Gasoline Volatile Organic Compound (VOC) Study
Austin, Texas
January 20, 2009
Revised 1/28/10

Background
In an effort to characterize VOC emissions from gasoline during vehicle refueling, the TCEQ conducted a VOC study in Austin, Texas, on January 20, 2010. A convenience store with gasoline pumps located in north Austin was selected for the study as it was considered representative of a typical vehicle refueling point.

General Monitoring Information
Sample collection for this study was conducted during the refueling of two vehicles. To simulate best and worst case scenarios, one vehicle did not have a vapor recovery system (VRS) (Vehicle 1), while the second vehicle (Vehicle 2) was equipped with a VRS. During the study, the VRS appeared to operate as designed. The vehicles were positioned approximately three feet from the fuel pump to ensure good air flow alongside the vehicle and to allow for GasFindIR (IR) camera observations of both downwind sample collection points. Monitoring staff collected five instantaneous canister samples including one upwind for background ambient concentrations, one at each vehicle's fuel tank (point source), and one approximately five feet downwind of each vehicle during refueling. The IR camera was utilized to detect emissions from the two vehicles during refueling and during sample collection to ensure the samples were collected in the plume. In addition to the IR camera, a toxic vapor analyzer (TVA) survey instrument was used at the point source to pinpoint the area of maximum concentration.

Gasoline Study Observations and Findings
Utilizing the IR camera, monitoring staff observed an emission plume from Vehicle 1 and little or no plume from Vehicle 2.

Results from the Vehicle 1 point source canister sample included 1,400,000 ppbv of n-butane, 670,000 ppbv of isopentane, 270,000 ppbv of n-pentane, 3,000 ppbv of isoprene, and 11,000 ppbv of benzene. Results for the canister sample collected approximately five feet downwind of vehicle 1's point source included 32,000 ppbv of n-butane, 15,000 ppbv of isopentane, 6,600 ppbv of n-pentane, 70 ppbv of isoprene, and 250 ppbv of benzene.

Results from the Vehicle 2 point source canister sample included 11 ppbv of n-butane, 6.3 ppbv of isopentane, 2.6 ppbv of n-pentane, 0.14 ppbv of isoprene, and 1.0 ppbv of benzene. Results for the canister sample collected approximately five feet downwind of vehicle 2's point source included 14 ppbv of n-butane, 7.2 ppbv of isopentane, 2.6 ppbv of n-pentane, 0.07 ppbv of isoprene, and 0.63 ppbv of benzene. Complete analytical results for this study are attached.