

# NMED

New  
Mexico  
Environment  
Department



## GOLD KING MINE SPILL UPDATE

November 20, 2018

Dennis McQuillan  
Chief Scientist  
New Mexico Environment Department

# August 5, 2015

## Gold King Mine Blowout

- **EPA work crew digging into a collapsed mine tunnel triggered the blowout of impounded water.**
- **Acidic mine water containing sediment and heavy metals discharged into Cement Creek, which flows into the Animas River, and into New Mexico where the Animas River joins the San Juan River before flowing into the Navajo Nation and Utah and Lake Powell.**

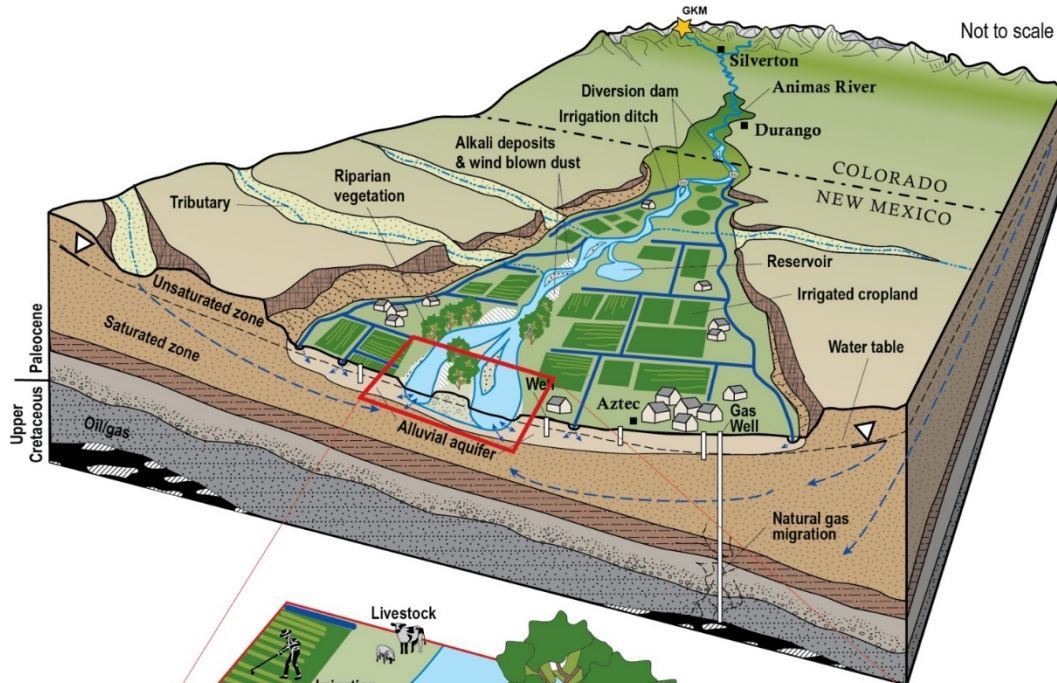


Photo by Julie O'Hare, used with permission.



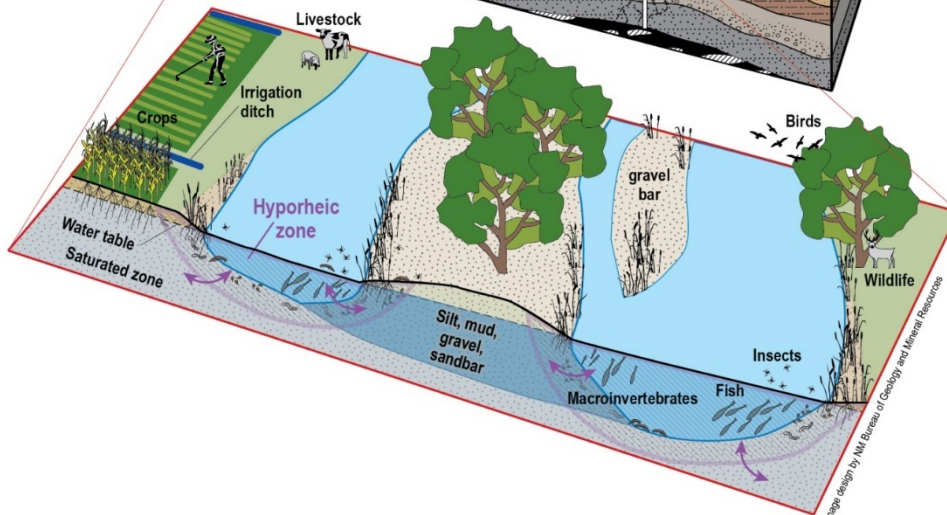
# Animas River Watershed System

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## Ongoing Issues

- **Need to differentiate sources of metals: natural geologic, legacy mining, GKM spill**
- **River water used as drinking water source sometimes contains elevated metals**
- **Elevated metals in sediment**
- **Occasional spills in Colorado**
- **Elevated bacteria and nutrients**





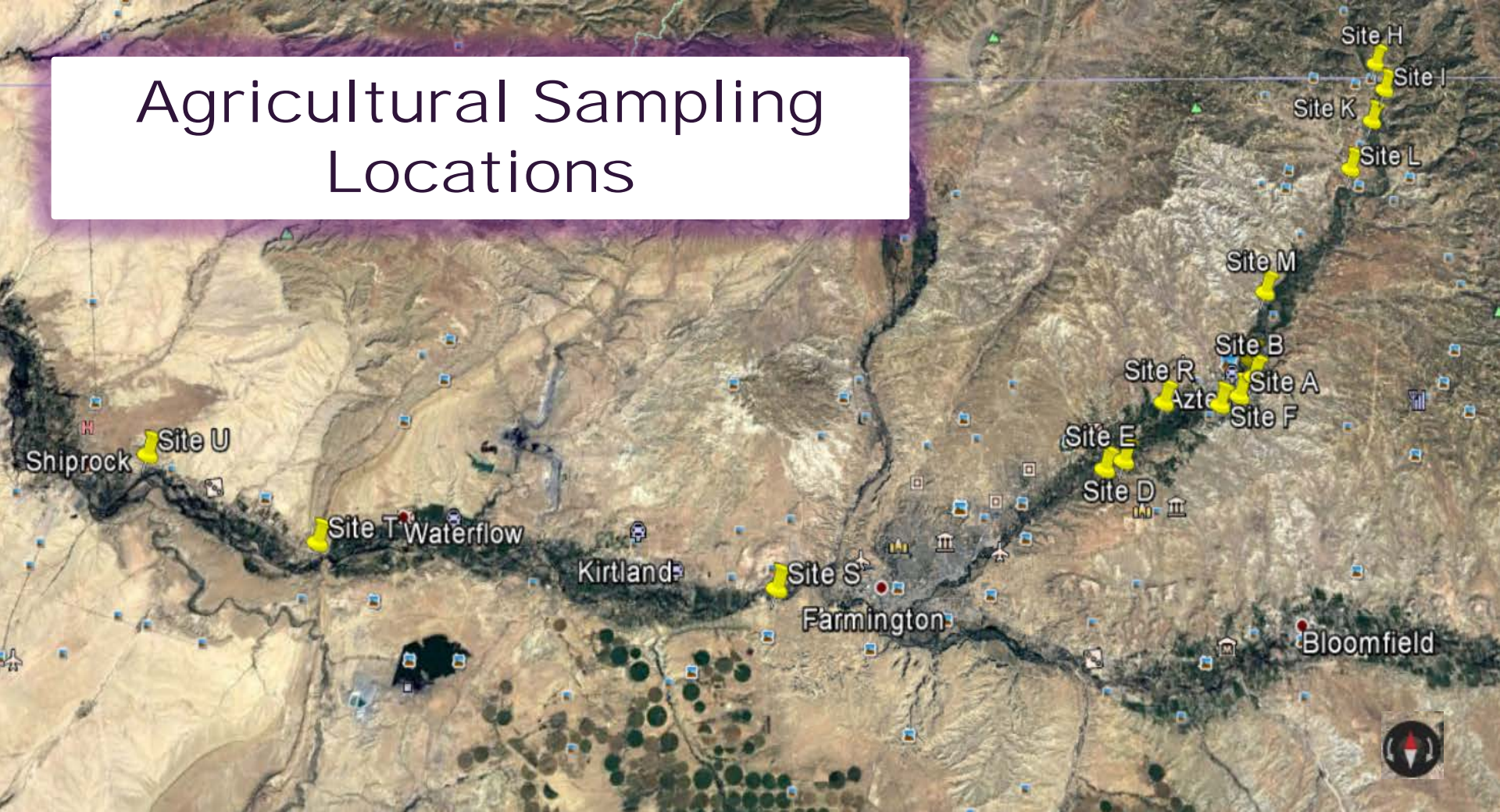
# WIIN Act

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- **Water Infrastructure Improvements for the Nation (WIIN) Act of 2016**
- **\$20 million total authorized**
- **\$4 million/year for 5 years to EPA, states and tribes for:**
  1. **Watershed scale monitoring; and**
  2. **Provision of monitoring data to the public.**
- **Specific projects funded in Arizona, Colorado, Navajo Nation, New Mexico, Southern Ute Indian Tribe, Ute Mountain Ute Tribe and Utah.**



# Agricultural Sampling Locations

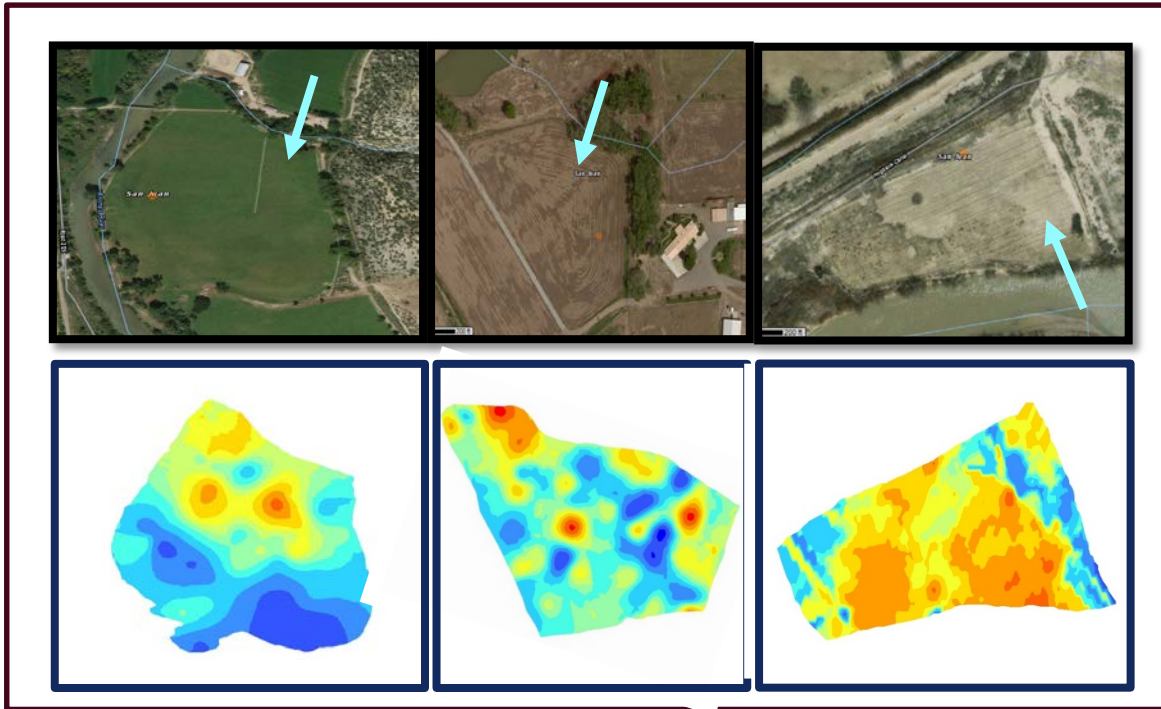


Sampling sites from the CO-NM border through Shiprock

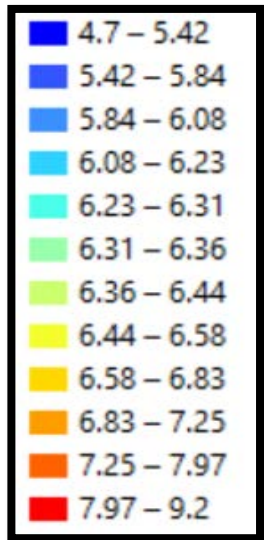
**NM**  
**STATE**

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New Mexico State University  
nmsu.edu

# Spatial distribution of Arsenic in agricultural field soil



Total Arsenic concentration (parts per million)



RSL:  
7.07 ppm

<b>Pasture grass</b>
14.1 hectares
Aztec

<b>Forage (alfalfa)</b>
3.04 hectares
Farmington

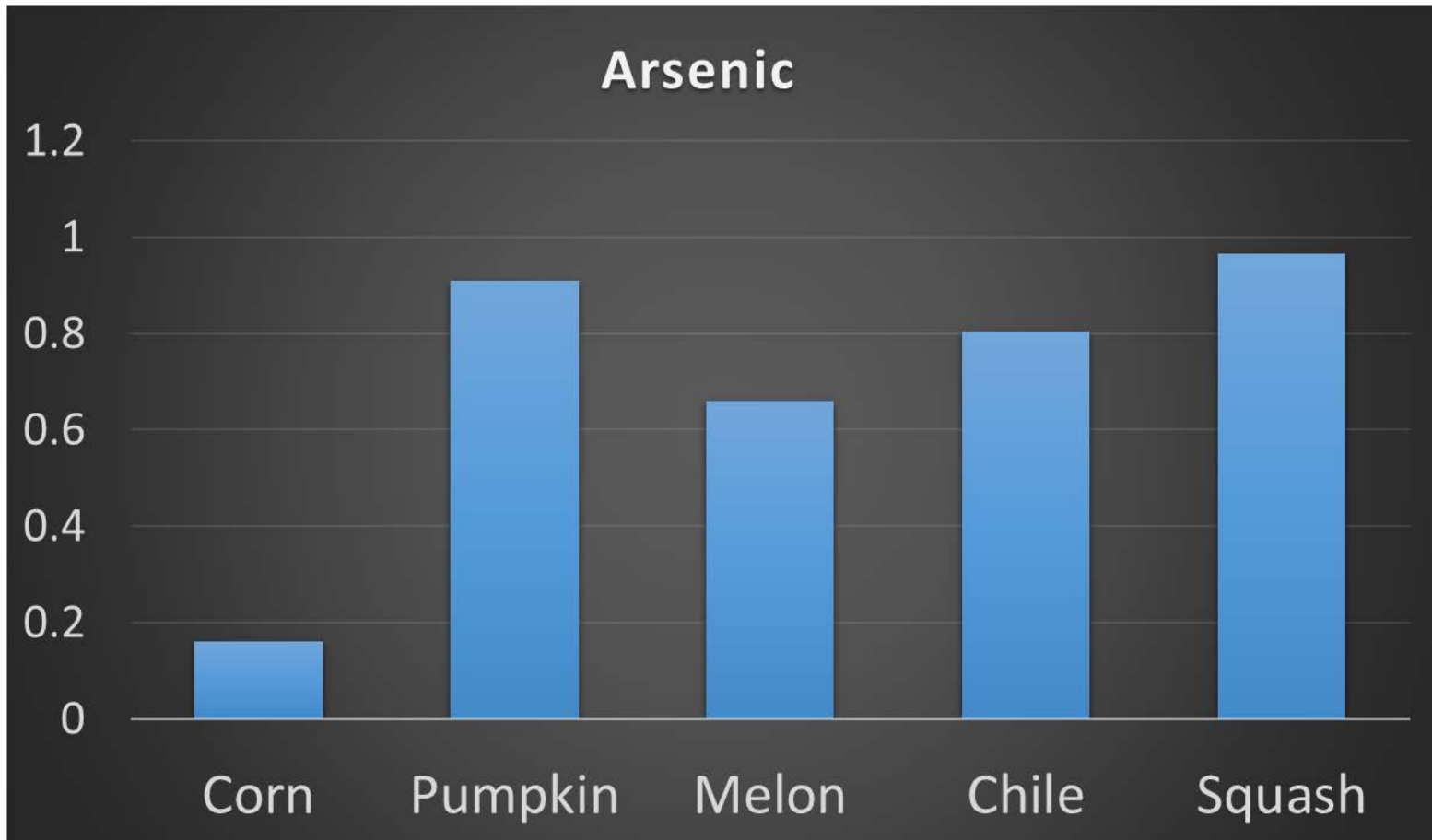
<b>Vegetables</b>
1.27 hectares
Shiprock

RSL: U.S. EPA Risk Screening Level for agricultural soil

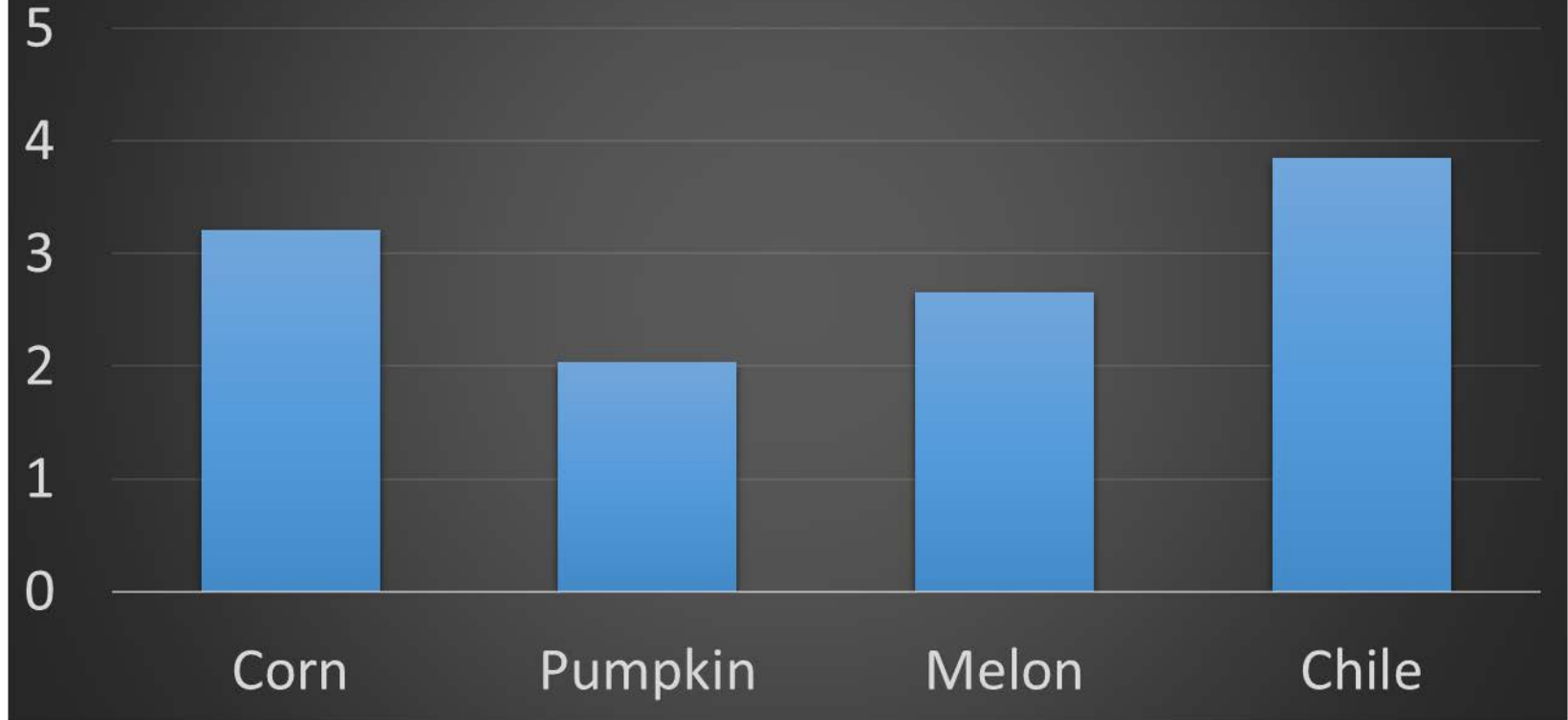




Even though arsenic exceeded soil screening levels in some areas, dangerous levels of arsenic were not detected in crops.



# Lead



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**Safe Limit-10 mg/kg**





# Agricultural Fact Sheet

**A public relations campaign is needed to counter unjustified stigma about crops grown in Animas Valley and San Juan County.**



## New Mexico Environment Department

PROTECTING OUR ENVIRONMENT, PRESERVING THE ENCHANTMENT

### Animas and San Juan River Water Quality Safe for Agricultural Uses

May 12, 2017

- Animas and San Juan River water quality has met irrigation and livestock-watering standards set by the New Mexico Water Quality Control Commission from 2016 to present.
- Test results from crops irrigated with Animas River water and sampled during August 2015 – October 2016 show no dangerous levels of heavy metals. Crop testing for heavy metals continues for March 2017 – October 2017.
- Since August 2015, no livestock or wildlife have been reported with unusual distress, illness, or mortality that could have been caused by heavy metals.

For additional information and updates, please go to

<https://www.env.nm.gov/river-water-safety/> or call 1-800-219-6157.



Photo: New Mexico State University Department of Plant and Environmental Sciences



# Aztec Drinking Water Reservoir Lake Varves

- 100 cm of sediment deposited over 70 years
- darker layers contain higher, but not dangerous, levels of metals





# River Sondes

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- Sondes installed in the river for flow rate, turbidity, pH, specific conductance, & temperature
- Real-time sonde data published on USGS website  
<https://www.usgs.gov/centers/nm-water>
- Sondes provide important data during high-flow events and spills





# Truck hauling Gold King Mine sludge crashes into Cement Creek

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Jonathan Romeo, The Durango Herald, July 9, 2018 (Used with permission.)

<https://durangoherald.com/articles/230969-truck-hauling-gold-king-mine-sludge-crashes-into-cement-creek#>





# Decision to haul Gold King Mine sludge raises questions



Critics fear move will impact upper Animas River aquatic life

Jonathan Romeo, The Durango Herald, July 10, 2018 (Used with permission.)

<https://durangoherald.com/articles/231033-decision-to-haul-gold-king-mine-sludge-raises-questions>



**Gladstone mine water treatment plant**



**Kittimac tailings site**

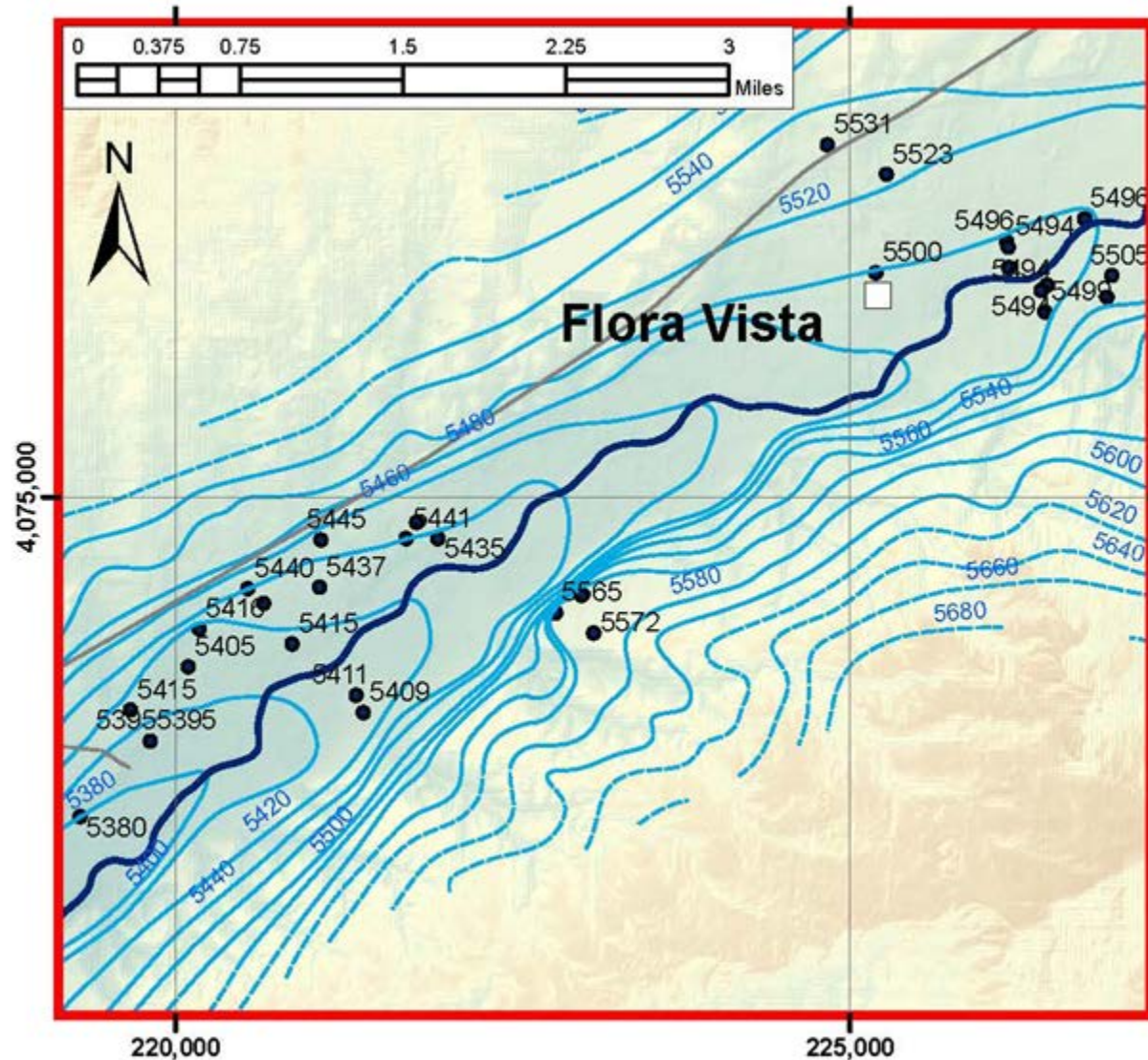


# Animas Alluvial Aquifer Characterization



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- The river and groundwater are hydraulically connected.
- Irrigation water recharges groundwater during growing season.
- Groundwater mostly flows downstream to the southwest, and discharges into the river.
- During winter, however, lower groundwater levels near Cedar Hill and Inca allow river water to seep into groundwater.
- Wells within 300 feet of the Animas River near Cedar Hill and Inca may be vulnerable to spills into the river during winter.







# Animas and San Juan Exposure and Risk Dashboard

(Updated May 19, 2017)

<https://www.env.nm.gov/wp-content/uploads/2016/01/Animas-San-Juan-Risk-Dashboard.pdf>

Potential Exposure Pathway	Risk Level	Explanation
Public Drinking Water Supplies	Safe	Public drinking water supplies are subject to multiple protective requirements of the federal Safe Drinking Water Act (SDWA) and, with one exception, are presently safe for all uses. These requirements include: infrastructure construction standards; solids settling and treatment; disinfection; treated water testing; and New Mexico Environment Department (NMED) inspections. The Harvest Gold water system remains on a boil water advisory for reasons unrelated to the GKM spill. For more information on public drinking water systems, please visit the <a href="#">Drinking Water Watch website</a> .
Private Domestic Wells	Use Caution	Private domestic wells are not subject to the protective requirements of the federal SDWA. Many private wells were not constructed in a sanitary manner or have deteriorated as the well has aged. These wells are at risk of contamination by bacteria, parasites, or viruses. See <a href="#">Fact Sheet on disinfecting a domestic well with shock chlorination</a> . High levels of manganese, iron, sulfate, and total dissolved solids existed in some wells prior to the Gold King Mine (GKM) spill. Elevated lead has been detected in private water systems that have galvanized steel plumbing components or lead solder. Following the GKM spill NMED tested more than 600 private domestic water wells in San Juan County, NM. There is no evidence that the GKM spill contaminated any water wells in New Mexico. NMED and the N.M. Bureau of Geology continue to monitor private domestic wells for evidence of mining and milling contamination.
River Water for Domestic Supply	Unsafe	Untreated river water should never be used for domestic supply, even if there are not visible signs of contamination. When untreated water is consumed from surface sources there is a risk of ingesting harmful bacteria, parasites, or viruses. Untreated river water also may contain high levels of lead and arsenic when spring runoff or storm events stir up contaminated river sediments.
Water Hauling	Use Caution	If you haul water for drinking and cooking, it is recommended that you use commercial bottled water, or obtain water from a public water supply system. Hauling untreated water from a ditch, river, lake, spring or private well is not recommended. See <a href="#">Fact Sheet on safe water hauling practices</a> .

Safe	Use Caution	Unsafe
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# Animas and San Juan Exposure and Risk Dashboard

River Water for Irrigation	Safe	River water presently complies with all standards for irrigated agriculture, and should be safe for irrigation of all crops. See the <a href="#">Fact Sheet on agricultural uses of water</a> .
Crops	Safe	Preliminary testing of crops by New Mexico State University shows safe levels of heavy metals. Crops will continue be tested during the 2017 growing season to monitor safety for consumption by humans and livestock.
River Water for Livestock	Safe	River water presently complies with all standards for livestock watering. See the <a href="#">Fact Sheet on agricultural uses of water</a> .
Livestock	Safe	The New Mexico State Veterinarian, New Mexico Department of Agriculture Veterinary Diagnostic Laboratory, and local veterinarians are on the alert for any signs of unusual animal distress or illness that could result from the GKM spill or other mining and milling contamination.
River and Ditch Sediment	Use Caution	NMED is monitoring sediment contamination in New Mexico to identify any hot spots that exceed residential risk screening levels for lead and other metals. The residents of San Juan County can be the eyes and ears for NMED in the field. Anyone who sees discolored or contaminated soil should notify NMED immediately by calling 1-800-219-6157. If you are comfortable doing so, you may pick up a <a href="#">sampling kit</a> from the NMED Farmington Office located at 3400 Messina Dr. (505) 566-9741 to safely collect a sediment sample that will be tested by NMED.
Fish	Safe	Fish tissue testing by the New Mexico Department of Game and Fish has not identified any heavy metal contamination attributable to the GKM spill. Elevated mercury and DDT were known to exist in fish tissue from some water bodies in San Juan County long before the GKM spill. Mercury is believed to originate largely from the burning of coal. DDT was banned as an insecticide in the United States in 1972, but is persistent in the environment. The "Quality Waters" of the San Juan River below Navajo Lake are located upstream from the confluence with the Animas River and were not affected by the GKM spill or by other mining and milling waste discharges into the Animas River. NMED has issued <a href="#">Fish Consumption Advisories</a> for mercury and PCBs in Lake Farmington, and for mercury in Navajo Reservoir.
Recreational Activities	Use Caution	Mining and milling contaminants do not presently pose hazards to people enjoying water sports, fishing and other recreational activities in and near the Animas and San Juan Rivers in New Mexico. However, both rivers may contain bacteria, parasites, or viruses which could pose a health hazard to people who come into contact with river water. It is recommended that people wash thoroughly after going in the river and avoid swallowing river water when swimming or doing water sports.

Safe	Use Caution	Unsafe
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# Panel Discussion on Making the Community Whole Again

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# Bonita Peak Superfund Site

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- **NMED supports Bonita Peak Mining District Superfund investigation and cleanup, while demanding that EPA:**
  1. **Use sound science;**
  2. **Be honest with the public; and**
  3. **Treat residents downstream from Colorado as stakeholders throughout the Superfund process.**
- **NMED is participating in the Biological Technical Assistance Group**



# Gold King Mine Spill Litigation

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- **The Federal District Court combined the State of New Mexico and the Navajo Nation lawsuits**
- **Awaiting rulings from the District Court on Defendants' Motions to Dismiss - timeline unknown**

