CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY

Name(s)
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Project Number
J0611

Project Title
How Does the Kern River Affect Southwest Bakersfield's Groundwater?

Abstract

Objectives/Goals
The objective of this project is to determine if southwest Bakersfield's groundwater gets less pure (total dissolved solids increase) and the water chemistry (Total Alkalinity, Total Hardness, and pH) changes as you get farther away from the Kern River.

Methods/Materials
A California Water Service Co. engineer was contacted, and permission was obtained to sample 10 city water wells. At each of the ten wells, the valve line was flushed for 30 seconds, and a water sample was collected in a sterilized, quart-sized, mason jar. Each water sample was tested three times using water test strips and three times using water test solutions (with color indicators) for Total Alkalinity, Total Hardness, pH, and Chlorine. Each water sample was also tested for Total Dissolved Solids (TDS) by Leslie's Pool Supply.

Results
I found that one of the most useful ways to show my results was on contour maps. These maps showed: (1) Total Alkalinity is highest in the northeast (NE) and lowest in the southwest (SW), and it ranges from 67 to 90 ppm; (2) Total Hardness is highest in the NE and lowest in the SW, and it ranges from 100 to 208 ppm; (3) pH is lowest in the NE and highest in the SW, and it ranges from 7.47 to 8.17; and (4) TDS is highest in the NE and lowest in the SW, and it ranges from 125 to 225 ppm.

Conclusions/Discussion
My hypothesis was proven incorrect. Total Alkalinity, Total Hardness, and pH did not change as you got farther away from the Kern River. TDS decreased a small amount the farther away you were from the Kern River. Contour maps showed that most of the changes occurred from NE to SW. This corresponds to high groundwater elevation in the NE and low elevation in the SW. The NE area (where Total Alkalinity, Total Hardness, and TDS were highest) is also below a part of the city where houses have stood for a number of years. The SW area (where Total Alkalinity, Total Hardness, and TDS were lowest) is below farmland or at the edge of town. This suggests groundwater is more contaminated below older neighborhoods.

Summary Statement
My project involved determining if groundwater in southwest Bakersfield gets less pure (total dissolved solids increase) and the water chemistry (Total Alkalinity, Total Hardness, and pH) changes as you get farther away from the Kern River.

Help Received
I obtained permission to sample city wells from a Calif. Water Service Co. engineer. My dad drove me to city water wells and Leslie's Pool Supply. My dad showed me how to use water test kits and how to contour a map. Leslie's Pool Supply helped me with TDS tests.