

**Red River Watershed Restoration Action Strategy
and Watershed Guide**

**by the
Red River Watershed Group**

November 18, 2003

Draft
Red River Watershed Restoration Action Strategy
and Watershed Guide

Prepared by the Red River Watershed Group
under a 319 Grant administered by The Meridian Institute
September 1, 2003 (revised)

Contributors and Editors:

Ernie Atencio, Land & Culture Consulting
Hope Buechler
Ron Gardiner
Rosemary Romero

Red River Watershed Group WRAS Subcommittee:

Rachel Conn, Amigos Bravos
Maggie Evans-Raél, Singing River Field Center and watershed resident
Gregory Gustina, Bureau of Land Management, Taos Field Office
Deb Kanter, U.S. Forest Service, Carson National Forest
William King, New Mexico Environment Department, Taos Field Office
Greg Miller, U.S. Forest Service, Carson National Forest
Allan Pasteris, New Mexico Environment Department, Surface Water Quality Bureau
Michele Potter, Red River Watershed Group Newsletter Editor
Harvey Seto, Molycorp, Inc.
Ron Thibedeau, Questa Ranger District, U.S. Forest Service, Carson National Forest
Chris Wolff, watershed resident

For more information contact:

Rosemary Romero, Coordinator
Red River Watershed Group
1350 San Juan Drive
Santa Fe, NM 87505
phone: (505) 982-9805
email: rosemary1350@cs.com

Contents

<i>I. Introduction: What is a WRAS?</i> _____	2
A Collaborative and Comprehensive Approach _____	2
Clean Water Act, TMDLs, Nonpoint Source, and Point Source Pollution _____	3
<i>II. Public Outreach</i> _____	4
Past Public Outreach Efforts _____	4
Ongoing and Future Public Outreach _____	5
<i>III. Watershed Inventory and Assessment</i> _____	6
A Restoration Blueprint _____	6
Information Needs and Sources _____	6
Water Quality Problems _____	7
Red River WRAS Blueprint _____	8
<i>IV. Water Quality Goals</i> _____	17
Desired Conditions and Uses _____	17
Monitoring and Assessments _____	17
Project and Process Evaluation _____	18
<i>V. Action Plan</i> _____	19
Still a Collaborative and Comprehensive Approach _____	19
Priorities and Timetable _____	19
<i>VI. Funding and Coordination</i> _____	22
Red River Watershed Group Structure _____	22
Funding _____	22
<i>Additional Information</i> _____	24
Partnership List _____	24
Directory of Government Agencies and Other Organizations _____	26
Glossary of Terms, Acronyms & Abbreviations _____	28
<i>Bibliography and Other Resources</i> _____	30
Land, Water & Management _____	30
Mining & Geology _____	35
History, Culture & Economics _____	36
Permitting & Regulatory Documents _____	38
Other Resources _____	40

I. Introduction: What is a WRAS?

A Collaborative and Comprehensive Approach

A Watershed Restoration Action Strategy, or WRAS, is a non-regulatory, voluntary approach to addressing nonpoint source impacts to water quality. It is based not on legal obligations but on a desire to restore watershed health and water quality through the strength of collegial collaboration, open communication, and building a watershed community among local residents, agencies, and other stakeholders. It is a general blueprint for a comprehensive, watershed-wide restoration program, one small project at a time.

The 1999 New Mexico Nonpoint Source Management Program from the New Mexico Environment Department (NMED), calls for development of WRASes for those watersheds in most need of restoration. The Red River has long been recognized by state and federal agencies as a high priority watershed, and it lies within the Upper Rio Grande watershed which is listed as a Category 1 watershed “in need of restoration.” Category 1 watersheds receive priority funding for restoration projects, and watersheds with an existing TMDL (see below), a WRAS and/or an active watershed group receive even greater consideration. So another purpose of a WRAS is to help secure and coordinate funding for restoration projects.

This WRAS, like a community, is an evolving process. It will continue to be an organic document with the hope of remaining as fresh, useful, and relevant as possible and keeping the momentum rolling. This document represents a starting point providing a basic framework and identifying priority areas, but we will add details and layers of information as we proceed, possibly including Geographic Information System (GIS) data and maps. We hope that this document will also serve as a general watershed and resource guide for any person or entity who would like to learn more about the Red River watershed or address water-related issues within the watershed.

This document is a product of the Red River Watershed Group. Since 1998 the RRWG has been working to draw together a broad-based group of watershed residents, agencies, and stakeholders to take on the immense task of restoring conditions that will improve the quality of water—and therefore the quality of life—throughout the Red River watershed. We address a variety of water quality issues throughout the entire drainage of the Red River and its tributaries—from the headwaters to the Río Grande—through a collaborative, consensus-based approach in which every voice has equal weight.

The Red River Watershed Group’s mission is to restore the Red River to support and be safe for a variety of uses and enhance the understanding about the area waters through information and education. We pursue that mission through these four goals:

1. Determine pollutants, their sources and effects, and communicate the information to citizens.
2. Seek opportunities to enhance fish habitat within the watershed.
3. Bring citizens together to restore, protect, and fully utilize the Red River.
4. Educate and inform users and citizens about the area and watershed stewardship.

Because of the regulatory history, agencies, and processes involved, there will be an unavoidable layer of technical jargon and acronyms and abbreviations in this document. We will try to make it as reader-friendly as possible with explanations, definitions, and glossaries throughout.

Clean Water Act, TMDLs, Nonpoint Source, and Point Source Pollution

The 1972 federal Clean Water Act (CWA) is the basis of most national and state water quality standards and regulations. The CWA protects water quality in all streams, lakes, and other surface waters of the U.S. It also established the goals of eliminating the discharge of all pollutants and cleaning up all surface waters to support fish, wildlife, and recreation by 1985. Thirty years later we still haven't reached those goals, but they are the intention and the ultimate aim of the regulatory processes described below and of this WRAS, all of which grew out of the CWA.

The TMDL, or Total Maximum Daily Load, is one tool that lies at the core of the WRAS, though we hope to go well beyond its limited scope in our restoration plans. As part of the federal Clean Water Act, TMDLs set limits to particular substances identified as pollutants for any given stretch of river. The New Mexico Environment Department began working on TMDL background monitoring for the Red River in 1999 and released a draft document in 2003. Only aluminum, stream bottom deposits, and turbidity have so far been identified as limited pollutants in the draft TMDL, but the background monitoring can provide a comprehensive picture of water quality impacts throughout the watershed.

Even for these few listed materials, the TMDL unfortunately does not include legal mechanisms for addressing "nonpoint source" impacts, which comprise up to 50% of water quality problems nationwide. Nonpoint source pollution, according to the Environmental Protection Agency (EPA), "occurs when water runs over land or through the ground, picks up pollutants, and deposits them in surface waters or introduces them into groundwater." It comes from scattered, often indistinct sources such as abandoned mines, agricultural runoff, erosion from denuded hillsides or streambanks, fires scars, overgrazing or overcutting, parking lots, recreational or paved roads, etc. Hence the need for a voluntary watershed group and this WRAS.

Point source discharges, on the other hand, are regulated by EPA under National Pollutant Discharge Elimination System (NPDES) permits and must meet TMDL limits. Point sources include any discharge that flows into a receiving body out of the end of a pipe or from a discrete source, such as runoff or seepage from an industrial site. NPDES regulated point sources on the Red River include only the Town of Red River Waste Water Treatment Plant, the Molycorp Mine site, the Molycorp tailings facility, and the Red River Fish Hatchery.

In considering the TMDL and the known source impacts in the Red River watershed, this WRAS reflects the priorities and recommendations set forth in the 1999 New Mexico Nonpoint Source Management Program and in the 1998 Clean Water Action Plan and Unified Watershed Assessment for New Mexico.

II. Public Outreach

Past Public Outreach Efforts

The Red River Watershed Group recognizes that public outreach and education are just as important to long-term nonpoint source mitigation and water quality protection as on-the-ground restoration projects. To that end, the group has been actively conducting outreach and education on water quality and watershed issues since 1998 through a variety of media and venues throughout the watershed. With the planning and implementation of projects outlined in this WRAS, we will continue and expand that process. Through our outreach, the Watershed Group has worked to establish credibility among a broad spectrum of watershed interests and develop our a role as an open forum, reliable information clearinghouse, and source of unbiased watershed information. A few examples of the Watershed Group's outreach efforts so far:

- Conducted open public meetings monthly over a period of several years
- Given presentations before the Questa Village Council, Questa Strategic Planning Committee, Red River Town Council, and other public meetings
- Surveyed local attitudes and restoration priorities with a questionnaire mailed out to every address in the watershed
- Distributed numerous newsletters and public announcement fliers
- Convened subcommittees and facilitated public discussions about the Red River TMDL, contamination from faulty septic systems and poorly regulated development in the upper valley, potential 319 (nonpoint source pollution prevention) projects in Questa, public access to a popular local camping and picnicking site that involved water quality impacts, and the WRAS
- Sponsored Water Fairs

Key ingredients for successful public outreach include 1) clearly identifying what's in this for local residents and stakeholders, 2) keeping the process and the information clear, jargon-free, and accessible to a wide diversity of the general public, and 3) striving for maximum buy-in through relationships, projects, and solutions that are collaborative and collegial.

It is an unending process, but the Watershed Group will continue to address the public interest in terms of important issues related to water quality, including fishing, drinking water, agriculture, recreation, aesthetics, property values, and general quality of life. These are the very values and priorities the public identified as important in the questionnaires mailed out in 2000. A snapshot of the results of that survey:

- 112 people responded, the majority from the Questa area
- 62% say moderate to major water quality problems exist in the watershed
- 37% say that most of the problems are in lower watershed; 40% say there are problems throughout
- Chemicals rank as the biggest problem, sediment second
- Historic and current mining rank as greatest source of pollutants
- Fishing, drinking, irrigation, recreation, and aesthetics all rank high as important uses
- Most residents have confidence in environmental groups and agencies to address water quality problems

- Most residents want to help by influencing policies and defining strategies
- Most residents want to learn more about issues through newsletters and meetings

Ongoing and Future Public Outreach

The Red River Watershed Group continues to solicit input and conduct outreach, and will expand that process through the implementation of projects outlined in this WRAS, through a variety of organizations and venues, including:

- Members of the Red River Watershed Group (local residents, non-profit organizations, local, state, and federal agencies, other stakeholders)
- Community constituents (acequias, foresters, ranchers, schools, summer residents, traditional community)
- Outdoor interests (anglers, ATV recreationists, hikers/backpackers, cross-country and downhill skiers)
- Local businesses (Red River and Enchanted Forest ski areas, ATV and snowmobile rentals, fishing and other outdoor sports, realtors, developers)
- Municipal Councils and Strategic Planning Committees
- Amigos Bravos community meetings
- ongoing TMDL development under the New Mexico Environment Department (NMED)

In particular, the Watershed Group will also involve watershed residents and other stakeholders, along with land management and regulatory agencies, in the decision making process through a combination of local advisory committees, public meetings, questionnaires, targeted interviews, and/or focus groups to help determine local water quality perspectives, values, and restoration priorities using sound scientific and technical expertise. We will also continue to take advantage of a variety of media and approaches for effective and creative public outreach and education, including oral histories, publications, and public events.

Details on coordinating cross-agency and public involvement are found in the Action Plan for this WRAS in Chapter V.

III. Watershed Inventory and Assessment

A Restoration Blueprint

The table included later in this chapter is the core of this WRAS, providing a watershed-wide overview of 1) potential water quality issues and potential impairments, 2) potential restoration needs and projects, and 3) key stakeholders and potential partners. We recognize the fact that this table is not a detailed and exacting as it might be, but given the physical, historical, cultural, jurisdictional, and water quality complexities of this particular watershed, it is the most comprehensive water quality overview and watershed restoration blueprint to date. In some cases the table provides specific direction; at the very least it is a springboard from which to move forward to more completely identify potential water quality problems and restoration projects.

The table is organized into eight reaches, or subwatershed areas, each with its own distinctive geography, jurisdictions, and collection of potential water quality issues, impairments, and potential remedies. The subwatershed areas are 1) Upper Red River Valley, 2) Town of Red River, 3) Middle Red River Valley, 4) Cabresto Creek, 5) Village of Questa, 6) Cerro and Guadalupe Mountain, 7) La Lama, and 8) Lower Red River Gorge. Each subwatershed heading includes a general description of topography and vegetation and is further divided into more specific stream reaches or tributaries.

Information Needs and Sources

In the spirit of approaching this WRAS as a living, working document, the Red River Watershed Group and its partners will continue to build on the overview presented in the table with additional layers of information and detail as we move forward with specific restoration projects. Some of the information we will continue to gather and add to the WRAS process includes:

- Additional maps, possibly including layered GIS maps
- Specifics on soils and vegetation
- Hydrogeology data
- More detail on surface water quality concerns
- Stream morphology assessments
- Abandoned mine inventory and assessment
- Inventory and assessment of U.S. Forest Service (USFS) and recreational roads
- Specific data on state highway impacts
- Details on jurisdiction, ownership, and land use
- Historical uses, traditional values, local knowledge
- Recognition of rapid changes in uses of land and water
- Recognition of regulation changes

Potential sources for this information include:

- USFS and Bureau of Land Management (BLM) Environmental Impact Statements and Environmental Assessments
- Detailed USFS abandoned mine inventory and assessment already completed
- Ongoing USFS inventory and assessment of national forest and recreational roads

- NMED TMDL background monitoring data and other studies
- New Mexico Office of the Natural Resources Trustee
- U.S. Geological Survey (USGS) Background Characterization Study
- U.S. Fish & Wildlife Service (USFWS) studies
- New Mexico Department of Fish & Game (NMDGF) studies
- New Mexico State Highway & Transportation Department (NMSHTD) information
- Town of Red River Strategic Plan
- Village of Questa Strategic Plan
- Taos County Planning Department
- Molycorp studies and reports
- New Mexico State Historical Archives
- Amigos Bravos library
- Personal libraries and archives of watershed residents
- Oral histories and local knowledge

Water Quality Issues

The water quality impairments listed on the table are labeled “potential,” because in some cases the jury is still out. But everything listed is an issue that has been identified as an area of concern by one party or another and worth at least further investigation and monitoring, if not a full-scale restoration project. And everything listed contributes in some way to overall watershed health and function in terms of water quality and/or water yield. In a few cases the “issue” is nothing more than an educational potential, but that is just as important to long-term nonpoint source mitigation and water quality protection as on-the-ground restoration projects.

A general list of water quality issues in the watershed, more-or-less from upstream to downstream, includes:

- Unnaturally dense forest conditions and excessive fuel loading in spruce-fir and mixed conifer areas from historical fire and forestry management practices
- Acid rock drainage (ARD) and metals and sediment loading from natural hydrothermal scars
- Sediment and nutrient contamination from excessive livestock and wildlife grazing
- Acid rock drainage (ARD) and metals loading from abandoned historic mines
- Nutrient contamination from poorly designed and poorly regulated septic systems in the upper valley floodplain, open pits, holding tanks and increased growth
- Wetlands, riparian, and stream impacts from dense and poorly regulated development in the upper valley
- Sediment erosion from excessive ATV use and poorly designed and maintained recreational roads
- Erosion from unnaturally dense ponderosa and piñon-juniper woodlands where grasses and groundcover are crowded out
- Sediment erosion from road cuts along State Highway 38 and other paved roads
- Acidic groundwater seeps along the Red River
- Severe erosion from the Hondo Fire scar
- Habitat loss due to degraded and unnaturally channelized stream course
- Permitting processes (NMED, Taos County, SEO, Army Corps of Engineers)

Red [RR1]River WRAS Blueprint

Watershed Location	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
1. Upper Red River Valley Subwatershed	Headwaters of the Red River to the Town of Red River, including tributary drainages, from 13,161 feet at Wheeler Peak to 8,750 at the Town. Includes high alpine cirques and lakes, alpine tundra and willows at higher elevation, spruce-fir and mixed conifer forests on steep slopes below, variable riparian vegetation, wetlands, beaver ponds and meadows along lower stream courses. Rapid housing development taking place in floodplain.		
1.A. Upper Red River Valley—Upper Drainages	Includes Sawmill Creek, East Fork, Middle Fork, West Fork, Bear Canyon, Black Copper Canyon, Goose Creek, and Road Canyon Creek.		
Wilderness area boundary, private and public lands	Several large mining or prospect sites with exposed waste rock dumps contributing ARD and metals, at least one with suspected releases to surface water	Remediation/reclamation per USFS study recommendations, possibly including anoxic drains, constructed wetlands, waste rock dump stabilization or removal	USFS, NMED, EPA USGS, Taos Pueblo, landowners, conservation NGOs, Amigos Bravos, RRWG
Most upper drainages	Unnaturally dense forest conditions and fuel loading; sediment loading; limited management options due to Wilderness Act restrictions	Forest thinning treatments and erosion mitigation under Wildland-Urban Interface and CFRP	USFS, NMED, TSWCD, Town of Red River, Taos County Commission, Taos Pueblo, local residents, RMYC, Rocky Mountain Elk Foundation, NM Game Commission and Sykes Act, National Wild Turkey Federation, Amigos Bravos, RRWG
1.B. Upper Red River Valley—Floodplain			
Upper Red River valley floodplain	Dense, poorly regulated home development with holding tanks and septic-related fecal coliform and nutrients	Community planning, zoning, residents association, incorporation, better enforcement, public nonpoint source education	USFS, NMED, COE, NRCS, Town of Red River, developers, local land owners, conservation NGOs, RRWG, ATV Rental Businesses, Amigos Bravos
Upper Red River valley riparian zone	Draft TMDL listed for Chronic Aluminum*; streambank erosion and sediment loading from streamside development Primitive campsites without toilet facilities	Stream channel restoration and erosion mitigation; riparian and vegetative restoration; habitat improvement for beaver and trout	USFS, NMED, NMDGF, COE, USFWS, TSWCD, NRCS, Town of Red River, local residents, fishing retailers and guides, NM Trout, Trout Unlimited, conservation NGOs, Amigos Bravos, RRWG

Watershed Location	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
2. Town of Red River Subwatershed	Main stem of the Red River through the Town of Red River, including tributary drainages, from 12,711 feet at the top of the upper watersheds to 8,750 feet at the Town. Includes high alpine meadows and lakes, spruce-fir and mixed conifer forests on steep slopes below, variable riparian vegetation and wetlands along stream courses. Aside from the Town, Red River Ski Area is the most prominent humanmade feature.		
2.A. Town of Red River—Upper Drainages	Includes Bobcat Creek, Placer Creek, Bitter Creek, Mallette Creek, and Pioneer Creek.		
Placer Creek	Draft TMDL listed for Acute Aluminum*; 17 various gold and silver mine sites circa 1890-1900, many with exposed waste rock dumps and ARD, seven with suspected releases to surface water	Remediation/reclamation per USFS study recommendations, possibly including anoxic drains, constructed wetlands, waste rock dump stabilization or removal	USFS, NMED, EPA, Town of Red River, RMYC, conservation NGOs, Amigos Bravos, RRWG
Bitter Creek	Draft TMDL listed for Acute Aluminum and Stream Bottom Deposits*; 20 various gold and silver mine sites circa 1890-1900, many with exposed waste rock dumps and ARD, 12 with suspected releases to surface water; lower canyon hydrothermal scar and associated debris apron contributing ARD and sediment	Remediation/reclamation per USFS study recommendations, possibly including anoxic drains, constructed wetlands, waste rock dump stabilization or removal; major scar and debris apron restoration, including erosion slope stabilization and revegetation treatments	USFS, NMED, EPA, COE, USGS, TSWCD, Town of Red River, conservation NGOs, Amigos Bravos, RRWG
Mallette Canyon road and Midnight Meadows recreational system	Extensive ATV use and poorly designed and maintained two-track forest roads causing soil erosion and sediment loading. Destructive use of ATV and fugitive dust	Recreational travel plan and signage to designate areas of enforcement, including volunteer road closures, reroutes, culvert projects, roadbed and erosion stabilization; continue USFS Trail Canyon Road System Improvement Project	USFS, NMED, Town of Red River, TSWCD, ATV guides and outfitters, conservation NGOs, Amigos Bravos, RRWG
Mallette Creek, Town of Red River	Extensive historic mining, including mine adits and ARD from waste rock dumps	Continue mine site reclamation (one site already remediated by USFS); public education with interpretive sites describing mine history and impacts of ARD	Town of Red River, USFS, NMED, NRCS, Red River Historical Society, conservation NGOs, Amigos Bravos, RRWG

Watershed Location	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
Pioneer Creek	Draft TMDL listed for Turbidity*; 24 various gold and silver mine sites circa 1890-1900, many with exposed waste rock dumps and ARD, 18 with suspected releases to surface water	Remediation/reclamation per USFS study recommendations, possibly including anoxic drains, constructed wetlands, waste rock dump stabilization or removal	USFS, NMED, EPA, Town of Red River, RMYC, conservation NGOs, Amigos Bravos, RRWG
Red River Ski Area	Ski slope erosion and stream sediment loading	Slope revegetation to reduce slope erosion underway; grass seeding and mountain scrub restoration	Red River Ski Area, USFS, NMED, NRCS, Town of Red River, TSWCD, conservation NGOs, Amigos Bravos, RRWG

2.B. Town of Red River—Floodplain

Popular fishing area through Town of Red River	Draft TMDL listed for Chronic Aluminum*; stream channel has been displaced to less than 10% of the floodplain, straightened, denuded of vegetation and natural debris; unstable banks contributing to sediment loading. Storm water runoff; potential contamination from the waste water treatment facility.	Stream channel restoration and erosion mitigation; riparian and vegetative restoration; habitat improvement for trout fishery. Storm water planning and mitigation.	Town of Red River, COE, NMED, NMSHTD, NMDGF, USFWS, USFS, TSWCD, NRCS, fishing retailers and guides, NM Trout, Trout Unlimited, Red River Ducks Unlimited, conservation NGOs, Amigos Bravos, RRWG
--	--	---	---

3. Middle Red River Valley Subwatershed

The Red River from below the Town of Red River to the Village of Questa, including tributary drainages, from 12,711 feet at the top of the upper watersheds to 7,480 at Questa. Includes some alpine environment, spruce-fir, mixed conifer and ponderosa forests and oak woodlands, variable riparian vegetation along stream courses. Most prominent features are the 4000 acre Molycorp mine site on the north side and the Columbine drainage and 30,500-acre Columbine-Hondo Wilderness Study Area on the south. This is also the portion of the watershed containing the most extensive and concentrated areas of naturally occurring acid generating rock, erosional features commonly referred to as hydrothermal scars.

3.A. Middle Red River Valley—Floodplain

Fawn Lakes Recreational Area	Off-channel ponds from highway borrow pits with badly eroding banks causing sediment loading	Beaver reintroduction and beaver pond restoration as sediment retention from upper watershed	NMSHTD, NMDGF, USFWS, USFS, Town of Red River, fishing retailers and guides, NM Trout, Trout Unlimited, Red River Ducks Unlimited,
------------------------------	--	--	--

Watershed Location	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
Many locations with acute erosion and bank instability within this stream reach	Draft TMDL listed for Chronic Aluminum*; this stretch of river was straightened, channelized, denuded of vegetation and natural channel debris in the highway construction, contributing to sediment and metal loading, benthic macroinvertebrate impairment; run-off from highway potential source of petroleum based water quality problems; Little to no aquatic life.	Stream channel restoration and erosion mitigation; riparian and vegetative restoration; habitat improvement for trout fishery.	conservation NGOs, Amigos Bravos, RRWG NMSHTD, NMDGF, COE, USFWS, USFS, TSWCD, Town of Red River, fishing retailers and guides, NM Trout, Trout Unlimited, conservation NGOs, Amigos Bravos, RRWG
3.B. Middle Red River Valley—Upper Drainages	Includes Haut N Taut Creek, Straight Creek, Hansen Creek, Sulphur Gulch, Columbine Creek, Goathill Gulch, Capulin Canyon, and Bear Canyon.		
Haut N Taut Creek, Straight Creek, Hansen Creek, Sulphur Gulch, Goathill Gulch, Capulin Canyon hydrothermal scar and associated debris apron	Metals and sediment contribution and riparian degradation; ARD	Major restoration, including erosion slope stabilization and revegetation treatments, pH abatement, riparian restoration, large-scale anoxic drains and gavins	USFS, NMED, EPA, Molycorp, Village of Questa, TSWCD, NMDGF, USFWS, RCRC, Amigos Bravos, conservation NGOs, Amigos Bravos, RRWG
Molycorp historic large-scale open pit and current underground mining, including lower Sulphur Gulch, Goathill Gulch, and Capulin Canyon	Potential, nonpoint source ARD or metals impacts.	Comprehensive mine site reclamation planning already underway; a voluntary water collection system has been constructed to intercept any pollutants that may be traceable to mine operations (3 ground water withdrawal wells and 2 French drains); proposed EPA Superfund listing	Molycorp, MMD, NMED, EPA, USFS, NMDGF, USFWS, Village of Questa, RCRC, Amigos Bravos, conservation NGOs, RRWG
Columbine Wilderness Study Area	De facto Wilderness management; potential listing of Rio Grande cutthroat trout as Threatened or Endangered	Monitor water quality; fish barriers; native cutthroat trout reintroduction; wilderness designation	USFS, NMDGF, USFWS, NM Trout, Trout Unlimited, RMYC, conservation NGOs, Amigos Bravos, RRWG

Watershed Location	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
Species			
4. Cabresto Creek Subwatershed	Entire drainage of Cabresto Creek, including tributary drainages, from its headwaters around 11,000 feet to its confluence with the Red River in Questa at 7,480 feet. Includes a range of vegetation types from spruce-fir, mixed conifer and ponderosa forests to piñon-juniper and oak woodlands and variable riparian vegetation along stream courses. The Lake Fork comes in from the 20,506-acre Latir Peak Wilderness Area and Cabresto Lake to the north. Very little development in the drainage until it reaches Questa, where it serves as an important acequia irrigation source.		
4.A. Cabresto Creek—Upper Basin			
Midnight Meadows and Midnight Mine area	Degraded forage base from historic heavy grazing causing moderate sediment load contribution; approximately 10-20 medium-sized gold and silver mine sites circa 1890-1900, most with waste rock dumps and ARD; recreational roads causing soil erosion and sediment loading	Rest-rotation grazing already implemented; riparian exclosures, reduced stocking, range riders, continue erosion control and restoration; anoxic drains, wetlands restoration, waste rock monitoring, reclamation or removal; recreational travel plan	USFS, grazing permittees, NMED, TSWCD, Questa Acequia Assoc., Quivira Coalition, conservation NGOs, Amigos Bravos, RRWG, private landowners
4.B. Cabresto Creek—Valley			
Cabresto Creek valley	Main stem of the Cabresto draft TMDL for Chronic Aluminum* likely from upstream abandoned mines; roads, residences, agriculture, irrigation diversions and other development	Upstream mine reclamation; better enforcement of local and state regulations; public nonpoint source education	USFS, NMED, EPA, Village of Questa, Questa Acequia Assoc., RMYC, SRFC, conservation NGOs, Amigos Bravos, RRWG
Cabresto Creek riparian zone	Moderate sediment contribution from hard-used recreational sites and naturally occurring from scars	USFS already addressing key erosional areas through protective barriers; additional restrictions for ATV use	USFS, NMED, TSWCD, NRCS, Village of Questa, Cabresto Acequia Assoc., Questa Acequia Assoc., RMYC, SRFC, conservation NGOs, Amigos Bravos, RRWG
5. Village of Questa Subwatershed	Main stem of the Red River, including tributary drainages and two off-channel ponds, through the Village of Questa at 7,480 feet. Includes piñon-juniper and oak woodlands, limited riparian vegetation along stream course, extensive agriculture and pasture land from acequia irrigation and domestic wells in and near the floodplain alluvium. 1996 Hondo Fire left a massive scar to the south.		

Watershed Location	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
5.A. Village of Questa— Upper Drainages	Includes Almarge Canyon and Largo Canyon.		
Hondo Fire, Largo Canyon erosion area	Severe erosion, riparian losses to bed rock, and heavy sediment contribution due to catastrophic 1996 Hondo wildfire	Slope stabilization, erosion abatement, upslope drainage check dams, tree felling into stream channel, reseeded; USFS continue wildfire rehabilitation and mitigation for unnatural fuel loading	USFS, Village of Questa, Molycorp, TSWCD, NRCS, Questa Acequia Assoc., Amigos Bravos, RRWG
5.B. Village of Questa— Valley and Floodplain	Includes numerous acequias irrigating farmland		
Riparian Corridor	Draft TMDL listed for Chronic Aluminum*; unnaturally channelized and generally unstable bank conditions; sparse riparian vegetation	Stream channel restoration and erosion mitigation; riparian and vegetative restoration; habitat improvement for trout fishery	Village of Questa, NMED, COE, EPA, TSWCD, NRCS, Molycorp, NMDGF, USFWS, USFS, RCRC, RMYC, SRFC, Roots and Wings School, fishing retailers and guides, NM Trout, Trout Unlimited, Amigos Bravos
Eagle Rock Lake	Off-channel NMSHTD borrow pit	Sediment removal, bank stabilization, restoration of wetlands and native vegetation; strong potential as open space park and environmental education site	Village of Questa, TSWCD, NMED, USFS, Molycorp, RCRC, RMYC, SRFC, Roots and Wings School, Amigos Bravos, conservation NGOs, RRWG
Hunts Pond	Off-channel county road borrow pit lagoon and humanmade wetlands; popular community gathering site accumulating human waste and trash	Sediment removal, bank stabilization, restoration of wetlands and native vegetation; fish stocking; strong potential as service-learning and environmental education site and community open space park	Village of Questa, TSWCD, NMED, USFS, RMYC, SRFC, Roots and Wings School, conservation NGOs, Amigos Bravos, RRWG
Village of Questa Wastewater Treatment Lagoons	Increasing community waste treatment needs	Expanded and improved facilities with “Living Machine” or other environmentally friendly technology; environmental education potential	Village of Questa, Iasis Co., NMED, EPA, NMWTB, conservation NGOs, Amigos Bravos, RRWG

Watershed Location	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
Village of Questa community wells and delivery infrastructure	Dated infrastructure and depleted wells	Upgrading Village of Questa community wells and delivery infrastructure	Village of Questa, NMOSE, NMED, EPA, NMWTB, Amigos Bravos, RRWG
Questa High School Watershed Watch Program and Village of Questa Youth Center	Citizen and community and water quality lab to monitor river, acequias, and alluvial domestic wells; domestic wells which have been polluted	Public education on water quality issues as they relate to traditional water use, domestic wells, recreation, etc.	NMED, EPA, NMDGF Watershed Watch Program, Questa Independent School District, Village of Questa and Youth Center, Questa Ancianos Program, Questa Acequia Assoc., SRFC, Roots and Wings School, Amigos Bravos, conservation NGOs, RRWG
6. Cerro and Guadalupe Mountain Subwatershed	Not all directly connected to the Red River, but well within the sphere of impact and interest, Guadalupe Mountain lies at 8,800 feet and Cerro at 7,600 feet just to the northeast. Includes Ponderosa on higher slopes, piñon-juniper and oak woodlands below and extensive agriculture and pasture land from acequia irrigation. Guadalupe Mountain is bounded by the Molycorp tailings impoundments to the east and the BLM Wild Rivers Recreation Area and Rio Grande Gorge to the west.		
Molycorp tailings impoundments	600 acres of mine tailings; groundwater quality impacts	Comprehensive mine site reclamation planning already underway, including long-term water quality abatement; proposed EPA Superfund listing and monitoring; have an approved groundwater discharge permit through NMED; a seepage interception system is already in place and collecting groundwater.	Molycorp, MMD, NMED, EPA, BLM, Village of Questa, NMDGF, USFWS, TSWCD, NRCS, RCRC, Questa residents, Amigos Bravos, conservation NGOs, RRWG
BLM Wild Rivers Recreation Area, Wild and Scenic Rio Grande		Long-term water quality monitoring	BLM, NMED, EPA, NMDGF, USFWS, TSWCD, Village of Questa, local residents, Molycorp, RCRC, Amigos Bravos, conservation NGOs, RRWG

Watershed Location	Water Quality Issues & Potential Impairments	Potential Restoration Needs & Projects	Key Stakeholders & Potential Partners
7. La Lama Subwatershed	The La Lama area, including Lama and Alamo Canyons, lies just at the edge of the watershed boundary and straddles the Hondo Fire area. The drainages start at about 11,600 feet in spruce-fir forest descending through young aspen and oak in the 1996 Hondo Fire scar to mixed conifer and ponderosa forests and piñon-juniper and oak woodlands around the community of La Lama.		
La Lama Upper Drainage	Severe erosion, riparian losses to bed rock, and heavy sediment contribution due to catastrophic 1996 Hondo wildfire	Slope stabilization, erosion abatement, upslope drainage check dams, tree felling into stream channel, reseeded; USFS continue wildfire rehabilitation and mitigation for unnatural fuel loading	USFS, TSWCD, La Lama Community Assoc., Taos County Commission RMYC, RRWG, NRCS, Amigos Bravos
La Lama Community Area	Erosion from unnaturally dense ponderosa and piñon-juniper woodlands where grasses and groundcover are crowded out; excessive fuel loading	Forest thinning treatments and erosion mitigation under Wildland-Urban Interface and CFRP	USFS, NMED, TSWCD, NRCS, La Lama Community Assoc., La Lama Acequia Assoc., Taos County Commission Roots and Wings School, RMYC, Amigos Bravos, RRWG
8. Lower Red River Gorge Subwatershed	Steep and narrow gorge section of the Red River from the rim at 7,600 feet to the confluence with the Rio Grande at 6,500 feet. River drops over 1,000 feet in about six miles through this stretch. Sparse piñon, juniper, oak and other shrubs on steep slopes with riparian vegetation along stream. The Red River Fish Hatchery lies in the stretch. The lower three miles are designated Wild and Scenic, renowned for fly fishing.		
NMDGF Red River Fish Hatchery head dam	Low head dam maintains a spawning migration barrier for brown trout and hybrid “cutbows”	Fishery management plan to either utilize barrier dam for native cutthroat trout reintroduction or modify with fish ladder to restore game fish spawning migration	NMDGF, USFWS, BLM, USFS, NMED, local residents, fishing retailers and guides, NM Trout, Trout Unlimited, conservation NGOs, Amigos Bravos, RRWG
NMDGF Red River Fish Hatchery and spring water source	Cumulative water quality impairments.	Abatement of existing water quality impairments; stabilize and monitor spring flow and quality; opportunities for public water quality education with high volume of local and interstate recreational tourism ; program to access water quality	NMDGF, USFWS, BLM, USFS, NMED, local residents, fishing retailers and guides, NM Trout, Trout Unlimited, conservation NGOs, Amigos Bravos, RRWG

* All TMDL listings are draft only.

Glossary of abbreviations

ARD	Acid Rock Drainage generated by unreclaimed mine waste rock dumps and tailings
BLM	U.S. Bureau of Land Management
CFRP	Collaborative Forest Restoration Program
COE	U.S. Army Corps of Engineers
EPA	U.S. Environmental Protection Agency
MMD	New Mexico Mining & Minerals Division
NGO	Non-Governmental Organization
NMDGF	New Mexico Department of Game & Fish
NMED	New Mexico Environment Department
NMOSE	New Mexico Office of the State Engineer
NMSHTD	New Mexico State Highway & Transportation Department
NMWTB	New Mexico Water Trust Board
NPDES	National Pollutant Discharge Elimination System
NRCS	U.S. Natural Resources Conservation Service (formerly Soil Conservation Service)
RCRC	Río Colorado Reclamation Committee
RMYC	Rocky Mountain Youth Corps
RRWG	Red River Watershed Group
SRFC	Singing River Field Center
TSWCD	Taos Soil & Water Conservation District
USFS	U.S. Forest Service
USFWS	U.S. Fish & Wildlife Service

IV. Water Quality Goals

Desired Conditions and Uses

One priority water quality goal is to implement the proposed TMDLs for the Red River and its tributaries in as far as we are able throughout the watershed. Remediating chronic and acute aluminum stream bottom deposits and turbidity contamination might be beyond the reach and capacity of the Red River Watershed Group.

As the WRAS continues to evolve through an iterative, adaptive process, Watershed Group partners and working groups will determine specific desired uses and the conditions required to reach those uses for each subwatershed and/or on a project-by-project basis. This process will involve the land management and regulatory agencies, but will also involve watershed residents and other stakeholder through an extensive outreach program. To help determine desired uses and conditions we will solicit local perspectives, values, and priorities through local advisory committees, public meetings, questionnaires, targeted interviews, and/or focus groups. The scoping, designing, and implementation of projects will obviously incorporate all available information and will also utilize the best science available.

Monitoring and Assessments

To measure whether we have attained the desired uses and conditions, it will be important to establish clear water quality goals and monitoring protocols for each restoration project. Along with conventional quantitative water quality measurements, in places we will also utilize the Rosgen Stream Classification System for general assessments of stream health and fishery habitat, as well as other qualitative ecological assessments as appropriate.

Whenever possible, we will utilize all available regulatory-related water quality monitoring data, both as existing baseline data and to monitor ongoing progress. Some of the baseline data will come from the draft TMDL background monitoring and other previous water quality studies and reports. However, all up-to-date and available data will be utilized. Particular projects may be able to piggyback on the monitoring and data from the ongoing USGS Background Characterization Study, the RI/FS, and other Molycorp studies. As Watershed Group partners, the regulatory agencies, Molycorp, and the Town of Red River water quality lab might contribute not only data, but technical assistance and expertise. In addition to existing partners, we may find need to hire professional consultants to help design and implement water quality monitoring and other assessments.

Water quality monitoring and other assessments, before, during, and after each project, can double as an excellent opportunity for hands-on education. Through the state-sponsored Watershed Watch, the Questa High School science program already has an active water quality monitoring program in place. Roots and Wings Community School in Lama, Rocky Mountain Youth Corps, non-profit community and environmental organizations, and the general public can all participate in monitoring and assessments. This approach opens many opportunities for expanded outreach, solicits in-kind contributions to help get the work done, and provides solid experiential education for the participants.

Project and Process Evaluation

In addition to physical monitoring and assessments, it is just as important to monitor and evaluate the process of communication, collaborative planning, and project implementation on an ongoing basis. The Watershed Group will actively solicit and incorporate recommendations and input from all project partners and local residents early in the planning process. During and after every project, we will actively solicit and incorporate follow-up recommendations and input as part of an iterative adaptive management process. This is important for better project implementation, but also for improving communications, strengthening collaborative partnerships, and working toward building a broad and strong watershed-wide community.

V. Action Plan

Still a Collaborative and Comprehensive Approach

A WRAS, by definition and intent, is a comprehensive approach that includes technical, educational, and financial components of watershed restoration. The Red River Watershed Group was originally founded to take on the significant water quality problems within the watershed in just such a comprehensive way—step by step, project by project. We take the next major step in that process with this WRAS. The Watershed Group may not take the lead on every project, but a main function will be to coordinate all the relevant stakeholders, information, technical resources, public educational activities, and finances for watershed restoration projects. With all projects, the Watershed Group will help coordinate compliance with all laws, regulations, and permits, particularly the legal requirements of NEPA and other federal laws for any actions on federal lands. This coordinated approach will help facilitate communication, networking, and planning among the many agency and private stakeholders, even beyond the scope of the WRAS, and will help avoid duplication of efforts.

The table in Chapter III includes a preliminary list of key stakeholders and potential partners for each potential project area. As part of the project coordination, the Watershed Group will continue to identify and involve core stakeholders for each water quality issue or restoration project, incorporating existing mandates and agreements between agencies and other entities as much as possible. As with monitoring and assessments, involving and coordinating local schools and educational and non-profit conservation organizations in restoration projects will be an integral part of our effort. Again, it is an excellent opportunity to both enlist volunteers and facilitate hands-on watershed and natural resource education.

The Watershed Group will always keep in mind the fact that this WRAS is a non-regulatory, voluntary approach based not on legal obligations but on the strength of collegial collaboration, open communication, and building a watershed community. It is important for us to keep that spirit in all our restoration planning and projects. Without a formal legal framework, however, we will structure strategic partnerships and stipulate expectations between agencies and other stakeholders through formal Memoranda of Understanding (MOUs) or Memoranda of Agreement (MOAs) to insure better follow through on restoration plans and projects. Some general MOUs and MOAs already exist between federal and state agencies.

Priorities and Timetable

Looking at the general list of water quality issues and potential problems and the potential restoration needs and projects on the table in Chapter III, it is obvious that there is no shortage of restoration work in this watershed. The trick will be to strategically prioritize the projects in a way that makes sense and is achievable. We will use several criteria for determining priorities and structuring projects:

- *Priority nonpoint source issues identified in the Draft Red River TMDL.* Various areas throughout the watershed have draft TMDLs proposed for Chronic and Acute Aluminum Stream Bottom Deposits, and Turbidity.

- *Consistency with existing management plans.* This might include, for instance, USFS forest thinning projects, erosion mitigation projects, grazing program modifications, or a recreation travel plan. The Village of Questa's recent Comprehensive Plan calls for such things as better land use planning, protecting local water and land, preserving open space, and developing economic opportunities, all of which could well be consistent with restoration projects.
- *Fit within existing MOUs and MOAs.* Several state and federal agencies already have formal agreements and relationships through MOUs and MOAs that deal with particular issues.
- *Reflect local community concerns and priorities.* The Watershed Group has already started addressing septic contamination in the upper valley, for instance, due to local residents' concerns.
- *Potential as experimental pilot projects to test the feasibility of certain treatments.* Before taking on a larger project with uncertain results, we will test certain treatments on a smaller scale first.
- *Potential as demonstration pilot projects to generate public interest, involvement, and support.* As one example, the Watershed Group has been instrumental in advancing the Hunt's Pond project in Questa, which will not yield major water quality improvements to the river, but will be a high visibility project in an area with significant community interest and use. The project was chosen and designed with community input, and we expect plenty of local involvement in hands-on restoration work, monitoring, and public educational activities.
- *Potential for building or strengthening partnerships.* Along the lines of the previous item, building and strengthening relationships among watershed residents and stakeholders is a high priority to keep the WRAS process moving forward.
- *Availability of funding.* All projects will of course be contingent on funding.

The table in Chapter III outlines water quality issues and potential restoration projects on a site-by-site basis. In general, the Watershed Group will address identified quality issues (from the list under "Water Quality Problems" in Chapter III) in the following ways:

- *Unnaturally dense forest conditions and excessive fuel loading in spruce-fir and mixed conifer areas from historical fire and forestry management practices.* Work with the USFS and local residents to develop local expertise in thinning and prescribed fire programs through the Collaborative Forest Restoration Program (CFRP) and the Wildland-Urban Interface fire program. This will also create significant opportunities for local capacity building and sustainable, small-scale economic development.
- *Acid rock drainage and mineralized sediment/metals loading from natural hydrothermal erosional scars.* Experiment first on small-scale debris-flow mitigation treatments and identify specific problem tributaries for large-scale treatment.
- *Sediment and nutrient contamination from excessive livestock and wildlife grazing.* Conduct impact assessment and mitigation, including the USFS's ongoing implementation of rest-rotation grazing management and erosions control.
- *Acid rock drainage and metals contamination from abandoned historic mines.* Following the recommendations from the completed USFS abandoned mine inventory and assessment, implement a variety of reclamation and remediation projects, possibly including full-scale mine reclamation, anoxic drains, and constructed wetlands development.

- *Nutrient contamination from poorly designed and poorly regulated septic systems in the upper valley floodplain.* Continue the process of citizen monitoring, public education, and regulatory enforcement of Taos County and NMED regulations.
- *Wetlands, riparian, and stream impacts from dense and poorly regulated development in the upper valley.* Continue the process of public education, citizen monitoring, and regulatory enforcement of U.S. Army Corps of Engineers permits and regulations.
- *Sediment erosion from excessive ATV use and poorly designed and maintained recreational roads.* Building upon the ongoing USFS recreational road inventory and assessment, prepare a comprehensive recreational travel plan with all stakeholders, possibly including volunteer road closures, reroutes, culvert projects, and roadbed and erosion stabilization.
- *Erosion from unnaturally dense ponderosa and piñon-juniper woodlands where grasses and groundcover are crowded out.* Work with the USFS and local residents to develop local expertise in thinning and prescribed fire programs through the CFRP and the Wildland-Urban Interface fire program, and reseed native grasses. This will also create opportunities for small-scale fuelwood enterprises.
- *Sediment erosion from road cuts along State Highway 38 and other paved roads.* Working with the New Mexico State Highway & Transportation Department and NMED, conduct an impact assessment and design mitigation projects.
- *Unregulated mineralized groundwater seeps into Red River.* Identify mineralized groundwater seeps that are not currently regulated conduct impact assessments, and design remediation projects.
- *Severe erosion from Hondo Fire scar.* Coordinate local youth, volunteer, and non-profit conservation organizations to help continue USFS's ongoing erosion control work.
- *Habitat loss due to degraded and unnaturally channelized stream course.* Conduct stream morphology assessments and enhancements based on Dave Rosgen's Stream Classification System.

A specific timetable for restoration work will emerge as the WRAS process moves forward and projects are prioritized as described above and get started. Depending on which of the many projects we choose to tackle first, our ability to coordinate and schedule with agencies and other stakeholders, and contingent on the availability of funding, we hope to be underway with at least one or two demonstration 319 nonpoint source projects by next year. Given the range, variety, and scale of water quality issues in the Red River watershed, however, comprehensive WRAS implementation will be an open-ended process likely to last indefinitely.

VI. Funding and Coordination

Red River Watershed Group Structure

As the main vehicle for facilitating and coordinating WRAS implementation, as described in previous chapters, the Red River Watershed Group will consider officially incorporating and seeking 501(c)(3) non-profit tax status. Among other benefits, this will create a more formalized and accountable structure, including, at a minimum, a board of directors and operating bylaws. It will also increase the group's credibility and open the possibility of applying directly for grants. As part of the process of formalizing the structure, it might become necessary for the group to hire a full-time coordinator or director, and possibly other staff and/or contractors, to oversee all the outreach, coordination, project implementation, fundraising, and other activities that could be undertaken under this WRAS.

Formal structure might include working committees on a variety of issues, a community advisory council, project committees, or any number of other mechanisms to insure stakeholder involvement in decision making and accountability to watershed residents and a Watershed Group partners.

Funding

One of the Watershed Group's main coordinating functions is to secure and coordinate appropriate funding to match up with particular restoration projects and key stakeholders. In some cases where funding is already in place or accessible with a particular Watershed Group partner, we may simply help coordinate the project and other partners around the funding. Matching funds are often required for federal or state grants and one of our coordinating functions will be to secure and document in-kind contributions of materials, equipment, and labor from all participating partners, schools, non-profit conservation organizations, and the general public.

Potential federal sources for watershed restoration funding include:

- 319 nonpoint source grants from EPA
- EPA watershed initiative grants
- CFRP grants
- U.S. Natural Resources Conservation Service assistance
- USFS and possible Abandoned Hardrock Mines Restoration Act funding for abandoned mine reclamation and ARD remediation

Potential state and local sources for watershed restoration funding include:

- New Mexico State Legislature
- Taos Soil and Water Conservation District
- Village of Questa
- Town of Red River

In addition to government grants and assistance, there are numerous private foundations, both locally and nationally, that fund watershed-based restoration initiatives such as this WRAS, and we will also research and seek grants from those sources as needed.

Additional Information

Partnership List

(see the glossary of abbreviations at the end of this section)

A. Past participation with the Red River Watershed Group

Amigos Bravos	RMYC
BLM	SRFC
Molycorp	Taos Pueblo
MMD	Town of Red River
NMDGF	Upper Valley residents
NMDGF Watershed Watch	USFS
NMED	USFWS
Questa residents	USGS
Red River residents	Village of Questa
Rio Grande Restoration	Western Environmental Law Center

B. Current and potential jurisdictional partners

BLM	NMWTB
Cabresto Acequia Association	NRCS
COE	OSE
EPA	Questa Acequia Association
La Lama Acequia Association	Taos County Commission
MMD	Taos County Commissioner Virgil Martinez
NM Game Commission and Sykes Act	Taos Pueblo
NM Governor Bill Richardson	Town of Red River
NM Representative Bobby Gonzales	TSWCD
NM Senator Carlos Cisneros	U.S. Congressman Tom Udall
NMDGF	U.S. Senator Jeff Bingaman
NMDGF Watershed Watch	U.S. Senator Pete Domenici
NMED	USFS
NMED	USFWS
NMSFD	USGS
NMSHTD	Village of Questa

C. Current and potential citizen and NGO partners

Amigos Bravos	Questa Youth Center
Cabresto Acequia Association	Red River Ducks Unlimited
Cabresto Canyon residents	Red River residents
La Lama residents	Red River Rocky Mountain Corps
Lama Foundation	Red River Ski Area
Molycorp	RCRC
National Wild Turkey Federation	Rio Grande Restoration
NM Trout	RMYC
Questa Acequia Association	Roots and Wings School
Questa residents	SRFC

Taos Community Foundation
Trout Unlimited
UNM Oral History Program

Upper Valley residents
Western Environmental Law Center

D. Current and potential partners with existing planning documents

Amigos Bravos	Taos County Planning Department
BLM	Taos Pueblo
EPA	Town of Red River
Molycorp	TSWCD
NMED	USFS
NMSHTD	Village of Questa
Taos County Commission	

Glossary of abbreviations

BLM	U.S. Bureau of Land Management
COE	U.S. Army Corps of Engineers
EPA	U.S. Environmental Protection Agency
MMD	New Mexico Mining & Minerals Division
NGO	Non-Governmental Organization
NMDGF	New Mexico Department of Game & Fish
NMED	New Mexico Environment Department
NMSFD	New Mexico State Forestry Division
NMSHTD	New Mexico State Highway & Transportation Department
NMWTB	New Mexico Water Trust Board
NRCS	U.S. Natural Resources Conservation Service (formerly Soil Conservation Service)
OSE	New Mexico Office of the State Engineer
RCRC	Río Colorado Reclamation Committee
RMYC	Rocky Mountain Youth Corps
RRWG	Red River Watershed Group
SRFC	Singing River Field Center
TSWCD	Taos Soil & Water Conservation District
USFS	U.S. Forest Service
USFWS	U.S. Fish & Wildlife Service

Directory of Government Agencies and Other Organizations

Amigos Bravos, Friends of the Wild Rivers

(non-profit advocacy group focusing on Molycorp issues)

PO Box 238
Taos, NM 87513

(505) 758-3874

www.amigosbravos.org/molycorpwatch

Molycorp, Inc.

(operates the Molycorp Mine and tailings impoundments near Questa)

PO Box 469
Questa, NM 87556

(505) 586-0212

www.molycorp.com

New Mexico Department of Game and Fish

(operates Red River Fish Hatchery and stocks river for fishing)

PO Box 25112
Santa Fe, NM 87504

(505) 476-8000

www.wildlife.state.nm.us

New Mexico Environment Department

(responsible for surface water, groundwater, and drinking water quality and permitting)

PO Box 26110
Santa Fe, NM 87502

www.nmenv.state.nm.us

NMED Drinking Water Quality Bureau
(community drinking water systems)

(505) 827-0187

NMED Groundwater Quality Bureau
(groundwater discharge permits)

(505) 827-2919

NMED Surface Water Quality Bureau
(319 program and TMDLs)

(505) 827-7536

NMED Taos Field Office

(liquid waste permitting for septic systems)

PO Box 208
Taos, NM 87571
(505) 758-8808

New Mexico Mining and Minerals Division

(administers mining and reclamation permits)

1220 South St. Francis Dr.
Santa Fe, NM 87505

(505) 476-3400

www.emnrd.state.nm.us/Mining

New Mexico Office of the State Engineer

(administers all New Mexico water rights)

PO Box 25102
Santa Fe, NM 87504

(505) 827-6175

www.seo.state.nm.us

Río Colorado Reclamation Committee

(Technical Assistance Grant group disseminating technical information related to Superfund)

P.O. Box 637

www.rcrc.nm.org

Questa, NM 87556

Taos Soil and Water Conservation District

(education and services for local natural resources conservation)

PO Box 2787

(505) 751-0584

Ranchos de Taos, NM 87557

email: tswcd@newmex.com

U.S. Army Corps of Engineers

(administers 404 permits for dredging or filling stream channels)

4001 Jefferson Plaza NE

(505) 342-3109

Albuquerque, NM 87109

www.usace.army.mil

U.S. Bureau of Land Management, Taos Field Office

(manages lower Red River and Río Grande Wild and Scenic Rivers area)

226 Cruz Alta Rd.

(505) 758-8851

Taos, NM 87571

www.nm.blm.gov

U.S. Environmental Protection Agency

(NPDES, and Superfund programs)

1445 Ross Ave., Suite 1200

(214) 665-6444/(800) 887-6063

Dallas, TX 75202

www.epa.gov

U.S. Forest Service, Carson National Forest

(manages most of the headwater and streamside lands in the watershed)

208 Cruz Alta Rd.

(505) 758-6200

Taos, NM 87571

www.fs.fed.us/r3/carson

USFS, Questa Ranger District

(local ranger district the includes the Red River watershed)

PO Box 110

(505) 586-0520

Questa, NM 87556

U.S. Geological Survey

(streamflow and groundwater monitoring and mapping services)

5338 Montgomery NE, Suite 400

(505) 830-7900/(888) 275-8747

Albuquerque, NM 87109

www.usgs.gov

U.S. Natural Resources Conservation Service

(conserves natural resources on private lands; formerly Soil Conservation Service)

224 Cruz Alta Rd.

(505) 758-3701

Taos, NM 87571

www.nrcs.usda.gov

Glossary of Terms, Acronyms & Abbreviations

- 319 program**—nonpoint source pollution prevention program under the Clean Water Act that provides grants and other assistance to local organizations and governments
- 404 permit**—required under the Clean Water Act before dredging or filling stream channels or wetlands, administered by the U.S. Army Corps of Engineers
- ARD**—Acid Rock Drainage generated by unreclaimed mine waste rock dumps and tailings
- BLM**—U.S. Bureau of Land Management
- BMPs**—Best Management Practices to reduce nonpoint source impacts
- CFRP**—Collaborative Forest Restoration Program, which provides federal funding for community-based forest thinning and stewardship and small-diameter wood marketing
- COE**—U.S. Army Corps of Engineers
- CWA**—commonly known as the Clean Water Act, the 1972 Federal Water Pollution Control Act protects water quality in all streams, lakes, and other surface waters of the U.S., with a goal of eliminating the discharge of all pollutants
- EPA**—U.S. Environmental Protection Agency
- GIS**—Geographical Information System is a databased computer mapping technology that can generate multiple layers of different kinds of map information
- GWQB**—Ground Water Quality Bureau of the New Mexico Environment Department
- MMD**—Mining and Minerals Division of the New Mexico Energy, Minerals & Natural Resources Department
- MOA**—Memorandum of Agreement
- MOU**—Memorandum of Understanding
- NEPA**—National Environmental Policy Act, which mandates an assessment of potential environmental consequences of management actions on federal public lands, possibly including Environmental Assessments or Environmental Impact Statements
- NGO**—Non-Governmental Organization, generally a non-profit community or environmental organization
- NMDGF**—New Mexico Department of Game & Fish
- NMED**—New Mexico Environment Department
- NMEMNRD**—New Mexico Energy, Minerals & Natural Resources Department
- NMMA**—New Mexico Mining Act, which requires mine permitting and Closeout and Reclamation Plans
- NMSFD**—New Mexico Forestry Division
- NMSHTD**—New Mexico State Highway & Transportation Department
- NMWQA**—New Mexico Water Quality Act, which mandates compliance with New Mexico water quality standards
- NMWTB**—New Mexico Water Trust Board
- Nonpoint source**—scattered, often indistinct pollution sources, such as abandoned mines, agricultural runoff, erosion from denuded hillsides or streambanks, fires scars, overgrazing or overcutting, parking lots, recreational or paved roads, etc.
- NPDES**—National Pollutant Discharge Elimination System permit under the Clean Water Act requires compliance with water quality standards and TMDLs for point source discharges to surface water, administered by the Environmental Protection Agency
- NPS**—Nonpoint source
- NRCS**—U.S. Natural Resources Conservation Service (formerly the Soil Conservation Service)

OSE—New Mexico Office of the State Engineer

Point source—any polluted effluent that flows into the river out of the end of a discharge pipe or from a distinct single source, such as runoff or seepage from an industrial site, usually regulated under NPDES permits

RI/FS—Remedial Investigation and Feasibility Study is a preliminary step in the Superfund cleanup process

RMYC—Rocky Mountain Youth Corps

RRWG—Red River Watershed Group

SRFC—Singing River Field Center

Superfund—money and process administered by the Environmental Protection Agency to clean up toxic contamination that threatens environmental and human health

SWQB—Surface Water Quality Bureau of the New Mexico Environment Department

TAG—Technical Assistance Grant through the Environmental Protection Agency to assist local community interests in interpreting and disseminating technical information related to the Superfund process

TMDL—Total Maximum Daily Loads set limits to particular substances identified as pollutants for any given stretch of river

TSWCD—Taos Soil & Water Conservation District

USDA—U.S. Department of Agriculture

USDOI—U.S. Department of Interior

USFS—U.S. Forest Service

USFWS—U.S. Fish & Wildlife Service

USGS—U.S. Geological Survey

Watershed—the entire area of land, from the headwaters to the mouth of a drainage, that flows into a stream or water body

Wildland-Urban Interface—federal program to reduce forest fire hazard on public lands around populated areas

WRAS—Watershed Restoration Action Strategy is a non-regulatory, voluntary approach to addressing nonpoint source impacts to water quality

Bibliography and Other Resources

All the material listed in this bibliography can be found in public and organizational libraries and at state and federal agencies. Using the following abbreviations and internet addresses where applicable, specific locations are included in parentheses following each entry.

Location Codes

AB	Amigos Bravos Library, Taos
BLM	Bureau of Land Management, Taos Field Office
CNF	Carson National Forest Supervisor's Office, Taos
EPA	Environmental Protection Agency, Region 6, Dallas, TX
General	General Library Access
GWQB	NMED Groundwater Quality Bureau, Santa Fe
MMD	New Mexico Mining and Minerals Division, Santa Fe
NMDGF	New Mexico Department of Game & Fish, Santa Fe
NMSHTD	New Mexico State Highway & Transportation Department, Santa Fe
Questa	Village of Questa Municipal Offices Repository
RR	Town of Red River
SWQB	NMED Surface Water Quality Bureau, Santa Fe
TPL	Taos Public Library
UNM	University of New Mexico Library Consortium, online at http://libros.unm.edu

Land, Water & Management

Akroyd, Robert F., Jr.

- 1988 Electroshocking Surveys of Red River. Memorandum to Michael Hatch. New Mexico Department of Game & Fish. (NMDGF, AB)

Atencio, Ernest

- 2000 The mine that turned the Red River blue: Activists turn the tables on the biggest, slipperiest mine in the Rio Grande watershed. *High Country News*, August 28: pp. 1, 10-14. (General; www.hcn.org)

CDM Federal Programs Corporation

- 2000 Final Work Plan/Health and Safety Plan, Preliminary Assessment/Site Inspection, Mallette Creek Watershed Abandoned/Inactive Mine Sites, Carson National Forest, New Mexico. Taos: U.S. Forest Service, November 27. (CNF)
- 2001 Final Preliminary Assessment/Site Inspection, Mallette Creek Watershed Abandoned/Inactive Mine Sites, Carson National Forest, New Mexico. Taos: U.S. Forest Service, December 7. (CNF)
- 2002 Final Preliminary Assessment/Site Inspection, Hansen Creek Watershed Abandoned/Inactive Mine Sites, Carson National Forest, New Mexico. Taos: U.S. Forest Service, July 8. (CNF)

Chadwick Ecological Consultants, Inc.

- 1997 Aquatic Biological Assessment of the Red River, New Mexico, in the vicinity of the Questa Molybdenum Mine. Prepared for Molycorp, Inc., Questa New Mexico. Also Red River Aquatic Biological Monitoring, 1998 through 2000. (AB)

Daniel B. Stephens & Associates, Inc.

- 2002 *Total Maximum Daily Load for Metals (Chronic and Acute Aluminum), Stream Bottom Deposits, and Turbidity in Listed Reaches in the Red River Watershed*. Albuquerque: New Mexico Environment Department. (AB)

ecology and environment, inc.

- 2001 Red River Headwaters, Carson National Forest, New Mexico. Preliminary Assessment/Site Inspection. Taos: U.S. Forest Service, Region 3, September. (CNF)
- 2002a Pioneer Creek Watershed, Carson National Forest, New Mexico. Preliminary Assessment/Site Inspection. Taos: U.S. Forest Service, Region 3, April. (CNF)
- 2002b Placer Creek Watershed, Carson National Forest, New Mexico. Preliminary Assessment/Site Inspection. Taos: U.S. Forest Service, Region 3, April. (CNF)
- 2002c Bitter Creek Watershed, Carson National Forest, New Mexico. Preliminary Assessment/Site Inspection. Taos: U.S. Forest Service, Region 3, May. (CNF)

Gardiner, Ron G.

- 1996 The Red River Watershed: Planning and Users Guide. Paper prepared for UNM Water Resources Administration Program. Courtesy of the author. (Questa)

Garn, Herbert S.

- 1984 *Spatial and Temporal Variations in Water Quality of the Rio Grande—Red River, Wild and Scenic River, Taos County, New Mexico*. Proceedings of a Symposium on Water Quality and Pollution in New Mexico, April 12, 1984. Socorro: New Mexico Bureau of Mines & Mineral Resources. (AB)
- 1985 Point and Nonpoint Source of Trace Elements in a Wild and Scenic River of Northern New Mexico. *Journal of Soil and Water Conservation*, vol. 40, no. 5. (General)

Garrabrant, Lynn A.

- 1993 *Water Resources of Taos County, New Mexico*. Prepared in cooperation with the New Mexico State Engineer Office, New Mexico Environment Department, and New Mexico Bureau of Mines and Mineral Resources. Albuquerque: U.S. Department of Interior, U.S. Geological Survey. (UNM)

Gross, Michele Beth

- 1992 Aquatic Insects as Biomonitors for Heavy Metal Contamination in the Red River, Taos County, New Mexico. Master's thesis, New Mexico Institute of Mining and Technology. (UNM)
- Hagan, Laura Beth
 2001 Natural and Mining-related Sources of Metal Contamination, Red River, Northwestern New Mexico: a Hydrogeochemical Investigation of Surface Water and Groundwater. Master's thesis, University of New Mexico, Department of Earth and Planetary Science. (UNM)
- Jacobi, Gerald Z., et al.
 1998 Benthic Macroinvertebrate Bioassessment of the Red River, New Mexico, USA. Paper presented at the 27th Congress of the International Association of Theoretical and Applied Limnology, Dublin, Ireland. (AB)
- Jacobi, Gerald Z. and Larry Smolka
 1984 *Intensive Survey of the Red River in the Vicinity of the Red River and Questa Wastewater Treatment Facilities and the Molycorp Complex, Taos County, New Mexico*. Santa Fe: Health & Environment Department. (AB)
- Kline, Doyle
 1974 My God—They're Tearing the Mountain Down! *Field & Stream*, August: pp. 56-70. (General)
- 1977 Killing of a Wild River. *Field & Stream*, September: pp. 104-110. (General)
- Lucius, Jeffrey E., et al.
 2001 Results of Electrical Surveys near Red River, New Mexico. U.S. Geological Survey Open-File Report 01-0331. Electronic document: <http://pubs.usgs.gov/of/2001/ofr-01-0331/index.html>.
- MacDonald, Lee, et al.
 2002 Alternative: Restore and Manage Forests, Piñon-Juniper Woodlands, and Riparian Systems. Alternative Assessment White Paper prepared for Jemez y Sangre Water Plan by Daniel B. Stephens & Associates, July. Courtesy of co-author Ernest Atencio.
- Melancon, Susan M. S., et al.
 1982 *Site Specific Water Quality Assessment: Red River, New Mexico*. Las Vegas, NV: U.S. Environmental Protection Agency. (AB)
- Morain, Stan
 1996 Landscape Change Survey, Red River Region, New Mexico: Aerial Photo Interpretation of Federally Acquired Photographs Collected Between 1935/36 and 1992. (AB)
- New Mexico Environment Department

- 1998 Clean Water Action Plan, Unified Watershed Assessment, New Mexico. Santa Fe: New Mexico Environment Department, September. (SWQB)
- 1999 *New Mexico Nonpoint Source Management Program*. Santa Fe: New Mexico Environment Department, Surface Water Quality Bureau, NPS Pollution Section. (SWQB)

New Mexico Health and Environment Department

- 1989 *Intensive Water Quality Survey of the Middle Red River, Taos County, New Mexico, September 12-October 25, 1988*. Santa Fe: Surface Water Quality Bureau, New Mexico Health and Environment Department. (AB)

New Mexico State Highway and Transportation Department

- 1992 *Environmental Assessment Project 1529.11: Reconstruction of NM 38, Questa east for 4.9 miles*. Santa Fe: Federal Highway Administration, New Mexico Division, and New Mexico State Highway and Transportation Department. (NMSHTD, UNM)
- 1995 *Environmental Assessment Project TPM-TPE-0038(14) CN-2432: NM 38 improvement project, Taos County, New Mexico*. Santa Fe: the New Mexico State Highway and Transportation Department, in cooperation with the U.S. Department of Transportation, Federal Highway Administration, New Mexico Division. (NMSHTD, UNM)

New Mexico Water Pollution Control Bureau

- 1982 *Point source waste load allocation for the town of Red River: milestone 6.2.b*. Santa Fe: Water Pollution Control Bureau, Environmental Improvement Division, New Mexico Health and Environment Department. (SWQB, UNM)

Nordstrom, D. K., et al.

- 2002 The Questa baseline and pre-mining ground-water quality investigation: preliminary data [abs.]. Geological Society of America Abstracts with Programs, v.34, no. 6: p. 51. Electronic document: http://wwwbrr.cr.usgs.gov/projects/GWC_chemtherm/questa.htm.
- 2003 A baseline and pre-mining ground-water quality investigation at the Questa molybdenum mine site, New Mexico, USA. [abs.]. 7th International Conference on the Biogeochemistry of Trace Elements, Uppsala, Sweden, June 15-19. Electronic document: http://wwwbrr.cr.usgs.gov/projects/GWC_chemtherm/questa.htm.

Rosgen, David L.

- 1996 *Applied River Morphology*. Pagosa Springs: Wildland Hydrology Books. (General, UNM)
- 1998 *Field Guide for Stream Classification*. Pagosa Springs: Wildland Hydrology Books. (General, UNM)

Slifer, Dennis

- 1996 *Red River Groundwater Investigation*. Santa Fe: New Mexico Environment Department, Surface Water Quality Bureau. (SWQB, AB)
- Smalling, Wes R.
1998 *Red River. Rocky Mountain Edition*, pp.18-21. (General)
- Smolka, Larry R. and Gerald Z. Jacobi
1986 *Water Quality Survey of the Red River, Taos County, New Mexico. April 15-17, 1985*. Santa Fe: Surface Water Quality Bureau, New Mexico Environmental Improvement Division. (CNF)
- Smolka, Larry R. and David F. Tague
1987 *Intensive Survey of the Red River, Taos County, New Mexico. August 18-21, 1986*. Santa Fe: Surface Water Quality Bureau, New Mexico Environmental Improvement Division. (CNF)
- Souder, Miller & Associates
1995 *Molycorp and the Red River: a summary of available information on geohydrology and environmental chemistry*. Prepared for Molycorp, Inc. Santa Fe: Souder, Miller & Associates. (AB)
- Sutley, S. J., et al.
1983 *Chemical analyses and statistical summary for samples of minus-200-mesh stream-sediment, magnetic, and nonmagnetic heavy-mineral concentrates from the Latir Peak and Wheeler Peak Wildernesses and the Columbine-Hondo Wilderness study area, Taos County, New Mexico* (microform). U.S. Department of Interior, U.S. Geological Survey. (UNM)
- U.S. Bureau of Land Management
1984 *Rio Grande Wild and Scenic River Recreation Area Management Plan*. Taos: Bureau of Land Management. (BLM)
- 1988 *The Taos Resource Management Plan*. Taos: Bureau of Land Management. (BLM)
- 2000 *Final Environmental Impact Statement for Riparian and Aquatic Habitat Management*, vols. I & II. Taos: Bureau of Land Management. (BLM)
- 2002 *Environmental Assessment. Pescadero/Red River Fault Loop Trail Links*. Taos: Bureau of Land Management. (BLM)
- 2002 *Rio Grande Corridor Final Plan*. Taos: Bureau of Land Management. (BLM)
- U.S. Department of Agriculture
1982 *Soil Survey of Taos County and parts of Rio Arriba and Mora Counties, New Mexico in cooperation with New Mexico Agricultural Experiment Station*. New Mexico State University. (UNM)

1987 *Terrestrial Ecosystems Survey of the Carson National Forest*. U.S. Forest Service, Southwestern Region. (CNF)

U.S. Environmental Protection Agency

1994 *Rural Nonpoint Source Management: Landscape Design and Maintenance for Pollution Control*. U.S. Environmental Protection Agency, Region 6, Water Management Division, Water Quality Management Branch. Washington: Terrene Institute. (EPA)

1996 *Nonpoint Pointers: A series of fact sheets on nonpoint source (NPS) pollution*. U.S. Environmental Protection Agency, Office of Water, March, publication numbers EPA-841-F-96-004A through J. (EPA).

U.S. Environmental Protection Agency with New Mexico Department of Game and Fish and New Mexico Environmental Improvement Agency

1971 *Water Quality Survey, Red River and Rio Grande, New Mexico*. Ada, OK: U.S. Environmental Protection Agency, Region 6, Surveillance and Analysis Division. (EPA, UNM)

U.S. Forest Service

1986-2003 *Environmental Assessments, Questa Ranger District*. Includes Midnight, Bobcat, Black Copper, Red River, and Columbine Grazing Allotments; Recreation and Trails Analyses; Red River Ski Area; Road improvements relative to motorized recreation; Timber sales; Wildland-Urban Interface Analyses. (CNF)

Winter, Elizabeth

1995 *The history of trout in the Red River between the towns of Questa and Red River, Taos County, New Mexico, with regard to the Molycorp mine workings*. Paper prepared for the Sierra Club. Santa Fe: Rio Grande Chapter of the Sierra Club. (AB)

Mining & Geology

Allen, B. C., et al.

1999 *Geochemistry of the Red River Stream System Before and After Open-Pit Mining, Questa Area, Taos County, New Mexico*. Santa Fe: New Mexico Office of the Natural Resources Trustee. (AB)

Bauer, Paul W. and John Harold Schilling

1991 *The Enchanted Circle: Loop Drives from Taos*. Series: Scenic Trips to the Geologic Past; no. 2. Socorro: New Mexico Bureau of Mines & Mineral Resources. (General, TPL)

Kuipers, James R.

2002 *Full Reclamation and Closure Plan, Molycorp Questa Mine, NM*. Prepared for Amigos Bravos. Bozeman: Center for Science in Public Participation, May 16. (AB)

Livo, Eric and Roger N. Clark

- 2002 Mapped Minerals at Questa, New Mexico, Using Airborne Visible-Infrared Imaging Spectrometer (AVIRIS) Data – Preliminary Report. U.S. Geological Survey Open-File Report 02-0026. Electronic document: <http://pubs.usgs.gov/of/2002/ofr-02-0026/index.html>.

McKinlay, Philip F.

- 1957 *Geology of Questa Quadrangle, Taos County, New Mexico*. Socorro: State Bureau of Mines and Mineral Resources, New Mexico Institute of Mining & Technology. (General, UNM)

Roberts, Thomas, T., et al.

- 1990 *Geology of the Red River District, Taos County, New Mexico*. New Mexico Geological Society Guidebook, 41st Field Conference. (General, AB)

Schilling, John H.

- 1956 *Geology of the Questa Molybdenum (Moly) Mine Area, Taos County, NM*. Socorro. New Mexico Bureau of Mines and Mineral Resources. (TPL)
- 1960 *Mineral Resources of Taos County, New Mexico*. Bulletin 71. Description of Mineral Deposits, Prospects and Mines as Related to Regional Geology. Socorro: New Mexico Bureau of Mines and Mineral Resources. (TPL)

History, Culture & Economics

Amigos Bravos

- 1997-99 Oral History Project. Numerous oral history interviews conducted in the Red River watershed by anthropology graduate students Lorenzo Sotelo, Eirian Humphreys, and Sandhya Ganapathy, project supervisor Ernie Atencio. (AB)

Atencio, Ernest

- 2001 *Of Land and Culture: Environmental Justice and Public Lands Ranching in Northern New Mexico*. Santa Fe: The Quivira Coalition. (TPL)

Balcomb, Kenneth C.

- 1981 *The Red River Hill*. Illustrated with sketches by the author. Albuquerque: Albuquerque Historical Society. (UNM)

Condie, Carole J. and Landon D. Smith

- 1992 *Data Recovery at Eight Archeological sites on the Cabresto by-pass road north of Questa, T29N R13E, Questa Ranger District, Taos County, New Mexico*; for Carson National Forest. Albuquerque: Quivira Research Associates. (CNF, UNM)

Hamilton, Winifred Oldham

- 1947 *Wagon days in Red River*. Raton: Daily Range. (UNM)

Kenneth W. Larsen & Associates

1973-74 *Comprehensive Plan, Red River, New Mexico*. Albuquerque: Larsen. (RR, UNM)

Martin, Craig

1991 *Fly-fishing in Northern New Mexico*. Albuquerque: University of New Mexico Press. (TPL)

Martinez, Marcelino

1980 Oral History: Questa in early days, working in mine. Harwood Foundation Oral History Project, Series 1. (TPL)

New Mexico Department of Health

2002 *Taos County, 2002 County Health Profile*. Santa Fe: Bureau of Vital Records and Health Statistics (previous years' profiles also available). (www.health.state.nm.us)

Nichols, John

1970 A Man with a Previous Record. *The New Mexico Review*, May: pp.11-14. (General)

Pearson, Jim Berry

1986 *The Red River-Twining Area: A New Mexico Mining Story*. Albuquerque: University of New Mexico Press. (UNM)

Peters, Steve

1971 *Incident on the Red River, and other true stories of New Mexico*. Santa Fe: Peters. (UNM)

Potter, Michele

1998 Unocal and Questa: A Multinational Corporation's Hold on a Northern New Mexico Village. Paper prepared for University of New Mexico Environmental Justice course. Courtesy of the author. (AB)

Questa Village Council

1973 *Village of Questa Comprehensive Plan*. Santa Fe: Scanion and Associates, Inc. (Questa, UNM)

2002 *Village of Questa Comprehensive Plan*. Santa Fe: Planners Ink, September. (Questa)

Seaman, Timothy J, and Richard C. Chapman, eds.

1993 *Guadalupe Mountain, New Mexico: an inquiry into the archeology of place*. Prepared for Bureau of Land Management, Albuquerque District. Albuquerque: Office of Contract Archeology, University of New Mexico. (BLM, UNM)

Stanley, F.

1962 *The Red River, New Mexico Story*. TX: Pantex. (UNM)

1962 *The Questa, New Mexico Story*. TX: Pantex. (UNM)

Streit, Taylor

1985 Red River Blues, A Downstream Disgrace. *Valley Alternative*, January 1. (General, AB)

2000 Remembering the Red River. *Fly Rod and Reel*, September/October, 2000. (General, AB)

Talberth, John, et al.

2001 A Framework for Assessing the Economic Benefits of Mine Reclamation: A Case Study Addressing Reclamation of the Molycorp Mine, Questa, New Mexico. Santa Fe: Ecology and Law Institute and Amigos Bravos, September 24. (AB)

The Taos News

1965-2003 Numerous articles on Molycorp, Questa, and the Red River watershed. *The Taos News*. (Taos News, AB)

Permitting & Regulatory Documents

(Overview and selected documents relating to a variety of permitting and regulatory processes.)

New Mexico Environment Department Groundwater Discharge Permit 933

Administered by the NMED Groundwater Quality Bureau (GWQB) under the New Mexico Water Quality Act, DP 933 requires compliance with New Mexico water quality standards for all water discharged into groundwater at the Molycorp tailings impoundments and a final Closure Plan for the area. Numerous public documents and studies available through NMED GWQB.

New Mexico Environment Department Groundwater Discharge Permit 1055

Administered by the NMED Groundwater Quality Bureau (GWQB) under the New Mexico Water Quality Act, DP 1055 requires compliance with New Mexico water quality standards for all water discharged into groundwater at the Molycorp Mine and mill site and a final Closure Plan for the area. Numerous public documents and studies available through NMED GWQB.

New Mexico Mining and Minerals Division Mining Permit and Closeout and Reclamation Plan

Administered by the New Mexico Energy, Minerals & Natural Resources Department Mining and Minerals Division (MMD) under the New Mexico Mining Act, the Mining Permit requires that Molycorp complete specific planning and documentation for mining activities; the Closeout and Reclamation Plan must reclaim the Mine site and tailings impoundments “to a condition that allows for the re-establishment of a self-sustaining ecosystem . . . appropriate for the life zone of the surrounding areas.” Numerous public documents and studies available through MMD.

U.S. Bureau of Land Management Guadalupe Mountain Tailings Disposal Facility

A 1980s proposal by Molycorp to build a new tailings disposal facility on Guadalupe Mountain on BLM land west of Questa generated numerous public documents and studies, under the National Environmental Policy Act process, available through BLM.

U.S. Bureau of Land Management

1985 *Proposed Molybdenum Tailings Disposal Facility for Molycorp, Inc.: Final Environmental Assessment*. Taos: U.S. Department of Interior, Bureau of Land Management, Albuquerque District, Taos Resource Area. (BLM, AB)

1989 *Molycorp Guadalupe Mountain Tailings Disposal Facility: Final Environmental Impact Statement*. Prepared for Bureau of Land Management. Albuquerque: U.S. Department of Interior, Bureau of Land Management, Albuquerque District Office. (BLM, AB)

U.S. Environmental Protection Agency National Pollutant Discharge Elimination System Permits

Administered by EPA under the Clean Water Act, NPDES permits requires compliance with water quality standards and TMDLs for point source discharges to surface water. NPDES permitted discharges in the Red River watershed include the Town of Red River Waste Water Treatment Plant, the Molycorp Mine site, the Molycorp tailings impoundment site, and the Red River Fish Hatchery. Background information and monitoring data are available to the public through EPA, Region 6.

Abshire, David

1998 *Report on Hydrological connection Associated with Molycorp Mining Activity, Questa, New Mexico*. EPA, Region 6, NPDES permits branch. (EPA, AB)

U.S. Environmental Protection Agency Superfund

Administered by EPA under Superfund, this process aims to clean up toxic contamination that threatens environmental and human health, beginning with the Remedial Investigation and Feasibility Study process. Numerous public document and studies available through EPA, Region 6.

Kent, Stuart

1995 Expanded site inspection report on Molycorp Inc. Questa Division, Taos County, New Mexico. Santa Fe: New Mexico Environmental Department, Groundwater Protection and Remediation Bureau-Superfund Program. (EPA, AB)

U.S. Environmental Protection Agency

1999 *Hazard Ranking System Documentation Record. Molycorp, Inc, Questa, Taos County*. Houston: U.S. Environmental Protection Agency, Region 6. (EPA, Questa)

URS

2002 *Molycorp Remedial Investigation/Feasibility Study Work Plan*, vols. 1 through 5. Prepared for Molycorp, Inc., Denver: URS Corporation. (EPA, Questa)

Other Resources

Center for Watershed Protection website: www.cwp.org.

Clean Water Network website: www.cwn.org.

EPA Clean Water Act website: www.epa.gov/region5/water/cwa.htm.

EPA Watershed Information Network website: www.epa.gov/win.

Río Colorado Reclamation Committee (local Superfund Technical Assistance Grant committee) website: www.rcrc.nm.org.

USFS public participation process for developing off-road vehicle travel plan: www.fs.fed.us/r2/psicc/sal/fourmile.htm.

USGS current Red River Background Characterization Study information: wwwbrr.cr.usgs.gov/projects/GWC_chemtherm/questa.htm.

Watershed Support Program website: www.4sos.org.