RESOLUTION TO ADOPT DESIRED FUTURE CONDITIONS FOR AQUIFERS IN GROUNDWATER MANAGEMENT AREA 11

THE STATE OF TEXAS §
§
GROUNDWATER MANAGEMENT AREA 11 §
§
GROUNDWATER CONSERVATION DISTRICTS §

WHEREAS, Texas Water Code § 36.108 requires the groundwater conservation districts located in whole or in part in a groundwater management area ("GMA") designated by the Texas Water Development Board to adopt desired future conditions for the relevant aquifers located within the management area;

WHEREAS, the groundwater conservation districts located wholly or partially within Groundwater Management Area 11 ("GMA 11"), as designated by the Texas Water Development Board, as of the date of this resolution are as follows: Neches & Trinity Valleys Groundwater Conservation District, Panola County Groundwater Conservation District, Pineywoods Groundwater Conservation District, and Rusk County Groundwater Conservation District (collectively hereinafter "the GMA 11 Districts");

WHEREAS, the GMA 11 Districts are each local governments operating under Chapter 36, Texas Water Code;

WHEREAS, the GMA 11 Districts desire to fulfill the requirements of Texas Water Code §36.108 through mutual cooperation and joint planning efforts;

WHEREAS, the GMA 11 Districts have had numerous public meetings, including stakeholder meetings for the specific purpose of receiving comments and input from stakeholders within GMA 11, and they have engaged in joint planning efforts to promote comprehensive management of the aquifers located in whole or in part in Groundwater Management Area 11;

WHEREAS, GMA 11 held meetings on February 25, 2015; March 26, 2015; April 8, 2015; May 4, 2015; July 15, 2015; September 3, 2015; November 4, 2015; January 19, 2016; March 22, 2016; and April 28, 2016, in compliance with its statutory duty to publicly consider the desired future conditions considerations listed in § 36.108(d);

WHEREAS, the GMA 11 Districts have considered the following factors, listed in §36.108(d), in establishing the desired future conditions for the aquifer(s):

(1) groundwater availability models and other data or information for the management area;

(2) aquifer uses or conditions within the management area, including conditions that differ substantially from one geographic area to another;

(3) the water supply needs and water management strategies included in the state water plan;

(4) hydrological conditions, including for each aquifer in the management area the total estimated recoverable storage as provided by the Texas Water Development Board Executive Administrator and the average annual recharge inflows, and discharge;

(5) other environmental impacts, including impacts on spring flow and other interactions between groundwater and surface water;

(6) the impact of subsidence;

(7) socioeconomic impacts reasonably expected to occur;

(8) the impact on the interests and rights in private property, including ownership and the rights of management area landowners and their lessees and assigns in groundwater as recognized under Texas Water Code §36.002;

(9) the feasibility of achieving the desired future conditions; and

(10) any other information relevant to the specific desired future conditions;

WHEREAS, the desired future conditions provide a balance between the highest practicable level of groundwater production and the conservation, preservation, protection, recharging, and prevention of waste of groundwater in the management area;

WHEREAS, after considering the factors listed in 36.108(d), Texas Water Code, the GMA 11 Districts may establish different desired future conditions for: (1) each aquifer, subdivision of an aquifer, or geologic strata located in whole or in part within the boundaries of GMA 11; or (2) each geographic area overlying an aquifer in whole or in part or subdivision of an aquifer within the boundaries of GMA 11;

WHEREAS, the GMA 11 Districts recognize that GMA 11 includes a geographically and hydrologically diverse area with a variety of land uses and a diverse mix of water users;

WHEREAS, at least two-thirds of the GMA 11 Districts had a voting representative in attendance at the April 28, 2016, meeting in accordance with Section 36.108, Texas Water Code; and the following districts had a voting representative in attendance at the meeting: Neches & Trinity Valleys Groundwater Conservation District, Panola County Groundwater Conservation District, Pineywoods Groundwater Conservation District, and Rusk County Groundwater Conservation District, and;

WHEREAS, the member GCDs in which the Carrizo-Wilcox, Queen City, and Sparta aquifers are relevant for joint planning purposes held open meetings within each said district between June 16, 2016 and July 14, 2016 to take public comment on the proposed DFCs for that district during the ninety (90) public comment period of May 5, 2016 thru August 31, 2016, and;

WHEREAS, on November 9, 2016, the district representatives reconvened to review the reports and consider any district-suggested revisions to the proposed desired future conditions.

WHEREAS, on this day of January 11, 2016, at an open meeting duly noticed and held in accordance with law in the City Council Chambers Room of Nacogdoches City Hall at 202 E. Pilar Street, Nacogdoches, Texas, the GCDs within GMA 11, having considered at this meeting comments submitted to the individual districts during the comment period and at this meeting, have voted, 4 districts in favor, 0 districts opposed, to adopt the following DFCs for in the following counties and districts through the year 2070 as follows:

NOW, THEREFORE, BE IT RESOLVED BY THE AUTHORIZED VOTING REPRESENTATIVES OF THE GMA 11 DISTRICTS AS FOLLOWS:

1. The above recitals are true and correct.

2. The authorized voting representatives of the GMA 11 Districts hereby establish the desired future conditions of the aquifer(s) as set forth in Attachment B by the vote reflected in the above recitals.

3. The authorized voting representatives of the GMA 11 Districts declare that the Gulf Coast, Nacatoch, Trinity, and Yegua-Jackson aquifer are non-relevant for the purpose of adopting Desired Future Conditions in Groundwater Management Area 11, as the districts determined that aquifer characteristics, groundwater demands, and current groundwater uses do not warrant adoption of a desired future condition. Technical justification of the non-relevant aquifers, as required by 31 Tex. Admin. Code §356.31, is set forth in Attachment C.

4. The GMA 11 Districts and their agents and representatives, individually and collectively, are further authorized to take all actions necessary to implement this resolution.

5. The desired future conditions of the aquifer(s) adopted by the GMA 11 Districts and attached hereto, along with the explanatory report, and proof of the notice of the meeting in which desired future conditions adoption occurred, shall be submitted to the Texas Water Development Board and sent to the GMA 11 Districts, as required by Section 36.108(d-3), Texas Water Code.

AND IT IS SO ORDERED. PASSED AND ADOPTED on this 11th day of January, 2017.

ATTEST:

Neches & Trinity Valleys Groundwater Conservation District

Panola County Groundwater Conservation District

Pineywoods Groundwater Conservation District

Rusk County Groundwater Conservation District

ATTACHMENTS

A: Copies of notices of January 11, 2017, meeting
B: Desired Future Conditions
C: Non-relevant Aquifers

Attachment A

NOTICE OF A MEETING FOR THE GROUNDWATER MANAGEMENT AREA 11

Notice is hereby given that the groundwater conservation districts (GCD) located wholly or partially within the **Groundwater Management Area 11** (GMA-11) as designated by the Texas Water Development Board (TWDB) consisting of:

Neches and Trinity Valleys Groundwater Conservation District (NTVGCD),
Panola County Groundwater Conservation District (PCGCD),
Pineywoods Groundwater Conservation District (PGCD), and
Rusk County Groundwater Conservation District (RCGCD);

Will hold a **Joint Planning Meeting at 10:00 a.m. on January 11, 2017** in room 119 (Commissioners Room) in Nacogdoches City Hall at 202 E. Pilar, Nacogdoches, TX, for the following purpose:

1. Call meeting to order and establish a quorum.
2. Public comments. [i]
3. Discussion and possible action to approve the minutes of the November 09, 2016 meeting.
4. Discussion and possible action on adopting a resolution for the adoption of Desired Future Conditions for the Carrizo-Wilcox, Queen City, and Sparta Aquifers within the boundaries of GMA 11 and on declaring the Gulf Coast, Nacatoch, Yegua-Jackson, and Trinity Aquifers not relevant for purposes of joint planning.
5. Review and possible action of the approval of the presented explanatory report.
6. Update on the new TWDB Northern Carrizo-Wilcox model.
7. Comments and updates from GMA-11 representatives' on the joint planning process.
8. Report from the GMA-11 representatives for the Region I and Region D regional water planning groups.
9. Discussion of possible agenda items for the next GMA-11 meeting.
10. Set date, time, and place of next meeting.
11. Adjourn meeting.

FILED FOR RECORD
at 9:17 o'clock A M.

DEC 21 2016

MARK STAPLES
County Clerk, Anderson County, Texas
By _____ Deputy

Dated and posted prior to 5:00 PM on or before the 30th day of December, 2016.

Leah Adams, GMA-11 Contact
Panola County Groundwater Conservation District

This meeting is available to all persons regardless of disability. If you require special assistance to attend or participate in the meeting, please contact the Panola County GCD at (903) 690-0143 at least 24 hours in advance of the meeting.

[i] **PUBLIC COMMENTS**: Citizens who desire to address GMA-11 on any matter may sign up to do so prior to this meeting. Public comments will be received during this portion of the meeting. Please limit comments to 3 (three) minute. No discussion or final action will be taken by GMA-11.

Questions, Requests for Information and Comments Submission: Citizens who wish to ask questions, to request additional information, or to submit comments may do so by submitting such information to the following person:

Leah Adams, Panola County GCD, 419 W. Sabine Street, Carthage, Texas 75633
(903) 690-0143 / ladams@pcgcd.org

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8. Report from the GMA-11 representatives for the Region I and Region D regional water planning groups.
9. Discussion of possible agenda items for the next GMA-11 meeting.
10. Set date, time, and place of next meeting.
11. Adjourn meeting.

FILED
AT 10:30 O'CLOCK A M
DEC 27 2016
AMY FINCHER
County Clerk, County Court at Law
Angelina County, Texas
By

Dated and posted prior to 5:00 PM on or before the 30th day of December, 2016.

Leah Adams, GMA-11 Contact
Panola County Groundwater Conservation District

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8. Report from the GMA-11 representatives for the Region I and Region D regional water planning groups.
9. Discussion of possible agenda items for the next GMA-11 meeting.
10. Set date, time, and place of next meeting.
11. Adjourn meeting.

FILED
FOR RECORD
2016 DEC 21 AM 10: 05
LAVERNE LUSK, COUNTY CLERK
CHEROKEE COUNTY, TEXAS
BY _____ DEPUTY

Dated and posted prior to 5:00 PM on or before the 30th day of December, 2016.

Leah Adams, GMA-11 Contact
Panola County Groundwater Conservation District

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11. Adjourn meeting.

Dated and posted prior to 5:00 PM on or before the 30th day of December, 2016.

Leah Adams, GMA-11 Contact
Panola County Groundwater Conservation District

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11. Adjourn meeting.

Dated and posted prior to 5:00 PM on or before the 30th day of December, 2016.

Leah Adams, GMA-11 Contact
Panola County Groundwater Conservation District

2016 DEC 29 AM 8:31

COUNTY

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9. Discussion of possible agenda items for the next GMA-11 meeting.
10. Set date, time, and place of next meeting.
11. Adjourn meeting.

FILED FOR RECORD
IN MY OFFICE
AT 11:35 O'CLOCK A M
DEC 21 2016
BOBBIE DAVIS
COUNTY CLERK, PANOLA COUNTY, TEXAS
BY _____ DEPUTY

COUNTY COURT * PANOLA COUNTY, TEXAS *

Dated and posted prior to 5:00 PM on or before the 30th day of December, 2016.

Leah Adams, GMA-11 Contact
Panola County Groundwater Conservation District

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8. Report from the GMA-11 representatives for the Region I and Region D regional water planning groups.
9. Discussion of possible agenda items for the next GMA-11 meeting.
10. Set date, time, and place of next meeting.
11. Adjourn meeting.

FILED FOR RECORD
Dec 21 2016 02:16P
TRUDY HOGUE, COUNTY CLERK
RUSK COUNTY, TEXAS
By Heather Hall DEPUTY

Dated and posted prior to 5:00 PM on or before the 30th day of December, 2016.

Leah Adams, GMA-11 Contact
Panola County Groundwater Conservation District

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Leah Adams, Panola County GCD, 419 W. Sabine Street, Carthage, Texas 75633
(903) 690-0143 / ladams@pcgcd.org

Leah Adams

From: Texas Register <TexReg@sos.texas.gov>
Sent: Tuesday, December 20, 2016 4:41 PM
To: ladams@pcgcd.org
Subject: S.O.S. Acknowledgment of Receipt

Acknowledgment of Receipt

Agency: Groundwater Management Area 11

Liaison: Leah Adams

The Office of the Secretary of State has posted

notice of the following meeting:

Board: Groundwater Management Area 11

Committee:

Date: 01/11/2017 10:00 AM "TRD# 2016008539"

Notice posted: 12/20/16 04:41 PM

Proofread your current open meeting notice at:

http://texreg.sos.state.tx.us/public/pub_om_lookup$.startup?Z_TRD=2016008539

Attachment B
Proposed Desired Future Conditions

GMA 11 Technical Memorandum 16-02 (Draft 2), dated March 25, 2016, summarizes how the results of groundwater availability model simulations were used to developed the proposed desired future conditions for the Sparta, Queen City, and Carrizo-Wilcox aquifers for GMA 11.

Table 5 from GMA 11 Technical Memorandum 16-02 (Draft 2), dated March 25, 2016 lists the proposed desired future conditions, and is presented below. As described in the technical memorandum, the proposed desired future conditions are average drawdowns (in feet) from year 2000 conditions to 2070 conditions were largely based on GAM Scenario 4. Based on an analysis of model output and model limitations, the output from the model was modified to develop the proposed desired future conditions as follows:

- Layers 2 and 4 (the confining units) were eliminated, and Table 5 includes only aquifer units. Areas that have no active cells are designated as NP (for not present).
- Layers 5, 6, 7, and 8 are combined, and a single drawdown value for the Carrizo-Wilcox Aquifer are listed
- All areas that are less than 200 square miles are eliminated (noted as NRS, or not relevant for purposes of joint planning due to size of area).
- Areas with negative drawdown that are greater than 200 square miles have had the negative drawdown cells eliminated from the average drawdown calculation, effectively assuming that those cells have a zero drawdown, and that the negative drawdown areas are a result of model limitations, as discussed (designated in yellow).
- The desired future condition in Panola County for the Carrizo-Wilcox Aquifer is listed as 3 feet. The actual average using all data from the model is 2 feet. If the areas with negative drawdown are assumed to be zero, the revised average is 4 feet. As presented at the March 22, 2016 GMA 11 meeting, Mr. Wade Oliver (representing the Panola County GCD) evaluated the average drawdown under Scenario 4 using an alternative analytical modeling approach and concluded that the drawdown was 3 feet. Thus, Mr. Oliver's result is consistent with the midpoint between the two GAM-based drawdown approaches.

TABLE 1. DESIRED FUTURE CONDITIONS - AVERAGE DRAWDOWN (FT) FROM 2000 TO 2070

County	Sparta Aquifer	Queen City Aquifer	Carrizo-Wilcox Aquifer
Anderson	NRS	9	90
Angelina	16	NRS	48
Bowie	NP	NP	5
Camp	NP	NRS	33
Cass	NP	10	68
Cherokee	NRS	14	99
Franklin	NP	NP	14
Gregg	NP	NRS	58
Harrison	NP	1	18
Henderson	NP	5	50
Hopkins	NP	NP	3
Houston	3	6	80
Marion	NP	24	45
Morris	NP	NRS	46
Nacogdoches	5	4	29
Panola	NP	NP	3
Rains	NP	NP	1
Rusk	NP	NRS	23
Sabine	1	NP	9
SanAugustine	2	NP	7
Shelby	NP	NP	1
Smith	NP	17	119
Titus	NP	NRS	11
Trinity	9	NRS	51
Upshur	NP	9	77
VanZandt	NP	NRS	21
Wood	NP	5	89
GMA11	4	10	56

Notes: NP = Not present

NRS = Not Relevant due to size (less than 200 square miles)

Yellow Cells represent average drawdown calculations that assume negative drawdown is zero (model artifact and model limitation)

Green Cell represents the recommended DFC for Panola County as described in report

Attachment C
Non-relevant Aquifer: Gulf Coast

I. INTRODUCTION

The Texas Water Development Board, in its July 2013 document, Explanatory Report for Submittal of Desired Future Conditions to the Texas Water Development Board, offers the following guidance regarding documentation for aquifers that are to be classified not relevant for purposes of joint planning:

> *Districts in a groundwater management area may, as part of the process for adopting and submitting desired future conditions, propose classification of a portion or portions of a relevant aquifer as non-relevant (31 Texas Administrative Code 356.31 (b)). This proposed classification of an aquifer may be made if the districts determine that aquifer characteristics, groundwater demands, and current groundwater uses do not warrant adoption of a desired future condition.*
>
> *The districts must submit to the TWDB the following documentation for the portion of the aquifer proposed to be classified as non-relevant:*
>
> 1. *A description, location, and/or map of the aquifer or portion of the aquifer;*
> 2. *A summary of aquifer characteristics, groundwater demands, and current groundwater uses, including the total estimated recoverable storage as provided by the TWDB, that support the conclusion that desired future conditions in adjacent or hydraulically connected relevant aquifer(s) will not be affected; and*
> 3. *An explanation of why the aquifer or portion of the aquifer is nonrelevant for joint planning purposes.*

This technical memorandum provides the required documentation to classify the Gulf Coast Aquifer as not relevant for purposes of joint planning.

II. AQUIFER DESCRIPTION AND LOCATION

As described in George and others (2011):

> ***The Gulf Coast Aquifer*** *is a major aquifer paralleling the Gulf of Mexico coastline from the Louisiana border to the border of Mexico. It consists of several aquifers, including the Jasper, Evangeline, and Chicot aquifers, which are composed of discontinuous sand, silt, clay, and gravel beds. The maximum total sand thickness of the Gulf Coast Aquifer ranges from 700 feet in the south to 1,300 feet in the north. Freshwater saturated thickness averages about 1,000 feet. Water quality varies with depth and locality: it is generally good in the central and northeastern parts of the aquifer, where the water contains less than 500 milligrams per liter of total dissolved solids, but declines to the south, where it typically contains 1,000 to more than 10,000 milligrams per liter of total dissolved*

solids and where the productivity of the aquifer decreases. High levels of radionuclides, thought mainly to be naturally occurring, are found in some wells in Harris County in the outcrop and in South Texas. The aquifer is used for municipal, industrial, and irrigation purposes. In Harris, Galveston, Fort Bend, Jasper, and Wharton counties, water level declines of as much as 350 feet have led to land subsidence. The regional water planning groups, in their 2006 Regional Water Plans, recommended several water management strategies that use the Gulf Coast Aquifer, including drilling more wells, pumping more water from existing wells, temporary overdrafting, constructing new or expanded treatment plants, desalinating brackish groundwater, developing conjunctive use projects, and reallocating supplies.

Figure 1 (taken from Wade and others, 2014) shows the limited extent of the Gulf Coast Aquifer in GMA 11. Note that it occurs only in a small portion of Angelina, Sabine, and Trinity counties.

NON-RELEVANT AQUIFER: NACATOCH

I. INTRODUCTION

The Texas Water Development Board, in its July 2013 document, Explanatory Report for Submittal of Desired Future Conditions to the Texas Water Development Board, offers the following guidance regarding documentation for aquifers that are to be classified not relevant for purposes of joint planning:

> *Districts in a groundwater management area may, as part of the process for adopting and submitting desired future conditions, propose classification of a portion or portions of a relevant aquifer as non-relevant (31 Texas Administrative Code 356.31 (b)). This proposed classification of an aquifer may be made if the districts determine that aquifer characteristics, groundwater demands, and current groundwater uses do not warrant adoption of a desired future condition.*
>
> *The districts must submit to the TWDB the following documentation for the portion of the aquifer proposed to be classified as non-relevant:*
>
> 1. *A description, location, and/or map of the aquifer or portion of the aquifer;*
> 2. *A summary of aquifer characteristics, groundwater demands, and current groundwater uses, including the total estimated recoverable storage as provided by the TWDB, that support the conclusion that desired future conditions in adjacent or hydraulically connected relevant aquifer(s) will not be affected; and*
> 3. *An explanation of why the aquifer or portion of the aquifer is nonrelevant for joint planning purposes.*

This technical memorandum provides the required documentation to classify the Nacatoch Aquifer as not relevant for purposes of joint planning.

II. AQUIFER DESCRIPTION AND LOCATION

As described in George and others (2011):

> ***The Nacatoch Aquifer*** *is a minor aquifer occurring in a narrow band across northeast Texas. The aquifer consists of the Nacatoch Sand, composed of sequences of sandstone separated by impermeable layers of mudstone or clay. These sandstones are marine in origin, coarsen upward, and are laterally discontinuous. The number of sand layers varies throughout the Nacatoch's extent, and the thickness of individual sand units ranges from more than 100 feet in the north to less than 20 feet to the south. Thickness of intervening mudstone units similarly ranges from more than 100 feet to only a few feet. Freshwater saturated thickness averages about 50 feet. The aquifer also includes a hydraulically connected cover of alluvium that is as much as 80 feet thick along major drainages. Groundwater in this aquifer is usually under artesian conditions except in shallow wells where the Nacatoch Formation*

crops out and water table conditions exist. The Mexia-Talco Fault Zone generally delineates the subsurface limit of the aquifer. The groundwater in the aquifer is typically alkaline, high in sodium bicarbonate, and soft. Total dissolved solids in the subsurface increase and are significantly higher south of the Mexia-Talco Fault Zone, where the water contains between 1,000 and 3,000 milligrams per liter of total dissolved solids. Water from the aquifer is extensively used for domestic and livestock purposes. The city of Commerce historically pumped the greatest amount from the Nacatoch Aquifer but has recently attempted to convert to surface water; however, because of recent droughts, the city has pumped 30 to 50 percent of its water from the aquifer. As a result of Commerce's reduced pumping, the declining water levels that had developed around Commerce in Delta and Hunt counties are stabilizing. The North East Texas Regional Water Planning Group, in its 2006 Regional Water Plan, recommended new and supplemental groundwater wells in the Nacatoch Aquifer as a water management strategy.

Figure 1 (taken from Wade and others, 2014) shows the limited extent of the Nacatoch Aquifer in GMA 11. Note that it occurs only in a small portion of Bowie, Henderson, Morris, Red River, and Titus counties.

NON-RELEVANT AQUIFER: TRINITY

I. INTRODUCTION

The Texas Water Development Board, in its July 2013 document, Explanatory Report for Submittal of Desired Future Conditions to the Texas Water Development Board, offers the following guidance regarding documentation for aquifers that are to be classified not relevant for purposes of joint planning:

> *Districts in a groundwater management area may, as part of the process for adopting and submitting desired future conditions, propose classification of a portion or portions of a relevant aquifer as non-relevant (31 Texas Administrative Code 356.31 (b)). This proposed classification of an aquifer may be made if the districts determine that aquifer characteristics, groundwater demands, and current groundwater uses do not warrant adoption of a desired future condition.*
>
> *The districts must submit to the TWDB the following documentation for the portion of the aquifer proposed to be classified as non-relevant:*
>
> 1. *A description, location, and/or map of the aquifer or portion of the aquifer;*
> 2. *A summary of aquifer characteristics, groundwater demands, and current groundwater uses, including the total estimated recoverable storage as provided by the TWDB, that support the conclusion that desired future conditions in adjacent or hydraulically connected relevant aquifer(s) will not be affected; and*
> 3. *An explanation of why the aquifer or portion of the aquifer is nonrelevant for joint planning purposes.*

This technical memorandum provides the required documentation to classify the Trinity Aquifer as not relevant for purposes of joint planning.

II. AQUIFER DESCRIPTION AND LOCATION

As described in George and others (2011):

> ***The Trinity Aquifer,*** *a major aquifer, extends across much of the central and northeastern part of the state. It is composed of several smaller aquifers contained within the Trinity Group. Although referred to differently in different parts of the state, they include the Antlers, Glen Rose, Paluxy, Twin Mountains, Travis Peak, Hensell, and Hosston aquifers. These aquifers consist of limestones, sands, clays, gravels, and conglomerates. Their combined freshwater saturated thickness averages about 600 feet in North Texas and about 1,900 feet in Central Texas. In general, groundwater is fresh but very hard in the outcrop of the aquifer. Total dissolved solids increase from less than 1,000 milligrams per liter in the east and southeast to between 1,000 and 5,000 milligrams per liter, or slightly to moderately saline, as the depth to the aquifer increases. Sulfate and chloride concentrations also tend to increase with depth. The Trinity Aquifer discharges to a large number of springs, with most discharging less than 10 cubic feet per second. The aquifer is one of the most extensive and highly used groundwater resources in Texas. Although its primary use is for municipalities, it is also used*

for irrigation, livestock, and other domestic purposes. Some of the state's largest water level declines, ranging from 350 to more than 1,000 feet, have occurred in counties along the IH-35 corridor from McLennan County to Grayson County. These declines are primarily attributed to municipal pumping, but they have slowed over the past decade as a result of increasing reliance on surface water. The regional water planning groups, in their 2006 Regional Water Plans, recommended numerous water management strategies for the Trinity Aquifer, including developing new wells and well fields, pumping more water from existing wells, overdrafting, reallocating supplies, and using surface water and groundwater conjunctively.

Figure 1 (taken from Wade and others, 2014) shows the limited extent of the Trinity Aquifer in GMA 11. Note that it occurs only in a small portion of Henderson County.

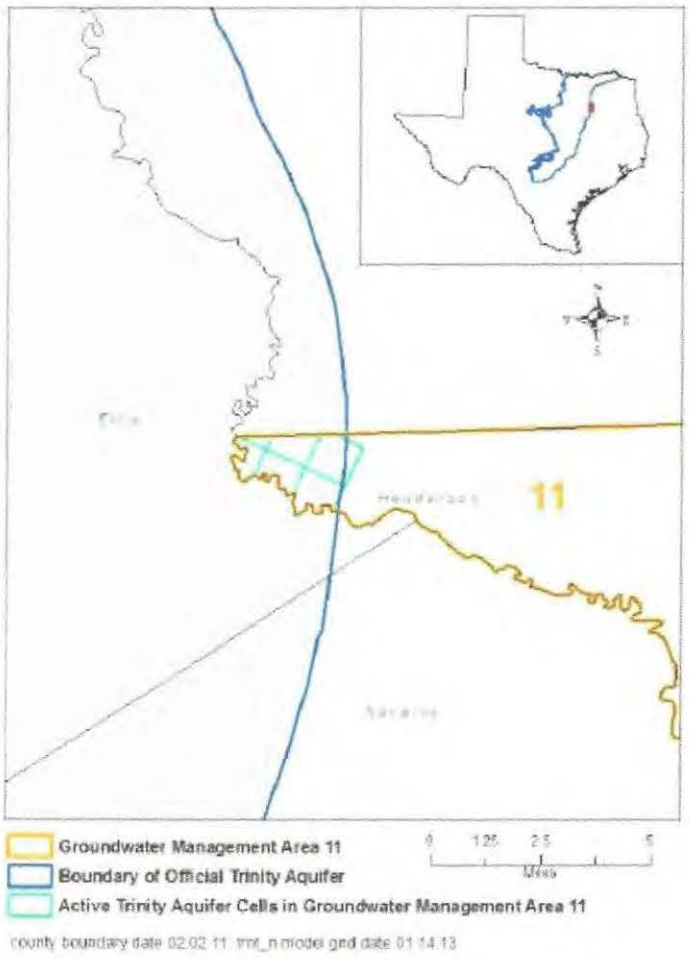

Figure 1. Location of Trinity Aquifer in GMA 11

III. AQUIFER CHARACTERISTICS

Kelley and others (2014) developed an updated groundwater availability model of the Northern Trinity and Woodbine aquifers for four groundwater conservation districts in north Texas. This

model covered the entire Northern Trinity Aquifer, including the small portion in Henderson County. Maps of calibrated horizontal hydraulic conductivity are provided in Kelley and others (2014, pg. 8:1-6, 8:1-7, 8:1-8, 8:1-9, 8:1-10, 8:1-11, 8:1-12). Estimated values are typically 0.1 ft/day or less, except for the Hosston Aquifer, which was shown as between 3 and 10 ft/day.

IV. GROUNDWATER DEMANDS AND CURRENT GROUNDWATER USES

The Texas Water Development Board pumping database does not list any pumping from the Trinity Aquifer in Henderson County. However, the database shows 42 AF/yr was pumping from the Trinity Aquifer in Trinity County in 2012.

V. TOTAL ESTIMATED RECOVERABLE STORAGE

Wade and others (2013) documented the total estimated recoverable storage for the Trinity Aquifer in GMA 11 as follows:

County	*Total Storage (acre-feet)*	*25 percent of Total Storage (acre-feet)*	*75 percent of Total Storage (acre-feet)*
Henderson	500,000	125,000	375,000
Total	500,000	125,000	375,000

Total storage is given in the first column. The recoverable storage is assumed to be between 25 and 75 percent of the total storage.

VI. EXPLANATION OF NON-RELEVANCE

Due to its limited areal extent and generally low use, the Trinity Aquifer is classified as not relevant for purposes of joint planning in Groundwater Management Area 11.

VII. REFERENCES

Kelley, V.A., Ewing, J., Jones, T.L., Young, S.C., Deeds, N., Hamlin, S., Jigmond, M., Harding, J., Pinkard, J., Yan, T.T., Scanlon, B., Beach, J., Davidson, T., Laughlin, K., 2014, Final Report: Updated Groundwater Availability Model of the Northern Trinity and Woodbine Aquifers. Report prepared for North Texas GCD, Northern Trinity GCD, Prairielands GCD, and Upper Trinity GCD. August 2014, Volume 1, 990p.

George, P.G., Mace, R.E., and Petrossian, R., 2011. Aquifers of Texas. Texas Water Development Board Report 380, July 2011, 182p.

Wade, S., Shi, J., and Seiter-Weatherford, C. 2014. GAM Task 13-034: Total Estimated Recoverable Storage for Aquifers in Groundwater Management Area 11. Texas Water Development Board, Groundwater Resources Division, April 2, 2014, 30p.

NON-RELEVANT AQUIFER: YEGUA-JACKSON

I. INTRODUCTION

The Texas Water Development Board, in its July 2013 document, Explanatory Report for Submittal of Desired Future Conditions to the Texas Water Development Board, offers the following guidance regarding documentation for aquifers that are to be classified not relevant for purposes of joint planning:

> *Districts in a groundwater management area may, as part of the process for adopting and submitting desired future conditions, propose classification of a portion or portions of a relevant aquifer as non-relevant (31 Texas Administrative Code 356.31 (b)). This proposed classification of an aquifer may be made if the districts determine that aquifer characteristics, groundwater demands, and current groundwater uses do not warrant adoption of a desired future condition.*
>
> *The districts must submit to the TWDB the following documentation for the portion of the aquifer proposed to be classified as non-relevant:*
>
> 1. *A description, location, and/or map of the aquifer or portion of the aquifer;*
> 2. *A summary of aquifer characteristics, groundwater demands, and current groundwater uses, including the total estimated recoverable storage as provided by the TWDB, that support the conclusion that desired future conditions in adjacent or hydraulically connected relevant aquifer(s) will not be affected; and*
> 3. *An explanation of why the aquifer or portion of the aquifer is nonrelevant for joint planning purposes.*

This technical memorandum provides the required documentation to classify the Yegua-Jackson Aquifer as not relevant for purposes of joint planning.

II. AQUIFER DESCRIPTION AND LOCATION

As described in George and others (2011):

> ***The Yegua-Jackson Aquifer*** *is a minor aquifer stretching across the southeast part of the state. It includes water-bearing parts of the Yegua Formation (part of the upper Claiborne Group) and the Jackson Group (comprising the Whitsett, Manning, Wellborn, and Caddell formations). These geologic units consist of interbedded sand, silt, and clay layers originally deposited as fluvial and deltaic sediments. Freshwater saturated thickness averages about 170 feet. Water quality varies greatly owing to sediment composition in the aquifer formations, and in all areas the aquifer becomes highly mineralized with depth. Most groundwater is produced from the sand units of the aquifer, where the water is fresh and ranges from less than 50 to 1,000 milligrams per liter of total dissolved solids. Some slightly to moderately saline water, with concentrations of total dissolved solids ranging from 1,000 to 10,000 milligrams per liter, also occurs in the aquifer. No significant water level declines have occurred in wells measured by the TWDB. Groundwater for domestic and livestock purposes is available from shallow wells over most of the aquifer's extent. Water is also used for some municipal, industrial, and irrigation purposes. The regional water planning groups, in their 2006*

Regional Water Plans, recommended several water management strategies that use the Yegua-Jackson Aquifer, including drilling more wells and desalinating the water.

Figure 1 (taken from Wade and others, 2014) shows the limited extent of the Yegua-Jackson Aquifer in GMA 11.

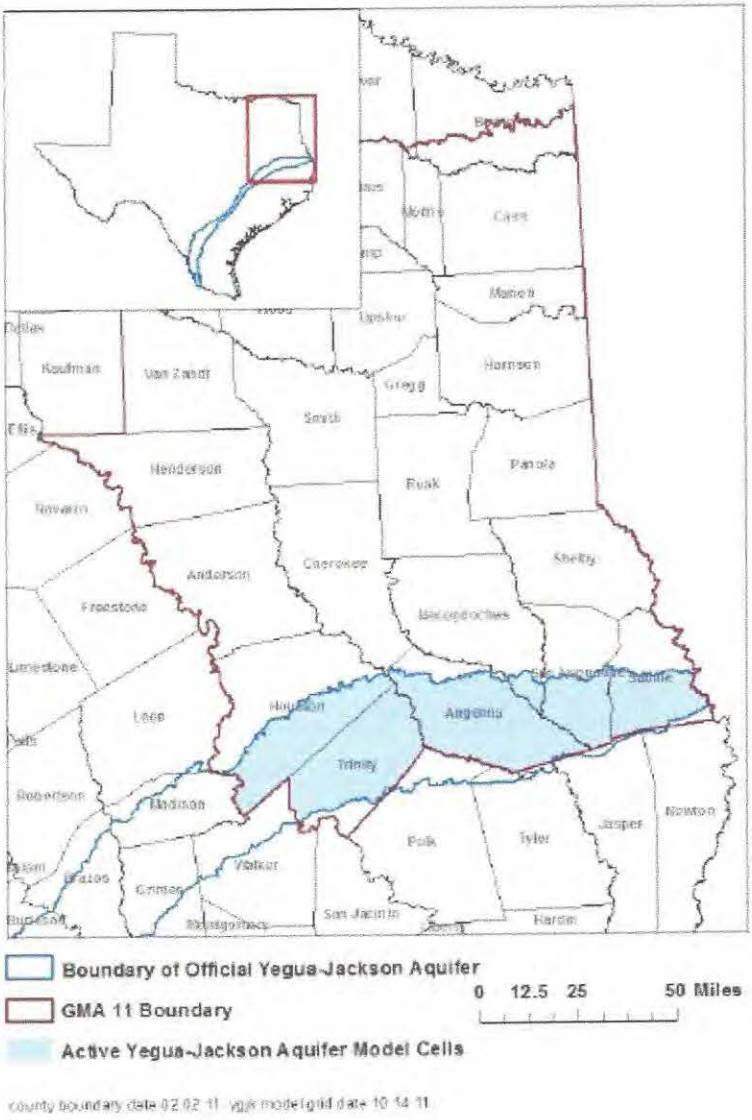

Figure 1. Location of Yegua-Jackson Aquifer in GMA 11

III. AQUIFER CHARACTERISTICS

Deeds and others (2010) developed a groundwater availability model of the Yegua-Jackson Aquifer for the Texas Water Development Board. Maps of calibrated horizontal hydraulic conductivity are provided on pages 8-7, to 8-11. Estimated values in the GMA 11 area vary considerably from less than 1ft/day to over 30 ft/day, depending on the unit and location.

IV. GROUNDWATER DEMANDS AND CURRENT GROUNDWATER USES

The Texas Water Development Board pumping database does not list any pumping from the Trinity Aquifer in Henderson County. However, the database shows 42 AF/yr was pumping from the Trinity Aquifer in Trinity County in 2012.

V. TOTAL ESTIMATED RECOVERABLE STORAGE

Wade and others (2013) documented the total estimated recoverable storage for the Yegua-Jackson Aquifer in GMA 11 as follows:

County	Total Storage (acre-feet)	25 percent of Total Storage (acre-feet)	75 percent of Total Storage (acre-feet)
Angelina	72,000,000	18,000,000	54,000,000
Houston	21,000,000	5,250,000	15,750,000
Nacogdoches	1,400,000	350,000	1,050,000
Sabine	30,000,000	7,500,000	22,500,000
San Augustine	19,000,000	4,750,000	14,250,000
Trinity	83,000,000	20,750,000	62,250,000
Total	226,400,000	56,600,000	169,800,000

Total storage is given in the first column. The recoverable storage is assumed to be between 25 and 75 percent of the total storage.

VI. EXPLANATION OF NON-RELEVANCE

Due to its limited areal extent and generally low use, the Yegua-Jackson Aquifer is classified as not relevant for purposes of joint planning in Groundwater Management Area 11.

VII. REFERENCES

Deeds, N.E., Yan, T., Singh, A., Jones, T.L., Kelley, V.A., Knox, P.R., and Young, S.C., 2010. Final Report: Groundwater Availability Model for the Yegua-Jackson Aquifer. Prepared for the Texas Water Development Board, March 2010, 582p.

George, P.G., Mace, R.E., and Petrossian, R., 2011. Aquifers of Texas. Texas Water Development Board Report 380, July 2011, 182p.

Wade, S., Shi, J., and Seiter-Weatherford, C. 2014. GAM Task 13-034: Total Estimated Recoverable Storage for Aquifers in Groundwater Management Area 11. Texas Water Development Board, Groundwater Resources Division, April 2, 2014, 30p.