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BEFORE THE
SCIENCE, SPACE, AND TECHNOLOGY COMMITTEE
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Good morning Chairman Smith, Ranking Member Johnson, and Members of the Committee. I am Mathy Stanislaus, Assistant Administrator for the U.S. Environmental Protection Agency's (EPA) Office of Solid Waste and Emergency Response (OSWER) that is responsible for the EPA cleanup and emergency response program. Thank you for the opportunity to appear today to discuss the Gold King Mine release and subsequent EPA response.

As EPA Administrator McCarthy has said, this was a tragic and unfortunate incident, and the EPA has taken responsibility to ensure that it is cleaned up appropriately. The EPA's core mission is to ensure a clean environment and protect public health, and we are dedicated to continuing to do our job to protect the environment and to hold ourselves to the same high standard we demand from others. The EPA is committed to working closely with response agencies and state, local and tribal officials to ensure the safety of citizens, respond to concerns, and to evaluate impacts to the environment.

Background

There are an estimated 23,000 former mines located in the state of Colorado. Of these mines, 6,127 have been addressed by the Colorado Division of Reclamation, Mining and Safety (DRMS). To help address the legacy of hardrock mining across the country, the Administration

has proposed in the FY 2016 and prior budgets to create an Abandoned Mines Lands (AML) Program for hardrock mines. The program would be funded through a new AML fee which would hold the hardrock mining industry responsible for the remediation of abandoned hardrock mines, just as the coal mining industry pays to reclaim abandoned coal mines.

Located within watersheds of the San Juan Mountains in southwestern Colorado are some 400 abandoned and inactive mines which have been the focus of both large and small scale mining operations between 1871 and 1991. The Gold King Mine is located in the Upper Animas Watershed which consists of three main streams, the Animas River, Cement Creek and Mineral Creek all of which drain the Silverton Caldera. The Animas River and many of its tributaries have historically received high concentrations of heavy metals from both acid rock/mine drainage at mine sites and from naturally occurring metal loading sources not affected by mining.

Water draining from these mines occurs when mining operations in the mountainsides alter the hydrology of the area and combine with natural springs, pulling water into mine tunnels. The water reacts with iron disulfide (pyrite) and oxygen to form sulfuric acid (acid rock/mine drainage). The resulting acidic water dissolves naturally occurring heavy metals such as zinc, lead, cadmium, copper and aluminum and results in water containing these metals flowing out of the mine adits (openings used for access or drainage).

When mining operations in the Upper Animas Watershed ceased, many of the mines were left discharging contaminated water into streams and rivers. In 1991, the last big mine in the region, the Sunnyside, stopped mining. Its owner, Sunnyside Gold Corp., proposed to install 3 bulkheads (mine plug) in the American Tunnel that drained its mine and the Colorado Mined Land

Reclamation Board approved a permit to allow the plugging. In 1996, Sunnyside reached a settlement agreement with the Colorado Water Quality Control Division to clean up abandoned mines nearby, while continuing to treat the metal-laden waters draining into upper Cement Creek through a water treatment facility. In 2002, Sunnyside and the Water Quality Control Division agreed to amend the settlement agreement to allow Sunnyside to turn over its water treatment operations to Gold King Mining Corporation. After Sunnyside installed the bulkheads in the American Tunnel, water flow out of the Gold King and Red and Bonita Mines increased substantially. Initially, the water from these mines, Upper Cement Creek, and the American Tunnel were run through the treatment plant that Sunnyside built, but after Gold King experienced a number of technical and financial issues, the treatment plant stopped operating in mid-2004.

The Colorado DRMS took action to address mine drainage into water resources in the Upper Animas by issuing a permit in 1986 for work on the Gold King mine adits. In 2008, the state continued its effort by constructing a discharge diversion structure (flume channel) to prevent additional water from pooling behind Gold King adit blockages and by developing a Gold King Mine Reclamation Plan in 2009 to address increased water pressure within the Gold King workings. Based upon 2009 – 2014 flow data, the average annual water discharge from the Gold King Mine and three nearby mines (Mogul, Red and Bonita, and American Tunnel) reached approximately 330 million gallons per year. By 2014, the EPA was working with the state of Colorado to take action at the Gold King Mine to address both the potential for a catastrophic release and the ongoing adverse water quality impacts caused by the significant mine discharges into the Upper Animas Watershed. Working with DRMS and the Animas River Stakeholder Group, the EPA planned to take action to reduce potential mine pool water pressure and reduce

increased mine discharges into Cement Creek and downstream waters by addressing the Gold King Mine adit blockages.

Regarding prior Superfund program activity, the EPA and the Colorado Department of Public Health and Environment (CDPHE) conducted a Superfund Site Assessment of the area in the 1990s. The assessment showed that water quality standards were not achieved in the Animas River near Silverton and identified the severe impacts to aquatic life in the Upper Animas and its tributaries from naturally occurring and mining-related heavy metals. In recognition of a community-based collaborative effort, the EPA agreed to postpone adding all or a portion of the site to the Superfund National Priorities List (NPL), as long as progress was being made to improve the water quality of the Animas River.

Until approximately 2005, water quality in the Animas River was improving. However, since the water treatment plant ceased operations, water quality in the Animas River has not improved, and for at least 20 miles below the confluence with Cement Creek, the water quality has declined significantly. Impacts to aquatic life were also demonstrated by fish population surveys conducted by Colorado Parks and Wildlife, which found no fish in the Animas River below Cement Creek for approximately two miles and observed precipitous declines in fish populations as far as 20 miles downstream since 2005.

Because of this declining water quality in the Animas River, in 2008, EPA's Superfund Site Assessment program, working with the state of Colorado, began investigations in Upper Cement Creek focused on evaluating whether the Upper Cement Creek area alone would qualify for inclusion on the NPL. This evaluation indicated that the area would likely qualify, although after receiving additional community input, the EPA deferred efforts to include the area on the NPL.

Since that time, the EPA, working with the state of Colorado, has continued and broadened its investigations of conditions at the site in order to understand the major sources of heavy metal contamination in the Upper Animas Watershed.

EPA Activities and Response at Gold King Mine

On August 5, 2015, the EPA was conducting an investigation of the Gold King Mine near Silverton, Colorado. Work was underway to dewater the mine pool to allow reopening of an adit to assess mine conditions to characterize ongoing mine discharges and determine appropriate mine mitigation measures. While excavating above an old adit, or mine opening, the lower portion of the bedrock crumbled and pressurized water began leaking above the mine tunnel. The leak quickly turned into a breach releasing approximately three million gallons of water stored behind the collapsed material into Cement Creek, a tributary of the Animas River. EPA and Colorado officials informed downstream jurisdictions within Colorado the day of the event and before the plume reached drinking water intakes and irrigation diversions. The following day, other downstream jurisdictions were notified, again, before the plume reached drinking water intakes and irrigation diversions.

The EPA deployed federal On-Scene Coordinators and other technical staff within 24 hours to Silverton and Durango Colorado, Farmington, New Mexico and the Navajo Nation to assist with preparations and first response activities in these jurisdictions. The agency continues to share information as quickly as possible with the states, tribes, and local communities as experts continue to work to analyze the impact of the release from the mine.

The agency activated its Emergency Operations Center in Washington D.C. and established a Unified Command Center in Durango, Colorado to help ensure coordination among its regions, laboratories and national program offices. The EPA has closely coordinated with our federal partners and with officials in Colorado, New Mexico, Utah, the Southern Ute and Ute Mountain Ute tribes and the Navajo Nation. The EPA response actions helped contain the leak, and flow from the mine is now controlled and being treated in a series of treatment ponds. Following the August 5 release, EPA and Colorado field staff and officials, notified state, local, and tribal officials prior to the contaminated plume reaching downstream water system intakes and irrigation water intakes.

One of the initial lessons learned in the aftermath of the Gold King Mine release is that the EPA can improve its communications regarding releases and other environmental events that may affect multiple jurisdictions. To support response related notifications and communications between the EPA and our state, tribal and local partners, I have issued guidance to Regional Response Teams (RRTs) to strengthen their Regional Contingency Plans, particularly regarding the need to alert and coordinate with responders in downstream alerts. I will ask RRTs to conduct an exercise that tests these strengthened alert mechanisms. I am also providing guidance to the Emergency Operations Center in EPA Headquarters and the ten Regional Operations Centers to improve information sharing with one another so that they can coordinate alerts as needed to downstream communities. Although this effort may result in some level of redundancy with existing state, tribal, and local notification mechanisms, we believe that receiving multiple notices is preferable to receiving late notification.

Following the August 5 release, the EPA opened a Unified Command Center in Durango, Colorado and an Incident Command in Farmington, New Mexico. At the height of the response, EPA employee and contractor supported exceeded 200 personnel. There are more than 20 different federal, state, and local agencies involved in the response working to help ensure the health and safety of the public.

As part of the response efforts, water quality samples were collected throughout the water system from multiple locations in Colorado and New Mexico to the Navajo Nation at daily intervals beginning on August 6, 2015[1]. Sediment sampling began on August 11, 2015. Surface water samples taken prior to the plume's arrival were used to establish a baseline for water quality comparisons. Each surface water sample was analyzed for 24 metals, including arsenic, cadmium, lead and mercury. Surface water samples were collected on August 6, 2015, at two (2) locations prior to arrival of the plume along the Animas and San Juan Rivers in New Mexico.

As of September 6, 2015, the EPA has collected 961 surface water samples and 689 sediment samples. The EPA has also tested private domestic drinking water wells from along the rivers in both Colorado and New Mexico, and as of September 6, the EPA has collected a total of 651 private drinking water well samples. Drinking water well data is being provided directly to the well owner.

The EPA has treated mine water in a series of settling ponds constructed near the portal. The treatment has been effective, and we are reducing the acidity of the water with the addition of lime and sodium hydroxide solution to facilitate sedimentation of the metals in the ponds.

[1] See: http://www2.epa.gov/goldkingmine/data-gold-king-mine-response

Flocculant agents (used in water treatment processes to improve the sedimentation or filterability of small particles) have been added to increase the amount of sedimentation.

Sampling data taken since the event indicates that metals and other constituents in water resources and sediment are returning to pre-event conditions. Based upon the comparison of pre-event data with data collected over the third and fourth weeks of August, the pre-event sampling data show that concentrations for all 24 metals in surface water have trended to pre-event conditions. Based upon the sediment sampling results, sediment sample concentrations are trending toward pre-event conditions as well.

Results consistent with this sampling data set have been utilized by jurisdictions along the Animas and San Juan Rivers to lift water use restrictions for irrigation, livestock watering, and recreational purposes. On August 14, the state of New Mexico lifted restrictions on the use of private water wells and the next day lifted restrictions on San Juan County's drinking water system supplied by the Animas and San Juan Rivers. And on August 14, the city of Durango, Colorado resumed the use of Animas River water for its drinking water system. In addition, sampling data reviewed by the Agency for Toxic Substances and Disease Registry (ATSDR) and the EPA indicate no anticipated adverse health impacts from metals detected in river water. Further, federal, and state fish and wildlife agencies have reported no fish kills or other wildlife impacts along the Animas River. The EPA will continue to work with our federal, state and tribal partners to evaluate potential longer-term ecological impacts in the aftermath of the release.

Specifically for the Navajo Nation, the EPA's conclusions that water and sediment are returning to pre-event conditions are based upon August 24 sampling data results on comparisons of San Juan River water and sediment data to EPA and Navajo EPA standards. Concentrations of iron

and other metals in San Juan River water in the Navajo Nation peaked during the week of August 10 as the mine release moved through the Navajo Nation, but have since trended to pre-release conditions. During the time period of water restrictions, the EPA has provided the Navajo Nation a total of 418,000 gallons of water for livestock and agriculture. The Navajo Nation President Russell Begaye has given the directive to open the Fruitland Irrigation canal, which delivers water from the San Juan River for irrigation to three Navajo chapters.

Agency Inquiry and Public Information Efforts

One of our foremost priorities during the response has been to collect and publicly release information to help ensure the health and safety of affected communities. Numerous status reports, sampling results, and documents have been posted on the agency's Gold King Mine website. The EPA has released documents to the public including the Gold King Mine work plan, the Site Health and Safety Plan, and the EPA Task Order on August 21, 2015. Additional documents were released on August 27 including the contractor's Draft Technical Memo of the August 5 release, including photographs, an EPA On-Scene Coordinator's description of the events depicted in the photographs, and an EPA phone duty officer's memorandum to the file about the incident and certain subsequent events. On August 28, the EPA released documents related to legal agreements, grant funding, contract work, and response summary from a Colorado employee on Gold King Mine. And on August 31, the EPA released documents related to a previous agency package for the Upper Animas Mining District Superfund National Priorities Listing as well as additional photographs of response efforts.

In the aftermath of the Gold King Mine release, the EPA initiated an internal review of the incident. On August 26, 2015, EPA released its Internal Review Summary Report which includes

an assessment of the events and potential factors contributing to the Gold King Mine incident. The Internal Review Team of EPA scientists and engineers conducted a one-week rapid assessment of the Gold King Mine release. To get the facts, the Internal Review Team conducted a site visit, several interviews, and reviewed pertinent documents. Their aim was to quickly assess what occurred and provide conclusions and recommendations so that the agency can learn from this experience and take any necessary actions to address safety at similar sites across the country.

The Internal Review Summary Report lists a number of key findings about the release that occurred on August 5, 2015. The Review Team concluded that the EPA group responsible for excavating the mine collected and analyzed flow data, inspected the site, and became familiar with its topography prior to starting field work. The EPA and the Colorado Division of Reclamation, Mining, and Safety also held public meetings to present their work plans. To the best of the Review Team's knowledge, no informed parties raised concerns about these plans.

The Review Team found that experienced professionals from the EPA and Colorado DRMS concluded that there was likely no or low mine water pressure. This determination was based on several factors, including observing water draining at the site, inspecting for seeps, lower adits at the Red and Bonita Mine were found to be unpressurized, and input from state experts that similar methods had been used at similar mine sites in Colorado. Experts with the state of Colorado supported the investigation and were in the field during the Gold King Mine investigation on August 4 and 5.

However, given the release, there was, in fact, high enough water pressure to cause a blowout. The Summary Report concludes that an underestimation of water pressure inside the mine

workings was likely the most significant factor related to the release. The Report indicates that site conditions made it difficult to undertake drilling to determine pressure within the mine. For example, the slope was steep and unstable, and the underlying bedrock was prone to cave-ins. The Summary Report concludes that such an attempt would have been "very challenging" and suggests that such an attempt may or may not have been successful in ascertaining mine water levels or pressure. Thus, the experts on the ground faced a situation where a difficult "technically challenging", "costly" effort requiring "multiple field seasons to accomplish" could in the end have been unsuccessful and unsafe.

In addition**,** to further the EPA and public understanding of the events leading up to and including the Gold King Mine release, the EPA announced on August 18 that the U.S. Department of the Interior (DOI) is leading an independent assessment of the factors that led to the Gold King Mine release. This DOI-led review will seek to provide the EPA with an independent analysis of the incident that took place at Gold King Mine, including the contributing causes. The assessment began on August 18, and DOI plans to deliver the assessment report to the EPA and the public before the end of October 2015.

Finally, while inquiries are conducted and response efforts continue, all EPA regional offices were directed to cease field investigation work at a number of other mines, including tailings facilities. While the EPA stops work on existing field investigations and assessments at other mining sites, the EPA also has instructed its regional offices to identify existing sites with similarities to the Gold King Mine site, to identify any potential immediate risks and to consider appropriate response actions.

Conclusion

The EPA is an agency whose core mission is ensuring a clean environment and protecting public health. We will continue working with our state, tribal, and local partners in responding to the tragic and unfortunate release from the Gold King Mine. The EPA is taking responsibility to ensure that it is cleaned up appropriately. We are committed to helping the people throughout the Four Corners Region who rely on the affected rivers for their drinking water, irrigation water and recreation. We know how important it is to them. The EPA is committed to finding out the causes of the release and taking the steps necessary to help ensure that nothing like this release happens again.