Ground Water Quality Standard for
1-Methylnaphthalene

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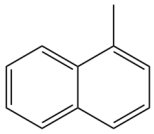
Summary of Decision: In accordance with the New Jersey Ground Water Quality Standards rules at N.J.A.C. 7:9C-1.7, the Department of Environmental Protection (Department) has determined that insufficient information is available to develop a specific or interim specific ground water quality criterion for 1-methylnaphthalene at this time. Since 1-methylnaphthalene is a synthetic organic chemical not listed in Appendix Table 1, and there is some evidence of carcinogenicity **the applicable constituent standard is the interim generic ground water quality criterion of 5 µg/L**. The basis for this criterion and PQL are discussed below.

1-methylnaphthalene
Alpha-methylnaphthalene
Molecular Formula:
$C_{11}H_{10}$
Molecular Structure:



Background: The chief industrial use of 1-methylnaphthalene is as an intermediate in the production of phthalate anhydrides, themselves, an intermediate in production of a large number of products. Most of the 1-methylnapthalene entering the environment originates from incidental releases, mainly from combustion sources.

Literature Search: . An online search of the published literature using the PubMed.gov database of the U.S. National Library of Medicine of the National Institutes of Health, and the Hazardous Substances Data Bank of the Toxicology Data Network of the U.S. National Library of Medicine was conducted. The non-peer reviewed literature including submissions to the USEPA under TSCA reporting requirements were also searched. In addition, published ATSDR and USEPA documents were also located and reviewed.

Reference Dose: A Reference Dose is derived based on the subchronic study of Jin et al. (2012). However, the cumulative uncertainty in this Reference Dose (as indicated by the cumulative uncertainty factor adjustment of 300,000 is considered to be incompatible with application of this Reference Dose.

Derivation of Ground Water Quality Criterion: The Department has determined that insufficient information exists on oral toxicity data for 1-methylnaphthalene 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 USEPA (2008) described the data on carcinogenicity of 1-methylnapthalene as "Suggestive Evidence of Carcinogenicity,", therefore, the interim generic ground water quality criterion of 5 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 analytical 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.

1-methyl naphthalene appears as a listed parameter in a published method "USGS 0-1433-01", Determination of Wastewater Compounds by Polystyrene-Divinylbenzene Solid-Phase Extraction and Capillary-Column Gas Chromatography/Mass Spectrometry" (See: National Environmental Methods Index (NEMI) http://www.nemi.gov/).The limit of detection in the method is 0.13 ppb. As explained above, a more conservative detection limit is established using a multiplier of five. The practical quantification level (PQL) calculated from the MDL X 5 is 0.7 ppb. Therefore, the Department has established a PQL of 0.7 ppb for 1-methyl naphthalene.

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 1-methyl naphthalene at this time; therefore, **the applicable constituent standard is the interim generic ground water quality criterion of 5 µg/L.**

Technical Support Documents: *Interim Specific Ground Water Quality Criterion Recommendation Report for 1-methyl naphthalene*, Alan B. Stern, Ph.D., D.A.B.T., NJDEP, March 18,2013; *Procedure for Describing Process for Development of Analytical Practical Quantitation Levels (PQLs) for 1-methyl naphthalene*, R. Lee Lippincott, Ph.D., NJDEP, March 13, 2014.

References: Jin M, Kijima A, Suzuki Y, Hibi D, Ishii Y, Nohmi T, Nishikawa A, Ogawa K, Umemura T. *In vivo genotoxicity of 1-methylnaphthalene from comprehensive toxicity studies with B6C3F1 gpt delta mice*. J Toxicol Sci. 2012;37(4):711-21.

USEPA (2008). *Provisional Peer Reviewed Toxicity Values for 1-Methylnaphthalene. Superfund Health Risk Technical Support Center, National Center for Environmental Assessment.*