

decided to exercise our authority under that statutory provision for the non-mercury cell chlorine production subcategory. That decision is discussed in a separate notice in today's **Federal Register**. However, we are not deleting the mercury cell chlor-alkali plant subcategory because the sources within the category also emit mercury, and we are establishing emissions standards for mercury emissions in today's final rule.

Comment: Some commenters concluded that we did not establish either cancer or noncancer thresholds for HCl and chlorine and, therefore, it is illegal for EPA to attempt to use section 112(d)(4) to set standards.

Response: The "threshold level" in section 112(d)(4) refers to the level of concentration of a chemical under which no health effects are expected from exposure, although this term is not defined in section 112. Further, section 112 does not address the process that must be followed to "establish" a threshold level.

The reference concentration (RfC) is a "long-term" threshold, defined as an estimate of a daily inhalation exposure that, over a lifetime, would not likely result in the occurrence of noncancer health effects in humans. We have determined that the RfC for HCl of 20 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) is an appropriate threshold value for assessing risk to humans associated with exposure to HCl through inhalation <http://www.epa.gov/iris/subst/0396.htm>.

In cases where we have not studied a chemical itself, we rely on the studies of other governmental agencies, such as the Agency for Toxic Substances and Disease Registry (ATSDR) or the Office of Health Hazard Assessment of California's Environmental Protection Agency (CAL EPA), for RfC values. The CAL EPA developed an RfC value of 0.2 $\mu\text{g}/\text{m}^3$ for chlorine based on a large inhalation study with rats.

Acute exposure guideline level (AEGL) toxicity values are estimates of adverse health effects due to a single exposure lasting 8 hours or less. The confidence in the AEGL (a qualitative rating of either low, medium, or high) is based on the number of studies available and the quality of the data. Consensus toxicity values for effects of acute exposures have been developed by several different organizations, and we are beginning to develop such values. A national advisory committee organized by EPA has developed AEGL's for priority chemicals for 30-minute, 1-hour, 4-hour, and 8-hour airborne exposures. They have also determined the levels of these chemicals at each exposure duration that will protect against discomfort (AEGL1), serious

effects (AEGL2), and life-threatening effects or death (AEGL3). Hydrogen chloride has been assigned AEGL values (65 FR 39264, June 23, 2000), including the 1-hour, AEGL1 of 2,700 $\mu\text{g}/\text{m}^3$ used in our revised analysis. Chlorine has also been assigned AEGL values (62 FR 58840), including the 1-hour AEGL1 of 1,500 $\mu\text{g}/\text{m}^3$ used in our revised analysis.

We maintain that the listing of health thresholds by EPA and other organizations in the public domain as discussed above has "established" health thresholds for HCl and chlorine. Further, the recognition of these levels by EPA, ASTDR, and CAL EPA indicates that chlorine and HCl are threshold pollutants.

Moreover, we provided the public an opportunity to comment on the thresholds for chlorine and HCl that we used in our original analysis for the proposed action (67 FR 44716). We used the same threshold level for HCl for both the proposed and final NESHAP for the pulp and paper mill category. We have also used the same threshold for HCl in the proposed and final NESHAP for lime production (67 FR 78046; final action is anticipated in August 2003). There is no requirement in section 112(d)(4) that EPA develop or finalize a threshold for a particular HAP in a certain manner. The thresholds we have used for both HCl and chlorine are consistent with the statutory language in section 112(d)(4).

Comments Related to the Risk Assessment

Comment: In the analysis for the proposed action (67 FR 44713), we used the HCl RfC to determine the long-term health effects of chlorine emissions, since chlorine photolyzes very quickly to HCl in sunlight. Two comments supported this methodology and stated that our decision was based on sound scientific knowledge of the pollutants of concern.

In contrast, two other commenters did not agree with our use of the HCl RfC as a threshold level for chlorine. The commenters stated that not all of the annual chlorine emissions can be considered as HCl and, therefore, the chlorine exposure was underestimated. The commenters argued that chlorine emissions will not undergo photolysis to convert to HCl when there is not bright sunshine (*i.e.*, at night or on cloudy days).

Response: The widely accepted fact that chlorine is photolyzed in sunlight formed the basis for the assumption in the original risk assessment that chronic exposure to chlorine would not occur. As a result of this comment, we re-

examined the literature on the atmospheric fate of chlorine to validate our original assumption.

The additional information obtained from the literature confirmed our earlier information. There are several different pathways that molecular chlorine can take, including photolysis (reaction with light), reactions with hydroxyl radicals, reactions with oxygen atoms, and reactions with water vapor. Each pathway results in different amounts of Cl_2 being removed from the troposphere, and different pathways are predominant at different times of the day. However, photolysis is the primary pathway.

Therefore, this information did not fundamentally change the assumption made in the original risk assessment, which was that on a long-term basis, individuals will be exposed more to HCl formed from the photolysis of chlorine than to chlorine. However, the commenters are correct that there will be situations where individuals will be exposed to chlorine. Therefore, in addition to the assessment where we considered only acute exposure to chlorine, we concluded that it was appropriate to consider the effects of chronic exposure to chlorine emissions from chlor-alkali plants. In order to provide an upper bound estimate of the chronic risks to compare with the lower bound estimates assuming that all chlorine was converted to HCl, we conducted modeling assuming that no chlorine is photolyzed.

In general, we consider an exposure concentration which is below the RfC concentration (what we call a hazard quotient of less than 1) to be "safe." This is based on the definition of RfC. The RfC is a peer reviewed value defined as an estimate (with uncertainty spanning perhaps an order of magnitude) of a daily inhalation exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious noncancer effects during a lifetime (*i.e.*, 70 years).

As discussed above, we conducted additional modeling for major source facilities within the subcategory using the same model used for the proposed action (ISCST3) to estimate chronic chlorine exposure using the assumption that no chlorine is photolyzed to HCl. The hazard quotients resulting from this additional modeling defined the upper bound of our risk assessment. The highest upper-bound hazard quotient estimated by the model is just over 0.3. (For more details regarding this revised risk assessment, refer to table 2 of the responses to comment document, available in the docket.) Given the health protective assumptions used in