

What are nitrates?

Nitrates (NO₃) are an essential source of nitrogen (N) for plants. When nitrogen fertilizers are used to enrich soils, nitrates may be carried by rain, irrigation and other surface waters through the soil into ground water. Human and animal wastes can also contribute to nitrate contamination of ground water. Although any well can become contaminated by nitrates, shallow, poorly constructed, or improperly located wells are more susceptible to contamination. Nitrate levels in drinking water can also be an indicator of overall water quality. Elevated nitrate levels may suggest the possible presence of other contaminants such as disease-causing organisms, pesticides, or other inorganic and organic compounds that could cause health problems.

Who is at risk from high nitrates in drinking water?

The Environmental Protection Agency (EPA) has set the Maximum Contaminant Level (MCL) of nitrate as nitrogen (NO₃-N) at 10 mg/L (or 10 parts per million) for the safety of drinking water. Nitrate levels at or above this level have been known to cause a potentially fatal blood disorder in infants under six (6) months of age called methemoglobinemia or “blue-baby” syndrome; in which there is a reduction in the oxygen-carrying capacity of blood. The symptoms of blue-baby syndrome can be subtle and often confused with other illnesses. An infant with mild to moderate blue-baby syndrome may have diarrhea, vomiting, and/or be lethargic. In more serious cases, infants will start to show obvious symptoms of cyanosis: the skin, lips or nailbeds may develop a slate-gray or bluish color and the infant could have trouble breathing. A sample of the infant’s blood can easily confirm a diagnosis of blue-baby syndrome. It is difficult to determine the true incidence of blue-baby syndrome, because it is not a reportable disease.

Others at risk from excess nitrates in drinking water are: pregnant women; individuals with reduced gastric acidity; and individuals with a hereditary lack of methemoglobin reductase.