



California Science Center
CALIFORNIA STATE SCIENCE FAIR
2001 PROJECT SUMMARY

Your Name (List all student names if multiple authors.) Jonathan C. Yip	Science Fair Use Only S0422
Project Title (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9) The Occurrence of VOCs and Indicator Bacteria in Local Groundwater and the Lexington Reservoir	Division _ Junior (6-8) <u>X</u> Senior (9-12)
Preferred Category (See page 5 for descriptions.) 4 - Chemistry	
Abstract (Include Objective, Methods, Results, Conclusion. See samples on page 14.) Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.	
<p>Objective: The objective was to analyze the relation between highway transportation and urbanization and the occurrences of indicator bacteria and VOCs (volatile organic compounds) in local ground- and surface water sources.</p> <p>Methods: Three samples were taken at each site of interest. To determine bacterial concentration, membrane filtration was used with medium facilitating the growth of total coliform, heterotrophic, and streptococcus bacteria. To determine ethanol, methanol, and MTBE (methyl tertiary-butyl ether) occurrence, a gas chromatograph was used, with which standards were run prior to sample testing. The data for the bacteria and the VOCs were compared to the samples' temperatures, elevations, and proximities to possible contaminating sources.</p> <p>Results: Total coliform bacteria was quite common in the sources that could be tested, save one groundwater well. Heterotrophic bacteria was relatively rare in groundwater, and Streptococcus bacteria were not present in any source, regardless of well depth. All water samples contained a relatively low concentration, if any concentration, of ethanol, methanol, and MTBE.</p> <p>Conclusion: Indicator bacteria concentration is largely determined by the specific location of the aquifer, not by the direct factor of increased urbanization. The cleanliness of aquifers (in terms of bacterial concentration) vary substantially. VOC occurrence is rare in both ground- and surface water sources where the only possibility of contamination is from automobile emissions.</p>	
Summary Statement (In one sentence, state what your project is about.) My project deals with the effect that urbanization factors have on the presence of indicator bacteria and volatile organic compounds.	
Help Received in Doing Project (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4. Used lab equipment at the Alza Corporation under the supervision of Mario Balatti; Testing space and materials provided by Los Gatos High School Science Dept.	