

**Snake River Watershed Task Force
February 12, 2014
Meeting Summary**

This meeting was open to the public.

Participants

Please see Appendix 1 for a list of meeting participants.

Meeting Purpose:

Update the Task Force and public on recent mitigation activities in the Snake River basin, particularly near the Pennsylvania Mine on Peru Creek, as well as on biological monitoring results and other restoration projects happening in other areas of the Snake River Watershed.

Presentations

Please refer to presentation slides and handouts for additional details (contact Julie Shapiro, jshapiro@keystone.org, or go to the Snake River Taskforce website: www.snakerivertaskforce.org).

Snake River Watershed Task Force: Background and History

Brian Lorch of Summit County provided an overview of the Task Force history.

- In the 1980s, many became concerned about how abandoned/inactive mines from the turn of the last century were affecting water quality in the basin, but liability and legal concerns prevented serious mitigation efforts.
- The U.S. Forest Service initiated the Task Force in 2000, with the following mission: “Improve water quality in the Snake River watershed. The Task Force will focus in particular on identifying, evaluating, and implementing opportunities to reduce heavy metal concentrations of concern.” The Task Force is a collaborative effort comprised of private, NGO, and government (county, state, and federal) stakeholder groups. A smaller technical Core Group focuses on scientific questions.
- The Brownfields Assessment conducted by Summit County screened over 250 private mine claims to assess which could be purchased as open space and undergo potential reclamation.
- Summit County has purchased over 400 acres as open space, negotiated properties along the Continental Divide National Scenic Trail, and acquired a protective covenant on the Pennsylvania Mine to allow for reclamation activities there.

Pennsylvania Mine Restoration Activities – Overview

Jeff Graves of the Colorado Division of Reclamation, Mining (DRMS) and Safety and Paul Peronard of the Environmental Protection Agency (EPA) provided an overview of the 2013 summer restoration activities and upcoming 2014 work on the Pennsylvania Mine.

Jeff Graves’s Presentation:

- In 2011, drilling and surveying took place at the Pennsylvania Mine in the F and C portals; these activities included a sonar survey, a borehole camera inspection and two alluvial sampling wells. Based on the outcome from this survey, the decision was made to do an open cut excavation in 2012.
- In 2012 the F and C portals were investigated in order to measure the extent of the accessible workings.

- The open cut excavation of both F and C portals included water treatment during excavation, the installation of 11 foot diameter culverts while backfilling, and reclaiming excavations.
- Data was collected that included inflow locations, the quantity of the flow and the chemistry (metals, isotopes).
- Data was also collected to determine areas that required rehabilitation while investigating possible bulkhead locations.
- Over the summer of 2013, DRMS removed collapsed underground material and cleaned about 500 feet of drift at a total cost of \$377,000. Flumes and pressure transducers were also installed to continue to gauge flow over time.
- Goals of 2014 work in the area include completing the first bulkhead by September (at an estimated cost of \$500,000), rehabilitating portions of Level C, and investigating source control options above Level C.

Q&A for Jeff:

- *If you plug from Level C to Level F, where would you take the drainage from Level C? That's still unclear and depends on the condition of the water. It may be possible to divert the Level C flow into settling ponds that would settle out "muck" in the water.*
- *How secure are the funding sources for this multi-year project? Funding has been secured for all work planned, including construction of the bulkhead.*
- *Is there an opportunity to install a connectivity probe to assess the concentration of metals in the water? Yes, and the USGS is tasked with some of that.*

Paul Peronard's Presentation:

- Paul emphasized that that the main goal at the Pennsylvania Mine is to reduce the offsite transfer of water contaminants, and explained the seven phases of the work:
 - Phase 1: Site preparation (2013-2014):
 - Improve drainage surface on Peru Creek Road and widen the road to allow traffic to the mine
 - Phase 2: Underground bulkhead construction (summer of 2014)
 - Phase 3: Reclaim waste piles
 - Phase 4: Seal off Level C surface water pathways (if necessary)
 - Phase 5: Bulkhead #2 construction (if necessary, but anticipated in 2015)
 - Phase 6: Treatment system construction (if necessary)
 - Phase 7: Post-removal site control (if necessary)
- For long-term monitoring, EPA's goal is to acquire seed funding that would be passed off to stakeholders in the area
- Next Steps:
 - Mobilize July 7 to begin bulkhead construction (DRMS)
 - Waste/water treatment (EPA)
 - Address Level C and upper works (EPA)
 - Compost/vegetate all parking areas and drainage ditches (EPA)
 - Clean/investigate the drift (DRMS)

Q&A for Paul:

- *What is a bulkhead? It's like a big plug made out of concrete, with a flexible seal made of caulk. Sort of like sticking a cork up a hose to stop water flow.*
- *Once you build the bulkhead, how do you know it will be secure forever? We always apply factors of safety and over-design. Even if it's supposed to be a watertight bulkhead, there's always a*

pressure release valve so you can drain it in the future if you're not comfortable with how it is performing. Typically, designs allow for a 100-110 year life.

Recent Monitoring & Restoration Activities on Peru Creek & Snake River

Jon Ewert of Colorado Parks and Wildlife and Andrew Todd of the USGS presented about recent monitoring of the fish populations in the Snake River.

- There are no fish living in Peru Creek or in the main stem of the Snake River until it meets the north fork, which provides enough dilution for them to survive.
- Brook trout is the resident species that reproduces – its population is not stocked or manipulated in any way (unlike rainbow trout). Compared to other species, brook trout are more tolerant of metal concentration in water.
- Between 2002 and 2007, fish populations showed a healthy range of ages, with many juvenile and adult fish were captured for counting. In July of 2007, a flash flood wiped out the entire population for several years. In 2010, only juvenile fish were counted. Numbers went up a bit in 2011, but have gone down in both 2012 and 2013.

Q&A for Jon and Andrew:

- *What's going on with invertebrate populations?* Monitoring done in the early summer of 2007 and 2009 showed that numbers were high, but in areas most influenced by the drainage, diversity is always low. There is some recovery in population as water quality and/or dilution improves. By fall, sites that are impacted by the runoff are affected very negatively.

Lane Wyatt of the Northwest Colorado Council of Governments (NWCCOG) and Jeff Graves (DRMS) provided a detailed overview of restoration projects on Peru Creek at the Silver Spoon Mine and the Delaware Mine.

- NWCCOG applied for a grant of more than \$300,000 in 2008 to implement best management practices at several sites and conduct data analysis to understand water quality. Those projects were finished in January, well under budget.
- At Silver Spoon Mine, drainage coming out of the mine site pooled on top of a waste pile and contained highly reactive pyrite. An impermeable line was installed.
- At Delaware Mine, iron precipitate was cleaned out of an existing pond. The channel was widened and deepened, an impermeable liner was installed, and limestone was laid down to increase the pH. Passageways where snowmelt was adding to the flow were plugged up and re-graded so they won't collect water anymore.
- There will be additional monitoring over the next few years to evaluate the effectiveness of implemented BMPs.

Q&A for Lane:

- *On Cinnamon Gulch downstream from Silver Spoon and Delaware, have there been any before/after studies to measure improvement in water quality?* Not yet – have some sampling sites and baseline conditions, but monitoring is ongoing.

Tim Steele of TDS Consulting gave an update on assessment and monitoring of water quality in the area.

- Dissolved-zinc concentrations in the water have increased significantly since 1972, with the most dramatic increase happening between 2006 and now. It's expected that zinc concentrations will decrease as a result of remedial actions upstream.
- The baseline period for ambient characterization has been determined.
- Future monitoring (pending the March 6 meeting) is strongly recommended to assess changes in baseline concentrations.

Q&A for Tim:

- *What level of toxicity for zinc can brook trout survive? We've seen brook trout survive with up to 1,000 parts per billion. We're approaching or surpassing these concentrations in the town of Keystone, which is why there has been more mortality. Rainbow trout have a much lower threshold.*

Closing and Information Stations

In closing, Julie Shapiro of The Keystone Center emphasized that while the Snake River Task Force itself does not organize volunteer opportunities, there are volunteer opportunities available through various agencies and other groups associated with the Snake River, and she offered to promote those opportunities through the Snake River Task Force email listserv. The presentation session of the meeting adjourned and participants broke from the large group; information stations on various topics were available around the room:

- Pennsylvania Mine surface and subsurface restoration (*EPA, DRMS*)
- Data assessment, monitoring, and restoration activities on Peru Creek (*TDS Consulting, NWCCOG*)
- Snake River water quality and biotic research and monitoring (*CPW, USGS*)
- Snake River Watershed Plan Update (*Blue River Watershed Group*)

Upcoming Meetings

The Snake River Watershed Task Force Core Team will meet on March 6, 2014 in Golden to discuss long-term monitoring to assess the impacts of the Pennsylvania Mine restoration work. There are two main topics to discuss: 1) the technical aspects of the monitoring (where, how frequently, who conducts lab analysis, etc.) and 2) the nature and management of the funding (who manages/governs, structure for making decisions, etc.).

Appendix 1: Meeting Participants, Snake River Watershed Task Force, Feb. 14, 2014, Keystone, CO

First	Last	Organization
Colin	Cares	Summit County Resident
Mike	Clary	Keystone Citizens League
Jan	Cutts	USFS, Dillon Ranger District
Ryan	Dunham	EPA Region 8
Rob	Eber	Attorney General's Office, State of Colorado
Jon	Ewert	CDOW
Jeff	Graves	Colorado Department of Natural Resources, Division of Reclamation, Mining & Safety
Charlotte	Gunther	Summit Cove Elementary
Dan	Jones	Keystone Ski Resort
Jason	Komes	Keystone Resort
Korben	Long	Summit Cove Elementary
Martin	McComb	EPA
Daryl	Oshiro	Keystone Owner's Association
Paul	Peronard	EPA
Ken	Riley	Keystone Owner's Association
Mark	Rudolph	Environmental Protection, CDPHE
Rob	Runkel	USGS
Tim	Steele	TDS Consulting, Inc.
Karsten	Stone	Summit Cove Elementary
Steve	Swanson	Summit County Resident
Andrew	Todd	US Geological Survey, Geophysics and Geochemistry Science Center
Britney	Venegar	Summit Cove Elementary
Erik	Vermulen	Snake River Planning Commission
Peter	Vos	Summit Cove Elementary
Sam	Williams	Summit Cove Elementary
Jason	Willis	Trout Unlimited
Troy	Wineland	Division of Water Resources, State of Colorado
Lane	Wyatt	NWCCOG

Keystone Center Facilitators: Julie Shapiro and Leslie Colwell