Missouri Department of Natural Resources

Carbon Monoxide Significant Impact Determination

Carbon monoxide (CO) is a colorless, odorless gas that is primarily the result of fuel combustion. In 1971, the Environmental Protection Agency established two primary CO standards based upon a 1-hour averaging period and an 8-hour averaging period.

If a construction project triggers the need for an ambient air quality impact analysis, the applicant must perform an initial assessment, or preliminary impact analysis, to determine if a full impact analysis is necessary. The preliminary impact analysis should only consider the potential emissions due to the proposed construction or the net emissions increase due to a modification. The results obtained from the preliminary impact analysis will be used to determine if the applicant can avoid a detailed, cumulative air quality analysis that requires an assessment of compliance with the National Ambient Air Quality Standards (NAAQS). Initially, the preliminary impact analysis will be used to answer the following questions:

1. Does the ambient concentration due to the proposed project exceed the significant impact levels?
2. Does the ambient concentration due to the proposed project exceed the significant monitoring thresholds (applies to PSD permit applications only)?
3. If a significant impact is predicted to occur, what is the furthest extent of the significant impact area?

CO is said to have a significant impact if the maximum predicted concentration for any averaging time exceeds the thresholds contained within Table 1.

Table 1
CO Significant Impact Thresholds

Pollutant	Averaging Time	Significant Impact Level	Comment
		($\mu g/m^3$)	
CO	1-Hour	2000	Maximum 1-Hour Impact
CO	8-Hour	500	Maximum 8-Hour Impact

If the predicted concentration exceeds the significant impact level for any averaging period, a full impact analysis is required. For example, if the predicted maximum CO impact for the 1-hour averaging period is 2002 $\mu g/m^3$ and the maximum 8-hour concentration is 452 $\mu g/m^3$, a full impact analysis is required for both averaging periods, even though the maximum 8-hour concentration is less than 500 $\mu g/m^3$.

If it is determined that a significant impact will take place, the applicant must determine the radius of impact due to the construction of the proposed project or modification. This information will be used to determine the extent of the model domain for the cumulative impact assessment and will aid in interactive source inventory development.

The radius of impact, commonly referred to as the significant impact area, is the circular area whose radius extends from the center of the facility to the most distant receptor where a significant impact is predicted to occur, or 50-kilometers, whichever is less. In order to determine the furthest extent of the impact area, each averaging period must be reviewed. For example, the model output for a new

construction project indicates that the significant impact for the 1-hour averaging period occurs out to a distance of 2.5-kilometers from the source and out to a distance of 1.3-kilometers from the same source for the 8-hour averaging period. The CO radius of impact for the project becomes 2.5-kilometers because this is the largest area of impact that is predicted to occur; refer to Figure's 1, 2 and 3.

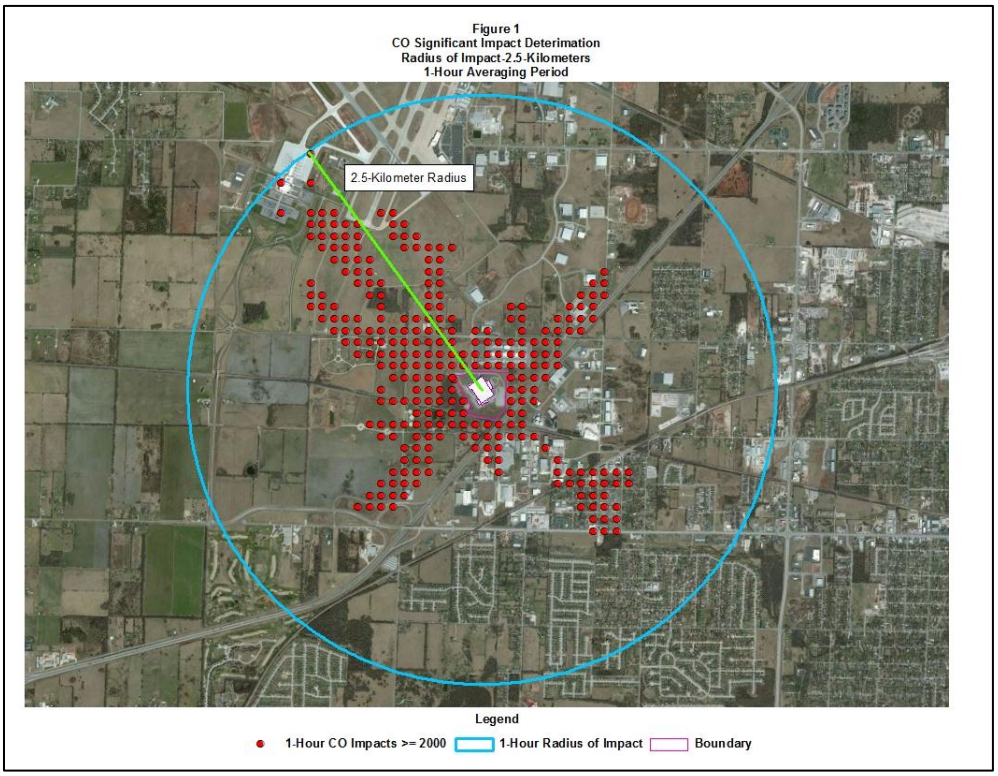
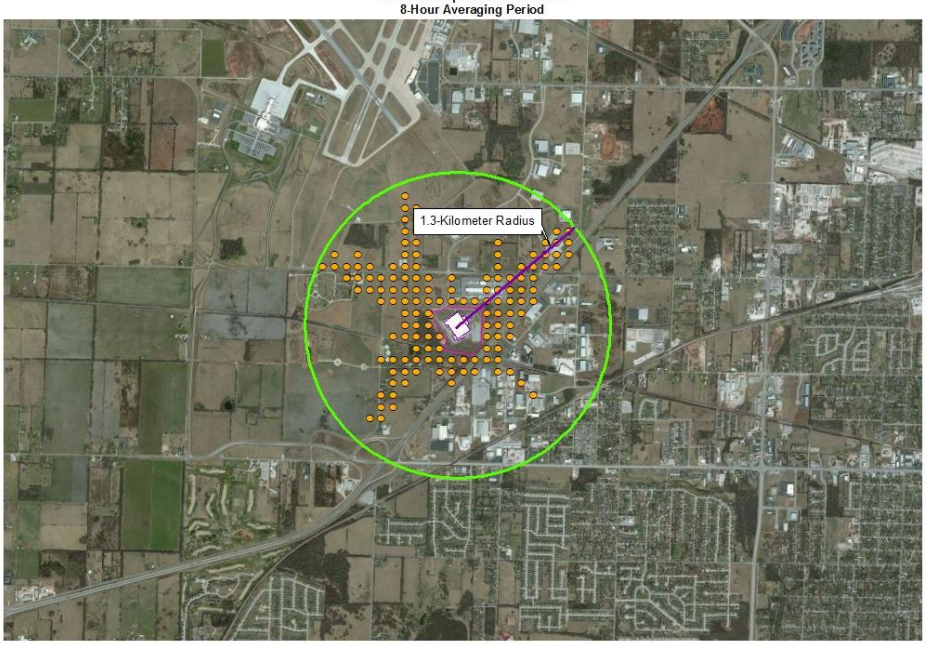


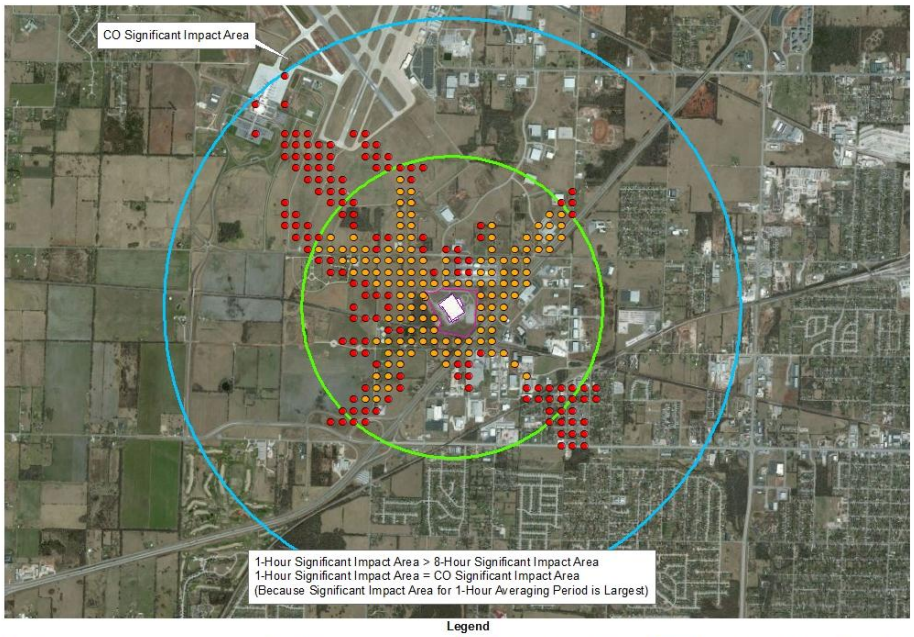
Figure 2
CO Significant Impact Deterimation
Radius of Impact-1.3-Kilometers
8-Hour Averaging Period



Legend

8-Hour CO Impacts >= 500 selection | 8--Hour Radius of Impact | Boundary

Figure 3
CO Significant Impact Deterimation
1-Hour & 8-Hour Significant Impact Comparison



Legend

8-Hour CO Impacts >= 500 selection | 1-Hour CO Impacts >= 2000 | 8--Hour Radius of Impact | 1-Hour Radius of Impact | Boundary

It is important to note that the determination of ambient impact due to new source or modification must consider quantifiable point source releases and fugitive source releases.

IMPORTANT!!! If a significant impact is predicted to occur and a ***Section 8,*** major source permit is being sought, the applicant must determine if pre-construction monitoring will be required. Part D, of the 1977 Clean Air Act Amendments, requires PSD applicants to collect site-specific monitoring data for CO if the significant monitoring threshold of 575 $\mu g/m^3$ is exceeded for the 8-hour averaging period. The primary objective of the data collection effort is to ensure that the existing air quality within the region is in compliance with the NAAQS. In addition, the information that is collected will be used to determine a monitored background value that will be incorporated into the final NAAQS results.

The applicant must collect a minimum of one-year of data if it is determined that preconstruction monitoring is required. Additional information regarding preconstruction data collection efforts can be found at the following link: Preconstruction Monitoring Requirements.