

## A Summary of Findings

### North Komelik, Tohono O'odham Nation

#### Overview

The Agency for Toxic Substances and Disease Registry (ATSDR) works with other agencies, states, tribal, and local governments to assess health risks in communities where people may come in contact with dangerous chemicals. This fact sheet summarizes findings from ATSDR's investigation of environmental health conditions in North Komelik, near the Cyprus Tohono Mine Site.

#### The Bottom Line

- The drinking water Tohono O'odham Utility Authority currently provides to North Komelik is safe.
- Until 2013, North Komelik drinking water contained arsenic and fluoride at levels that could have harmed people's health if they drank it for 1 year or more.
- Perchlorate may have been present in North Komelik drinking water before 2003; however, there is not enough data to know if it was present at levels that could have harmed people's health.
- We don't have enough data to judge the quality of the air for people living near the site, so ATSDR recommends that the mine owner, federal agencies, and the Tohono O'odham Nation conduct more testing.
- Locally-available animals and plants are most likely safe to eat, but to be sure, ATSDR would need to review site-specific data. Local soils are likely safe; however, it is good for your health to limit the amount of soil you eat by accident. ATSDR suggests that everyone wear gloves while gardening or harvesting plants, clean plants before eating them, and wash hands after gardening or harvesting.
- There is not enough information to know whether a restart of copper mining operations could pose health risks to tribal members in the future. ATSDR recommends the mine owner, federal agencies, and the Tohono O'odham Nation review the proposed mining plan to forecast the health and environmental risks prior to restarting mine operations.

- The green dot means no expected harm to people's health.
- The red dot means that past exposure could harm people's health.
- The yellow dot means there is not enough information for ATSDR to conclude whether people's health could be harmed.

#### History

The Cyprus Tohono Corporation (CTC) mine site is located 32 miles south of Casa Grande, AZ, in a rural part of the Tohono O'odham Nation (TON). The site boundary is 1 mile east of the village of North Komelik. CTC has a 4,180 acre mining lease with the Bureau of Indian Affairs and the TON for this site. The US Environmental Protection Agency (EPA) is investigating groundwater contamination at the site.

Copper mining began on the site in the 1880's. Open pit mining began in 1959. In 1970, large-scale underground mining and processing of oxide and sulfide ores began. Open pit mining ended in 1997, and in 1999, the mine transitioned to care and maintenance mode. Past mining activities contaminated local groundwater with uranium, sulfate, and perchlorate. EPA is investigating options for cleaning up groundwater contamination. CTC is considering whether to resume mining activities.

#### *ATSDR Activities at the Cyprus Tohono Mine Site*

Representatives of ATSDR visited the Nation with EPA in September 2013 and January 2015 and spoke with TON officials and community members of North Komelik. Since then, ATSDR has been reviewing data and information about human contact with chemicals, and possible health effects at the site. ATSDR did this work at the request of the EPA and the TON.

## Community Concerns

North Komelik community members and TON officials expressed primary concerns about:

- Drinking water
- Air
- Locally-available plants and animals used for food
- Effects to human health and the environment if the mine were to re-open

## Health Investigation

### What did ATSDR do?

ATSDR looked at:

- Groundwater data from 1980 - 2012
- Drinking water data from 1978 - 2013
- Mine site sediment data from 2002 and mine soil data from 2003
- North Komelik village soil data from 2003
- Studies from other parts of the country of animal and plant uptake of metals

### What did ATSDR find?

During our investigation, ATSDR collected detailed information about the community's and the TON officials' concerns. These issues are listed below — along with what we learned about them.

#### Drinking water:

Up until April 2013, North Komelik drinking water contained levels of arsenic that could have posed a health risk to adults and children. Arsenic and fluoride occur naturally in groundwater in the area.

- During the time people drank this water, they were at higher risk for non-cancer health effects of arsenic, such as stomachache, nausea, and skin changes (see Box 1).
- People who drank this water for a lifetime (70 years for adults and 18 years for children) may be at higher risk for developing skin, bladder, and lung cancers (see Box 1).

Up until April 2013, North Komelik drinking water contained elevated levels of fluoride. Some amount of fluoride is good for teeth, protecting them from cavities. However, the levels of fluoride in North Komelik drinking water during this time could have caused cosmetic changes to children's teeth, if they drank it for 1 year or more. See Box 2 for health facts about fluoride and children's teeth.



The Cyprus Tohono Mine Site, near the North Komelik community.

#### Box 1. Arsenic, Drinking Water, and Your Health

*Using drinking water with arsenic above health guidelines at the levels that were in North Komelik water could have caused stomachache, nausea, and skin changes during the time people were drinking it. In addition, people who drank this water for a lifetime (70 years for adults and 18 years for children) may be at higher risk for developing skin, bladder, and lung cancers.*

*There is some evidence that ongoing exposure of children to arsenic in drinking water may result in lower IQ scores.*

*If you drank North Komelik water before 2013 talk with your doctor about your past arsenic exposure.*

#### Box 2. Fluoride and Children's Teeth

*Fluoride is a compound that's found naturally in the environment. Many types of toothpastes contain fluoride because it helps strengthen teeth and prevent cavities. But drinking too much fluoride during the time teeth are forming (before 8 years of age) can cause visible changes in teeth like lines and spots.*

Beginning in 2009, perchlorate was found at elevated levels in a groundwater monitoring well which had provided North Komelik drinking water from 1994 – 2002.

- When the well was used as a drinking water source (1994 – 2002), it was not sampled for perchlorate.
- When the well was sampled for perchlorate (starting in 2009), it was not used as a drinking water source.
- ATSDR has no data to know if the well contained perchlorate during the time it was used as drinking water source, so it is not possible to know if residents were exposed to perchlorate at levels that could affect their health.
- If the well did contain elevated levels of perchlorate during the time it was used as a drinking water well, any human exposure would have stopped in December 2002 when the well was taken out of use.
- See Box 3 for information about perchlorate and health.

Starting in April 2013, the Tohono O’odham Utility Authority has been supplying drinking water to North Komelik from the Greater Santa Rosa Regional System. This drinking water is treated for arsenic and the source waters did not contain fluoride at harmful levels upon recent sampling. The Greater Santa Rosa Regional System does not test for perchlorate. The System’s source of drinking water is more than 5 miles south of the mine. The perchlorate plume has migrated 3.5 miles northwest-north from the mine. Thus, this drinking water is not expected to harm people’s health, now or in the future.

### **Box 3. Perchlorate and Health**

*If you drink water with perchlorate in it, the perchlorate can change your thyroid gland’s ability to use the nutrient iodine. Your thyroid gland uses iodine to make hormones that regulate many body functions. Perchlorate may have been present in North Komelik drinking water from 1994 - 2002. However, ATSDR has no data on perchlorate levels in North Komelik drinking water during that time frame, so it is not possible to know if residents were exposed to perchlorate at levels that could affect their health.*

### **Air:**

- There are no data available about the air at the site or in North Komelik.
- If data on air become available, ATSDR will review them on request.

### **Locally-available animals and plants:**

- There are no data available about the build-up of contaminants in local animals or plants. However, ATSDR reviewed findings of studies carried out in other locations about build-up of similar contaminants in the meat or liver of deer and in plants.
- Based on those studies, ATSDR believes that people who eat deer or collect plants from the Nation’s lands are not likely to have harmful health effects.
- We emphasize that this is an assumption, and that we would need samples of North Komelik animals or plants to make a proper estimate of potential risk from eating local animals or plants.
- If data on contaminants in local animals or plants becomes available, ATSDR will review them on request.

### **Possible environmental and health effects of re-opening the mine:**

- It is well known that mining operations change the environment. Some changes, like noise, disturbances to soil containing the Coccidioides (Valley Fever) fungus, or changes to surface water, groundwater, or air, may contribute to health effects.
- There is not enough information right now to know if re-opening the mine could contribute to health effects in the future.



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## How can the North Komelik community protect their health?

There are things people in North Komelik can do to protect their health. Here's a summary of ATSDR recommendations:

- Drink the water the Tohono O'odham Utility Authority is now providing to the North Komelik community.
- If you drank North Komelik water before 2013, talk with your physician about your past exposure to arsenic.
- Although soil contamination is not likely a health concern in the community, ATSDR suggests using gardening and harvesting techniques that reduce the amount of soil and surface dust that get into your body, including:
  - Wear gardening gloves when gardening or harvesting.
  - Wash local plants with clean water and a scrub brush before preparing or eating them.
  - Wash hands after gardening or harvesting.

## What can other organizations do?

To make sure the North Komelik community is safe, ATSDR recommends that the CTC, TON, the Bureau of Land Management, the Bureau of Indian Affairs, and EPA take steps to:

- Test any new or existing groundwater wells for chemical and biological contamination before any future use as a human drinking water source.
- Collect baseline air quality data on particulates, volatile organic compounds (VOCs), and metals near the mine.
- Start air monitoring if mining restarts.
- Consider analyzing the potential environmental and health impacts of restarting mine operations with the goal of minimizing health risks.

## Where can I learn more?

The authors of the ATSDR report are available to answer your questions. You can contact them by telephone or email.

Ben Gerhardstein, Public Health Advisor, tel: 415-947-4316, [bgerhardstein@cdc.gov](mailto:bgerhardstein@cdc.gov)

Katherine Pugh, Environmental Health Scientist, tel: 770-488-0765, [khpugh@cdc.gov](mailto:khpugh@cdc.gov)

You may call ATSDR toll free at 800-232-4636.

ATSDR's report is available at the two public repository locations listed below. You may also ask Ben Gerhardstein to send you a copy by email or postal mail.

### Sells Repository

Mineral Resources Administrator  
Department of Natural Resources  
Tohono O'odham Nation  
Sells Business Loop, Hwy 86  
BIA Compound  
Sells, AZ 85634

### Sif Oidak Repository

Sif Oidak District Office  
Tohono O'odham Nation  
BIA Route 15  
North Komelik, AZ 85130  
(520) 361-2360

You may also access the Health Consultation at: <http://www.atsdr.cdc.gov/hac/pha/HCPHA.asp?State=AZ>.



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