



Evaluating Water Quality in the Houston Ship Channel and Galveston Bay

Assessing Contamination in Fish from PCBs

High concentrations of polychlorinated biphenyls (PCBs) in fish tissue can pose a risk to consumers, even at low concentrations. Although their manufacture is now banned, PCBs are extremely persistent in the environment. The Texas Department of State Health Services (DSHS) has consequently issued fish consumption advisories for areas of the Houston Ship Channel and Galveston Bay.

Polychlorinated biphenyls (PCBs) are a group of chemicals that share a common structure called biphenyl, but vary in the number and location of attached chlorine atoms. Prior to discovery of their toxicity in the early 1970s, PCBs were widely used in electrical equipment and sealants. PCBs are linked to increased rates of certain cancers in rats, mice, and study animals, suggesting they are probably cancer-causing in humans.

In October 2001, in advisory ADV-20, DSHS warned people to limit or stop eating all species of finfish due to PCBs in fish tissue. The area covered by ADV-20 is the Houston Ship Channel upstream of the Lynchburg Ferry crossing and all its contiguous waters, including the San Jacinto River Tidal segment below the U.S. Highway 90 bridge.

In January 2005, DSHS issued a subsequent advisory (ADV-28) warning people to limit or stop eating speckled trout, also known as spotted sea trout or spotted weakfish, because of contamination by PCBs and dioxin. ADV-28 includes the Upper Galveston Bay and the Houston Ship Channel downstream of the Lynchburg Ferry crossing and all its contiguous waters, including Upper Galveston Bay north of a line drawn from Red Bluff Point to Five Mile Cut Marker to Houston Point.

DSHS renewed and combined the various advisories for the ship channel and bay watersheds in 2013 as ADV-49, and renewed it again in 2015 as ADV-50. See the ADV-50 area and full consumption advice on the DSHS webpage [Fish Consumption Advisories and Bans](#)¹. The dioxin contamination in fish from the Houston Ship Channel was examined in an earlier project.

Learn more about water quality standards, monitoring, and TMDLs by reading [Preserving and Improving Water Quality](#)², available on our website and in print.



Houston Ship Channel and Upper Galveston Bay Watershed

The Ship Channel system is in the San Jacinto River Basin. Its various branches originate in western and northern areas of the city of Houston and at the Lake Houston Dam on the San Jacinto River. The Ship Channel area has one of the highest densities of petrochemical facilities in the world. Facilities in the area, and the waterway itself, are important elements in the economic health of the region, state, and nation.

Houston has long been one of the busiest ports in the United States. The channel's production of materials and its inland location have been, and will continue to be, important to the military security of the nation.

The commercial navigation provided by the channel initiated and supported the historic growth of the Houston area economy. The headwater reaches, tributaries, and fringes of both the Houston Ship Channel System and Upper Galveston Bay also provide recreational opportunities for residents.

The watershed includes portions of the following political jurisdictions:

¹ <https://www.dshs.texas.gov/seafood/advisories-bans.aspx>

² <https://www.tceq.texas.gov/publications/gi/gi-521>

- *Counties:* Chambers, Fort Bend, Galveston, and Harris
- *Cities:* Houston, Pasadena, Baytown, La Porte, and Deer Park.

The Ship Channel System consists of 14 classified segments, which together comprise the “enclosed” portion of the Houston Ship Channel, with its major tributaries and side bays. This project includes ten of the Ship Channel segments:

- San Jacinto River Tidal (Segment 1001)
- Houston Ship Channel (1005, 1006, 1007)
- Tabbs Bay (2426) • San Jacinto Bay (2427)
- Black Duck Bay (2428) • Scott Bay (2429)
- Burnett Bay (2430) • Barbours Cut (2436)

Also included are three segments not considered part of the Houston Ship Channel system:

- Cedar Bayou Tidal (Segment 0901)
- Upper Galveston Bay (Segment 2421)
- Bayport Channel (Segment 2438)

Project Development

TCEQ initiated this project in 2007 through a contract with the University of Houston (UH) and Parsons. UH and Parsons collected data between 2008 and 2009, and submitted their final project report with their analysis of the data in September 2010.

Public Participation

In all its projects, TCEQ seeks to gather opinion and information from people affected by its projects. Due

to the lengthy and extremely technical nature of the sampling, analysis, and model development associated with this project, the Houston-Galveston Area PCBs and Dioxins Stakeholder Group, previously formed to advise TCEQ on an earlier project to assess dioxins in the Houston Ship Channel, advised TCEQ on this project for PCBs.

The stakeholder group included area residents and representatives of nongovernmental organizations, industry, and various local, state, and federal governments. The Houston Galveston Area Council (H-GAC) coordinated public participation. H-GAC also coordinated participation, as needed, with the Texas Clean Rivers Program Steering Committee and the Technical Advisory Group (TAG) for the San Jacinto River Basin and associated coastal basins.

For More Information

Visit the TCEQ project and stakeholder group webpages at:

www.tceq.texas.gov/waterquality/tmdl/78-hsc-pcbs.html

and

www.tceq.texas.gov/waterquality/tmdl/26-houston_group.html

Call us at 512-239-6682 or email tmdl@tceq.texas.gov.

Highlights

- Data collection was completed in 2009. Results indicated PCBs concentrations in water, sediment, and tissues were elevated. Preliminary analyses suggested that current sources were unlikely to be significant and that residual sediment loads were the primary issue.
- Analysis and modeling were completed in 2010, confirming that the legacy contamination in the sediment is the primary source of the concentrations in fish tissue.