

## SUMMARY OF OTA'S FINDINGS

DoD have designed a GIS capable of producing individual estimates of risk resulting from exposure to oil fire smoke (and for smoke plus ambient background concentrations of toxic substances using measurements of air samples over a nine-month period) for each person who served in the Persian Gulf region, in response to the Congressional mandate. The system will be fully operational when the exposure information is all placed into the GIS (some time in 1995) and daily location data for each unit stationed in the region during the conflict are completely abstracted from original military records (some time in 1996). The risk assessment framework adopted by DoD is a logical and well-executed response to the mandate, based philosophically on the way the Environmental Protection Agency (EPA) conducts risk assessments under various environmental health laws. This type of risk assessment, because of a desire to protect public health, inherently overestimates risks to health.

In its *Final Report: Kuwait Oil Fire Health Risk Assessment*, EHA reported estimated health risks that were extremely low: an estimated upper limit of lifetime cancer risk of two in a million (possibly rising to three in a million when exposure is extended to the entire period during which the fires burned, and possibly somewhat higher at some places where measurements were not taken), and a low probability of noncancer health risks (not quantified in the same way as cancer risks). These risk levels are similar to estimates for a person spending the same amount of time in a U.S. city, calculated in the same way. Under existing risk assessment scenarios, these risk estimates would be considered so low that, in most cases, they would be dismissed. Scientifically, there is no added value to actually generating (or being able to generate) risks for individuals, all of which would be below these upper limits (or slightly modified upper limits not expected to be much different from these) and would, in any case, not be very accurate. Risk assessment methods have generally been designed to apply to groups of people and not to estimate precise risks for any one individual. Since all estimated risks would be very low, they could not be used to identify any particularly "high risk" cohorts that might benefit from medical surveillance or other intervention.

The GIS may have uses other than generating oil fire health risk estimates. It is a versatile and powerful analytic tool that might be put to use in epidemiologic studies of other exposures in the Persian Gulf, but only if sufficient information on those other exposures were available and could be described accurately in time and place. (OTA is unaware of efforts to systematically catalog exposures in this way.) This type of use will depend on ESG completing its troop location inventory, independent of the needs of the oil fire risk assessment.

**The important conclusion that OTA draws from DoD's report on oil fire health risk assessment is that, using state-of-the-art risk assessment methods, the risks to health from exposure to the smoke and the background air contaminants in the Persian Gulf are likely to be extremely small.** If aspects of the Persian Gulf experience are causing illness, they are likely to be other than oil fire smoke, according to DoD's risk assessment.

**When completed, DoD's GIS and its associated risk assessment system will meet the Congressional mandate for individualized estimates of exposure from Persian Gulf oil fires.** The troop location and atmospheric data related to the smoke will be easily accessible indefinitely once they are all entered into the system. **The scientific value of the program, however, lies in what already has been accomplished, which establishes that overall risks to health from oil fire smoke are very low.** Additional scientific value may come from its use in evaluating other exposures that are suspected of