

## **Is it safe to inject sewage below the fresh/salt water interface in the Yucatecan karst coastal aquifer?**

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Injecting sewage water below the fresh/salt water interface is a common practice throughout the Yucatan peninsula. In addition to sewage, industrial and other urban effluents are injected below this interface.

Temperature and electrical conductivity (T-EC) logging has been conducted for the past 20 years, as well as electrical resistivity profiles (ERP) have been run in order to design injection wells that discharge sewage water below the position of the fresh/salt water interface (50% of fresh and marine waters). Similar measurements have been run into natural karst Yucatecan geofoms called “cenotes” or sinkholes.

Most of the time, the characteristic inverted “S” shape of the fresh and salt water zone changes due to the Luzcinski potential and the main characteristic of the rock (primary-secondary porosity and lithology) In the Yucatecan karst coastal aquifer the theoretical position of the fresh-salt water interface changes during the drilling and also it is altered by the presence of injected sewage waters.

Groundwater scientists have established that the mixing zone of the fresh/salt water interface changes its position during a hydrologic year and due to the influence of the tides. This phenomenon does not happen in the Yucatecan Aquifer. Measurements of the mixing zone during some years confirm this particular situation for the Yucatan Peninsula.

Results of the spatial and temporal behavior of the fresh/salt water interface in the Yucatecan karst coastal aquifer show that the influence of the regional groundwater flow predominates over that of the tides, and recharge and discharge aquifer behavior.