

Yegua-Jackson Aquifer: Not Relevant for Purposes of Joint Planning

GMA 11 Technical Memorandum 16-06, Draft 1

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May 3, 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 Yegua-Jackson Aquifer as not relevant for purposes of joint planning.

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

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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.

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

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.

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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.

Total Estimated Recoverable Storage

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

<i>County</i>	<i>Total Storage (acre-feet)</i>	<i>25 percent of Total Storage (acre-feet)</i>	<i>75 percent of Total Storage (acre-feet)</i>
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.

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.

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.

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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.