

per year (tpy) of EGBE or 25 tpy of EGBE combined with other HAP.)

We have determined that the petitioner performed the dispersion modeling analysis following appropriate modeling guidance. Based on our technical review of the various emission modeling components, we have confirmed that the highest predicted maximum annual average off-site concentration (*i.e.*, the maximum annual level occurring over 5 years) of EGBE for any individual major source facility does not exceed 0.3 mg/m<sup>3</sup>. We judge that these estimates are more likely to over predict than under predict actual exposures due to the health-protective assumptions made in the analysis. Based on the information provided in the petition on EGBE emissions, we evaluated the potential impact of emission sources within close proximity to each other. First, we looked at the emissions from closely located major sources. Based on our evaluation, we concur with the petitioner that the maximum annual EGBE concentration from closely located major sources is expected to be no greater than 0.07 mg/m<sup>3</sup>.

Next, we evaluated the petitioner's modeling approach for closely located area sources (*i.e.*, sources emitting less than 10 tpy EGBE located 500 meters from each other). We determined that the assumptions underlying the petitioner's model were conservative, and that the maximum estimated annual concentration of EGBE from area sources is likely to be no greater than 0.5 mg/m<sup>3</sup>. We note that this concentration is higher than the maximum annual ambient average concentration predicted from either a major source or a group of closely located major sources. This is not unexpected as smaller sources can have emission release characteristics that can result in higher impacts to the surrounding communities. For example, while smaller sources may emit less EGBE, they may also have shorter stack heights, or fence lines that are closer to the emission points. Also, people may live closer to a smaller facility.

We reviewed the literature and various EPA databases to assess the potential contribution of the ambient background EGBE to the maximum annual concentration of EGBE. Subsequently, we determined that EGBE monitoring data that could be used to determine the background EGBE level are not available. We, therefore, proceeded to evaluate the petitioner's background estimation approaches. Based on our evaluation, we have determined that both approaches provide acceptable, yet conservative

estimates. Therefore, we have concluded that the ambient background concentration of EGBE is not likely to have a significant influence on maximum annual exposures to EGBE.

To summarize the air quality modeling component of the inhalation exposure assessment, the petitioner provided a tiered modeling analysis of EGBE emissions using EPA guidelines and models. The analysis was performed following acceptable modeling guidance. Based on a detailed technical review of the analyses, it is our conclusion that model inputs, assumptions, and results provide a conservative representation of EGBE sources. The modeling analysis demonstrated that the maximum annual concentration of EGBE was no greater than 0.3 mg/m<sup>3</sup> from a single major source, 0.07 mg/m<sup>3</sup> from a cluster of major sources, and 0.5 mg/m<sup>3</sup> from a cluster of area sources.

We judge the petition's overall approach to exposure assessment to be acceptable. The use of the maximum annual average ambient concentration for each emission source to characterize the exposed population provides a conservative approach to chronic exposure modeling. Furthermore, based on our experience, we judge that a refined exposure assessment estimating exposures for actual people living near these facilities would result in maximum individual exposures significantly lower than the maximum annual average ambient approach. Given the likely proximity of inhabitable areas and the variability of human activity patterns over an annualized time period, it is our expectation that actual maximum individual exposure would be at least a factor of 2 less than predicted by the models and at least an order of magnitude below EPA's RfC.

After evaluating the petitioner's ingestion exposure scenarios, we determined that the scenarios were acceptable and that the human exposure parameters used to calculate a person's average daily intake were conservative. However, as a part of our assessment of potential ecological risk due to EGBE emissions, we had previously derived an independent estimate of the concentration of EGBE in a water body situated at the point of the maximum annual average EGBE concentration from the largest emission source in the petitioner's inventory. This estimate was approximately 28 times greater than that presented in the petition. Therefore, based on this estimate, we were concerned that the petitioner's estimation method was not sufficiently

conservative, and we carried out the following analysis described below.

Our estimation of EGBE in surface water was a worst-case estimate. It was derived using a Mackay Level III fugacity model to estimate the steady state equilibrium concentration of a known volume (*i.e.*, 1,000 kilograms per hour (kg/h) of EGBE released to the atmosphere in each of four environmental media: Air, soil, sediment, and water. The EGBE concentration predicted in air was then ratioed with the maximum concentration predicted for a single major source from the petitioner's ISCST3 model (*i.e.*, 0.3 mg/m<sup>3</sup>) of the largest emission source to develop a scaling factor. The EGBE concentration in water as predicted by the Mackay model was then multiplied by the scaling factor to predict EGBE concentrations in a water body situated at the point of the maximum annual average EGBE concentration. The results yielded an estimated concentration of 3.6 milligrams per liter (mg/L) of EGBE in the water body.

We consider these results to be very conservative (*i.e.*, worst case) because numerous variables were not taken into consideration that, if considered, were likely to reduce estimates of EGBE in water. For example, we did not consider degradation in the water, nor did we consider that the body of water would have to be continuously exposed at the fence line concentration across its entire surface to approach this predicted concentration. Therefore, we do not anticipate surface water concentrations greater than 3.6 mg/L to occur as a result of airborne deposition of EGBE.

Even though we do not feel that surface water concentrations would approach 3.6 mg/L, we used this worst case estimate, to recalculate the average daily intake for each of the age groups in each exposure scenario. For the Residential Scenario involving the ingestion of EGBE in drinking water, we calculated an average daily intake of 0.1 milligram per kilogram per day (mg/kg/day) for adults and 0.2 mg/kg/day for children of both age groups. For the Residential Scenario involving dermal contact with EGBE during bathing and showering, we determined an average daily intake of 0.00003 mg/kg/day for adults, 0.0004 mg/kg/day for older children, and 0.0005 mg/kg/day for younger children. For the Recreational Scenario involving incidental ingestion of EGBE in surface water while swimming, we calculated an average daily intake of 0.0007 mg/kg/day for adults, 0.04 mg/kg/day for older children, and 0.03 mg/kg/day for younger children. Lastly, for the