Nitrogen Dioxide – Guidance for Air

The following guidance was developed by the Minnesota Department of Health (MDH) at the request of the Minnesota Pollution Control Agency (MPCA).

California Acute Reference Exposure Level for Air

Updated July 2, 2004

Chemical: Nitrogen Dioxide

CAS number: 10102-44-0

Endpoint(s): Respiratory system; increased airway reactivity in asthmatics

Acute Value: 470 µg/m^3

Source: California Environmental Protection Agency, Office of Environmental Health Hazard Assessment

In response to the request from the Minnesota Pollution Control Agency, the Minnesota Department of Health (MDH) completed an assessment of the acute California Reference Exposure Level (CA REL) for nitrogen dioxide (NO2). At this time, no National Ambient Air Quality Standard exists for acute NO2.

MDH's assessment concluded that the CA REL for NO2 is adequately protective of public health and is well supported by clinical studies showing increased airway responsiveness in sensitive populations (e.g., asthmatics). While these studies show a range of responsiveness following NO2 exposures, they indicate that mild adverse effects occur in sensitive populations at concentrations near the CA REL. The CA REL incorporates an uncertainty factor of 1, and therefore, does not provide additional buffer between the value and the concentration at which effects have been observed in sensitive populations. Studies of healthy populations indicate that respiratory effects from acute NO2 exposures occur at considerably higher concentrations (e.g., 2-3 orders of magnitude higher) than those observed in sensitive populations.

Given the potential for adverse effects to sensitive populations from acute NO2 exposures and the fact that diesel generators and other combustion sources may emit relatively high NO2 concentrations, MDH considers it prudent public health policy to evaluate acute NO2 exposures at the screening level. If acute NO2 exposures are identified as a potential risk driver, MDH conducts further evaluation to evaluate emissions, exposures and potential health risks.

* Please be advised that, although we feel this value will provide an adequate level of protection, there is a degree of uncertainty associated with all values, and they should be considered provisional. The California Air Resources Board is currently reviewing the NO2 and other California Ambient Air Quality Standards to determine if they are protective of public health, particularly that of infants and children.

For more information about the CA Air Resources Board review of NO2, see:

- Review of the Ambient Air Qulaity Standard for Nitrogen Dioxide (https://www.arb.ca.gov/research/aaqs/no2-rs/no2-rs.htm)

References

California Environmental Protection Agency, Air Resources Board, Staff Report, Review of the One Hour Ambient Air Quality Standard for Nitrogen Dioxide, December 1992.

California Environmental Protection Agency, Air Resources Board, Technical Support Document, Review of the One Hour Ambient Air Quality Standard for Nitrogen Dioxide, December 1992.

California Environmental Protection Agency, Air Resources Board and Office of Environmental Health Hazard Assessment, Prepared by Mark Frampton, MD, Departments of Medicine and Environmental Medicine, University of Rochester School of Medicine and Dentistry, Nitrogen Dioxide: Evaluation of Current California Air Quality Standards with Respect to Protection of Children, September 1, 2000.

California Environmental Protection Agency, Office of Environmental Health Hazard Assessment, Determination of Acute Reference Exposure Levels for Airborne Toxicants, Acute Summary Toxicity, Nitrogen Dioxide, March 1999.

Minnesota Department of Health
ESA-EIA
625 Roberts St N
St. Paul, MN 55164
651-201-4899
health.risk@state.mn.us
www.health.state.mn.us

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