U.S. ENVIRONMENTAL PROTECTION AGENCY

OFFICE OF INSPECTOR GENERAL

Cleaning Up Communities

Gold King Mine Release: Inspector General Response to Congressional Requests

Report No. 17-P-0250 **June 12, 2017**

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Abbreviations

CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
DRMS	Colorado Division of Reclamation Mining and Safety
EPA	U.S. Environmental Protection Agency
ERRS	Emergency and Rapid Response Service
OIG	Office of Inspector General
OSC	On-Scene Coordinator
START	Superfund Technical Assessment and Response Team
U.S.C.	United States Code

Cover photo: An image of the Gold King Mine site after the release of mine water on August 5, 2015. (EPA photo)

U.S. Environmental Protection Agency
Office of Inspector General

17-P-0250
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At a Glance

Why We Did This Review

The U.S. Environmental Protection Agency's (EPA's) Office of Inspector General (OIG) conducted this review in response to two congressional requests to examine the cause of, and the EPA's response to, the August 5, 2015, release of mine water from the Gold King Mine near Silverton, Colorado.

On August 5, 2015, the EPA was conducting an investigation and assessment of the mine, which included excavation work. During the excavation, collapsed mine material gave way, opening the mine portal and releasing an estimated 3 million gallons of water into Cement Creek. The creek flows into the Animas River—a source of drinking water and recreation.

In this report, the OIG addresses the issues raised regarding the EPA's mine site work leading up to the release, and the agency's notification actions following the release.

This report addresses the following EPA goal or cross-agency strategy:

- *Cleaning up communities and advancing sustainable development.*

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Gold King Mine Release: Inspector General Response to Congressional Requests

What We Found

Brief compilations of our findings related to the Gold King Mine release are summarized below.

Since causing the uncontrolled release of 3 million gallons of contaminated mine water, the EPA has taken steps to improve notification to water consumers, and to minimize the possibility of similar incidents at other mine sites.

- **EPA work being done, the cause of the release, and EPA expertise**—The EPA was conducting a removal evaluation to find solutions to ongoing mine water drainage. The August 5, 2015, release of mine water was caused by the EPA's excavation activities. The EPA's on-scene coordinators had over 50 years of combined experience as on-scene coordinators. They also directed an experienced contractor crew. The EPA had identified concerns about the water level and the potential blow-out of the blockage, had worked with experts to plan the evaluation work, and was still early in the process of conducting an evaluation of site conditions when the release happened.

- **EPA criteria for approving a contractor and agency staff**—The criteria that the EPA used to approve (hire) a contractor would not apply to agency staff.

- **EPA policy on indemnification of contractors**—The EPA has guidance for providing indemnification for negligence at certain sites, but it does not apply here because no indemnification was offered in the contract solicitation, and the Emergency and Rapid Response Service contract between the EPA and Environmental Restoration LLC does not contain any indemnification provisions. As such, no impediments or obstacles with the standard of care taken during the response activities have been identified.

- **Independence of the Bureau of Reclamation, and the basis for material differences between the bureau's report and other EPA or OIG information or reports**—The bureau's review was conducted independently of the EPA. The bureau's report gave the impression that the EPA was intentionally opening the mine the day of the release. We found that the EPA had no plan to open the mine on August 5, 2015.

- **EPA legal requirements and policies for notification actions**—The EPA followed legal requirements, and current policies and guidelines in reporting the release. We found no delays in required EPA notifications.

- **Additional policies to safeguard against future releases**—The OIG did not identify any additional policies or safeguards beyond the actions the EPA has already taken. There are no recommendations in this report.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

THE INSPECTOR GENERAL

June 12, 2017

MEMORANDUM

SUBJECT: Gold King Mine Release: Inspector General Response to Congressional Requests
Report No. 17-P-0250

FROM: Arthur A. Elkins Jr.

TO: Barry Breen, Acting Assistant Administrator
Office of Land and Emergency Management

Deb Thomas, Acting Regional Administrator
Region 8

This is our report on the subject evaluation conducted by the Office of Inspector General (OIG) of the U.S. Environmental Protection Agency. The project number for this evaluation was OPE-FY15-0059.

Because this report contains no recommendations, you are not required to respond to this report. However, if you submit a response, it will be posted on the OIG's public website, along with our memorandum commenting on your response. Your response should be provided as an Adobe PDF file that complies with the accessibility requirements of Section 508 of the Rehabilitation Act of 1973, as amended. The final response should not contain data that you do not want to be released to the public; if your response contains such data, you should identify the data for redaction or removal along with corresponding justification.

We will post this report to our website at www.epa.gov/oig.

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Introduction

Why We Did This Review

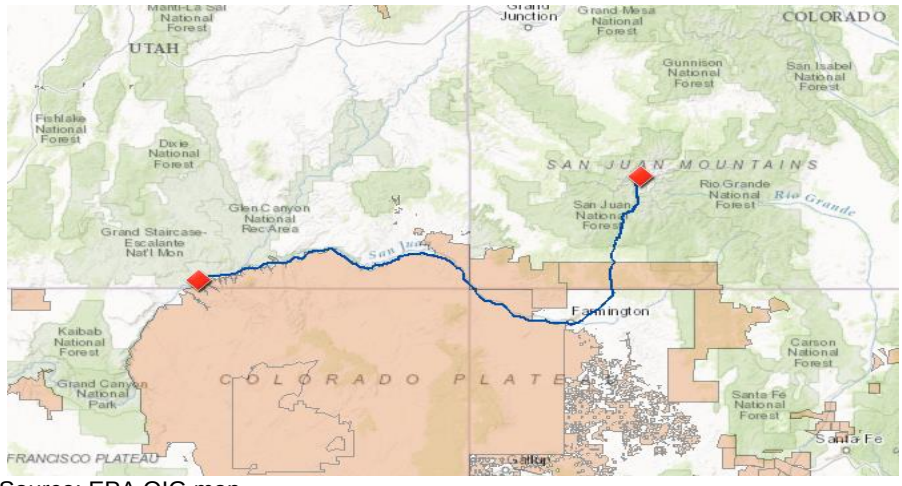
The U.S. Environmental Protection Agency (EPA), Office of Inspector General (OIG), conducted this review in response to two congressional requests to examine the cause of, and the EPA's response to, the August 5, 2015, release of mine water from the Gold King Mine site near Silverton, Colorado. Appendix A contains a complete list of the 16 issues we addressed. Appendix B contains a timeline of actions and communications.

Background

On August 5, 2015, while evaluating the ongoing discharge from the Gold King Mine, an EPA-led team triggered a release of approximately 3 million gallons of contaminated mine water that contained sediment and metals, such as lead, copper, arsenic, zinc and cadmium. Since 2005, and up to the release on August 5, 2015, the Gold King Mine had been discharging approximately 200 gallons per minute or more of contaminated mine water. Two hundred gallons per minute of discharge equals a release of 3 million gallons about every 10 days. Video footage of the Gold King Mine release is available for viewing.

The released mine water flowed into Cement Creek, a tributary of the Animas River. At Silverton, Colorado, the plume flowed into the Animas River. Near Farmington, New Mexico, the release discharged from the Animas River to the San Juan River, and from there the plume eventually flowed into Lake Powell. The release prompted emergency action that was considered nationally significant or precedent setting.

Figure 1: Map of the Four Corners area of the United States



Source: EPA OIG map.

Note: Gold King Mine and Lake Powell are identified with red markers. A blue line follows the river path that the released mine water from Gold King Mine travelled. Tribal lands are shown in orange.

The EPA conducted an internal review of the Gold King Mine release in August 2015,[1] and issued an addendum in December 2015.[2] At the EPA's request, the U.S. Department of the Interior's Bureau of Reclamation conducted a technical evaluation of the Gold King Mine release, and the bureau issued its report in October 2015.[3] In December 2015, the EPA completed an After-Action Review[4] of its response to the release, and a 1-year after report was completed in August 2016.[5] These reports made a number of recommendations to safeguard against future incidents.

Responsible Offices

The following EPA offices are responsible for the issues discussed in this report: Office of Land and Emergency Management's Office of Emergency Management, and Region 8's Office of Ecosystems Protection and Remediation.

Scope and Methodology

We performed our work from August 2015 through March 2017. We conducted this performance audit in accordance with generally accepted government auditing standards, except for the preparation of Appendix B, which was prepared by the EPA OIG's Office of Investigations using its professional judgment to determine which communications were responsive to the request. Adding this work does not change our findings and conclusions. Generally accepted government auditing standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objective. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective.

We interviewed personnel from EPA headquarters and EPA Regions 6, 8, 9 and 10. We also interviewed personnel from the U.S. Bureau of Reclamation; the U.S. Geological Survey; the U.S. Army Corps of Engineers; the state of Colorado; contractors on-site August 5, 2015; and those knowledgeable about mining issues.

[1] U.S. Environmental Protection Agency, Summary Report: EPA Internal Review of the August 5, 2015 Gold King Mine Blowout, August 24, 2015.
[2] U.S. Environmental Protection Agency, Addendum to EPA Internal Review of Gold King Mine Incident, December 8, 2015.
[3] U.S. Bureau of Reclamation, Technical Evaluation of the Gold King Mine Incident, San Juan County, Colorado, October 22, 2015.
[4] U.S. Environmental Protection Agency, After-Action Review: EPA's Response to the Gold King Mine Release on August 5, 2015 (Internal/Deliberative Process), December 21, 2015.
[5] U.S. Environmental Protection Agency, One Year After the Gold King Mine Incident—A Retrospective of EPA's Efforts to Restore and Protect Impacted Communities, August 1, 2016.

We reviewed the following documents relevant to the Gold King Mine release:

- The EPA's Internal Review, Addendum and attachments.
- The U.S. Bureau of Reclamation's Technical Evaluation, and peer reviewers' comments on the draft.
- Site-specific documents guiding or documenting work the EPA was conducting at Gold King Mine in 2014 and 2015, including work plans, the health and safety plan, and work conducted in 2014.
- Agency emails, personnel records and documentation.
- Other current and historical documents related to mining and cleanup operations at Gold King Mine and other nearby mines.

On March 24, 2017, we issued a discussion document to the agency. The agency provided comments on the discussion document. We met with the agency to discuss its comments, and made changes to the report as appropriate.

On March 28, 2017, we provided relevant excerpts of the discussion document to the Colorado Division of Reclamation Mining and Safety (DRMS), and the U.S. Department of the Interior's Bureau of Reclamation. DRMS provided comments on the discussion document. We met with DRMS to discuss its comments, and made changes to the report as appropriate. The U.S. Department of the Interior declined to comment on our discussion document.

Results of Review

This section addresses 16 issues regarding the EPA's work at the Gold King Mine site leading up to the release, and the EPA's immediate response. Appendix B contains a timeline of actions and communications.

Issues 1 and 2:	Details on work the EPA was conducting at Gold King Mine prior to the release on August 5, 2015, and the cause of the release of mine water.

The EPA was performing a removal site evaluation at Gold King Mine to investigate the possibility of opening the collapsed mine portal.[6] The EPA was seeking to find solutions to ongoing mine water drainage when excavation activities caused the release of mine water.

Colorado's DRMS reported in 2009 that the portal was completely collapsed and that future work may be needed "to alleviate the potential for an unstable increase in mine pool head within the Gold King [Mine] workings."

The goal of the EPA's removal site evaluation at Gold King Mine was to identify actions that may be taken to reduce the volume or improve the quality of water released from the mine. A removal site evaluation includes a preliminary assessment that identifies the source and nature of the release or threat of release; and, if more information is needed, an on-site inspection. The removal site evaluation and inspection are information-gathering activities conducted prior to the EPA making a decision about whether to perform a removal action to address the situation.

The EPA's evaluation activities at Gold King Mine were conducted in conjunction with an EPA removal action at the nearby Red and Bonita Mine. The EPA wanted to open the Gold King Mine to monitor any changes resulting from the Red and Bonita Mine action.

The EPA started its removal evaluation at Gold King Mine in 2014. The EPA used the services of contractors under EPA Superfund Technical Assessment and Response Team (START) and EPA Emergency and Rapid Response Service (ERRS) contracts. The ERRS contract task order identified the following risks at the site:

> Conditions may exist that could result in a blow-out of the blockages and cause a release of large volumes of contaminated mine waters and sediment from inside the mine, which contain concentrated heavy metals.

[6] In this report, we discuss only the portal where the release occurred on August 5, 2015. We do not discuss the other portals into Gold King Mine.

The EPA further specified that the work was to serve the following purpose:

> [R]e-open the Gold King Mine portal and workings to investigate the conditions to assess the on-going releases. This will require the incremental de-watering and removal of such blockages to prevent blowouts.

According to EPA records, the work that the agency and its contractors conducted in 2014 was suspended, as they uncovered conditions that required them to plan to treat a greater quantity of water potentially accumulated behind the blockage.

In 2015, the EPA used the services of its ERRS contractor. The ERRS response manager stated that the purpose of the excavation activities on August 4–5, 2015, was to investigate the rock conditions at Gold King Mine. Because so much of the rock was fractured, the search was for competent rock. Excavation activities were conducted so that a team of experts, who would be on-site August 14, 2015, could assess conditions and discuss how to move forward.

The Colorado DRMS geological engineer, who also participated in planning activities and was present at the Gold King Mine on August 4–5, 2015, told the OIG that the objective of the work on those days was to clean away loose material to expose something more useful to look at when the mining subcontractor arrived the following week. The DRMS geological engineer also told the OIG that there was no plan to open the mine portal or adit[7] before the meeting of experts planned for August 14, 2015.

Based on statements made by those present, the EPA-led team removed unconsolidated material (loose rock and dirt) from around and above the portal. The team conducted excavation activities by scraping away unconsolidated material, hauling away collapsed material, and examining newly exposed areas for conditions that would indicate they had reached material that the on-scene coordinator (OSC) on-site considered to be the blockage.[8] The excavation activities exposed collapsed timbers and material filled in around those timbers. According to the OSC on-site, the team stopped excavation in front of the blockage on August 4, 2015, after they reached material that was compacted, well consolidated, and considered by the OSC on-site to be the blockage.

[7] An "adit" is a horizontal entry into a mine, with one opening to the surface, commonly and erroneously called a tunnel (a tunnel is open on both ends). A "portal" is the surface entrance to a tunnel or adit.
[8] Two OSCs were involved at the Gold King Mine site. One was the lead OSC who oversaw the planning and overall work at Gold King. The other OSC served as a replacement or backup when the lead was on leave. On August 4–5, 2015, the backup OSC was on-site, and the lead OSC was on leave.

Pictures taken at the end of the workday on August 4, 2015, show that the excavation activities had exposed collapsed timbers and material filled in around those timbers.

Exposed, collapsed timbers and material filled in and around the timbers at the Gold King Mine portal on the afternoon of August 4, 2015. (EPA photo)

Based on statements made by those present, when activities resumed on the morning of August 5, 2015, excavation focused on removing loose material above the portal to expose bedrock. The day started with a safety briefing that included crews for both the Red and Bonita Mine and the Gold King Mine.

Present at Gold King Mine on August 5, 2015, was the EPA OSC, the ERRS contractor response manager, the ERRS contractor/excavator operator, and a START contractor. Later in the morning, an ERRS contractor/loader operator was brought from the Red and Bonita Mine to the Gold King Mine to assist with the activities. In addition, two Colorado DRMS personnel were present for a short period of time prior to the release. The Colorado DRMS personnel were in the vicinity that week to work at the Red and Bonita Mine and to conduct water sampling in the area.

According to the response manager, excavating activity at Gold King Mine was directed by the EPA OSC. Both the START contractor and the response manager stated that work did not proceed any differently because another EPA OSC was filling in for the lead OSC. The excavator operator built a ramp to enable reaching higher. The OSC directed the excavator operator to "scratch" above the portal. This activity was intended to remove loose material and locate the rock above the mine's portal. The OSC on-site told us that he approached Gold King Mine as he approaches all "blind" adits (an adit you cannot see into), with the assumption that it was full of water and under pressure. According to the excavator operator, all activities at the site were "done as careful as possible."

The excavator operator described the August 5, 2015, activities in detail:

- The OSC would direct the excavator operator to remove a "little" material and stop.
- The OSC and others would then examine the area from which the material was removed.
- After the examination, the OSC would direct the excavator to remove a little more material.
- This process was repeated approximately 12 times over a 2- to 3-hour period.

Photo of excavation activities on August 5, 2015. Image was taken about 1.5 hours before the release. (EPA photo)

- The excavator operator piled the material removed from above the adit in front of the excavator.
- When excavation ceased, a loader was used to remove the excavated material.

At the EPA's request, Colorado DRMS personnel were at the Gold King Mine on August 5, 2015, to discuss future portal stabilization. Colorado DRMS personnel told the OIG that they did not see any issues or have any concerns with the work the EPA was conducting. The excavator operator estimated that only one removal was made after Colorado DRMS personnel left the site.

The OSC on-site said they stopped excavation above the adit portal once bedrock was exposed. According to the START contractor, they had finally found bedrock through the work they were doing on August 5, 2015, but that was at the same time the leak started. The loader operator said he moved two or three scoops of dirt that the excavator had removed from the area around the mine. Then, both the loader operator and the excavator operator noticed a "little bit of water coming out of the rock face."

According to the START contractor and the photographs he took on August 5, 2015, the initial leak was evident at 10:51 a.m. The response manager said it was "way above where anyone expected." The OSC and the response manager said,

and the photos show, the leak started out clear and small, and within minutes turned red or orange and increased in volume.

The initial spurt of water from the Gold King Mine is barely visible in this photo taken at 10:51 a.m. on August 5, 2015. The OIG added the red arrow. (EPA photo)

All personnel were able to move away from the released water, so no one was injured. The operators were able to move equipment out of the way. The START contractor said it took about 10 minutes for the small leak to become a full opening of the adit releasing the water. For about 30 minutes, large amounts of water flowed from the mine, eroding adit blockage material and other material, such as the earthen ramp that had been built. Materials were carried over the side of the mine dump and into Cement Creek. After approximately 50 minutes, the flow diminished enough for the crew to direct the water back into an already existing concrete channel.

The OSC, along with the START contractor, response manager, excavator operator, and Colorado DRMS geological engineer present at Gold King Mine on August 5, 2015, all indicated that the work being done that day was investigative in nature. The purpose of the work was to find competent rock above the adit, and there was no plan that day to open the adit. The OSC on-site August 5, 2015, asserted that the team was not excavating the blockage, was not attempting to open the adit, and had no plans to dewater the mine that day.

Although the OSC on-site did not intend to open the mine that day, due to a misjudgment about the height of the adit, the OSC on-site reported inadvertently excavating down to within a foot or two of the top of the adit portal, which initiated an internal erosion failure that caused the release. This is consistent with the Bureau of Reclamation conclusion. In its October 2015 review, the bureau concluded that excavation-induced failure triggered internal erosion and resulted in the uncontrolled release.

Issue 3: **Details on the expertise of EPA employees and contractors carrying out the work at Gold King Mine.**

The EPA had qualified, experienced individuals with relevant expertise conducting the work at Gold King Mine. The EPA had two OSCs involved at the mine, as well as ERRS and START contractors. The ERRS contractor had secured the services of a mining subcontractor. In addition, the EPA received technical advice from the Colorado DRMS.

EPA OSCs

The EPA requires OSCs to complete a core competency training program to develop the advanced knowledge, skills and capabilities needed to address a wide variety of environmental responses. This training is spread out over a 3-year period, and includes the following requirements:

- 160 hours of health and safety courses.
- 54 hours of contracts training to attain certification as a Contracting Officer's Representative.
- 300 hours (approximately) of general training in different types of responses, use of equipment, response processes (e.g., the Stafford Act, oil spills, incident command system, and spills of national significance), and quality assurance/quality control.
- 85 hours of spill prevention, control, and Countermeasure and Facility Response Plan Inspection training.

The National Oil and Hazardous Substances Pollution Contingency Plan (i.e., the National Contingency Plan) sets forth requirements for response operations, and tasks OSCs with directing response efforts and coordinating all other efforts at the scene of a discharge or release. The OSC position description acknowledges that the OSC must rely on experience and judgment to solve problems encountered. The description further states that OSCs are given wide latitude in terms of responsibility for planning, designing and implementing solutions for site cleanup, and the alleviation of damage caused by the release of hazardous substances.

According to EPA records, the two OSCs for Gold King Mine had over 5 decades of experience as OSCs. EPA records show that the lead OSC for Gold King Mine has a Bachelor of Science degree in environmental resource management, and the OSC on-site for August 4–5, 2015, has a bachelor's degree in geological engineering, as well as graduate-level credits in hydrology. EPA records indicate that the OSC on-site also had prior work experience in the mining industry, where

his duties included exploration, mine investigations and evaluations. Each OSC has completed removal actions and emergency response operations at numerous mine sites. Both were recognized among their peers and colleagues as "some of the most experienced people in these situations of anybody in the country," and are considered "the top guys" for dealing with mines.

EPA Contractors and Subcontractors

The agency used the services of ERRS and START contractors to perform and assist with Gold King Mine work. The ERRS contractor subcontracted with a mining construction company for services at the mine.

The ERRS contractor is Environmental Restoration LLC, whose employees were on-site at the time of the release from Gold King Mine. According to Environmental Restoration, it is the largest provider of emergency response services to the EPA, with contracts in seven of the 10 EPA regions. Environmental Restoration provides hazardous waste materials management and removal services that include emergency response, site and mine site remediation, environmental construction, and specialty technical services.

According to EPA records, the Environmental Restoration response manager for Gold King Mine has a bachelor's degree in natural resources and environmental science, and a Master of Science in management. He became an EPA-approved response manager in 1996, was a certified hazardous materials manager, and had 19 years of experience working in the environmental field. The Environmental Restoration excavator operator told the OIG that he had over 30 years of experience operating heavy equipment, including experience working at other mine reclamation sites. The Environmental Restoration loader operator said he had about 10 years of experience operating heavy equipment.

The START contractor is Weston Solutions. According to its website, Weston Solutions specializes in a number of areas, including environmental investigation and remediation, hazardous waste management, and emergency planning and response. The START employee at Gold King Mine on August 5, 2015, said he holds a bachelor's degree in civil engineering and a master's degree in environmental science, and had been employed with Weston Solutions since October 2011. He is also a licensed professional engineer in the state of Colorado.

Environmental Restoration subcontracted with Harrison Western for mining services at Gold King Mine. According to Harrison Western's website, the company has completed hundreds of complex civil and underground construction projects, and it has more than 45 years of experience in construction, mine development, engineering and process development. Harrison Western offers services in civil construction, engineering, mine development, underground construction, mining and excavation support. Harrison Western participated in

agency planning activities for 2015 and was scheduled to deploy to Gold King Mine later in August 2015.

State Personnel

According to its website, the Colorado DRMS mission is to protect the public, miners and the environment during current mining operations; restore abandoned mines; and ensure that all mined land is reclaimed for beneficial use. Its programs include the Office of Active and Inactive Mines, which reclaims and safeguards abandoned mine sites that are dangerous and create environmental hazards.

The Program Director for Active and Inactive Mines, and one of his inactive mine reclamation geological engineers, were at Gold King Mine on August 5, 2015, but left prior to the release to visit a nearby mine. The Program Director told the OIG that he received a master's degree in geology and has worked for the Colorado DRMS for 30 years. The geological engineer said he holds a bachelor's degree in geological engineering and has worked for Colorado DRMS for about 24 years.

We found that the EPA had qualified, experienced individuals with relevant expertise conducting the work at Gold King Mine. In addition, the EPA supplemented its in-house expertise with experienced contractors, subcontractors and state consultants. We found that the OSC on-site had the experience and authority to direct the removal site evaluation at Gold King Mine.

Issues 4 and 5:	**Whether given known concerns that the work at the Red and Bonita Mine could increase water in the Gold King Mine, the EPA took appropriate care to determine water levels in the Gold King Mine before removing rock from the portal. Whether the EPA should have conducted pressure tests on the trapped water behind the mine pool before attempting to open the Gold King Mine, as was done at the Red and Bonita Mine.**

We found no specific standards for the level of care to be taken or how to assess a collapsed mine portal. The EPA had identified concerns about the water level and the potential for blow-out of the blockage, had worked with experts to plan the evaluation work, and was still early in the process of conducting an evaluation of site conditions when the release happened. Based on interpretation of mine site conditions, the lead OSC did not believe direct testing of water behind the blockage was necessary. In addition, they considered drilling a well, but there were safety risks, engineering challenges, unknown benefits, and high costs associated with drilling at Gold King Mine.

The EPA's evaluation activities at Gold King Mine were conducted in conjunction with the construction of a bulkhead in the nearby Red and Bonita Mine. However, according to the Colorado DRMS geological engineer, when the release occurred on August 5, 2015, the bulkhead at the Red and Bonita Mine had not been fully constructed; therefore, it could not have caused any changes to the

water levels in Gold King Mine. Changes in the flow out of Gold King Mine and other nearby mines due to the installation of other bulkheads was documented.

We found broad criteria for the work the EPA was conducting, but no standards for the level of care to be taken or how to go about opening a collapsed mine portal. Pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the EPA responds to and addresses threatened or actual releases of hazardous substances, and performs removal activities to protect public health, welfare or the environment.[9]

The National Contingency Plan provides the organizational structure and procedures to prepare for and respond to discharges of oil, and releases of hazardous substances, pollutants and contaminants. The EPA also has a National Hardrock Mining Framework, and an Abandoned Mine Site Characterization and Cleanup Handbook. Both the framework and handbook provide resources and references on how to implement EPA legal and regulatory authorities for addressing the environmental impacts of mining. However, neither document establishes standards for how to assess a collapsed mine portal.

Colorado developed a "best management practices" manual for abandoned mine land reclamation in 2002. The manual provides an overview of approaches to address environmental and safety problems caused by past mining. The manual states that actions must be designed and engineered to take into account the volume of water, water chemistry, and mine configuration; however, the manual does not provide standards for doing this site-specific work. A Colorado DRMS geological engineer we spoke with indicated that each mine is unique, so having a checklist or detailed criteria to follow would not be useful, but having evaluation criteria with multiple options for inactive mines would be helpful.

Accumulation of water behind the Gold King Mine blockage was presumed, even though drainage was ongoing. In its 2009 project summary, the Colorado DRMS identified the potential for an unstable increase in the level of the water accumulated within Gold King Mine. In a 2014 task order for work at Gold King, the EPA acknowledged the risk when the agency required that its ERRS contractor incrementally dewater and remove blockage so as to prevent blowouts. In its 2015 work plan, the EPA identified that it was likely that the collapsed portal condition caused impounding of water behind the collapse. The Gold King Mine work plan contains the following warning:

> Conditions may exist that could result in a blow-out of the blockages and cause a release of large volumes of contaminated mine waters and sediment from inside the mine, which contain concentrated heavy metals.

[9] Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. § 9604(a)(1).

The lead OSC told the OIG that the variation in flow from Gold King Mine created some uncertainty as to how much water was behind the blockage. He explained that when a mine is completely blocked, as was the case at Gold King Mine, the quantity of water behind the blockage is unknown. However, he said they were under the impression that Gold King Mine was not completely full. The lead OSC said the assumption that the adit was not completely full was based, in part, on the fact that they did not see any water seepage up high around the upper portions of the adit blockage. The assumption was also based, in part, on their observations and what they understood from the work that Colorado DRMS had completed in 2009.

The lead OSC also said the interpretation—which was discussed with the ERRS contractor, the START contractor, the mining subcontractor, and the Colorado DRMS—was that the flow at Gold King Mine was still coming out of the blockage where it was before, and it was still draining adequately. There was an assumption that because the mine was draining, it was not under pressure. The EPA's approach, as Colorado DRMS understood it, was to proceed with caution.

In conducting the removal evaluation at Gold King Mine, the EPA consulted with the Colorado DRMS geological engineer about water levels in the mine and the surrounding vicinity. The Colorado DRMS geological engineer told the OIG that measurements obtained from monitoring the water emerging from the mine were a good indication and an acceptable method of determining the level of water behind the blockage. He also told the OIG that the Colorado DRMS was comfortable with the EPA's estimates of chamber size, plus or minus a few feet, and the amount of water expected behind the blockage.

According to the Colorado DRMS geological engineer, no mine maps identifying the height and width of the adit were available. The EPA estimates were based on publicly available information on the mine, and information obtained from persons who had previously worked at or been in the mine. The estimates were also based on information obtained from the Colorado DRMS regarding its 2007–2009 activities at Gold King Mine, monitoring and sampling results obtained from the site, and observations from the 2014 EPA excavation activities at the site.

Direct testing of water pressure in Gold King Mine would have involved drilling a well, which presented safety, engineering and cost challenges. The EPA had not made a decision about drilling into the adit to determine water level or pressure at the time of the release. The lead OSC said drilling had not been ruled out and "may have come out of" the planned meeting of experts on August 14, 2015.[10] He believed drilling was not necessary, because the interpretation of site conditions was that the mine was not pressurized as the mine was still discharging water.

[10] We concluded that based on the weight of the evidence we reviewed there was no prior decision to drill at the mine on August 4–5, 2015. However, the lead OSC provided inconsistent statements to the OIG about whether the decision to drill had been ruled out.

The lead OSC had drilled a monitoring well into the nearby Red and Bonita Mine approximately 5 years earlier. At the Red and Bonita Mine, the road loops back over the hillside on top of the portal. This allowed the EPA to get a drilling rig safely positioned above the portal. However, the Gold King Mine portal is located on a steeper and more unstable mountainside than the Red and Bonita Mine portal. In addition, no road crosses above the adit that would have provided stable drilling locations. These conditions at Gold King Mine meant that any drilling attempt from above would have been more costly, required more time, and been more uncertain to achieve success in comparison with what was done at the Red and Bonita Mine.

Slope above Red & Bonita Slope above Gold King

Side-by-side comparison of Red & Bonita and Gold King mine slopes. (EPA photo)

Given the short construction season in the area due to long winter conditions, drilling would take a full work season or potentially two. Thus, had the EPA chosen to conduct drilling, the opportunity to observe conditions within Gold King Mine prior to the installation of the Red and Bonita Mine bulkhead would have been lost, and the ongoing discharge would have continued for another year.

Some of the concerns associated with drilling at the Gold King Mine included safety risks, engineering challenges, unknown benefits and high costs. From the experts we spoke with, there were mixed opinions on whether drilling was feasible or advisable at the site due to these risks. We asked whether horizontal drilling could have been used to access the adit behind the blockage. One mining engineer we spoke with said that horizontal drilling could be done from the mountainside using standard mining exploration equipment. However, another cautioned that specialized equipment and drilling techniques would be needed to guard against creating a dangerous blowout through the drill hole.

In addition, Colorado DRMS told the OIG that pressure testing is not always a good option for some mines unless it is done immediately prior to the planned work and testing is done at multiple locations within the underground workings. Colorado DRMS explained that mines are very dynamic, and the internal structure can change within months. Therefore, even if the mine had been pressure tested, the data collected could have been wrong by the time work started if significant time passed between the pressure test and the commencement of work. According to the lead OSC, his decision to approach the mine from the front end seemed the most feasible and reasonable thing to do.

The lead OSC had arranged a meeting of experts for August 14, 2015. He told the OIG that the purpose was to get agreement on whether to proceed with the plan to open the mine given all they knew at that point, and that the option to drill into the adit was something that may have "come out of" the meeting. The meeting was to include experienced personnel from the EPA, Colorado DRMS, contractor and subcontractor personnel, and a mining expert (a Supervisory Civil Engineer) from the U.S. Bureau of Reclamation. The lead OSC said that for any operation with uncertainty (and that requires a lot of judgment), it is important to have an opportunity to get together to see whether there is a path forward for everyone to support or not support. He said bringing all parties together is something he has done routinely on all projects throughout his career, and these kinds of meetings allow all parties to change tactics and approach with very short notice.

We found the EPA was not required to conduct direct testing of the water level or pressure, and given the interpretation of the site risks associated with drilling, it is not clear the EPA should have conducted testing. We found it reasonable that the EPA had not conducted direct testing of the water level or pressure during the removal site evaluation at Gold King Mine by the time of the release on August 5, 2015. This was reasonable because of the interpretation of site conditions by the team, and because of safety risks, engineering challenges, unknown benefits, and high costs associated with drilling at the site.

Issue 6:	**Criteria the EPA would apply before approving a contractor for a similar cleanup performed by a private party, and whether the EPA applied the same criteria to itself.**

The criteria that the EPA used to approve a contractor would not apply to agency staff. The EPA used the Federal Acquisition Regulations as the criteria to evaluate and approve its contractor. There is no requirement to use Federal Acquisition Regulations to evaluate and approve EPA staff. However, a comparison of specific technical job qualifications of the contractor and agency staff is appropriate. We believe that the qualifications of the agency's OSCs working at Gold King Mine were at least equal to the qualifications of the Environmental Restoration Program Manager (contractor), and exceeded the requirements of the Environmental Restoration Response Managers (contractors). Consequently, we believe that the technical knowledge of the agency's OSCs was sufficient to meet or exceed the technical requirements of the contract.

Issue 7:	The EPA's policies regarding indemnification of contractors, and whether indemnification policies have created any impediments or obstacles with the standard of care taken during response activities.

The EPA has guidance for providing indemnification for negligence at certain sites, but it does not apply here because there was no indemnification offered in the contract solicitation, and the ERRS contract between the EPA and Environmental Restoration LLC does not contain any indemnification provisions. Indemnification is defined as a provision in a contract under which one party commits to compensate the other for any harm, liability or loss arising out of the contract. As such, no impediments or obstacles with the standard of care taken during the response activities have been identified.

Issue 8:	How the EPA defined and assured the independence of Bureau of Reclamation staff, officials, contractors or others involved in conducting, supervising, reviewing or overseeing the EPA's requested external assessment of factors that led to the Gold King Mine release on August 5, 2015.

The EPA arranged for, but did not direct, Bureau of Reclamation staff and peer reviewers conducting the external assessment that the EPA requested. The EPA did not identify procedures for assuring independence. However, the EPA said it applied the common definition of independence to the evaluation it requested from the bureau: not being subject to control by others. EPA officials said they ensured that the EPA did not control bureau staff or peer reviewers because the EPA limited its interaction with them. In addition, the EPA engaged peer reviewers to examine the report's findings. We found this approach to safeguarding independence to be reasonable.

According to the EPA, the agency discussed the possibility of doing a review of the Gold King Mine incident with the U.S. Department of the Interior and the U.S. Army Corps of Engineers. The Department of the Interior suggested that its Bureau of Reclamation was the appropriate agency within the department to conduct the review. Interior also proposed that the U.S. Army Corps of Engineers serve as peer reviewers. After agreeing with this arrangement and finding other peer reviewers, the EPA then set up funding for the Bureau of Reclamation team and peer reviewers, and provided a broad statement of work with minimum requirements. After funding was established, the EPA informed us that the only contact they had with the review team and peer reviewers was a site visit and to provide information, upon request.

Cover of the Bureau of Reclamation's October 2015 technical review.

The Director of the Bureau of Reclamation Technical Service Center said the expertise and experience of the Supervisory Civil Engineer selected to lead the technical evaluation made him uniquely qualified within the bureau. The Supervisory Civil Engineer said he has extensive professional experience in mining, both bachelor's and master's degrees in mining engineering, and he is a licensed professional engineer in Colorado and Montana.

The bureau's Supervisory Civil Engineer said he maintained his independence during the review by sticking to the facts, bringing other people in, and bringing peer reviewers to the site to let them make their own conclusions about the release.[11] The bureau's Technical Service Center Director said the independence of the review was ensured partly by using a peer review system. According to the bureau, its reviewers also followed the Department of the Interior's Scientific Integrity Policy. One of the requirements of that policy is that an employee will not knowingly participate in a matter that causes a conflict of interest.

Issue 9: The basis for material differences between the Bureau of Reclamation report and other official EPA or EPA OIG information collected on the factors that led to the Gold King Mine release.

We identified a material difference between the Bureau of Reclamation report and information the OIG gathered on factors that led to the release from Gold King Mine. Much of the bureau's report was consistent with information we collected about the issues and activities at the mine, particularly in identifying the excavation activities as the cause of the release. However, the bureau's report states the following:

> The [Bureau of Reclamation] report discusses field observations by EPA (and why they continued digging), but does not describe why a change in EPA field coordinators caused the urgency to start

[11]The same Supervisory Civil Engineer had provided technical consultation services to the EPA on plans for the Red and Bonita Mine bulkhead in May 2015, and was scheduled to provide consulting services at Gold King Mine on August 14, 2015. After the release at Gold King Mine, he went on-site as planned, but spent his time assisting in stabilizing the mine. According to EPA officials involved in arranging the external review, they were unaware of the Bureau of Reclamation engineer's prior involvement. The participation of the bureau's Supervisory Civil Engineer as lead reviewer created the appearance of a lack of independence because of his work with the EPA on another mine, and his planned meeting on the Gold King Mine. However, we found that the Bureau of Reclamation review was conducted independently from the EPA, as the EPA arranged the external review and then remained only responsive to bureau's requests. Also, Bureau of Reclamation reviewers indicated they were able to do their work without any interference.

> digging out the plug rather than wait for [Bureau of Reclamation] technical input as prescribed by the EPA project leader.

The OIG found that the EPA plan did not include opening the mine on August 5, 2015, and the EPA was not attempting to open the mine the day of the release (i.e., "digging out the plug"). We were told by the OSC and contractors on-site that they had no intention of opening the mine that day; rather, they were exposing the blockage and the bedrock to better assess conditions and determine next steps.

According to the lead OSC and EPA planning documents, attempting to reopen the Gold King Mine was not scheduled for August 4–5, 2015. The activities on August 4–5 were preparation steps for reopening the mine portal, but were not in themselves steps to open the mine.

Contracting personnel on-site told the OIG that work on August 4–5, 2015, did not proceed any differently with the replacement OSC directing the work. The START contractor said he did not "have any reason to think the activities would have proceeded differently that morning. They were following the plan." The field schedule shows, and the replacement OSC confirmed, that the change in OSC had been planned months in advance. The lead OSC said he took care to select another OSC with the appropriate background and experience to take over while he was away. As stated earlier in this report, we found that both OSCs were qualified and had relevant expertise to conduct the work at Gold King Mine.

The Gold King Mine field schedule shows that the activities for the first week of August included water treatment for the mine, documenting progress at the mine, and the excavation of the adit. When we asked the lead OSC about the schedule, he explained that the reference to the excavation of the adit did not mean removing the blockage. He said the excavation activities for the first week of August 2015 were an attempt to evaluate the ground above and around the blockage, to allow for a more complete assessment of the ground and bedrock above the adit and blockage the following week. The lead OSC said it was not a certainty that the full operation to open the adit was in fact going to proceed as conceived.

The lead OSC sent a July 29, 2015, email to the response manager setting forth the priority and strategy, as had been discussed with others on the team, regarding work to prepare for opening Gold King Mine. He also forwarded the email to the OSC who would be on-site while he was away. The lead OSC's instructions included steps to establish adit drainage control and to set up the water management system before removing any adit blockage. The instructions also included an option to excavate above the adit to investigate the slope. In his email, the final step listed in preparation for opening the mine was the adit face excavation. The lead OSC explained that this meant removing loose material; it did not include excavating the blockage.

The work plans laid out many steps that were to be taken in preparation for opening the mine. In particular, the portal was to be stabilized prior to opening the mine. The Gold King Mine field schedule showed that the mining subcontractor was to arrive in mid-August 2015 to stabilize the portal, and then open the mine the last week of August 2015.

The lead OSC had arranged a meeting of experts for August 14, 2015, the purpose of which was to get agreement on whether to proceed with the plan, given all that they knew at that point. Based on these kinds of meetings, the lead OSC said they can change tactics and approach with very short notice. The meeting was to include the EPA, the Colorado DRMS, contractor and subcontractor personnel, and a mining expert from the Bureau of Reclamation.

The OSC, the START contractor, response manager, excavator operator, and Colorado DRMS geological engineer present at Gold King Mine on August 5, 2015, all indicated that the work being done that day was investigative in nature. The purpose of the work was to find competent rock above the adit, and there was no plan that day to open the adit. The response manager told the OIG that the activities on August 5, 2015, did not include an attempt to install a stinger to remove water from the mine, and no decision had been made as to when or whether the installation of the stinger would occur. (A stinger is a metal pipe that would have been inserted past the blockage into the void behind the blockage, allowing drainage and controlled pumping out of mine water, as had been done at the nearby Red and Bonita Mine.)

The lead OSC told the OIG that the site was not yet ready for installing a stinger, the water management system and other equipment, and that the mining contractors all needed to be present at the site. The OSC on-site asserted that the stinger was not on-site on August 5, 2015, and that the system to convey water from Gold King Mine to the treatment plant at the Red and Bonita Mine was not completed. The OSC on-site August 5, 2015, also asserted that the team was not attempting to open the adit and had no plans to dewater the mine on August 5, 2015.

The Bureau of Reclamation report stated that there was an "urgency to start digging out the plug," which implied the EPA was intentionally opening the mine on August 5, 2015. Our work shows the EPA was not attempting to open the mine the day of the release.

Issues 10, 11, 12, 13, 14 and 15:	**The EPA's legal requirements, current policies and guidelines on reporting a release of a hazardous substance, and contacting tribal, state and local government agencies. The EPA's response[12] to the Gold King Mine release and whether EPA followed its legal requirements, current policies and guidelines in how the agency notified tribal, state and local agencies regarding the release; whether the policies and guidelines were designed to ensure compliance with legal requirements; and whether any reported delays in notification created any health risks.**

We reviewed CERCLA, which controls the cleanup of hazardous waste sites, the National Contingency Plan, and EPA Region 8's Regional Contingency Plan.[13] Because the relevant requirements in these documents use terms such as "immediately" and "promptly," we used professional judgment in determining compliance. The EPA's policies and guidelines were designed and implemented in a manner to ensure that the agency complies with legal requirements. The EPA ensured notification to the National Response Center as required by CERCLA and the National Contingency Plan. As described in the Region 8 Regional Contingency Plan, the states are responsible for notifying their downstream water users. In the Gold King Mine release, where the potentially affected areas crossed jurisdictional boundaries, multiple EPA regions worked with relevant states and tribes to notify downstream water users prior to the plume reaching their borders.

Initial Notification

CERCLA[14] and the National Contingency Plan[15] require that any person in charge of a facility, as soon as they have knowledge of a release of a hazardous substance from the facility in a reportable quantity, immediately notify the National Response Center.[16] EPA Region 8's Regional Contingency Plan explains that anyone who identifies or observes a discharge or release should report the spill to the National Response Center; however, it is the spiller's legal responsibility to report all spills.

After the Gold King Mine release began at 10:51 a.m. on August 5, 2015, the EPA's OSC and contractors on-site reacted to get out of the way of the rushing water. There is no cell phone service at the site, and the satellite phone was

[12] For purposes of this review, the "response" to the release was the EPA's initial communication about the release to affected parties; it does not include data sharing or other aspects of the EPA's cleanup efforts. This differs with other uses of the term "response" within this document and by the EPA. Under CERCLA and the National Contingency Plan, "response" means remove, removal, remedy or remedial action, including enforcement activities related thereto.
[13] EPA Region 8 covers Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming, and 27 tribal nations.
[14] Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. § 9603(a).
[15] National Contingency Plan, 40 CFR § 300.125(c).
[16] The National Response Center is located at U.S. Coast Guard headquarters and is the national communications center continuously manned for handling activities related to response actions. The National Response Center acts as the single point of contact for all pollution incident reporting, and as the National Response Team's communications center.

reported to have unreliable service in that area. In addition, the surging water washed out the access road to the mine. As a result, the OSC and the Response Manager began initial notifications by two-way radio.

The OSC and the Response Manager radioed to contractors further down the mountain at the Red and Bonita Mine, and to the Colorado DRMS personnel who were at another mine site on the same mountain. They requested that the contractors secure the road crossings and that the Colorado DRMS personnel provide notification.

After receiving radio communication of the release, the Colorado DRMS personnel drove toward Silverton, Colorado, and made the notification to the National Response Center at 12:27 p.m. (NRC Report #1124824), after cell phone service had been established. The remaining workers on-site worked into the night to secure the area and rebuild the road to allow access for the cleanup activities that would begin.

Figure 2: National Response Center Notification

Legal requirement	Did the EPA meet this requirement?
A release of a hazardous substance must be immediately reported to the National Response Center. (CERCLA 42 U.S.C. § 9603(a); NCP 40 CFR § 300.125(c))	Yes. The EPA met this requirement by having the state personnel travel to establish cell phone communication to call the National Response Center as soon as possible.

Source: OIG-generated table.

After the National Response Center receives notice of a release, CERCLA[17] requires that the center "convey the notification expeditiously to all appropriate Government agencies, including the Governor of any affected State."

The National Contingency Plan says that "[a]ll notices of discharges or releases received at the [National Response Center] will be relayed immediately by telephone to the OSC."[18] EPA Region 8's Regional Contingency Plan explains that the National Response Center will notify a federal OSC through Region 8's Emergency Operations Center—the regional site for notification, communication and interagency coordination during a pollution incident.

[17] Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. § 9603(a).
[18] Title 40 CFR § 300.125(c).

In the Gold King Mine incident, the National Response Center notified the following entities at 12:37 p.m.:

- Centers for Disease Control and Prevention.
- U.S. Department of Homeland Security.
- U.S. Coast Guard Investigative Service.
- Colorado Department of Public Health and Environment.
- Colorado Information Analysis Center.
- U.S. Department of Transportation, Crisis Management Center.
- National Infrastructure Coordinating Center.
- National Oceanic and Atmospheric Administration.
- Colorado Oil and Gas Conservation Committee.
- U.S. Department of the Interior, Office of Environmental Policy and Compliance.
- U.S. Coast Guard, District 8.

The National Response Center notified EPA Region 8's Emergency Operations Center at 12:39 p.m.

Figure 3: Natural Resource Trustee Notification

Legal requirement	Did the EPA meet this requirement?
The OSC shall ensure that the trustees for natural resources are promptly notified of discharges or releases. (NCP 40 CFR § 300.135(j)(1))	Yes. The EPA met this requirement through the NRC notifications, and through multiple EPA regions notifying relevant states and tribes.

Source: OIG-generated table.

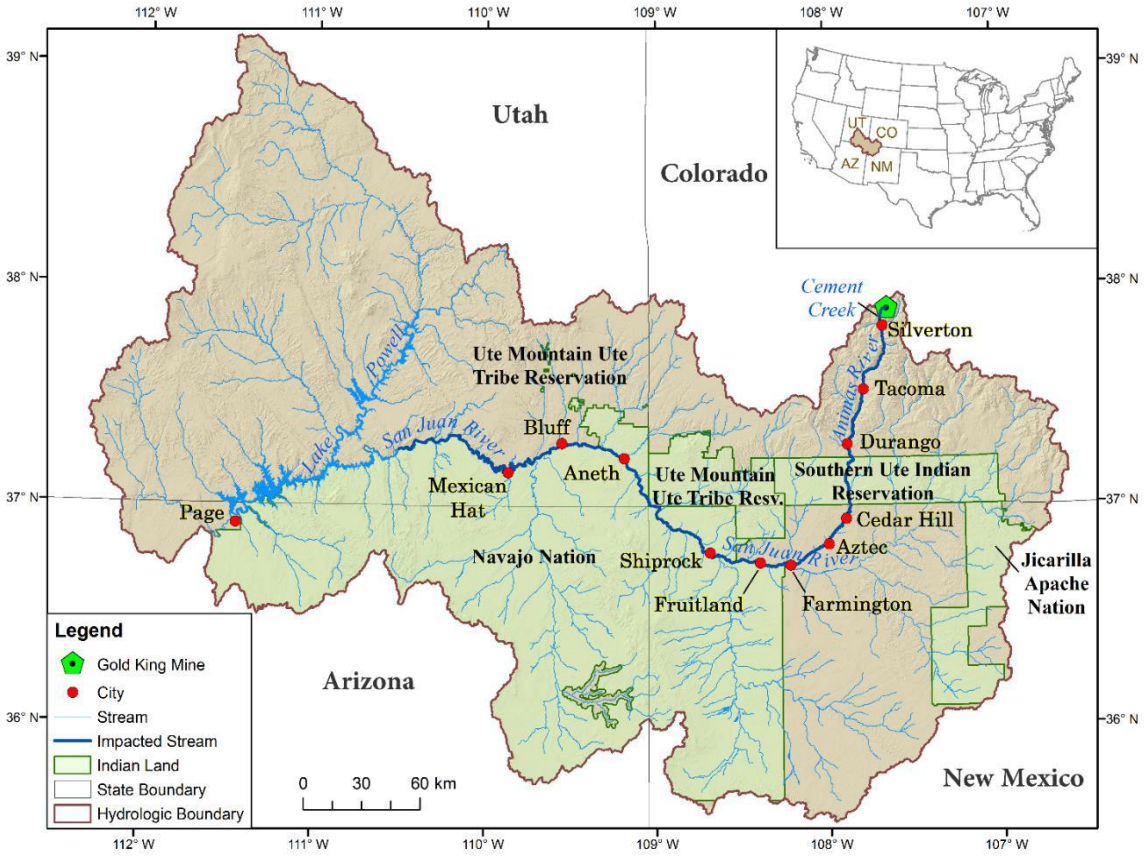
Notification to Downstream Water Users

According to EPA Region 8's Regional Contingency Plan, upon notification from the National Response Center, the OSC will investigate the report to determine the threat posed to public health, welfare or the environment. National Response Center notifications, distributed as described above, are the initial way natural resource trustees and other stakeholders learn about a release or discharge.

For purposes of the National Contingency Plan, the term "state" includes Indian tribes. In addition, the tribal chairmen, or their designee, act as natural resource trustees for their tribe.

EPA Region 8's Regional Contingency Plan directs the state member of the Regional Response Team to notify downstream water users of a release potentially impacting them.

Figure 4: Map of the Animas River, San Juan River, and Lake Powell area affected by the Gold King Mine release



Source: EPA.

Colorado

The Colorado Department of Public Health and the Environment provides a representative to the Regional Response Team for Colorado. As previously noted, the department was notified by the National Response Center at 12:37 p.m. on August 5, 2015. The Colorado Department of Public Health and the Environment informed EPA Region 8 that it had completed notifications to Colorado downstream water users by 1:39 p.m. the same day. The plume passed through the city of Durango, Colorado, which relies on the Animas River as one of its drinking water sources, late in the afternoon on August 6, 2015, hours after EPA officials told city officials to close water system intakes.

Southern Ute Tribe

A Southern Ute Indian Tribe council member testified that the tribe first learned of the Gold King Mine release when the Deputy Director of the Colorado Department of Natural Resources notified the tribe's Wildlife Resources Division

on Wednesday afternoon, August 5, 2015. The tribe immediately responded by implementing its emergency management plan. By August 7, 2015, the EPA had been coordinating with the Southern Ute Tribe. The plume reached the borders of the Southern Ute Tribe Territory in the early morning on August 7, 2015.

New Mexico

The EPA Region 6 Deputy Regional Administrator contacted New Mexico on the afternoon of August 6, 2015, before 2:00 p.m. The New Mexico Environment Department informed the EPA on August 6, 2015, that the compliance officer was working with New Mexico water systems that use the Animas River for drinking water. By August 7, 2015, the EPA and the department were providing assistance to community water systems and closely monitoring the situation. According to the EPA, the leading edge of the plume reached New Mexico on August 7, 2015.

Navajo Nation

EPA Region 9 notified the Navajo Nation via email on the evening of August 6, 2015, and began in-person work with Navajo Nation staff on August 7, 2015, including the sampling of the San Juan River. The President of the Navajo Nation issued a "Precautionary Notice" related to the San Juan River on August 7, 2015. According to the EPA, the plume reached the Navajo Nation on August 8, 2015, in the afternoon.

Ute Mountain Ute Tribe

The EPA reported that on August 8, 2015, the Southern Ute Tribe notified the Ute Mountain Ute Tribe about the release. According to the EPA, the plume was not visible, but the agency estimated the plume would pass a Four Corners sampling location at 12:00 p.m. on August 9, 2015. The Four Corners sampling location is the closest sampling point to the tribal lands of the Ute Mountain Ute Tribe. On August 11, 2015, EPA Region 8 participated in discussions with the Ute Mountain Ute Tribe regarding communication and coordination activities.

Utah

On August 6, 2015, EPA Region 8 notified its Regional Response Team members via email about the Gold King Mine release and provided the first situation report on the release. Regional Response Team members include Utah and other EPA Region 8 states, as well as other federal agencies. On August 10, 2015, the Utah Department of Environmental Quality reported that its Division of Drinking Water had assessed the drinking water sources and systems regulated by the state of Utah, and determined that the state should not be affected by the San Juan River contamination. The Utah Division of Drinking Water had also been in touch with the Navajo Tribal Utility Authority about drinking water systems not regulated by state of Utah, which could be impacted by the release. Utah

Department of Environmental Quality scientists estimated the plume first arrived in Utah during the night of August 9, 2015.

Arizona

EPA Region 9 contacted the Arizona Department of Environmental Quality about the Gold King Mine release on August 7, 2015. The state contact indicated no impacts were expected in Arizona. By August 10, 2015, the department reported that available information suggested that the Gold King Mine release had not affected Arizona's surface, ground or drinking water.

Public Notification

The National Contingency Plan states the following:

> When an incident occurs, it is imperative to give the public prompt, accurate information on the nature of the incident and the actions underway to mitigate the damage. OSCs/RPMs [Remedial Project Managers] and community relations personnel should ensure that all appropriate public and private interests are kept informed and that their concerns are considered throughout a response. They should coordinate with available public affairs/community relations resources to carry out this responsibility by establishing, as appropriate, a Joint Information Center bringing together resources from federal and state agencies and the responsible party.[19]

By August 7, 2015, the EPA began issuing press releases and holding public meetings, and the agency continued them throughout the cleanup. The EPA's Press Releases and Updates for Gold King Mine Response website provides the latest updates on the agency's work at the mine site.

By August 11, 2015, the EPA had helped to establish a Joint Information Center in Durango, Colorado, to provide information about state, regional, tribal and federal responses to the Gold King Mine release. In addition, the EPA created and continues to maintain the Emergency Response to August 2015 Release From Gold King Mine website to house data and documentation regarding the release, and to make information easily accessible to those interested or affected.

[19] Title 40 CFR § 300.155(a).

Issue 16:	What additional policies should be in place to safeguard against future spills at abandoned mine sites during remediation projects.

During our work, the EPA and others have reviewed aspects of, and conducted lessons learned about, the Gold King Mine release. As a result, the EPA has taken steps to minimize the potential for uncontrolled releases resulting from initiating or conducting response activities at mine sites. The EPA also has taken actions designed to improve the notification and communication processes when a release occurs.

We did not identify any additional policies or safeguards that should be in place beyond those recently identified by others. Examples of policies/safeguards provided by others include the following:

- **August 2015.** The EPA's 2015 internal review report recommended that the agency (1) develop guidance to minimize the risks of adit blow-outs; (2) develop a tool box for investigating mines; and (3) where there is concern of an adit blow-out, information and rationale developed by a site team should be critically reviewed. The EPA is creating a document, titled "Planning for Response Actions at Abandoned Mines with Underground Workings: Best Practices for Preventing Sudden, Uncontrolled Fluid Mining Waste Releases," which it expects to complete by June 16, 2017.

- **September 2015.** The EPA's Assistant Administrator for Land and Emergency Management asked EPA Regional Administrators to ensure that Regional Response Team representatives work to strengthen their Regional Contingency Plans, particularly regarding the need to alert and coordinate with responders in downstream jurisdictions. The Assistant Administrator asked Regional Response Teams to conduct an exercise that tests strengthened alert mechanisms. The EPA said this was completed by March 31, 2016.

- **October 2015.** The Bureau of Reclamation recommended that a failure modes analysis be incorporated into project planning, various sources of information should be checked, considerations of how to handle mine water should be taken, water conditions in the mine should be directly measured, and independent expertise should be brought in where significant consequences of failure are possible for projects. The EPA expects to complete this June 16, 2017.

- **March 2016.** The EPA's Assistant Administrator for Land and Emergency Management sent a memo to all EPA regional offices about planning for removal and remedial activities at hardrock mining and mineral processing sites with fluid hazards, and to share the agency's expectations for the work that is done at those sites. The EPA defined a

fluid hazard as an accumulation of mine-related water that could be uncontrollably released and thereby create a potential or actual emergency. To minimize the possibility of future releases, cleanup activities at those sites will include consultation with headquarters, management oversight, and contingency planning. In April 2017, the EPA issued a revised memo to streamline the consultation process. The memo was based on experience gained conducting fiscal year 2016 consultations and developing the "best practices" document discussed above. The memo updated and superseded the March 2016 memo.

- **June 2016.** EPA Region 8's Regional Contingency Plan was updated to add a step in the notification process. The step involves contacting other Regional Emergency Operations Centers if the incident could cross regional boundaries.

- **August 2016.** The EPA addressed preparedness for any future incidents that have potential multistate and regional impacts by improving stakeholder notifications through the review and strengthening of Regional Contingency Plans and emergency response planning documents. The EPA also planned to increase its capacity for rapid data collection and dissemination by creating a National Data Playbook. The EPA completed this in February 2017.

- **September 2016.** The EPA's Office of Land and Emergency Management requested that each EPA region develop a plan to maintain updated information for tribal emergency response contacts. The Office of Land and Emergency Management has worked closely with the EPA's Office of International and Tribal Affairs, and the Office of Public Affairs, to develop a sustainable approach for maintaining tribal emergency contact plans. This was completed by September 30, 2016. During the summer of 2016, the EPA reached out to tribes to educate them on the automated National Response Center, and to encourage tribes to participate. This will help ensure that tribes get timely automatic notification of a spill that impacts their geographic area. The EPA said 24 tribes have signed up for the notification as of November 2, 2016. This is three times the number that had previously been in the system.

Appendix A

Issues Addressed

We issued two notification memorandums to the EPA regarding this work.[20] We addressed the following issues:

1. Details on the work the EPA was conducting at the Gold King Mine prior to the release on August 5, 2015.

2. The cause of the August 5, 2015, release from the Gold King Mine in Colorado.

3. Details on the expertise of the EPA employees and contractors carrying out that work.

4. Whether given known concerns that work at the Red and Bonita Mine could increase water in the Gold King Mine, the EPA took appropriate care to determine water levels in the Gold King Mine before removing rock from the portal.

5. Whether the EPA should have conducted pressure tests on the trapped water behind the mine pool before attempting to open the Gold King Mine, as was done at the Red and Bonita Mine in 2010.

6. Criteria the EPA would apply before approving a contractor for a similar cleanup performed by a private party, and whether the EPA applied the same criteria to the EPA.

7. The EPA's policies regarding indemnification of contractors, and whether indemnification policies have created any impediments or obstacles on the standard of care taken during response activities.

8. How the EPA defined and assured the independence of Bureau of Reclamation staff, officials, contractors or others involved in conducting, supervising, reviewing or overseeing the EPA's requested external assessment of the factors that led to the Gold King Mine release on August 5, 2015.

9. The basis for material differences between the Bureau of Reclamation report and other official EPA or EPA OIG information collected on the factors that led to the Gold King Mine release.

10. The EPA's legal requirements and current policies and guidelines on reporting a release of a hazardous substance.

[20] EPA OIG, Gold King Mine Release Notification Memorandum—August 17, 2015; and EPA OIG, Gold King Mine Release 2nd Notification Memorandum—November 4, 2015.

11. The EPA's legal requirements and current policies and guidelines on contacting tribal, state and local government agencies when the agency creates a release of a hazardous substance.

12. The EPA's response to the August 5, 2015, release from the Gold King Mine.

13. Whether the EPA followed its legal requirements, current policies and guidelines in this particular release at Gold King Mine.

14. How the EPA's current policies and guidelines are designed to ensure compliance with legal requirements, and to keep tribal, state and local agencies adequately informed regarding a release of hazardous substances.

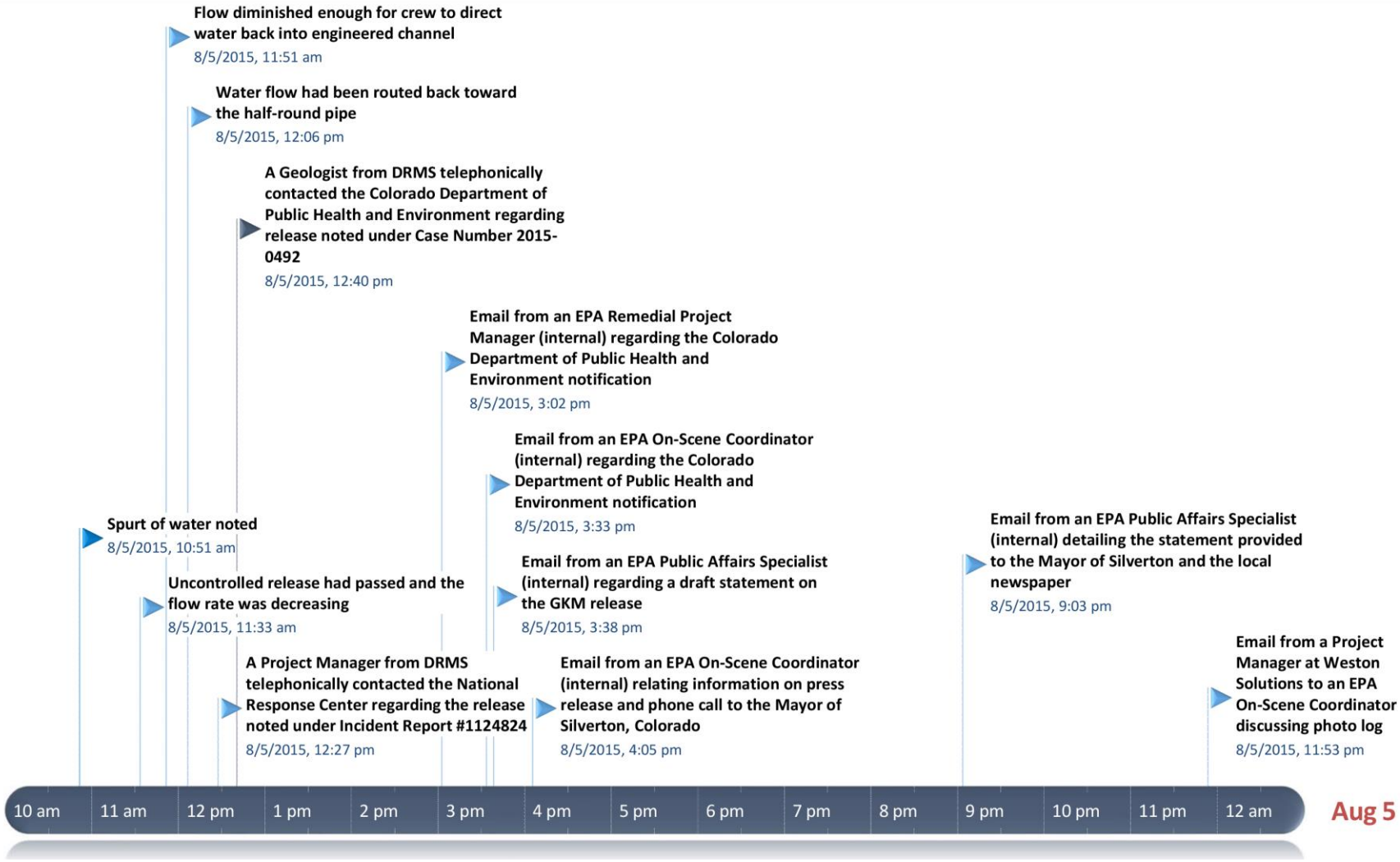
15. Whether any reported delay in providing information to tribal, state and local agencies created any reported health risks or delayed emergency responses from those agencies.

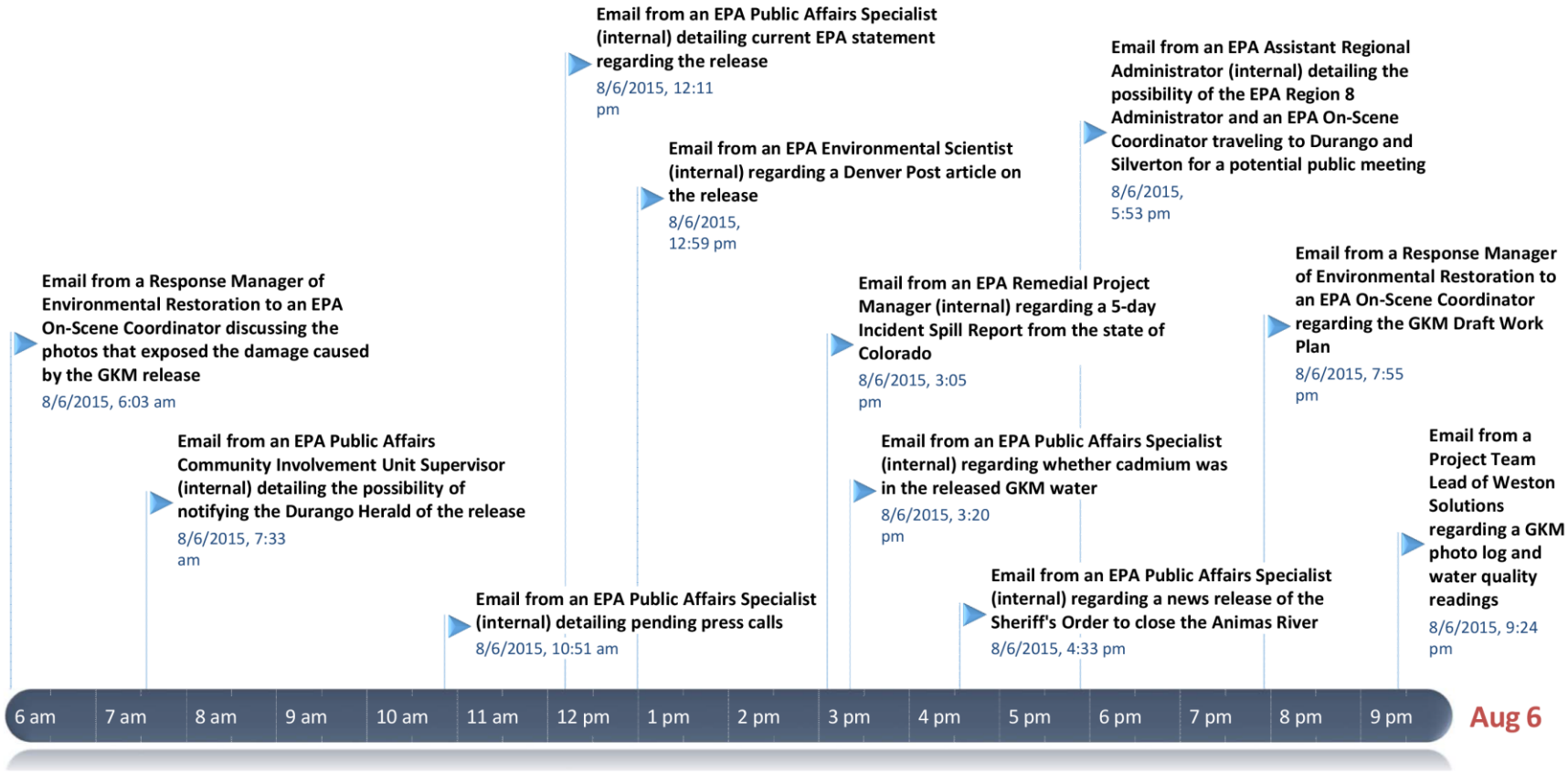
16. What additional policies should be in place to safeguard against future spills at abandoned mine sites during remediation projects.

Appendix B

Timeline of Actions and Communications

The EPA OIG's Office of Investigations created the following timeline in response to the August 19, 2015, congressional request to depict the EPA's actions, and its internal and external communications, in the hours and days immediately following the release of mine water from the Gold King Mine on August 5, 2015. The Office of Investigations prepared this timeline using its professional judgment to determine which communications were responsive to the request.


Flow diminished enough for crew to direct water back into engineered channel
8/5/2015, 11:51 am
Water flow had been routed back toward the half-round pipe
8/5/2015, 12:06 pm
A Geologist from DRMS telephonically contacted the Colorado Department of Public Health and Environment regarding release noted under Case Number 2015-0492
8/5/2015, 12:40 pm
Email from an EPA Remedial Project Manager (internal) regarding the Colorado Department of Public Health and Environment notification
8/5/2015, 3:02 pm
Email from an EPA On-Scene Coordinator (internal) regarding the Colorado Department of Public Health and Environment notification
8/5/2015, 3:33 pm
Spurt of water noted
8/5/2015, 10:51 am
Uncontrolled release had passed and the flow rate was decreasing
8/5/2015, 11:33 am
Email from an EPA Public Affairs Specialist (internal) regarding a draft statement on the GKM release
8/5/2015, 3:38 pm
Email from an EPA Public Affairs Specialist (internal) detailing the statement provided to the Mayor of Silverton and the local newspaper
8/5/2015, 9:03 pm
A Project Manager from DRMS telephonically contacted the National Response Center regarding the release noted under Incident Report #1124824
8/5/2015, 12:27 pm
Email from an EPA On-Scene Coordinator (internal) relating information on press release and phone call to the Mayor of Silverton, Colorado
8/5/2015, 4:05 pm
Email from a Project Manager at Weston Solutions to an EPA On-Scene Coordinator discussing photo log
8/5/2015, 11:53 pm
10 am
11 am
12 pm
1 pm
2 pm
3 pm
4 pm
5 pm
6 pm
7 pm
8 pm
9 pm
10 pm
11 pm
12 am
Aug 5


Email from a Response Manager of Environmental Restoration to an EPA On-Scene Coordinator discussing the photos that exposed the damage caused by the GKM release
8/6/2015, 6:03 am
Email from an EPA Public Affairs Community Involvement Unit Supervisor (internal) detailing the possibility of notifying the Durango Herald of the release
8/6/2015, 7:33 am
Email from an EPA Public Affairs Specialist (internal) detailing pending press calls
8/6/2015, 10:51 am
Email from an EPA Public Affairs Specialist (internal) detailing current EPA statement regarding the release
8/6/2015, 12:11 pm
Email from an EPA Environmental Scientist (internal) regarding a Denver Post article on the release
8/6/2015, 12:59 pm
Email from an EPA Remedial Project Manager (internal) regarding a 5-day Incident Spill Report from the state of Colorado
8/6/2015, 3:05 pm
Email from an EPA Public Affairs Specialist (internal) regarding whether cadmium was in the released GKM water
8/6/2015, 3:20 pm
Email from an EPA Public Affairs Specialist (internal) regarding a news release of the Sheriff's Order to close the Animas River
8/6/2015, 4:33 pm
Email from an EPA Assistant Regional Administrator (internal) detailing the possibility of the EPA Region 8 Administrator and an EPA On-Scene Coordinator traveling to Durango and Silverton for a potential public meeting
8/6/2015, 5:53 pm
Email from a Response Manager of Environmental Restoration to an EPA On-Scene Coordinator regarding the GKM Draft Work Plan
8/6/2015, 7:55 pm
Email from a Project Team Lead of Weston Solutions regarding a GKM photo log and water quality readings
8/6/2015, 9:24 pm
6 am
7 am
8 am
9 am
10 am
11 am
12 pm
1 pm
2 pm
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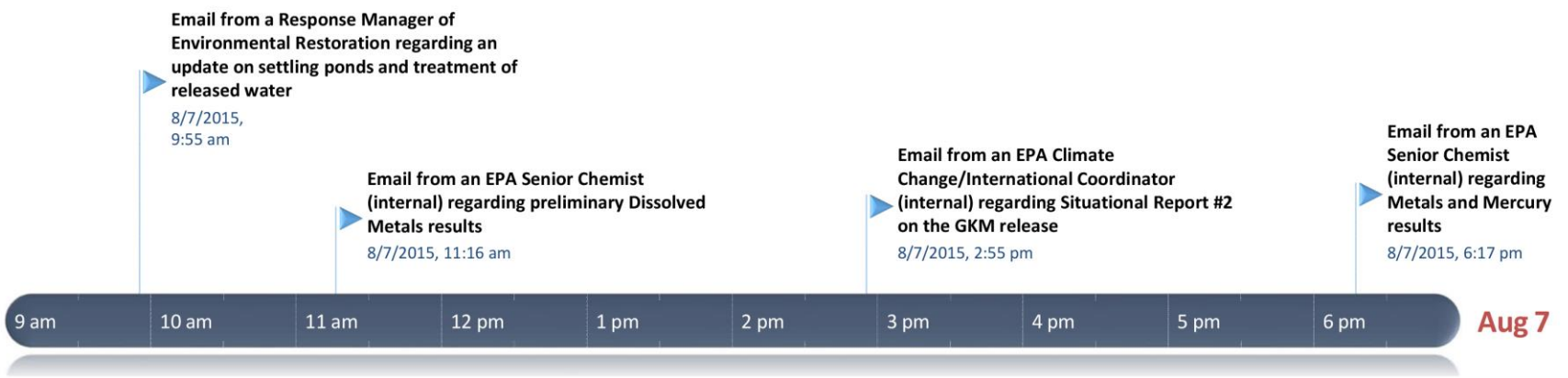
8 pm
9 pm
Aug 6


Email from a Response Manager of Environmental Restoration regarding an update on settling ponds and treatment of released water
8/7/2015, 9:55 am
Email from an EPA Senior Chemist (internal) regarding preliminary Dissolved Metals results
8/7/2015, 11:16 am
Email from an EPA Climate Change/International Coordinator (internal) regarding Situational Report #2 on the GKM release
8/7/2015, 2:55 pm
Email from an EPA Senior Chemist (internal) regarding Metals and Mercury results
8/7/2015, 6:17 pm
9 am
10 am
11 am
12 pm
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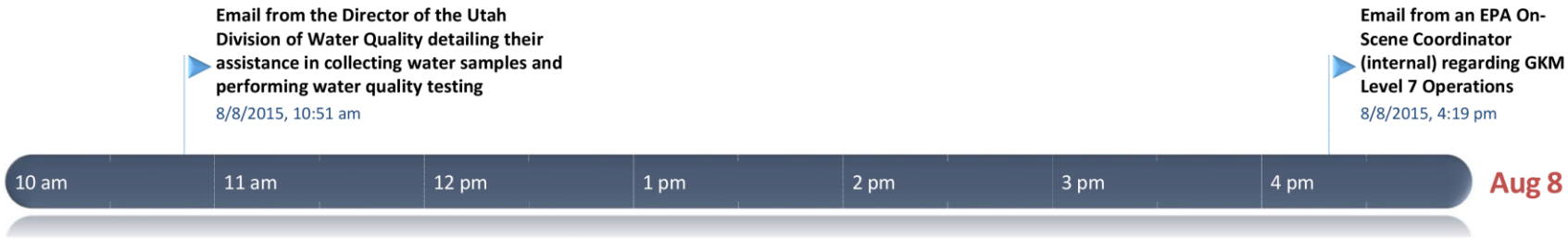
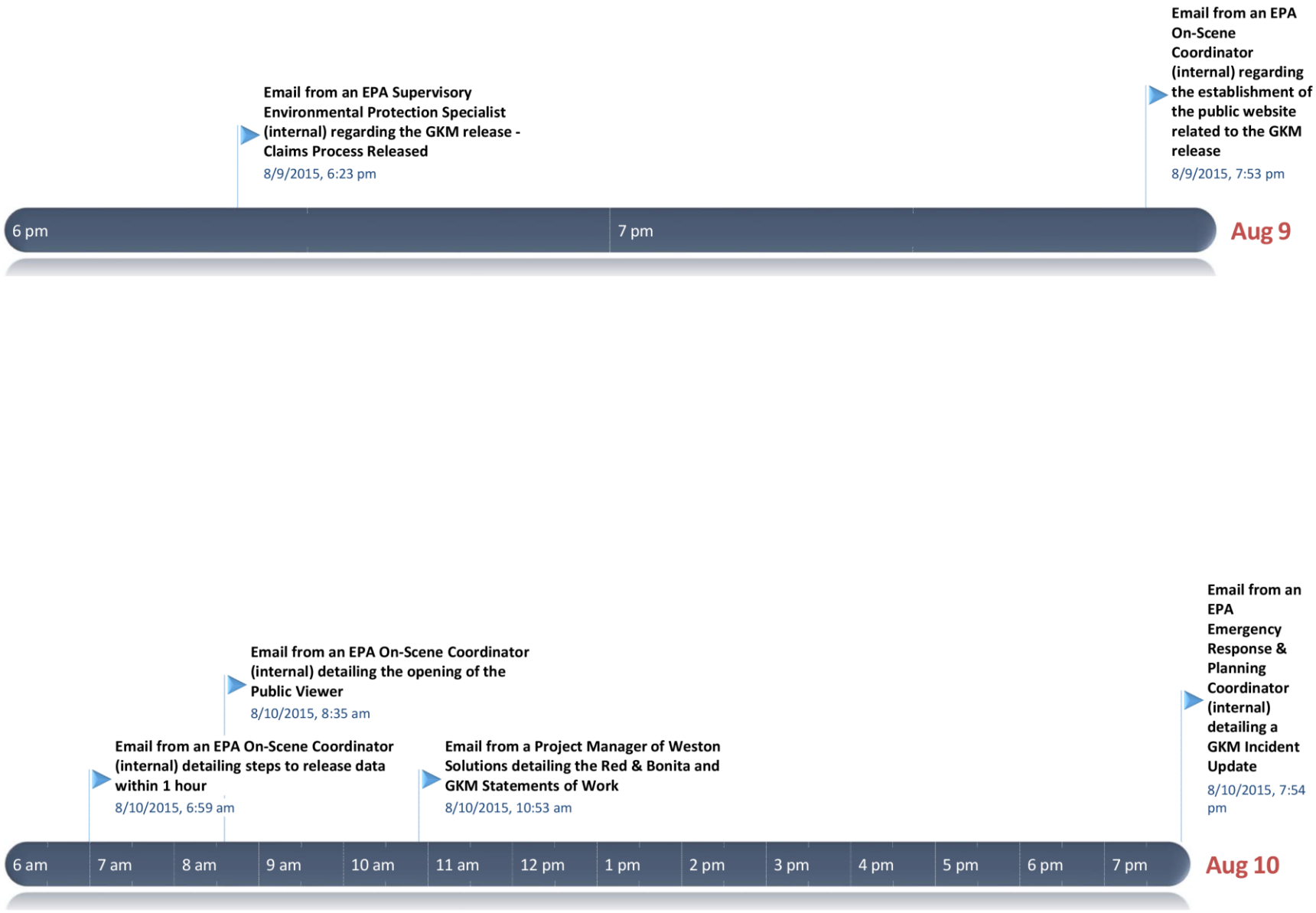
2 pm
3 pm
4 pm
5 pm
6 pm
Aug 7


Email from the Director of the Utah Division of Water Quality detailing their assistance in collecting water samples and performing water quality testing
8/8/2015, 10:51 am
Email from an EPA On-Scene Coordinator (internal) regarding GKM Level 7 Operations
8/8/2015, 4:19 pm
10 am
11 am
12 pm
1 pm
2 pm
3 pm
4 pm
Aug 8


Email from an EPA Supervisory Environmental Protection Specialist (internal) regarding the GKM release - Claims Process Released
8/9/2015, 6:23 pm
Email from an EPA On-Scene Coordinator (internal) regarding the establishment of the public website related to the GKM release
8/9/2015, 7:53 pm
6 pm
7 pm
Aug 9
Email from an EPA On-Scene Coordinator (internal) detailing the opening of the Public Viewer
8/10/2015, 8:35 am
Email from an EPA On-Scene Coordinator (internal) detailing steps to release data within 1 hour
8/10/2015, 6:59 am
Email from a Project Manager of Weston Solutions detailing the Red & Bonita and GKM Statements of Work
8/10/2015, 10:53 am
Email from an EPA Emergency Response & Planning Coordinator (internal) detailing a GKM Incident Update
8/10/2015, 7:54 pm
6 am
7 am
8 am
9 am
10 am
11 am
12 pm
1 pm
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3 pm
4 pm
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6 pm
7 pm
Aug 10

Appendix C

Distribution

The Administrator
Chief of Staff
Assistant Administrator for Land and Emergency Management
Regional Administrator, Region 8
Agency Follow-Up Official (the CFO)
Agency Follow-Up Coordinator
General Counsel
Associate Administrator for Congressional and Intergovernmental Relations
Associate Administrator for Public Affairs
Principal Deputy Assistant Administrator, Office of Land and Emergency Management
Director, Office of Emergency Management, Office of Land and Emergency Management
Deputy Regional Administrator, Region 8
Audit Follow-Up Coordinator, Office of the Administrator
Audit Follow-Up Coordinator, Office of Land and Emergency Management
Audit Follow-Up Coordinator, Region 8