# A Field Study on Arsenic in South Texas Drinking Water: Assessing Risk and Identifying Solutions

Garcia, Alan (School: Veterans Memorial Early College High School)
Pineda, Zeviel (School: Veterans Memorial Early College High School)

Arsenic is toxic. The primary goal of this research is to scientifically detect and quantify arsenic levels in drinking water due to local residents' concerns and assess the potential health implications and identify solutions. Water was collected from nineteen locations along Military Highway in Cameron County, and each sample was analyzed with a field testing kit under three trials and verified with mass spectrometer testing at Texas A&M University. The hypothesis that arsenic will be present at high levels—but under the state and federal limit of 10 parts per billion (ppb)—and will be related to geographic location, was partially true. The arsenic concentration was not always below EPA/state limits; results showed arsenic above 10 ppb in five locations, with the highest reading recorded at 10.6 ppb (mass spectrometer) from two locations. Overall, the samples were at higher levels, with an average of 7.06 ppb, which is notable because some states have a 5 ppb limit. Along with arsenic, other heavy metals were found above the EPA standard, such as Zinc and Iron. The locations that possessed the highest concentrations of arsenic were geographically clustered together. Other relatively high readings (8.8 ppb, 8.9 ppb, 9.4 ppb, 9.5 ppb) were also found in geographic clusters. Because there is no amount of arsenic a person may be safely exposed to, all sites with arsenic present a critical hazard to the general public. Recommendations from other states should be considered to educate residents and address this issue.

**Awards Won:**
Fourth Award of $500