

Peru Creek Basin Brownfield Assessment Summit County, Colorado

Brownfields Assessment Demonstration Pilot

Final Report

June 25, 2004



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The Pennsylvania Mine and the Giant Millsite

In April 2001 Summit County was awarded a \$250,000 USEPA Brownfields Assessment Demonstration Pilot grant to identify, assess, and plan response activities to address mining-related contamination and revitalization in the Peru Creek Basin.

The Peru Creek Pilot project area is an approximately 15 square mile, high altitude, sub-alpine and alpine basin in Summit County, Colorado. Peru Creek is a tributary to the Snake River. The Snake River terminates in Dillon Reservoir, a principle domestic water storage impoundment owned by the City of Denver. About 3,000 people live year-round in the Snake River Watershed, though resort use swells that number to over 20,000. The small town of Montezuma sits on the Snake River two miles upstream from its confluence with Peru Creek. Keystone Resort is three miles downstream on the Snake. Peru Creek is not a source of domestic water for either, though Keystone Resort does use Snake River water for snowmaking.

Federal lands administered by the US Forest Service comprise over 80% of the land in the Peru Creek Basin. The principal targets for the Brownfields Assessment was the approximately 1200 acres in the basin that are privately owned. Most of the private lands are inactive, patented mining claims with parcels ranging in size from 1.8 acres to 296 acres. Past mining activities in Peru Creek Basin have left a legacy of waste rock dumps, tailings piles, partially collapsed buildings, scarred hillsides, and open adits scattered throughout the area. Acid mine drainage from some of these abandoned mine sites significantly degrades the water in Peru Creek itself.

I. Peru Creek Basin Brownfields Assessment Goal

The goal of the Peru Creek Basin Brownfield Assessment was to utilize a suite of Brownfield tools to allow Summit County, via the county's Open Space Program, to acquire, and where necessary clean and reclaim, prioritized properties in the Peru Creek Basin, so that at some yet-to-be-determined time, those properties can be transferred to the United States Forest Service.

Summit County used County Open Space funds to acquire those claims in the basin that met the criteria established by the Brownfields Assessment. Summit County's Open Space funds are generated from a real estate property tax approved by Summit County voters in November 1993, providing approximately \$700,000 annually through 2004 to fund protection and acquisition of open space resources in Summit County. In 1999, County voters overwhelmingly approved an additional tax mill levy that will generate approximately an additional \$2.5 million per year for a ten-year period.

Acquisition of prioritized properties in Peru Creek helped Summit County meet open space objectives by reducing habitat fragmentation caused by dispersed second-home and cabin development, thereby reducing demand and cost of providing county services such as police, fire and road maintenance, and providing for passive recreation opportunities.



Participants in USEPA/USDA "Brownfields Federal Partnership Mine-Scarred Lands Initiative" stop at Shoe Basin #1 Mine during June 8, 2004 site visit

II. Brownfields Assessment Accomplishments

The Summit County Open Space and Trails Department conducted the Brownfields assessment on behalf of the Summit County Board of County Commissioners. Grant contracting between Summit County and the USEPA was finalized in September 2001. Shortly thereafter, the Trust for Land Restoration and American Geological Services were contracted by Summit County to assist with the project. Fieldwork for the project was conducted September-October, 2001, June-October, 2002, and June-October 2003.

As a result of the Peru Creek Basin Brownfields Assessment:

- 1) One hundred landowners were contacted via mail, telephone or personal visit;
- 2) Fifty-four privately owned blocks of patented mining claims were assessed for environmental impacts using a modified Phase I Environmental Assessment;
- 3) Fourteen patented claim blocks were prioritized for potential acquisition;
- 4) Nine patented claim blocks (34 individual claims) totaling approximately 167 acres were acquired by Summit County and conserved as open space. Summit County has another 4 claims totaling approximately 21 acres under contract;
- 5) One site, Shoe Basin #1, was prioritized for reclamation to reduce metals loading into Peru Creek, and for re-use as a developed backcountry trailhead/parking area recreation site. A Phase II Environmental Assessment was completed; a Colorado Voluntary Clean-up (VCUP) application and a USEPA Brownfields Clean-up grant proposal were submitted. Total budget for cleanup of the site is \$235,000. On June 15, 2004, the USEPA announced that Summit County was approved for a Brownfields Cleanup Grant of \$195,000 for the Shoe Basin #1 reclamation.
- 6) Colorado Division of Minerals and Geology will perform physical closure of approximately 20 dangerous mine openings during the summer of this year (2004);
- 7) One landowner has agreed to place a conservation easement on his property, allowing for no development of a claim block totaling approximately 150 acres; and
- 8) The United States Department of Agriculture, and the United States Environmental Protection Agency selected the Pennsylvania Mine as one of six national demonstration sites for the "Brownfields Federal Partnership Mine-Scarred Lands Initiative" to cooperate with the Snake River Task Force to help resolve issues at the Pennsylvania Mine, as part of a nation-wide demonstration project of inter-governmental cooperation related to Brownfields mine-scarred lands.



On June 15, 2004, the USEPA announced that Summit County was approved for a Brownfields Cleanup Grant of \$195,000 toward reclamation of the Shoe Basin #1 Mine

III. Brownfields Assessment Objectives and Tasks

The specific objectives and tasks to reach the goal of the Peru Creek Brownfields Assessment Pilot included:

A. Prioritization Activities, conducted September 2001-September 2002:

- 1) Gather existing data and conduct an **Initial Private Property Screening** of the private property within the basin;
- 2) Conduct an **Initial Environmental Liability Management Analysis**;
- 3) **Prioritize** sites on the basis of the preliminary assessment and conduct a Phase II environmental assessment for highest priority sites;

B. Phase II Assessment and Remediation, conducted October 2002-June 2004:

- 4) Conduct a **Phase II Environmental Assessment** and a more complete **Environmental Liability Management Analysis** of the Upper Transpacific Tourism block of claims, including Shoe Basin #1;
- 5) **Develop remediation plans** for the Shoe Basin #1;
- 6) **Acquire** the Upper Transpacific Tourism block of claims in a manner that best manages environmental liability and meets the open space goals of the assessment;
- 7) Develop the results of the assessment as a demonstration model and conduct a program of **education and outreach**.

IV. Role of the Trust for Land Restoration

The Trust for Land Restoration, Inc. (TLR) was hired as a sole source contractor to coordinate all activities of the assessment generally, and specifically to conduct the environmental liability management, prioritization, and outreach tasks of the assessment. TLR also helped recruit, hire and coordinate the activities of an environmental consulting firm.

TLR is a non-profit land trust whose mission is to promote the restoration of environmentally significant lands degraded by mining. TLR has expertise in environmental law; land conservation, ecological assessment, mining, geology, and government relations. TLR's attorneys have specific legal expertise related to mined-land liability. It is the only land trust in the country dedicated to evaluating and managing the legal complexities surrounding mined-land liability issues.

TLR has been cooperating with Summit County to resolve mined-land liability issues in Peru Creek Basin since October 2000. TLR originally conceived of the Peru Creek Brownfield Pilot proposal and cooperated with Summit County in soliciting the interest of a variety of concerned organizations, including the Colorado Department of Public Health and the Environment, and drafting the successful Pilot proposal.

The tasks completed by TLR for the Peru Creek Basin Brownfields Assessment include providing a legal analysis of liability issues; coordinating stakeholder involvement; facilitating prioritization of parcels for acquisition; performing due diligence tasks; conducting landowner interviews; engaging regulators; developing clean-up funding strategies; and coordinating all project related activities of project cooperators and contractors.

V. American Geological Services as Environmental Consultant/Contractor

American Geological Services, Inc. (AGS) was selected as the environmental consultant/contractor to provide qualified environmental site assessment (including Initial Private Property Screening, and Phase II Environmental Assessment); to develop a project specific database and GIS platform; and to develop an USEPA approved Quality Assurance Project Plan (QAPP) and a Sampling and Analysis Plan (SAP). AGS was selected via a competitive process from among five firms that responded to a Request for Proposals distributed via US Mail by Summit County on July 23, 2001.

VI. Project Overview

A. The Need for the Peru Creek Brownfield Assessment

The hardrock mining industry played a major role in the economic development of the West. Unfortunately, the hardrock mining industry left the West with a legacy of contaminated inactive and abandoned mine sites that lay idle and continue to degrade our environment. These contaminated mine sites are the Brownfields of the rural West. Unfortunately, the clean up, reuse and revitalization of rural lands contaminated by mining is often hampered by the same liability concerns that encumber urban lands. The federal government recognized the need to encourage the use of Brownfields techniques in rural and natural settings impacted by past mining by including “mine-scarred lands” in the Small Business Liability Relief and Brownfields Revitalization Act (H.R. 2869), signed into law by the President on January 11, 2002.

The Peru Creek Pilot project area is an approximately 15 square mile, high altitude, sub-alpine basin in Summit County, Colorado. Summit County is located 70 miles west of Denver, in the heart of the Rocky Mountains. The year- round population of Summit County is approximately 19,000, but the County contains four major ski resorts and hosts nearly 2,000,000 visitors each year. Summit County includes the towns of Breckenridge, Frisco, Dillon, and Silverthorne, and the resorts of Keystone, Arapahoe Basin, Cooper Mountain and Breckenridge.

Peru Creek is a tributary to the Snake River. The Snake River terminates in Dillon Reservoir, a principle domestic water storage impoundment owned by the City of Denver. About 3,000 people live year-round in the Snake River Watershed, though resort use swells that number to over 20,000. In Peru Creek Basin itself there are currently two year-round residences, and dozens of small summer cabins and shelters. The small town of Montezuma sits on the Snake River, two miles upstream from its confluence with Peru Creek. Keystone Resort is three miles downstream on the Snake. Peru Creek is not a source of domestic water for either, although Keystone Resort does use Snake River water for snowmaking.



Private lands in the Peru Creek Basin are under increasing pressure for second-home development

Federal lands, administered by the US Forest Service, comprise over 80% of the land in the Peru Creek Basin. Approximately 1200 acres in the basin are privately owned. Most of the private lands are inactive, patented mining claims with parcels ranging in size from 1.8 acres to 296 acres. Summit County was a major landowner in the basin, owning about 200 acres at the beginning of the Peru Creek Brownfields Assessment in 2001. The County obtained this land in Peru Creek through involuntary tax default and through purchase and donation.

As is found throughout the Rocky Mountains, past mining activities in Peru Creek Basin have left a legacy of waste rock dumps, tailings piles, partially collapsed buildings, scarred hillsides, and open adits scattered throughout the area. Acid mine drainage from some of these abandoned mine sites significantly degrade the water in Peru Creek itself. Large sections of Peru Creek are coated in iron and aluminum oxide that precipitate out of solution as flow from pristine tributaries raise the pH of the stream water.

Peru Creek has been identified as the primary source of metals loading into the Snake River. Peru Creek and the Snake River are listed as Clean Water Act 303(d) "Water Quality Limited" streams, requiring TMDL assessments, scheduled to be completed by the State of Colorado 6/30/06. Peru Creek has high concentrates of iron, zinc, cadmium, copper, lead and manganese. TMDL implementation is likely to lead to restraints on permitted activities on both public and private land within the area and would cause negative impacts on recreation and economic development within the entire Snake River Watershed. Thus, cleaning up abandoned mine sites within the Peru Creek watershed will be a positive benefit to the economy of the County.

Since most of the mining operations that damaged the environment in and around Peru Creek occurred in the late 1800s, it is highly unlikely that any of the current owners of property within the basin caused or contributed to the ongoing release of hazardous substances. Without access to Brownfields Pilot funds, it is doubtful that the contaminated properties within the basin would have been assessed for potential remediation, as there simply aren't the economic re-use incentives found in urban Brownfields projects to drive cleanup of rural mined lands.

Prior to the beginning of the Peru Creek Brownfields Assessment, Summit County had successfully transferred some of its Peru Creek properties to the Forest Service, but contamination and its associated liability issues were preventing this activity from continuing. The County had proposed use of County Open Space funds to acquire other mining claims for trade to the Forest Service, and the Forest Service had expressed interest in trading for them, but until this Brownfields assessment, these trades had been stopped by liability concerns.

Aside from the Forest Service, the owner of the next largest amount of acreage in the basin was a small, family-owned real estate investment company known as Transpacific Tourism. Transpacific purchased about 330 acres of basin mining claims in the late-1980's with the intent of reselling to a Japanese investor, potentially as home sites. The investor reneged, leaving Transpacific with the property to try to sell on the open market.

The Transpacific properties include at least two draining mine adits, one at the site of the Pennsylvania Mine and the other at Shoe Basin. Learning that its holdings include contaminated property, Transpacific changed strategies in the mid-90s and sought unsuccessfully to sell its holdings as one intact piece. Over the last 15 years, several prospective buyers, including the US Forest Service, have considered acquiring Transpacific's holdings, but turned away, justifiably cautious of cleanup responsibility and its associated environmental liability.

Community attempts to remediate environmental problems associated with contaminated sites within the Peru Creek Basin date back more than a decade. One of the best-known attempts to reduce metals loading began in 1990 when the Colorado Division of Minerals and Geology (CDMG) identified the Pennsylvania Mine for a demonstration water treatment project. CDMG constructed a water treatment demonstration plant to test a concept for removing metals from the discharge of a draining adit. CDMG successfully operated the plant during two test periods in 1992 and 1993, but the agency became fearful of long-term liability implications, and decommissioned the plant in 1994.

In 1999 a local stakeholders group formed in response to the recognition that the solution to water quality problems in the Snake River Basin would require broad-based stakeholder involvement. The Snake River Basin Task Force characterized Peru Creek as the primary source of metals loading to the Snake River. The task force specifically targeted water quality problems caused by abandoned mines.

B. Flow of Ownership Plan: Eventual Transfer to United States Forest Service

The stated, desired result of this assessment was to allow Summit County, with the assistance of the Trust for Land Restoration, and in cooperation with the US Forest Service and the State of Colorado, to acquire prioritized properties, clean and reclaim where necessary, and at some future time, transfer those properties into Federal ownership.

Summit County's intention was to use Summit County Open Space funds to acquire mining claims in the basin for trade to the US Forest Service. These funds are generated from a real estate property tax approved by Summit County voters in November 1993, providing approximately \$700,000 annually through 2004 to fund protection and acquisition of open space resources in Summit County. In 1999, County voters overwhelmingly approved an additional tax mill levy that will generate approximately an additional \$2.5 million per year for a ten-year period. Summit County's Open Space funds are not available for environmental assessment or cleanup.

The US Forest Service, through its land exchange program, will acquire those lands that provide important public values related to National Forest management, including access to National Forest recreation opportunities, protection of wetlands and other important ecosystems, and prevention of development into the upper reaches of valley's basin. As has occurred in recent, similar transactions between Summit County and USFS, Summit County will receive like value Forest Service lands closer to populated areas in trade for the Peru Creek parcels that are ultimately acquired.

The Landownership Adjustment Analysis (1993) for the Dillon Ranger District of the White River National Forest defines the land acquisition and conveyance objectives for the upper Snake River Basin. The recommended strategy for land adjustments is to acquire parcels of private land when these parcels are determined to provide important public values related to National Forest management plan. The White River National Forest will not acquire non-National Forest System lands that need major reclamation work or are in areas of active mining.



USFS' Bob Steckley and Summit County's Brian Lorch
at Shoe Basin #1, 06/08/04

Properties in Peru Creek eventually acquired by the US Forest Service will be incorporated into the National Forest System and managed by the Forest Service as directed by the White River Land and Resources Management Plan. Such management may include enhancement of properties for public access points to National Forest lands, and allow for the development of a trailhead parking area to access the Continental Divide National Scenic Trail and climbing routes to Grays and Torreys Peaks (two of the more popular 14,000' peaks in Colorado). Some private mining claims actually have parts of the Continental Divide Trail crossing them.

Consolidating Federal ownership in this scenic valley has the added benefit of reducing the threat of habitat fragmentation from cabin and second home development and preserving open space and wildlife habitat benefits in the basin.

VII. Prioritization

A. Designing a Prioritization Process

The challenge at Peru Creek, with nearly 70 separate owners holding over 100 blocks of private property totaling 1200 acres of mine-land, was how to prioritize which properties to fully assess and attempt to acquire and clean? Summit County recognized from the beginning of the project that some sort of process would need to be designed and implemented to determine which sites were most suitable to consider for acquisition. The County's acquisition funds are limited. The cost of complete Phase II Environmental Assessment is significant (\$10,000 to \$50,000 per site). The contribution of any potential acquisition to helping meet Greenspace goals (Forest Service goals and open space protection objectives) varies. With very few exceptions, each landowner's interest in selling was unknown at the outset of the project.

Compounding the prioritization dilemma was that quantity and quality of information about contamination on individual private property parcels in Peru Creek varies, and existed in different forms and in different places. Some properties are more contaminated than others. Some properties have little or no contamination. Type of contamination, degree of contamination, and physical factors such as site accessibility and size vary, the cost of cleanup and the liability associated with the cleanup on each site varies.

To meet the goal to prioritize sites for further study (including Phase II Environmental Assessment) and acquisition, Summit County and TLR designed a prioritization process for the Peru Creek Brownfields Assessment to consolidate existing information and generate new information that included three principal components:

- 1) Stakeholder Outreach and Stakeholder Input
- 2) Initial Private Property Screening
- 3) Preliminary Liability Management Analysis

B. Stakeholder Outreach

Identifying and involving key stakeholders was a key element for achieving success in the Peru Creek Brownfields Assessment. As described in the *Handbook of Tools for Managing Federal Superfund Liability Risks at Brownfields and Other Sites*:¹

By its very nature, property reuse is a local activity. Parties with the greatest stake in the economic and environmental benefits of a reuse project are the owner(s), surrounding property owners, local citizens, developer(s), local government, and state government. Because of their stake in the project, these parties are generally in the best position to plan, implement, and oversee required cleanup and reuse activities.

During the early stages of the Prioritization process, key individuals representing diverse interests were identified and later assembled as the Peru Creek Brownfields Assessment Advisory Team. The team met for the first time as a group on January 11, 2002, and again on May 10, 2002. A smaller version of the team, including representatives of Summit County, TLR, AGS, and the US Forest Service, met on April 19 and April 30, 2002.

Site visits to Peru Creek were conducted by Summit County on September 25, 2002 and July 10, 2003. Representatives of the US Forest Service and Department of Agriculture, Office of General Counsel, attended both site visits. Representatives of CDPHE, EPA, Snake River Task Force and Arapahoe Basin Ski Area attended the September 2002 site visit. AGS and TLR attended both visits.

Summit County, AGS, and TLR traveled to Denver on August 12, 2003 to meet with CDPHE and EPA.

Summit County and TLR participated in a site visit to the Pennsylvania Mine on June 8, 2004 that was coordinated by the Dillon Ranger District of the US Forest Service, and included staff from the US Department of Agriculture and the EPA seeking to develop the Pennsylvania Mine as part of a nation-wide demonstration project of inter-governmental cooperation related to Brownfields mine-scarred lands.

All landowners within the 15.5 square mile Peru Creek Basin were notified in 2002 that assessment work associated with the Peru Creek Brownfields Assessment project was being completed. Numerous public meetings have been held in the process of the assessment project have been attended by local citizens, local government and agency personnel.

¹ Handbook of Tools for Managing Federal Superfund Liability Risks at Brownfields and Other Sites. EPA Publication Number: EPA 330-B-98-001, November 1998.

The Summit County Open Space Advisory Committee (OSAC) discussed the Upper Transpacific Tourism acquisition and Shoe Basin Mine cleanup as an agenda item at its publicly noticed regular meeting on August 6, 2003 with 15 Summit County residents present. At that meeting, the OSAC made a recommendation to the Summit County Board of County Commissioners to approve acquisition and cleanup of the mine and the property surrounding it.

As a noticed item on the agenda of the September 2, 2003 open work-session of the Summit County Board of County Commissioners, staff of the Summit County Open Space and Trails Department presented the Commissioners with a draft Shoe Basin Mine acquisition and cleanup plan. The Commissioners authorized the Open Space and Trails Department to purchase the 110-acre property surrounding the Shoe Basin Mine, to option the Shoe Basin Mine property itself, and to pursue an EPA Brownfields Cleanup grant for the project. This was reported in the September 17, 2003 edition of the Summit Times newspaper and September 10, 2003 addition of the Summit Daily News in an article entitled “*County to Buy Peru Creek Open Space – Old Shoe Basin Mine is Targeted for Environmental Work.*”

Summit County Open Space and Trails Department’s Brian Lorch discussed the Shoe Basin Mine Acquisition, Cleanup and EPA Brownfields grant, and took public comment, as a noticed agenda item at the October 7, 2003 technical committee meeting of the Snake River Watershed Task Force. Twenty people attended this meeting, including local residents, representatives of the Colorado Department of Public Health and Environment, the Colorado Department of Minerals and Geology, the University of Colorado, the Trust for Land Restoration, the United States Geological Survey, and the United States Forest Service.

Organizations and their representatives who have participated on the Peru Creek Brownfields Assessment Advisory Team or on site visits include:

American Geological Services: Mark Arnold, Dorinda Bair

Colorado Department of Public Health and Environment: Dan Scheppers, Mark Walker, Bill McKee, Bonie Pate.

Northwest Colorado Council of Governments (NWCCG): Robert Ray, Lane Wyatt.

Snake River Task Force: Mary Davis Hamlin, Sabre Duren, John Cathrall.

Summit County Open Space and Trails Department: Todd Robertson, Brian Lorch.
Summit County Open Space Advisory Council (OSAC): Mike Clary.

Trust for Land Restoration: Pat Willits, April Montgomery, Bob Moran.

United States Department of Agriculture, Office of the General Council: Mike Hope.
United States Department of Agriculture, National Brownfields Coordinator: Blake Velde, Brenda Styer-Gee.

United States Environmental Protection Agency: Tom Pike, Carol Russell, Sabrina Forrest

United States Forest Service: Paul Semmer, Bob Steckley, Brian Lloyd, Suzanne Buntrock, Daryl Gusey, Art Bauer.

Liaison to the Snake River Task Force: Brian Lorch, Pat Willits.

The Snake River Task Force is a local stakeholders group formed in 1999 in response to the recognition that the solution to water quality problems in the Snake River Basin would require broad-based stakeholder involvement. Peru Creek is a tributary to the Snake River and has been identified by the Task Force as the primary source of metals loading to the Snake River. The Task Force specifically targeted water quality problems caused by abandoned mines. The Keystone Center provides a Project Support Coordinator for the Task Force.

<h2>The Snake River Watershed Task Force</h2> <p>Mary Davis Hamlin, Facilitator 970-513-5800</p>	<p>Arapahoe Basin Ski Area Blue River Chapter of the Sierra Club Chihuahua Mining and Milling Company Colorado Dept of Public Health and Environment Colorado Division of Minerals and Geology Denver Water Department Dundee Reality USA The Keystone Citizens League Keystone Real Estate Development Town of Montezuma Northwest Colorado Council of Governments Shaping our Summit Snake River Planning Commission Summit County Board of County Commissioners Summit County Environmental Health Summit County Open Space and Trails Summit Water Quality Committee US Army Corps of Engineers US EPA, Region VIII US Forest Service, White River National Forest University of Colorado at Boulder, INSTAR Vidler Water Company Water Treatment and Decontamination International</p>
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Summit County's Brian Lorch and USEPA's Carol Russell review documents during Pennsylvania Mine site visit, 06/08/04



Transpacific Tourism owner Bud Anderson at the Pennsylvania Mine, 06/14/04

C. Initial Private Property Screening

The Initial Private Property Screening was essentially a modified Phase I Environmental Assessment that provided initial environmental assessment of about two-thirds of the private property in Peru Creek Basin. The purpose of the screening was to identify recognized environmental conditions on private land prior to making decisions about which sites were worthy of Phase II Environmental Assessment.

The goal of Initial Prioritization was to use information gathered during by the screening to generate two lists:

- 1) Sites that meet relatively free of serious environmental contamination and liability as they exist today, and can be considered for acquisition in their current state; and
- 2) Three to five sites to undergo Phase II Environmental Assessment.

Components of this screening included records review, interviews, historical use information, and site reconnaissance. Each landowner was contacted via US Mail (to the address on record at the Summit County Assessor's Office).

To aid the Initial Private Property Screening and other Prioritization analysis, a GIS database was constructed, with topographic contours; roads; parcel boundaries; land ownership; structures; mine adits; and mine tailings dumps.

AGS conducted site reconnaissance activities for the Initial Private Property Screening during September and October 2001. Data was entered into the assessment database, along with data from a previous USFS Abandoned Mine Lands Inventory. AGS presented this data to Peru Creek Brownfields Assessment Advisory Team on January 11, 2002, in the form of claim descriptions of 52 ownership blocks (of a possible 70).

Results of the Initial Private Property Screening were then organized to reflect:

- a) Properties that are free of contamination and liability concerns and meet criteria for acquisition in their current state;
- b) Properties that appear to be free of contamination but require additional assessment;
- c) Properties that have contamination but no apparent contaminated water discharges or ground water contamination concerns;
- d) Properties that have contaminated water discharges and/or ground water contamination concerns, but also have potential remediation scenarios that allow for water diversion or other hydrologic control to eliminate water contamination;
- e) Properties that have contaminated water discharges and/or ground water contamination concerns which likely require active or passive treatment.



Acid Rock Drainage from the Pennsylvania Mine flows over the Giant Millsite, 06/14/04

D. Forest Service Priorities

Peru Creek Basin lies within the Dillon District of the White River National Forest. The *Proposed Revised Land and Resource Management Plan for the White River National Forest* includes the following in its real estate standards for land adjustment activities:

Evaluate and balance the overall combination of all resource values and factors including wildlife habitat, fisheries habitat, riparian areas, wetlands, cultural resources, recreation opportunities, scenic values, watershed protection... public access, better federal land management, and other factors.²

And:

Opportunities to acquire non-federal lands by purchase or exchange where lands are valuable for NFS purposes should consider the following:

- Designated Wilderness and other areas classified by Congress;
- Lands with historical and other important heritage resources, outstanding scenic values, or critical ecosystems when these resources are threatened by change in use, or when management may be enhanced by public ownership;
- Lands with water frontage, such as lakes, streams, flood plains, wetlands, and associated riparian ecosystems;
- Lands with important value for outdoor recreation purposes, and lands needed for scenic condition protection;
- Lands needed to bring existing NFS lands into consolidated geographical units, or to reduce the miles of interior boundaries and the number of interior corners.
- Avoidance of land acquisition where it is likely that the lands could go to patent under the 1872 Mining Law, unless the minerals will be donated to the United States.³

The Dillon District mapped Forest priority areas in Peru Creek, showing areas of primary focus to help meet National Forest Resource Management Objectives⁴. AGS then scanned the Forest Service map and entered into the assessment GIS database. This map included:

1. Peru Creek itself and parcels immediately adjacent to the creek containing riparian and wetland habitat;
2. Parcels within the basin suitable for development where such development would harm the natural resources in the area; and
3. Parcels along existing trails or trailheads (or potential trailheads).

² Proposed Revised Land and Resource Management Plan for the White River National Forest, p. 2-32. USDA White River National Forest, Glenwood Springs CO. June 2002.

³ Ibid, p.2-33.

⁴ Written communication supplied by Paul Semmer, USFS Dillon District; January 25, 2002.

A review of the mapped Forest Service priority-area polygons shows them to be mostly clustered in three principal areas:

1. Along Peru Creek itself and its flanking hillsides, from Warden Gulch for a distance of about 5 miles upstream, east and northeast to the Continental Divide. This area includes upper Peru Creek and the Shoe Basin, Peruvian and Treasury Mines;
2. Warden Gulch; and
3. Cinnamon Gulch.



USFS' Bob Steckely, USEPA's Carol Russell and Summit County during Peru Creek site visit, 06/08/04

E. Arriving at Prioritization Recommendations

At the April 19, 2002 meeting AGS suggested a “Peru Creek Drainage Basin Mine Feature Matrix” (Attachment A) that scored 10 feature components as a starting point to rate claims for cleanup. These 10 components were: slope, road access, equipment access, area of environmental disturbance, severity of physical hazards (i.e. mine openings, and shafts), vegetation density, vegetation cover type, surface drainage, severity of erosion, and quantity of adit discharge (if any).

Also at the April 2002 meeting, AGS presented a spreadsheet summary of all claims for which information had either been collected by AGS or by the Forest Service AML study (Attachment B), along with a brief analysis of the first phase of a study by URS of possible Arapahoe Basin Snow-Making Mitigation sites in Peru Creek Basin.⁵ Based upon the data collected by USFS, URS, and AGS itself, AGS made the following recommendations:

1. Due to the complex hydro-geology and hydrology found in Cinnamon Gulch, combined with the cumulative amount of contaminated discharge reaching Peru Creek, combined with the potential liability of acquiring any property in Cinnamon Gulch, acquisition or Phase II Environmental Assessment of ANY of the properties in Cinnamon Gulch is not recommended at this time.
2. Although Shoe Basin Mine does include one adit discharging at a flow of 1 to 2.5 gallons per minute, of high acidic, high metal concentration water, there may be justification to perform Phase II EA with environmental liability analysis, and to obtain remediation cost estimates. Among reasons for that justification are that the site is large, easily accessible, under one owner, and high on the Forest Service priority list. Also, although it might require either passive or active water treatment, Shoe Basin is not as complex hydrologically as Cinnamon Gulch.
3. The following claims were suggested as best meeting the criteria for Phase II Environmental Assessment:

Claim Name	General location	Acres	USFS Priority?	CWA Liability?
Braganza and Braganza Extension	Warden Gulch	9	yes	potential
Carrie	Peru Creek (western end)	45.5	yes	potential
Calla Mill Site	Peru Creek @Horseshoe Basin	5	yes	potential
Decatur Townsite	Peru Ck near Cinnamon Gulch	58	yes	likely
Ere and Emma	Peru Ck @ Horse Shoe Basin	12.7	yes	potential
Foster and Chihuahua Placer	Peru Ck @t Chihuahua Gulch	38	no	potential
Isabel and Isabel #5	Cooper Mountain	97	no	potential
Lone Jack	Peru Creek near Cinnamon Gulch	5	yes	likely
Paymaster	Cinnamon Gulch	?	yes	likely
Revenue	Near Divide above Cinnamon Gulch	4.3	yes	no
Rich Ore	Cinnamon Gulch	48.6	yes	likely
Shoe Basin #1	Peru Creek @Shoe Basin	110	yes	likely
Sunrise Lode	Upper Cinnamon Gulch	5	yes	likely
Tariff	Cooper Mountain	15.5	edge	no

⁵ URS “Site Assessment Analytical Results Report-Phase 1”, USEPA contract 68-W-00-118, September 2001.

At a later date, AGS presented to Summit County a list with claim descriptions of 34 claims totaling 511.986 acres (or about 43%) of the private property in Peru Creek Basin that is deemed to be of limited environmental impact and liability. This list is confidential.

VIII. Recommendations for Phase II Environmental Assessment

The assessment advisory team met on May 10, 2002 to consider the information and recommendations. The team directed TLR to contact owners of eight properties and determine if there was an interest in selling properties in fee or in donating a conservation easement. TLR worked through June making confidential landowner contacts. Summit County and TLR conferred on June 24, 2002 to make the following recommendations:

- 1) The Upper Transpacific Tourism properties (110 acres) that includes the Shoe Basin #1 Mine, owned by Transpacific Tourism Inc., will have a Phase II Environmental Assessment in 2002. Summit County Open Space and Trails Department assumed the lead in negotiating a real estate purchase contract, subject to the results of the expanded Phase I EA. USFS priority for potential trailhead and limiting development;
- 2) The Braganza and Braganza Extension claims (9.2 acres), located at the top of Warden Gulch, will have an expanded Phase I Assessment in 2002 confirming information gathered by AGS and USFS that the site does not require a full Phase II nor any remediation. TLR assumed the lead in negotiating a real estate purchase contract, subject to the results of the expanded Phase I EA; and
- 3) The Revenue claim (4.3 acres), located at the top of Cinnamon Gulch, was not visited by AGS in 2001. In 2002 it will have an Initial Site Reconnaissance visit confirming information gathered by USFS that the site is free of environmental contamination that might trigger liability concerns. TLR assumed the lead in negotiating a real estate purchase contract, subject to the results of the Initial Site Reconnaissance.



Standing water atop waste rock and mill tailings at Shoe Basin #1, 06/08/04

IX. Shoe Basin Mine #1 Reclamation

Summit County purchased 110 acres known as the Upper Transpacific Tourism property, on December 15, 2003 to create the Old Shoe Open Space. As part of this purchase contract, Summit County separated out the 5-acre parcel containing the Shoe Basin Mine #1, to purchase at a later time, if and when a cleanup of the site is completed. Summit County also submitted an application, with the permission of the landowner, to the Colorado Department of Public Health and Environment, to perform a cleanup of the site under the auspices of the State Voluntary Clean-Up Program (VCUP). That application is still pending approval. Summit County also applied to the USEPA for Brownfields Cleanup funds, totaling \$195,000, to assist with the projected \$235,000 cleanup. That request was approved June 2004.

The Shoe Basin Mine history is poorly recorded. This mine is closely associated with the Peruvian Mine located approximately 2,000 feet north of the Shoe Basin Mine. The Peruvian vein was discovered in 1874 and was mined until 1893 (Lovering, 1935). The Peruvian Mine was inactive until 1914 when the Shoe Basin Mine adit was driven to connect with the Peruvian vein. The Shoe Basin Mine was only active for two years, and the workings between the two mines are reported to have collapsed by 1929. (Lovering, 1935). The vein ore was mined for gold, silver, copper, lead and zinc. There are two metal sheds built in the 1980's on the site, but no new mining occurred then. The Phase II EA found no evidence of on site milling or ore processing. No petroleum products were located on the site.⁶

The current owner, Transpacific Tourism Inc., purchased the site in 1989 as investment property, and has been a passive owner of the property since, meaning they have not engaged in any mining-related activity. In fact, they have made no changes to the property since purchasing it. They have made no attempt to deny public access and recreational users currently utilize a portion of the waste dump as a de facto parking lot.

Summit County's goal is to turn the entire Upper Transpacific Tourism property into an open space park. Reclamation of the Shoe Basin Mine will allow for the redevelopment of the site so that part of the mine site can be re-used as a trailhead, parking area, and backcountry interpretive area. The US Forest Service will utilize the site as a trailhead portal to the Continental Divide National Scenic Trail and the upper portions of the basin after it has been redeveloped.

Today, the Shoe Basin Mine consists of a waste rock dump with approximately 4,000 cubic yards of sub-grade ore and development rock. Results of a Phase II Environmental Assessment⁷ show this dump material to contain elevated concentrations of lead and zinc. Results of the leach testing indicate that zinc and lead have a slight potential to leach from the waste dump material. Lead concentrations exceed the Median Wildlife Risk Management Concentration (RMC) set by the BLM, and would be classified at the moderate risk level for wildlife. One sample contained lead values that exceeded the BLM human health RMC for camping. The BLM RMC for human risk was developed from the USEPA criteria.

⁶ Voluntary Cleanup Application, Shoe Basin Mine, p 12. Prepared by American Geological Services for Summit County, November 18, 2003.

⁷ Phase II Environmental Assessment, Peru Creek Basin, Summit County Colorado, Draft November 10, 2003. American Geological Services, Inc.

Organization:	Description of Activities
United States Forest Service Paul Semmer 970-262-3448	Consolidating ownership. Conducting preliminary review of mined sites on Federal lands. Contracting property surveys. Initiated Snake River Watershed Task Force.
Snake River Basin Task Force (SRWTF) Mary Davis Hamlin, Keystone Center 970-513-5800	Gathering data regarding water quality and aquatic habitat in pilot area. Coordinating public agency and private efforts in Basin.
Colorado Division of Minerals and Geology Jim Herron 303-866-3567	Mapped locations of mined sites in Basin. Studied options to treat acid mine drainage from an abandoned mine in the pilot area. Initiated water treatment project - thwarted by liability concerns.
Northwest Colorado Council of Governments Lane Wyatt 970-468-0295	Participant in Snake River Basin Task Force. Pursuing funding for cleanup projects. Participating in creating Water Quality Standards for Peru Creek.
Summit Water Quality Committee Lane Wyatt 970-468-0295	Provided \$70,000 to USGS to compile and analyze water quality data in Summit County. Installed flow gage in Peru Creek in 2000.
Arapahoe Basin Ski Area Jim Gentling 970-496-4267	Initiated and designed a remediation project on County-owned land- thwarted by liability and technical concerns
Trust for Land Restoration Pat Willits 970-626-3236	Non-profit land trust specializing in mining land liability management. Approved as sole-source provider to Peru Creek Brownfields Assessment of liability management, landowner contact, and stakeholder outreach.
INSTAAR; University of Colorado at Boulder Diane McNight 303-492-4687	Studying water quality and aquatic impacts of acid mine drainage in Peru Creek for over a decade.
Summit County Open Space Advisory Council Scott Hummer (970) 468-2442	Citizen advisory board appointed by Summit County Board of County Commissioners to make recommendations regarding acquisitions by Summit County Open Space Program.
Summit County Open Space Department Brian Lorch (970) 668-4067	Initiated and near completion on Peru Creek Brownfields Assessment. 507 acres of mining claims in Snake River Basin purchased or under contract. Pursuing Cleanup at Shoe Basin
Colorado Department of Public Health and Environment Bill McKee (303)692-3583	Water quality sampling associated with standard in Upper Colorado River Basin
US Geological Survey Stan Church 303-236-1900	Water and Sediment Study of the Snake River Watershed, Colorado. Oct 2001 Open File Report 02-0330