AGENDA

RIO GRANDE REGIONAL WATER PLANNING GROUP
(RGRWPG) (REGION M)

9:30 A.M. WEDNESDAY, FEBRUARY 8, 2017

LRGVDC MAIN CAMPUS
KEN JONES EXECUTIVE BOARD ROOM
301 W. RAILROAD ST., WESLACO, TEXAS

PRESIDING: TOMAS RODRIGUEZ, CHAIRMAN

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1. Call to Order & Roll Call ..... Chairman

2. Consider Approval of October 5, 2016 Meeting Minutes ..... Chairman

ACTION ITEM

3. Public Comment ..... Chairman

4. Consider Ratification of Executive Committee Action RE:
Letter of Support to North Alamo Water Supply Corporation ..... Chairman

ACTION ITEM

5. Consider Petitions from Voting Members for Additional Terms ..... Chairman

ACTION ITEM

6. Election of Officers and Executive Committee ..... Chairman

ACTION ITEM

7. Discussion and Possible Action RE: Water Conservation Advisory
Council Final Draft of Legislative Report ..... Chairman

ACTION ITEM

8. Discussion and Possible Action RE: Goldwater Project.....Kip Averitt
Principal for Goldwater Project

ACTION ITEM

9. Presentation on Brackish Desalination - LRGV Groundwater Transport Model ..... Dr. Bill Hutchison
TWDB Contractor Team Member

10. Status Reports

ACTION MAY BE TAKEN ON ANY OF THE FOLLOWING ITEMS

A. Presentation of Texas State Soil and Water Conservation Board (TSSWCB)
Rio Grande Carrizo Cane Program..... Aaron Wendt
Natural Resources Policy Analyst

B. Follow-up and Discussion on Sierra Club Workshop ..... Chairman

C. Status on Current TWDB Contract Activities.....Sara Eatman
Black & Veatch

1. Draft Population and Demand Projections
2. Draft Non-Population Demand Projection Methodologies
3. Request for Application (RFA) for TWDB Funding

D. Financial Report .....Marcie Oviedo
LRGVDC

1. Consider Approval of 2017 Annual Budget
2. Demonstration and Discussion of Region M Website, riogranderegionalwaterplan.org

E. Status of Joint Groundwater Area Planning in GMA's 4, 5, 7, 13, & 16..... Armando Vela
GMA 16

F. Discussion of IBWC Water Accounting at Fort Quitman ..... Chairman

G. Status of No Charge Releases from the San Juan River ..... Chairman

H. Reports from Other Water Planning Groups

1. Reports from Liaisons with Regions: Region E, Glenn Jarvis; Region J, Chairman Tomas Rodriguez; Region L, Don McGhee, and Region N, Judge Humberto Gonzalez

I. Report on Water Conservation Plans and Drought Management Plans Filed with Region ..... Chairman

J. Report on Notices of Applications for Funding and Grants ..... Chairman

K. Status of Studies and Activities on Rio Grande Basin Groundwater Interaction with Surface Water ..... Chairman

11. Reports from Federal and State Agencies

ACTION MAY BE TAKEN ON ANY OF THE FOLLOWING ITEMS

A. TWDB ..... Connie Townsend
Regional Water Planning Liaison

1. Presentation on Summary of 2016 Regional Water Planning Rules Revisions

B. IBWC ..... Edward Drusina
Commissioner

C. TCEQ Watermaster ..... Jose "Lupe" Luna
Rio Grande Watermaster

D. TPWD ..... Willy Cupit

12. Discussion and Consider Action RE: Meeting Schedule ..... Chairman

13. New Member Orientation ..... Connie Townsend TWDB

14. Adjourn

Agenda items may be considered, deliberated and/or acted upon in a different order than numbered above. The Board of Directors of the Rio Grande Regional Water Planning Group (RGRWPG) (Region M) reserves the right to adjourn into Executive (Closed) Session at any time during the course of this meeting to discuss any of the items listed on this agenda as authorized by the Texas Open Meetings Act. No final action will be taken in Executive Session.

PUBLIC INPUT POLICY

Public Input Policy: "At the beginning of each RGRWPG meeting, the RGRWPG will allow for an open public forum/comment period. This comment period shall not exceed one (1) hour in length, and each speaker will be allowed a maximum of three (3) minutes to speak. All individuals desiring to address the RGRWPG must be signed up to do so, prior to the open comment period. The purpose of this comment period is to provide the public an opportunity to address issues or topics that are under the jurisdiction of the RGRWPG as outlined within final implementation guidelines of Senate Bill 1, 75th Legislative Session (SB-1). For issues or topics which are not otherwise part of the posted agenda for the meeting, RGRWPG members may direct staff to investigate the issue or topic further. No action shall be taken on issues or topics which are not part of the posted agenda for the meeting. Members of the public may be recognized on posted agenda items deemed appropriate by the Chairman as these items are considered, and the same time limitation (3 minutes) applies."

MINUTES

MEETING OF THE
RIO GRANDE REGIONAL WATER PLANNING GROUP (RGRWPG) (REGION "M")

9:30 A.M. WEDNESDAY, OCTOBER 5, 2016

LRGVDC MAIN CAMPUS – KEN JONES EXECUTIVE BOARD ROOM
301 W. RAILROAD STREET, WESLACO, TX
PRESIDING: TOMAS RODRIGUEZ, CHAIRMAN

- DRAFT -

1. Call to Order and Roll Call

Chairman Rodriguez called the meeting to order at 9:32 a.m. and announced that the meeting had been posted as required by statute and a quorum of the voting membership was present. LRGVDC Executive Director Ron Garza welcomed the Group to the LRGVDC main campus and the new Ken Jones Executive Board Room and briefed them on the amenities and the new computer tablets that replaced the three-ring binders for meeting information. The Chairman then introduced two new Voting Members: Mr. Dale Murden and Dr. Neal Wilkins.

The following voting members were in attendance:

Board Members	Category
Tomas Rodriguez, Chairman	Public
Sonny Hinojosa, Vice Chairman	Water Districts
Donald McGhee, Secretary	Industries
Frank Schuster, Executive Committee	Other
Mayor Jim Darling	River Authorities
Carlos Garza	Small Business
Jaime Flores	Environmental
Armando Vela	Groundwater Management Area
Judge Humberto Gonzalez	Counties
Dale Murden	Agriculture
Dr. Neal Wilkins	Agriculture

The following members were not in attendance:

Nick Benavides, Executive Committee	Small Business
Glenn Jarvis	Other
John Bruciak	Municipalities
Sonia Lambert	Water Districts
Dennis Goldsberry	Water Utility
Jorge Barrera	Municipalities
Judge Joe Rathmell	Counties
Robert Pena, Jr.	Electric Generating Utility
Riazul Mia	Municipalities

2. Consider Approval RE: Minutes of July 13, 2016 Meeting

Mr. Don McGhee made a motion to approve the minutes as presented. Mr. Carlos Garza seconded the motion, and upon a vote the motion carried unanimously.

3. Hear Public Comment

No requests for Public Comments were received.

4. Consider Authorizing LRGVDC to Provide Public Notice and Submit a Grant Application to TWDB on Behalf of Region M for Funding to Complete the 5th Round of Regional Water Planning, and Negotiate and Execute the Amendment to TWDB Contract No. 1548301841

Mayor Jim Darling made a motion to authorize the LRGVDC to provide public notice and submit a grant application to TWDB on behalf of Region M for funding to complete the 5th Round of Regional Water Planning. Judge Humberto Gonzalez seconded the motion, and upon a vote the motion carried unanimously.

5. Status Reports

A. Discussion RE: Sierra Club Workshop
Chairman Rodriguez announced that he has been invited to speak at the SWIFT Funding Workshop: Focus on Water Conservation scheduled for October 20, 2016 at 9:00 a.m. The workshop is being coordinated by the Sierra Club and the Chairman invited and encouraged the Group to attend.

B. Status on Current TWDB Contract Activities
Ms. Sara Eatman, Engineer for Black & Veatch was recognized and stated that at the beginning of the plan process there is little activity. However the main project staff has worked on over the past months has been reviewing the TWDB's draft list of Water User Groups (WUGs). This planning cycle WUGs are changing from city-based to utility-based, so it is important to make sure that population and demands are appropriately projected in the upcoming cycle of planning. This will lay the groundwork for the next Regional Water Plan.

C. Financial Report
Ms. Marcie Oviedo, LRGVDC was recognized and stated that as per unanimous action taken at the last meeting and the Group's request, she has researched revamping riograndewaterplan.org, the Group's website. She presented samples of other Regional Water Planning Groups' websites on the screen for comparison and consideration. Mr. Carlos Garza stated that based on what he learned when his company revamped their website he suggests that riograndewaterplan.org should be mobile friendly and able to adjust to screens on cell phones and other handheld devices, as well as laptops and desktop computers. Ms. Oviedo, Ms. Eatman, Mr. Garza and Mr. Jaime Flores agreed to work on the specifications for the website refurbishment. No action was taken at this time.

D. Status of Joint Groundwater Area Planning in GMA's 4, 5, 7, 13, & 16
Mr. Armando Vela stated that there was no new information to report at this time.

E. Discussion of IBWC Water Accounting at Fort Quitman
The Chairman stated that there was no new information to report on this item at this time.

F. No Charge Releases from the San Juan River
Mr. Sonny Hinojosa was recognized and stated that some of the irrigation district managers had a conference call with TCEQ, who again offered diversions as a way to repay the debt from the releases. The managers declined the opportunity to pick up excess flows because Mexico would get credit against their water debt, which would result in less water released upstream, and less water in the reservoirs.

G. Reports RE: Other Water Planning Groups

1. **Reports from Liaisons with Regions: Region E, Glenn Jarvis; Region J, Chairman Tomas Rodriguez; Region L, Don McGhee, and Region N, vacant**
There was no new information to report.

   a. **Consider Liaison for Region N**

Mayor Jim Darling made a motion to assign Judge Humberto Gonzalez as Liaison to the Region N Water Planning Group. Mr. Don McGhee seconded the motion, and upon a vote the motion carried unanimously. Staff will contact Region N to advise them of this change.

H. Reports on Water Conservation Plans and Drought Management Plans Filed with Region
No new plans have been received since the last meeting. It was the consensus of the Group to post this list on riograndewaterplan.org and highlight those entities that are not current.

I. Report on Notices of Applications for Funding and Grants
No new notices have been received since the last meeting.

J. Status of Studies and Activities on Rio Grande Basin Groundwater Interaction with Surface Water
There is no new information on this study.

6. Reports from Federal and State Agencies

A. TWDB
Ms. Townsend was recognized and gave a presentation on Region M RWPG Updates that included deadlines for the 5th Cycle of Regional Water Planning that extended to the beginning of 2017. She reiterated information on the Sierra Club SWIFT Conservation Workshop in Weslaco will be held on October 20; announced the TWDB Financial Assistance Workshop will be held on December 6 at 9:00 a.m. at the McAllen City Hall; the Water for Texas 2017 Conference will be held January 23 – 25 in Austin, and the Texas Legislative Session will be from January – June 2017.

1. Presentation RE: Interactive State Water Plan
Ms. Townsend gave a detailed demonstration of the new 2017 Interactive State Water Plan website illustrating what a valuable tool it could be to water related entities.

B. IBWC
No representative from the IBWC was present and no report was provided.

C. TCEQ Watermaster
There were no representatives from the TCEQ Watermaster's office; the report on reservoir levels was on the tablets.

D. TPWD
No one from TPWD was present and no report was provided.

7. Discussion and Possible Action RE: Meeting Schedule
It was the consensus of the Group to continue meeting at the new LRGVDC Main Campus Board Room and to schedule the next meeting on January 11, 2017 at 9:30 a.m.

8. Adjourn
There being no further business to come before the Group the meeting was adjourned at 10:46 a.m.

_____
Tomas Rodriguez, Chairman

RIO GRANDE
REGIONAL WATER PLANNING GROUP

MEMORANDUM

TO: RGRWPG Voting Members

FROM: Ron Garza, LRGVDC Executive Director

DATE: February 1, 2017

SUBJ: Ratification of Executive Committee Action

On December 20, 2016 Mr. Jorge Arroyo, North Alamo Water Supply Corporation (NAWSC) contacted Chairman Tomas Rodriguez requesting a letter of support for their application to the Bureau of Reclamation for a grant to study brackish groundwater desalination. The deadline to submit the letter of support was prior to the February 8 meeting; subsequently the request was submitted to the Executive Committee for consideration.

The Executive Committee gave their approval and the letter (attached) was sent as requested by NAWSC.

Staff respectfully requests ratification of this item.

RIO GRANDE
REGIONAL WATER PLANNING GROUP

January 4, 2017

Mr. Matthew Reichert
Bureau of Reclamation
Financial Assistance Services
Denver Federal Center
6th Avenue & Kipling
Building 56, Room 1000
Denver, CO 80225

Dear Mr. Reichert,

The Rio Grande Regional Water Planning Group (RGRWPG) (Region M) is pleased to support North Alamo Water Supply Corporation's (NAWSC) grant application to study the feasibility of higher energy efficiency alternatives for brackish groundwater desalination. Brackish groundwater desalination is an important component of Region M's current water supplies and a critical strategy for the future. Region M's recently adopted 2016 Regional Water Plan recommends developing 20,000 acre-feet per year of brackish groundwater desalination to meet water supply shortages over the next 50 years.

The energy expense of brackish groundwater desalination is often cited as a challenge to its implementation. NAWSC operates five (5) brackish groundwater desalination facilities in Region M, and the Group supports their initiative to seek more cost-effective means of this important process. If NAWSC is successful in this effort, the Region M area stands to gain from this knowledge.

Thank you for the opportunity to submit this letter of support to fund NAWSC's request. Should you have any questions please do not hesitate to contact me.

Sincerely,

Tomas Rodriguez, Chair

Stewards of water resources from Amistad to the Gulf

Administrative Agent: Lower Rio Grande Valley Development Council, Ron Garza, Executive Director
301 W Railroad – Weslaco, Texas 78596
Telephone: 956-682-3481 Fax: 956-631-4670 Website: riograndewaterplan.org

*Tomas Rodriguez
Laredo, *Chairman*

*Sonny Hinojosa
HCID #2, San Juan, *Vice-Chairman*

*Donald K. McGhee
Hydro Systems, Inc., Harlingen

*Frank Schuster
Val Verde Vegetable Co., McAllen

*Nick Benavides
Nick Benavides, Company, Laredo

Glenn Jarvis
Attorney, McAllen

John Bruciak
Brownsville PUB

Sonia Lambert
CCID No. 2, San Benito

James Darling
City of McAllen Mayor

Carlos Garza, P.E.
AEC Engineering, LLC., Edinburg

Dennis Goldsberry
North Alamo WSC, Donna

Jorge Barrera
Eagle Pass Water Works

Joe Rathmell
Zapata County Judge

Jaime Flores
Arroyo Colorado Partnership, Weslaco

Armando Vela
Red Sands GCD, Linn

Humberto Gonzalez
Jim Hogg County Judge

Robert Pena, Jr.
Texas Energy Consultants, Edinburg

Dale Murdon
Texas Citrus Mutual, Mission

Riazul Mia
City of Laredo, Engineer

Dr. Neal Wilkins
East Wildlife Foundation

***Executive Committee**

RIO GRANDE
REGIONAL WATER PLANNING GROUP

MEMORANDUM

TO: RGRWPG Voting Members

FROM: Ron Garza, LRGVDC Executive Director

DATE: February 1, 2017

SUBJ: Member Terms

According to the Region M Bylaws:

> **"Section 2. Terms of Office**
> The terms of all initial voting members shall expire on September 1, 2001. Upon the expiration of the initial terms, all voting members shall draw lots for additional terms of five years or two years, such that half of the voting members' terms will expire in two additional years and the other half in five additional years. If there is an odd number of voting members at the time the lots are drawn, one more than half shall draw lots for the two-year terms. No later than ninety calendar days prior to the end of the two-year terms, the voting members shall initiate procedures to appoint successors for the voting members drawing two-year terms, utilizing the process set forth under Section 4 of this Article. Outgoing voting members shall be given the opportunity to fully participate in the selection process for their successors and shall serve until their successors take office. *At the conclusion of the two-year terms described above, all subsequent terms of office for voting members shall be five years, the goal of staggering the terms of office having been accomplished. All persons shall be eligible to serve a maximum of two (2) consecutive five-year terms as a voting member of the RGRWPG. (Amended 7/16/2003). Those persons completing two consecutive terms may petition the RGRWPG to serve additional terms. A two-thirds (2/3) vote of the voting members present is required for approval of a petition for additional terms*. (Amended 4/16/2008)."

Please see attached list of Member Term Lengths to consider those who are eligible for additional terms.

Stewards of water resources from Amistad to the Gulf

RGRWPG - REGION M - MEMBERS AND TERM LENGTHS
for 2017 – revised 1/20/2017

Name	Category	1st Term Began	Current Term Ends September 1st of:	5 Year Term Currently Serving	# of 5 Year Terms Completed
1. Glenn Jarvis	Other	03/25/1998	2016	4th	3
2. Sonny Hinojosa	Water Districts	03/25/1998	2016	4th	3
3. Donald K. McGhee	Industries	06/27/2001	2018	4th	3
4. John Bruciak	Municipalities	06/27/2001	2016	3rd	2
5. Sonia Lambert	Water Districts	11/19/2003	2018	3rd	2
6. Mayor James Darling	River Authorities	11/17/2004	2019	3rd	2
7. Tomas Rodriguez	Municipalities	07/30/2008	2018	2nd	1
8. Carlos Garza	Small Business	07/30/2008	2018	2nd	1
9. Dennis Goldsberry	Water Utilities	08/04/2010	2020	2nd	1
10. Jorge Barrera	Municipalities	08/04/2010	2020	2nd	1
11. Judge Joe Rathmell	Counties	06/01/2011	2021	2nd	1
12. Jaime Flores	Environmental Interests	08/03/2011	2021	2nd	1
13. Armando Vela	GMA Category	10/05/2011	2021	2nd	1
14. Frank Schuster	Other	01/04/2012	2017	1st	
15. Nick Benavides	Small Business	06/05/2013	2018	1st	
16. Judge Humberto Gonzalez	County	06/18/2014	2019	1st	
17. Robert Pena, Jr.	Electric Generating Utility	06/18/2014	2019	1st	
18. Dale Murdon	Agriculture	03/09/2016	2021	1st	
19. Riazul Mia	Municipalities	03/09/2016	2021	1st	
20. Dr. Neal Wilkins	Agriculture	07/13/2016	2021	1st	

RIO GRANDE REGIONAL WATER PLANNING GROUP

MEMORANDUM

TO: RGRWPG Voting Members

FROM: Ron Garza, LRGVDC Executive Director

DATE: February 1, 2017

SUBJ: Election of Officers

According to the Region M Bylaws:

ARTICLE VII. OFFICERS

Section 1. Officers, Restrictions and Terms of Office
Voting members of the RGRWPG shall select from the voting membership a Chair, Vice Chair, and a Secretary to serve as officers. Each officer shall serve a term of one calendar year.

Section 6. Executive Committee
The Executive Committee shall be composed of five RGRWPG members, including the Chair, Vice Chair, Secretary and two members-at-large. *No two voting members representing the same interest shall serve as members of the Executive Committee at the same time.* The two members-at-large shall be selected annually in the same manner and with the same terms as set forth for the selection of officers under this Article.

Those currently servicing on the Executive Committee are:

NAME	OFFICE	CATEGORY	COUNTY
Tomas Rodriguez	Chair	Public	Webb
Sonny Hinojosa	Vice Chair	Water Districts	Hidalgo
Don McGhee	Secretary	Industries	Cameron
Frank Schuster	Member-at-Large	Other	Hidalgo
Nick Benavides	Member-at-Large	Small Business	Webb

DRAFT 10/04/2016

Progress Made in Water Conservation in Texas

Report and Recommendations to the 85th Texas Legislature

Submitted by the

Water Conservation Advisory Council

www.savetexaswater.org

Karen Guz, Presiding Officer

December 1, 2016

Water Conservation Advisory Council

December 1, 2016

The Honorable Greg Abbott
Governor, State of Texas

The Honorable Dan Patrick
Lieutenant Governor of Texas

The Honorable Joe Straus, III
Speaker, Texas House of Representatives

Re: Water Conservation Advisory Council Report

Dear Sirs:

It is our honor as members of Water Conservation Advisory Council to provide you with the fifth biennial report on progress made in water conservation in Texas.

The council serves as a professional forum for the continuing development of water conservation resources, expertise, and progress evaluation of the highest quality for the benefit of Texas. In addition to their professional endeavors, the 23 members of the council, their designated alternates, and interested stakeholders have voluntarily dedicated countless time and effort to protecting water resources, reducing the consumption of water, eliminating the loss or waste of water, improving water use efficiency, and increasing the recycling and reuse of water.

The council would like to extend our sincere appreciation to Mr. C.E. Williams, who served as the presiding officer of the council for almost ten years and who exemplifies what it means to selflessly serve Texas.

Respectfully submitted on behalf of the 23 members of the council,

Signature

Karen Guz
Presiding Officer, Water Conservation Advisory Council

c: The Honorable Charles Perry
Chairman, Senate Committee on Agriculture, Water, & Rural Affairs

The Honorable Jim Keffer
Chairman, House Natural Resources Committee

Executive Summary

In 2007, the 80th Texas Legislature created the Water Conservation Advisory Council to provide the resource of a select group of professionals with expertise in water conservation. The council operates under the following mission:

> *to establish a professional forum for the continuing development of water conservation resources, expertise, and progress evaluation of the highest quality for the benefit of Texas— its state leadership, regional and local governments, and general public*.

Water conservation is critical to ensuring all Texans have an adequate water supply today and into the future. The Water Conservation Advisory Council provides a unique service to all those committed to the shared responsibility of ensuring efficient use of our most precious resource.

Since the last report to the legislature, council members, their designated alternates, and numerous interested parties have contributed extensive time and effort to expand awareness of the importance of wise water stewardship by hosting frequent guest presenters at their meetings, posting white papers and guidance documents as online resources, refined voluntary measures outlined in the best management practices guide, monitored implementation of water conservation strategies by water users included in regional water plans, and presented nine Blue Legacy Awards showcasing champions of water conservation in Texas. This fifth report to state leadership summarizes the council's recent activities related to their seven statutory charges.

In addition, as directed by Senate Bill 551 passed by the 84th Texas Legislature in 2015, this report contains "recommendations for legislation to advance water conservation in this state, which may include conservation through the reduction of the amount of water lost because of evaporation." Included herein are eight legislative recommendations, summarized below, that represent the majority opinion of the council members but do not necessarily reflect the views of each entity or interest group.

1. Designation of a water conservation coordinator

The council recommends that the state require a retail public utility that provides potable water service to 3,300 or more connections to designate an employee as the water conservation coordinator responsible for implementing the water conservation plan.

2. Enhanced water loss audit training

The council recommends that the state require water audit reports that are already required to be prepared and submitted annually be completed by a person trained in water loss auditing.

The council further recommends that the Texas Water Development Board (TWDB) adopt rules to specify training options.

3. Addition of a non-voting member to regional water planning groups

The council recommends that the Texas Legislature consider including a staff member of the Texas State Soil and Water Conservation Board, designated by its Executive Director, as a required non-voting member of each regional water planning group.

4. Adoption of enforceable time-of-day limitations on outdoor watering

The council recommends that the Texas Legislature require a political subdivision that provides retail public water service and applies to the TWDB for state financial assistance of more than $500,000 for a municipal water supply project to adopt enforceable time-of-day limitations on outdoor watering by its customers as part of an ongoing conservation program before the TWDB makes a financial commitment. This requirement does not apply to entities that are primarily wholesale water providers or nonprofit water supply corporations, and the requirement may be waived for financial assistance to meet an emergency need. The TWDB should adopt guidance to assist political subdivisions in developing and implementing this requirement.

5. Enhanced data collection, management, and accessibility

The council recommends that, subject to available state revenue for the 2018–2019 biennium, the Texas Legislature increase appropriations to the Texas Water Development Board to enhance existing data collection, management, and accessibility efforts.

6. Funding the statewide water conservation public awareness program

The council recommends that, subject to available state revenue for the 2018–2019 biennium, the Texas Legislature appropriate up to $3 million per year to the TWDB to implement the statewide water conservation public awareness program that was created by the Texas Legislature in 2007 with the passage of Senate Bill 3 and House Bill 4.

7. Funding agricultural water conservation programs

The council recommends that, subject to available state revenue for the 2018–2019 biennium, the Texas Legislature maintain funding levels for agricultural water conservation education, training, and financial assistance programs focused on improving water use efficiency in agricultural irrigation.

8. Funding research in higher education

The council recommends that, subject to available state revenue for the 2018–2019 biennium, the Texas Legislature increase appropriations to the TWDB to be distributed through a competitive grants process to address the lack of research and coursework in municipal and industrial water conservation beyond landscape irrigation at publicly-funded universities.

Legislative charges

Introduction

Water conservation activities are expected to provide for 30 percent of new water needs by 2070.[1] Successful demand management will be critical to meeting the needs of new Texans, with the population projected to increase by 70 percent in that time, growing to over 51 million people.

In 2007 the 80th Texas Legislature, via passage of Senate Bill 3 and House Bill 4, established the Water Conservation Advisory Council[2]. The legislature directed the council to report on progress made on water conservation in relation to seven specific charges. This is the fifth report to state leadership briefly addressing each charge and identifying key findings and recommendations to advance water conservation efforts in Texas.

Charge 1. Monitor trends in water conservation implementation

Agricultural Water Conservation

According to the 2012 *Census of Agriculture*[3], Texas ranks fourth in the nation in number of acres irrigated and fifth in irrigation water applied. Because irrigation is so critical to Texas' food and fiber production and the state's agricultural sector, producers are deliberately working to conserve water. Planting decisions reflect both water availability and fluctuations in global commodity markets. Effective precipitation or lack thereof impacts the actual applied volume of irrigation water prior to planting and during the growing season.

Statewide, irrigation water use hovers around 9 million acre-feet per year and has been close to that number since the 1970s, but agricultural production has increased steadily due to improvements in irrigation efficiency and crop genetics. Agricultural producers continue to voluntarily adopt best management practices to improve irrigation efficiency; however, the data needed to fully assess and quantify the extent of this trend is not readily available. The last detailed statewide assessment of agricultural irrigation practices was conducted in 2001 and reported in TWDB *Report 347: Surveys of Irrigation in Texas*[4]. The Census of Agriculture's *Farm*

[1] Water for Texas—2017 State Water Plan: pre-publication version, available online at www.twdb.texas.gov/waterplanning/swp/2017/.
[2] www.statutes.legis.state.tx.us/Docs/WA/htm/WA.10.htm
[3] USDA - National Agricultural Statistics Service *2012 Census of Agriculture* online at www.agcensus.usda.gov/Publications/2012.
[4] Report 347 can be found at www.twdb.texas.gov.

and Ranch Irrigation Survey (2013)[5], currently the best source of information regarding trends in adoption of conservation practices, indicates significant progress by agricultural producers.

- → Adoption of center pivot sprinklers continues to increase with over 82 percent of surveyed acres using this technology versus 78 percent in 2008.
- → Adoption of drip, trickle, and other efficient irrigation systems doubled between 2008 and 2013 and now comprises 6 percent of surveyed acres.
- → Use of less efficient flood and furrow irrigation continues to decline and comprised only 12 percent of the total acres surveyed, down from 19 percent in 2008.

Institutional and Commercial Water Conservation

Institutional users include schools, hospitals, and nursing homes, whereas commercial users include offices, restaurants, and retail stores. Monitoring trends in water use and conservation for these unique water use sectors is complicated. A recent analysis by Hoffman[6] to isolate the commercial and institutional components of reported municipal water use found that 21 percent of the metered water was used by commercial entities and 4 percent went to institutional users. The study also noted that indoor per capita residential use was roughly equal to per capita use in the commercial and institutional sectors.

Determining a metric similar to the per capita water use associated with municipal use is difficult because it requires site-specific 'population' information that depends on the type of facility and may be proprietary in nature. For commercial facilities, 'population' could be based on square feet of heated space for an office building, the number of occupied guest rooms for a hotel, meals served for a restaurant, or beds in a hospital. Future efforts should focus on developing an appropriate metric that incorporates available site specific information with non-proprietary data that can be gathered from tax records or economic output reports.

Manufacturing and Electric Power Generation Water Conservation

Texas ranks first in the nation in electric power production and second for manufacturing output. Because the sustainability of the Texas manufacturing sector is so highly dependent on water, manufacturers closely track and manage their water usage, file the required water

[5] USDA - National Agricultural Statistics Service *Farm and Ranch Irrigation Survey (2013)* online at www.agcensus.usda.gov/Publications/2012.
[6] The full analysis by Hoffman can be found on savetexaswater.org under 'Resources'.

conservation plans, complete the Texas Water Development Board's annual water use survey, and seek out opportunities to conserve water on a consistent basis. A recent analysis[7] showed a dramatic reduction in water use per unit of output in manufacturing and an increase in water used per kilowatt of power generated. In fact, over the last two decades, Texas refiners have reduced water usage by as much as 30 percent while output revenue has increased steadily. The combination of economic gains and water use efficiency is the result of innovation by many Texas industries.

Though each of the state's 27 complex and multi-operational refineries is unique, with distinct water needs and operations, water conservation has resulted from

- evolving water management practices;
- water treatment and technology development;
- utilization of alternative sources;
- collaboration within the industrial sector; and
- cooperation at the local, regional, and state level.

Water consumption by industries is highly variable making it difficult to compare one water user to another. Future efforts should continue to explore opportunities for improved efficiency and development of water conservation best management practices appropriate for each facility. The sector should consider sharing non-proprietary information within their respective trade groups as a way of encouraging water conservation. The council welcomes water users to share their successes and water metrics through case studies posted to the council's online resource library to potentially accelerate efficiency gains.

Municipal Water Conservation

Reports submitted by municipal water providers document water conservation progress. The average total water use per capita and residential use per capita have dropped significantly in the past five years. While these numbers are encouraging, they do not tell the entire story because conservation initiatives vary greatly across the state, complicating the effort to assess trends. Useful data are also provided to the state through water conservation plans and reports on implementation progress required of certain entities in Texas.

An entity's water conservation plan identifies strategies for reducing the consumption of water, reducing water loss, and increasing water reuse and contains best management practices which, if implemented, can help an entity reach their goals. In 2015, the most common activities from 447 submitted annual reports included meter replacement, leak repair, and customer education

[7] Find Hoffman's examination of water use trends on savetexaswater.org. In addition, TWDB funded a review of past methodologies used to create water demand projections used in regional water planning, and the report will be posted at www.twdb.texas.gov.

programs. The data compiled from the past five years of annual water conservation reports are shown in tables 1 and 2.

Table 1. Water conservation annual report data

	5-Year Goal average†	2010 average	2011 average	2012 average	2013 average	2014 average	2015 average
Total GPCD*	145	142	162	148	148	148	143
Residential GPCD	92	114	105	94	82	79	78
Water Loss GPCD	17	18	19	21	20	20	18
Water Loss Percent	10	13	12	12	13	13	13
Water Reused Percent	NA‡	6	6	7	6	7	10
Water Saved Percent	NA‡	7	6	10	6	9	14

*GPCD = gallons per capita daily; †based on 2014 conservation plans; ‡NA = not applicable

Table 2. Water conservation annual report activities

	2010	2011	2012	2013	2014	2015
Meters Replaced	409,812	360,353	459,026	326,305	364,875	359,957
Leaks Repaired	138,129	194,587	154,674	96,991	140,976	110,387
Education Programs	227	354	301	308	266	297
Drought Plans Activated	47	230	168	164	179	118

The sector-based water use metric developed by the Texas Commission on Environmental Quality and the Texas Water Development Board, in consultation with the Water Conservation Advisory Council, allows for comparisons of water use among municipalities and water utilities. The forthcoming biennial report to the legislature titled *Water Use of Texas Water Utilities*[8] provides a detailed analysis.

A recently completed study of water use within individual households provided encouragement for progress made in water conservation and insight regarding future conservation in the residential sector. The Water Research Foundation's *Residential End Uses of Water, Version 2*[9] contains detailed survey response data, historic billing data, and other data obtained for each

[8] In 2011, the 82nd Texas Legislature passed Senate Bill 181 to address the calculation and reporting of water usage by municipalities and water utilities for state water planning and other purposes. Through amendments to Chapter 16 of the Texas Water Code, this legislation established a consistent method for reporting water use data and to improve conservation reporting procedures. The next biennial report is due to the legislature on January 1, 2017.

[9] The electronic version of the Executive Report is available to the public at www.waterrf.org/4309.

study site, including data from San Antonio Water System and Austin Water Utility, and reveals several trends. First, indoor household water use dropped 22 percent since 1999 with most of that resulting from a transition to more efficient water fixtures. Over time as older fixtures are replaced, indoor consumption should continue to drop. Significant water conservation gains are also expected as citizens become more aware of household leaks and more proactive about repair. Across all households, 12 percent of all water was lost due to preventable, unrepaired leaks. In fact, much of the water waste came from 32 percent of households (with leaks of up to 600 gallons per household per day). While the success of fixture standards and replacement programs is reason for celebration, the high rate of water loss from preventable leaks points to the need for continued water education for Texans.

Finally, the study looked at outdoor water usage and found high variability even among households that seemed similar. Theoretical landscape water budgets were calculated for all participating households and compared to actual use: 70 percent of households watered less than this theoretical amount. The study underscored the need to target outdoor conservation programs wisely. Large water savings can be accomplished by working with those households that water excessively.

Wholesale Water Conservation

Similar to municipal entities, wholesale and regional water suppliers must submit water conservation plan updates every five years and implementation reports every year. Wholesale water providers face the challenge of making progress in conservation without having direct retail customers. As a result, many wholesale water providers have recently initiated or expanded conservation efforts focused on general public outreach with the use of dedicated advertising campaigns, websites, social media, and newsletters. Wholesale water providers are also increasingly developing programs and materials that directly support and assist their wholesale customers' conservation program efforts. Support for wholesale customers from the provider can vary based on the dedicated resources and needs of the customer. Wholesale water providers and customers across the state are working together to provide a variety of resources and programs including model conservation plans, regional conservation conferences, workshops, rebate programs, outreach materials, bulk purchasing opportunities, and technical assistance.

Charge 2. Monitor new technologies for possible inclusion in the Best Management Practices Guide

Members of the council, their designated alternates, and interested stakeholders continue to monitor new water conservation technologies across all sectors to ensure the online guide contains the most up-to-date best management practices. Recent efforts, coordinated through

the council's workgroups, include modernizing outdated practices and composing original documents to reflect recent technological advances in water conservation.

Updates in progress include irrigation scheduling using real-time soil moisture monitoring and evapotranspiration networks; technical assistance and outreach for wholesale water providers; system water audits and water loss control; waste water management; and cooling towers, boilers, and other thermodynamic operations. In addition, new best management practices are being drafted on wholesale conservation water rates; supervisory control and data acquisition systems; custom rebates for the industrial, commercial, and institutional sectors; and landscape irrigation design changes and efficiency retrofits.

Charge 3. Monitor the effectiveness of the statewide water conservation public awareness program and associated local involvement in implementation of the program

Water conservation is the most cost-effective water management strategy to meet the state's water needs, and regional water planners often identify public awareness and education as a key component of that strategy. Municipal water conservation is recommended in the 2017 State Water Plan to meet almost 10% of the state's water demands by 2070 (Figure 1).

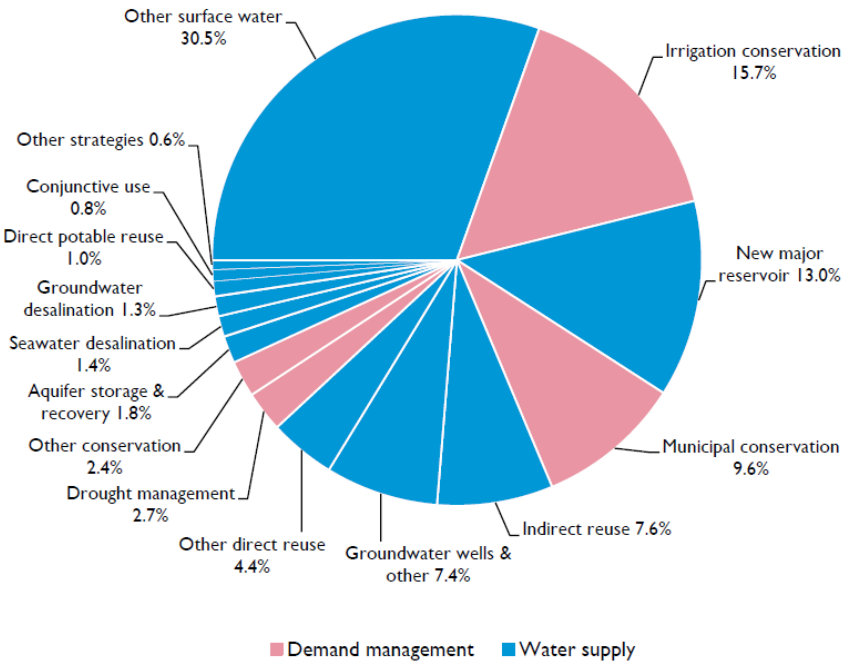

Figure 1. Share of recommended water management strategies by strategy type in 2070 (TWDB 2016)

In monitoring water conservation programs and public awareness efforts, the council found that consistent messaging supported by research and data enhances the effectiveness of these activities. Research in Texas in 2004 and 2014[10] indicated that people are more likely to conserve water when they know the source of their water supplies. That theme is an essential component of the statewide water conservation public awareness program "Water IQ: Know Your Water" which was established by the Texas Legislature in 2007 with the enactment of Senate Bill 3 and House Bill 4.

Since passage of that legislation, however, in the absence of direct legislative appropriations to the Texas Water Development Board for implementation of Water IQ, this public awareness program has not been a statewide effort. Some local and regional water utilities, political subdivisions, and nonprofit groups – for example, North Texas Municipal Water District – have adopted Water IQ as their water conservation outreach program. Currently almost 100 entities are Water IQ partners, and others may join this effort by signing up at www.WaterIQ.org. Some private funds have been raised and spent in cooperation with the Texas Association of Broadcasters to spread Water IQ messages, but the reach of these efforts is limited by geography and available funding. The council's review indicates that Water IQ will reach its potential for advancing water conservation only if it becomes truly statewide in scope and is supported by state-level funding, and the council has prepared a recommendation in that regard.

Charge 4. Develop and implement a state water management resource library

The Council has partnered with the Alliance for Water Efficiency since 2008 to provide access to a national library of available water conservation resources including research, information, and tools. The Alliance for Water Efficiency is a stakeholder-based 501(c)(3) non-profit organization dedicated to the efficient and sustainable use of water.

In addition, council members representing various water use sectors and interest groups contribute additional resources that are posted on the council's webpage (savetexaswater.org). Recently added resources include an in-depth analysis of the commercial and institutional portion of reported municipal water use; snapshots of water conservation and reuse efforts undertaken by rural systems and urban utilities; and a water conservation scorecard.

The council's resource library will increasingly be a location where ideas on water efficiency, program evaluation papers, and reports on new technology can be shared. Pecan Street Inc.,

[10] Find the 2014 "Texas Statewide Water Conservation Survey" by Baselice & Associates and enviromedia at texaswater.org or on the council's resources webpage.

part of the University Municipal Water Consortium, recently shared a paper on Automatic Meter Integration (AMI) and other real time consumption technologies that are rapidly advancing. Their review[11] of AMI options being deployed raises important questions about how this technology can be implemented in ways that are cost effective and result in water conservation education for consumers.

Charge 5. Develop and implement a public recognition program for water conservation

The council created the Blue Legacy Awards in 2010 to recognize members of the municipal, agricultural, and manufacturing water use sectors who have demonstrated an incomparable commitment to water conservation. Awards are presented at premier events to elevate the importance and awareness of water conservation related issues. More than thirty champions of water conservation have been celebrated for their efforts to date. Their success stories and photographs, as well as nomination packets, can be found on savetexaswater.org. The council plans to present the 2017 awards as part of Texas Water Day at the Capitol on March 22, 2017.

Figure 2. C.E. Williams, former presiding officer of the council, presents three of the nine Blue Legacy Awards given out at Texas Water Day at the Capitol on March 26, 2015. Left to right: Mrs. Janet Adams of Fort Davis Water Supply Corporation (municipal); Dr. Shad Nelson of Texas A&M-Kingsville (agricultural); and Mr. Nick McFarland of Cargill Meat Solutions (manufacturing).

Table 3. Blue Legacy Award nomination categories

Agricultural ~ Non-Producer	Municipal ~ population <10,000
Agricultural ~ Producer	Municipal ~ population 10,000 to 50,000
Manufacturing*****	Municipal ~ population 50,000 to 100,000
Municipal ~ River Authority or Regional Water District	Municipal ~ population 100,000 to 500,000
*******first awarded in 2015*	Municipal ~ population >500,000

[11] Find the full paper on the council's website under Resources.

Charge 6. Monitor the implementation of water conservation strategies by water users included in regional water plans

Based on the October 2012 rule change by the Texas Water Development Board[12], the council anticipated that the 2016 regional water plans would provide extensive information on the implementation of any water conservation strategies recommended for water user groups in the previous (2011) plans. However, a review by Kramer[13] of a selected sample of the 2016 regional water plans indicates that the plans vary widely in the level of detail, comprehensiveness, and usefulness of their respective discussions of the implementation of water conservation strategies recommended in the 2011 plans, and most of the evaluation, with some exceptions, is of municipal conservation strategies rather than conservation strategies in other sectors of water use.

Indeed, the overview of conservation implementation found in most plans is minimal. The reasons most often cited for the paucity of information provided is inadequate budget to conduct a review of implementation and poor implementation survey response rates by water user groups and entities. Several regional plans, however, demonstrate a determined effort to gather and present information on conservation strategy implementation, with varying degrees of success. Among these are the 2016 plans for Regions C, H, and K. One common theme throughout most of the regional plans reviewed for this evaluation is that per capita water consumption in Texas is projected to continue to drop (although the 2011 base per capita use for the 2016 regional plans in some regions was higher than the base used for the 2011 plans), and this in part reflects implementation of passive and active conservation requirements and initiatives.

Charge 7. Monitor target and goal guidelines for water conservation to be considered by the Texas Commission on Environmental Quality and Texas Water Development Board

As proposed by the Water Conservation Implementation Task Force in its 2004 report to the legislature[14], targets and goals established by an entity should consider a minimum annual reduction of one percent in total gallons per capita per day (gpcd), based upon a five-year rolling average, until such time as the entity achieves a total gpcd of 140 or less. The task force

[12] Title 31, Part 10 of the Texas Administrative Code, Rule §357.45: Implementation and Comparison to Previous Regional Water Plan.
[13] Find the detailed analysis by Kramer on the council's website (savetexaswater.org).
[14] Online at www.savetexaswater.org/about/doc/WCITF_Report_2004.pdf.

also proposed a statewide goal of 140 gallons per capita per day. Total gpcd equals the total amount of water diverted or pumped for potable use divided by total population.

It is important to note that the selection of the goal of 140 gallons per capita per day was a compromise and that a more aggressive but achievable goal (if adopted) would save Texas even more water. In fact, according to the 2017 State Water Plan, if all the recommended municipal conservation and reuse strategies were implemented in 2070, the projected statewide municipal average gallons per capita per day would decline from the currently projected 163 gallons per capita per day in 2020 (without recommended conservation or reuse strategies) to approximately 124 gallons per capita per day in 2070 (with recommended conservation and reuse strategies)[15].

The report by the task force includes the directive to revisit these targets and goals "as data become available to set more meaningful stretch goals and targets." The council continues to monitor target and goal guidelines in consultation with the Texas Commission on Environmental Quality and the Texas Water Development Board.

[15] Water for Texas—2017 State Water Plan: pre-publication version, available online at www.twdb.texas.gov/waterplanning/swp/2017/.

Recommendations for legislation to advance water conservation in Texas

In 2015, the 84th Texas Legislature passed Senate Bill 551 directing the council to include in their report "recommendations for legislation to advance water conservation in this state, which may include conservation through the reduction of the amount of water lost because of evaporation." Included herein are eight legislative recommendations for consideration that represent the majority opinion of the council members but do not necessarily reflect the views of each entity or interest group.

1. Designation of a water conservation coordinator

The state of Texas requires[16] a retail public utility that provides potable water service to 3,300 or more connections to develop and implement a water conservation plan; however, without dedicated staff resources, a well-developed plan may never be implemented.

A designated water conservation coordinator could improve the ability of a water supplier to implement their plan and associated programs. For example, in 2009 the Lower Colorado River Authority modified its water conservation plan rules for municipal contract customers to include a requirement to designate a water conservation coordinator tasked with implementing the plan. Several water supply customers have since reported more aggressive implementation of water conservation programs thanks to their designated coordinator.

The council recommends that the state require a retail public utility that provides potable water service to 3,300 or more connections to designate an employee as the water conservation coordinator responsible for implementing the water conservation plan.

2. Enhanced water loss audit training

Section 16.0121 of the Texas Water Code[17] requires a retail public utility providing potable water to perform and file with the Texas Water Development Board an audit computing the utility's system water loss during the preceding year. The audit must be completed annually unless the utility does not receive financial assistance from TWDB and does not provide service to more than 3,300 connections in which case an audit is due every five years.

Conducting a water loss audit requires a detailed understanding of the utility's system and knowledge of the terminology and tools available for analyzing results of the audit itself. An

[16] Texas Water Code §13.146, www.statutes.legis.state.tx.us/Docs/WA/htm/WA.13.htm#13.146
[17] www.statutes.legis.state.tx.us/Docs/WA/htm/WA.16.htm

improperly conducted audit wastes time and resources and, most importantly, does not provide the utility with the information needed to adequately track water loss or identify issues that require immediate action.

The council recommends that the state require water audit reports that are already required to be prepared and submitted annually be completed by a person trained in water loss auditing. The TWDB should adopt rules to specify training options.

3. Addition of a non-voting member to regional water planning groups

The Texas State Soil and Water Conservation Board serves as the lead state agency for the planning, management, and abatement of nonpoint source pollution resulting from agricultural and silvicultural activities; administers grant programs aimed at encouraging voluntary implementation of agricultural conservation practices; and functions to conserve the state's soil and water resources providing benefits to all Texans[18]. Rule §357.11 of the Texas Administrative Code states that each regional water planning group shall include voting members representing over ten specific interest groups and non-voting members representing adjacent planning groups, certain entities with surface water rights, and a staff member from the Texas Water Development Board, the Texas Parks and Wildlife Department, and the Texas Department of Agriculture.

The council recommends that the Texas Legislature consider including a staff member of the Texas State Soil and Water Conservation Board, designated by its Executive Director, as a required non-voting member of each regional water planning group.

4. Adoption of enforceable time-of-day limitations on outdoor watering

Outdoor water use, particularly lawn watering, accounts for almost one third of annual residential water use in Texas and can represent a much higher percentage during our hot, dry summers. Municipal water use during the summer months in Texas in many areas is as much as 50% to 100% higher than in the winter months, an increase usually driven by outdoor watering. Peak water demand, which may determine the sizing of water utility infrastructure, in most municipal utilities occurs during the summer. Shaving this peak demand through limitations on outdoor watering could help to avoid not only evaporative water loss and water waste but also the cost of building unnecessary water supply infrastructure.

Putting reasonable limitations on outdoor watering is not detrimental to most outdoor landscapes, especially those that are characterized by climate suitable or drought tolerant trees,

[18] Texas Agriculture Code §201.026, www.statutes.legis.state.tx.us/Docs/AG/htm/AG.201.htm#201.026

plants, and grasses. Some studies show that homeowners have a tendency to overwater landscapes.

An increasing number of political subdivisions in Texas have limited outdoor watering on an ongoing basis (limitations may vary based on the time of the year) and have identified significant reductions in water use as a result. However, the Texas Water Conservation Scorecard report[19] recently released by the Texas Living Waters Project found that only about a third of retail public water utilities in the state serving a population of 25,000 or more have any limitations on outdoor water use except during drought. One way to encourage more political subdivisions to adopt such practices would be to require them to have enforceable time-of-day watering limitations on outdoor watering in order to obtain state financial assistance for a water supply project.

The council recommends that the Texas Legislature require a political subdivision that provides retail public water service and applies to the TWDB for state financial assistance of more than $500,000 for a municipal water supply project to adopt enforceable time-of-day limitations on outdoor watering by its customers as part of an ongoing conservation program before the TWDB makes a financial commitment. This requirement should not apply to entities that are primarily wholesale water providers or nonprofit water supply corporations, and the requirement may be waived for financial assistance to meet an emergency need. The TWDB should adopt guidance to assist political subdivisions in developing and implementing this requirement.

5. Enhanced data collection, management, and accessibility

As discussed previously in this report under Charge 1, the lack of quality data hampers efforts to monitor trends in implementation of water conserving activities. Often the data needed to assess progress simply does not exist. For example, the last statewide survey of irrigated acreage, water use, and irrigation system by type, conducted cooperatively by the Natural Resources Conservation Service, the Texas State Soil and Water Conservation Board, and the Texas Water Development Board, was published in 2001[20].

The Texas Water Development Board collects data to assist with water planning, resource management, and educating Texans of all ages about water. Also vital to the agency's mission is the dissemination of these data[21]. Ensuring up-to-date and accurate information is collected, managed, and made available online to the public allows for enhanced analyses and can help direct future water conservation efforts.

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[19] www.texaswaterconservationscorecard.org

[20] www.twdb.texas.gov/publications/reports/numbered_reports

[21] See, for example, Water Data Interactive at www.twdb.texas.gov/mapping.

The council recommends that, subject to available state revenue for the 2018–2019 biennium, the Texas Legislature increase appropriations to the TWDB to enhance existing data collection, management, and accessibility efforts.

6. Funding the statewide water conservation public awareness program

Establishment and funding of a statewide water conservation public awareness program was a consensus recommendation of the Water Conservation Implementation Task Force (a diverse stakeholder group) established for the 2004-2005 biennium by passage of Senate Bill 1094. The program, known as Water IQ, was established by the Texas Legislature without opposition in 2007 but no funds were specifically appropriated to the Texas Water Development Board for the program then or in subsequent legislative sessions.

The Legislative Budget Board (LBB) staff in the 2013 Government Effectiveness & Efficiency Report (GEER)[22] suggested a $6 million appropriation for the biennium for Water IQ as part of its recommendations to "Enhance State Participation in Municipal Water Conservation," noting that the program could help lower water use by Texans. The LBB staff calculated at the time that a reduction in water consumption of just one gallon per capita per day by all Texans could avoid $407.2 million of the $53.1 billion in capital costs that had been projected by the 2012 state water plan.

Various regional water planning groups have recommended funding for the program in their most recent (2016) water plans. The council believes that the rationale for state funding for Water IQ is sound – a relatively small expenditure for conservation now will reduce water demands over time, decreasing the amount of infrastructure needed in the future and saving Texans money in coming years. Moreover, a statewide public awareness program will complement existing local and regional conservation efforts while carrying the conservation message to communities that do not have the financial resources for a program of their own.

The council recommends that, subject to available state revenue for the 2018–2019 biennium, the Texas Legislature appropriate up to $3 million per year to the TWDB to implement the statewide water conservation public awareness program that was created by the Legislature in 2007 with the passage of Senate Bill 3 and House Bill 4.

[22] *Texas State Government Effectiveness and Efficiency Report, Selected Issues and Recommendations*, January 2013, p.321, online at www.lbb.state.tx.us/publications.aspx.

7. Funding agricultural water conservation programs

According to the Texas Water Resources Institute[23], voluntary adoption of new practices and technologies by agricultural producers resulted in a dramatic increase in statewide irrigation application efficiency: from about 60 percent efficient in 1970 to 88-95 percent today. Despite these efforts, opportunities for even more conservation remain.

Agricultural irrigation water conservation figures heavily in efforts by regional water planning groups to ensure Texas has adequate water supplies in the future. According to the 2017 State Water Plan, agricultural irrigation demand is expected to decrease during the fifty-year planning horizon as a result of on-farm practices such as equipment upgrades that improve irrigation efficiency and in-district projects like lining canals to reduce conveyance losses. In addition, agricultural irrigation represents the vast majority of unmet needs in each decade through 2070, highlighting the importance of increased irrigation efficiency in maintaining the economic viability of the agricultural sector. Continued investments in educational outreach, technical assistance, and financial incentives are needed to ensure that the agricultural sector continues to thrive as producers and irrigation districts continue to adopt practices that result in significant water savings for the benefit of all Texans.

The council recommends that, subject to available state revenue for the 2018–2019 biennium, the Texas Legislature should maintain funding levels for agricultural water conservation education, training, and financial assistance programs focused on improving water use efficiency in agricultural irrigation.

8. Funding research in higher education

The 2017 State Water Plan shows water use increasing along with population over the fifty year planning horizon. Municipal demand, which includes indoor residential, landscape irrigation, commercial, and institutional water use, plus water lost due to leaks, is projected to increase by the greatest total volume. Collectively, the municipal and industrial (manufacturing and steam-electric power generation, and mining) sectors are the fastest growing water user groups in Texas, accounting for an average six million acre-feet per year over the past five years. Based on a TWDB study of residential landscape water use[24], an estimated 80 percent of all municipal and industrial water is used for purposes other than landscape irrigation.

An informal survey by the council of public universities in Texas revealed the following: few courses exist exploring how water is used in these growing sectors; academic research

[23] *Status and Trends of Irrigated Agriculture in Texas* can be found online at twri.tamu.edu/publications/educational-materials/2012/em-115/.

[24] TWDB Technical Note 12-01: *The Grass is Always Greener… Outdoor Residential Water Use in Texas*, online at www.twdb.texas.gov/publications/reports/technical_notes.

investigating or developing technologies focused on the technical, economic, and sociological aspects of municipal and industrial water use efficiency is sparse; and despite accounting for only 20 percent of water use, landscape irrigation and horticulture are the primary focus of most university level efforts related to water use efficiency.

This could lead to a shortage of professionals trained in commercial and institutional water use and associated equipment; the analysis of air conditioning and industrial cooling systems that use less water and less energy; the and use of alternate on-site sources of water; and the design and development of innovative, water efficient equipment. Public universities in Texas have a tremendous opportunity to address these concerns through research, classroom instruction, and service learning projects.

The council recommends that, subject to available state revenue for the 2018–2019 biennium, the Texas Legislature increase appropriations to the Texas Water Development Board to be distributed through a competitive grants process to address the lack of research and coursework in municipal and industrial water conservation beyond landscape irrigation at publicly funded universities.

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Summary of comments received between August 1 and September 30, 2016 on current draft of 2016 WCAC report to the legislature

#	from	comment	action
1	John Mueller	minor edits/typos	corrected
2	Sanjeev Kalaswad	minor edits	incorporated minor language edits
3	Aubrey Spear	amended language for recommendation #4; see attachment	noted
4	Bill Hoffman	recommendation for higher education research funding was discussed but left pending without a formal vote at August 1 council meeting	edited language and included in draft report as recommendation #8 for consideration at October 25 meeting
5	Ken Kramer	minor edits/typos; suggested additional information and/or footnotes (charge 1, table 1, and recommendation 6)	corrected; added language and footnotes
6	Carole Baker	include reference to Pecan Street white paper	included in charge 4
7	Dustan Compton	minor edits; new paragraph on wholesale conservation for charge 1	incorporated some suggested edits; included paragraph, with minor edits, in charge 1
8	Kevin Wagner	minor comments and edits; new language for ag conservation portion of charge 1	addressed comments; accepted new language for ag conservation section of charge 1
9	Jay Bragg	concurred with Wagner's changes	noted
10	Dan Hunter	concurred with Wagner's changes	noted
11	Charlie Moehlenbrock	no formal comments from TCEQ	noted
12	Cindy Loeffler	no formal comments from TPWD; consider adding a dollar amount to recommendation 5	noted

Detailed comments received between August 1 and September 30, 2016 on current draft of the 2016 WCAC report to the legislature

1. (Mueller) spelling errors identified in tracked changes document

2. (Kalaswad) minor edits to language in recommendations portion of executive summary

3. (Spear) amended language for recommendation #4 inserted below

4. Incentives for utilities to Adopt~~ion of~~ enforceable time-of-day limitations on outdoor watering

{first two paragraphs unchanged so omitted from this comments list - Mindy}

An increasing number of political subdivisions in Texas have limited outdoor watering on an ongoing basis (limitations may vary based on the time of the year) and have identified significant reductions in water use as a result. However, the Texas Water Conservation Scorecard report recently released by the Texas Living Waters Project found that only about a third of retail public water utilities in the state serving a population of 25,000 or more have any limitations on outdoor water use except during drought. One way to encourage more political subdivisions to adopt such practices would be to ~~require~~ provide additional points for utilities that adopt ~~them to have~~ enforceable time-of-day watering limitations on outdoor watering ~~in~~ when they are being evaluated to potentially receive ~~order to obtain~~ state financial assistance for a water supply project.

The council recommends that the Texas Legislature should ~~require~~ encourage a political subdivision that provides retail public water service and applies to the Texas Water Development Board for state financial assistance of more than $500,000 for a municipal water supply project to adopt enforceable time-of-day limitations on outdoor watering by its customers as part of an ongoing conservation program before the Board makes a financial commitment. This requirement should not apply to entities that are primarily wholesale water providers or nonprofit water supply corporations, and the requirement may be waived for financial assistance to meet an emergency need. The Board should adopt guidance to assist political subdivisions in developing and implementing this requirement.

4. (Hoffman) edited language of recommendation based on meeting discussion on August 1; included in current draft as recommendation #8; will require a discussion and possible vote on October 25, 2016

5. (Kramer) minor edits addressed in draft; additional suggestions pasted below with action in brackets

> (a) on page 6 of the draft, under "Manufacturing and Electric Power Generation Water Conservation" – Am I correct in remembering that TWDB has contracted with someone to update the assessment of anticipated water demands from the steam electric power sector for use in regional and state planning, and, if so, would it not be appropriate to mention that in this section of the WCAC report? [correct; footnote amended]
>
> (b) on page 7 of the draft, in Table 1 – I assume that the column "5-Year Goal Average" refers to the goals set in various water conservation plans that were due or submitted in 2009 (or close to that year). Should we clarify that these goals were set in 2009 (or thereabouts)? [goals from 2014 plans; reflected in draft]
>
> (c) on page 17 of the draft, in the second paragraph of the background discussion of legislative recommendation #6 – Do you want to insert a footnote for that 2013 GEER report which suggested the $6 million appropriation for the biennium for Water IQ? If so, here is the link to the report (the appropriation recommendation is on page 321, and you may develop a footnote using your format from for this report): {link} [included in footnote and reference list]

6. (Baker) included reference in charge 4; will need to format document as white paper prior to posting

7. (Compton) included new paragraph with minor edits under charge 1; accepted some suggested grammatical edits

8. (Wagner) noted number of conservation plans represented in Table 1; amended language under agricultural water conservation in charge 1

9. (Bragg) no action required

10. (Hunter) no action required

11. (Moehlenbrock) no action required

12. (Loeffler) no action required; noted suggestion to add dollar amount to recommendation #5