

the potential for the model to overestimate exposure (compared to the original modeling approach), while maintaining adequate levels of conservatism in the final estimate. To accomplish that, the petitioner quantified the degree of overestimation in the previous modeling approaches due to conservative source-receptor configurations and adjusted to current model accordingly. That adjustment removed one level of conservatism from the estimates and provided a more realistic, but still conservative, estimate of the maximum annual average concentrations. The adjustment was applied to each of the emission sources in the previous analysis for those sources emitting from 90 to 200 tpy.

Based on this approach, the petitioner estimated that the maximum annual average concentration for the 18 facilities identified which emitted between 90 and 200 tpy of MEK would be less than 0.96 mg/m³. This value occurred at only one emission source; the remaining 17 facilities in the 90 to 200 tpy range were all less than 0.75 mg/m³.

We conducted a detailed review of the revised analytical approach and determined that it was acceptable. To quantify the conservatism of the adjusted model outputs, we recommended a site-specific analysis using an ISCST3 model (*i.e.*, tier 3) of the source with the highest estimated MEK concentration (*i.e.*, 0.96 mg/m³) after the adjustment. The tier 3 analysis predicted a maximum annual average concentration of 0.17 mg/m³ of MEK from that facility. The tier 3 estimate was then compared to the adjusted emissions estimates to determine the extent of the conservatism remaining in the adjusted estimates. That comparison indicated that the petitioner's adjusted approach overestimated maximum annual average concentration for the source by approximately a factor of six.

The petitioner provided the tier 3 analysis and the supporting data for our evaluation. After reviewing the model run and the supporting documentation in detail, we concluded that the petitioner's approach applies appropriate EPA guidelines and adequately characterizes maximum MEK concentrations from industrial sources. Therefore, based on that information, we have concluded that the maximum annual average MEK concentration from facilities emitting between 90 and 200 tpy of MEK may not reasonably be anticipated to exceed 0.96 mg/m³, and we expect it to be much less in most cases.

We used the petition's information on the identity and location of MEK

facilities to assess the impacts of sources located in close proximity to one another. Using a tier 2 analysis, we independently modeled the emissions from nine sources located relatively close to one another in two adjacent postal ZIP codes. Our analysis confirmed that MEK disperses rapidly as the distance from the emission source increases, and that at the point of maximum impact, the maximum annual average MEK concentration from multiple sources located close to each other may not reasonably be anticipated to exceed 1 mg/m³; in fact, we expect it to be much less than 1 mg/m³.

To evaluate the potential contribution of the ambient background MEK to the maximum annual concentration of MEK, we reviewed the literature and various databases, including our Aerometric Information Retrieval System (AIRS) monitoring database and the California Air Toxics database. The available data show MEK measurements ranging from nondetectable to a high of 0.002 mg/m³ reported in AIRS. That value occurred in the Houston ship channel and represents mean concentrations, averaged over 1 year, from seven sites for the years 1987–1995. In addition, the 2001 AIRS entries show similar maxima (*e.g.*, AIRS shows averages of 0.002 mg/m³ from sites in Providence, Rhode Island). Based on that review, we have concluded that background concentrations are not likely to have a significant influence on maximum annual exposures to MEK.

Given that the petitioner used the same modeling approach to predict 24-hour concentrations as was used to predict annual average concentrations, we accept the conclusion that the maximum 24-hour average concentration expected would be less than 10 mg/m³. However, we also wanted to evaluate predicted concentrations which may occur over a 1-hour time period. Using air dispersion modeling principles described in EPA's SCREEN3 User's Manual and the estimated annual average and 24-hour average concentrations presented in the petition, we estimated the maximum 1-hour concentration. The predicted annual average concentration is approximately 1 mg/m³ and the 24-hour average is about 10 mg/m³. To estimate the 1-hour maximum, we multiply the 24-hour average by 2.5. This results in a 1-hour maximum of approximately 25 mg/m³.

In terms of ambient air monitoring data, the 2001 AIRS shows that the highest 24-hour concentration is 0.03 mg/m³, and the highest 3-hour concentration is 0.06 mg/m³. Both of these concentrations were monitored in

Rhode Island at the same location as the highest annual average concentrations for the year 2001. As with the annual average monitoring data, these short-term values are sufficiently low so as not to contribute significantly to short-term maximum concentrations.

To summarize, the petitioner developed a tiered modeling analysis of MEK emissions using EPA's tiered approach to regulatory models. We determined that the petitioner performed all analyses following EPA modeling guidelines, and that the results provide conservative estimates of ambient levels of MEK from the inventoried sources. The modeling study demonstrated that, with the exception of the one location (at the entrance to a facility in an industrial park), estimated maximum annual average concentrations of MEK were less than 1 mg/m³ for all facilities modeled, and well below 1 mg/m³ for most of the facilities modeled. For 24-hour and 1-hour averages, we expect the concentrations would not exceed 10 and 25 mg/m³, respectively. Also, based on the location of the maximum annual and 24-hour off-site concentration predicted at the highest emitting facility, EPA has concluded that no individual could be reasonably anticipated to experience chronic or 24-hour exposures at the level of the predicted maximum ambient concentrations. Therefore, given the conservatism built into the models and petitioner's modeling assumptions, EPA has concluded that we may not reasonably anticipate maximum annual exposures to MEK to exceed 1 mg/m³. In addition, based on the evaluation of multiple sources located relatively close together, we may not reasonably anticipate that the collective emissions of MEK will result in a maximum annual average off-site concentration of MEK greater than 1 mg/m³, or a 24-hour average greater than 10 mg/m³. We, by extrapolation, have concluded that 1-hour concentrations from multiple sources would not exceed 25 mg/m³. Finally, the petitioner's use of air concentrations for each emission source to characterize the exposed population is an acceptable, conservative approach to exposure modeling. That is, an exposure assessment that would estimate exposures for actual people living near these emission sources would likely result in maximum individual exposures from ambient air that are lower than the estimates presented in the petition. Given the likely proximity of inhabitable areas and the variability of human activity patterns, it is our expectation that actual