

# Introduction to Subsidence and Groundwater Regulation



*This document is for guidance only. It does not replace or supersede the official rules and regulations of the District.*

**Q I've never heard of the Subsidence District. When was it created and what does it do?**

**A** The Harris-Galveston Subsidence District (District) is a special purpose district created by the Texas Legislature in 1975. The District was created to provide for the regulation of groundwater withdrawal throughout Harris and Galveston counties for the purpose of preventing land subsidence, which leads to increased flooding. The District's enabling legislation is found in Chapter 8801 of the Special Districts Code.

**Q What is land subsidence and why is it something that must be prevented?**

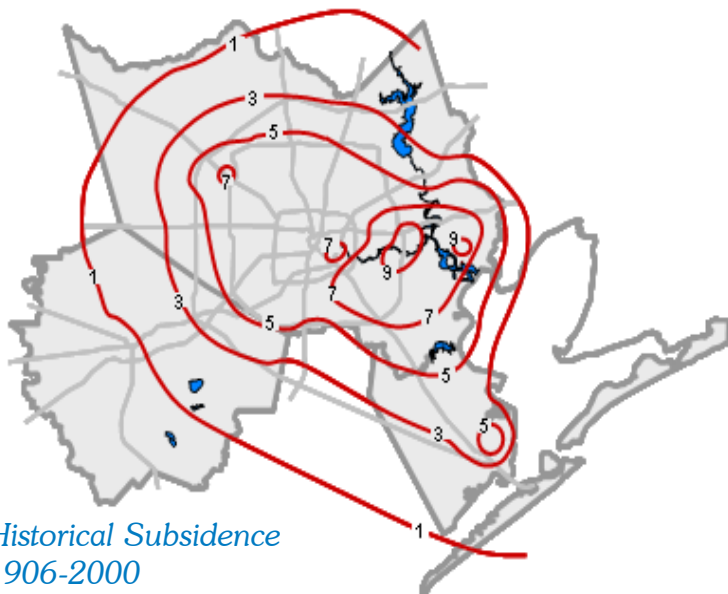
**A** Subsidence is the permanent and irreversible lowering of the elevation of the land surface in relation to mean sea level. Subsidence in this area is caused by the compaction of subsurface clay layers due to the loss of support pressure resulting from water level declines. Prior to the District's creation, prolonged and increased pumping of groundwater for municipal, industrial, and irrigation supplies in Harris and Galveston counties had caused the water level of the aquifer system beneath the area to

decline over a broad region, which resulted in one of the largest subsidence bowls in the United States. Approximately 4,700 square miles of land subsided more than 0.5 feet from 1943 to 1973, with the maximum subsidence in the area approximated at 10 feet. More than 31 square miles of low lying coastal land was permanently inundated, and the potential for tidal flooding, particularly from storm surges, increased in the coastal region because of loss of elevation.

**Q I don't live near the coast. Why should I be concerned with subsidence-related flooding? Are there other problems created by the lowering of aquifer levels?**

**A** Subsidence can also lead to increased inland flooding along streams and waterways due to changes in stream gradient and also due to "ponding" caused by localized subsidence in the vicinity of major water production areas. Inland flooding has become a greater concern over the years because the center of maximum groundwater pumping in the District has shifted from the Ship Channel to West and Northwest Houston and Harris County.

Although the District was created for the specific purpose of preventing subsidence, the lowering of water levels in the aquifers beneath the District also results in a number of other problems. Declining water levels can activate or accelerate the movement of geologic faults, which results in significant damage to buildings and other structures. Lower water levels also require deeper wells and increased pumping costs, and in some cases, water levels have fallen below the depths of existing wells requiring the drilling of replacement wells. Another type of problem related to water level declines involves the issue of groundwater quality and can include such problems as saltwater intrusion, radon contamination, and contaminant transport.



*Historical Subsidence  
1906-2000*

**Q Those are serious problems, but how does the Subsidence District accomplish its task of preventing subsidence?**

**A** The primary means by which the District accomplishes its statutory purpose of preventing subsidence is by regulating the amount of groundwater that may be withdrawn from aquifers, which means converting some portion of the groundwater demand within the District over to surface water supplies.

The goal is not to prevent all use of groundwater, but instead to use it wisely in a manner that doesn't cause subsidence or deplete the aquifer, threatening future water supplies. The document that outlines this regulatory program is the District's Regulatory Plan, which works in conjunction with the District's well permitting program.

**Q Do all groundwater wells within the District have to be permitted?**

**A** No. Some types of wells are statutorily excluded from the requirement to have a permit. Wells that serve only a single-family dwelling and have a casing diameter of five inches or less are excluded from the District's permit requirements. Also, the permitting requirements do not apply to windmills serving a well with a casing diameter of four inches or less, monitoring wells, leachate wells, dewatering wells, or hand-pumped wells.

**Q I've owned my well for 20 years. Why am I just now being required to get a permit?**

**A** Most water wells in Harris and Galveston counties have been required to be permitted since 1976. After the 1993 legislative session, changes were adopted regarding which wells must be permitted by the District, resulting in an increase in the number of wells subject to permitting. In an effort to notify well owners of the changes in the permitting requirements, the District published notices in the newspaper, posted notices at the county courthouses, and held a public hearing to receive public comment. Despite these public outreach efforts, unpermitted wells are still periodically discovered by District staff during routine inspections throughout the District.

**Q How does the District keep track of how much groundwater is pumped by a well owner? Will I have to put a meter on my well?**

**A** The District's rules require a meter for all permitted wells, however, the District may at its discretion authorize certain exceptions from the metering requirement.

The following wells may be eligible for an exception from the metering requirement:

1. Wells five inches nominal or less in inside casing diameter with estimated pumpage of five-million gallons per year or less and which are not connected with any other well.
2. Wells in aggregate or interconnected systems in which all wells are five inches nominal or less in inside casing diameter and where the aggregate or interconnected system has an estimated pumpage of five-million gallons per year or less.

Another way that the District monitors groundwater usage is by collecting annual pumpage data from each well owner. Each year around January 1st, you will receive an Annual Report Form for each permitted well that you own on which you will report the amount of groundwater pumped for the preceding year. Each well owner is required to fill out and return the Annual Report Form by January 31st. If your well is not required to be metered, then you are asked to estimate the amount of pumpage to the best of your ability.

**Q How do I contact the Subsidence District?**

**A** If you have additional questions or need more information, or if you need to report changes in contact names or well ownership, you may contact the District at the following number or address:

Harris-Galveston Subsidence District  
1660 West Bay Area Blvd  
Friendswood, TX 77546-2640  
Website: [www.subsidence.org](http://www.subsidence.org)  
Phone: (281) 486-1105  
Fax: (281) 218-3700

