

# NITRATE REDUCTION IN DRINKING WATER IN APAŠKO POLJE

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## Apače public water supplies

Approximately 70% residents of the municipality of Apače are supplied with drinking water from Apače public water system and other small local water supply systems. All other residents in the community are using water from water system which is not under any control.

A nitrate test is recommended for all newly constructed private wells and wells that have not been tested during the past five years. Testing is also recommended for wells used by pregnant women and is essential for wells that serve infants under six months of age.

The source of water from Apače public water system is in groundwater from drainage reservoirs in Segovci from where water wells are distributed over the system.

Since 01/01/2011 water supply system in the municipality of Apače has been managed by JP Prlekija d.o.o., Ormoška cesta 3, 9240 Ljutomer.

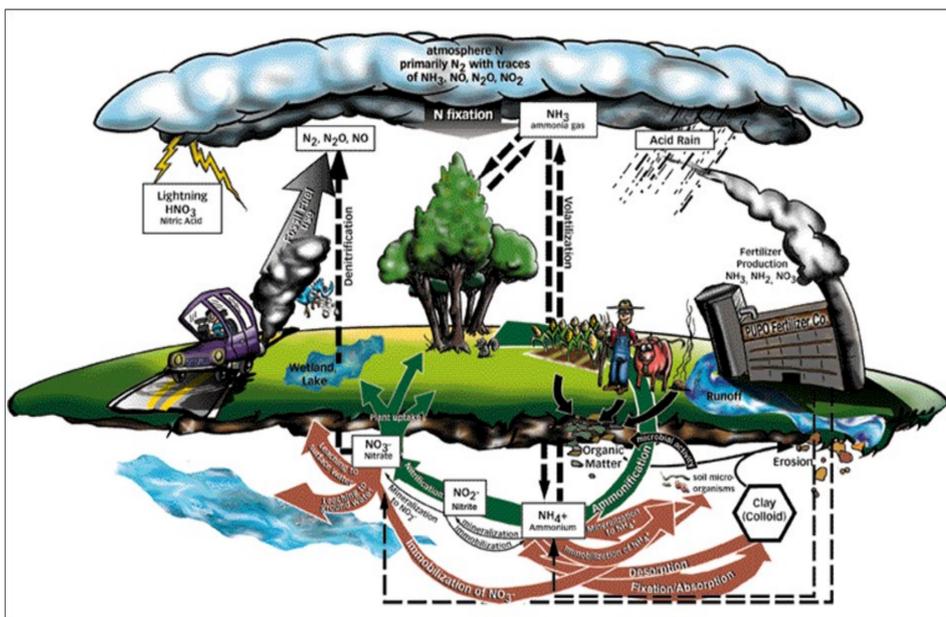
## Nitrate levels in drinking water

Water naturally contains less than 1 milligram of nitrate-nitrogen per liter.

According to the Rules on drinking water (Ur.l. RS, št. 19/2004, 35/2004, 26/2006, 92/2006, 25/2009) the maximum allowable level of nitrates in public drinking water is 50 mg/l and 0,50 mg/l for nitrite.

## Sources of nitrate contamination

- . fertilizers,
- . animal wastes,
- . septic tanks,
- . municipal sewage treatment systems,
- . decaying plant debris.



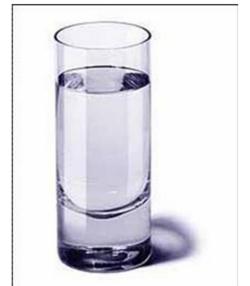
Nitrate circulation in the environment

## Inter-sectoral cooperation :

- Municipality of Apače
- Institute of Public Health Murska Sobota
- Ministry of the Environment and Spatial Planning of the RS
- Agricultural and Forestry Institute Murska Sobota
- Agricultural Advisory Service Murska Sobota
- Ministry of Agriculture, Forestry and Food
- Agricultural Institute of Slovenia
- Farmers

## Health Effects

The primary health hazard from drinking water containing nitrates occurs in the digestive system when nitrates are transformed to nitrites. The nitrite oxidizes iron in the hemoglobin of the red blood cells to form methemoglobin, which lacks the oxygen-carrying ability of hemoglobin. This creates the condition known as methemoglobinemia.

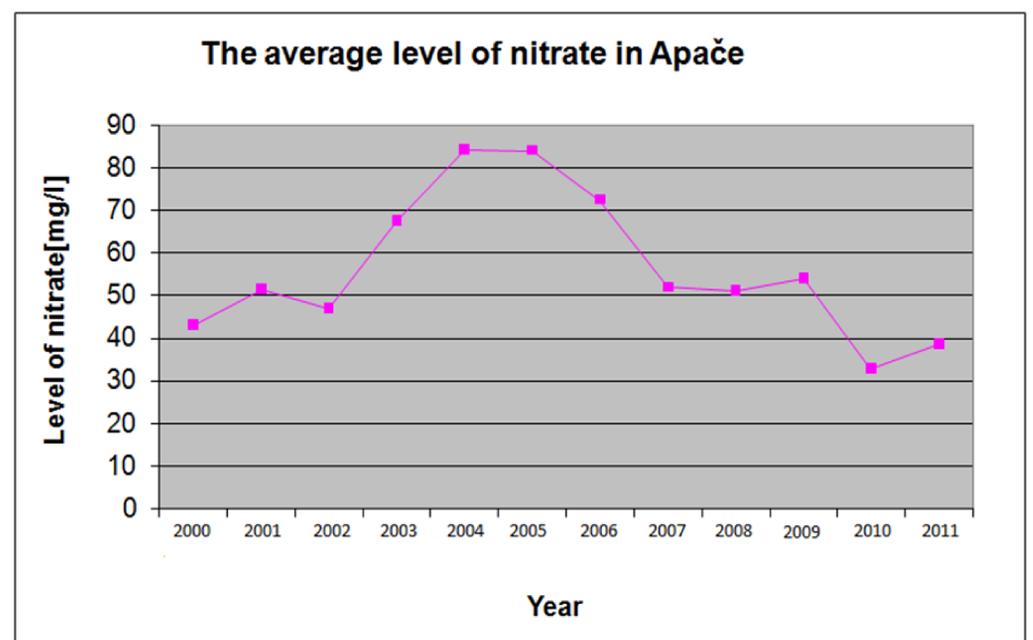


## Vulnerable groups:

- . infants under six months
- . pregnant women
- . nursing mothers
- . older individuals who have genetically impaired enzyme systems for metabolizing methemoglobin.

## Nitrate reduction and sanction

- . Respite care for vulnerable groups of pre-packaged water from 2005 until 2010.
- . Comprehensive solutions are needed for long-term protection of the population:
  - water preparation (ion exchange, biological denitrification, membrane technology such as reverse osmosis and electro dialysis)
  - stirring water
  - new water source
- . **Decree on determining the drinking water protection area for the Apaško polje body of water (Ur.l.RS.št.29/2007) was adopted in 2007**
  - The input of nitrogen from livestock manure can not exceed 170 kg N/ha of agricultural land in use at the holding level.
  - Entry of fertilizers into the ground and plowing soil are prohibited within 100 m from the object to capture drinking water that is included in the system of public drinking water.
  - Determine the list of active substances that can not be used in narrow water protection areas.
- . Public water supplies are tested regularly by the Institute of Public Health Murska Sobota for the presence of nitrates.
- . Since September 2009 the amount of nitrate has been below 50 mg/l.



The average level of nitrates in drinking water in Apače