

SUMMARY REPORT

EPA Internal Review of the August 5, 2015 Gold King Mine Blowout 8/24/2015

Purpose:

The purpose of this report is to provide the EPA Internal Review Team's (Team) assessment of the events and potential factors contributing to the blowout from the Gold King Mine (GKM) in Colorado on August 5, 2015. This report provides the Team's observations, conclusions, and recommendations that regions may apply to ongoing and planned site assessments, investigations, and construction or removal projects at similar types of sites across the country.

Team Charge:

The Assistant Administrator of the Office of Solid Waste and Emergency Response (OSWER) charged a subgroup of the National Mining Team on August 14, 2015 to conduct a rapid analysis of the Gold King Mine (GKM) release and provided them with the following charge:

The EPA Gold King Mine Internal Review Team (Team) is charged with conducting an internal review of the August 5, 2015, release of approximately 3,000,000 gallons of mine wastewater from the Gold King Mine near Silverton, CO. This review will entail developing a detailed, chronological description of events as well as identifying potential factors contributing to the release. The review may include recommendations that regions may apply to ongoing and planned site assessments, investigations, and construction or removal projects. The review will include:

- *A visit, during the week of August 16, 2015, to the Gold King Mine site to observe post-August 5 site release conditions.*
- *Interviews with the on-site EPA On-Scene Coordinator and other appropriate EPA staff, appropriate contractor representative(s) (e.g., Emergency Response and Rapid Services [ERRS], Superfund Technical Assessment and Response Team [START] contractor), and others, e.g., State, other Federal agency/departmental personnel, as appropriate, to document their recollections of the event. Interviews shall not interrupt response. [See Attachment B for a list of people interviewed.]*
- *Interviews to be conducted using guidelines to be included in a briefing from the Office of the General Counsel.*
- *Review of pertinent site documentation, (e.g., work plan, schedule, quality assurance response form, other pertinent technical/engineering/contractual documents/any photographic records) to identify potential factors contributing to the release.*

- *Potential coordination with the subsequent external review being conducted by the US Department of Interior/Bureau of Reclamation and US Army Corps of Engineers thereby minimizing the impact to response operations.*
- *Any recommendations to implement at similar sites, both ongoing and new, based on the results of the Team's review.*

A senior manager from OSRTI will be identified to facilitate the identification of individuals to be interviewed, agencies to engage, etc. The Team will develop a preliminary report addressing the information above and deliver it electronically to the OSWER Assistant Administrator by Monday, August 24, 2015. If necessary, the team may also indicate if additional gaps need to be filled, and the timeframe it would take to fill those gaps.

Scope of Team Review:

The Team was asked to conduct a one week rapid assessment of the GKM Blowout. From August 15 to August 24, 2015, the Team performed a site visit, interviewed key individuals, reviewed available information, and drafted a report.

EPA's Internal Review Team consisted of the following: individuals:

John Hillenbrand, CEG, EPA Region 9 – Team Leader
 Joshua Wirtschafter, Assistant Regional Counsel, EPA Region 9
 Ed Moreen, P.E. Civil, EPA Region 10
 Lisa Price, Geologist, EPA Region 6
 Shahid Mahmud, Environmental Engineer, EPA Headquarters

The following are the attachments included in this report:

Attachment A: List of documents reviewed by the Team
 Attachment B: List of interviewees
 Attachment C: Map of Mine Workings
 Attachment D: Working Assumptions Diagram of conditions at new Gold King Mine Level 7 Portal
 Attachment E: Gold King Mine Flow Data and Chart
 Attachment F: Report Photos
 Attachment G: Photo log from 2014 and 2015 Removal Investigation activities

In addition, the Team conducted a limited review of internet resources to determine if there are existing guidelines or procedures for investigating sites with similar characteristics as this site.

Background Information:

The following is the chronology of pertinent site events.

1880's – The Gold King Mine began operation.

Mid-1900's – The Gold King Mine operations ceased; mining had occurred at seven (7) different elevations (levels) through three (3) adits: the Level 7, Number 1, and Sampson. Historical mine water levels could not be ascertained by the team during the review period.

Mid-1900's -- The American Tunnel was constructed below the lowest mine workings in the area (Attachment C: Map of Mine Workings). It runs from the drainage adit discharge point in Gladstone, beneath the Gold King Mine and eventually reaches the Sunnyside mine complex approximately two (2) miles northeast. During operation of the American Tunnel it effectively drained the Gold King and Red and Bonita Mines. It passes 500 feet directly beneath the Gold King Mine Level 7 adits. Anecdotal information puts construction in the early to mid-1900's. A treatment plant was constructed to treat the water from the tunnel prior to release to Cement Creek. The date of construction of both the water treatment plant and the American Tunnel could not be ascertained during the review period.

1986 – A permit was issued to the Gold King Mines Corporation (Permit Number M-1986-013) by the state of Colorado to re-work the historic interconnected adits. During the permitted mine operations, another adit was driven at the Gold King Level 7 (the Adit) to bypass a collapse in the original Gold King Level 7 Adit (the Old Adit).

2002 – Treatment of the discharge water from the American Tunnel ceased after installation of the last bulkhead. Flow from the American Tunnel continued after the installation of the bulkhead at approximately 100 gallons per minute (gpm). Since closure of the American Tunnel, the water quality in the Animas River has degraded progressively due to the impact of drainage from the American Tunnel and other newly draining adits.

2005 – No documentation of flow for the Adit is available before July 2005. Anecdotal information suggests that the Red and Bonita Mine, which did not have any previously documented mine water discharge, began releasing approximately 300 gpm of water after the American Tunnel closure. The Adit also experienced an increase after the American Tunnel closure from no significant flow to flow rates of approximately 42 gpm in July and 135 gpm in September¹. (See Attachment E: Gold King Mine Flow Data and Chart)

2006 – Mine water flow rate from the Adit was approximately 314 gpm¹ in October.

2007 – Release of mine water from the Old Adit breached the existing discharge ditch and saturated the mine waste pile. The saturated conditions led to a slope failure that partially blocked access to the site and filled the North Fork of Cement Creek with mine waste. The quantity of mine water discharged is not known.

¹ The Team could not ascertain in the time allowed if flow rates represent composite for both the Old Adit and the Adit or just the Adit

2008 – The Colorado Division of Reclamation, Mining & Safety (DRMS) constructed a discharge diversion structure (flume channel) to prevent future mine water saturation of the Gold King Level 7 mine waste pile at the Old Adit. This work was paid for by the forfeiture of the bond associated with the permit issued in 1986, M-1986-013.

2009 – The DRMS’s Gold King Mine Reclamation Plan called for all four (4) adits of the Gold King complex to be backfilled and the installation of a flume to divert the discharge. The two (2) Gold King Level 7 adits (Adit and Old Adit) were partially collapsed already but additional closure work was conducted. This work was paid for by the forfeiture of the bond associated with the permit issued in 1986, M-1986-013. DRMS stated in the project summary for the activities that “[a] future project at the site may attempt to cooperatively open the Level 7 Old Portal in an effort to alleviate the potential for an unstable increase in mine pool head within the Gold King workings.” The Old Adit was releasing roughly 200 gpm.

2010 – The average mine water flow rate from the Gold King Level 7 mine was 206 gpm¹.

2011 – The average mine water flow rate from the Gold King Level 7 mine was 140 gpm¹.

2014 – EPA planned to expose the Adit in 2014 – EPA was working with DRMS and the Animas River Stakeholder Group (ARSG), which is composed of industry, agency and citizens including former miners and equipment operators who have worked on some of the mine adit closures in the area of Gold King, to identify actions that may be needed to reduce contaminant loading to Cement Creek and downstream waters. This included a plan to install bulkheads at the Red and Bonita Mine. It was determined appropriate to attempt to open the Adit prior to restricting flow at the Red and Bonita Mine with a bulkhead and potentially changing the water level elevations in the Red and Bonita Mine. To accomplish this objective, EPA planned to expose the Adit behind the external blockage, build a portal structure, and convey Adit flows into the existing channel (see Attachment D). This was being done to allow access for further investigation of the Adit. The flow rate data from the Gold King Level 7 mine was approximately 112 gpm in August, 2014, however, on September 11, 2014 prior to the beginning of site work, the flow rate was less than 13 gpm.¹

A retention pond was constructed to capture solids that might be released during the Adit work. On September 11, work began to remove the material that was blocking the Adit. The excavation extended approximately 20 feet into the Adit entrance. The work stopped when it was determined that the elevation of the Adit floor was estimated to be six (6) feet below the waste-dump surface elevation. EPA determined that Adit drainage would need to be managed in a larger settling pond(s) requiring additional treatment.

The excavation in 2014 revealed that two (2) 24-inch pipes were in the tunnel blockage adjacent to the top (roof) of the maximum 10 foot tall Adit. (See Diagram in Attachment D). The presence of water below the two (2) 24-inch pipes indicated the current flow of water was coming out at least four (4) feet below the roof of the Adit, indicating approximately six (6) feet of impounded water above the estimated Adit floor elevation.

On September 12, two (2) drain pipes were placed at the base of the blockage to capture the ongoing mine water drainage and direct flow into the existing flume channel installed in 2008 by DRMS. Geo-fabric, crushed rock, and quick-dry concrete was used to secure the pipes in place. The Adit area was backfilled and compacted with additional loads of crushed rock to maintain a stable surface at the Adit for potential future work. Field work was suspended for the rest of the year.

2015 – Based on information acquired in 2014, EPA, again, planned to reopen the Adit and workings to investigate the conditions to assess the ongoing releases of mine water. This would require incremental de-watering and removal of internal blockages that were preventing the release of impounded water. A secondary purpose of the work is to attempt to gain access to the mine workings and to mitigate flows, if possible.

In January and May, 2015, the ARSG held meetings, open to the public, where DRMS and EPA presented their plans for removal investigation at the Adit. The Meeting Summaries posted by ARSG do not record any stakeholder criticism of the planned approach.

EPA returned to the Adit in late July, initiating site preparations with reconstruction of the access road and installation of an alternative mine drainage pipe at a deeper depth in anticipation that the Adit floor is lower than the other drainage pipes installed in 2014.

On August 4, excavation began above the top of the Adit to remove consolidated soils and debris. The goal was to find competent bedrock within which to anchor a support structure for the Adit. During this first day of excavation, according to the OSC, mine timbers and the external Adit blockage were newly exposed

On August 5, excavation resumed. The OSC observed a solid rock surface and constructed a ramp above the external Adit blockage to remove soil from the bedrock surface. During the excavation, the lower portion of the bedrock face crumbled away and there was a spurt of water from the area in the lower part of the excavation area. Shortly after the water spurting, more water started coming from the localized area of the spurt. The color of the water was initially clear but then changed to red/orange. The OSC speculated that the excavation might have knocked something loose when removing the soils from the rock face.

The time lapse between the spurting to the flow of red/orange water was 3 to 4 minutes. It took approximately 1 hour for the peak flow to subside.

Observations Related to the Release:

The Team interviewed key personnel involved with the Adit blowout from EPA Region 8 on August 17, 2015, to document their recollections of the event and to get pertinent site documents and other information on the site. EPA Region 8's personnel provided a package of key site-related documents, pictures of the site, and site diagrams. On August 18, 2015, the lead OSC from Region 8 led a site visit of the Gold King Mine. Senior mining experts from the DRMS also participated in this site visit. The Team asked the State experts about their understanding of the site and recollection of the events at the Adit and the upper Animas River mining district.

The August 18 tour included stops at: the American Tunnel entrance with an explanation of the underground working by DRMS; the road above the series of ponds that treat the post-blowout drainage from the Adit (see Appendix F, photo 1); the Gold King Mine area; and both the Old Adit and the Adit. No stop was made at the Red and Bonita Mine (Appendix F photo 2 and Attachment C, map of workings).

In addition to bringing an understanding to the chronology of events listed above, the site visit and work plan provided the following supplemental information:

- The work plan accounted for the possibility of pressurized (mine water with a head high enough to cause water to exit the Adit at high velocity) mine water conditions. In the introduction, the work plan states:

“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.”

- The work plan outlined the steps to be taken such as gradually lowering the debris blockage and the use of equipment (stinger) that would help control drainage from the mine under non- or slightly pressurized conditions. A stinger is a metal pipe that is inserted from above the top of the mine adit front at an angle, through the debris and collapse blockage into the void behind the blockage, allowing drainage and control of mine water.
- For the Adit, a determination of no or low mine water pressurization was made by experienced professionals from EPA and the DRMS. Based on discussions with the EPA and State people associated with the site, this determination was based on the following conditions:
 1. The hill above the Adit was inspected for seeps which would have indicated outward flow from mine water that had a pressure head above the top of the Adit. It was reported that there were no seeps.
 2. The mine was draining, which indicated that since water was able to escape, buildup of pressure was less likely.
 3. The DRMS experts, (b) (6) who supported the removal investigation, had worked in the area for years, were familiar with the site and knew the details of the operation and area hydrology
 4. The Animas River Stakeholders Group (ARSG) had been given a presentation by (b) (6), EPA’s On-Scene Coordinator (OSC), and (b) (6) with DRMS, as documented in the May ASRG Meeting Summary.
 5. The DRMS experts supported the removal investigation at the Adit and were present at the site during the operations on August 4 and 5.
 6. The “seep” level coming from the Adit during excavation seemed to be at the mid-level of the material blocking the Adit, indicating a partially filled adit as opposed to a pressurized one (See Attachment D, bottom of two metal pipes).

7. The Red and Bonita Mine Adit was lower in elevation (a few hundred feet) and found to be unpressurized after it was accessed by drilling from above.
 8. The DRMS experts indicated that similar techniques have been employed at other similar mine sites. One DRMS expert noted that a similar investigation technique was implemented at the Captain Jack Mine in Colorado but did not result in a blowout.
- Despite the available information suggesting low water pressure behind the debris at the Adit entrance, there was, in fact, sufficiently high pressure to cause the blowout. Because the pressure of the water in the Adit was higher than anticipated, the precautions that were part of the work plan turned out to be insufficient. The inability to obtain an actual measurement of the mine water pressure behind the entrance blockage seems to be a primary issue at this particular site. If the pressure information was obtained, other steps could have been considered. However, the Team cannot determine whether any such steps would have been effective, or could have been implemented prior to a blowout.
 - Mine water pressurization data from behind the blockage potentially could have been obtained through a drill hole inserted further back into the Adit from above the mine tunnel. Such a technique was performed at the nearby Red and Bonita Mine and found no pressurization. Consequently, it was determined that the tunnel was not full of water and excavation of the Adit at that mine could proceed. Such a technique was not used at the Adit. Based on the site topography (steepness and ruggedness) observed by the Team and conversations with the OSC and the DRMS experts, (See Attachment F, first photo) the use of such a technique would have been very difficult and expensive at the Adit. The unstable and steep slope above the Adit had loose soils and rock and the underlying bedrock was prone to cave-ins, as observed over the nearby Old Adit (See Attachment F, photo 3). Because of the soil and rock conditions, the access and drilling of a hole into the Adit from above would have been quite costly and require much more planning and multiple field seasons to accomplish. Although difficult and therefore expensive and technically challenging, this procedure may have been able to discover the pressurized conditions that turned out to cause the blowout.
 - An additional potential clue of potential pressurization was the decrease in flows from the Gold King Adits over the years (Attachment E). That decrease could have been an indication of impounded water from a blockage. The mine drainage flow before 2005 was understood to be zero and increased from 42 gpm in 2005 to 135gpm in September 2005 and peaked at 314 gpm in October 2006. This increase is attributed to rising groundwater in the Gold King Mine workings from plugging of the back portion of the American tunnel in 1995 and possibly 2002. The average flows in 2010 dropped to 206 gpm, further dropped to an average of 140 in 2011 and finally to about 70 gpm or less in the past year. These conditions may indicate some type of internal change to the mine such as additional cave-ins, or a restriction due to already caved material, perhaps by chemical precipitates, or some other cause. It is also possible that the reduced flows could have been attributed to decreased precipitation in the area or increased flows from the American Tunnel.

- The Team was not able to identify any calculations made on the possible volume of water that could be held behind the portal plug. This calculation could have been useful in determining possible response scenarios for unexpected releases.
- The Request for Proposals (RFP) that included the work at the Adit project requested a plan for dealing with mine water flow and also states that the blockage in the Adit must be removed in a manner to prevent a surge of impounded mine water from being released. It called for the water impounded behind the blockage to be drawn down in a controlled manner as the blockage is removed. Upon review of the work plan, the contractor provided a description and conceptual drawing for dealing with the water (Attachment D). However, the Team believes that Emergency Action Plan (EAP) included with the site plan did not anticipate or plan for the volume or pressure encountered and contained only limited emergency procedures in case of a mine blowout. This lack of information about a blowout in the EAP could indicate the low expectation of its occurrence by the contractor and reviewers. These procedures and contacts may have been included in the Site Health and Safety Plan but this document could not be obtained in time for this report.

Conclusions:

Based on the review of the available information, including the interviews, documents and site visit, the Team is providing the following conclusions:

1. The EPA site removal investigation team had extensive experience with the investigation and closure of mines. The EPA site removal investigation team had consulted with and had the field support of the DRMS. The EPA site removal investigation team also performed outreach to the ARSG, to provide an opportunity for additional input regarding the planned activities. The EPA site removal investigation team and the other entities consulted or who provided information about the proposed activities had extensive site knowledge of the mine workings and extensive experience evaluating and working on mine sites. None of those participating or informed parties raised any significant concerns with the proposed activities.
2. In preparation for the investigation activities, EPA had collected and analyzed flow data, was familiar with site topography, and had inspected the site for signs of seeps, including the area above the Adit, prior to implementing the execution of the work plan.
3. It is not evident that the potential volume of water stored within the Adit had been estimated. Given the maps and information known about this mine, a worst case scenario estimate could have been calculated and used for planning purposes. When adequate information is available, performing such calculations may aid the site management team in instances where water is anticipated to be trapped in an adit. The interconnectivity of

mine workings could be used to estimate potential water volume prior to opening up a collapsed adit.

4. Additional expert opinions may be warranted for sites with collapsed adits, complex interconnectivity of mine workings, and highly transmissive bedrock groundwater systems.
5. The work plan contained an EAP which included provisions for mine emergencies including cave-ins. However, based on the documents reviewed by the Team, it was lacking emergency protocols in the case of a significant flow or blow out. It should be noted that the site team responded appropriately during and after the blowout by moving personnel and equipment and diverting mine water discharge. Such provisions are an important component of an EAP on sites such as the Gold King Mine. There may have been some contingencies planned in case of a blowout, but it could not be ascertained by the Team during the review period.
6. The Adit is located in a remote, rugged mountain location in the Rocky Mountains. The level of effort necessary to mobilize a drill rig and create a drill pad to undertake drilling or other investigative techniques to determine pressure (hydrostatic head) within the mine would require significant resources and add additional time to the implementation schedule and may not be successful in ascertaining water levels or pressure within the mine. Safety is a key consideration for drilling at the Gold King site, and establishing a safe location for the drill pad would be very challenging given the steepness and instability of the slopes above and in proximity to the Adit. Drilling to hit a target such as an adit or tunnel can be very challenging if the drill pad cannot be located in close proximity the adit entrance. It can also be a lengthy process and require considerable effort and expense. However, if it could be performed successfully and safely, drilling could provide the information needed to ascertain the pressure behind the collapsed workings within the mine.
7. In reviewing the pertinent documents provided, interviews conducted, visiting the site and evaluating the photo logs, the Team concludes that the Adit blowout was likely inevitable. Actions taken by the EPA OSC to pull out the site personnel and crew from and near the Adit, just prior to the blowout, probably avoided any fatalities from the pressurized Adit blowout.
8. Although the removal investigation team was quite experienced and followed standard procedures of a well thought out work plan that included state and ARSG involvement, the underestimation of the water pressure in the Gold King Mine workings is believed to be the most significant factor relating to the blowout.

9. A limited review of internet resources did not reveal any existing guidelines or procedures for assessing highly pressurized mine adits or tunnels, such as Gold King Mine.

Recommendations:

1. EPA should develop guidance to outline the steps that should be undertaken to minimize the risk of an adit blowout associated with investigation or cleanup activities. The guidance, at a minimum, should:
 - a. Identify a tiered approach that requires increased detail regarding the proposed action based on the complexity of the site conditions or the potential nature of any release.
 - b. Provide criteria to identify whether a proposed investigation or cleanup action presents a low, moderate, or high risk with respect to the potential for an adit blowout and significant release of acid mine drainage or mine waste.
 - c. Require that a management review meeting(s), including the key state (and other federal agencies when appropriate) be held to determine whether sufficient information exists to meet the criteria established in the guidance or whether additional information is necessary before undertaking the investigation or cleanup activity.
 - d. Outline the outreach activities to inform the local community and stakeholders.
 - e. Identify the contingency planning that may be appropriate based upon the risk of blowout and the nature of the potential release.
2. Even though the chance of encountering pressurized mine water was investigated in many ways at the Gold King Mine, the Gold King Mine blowout suggests that EPA should develop a toolbox of additional investigative tools such as remote sensing or drilling into the mine pool from the top or side that should be more seriously considered at similar sites. It's important to recognize that underground mines may be extremely complex, making characterization of the internal hydraulic conditions and flow paths challenging. Adding to this complexity is that older mine workings are often not well mapped and that some underground mines may also be structurally unstable and prone to cave-ins and internal plugging making them very difficult to assess. The toolbox should identify techniques which could be used to minimize uncertainties associated with these types of mines. Site specific conditions may make certain investigative tools prohibitive or extremely challenging and costly. In the end, while additional information gathering may reduce the uncertainty, a complete understanding of the underground conditions may not be attainable.
3. Emergency Action Plans should include protocols should a blowout occur at those mine sites where there is a potential for such an event to occur.

4. Information and rationale developed by a site team in anticipation of an investigation or cleanup action for sites where an adit blowout could be a concern (e.g., available pressure information, a reasonable estimate of the volume of water within the mine workings, or adit drainage flow rate data) should be critically reviewed by a qualified and experienced Regional Mining engineer and or Mining Hydrologist/Geologist. The Region may want to consider getting assistance from qualified outside parties such as other federal agencies, state agencies, or outside consultants in conducting this critical review.

5. The Team also recommends that subsequent reviews of the Gold King Mine Adit Blowout by an Independent External Review Group or the Office of Inspector General consider the possibility of assembling a panel of experts consisting of mining industry experts, other federal and state mining experts, academia, consultants, non-governmental organizations and tribal governments to further analyze the situation encountered at this site and come up with recommendations on additional safeguard measures to reduce the risk and minimize the consequences of such incidents in the future.

Attachment A

List of documents reviewed by the Team

Animas River Stakeholders Group, January 2015, Meeting Summary, 3 p.

Animas River Stakeholders Group, May 2015, Meeting Summary, 3 p.

Colorado Division of Reclamation, Mining & Safety, 2008, Project Summary: Gold King Bond Forfeiture M-1986-013, Phase I – 2008, Permanent Portal Discharge Diversion Structure, 2 p.

Colorado Division of Reclamation, Mining & Safety, 2009, Project Summary: Gold King Bond Forfeiture M-1986-013, Phase II – 2009 Reclamation at the Sampson, Number One, and Level Seven Portals, 4 p.

Colorado Division of Reclamation, Mining & Safety, 2014, Approximation of Mine Portal Elevations and Mine Pool Elevations Map, 1 p.

Colorado Division of Reclamation, Mining & Safety, 2015, Red and Bonita, Sunnyside, Gold King, and Mogul and Grand Mogul Mine Workings Map, 1 p.

Environmental Protection Agency, September 2014, POLREP#1 (Initial Pollution Report) – Removal Assessment, Gold King Mine Site, 9 p.

Environmental Protection Agency, August 2015, Gold King – EPA Working Assumptions, 2 p.

Environmental Restoration, LLC, July 2014, Request for Proposal, Gold King Mine, 16 p.

Environmental Restoration, LLC, May 2015, Action/Work Plan, Gold King Mine, 6 p.

Attachment B

List of key personnel interviewed EPA Internal Review Team of the Gold King Mine Spill, Colorado

The EPA Internal Review Team conducted a series of interviews with key personnel involved in deciding how to proceed with the removal assessment at the site and or who were present at the site prior to the release at the Gold King Mine site in Colorado. The team asked these key personnel about what information they reviewed and considered prior to making the decision to proceed with the removal assessment at the site and what kind of actual field conditions they encountered just prior to the spill. The list below provides the names and affiliations of the key personnel interviewed by the EPA's Internal Review Team.

Key Personnel Interviewed

Formal interviews were held on August 17, 2015, were held at the Recreation Center in Durango, Colorado. The personnel included:

(b) (6) - Program Director, USEPA Region 8 Preparedness, Assessment and Emergency Response Program

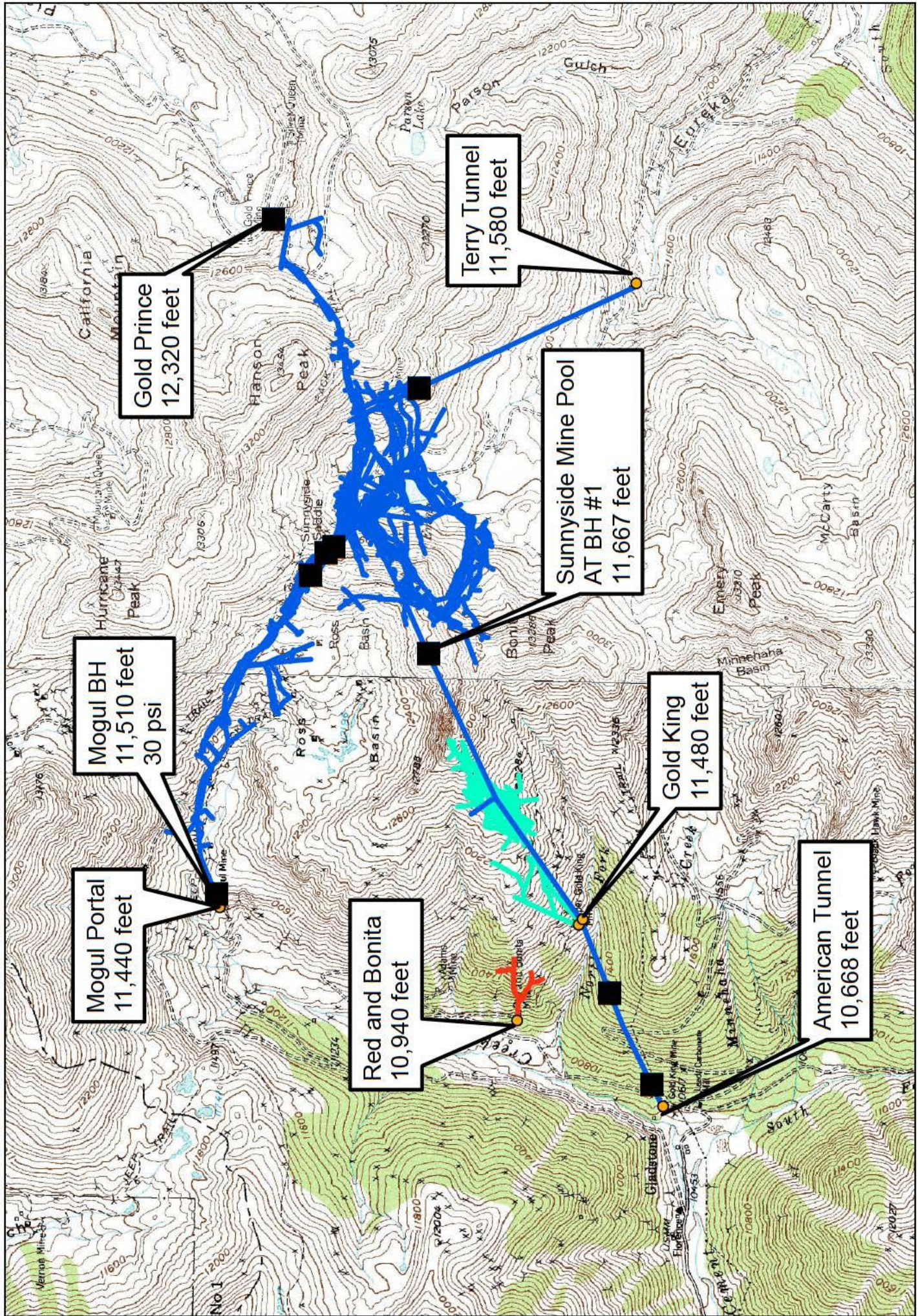
(b) (6) USEPA Region 8 On-Scene Coordinator

(b) (6) (by phone) - USEPA Region 8 On-Scene Coordinator

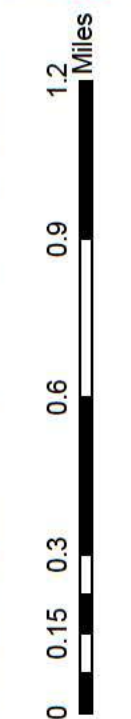
During the site visit to the Gold King Mine site on August 18, 2015, the EPA Internal Review Team talked (informal discussions) with the following personnel:

(b) (6) Colorado Division of Reclamation Mining and Safety

(b) (6) Colorado Division of Reclamation Mining and Safety



Approximation of Mine Portal Elevations
and Mine Pool Elevations
Created for ARSG
(616)
4/17/2014



Mine and Pool Elevations

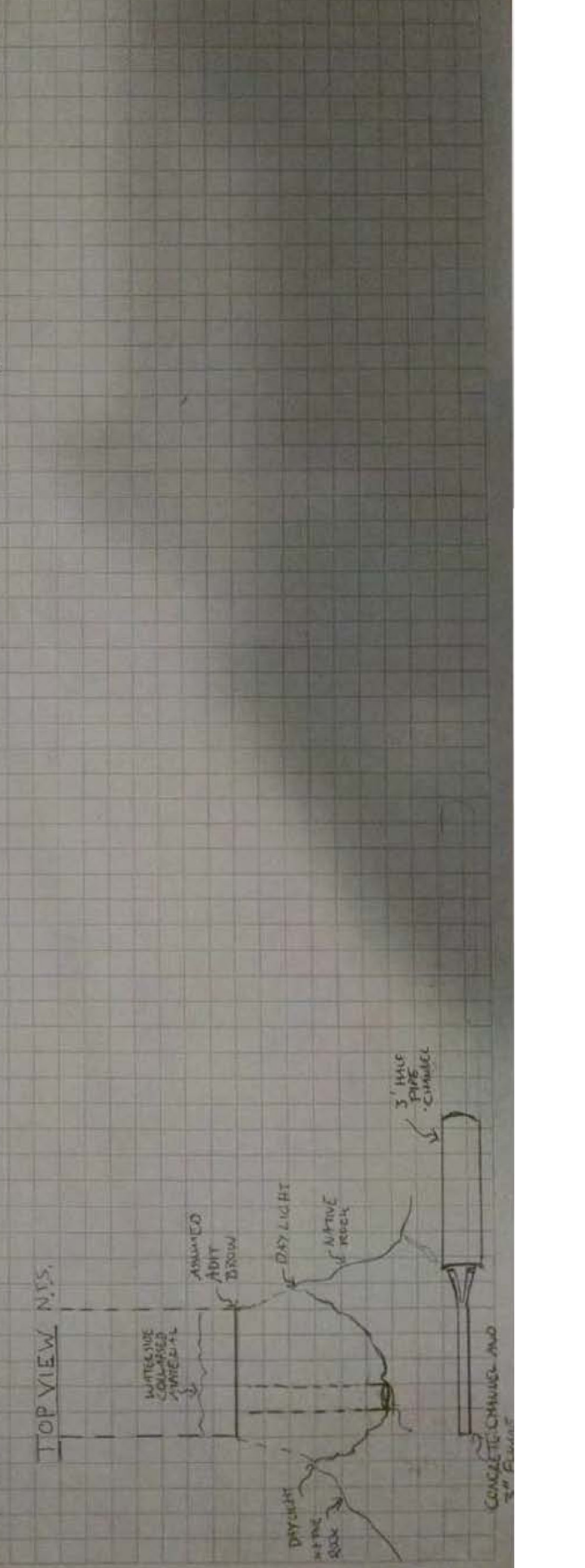
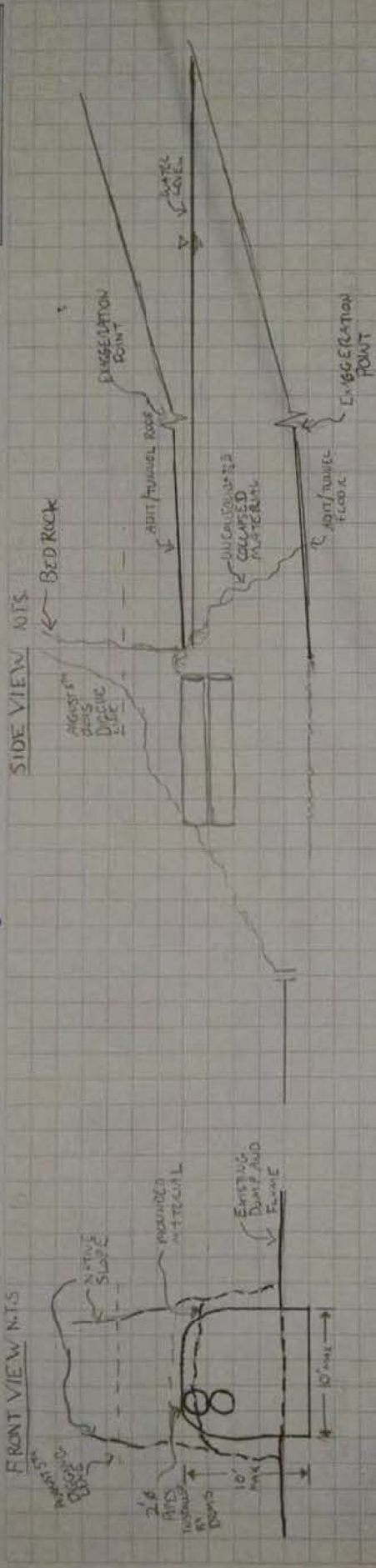
Gold King Mine

2015

EPA Working Assumptions

SHEET _____ of _____
 W.O. NO. _____
 TASK NO. _____
 APPROVED BY _____
 DEPT. _____ DATE _____

CLIENT/SUBJECT: Grand Kwig/MWE
 TASK DESCRIPTION: EPA Wastewater Assessment
 PREPARED BY: (b) (6) DEPT: _____ RS. DATE: _____
 MATH CHECKED BY: (b) (6) DEPT: _____ RS. DATE: _____
 METHOD REV. BY: _____ DEPT: _____ DATE: _____



Attachment E

Gold King Mine Flow Data and Chart

Flow from Gladstone Area Mines

The annual discharge of water from the Gold King Mine and 3 nearby mines (Mogul, Red and Bonita, and American Tunnel) was estimated using ESAT data from 2009 through 2014 (Table 1). The average annual runoff flow and the average annual non-runoff flows were weighted to estimate overall annual flow. The four mines discharge approximately 330 million gallons of water per year (based on 2009-2014 flow data). Additional mines in the area also release acid mine drainage. The recent release of 3 million gallons is less than 1 percent of the annual discharge from the four mines.

TABLE 1
Historic Annual Flows from 4 Mines (Mogul, Red and Bonita, Gold King and American Tunnel)
2009-2012

	4 Mines Flow			CC06 Flow			
	Flow (cfs)	Days	Annual Flow (gpy)	Flow (cfs)	Days	Annual Flow (gpy)	% of Total
Average of Yearly Average Flow*							
Non-Runoff	1.364	273	240,700,000	0.270	273	47,600,000	20%
Runoff	1.474	92	87,700,000	0.391	92	23,300,000	27%
	Total		328,400,000	Total		70,900,000	22%
2009							
Non-Runoff	1.477	273	260,500,000	0.426	273	75,100,000	29%
Runoff	1.623	92	96,500,000	0.452	92	26,900,000	28%
	Total		357,000,000	Total		102,000,000	29%
2010							
Non-Runoff	1.227	273	216,400,000	0.418	273	73,800,000	34%
Runoff	1.381	92	82,100,000	0.522	92	31,000,000	38%
	Total		298,500,000	Total		104,800,000	35%
2011							
Non-Runoff	1.365	273	240,800,000	0.313	273	55,200,000	23%
Runoff	1.389	92	82,600,000	0.313	92	18,600,000	23%
	Total		323,400,000	Total		73,800,000	23%
2012							
Non-Runoff	1.562	273	275,600,000	0.313	273	55,200,000	20%
Runoff	1.389	92	82,600,000	0.313	92	18,600,000	23%
	Total		358,200,000	Total		73,800,000	21%

cfs cubic feet per second

gpy gallons per year

Calculations based on EPA/ESAT flow monitoring data from 2009-2014. Overall flows for 2013 and 2014 are not shown because spring flows are not available for either year due to snowpack conditions. The average annual runoff flows from 2009-2012 and the average non-runoff flows from 2009-2014 were averaged to calculate the overall average runoff flow. Runoff averages included measurements made during May, June, July. Non-runoff averages included measurements made during other months of the year.

Variability of Gold King Mine Flow

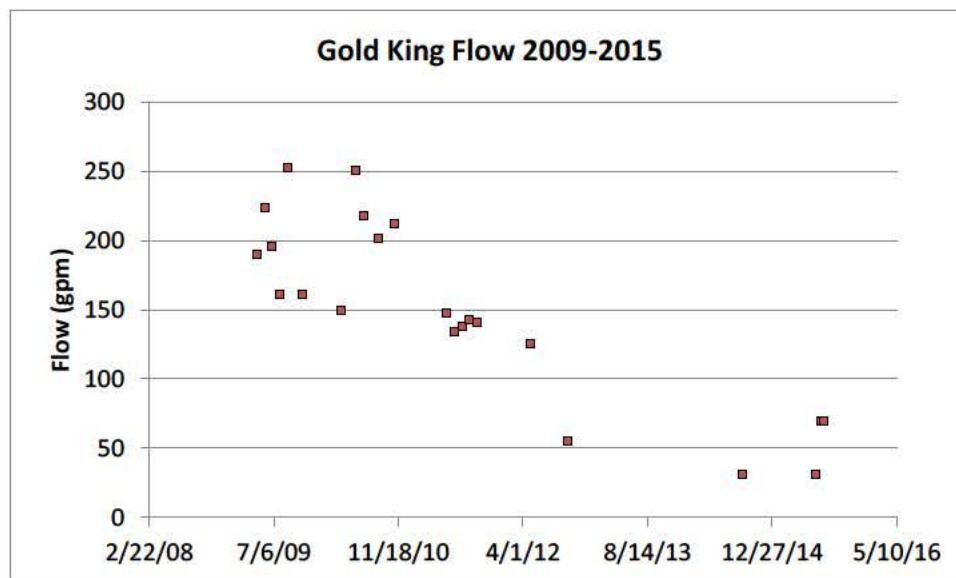
Gold King Mine flow data is available from 2009 through 2014, with multiple sampling events from 2009-2011 and fall sampling from 2012-2014. Gold King Mine spring flow was not measured from 2012 to the present due to high snow and potential avalanche conditions, and flow was not measured during fall 2013 due to the government shutdown. Flow was also measured by START during 2014 and 2015 site visits.

For years with multiple flow measurements (2009, 2010, 2011), the Gold King Mine discharge varied by up to 45 percent within 1 year (2009), when the November flow was 45 percent greater than the August flow.

The Gold King Mine discharge annual average runoff flow varied from the annual average non-runoff flow by up to 22 percent (2010).

Older historic data from START showed flow was 42 gpm in July 2005, 135 gpm in September 2005, and 314 gpm in October 2006. This widely variable flow may have been due to backup of water behind the American Tunnel reaching the elevation of the Gold King rather than an indication of the variability of flow from the Gold King Mine.

Measurements in 2015 included 31 gallons per minute (gpm) on June 24 (similar to Fall 2014), and 69 gpm on both July 15 and July 23.



Appendix F

Photos and Google Earth Images

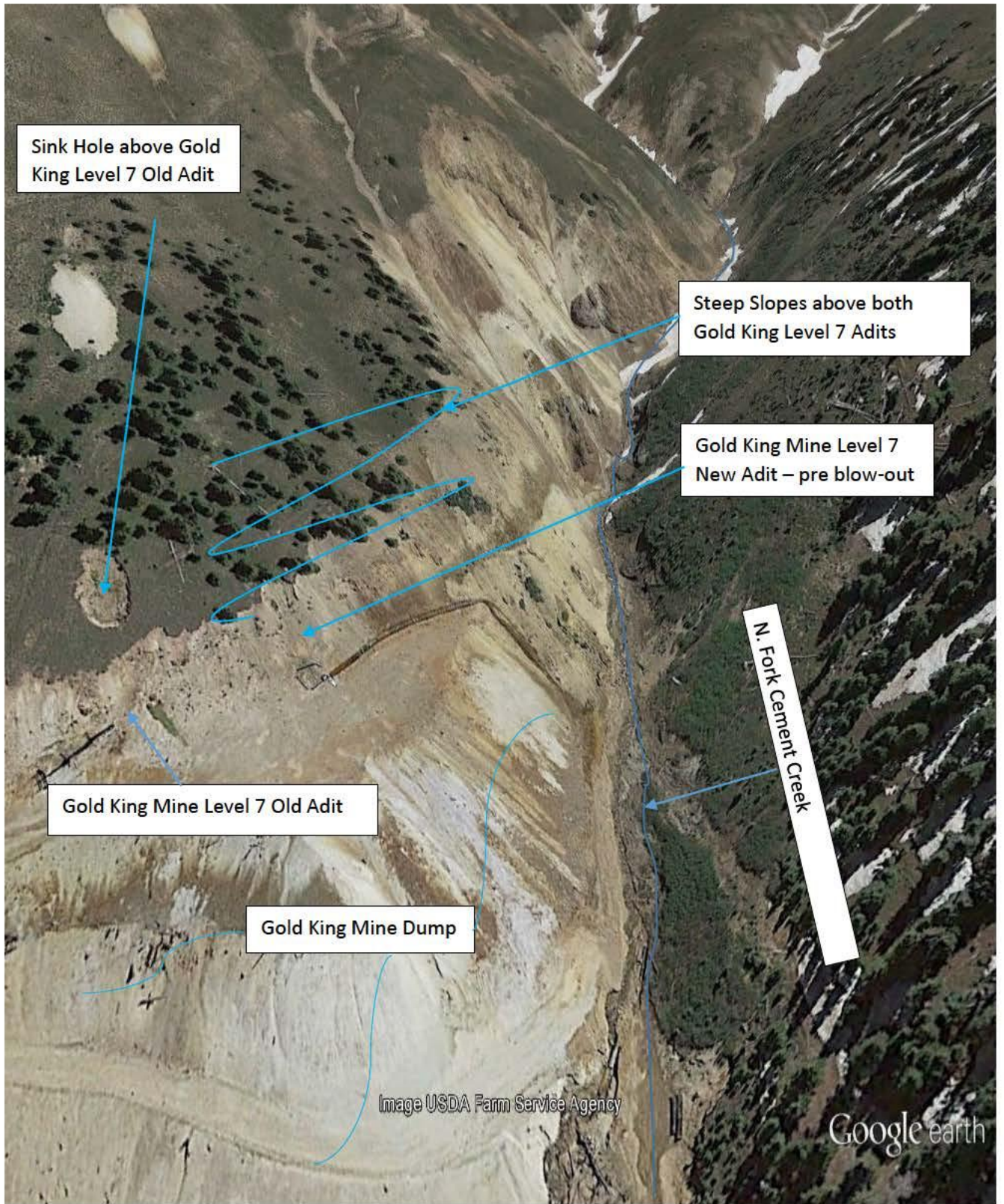


Photo 1 Google Earth June 2015 Image - Gold King Level 7 Adits and Mine Dump



Photo 2 Google Earth June 2015 Image - Gold King Level 7 and Red & Bonita Mine Adits



Photo 3 August 18, 2015 – Sink Hole and Slope above Gold King Mine Old Adit



Photo 4 August 18, 2015 – Gold King Mine Level 7 Adit post-blowout

Attachment G: Gold King Assessment – Photo Log from Epaosc.org

Attachment G: Gold King Assessment – Photo Log from Epaosc.org

Description: Collapsed timbers uncovered.

Category: 2015

Latitude: 37.894578

Date Taken: 8/5/2015

Longitude: -107.63832

Tags:



Description: Ongoing 2015 investigation work.

Category: 2015

Latitude: 37.894578

Date Taken: 8/4/2015

Longitude: -107.63832

Tags:



Description: 2015 investigation progress check

Category: 2015

Latitude: 37.894578

Date Taken: 8/4/2015

Longitude: -107.63832

Tags:



Description: Adit excavation work 2015.

Category: 2015

Latitude: 37.894578

Date Taken: 8/4/2015

Longitude: -107.63832

Tags:



Description: Initial investigation work in 2015.

Category: 2015

Latitude: 37.894578

Date Taken: 7/29/2015

Longitude: -107.63832

Tags:



Gold King Assessment

Photo Log

Description: 2015 initial site conditions, facing northeast

Category: 2015

Latitude: 37.894578

Date Taken: 7/28/2015

Longitude: -107.63832

Tags:



Description: 2015 initial site conditions, facing west.

Category: 2015

Latitude: 37.894518

Date Taken: 7/14/2015

Longitude: -107.63863

Tags:



Description: Restored berm 2014 with added drainage pipes in foreground.

Category: 2014

Latitude: 37.8944933333333

Date Taken: 9/12/2014

Longitude: -107.6383883333333

Tags:



Description: Installation of new pipes to collect adit discharge.

Category: 2014

Latitude: 37.894615

Date Taken: 9/12/2014

Longitude: -107.63838

Tags:



Description: Excavation progress 2014. Metal pipes that previously conveyed water to the concrete channel are exposed.

Category: 2014

Latitude: 37.895345

Date Taken: 9/12/2014

Longitude: -107.6381633333333

Tags:



Gold King Assessment

Photo Log

Description: 2014 excavation work.

Category: 2014

Latitude: 37.89361

Date Taken: 9/11/2014

Longitude: -107.638153333333

Tags:



Description: 2014 excavation work.

Category: 2014

Latitude: 37.893685

Date Taken: 9/11/2014

Longitude: -107.638411666667

Tags:



Description: Gold King Mine discharge flowing east in half pipe channel during preparations for 2014 site work.

Category: 2014

Latitude: 37.89451

Date Taken: 9/11/2014

Longitude: -107.638383333333

Tags:



Description: Water flowing slowly from opening 100 feet west of main Gold King Mine adit.

Category: 2014

Latitude: 37.894629

Date Taken: 9/11/2014

Longitude: -107.638679

Tags:



Description: Gold King Mine prior to 2014 site work

Category: 2014

Latitude: 37.89454

Date Taken: 9/11/2014

Longitude: -107.638261666667

Tags:



Description:

Gold King Assessment

Photo Log

Gold King Mine prior to 2014 site work. Water flowed to a concrete channel, through a flume (by white plastic structure at right), to a half pipe channel, and down the east face of the waste rock dump to North Fork Cement

Category: 2014

Latitude: 37.894561

Date Taken: 8/27/2014

Longitude: -107.638486

Tags:





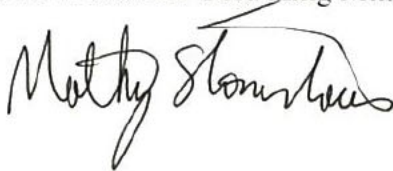
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

DEC 8 2015

MEMORANDUM

OFFICE OF
SOLID WASTE AND
EMERGENCY RESPONSE

SUBJECT: Transmittal of Addendum to EPA Internal Gold King Mine Review Report

FROM: Mathy Stanislaus
Assistant Administrator 

TO: Gina McCarthy
Administrator

This memorandum transmits an addendum to the August 24, 2015, Environmental Protection Agency (EPA) internal review team's Gold King Mine report.

This addendum provides clarity pursuant to additional information that has become available since the initial EPA Internal Review report was issued on August 26, 2015. This includes information presented in the October 2015 Department of the Interior/Bureau of Reclamation (BOR) Technical Review of the Gold King Mine Incident (DOI Report), as well as reservations expressed by the US Army Corps of Engineers (USACE) peer reviewer regarding internal EPA communication and coordination, especially in light of the work at the site on August 4 and 5 and the planned August 14 consultation with the Bureau of Reclamation (BOR).

Since the EPA internal review report did not identify this coordination as an area of concern or include any extensive related discussion, we reviewed these findings and I asked Nancy Grantham and Dana Stalcup to conduct follow up interviews with the two On-Scene Coordinators (OSCs) most closely associated with the event. The interviews focused primarily on the coordination and communication and the "handoff" of site management between the two OSCs, and how the work being conducted on August 4 and 5 related to the planned August 14 consultation with BOR, including consultation and collaboration with the Colorado Division of Reclamation and Mine Safety (DRMS).

The interview meeting took place on December 2, 2015, in the EPA Region 8 office in Denver, CO. Participants were:

(b) (6) Region 8 OSC
(b) (6) Region 8 OSC
Laura Williams, Region 8 Supervisor
Nancy Grantham, HQ OPA/OA
Dana Stalcup, HQ OSWER/OSRTI

If you have any questions, please call Dana Stalcup at 703-603-8702.

Addendum to EPA Internal Review of Gold King Mine Incident

This addendum provides clarity pursuant to additional information that has become available since the initial EPA Internal Review report was issued on August 26, 2015. This includes information presented in the October 2015 Department of the Interior/Bureau of Reclamation (BOR) Technical Review of the Gold King Mine Incident (DOI Report), as well as reservations expressed by the US Army Corps of Engineers (USACE) peer reviewer regarding internal EPA communication and coordination, especially in light of the work at the site on August 4 and 5 and the planned August 14 consultation with the Bureau of Reclamation (BOR).

Since the EPA internal review report did not identify this coordination as an area of concern or include any extensive related discussion, we reviewed these findings and conducted a follow up interview with the two On-Scene Coordinators (OSCs) most closely associated with the event. The interview focused primarily on the coordination and communication and the “handoff” of site management between the two OSCs, and how the work being conducted on August 4 and 5 related to the planned August 14 consultation with BOR, including consultation and collaboration with the Colorado Division of Reclamation and Mine Safety (DRMS).

The narrative that follows is intended to clarify any misunderstandings about the incident (including the intent of activities on August 4 and 5), as well as to shed light on the historical collaboration with expert parties external to EPA in the work in the Animas River mining district.

A list of planned questions is attached. However, the interviews took the form of a discussion, and the questions were not asked explicitly but were used as a guide to ensure all key issues were addressed.

The meeting took place on December 2, 2015, in EPA Region 8 office in Denver. Participants were:

(b) (6), Region 8 OSC

(b) (6), Region 8 OSC

Laura Williams, Region 8 Supervisor

Nancy Grantham, HQ OPA/OA

Dana Stalcup, HQ OSWER/OSRTI

What follows is a narrative account of some of the activities that led up to the Gold King Mine release on August 5, 2015, and serves to respond to some of the issues raised by the USACE peer reviewer for the DOI Report.

The Colorado Division of Reclamation and Mine Safety (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 (GKM) site adits. In 2008, the state continued its effort by constructing a discharge diversion structure (flume channel) to prevent additional water from pooling behind GKM adit blockages and by developing a Gold King Mine Reclamation Plan in 2009 to address increased water pressure within the Gold King workings. DRMS' 2009 project summary states: "The mine drainage and the collapse at the Level 7 Portal continues to be of concern to the landowner, DRMS, and the Animas River Stakeholders Group (ARSG). A future project at the site may attempt to cooperatively open the Level 7 Portal in an effort to alleviate the potential for an unstable increase in mine pool within the Gold King workings."

There is a long history of collaborative work by EPA, DRMS, and ARSG regarding the acid mine drainage from the abandoned mines in the Upper Animas River mining district. The GKM site was one of the mines/adits that EPA agreed to take the lead on for assessment and potential work. (b) (6) was the lead OSC, with support from others, including (b) (6), as needed.

At the request of DRMS, by 2014 EPA was working with DRMS to take action at the GKM site 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.

Preliminary assessment work by EPA and DRMS at the GKM site was initiated in September of 2014. Specifically, excavations were performed to remove the metal grating and portions of two pipes installed by DRMS in 2009. It quickly became obvious that more extensive assessment work would be needed before any bulkheading/plugging of the mine adit or other action could be taken. Work stopped after 2 days when DRMS and EPA staff observed additional seepage and the project was put on hold until the following year due to the coming winter weather.

Throughout the winter and early spring months of 2015, EPA, DRMS and others were developing plans for an approach to assess a path forward for the GKM site. Per (b) (6)'s direction, the EPA contractor brought on a mining expert subcontractor to support site activities. (b) (6) also worked with DRMS and contractors to develop a conceptual plan. Among other possibilities, one potential approach was to be similar to the approach ultimately taken at the nearby Red and Bonita mine, that being to find a way to reduce the water levels, then to remove any blockages, and then investigate the mine for potential source control options and to have a stable condition before the closure of the Red and Bonita bulkhead valve (due to the potential impact on GKM).

In May of 2015, EPA and DRMS presented their plans for removal investigation at the GKM site adit, including work on the Red and Bonita bulkhead, to ARSG, who had long seen the GKM site as a priority in the Animas River mining district (see attached Powerpoint presentation given by (b) (6), EPA, and (b) (6), DRMS).

During the summer 2015 construction season, at the same time that the assessment work was being planned for the GKM site, (b) (6) was also working on completing the work at Red and Bonita mine, some of which had been done in 2014; the work at Red and Bonita included drawing down the mine pool water, clearing blockages, and installing an engineered bulkhead with flow control. Since contractor crews and equipment, as well as the EPA and DRMS team, were available in the immediate Animas River Mining district the week of August 3, (b) (6) had planned some coordinated work at the GKM site (reflected in the attached project plan). (b) (6) had a long-planned vacation scheduled for the first week of August, and at least 2 months in advance he requested (b) (6) manage the site work while he was out, specifically the preparatory and assessment work to be conducted at GKM site. Specifically, (b) (6) identified the following work: adit drainage control; water management system; excavation above adit/hill slope; and adit face excavation. This work was to assess the site conditions and to help prepare for a decision on future work. The water management system would be needed if there was a decision to open the GKM site adit since there was potentially significant water buildup in the adit. The excavation above and at the face of the adit was needed to determine the exact location and condition of the blockage, and the exact location of the bedrock above and around the adit. This information was needed to inform options to be considered for future work, which would be discussed during a consultation meeting planned for August 14 (discussed in more detail below). In addition to providing the direction via e-mail (attached), (b) (6) also provided clear verbal direction to (b) (6), the EPA contractors, and DRMS staff not to proceed with any work on actually opening the adit until after his return and the planned consultation on August 14.

While (b) (6) left direction for (b) (6) and the team regarding the preparatory work while he was out, he also was planning potential future actions. He previously had initiated an interagency tasking and funding for BOR to provide support and advice for the Red and Bonita Mine. Just prior to leaving for vacation, (b) (6) contacted Mike Goble of BOR and requested that he be part of a consultation meeting at the GKM site on August 14. EPA was assembling a team of experts to help inform the decision as to how to proceed with the GKM site adit work. The preparatory and assessment work being conducted on August 4 and 5 were a key part of preparing for the consultation meeting on August 14, to allow the team to know the site conditions more precisely and put EPA in a better position to make the most informed decision possible regarding future work.

(b) (6) and the team (including (b) (6) of DRMS and contractors) arrived at the site and began some excavation work on August 4. Under (b) (6) direction, the team slowly and carefully scraped away loose soil and rubble near the face of the adit with the initial goal of locating the primary blockage. By the end of the day, the team had located the blockage, which they were able to identify as the blockage based on the tightness and condition of the material. They decided to wait until the following day, when (b) (6) and (b) (6) of DRMS would also join them, to continue additional excavation. On August 5, under the direction of (b) (6), and with consultation from DRMS as well as contractor support, the team began additional excavation to identify the location of bedrock above and around the adit. Through this careful scraping and excavation, they were able to locate the bedrock. Prior to the final excavation and cleanup, the DRMS personnel left the site to proceed to other nearby mining sites. (b) (6) continued to oversee the final cleanup work, which included clearing of the loose colluvium near the adit. Just prior to finishing, the team noticed a water spout a couple of feet high in the air near where they had been excavating above the top of the adit. Within a few minutes, the spout had turned into a large gush of yellow/orange water that ultimately resulted in a release of an estimated three million gallons.

In retrospect, and based on information learned after the adit had been excavated later in the summer, (b) (6) and (b) (6) determined that (b) (6) and the team were much closer to the brow of the adit when excavating on August 5 than they thought, perhaps only a foot or so above the adit brow, which turned out to be approximately 19 feet above the adit floor, due to additional collapsing above the original portal location. The fact that the adit opening was about 2 times the assumed 8 to 10 foot maximum adit height resulted in a closer than anticipated proximity to the adit brow, and combined with the pressure of the water was enough to cause the spout and blowout.

In summary, highlighted below are the key factors relative to EPA's work at the GKM site on August 4-5:

- (b) (6) (b) (6)), the lead EPA OSC, coordinated at least 2 months in advance with EPA OSC (b) (6) (b) (6)) for (b) (6) to manage the site during a long-planned vacation in early August 2015.
- In addition to extensive experience in dealing with abandoned mines, both (b) (6) and (b) (6) are specifically familiar with the Upper Animas Mining District and with the GKM site, and thus (b) (6) was an appropriate replacement while (b) (6) was on vacation (see attached memo dated December 4, 2015). Also, while the EPA OSC is the final decision-maker at the site, the two DRMS employees, (b) (6) and (b) (6), are considered by EPA to be experienced experts in the mining field.
- (b) (6) left specific instructions with (b) (6), the contractors, and DRMS, that they were to conduct preparatory work during the week of August 3 while he was out (see attached email).
- (b) (6) of DRMS was working under an EPA cooperative agreement (attached) for the Red and Bonita Mine. The cooperative agreement statement of work included

evaluation of the Gold King Mine in coordination with the Red and Bonita work:
“Additional work may include DRMS assistance with monitoring and assessing impacts caused by the Red and Bonita bulkhead on the hydrology of the Cement Creek and Upper Animas drainages, particularly related to discharges from vicinity mines.”

- The work being conducted on August 4 and 5 was completely consistent with the direction provided by (b) (6). It was assessment work that needed to be conducted to expose the portal and surrounding bedrock to allow observation of the portal conditions for development of a detailed plan to reopen the adit. It included setting up a water management system, potential excavation above the adit, and excavation at the face of the adit. It did not include any work on actually opening the adit.
- Also, in late July, prior to leaving for vacation, (b) (6) contacted Mike Gobla at BOR and requested their support at GKM on August 14. This was to be a meeting among the entire team (EPA, contactors, DRMS, and BOR) to discuss potential removal actions at GKM site, such as possibly removing water, removing blockages, and installing an engineered bulkhead. Other possible actions would also be considered and discussed at the August 14 meeting.
- The excavation work on August 4 and 5 was ultimately a decision to be made by the EPA OSC (b) (6), with advice from qualified and experienced personnel, including DRMS staff and EPA on-site contractors. The purpose of the excavation was to locate the adit blockage, and to locate competent bedrock above the top of the adit. The specific locations of the blockage and the surrounding bedrock were critical to informing the discussion on August 14 and the subsequent decision on possible removal work such as opening the adit and investigating the mine for sources of water inflow and possible source control. This had been discussed at length with DRMS and the ARSG over the preceding year as an appropriate objective associated with the bulkhead plans for the Red and Bonita mine, which is approximately 400 to 500 feet lower on the same mountain slope.
- The team began their excavation work on August 4, with very deliberate and careful excavation focused on removing loose soil and rubble. By the end of August 4, the onsite team had located the blockage, with a high level of confidence, based on the tightness and conditions of the material. However, they had not yet located the bedrock above the adit.
- On August 5, the onsite team under (b) (6)'s direction continued to carefully scrape away and remove the loose soil and rubble until they finally located the bedrock. The team had just finished locating the bedrock, and were clearing away some additional rubble in front of the adit face, when they spotted a water spout, followed shortly thereafter by the large release of water.
- Both the EPA Internal Report and the DOI report discuss plans to install a stinger as a means for checking hydraulic pressure and drawing down water. The stinger or well point pipe installation was to be performed by Harrison Western after they had assessed the area exposed during the initial work on August 4 and 5. The final determination on how to proceed was going to be made following the scheduled meeting with BOR on August 14.

- Both the EPA Internal Report and the DOI report discuss the approach of drilling from above as was done successfully at the Red and Bonita mine, informing the decision on how to reopen the adit. However, drilling a hole from above at the GKM site would have been significantly more difficult, due to the challenge of finding a safe, stable location above the adit, the length and angle for such a drilling, and the uncertainty of how the process might impact the stability of the adit.
- In summary, the work on August 4 and 5 was assessment and preparatory work being conducted (using EPA removal assessment dollars) to better inform a planned consultation on August 14. There was no plan or intent to begin digging out the collapsed/non-engineered plug blockage on August 4 or 5. The work being conducted on August 4 and 5 was completely consistent with the direction provided by the primary OSC (b) (6) prior to his leaving for vacation, to help plan for the August 14 meeting and potential future work. OSC (b) (6) was contacted at least 2 months earlier by (b) (6) to substitute for him in early August at Gold King Mine and was an appropriate backup because of his mining expertise and familiarity with the site, and the two coordinated closely on the planned work.

From: (b) (6)
To: (b) (6)
Subject: FW: Gold King Mine - prep
Date: Wednesday, July 29, 2015 10:42:00 AM

(b) (6) here's the basic direction to ERRS regarding the GK adit opening. Currently Harrison Western is not mobilizing until about 8/17 week.

(b) (6)
Federal On-Scene Coordinator
Emergency Response Unit
US EPA - Region 8
1595 Wynkoop Street
Denver, CO 80202

Office: 303-312-(b) (6)

-----Original Message-----

From: (b) (6)
Sent: Wednesday, July 29, 2015 7:04 AM
To: (b) (6)
Cc: (b) (6)
Subject: Gold King Mine - prep

Matt ,

The following are the priority and strategy discussed onsite with (b) (6) regarding work to prepare for opening the adit:

1. Adit drainage control: leave the existing half pipe to receive flow from the adit until the ground level is lowered. Set a channel or drain pipe arrangement to the right as you look at the adit to divert flow to the half-pipe diverting water from the area that will be excavated.
2. Water management system:
 - A. set up the pipe and filter bags towards the outlet end of the discharge pipe/ dump.
 - B. Before any excavation towards the adit floor between the concrete flume channel and adit, the sump and sump-pump set up to handle adit discharge must be in place.
 - C. Water management system 2: the piping / hose must be in place to allow flow to be directed to the R n B pond before removing any adit blockage at or below 24" pipe in the adit debris. And, the steel stinger pipe ,4" threaded well casing pipe. must be prepared and available.
3. Excavation above adit / hill slope: the option to investigate the slope with the excavator was discussed. If appropriate, this option would require placing enough borrow material on top of the existing berm in front of the adit to allow access above the adit to expose the rock face.
4. Adit face excavation: this will occur only when either the OSC or DRMS (b) (6) or HW mine crew Superintendent and the ERRS RM are present. In addition the ability to treat water must be set up with START present.

(b) (6) has some conceptual dregs of the layout. Let me know if you have questions.

I would to talk with you and (b) (6) his morning or at lunch time. Let know when works.

(b) (6)

From the Executive Summary of the Technical Evaluation of the Gold King Mine Incident, developed by the Bureau of Reclamation of the US Department of Interior, dated October 2015:

It is important to note that although the USACE peer reviewer agreed that the report properly describes the technical causes of the failure, he had serious reservations with the chronology of events internal to EPA from the day of the telephone call to BOR and up to the day of the mine failure. He pointed out that the actual cause of failure is some combination of issues related to EPA internal communications, administrative authorities, and/or a break in the decision path, and that the report was non-specific regarding the source of information concerning EPA documents and interviews with EPA employees and the onsite contractor. The USACE believes that the investigation and report should have described what happened internal within EPA that resulted in the path forward and eventually caused the failure. The 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 digging out the plug rather than wait for BOR technical input as prescribed by the EPA project leader.

Also from the same report, pages 44-45:

On or about July 23, 2015, the EPA OSC (On Scene Coordinator), who was the project leader, made a brief telephone call (about 2 minutes) to Mr. Gobla at BOR to ask if funding of \$4,000 had finally been transferred to BOR for the Red and Bonita Mine. He requested that Mr. Gobla travel to the site. The EPA OSC project leader explained he was about to leave for vacation and wanted a site visit on August 14, 2015, which would be his first day back from vacation. The EPA OSC project leader stated that the upstream form for the bulkhead had been placed in the Red and Bonita Mine and they would be placing concrete in a few days. He went on to say that he did not want any more review of the Red and Bonita Mine; the purpose of the site visit on August 14, 2015, would be for the Gold King Mine as he was "unsure about the plans for the Gold King Mine" and wanted an outside independent review of the EPA/DRMS plans by BOR. The EPA OSC project leader scheduled to have DRMS and contractor personnel in Silverton on August 14, 2015, to present the plans to BOR and be available to answer questions. This was the first time that BOR had heard of the Gold King Mine. The plan was for Mr. Gobla to travel on August 13, 2015, and be onsite all day August 14, 2015; this plan was confirmed, and the call ended without any further discussion about the project or what it would involve.

The internal communication issue flagged by the USACE peer reviewer was not addressed in the internal review conducted by EPA. The following questions will be posed during follow-up internal EPA interviews of the two On-Scene Coordinators:

Potential Interview Questions:

Communication with BOR prior to August 5 [these questions for (b) (6)]

- Can you please provide all work planning documents regarding the work during the week of August 3 and the planned consultation on August 14 and any subsequent planned work.
- Did you contact Mike Gobla to discuss the Gold King Mine?
- What day did you contact Mike Gobla?
- What was the purpose of the call?
- Did you make any notes of the call? If so, may I have them?
- Would you please repeat for me now the entire phone call, as best you can?

- The DOI report indicates that funding was being transferred from EPA to Bureau of Reclamation. How much funding was being transferred? Was that funding for Red and Bonita Mine, Gold King Mine, or both? What specific activities were to be supported by that funding? Are there any other funding related issues that are relevant to the BOR support at Gold King Mine?
- Was this the first transfer of funds, or had prior funding been provided? If so for what purpose?
- Did you ask Mike Gobla to visit the Gold King Mine or the Red and Bonita Mines or both on August 14?
- What was the intended purpose of Mike Gobla's visit on August 14?
- Did you express to Mike Gobla during your call that you were "unsure about the plans for the Gold King Mine?" If so, why? What were you unsure of?
- Did you discuss with the EPA internal review team your contact with Mike Gobla in late July and plans to meet with him in mid-August? If not, why not? Was there any discussion about prior or ongoing coordination with BOR?

Hand off of site management from (b) (6) to (b) (6) [these questions for (b) (6)]

- What days were you on vacation in July and August 2015?
- Was another OSC covering your sites on the days you were out on vacation? Who? Which sites? How was that OSC selected?
- How far in advance did you plan for another OSC to cover your sites?
- Did you plan that site work would be conducted while you were out? Why was this work to be conducted while you were out, and was it critical that it be conducted while you were out?
- If you were not on vacation, would you have been on-site for this type of activity? Approximately, on average, how many days per month are you on site? What types of actions require your physical presence at the site?
- What specific instructions did you leave to the person covering Gold King Mine when you were out on vacation? Were these instructions verbal or in writing? Did you specifically address what work if any should or should not be done regarding opening the adit at Gold King Mine?
- Do you believe that the OSC followed all of your specific instructions? Why – eg, is the belief based on observations or conversations? What observations? If conversations, with whom?
- How far in advance did you discuss the work to be conducted at Gold King with the OSC covering the site while you were on vacation?
- How did the work carried out at the Gold King Mine on August 4 and 5 relate to your planned meeting with Mike Gobla on August 14?
- Did the work plans for Gold King Mine envision two distinct phases of activities, one during the week of August 3 and the other after August 14?
- Page 52 of the DOI report indicates the plan on August 5, 2015, was to open the Gold King Mine adit. Is this a correct characterization of the work you had asked (b) (6) to carry out and do you believe that is what (b) (6) was doing on August 5?
- If (b) (6) was not opening up the adit, do you believe the work being conducted at the site was to establish clearer lines of sight so that the consultation on August 14 would be more effective?
- Is there anything else you think we should know but that we have not yet asked you about? Do you have any other notes or other pertinent written records that you have not already given me?

Hand off of site management from (b) (6) to (b) (6) [these questions for (b) (6)]

- Did (b) (6) ask you to cover his sites for him while he was on vacation?

- How far in advance did (b) (6) discuss his vacation and his request for you to cover Gold King Mine for him?
- Were your managers aware that you had been asked to cover (b) (6) sites? If so, which managers were aware, to your knowledge? Do you have any written records regarding this?
- Were you at the Gold King Mine prior to August 4, 2015? When? How many times?
- Had you discussed Gold King Mine with (b) (6) at any point in 2014?
- Were you at the Gold King Mine on August 4 and 5, 2015?
- What instructions did (b) (6) give you for the work that was needed to be done, or specifically not done, at the Gold King Mine while he was on vacation? Were the instructions verbal or written? If written, may we have a copy?
- What was the purpose of your work at the Gold King Mine on August 4 and 5, 2015?
- Please describe the work being done on August 5.
- Page 52 of the DOI report indicates the plan on August 5, 2015, was to open the Gold King Mine adit. Is this a correct characterization of the work being done on August 5?
- If the work being done was not to open the adit, please describe what exactly was the work being done at the site and how did it relate to the BOR August 14th visit? For instance was the work being done to establish clearer line of sight for the August 14th consultation with BOR?
- If work was not being done to open the adit, please describe how this was communicated to the DOI when they were conducting the independent review.
- Did the work plans for Gold King Mine envision two distinct phases of activities, one during the week of August 3 and the other after August 14?
- Is there anything else you think we should know but that we have not yet asked you about? Do you have any other notes or other pertinent written records that you have not already given me?

Other potential areas of questioning:

- Nature of involvement of State DRMS personnel in the activities at Gold King Mine [visits to site, advisory roles, etc.]
- Understanding of the nature of the blockage in adit [geology, physical nature, actual size and location of adit opening, etc.]
- Related to the presentations to and communication with the ARSG: Was the plan fully vetted and was input sought and provided?



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

DEC - 4 2015

OFFICE OF
SOLID WASTE AND
EMERGENCY RESPONSE

MEMORANDUM

SUBJECT: Qualifications of Individuals Involved with Gold King Mine

FROM: Mathy Stanislaus
Assistant Administrator

A handwritten signature in black ink that reads "Mathy Stanislaus".

TO: Gina McCarthy
Administrator

There has been a significant focus on the qualifications of individuals involved with the Gold King Mine, specifically the availability of a "mining engineer" prior to and during the removal operation. Based on discussions with Office of Solid Waste and Emergency Response (OSWER) personnel on the National Mining Team, mining engineers are trained in and focused on the development and operations of mines, not typically with an emphasis on the remediation of abandoned mines. The Office of Personnel Management (OPM) position classification standard for the Mining Engineering Series, GS-0880, supports this perspective. It notes that mining engineers in the federal service are primarily concerned with the following: (1) discovery and efficient extraction from the earth of metallic ores, nonmetallic minerals, and solid fuels; (2) the development, improvement, and use of safe, efficient, non-wasteful mining methods and equipment; the conservation of our Nation's mineral and natural resources; and (3) the health and safety of mine workers and the public. The description excludes the remediation of abandoned mines.

The federal government as a whole only has 124 individuals in a mining engineer job series (GS-0880). A majority of these individuals are at the Department of Interior (51), Department of Labor (38), and the Department of Health and Human Services (25). The remaining ones are spread across a number of agencies including the Securities and Exchange Commission, Export-Import Bank, Departments of Treasury and Agriculture, and the United States Army. Per the most recently available public data from OPM (June 2015), the Environmental Protection Agency (EPA) does not have any individuals in a mining engineer job series; however, the EPA does have engineers with extensive mining experience. The EPA has almost 2,000 employees in the Engineering and Architecture (08xx) job series. Almost one-tenth of these individuals hold doctorate degrees and over a quarter have master's degrees. In addition, there are many employees who may hold engineering degrees or Professional Engineering (PE) licenses who

may be classified in other job series including those serving in supervisory or management positions.

In addition, key personnel involved in activities related to Gold King Mine were EPA On-Scene Coordinators (OSCs). Each OSC must undergo a training program (beyond that required for other employees) to develop advanced knowledge, skills, and capabilities to address a wide variety of environmental responses. This training consists of a Core Competency Program over a three year period including 160 hours of Health and Safety courses; 54 hours of Contracts Training to attain certification as a Contracting Officer's Representative; approximately 300 hours of General Training regarding different types of responses, use of equipment, response processes (Stafford Act, oil spills, Incident Command System, Spills of National Significance), and Quality Assurance/Quality Control; and 85 hours of Spill Prevention, Control, and Countermeasure (SPCC)/Facility Response Plan (FRP) Inspection Training. Many of these courses require an annual or every 2 years refresher training to maintain certification. To ensure OSCs have achieved the required standard of training, each course includes a competency exam. All OSCs must attain a passing score to maintain their certification and must document proof of their training every three years to maintain their federal credentials.

EPA professionals that manage work at mining sites in the Superfund program are typically supported by contractors. For mining sites, the contractors are selected to include specialized expertise to support site work. Between the EPA staff and the contractor staff, at least one licensed PE is typical for cleanup work. States license PEs, and states generally expect, if not require, that individuals performing engineering work be licensed PEs.

At the time of the incident at Gold King Mine, EPA had a geological engineer on site who has a degree from the Colorado School of Mines with a background in mine site development and mine investigations. In addition, an EPA contractor, who is a Colorado-licensed professional engineer, was also on site. The contractor was also involved in the development of the work plan. Overall, the work at Gold King Mine has had a number of engineers and technical experts on site and/or involved in the planning over the years. This expertise includes professional staff from the State of Colorado (including a geological engineer with extensive experience in abandoned mines and a geologist with experience in mining and abandoned mines) and the EPA (including staff with experience in excavations, a civil engineer with a PE license, and a geological engineer with 12 years of experience in the development and management of underground mining operations and 28 years of experience at EPA with mining site response work).

If you have any questions or need additional information, please contact me.

cc: Stan Meiberg
Matt Fritz
Avi Garbow
Stacey Mitchell
Nichole Distefano
Barry Breen
Nitin Natarajan

Grantham, Nancy

From: (b) (6)
Sent: Friday, December 04, 2015 6:22 PM
To: Grantham, Nancy
Cc: Peterson, Cynthia
Subject: RE: still looking for 2 powerpoint presentations
Attachments: BulkheadDesignPlan-Red and Bonita Mine.pptx

Here's the presentation on the Red and Bonita bulkhead plan. The discussion about the Gold King investigation followed the discussion about the Red and Bonita. (b) (6) with DRMS participated in discussing both operations with the ARSG / public meeting.

(b) (6)

(b) (6)

Federal On-Scene Coordinator
Emergency Response Unit
US EPA - Region 8
1595 Wynkoop Street
Denver, CO 80202

Office: 303-312-(b) (6)

From: Grantham, Nancy
Sent: Friday, December 04, 2015 3:12 PM
To: (b) (6)
Cc: Grantham, Nancy
Subject: still looking for 2 powerpoint presentations

1. (b) (6) presentation at 5/15 arsg meeting
2. Presentation to Administrator when she visited Durango second week in August

Thanks ng

Nancy Grantham
US EPA
202-564-6879
857-829-8250

ARSG MEETING SUMMARY

May 27, 2015

ATTENDEES: Peter Butler, Bill Simon, Steve Fearn, Ty Churchwell, Larry Perino, John Ferguson, Ray Ferguson, Kirstin Brown, Gene Larson, Tim Cutter, Mary Blanchard, Brian Lloyd, Tom Schillaci, (b) (6), (b) (6), Jen Beck, Doug Jamison, Randy Perlis, Mark Esper, Dan Wall, Paula Schmittiel, Cynthia Peterson, Steve Wharton, William Tookey.

ANNOUNCEMENTS: None

Briefs:

Non-Responsive



Topics:

6. Activities Regarding Red & Bonita and Gold King: (b) (6) with EPA and (b) (6) with DRMS gave a presentation on installing the Red & Bonita bulkhead this summer. Much of the discussion focused on the location of the fracture zone we call the Bonita fault which may be the source of most of the water. The expectation is that the water level will rise in the fracture zone and possibly express in a new location. The question is where might it surface, how much will surface, and what will be the quality. One possibility is that water will surface

where the North Fork of Cement Creek crossed the fault zone, below the Gold King #7 level. EPA plans on an intensive sampling program at many sites within the vicinity of the Red & Bonita once the bulkhead valve is closed. Work will begin in a few weeks. Closure is expected in early fall. The process will be reversible if need be because the valve can be re-opened.

The first step for installing the bulkhead is to muck out the sludge in the tunnel back to the bulkhead site. The sludge will be caught and treated in a system directly below the mine. (As a side note, (b) (6) mentioned that last year when the mine was explored, they found evidence of check dams and diversions indicating that at some point, the miners were dealing with water in the mine workings.) Once this step has been completed, the contractor will start to open up the Gold King #7 level. There is a pool of water several feet deep behind the collapsed portal. The treatment system at the Red & Bonita will be used to handle the water and muck from the Gold King as work begins there. EPA is willing to remove the initial blockage into the Gold King, but if there is another collapse farther in, they may not want to expend the resources to open it up.

Non-Responsive



Non-Responsive



Possible Agenda Items for Next Meeting:

Red & Bonita and Gold King

Upcoming WQCC Hearings regarding Animas

Koehler Bulkhead Valve

Bullion King

Arrastra Gulch

Red and Bonita Mine
Removal Action – Bulkhead Plan Summary
May 2015



Mine Discharge and Underground Workings

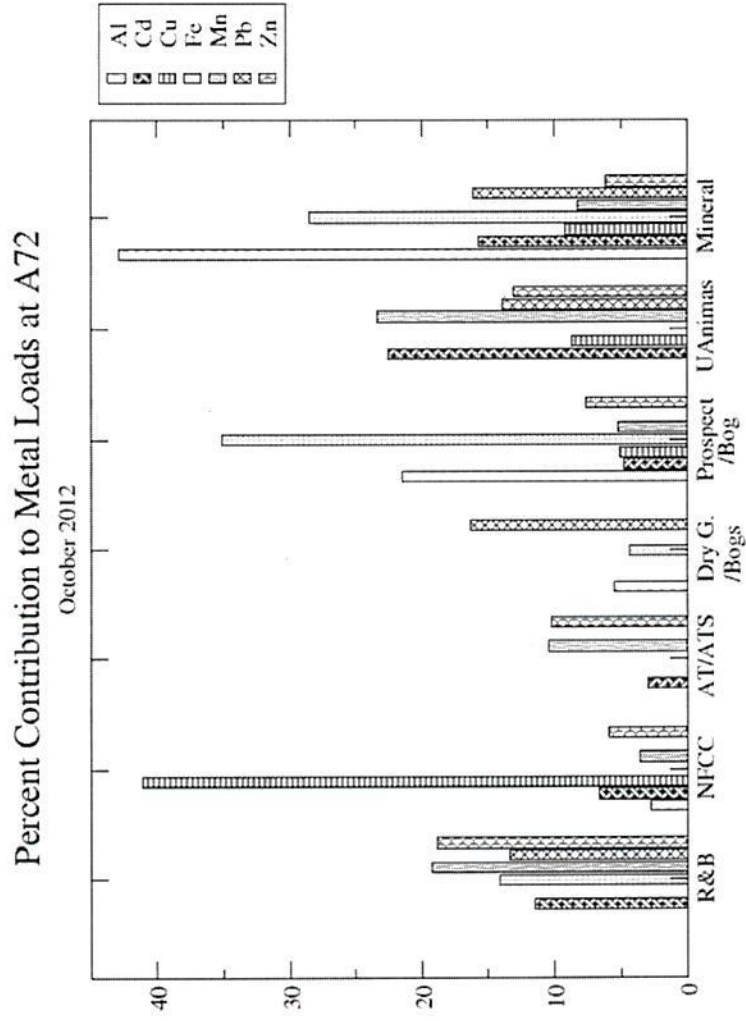
- Flow is approximately 200 to 300 gpm
- Zinc concentration is consistently near 16,000 ug/L
- Cadmium concentrations are near 30 ug/L
- Iron concentration is approximately 93,000 ug/L
- pH ranges from 5.5 to 6 su.
- Underground workings are estimated at 3000 to 3500 ft.
- EPA and DRMS were able to access approximately 2000 ft in 2013

Adits Flows in Cement Ck from 2005 to 2012

Mine Adit Discharge 2005 to 2011

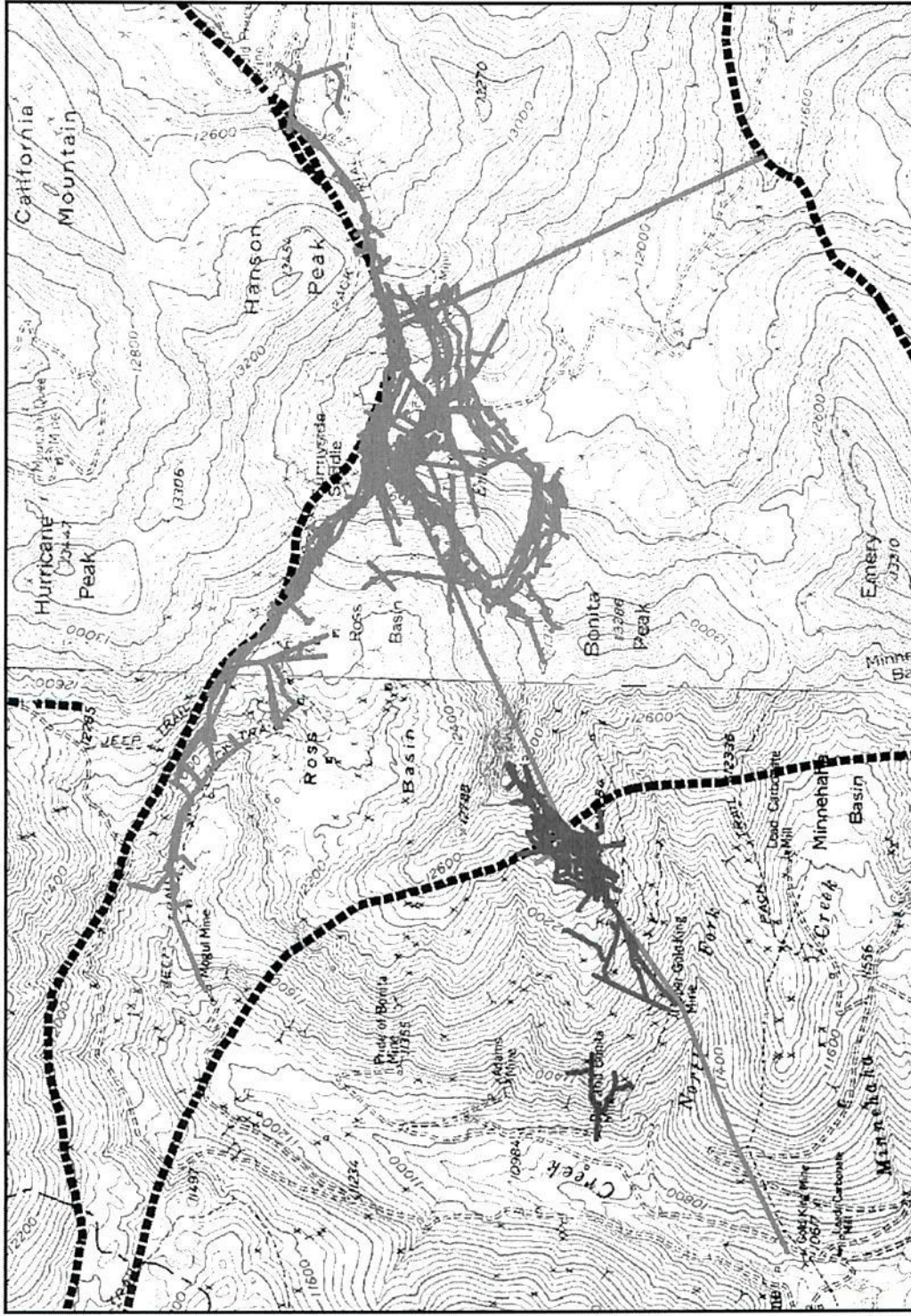
Mine	Elevation (feet AMSL)	Bulkhead Installed	Flow Rate (gpm)						
			July 2005	September 2005	October 2006	Average 2010	Average 2011	July 2012	Oct 2012
Mogul (pH 3.5)	11,376	2003	21	27	11	54	56	128	90 (?)
Gold King 7 Level (pH 2.5 to 5)	11,386	None	42	135	314	206	140	128	55 - 85
Red & Bonita (pH 6)	10,893	None	210	224	233	216	319	314	202
American Tunnel (pH 5)	10,540	gpm - Gallons per minute. 1997 2001 2002	95	90	84	101	101	193	103

USGS - Part IV: Results – Loads & Sources

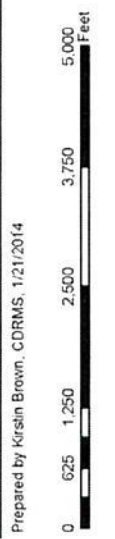


Audit Loading Analysis Conclusion

- Red and Bonita contributes approximately 18% of the Zn and 12% of the Cd load in Oct 2012 in the Animas at A72 (relative source contributions vary seasonally)
- The flow from Red and Bonita averages approximately 300 gpm and appears to have stabilized since the Am Tnnl plugs
- Zn and Cd are two of the primary contaminants of concern based on the Screening Level Ecological Risk Assessment
- No other single mine source contributes as much Zn in either Cement Ck or the Animas
- USGS reactive / transport modeling indicates that the Zn from R n B audit is conserved in transport to A72

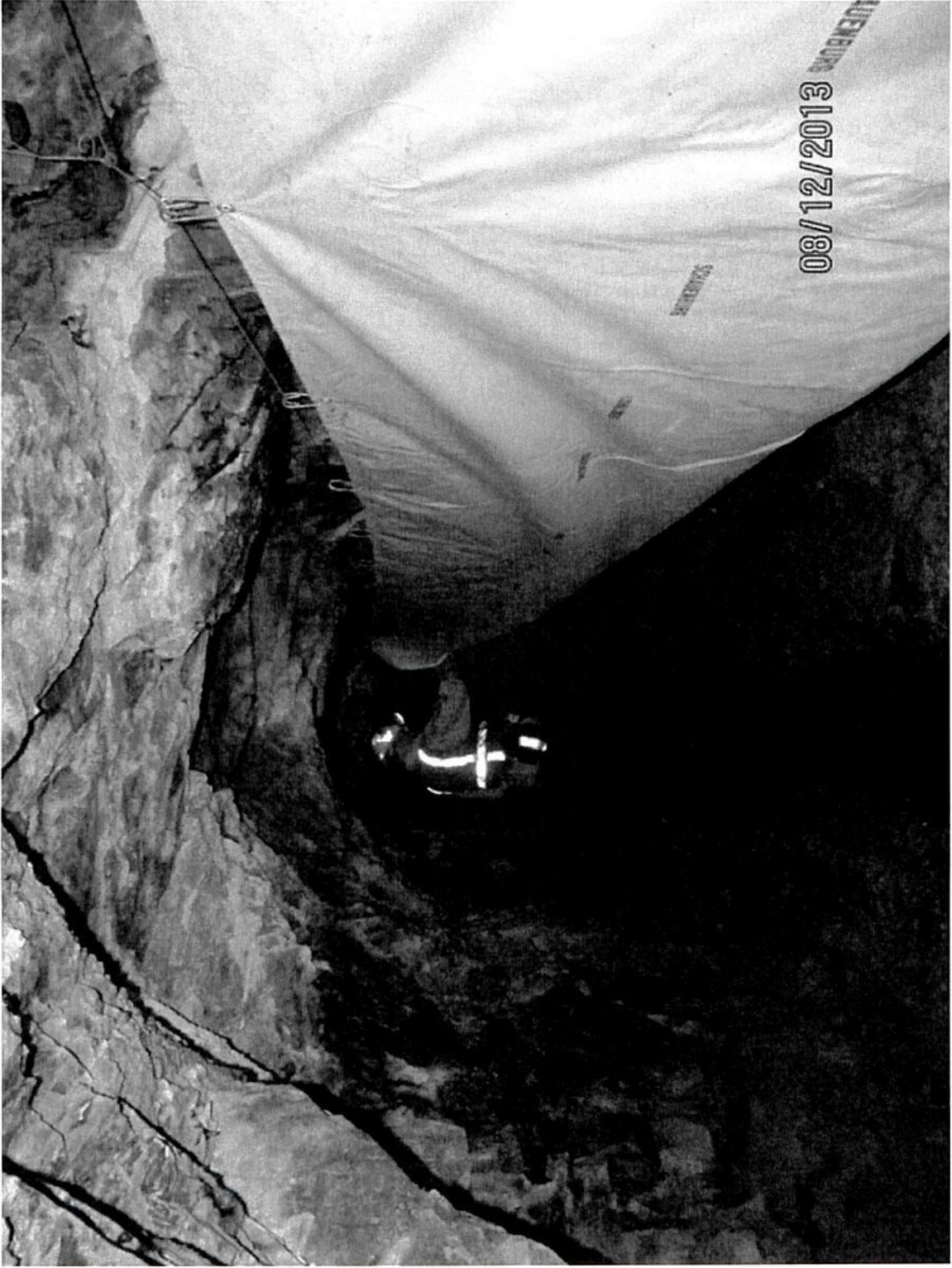


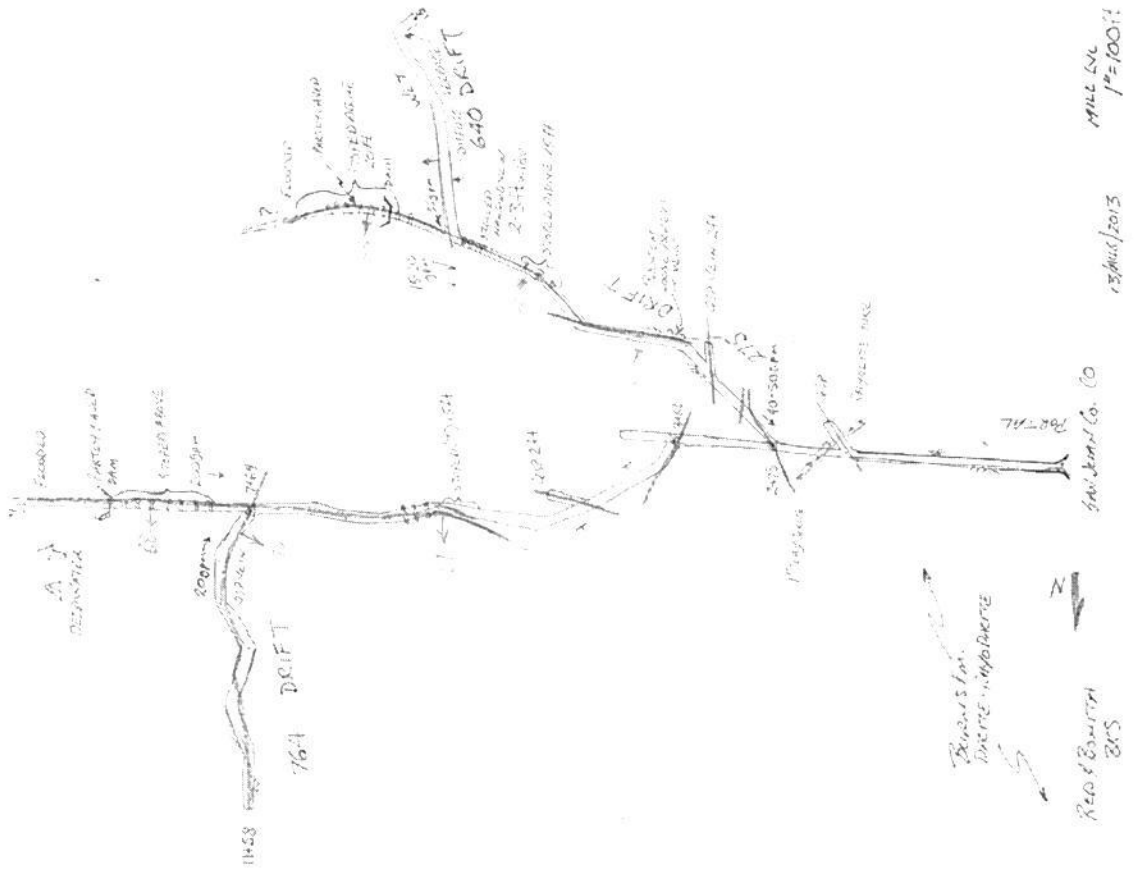
Mine Workings past cave-ins are only projected to line of sight
SUNNYSIDE WORKINGS
 Most Recent workings, needs more work
GOLD KING WORKINGS
 There is more data that needs to be added on 7 Level



Prepared by Kirstin Brown, CDRMS, 1/21/2014

Legend
 R & B Workings (Shaded)
 Gold King Workings
 Sunnyside Workings
 USGS Mapped Faults (PP-1551)





Design Factors and Investigation Results

- Underground Investigations – rock conditions and workings extent
- Rock Quality: American Tunnel (Burns Member) cores & rock hardness results
- Secondary permeability index- packer tests in Red and Bonita at the bulkhead location – effectively impermeable / 1.54×10^{-14} L/m²
- Overburden elevation at bulkhead site ~ 196 feet
- Hydraulic fracturing and hydraulic jacking/fractures
- Probable head pressures analysis

Mine Elevations/Bulkheads/Bulkheads/mine pool elevations

DATE	Mine & Bulkhead Status & Pressure (psi)	Elevations
9/xx/1994 ?	Terry Tunnel Bulkhead #1 – constructed	Portal 11,554 ft
9/9/1996	American Tunnel Bulkhead #1 - closed	Portal 10,660 ft
	Red and Bonita Mine Portal	Portal 10,957 ft
	Mogul Mine – bulkhead	Portal 11,400 ft
	Gold King Level #7	Portal 11,440 ft
American Tunnel Bulkhead #1 Pressure Gauge		
9/3/1997	312	Mine Pool elev. 11,380 feet
8/28/1998	359	Mine Pool elev. 11,488 feet
9/24/1999	415	Mine Pool elev. 11,618 feet
10/10/2000	440	
12/4/2000	438	Mine Pool elev. 11,671 feet
3/27/2001	438	
5/14/2001	438 <u>Final Pressure</u>	Final Measure <u>11,671 ft</u>

Water Elevations / Pressure Heads / Rock Thickness

Pressure Head	Water Pressure	Required Rock Thickness
1253 feet (Lake Emma)	543 psi	237 feet
714 feet (Sunnyside Mine Pool)	309 psi	135 feet
500 feet (Probable Head)	217 psi	95 feet
1037 feet (hydro-fracing Point)	449 psi	196 feet

Water Elevations and Bulkhead Pressures

- American Tunnel bulkhead #2: constructed for a maximum water head of 640 feet, equating to a water table at 11, 251 feet elevation
- bulkhead #2 pressure equilibrated at 11,015 feet elevation when the water intersected an outlet to surface via the Red and Bonita mine, elevation 10, 957 feet.
- Red and Bonita bulkhead - potentially cause an increase in ground water to the 11, 251 feet, which is the projected Am Tn #2 pressure.
- At 11,251 ft, the pressure head of 294 feet (127 psi) at the Red and Bonita bulkhead.
- The next pathway for ground water to surface would be at the Gold King level #7, 11, 440, which would create a pressure head of 483 feet (209 psi) at the Red and Bonita bulkhead.

A

14,000'
13,000'
12,000'
11,000'
10,000'
9000'

SECTION
BEND IN

ROSS BASIN
FAULT ZONE

BONITA
FAULT
ZONE

GOLD KING MINE

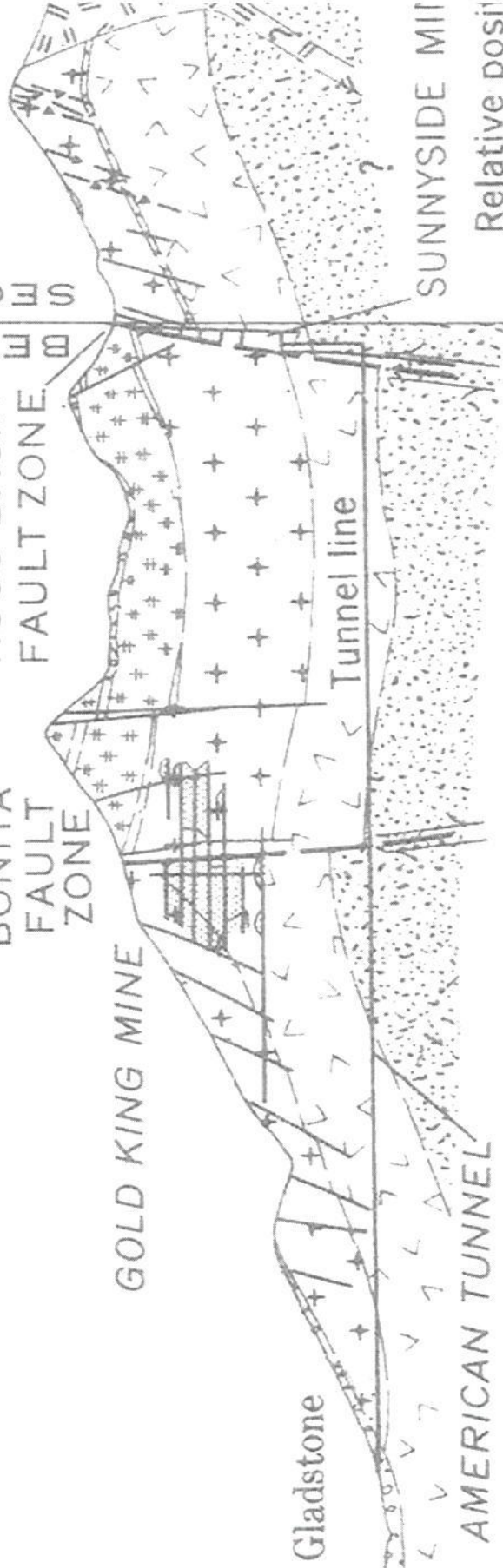
Gladstone

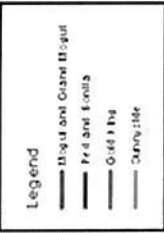
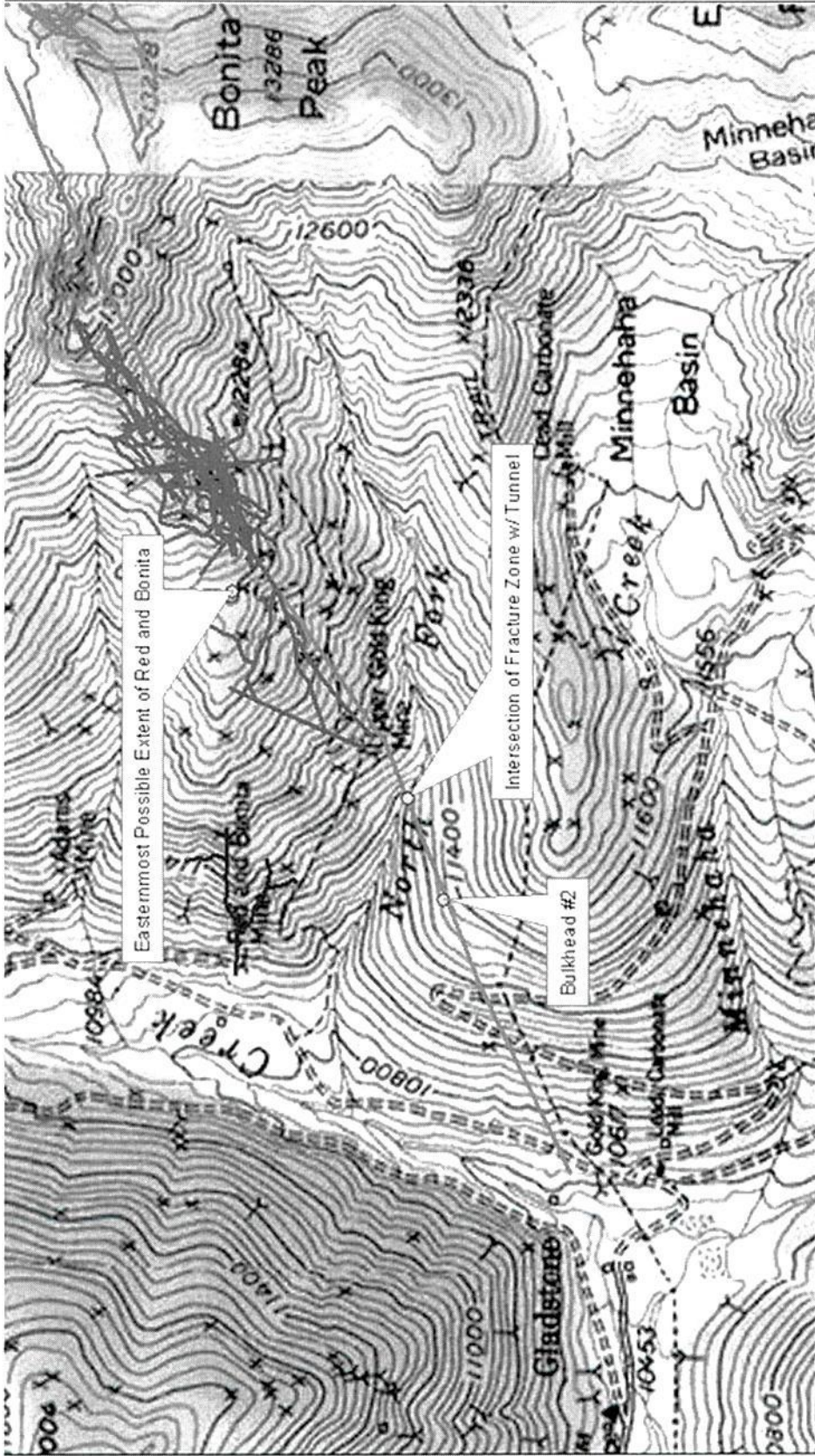
Tunnel line

AMERICAN TUNNEL

SUNNYSIDE MII

Relative posit





Upper Cement Creek



5/14/2015

Red and Bonita Bulkhead Design Basis – analysis and results

- 6 foot long bulkhead (reinforced) will perform adequately under a pressure head of 500 feet (217 psi), which is Gold King – 7 level plus
- 15 foot long bulkhead (reinforced) will perform adequately under a pressure head of 1253 feet (543 psi), which is the pressure head that would occur on the Red and Bonita mine if the Sunnyside mine pool were to climb to the Lake Emma outlet elevation.
- While this scenario is considered highly unlikely, EPA and CIMRP determined that it is prudent to construct the Red and Bonita bulkhead to this conservative standard. (The cost difference is small.)
- This is true even in the case of a potential Gold King mine bulkhead.
- This design uses the methodologies detailed in Einarson and Abel (1990) and Lang (1999) for maximum hydrostatic head at the bulkhead of 1253 feet and an earthquake acceleration of 0.185 g.

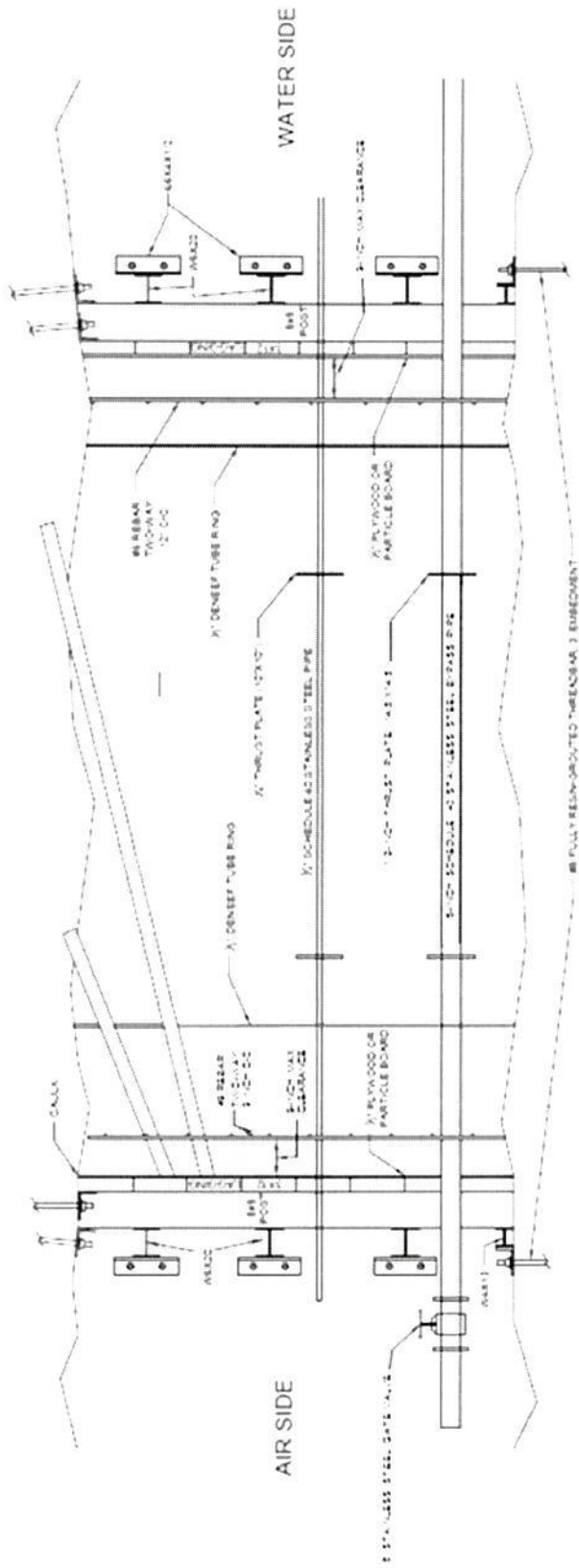
Red and Bonita Bulkhead Design Spreadsheet



	B1	A	B	C	D	E	F	G	H
1		Punching Shear Design							
2									
3		Inputs:							
4		Concrete Compressive Strength (f_c)	3,000 psi						
5		Bulkhead Height (h_b)	10 ft						
6		Bulkhead Width (w_b)	7 ft						
7		Design Head (H)	1253 ft						
8		Water Density (γ_w)	62.4 pcf						
9		Fluid Static Load Factor (Φ_{FL})	1.4						
10		Factored Water Hammer Pressure (P_w)	115,103 lb (Calculated from Water Hammer Tab)						
11									
12		Calculations:							
13		Concrete Shear Strength (f_{cd})	$f_{cd} = 2 * f_c^{2/3} =$	109.5 psi					
14		Static Fluid Load on Bulkhead Face (F_3)	$F_3 = H * \gamma_w * h_b * w_b =$	5,473,104 lb					
15		Factored Static Fluid Load on Bulkhead (F_3')	$F_3' = F_3 * \Phi_{FL} =$	7,662,346 lb					
16		Length of Bulkhead Required for Shear (L_1)	$L_1 = F_3' / (2 * (h_b + w_b) * f_{cd}) =$	14.29 ft					
17									
18		Earthquake Consideration (Water Hammer):							
19		Length of Bulkhead Required (L_2)	$L_2 = (F_3' + P_w) / (2 * (h_b + w_b) * f_{cd}) =$	14.50 ft					
20									
21									
22									
23									
24									
25									
26									
27									
28									
29									
30									

Red and Bonita Bulkhead Features and Specifications

- bulkhead dimensions are 6' x 8' x 15' long
- bulkhead volume is 27 cubic yards – this may require adjustment once bulkhead location is scaled and mucked
- low pressure grouting is necessary around the upper contact of the concrete with the roof of the adit
- flexural reinforcing at the bulkhead outby end is #9 bars on 9 inch centers and temperature shrinkage rebar at the bulkhead inby end is #6 bars
- eight inch stainless steel bypass and three-fourth inch monitoring piping will be installed
- Concrete will use sulfate resistant Type V cement, 559 lbs. per cubic yard of concrete and 240 lbs. fly ash, water/cement ratio of 0.52 by weight, and will include Xypex® admixture for waterproofing

LONGITUDINAL CROSS SECTION OF BULKHEAD



<p>PLATE 1</p>	<p>RED AND BONITA MINE BULKHEAD</p>
	 <p>COLORADO Division of Reclamation Mining and Safety</p>
<p>SCALE</p> 	

Monitoring Pressure and Water Flow / Quality

- Pressure Monitoring – transducer and standard pressure gauge
- Bulkhead Sampling Port and Injection Line
- Water Flow and Quality Monitoring
 - Adits: Gold King, Mogul, American Tunnel, Gold Point, Adams and Silver Ledge
 - Surface Water: NFCC, bracket R n B reach CC03 & 03B, CC17 CC18B, CC18, C48, , Eureka Gulch, A72
 - Seeps/surveillance – R n B vicinity
- Visual inspection of the bulkhead and surrounding zone

Grantham, Nancy

From: (b) (6)
Sent: Friday, December 04, 2015 12:52 PM
To: Grantham, Nancy; Williams, Laura; Stalcup, Dana; Sisk, Richard
Cc: Card, Joan; Ostrander, David; Hestmark, Martin; (b) (6)
Subject: RE: Removal docs for gkm: Attorney Client Privileged
Attachments: R and B Work Plan.pdf

Re: DRMS support to EPA for the Red and Bonita and other mines:

The attached document represents the Statement of Work for the cooperative agreement that was created with DRMS, which (b) (6) understood included investigation of the Gold King mine. We had funding to have DRMS support the Red and Bonita work and they understood that the one of the objectives related to the Red and Bonita was to evaluate the Gold King mine if possible in coordination with the Red and Bonita work. The last sentence in the first paragraph is related to the planned work at Gold King mine.

The potential to need to expand or create a new agreement was understood depending on the level of effort if the Gold King mine underground investigative work became a significant effort for DRMS.

(b) (6)

(b) (6)

Federal On-Scene Coordinator
Emergency Response Unit
US EPA - Region 8
1595 Wynkoop Street
Denver, CO 80202

Office: 303-312- (b) (6)

-----Original Message-----

From: Grantham, Nancy
Sent: Friday, December 04, 2015 10:07 AM
To: Williams, Laura; Stalcup, Dana
Cc: Card, Joan; Ostrander, David; Hestmark, Martin; (b) (6)
Subject: RE: Removal docs for gkm

Hi -- just checking in on this -- as well as any documentation of DRMS asking EPA for assistance.

Also, (b) (6) you mentioned there may be a coop agree for gkm that was near completion?

This would all be helpful.

Thanks ng

-----Original Message-----

From: Grantham, Nancy
Sent: Thursday, December 03, 2015 11:10 AM
To: Williams, Laura <williams.laura@epa.gov>; Stalcup, Dana <Stalcup.Dana@epa.gov>

Cc: Card, Joan <Card.Joan@epa.gov>; Grantham, Nancy <Grantham.Nancy@epa.gov>; Ostrander, David <Ostrander.David@epa.gov>; Hestmark, Martin <Hestmark.Martin@epa.gov>
Subject: Removal docs for gkm

Hi Laura -- nice to see you yesterday and thanks for sitting in on our discussion.

If you could provide the removal funding documents for gkm we discussed - as prioritized for the animas watershed - it would be greatly appreciated.

Thx ng

Sent from my iPhone

**Colorado Department of Natural Resources/Division of Reclamation, Mining & Safety
Work Plan for Red and Bonita Mine near the Town of Silverton, San Juan County, Colorado**

The Colorado Division of Reclamation, Mining, and Safety (DRMS) has been tasked by EPA to provide technical engineering support for a water impounding concrete bulkhead to be installed in the Red and Bonita Mine during 2015. Additional work may include DRMS assistance with monitoring and assessing impacts caused by the Red and Bonita bulkhead on the hydrology of the Cement Creek and Upper Animas drainages, particularly related to discharges from vicinity mines.

Component 1: Red and Bonita bulkhead design (DRMS/ [REDACTED] XX work hours): \$xx,xxx.xx
Output: A complete design and specification package will be prepared for a water impounding concrete bulkhead for the Red and Bonita Mine. The design and specification will be provided to EPA by March xx, 2015.

Component 2: Assist EPA with technical planning associated with underground workings preparations and contractor equipment requirements required to perform bulkhead construction.
(DRMS/Sorenson, xx work hours): \$xxxx.xx
Output: Office and field engineering support including planning documents and meetings during and after the selection of the bulkhead installation contractor(s).

Component 3: Construction Phase Inspections
(DRMS/Sorenson): \$xx,xxx.xx (xxx work hours) + \$xxxx.xx (travel) \$xx,xxx.xx
Output: Perform onsite inspections during the construction phase on a periodic basis to evaluate the preparation of the bulkhead site and construction of the bulkhead and provide field engineering support if needed. This work will occur between July and October 2015.

TOTAL: \$25,000.00

Basis for Estimated Costs:

Sorenson Hourly: \$xx.xx + xx.xx% indirect = \$xx.xx

Mileage: \$0.52/mile

Per Diem: \$46/day (Silverton)

Lodging: \$75/day (Silverton)

Timelines/Milestones:

Component 1 completed prior to 3/xx/15

Component 2 completed prior to 8/1/15

Component 3 completed prior to 11/30/15


Progress Reports:

The project closeout report will be submitted to the Project Officer on or before 12/31/15



1570348

V - 96819601 - 0 Page 1

	U.S. ENVIRONMENTAL PROTECTION AGENCY Cooperative Agreement	GRANT NUMBER (FAIN): 96819601	DATE OF AWARD
		MODIFICATION NUMBER: 0	03/11/2015
		PROGRAM CODE: V	MAILING DATE
		TYPE OF ACTION	03/18/2015
RECIPIENT TYPE: State		PAYMENT METHOD: ACH	ACH# 80004
RECIPIENT: CO Department of Natural Resources 1313 Sherman Street, Room 718 Denver, CO 80203-2239 EIN: 84-0644739		Send Payment Request to: Las Vegas Financial Center- LVFC	
PROJECT MANAGER		PAYEE:	
(b) (6) 1313 Sherman Street, Room 718 Denver, CO 80203-2239 E-Mail: (b) (6)@state.co.us Phone: 303-866-3567 ext. (b) (6)		CO Dept of Natural Resources 1313 Sherman Street, Room 718 Denver, CO 80203-2239	
EPA PROJECT OFFICER		EPA GRANT SPECIALIST	
(b) (6) 1595 Wynkoop Street Denver, CO 80202-1129 E-Mail: (b) (6)@epa.gov Phone: 303-312-(b) (6)		(b) (6) REG, 08, BTMS E-Mail: (b) (6)@epa.gov Phone: 303-312-(b) (6)	
PROJECT TITLE AND DESCRIPTION CO Dept Natural Resources Upper Animas Watershed Mines Technical engineering support as well as monitoring and assessment of the Red and Bonita Mine, Cement Creek and Upper Animas areas.			
BUDGET PERIOD	PROJECT PERIOD	TOTAL BUDGET PERIOD COST	TOTAL PROJECT PERIOD COST
04/01/2015 - 01/31/2017	04/01/2015 - 01/31/2017	\$25,000.00	\$25,000.00
NOTICE OF AWARD			
Based on your Application dated 02/05/2015 including all modifications and amendments, the United States acting by and through the US Environmental Protection Agency (EPA) hereby awards \$1,500. EPA agrees to cost-share 100.00% of all approved budget period costs incurred, up to and not exceeding total federal funding of \$1,500. Recipient's signature is not required on this agreement. The recipient demonstrates its commitment to carry out this award by either: 1) drawing down funds within 21 days after the EPA award or amendment mailing date, or 2) not filing a notice of disagreement with the award terms and conditions within 21 days after the EPA award or amendment mailing date. If the recipient disagrees with the terms and conditions specified in this award, the authorized representative of the recipient must furnish a notice of disagreement to the EPA Award Official within 21 days after the EPA award or amendment mailing date. In case of disagreement, and until the disagreement is resolved, the recipient should not draw down on the funds provided by this award/amendment, and any costs incurred by the recipient are at its own risk. This agreement is subject to applicable EPA regulatory and statutory provisions, all terms and conditions of this agreement and any attachments.			
ISSUING OFFICE (GRANTS MANAGEMENT OFFICE)		AWARD APPROVAL OFFICE	
ORGANIZATION / ADDRESS		ORGANIZATION / ADDRESS	
Environmental Protection Agency, Region 8 1595 Wynkoop Street Denver, CO 80202-1129		U.S. EPA, Region 8 EPR 1595 Wynkoop Street Denver, CO 80202-1129	
THE UNITED STATES OF AMERICA BY THE U.S. ENVIRONMENTAL PROTECTION AGENCY			
Digital signature applied by EPA Award Official Wayne Anthofer -			DATE
			03/11/2015

EPA Funding Information

FUNDS	FORMER AWARD	THIS ACTION	AMENDED TOTAL
EPA Amount This Action	\$	\$ 1,500	\$ 1,500
EPA In-Kind Amount	\$	\$	\$ 0
Unexpended Prior Year Balance	\$	\$	\$ 0
Other Federal Funds	\$	\$	\$ 0
Recipient Contribution	\$	\$	\$ 0
State Contribution	\$	\$	\$ 0
Local Contribution	\$	\$	\$ 0
Other Contribution	\$	\$	\$ 0
Allowable Project Cost	\$ 0	\$ 1,500	\$ 1,500

Assistance Program (CFDA)	Statutory Authority	Regulatory Authority
66.802 - Superfund State Political Subdivision and Indian Tribe Site Specific Cooperative Agreements	CERCLA: Sec. 104(d)(1)	2 CFR 200 2 CFR 1500 40 CFR 33 and 40 CFR 35 Subpart O

Fiscal									
Site Name	Req No	FY	Approp. Code	Budget Organization	PRC	Object Class	Site/Project	Cost Organization	Obligation / Deobligation
-	158ALVS004	15	T	8ALOS	303DC6	4185	08UPRS00	C001	1,500
									1,500

Table A - Object Class Category (Non-construction)	Total Approved Allowable Budget Period Cost
1. Personnel	\$18,488
2. Fringe Benefits	\$4,622
3. Travel	\$0
4. Equipment	\$0
5. Supplies	\$0
6. Contractual	\$0
7. Construction	\$0
8. Other	\$0
9. Total Direct Charges	\$23,110
10. Indirect Costs: % Base	\$1,890
11. Total (Share: Recipient 0.00 % Federal 100.00 %.)	\$25,000
12. Total Approved Assistance Amount	\$1,500
13. Program Income	\$0
14. Total EPA Amount Awarded This Action	\$1,500
15. Total EPA Amount Awarded To Date	\$1,500

BIDDERS LIST, 40 CFR, Section 33.501(b) and (c)

Recipients of a Continuing Environmental Program Grant or other annual reporting grant, agree to create and maintain a bidders list. Recipients of an EPA financial assistance agreement to capitalize a revolving loan fund also agree to require entities receiving identified loans to create and maintain a bidders list if the recipient of the loan is subject to, or chooses to follow, competitive bidding requirements. Please see 40 CFR, Section 33.501 (b) and (c) for specific requirements and exemptions.

FAIR SHARE OBJECTIVES, 40 CFR, Part 33, Subpart D

A recipient must negotiate with the appropriate EPA award official, or his/her designee, fair share objectives for MBE and WBE participation in procurement under the financial assistance agreements.

In accordance with 40 CFR, Section 33.411 some recipients may be exempt from the fair share objectives requirements described in 40 CFR, Part 33, Subpart D. Recipients should work with their DBE coordinator, if they think their organization may qualify for an exemption.

Current Fair Share Objective/Goal

The dollar amount of this assistance agreement or the total dollar amount of all of the recipient's financial assistance agreements in the current federal fiscal year from EPA is \$250,000, or more. **The Colorado Department of Public Health and Environment** has negotiated the following, applicable MBE/WBE fair share objectives/goals with EPA as follows:

MBE: CONSTRUCTION 6.1%; SUPPLIES 6.1%; SERVICES 6.1%; EQUIPMENT 6.1%
WBE: CONSTRUCTION 6.6%; SUPPLIES 6.6%; SERVICES 6.6%; EQUIPMENT 6.6%

Negotiating Fair Share Objectives/Goals

In accordance with 40 CFR, Part 33, Subpart D, established goals/objectives remain in effect for three fiscal years unless there are significant changes to the data supporting the fair share objectives. The recipient is required to follow requirements as outlined in 40 CFR Part 33, Subpart D when renegotiating the fair share objectives/goals.

MBE/WBE REPORTING, 40 CFR, Part 33, Subpart E

MBE/WBE reporting is required annually for assistance agreements where there are funds budgeted for procuring construction, equipment, services and supplies, including funds budgeted for direct procurement by the recipient or procurement under subawards or loans in the "Other" category, that exceed the threshold amount of \$150,000, including amendments and/or modifications.

Based on EPA's review of the planned budget, this award does not meet the condition above and is not subject to the reporting requirements of the Disadvantaged Business Enterprise (DBE) Program. However, if during the performance of the award the total of all funds expended for direct procurement by the recipient and procurement under subawards or loans in the "Other" category exceeds \$150,000, annual reports will be required in accordance with the reporting paragraph below and you are required to notify your grant specialist for additional instructions.

The recipient also agrees to request prior approval from EPA for procurements that may activate DBE Program reporting requirements.

This provision represents an approved deviation from the MBE/WBE reporting requirements as described in 40 CFR, Part 33, Section 33.502; however, the other requirements outlined in 40 CFR Part 33 remain in effect, including the Good Faith Efforts requirements as described in 40 CFR Part 33 Subpart C and Fair Share Objectives negotiation as described in 40 CFR Part 33 Subpart D and explained below.

REPORTING PROVISION

When required, MBE/WBE reports must be submitted annually. The recipient agrees to complete and submit a "MBE/WBE Utilization Under Federal Grants, Cooperative Agreements and Interagency Agreements" report (EPA Form 5700-52A) on an annual basis. All procurement actions are reportable, not

Administrative Conditions

General Terms and Conditions

The recipient agrees to comply with the current EPA general terms and conditions available at : http://www.epa.gov/ogd/tc/general_tc_applicable_aa_recipients_dec_26_2014.pdf. These terms and conditions are in addition to the assurances and certifications made as part of the award and the terms, conditions or restrictions cited throughout the award.

The EPA repository for the general terms and conditions by year can be found at : <http://www.epa.gov/ogd/tc.htm>.

- A. In addition to the General Terms and Conditions, all recipients must comply with the Statutory, Regulatory, and Program Guidance (CFDA) requirements listed on the Award Document, Page 2, entitled: "EPA Funding Information."

B. UTILIZATION OF SMALL, MINORITY AND WOMEN'S BUSINESS ENTERPRISES

GENERAL COMPLIANCE, 40 CFR, Part 33

The recipient agrees to comply with the requirements of EPA's Disadvantaged Business Enterprise (DBE) Program for procurement activities under assistance agreements, contained in 40 CFR, Part 33.

SIX GOOD FAITH EFFORTS, 40 CFR, Part 33, Subpart C

Pursuant to 40 CFR, Section 33.301, the recipient agrees to make the following good faith efforts whenever procuring construction, equipment, services and supplies under an EPA financial assistance agreement, and to require that sub-recipients, loan recipients, and prime contractors also comply.

Records documenting compliance with the six good faith efforts shall be retained:

- (a) Ensure DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities. For Indian Tribal, State and Local and Government recipients, this will include placing DBEs on solicitation lists and soliciting them whenever they are potential sources.
- (b) Make information on forthcoming opportunities available to DBEs and arrange time frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process. This includes, whenever possible, posting solicitations for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.
- (c) Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs. For Indian Tribal, State and local Government recipients, this will include dividing total requirements when economically feasible into smaller tasks or quantities to permit maximum participation by DBEs in the competitive process.
- (d) Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually.
- (e) Use the services and assistance of the SBA and the Minority Business Development Agency of the Department of Commerce.
- (f) If the prime contractor awards subcontracts, require the prime contractor to take the steps in paragraphs (a) through (e) of this section.

CONTRACT ADMINISTRATION PROVISIONS, 40 CFR, Section 33.302

The recipient agrees to comply with the contract administration provisions of 40 CFR, Section 33.302.

just that portion which exceeds \$150,000.

When completing the annual report, recipients are instructed to check the box titled "annual" in section 1B of the form. For the final report, recipients are instructed to check the box indicated for the "last report" of the project in section 1B of the form. Annual reports are due by October 30th of each year. Final reports are due by October 30th or 90 days after the end of the project period, whichever comes first.

The reporting requirement is based on total procurements. Recipients with expended and/or budgeted funds for procurement are required to report annually whether the planned procurements take place during the reporting period or not. If no budgeted procurements take place during the reporting period, the recipient should check the box in section 5B when completing the form.

MBE/WBE reports should be sent to Grants Specialist specified on the grant. The current EPA Form 5700-52A can be found at the EPA Office of Small Business Program's Home Page at http://www.epa.gov/osbp/dbe_reporting.htm

Programmatic Conditions

1. Authority

The Environmental Protection Agency, (EPA) awards this Cooperative Agreement (CA) in accordance with the Federal Grant and Cooperative Agreement Act of 1977. This Agreement is subject to all applicable EPA assistance regulations, including those contained in 40 CFR Part 35, Subpart O.

2. Prompt Payment Act Provisions

In accordance with Section 2(d) of the Prompt Payment Act (PL 97-177), Federal funds may not be used by the recipient for the payment of interest penalties to contractors when bills are paid late, nor may interest penalties be used to satisfy cost-sharing requirements. Obligations to pay such interest penalties will not be obligations of the United States.

3. EPA Measure for Non -Compliance

If the State should fail to comply with one or more conditions in this agreement, EPA may terminate the cooperative agreement in whole or in part. Prior to any termination, EPA will provide the State with a 60 day notice and an opportunity for consultation with the Regional Administrator or his or her designee.

4. Exclusion of Third Parties

This agreement extends no benefit or rights to any party not a signatory. In addition, EPA does not assume any liability to third parties with respect to losses due to bodily injury or property damages that exceed the limitations contained in the provisions of 28 USC sections 1346(b), 2671-2680. To the extent permitted by State law, the State does not assume liability to any third parties with respect to losses due to bodily injury or property damage.

5. Activities Prohibited By State Laws

In the event that the State determines after execution of the CA that State laws or other restrictions prevent the State from acting consistent with CERCLA, as amended by SARA, the State must agree to promptly notify and consult with EPA regarding the use of such laws or other restrictions.

6. Progress Report Requirements

In accordance with the provisions of 40 CFR 35.6650, the recipient must submit progress reports quarterly

on the activities delineated in the cooperative agreement statement of work. The reports must be submitted to the EPA Project Officer within 60 days of the end of each Federal fiscal quarter.

In accordance with 40 C.F.R. §31.40, the recipient agrees to submit performance reports that include brief information on each of the following areas:

1)

a comparison of actual accomplishments to the outputs/outcomes established in the assistance agreement workplan for the period;

2)

the reasons for slippage if established outputs/outcomes were not met; and

3) *additional pertinent information, including, when appropriate, analysis and information of cost overruns or high unit costs.*

In accordance with 40 C.F.R. § 31.40 (d), the recipient agrees to inform EPA as soon as problems, delays or adverse conditions become known which will materially impair the ability to meet the outputs /outcomes specified in the assistance agreement work plan.

7. Recordkeeping System Standards

The recipient must maintain a recordkeeping system that enables site-specific costs to be tracked by site activity, and operable unit as applicable, and provides sufficient documentation for cost recovery purposes.

8. Funds Use

These funds must be used for activities directly related to Superfund response actions stated in the workplan.

9. Substantial Federal Involvement

Substantial Federal involvement with the recipient is anticipated during the performance of the cooperative agreement. This Federal involvement includes:

1. Monitoring by EPA of the recipient's performance
2. Consultation and collaboration on technical matters that will help the recipient carry out the agreement effectively.
3. EPA's prior review and approval of project phases and the substantive terms of proposed contracts the recipient enters into to carry out specific elements of the scope of work .

10. RECIPIENT PERFORMANCE REPORTING

Recipients subject to 40 C.F.R. Part 30

Performance Reports:

In accordance with 40 C.F.R. § 30.51 (d), the recipient agrees to include in performance reports submitted under this agreement brief information on each of the following areas: 1) a comparison of actual accomplishments with the anticipated outputs/outcomes specified in the assistance agreement work plan; 2) reasons why anticipated outputs/outcomes were not met; and 3) other pertinent information, including,

when appropriate, analysis and explanation of cost overruns or high unit costs .

In accordance with 40 C.F.R. § 30.51 (f), the recipient agrees that it will notify EPA of problems , delays, or adverse conditions which materially impair the ability to meet the outputs /outcomes specified in the assistance agreement work plan.

Recipients subject to 40 C.F.R. Part 31 (other than recipients of State or Tribal Program grants under 40 C.F.R. Parts 35 Subparts A or B)

Performance Reports:

In accordance with 40 C.F.R. §31.40, the recipient agrees to submit performance reports that include brief information on each of the following areas: 1) a comparison of actual accomplishments to the outputs/outcomes established in the assistance agreement workplan for the period ; 2) the reasons for slippage if established outputs/outcomes were not met; and 3) additional pertinent information, including, when appropriate, analysis and information of cost overruns or high unit costs .

In accordance with 40 C.F.R. § 31.40 (d), the recipient agrees to inform EPA as soon as problems , delays or adverse conditions become known which will materially impair the ability to meet the outputs /outcomes specified in the assistance agreement work plan.

1. EPA may terminate the assistance agreement for failure to make sufficient progress so as to reasonably ensure completion of the project within the project period , including any extensions. EPA will measure sufficient progress by examining the performance required under the workplan in conjunction with the milestone schedule, the time remaining for performance within the project period , and/or the availability of funds necessary to complete the project .
2. Unless the event(s) are specified in the approved workplan, the recipient agrees to obtain prior approval from EPA for the use of grant funds for light refreshments and/or meals served at meetings, conferences, training workshops, and outreach activities (events). The recipient must send requests for approval to the EPA Project Officer and include:
 - (1) An estimated budget and description for the light refreshments , meals, and/or beverages to be served at the event(s);
 - (2) A description of the purpose, agenda, location, length and timing for the event.
 - (3) An estimated number of participants in the event and a description of their roles .

Recipients may address questions about whether costs for light refreshments , and meals for events are allowable to the recipient's EPA Project Officer . However, the Agency Award Official or Grant Management Officer will make final determinations on allowability .

Note: U.S. General Services Administration regulations define light refreshments for morning , afternoon or evening breaks to include, but not be limited to, coffee, tea, milk, juice, soft drinks, donuts, bagels, fruit, pretzels, cookies, chips, or muffins. (41 CFR 301-74.11).

11. Wage Rate Requirements under Section 104(g) of CERCLA **Preamble**

Section 104(g) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) requires that all laborers and mechanics employed by contractors and subcontractors in the performance of construction, repair, or alteration work funded in whole or in part under CERCLA Section 104 shall be paid wages at rates not less than those prevailing on projects of a character similar in the locality as determined by the Secretary of Labor in accordance with Sections 3141-3144, 3146, and 3147 of Title 40 of the United States Code.

Pursuant to Reorganization Plan No. 14 and the Copeland Act, 40 U.S.C. 3145, the Department of Labor

has issued regulations at 29 CFR Parts 1, 3, and 5 to implement the Davis-Bacon and Related Acts (DB). Regulations in 29 CFR 5.5 instruct agencies concerning application of the standard Davis-Bacon contract clauses set forth in that section. Federal agencies providing grants, cooperative agreements, and loans under the CERCLA 104 shall ensure that the standard Davis-Bacon (DB) contract clauses found in 29 CFR 5.5(a) are incorporated in any resultant covered contracts that are in excess of \$2,000 for construction, alteration or repair (including painting and decorating).

For cooperative agreements under 40 C.F.R part 35, Subpart O, the project officer should carefully review the statement of work to determine whether there will be contract(s) in excess of \$2,000 for construction, alteration, or repair (including painting and decorating). Generally, this type of work may occur under removal and remedial response cooperative agreements. It may also occur under a support agency cooperative agreement if the state is providing in-kind services as part of its cost share as documented in a Superfund State Contract. Construction, alteration or repair activities normally do not occur under Core, pre-remedial, and enforcement cooperative agreements; therefore, the Davis-Bacon Act terms and conditions need not be included in these cooperative agreements. If the project officer has a question regarding whether the Davis Bacon term and condition should be included in the cooperative agreement, he/she may contact (b) (6) for guidance.

The Secretary of Labor retains final coverage authority for DB under Reorganization Plan Number 14.

1



Document Review

Compass Document: GO V96819601

08/18/15

Document Summary: General Ledger Entries
 Doc Type: GO
 Doc No: V96819601
 Vendor Code: 840644739B V
 IGMS Grant No: 96819601-1
 IGMS Budget Start Date: 04/01/2015
 IGMS Budget End Date: 01/31/2017
 IGMS Project Start Date: 04/01/2015
 IGMS Project End Date: 01/31/2017
 Order Date: 03/11/15
 Closed Date:
 Servicing Finance Office: LVFC
 Order Amount: \$25,000.00
 Net Paid Amount: \$1,433.36
 Closed Amount: \$1,433.36
 Available Amount: \$23,566.64
 Vendor: EXECUTIVE DIRECTOR'S OFFICE
 Vendor Legal Name: NATURAL RESOURCES, COLORADO DEPARTMENT OF
 Alternate Vendor:
 Description:
 Extended Description:

Document Details: **Expand**

Line#	Line Amt	Expended Amt	Closed Amt	Refunded Amt	Available Amt	RFY	Fund	Org	Program	Project	FOC	Cost Org	Comments	Extended D
1	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	2015	T	8AL0S	303DC6	08UPRS00	4185	C001	RQ:158ALVS004	Amend0
2	\$23,500.00	\$1,433.36	\$1,433.36	\$0.00	\$22,066.64	2015	TR2	08L	303DC6	08UPRS00	4185	C001	RQ:1508LSP023	Amend1
3	\$1,500.00	\$0.00	\$0.00	\$0.00	\$1,500.00	2015	TR2	08L	303DC6	08UPRS00	4185	C001	RQ:1508LSP023	BONITA MI

Document Activity:

Date	Ref Amount	Related Document	Direction	Date	Ref Amount	Related Document	Date	Ref Amount	Related Document
06/29/2015	\$1,433.36	DT 15AS923502	Forward						
06/22/2015	\$1,500.00	RQ:1508LSP023	Back						
06/22/2015	-\$1,500.00	RQ:158ALVS004	Back						
05/05/2015	\$23,500.00	RQ:1508LSP023	Back						
03/12/2015	\$1,500.00	RQ:158ALVS004	Back						

Warehouse Homepage

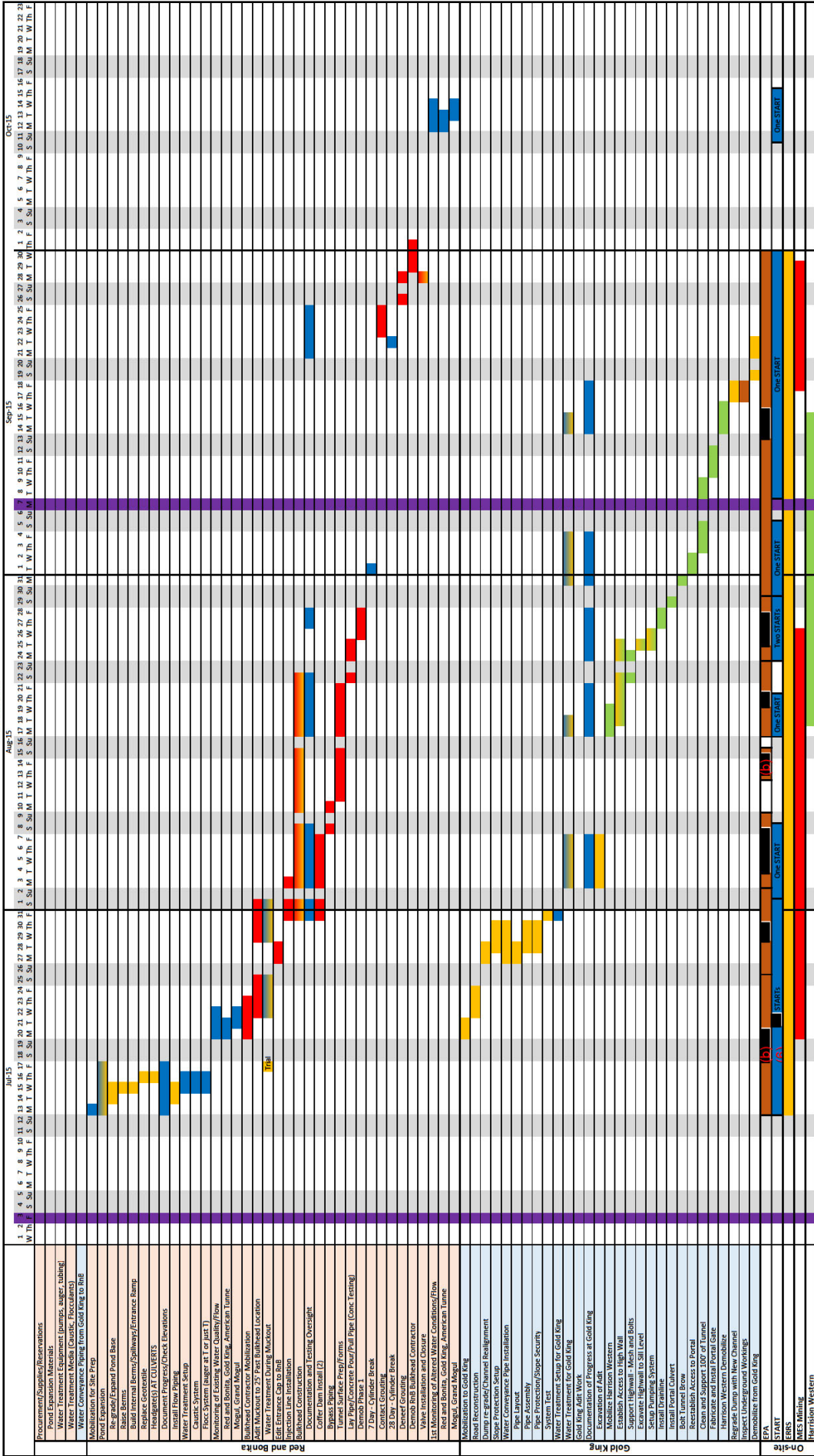
EPA's Work Home | EPA Internet

https://V1742TRTA Y006 RTP.EPA.GOV/neis/grant_web/grant_result

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Red and Bonita / Gold King
2015 Field Schedule
Revised 6/10/2015



■ ERS
■ ERS
■ MES Mining
■ Harrison Western
■ EPA/DRMS