

**UPDATED:**

The Risks of Using Animas/San Juan River Water on Crops Following the Mine Spill Upstream

Following the mine spill in southwestern Colorado, emergency managers at the local, county, state, and federal levels of government are advising farmers along the Animas River and the affected stretch of the San Juan River in northwestern New Mexico: **No matter the visual appearance of the river water, do not use it to irrigate your crops until government officials declare it safe to use again.**

Farmers who go against this advice run the following risks:

- Flood irrigation will carry suspended particles and dissolved metals into the field where they can attach themselves to plants and soil.
- The closer the plant is to the source of contamination, the more likely it is to be affected by that contamination. The same is true about a plant's roots. Plants with shallow root systems (such as vegetable crops) stand a higher chance of being exposed to whatever substances are in the water than plants with deeper roots systems, especially when watered via flood irrigation. Plants with deeper root systems are a bit more protected in the sense that the soil above them acts as a filter for whatever may be in the water.
- Contaminants released in the spill may adhere to crops whose edible portion is the active growing portion or is in direct contact with contaminated water and soil. These plants include but are not limited to: Leafy vegetables such as spinach, lettuce, and celery, as well as root crops such as carrots, potatoes, beets, and radishes.

This document was designed for you to know if water is safe or unsafe to use for irrigation purposes. An important thing to keep in mind: The data in the table below refers to **total metals**, which includes metals that are dissolved in the water (these are called **dissolved metals**) plus metals that are suspended in the water.

- *Dissolved* metals are what pass through a filter whose pores are only 0.45 micrometers in diameter – a hole that size is too small for even a single strand of human hair to pass through.
- *Total* metals include the metals that are dissolved in the water, plus the metals that are piggybacking on other substances in the water (algae, clays, etc.).
- Sometimes, *dissolved* metals and *total* metals are almost equal – this is the case in filtered drinking water. When there is a dramatic difference between *dissolved* metals and *total* metals, water quality needs to be investigated further.

The data in the table below shows the *Maximum Contaminant Levels (MCL)* of six metals. Water with concentrations higher than the MCL numbers listed should not be used for irrigation purposes. The units shown in the table are parts per million (ppm). One ppm is roughly equivalent to adding one drop to 50 liters (about 13 gallons).

Data from the U.S. Environmental Protection Agency (EPA) (<http://nepis.epa.gov/Adobe/PDF/30006MKD.pdf>)

| Element | Irrigation Water MCL | |
|---------|---|-------------------------|
| | SHORT term (up to 20 years) mg/L (ppm) | LONG term mg/L (ppm) |
| Arsenic | 2 | 0.1 |
| Cadmium | 0.05 | 0.01 |
| Iron | 20 | 5 |
| Lead | 10 | 5 |
| Mercury | 0.002 | 0.002 |
| Zinc | 10 | 2 |

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