

Report to Hillcrest Community – September, 2007:



Figure 1. View from backyard at home where one of the soil samples was collected.

Soil and house dust samples were collected from several homes in the Hillcrest Community in May, 2007 to identify the most common chemicals in the immediate environment. The soil and dust samples were analyzed for combustion by-products (polycyclic aromatic hydrocarbons or PAHs). These chemicals may include more than 400 different compounds. Combustion by-products are produced by the production of petroleum hydrocarbons. These compounds are also produced by cooking foods, burning papers or cigarettes, and vehicle emissions. Only seven samples were collected. This included two soil samples (outdoor) and five dust samples (indoor). The soil and dust were extracted and analyzed using standard (EPA) methods.

The results show the presence of combustion by-products in both the soil and the dust. The total concentration of PAHs in the soils ranged from 2 mg/kg to 3.9 mg/kg (or ppm). The concentration of benzo(a)pyrene (an EPA Class 2 carcinogen) ranged from 0.14 mg/kg to 0.23 mg/kg. The acceptable concentration for residential soil (EPA-Region 3 Risk Based Concentration) is 0.022 mg/kg. These results indicate that the level of carcinogenic chemicals in the two soil samples was above acceptable concentrations.

A comparison of the concentration of the five dust samples with samples from other parts of Texas and the world is provided in Table 1. The samples from China were collected in kitchens where coal combustion materials had accumulated. The samples from the Former Soviet Union were collected from entry ways in homes adjacent to a synthetic rubber plant. The samples collected from homes in rural communities in Texas is for comparative purposes. The concentrations of chemicals detected in house dust in the Hillcrest Community is comparable to levels detected in houses from the Former Soviet Union. The concentration of carcinogenic PAHs in house dust in the Hillcrest Community ranged from 0.12 μm^2 to 2.5 μm^2 .

Table 1. Concentrations of combustion by-products in floor dust samples from several different locations.

Source of dust	Contaminant concentration (μm^2)	
	Total PAHs	Carcinogenic PAHs
Former Soviet Union	6.1	1
China	232	53
Texas (rural communities)	1.3	BD*
Hillcrest Community (ave. 5)	6.8	0.76

* BD = below detection (concentration of chemical was below instrument detection limits).

These concentrations will change at different times of the year and in different houses. The results do indicate that combustion by-products were detected frequently, and at elevated concentrations, in each of the samples collected. Additional sampling is planned to provide more accurate information regarding the concentration of these chemicals in soil and house dust.

This study was supported by a pilot project from the Texas A&M Center for Environmental & Rural Health. For more information contact Dr. K.C. Donnelly at kdonnelly@cvm.tamu.edu