

# Ground Water Quality Standard for n-Propanol

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NJDEP

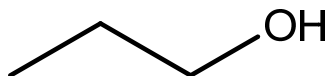
**Summary of Decision:** In accordance with the [New Jersey Ground Water Quality Standards rules at N.J.A.C. 7:9C-1.7](#), the Department of Environmental Protection (Department) has determined that insufficient information is available to develop a specific or interim specific ground water quality criterion for n-propanol at this time. Since n-propanol is a synthetic organic chemical not listed in [Appendix Table 1](#), and there is no evidence of carcinogenicity, **the applicable constituent standard is the interim generic ground water quality criterion of 100 µg/L**. The basis for this criterion and PQL are discussed below.

## n-Propanol

propyl alcohol

**Molecular Formula: C<sub>3</sub>H<sub>8</sub>O**

**Molecular Structure:**



**Background:** n-Propanol is a colorless, highly flammable, volatile liquid that is miscible with water and organic solvents. In 1979, more than 130,000 tons were produced worldwide. It is used as a solvent industrially and in consumer products, such as printing inks, cosmetics, lotions, glass cleaners, polishes, and antiseptics. It is also used as an intermediate in chemical manufacturing (Inchem, 1990).

**Literature Search:** The toxicological database for n-propanol is limited, particularly in regard to subchronic or chronic studies suitable for the development of a human health-based ground water quality criterion. The literature available on n-propanol was thoroughly reviewed by the World Health Organization's International Programme on Chemical Safety (Inchem, 1990). A literature search conducted by the Department located no studies that could serve as a basis for a specific ground water quality criterion or that provided evidence of carcinogenicity for n-propanol.

**Derivation of Ground Water Quality Criterion:** The Department has determined that insufficient information exists for n-propanol to develop a specific or interim specific health-based ground water quality criterion. The Ground Water Quality Standards at N.J.A.C 7:9C-1.7(c)6 establish that for synthetic organic chemicals (SOC) not listed in Appendix Table 1, the interim generic ground water quality criterion of 5 µg/L applies to SOCs defined as carcinogens at N.J.A.C. 7:9C-1.4 (generally, chemicals categorized by USEPA carcinogen risk assessment as Group A, B, or C), and the interim generic ground water quality criterion of 100 µg/L applies to SOCs defined as non-carcinogens at N.J.A.C. 7:9C-1.4 (generally, chemicals categorized by USEPA carcinogen risk assessment as D or E). The Department could find no evidence of carcinogenicity of this constituent in the available literature; therefore, the interim generic ground water quality criterion of 100 µg/L applies to this constituent.

**Derivation of PQL:** The method detection limit (MDL) and the practical quantitation level (PQL) are performance measures used to estimate the limits of performance of analytic chemistry methods for measuring contaminants. The MDL is defined as "the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero" (40 CFR Part 136 Appendix B). USEPA recommends that the MDL be multiplied by a factor of five or 10 to account for the variability and uncertainty that can occur at the MDL. The Department uses a value of five as the median upper boundary of the inter-laboratory MDL distribution from the New Jersey certified laboratory community and multiplies the MDL by five to derive the PQL. Establishing the PQL at a level that is five times the MDL provides a reliable quantitation level that most laboratories can be expected to meet during day-to-day operations.

n-Propanol appears as a listed parameter in an analytical method – "OSW USEPA 8015C, Nonhalogenated Organics by GC-FID" (see [National Environmental Methods Index \(NEMI\)](#)). The limit of detection in this method is specified as 7 ppb. As explained above, a more conservative detection limit is established using a multiplier of five.  $7 \text{ ppb} \times 5 = 35 \text{ ppb}$ , which rounds to 40. Therefore, the Department has established a PQL of 40 ppb for n-propanol.

**Conclusion:** Based on the information provided above (and cited below), the Department has determined that insufficient information is available to develop a specific or an interim specific ground water quality criterion for n-propanol at this time; therefore, the applicable constituent standard is the interim generic ground water quality criterion of 100 µg/L.

**Technical Support Documents:** *Interim Specific Ground Water Quality Criterion Recommendation Report for n-Propanol*, Dr. Gloria Post, NJDEP, June 23, 2006; *Procedure for Describing Process for Development of Analytical Practical Quantitation Levels (PQLs) for n-Propanol*, R. Lee Lippincott, Ph.D., NJDEP, July 21, 2006.

**References:**

Gibel, W., Lohs, K., & Wildner, G.P. (1975) [Experimental study on the carcinogenic activity of propanol-1, 2-methyl- propanol-1 and 3-methylbutanol. I.] Arch. Geschwulstforsch., 45: 19-24 (in German).

Hillbom, M.E., Franssila, K., & Forsander, O.A. (1974) Effects of chronic ingestion of some lower aliphatic alcohols in rats. Res. Commun. chem. Pathol. Pharmacol., 9: 177-180.

INCHEM (1990). International Programme on Chemical Safety Environmental Health Criteria 102. 1-Propanol. World Health Organization, Geneva. <http://www.inchem.org/documents/ehc/ehc/ehc102.htm>

Nelson, B.K., Brightwell, W.S., & Burg, J.R. (1985) Comparison of behavioural teratogenic effects of ethanol and n-propanol administered by inhalation to rats. Neurobehav. Toxicol Teratol., 7: 770-783.132.

Nelson, B.K., Brightwell, W.S., Mackenzie-Taylor, D.R., Khan, A., Burg, J.R., Weigel,

W.W. & Goad, P.T. (1988) Teratogenicity of n-propanol and isopropanol administered at high inhalation concentration to rats. *Food Chem. Toxicol.*, 26(3): 247-254.

Wakabayashi, T., Horiuchi, M., Sakaguchi, M., Onda, H., & Iijima, M. (1984) Induction of megamitochondria in the rat liver by n-propyl alcohol and n-butyl alcohol. *Acta pathol. Jpn.*, 34: 471-480.



New Jersey Department of Environmental Protection  
Water Monitoring and Standards  
Bureau of Water Quality Standards and Assessment  
[www.state.nj.us/dep/wms/bwqsa/](http://www.state.nj.us/dep/wms/bwqsa/)  
(609) 777-1753

