it	Need more info
Expanded Reclaimed Water System	31		7	
Decentralized Options for Wastewater Reuse	37		2	1
Indirect Potable Reuse	11	10	7	10
Direct Potable Reuse	17	3	7	11
Rainwater and Stormwater Capture	43		2	
Aquifer Storage and Recovery	18	2	10	9
Additional LCRA supply/Enhanced Lake Operations/Capture of Stormwater Inflows	16	3	3	13
Groundwater	7	7	9	12
Seawater Desalination	5	19	3	11

### Public Workshop #3 - Added Option Categories

New Off-Channel Reservoir	5	3	2	5
Inter-Basin Transfers	1	9	2	5
Partnership Approaches	6	5		5

# **WHO OWNS THE RAIN? DIFFUSED SURFACE WATER, STATE WATER, AND RAINWATER HARVESTING IN TEXAS**

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State Bar of Texas  
**18<sup>TH</sup> ANNUAL**  
**CHANGING FACE OF WATER RIGHTS COURSE**  
February 23-24, 2017  
San Antonio

## **CHAPTER 4**

## ROSS CROW

### BIOGRAPHICAL INFORMATION

#### **EDUCATION**

Admitted to Texas Bar November 1987.

Admitted to practice before U.S. District Court, Western District of Texas.

Doctor of Jurisprudence. University of Texas School of Law. May 1987. Founding member of Texas Law Fellowships.

Bachelor of Arts with Honors. University of Texas. Plan II Program. December 1984.

#### **PROFESSIONAL BACKGROUND**

**City of Austin, Law Department.** Assistant City Attorney. Specialize in water rights and issues related to City's water supply. Negotiate agreements with water districts. Extensive transactional work on developer cost reimbursement agreements.

**Booth, Ahrens & Werkenthin.** Specialized in water issues representing diverse clients throughout Texas—public bodies, corporations, land and water rights owners, aquacultural interests, trade associations, and individuals. Provided clients with in-depth research and writing on water issues, including water and wastewater utility issues.

**Sahs & Associates.** Specialized in environmental law issues, including legal research and writing on water and wastewater issues. Represented clients in court and administrative hearings. Represented clients in mediation and negotiations. Lobbied at federal level.

#### **SELECTED SPEECHES/PAPERS**

*Municipal Regulation of Groundwater and Takings*, 44 Tex. Envtl. L.J. 1, 3 (2014).

*Central Texas Water Supply Issues: Municipal Perspective*, Water Law Institute, Texas Water Law, 24<sup>th</sup> Annual Super Conference, September 2014

*Managing Impacts of Drought: City of Austin—A Case Study*, State Bar of Texas, The Changing Face of Water Rights Annual Conference, San Antonio, February 2013

*Dispute Resolution on Water Rights Matters: A Case Study*, State Bar of Texas, The Changing Face of Water Rights Annual Conference, San Antonio, February 2011

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## WHO OWNS THE RAIN? DIFFUSED SURFACE WATER, STATE WATER, AND RAINWATER HARVESTING IN TEXAS

### I. INTRODUCTION<sup>1</sup>

State law in Texas as a matter of policy now expressly encourages political subdivisions to promote rainwater harvesting. The City of Austin, for example, plans to promote a significantly increased amount of rainwater harvesting as part of its long-range water plan. In the recent 2016 regional water plan for Region K, the City has indicated that it plans for approximately 16,500 acre-feet per year of its water demand to be met or offset by rainwater harvesting by the year 2070. As use of this resource increases, a perennial question asked in water supply planning is who or what entity has the right to use the water and to what extent. This article asks the question, who owns the rain and its runoff—often in the form of what is termed “diffused surface water.” When does rain and its runoff belong to the property owner where it falls, flows and collects and when does it become state water subject to permitting? Further, this article explores the extent of this ownership right in rainwater, including the property owner’s right to use or distribute harvested rainwater.

Despite a reference to rainwater in the statutory definition of state water and statements by a few courts which could be a source of confusion, an extensive analysis herein of legislation, court holdings, and interpretation by the state agency charged with water rights permitting conclusively supports the common understanding that rainwater in the form of diffused surface water is owned by the property owner where that diffused surface water flows or collects and is not state water until it enters a watercourse. This analysis also concludes that the property owner that collects diffused surface water, as the owner of that water, can use and transfer that water without a permit from the state.

### II. ANALYSIS

In Texas, rainwater is not confined to either private or public ownership, but can form the diffused surface water belonging to a property owner or contribute to the flow of state water in a watercourse. This article begins with key holdings from court opinions regarding ownership of rainwater that falls on one’s property, followed by an overview of court

opinions regarding ownership of diffused surface water and state water, along with an in depth analysis of statutory enactments defining state water, as these provide essential context regarding the ownership rights in rainwater. This article then takes a closer look at the facts and analysis in key cases concerning a property owner’s rights in rainwater in the form of diffused surface water. From this groundwork, this article then addresses questions raised by the Texas Supreme Court’s 1936 decision in *Turner v. Big Lake Oil Co.* In this opinion, regarding a question whether a statute defining state water affected private ownership of diffused surface water the court held the statute inapplicable to properties granted by the sovereign prior to the 1921 adoption of the statute. As the case did not involve property granted subsequent to the statute’s adoption the court did not rule with regard to these properties. This article, in a detailed review of court opinions, legislative enactments, and state agency interpretation seeks to address outstanding questions and concludes that a property owner’s ownership rights in diffused surface water and the rain that falls upon one’s property is a well-settled matter, regardless of the date the underlying property was granted by the sovereign.

#### A. Rainwater

##### 1. Ownership

The Texas Water Code defines by statute what water belongs to the state. Upon preliminary examination, it may appear that state ownership of water includes ownership of the rainwater on every watershed in the state without limitation. As mentioned, the analysis herein concludes otherwise. Specifically Texas Water Code section 11.021(a) states:

(a) The water of the ordinary flow, underflow, and tides of every flowing river, natural stream, and lake, and of every bay or arm of the Gulf of Mexico, and the storm water, floodwater, and *rainwater of every river, natural stream, canyon, ravine, depression, and watershed in the state is the property of the state.*

Tex. Water Code Ann. § 11.021 (West) (emphasis added). Although the definition is so broad that it may appear at first that any rainwater falling on any watershed is property of the state, in the 1930’s the Texas Supreme Court addressed the issue declaring that:

[G]enerally it may be said that the *rainwater which falls on lands is*, so long as it remains on the land, the *property of the owner, to* ~~do~~

<sup>1</sup> The views expressed in these materials do not necessarily represent those of the City of Austin.

*with as he pleases*, in the absence of some prescriptive or contractual right.

*Miller v. Letzerich*, 121 Tex. 248, 254, 49 S.W.2d 404, 408 (1932) (emphasis added). A few years later the Texas Supreme Court directly addressed the reference to rainwater in this statute defining state water. The 1921 statute, later codified into Texas Water Code §11.021, similarly provided that, “rain waters of every . . . watershed, within the State of Texas, are hereby declared to be the property of the State . . .” Act of 1921, 37th Leg., R.S., ch. 124. In its analysis of this provision, the court concluded that this law:

must be interpreted, however, in the light of the Constitution and of the common law and Mexican civil law under which lands have been granted in this State. Under both the common law and the Mexican civil law, *the owners of the soil on which rains may fall and surface waters gather are the proprietors of the water* so long as it remains on their land, and *prior to its passage into a natural water course* to which riparian rights may attach.

*Turner v. Big Lake Oil Co.*, 128 Tex. 155, 169-70, 96 S.W.2d 221, 228 (1936) (emphasis added, citations omitted). The court in analyzing the statute in this broader context determined that the property owner, and not the state, owns the rainwater that falls on their own property. In this regard the Texas Supreme Court in 1936 declared:

No citation of authority is necessary to demonstrate that *the right of a landowner to the rainwater which falls on his land is a property right which vested in him* when the grant was made. Being a property right, *the Legislature is without power to take it from him* or to declare it public property and subject by appropriation or otherwise to the use of another.<sup>2</sup>

*Id.* (emphasis added). This article examines these two key decisions by the Texas Supreme Court, along with others related to the topic, in greater detail below.

<sup>2</sup> Note that the 1921 statute which the court analyzed also expressly states, “[p]rovided that nothing in this Act shall prejudice vested private rights.” Act of 1921, 37th Leg., R.S., ch. 124, §3. Similar language is found in Texas Water Code §11.001(a).

## 2. Right to collect rainwater on “land”

The Texas Supreme Court refers to the right of a landowner to the rainwater which falls on his “land.” Similarly the Texas Commission on Environmental Quality (TCEQ)<sup>3</sup> defines diffused surface water as “[w]ater on the surface of the *land* in places other than watercourses.” 30 Tex. Admin. Code § 297.1(16) (emphasis added). Particularly with regard to the Texas Legislature’s emphasis on rainwater harvesting (discussed below), which is very often accomplished through roof collections systems, the term “land” as used in these contexts is best read to include the improvements on the land such as buildings with rooftops. There are instances, for example, in which the Texas Supreme Court has stated that title to “land” includes buildings, as one opinion provided that, “[w]here the fee simple absolute title to *land* has been acquired the condemnor acquires all appurtenances thereto, buildings thereon, minerals lying beneath the surface, waters thereon . . . .” *Brunson v. State*, 418 S.W.2d 504, 506 (Tex. 1967) (emphasis added).<sup>4</sup>

Land can also be read to mean real property. Note, for example, that Texas Water Code § 36.002 (relating to ownership of groundwater) refers in this same section both to rights to groundwater “below the surface of the landowner’s land” and “below the surface of real property.” Tex. Water Code Ann. § 36.002 (West). Statutes have defined “real property” to include improvements. For example, the Texas Tax Code in § 1.04 defines real property providing that, “(2) ‘Real property’ means: (A) land; (B) an improvement; . . .” and “(3) ‘Improvement’ means: (A) a building, structure, fixture, or fence erected on or affixed to land . . . .” Tex. Tax Code Ann. § 1.04 (West). Thus under this definition rainwater that falls on a property owner’s rooftop, falls on the real property of the property owner. Particularly in light of subsequent legislation promoting rainwater harvesting that apparently assumes property owners’ rights in this water, usage of the term “land” should be understood

<sup>3</sup> TCEQ is “agency of the state” for implementing laws on natural resources and has general jurisdiction over water and water rights. See Tex. Water Code Ann. § 5.012-.13 (West).

<sup>4</sup> In this particular case the State Highway Commission by condemnation obtained only an easement across the property at issue and not the fee simple title, and as the condemnation judgment did not specifically include the improvements, the court held the condemnation judgment did not award the state title to the improvements located on the land about which the judgment is silent. In its analysis the court also referred to, “the ownership of the landowner in improvements *which are a part of the realty* . . .”, again supporting the understanding that term “land” includes the buildings and rooftops on it. *Id.* at 507.



as including its improvements. TCEQ also interprets this rainwater falling on a roof as being classified under diffused surface water and hence belonging to the property owner where it falls.<sup>5</sup>

### 3. Legislature implicitly recognizes rights in rainwater

In addition to the courts' pronouncements on property owners' rights in rainwater that falls on their land, numerous laws have been adopted by the Texas legislature that promote rainwater harvesting. These laws appear to be consistent with the understanding that a property owner owns the rain that falls on their property and can collect that rainwater and use it as they please without the need of obtaining any permit from the state. The legislature, for example, has specifically urged cities to promote rainwater harvesting:

Each municipality and county is encouraged to promote rainwater harvesting at residential, commercial, and industrial facilities through incentives such as the provision at a discount of rain barrels or rebates for water storage facilities.

Tex. Loc. Gov't Code Ann. § 580.004 (West). Certainly the legislature in adopting this policy does not, for example, contemplate residential users with rain barrels obtaining a state water right permit for that use. This same statute requires the Texas Water Development Board to ensure training on rainwater harvesting is available for members of the permitting staff of municipalities and counties quarterly. *Id.* In addition, these entities may not deny a building permit solely because the facility will implement rainwater harvesting. *Id.* The Texas Water Code also declares rainwater harvesting a public policy of the state:

It is the public policy of the state to provide for the conservation and development of the state's natural resources, including: . . .

(8) the promotion of rainwater harvesting for potable and nonpotable purposes at public and private facilities in this state, including residential, commercial, and industrial buildings.

Tex. Water Code Ann. § 1.003 (West). Critical to note is that the legislature in this core state water policy statement promotes rainwater harvesting at private facilities, including residential and commercial. Again,

this apparently includes an assumption that the private property owner has the ownership rights in the rain that falls on their property that allows them to harvest the rainwater. Another example of legislation that appears to rely significantly on this assumption is a provision in the Texas Finance Code providing that, “[f]inancial institutions may consider making loans for developments that will use harvested rainwater as the sole source of water supply.” Tex. Fin. Code Ann. § 59.012 (West). The legislative authorization of significant financial investment relying on the right to harvest rain indicates implicit recognition by the legislature of those private landowner rights in rainwater. In *Domel v. City of Georgetown*, 6 S.W.3d 349 (Tex. App. 1999, pet. denied), the court, for example, recognized certain rights as being implicit in several Water Code provisions, stating that, “[t]he State's right to use its watercourses to transport water is *implicit* in several sections of a comprehensive statewide water plan passed by the legislature in 1997.” *Id.* at 353 (emphasis added). Similarly, in statutes on rainwater harvesting, appears the implicit understanding that a private property owner has a right to collect and use the rainwater that falls on their property.

A property owner's ownership rights in rainwater and in diffused surface water (discussed in next section) are highly interrelated, as typically the rainwater that falls on property becomes diffused surface water and can remain as such unless it enters a watercourse where it becomes state water. *See Id.* The next section discusses a property owner's ownership rights in diffused surface water, followed by a discussion of state ownership of water.

## B. Diffused Surface Water<sup>6</sup>

### 1. Ownership

Commentators have noted that under the law in Texas water exists in three states: groundwater, water in a watercourse referred to as “surface,” “public,” or “state” water, and diffused surface water.<sup>7</sup> Although of

<sup>6</sup> Note that courts use both the terms “diffuse” and “diffused” when referring to diffused surface water. The term “diffused” is most often used in this article, as this is the form used in TCEQ rules when defining the term “diffused surface water.” *See* 30 Tex. Admin. Code § 297.1(16). In addition, when the term “surface water” signifies “diffused surface water,” for clarity, the bracketed term “[diffused]” is often added before the term “surface water.”

<sup>7</sup> Timothy L. Brown, *A Primer for Understanding Texas Water Law*, Legislative Reference Library of Texas, 2006, [http://www.lrl.state.tx.us/legis/water\\_Primer.pdf](http://www.lrl.state.tx.us/legis/water_Primer.pdf) (last visited Jan. 26, 2017).

<sup>5</sup> Discussion with TCEQ legal counsel December 28, 2016.

the three, diffused surface water is least often in the spotlight, nonetheless, the Texas Supreme Court has given high praise to diffused surface water declaring:

The scientific fact is that [diffused] surface waters are the source of all life on this planet, as essential to its continuance as light, air, and soil. Moreover, these waters, flowing in their natural diffused state over the earth's surface, are gentle in their movements, passing into and becoming a part of the soil, carrying and distributing organic matter for the enrichment in turn of the estates over which they flow, and furnishing the source of supply of all ground water from which wells, springs, streams, and rivers draw their sustenance.

*Miller v. Letzerich*, 121 Tex. 248, 261, 49 S.W.2d 404, 411 (1932).<sup>8</sup> As the recognized source of so many other types of water, this article intends to give diffused surface waters its due respect.

Courts have defined the term, providing, for example, that diffused surface water is water “which is diffused over the ground from falling rains or melting snows, and [it] continues to be such until it reaches some bed or channel in which water is accustomed to flow.” *Dietrich v. Goodman*, 123 S.W.3d 413, 419 (Tex. App.—Houston [14th Dist.] 2003, no pet.). Consistent with various court opinions, TCEQ’s rules include a definition for diffused surface water which is a little more comprehensive providing that:

Diffused surface water—Water on the surface of the land in places other than watercourses. Diffused water may flow

vagrantly over broad areas coming to rest in natural depressions, playa lakes, bogs, or marshes. (An essential characteristic of diffused water is that its flow is short-lived.)

30 Tex. Admin. Code § 297.1(16). The TCEQ rule definition of diffused surface water provides a simple two part criteria that broadly defines diffused surface water, which broken down is water: (1) on the surface of the land,<sup>9</sup> and (2) in places other than watercourses. Note that the name “diffused surface water” can be somewhat of a misnomer, as it is recognized that the waters can collect and still fall under the definition. The rule does not place any apparent restriction on the source of the water, which may include groundwater.<sup>10</sup> That diffused surface water may be sourced from groundwater is confirmed in the facts in the Texas Supreme Court’s opinion in *Turner*, as discussed below.

With regard to surface water, courts distinguish between diffused surface water and water in a watercourse and contrast the ownership of these, explaining:

Texas law categorizes surface water into one or two general types: diffuse surface water and water in a watercourse. Diffuse surface water belongs to the owner of the land on which it gathers, so long as it remains on that land and prior to its passage into a natural watercourse. *See Turner v. Big Lake Oil Co.*, 128 Tex. 155, 96 S.W.2d 221, 228 (1936). In contrast, water in a watercourse is the property of the State, held in trust for the public. *See Tex. Water Code Ann. § 11.021(a)* (West 1988) . . .

*Domel v. City of Georgetown*, 6 S.W.3d 349, 353 (Tex. App. 1999, pet. denied). Courts have sought to describe the point at which a property owner’s diffused surface water becomes state water in a watercourse and recognize that if the water is captured prior to that point, it remains the landowner’s property observing:

Diffused surface water (belonging to the land owner) becomes a natural watercourse (belonging to the State) at the point where it begins to form a reasonably well-defined

<sup>8</sup> The court made this comments in rejecting a New Jersey court’s decision citing surface waters as the “common enemy” (from which all landowners could resist flow onto their property) noting that, “[t]he New Jersey court, in saying that such surface waters were a ‘common enemy,’ spoke not only without any judicial support, but without any support in nature itself.” The doctrine, the Texas Supreme Court, stemmed from a common law right of property owners to defend against the destruction of sea water, not surface water. In this regard the court stated:

To say that the surface waters having their source in precipitation, snow, and rain, and passing in a diffused state over the surface of the earth, are a ‘common enemy,’ comparable to the constant ravages of the sea against its shore line, would tax the credulity of a child.

*Miller v. Letzerich*, 121 Tex. 248, 260–61, 49 S.W.2d 404, 411 (1932).

<sup>9</sup> Again, as discussed above, surface of the “land” should be considered to include improvements on the land such as buildings and their rooftops.

<sup>10</sup> Discussion with TCEQ legal counsel on December 28, 2016.

channel, with bed and banks, or sides and current, although the stream itself may be very small and the water may not flow continuously. *International–Great N.R.R. Co. v. Reagan*, 121 Tex. 233, 49 S.W.2d 414, 418–19 (1932). However, if the land owner can capture or impound “casual and vagrant” waters before they coalesce into a natural gully, stream, or other watercourse, they remain his property. *Hoefs*, 190 S.W. at 806.

*Watts v. State*, 140 S.W.3d 860, 865 (Tex. App.—Houston [14th Dist.] 2004, pet. ref’d). In *Motl v. Boyd*, (disapproved of on other grounds related to riparian rights on Spanish and Mexican land grants), the Texas Supreme Court also observed in analyzing the 1917 conservation amendment to the Texas Constitution:

The phrase ‘its storm and flood water,’ as used in this amendment is not to be construed as applying to waters which flow on the ordinary superficial surface of the land, *for these waters, until they reach the natural streamways are, and have always been, the property of the person on whose lands they fall.*

*Motl v. Boyd*, 116 Tex. 82, 122, 286 S.W. 458, 473 (1926) *disapproved of by Valmont Plantations v. State*, 163 Tex. 381, 355 S.W.2d 502 (1962) (emphasis added). In addition, one court found that, “a distinguishing feature of ‘[diffused] surface water’ is that it is never found in a natural watercourse.” *Dietrich v. Goodman*, 123 S.W.3d 413, 418 (Tex. App.—Houston [14th Dist.] 2003, no pet.).

## 2. Similarities in diffused surface water and groundwater rights

Courts have classified ownership rights in groundwater and in diffused surface water as similarly belonging to the owner of the land.

It was well established early in the twentieth century that waters which “ooze through the soil” (percolating ground water) and waters which “diffuse or squander themselves over the surface, following no definite course” (diffused surface water) belong to the owner of the land.

*Watts* at 865 (citing *Hoefs v. Short*, 190 S.W. 802 (Tex. Civ. App.—El Paso 1916), *aff’d*, 114 Tex. 501, 273 S.W. 785 (1925)). This same opinion, as quoted further above, also refers to landowners’ right to “capture” these waters on the surface of their land, (which, as discussed should be understood also to

include roof catchment). In addition, other courts have recognized the right to collect and use this water without liability to others, declaring that, “[a] landowner has the right to collect and appropriate to his own use all [diffused] surface water upon his property without liability to other owners upon whose property it would flow if not so appropriated.” *Republic Prod. Co. v. Collins*, 41 S.W.2d 100, 102 (Tex. Civ. App. 1931), *writ dismissed w.o.j.* (Oct. 28, 1931). Note that with regard to groundwater that the Texas Supreme Court has held that, “[t]he rule of capture . . . provides that, absent malice or willful waste, landowners have the right to take all the water they can capture under their land and do with it what they please, and they will not be liable to neighbors even if in so doing they deprive their neighbors of the water’s use. *Edwards Aquifer Auth. v. Day*, 369 S.W.3d 814, 827–28 (Tex. 2012) (quoting *Sipriano v. Great Spring Waters of Am., Inc.*, 1 S.W.3d 75 (Tex. 1999).) Regarding the limitation in the *Turner* and *Miller* decisions on ownership of diffused surface water to “so long as it remains on their land,” when diffused surface water flows on to another’s property, similar to groundwater, it no longer remains the property of the property owner from whose land the water has passed.<sup>11</sup> However, in *Collins*, the court recognized that diffused surface water, when captured by the property owner, could then be used by the property owner as they please, including transferring it to others for use elsewhere.<sup>12</sup>

## 3. Diffused surface water collected, used and transferred

Despite its name, diffused surface water can gather, be collected in impoundments and used or transferred. Importantly, TCEQ in its rule definition quoted above recognizes that diffused surface water can gather or collect in various instances and still fall under the definition of diffused surface water and not be classified as state water in a natural watercourse. Similarly, court opinions have also recognized that, “[d]iffuse surface water belongs to the owner of the land on which it *gathers* . . . .” *Domel* at 353 (emphasis added).

As discussed in more detail below, in the *Collins* case, the property owner’s “own use” of the surface water from the surface tank involved not only the property owner’s use on his own property, but also

<sup>11</sup> See, e.g., references to a landowner’s ownership of both oil and gas and groundwater “in place beneath his land.” *Day* at 832–33.

<sup>12</sup> A full comparison of the ownership rights in groundwater and diffused surface water is beyond the scope of this article.

agreeing to provide water to another property owner, who in turn sold that water to others. Also, as detailed below, an appeals court sided with TCEQ in an opinion wherein the court held that significant amounts of diffused surface water could be captured in a detention channel and diverted from the channel for use without any permit from the state. *Citizens Against Landfill Location v. Texas Comm'n on Env'tl. Quality*, 169 S.W.3d 258, 274 (Tex. App.—Austin 2005, pet. denied). Although the flow of diffused surface water may be short-lived, the residency time of the diffused surface water in a natural depression, playa lake, bog or marsh is not limited by TCEQ's rule defining diffused surface water.<sup>13</sup>

#### 4. Overflow cases under Texas Water Code 11.086

Many of the cases that draw the distinction between diffused surface water and state water in a natural water course result from litigation under Texas Water Code 11.086 concerning the harmful diversion of "surface" water onto neighboring property. As one court explained this statute:

Section 11.086(a) of the Texas Water Code prohibits a person from diverting or impounding the natural flow of "surface water" in a manner that damages the property of another by the overflow of the water diverted or impounded.

*Dietrich v. Goodman*, 123 S.W.3d 413, 417 (Tex. App.—Houston [14th Dist.] 2003, no pet.). The court further explained that "today the term 'surface water,' as used in Section 11.086 of the Water Code, means only 'diffused surface water,'" *Id.* at 418, and thus courts in these cases have at times engaged in considerable analysis of the distinction between diffused surface water and state water. That analysis, as mentioned, focuses on whether the water at issue has formed or entered into a watercourse. *See eg. Dietrich* at 419-20.

<sup>13</sup> Although limited in its application to the specific subchapter in which it appears, a TCEQ rules in a separate chapter provides some insight into the meaning of "playa lake" stating:

(16) Playa lake--A shallow (generally less than one meter deep), isolated, naturally ephemeral approximately circular lake located in an enclosed basin in the High Plains and West Central Plains areas of the state.

30 Tex. Admin. Code §210.52.

#### 5. Distinguishing rainwater and diffused surface water

Rainwater and diffused surface water overlap significantly, but also have distinctions. Both belong to the property owner prior to entering a watercourse. Rainwater, however, can enter into a watercourse and under the terms of Texas Water Code 11.021 still be regarded as rainwater, whereas diffused surface water loses its identity as such when it enters a watercourse and becomes state water and is "never" found in a watercourse. *Dietrich* at 418.

The rainwater that can be harvested by a property owner without any permit from the state essentially is diffused surface water and not rainwater in a watercourse. The law discussed herein about ownership of rainwater is in essence about the ownership of diffused surface water. Although addressing rainwater directly, the *Turner* opinion is, for example, as much about diffused surface water as it is about rainwater.

Rainwater is a common source of diffused surface water, although other sources, such as groundwater brought to the surface and flowing in a diffused manner across property before reaching a watercourse would be considered diffused surface water under TCEQ's definition. In fact, the water at issue in *Turner* was not directly from rainfall but instead was brackish groundwater from oil wells stored in surface ponds that escaped. *See Turner* at 221.

From all of the above discussion, it can be understood that it is well established that the defining line between a property owner's ownership in diffused surface water (including rainwater in that form) and state ownership of water is when the water enters into or forms a watercourse. The following examines the statutory definition of state water, which should be considered in context to the many judicial opinions holding that water in a watercourse is state water.

### C. State Water

#### 1. Statutory Evolution of Definition

##### a. Current Definition and Overview

The current definition of state water in the Texas Water Code provides in two subsections that:

#### § 11.021. State Water

- (a) The water of the ordinary flow, underflow, and tides of every flowing river, natural stream, and lake, and of every bay or arm of the Gulf of Mexico, and the storm water, floodwater, and rainwater of every river, natural stream, canyon, ravine, depression, and watershed in the state is the property of the state.

- (b) Water imported from any source outside the boundaries of the state for use in the state and which is transported through the beds and banks of any navigable stream within the state or by utilizing any facilities owned or operated by the state is the property of the state.

Tex. Water Code Ann. § 11.021 (West). The focus of this article is on the portion of the definition found in subsection (a). Starting more than a century ago, this legislative definition of state water underwent considerable evolution over a period of more than 30 years. It is helpful in understanding the intent of the legislature in defining “state water” to consider the various statutory modifications made over the years. Also, in terms of issues raised by the Texas Supreme Court in *Turner* (quoted above and discussed in more detail below) regarding the interaction between legislative claims to state ownership of water and private property vested rights in certain waters, it is beneficial to understand that the legislature did not make an unqualified claim of ownership to most types of surface waters until 1921.

Beginning with the Irrigation Act of 1889 and until the Texas legislature’s 1921 declaration of state ownership of certain types of surface water, the “public” or “state” ownership of water had various qualifications on that ownership. The qualifications on public or state ownership decreased with each iteration of the statute from 1889, 1895, 1913, 1917 and 1921. This evolution took place during a period in Texas which included severe drought from 1908 to 1912,<sup>14</sup> the development of an appropriative water rights system through a series of legislative enactments, and the adoption of a state constitutional amendment in 1917 for conservation of the natural resource of the state.

In 1971 the legislature codified numerous water statutes into the Texas Water Code, including codification of the 1921 definition of state water without substantive revision into Chapter 5 of the Water Code in Section 5.021. In 1977 the legislature renumbered this provision, placing it in its current location in the Water Code in §11.021. The following tracks this evolution of the definition of state water, which is helpful in understanding how some terms that may at first appear to overlap with or include diffused

surface water do not. This analysis also helps to provide context to the court’s analysis of this statute in *Turner* and subsequent court opinions, as discussed in more detail below. The development of the statute also shows a legislative intent to define state water as water in a stream or watercourse.

#### b. Irrigation Act of 1889

For the Irrigation Act of 1889, the legislature indicated in its title that it was “[a]n Act to encourage irrigation . . . in the arid districts of Texas.” Act approved March 19, 1889, 21st Leg., R.S., ch. 88, 1889 Tex. Gen. Laws 100. Terms in Section 2 of the 1889 Irrigation Act contained limitations on the definition “public” water in declaring the “unappropriated waters . . . within the arid portions of the state . . . to be the property of the public” stating that:

That the *unappropriated waters of every river or natural stream within the arid portions of the state*, as described in the preceding section of this act, are hereby *declared to be the property of the public*, and may be acquired by appropriation for the uses and purposes as hereinafter provided.

*Id.* at §2 (emphasis added). Importantly, this initial act of the legislature declared as public property only the waters of “every river or natural stream,” reflecting a legislative intent from the beginning that public water (later termed state water) included only those waters in a watercourse. In addition, Section 1 of the 1889 Act provided that this water “may be diverted from its *natural channel* for irrigation, domestic, and other beneficial uses.” *Id.* at §1 (emphasis added). The reference to diversion from a natural channel, which in this initial statute referred only to a “river or natural stream” also indicates the intent of the legislature to indicate that natural channel refers to a watercourse and that this “public” water resided in a watercourse. Significantly this reference to diversion of the public or state water from “its natural channel” appeared in every iteration of the statute including the current Water Code at 11.022 and serves as a continuing expression of the legislative intent. As discussed below, in 1921 the legislature integrated the term “natural channel” into the statute in such a manner that made it clear that all types of water referenced in the definition of state water resided in a natural channel.

#### c. Irrigation Act of 1895

The Irrigation Act of 1895 similarly limits a declaration of “public” ownership of various types of surface water to “unappropriated waters” in portions of the state in which irrigation is beneficial to agriculture due to insufficient rainfall. The 1895 Act begins to

<sup>14</sup> Terrence Henry, *A History of Drought and Extreme Weather in Texas*, State Impact, Nov. 29, 2011, <https://stateimpact.npr.org/texas/2011/11/29/a-history-of-drought-and-extreme-weather-in-texas/>, (last visited January 19, 2017).

take on more of the characteristics of the modern law providing in Section 1 of the Act in more elaborated detail:

That the *unappropriated waters* of the ordinary flow or underflow of every running or flowing river or natural stream, and the storm or rain waters of every river or natural stream, canyon, ravine, depression or watershed *within those portions of the State of Texas in which by reason of the insufficient rainfall or by reason of the irregularity of the rainfall, irrigation is beneficial* for agricultural purposes, *are hereby declared to be the property of the public*, and may be acquired by appropriation for the uses and purposes and in the manner as hereinafter provided.

Act of March 9, 1895, 24th Leg., R.S., ch. 21, §1, 1895 Tex. Gen. Laws 21 (emphasis added). Note that in the 1895 version of the Irrigation Act the term “rain waters” first appears in the text. The reference to water being “diverted from its natural channel” is included in Section 3 of the 1895 which relates to the “ordinary flow or underflow of the running water of every natural river or stream . . .” *Id.* at §3. Section 2, which relates to storm, flood, or rain waters being held by dams or diverted by canals does not include the reference to diversion from a natural channel. This pattern of referring to the natural channel in just one of two sections like these is maintained in the 1913 and 1917 iterations of the law, however, significantly in 1921, as discussed further below, the term “natural channel” is integrated into the definitional section of the statute itself, thereby referring to all types of water included in the definition.

*d. Irrigation Act of 1913*

The 1913 Irrigation Act shifts from the earlier pronouncements that certain waters are property of the “public” to a declaration that certain waters are “property of the State.” The limitation to arid areas or areas of insufficient rainfall is dropped from the statute, although the “unappropriated waters” qualifier remains in the statute.

Section 1. *Certain Waters* declared State property. The *unappropriated waters* of the ordinary flow and underflow and tides of every flowing river or natural stream, of all lakes, bays or arms of the Gulf of Mexico, collections of still water, and of the storm, flood or rain waters of every river or natural stream, canyon, ravine, depression or watershed, within the State of Texas, the title

to which has not already passed from the State, and hereby declared to be the property of the State, and the right to the use thereof may be acquired by appropriation in the manner and for the uses and purposes hereinafter provided.

Act of April 9, 1913, 33d Leg., R.S., ch. 171, §1. (emphasis added). The term “collections of still water” temporarily appeared in the definition of state water in 1913 until removed in the 1921 iteration. The later removal of this term appears to be an indicator of legislative intent to remove from the definition of state water provisions that could be interpreted to include diffused surface water.

*e. Irrigation Act of 1917*

The 1917 Irrigation Act adjusted the qualification on the waters declared to be property of the State, declaring state ownership to “[t]he unowned and unappropriated waters . . .” stating in Section 1 of the Act:

The *unowned and unappropriated waters* of the ordinary flow and underflow and tides of every flowing river or natural stream, of all lakes, bays or arms of the Gulf of Mexico, collections of still water, and of the storm, flood or rain waters of every river or natural stream, canyon, ravine, depression or water shed, within the State of Texas, *are hereby declared to be the property of the State*, and the right to the use thereof may be acquired by appropriation in the manner and for the uses and purposes hereinafter provided.

Act of March 19, 1917, 35th Leg., R.S., ch. 88, §1 (emphasis added). This 1917 iteration, approved by the legislature on March 19, 1917, preceded the adoption by statewide vote later on August 21, 1917 of the conservation amendment of the Texas Constitution. In the portion of the statute relating to fees for applications, besides the base fee, an additional fee was required for every application “for storage of water,” and additional fees were required based on the volume of the reservoir. The statute, however, excepted surface water from the payment of the storage fee with the phrase “except surface water.” *Id.* at §41. The *Hoefs* appeals court decision in 1916 just prior to the 1917 legislative session treats the terms “diffused surface water” and “surface water” as interchangeable terms reflecting the common usage of the term surface

water to mean diffused surface water.<sup>15</sup> By stating in the statute “except surface water,” the legislature provided that surface water would not be counted in either the base fee for water storage, nor would it be counted in the reservoir volume used as the basis for calculating increases in the storage fee. The legislature in this manner distinguished this “surface water” and by making this distinction indicated a legislative intent to distinguish it from state water and not apply the requirements it would apply to state water.<sup>16</sup> Perhaps most notably, by use of the term “surface water,” the legislature indicated its awareness of this classification of water and it did not include the term “surface water” in the definition of state water.<sup>17</sup>

Again, adoption of the 1917 statute occurred shortly after the 1916 *Hoefs* appeals court decision, so this decision would likely have influenced the legislature. As discussed below, in 1916 the appeals court in *Hoefs v. Short* quoted at length from authorities that concluded that appropriative and other water rights could not “attach” to diffused surface water. See *Hoefs v. Short*, 190 S.W. 802 (Tex. Civ. App.—El Paso 1916), *aff’d*, 114 Tex. 501, 273 S.W. 785 (1925).

#### f. 1917 Texas Constitutional Amendment

In February 1917, the Texas Legislature also adopted legislation to put up for statewide election in

August of that year a proposed amendment to the Texas Constitution as Section 59 in Article XVI related to the conservation and development of natural resources, particularly water. This landmark amendment approved by Texas voters and added to the Texas Constitution on August 21, 1917 is commonly referred to as the “conservation amendment.” See, e.g., *Motl v. Boyd* at 463. The conservation amendment, directing the legislature to adopt laws as may be appropriate for the conservation and development of natural resources including water, serves as the foundation of a significant amount of the Texas water law adopted subsequently.

The following language excerpted from the originally proposed amendment in 1917 remains the same today except for the addition in the current version of “and development of parks and recreational facilities” after the first comma in Section 59 (a):

Sec. 59. (a) The conservation and development of all of the natural resources of this State, including the control, storing, preservation and distribution of its storm and flood waters, the waters of its rivers and streams, . . . are each and all hereby declared public rights and duties; and the Legislature shall pass all such laws as may be appropriate thereto.

Tex. Const. art. XVI, § 59 (a) (as originally adopted). Regarding the 1917 “conservation amendment” the Texas Supreme Court in *Motl v. Boyd* stated that:

It is noted that the amendment, after declaring that the conservation and development of the natural resources of the state were public rights and duties, included within these resources *the waters of the state*, dividing them, however, plainly into two classes: First, ‘its *storm and flood waters*’; and, second, ‘the waters of its *rivers and streams*.’

*Motl v. Boyd* at 473 (emphasis added). The court’s statement made not long after the adoption of the state constitutional amendment that it divided the waters of the state into these two classes evidences a judicial understanding of the legislative intent to limit state water to these types of water, which did not include diffused surface water. As storm and flood waters might be read to include both the flood waters of streams and diffused surface water, to avoid any confusion on this point, the court expressly further explained that diffused surface waters were not included in the storm and flood waters by following the above statement immediately with the clarification

that:

<sup>15</sup> See e.g., *Hoefs v. Short*, 190 S.W. 802, 806 (Tex. Civ. App. 1916), *writ granted* (Dec. 12, 1917), *aff’d*, 114 Tex. 501, 273 S.W. 785 (1925).

<sup>16</sup> The Legislature modified the statute in 1920 regarding fees for permits by placing a limit of \$6000 on any permit application. Acts 1920, 36<sup>th</sup> Leg. 3d C.S., ch. 46 §1. Section 4 of this Act repealed all laws in conflict which would have included this fee provision in the 1917 Act, as it had no limit and required an additional twenty five dollars for every thousand acre feet of storage which could exceed \$6000 for large reservoirs. See also Supplement to Vernon’s Texas Civil and Criminal Statutes, Vol. 2, Art. 5001ff, pp. 1388-89, 1922. The repeal is not relevant to the point made above, which is that the legislature, by use of the term “surface water” appears to have distinguished it from state water.

<sup>17</sup> The term “surface water” as used in sections of the current Texas Water Code, for example in Chapter 11 relating to Water Rights, has different meanings. The term “surface water” in 11.086 is understood to mean diffused surface water. *Dietrich v. Goodman*, 123 S.W.3d 413, 418 (Tex. App.—Houston [14th Dist.] 2003, no pet.). More current sections adopted in the past 20 years in particular use the term surface water in a manner that indicates state water. See, e.g., Texas Water Code §§11.1501, 11.151, and 11.1271.

The phrase ‘its storm and flood water,’ as used in this amendment is not to be construed as applying to waters which flow on the ordinary superficial surface of the land, for these waters, until they reach the natural streamways are, and have always been, the property of the person on whose lands they fall.

*Id.* Regardless of certain aspects of the law that have changed since the *Mott* opinion was decided, the statements regarding ownership of state water and diffused surface water highlighted in this discussion remain consistent with how these terms are interpreted today as discussed herein.

g. *1921 Amendment*

After the adoption of the conservation amendment in 1917 declaring, “[t]he conservation and development of all of the natural resources of this State, . . . are each and all hereby declared public rights and duties . . . .” and requiring that, “the Legislature shall pass all such laws as may be appropriate thereto,” Tex. Const. art. XVI, § 59 (a), the legislature in 1921 adopted amendments to the Irrigation Act of 1917. The title of the legislation indicates the 1921 law is to “make effective” Article XVI, Section 59 “so as more specifically define the public waters of the State of Texas.” Act of 1921, 37th Leg., R.S., ch. 124.<sup>18</sup>

Importantly, after adoption of the conservation amendment, the amendments adopted by the legislature in 1921 eliminated the limitation on state ownership to ownership of “unowned and unappropriated waters.” Also the legislature indicated that these state waters resided in a natural channel by incorporating this term into the definitional portion of the statute. This 1921

version as quoted by the Texas Supreme Court in *Turner*:

Art. 7467. Property of the State.-The waters of the ordinary flow and underflow and tides of every flowing river or natural stream, of all lakes, bays or arms of the Gulf of Mexico, and the storm, flood or rain waters of every river or natural stream, canyon, ravine, depression or watershed, within the State of Texas, as, are hereby declared to be the property of the State, and the right to the use thereof may be acquired by appropriation in the manner and for the uses and purposes hereinafter provided, and *may be taken or diverted from its natural channel* for any of the purposes expressed in this chapter.

*Turner v. Big Lake Oil Co.*, 128 Tex. 155, 169, 96 S.W.2d 221, 228 (1936) (emphasis added, court emphasis omitted). As an appropriative right authorizes state water to be diverted from its “natural channel” the legislature expressed its intention in 1921 that the various waters included in the definition are those which reside in or have entered into a natural channel. As discussed in detail below, this same legislative intent is reflected in the requirements of the Water Rights Adjudication Act adopted in 1967. Also, the legislature’s apparent acceptance over many years of courts determining that diffused surface water becomes state water only upon entering a watercourse, appears to define the scope of the water named in this definition of state water to mean water in a watercourse.

Relevant also to ownership rights in rainwater and diffused surface water Section 3 of the 1921 statute states, “[p]rovided that nothing in this Act shall prejudice vested private rights.”<sup>19</sup> Act of 1921 at §3. The provision is clearer and appears more supportive of vested rights than a provision in the 1917 Act that would neither “validate or invalidate” a vested right stating, “[n]othing in this Act contained shall be held or construed to alter, affect, impair, increase, destroy, validate or invalidate any existing or vested right of property existing at the date when this Act shall go into effect.” Act of 1917 at §137. What appears to be clearer support of vested rights may also have been influenced by the 1916 appeals court decision in *Hoefs*

<sup>18</sup> Note the Act itself does not indicate the specific date of approval, but rather notes that it was presented to the Governor on March 11, 1921 and due to inaction became law without his signature within the time prescribed by the Constitution. The Texas constitution in this regard currently provides that, “[i]f any bill shall not be returned by the Governor with his objections within ten days (Sundays excepted) after it shall have been presented to him, the same shall be a law, in like manner as if he had signed it . . . .” Tex. Const. art. IV, § 14. Regarding the effective date, a 1922 Vernon’s collection of statutes, after Section 1 of the 1921 Act states that it, “[t]ook effect 90 days after March 12, 1921, date of adjournment.” Supplement to Vernon’s Texas Civil and Criminal Statutes, Vol. 2, Art. 4991, pp. 1386-87, 1922.

<sup>19</sup> Current Texas Water Code § 11.001 similarly provides in subsection (a), “[n]othing in this code affects vested private rights to the use of water, except to the extent that provisions of Subchapter G [Water Rights Adjudication Act §11.301 et seq.] of this chapter 1 might affect these rights.” Tex. Water Code Ann. § 11.001 (West).



which included discussion of vested rights in diffused surface water. *See Hoefs v. Short*, 190 S.W. 802 (Tex. Civ. App.—El Paso 1916), *aff'd*, 114 Tex. 501, 273 S.W. 785 (1925).

#### h. 1971 Codification

Texas Water Code §1.001 adopted in 1971 along with a substantial codification of the state's water law statutes into the Texas Water Code explains that the intent of the codification process is not to make substantive changes to the law, stating in subsection (a):

This code is enacted as a part of the state's continuing statutory revision program, begun by the Texas Legislative Council in 1963 as directed by the legislature in Chapter 448, Acts of the 58th Legislature, Regular Session, 1963 (Article 5429b-1, Vernon's Texas Civil Statutes). The program contemplates a topic-by-topic *revision* of the state's general and permanent statute law *without substantive change*.

Tex. Water Code Ann. § 1.001 (West) (emphasis added). The following shows the non-substantive changes made to the definition:

~~Art. 7467. Property of the State.— §5.021 [later moved to §11.021] State Water. The waters of the ordinary flow, and underflow, and tides of every flowing river, or natural stream, of all and lakes, and of every bays or arms of the Gulf of Mexico, and the storm water, floodwater, or and rainwater rain waters of every river, or natural stream, canyon, ravine, depression, or and watershed, within the State of Texas, as, are hereby declared to be in the state is the property of the State, and the right to the use thereof may be acquired by appropriation in the manner and for the uses and purposes hereinafter provided, and may be taken or diverted from its natural channel for any of the purposes expressed in this chapter.~~

The last portion the statute (shown above with strikethrough) was put in a separate statute which was ultimately moved to §11.022 of the Water Code. Significantly, the reference to state water being diverted from its “natural channel” is retained in the current code which provides in the section titled “Acquisition of Right to Use State Water”:

The right to the use of state water may be acquired by appropriation in the manner and for the purposes provided in this chapter.

When *the right to use state water* is lawfully acquired, it may be taken or diverted *from its natural channel*.

Tex. Water Code Ann. § 11.022 (West) (emphasis added). Again, the definition of state water in §11.021 needs to be read in context with the legislative pronouncement in §11.022 that when a right to state water is acquired it may be taken from its “natural channel.” Note that the court in *Domel* expressly cites Texas Water Code §11.021(a) as support for the conclusion that “water in a watercourse is the property of the State, held in trust for the public.” *Domel* at 353. Also some interpretation of legislative intent in §11.021 to include just water in a watercourse can be discerned from TCEQ's rule definition of diffused surface water which provides, as mentioned, that this water is “[w]ater on the surface of the land in places other than watercourses.” *See* 30 Tex. Admin. Code § 297.1(16). The rule, in effect, draws a bright line between diffused surface water, which as defined appears to encompass all water on the surface that is found in places other than watercourses and state water found in watercourses. Under this definition, watercourses, which are state water, could not include diffused surface water.

#### 2. Water Rights Adjudication Act Informs Definition of State Water

In the discussion of the statutory definition of state water above, the analysis of the evolution of the statute found legislative intent to define state water as water in a watercourse, noting in particular the reference to diverting this state water from its “natural channel.” Through requirements of the Water Rights Adjudication Act, Texas Water Code 11.301 et seq. (herein “Adjudication Act”), the legislature further clarifies what it considers to be state water. Read in conjunction with §11.021 and §11.022, the Adjudication Act should be considered as additional authority on what constitutes state water, as its very purpose has been to adjudicate or settle water rights claims to state water.<sup>20</sup> The Adjudication Act expressly states that water rights claims for state water are for water in a stream or watercourse, which as discussed above and in more detail below would not include “rainwater . . . on every watershed” when in the form of diffused surface water or harvested rainwater before entering a watercourse.

<sup>20</sup> The Adjudication Act in its “Declaration of Policy” recognizes its purpose as, “[t]he conservation and best utilization of the *water resources of this state* . . . (emphasis added).” Tex. Water Code Ann. § 11.302 (West).

The Adjudication Act repeatedly states that the state water rights being adjudicated are in a *stream* or segment of a stream. For example, the Act states, “[t]he water rights in *any stream or segment of a stream* may be adjudicated as provided in this subchapter . . . (emphasis added).” Tex. Water Code Ann. § 11.304 (West) and “[e]very person claiming a water right of any nature, except for domestic or livestock purposes, *from the stream or segment under adjudication* shall file a sworn claim with the commission . . . (emphasis added).” Tex. Water Code Ann. § 11.307 (a) (West). In addition, for all water rights claims except permits or certified filings, the claimant must file with the commission a statement setting forth “the *stream or watercourse* . . . in which the right is claimed (emphasis added).” Tex. Water Code Ann. § 11.303(c) (West). (Permits and certified filings claims are processed under the provisions cited above and others referring to adjudicating claims in a stream or stream segment.)

### 3. Court Opinions Aid Interpretation of Statutes

Regarding the requirement in the Adjudication Act to identify the stream or watercourse in which the right to state water is claimed, the Texas Supreme Court in *Turner* referred to “streams and water courses” as synonymous with “public waters,” for example, when the court held that, “[t]he Court of Civil Appeals quite correctly determined that the rules of law applicable to the pollution of *streams and water courses or public waters* were not applicable here . . . (emphasis added).” *Turner* at 222. Other courts have held in this regard, “it is a well established rule in Texas that waters of public streams belong to the sovereign.” *South Tex. Water Co. v. Bieri*, 247 S.W.2d 268, 272 (Tex.Civ.App.—Galveston 1952, writ ref’d n.r.e.). Also, an examination of the usage of the term “stream” in the landmark 1925 Texas Supreme Court opinion *Hoefs v. Short*, which provided the definition for a natural watercourse in Texas, supports the conclusion that the usage of the term “stream” in the Adjudication Act refers to a natural watercourse containing state water and not diffused surface water.

The *Hoefs* court held that the waters at issue were, “not [diffused] surface waters, but are the *waters of a stream*,” and as a result “water rights attach to it.” *Hoefs v. Short*, 114 Tex. 501, 505, 273 S.W. 785, 786 (1925) (emphasis added). The court clarified that these water rights attaching to the stream included appropriative water rights. *Id.* at 788. The fact that appropriative water rights for state water attach to the water of a stream, of course, confirm its status as state water. With regard to use of the term “natural channel” in §11.022, the *Hoefs* court links this term “channel” with “stream” as used in the Adjudication Act, observing that the water in the creek at issue was

“accustomed to flow in a *well-defined channel*, in a *stream*, which, though intermittent as to flow, has a well-defined and permanent existence.” *Id.* at 786 (emphasis added). All this indicates that the legislature intended by usage of the term “stream” in the Adjudication Act, like in the definitive Texas Supreme Court opinion on what constitutes a stream, that the term as used means water in a watercourse and does not include diffused surface water. Thus, in this manner, the legislature indicated in the Adjudication Act that the state water included in the definition in §11.021 is water in a watercourse.<sup>21</sup> In addition, recent statutes promoting rainwater harvesting reflect an implicit assumption by the legislature that the rainwater and resulting diffused surface water is privately owned.

In this and further discussion below, this article concludes in a careful and detailed review of legislative enactments and court opinions, that the state water under §11.021 and §11.022 which may be diverted from a “natural channel” would not include rainwater or diffused surface water on private property not in watercourse. This is despite the potentially confusing language in §11.021 (a) which, without reference to the “natural channel” language in §11.022 and other legislative enactments and court decisions, might appear to include “rainwater of every . . . watershed” without limitation in the definition of state water. This conclusion is also despite some confusing statements by one appeals court on the matter discussed in more detail below. This discussion begins with a more detailed look at the key cases concerning private ownership of rainwater and diffused surface water.

## III. KEY CASES: A CLOSER LOOK

### A. *Miller*: Basis for vested right in rainwater (diffused surface water)

The Texas Supreme Court’s decision in *Miller v. Letzerich*, 121 Tex. 248, 49 S.W.2d 404 (1932) recognizing certain vested rights related to diffused surface water set the stage for further analysis and pronouncements on a property owner’s ownership rights in rainwater and diffused surface water by the court in *Turner*. For the purposes of providing context to the decision in *Turner*, the *Miller* decision is examined here first.

<sup>21</sup> Besides the statutory definition of state water, courts have recognized state ownership of water in navigable streams, holding that, “Texas holds the title to the waters in a navigable stream in trust for the public.” *In re Adjudication of the Water Rights of Upper Guadalupe Segment of Guadalupe River Basin*, 642 S.W.2d 438, 444 (Tex. 1982).

In *Miller*, the trial court enjoined the plaintiffs in error (defendants in original suit in trial court--the property owner and a tenant Miller) from repairing an existing levee and ditch and extending it so as to divert the natural flow of surface water on to the adjacent land of defendants in error (plaintiffs in original suit). *Id.* at 406. The court of appeals affirmed this judgment, as did the Texas Supreme Court based on a statute adopted in 1915 prohibiting the diversion of the natural flow of surface waters in such a manner as to damage the property of another. *Id.* at 415. The plaintiffs in error argued they had a vested right in the existence and use of the levee and ditch constructed before 1915. *Id.* at 407. After considerable analysis, the court rejected this assertion.

The court concluded that the 1915 statute essentially adopted the Mexican civil law rule. *Id.* at 409. This rule allowed for water to pass from a higher to a lower estate, "so long as the surface water from the dominant estate reaches the borders of the servient one untouched and undirected by the hands of man." *Id.* at 408. For properties granted under the Mexican civil law, the court concluded that the property owners had a vested right in the rule regarding diffused surface waters, but the civil law simply had the same prohibitions as the 1915 statute that the owners of the ditch could not cast surface waters onto their neighbor's property. *Id.* Further, as "the English common-law rule as to surface waters is substantially the same as that of the civil law," *Id.* at 409, both had the same requirements regarding diffused surface waters as the 1915 statute. The court concluded that the 1915 overflow statute "applied to all lands of the state, whether granted under the civil or under the common law." *Id.* at 414.

This, however, did not entirely settle the matter as the original defendants argued that a different rule termed the "common enemy doctrine" had been adopted as the common law which "is that surface waters are a 'common enemy and may be fought off in any way in which the landowner can best get rid of them, even though their diversion may injure the adjacent landowner." *Id.* at 409. The *Miller* court declared that Texas courts previously "adopted the 'common enemy doctrine' under the mistaken view that it was the common-law rule," but the doctrine, "in fact had no foundation under the common law." Regardless, "[n]o easement or servitude of any character was created or intended by the so-called common-law rule." and property owners thus had "no vested right in the rule." *Id.* at 412. The rule, which permitted owners to "use their property in a certain way" that even though it might injure adjacent properties, allowed for no cause of action. *Id.* As the property owner had no vested right in the rule, "[t]he act of 1915 changed the rule and gave a cause of

action," as the court explained, "[i]t is elementary that the rules of the common law governing the use of property may be changed and a cause of action prescribed where none existed before." *Id.* As the defendants in the original action had concentrated waters in a ditch "in a manner calculated to inflict injury" on the neighboring property, "their acts are prohibited, not only by the civil law and the statute under examination, but are condemned with equal emphasis by the so-called 'common law rule' or 'common enemy doctrine.'" *Id.* at 414.

Again, the *Miller* opinion is important to the subject of this article in that the Texas Supreme Court in its analysis included discussion regarding property owner rights related to diffused surface water or "rainwater," which the court concluded are vested rights. *Id.* at 408. The *Miller* court's recognition of civil and common law rules with regard to the ownership of diffused surface water helped form the basis for the Texas Supreme Court's opinion four years later in 1936 that a landowner has a vested property right to rainwater which falls on his land which the Legislature cannot take away or declare public property. *Turner* at 228.

The *Miller* court's analysis leading to the conclusion that a property owner has vested ownership rights in rainwater and diffused surface water started by addressing the civil law and common law concerning diffused surface water in separate discussions, taking up first the Mexican civil law, which the court recognized as a continuation of the Spanish civil law.<sup>22</sup> The court recognized two aspects to the civil law, the first of which concerned ownership of the diffused surface water and the second of which concerned right to let this water flow from higher estate onto a lower one. Regarding the first aspect of the civil law the court explained:

As to the rights of the owners of coterminous estates under the Mexican civil law, generally it may be said that the rainwater which falls on lands is, so long as it remains on the land, the property of the owner, to do with as he pleases, in the absence of some prescriptive or contractual right.

*Miller* at 408. Regarding the second aspect of the civil law related to diffused surface waters, the court continued:

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<sup>22</sup> The court found that, "[a]fter the revolution by which Mexico gained her independence, the Spanish civil law prevailed in connection with the decrees and statutes of the supreme government of Mexico. *Miller* at 407.

The second rule of the civil law is that lands lower than the coterminous estate owe a service to receive the burden of surface waters which may flow from the higher estate onto the lower, so long as the surface water from the dominant estate reaches the borders of the servient one untouched and undirected by the hands of man [except for ordinary uses of the property for farming].

*Id.* Thus the first rule essentially recognizes the property owner's right to the diffused surface water, and to use it as they please, and the second rule the right to let it flow onto another property. In short, the property owner can keep and use diffused surface water, or let it pass on. Regarding these diffused surface water rights the court further stated that, "[t]hese rights of the owners of estates under the civil law are appurtenant to and a part of the land itself, and passed to them with the grants." *Id.*

Regarding the second rule, "[t]he right of the owner of the upper estate to have the surface waters falling thereon to pass in their natural condition on to the lands of the lower estate," the court found that this right, "is a servitude or natural right in the nature of an easement over the lower estate of his neighbor." *Id.* The court concluded, "[i]t is a right of property . . . and being a part of the grants made by the sovereign to the owners of the estates, it is a *vested right*, protected by the Constitution." *Id.* (emphasis added).

The *Miller* court not only discussed ownership rights in diffused surface water with regard to the civil law, but also with regard to the common law. In its lengthy discussion of the common law concerning diffused surface waters, the court (in response to cases cited by a court in another jurisdiction allegedly in support of the common enemy doctrine being the common law) declared:

We have read the cases, and all that was decided in them was that *the owner of lands upon which surface water gathered might divert and use the surface water for his own purposes* without actionable injury to the adjacent landowner who had theretofore received the flow of the surface water and desired to make continued use of it.

*Id.* at 410 (emphasis added). This discussion laid the groundwork for the court's holding in *Turner* that ownership rights in rainwater and diffused surface water were conveyed in grants out of the sovereign under both the civil and common law.

The *Miller* court confirmed that "whatever title, rights, and privileges the inhabitants of Texas received

by virtue of land grants from the Spanish and Mexican governments, which *were part of the realty itself* or were easements or servitudes in connection therewith, remained intact, notwithstanding the change in sovereignty." *Id.* at 408. (emphasis added). Specifically with regard to the "easement over the lower estate" the court concluded that "it is a vested right, protected by the Constitution." *Id.* The *Miller* court's conclusion that one aspect of a property owner's right in diffused surface waters under civil law is a vested right (lower estate easement) implied that the other aspect of this right (surface water ownership) was a vested right as well. Based on the foundation established in *Miller*, *Turner* expressly confirmed this ownership right was a vested right, and further confirmed it under both the civil and common law, since, as mentioned above, the *Miller* court also found the "English common-law rule as to surface waters is substantially the same as that of the civil law." *Id.* at 409, *See Turner* at 228. The *Miller* court's analysis recognizing vested rights related to rainwater and diffused surface water thus set the stage for further pronouncements concerning vested rights in these by the court in *Turner*.

#### B. *Turner*: Vested rights further recognized

*Turner v. Big Lake Oil Co.*, 128 Tex. 155, 96 S.W.2d 221(1936) is the principle Texas Supreme Court decision declaring property owners' rights to the rainwater that falls on their land, and the resulting diffused surface water. An examination of the facts, issues and court's analysis helps to shed further light on the underpinnings to a property owner's right to this "rainwater," which is analyzed by the court as a question regarding the ownership of water the court recognized "in law and fact" as diffused surface water. The dispute in *Turner* originated from "the escape of salt waters from ponds" constructed and used by the defendant in the operation of their oil wells. *Id.* Defendant "ran the polluted waters from the [oil] wells," to storage on defendant's property in artificial earthen ponds, which broke and overflowed onto the plaintiffs' property. *Id.* The escaped pond water traveled for several miles down a draw and came to rest in natural water holes on plaintiffs' property. *Id.*

The court concluded that there were two issues to resolve in determining whether the defendant had any liability for the release of the polluted waters. First, the court considered whether the defendant could be liable, despite no finding of negligence, under a common law rule of absolute liability. *Id.* at 221-227. Second, despite the court's conclusion that the spilled water remained diffused surface water "in law and fact" at all times, the court addressed whether the statutory definition of state water nonetheless made the escaped water at issue public or state water for the

purpose of triggering the applicability of state water pollution statutes. *Id.* at 228. Regarding the first issue, the court concluded that Texas courts had rejected the notion that, under the facts at issue, the defendant could be liable without proof of negligence.<sup>23</sup>

In analyzing the second issue, the plaintiffs in error argument that the diffused surface waters in Garrison draw under the state statute were public waters to which anti-pollution statutes applied, the court italicized a portion of the 1921 statute defining state water as follows:

The statute in so far as here involved reads:  
 ‘Art. 7467. Property of the State. . . . *storm, flood or rain waters of every river or natural stream, canyon, ravine, depression or watershed, within the State of Texas, as, are hereby declared to be the property of the State, . . .* (Italics ours.)

*Id.* at 227–28. The court then explained the plaintiffs’ contention was that this statutory language transformed the rainfall on the watershed, that is legally and factually diffused surface water, before it has reached a stream, into public or state water stating:

The contention here is that this article, particularly the italicized words, makes the water from rainfall while on the watershed, or in ravines and draws, and while it is still regarded in law and fact as surface water, and before it has reached a riparian or public stream, public waters, the pollution of which is prohibited by positive enactment.

*Id.* at 228. In its analysis of the plaintiffs’ contention and the statute the court declared:

The statute is capable of this construction if it alone were to be looked to for its meaning. It must be interpreted, however, in the light of the Constitution and of the common law and Mexican civil law under which lands have been granted in this State. *Miller v. Letzerich*, 121 Tex. 248, 49 S.W.(2d) 404, 85 A.L.R. 451.

*Id.* Regarding the second issue the court concluded that if the 1921 statute defining state water were construed so as to make diffused surface waters into public waters and subject to appropriation, then it would be clearly void, in violation of the state Constitution. *Id.* The court stated further that in order to sustain the statute’s validity, the court would be compelled to say that the statute had no application to lands granted prior to the enactment of the statute in 1921, in so far as it attempts to take from the grantees their rights to diffused surface waters and to make them public waters subject to appropriation. *Id.*

Although the *Turner* court declined to express an opinion regarding a property owner’s rights in diffused surface waters on land based on grants made subsequent to 1921,<sup>24</sup> this article above and below explains in detail that an analysis of legislative enactments and court decisions consistently support the conclusion that a property owner owns the rain that falls on their property and the resulting diffused surface waters that flow and collect there regardless of the date of the grant out of the state. In addition, a very significant amount of land grants in Texas issued out of the sovereign well before 1921, making the issue moot for a very substantial number of properties.<sup>25</sup>

<sup>23</sup> The court’s analysis of this issue is of interest regarding its recognition of the importance to Texas property owners of storing and using water collected on their property. Contrasting the law in England where courts had treated the subject differently, the court drew a strong contrast to the circumstances in Texas, especially arid parts where “storage of water from rainfall” was a necessity, whereas in England, due to the climate, it was not. The storage of water in England, as a result, could be regarded as a dangerous activity with property owners subject to absolute liability for any damage resulting from that water storage. The court commented: “[t]he country is almost without streams; and without the storage of water from rainfall in basins constructed for the purpose, or to hold waters pumped from the earth, the great livestock industry of West Texas must perish . . . . *With us the storage of water is a natural or necessary and common use of the land, necessarily within the contemplation of the state and its grantees when grants were made . . . .* *Turner* at 226 (emphasis added).

<sup>24</sup> In this regard the court stated, “[w]hether or not the article [1921 statutory definition] in this respect could be applied under our Constitution to grants made subsequent to the passage of the law is not before us in this case, and no opinion is expressed relative thereto.” *Id.*

<sup>25</sup> The Texas General Land Office provides that:

In *Hogue v. Baker* (1898) the Texas Supreme Court declared that there was no more vacant and unappropriated land in Texas. In 1900 an act was passed “to define the permanent school fund of the State of Texas, to partition the public lands between said fund and the State, and to adjust the account between said fund and said state; to set apart and appropriate to said school fund, the residue of the public domain....” Thus all of the remaining unappropriated land was set aside by the legislature for the benefit of public schools.

The *Turner* opinion made two aspects of the vested rights in diffused surface water more clear than in *Miller*. One that there was a vested right not only under the civil law, but also the common law with regard to a property owner's ownership rights in diffused surface water.

Under *both the common law and the Mexican civil law*, the owners of the soil on which rains may fall and surface waters gather are the proprietors of the water so long as it remains on their land, and prior to its passage into a natural water course to which riparian rights may attach.

*Id.* (emphasis added). The court's holding solidified the understanding that, besides Spanish and Mexican land grants, which under the civil law included ownership rights in diffused surface water, grants out of both the Republic of Texas and the State of Texas after the adoption of the common law in 1840 included ownership rights to the diffused surface water.

*Miller* had stated expressly that a property owner with surface water rights subject to Spanish or Mexican civil law in effect at the time of the grant had a vested right in the "right of the owner of the upper estate to have the surface waters falling there on to pass in their natural condition on to the lands of lower estate," which the court termed a "natural easement." *Miller* at 408. The *Turner* opinion also made it clear the the ownership rights in diffused surface water (and not just the "natural easement") constituted a vested right and regardless of whether the civil or common law were in effect at the time of the grant. *Turner* at 228. The court declared in this regard:

No citation of authority is necessary to demonstrate that the right of a landowner to the rainwater which falls on his land is a property right which vested in him when the grant was made. Being a property right, the Legislature is without power to take it from him or to declare it public property and subject by appropriation or otherwise to the use of another. *This is so regardless of the question as to whether the grant was made by Texas or Mexico.*

*Id.* (emphasis added). These ownership rights in diffused surface water, similar to rights in groundwater, include the right to use and transfer that water to others as borne out by the facts and analysis in the *Collins* opinion discussed next.

The question was not before the *Turner* court regarding ownership in diffused surface water on properties granted by the state after 1921 and arguably it was more efficient for the court not to offer an opinion on the question which would have involved a more detailed analysis of legislative history along the lines of what was undertaken by the court in *Motl v. Boyd*. However, prior opinions as well as express statutory language suggest how the court would have addressed the issue. The court's statements in *Motl* (discussed above) about the limitations of state water to streams and that state water did not include diffused surface water, as well as comments by both the Texas Supreme Court and the appeals courts in *Hoefs v. Short*, regarding criteria for a natural watercourse to which water rights attach (i.e. state water) that is not inclusive of diffused surface water, as discussed in more detail below, give a clear indication of the direction of the court's opinion on the issue. In addition, a careful analysis of the legislative intent similar to that done in *Motl* would be expected to have considered indicators in the statute defining state water, such as the reference to diverting state water from "its natural channel" and a distinguishing reference to "surface water" found in the 1917 statute as discussed. Had the court proceeded to offer an opinion on this issue that was not before it, consistent with its statements in *Motl* and *Hoefs* and language in the statute, it would be expected that the court in *Turner* would have concluded that the legislature did not intend to include diffused surface waters in the statute defining state water and that ownership of diffused surface water on properties granted after 1921 is the same as ownership on properties after 1921. Regardless of the *Turner's* court's decision not to offer an opinion on this, an analysis herein of the legislature's language in the Water Rights Adjudication Act, and other legislative enactments adopted subsequent to *Turner* supports this conclusion regarding legislative intent. In addition, courts have treated the matter as well settled that a property owner owns the diffused surface water on their property before it enters a watercourse--with no reference to when the property was granted by the state, and the Texas Supreme Court, has been petitioned on such cases (*See, e.g., Citizens, Domel, and Watts* cited above) and has had the opportunity to weigh in otherwise.

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Texas General Land Office, *Categories of Land Grants in Texas*, January, 2015,

<http://www.glo.texas.gov/history/archives/forms/files/categories-of-land-grants.pdf> (last visited Jan. 31, 2017).

### C. *Collins*: Right to transfer diffused surface waters

As discussed above, in *Republic Prod. Co. v. Collins*, 41 S.W.2d 100, 102 (Tex. Civ. App. 1931), writ dismissed w.o.j. (Oct. 28, 1931) affirms that an owner of the surface rights to property owns the “surface water” on the property and can collect and retain that surface water for the property owner’s own use, including the right to sell these diffused surface water to others. In *Collins*, plaintiff and defendant in a joint effort, completed a surface tank on plaintiff’s property for collecting diffused surface water. Plaintiff and defendant entered into an agreement whereby the parties agreed to certain limited uses of the water. Plaintiff, owner of the property with the surface tank, would have use of water for, among other things, irrigation of land adjacent to the tank. Defendant, in consideration of his labor in completing the tank, had the right to use water from the tank in drilling and operating oil and gas wells on the defendant’s lease contiguous to the plaintiff’s property.

Surplus water was to remain in the tank on plaintiff’s property for the benefit of the plaintiff’s estate.<sup>26</sup>

Despite terms of the agreement, defendant, sold water obtained from the surface tank to oil companies with leases contiguous to defendant’s lease. The trial court entered a judgment for the plaintiff for half the funds defendant collected from the oil companies for the water, less certain expenses. *Id.* at 101–02. The appeals court summarized the matter stating:

In brief, the suit itself involves merely the right to recover the value of surplus surface water collected in a surface tank on the Collins homestead or freehold; the tank having been constructed by the joint efforts of plaintiff and defendant, and the rights of the latter to water therefrom fixed by the specific terms of a special contract pleaded and proved, as aforesaid.

*Id.* at 102. After disposing of appellant’s (defendant in trial court) various “propositions of error,” the court affirmed the trial court’s judgment requiring the defendant to pay the plaintiff. *Id.* at 105.

Regarding the landowner’s rights in the diffused surface water, the *Collins* court found that, “[i]t is

generally held that the owner of the soil has the *absolute right* to the surface water thereon, and he may in the improvement of his lands, or *for his own use*, retain all such water.” *Id.* at 102. (emphasis added). The court also commented that “the same rule” is stated “in this language: ‘A landowner has the right to collect and *appropriate to his own use* all surface water upon his property without liability to other owners . . . .’” *Id.* (emphasis added). It is clear from the court’s disposition of the matter that the court did not consider the land owner’s use under this “absolute right” limited only to improvement of his lands and in interpreting that “absolute right” read the phrase “or for his own use” broadly to include exchanging that water with others and transferring it off the property.

The court in *Collins*, in fact, found no objection with the exchange or sale of the “surface water” to others—either the exchange between plaintiff and defendant, or defendant’s outright sale of water to oil companies with contiguous leases. The court sought only to assure that the proceeds of this sale were equitably apportioned between plaintiff and defendant per the terms of the agreement. No issue was raised by the court that questioned the ownership interest that allowed for such sale. Besides stating the general principle upon which the property owner’s ownership of the water was based (as quoted above in the section on diffused surface water) regarding ownership of the water the court found that, “[f]urther, an examination of the testimony adduced by the defendant . . . discloses that the plaintiff’s ownership of the water, save as affected by the agreement involved in this suit, was not and is not denied.” *Id.* at 102.

Further, regarding the contract at issue in the *Collins* case in which the property owner, as an exchange, authorized another person to use the diffused surface water on a separate property, the court recognized that, “[s]uch contracts are common, and no reason can be perceived why the parties were not able to make the same as here alleged.” *Id.* at 102. Again, the court’s acceptance of this “common” practice of exchanging or selling diffused surface water thus acknowledged that a key aspect of ownership of surface water is that the property owner is free to utilize or dispose of the water as they choose, including sale or exchange with others.

### D. *Citizens Against Landfill Location*: Right to use diffused surface water without permit

For determining ownership rights in rainwater or diffused surface water collected on private property the case *Citizens Against Landfill Location v. Texas Comm’n on Envtl. Quality*, 169 S.W.3d 258 (Tex. App.—Austin 2005, pet. denied) (herein referenced in short form as “*Citizens*” due to frequent citation) merits special consideration and analysis. In this

<sup>26</sup> Note this tank in the *Collins* case is not a domestic and livestock tank falling under some domestic and livestock exception. The domestic and livestock exemption is an exemption from state water right permitting for the impoundment of state water as discussed further below. No state water is involved in the *Collins* case.

relatively recent decision in terms of water rights litigation, the Commission itself took the position that no water right permit was required to either impound or use a significant amount of rainwater collected on private property in a surface impoundment. In its holdings the court recognized the property owner's ownership in what the court terms as both collected "rainwater" and "diffuse surface water."

Some background information is helpful in understanding the holding in the *Citizens* opinion. In order to obtain a permit for expanding its landfill, BFI had to demonstrate that it could maintain a run-off management system capable of collecting and controlling, at least, the water volume resulting from a 24-hour, 25 year storm. *Id.* at 269. The landfill designer testified that the total volume of the detention channel surrounding the landfill was 96.7 acre-feet and that the volume of run-off associated with a 24-hour, 25-year storm was 64.2 acre-feet, and thus the channel had sufficient capacity. *Id.* at 269. Although BFI was permitted to discharge run-off into drainage ditches run by the Donna Irrigation District, BFI's practice was to impound water in the detention channel and evidence showed there had been only one discharge into the drainage ditches during the entire history of the landfill. *Id.* at 269-70.

The appellants (protestants in administrative hearing referred to collectively in the opinion as "Citizens") contended that the Commission ignored BFI's failure to provide evidence of a right to impound run-off water in its detention channel which would also be used for the purposes of dust suppression and irrigation. *Id.* at 274. Citizens argued that a water right permit would be required for the Commission to approve the application. *Id.*

In its analysis of the facts the court reported that, "[t]he record contains evidence that the detention channel is completely manmade and is designed to capture only the surface water that originates onsite; that there is no water flow from outside the site into the detention channel." *Id.* at 274. The court, noting that water in a watercourse is state water and applying the *Hoefs* court's definition of a water course found that, "while it could be argued that the detention channel has defined banks and beds, the evidence in the record is clear that the water in the channel has no defined current and that there is no permanent supply of water feeding the channel. Therefore, we hold that the detention channel is not a watercourse."<sup>27</sup> *Id.*

<sup>27</sup> In its analysis, the *Citizens* court summarized the pertinent law stating, "Texas law categorizes surface water into one of two general types: diffuse surface water and water in a water course." *Id.* Further the court recognized that, "[d]iffuse

Pertinent to the subject of this article, the court described the detention channel as a rainwater collection system, stating, "there is testimony that the *only purpose of the detention channel is to collect rainwater* and not to divert the ordinary flow from any adjacent river, stream, or water course." *Id.* (emphasis added). The court concluded, "BFI *may impound diffuse surface water originating at the landfill without a permit.*" *Id.*<sup>28</sup> (emphasis added). The court not only found that a permit was not required for impoundment, but importantly as well, no permit was required for the *use* of that impounded diffuse surface water. The court summarized its decision stating:

We hold that the Commission did not err as a matter of law by determining that BFI was not required to demonstrate that it possessed a permit to collect diffuse surface water in its detention channel to be used later for dust suppression and irrigation.

*Id.* In sum, the *Citizens* case provides an important example demonstrating that courts and TCEQ have recognized a property owner can:

- Impound a significant sum (eg. 96 acre-feet) of diffused surface water ("rainwater"),
- Use the impounded diffused surface water for uses such as irrigation and dust suppression (not domestic and livestock or other type of exempt use), and
- Make these uses of diffused surface water ("rainwater") while not being required to have a state water right permit or even any exemption from a state water right permit, since the diffused water impounded and used is not state water, but privately owned.

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surface water belongs to the owner of the land on which it gathers, so long as it remains on that land prior to its passage into a natural watercourse," *Id.* and that, "[w]ater in a watercourse is the property of the State." *Id.* The court reiterated the definition of a watercourse from *Hoefs* that, "[a] watercourse has (1) a defined bank and beds, (2) a current of water, and (3) a permanent source of supply." *Id.*

<sup>28</sup> The fact that the diffused surface water originated at the landfill may have provided some further assurance that the water was not part of a water course because the origin is known, however, the fact that water originates on adjacent property or comes partially from that source would not alone cause the diffused surface water to meet the definition of a watercourse. That analysis would still have to be done with regard to the facts of a particular case. The diffused surface water in the *Turner* opinion, for example, crossed property boundaries and remained diffused surface water.



### E. *Hoefs v. Short*: Water Rights Attach to Watercourse, Not Diffused Surface Water

The seminal case establishing the criteria for a natural watercourse is the Texas Supreme Court decision *Hoefs v. Short*, 114 Tex. 501, 273 S.W. 785 (1925). A key issue being decided by the *Hoefs* court was whether the water in a certain creek was, as the defendants contended, only diffused surface water and thus the defendants' private property to impound and use as they wished. Defendants asserted on this basis that they could not be enjoined from building a dam and canals that would take all the water in the creek or be required to pass a certain amount of water by their dam to satisfy the water rights of the plaintiff, a downstream landowner.<sup>29</sup> The court explained:

The major contention of the defendants is that the waters of Barilla creek are mere surface waters, to which water rights do not attach. It is obvious from the evidence that this defense is untenable. The waters of Barilla creek are not diffused over the surface of the ground, but are accustomed to flow in a well-defined channel, in a stream, which, though intermittent as to flow, has a well defined and permanent existence.

*Id.* at 786. Regarding the definition of a "natural watercourse" the court in *Hoefs* referenced the criteria that, "a stream in order to be a natural water course to which water rights attach must have bed, banks, a current of water, and a permanent source of water supply . . ." *Id.* at 786-87. The court made the qualification that, "while the rule as ordinarily expressed is that a water course must have a well-defined channel, bed, and banks, yet there may be instances where these are slight, imperceptible, or absent, and still a water course exist." *Id.* at 787. In addition the court explained that, "a current of water is necessary, yet the flow of water need not be continuous, and the stream may be dry for long periods of time." *Id.*

In *Hoefs*, the court in response to the defendants' contention that "the waters of Barilla creek are mere

[diffused] surface waters, to which water rights do not attach," declared:

The waters of Barilla creek are not diffused over the surface of the ground, but are accustomed to flow in a well-defined channel, in a stream, which, though intermittent as to flow, has a well-defined and permanent existence. They are therefore not [diffused] surface waters, but are the *waters of a stream*. We are of the opinion also that Barilla creek is a *stream* of such character that *water rights attach* to it.

*Hoefs v. Short*, 114 Tex. 501, 505, 273 S.W. 785, 786 (1925) (emphasis added; citations omitted). Importantly the *Hoefs* court clearly stated that this requirement for water to be in a natural watercourse for water rights to attach applied to both riparian and appropriate rights. In its conclusion the court declared that:

We therefore hold that Barilla creek under the undisputed evidence and admitted facts *meets all the requirements of a natural water course to which water rights, whether riparian or by appropriation, attach*.

*Id.* at 788 (emphasis added). The appeals court opinion in *Hoefs*, affirmed by the Texas Supreme Court, provides considerable discussion on prior precedent not supporting any appropriate right in diffused surface water, quoting at length the water treatise by Weil that concluded:

All the many cases already cited considering whether there was or was not a water course held that, if there was not a water course, but only diffused surface water, neither the law of riparian rights nor the law of permanent rights by priority of appropriation applies.

*Hoefs v. Short*, 190 S.W. 802, 806 (Tex. Civ. App. 1916), *writ granted* (Dec. 12, 1917), *aff'd*, 114 Tex. 501, 273 S.W. 785 (1925).<sup>30</sup> Quoting yet another

<sup>29</sup> As explained in the 1916 appeals court decision in *Hoefs*, both plaintiff and defendants had an appropriative right from the Board of Water Engineers which had been established by the Texas legislature in 1913. *Hoefs v. Short*, 190 S.W. 802, 803 (Tex. Civ. App. 1916), *writ granted* (Dec. 12, 1917), *aff'd*, 114 Tex. 501, 273 S.W. 785 (1925). The Texas Supreme Court also recognized the property owners along the stream as having riparian rights. *Hoefs v. Short*, 114 Tex. 501, 510, 273 S.W. 785, 788 (1925).

<sup>30</sup> The appeals court provided also in this regard that, "[i]t is stated by Mr. Weil in his work on Water Rights in the Western States (3d Ed. § 349) that diffused surface water cannot be appropriated against the landowner on whose land it lies; that its presence and movements are too capricious to found any right upon distinct from the land where it is gathered, and such water is owned by the owner of the land where it happens to lie." *Id.*

authority on the topic, Kinney, the appeals court noted that the same conclusion had been reached:

If a man collect and impound surface and flood waters from his own land before they reach any natural stream or channel and holds the same on his land and premises, the fact that he may not use it for irrigation or any other commercial purpose does not render it any less his property or authorize any one else to invade his property or appropriate and divert the same. A permit from the state engineer cannot give any sanction to such a procedure. *The state engineer has no right to grant permits to one man to use another man's property.*

*Id.* (emphasis added). It can be deduced from the statements of both the appeals court and the Texas Supreme Court in *Hoefs*, that to be state water for which a state permit can be granted, the water must be in a watercourse to which appropriative water rights can attach.

Further, in regards to the statutory definition of state water, the Texas Supreme Court in *Hoefs*, concerning the source of supply for the creek it determined to be a watercourse, explained that “rainfall on its watershed in sufficient quantities will produce a flow of water in this channel.” *Hoefs v. Short*, 114 Tex. 501, 506, 273 S.W. 785, 786 (1925). Taken together with statements by the courts regarding “watercourses” to which water rights “attach,” the courts concluded that state water rights permitting did not apply to the rainfall on the watershed until it produced “a flow of water” in a “channel,” or in other words formed a watercourse. Thus the term “rainwater of every . . . watershed” in the definitional statute should be interpreted in the context the *Hoefs* court’s interpretation of it becoming state water when it coalesces into a watercourse.

Thus at a time generally contemporaneous to the adoption of the 1921 statute (both before and after), the courts in *Hoefs* interpreted this statutory language defining state water as not meaning that any rainwater, simply by falling on any watershed, became state water, but rather state appropriative rights attached when it entered into a stream that met the requirements of a natural watercourse. The legislature after the 1916 appeals court decision in *Hoefs* took the opportunity to change the definition of state water, but chose not to add any express term regarding diffused surface water or any other type of language that would support the idea that diffused surface water was included in the

definition. It must be presumed that the legislature adopted the statutory definition of state water with knowledge of the existing law<sup>31</sup> and knowing that the *Hoefs* 1916 appeals court opinion quoted authorities that declared that if water was not in a watercourse the law of water rights by prior appropriation did not apply. That the legislature did not make any change to the statute in 1921 that can be interpreted as an attempt to include diffused surface water as state water—and in particular not including the well-known terms “surface water” or “diffused surface water” in the statutory definition—speaks to the legislative intent not to include these in the definition of state water.

A solid understanding of the cases discussed above is helpful in addressing some potential points of confusion regarding a property owner’s rights in diffused surface water. Before proceeding to that analysis, it is worthwhile to take a brief moment to consider how exemptions from state permitting for domestic and livestock ponds factors into a property owner’s right to collect diffused surface water on their property without a permit.

#### IV. ADDRESSING POTENTIAL POINTS OF CONFUSION

##### A. Permit Exemptions Do Not Apply to Diffused Surface Water

The statutory exemptions under Texas Water Code §§11.142 – 11.1422 are exemptions from state permitting for the impoundment and use of state water for certain purposes. The most common of these is the exemption for domestic and livestock purposes. As the exemptions are from permits for state water, these exemptions do not apply if state water is not being used, such as the collection and storage of diffused surface water. In this regard, the Texas Groundwater Protection Committee established by the legislature in 1989 under House Bill 1458 (codified in the Texas Water Code in Sections 26.401 -26.408) with the Executive Director of the Texas Commission on Environmental Quality (TCEQ) serving as Chair, and the Executive Director of the Texas Water Development Board (TWDB) serving as Vice Chair, includes in its public information the following statement:

Some landowners may have concerns about whether the state requires them to obtain a permit to build a reservoir on their property

<sup>31</sup> A statute is presumed to have been enacted by the legislature with complete knowledge of the existing law and with reference to it. *Acker v. Texas Water Comm'n*, 790 S.W.2d 299, 301 (Tex. 1990).

for the use of a stock tank. This falls into the “stock tank exception” that allows landowners to build up to a 200-acre-foot reservoir on their property without receiving permission from the state. . . . *The “stock tank exception” as discussed above does not apply to diffused surface water.* This means that a landowner may harvest the rainwater into the soil, or capture and store drainage water, as long as the water is captured before it reaches a natural water course.<sup>32</sup>

The court in the *Citizens* opinion, for example, makes no reference to any need for any permit exemptions for the 96 acre feet of water impounded by the landfill owner in the detention channel. The court expressly recognized that the property owner in constructing a detention channel to “collect rainwater” had private ownership of such impounded diffused surface water. Consequently, the landfill owner was also not required to obtain any permit for uses of state water under Texas Water Code §11.143, which requires the owner of an exempt reservoir under §11.142 to obtain a permit for uses not described under that section.

## B. Addressing Certain Cases

As discussed above in some detail, private ownership of rainwater that falls on one’s property and diffused surface waters that reside there in Texas is generally considered a well-settled matter and this article does not conclude differently, however, there is the potential for some confusion, as mentioned, due to some terms in the statutory definition of state water, the Texas Supreme Court’s opinion on the matter in *Turner v. Big Lake Oil Co.* (declining to express an opinion on certain aspects of this matter that were not before it), and one appeals court opinion discussing *Turner*, which this article seeks to address. In particular there could be confusion as to whether there is any difference in a property owner’s rights in rainwater and diffused surface water on land that was granted out of the state after 1921 when the Texas legislature adopted the modern definition of state water. This is the question which the court expressly declined to address in *Turner*. An appeals court conducted some analysis related to the question, although as discussed below, upon examination, the appeals court in that opinion by its statement of facts and analysis actually confirms that diffused surface

water on a property granted by the state after 1921 is privately owned. This appeals court opinion is analyzed in detail below and also considered in context to an analysis of legislation and case law on the issue both prior and subsequent to the *Turner* opinion. This analysis concludes that the legislature did not intend any difference in the rights of property owners in rainwater and diffused surface water depending on the date of initial grant out of the state.<sup>33</sup>

### 1. *In re Adjudication of Water Rights of Lower Guadalupe River Segment*

A case which can be a source of confusion regarding the subject of this article is *In re Adjudication of Water Rights of Lower Guadalupe River Segment*, 730 S.W.2d 64 (Tex. App. 1987), writ refused NRE (Sept. 16, 1987) (herein also referenced in short form as *Guadalupe* due to frequent citation). In the *Guadalupe* opinion, a property owner appealed the adjudication of water rights in a lake under which appellant owned most of the bed. The Texas Water Commission had determined the waters of the lake were owned by the state. The property owner, Indianola, filed exceptions in district court which affirmed the Commission’s ruling. The appeals court affirmed the trial court.

The sole issue on appeal was whether the water in the lake was publicly or privately owned. Indianola contended the waters in the lake were “surface waters” which they owned citing the *Turner* and *Collins* decisions. Importantly, with regard to the facts, the court noted that it was agreed that all waters in the lake originated from rain or from *floodwaters of the Guadalupe River*. *Id.* at 66, n. 1. Based on this stated fact, it appears the court needed to perform only a simple analysis to conclude that a lake impounding flood waters of a major river was state water and that any surface water from runoff on the property that entered the lake also became state water. The *Guadalupe* court in fact cited *Bass v. Taylor* which, for example, concluded in a discussion of this topic that, the flood plain is part of the stream, “and the waters that flow therein when the stream overflows its banks are still the waters of Wilson creek, and are not surface waters.” *Bass v. Taylor*, 126 Tex. 522, 530, 90 S.W.2d 811, 815 (1936).

<sup>32</sup> Texas Groundwater Protection Committee, *Water in Texas—Who Owns It?*, [http://tgpc.state.tx.us/POE/FAQs/WaterOwnership\\_FAQ.pdf](http://tgpc.state.tx.us/POE/FAQs/WaterOwnership_FAQ.pdf) (last visited January 31, 2017).

<sup>33</sup> Although, as mentioned, very significant amounts of property in Texas had already been granted out of the sovereign prior to 1921, there have been grants subsequent to 1921 as discussed in *In re Adjudication of Water Rights of Lower Guadalupe River Segment*, 730 S.W.2d 64 (Tex. App. 1987), writ refused NRE (Sept. 16, 1987).

However, in addressing the question before it as to whether the water at issue was state water or diffused surface water, rather than proceeding first with the usual analysis for making this determination based on whether the water in question entered a watercourse, the court instead attempted to match up waters named in the statutory definition of state water with the water at issue. Although understandably this may have seemed to be a practical approach, the confusion ensues from this. This is due in large part to the fact that some of the waters described in the statutory definition of state water, such as the rainwater or floodwater of a "depression," the primary statutory term focused on by the *Guadalupe* court, can be either state water or diffused surface water, depending on whether the depression constitutes a watercourse.<sup>34</sup> Both the *Turner* and *Collins* opinions, for example, involved water that came to rest in a natural depression (*Turner*) or were collected in a constructed depression (*Collins*) which those courts concluded remained diffused surface waters. TCEQ rules expressly recognize diffused surface water may come to rest in natural depressions. 30 Tex. Admin. Code §297.1(16). The agency also successfully took the position in the *Citizen* opinion discussed above that diffused surface water was not state water and in particular diffused surface water collected in a detention channel (also apparently a depression) did not constitute state water.

The *Guadalupe* opinion nonetheless attempted to conclude that because the waters had entered a

depression, they became state waters as a result of being waters identified in the statutory definition of state water, without considering (at least in any express manner) whether the depression (or "lake") was a watercourse. The *Guadalupe* court's statutory analysis is internally contradicted, by its own recognition that in the *Collins* case, water captured in a depression remained diffused surface waters. The court attempted to distinguish that case by explaining that the depression in *Collins* dealt with *artificially* impounded surface waters, and not surface waters collected by a *natural* depression to form a lake. The statute makes no distinction between a natural or artificial depression. The distinction pertinent to the court's evaluation was not the artificial or natural aspect of the depression, but whether the depression was a watercourse or not. The surface tank in *Collins* by the facts was not a watercourse and the lake in *Guadalupe*, as shown by facts discussed, was one.

The *Guadalupe* court's logic is also confounded by the fact that in *Turner* the water in that case came to rest in *natural* water holes—natural depressions, but the *Turner* court very clearly determined that these waters were both in fact and in law still diffused surface waters. Rather than recognizing that the *Turner* court was addressing different facts and a very different question, as discussed below, the *Guadalupe* court instead attempted to distinguish *Turner* by noting that, unlike in *Guadalupe*, the waters in *Turner* were on lands granted by the state before the enactment of the 1921 statutory definition of state water to which lands and water thereon the statute, the *Turner* court determined, had no application.

The *Guadalupe* court's argument for distinguishing *Turner* based on the date of state property grant is misplaced, however, because with regard to the water in the lake, the *Guadalupe* opinion never reached the question addressed by the court in *Turner*. Thus the manner in which the *Turner* court addressed that different question based on the date of property grant was not relevant to the analysis of the lake water in the *Guadalupe* case. In *Turner*, because the court had concluded that the waters at issue were in fact diffused surface water, it confronted another issue that the *Guadalupe* court did not and could not have confronted, which, was: despite the fact that the water at issue was diffused surface water in law and in fact, did the 1921 statute make these waters state water? The *Turner* court's analysis regarding the date of the property grant being prior to the adoption of the statute (thus making the statute inapplicable) was relevant only to this separate question addressed in the *Turner* opinion, and not to the *Turner* court's initial determination that the waters at issue in that case were diffused surface water.

<sup>34</sup> Although the definitional statute §11.021 has the term "lake" in it, it is in a series of terms preceded by the term "flowing" and the property owner had argued that since the lake water at issue was not flowing, it did not come under the statute. The court rejected that argument in a cursory and less than convincing manner. It appears that the court still recognized the problematic aspect of relying on the term "lake" and as a result the court primarily focused its analysis on the statutory term "depression," describing the waters at issue for example as, "surface waters which were collected by a natural depression to form a lake to which the state claims title." *Id.* at 66. The court also asserted that, "[o]nce surface waters and flood waters come to rest in the natural depression formed by the bed of Green Lake, they become lake waters." *Id.* at 67. The court concluded that the waters came "within the province of 11.021 and its predecessors, whether classified as a "lake" or as "the storm water, floodwater, and rainwater of [a] . . . depression." *Id.* The court's conclusion "whether classified" as a lake or depression again showed the court's hesitancy in just relying on the term "lake" and why it repeatedly emphasized that the term depression applied. Again, whether the depression or lake in *Guadalupe* was a natural watercourse would have been the standard analysis of whether the surface water became state water upon entering the water body.

As the *Guadalupe* court did not ever determine the waters at issue in the depression were diffused surface water in the first place, it could not reach the next question addressed by the court in *Turner* as to whether the statute identified such diffused surface water as state water. The *Turner* court's analysis regarding the date of the grant of the property by the state which the *Turner* court used to address that second question is simply irrelevant to the *Guadalupe* court's analysis of the lake water that never reached that question. Ultimately the *Turner* and *Collins* cases could have been easily distinguished by the *Guadalupe* court as inapplicable after a brief analysis concluding the lake waters at issue were simply not diffused surface water as they were in *Turner* and *Collins*, since a lake that impounded floodwaters from a river was a watercourse, and thus state water, along with any diffused surface water that flowed into that state water--and hence the statutory reference to waters of a "depression" in the definition of state water did apply in that instance.

Significantly, the *Guadalupe* court's approach to identifying state water by reliance on statutory terms also appears further confounded by the fact that despite the statute's reference to rainwater of every watershed as state water, the *Guadalupe* court recognized the waters on the property at issue, *before* they enter the depression or lake, as "surface water"--clearly meaning by this term privately owned diffused surface water. The *Guadalupe* court by asserting that the surface water lost its character as surface water when it came to rest in a natural depression forming the lake, recognized that until these waters entered the lake, they maintained their character as surface water. By recognizing the water as state water only when it came to rest in the lake, the court implicitly recognized this surface water as privately owned before it entered the lake. The only water at issue in *Guadalupe* is the ownership status of the water *after* it has entered the lake. Because the *Guadalupe* court was well aware of the question from the *Turner* opinion--did the statutory language including rainwater of every watershed in the definition of state water make diffused surface water state water--the *Guadalupe* court, in effect implicitly concluded that the statutory term "rainwater of every . . . watershed" did not transform these diffused surface waters, before they entered the lake, into state waters, despite the fact that the property was granted by the state after 1921. In this regard, the *Guadalupe* opinion can be seen as answering the question left open in the *Turner* opinion--did diffused surface water on properties granted after 1921 become state waters under the statute? As the *Guadalupe* court in determining the ownership status of the water on the property considered what were state waters under the statute, and was aware of this question raised in the

*Turner* opinion and left undecided for properties granted after the adoption of the 1921 statute, it follows by the court's treatment of these diffused surface waters as private water before entering the lake, that the *Guadalupe* court answered this question left unaddressed in *Turner* in the negative.

It is essential to note in regard to this question the *Guadalupe* court stated, "The [*Turner*] Court expressly reserved the question of what effect the law would have on subsequent grants. . . . Had the question been before the Court, we are certain that the opposite result would have been reached." Despite this assertion, as just discussed, the *Guadalupe* court did *not* find an opposite result with regard to the diffused surface water before it reached the lake on the property which it determined was one of the "subsequent grants" after adoption of the 1921 statute. This assertion then must have been limited to the lake water in the "depression" at issue. First, the *Turner* court, as any other, would have found "the opposite result" concerning the water at issue in *Guadalupe* (finding it state water rather than diffused surface water) not because of a difference in the date of the state's grant of the underlying property, but because any ordinary analysis would conclude these were waters in a watercourse, and thus state water. Second, as discussed above, since with regard to the lake water, the same question was not before the *Guadalupe* court as had been before the *Turner* court, any "opposite result" in *Guadalupe* is due to answering a different question. The question in *Turner* concerned the effect of the statute on waters already determined to be diffused surface waters. In *Guadalupe*, the waters in the lake were never determined to be diffused surface waters, so the question from *Turner* as to the statutory effect on diffused surface waters was never before the court in *Guadalupe* with regard to the lake water. Thus the *Guadalupe* court could not and did not give any "opposite" answer to a question that was not before it. With regard to the diffused surface waters in *Guadalupe* before they reached the lake, the court's opinion actually has the *same* result as in *Turner*--there was no determination that the statute in either case transformed those diffused surface waters into state water.

The lake water at issue in the *Guadalupe* case would be determined to be state water regardless of the grant date of the underlying property being before or after the 1921 adoption of the definition of state water. Ultimately, the *Guadalupe* court's focus on the date of the property grant and discussion of the *Turner* opinion regarding this adds nothing to the *Guadalupe* court's analysis of any value in answering the question before it regarding the status of the water in the depression. The date of the grant is simply irrelevant to the analysis of this lake water all together. The diffused surface water once it flowed into the lake entered into

in the watercourse and would still be concluded to be state water *regardless of the date the state granted the property*, thus making the date of the grant inapplicable to the status of the lake water.

The *Guadalupe* opinion, in the analysis it does rely on, if not expressly then by implication, essentially confirms the well-established understanding concerning private ownership of diffused surface water. Although not using the term or concept of “watercourse” to explain why the surface waters which flowed into the “lake” at issue became state waters the *Guadalupe* court cited for support *Bass v. Taylor*, 126 Tex. 522, 530, 90 S.W.2d 811 (1936) which stated the commonly understood law that, “[w]hen once surface water has found its way to the beds of *well-defined streams*, and has joined their currents, it ceases to possess any of the qualities of surface water.” *Id.* at 815 (emphasis added). Again, the *Bass* court recognized that water in the flood plain was still part of the water of this well-defined stream, and to the extent the lake at issue in *Guadalupe* captured Guadalupe River floodwater in the flood plain, it captured state water from this stream which remained state water. As discussed in the *Hoefs* opinion, a “well-defined” stream describes a key criteria for a watercourse, and as recognized by Texas courts water in a watercourse is the property of the State. *See eg. S. Tex. Water Co. v. Bieri*, 247 S.W.2d 268, 272 (Tex. Civ. App. 1952), *writ refused NRE* (stating “it is a well established rule in Texas that waters of public streams belong to the sovereign.”)

In sum, as explained in detail above, although upon an initial casual reading one might get an impression otherwise, under a more detailed and careful analysis as discussed herein, *Guadalupe* cannot and does not stand for the proposition that waters that are diffused surface waters in law and in fact become state water if on a property granted after 1921. Among other things, such a conclusion would not be relevant or applicable to the question or facts in that case. The court in *Guadalupe*, in the analysis it appears to actually rely upon by reference to the opinions the court cites, follows the well-established law on diffused surface water becoming state water upon entering a watercourse. If it was claimed that *Guadalupe* stood for anything else, it would stand out as remarkably inconsistent with over a century of case law precedent from before and after the 1921 adoption of the definition of state water, with other statutory enactments over that same period of time, with the history of civil and common law as noted by the Texas Supreme Court in *Miller* and *Turner*, and with the state agency charged with issuing state water rights in both its rules and positions it has taken in litigation. Further the *Guadalupe* opinion supports the conclusion that for properties granted after adoption of the statutory

definition of state water in 1921, such as the property at issue in *Guadalupe*, that like those granted before, the statutory language referring to “rainwater of every . . . watershed” does not transform diffused surface waters on those properties into state water, as it did not with the diffused surface waters in the *Guadalupe* opinion.

## 2. *Walenta v. Wolter*

Another statement by a Texas court in *Walenta v. Wolter*, 186 S.W. 873, 874 (Tex. Civ. App. 1916), *writ refused* (Nov. 14, 1917), cited in the *Guadalupe* opinion, may cause some confusion about when “surface water” becomes state water and the rights of property owners to collect surface water and use it as they please. An analysis of the statement in *Walenta v. Wolter*, however, finds that these do not alter the conclusion that a property owner can harvest rainwater and diffused surface water on their property and use it as they please. In *Walenta v. Wolter* a Texas Appeals court in 1916 drew the tentative conclusion that:

It seems clear that when rainfall is under control, either by ditches, tanks, ponds, or pipes, it is no longer surface water as defined by the decisions.

*Id.* at 874. This over-generalized conclusion is at odds TCEQ’s definition of diffused surface water quoted above, with the facts and conclusions in the Texas Supreme Court opinion *Turner* (diffused surface water that came to rest in “natural water holes” remained diffused surface water) and the more recent opinion in *Citizens Against Landfill Location* (in which TCEQ successfully took the position that diffused surface water which collected in a man-made channel did not become state water). As quoted in several opinions above, the recognized legal test for when diffused surface water is no longer diffused surface water is when it enters into a watercourse. The Texas Supreme Court, about ten years after the *Walenta* opinion in *Hoefs*, defined natural watercourse in a manner that would exclude at least some ditches, tanks, ponds or pipes, and as these would not meet the court’s definition of a natural watercourse, and the water in them, including rainwater from rainwater harvesting, would not be state water.

## V. CONCLUSION

Based on the analysis herein, it can be concluded that rainwater and diffused surface water in Texas belongs to the owner of the property on which this water falls, flows in a diffused manner, or gathers before entering a watercourse. The Texas Supreme Court has held these ownership rights conveyed in the original grant of the property out the sovereign under

both the civil and common law and are a property right which vested when the grant was made. As discussed, the matter is well settled among the courts, supported by the legislative intent of statutes related to state water and rainwater harvesting, and confirmed by the state agency charged with permitting state water by the manner it has interpreted ownership rights in diffused surface water in litigation on the subject.

This conclusion is drawn despite some potential points of confusion which this article has sought to address in substantial detail regarding the statute defining state water and a few court opinions. In the landmark 1936 Texas Supreme Court opinion, *Turner v. Big Lake Oil Co.*, some landowners attempted unsuccessfully to assert that the statutory definition of state water included diffused surface water in some of its terms. The court concluded that if the statute was construed to make diffused surface waters into public waters subject to appropriation it would be void in violation of the state Constitution, as the legislature was without power to take these vested property rights and declare them public property. To sustain the validity of the statute, however, the court limited the scope of its decision, declaring the 1921 statute had no application to lands granted prior to its enactment in so far as it attempted to take property owner's rights in diffused surface water. The court had done so also for practical reasons, as it found no contention that the surface waters were on lands granted by the state after enactment of the statute in 1921. Although the court in declining to express an opinion on facts that were not before it, left seemingly unaddressed rights in diffused surface water on lands granted after adoption of the 1921 statute, a detailed consideration of legislative enactments both before and after 1921 shows the legislative intent not to include diffused surface water in state water, regardless of whether the diffused surface water is on a property granted prior to or after the enactment of the 1921 statute defining state water. Put simply, this review shows a manifest intent to define state water as water in a watercourse, exclusive of any diffused surface water. Court opinions both prior and subsequent to *Turner* consistently support this conclusion as well.

In particular, the conclusion is supported by the legislature's inclusion in the 1921 statutory definition of state water a reference to the acquiring the right to divert this state water from its "natural channel" (currently at Texas Water Code §11.022), removal of "collections of still water," which was susceptible of being interpreted to include diffused surface water, and failure over several iterations to include any express language on diffused surface water in the statute. Earlier, as discussed, the legislature included an exception for "surface water" in the 1917 Act that distinguished it from state water. These speak to a

legislative intent to not include diffused surface water in state water and to define state water as water in a watercourse. Further, the adoption of the Water Rights Adjudication Act in 1967, by requiring a claimant to state water to identify the stream or watercourse in which the state water is claimed, further underscores the legislative intent to define state water as water in a watercourse. Also, as discussed, recent statutes promoting rainwater harvesting on private property are indicative of a legislative recognition of a property owner's ownership rights in this water.

Prior to *Turner* the Texas Supreme Court unambiguously declared in 1926 in *Motl v. Boyd* regarding diffused surface waters that "these waters, until they reach the natural steamways are, and have always been, the property of the person on whose lands they fall." *Motl v. Boyd* at 473. The 1916 appeals court opinion in *Hoefs v. Short*, preceding the 1921 version of the statute defining state water, contained substantial discussion of a property owner's rights in diffused surface water, and as discussed, changes implemented by the legislature in 1921 appear consistent with that discussion. The Texas Supreme Court in 1925 affirmed the appeals court decision in *Hoefs v. Short*, holding that the waters at issue were not diffused surface water but waters of a stream to which appropriative water rights attach and further affirmed the *Hoefs* appeals court discussion in *Motl v. Boyd* by declaring unambiguously the private ownership of diffused surface water.

As cited herein, numerous courts over the years subsequent to *Turner* have held that diffused surface water belongs to the owner of the land on which it gathers prior to its passage into a natural watercourse, expressing no limitations on that ownership. See, e.g., *Domel* at 353. More recently TCEQ successfully adopted the position in litigation that no state permit was required for a property owner to collect and use diffused surface water, confirming the inapplicability of the statute defining state water to this private water. While Texas courts have continued consistently to hold with unmistakable clarity that diffused surface water belongs to the property owner and not the state until it enters a watercourse, the legislature over at least a century has had an opportunity to adopt changes to the legislation that would otherwise expressly state that diffused surface water is included in state water, but has never done this. One appeals court opinion which may appear at first to be an outlier in some regards, upon closer analysis relies on precedent supporting the common understanding that diffused surface water becomes state water upon entering a watercourse and, very significantly, confirms that a property owner owns the diffused surface water on their property on land granted out of the state *after* the 1921 enactment statute defining state water.

The ownership rights to rainwater and diffused surface water include the right to use that water as the property owner chooses, including the right to transfer that water to others as shown in the *Collins* opinion discussed herein, thereby enhancing its beneficial use and developing the state's natural resources. Policy reasons support this private ownership of rainwater and diffused surface water in Texas. The Texas Supreme Court in *Turner* recognized years ago its essential use in Texas farming and ranching operations. More recently the legislature has recognized the importance of rainwater harvesting in Texas to promote conservation, particularly of water for domestic uses, which helps make the state's water supply more resilient, especially in times of drought.