

threshold pollutants would not result in air concentrations above the threshold levels, with an ample margin of safety, even if the category is otherwise subject to MACT. A second scenario would allow the section 112(d)(4) provision to be applied to both threshold and non-threshold pollutants, using the one in a million cancer risk level for decisionmaking for non-threshold pollutants. A third scenario would allow a section 112(d)(4) exemption at a facility that emits both threshold and non-threshold pollutants. For those emission points where only threshold pollutants are emitted and where emissions of the threshold pollutants would not result in air concentrations above the threshold levels, with an ample margin of safety, those emission points could be exempt from the MACT standard. The MACT standard would still apply to non-threshold emissions from other emission points at the source. For this third scenario, emission points that emit a combination of threshold and non-threshold pollutants that are co-controlled by MACT would still be subject to the MACT level of control. However, any threshold HAP eligible for exemption under section 112(d)(4) that are controlled by control devices different from those controlling non-threshold HAP would be able to use the exemption, and the facility would still be subject to the provisions of the standard that control non-threshold pollutants or that control both threshold and non-threshold pollutants.

Estimation of hazard quotients and hazard indices. Under the section 112(d)(4) approach, EPA would have to determine that emissions of each of the threshold pollutants emitted by PCWP sources at the facility do not result in exposures which exceed the threshold levels, with an ample margin of safety. The common approach for evaluating the potential hazard of a threshold air pollutant is to calculate a "hazard quotient" by dividing the pollutant's inhalation exposure concentration (often assumed to be equivalent to its estimated concentration in air at a location where people could be exposed) by the pollutant's inhalation Reference Concentration (RfC). An RfC is defined as an estimate (with uncertainty spanning perhaps an order of magnitude) of a continuous inhalation exposure that, over a lifetime, likely would not result in the occurrence of adverse health effects in humans, including sensitive individuals. The EPA typically establishes an RfC by applying uncertainty factors to the critical toxic effect derived from the lowest- or no-observed-adverse-effect level of a pollutant.² A hazard quotient less than one means that the exposure concentration of the pollutant is less than the RfC and, therefore, presumed to be without appreciable risk of adverse health effects. A hazard quotient greater than one means that the exposure concentration of the pollutant is greater than the RfC. Further, EPA guidance for assessing exposures to mixtures of

threshold pollutants recommends calculating a "hazard index" by summing the individual hazard quotients for those pollutants in the mixture that affect the same target organ or system by the same mechanism.³ Hazard index (HI) values would be interpreted similarly to hazard quotients; values below one would generally be considered to be without appreciable risk of adverse health effects, and values above one would generally be cause for concern.

For the determinations discussed herein, EPA would generally plan to use RfC values contained in EPA's toxicology database, the Integrated Risk Information System (IRIS). When a pollutant does not have an approved RfC in IRIS, or when a pollutant is a carcinogen, EPA would have to determine whether a threshold exists based upon the availability of specific data on the pollutant's mode or mechanism of action, potentially using a health threshold value from an alternative source, such as the Agency for Toxic Substances and Disease Registry (ATSDR) or the California Environmental Protection Agency (CalEPA). Table 2 of this preamble provides RfC's, as well as unit risk estimates, for the HAP emitted by facilities in the PCWP source category. A unit risk estimate is defined as the upper-bound excess lifetime cancer risk estimated to result from continuous exposure to an agent at a concentration of 1 µg/m³ in air.

TABLE 2.—DOSE-RESPONSE ASSESSMENT VALUES FOR SOME HAP REPORTED EMITTED BY THE PLYWOOD AND COMPOSITE WOOD PRODUCTS SOURCE CATEGORY ^{a, b}

Chemical name	CAS No.	Reference concentration ^c (mg/m ³)	Unit risk estimate ^d (1/(µg/m ³))
Acetaldehyde	75-07-0	9.0E-03 (IRIS)	2.2E-06 (IRIS)
Acrolein	107-02-8	2.0E-05 (IRIS)	
Benzene	71-43-2	6.0E-02 (CAL)	7.8E-06 (IRIS)
Carbon tetrachloride ^e	56-23-5	4.0E-02 (CAL)	1.5E-05 (IRIS)
Chloroform ^e	67-66-3	9.8E-02 (ATSDR)	
Formaldehyde	50-00-0	9.8E-03 (ATSDR)	1.3E-05 (IRIS)
Manganese compounds	7439-96-5	5.0E-05 (IRIS)	
Methanol	67-56-1	4.0E+00 (CAL)	
Methyl ethyl ketone	78-93-3	1.0E+00 (IRIS)	
Methylene chloride	75-09-2	1.0E+00 (ATSDR)	4.7E-07 (IRIS)

² "Methods for Derivation of Inhalation Reference Concentrations and Applications of Inhalation Dosimetry." EPA-600/8-90-066F, Office of Research and Development, USEPA, October 1994.

³ "Supplementary Guidance for Conducting Health Risk Assessment of Chemical Mixtures. Risk Assessment Forum Technical Panel," EPA/630/R-

00/002. USEPA, August 2000. <http://www.epa.gov/nceawww1/pdfs/chem mix/chem mix 08 2001.pdf>.