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## WATER QUALITY IN THE RIO COSTILLA WATERSHED: MULTIPLE AGENCIES, MULTIPLYING PROBLEMS

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### INTRODUCTION

The Rio Costilla watershed includes over 180,000 acres in northern Taos County near the Colorado-New Mexico border. Rio Costilla originates in the Sangre de Cristo mountains of Colorado at an elevation of over 11,000 feet, passes southward through New Mexico, turns north into Colorado and joins the Rio Grande in Colorado at an elevation of less than 7,500 feet. Vegetation types range from mountain wet meadow and spruce-fir to sage brush and piñon-juniper. Tributaries include Casias Creek, Powderhouse Creek, Comanche Creek, Latir Creek, Cordova Creek, and Ute Creek.

Within the watershed are the communities of Costilla and Amalia, part of the Vermejo Ranch, the Rio Costilla Cooperative Livestock Association properties, Ski Rio, and the Valle Vidal Unit of the Carson National Forest. The Rio Costilla plays a role in each of these groups' economies and day-to-day operations. Each, in turn, influences water quality in the Rio Costilla and its tributaries.

As a perennial tributary of the Rio Grande in Taos County, the Rio Costilla and its tributaries are part of Stream Segment 2-120, designated by the New Mexico Water Quality Control Commission. The commission has assigned the designated uses of high quality coldwater fishery, secondary contact

recreation, domestic water supply, irrigated agriculture, and livestock and wildlife watering to segment 2-120. These uses of the Rio Costilla play a vital role in the well-being of area residents and the state as a whole. Currently, the uses of Costilla Creek are significantly impaired by non-point source (NPS) pollution.<sup>1</sup>

The New Mexico Environment Department has recently received a grant under the NPS program of the federal Clean Water Act for a 5-year effort to monitor NPS control efforts and their effectiveness in the Rio Costilla watershed. We have been working with the Forest Service for some time on the Comanche Creek project. As the state begins to expand its efforts in this watershed, we felt this conference was a good place to present the program. As this project develops there will indeed be "many agencies working for the future."

### **The NPS Program: A Need for Cooperation between Agencies**

The New Mexico Environment Department's activities in the Rio Costilla watershed are part of the New Mexico NPS Management Program adopted by the Water Quality Control Commission in response to Section 319 of the federal Clean Water Act. The goal of the Clean Water Act is to restore

the physical, chemical and biological integrity of the nation's waters. Section 319, enacted in 1987, required states to assess NPS impacts on water quality and implement a management program to address those impacts. In New Mexico, over 98 percent of known surface water pollution is due to NPS impacts, while approximately half of New Mexico's streams are significantly affected. New Mexico's management program has a statewide component and a component focusing on targeted watersheds. Both components of the NPS management program rely heavily on multi-agency cooperation and voluntary implementation of Best Management Practices (BMPs) to control NPS impacts on water quality. Comanche Creek and Costilla Creek watersheds have been targeted under the NPS management program.

You may ask, as many in the Costilla Creek watershed have asked, "Why Costilla Creek?" First, in the Valle Vidal Unit of the Carson National Forest, the U.S. Forest Service is implementing several watershed improvement projects. These provide us with on-the-ground implementation of NPS controls so that we can study their effectiveness in a New Mexico situation. The state is receiving excellent cooperation from the Forest Service. In addition to the Forest Service, the Taos County Soil and Water Conservation District is interested in participating in the NPS management program, so we have an agency working with private landowners in the watershed. Finally, we felt that with cooperation from the Forest Service and the Taos County Soil and Water Conservation District, the NPS problems presented in the Costilla Creek watershed appeared to be problems that could begin to be addressed during one person's career. Most NPS problems in the Rio Costilla are related to erosion and sedimentation—we are not dealing with a stream that is so far gone that being able to document recovery could be impossible for decades. The state may be able to use Rio Costilla to document how a voluntary NPS control program can be implemented and how water quality can be improved.

#### **Water Quality Issues in the Costilla Creek Watershed**

Table 1 lists water quality sampling stations in the Costilla Creek watershed utilized by the Environment Department. Over the last decade, the state has documented that Costilla Creek, Coman-

che Creek, and Cordova Creek are impaired by NPS pollution.<sup>2</sup> The designated fishery, domestic water supply use, irrigation use and secondary contact recreation use of Costilla Creek are impaired by metals, siltation, nutrient enrichment (total phosphorus and nitrogen), un-ionized ammonia, streambank destabilization and loss of riparian vegetation. Comanche Creek is impaired by pH, high temperatures, turbidity, siltation, un-ionized ammonia, reduction of riparian vegetation and streambank destabilization. Cordova Creek is impaired by siltation, nutrients, turbidity and metals. We have very little data for Powderhouse and Latir creeks but believe, in general, NPS impacts are less on these streams.

**TABLE 1. WATER QUALITY MONITORING STATIONS IN THE RIO COSTILLA WATERSHED USED BY NMED.**

Rio Costilla at USGS Gage above the Village of Costilla
Rio Costilla below Latir Creek
Rio Costilla above Latir Creek
Latir Creek above Rio Costilla
Rio Costilla at lower Valle Vidal boundary
Rio Costilla below Comanche Creek
Rio Costilla above Comanche Creek
Comanche Creek above Rio Costilla
Comanche Creek at cattle guard 3 mi. above Rio Costilla
Comanche Creek below revetment 4 mi. above Rio Costilla
Comanche Creek below upper enclosure
Comanche Creek above upper enclosure 4.5 mi. above Rio Costilla
Comanche Creek above Foreman Creek confluence
Rio Costilla at upper Valle Vidal boundary

## Water Quality in the Rio Costilla Watershed: Multiple Agencies, Multiplying Problems

### Sources of Water Quality Impairment

Water quality in the Rio Costilla watershed is impacted by several non-point sources. These include grazing, hydromodification, roads, recreational development, irrigated agriculture and wastewater disposal through septic systems. Except for on-site liquid waste systems, the major impacts caused by these sources are destruction of riparian and stream habitat, streambank destabilization and sedimentation caused by erosion. The sediment inputs result from water quality standards violations discussed earlier.

Historically, grazing has been a significant source of NPS impacts. Many reaches of the Rio Costilla and Comanche Creek exhibit the destabilized banks, downcutting and changes in channel morphology that occur when cattle grazing is not properly managed. In the Valle Vidal, an additional factor may be grazing impacts associated with wild ungulates, primarily elk.

Road runoff and road maintenance and construction are major influences on water quality in the watershed. The most dramatic example of water quality impairment from road building in the Rio Costilla watershed is State Road 196 along Cordova Creek. The construction of this high standard road resulted in the filling of the original stream channel and the dredging of an unstable ditch into which this trout stream was diverted. This diversion has resulted in the elimination of the historical biota, massive sediment transport, slope and road destabilization and impairments of downstream waters. Comanche Creek and Costilla Creek are also negatively impacted by roads.

Recreation is having an impact in certain areas. Most recreation impacts relate to roads and vehicles and from eroding ski slopes at Ski Rio.

Above Amalia, flows are diverted for irrigated agriculture. Water quality impacts from irrigated agriculture return flows have not been extensively studied in the watershed. It has been documented that return flows are significantly warmer and more turbid than in the receiving waters. Other identified impacts from irrigated agriculture relate to hydromodification.

Some of the most dramatic water quality impairment in the Rio Costilla occurred as a result of the Costilla Dam rehabilitation project. Failure to contain sediment during construction and dam drawdown resulted in extreme violations of water

quality standards. On August 29, 1989 the Environment Department measured turbidity at 200 nephelometric units (NTU), over 800 percent of the state standard of 25 NTU. Total phosphorus concentrations were 0.66 mg/l and 0.76 mg/l or 660 percent and 760 percent of the state water quality standard for phosphorus. Sediment deposition occurred throughout the reach on stream bottoms and banks and dead fish were noted on the streambank.

In September, 1988 and in April, May, August, September and October of 1989 water quality standards were repeatedly violated according to monitoring data collected by the Interstate Steam Commission. Fully 36 percent of reported values exceeded state standards in a reach never known previously to exceed the state standard.<sup>3</sup> Study of aquatic macroinvertebrates during the project documented a 90 percent reduction in standing crop of those organisms below the dam which form the prey base for fish.

### Water Quality Protection Programs

Stream ecosystems can recover from the effects of NPS pollution. First, however, the pollution must be controlled. The state's NPS management program seeks control of NPS pollution through voluntary implementation of Best Management Practices. Success in the Rio Costilla watershed project will require the cooperative efforts, at a minimum, of the U.S. Forest Service, the U.S. Soil Conservation Service, the U.S. Agricultural Conservation and Stabilization Service, the U.S. Environmental Protection Agency, the U.S. Federal Deposit Insurance Corporation, the New Mexico Environment Department, the Interstate Stream Commission, the New Mexico State Highway and Transportation Department, the Taos County Soil and Water Conservation District, and private citizens living in Amalia and Costilla or owning land in the watershed. Again, our goal is to demonstrate that a voluntary approach will work to control NPS pollution.

The Forest Service has undertaken numerous activities to control NPS pollution in the Valle Vidal. These include road closings, vehicle access control, installation of erosion control and fish habitat improvement structures, exclosures to stop cattle and elk impacts at selected sites, revegetation of cut-and-fill slopes along roads, removal of cattle from much of the unit and closer management of

remaining cattle, and planting riparian plants. Due to these activities, many of the incised banks in the upper Comanche Creek area show evidence of natural healing.

The Forest Service is planning road work along Costilla Creek to accommodate the area's increase in recreational use. Working through the new management agency agreement with the Environment Department, the Forest Service should be able to carry out the road improvement project without damage to water quality.

The Taos County Soil and Water Conservation District has initiated an inventory of NPS problems on private lands within the watershed using monies passed through the Environment Department from the U.S. Environmental Protection Agency. In addition to creating an inventory of NPS problems, the district hopes to increase public awareness of water pollution problems and the methods available to correct such problems so that public support for the district in implementing NPS control plans will increase. The district has committed to provide over \$100,000 each year to carry out a natural resource conservation program in Taos County, including the Rio Costilla watershed. With 75 percent of the watershed privately owned, the work of the Soil and Water Conservation District and cooperating landowners will be essential to realizing progress in achieving water quality goals. As the watershed project proceeds, the U.S. Soil Conservation Service and Agricultural Stabilization Service will be involved in helping to plan and cost-share implementation of BMPs for NPS control.

Several other entities will play a role in the watershed. The Interstate Stream Commission (ISC) will be involved with operation of the Costilla Dam now that rehabilitation work is in its final stages. The ISC has committed to assisting in mitigation for habitat damage done during the rehabilitation project. The agency may also play a role in helping to fund certain BMPs if they relate to use of water in irrigation.

The State Highway and Transportation Department has responsibility for State Highway 196 along Cordova Creek. This area will require intensive actions to stabilize the stream.

Interestingly, the federal government now owns Ski Rio, as a casualty of the Savings and Loan crisis. The Taos County Soil and Water Conservation District has already informed Ski Rio that eroding ski slopes are a potential NPS of pollution in the watershed. While the federal government

owns these properties, provisions in the federal Clean Water Act (e.g., section 313) requires it to manage the facility in a manner which insures attainment of the state's water quality standards.

The Environment Department will work with all these entities to coordinate activities and make sure the state is demonstrating progress in the NPS management program. Water quality monitoring will be conducted during all seasons for at least five years. Monitoring will occur upstream and downstream of locations in which BMPs are being implemented. The monitoring should identify success stories and assist in program refinement.

Environment Department monitoring in the Costilla Creek watershed will also address biological and physical measurements of water quality. While we continue to sample for chemical constituents such as nutrients, metals and pH, the department will also be conducting surveys of riparian and stream habitat conditions and using methods that will give an indication of how the biological components of the stream system are responding to NPS controls. The impacts of flow manipulation on fishery habitat in the stream also will be investigated.

## SUMMARY

The Rio Costilla, impaired by various NPS impacts, can meet the goals of the Clean Water Act if the many agencies and individuals with a stake in the stream make water quality a priority and cooperation and coordination a reality. Streams can recover, if the damage is halted and repaired. Too often, actions by various agencies have actually aggravated NPS problems.

Many believe a voluntary approach to containing NPS pollution will not work. We hope that it will. Certainly, the citizens and the U.S. Congress will insist that progress be made either by voluntary action or through regulation. Senator David Durenberger summarized Congress' position on using a voluntary approach to control NPS pollution of the nation's waters in an address to the Senate Subcommittee on Environmental Protection, of the Committee on Environment and Public Works, in July, 1991:

"Has section 319 improved water quality by controlling non-point source pollution? There is absolutely no evidence that it has. Some will discount the

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lessons we should draw from the 319 experience. Some will say it was never funded and that a large commitment of federal dollars will turn the corner on the problem. Some will say that the new Coastal Zone Management amendments will provide the tools to make it work. Some will say that another round of voluntary programs based on the 1990 farm bill should be given a chance.

Well, all of that speculation on what might be should not obscure the lesson to be learned. Section 319 has not improved water quality one iota. And I told you it wouldn't way back when.

We have had any number of voluntary planning programs since the founding of the Soil Conservation Service in 1935. We have spent more than \$30 billion on voluntary cost share programs and water quality planning over that 50-year history only to find today that non-point source pollution, principally from agriculture, remains our biggest water quality problem.

So what do we do now? My recommendation would be that we go back to the fundamentals of the Clean Water Act. We need criteria documents that focus on the non-point problem. We need state standards and monitoring programs that are intended to measure non-point, rather than point source, impacts. We need watershed plans under Section 303 (the Total Maximum Daily Load section-ED) that carefully define the load reductions necessary to meet water quality standards. We need enforceable requirements applicable to private business entities and municipal activities that are polluting the waters that belong to all of the people of the United States.

...We can't just throw away the fundamental tools of the Clean Water Act and expect to solve the non-point problem. We don't need a new program of a different approach. We just need a commitment to carry out the requirement of the Clean Water Act for all sources of pollution.

'Publish' and 'promulgate' and 'fund' are not the verbs that are going to solve the non-point problem. We need to 'monitor', 'identify', 'allocate', 'specify', 'implement', and 'enforce' if we are to solve this problem. The solutions are site-specific, water quality-related and in need of constant maintenance and adjustment. If we still don't have the political will to carry out that kind of effort, we ought to just acknowledge it and put our scarce resource into some other human problem more easily solved".<sup>4</sup>

The New Mexico Environment Department is not quite ready to give up on the voluntary approach. We do believe, however, that Congress and the American public will not walk away from the goals of the Clean Water Act. There is the political will, we believe, to assure attainment of Clean Water Act goals. The Rio Costilla watershed project provides New Mexicans with an excellent opportunity to demonstrate we are serious about cleaning up water and know how to do it. There are multiple agencies, there are multiple problems. But there are also multiple opportunities for success.

#### ENDNOTES

1. New Mexico Water Quality Control Commission. 1990. Water quality and water pollution control in New Mexico, 1990. NMWQCC, Santa Fe, NM.
2. Ibid.
3. 1 December 1989 letter from Kathleen Sisneros, NMED to Steve Dougan, U.S. Army Corps of Engineers.
4. EPA News Notes. September 1991. No. 15, pp 7-8.