

Subject: RE: FACT calls for more definitive JP-8 jet fuel exposure testing in the Sierra Vista leukemia cluster investigation than was done in Fallon

Date: Thu, 13 May 2004

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Dear Terry,

I am writing this response on behalf of all of the CDC co-investigators who are working with the Arizona Department of Health Services and the Cochise County Health Department to evaluate environmental exposures in Sierra Vista. We thank you for your thoughtful email and have carefully considered your comments and suggestions.

As you know, real-life exposures are a competing mix of where you live, who you live with, where you work, what you eat, your general health status, etc. Ambient air sampling will tell you what is currently available for human inhalation. Breath samples will be a mixture of what has just been inhaled and chemicals that were recently inhaled and leave the body through the lungs; measuring blood and urine levels will tell you how a particular person metabolized and distributed that exposure throughout their body. The Division of Laboratory Sciences at the National Center for Environmental Health, CDC is the premier laboratory for measuring very small levels of chemicals in blood and urine. We are planning to measure volatile organic components in blood samples using state-of-the-art methods. We are currently working to adapt the methods that were used in the Fallon study to include additional analytes that form the JP-8 chemical "signature", and anticipate that this method will be ready for use when the Sierra Vista study begins. However in Sierra Vista, as in Fallon, the volatile organic measurements will only tell us what the exposure is at the time

of sample collection.

Your email refers to an EPA method for measuring JP-8 "signature" component ratios of chemicals in environmental and biological samples. Our chemists are familiar with this EPA research and agree that it is showing interesting results in occupational settings. The breath samples do indeed reflect what is in the ambient air samples when people are exposed to very high concentrations and in the absence of competing environmental volatile organic exposures. Human samples of exhaled air are positive for JP-8 in occupational settings with high JP-8 levels and minimal competing environmental volatiles. As the EPA scientists themselves agreed during conversations with CDC scientists, this methodology is not ready for use in a non-occupational exposure assessment. We believe that the breath analysis results would not be useful in defining community exposure in any meaningful way.

Naphthalene, one component of JP-8 fuel, is found throughout our environment. It is discharged from a variety of incomplete combustion processes from industrial, domestic and natural sources (motor vehicle traffic, air traffic, residential heating with fossil fuels, gasoline burning, industrial plants, forest fires, tobacco smoke, etc.). Naphthalene from any of these sources can mask naphthalene from exposure to jet fuel fumes or exhaust, unless the JP8 exposure is significant and on-going (as was the case in the studies cited under a controlled environment). Environmental exposure to naphthalene will not be so controlled and predictable in an epidemiologic investigation, and will therefore be much more difficult for us to see against the substantial background levels from all of these other sources. Levels of naphthalene and its metabolites in the population will be very difficult to interpret in relation to a low level environmental exposure. As you are aware, exposures potentially related to leukemia probably occurred several years ago. Given that the case families are living over a fairly large geographic area it is highly unlikely that they selectively were exposed to transient levels of airborne volatiles that would be detected in the population selected for current biological sampling. Unfortunately no measurements taken now will definitively describe historical exposure to volatile compounds. It may make more sense to conduct continuous or periodic air sampling. Perhaps you might consider working with local authorities to request that EPA or a similar agency conduct the kind of ambient air sampling that you suggest recognizes the JP-8 signature.

We are committed to performing the best possible exposure assessment using biological samples in community settings. Benzene is a known carcinogen whether it results from JP-8, gasoline or tobacco smoke; our

assessment will define benzene and other volatile organic exposures, including naphthalene and its metabolites. However, the levels we measure will not explain the 12 children diagnosed with leukemia in Sierra Vista. The exposure assessment will tell us what kind of environmental exposures are currently affecting the community. As in Fallon, sample collection will likely happen over a period of time and will be representative of several weeks of air traffic operations at Libby Army Airfield and potential exposure.

We appreciate your input. Please feel free to call me if you want to discuss this further.

Sincerely yours,

Carol

Please note new contact information!

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