

# Animas, San Juan Spring Runoff Preparedness Plan

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Navajo Nation  
Environmental Protection Agency



San Juan Soil and Water  
Conservation District (NM)



COLORADO  
Division of Homeland Security  
& Emergency Management  
Department of Public Safety



## **Introduction**

On August 5, 2015, a U.S. Environmental Protection Agency (EPA) work crew digging into the Gold King Mine (GKM) Level 7 adit near Gladstone, Colorado, triggered a blowout and ongoing discharge of impounded mine water. The EPA reported that more than 3 million gallons of acidic mine water containing sediment, heavy metals, and other chemicals 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. EPA also estimated that more than 400,000 Kg of metals entered the Animas River as a result of the GKM discharge.

Metals are accumulated and stored in streambed sediments during low flow, and these metals can be released into the water column in both dissolved and suspended phases during periods of high flow. EPA monitoring data collected since August 5, 2015 show that concentrations of dissolved and total metals in the Animas and San Juan Rivers increase to levels of concern during high streamflow caused by monsoonal storm events. Monitoring by the City of Farmington has correlated increases in turbidity with increases in total lead in the Animas River. These increases of total metal concentrations in river water are not a violation of EPA National Primary Drinking Water Regulations, but are of concern to the public water systems that use rivers as a water source. These public water systems must ensure that their treatment infrastructure produces drinking water in compliance with the National Primary Drinking Water Regulations, and there is concern about the potential accumulation of metals in treatment infrastructure. The increase of metals in river water also is of concern to irrigators and others who use the river as a source of water supply. In addition to public drinking-water systems, the Animas and San Juan Rivers are used for private domestic water supply and for irrigation.

Spring 2016 will be the first snowmelt runoff season in the Animas and San Juan watersheds after the GKM spill. In addition to public health and safety hazards that typically occur in flood events, there is the additional concern about heavy metal contamination in the watershed.

## **Preparedness Plan**

A consortium of state, tribal, county, municipal and federal agencies, whose logos appear on the first page of this document above, are working together to put the following actions and contingencies into place.

On September 7, 2015, the EPA issued a [GKM Stakeholders Alert and Notification Plan](#). The collaborating agencies will work with EPA and other stakeholders to suggest updates and modifications to EPA's notification plan.

**Emergency Operations and Incident Command** – The collaborating agencies will activate their emergency operations and command structures as they deem necessary. State, tribal, county and municipal law enforcement, fire, EMT, river rescue teams, and personnel who may be called upon to protect public safety during flooding situations, will be provided with a copy of this preparedness plan along with the opportunity to ask questions. To the greatest extent possible, regulatory and scientific agencies will provide technical expertise and resources to the emergency response agencies.

### **Continuous River Monitoring for Turbidity, Conductance, and pH**

The City of Farmington, NM has already deployed sondes at each of their two pump stations that divert river water for treatment and drinking-water supply. The states of Colorado, New Mexico, and Utah have partnered with the U.S. Geological Survey (USGS) water science centers in each respective state to develop a proposal to deploy a network of continuous river monitoring equipment or multi-parameter sondes at the following existing USGS Gaging Stations that are also shown in Figure 1:

- Cement Creek at Silverton, CO (09358550)
- Animas River below Silverton, CO (09359020)
- Animas River at Durango, CO (09361500)
- Animas River near Cedar Hill, NM (09363500)
- Animas River below Aztec, NM (09364010)
- San Juan River at Farmington, NM (09365000)
- San Juan at Shiprock, NM (09368000)
- San Juan at Four Corners, CO (09371010)
- San Juan near Bluff, UT (09379500)

The sondes will measure turbidity, specific conductance, pH and temperature. The collaborating parties will work to develop a communication system capable of making monitoring data from the sondes available to regulatory agencies, public water systems, irrigators, and other water users. The monitoring data can be used to inform any decisions on continued use and treatment of river water.

USGS will make provisional data from the sondes, along with stream flow data from those locations, available on the USGS WaterWatch website <http://waterwatch.usgs.gov/index.php>. The WaterWatch website allows users to access real-time USGS monitoring data and to create graphs. The WaterWatch website also allows users to self-subscribe for email and/or text alerts when monitoring parameters exceed values specified by the subscriber.

The Southern Ute Indian Tribe (SUIT) has deployed three continuous reading sondes on the Animas River within the exterior boundaries of the Reservation. The sondes measure pH, dissolved oxygen, temperature, and specific conductance in 30 minute increments. The sondes

are not linked to a real time reporting mechanism, but the data will be uploaded weekly to the tribe's water quality program website <https://www.southernute-nsn.gov/environmental-programs/water-quality/>. The sonde sites (numbered in river miles from the New Mexico Border north) under evaluation are:

AR17-2: Near the northern border of the Reservation below the City of Durango

AR 7-2: Below Basin Creek and above the Weaselskin Bridge

AR2-7: Southern border of the Reservation, below the Florida River confluence with the Animas.

**Figure 1. Map of Sonde Locations.**



### **Surface Water Quality Sampling**

USGS will perform integrated river water sampling at beginning, peak and recession of spring snowmelt at the Animas near Cedar Hill, Animas below Aztec, San Juan at Farmington, San Juan at Shiprock, San Juan at Four Corners and San Juan at Bluff sonde locations, and the Colorado Department of Public Health and Environment (CDPHE) will perform the same analysis or will have contracts with local public health agencies to have the same analysis completed at the sonde locations north of the Cedar Hill station. Samples will be analyzed for dissolved and total metals, and for general chemistry. USGS also will install an automated water

sampling device at the Animas below Aztec gage to collect samples for total metals and general chemistry. Samples will be analyzed by the USGS laboratory and made available to the public on the USGS website after their quality assurance and control procedures are complete. The N.M. Environment Department (NMED) and the Cities of Farmington, NM, and Durango, CO, also will continue to collect river water samples for analysis of dissolved and total metals based on existing sampling schedules and during periods of high turbidity.

The SUIT will collect surface water and sediment samples at the three sonde locations on the Reservation. The surface water samples will be assessed for 25 total and dissolved metals and major cations. The sediment samples will be analyzed for 8 total metals. All analysis will be performed by a private, EPA accredited laboratory in Colorado. The analyte list and lab analyses follows an EPA-approved Sampling and Analysis Plan. These data will be available via the Tribe's Water Quality Website and shared directly with partnering agencies and the general public. The water quality and sediment sites (numbered in river miles from the New Mexico Border north) under evaluation are:

AR17-2: Near the northern border of the Reservation below the City of Durango

AR 7-2: Below Basin Creek and above the Weaselskin Bridge

AR2-7: Southern border of the Reservation, below the Florida River confluence with the Animas.

New Mexico and the City of Farmington will continue to evaluate the relationships between turbidity and dissolved and total metals. These relationships will be communicated to water users to help inform any decisions water users may make on continued use and treatment of river water. New Mexico Department of Health (NMDOH) and NMED are drafting a fact sheet for persons who haul water from the rivers or irrigation ditches for domestic supply. This fact sheet will be distributed to collaborating agencies and the public.

In Utah, UDEQ will collect weekly water quality samples from four sites. UDEQ will collect water quality samples (total and dissolve metals and major anions and cations) weekly during spring runoff at the following San Juan River monitoring locations:

- MLID 4953000: the San Juan River at Mexican Hat, Utah (hereafter referred to as SJR Mexican Hat site)
- MLID 4953250: the San Juan River at Sand Island located near the town of Bluff, Utah (hereafter referred to as SJR Bluff site)
- MLID 4953390: the San Juan River in Montezuma, Utah (hereafter referred to as SJR Montezuma)
- MLID 4954000: the highway 160 bridge crossing the San Juan River in Colorado (hereafter referred to as SJR Stateline site)

UDEQ has planned for 10 weeks of sampling to ensure that the peak of the spring runoff period is captured and to provide sufficient data to develop site-specific relationships between parameters monitored continuously (e.g., turbidity, pH, and specific conductance) and dissolved and total metals in the water column.

In Colorado, CDPHE will collect weekly water chemistry and sediment grab samples corresponding to the rise, peak and fall of spring runoff from one site on Cement Creek and 3 sites on the Animas River to analyze for dissolved and total metals, plus additional parameters in CDPHE's routine water chemistry panel. Samples will be analyzed by CDPHE. The water quality grab samples will be collected at the following sites proximate to existing USGS Gages:

- WQCD CEM49 – Cement Creek at mouth
- WQCD 82 – Animas River near Silverton
- WQCD 81 – Animas River at Baker's Bridge
- WQCD 9423A – Animas River at 9<sup>th</sup> Street Bridge in Durango

When threshold exceedance notifications occur at the USGS gages on Cement Creek or the Animas River, within Colorado, local monitoring participants will use handheld, multi-parameter sondes to confirm threshold exceedances. Additionally, water chemistry and sediment grab samples will be collected during the onsite verification. Samples will be analyzed by CDPHE. In addition, CDPHE will work with USGS to develop a sampling protocol necessary to develop a relationship between the real-time parameters and dissolved and total metals. Colorado will be using a methodology delineated as a Watershed Adaptive Response Management (WARM) methodology in determining trigger levels and adjusting or adapting the methodology as river conditions change and as data indicates changes are necessary.

**Lake Powell Sediment Monitoring** – To evaluate the current pollutant loading via sediment transport to Lake Powell, UDEQ plans to contract with USGS to deploy sediment traps in the San Juan River delta of Lake Powell. The USGS deployed sediment traps soon after the GKM release (Figure 2) and these sediments are currently being analyzed for metals. The metal concentrations will be used to evaluate the concentrations of metals in sediments that are being deposited into Lake Powell. The data will be compared to metal concentrations in San Juan River sediments further upstream and in historic core data from Lake Powell.



**Figure 2. Sediment trap deployed in San Juan River Delta August - September, 2015**

## **Drinking-Water Monitoring and Sharing**

The collaborating agencies continue to work closely with public water supply systems to ensure that treated drinking water provided to consumers complies with all of the National Primary Drinking Water Standards. Multiple levels of protection have been put in place to prevent contaminants in the river water from occurring in treated drinking water at concentrations exceeding drinking water standards.

Water sharing infrastructure and agreements, as were developed during the August 2015 spill event, remain in place if needed to ensure that some of the smaller systems do not run out of water in the event that river intakes are closed due to high levels of metals.

## **Aquifer and Water-Well Monitoring**

The N.M. Bureau of Geology (NMBG) has already performed water seasonal water-table mapping, and sampling of private domestic wells that may be influenced by surface water, in August 2015 and in January 2016. Water samples are analyzed by the NMBG laboratory for metals, general chemistry and stable isotopes. NMBG also has installed continuous water-level recorders at several locations in the Animas River alluvial aquifer. NMBG will repeat the water-table mapping and water-well testing during the period of snowmelt runoff. The monitoring data will be reviewed to identify any possible changes in hydraulic relationships between the aquifer and river and in well water chemistry. If any wells are suspected of having been influenced by surface water, NMED and NMBG will advise and counsel the well users.

San Juan Basin Health Department will perform periodic sampling of private domestic wells within Colorado that may be influenced by surface water in collaboration with CDPHE. Water samples will be analyzed for metals, bacteria, nitrate/nitrite and basic chemistry. SJBH and CDPHE will provide guidance to well users based on the results of this sampling.

In January 2016, the SUII initiated a well monitoring program for tribal members on the Reservation within close proximity to the Animas River. The Tribe will collect well samples quarterly and deliver the samples to a private, EPA-accredited lab for analysis of 28 metals and cations.

**Flooding of Residential Areas** – In the event that residential areas are flooded, first responders will follow standard procedures to protect public safety and property. If private domestic wells become inundated by flood water or show evidence of surface-water contamination, the collaborating agencies will advise the residents of emergency water well disinfection procedures. The collaborating agencies also may provide free testing of inundated wells for both E coli (after disinfection is completed) and for total metals. The collaborating agencies will notify well owners of any high test results for metals and will follow up with homeowners on options to resolve the issue.

**Storage and Disposal of Potentially Contaminated Flood Sediment** – Within areas under State or tribal jurisdiction, the relevant environmental agencies will work with communities that are at risk of flooding to identify locations where potentially contaminated flood sediment can be stored and properly disposed. Testing protocol and criteria will be developed to determine the appropriate method of disposal.

**Pre-Runoff Training for Partners and Stakeholders** – The collaborating states and tribes will host one or more training sessions, as necessary to inform first responders, water users and other stakeholders of the provisions of this preparedness plan. Training on how to use the USGS WaterWatch website also will be offered. A NMED training presentation on Health and Safety during flood-response operations has been made available to the collaborating agencies.

### **Public Notification and Communication**

**Reverse 911** – The collaborating emergency response agencies have drafted reverse 911 messages for various situations that may arise, including closure of river areas due to dangerously high water, and flooding of residential areas. The agencies will discuss what specific observations or events might be used to trigger the issuance of a reverse 911 notification, and will discuss the need to develop additional messages for situations that may arise.

**San Juan County (NM) AG Alert** – This system was created by NM State University to communicate with farmers and ranchers in the area, and sends out telephone messages similar to a reverse 911 system. During spring runoff, the AG Alert system will be used to advise the agricultural community of the quality of river water and compliance with NM Water Quality Control Commission stream standards for irrigation and livestock watering.

**Fact Sheets** – Some of the collaborating agencies have developed fact sheets on potential hazards from flooding that are available to other collaborating agencies, to emergency responders and to the public as needed.