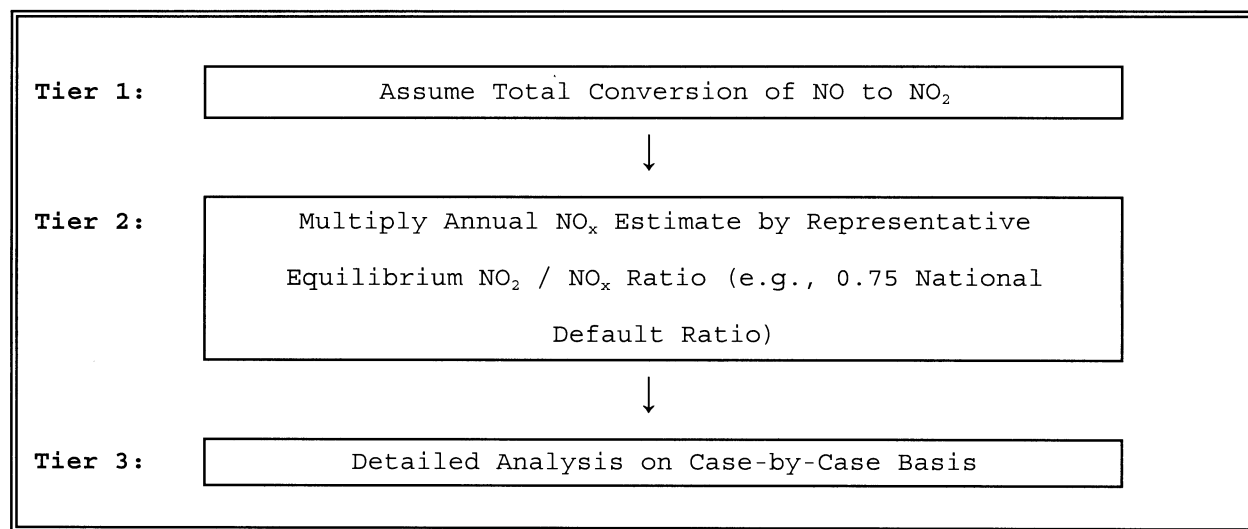


FIGURE 6-1

**Multi-tiered Screening Approach for Estimating Annual NO₂
Concentrations from Point Sources**



b. For Tier 1 (the initial screen), use an appropriate model in subsection 4.2.2 to estimate the maximum annual average concentration and assume a total conversion of NO to NO₂. If the concentration exceeds the NAAQS and/or PSD increments for NO₂, proceed to the 2nd level screen.

c. For Tier 2 (2nd level) screening analysis, multiply the Tier 1 estimate(s) by an empirically derived NO₂/NO_x value of 0.75 (annual national default).⁶⁴ The reviewing agency may establish an alternative default NO₂/NO_x ratio based on ambient annual average NO₂ and annual average NO_x data representative of area wide quasi-equilibrium conditions. Alternative default NO₂/NO_x ratios should be based on data satisfying quality assurance procedures that ensure data accuracy for both NO₂ and NO_x within the typical range of measured values. In areas with relatively low NO_x concentrations, the quality assurance procedures used to determine compliance with the NO₂ national ambient air quality standard may not be adequate. In addition, default NO₂/NO_x ratios, including the 0.75 national default value, can underestimate long range NO₂ impacts and should be used with caution in long range transport scenarios.

d. For Tier 3 (3rd level) analysis, a detailed screening method may be selected on a case-by-case basis. For point source modeling, other refined screening methods, such as the ozone limiting method,⁶⁵ may also be considered. Also, a site specific NO₂/NO_x ratio may be used as a detailed screening method if it meets the same restrictions as described for alternative default NO₂/NO_x ratios. Ambient NO_x monitors used to develop a site specific ratio should be sited

to obtain the NO₂ and NO_x concentrations under quasi-equilibrium conditions. Data obtained from monitors sited at the maximum NO_x impact site, as may be required in a PSD pre-construction monitoring program, likely reflect transitional NO_x conditions. Therefore, NO_x data from maximum impact sites may not be suitable for determining a site specific NO₂/NO_x ratio that is applicable for the entire modeling analysis. A site specific ratio derived from maximum impact data can only be used to estimate NO₂ impacts at receptors located within the same distance of the source as the source-to-monitor distance.

e. In urban areas (subsection 8.2.3), a proportional model may be used as a preliminary assessment to evaluate control strategies to meet the NAAQS for multiple minor sources, *i.e.*, minor point, area and mobile sources of NO_x; concentrations resulting from major point sources should be estimated separately as discussed above, then added to the impact of the minor sources. An acceptable screening technique for urban complexes is to assume that all NO_x is emitted in the form of NO₂ and to use a model from Appendix A for nonreactive pollutants to estimate NO₂ concentrations. A more accurate estimate can be obtained by: (1) Calculating the annual average concentrations of NO_x with an urban model, and (2) converting these estimates to NO₂ concentrations using an empirically derived annual NO₂/NO_x ratio. A value of 0.75 is recommended for this ratio. However, a spatially averaged alternative default annual NO₂/NO_x ratio may be determined from an existing air quality monitoring network and used in lieu of the 0.75 value if it is

determined to be representative of prevailing ratios in the urban area by the reviewing agency. To ensure use of appropriate locally derived annual average NO₂ / NO_x ratios, monitoring data under consideration should be limited to those collected at monitors meeting siting criteria defined in 40 CFR Part 58, Appendix D as representative of "neighborhood", "urban", or "regional" scales. Furthermore, the highest annual spatially averaged NO₂/NO_x ratio from the most recent 3 years of complete data should be used to foster conservatism in estimated impacts.

f. To demonstrate compliance with NO₂ PSD increments in urban areas, emissions from major and minor sources should be included in the modeling analysis. Point and area source emissions should be modeled as discussed above. If mobile source emissions do not contribute to localized areas of high ambient NO₂ concentrations, they should be modeled as area sources. When modeled as area sources, mobile source emissions should be assumed uniform over the entire highway link and allocated to each area source grid square based on the portion of highway link within each grid square. If localized areas of high concentrations are likely, then mobile sources should be modeled as line sources using an appropriate steady-state plume dispersion model (*e.g.*, CAL3QHCR; subsection 6.2.3).

g. More refined techniques to handle special circumstances may be considered on a case-by-case basis and agreement with the appropriate reviewing authority (paragraph 3.0(b)) should be obtained. Such techniques should consider individual quantities of NO and NO₂ emissions, atmospheric transport