



**Department of Pesticide Regulation**



Paul E. Helliker  
Director

**MEMORANDUM**

Gray Davis  
Governor  
Winston H. Hickox  
Secretary, California  
Environmental  
Protection Agency

TO: Gary Patterson, Chief  
Medical Toxicology Branch

**HSM-01014**

FROM: Chuck Andrews, Chief  
Worker Health and Safety  
Branch  
445-4222

DATE: October 4, 2001

SUBJECT: **WORKER HEALTH AND SAFETY BRANCH POLICY ON THE  
ESTIMATION OF SHORT-TERM, INTERMEDIATE-TERM, ANNUAL  
AND LIFETIME EXPOSURES**

The policy stated in this memorandum supercedes that established previously by HSM-980009 (Sanders, 1998). The primary change to the previous policy is that fixed periods constituting subchronic and chronic exposure are no longer used. This change is being made because of recognition of the arbitrariness of amortizing human exposures over time periods corresponding to animal toxicity studies. Instead, the Worker Health and Safety Branch (WHS) exposure assessor will characterize the actual temporal pattern of exposure over a year, and determine the actual lengths of exposure intervals.

In order to avoid confusion with the intervals used in toxicology and elsewhere, the terms "acute", "subchronic" and "chronic" will no longer be used in WHS exposure assessments. Exposure intervals will be described as "short-term", "intermediate-term", "annual" and "lifetime". These terms are defined below.

Once the exposure intervals and exposure magnitudes have been estimated, a risk assessor in the Medical Toxicology Branch will determine whether adverse effects are possible, by comparing the intervals of exposure to the times-to-effect (or study lengths) of toxicity endpoints of concern.

**Short-term exposure**

Exposures lasting seven days or less are considered to be short-term exposures. An upper-bound estimate of daily exposure is used to represent short-term exposure. Exposure assessments will always provide short-term exposure estimates.

**Intermediate-term exposure**

Periods of frequent exposure lasting more than seven days but substantially less than a year, whether exposure is constant or intermittent during the period, are considered intermediate-term exposures. If the exposure assessor determines that intermediate-term exposures do occur, the assessment will indicate the length of the exposure period(s), whether the exposure is constant or



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intermittent, and the estimated average daily exposure over the interval. In general, it is assumed that the average daily exposure is received on every day of an intermediate-term period. However, if the exposure is intermittent or sporadic during the period, the exposure may be amortized over the total period.

### Annual exposure

Exposure assessments will always provide annual exposure estimates. Unless specifically indicated in the exposure assessment, annual exposure will be calculated as the sum of all daily exposures amortized over 365 days.

### Lifetime exposure

Exposure assessments will always provide lifetime exposure estimates. Lifetime exposure will be calculated as the sum of all annual exposures amortized over 75 years.

### Reference

Sanders, J. 1998. Definition of exposure constituting chronic and subchronic. HSM-980009. Sacramento, CA: Worker Health and Safety Branch, Department of Pesticide Regulation, California Environmental Protection Agency.

cc: Joseph P. Frank  
Keith Pfeifer