

Edwards (Balcones Fault Zone) Aquifer: Not Relevant for Purposes of Joint Planning

GMA 13 Technical Memorandum 16-06, Draft 2

William R. Hutchison, Ph.D., P.E., P.G.

April 4, 2016

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 non-relevant for joint planning purposes.*

This technical memorandum provides the required documentation to classify the Edwards (Balcones Fault Zone) Aquifer as not relevant for purposes of joint planning.

Aquifer Description and Location

As described in George and others (2011):

The Edwards (Balcones Fault Zone) Aquifer is a major aquifer in the south-central part of the state. It consists primarily of partially dissolved limestone that creates a highly permeable aquifer. Aquifer thickness ranges from 200 to 600 feet, and freshwater saturated thickness averages 560 feet in the southern part of the aquifer. The groundwater, although hard, is generally fresh and contains less than 500 milligrams per liter of total dissolved solids. Water from the aquifer is

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primarily used for municipal, irrigation, and recreational purposes. San Antonio obtains almost all of its water supply from the Edwards (Balcones Fault Zone) Aquifer. The aquifer feeds several well-known springs, including Comal Springs in Comal County, which is the largest spring in the state, and San Marcos Springs in Hays County, which is the second largest. Hueco, San Pedro, San Antonio, and Leona springs also discharge from the aquifer. Because of the aquifer's highly permeable nature, water levels and spring flows respond quickly to rainfall, drought, and pumping. Although water levels periodically and seasonally decline rapidly in wells throughout the aquifer, they also rebound quickly with adequate rainfall. The regional water planning groups, in their 2006 Regional Water Plans, recommended several water management strategies that use the Edwards (Balcones Fault Zone) Aquifer, including drilling new wells, constructing small dams along streambeds to enhance recharge to the aquifer, and reallocating supplies from irrigation to municipal users. They also recommended expanding an existing aquifer storage and recovery facility that stores water from the Edwards (Balcones Fault Zone) Aquifer in the Carrizo-Wilcox Aquifer in southern Bexar County.

Figure 1 (taken from Wade and Bradley, 2013) shows the limited extent of the Edwards (Balcones Fault Zone) Aquifer in GMA 13. Note that it occurs only in a small portion of Atascosa, Bexar, Frio, Medina, Uvalde, and Zavala counties.

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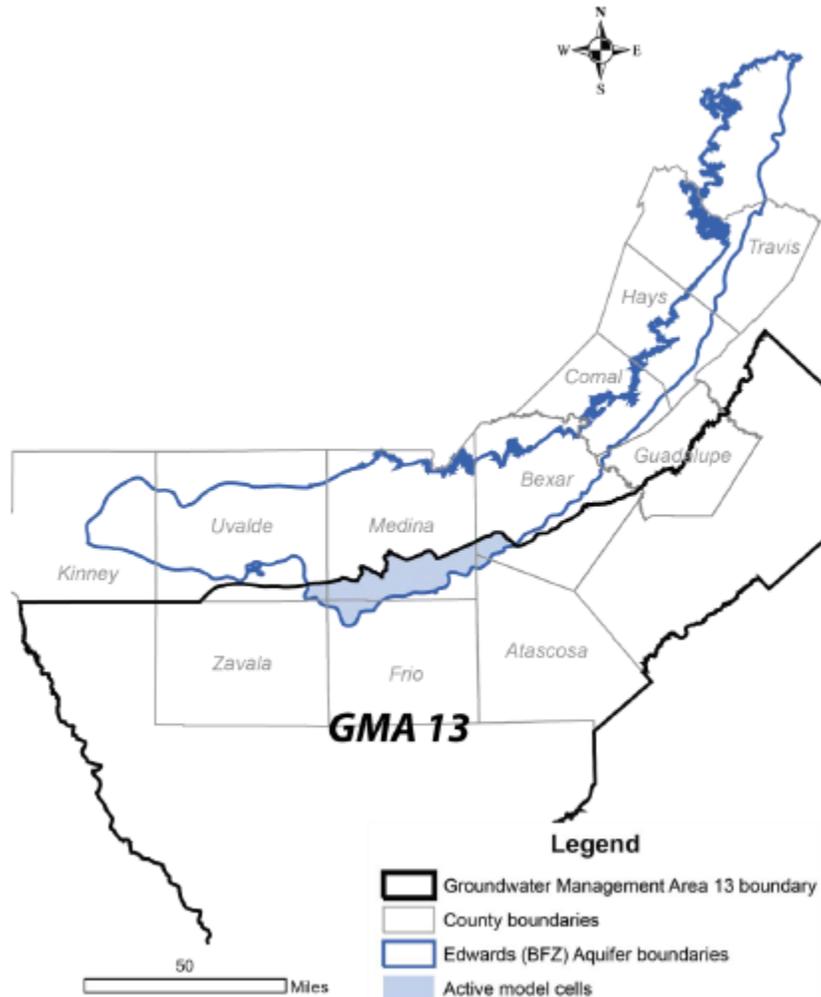


Figure 1. Location of Edwards (Balcones Fault Zone) Aquifer in GMA 13

Aquifer Characteristics

Lindgren and others, (2004, p 26) provided a map of the distribution of hydraulic conductivity that included the limited area of the aquifer within GMA 13. Within GMA 13, the hydraulic conductivity appears to range from about 50 ft/day to about 500 ft/day.

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Groundwater Demands and Current Groundwater Uses

The Texas Water Development Board pumping database shows 2012 groundwater pumping for the Trinity Aquifer as follows:

- Atascosa: 413 AF/yr
- Bexar: 268,490 AF/yr
- Frio: 0 AF/yr
- Medina: 41,554 AF/yr
- Uvalde: 74,218 AF/yr
- Zavala: 0 AF/yr

Please note that these are totals for the entire county, not necessarily in the GMA 13 portion of the Trinity Aquifer.

Total Estimated Recoverable Storage

Wade and others (2013) documented the total estimated recoverable storage for the Trinity Aquifer in GMA 13 as follows:

<i>County</i>	<i>Total Storage (acre-feet)</i>	<i>25% of Total Storage (acre-feet)</i>	<i>75% of Total Storage (acre-feet)</i>
Atascosa	29,000	7,250	21,750
Bexar	130,000	32,500	97,500
Frio	240,000	60,000	180,000
Medina	1,200,000	300,000	900,000
Uvalde	110,000	27,500	82,500
Zavala	9,400	2,350	7,050
Total	1,718,400	429,600	1,288,800

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

Explanation of Non-Relevance

Due to its limited areal extent and generally low use, the Edwards (Balcones Fault Zone) Aquifer is classified as not relevant for purposes of joint planning in Groundwater Management Area 13.

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References

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

Lindgren, R.J., Dutton, A.R., Hovorka, S.D., Worthington, S.R.H., and Painter, S., 2004. Conceptualization and Simulation of the Edwards Aquifer, San Antonio Region, Texas. USGS Scientific Investigations Report 2004-5277., 153p.

Wade, S., and Bradley, R., 2013. GAM Task 13-036: Total Estimated Recoverable Storage for Aquifers in Groundwater Management Area 13. Texas Water Development Board, Groundwater Resources Division, July 8, 2013, 30p.