COMMUNITY WATER CENTER
EL CENTRO COMUNITARIO POR EL AGUA

Nitrate

- Legal Limit (Maximum Contaminant Level, MCL): 10 mg/L (as Nitrogen)[a,b]
- Public Health Goal (PHG): Same as MCL[c]

Common sources of the contaminant in the Central Valley and Central Coast[d]

The main source of nitrate contamination, both in ground and surface water, comes from the use of fertilizers that contain nitrogen. Additional sources include animal and human waste, including dairies, septic tanks and sewer systems.

Possible health impacts of short-term exposure[e]

- Methemoglobinemia or Blue Baby Syndrome (symptoms include shortness of breath and blueness or darkening of skin, especially around the mouth, particularly in infants). Without immediate treatment, this can be fatal.
- Diarrhea and vomiting
- Spontaneous abortions, stillbirths or Sudden Infant Death Syndrome (SIDS)

Possible health impacts of long-term exposure[f]

- Diuresis, increased starchy deposits and hemorrhaging of the spleen
- In pregnant women: preeclampsia, anemia, or premature births
- Hypotension (low blood pressure)
- Potential Cancer Risk[g]

Sensitive populations[h]

The most sensitive population is infants younger than six months, particularly premature infants, and pregnant women, particularly after the 30th week. People with low gastric acidity, iodine deficiencies, or low vitamin C are also more susceptible. Drinking water with both nitrate and bacterial contamination may lead to higher risk of nitrate health impacts.

Pathways of exposure[i]

The main pathway of exposure is through drinking water that has high levels of nitrate. Infants can be exposed when contaminated water is mixed with their formula or when nursing mothers drink water with high nitrate levels. Inhaling steam from water containing nitrate is not a route of exposure.

Tips for reducing exposure at home[j]

- Do not boil water to remove nitrate; boiling water can increase the level of nitrate in water!
- Do not mix baby formula with contaminated water.
- Buy bottled water or use a certified treatment device in your home. Certified home treatment systems for nitrate primarily include reverse osmosis and ion exchange units. Under-the-sink units typically range from $150 - $400. Pitcher filters (*e.g.*, Brita) or chlorination do not remove nitrate. You can get more information, including a full list of certified home filtration devices is available at https://www.waterboards.ca.gov/drinking_water/certlic/device/watertreatmentdevices.html or by calling the State Water Resource Control Board, Residential Water Treatment Device Registration unit at (916) 449-5635.

716 10th Street, Suite 300
Sacramento, CA 95814
(916) 706-3346

900 West Oak Avenue
Visalia, CA 93291
(559) 733-0219

406 Main Street, Suite 421
Watsonville, CA 95076
(831) 288-0450

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Nitrate References

a. California Code of Regulations, Section 64431, "Maximum Contaminant Levels - Inorganic Chemicals" available at https://govt.westlaw.com/calregs/Document/I2810C4E12DCC4B40A165E23D1B6C6F0D?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default) (last visited Apr. 2020); EPA (2020), "National Primary Drinking Water Regulations" available at https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations#Inorganic (last visited Apr. 2020).

b. EPA (2020), "National Primary Drinking Water Regulations" available at https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations#Inorganic (last visited Apr. 3, 2020).

c. OEHHA (2018), "Nitrite and Nitrate Public Health Goals" available at https://oehha.ca.gov/water/chemicals/nitrite-and-nitrate (last visited Apr. 2020).

d. SWB (2018), "Nitrates and Nitrites in Drinking Water," available at https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Nitrate.html (last visited Apr. 2020); OEHHA (1997), "Public Health Goals for Nitrate and Nitrite in Drinking Water," available at https://oehha.ca.gov/water/public-health-goal/summary-public-health-goals-nitrate-and-nitrite (last visited Apr. 2020); WHO (2011), "Nitrate and Nitrite in Drinking Water," available at https://www.who.int/water_sanitation_health/dwq/chemicals/nitratenitrite2ndadd.pdf (last visited Apr. 2020).

e. SWB (2018), "Nitrates and Nitrites in Drinking Water," available at https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Nitrate.html (last visited Apr. 2020); ATSDR (2007) "Case Studies in Environmental Medicine, Nitrate/Nitrite Toxicity," available at http://www.atsdr.cdc.gov/csem/nitrate_2013/docs/nitrite.pdf (last visited Apr. 2020).

f. National Institute of Health - Department of Cancer Epidemiology and Genetics (2020), "Drinking Water Contaminants," available at https://dceg.cancer.gov/research/what-we-study/drinking-water-contaminants (last visited Apr. 2020).

g. OEHHA (1997), "Public Health Goals for Nitrate and Nitrite in Drinking Water," available at https://oehha.ca.gov/water/public-health-goal/summary-public-health-goals-nitrate-and-nitrite (last visited Apr. 2020); WHO (2011), "Nitrate and Nitrite in Drinking Water," available at https://www.who.int/water_sanitation_health/dwq/chemicals/nitratenitrite2ndadd.pdf (last visited Apr. 2020).

h. SWB (2018), "Nitrates and Nitrites in Drinking Water," available at https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Nitrate.html (last visited Apr. 2020).

i. SWB (2018), "Nitrates and Nitrites in Drinking Water," available at https://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Nitrate.html (last visited Apr. 2020); OEHHA (1997), "Public Health Goals for Nitrate and Nitrite in Drinking Water," available at https://oehha.ca.gov/water/public-health-goal/summary-public-health-goals-nitrate-and-nitrite (last visited Apr. 2020).

j. CDC (2020), "Nitrate and Drinking Water from Private Wells," available at https://www.cdc.gov/healthywater/drinking/private/wells/disease/nitrate.html (last visited Apr. 2020); SWB (2017), "Groundwater Information Sheet: Nitrate," available at https://www.waterboards.ca.gov/water_issues/programs/gama/docs/coc_nitrate.pdf (last visited Apr. 2020).