



Exploring Collaborative Solutions for AML Site Remediation

Jason Willis

Mine Restoration Project Manager

April 10th, 2017 – Washington, D.C.
Committee on Earth Resources Spring Meeting Panel 3



Challenges to Cleaning Up Abandoned Mines



Animas River Spill (www.wired.com)

- No identifiable or responsible owner (PRP)
- Lack of a dedicated funding source or funding cuts
- Liability concerns due to the Clean Water Act for Good Samaritan Organizations
- Site specific design challenges -- No one-size fits all solution.



What is TU's Role in Mine Reclamation Work?

- ✍ Focus on watersheds that exceed State water quality standards
 - Grant funded projects (CDPHE 319 NPS, NFF, CWCB, CSFS)
 - Private funding for match and construction
 - Freeport McMoRan Mining, Newmont Mining, and Tiffany & Co. Foundation
 - Federally and State funded projects (USFS, BLM, DRMS)
- ✍ TU is part of the mixed ownership group in Colorado
- ✍ Filling a non-profit, non-governmental organization (NGO) role in the mixed ownership group.
 - Brings alternative sources of funding to projects (private partnerships)
 - Flexibility in contracting
 - Engineering experience to assist in project development
 - Collaborative relationships with Federal, State, Private, and Local agencies

TU Program Expansion & Recent Reclamation Work



- ✎ Mine reclamation program expansion over past 4 years
 - Project design, engineering, contracting, management, oversight, and reporting
- ✎ 2012 – Kerber Creek Project
- ✎ 2016-17 – Santiago Mine and Mill, Lower Creek, Lion Creek, Akron Mine, Tiger Mine, and Minnie Lynch Mine Reclamation Projects
 - Over \$1.238 million spent during FY 2016 on construction alone in Colorado
 - All projects focused on WQ improvement or mine reclamation with components of stream restoration and revegetation

Collaborative Project Examples



- ✎ Akron Mine Project – TU, NFF, USFS, EPA, USGS, DRMS, BoR, CDPHE
- ✎ Leavenworth Watershed – TU, USFS, Freeport, NFF, DRMS, CDPHE, USGS, EPA, SHPO
- ✎ 319 Projects – TU, CDPHE, NRCS, CWCB, Freeport, and various partners

Akron Mine Project – White Pine, CO

- ✍ Project recently awarded USFS Rocky Mountain Region 2016 Regional Forester's Honor Award for Sustaining our Nation's Forests and Grasslands.
- ✍ NP Phase I Cost = \$190,340
- ✍ Final Cost NP Phase 2 = \$272,404
- ✍ Project Total: \$462,744



- ✍ 127,000 CY of Mine Waste and Tailings Relocated and/or Consolidated
 - Repositories A and B created to house 40,000CY of highly contaminated tailings/waste
 - Remaining 87,000 CY consolidated and re-graded out of the floodplain to a 4.5:1 slope, and then capped with two feet of clean material.

2015-16 North Pile Project Totals

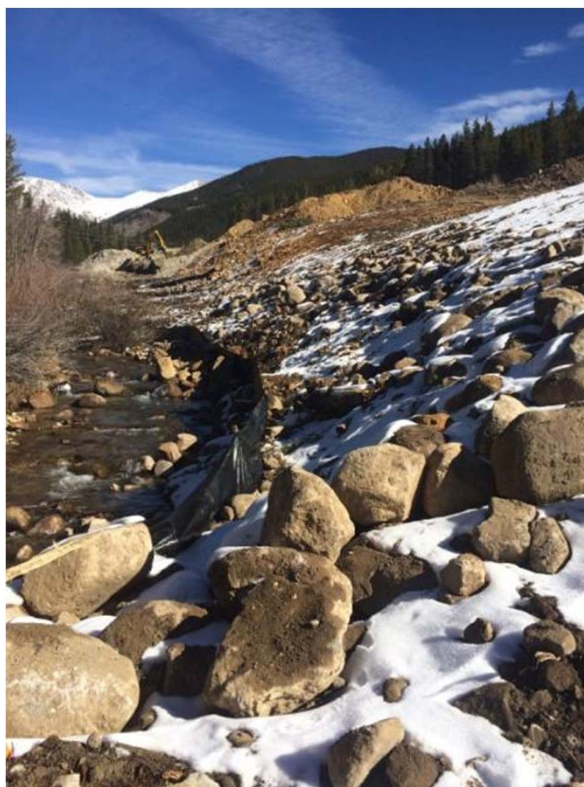
- ✎ Relocation of tailings/waste allowed for creation of 60-80 ft. of clean floodplain along an 1,100 ft. section of Tomichi Creek.
 - Based on 100-500 yr. flood return periods
 - 1,100 ft. of rock toe added at base of repositories
 - Over 150 willow bulb transplants installed in floodplain
 - 6 rock/log sills installed and one cross vane
 - Re-routed Akron adit flow and created channel
 - 196 riparian plugs planted for species diversity
 - 13 acres of seed applied with biosol, 600 CY of manure, 200 CY of compost across Site.



Woody Material in the Floodplain



Akron/Tomichi Before and After Photos



Leavenworth Creek Watershed – Georgetown, CO



- ✍ 2016 work at historic Santiago Mine and Mill Site
- ✍ Coordination with State Historical Preservation Office (SHPO) for Ore bin 1 (OBI) preservation
 - TU essential in bridging gap between project partners and SHPO
- ✍ Construction broken up into seven tasks
 - Task 1 – Removal Action of 4,770 CY of tailings/waste and construction of 600ft of run/on run/off control ditch
 - Remaining tasks pertained to mobilization/demobe, preservation, stabilization, and decontamination of historic structures on site.
 - Mill building interior, water tank, ore bin 1&2, and truck drop

Santiago Mine and Mill – Before and After Photos



Removal action of
4,770 CY



OBI preservation
work



Santiago Mine and Mill – Before and After Photos

Clean-up and
decontamination of
Mill building
interior

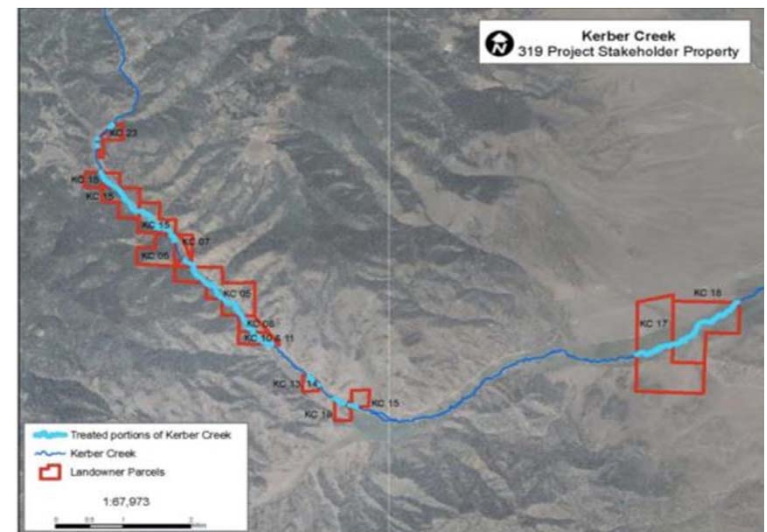


Construction of
600ft run-on-off
channel



319 Non-Point Source – Project Updates

- ✍ Proposed EPA Cuts: 319 NPS Program has been a critical funding source to AML clean-up in Colorado
- ✍ Since 2008 funding received for five CO projects
 - Kerber Creek Phase I and II - \$856,000
 - Evans Gulch - \$243,000
 - Illinois Gulch - \$102,000
 - Leavenworth Creek - \$123,060
 - Total of \$1,324,060
- ✍ All of these projects have, or will, improve water quality on private and public lands
- ✍ Both Phases of Kerber Creek yielded huge successes
 - 10.91 miles of stream restored (43% of total 25 miles)
 - 21.82 miles of stream bank restored
 - Recipient of 2016 Excellence in Project Implementation Award



Kerber Creek Project – Villa Grove, CO

- ✎ Project duration from 2008-2016
 - Sinuosity increased from 3% - 15.5% at four monitoring stations
 - Increased species diversity and cover frequency index at monitoring locations
 - 37% -80% reduction in bare soil coverage
 - Attainment of macroinvertebrate indices at 4/6 sites
 - Improvement in WQ and increased populations in brook trout



Questions/Comments?



🐟 Thank You! – Jason Willis – Project Manager – jwillis@tu.org

