CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY

Name(s)
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Project Number
J0907

Project Title
Is Soil at Old Gas Station Sites Contaminated by Petroleum Components?

Abstract

Objectives/Goals
This experiment studied the question if there would be contamination in soil samples at old gas station sites. Soil was to be obtained from 5 abandoned gas station sites around the city of Apple Valley and tested for lead contamination, presence of hydrocarbons, pH levels and variances in soil nutrients; phosphorus, potash and nitrogen levels. Two soil samples (variables) were to be taken from each site plus one control sample (constant), to compare them to.

Methods/Materials
15 soil samples were obtained from 5 old abandoned gas station sites. The control sample was taken 100 feet away from mid-station from adjacent lot. This was to establish if there had been any circular areal zone of contamination. At each site, information was recorded on a site sample sheet that included the color, texture, odor, and appearance of the soils. Also, how long it had been since the gas station had closed. I interviewed owners and business people nearby to find out more about the gas station sites. Lead testing, pH and nutrient testing kits were used in 75 seperate experiments to test for pH , lead contamination, potash, phosphorus and nitrogen levels. The various sample soils were measured/rinsed/strained and in the cases of finding lead, the samples were each boiled for 40 minutes. During conducting the tests, various sample specific capsules and liquids including liquid balancers and indicators were added to the soil samples and the rinsed soil samples test tubes. Color changes for presence of lead were compared visually and all other tests were compared to 3 color charts and noted. Results were observed and documented.

Results
There wasn't lead contamination at all of the gas station sites. There was lead presence at sites 1A, 3A, site 3 control and site 4A and 4B. The pH levels were either very high or very low at lead presence sites. Very low nitrogen was found at all areas that tested positive for lead. Soil nutrient testing varied from high to low at the different sites.

Conclusions/Discussion
I concluded that 4 soil samples at old gas station sites in Apple Valley and one control site were contaminated by lead. All of the sites except 2 control sites were positive for hydrocarbons and petroleum components. Many of the area's soils that were analyzed were changed in soil composition due to lead and hydrocarbon contamination in this experiment.

Summary Statement
This project is about finding out if there is presence of lead, hydrocarbons, petroleum components, and changes in soil composition in the soil at old gas station sites.

Help Received
Photsgraphs of me doing my experiment were taken by my mother.