



Alternative Water Supply in Northeastern Harris County Feasibility Study

EXECUTIVE SUMMARY

September 2026

Introduction

In Harris County, Texas, substantial groundwater withdrawals from the Gulf Coast Aquifer System have led to subsidence, or the gradual sinking of the land. Although subsidence in this region occurs slowly, it is irreversible and has significant impacts, such as damage to infrastructure and increased flood risks. The Harris-Galveston Subsidence District (HGSD) was created by the Texas Legislature in 1975 to prevent further subsidence in Harris and Galveston counties through science-driven [groundwater regulation](#) and award-winning water conservation programs.

HGSD implements a [Regulatory Plan](#) that establishes guidelines to reduce groundwater withdrawals over time and shift the region's primary water source to alternative water supplies (AWS), like treated surface water or reclaimed water, that do not cause further land subsidence. Measured elevation data show significant improvements in subsidence rates for areas that have transitioned to AWS and no longer rely on groundwater as their primary water source.

In 2022, HGSD completed an [Alternative Water Supply Availability Assessment](#) that identified a portion of northeast Harris County as needing AWS to meet future growth and water demand projections without causing further subsidence. This area, shown in , is referred to as the East Harris Study Area (EHSA). Although some portions of the EHSA have greatly reduced reliance on groundwater, including Baytown and surrounding communities through the Baytown Area Water Authority (BAWA), the Newport Municipal Utility District (MUD), and the Crosby MUD, most water supply outside of these areas is still sourced from groundwater. Additionally, no unappropriated water rights from nearby surface water reservoirs, such as the San Jacinto River and Lake Houston, are available. Therefore, this area will need to obtain surface water from other water rights holders or seek other AWS options to meet future water demand.

The goal of this study is to assess and identify feasible AWS options and strategies for the EHSA to support future water demands without causing further subsidence.

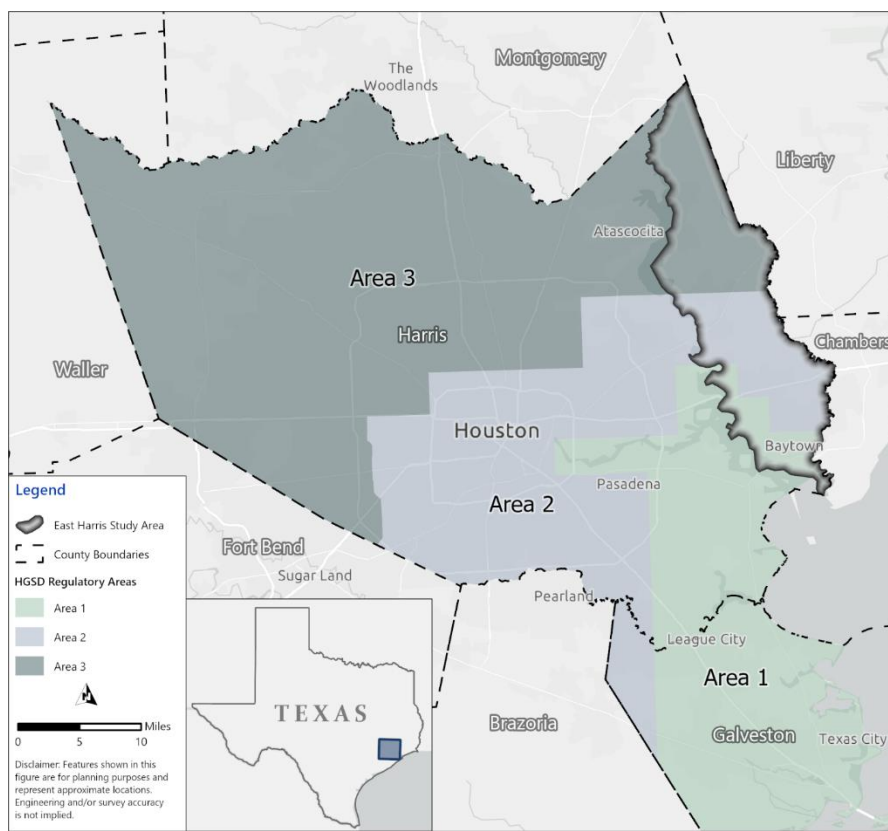


Figure 1. Location of East Harris Study Area and delineation of HGSD's Regulatory Areas in Harris and Galveston counties, Texas.

Projected Water Demands and Alternative Water Supply Planning Areas

The total population of the EHSA is projected to grow from approximately 162,800 in 2020 to nearly 296,000 by 2070, with most growth occurring before 2040 (**Figure 2**). The Baytown area currently comprises the majority of the population, but significant growth is expected in the northern portion of the study area. Urbanization is also expected to increase, with more than 90 percent of the population living in developed areas by 2040, indicating that most future water demand will be associated with municipal systems rather than rural domestic use.

Based on projected development patterns and existing water supply conditions, the EHSA was divided into three AWS Planning Areas, as shown in **Figure 2**, each with different levels of access to surface water and infrastructure.

The AWS Planning Areas are presented below from north to south:

1. **Lake Houston-North AWS Planning Area:** includes several unincorporated communities on the northeast side of Lake Houston, along with areas served by the City of Houston water system; all public water systems in this area currently rely solely on groundwater.
2. **Newport-Crosby AWS Planning Area:** covers the communities of Newport, Crosby, and Barrett in central eastern Harris County; some surface water is available in this area by Newport MUD and Crosby MUD that purchase raw water from SJRA which is treated and provided to retail customers.
3. **Baytown AWS Planning Area:** comprises the entirety of the BAWA within southeastern Harris County, along with areas north of Interstate 10 and south of Barbers Hill Road and FM 1942; many of the existing public water systems in this area beyond the northern administrative boundary of the BAWA are currently receiving treated water from BAWA.

Municipal water demand projections indicate substantial growth driven primarily by population increases in urbanized areas, with total demand projected to increase from approximately 6,770 million gallons per year (MGY) / 20,800 acre-feet per year (AFY) in 2020 to over 13,300 MGY / 40,800 AFY by 2070, with most of the growth occurring before 2040.

The need for AWS is determined by comparing projected municipal water demand to existing surface water availability, with areas relying entirely on groundwater, such as Lake Houston-North AWS Planning Area, having the highest unmet needs. In contrast, areas with partial surface water access, such as Newport-Crosby AWS Planning Area, have lower but still significant deficits. In the Baytown AWS Planning Area, existing contracts for surface water supply are sufficient to meet demand through 2040, after which supply deficits begin to emerge and grow over time. The demand for AWS for the EHSA as a whole is projected to increase from approximately 910 MGY / 2,800 AFY in 2020 to 5,600 MGY / 17,200 AFY by 2070.

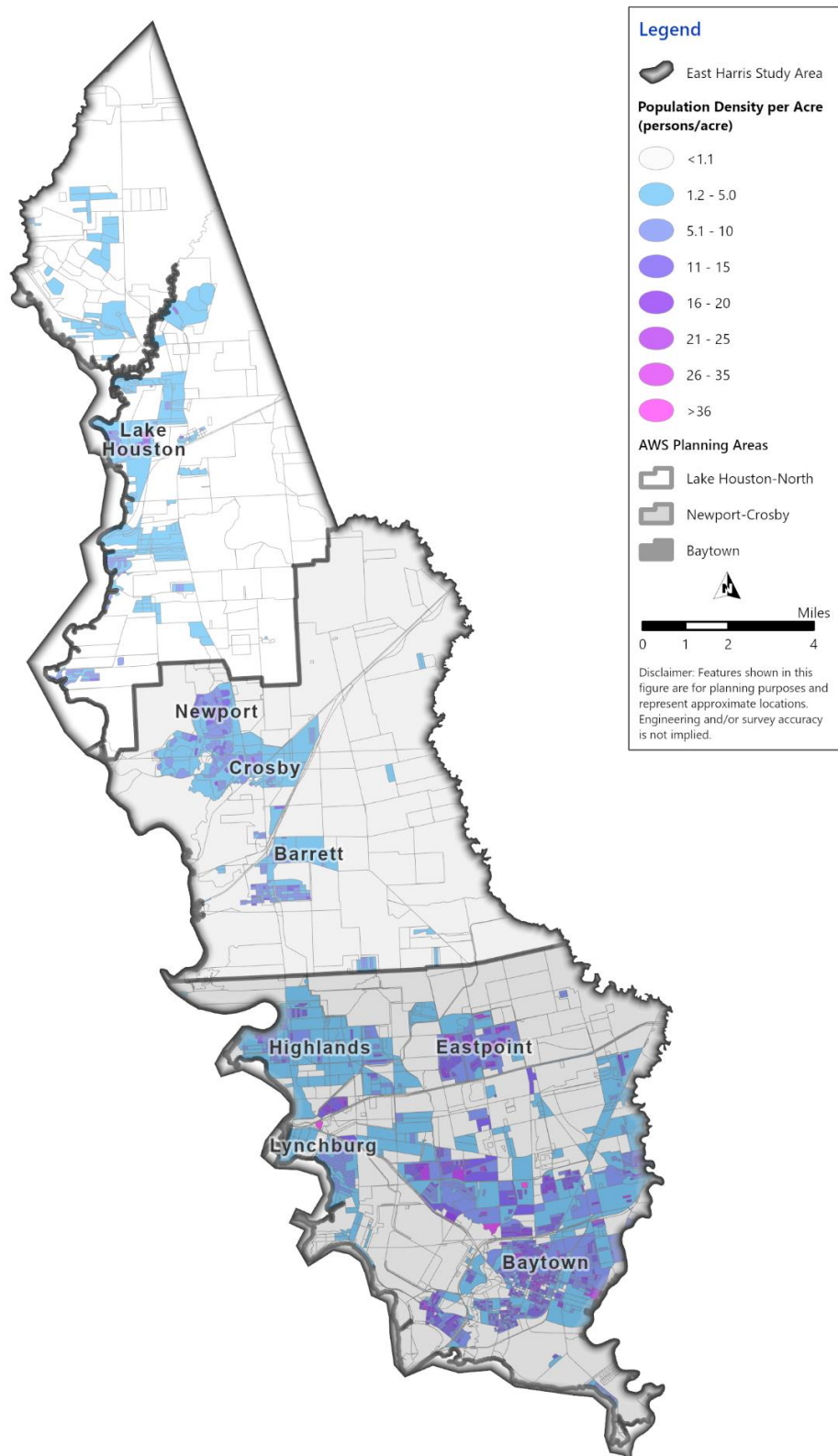


Figure 2. Projected Population Density in 2040 for the East Harris Study Area and location of the three Alternative Water Supply (AWS) Planning Areas.

Alternative Water Supply Options

Several AWS options were considered and evaluated for feasibility for the EHSA, including treated surface water, reclaimed water, and seawater desalination. These options were characterized with respect to quantity, quality, reliability, and potential environmental impacts, using the Texas Water Development Board's (TWDB) regional water planning process to ensure consistency.

Treated surface water is the primary AWS strategy for the EHSA because it provides the most feasible available supply to meet the objectives of reducing groundwater use and achieving compliance with HGSD's Regulatory Plan. Regional coordination among utilities, authorities, and stakeholders is essential to successfully deliver these supplies and ensure solutions are practical, locally appropriate, and sustainable.

A summary of the identified AWS options is presented in **Table 1**. This table shows the projected water demand for each AWS Planning Area, the most viable AWS option(s) and the source or supplier, the amount of supply provided, and the estimated cost for each project.

Table 1. Summary of Projected Water Demand, Alternative Water Supply (AWS) Options, AWS Magnitude, and Estimated Cost for each AWS Planning Area

AWS Planning Area	2070 Demand ¹ (MGY/AFY)	Proposed AWS Option(s)	AWS Source/Supplier	Magnitude of AWS	Estimated Cost
Lake Houston-North	2,750/8,440	Purchase Treated Surface Water	City of Houston	ADD: 7.5 MGD MDD: 15 MGD	\$165,126,000
		New Surface Water Treatment Plant	Purchased Supply: City of Houston or SJRA; Local Supply ² (479 MGY/1,471 AFY)	ADD: 7.5 MGD MDD: 15 MGD	\$305,326,000
		Direct Potable Reuse	Reclaimed water from Cedar Bayou WWTP (City of Houston)	1.3 MGD	\$59,174,000
Newport-Crosby	1,550/4,760	Expand Treated Surface Water to Serve Additional Public Water Systems	SJRA via transmission line from Crosby MUD or Newport MUD	ADD: 1.5 MGD MDD: 3.0 MGD	\$16,868,000
Baytown	1,300/3,990	BAWA East Surface WTP Expansion	City of Houston	+12 MGD	\$124,515,500

MGY: Million Gallons per Year; AFY: Acre-Feet per Year; ADD: average day demand; MDD: maximum day demand

1. AWS demand for each Planning Area is calculated as the municipal water demand for urbanized areas less the amount of surface water supply already available. Although this AWS amount can be reduced by up to 20% or more based on the HGSD Regulatory Area's groundwater reduction goals or specific Groundwater Reduction Plan requirements, the full amount has been used in this study as the target for AWS.

2. Diversions under Certificate of Adjudication No. 10-3980B, owned by Riceland Landvest, LLC (Harris County MUD 599), which allows for the diversion of up to 479 MGY (1,471.2 AFY, annual equivalent of 1.3 MGD) at a priority date of December 7, 1942.

Conclusions and Recommendations

This study recommends the creation of a new regional water authority (RWA) as a coordinated regional approach to address water supply challenges in the northern and central portions of the EHSA, ensuring that HGSD's Regulatory Plan requirements are met and prevent further subsidence. A water authority would provide surface water and groundwater for various uses to multiple independent public water systems (PWS) in the northern EHSA, construct infrastructure to deliver water to PWS, secure financing for needed projects, and establish rate structures for wholesale water sales and customer classes. A regional water authority may only be created by an act of the Texas Legislature, signed into law by the governor, and approved by voters (if required as part of the enabling legislation).

The need for RWA arises from the fragmented nature of existing water service, where 46 independent PWS operate with limited access to surface water and insufficient capacity to transition away from groundwater. The new RWA, for example the East Harris County Regional Water Authority (EHCRWA), would secure the needed AWS and consolidate planning and infrastructure development across the Lake Houston–North and Newport–Crosby AWS Planning Areas, while coordinating with existing providers such as the City of Houston, Newport MUD, Crosby MUD, San Jacinto River Authority, and Baytown Area Water Authority, where appropriate (**Figure 3**).

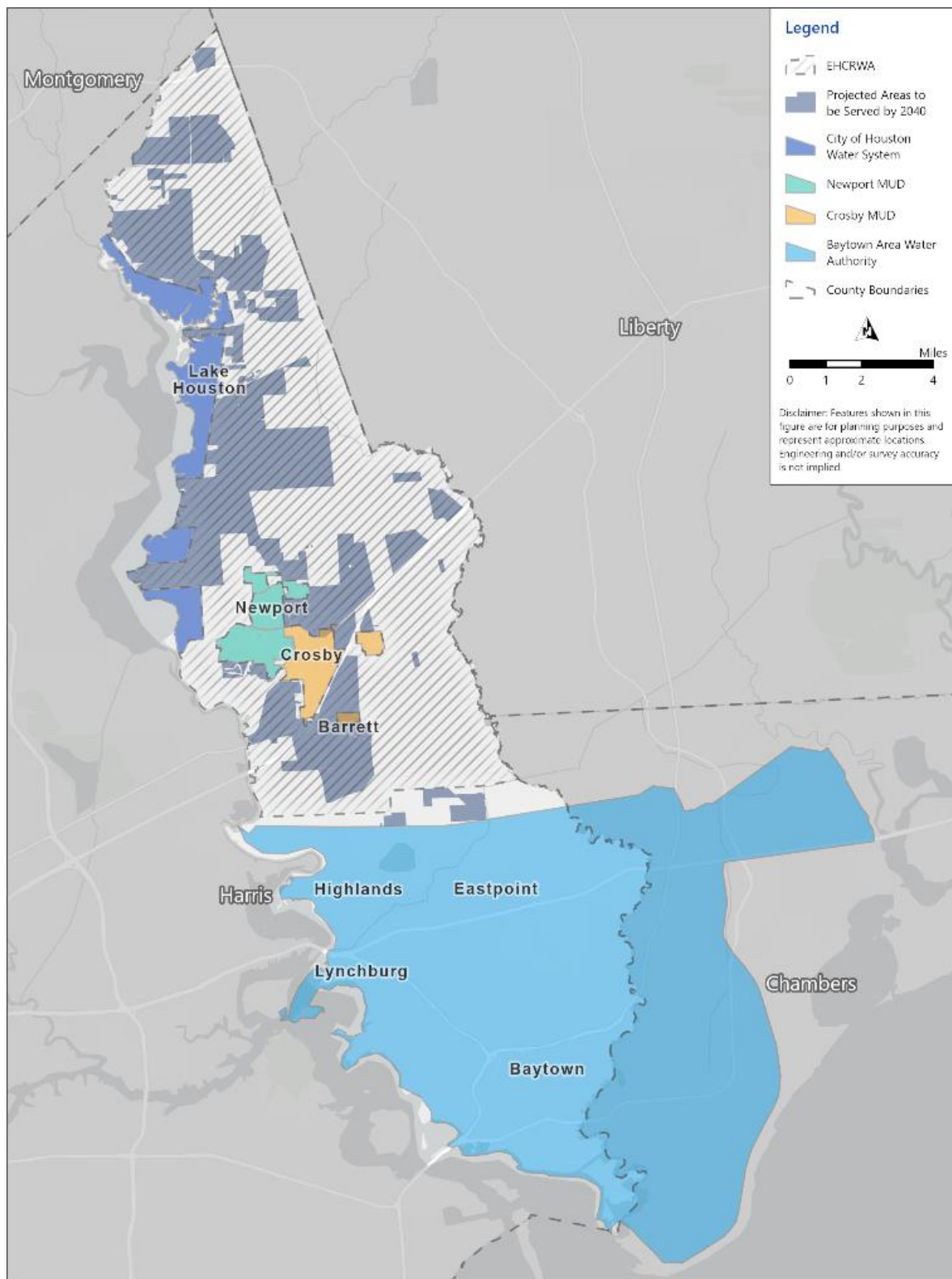


Figure 3. Proposed Service Area for a new Regional Water Authority (RWA), such as the East Harris County RWA (EHCRWA), with potential customers to be served by 2040 as well as the location of water providers in the East Harris Study Area.