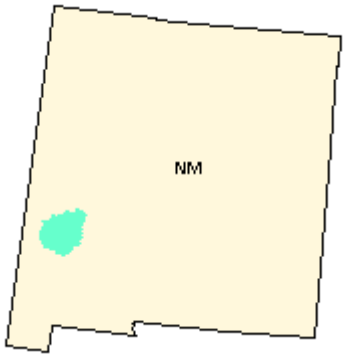
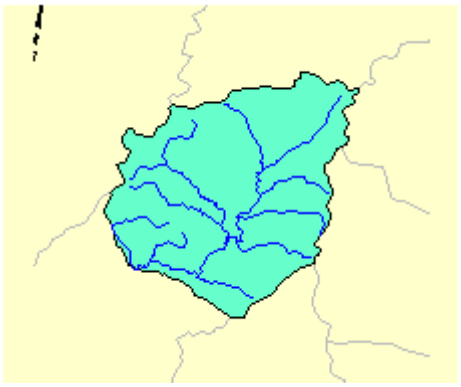
TOTAL MAXIMUM DAILY LOAD FOR METALS (CHRONIC ALUMINUM) FOR THE EAST FORK OF THE GILA RIVER AND TAYLOR CREEK





Summary Table

New Mexico Standards Segment	Gila River, 20.6.4.503 NMAC (formerly 2503)
Waterbody Identifier	•East Fork of the Gila River from the confluence with the west fork to Taylor Creek, 7.5 mi. •Taylor Creek from the confluence with the Beaver Creek to Wall Lake, 2.9 mi.
Parameter of Concern	Metals (chronic aluminum)
Uses Affected	•East Fork Gila River and Taylor Creek – domestic water supply, high quality coldwater fishery, irrigation, livestock watering, wildlife habitat, and secondary contact
Geographic Location	Gila River Basin East Fork of the Gila River (GRB1-20000) Taylor Creek (GRB1-20300)
Scope/size of Watershed	•326 mi^2 (East Fork Gila River) •102 mi^2 (Taylor Creek)
Land Type	Ecoregion: Arizona/New Mexico Mountains
Land Use/Cover	•East Fork Gila River: Forest (90%), Rangeland (9%), Agriculture (<1%), Barren (<1%) •Taylor Creek: Forest (99%), Rangeland (<1%), Agriculture (<1%)
Identified Sources	•East Fork of the Gila River: Natural, Rangeland, Removal of Riparian Vegetation, Forest Management •Taylor Creek: Natural, Rangeland, Recreation, Upstream Impoundment
Watershed Ownership	•East Fork of the Gila River: Forest Service (99%) and Private (<1%) •Taylor Creek: Forest Service (99%) and Private (<1%)
Priority Ranking	1 - East Fork of the Gila River 3 - Taylor Creek
Threatened and Endangered Species	East Fork of the Gila River: Spikedace and Loach Minnow (Threatened)
TMDL for: Metals (chronic aluminum) East Fork of the Gila River Taylor Creek	WLA(0) + LA(126.4) + MOS(22.3)= **148.7 lbs/day** WLA(0) + LA(39.4) + MOS(7.0)= **46.4 lbs/day**

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List of Abbreviations

BMP	Best Management Practice
CFS	Cubic Feet per Second
CWA	Clean Water Act
CWAP	Clean Water Action Plan
EPA	United States Environmental Protection Agency
FS	United States Department of Agriculture Forest Service
HQCWF	High Quality Coldwater Fishery
LA	Load Allocation
MGD	Million Gallons per Day
mg/L	Milligrams per Liter
MOS	Margin of Safety
MOU	Memorandum of Understanding
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NPS	Nonpoint Source
SWQB	Surface Water Quality Bureau
TMDL	Total Maximum Daily Load
USGS	United States Geological Survey
UWA	Unified Watershed Assessment
WLA	Waste Load Allocation
WPS	Watershed Protection Section
WQLS	Water Quality Limited Segment
WQCC	New Mexico Water Quality Control Commission
WQS	Water Quality Standards
WRAS	Watershed Restoration Action Strategy

EXECUTIVE SUMMARY

Section 303(d) of the federal Clean Water Act requires states to develop Total Maximum Daily Load (TMDL) management plans for water bodies determined to be water quality limited. A TMDL documents the amount of a pollutant a water body can assimilate without violating a state's water quality standards. It also allocates that load capacity to known point sources and nonpoint sources at a given flow. TMDLs are defined in 40 CFR Part 130 as the sum of the individual Waste Load Allocations (WLA) for point sources and Load Allocations (LA) for nonpoint sources, including a margin of safety (MOS), and natural background conditions.

Tavlor Creek

The East Fork of the Gila River (from the confluence with the West Fork of the Gila River upstream to Taylor Creek) and Taylor Creek (from the confluence of Taylor and Beaver Creeks upstream to Wall Lake) are part of the greater Gila River Basin Watershed, located in southwestern New Mexico. Stations were located throughout the basin to evaluate the impact of tributary streams and to establish background conditions. As a result of this monitoring effort, multiple exceedances of New Mexico water quality standards for metals (chronic aluminum) were documented on the East Fork of the Gila River and Taylor Creek.

A general implementation plan for activities to be established in the watershed is included in this document. The Surface Water Quality Bureau's Watershed Protection Section will further develop the details of this plan. Implementation of recommendations in this document will be done with full participation of all interested and affected parties. During implementation, additional water quality data will be collected. As a result targets will be re-examined and potentially revised; this document is considered to be an evolving management plan. In the event that new data indicate that the targets used in this analysis are not appropriate or if new standards are adopted, the load capacity will be adjusted accordingly. When water quality standards have been achieved, the reach will be removed from the TMDL list.

Background Information

The East Fork of the Gila River and Taylor Creek are part of the greater Gila River Basin. The Gila River Basin is a watershed shared between New Mexico and Arizona. Both reaches in this TMDL are within the New Mexico state boundary. East Fork of the Gila River has a 326 mi^2 drainage area and is located in southwestern New Mexico. Taylor Creek has a drainage area of 102 mi^2 and is upstream of the East Fork of the Gila River. Both sub-basins are dominated by forested land, which almost completely consist of U.S. Forest Service managed lands (see figures 1 and 2). The reaches under consideration in this TMDL are 7.5 miles (East Fork of the Gila River) and 2.9 miles (Taylor Creek), neither of which has known point sources.

Surface water quality monitoring stations were used to characterize the water quality of the stream reaches. Stations were located to evaluate the impact of tributary streams, and to establish background conditions. As a result of monitoring efforts, several exceedances of New Mexico water quality standards for metals (dissolved aluminum) were documented on the East Fork of the Gila River and Taylor Creek. The East Fork of the Gila River was not found to be impaired for other constituents. Taylor Creek was also found to be impaired due to temperature. TMDLs for temperature will be addressed in another TMDL document.

Endpoint Identification

Target Loading Capacity

Overall, the target values for both TMDLs will be determined based on 1) the presence of numeric criteria, 2) the degree of experience in applying the indicator and 3) the ability to easily monitor and produce quantifiable and reproducible results. For this TMDL document target values for metals are based on numeric criteria.

Metals (dissolved aluminum)

> According to the New Mexico water quality standards (20.6.4.900.J NMAC) the State's standard leading to an assessment of use impairment is the numeric criteria stating that "chronic dissolved aluminum shall not exceed 87 ug/L" and "acute dissolved aluminum shall not exceed 750 ug/L" for all subcategories of fisheries.

Although there are no adverse affects to biota at acute levels of 750 ug/L, or chronic levels of 87 ug/L, high chronic levels of dissolved aluminum are toxic to fish, benthic invertebrates, and some single-celled plants. Chronic dissolved aluminum concentrations from 100 to 300 ug/L increases mortality, and retards growth, gonadal development, and egg production of fish (http://h2osparc.wq.ncsu.edu).

Exceedances of the numeric criteria for both chronic and acute aluminum were observed during the summer and fall of 1996, and summer of 1999 water quality sampling runs. These exceedances resulted in the listing of both Taylor Creek and the East Fork of the Gila River for metals (chronic aluminum), and the drafting of this TMDL document.

To be conservative, this TMDL was drafted for chronic aluminum, which should also protect against any acute exceedances.

Flow

Metals concentrations in a stream vary as a function of flow. As flow increases the concentration of metals can increase. These TMDLs are calculated for the East Fork of the Gila River and Taylor Creek at a specific flow. When available, US Geological Survey (USGS) gages are used to estimate flow. Where gages are absent or poorly located along a reach, either actual flows are measured as water quality samples are being taken or geomorphological cross sectional information is taken to model the flows. In the development of these TMDLs, we used the greatest monthly mean flow data from USGS gage #9430500, located near the town of Gila. Estimates were calculated for both Taylor Creek and East Fork of the Gila using percent of watershed area draining to this gage. It is important to remember that the TMDL is a planning tool to be used to achieve water quality standards. Since flows vary throughout the year in these systems the target load will vary based on the changing flow. Management of the load should set a goal at water quality standards attainment, not meeting the calculated target load.

Calculations

A target load for metals (chronic aluminum) is calculated based on a flow, the current water quality standards, and a unit-less conversion factor, 8.34 that is a used to convert mg/L units to lbs/day (see Appendix A for Conversion Factor Derivation). The target loads (TMDLs) predicted to attain standards were calculated using Equation 1 and are shown in Table 1.

Equation 1. critical flow (mgd) x standard (mg/L) x 8.34 (conversion factor) = target loading capacity

Table 1: Calculation of Target Loads

Location	Flow* (mgd)	Standard Metals Dissolved Aluminum (mg/L)	Conversion Factor	Target Load Capacity (lbs/day)
East Fork of the Gila River	204.9	.087	8.34	148.7
Taylor Creek	64.0	.087	8.34	46.4

*Greatest monthly mean flow taken from USGS gage #9430500 and estimated as a percentage of watershed area draining to this gage.

The measured loads were calculated using Equation 1. The flows were the same flows used in calculating the target load that were estimated from a USGS gage. The geometric mean of the data that exceeded the standards from the data collected at each site for dissolved aluminum and was substituted for the standard in Equation 1. The same conversion factor of 8.34 was used. Results are presented in Table 2.

Figure 1

HUC 5 NAME

O Bar O Canyon

HUC	ACRES	MI^2
1010010	24,390	38.11
1010020	18,131	28.33
1010030	24,848	38.83
1010040	32,116	50.18
1010050	30,740	48.03
1010060	16,635	25.99
1010070	29,284	45.76
1010080	22,098	35.53
1010090	23,753	37.11
1010100	16,957	26.50
		373.36

Corduroy Creek

HUC	ACRES	MI^2
1020010	30,038	46.93
1020020	24,912	38.93
1020030	24,921	38.94
1020040	30,417	47.53
1020050	27,279	42.62
1020060	35,864	56.04
1020070	28,588	44.67
		315.65

Wall Lake

HUC	ACRES	MI^2
1040010	21,562	33.69
1040020	23,226	36.29
1040030	13,614	21.27
1040040	25,572	39.96
1040050	23,036	35.99
1040060	23,647	36.95
1040070	19,607	30.64
1040080	31,491	49.20
1040090	24,577	38.40
		322.39

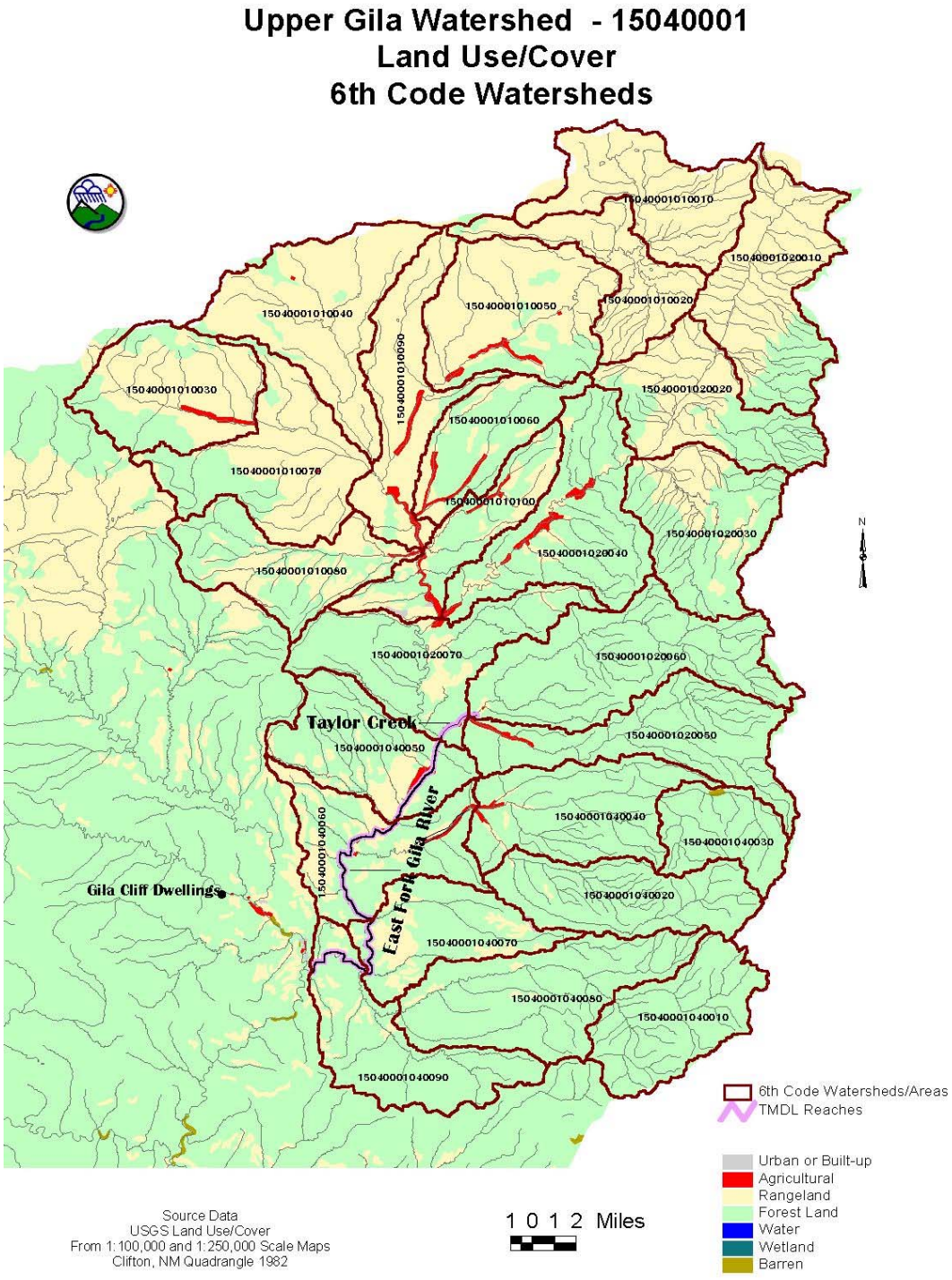

Figure 2

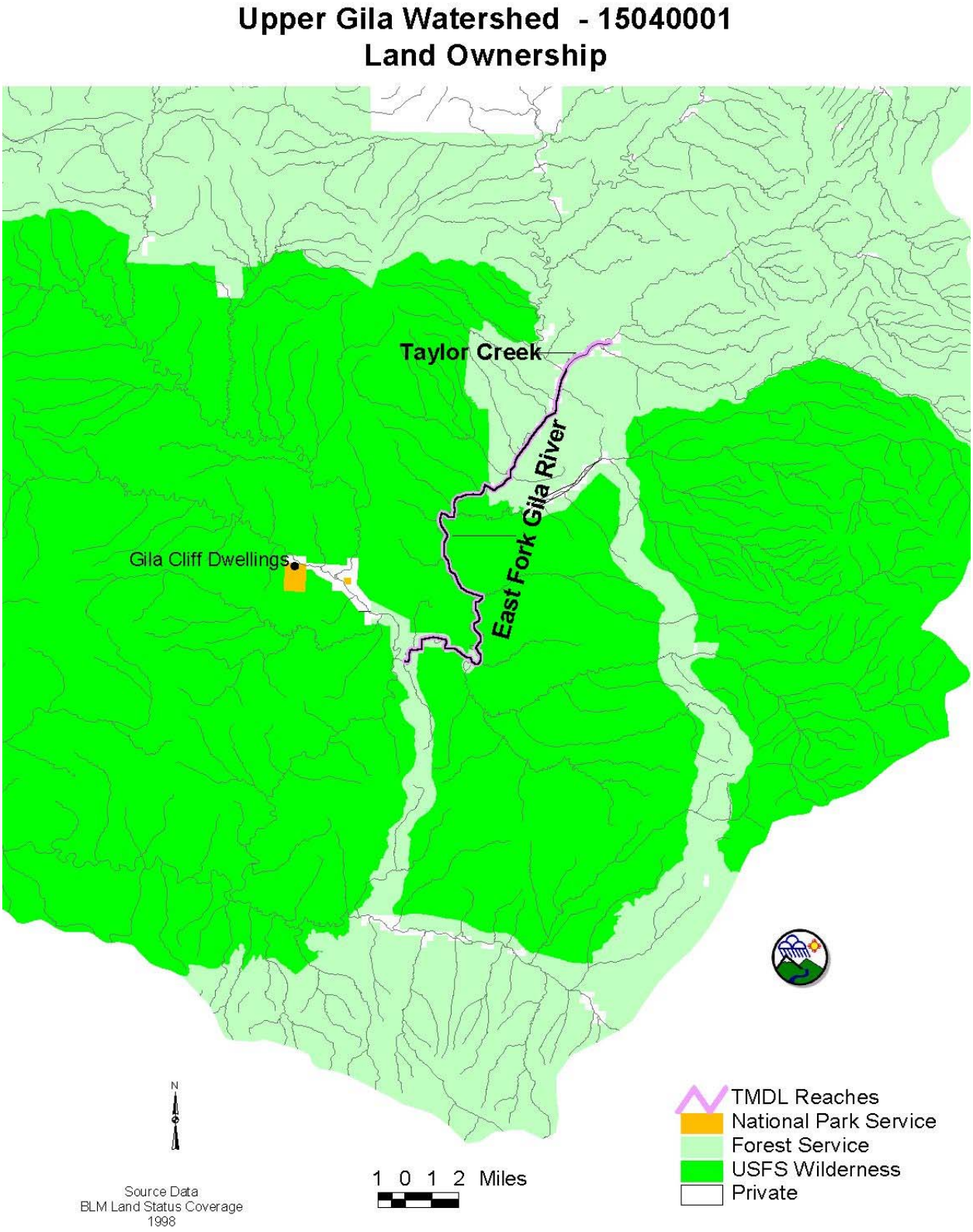
Upper Gila Watershed - 15040001
Land Ownership
Taylor Creek
East Fork Gila River
Gila Cliff Dwellings
N
1 0 1 2 Miles
Source Data
BLM Land Status Coverage
1998
TMDL Reaches
National Park Service
Forest Service
USFS Wilderness
Private

Table 2: Calculation of Measured Loads

Location	Flow* (mgd)	Field Measurements‡ Dissolved Aluminum (mg/L)	Conversion Factor	Measured Load (lbs/day)
East Fork of the Gila River	204.9	~~.505~~ 0.410	8.34	~~863.0~~ 700.6
Taylor Creek	64.0	~~.75~~ 0.707	8.34	~~400.3~~ 377.4

*Greatest monthly mean flow taken from USGS gage #9430500 and estimated as a percentage of watershed area draining to this gage.
‡This is the geometric mean of metals (dissolved aluminum) values that exceeded the numeric standard (see Appendix B).

Background loads were not possible to calculate in this watershed. A reference reach, having similar stream channel morphology and flow, was not found. It is assumed that a portion of the load allocation is made up of natural background loads. In future water quality surveys, finding a suitable reference reach will be a priority.

Waste Load Allocations and Load Allocations

Waste Load Allocation (WLA)

There are no point source contributions associated with this TMDL. The waste load allocation is zero.

Load Allocation (LA)

In order to calculate the load allocation (LA) the waste load allocation (WLA), background, and margin of safety (MOS) were subtracted from the target capacity (TMDL) following Equation 2.

Equation 2. $WLA + LA + MOS = TMDL$

Results are presented in Table 3 (Calculation of TMDLs for Metals).

Table 3: Calculation of TMDL for Metals (aluminum)

Location	WLA (lbs/day)	LA (lbs/day)	MOS (15%) (lbs/day)	TMDL (lbs/day)
East Fork of the Gila River	0	126.4	22.3	148.7
Taylor Creek	0	39.4	7.0	46.4

The load reductions that would be necessary to meet the target loads were calculated to be the difference between the target load (Table 1) and the measured load (Table 2), and are shown in Table 4 (Calculation of Load Reductions). For example, for Taylor Creek, achieving the target load of 46.4 lbs/day would require a load reduction of 353.9 lbs/day.

Table 4: Calculation of Load Reductions (in lbs/day)

Location	Target Load	Measured Load	Load Reduction
East Fork of the Gila River	148.7	~~863.0~~ 700.6	~~714.3~~ 551.9
Taylor Creek	46.4	~~400.3~~ 377.4	~~353.9~~ 331.0

Identification and Description of Pollutant Source(s)

Table 5: Pollutant Source Summary

Pollutant Sources (% from each)	**Magnitude** (WLA + LA + MOS)	**Location**	**Potential Sources**
Point (0%): None	0	--------	None
Nonpoint (100%): •Metals (aluminum)	148.7	East Fork Gila	Natural, Removal of Riparian Vegetation, Rangeland, and Forest Management
	46.4	Taylor Creek	Natural, Rangeland, Recreation, and Upstream Impoundment

Linkage of Water Quality and Pollutant Sources

Taylor Creek

Where available data are incomplete or where the level of uncertainty in the characterization of sources is large, the recommended approach to TMDLs requires the development of allocations based on estimates utilizing the best available information.

SWQB fieldwork includes an assessment of the potential sources of impairment (SWQB/NMED 1999a). The Pollutant Source(s) Documentation Protocol, shown as Appendix C, provides an approach for a visual analysis of a pollutant source along an impaired reach.

Although this procedure is subjective, SWQB feels that it provides the best available information for the identification of potential sources of impairment in this watershed. Table 5 (Pollutant Source Summary) identifies and quantifies potential sources of nonpoint source impairments along each reach as determined by field reconnaissance and assessment. A further explanation of the sources follows.

East Fork of the Gila River

In general, increased metals in the water column can commonly be linked to increased turbidity, where metals are naturally abundant in the sediment. Examination of the state's geologic map (Dane and Bachman, 1965) shows that East Fork of the Gila runs primarily through quaternary age basalt and basaltic andesite flows. Basalt is a mafic, volcanic rock, composed of 16.8% Al_2O_3, which is derived from its plagioclase feldspar constituent ($CaAlSi_2O_8$). Andesite is an intermediate volcanic rock composed of 52-66% SiO_2 and 17% Al_2O_3. Because aluminum is a major constituent of the sediment in this area, it is not surprising to see such high quantities in the water column, especially when associated with high flows and turbidity.

The upper drainage of the East Fork Gila River has a large stand of pinon pine and junipers, which contribute to erosion by encroachment and subsequent inhibiting of native groundcover. Historical fire suppression in the area has propagated this type of ecosystem. Historically, farms and homesteads were located along this reach. The practices employed during historical periods of poor land management, result in an area characterized by low regenerative abilities, erosive soils, and poor riparian areas.

Loss of fire in the ecology of many western forests is an historical fact and much has been written about the changes to the vegetative state of the forest, increased erosion, and changes to watershed runoff characteristics due to fire suppression. Fire suppression leads to catastrophic wildfires, pinon-juniper encroachment, and other changes in the watershed. Catastrophic wildfires (and even low intensity wildfires) increase surface erosion and sediment delivery rates by removing the litter layer and organic debris that traps sediment on hillsides and along the stream channel. Catastrophic wildfires also can greatly increase surface erosion by temporarily creating a hydrophobic soil layer. Erosion rates are also affected by the loss of ground cover as raindrop impact is the primary mechanism for detaching the soil particle and ground cover reduces the impact force of the individual raindrop. Roots of the associated cover also play a role in reducing erosion by binding the soil and holding it in place during sheet wash and rilling. The same factor (loss of ground cover) is associated with over-grazing.

Results from biological sampling at selected sampling sites are used to assess degree of impairment. Benthic macroinvertebrates have been collected at two sites on the East Fork of the Gila River seasonally over the course of several years. The Gila National Forest collected the most recent data on June 9, 1999. The East Fork Gila River at Grapevine Campground (EFGR3) was used as a reference site for the East Fork Gila upstream from the Diamond Creek confluence (EFGR1). The EPT (Ephemeroptera, Plecoptera, Tricoptera) Index was 10 at EFGR1 and 11 at EFGR3 (the reference site).

Closer examination of specific genus and species present at the reference site indicates slight enrichment (due the abundance of *Hydropsyche venada* and *Petrophila* sp., for example) but overall good condition. The number of taxa differed little at both sites from those of previous years; 29 at EFGR3 and 27 at EFGR1. Standing benthic crops were generally the same order of magnitude as found in June 1998 at EFGR3, but were reduced by 35% at EFGR1. One third of the standing crop found in EFGR1 was comprised of the sensitive caddisfly *Culoptila* sp.. Diversity indices were good (>3.40) at both locations.

The overall biological condition, using EFGR3 as a reference location showed that EFGR1, in 1999, was "non-impaired" with 93% of the reference site conditions present.

The macroinvertebrate community at EFGR1 showed considerable improvement when compared to the results of the June 1998 sampling run, when it was rated as "slightly impaired" with only 59% of the reference location conditions present.

Taylor Creek

The primary sources of impairment along Taylor Creek consist of recreational activities, rangeland (historical grazing practices), as well as upstream impoundment. Upstream impoundment generally has the effect of decreasing sediment loads downstream, by trapping upstream sediment. However, the dam at Wall Lake is mostly filled with sediment, therefore sediment storage is minimal. Much of the entrained sediment is transported downstream beyond the lake and into the stream during large flows. Flows into Wall Lake are 40% contributed by Hoyt Creek Springs and subsequent summer rainfall events. Historically, there were numerous tin mines up Hoyt canyon.

Taylor Creek runs primarily through tertiary age rhyolite flows with phenocrysts of sandinine ($KAlSi_3O_8$) and smoky quartz. Rhyolite is a light-colored, felsic lithology, which is composed 71% of SiO_2 and 14% of aluminum oxide Al_2O_3 (Travis, 1955).

The field data show aluminum exceedances occurring only in the monsoonal season when flow and turbidity were both extremely high. Considering the geological composition of the area surrounding both Taylor Creek and East Fork of the Gila, aluminum is most likely directly linked to naturally occurring sediment transport. Because the dissolved aluminum exceedences occurred coincidently with turbidity exceedances, future TMDL's may have to be written for turbidity on these two reaches.

Margin of Safety (MOS)

TMDLs should reflect a margin of safety based on the uncertainty or variability in the data, the point and nonpoint source load estimates, and the modeling analysis. For this TMDL, there will be no margin of safety for point sources, since there are none.

However, for the nonpoint sources the margin of safety is estimated to be an addition of **15%** for metals to the TMDLs for East Fork of the Gila River and Taylor Creek, excluding the background. This margin of safety incorporates several factors:

•*Errors in calculating NPS loads*

A level of uncertainty exists in sampling nonpoint sources of pollution. Analytical techniques used for measuring metals concentrations in stream water are 15% accurate. Accordingly, a conservative margin of safety for metals increases the TMDL by 15%.

•*Errors in calculating flow*

Flow estimates were based on a USGS gage located downstream of sampling sites on both Taylor Creek and East Fork of the Gila River. Flow was then estimated as percent of watershed draining to this gage. Conservative values were used to calculate loads and do not warrant an additional MOS.

Consideration of Seasonal Variation

Aluminum data used in the calculation of this TMDL were collected during spring, summer, and fall in order to ensure coverage of any potential seasonal variation in the system. Critical condition is set to the greatest monthly mean flows for metals. Data where exceedances were seen (during high monsoonal flows) were used in the calculation of the measured loads.

Future Growth

Estimations of future growth are not anticipated to lead to a significant increase for metals that cannot be controlled with best management practice implementation in this watershed. Both the East Fork of the Gila River and Taylor Creek are predominantly on federally managed lands.

Monitoring Plan

Pursuant to Section 106(e)(1) of the Federal Clean Water Act, the SWQB has established appropriate monitoring methods, systems and procedures in order to compile and analyze data on the quality of the surface waters of New Mexico. In accordance with the New Mexico Water Quality Act, the SWQB has developed and implemented a comprehensive water quality monitoring strategy for the surface waters of the State.

The monitoring strategy establishes the methods of identifying and prioritizing water quality data needs, specifies procedures for acquiring and managing water quality data, and describes how these data are used to progress toward three basic monitoring objectives: to develop water quality-based controls, to evaluate the effectiveness of such controls and to conduct water quality assessments.

The SWQB utilizes a rotating basin system approach to water quality monitoring. In this system, a select number of watersheds are intensively monitored each year with an established return frequency of every five years. The SWQB maintains a current quality assurance and quality control plan to cover all monitoring activities. This document, "Quality Assurance Project Plan for Water Quality Management Programs" (QAPP) is updated annually (SWQB/NMED 2001). Current priorities for monitoring in the SWQB are driven by the 303(d) list of streams requiring TMDLs. Short-term efforts will be directed toward those waters which are on the EPA TMDL consent decree (Forest Guardians and Southwest Environmental Center v. Carol Browner, Administrator, US EPA, Civil Action 96-0826 LH/LFG, 1997) list and which are due within the first two years of the monitoring schedule. Once assessment monitoring is completed, those reaches showing impacts and requiring a TMDL will be targeted for more intensive monitoring. The methods of data acquisition include fixed-station monitoring, intensive surveys of priority water bodies, including biological assessments, and compliance monitoring of industrial, federal and municipal dischargers, and are specified in the SWQB Assessment Protocol (SWQB/NMED 2000).

Long term monitoring for assessments will be accomplished through the establishment of sampling sites that are representative of the waterbody and which can be revisited every five years. This gives an unbiased assessment of the waterbody and establishes a long term monitoring record for simple trend analyses. This information will provide time relevant information for use in 305(b) assessments and to support the need for developing TMDLs.

The approach provides:

- a systematic, detailed review of water quality data, allowing for a more efficient use of valuable monitoring resources.
- information at a scale where implementation of corrective activities is feasible.
- an established order of rotation and predictable sampling in each basin which allows for enhanced coordinated efforts with other programs.
- program efficiency and improvements in the basis for management decisions.

It should be noted that a basin would not be ignored during its five to seven year intensive sampling rotation. The rotating basin program will be supplemented with other data collection efforts. Data will be analyzed, field studies will be conducted, to further characterize identified problems, and TMDLs will be developed and implemented. Both long term and field studies can contribute to the 305(b) report and 303(d) listing processes.

The following schedule is a draft for the sampling seasons through 2004 and will be followed in a consistent manner to support the New Mexico Unified Watershed Assessment (UWA) and the Nonpoint Source Management Program. This sampling regime allows characterization of seasonal variation through sampling in spring, summer, and fall for each of the watersheds.

- 1998 Jemez Watershed, Upper Chama Watershed (above El Vado), Cimarron Watershed, Santa Fe River, San Francisco Watershed
- 1999 Lower Chama Watershed, Red River Watershed, Middle Rio Grande, Gila River Watershed (summer and fall), Santa Fe River
- 2000 Gila River Watershed (spring), Dry Cimarron Watershed, Upper Rio Grande 1 (Pilar north to the NM/CO border), Shumway Arroyo
- 2001 Upper Rio Grande 2 (Pilar south to Cochiti Reservoir), Upper Pecos Watershed (Ft Sumner north to the headwaters)
- 2002 Canadian River Watershed, San Juan River Watershed, Mimbres Watershed
- 2003 Lower Pecos Watershed (Ft. Sumner south to the NM/TX border including Ruidoso), Lower Rio Grande (southern border of Isleta Pueblo south to the NM/TX border)
- 2004 Rio Puerco Watershed, Closed Basins, Zuni Watershed

Implementation Plan

Management Measures

Management measures are "economically achievable measures for the control of the addition of pollutants from existing and new categories and classes of nonpoint sources of pollution, which reflect the greatest degree of pollutant reduction achievable through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives" (USEPA, 1993). A combination of best management practices (BMPs) and public education will be used to implement this TMDL.

Introduction

The uptake and transport of metals in surface waters can pose a considerable nonpoint source pollution problem. Metals such as aluminum, lead, copper, iron, zinc and others can occur naturally in watersheds in amounts ranging from trace to highly mineralized deposits. Some metals are essential to life at low concentrations but are toxic at higher concentrations. Metals such as cadmium, lead, mercury, nickel, and beryllium represent known hazards to human health. The metals are continually released into the aquatic environment through natural processes, including weathering of rocks, landscape erosion, geothermal or volcanic activity. The metals may be introduced into a waterway via headcuts, gullies or roads. Depending on the characteristics of the metal, it can be dissolved in water, deposited in the sediments or both. Metals become dissolved metals in water as a function of the pH of a water system. In urban settings, storm water runoff can increase the mobilization of many metals into streams.

Examples of sources that can cause metals contamination:

- Activities such as resource extraction, recreation, some agricultural activities and erosion can contribute to nonpoint source pollution of surface water by metals.
- Stormwater runoff in industrial areas may have elevated metals in both sediments and the water column.

Actions to be Taken

On this watershed the primary focus will be on the control of dissolved aluminum listed in the CWA §303(d) report as exceeding the State of New Mexico Standards for Interstate and Intrastate Surface Waters.

During the TMDL process in this watershed, point sources have been reviewed and will be addressed through the permit process. The nonpoint source contributions will need to address aluminum exceedances through BMP implementation. In addition, sediment loads may need to be addressed.

BMPs can be implemented to address and remediate metal contamination. They include, but are not limited to:

1. Wetlands are used to filter runoff water and sediment from source areas in the watershed. Metals may be bound up in the root systems of wetlands vegetation, preventing them from entering a waterway. (The Use of Wetlands for Improving Water Quality to Meet Established Standards, 1992, Filas and Wildeman.)

2. Improving the pH in a stream. Neutral to alkaline pH waters will generally not pose a metal exceedance problem. An acidic pH will dissolve available metals.

   In such a case, a remedy for metals contamination could be an adjustment of the pH of runoff before it enters the water body. An approach may be the construction of an anoxic alkaline drain to raise the pH and precipitate the contained metals. An anoxic alkaline drain is constructed by placing a high pH material in a trench between runoff and the stream to be used as a buffer (Red River Groundwater Investigation- NMED-SWQB-Nonpoint Source Pollution Section, 1996, D. Slifer).

3. A method for reducing metals used in controlled situations includes the use of sulfate and sulfate reducing bacteria. The sulfate, (if not already present), and the sulfate reducing bacteria are applied into the water column. This provides a mechanism for some metals to precipitate out of solution. (A Treatment of Acid Mine Water Using Sulfate-Reducing Bacteria, 1979, Wakao, Saurai, and Shiota).

4. Stormwater and construction BMPs can be used to divert flows off metal-producing areas directing them away from streams into areas where the flows may infiltrate, evaporate, or accumulate in sediment retention basins.

(Conservation Design for Stormwater Management: A Design Approach to Reduce Stormwater Impacts from Land Development and Achieve Multiple Objectives Related to Land Use, 1997, Delaware Department of Natural Resources and Environmental Control, Sediment and Stormwater Program & the Environment Management Center, Brandywine Conservancy.

Additional sources of information for BMPs to address metals are listed below. Some of these documents are available for viewing at the New Mexico Environment Department, Surface Water Quality Bureau, Watershed Protection Section Library, 1190 St. Francis Drive, Santa Fe, New Mexico.

Mining

Internet websites:

- http://www.epa.gov/region2/epd/98139.htm
- http: www.epa.gov/OSWRCRA/hazwast/ldr/mining/docs/hhed1196.pdf

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  Construction Sites
  Developed Areas
  Sand and Gravel Pits
  Farms, Golf Courses, and Lawns

Other BMP activities in the Watershed

The following are activities in this watershed that have occurred, are occurring, or are in the planning stages to address metals sources or other nonpoint source issues. Currently there are no §319(h) projects or road closures in these watersheds. However, there has been some prescribed burning and grazing cutback.

According to the Gila National Forest, the grazing allotments in these reaches include:

Wilderness District- Diamond Bar Allotment- has had no grazing at all since 1997,
Taylor Creek Allotment- is authorized for 263 animal units but has had no grazing at all since 1998,

Black Range District- Alexander Allotment-had a recent change in the grazing plan. It has been combined with the Corduray and Burnt Cabin allotments and gone from year-round grazing to seasonal grazing, changed from cow/calf operation to a yearling operation with 1129 animal units.

Turkey Run Allotment- is currently performing an Environmental Assessment (EA) for the grazing management plan on the allotment but no there are no results yet. They are also performing range improvement by creating upland watering sources (trick tanks) to encourage cattle to stay out of riparian areas. This allotment contains 94 animal units.

Recent Fires and Planned Fire Activities:

The Wilderness District said the only recent catastrophic wildfire was the Divide fire in 1989, the Bonner fire in 1996, and several smaller, low intensity fires of approximately 20-30 acres have been allowed to burn in the last few years. There are currently no planned or prescribed burns in the Wilderness District, however, if lightening causes any fires they will decide on a case by case basis to let them burn or to suppress them. The Black Range District has conducted a prescribed fire in the Indian Peaks area starting in March 2001, and continuing to the present. This prescribed fire was estimated by the District to have burned approximately 13,000 acres in mixed ponderosa, pinion, and juniper.

Coordination

In this watershed public awareness and involvement will be crucial to the successful implementation of this plan and improved water quality. Staff from the SWQB will work with stakeholders to provide the guidance in developing the Watershed Restoration Action Strategy (WRAS). The WRAS is a written plan intended to provide a long-range vision for various activities and management of resources in a watershed. It includes opportunities for private landowners and public agencies in reducing and preventing impacts to water quality. This long-range strategy will become instrumental in coordinating and achieving a reduction of metals levels and will be used to prevent water quality impacts in the watershed. SWQB staff will assist with any technical assistance such as selection and application of BMPs needed to meet WRAS goals. Stakeholder public outreach and involvement in the implementation of this TMDL will be ongoing. Stakeholders in this process will include SWQB, and other members of the Watershed Restoration Action Strategy, including the Gila National Forest, and the Gila Permitees Association.

Implementation of BMPs within the watershed to reduce pollutant loading from nonpoint sources will be on a voluntary basis. Reductions from point sources will be addressed in revisions to discharge permits.

Time Line

Implementation Actions	Year 1	Year 2	Year 3	Year 4	Year 5
Public Outreach and Involvement	X	X	X	X	X
Establish Milestones	X				
Secure Funding	X		X		
Implement Management Measures (BMPs)		X	X		
Monitor BMPs		X	X	X	
Determine BMP Effectiveness				X	X
Re-evaluate Milestones				X	X

Section 319(h) Funding Options

The Watershed Protection Section of the SWQB provides USEPA §319(h) funding to assist in implementation of BMPs to address water quality problems on reaches listed on the §303(d) list or which are located within Category I Watersheds as identified under the Unified Watershed Assessment of the Clean Water Action Plan.

These monies are available to all private, for profit and nonprofit organizations that are authenticated legal entities, or governmental jurisdictions including: cities, counties, tribal entities, Federal agencies, or agencies of the State. Proposals are submitted by applicants through a Request for Proposal (RFP) process and require a non-federal match of 40% of the total project cost consisting of funds and/or in-kind services. Further information on funding from the Clean Water Act §319 (h) can be found at the New Mexico Environment Department website: http://www.nmenv.state.nm.us.

Assurances

New Mexico's Water Quality Act (Act) does authorize the Water Quality Control Commission to "promulgate and publish regulations to prevent or abate water pollution in the state" and to require permits. The Act authorizes a constituent agency to take enforcement action against any person who violates a water quality standard. Several statutory provisions on nuisance law could also be applied to nonpoint source water pollution. The Water Quality Act (20 NMAC 6.2) (NMWQCC 1995a) also states in §74-6-12(a):

> *The Water Quality Act (this article) does not grant to the commission or to any other entity the power to take away or modify the property rights in water, nor is it the intention of the Water Quality Act to take away or modify such rights.*

In addition, the State of New Mexico Surface Water Quality Standards (see Section 1100E and Section 1105C) (NMWQCC 1995b) states:

> *These water quality standards do not grant the Commission or any other entity the power to create, take away or modify property rights in water. New Mexico policies are in accordance with the federal Clean Water Act §101(g):*

It is the policy of Congress that the authority of each State to allocate quantities of water within its jurisdiction shall not be superseded, abrogated or otherwise impaired by this Act. It is the further policy of Congress that nothing in this Act shall be construed to supersede or abrogate rights to quantities of water, which have been established by any State.

> *Federal agencies shall co-operate with State and local agencies to develop comprehensive solutions to prevent, reduce and eliminate pollution in concert with programs for managing water resources*.

New Mexico's Clean Water Action Plan has been developed in a coordinated manner with the State's 303(d) process.

All Category I watersheds identified in New Mexico's Unified Watershed Assessment process are totally coincident with the impaired waters lists for 1996 and 1998 as approved by EPA. The State has given a high priority for funding, assessment, and restoration activities to these watersheds.

The description of legal authorities for regulatory controls/management measures in New Mexico's Water Quality Act does not contain enforceable prohibitions directly applicable to nonpoint sources of pollution.

The Act does authorize the Water Quality Control Commission to "promulgate and publish regulations to prevent or abate water pollution in the state" and to require permits. Several statutory provisions on nuisance law could also be applied to nonpoint source water pollution.

NMED nonpoint source water quality management utilizes a voluntary approach. The state provides technical support and grant monies for implementation of BMPs and other NPS prevention mechanisms through §319 of the Clean Water Act. Since portions of this TMDL will be implemented through NPS control mechanisms, the New Mexico Nonpoint Source Program will target efforts to this and other watersheds with TMDLs. The Nonpoint Source Program coordinates with the Nonpoint Source Taskforce. The Nonpoint Source Taskforce is the New Mexico statewide focus group representing federal and state agencies, local governments, tribes and pueblos, soil and water conservation districts, environmental organizations, industry, and the public. This group meets on a quarterly basis to provide input on the §319 program process, to disseminate information to other stakeholders and the public regarding nonpoint source issues, to identify complementary programs and sources of funding, and to help review and rank §319 proposals.

In order to obtain reasonable assurances for implementation in watersheds with multiple landowners, including Federal, State and private land, NMED has established Memoranda of Understanding (MOUs) with various Federal agencies, in particular the Forest Service and the Bureau of Land Management. MOUs have also been developed with other State agencies, such as the New Mexico State Highway and Transportation Department. These MOUs provide for coordination and consistency in dealing with nonpoint source issues.

New Mexico's Clean Water Action Plan has been developed in a coordinated manner with the State's 303(d) process. All Category I watersheds identified in New Mexico's Unified Watershed Assessment process are totally coincident with the impaired waters list for 1996 and 1998 approved by EPA. The State has given a high priority for funding assessment and restoration activities to these watersheds.

The time required to attain standards for all reaches is estimated to be approximately 10-20 years. This estimate is based on a five-year time frame implementing several watershed projects that may not be starting immediately or may be in response to earlier projects. The cooperation of all watershed stakeholders will be pivotal in the implementation of this TMDL.

Milestones

Milestones will be used to determine if control actions are being implemented and standards attained. For this TMDL, several milestones will be established which will vary and will be determined by the BMPs implemented. Examples of milestones for metals include:

- increases in wetland areas to filter associated reductions in metals concentrations found in the stream.
- increases in stabilized streambanks and enhanced riparian areas to decrease erosion and potential loading of sediment associated with metals into a stream.
- monitoring within a time frame and continued public outreach effort to educate watershed stakeholders on measures to prevent further water quality exceedances.

Milestones will be coordinated by SWQB staff and will be re-evaluated periodically, depending on which BMPs were implemented. Further implementation of this TMDL will be revised based on this reevaluation. As additional information becomes available during the implementation of the TMDL, the targets, load capacity, and allocations may need to be changed. In the event that new data or information show that changes are warranted, TMDL revisions will be made with assistance of the watershed stakeholders. The re-examination process will involve: monitoring pollutant loading, tracking implementation and effectiveness of controls, assessing water quality trends in the waterbody, and re-evaluating the TMDL for attainment of water quality standards. Although specific targets and allocations are identified in the TMDL, the ultimate success of the TMDL is not whether these targets and allocations are met, but whether beneficial uses and water quality standards are achieved.

Public Participation

Public participation was solicited in development of these TMDLs. See Appendix D for flow chart of the public participation process. The draft TMDLs were made available for a 30-day comment period starting **August 14, 2001**. Response to comments is attached as Appendix E of this document. The draft document notice of availability was extensively advertised via newsletters, email distribution lists, webpage postings (http://www.nmenv.state.nm.us/) and press releases to area newspapers.

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Appendices

APPENDIX A Conversion Factor Derivation

APPENDIX B Field Data Used in the Calculation of this TMDL

APPENDIX C Pollutant Sources Documentation Protocol

APPENDIX D Public Participation Process Flow Chart

APPENDIX E Response to Comments

Appendix A: Conversion Factor Derivation

8.34 Conversion Factor Derivation

Million gallons/day **x** Milligrams/liter **x** 8.34 = pounds/day

10^6~~gallons~~/day **x** 3.7854 liters/~~1 gallon~~ **x** 10^{-3}gram/liter **x** 1 pound/454 ~~grams~~ = pounds/day

10^6 (10^{-3}) (3.7854)/454 = 3785.4/454

= 8.3379
= 8.34

Appendix B: Data Used For Calculation of the Measured Load

Location	Date (mmddyy)	Dissolved Al (µg/L)
East Fork Gila River	08/02/1999	**210**
East Fork Gila River	08/03/1999	**800**
East Fork Gila River	11/01/1999	10
East Fork Gila River	11/02/1999	10
East Fork Gila River	03/06/2000	10K
East Fork Gila River	03/07/2000	10K
East Fork Gila River	03/08/2000	10K
East Fork Gila River	03/08/2000	10K

10K = below detection limit
geometric mean of exceedances = 410 µg/L

Location	Date (mmddyy)	Dissolved Al (µg/L)
Taylor Creek Below Wall Lake	08/09/1999	**1000**
Taylor Creek Below Wall Lake	08/10/1999	**500**
Taylor Creek Below Wall Lake	10/25/1999	70
Taylor Creek Below Wall Lake	10/26/1999	30
Taylor Creek Below Wall Lake	02/28/2000	30
Taylor Creek Below Wall Lake	02/29/2000	50
Taylor Creek Below Wall Lake	03/01/2000	10K
Taylor Creek Below Wall Lake	03/01/2000	20

10K = below detection limit
geometric mean of exceedances = 707 µg/L

Appendix C: Pollutant Source(s) Documentation Protocol

POLLUTANT SOURCE(S) DOCUMENTATION PROTOCOL

New Mexico Environment Department
Surface Water Quality Bureau

July 1999

This protocol was designed to support federal regulations and guidance requiring states to document and include probable source(s) of pollutant(s) in their §303(d) Lists as well as the States §305(b) Report to Congress.

The following procedure should be used when sampling crews are in the field conducting water quality surveys or at any other time field staff are collecting data.

Pollutant Source Documentation Steps:

1). Obtain a copy of the most current §303(d) List.

2). Obtain copies of the **Field Sheet for Assessing Designated Uses and Nonpoint Sources of Pollution**.

3). Obtain digital camera that has time/date photo stamp on it from the Watershed Protection Section.

4). Obtain GPS unit and instructions from Neal Schaeffer.

5). Identify the reach(s) and probable source(s) of pollutant in the §303(d) List associated with the project that you will be working on.

6). Verify if current source(s) listed in the §303(d) List are accurate.

7). Check the appropriate box(s) on the field sheet for source(s) of nonsupport and estimate percent contribution of each source.

8). Photodocument probable source(s) of pollutant.

9). GPS the probable source site.

10). Give digital camera to Gary King for him to download and create a working photo file of the sites that were documented.

11). Give GPS unit to Neal Schaeffer for downloading and correction factors.

12). Enter the data off of the **Field Sheet for Assessing Designated Uses and Nonpoint Sources of Pollution** into the database.

13). Create a folder for the administrative files, insert field sheet and photodocumentation into the file.

This information will be used to update §303(d) Lists and the States §305(b) Report to Congress.

FIELD SHEET FOR ASSESSING DESIGNATED USES AND NONPOINT SOURCES OF POLLUTION

CODES FOR USES NOT FULLY SUPPORTED

☐	HQCWF	=	HIGH QUALITY COLDWATER FISHERY	☐	DWS	=	DOMESTIC WATER SUPPLY
☐	CWF	=	COLDWATER FISHERY	☐	PC	=	PRIMARY CONTACT
☐	MCWF	=	MARGINAL COLDWATER FISHERY	☐	IRR	=	IRRIGATION
☐	WWF	=	WARMWATER FISHERY	☐	LW	=	LIVESTOCK WATERING
☐	LWWF	=	LIMITED WARMWATER FISHERY	☐	WH	=	WILDLIFE HABITAT

Fish culture, secondary contact and municipal and industrial water supply and storage are also designated in particular stream reaches where these uses are actually being realized. However, no numeric standards apply uniquely to these uses.

REACH NAME:

SEGMENT NUMBER:

BASIN:

PARAMETER:

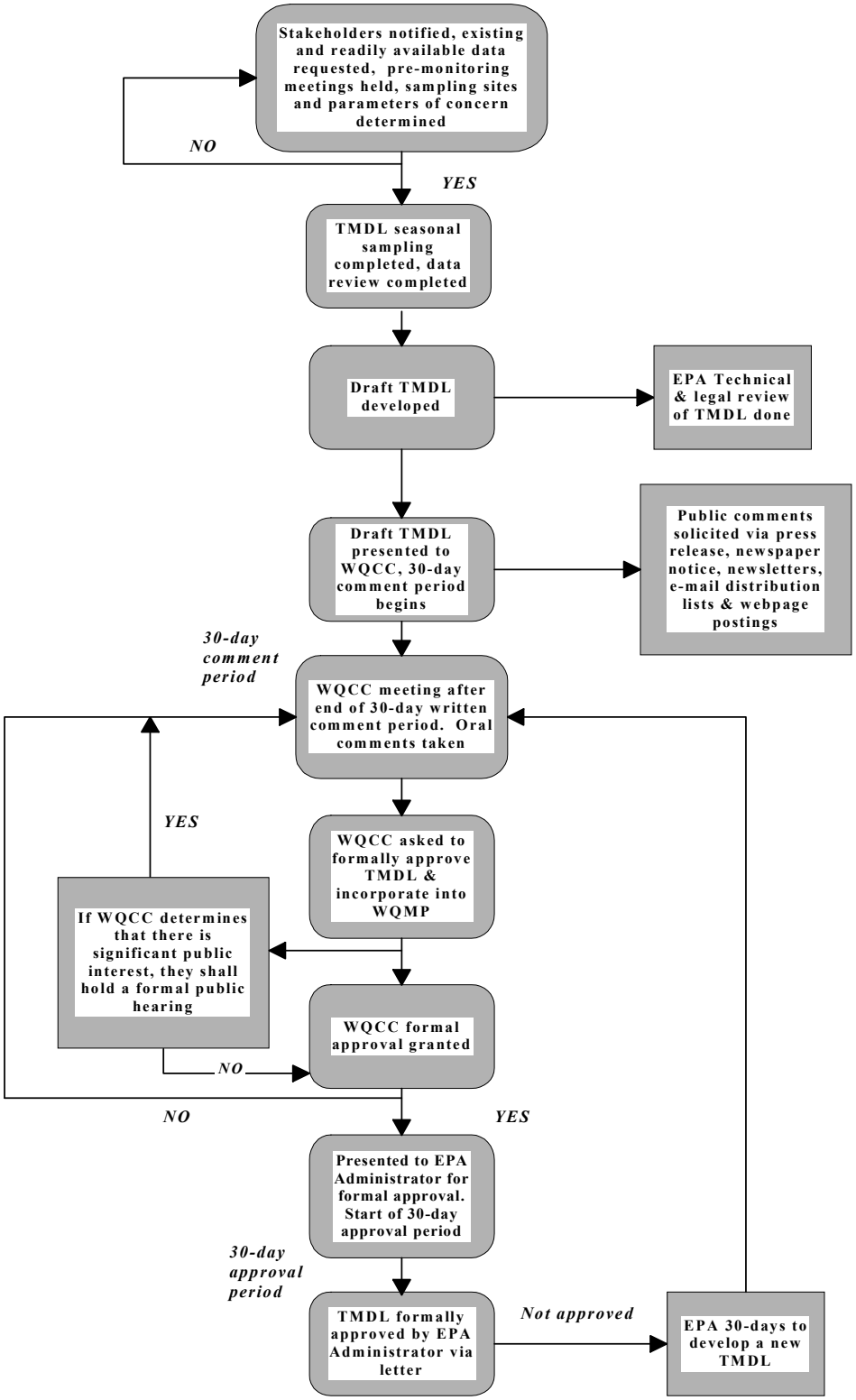
STAFF MAKING ASSESSMENT:

DATE:

CODES FOR SOURCES OF NONSUPPORT (CHECK ALL THAT APPLY)

☐	0100	INDUSTRIAL POINT SOURCES	☐	4000	URBAN RUNOFF/STORM SEWERS	☐	7400	FLOW REGULATION/MODIFICATION
						☐	7500	BRIDGE CONSTRUCTION
☐	0200	MUNICIPAL POINT SOURCES	☐	5000	RESOURCES EXTRACTION	☐	7600	REMOVAL OF RIPARIAN VEGETATION
☐	0201	DOMESTIC POINT SOURCES	☐	5100	SURFACE MINING	☐	7700	STREAMBANK MODIFICATION OR DESTABILIZATION
			☐	5200	SUBSURFACE MINING	☐	7800	DRAINING/FILLING OF WETLANDS
☐	0400	COMBINED SEWER OVERFLOWS	☐	5300	PLACER MINING			
			☐	5400	DREDGE MINING	☐	8000	OTHER
☐	1000	AGRICULTURE	☐	5500	PETROLEUM ACTIVITIES	☐	8010	VECTOR CONTROL ACTIVITIES
☐	1100	NONIRRIGATED CROP PRODUCTION	☐	5501	PIPELINES	☐	8100	ATMOSPHERIC DEPOSITION
☐	1200	IRRIGATED CROP PRODUCTION	☐	5600	MILL TAILINGS	☐	8200	WASTE STORAGE/STORAGE TANK LEAKS
☐	1201	IRRIGATED RETURN FLOWS	☐	5700	MINE TAILINGS	☐	8300	ROAD MAINTENANCE or RUNOFF
☐	1300	SPECIALTY CROP PRODUCTION (e.g., truck farming and orchards)	☐	5800	ROAD CONSTRUCTION/MAINTENANCE 8400	☐	8400	SPILLS
			☐	5900	SPILLS	☐	8500	IN-PLACE CONTAMINANTS
☐	1400	PASTURELAND				☐	8600	NATURAL
☐	1500	RANGELAND	☐	6000	LAND DISPOSAL	☐	8700	RECREATIONAL ACTIVITIES
☐	1600	FEEDLOTS - ALL TYPES	☐	6100	SLUDGE	☐	8701	ROAD/PARKING LOT RUNOFF
☐	1700	AQUACULTURE	☐	6200	WASTEWATER	☐	8702	OFF-ROAD VEHICLES
☐	1800	ANIMAL HOLDING/MANAGEMENT AREAS	☐	6300	LANDFILLS	☐	8703	REFUSE DISPOSAL
☐	1900	MANURE LAGOONS	☐	6400	INDUSTRIAL LAND TREATMENT	☐	8704	WILDLIFE IMPACTS
			☐	6500	ONSITE WASTEWATER SYSTEMS (septic tanks, etc.)	☐	8705	SKI SLOPE RUNOFF
☐	2000	SILVICULTURE				☐	8800	UPSTREAM IMPOUNDMENT
☐	2100	HARVESTING, RESTORATION, RESIDUE MANAGEMENT	☐	6600	HAZARDOUS WASTE	☐	8900	SALT STORAGE SITES
			☐	6700	SEPTAGE DISPOSAL			
☐	2200	FOREST MANAGEMENT	☐	6800	UST LEAKS	☐	9000	SOURCE UNKNOWN
☐	2300	ROAD CONSTRUCTION or MAINTENANCE						
			☐	7000	HYDROMODIFICATION			
☐	3000	CONSTRUCTION	☐	7100	CHANNELIZATION			
☐	3100	HIGHWAY/ROAD/BRIDGE	☐	7200	DREDGING			
☐	3200	LAND DEVELOPMENT	☐	7300	DAM CONSTRUCTION/REPAIR			
☐	3201	RESORT DEVELOPMENT						
☐	3300	HYDROELECTRIC						

Appendix D: Public Participation Flowchart



Appendix E: Response to Comments

September 18, 2001

Sent via facsimile, 505-827-0160, hard copy to follow

Mr. David Hogge
New Mexico Environment Department
Surface Water Quality Bureau
P.O. Box 26110
Santa Fe, NM 87502

RE: Southwestern New Mexico TMDLs

Dear Mr. Hogge:

The following comments on southwestern New Mexico draft TMDLs and proposed de-listing of several streams and waters from the 303(d) list is submitted on behalf of the nearly 6,000 members of the Center for Biological Diversity. The Center for Biological Diversity (CBD), formed in 1989, protects endangered species and wild places of western North America and the Pacific through science, policy, education, and environmental law.

Please include the Center on the mailing list as an interested party for all future actions by the Bureau involving the Clean Water Act 303(d) list and development of TMDL's. Our comments here will be unfortunately brief because we did not receive notice of the Bureau's proposed action until well into the comment period.

NMED Response

The Center for Biological Diversity has been added to our mailing list. Current information on the TMDL program can also be found on our web page (www.nmenv.state.nm.us/swqb/swqb.html).

CBD believes the proposed de-listings are neither adequately justified or explained. The Bureau's reliance on qualitative narrative standards rather than quantitative numerical standards is especially problematic. Additionally, many of the streams are proposed for de-listing despite the fact that their biological assessment numbers are quite low and some appear to be more impaired than the last time an assessment was conducted. For example, Whitewater Creek is proposed for de-listing despite the fact that is scored only 59% on its biological assessment and its percent fines increased from 5% to 13%.

NMED Response

The Protocol for the Assessment of Stream Bottom Deposits is used to determine the level of use attainment using benthic macroinvertebrate and percent fines data collected in the reach being assessed. According to this USEPA-approved protocol, the benthic macroinvertebrate community combined with the percent fines at this site indicate a rating of full support, impacts observed (FSIO). Clarifying text was added to the de-list letter. SWQB plans to refine benthic macroinvertebrate sampling protocols and interpretation methods in the near future.

With respect to the draft TMDL's, the draft documents are very general, and do not provide enough details (i.e. which polluters will be required to act) to provide specific comments. However, CBD is concerned that the Bureau presently appears to be relying solely on Best Management Practices (BMPs) to implement the program. BMP's are mitigation measures, often ineffectual, not measures for actually cleaning up impaired watersheds.

NMED Response

Presently, there is no requirement under the federal Clean Water Act for reasonable assurances for implementation of nonpoint source pollution. As stated in existing guidance (Guidance for Water Quality-Based Decisions: The TMDL Process, EPA 440/4-91-001, April 1991) implementation of nonpoint source BMPs is through voluntary programs such as section 319 of the Clean Water Act. Site-specific or watershed-specific voluntary actions are mechanisms that may provide reasonable assurances for nonpoint sources. The SWQB believes that the Watershed Protection Program in New Mexico is a strong program that will provide for the implementation of nonpoint source BMPs.

In this watershed, public awareness and involvement will be crucial to the successful implementation of BMPs and improved water quality. Staff from the SWQB will work with stakeholders to provide the guidance in developing the Watershed Restoration Action Strategy (WRAS). The WRAS is a written plan intended to provide a long-range vision for various activities and management of resources in a watershed. It includes opportunities for private landowners and public agencies to reduce and prevent impacts to water quality. This long-range strategy will become instrumental in coordination, reducing, and preventing further water quality impacts in the watershed. SWQB staff assists with technical assistance such as the selection and application of BMPs needed to meet WRAS goals. The watershed management plans would include any specific BMPs for activities that may be contributing to the water quality impairment. It is not the intention of the SWQB to provide an all inclusive watershed management plan without watershed participation.

Thank you for this opportunity to comment. Please ensure we are provided copies of future 303(d) and TMDL comments. Notice of the availability of these documents may also be sent to my email address listed in the letterhead.

Sincerely,

Brian Segee

September 12,2001

David Hogge
TMDL Coordinator
NM Environment Department
Surface Water Quality Bureau
1190 St. Francis Drive
Santa Fe, NM 87502

Re: Comments on draft TMDLs for the Gila and San Francisco Watersheds

Dear Mr. Hogge:

The New Mexico Municipal Environmental Quality Association has reviewed the following draft TMDLs. Opened for public comment on August 14, 2001:

- Black Canyon Creek: Temperature
- Centerfire Creek: Conductivity
- East Fork of the Gila River and Taylor Creek: Metals (Chronic aluminum)
- Mogollon Creek: Metals (Chronic aluminum)
- Negrito Creek: Temperature
- San Francisco River: Temperature
- Taylor Creek: Temperature
- Tularosa River: Conductivity
- Whitewater Creek: Turbidity

Association comments are attached, arranged alphabetically by stream segment.

Please contact me or Legislative Liaison Regina Romero at 982-5573 with questions or comments.

Best Regards,

William F. Fulginiti
Executive Director

New Mexico Municipal Environmental Quality Association
Comments Regarding Draft TMDLs for the
Gila River Watershed

September 12, 2001

East Fork of the Gila River and Taylor Creek: Metals (Chronic aluminum)

- An appendix should be included, showing the actual in-stream aluminum results that were used to determine the mean aluminum values used to calculate measured loads in Table 2 on page 5.

NMED Response

An Appendix has been added to the document that includes all the data used to calculate measured loads. A reference to this Appendix was added to the text.

- On page 5 in Table 2, a geometric mean of measured aluminum values that exceeded stream standards was used to calculated the TMDL. The geometric mean is best applied to non-normally distributed statistical populations and may not be accurate for aluminum in natural waters. Please explain the rationale for using a geometric mean rather than an arithmetic mean.

NMED Response

SWQB uses the geometric mean of water quality data that violate water quality standards in calculation of the measured load. Using all the data, including those values below the standard, could weight the geometric mean to a value below the standard. This is consistent to the state standards which are, in general, not based on averages but can be based on an exceedances violation. The SWQB expresses field measurements across TMDL documents in a consistent manner to assist in stakeholder understanding of the documents.

The measured load discussion in the document is not a required element of a TMDL. The purpose of this section is to express the current condition of the watershed to the stakeholders and is useful in the design and implementation of BMPs. This section does not affect the TMDL calculation.

- On page 5, Table 3 should include a reference to derivation of the margin of safety on page 9 of the document.

NMED Response

The Margin of Safety is referenced in the Table of Contents and should provide the reader adequate reference for Table 3.

- On page 8, a phase seems to be missing from the first sentence in the last paragraph.

NMED Response

The first two sentences were re-written to clarify the statement.

- On page 9, one or more references to scientific publications should be included in the discussion of errors in calculating NPS loads, justifying the quoted 15% accuracy for determining metals concentrations in stream water.

NMED Response

SWQB has been consistent in its application of MOS throughout the development of TMDLs. Much of the consideration for developing MOS values is based on information available in the New Mexico Quality Assurance Project Plan (QAPP) for Water Quality Management Programs (2001). The QAPP is approved by EPA annually and provides the framework for water quality monitoring and data collection for the SWQB. This includes the use of precision and accuracy information as an explicit MOS value. Implicit MOS use conservative assumptions and critical conditions, which are consistent with nationally available MOS information.

NMED is in the process of developing a MOS Protocol that will further explore the science and rationale behind the development of specific MOS values for the TMDL documents. This document is expected to be completed in 2002 and will be available on the SWQB website.

- On page 12, BMP number 3 seems ill advised, since it involves further modification of water quality through the addition of chemicals and bacteria, with potential unforeseen consequences.

NMED Response

The intention of this list is to provide stakeholders with some ideas for various BMPs that have been shown to positively impact water quality. It is not the intention of this section to "advise" implementation of any specific BMPs. No changes have been made to the text to address your comment.

- On page 20, the draft TMDL should include a *Measures of Success* section, consistent with other TMDLs drafted for this watershed.

NMED Response

The "Milestones" section of this document is meant to incorporate measures of success. For other documents (eg the temperature TMDLs) specific measures are provided that go beyond general milestones. This is due to having more available information about the watershed or data assessment techniques used for these pollutants. No additional text will be added to this document.

New Mexico Environment Department
Surface Water Quality Bureau
PO Box 26110
Santa Fe, NM 87502

September 13, 2001

RE: Comments on Proposed TMDL for Metals (Chronic Al) for E. Fork of Gila River and Taylor Creek

Via facsimile (505) 827-0160 and mail

To Whom It May Concern;

The following constitute Forest Guardians' comments on the above-named TMDL. We welcome the opportunity to participate in the public decision-making process for an issue as important and crucial to water quality as TMDL development. We hope that our comments are taken into serious consideration as the TMDL moves toward final approval, and we encourage you to continue to keep us informed so that we may continue to be involved in this process.

I. Voluntary Best Management Practices (BMPs)

We contend that voluntary BMP's in the draft implementation plan comply with neither the letter nor the spirit of the Clean Water Act, and will not result in the eventual re-attainment of water quality standards as envisioned by the TMDL process. We therefore urge you to include mandatory BMPs in the final TMDLs in order to assure that water quality standards have a real chance to be attained. We base this comment on the following narrative.

A TMDL consists of a pollutant specific standard and a plan to meet that standard. The standard, or "target load" is the maximum amount of pollution that a river can take from all sources without violating water quality standards. Once this "target load" is established, the TMDL then mandates pollution reductions to the various sources of pollution in a watershed to meet that standard. Pollution reductions are achieved through "load allocations" which set the maximum amount of pollution each source can contribute. These load allocations are referred to as "wasteload allocations" or "WLAs" when applied to point sources and "load allocations" or "LAs" when applied to nonpoint sources. A TMDL, therefore, represents the "sum of the individual WLAs for point sources and LAs for nonpoint sources and natural background." 40 C.F.R. § 130.2(i).

At a minimum, each plan of implementation must include "reasonable assurances" that the
WLAs or LAs will, in fact, be implemented and achieved. With respect to WLAs for point sources, such assurances are easily provided by demonstrating how the load allocations will be incorporated into the permit. 40 C.F.R. §130.7(a). In each permit, effluent limitations can be adjusted to ensure that the pollution reductions succeed. With respect to nonpoint sources, providing these assurances is more difficult because there are generally no permits to adjust. Rather, the TMDLs are implemented via BMPs which are incorporated into a state's water quality management plan as outlined in section 303(e) of the CWA. 33 U.S.C. § 1313(e); 40 C.F.R. § 130.7(a).

Once the "target load" and "load allocations" are established, the TMDL process gets underway. The next step is to transform the calculations in the TMDL into real, on-the-ground results--to implement the TMDL. As a last resort measure, Congress mandated that TMDLs succeed in improving water quality. TMDLs "shall be established at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety which takes into account any lack of knowledge." 33 U.S.C. § 1313(d)(1)(C). EPA agrees, stating that "TMDLs shall be established at levels necessary to attain and maintain . . . water quality standards." 40 C.F.R. § 130.7(c)(1). Whether or not a TMDL will improve water quality is therefore the standard for State TMDLs. 33 U.S.C. § 1313(d)(2).

"Reasonable assurances" are a required element of a TMDL and/or plan to implement a TMDL. Congress' intent to require reasonable assurances that TMDLs will be implemented to improve water quality is clearly reflected in the plain language of section 303 of the CWA, the legislative history of section 303 of the CWA, and the very purpose of the CWA. This is a reasonable conclusion because it ensures that the goals of the CWA are met.

In drafting the language of section 303 of the CWA, Congress consciously used the word "shall." States "shall" prepare TMDLs, "shall" establish such TMDLs at level necessary to implement water quality standards, "shall" disapprove TMDLs that fail to implement water quality standards, and "shall" have a management plan which includes TMDLs and a provision for "adequate implementation." 33 U.S.C. §§ 1313(d)(1)(C), 1313(e)(1), 1313(e)(3)(C), (F).

However the burden will fall primarily on the polluters to ensure that the BMPs are actually implemented. In NMED's own words from other TMDLs, cooperation from the polluters "will be pivotal in implementation of this TMDL." See Cordova Creek TMDL, 1999. The key word in NMED's plan is "cooperation." The polluters in that TMDL, like here, have the option of doing nothing. They can choose not to get involved-not to undertake the expensive and time consuming burden of implementing the BMPs. There are absolutely no obligations or mandates in the plan requiring polluters to implement the necessary BMPs.

By allowing section 319's voluntary program to be the sole basis for implementing the TMDL, the State is ignoring the "reasonable assurance" requirement. Unlike section 319's voluntary, consensus based approach under the CWA, TMDLs must "implement applicable water quality standards." 33 U.S.C. § 1313(d)(1)(C). Thus, unlike section 319 plans, TMDLs must provide assurances that pollution reductions will occur and that water quality will be improved. See 33 U.S.C. § 1313(d)(1)(C). The "purely voluntary" plan to implement the TMDL plainly fails to provide such assurances. As such, there clearly are no assurances that this TMDL will be implemented to improve water quality.

The evidence suggesting that "purely voluntary" plans generally do not work is overwhelming. The failure of sections 208 and 319 of the CWA, two voluntary programs to control nonpoint source pollution, provides a good illustration. Unlike the CWA's point source program, which includes mandatory effluent limitations outlined in federally issued permits, the nonpoint source programs of section 208 and 319 of the CWA are void of any meaningful federal mandates. Both programs are "purely voluntary." They rely on voluntary state planning and implementation, technical assistance, and ineffective financial incentives, rather than mandatory controls, to abate nonpoint source pollution. See 33 U.S.C. §§ 1288(b)(2)(F),1288(j),1329(h). The result is predictable.

Today, while point source pollution is at a twenty year low, nonpoint source pollution is out of control. In EPA's own words, nonpoint source pollution remains the Nation's largest rivers, lakes, and estuaries are not clean enough to meet basic uses such as fishing or swimming. The current nonpoint source pollution problem can be attributed to one factor: State reliance on voluntary compliance.

Under the voluntary schemes of sections 208 and 319 of the CWA, states are opting not to implement nonpoint source controls. States are reluctant to require controls because, as one observer noted, "the expense to states, both in terms of money and the political costs of imposing burdensome regulations on powerful agricultural interests, is potentially significant." See Houck, supra footnote 10 at 527. Without a "meaningful federal mandate, the states, with a few . . . exceptions have not implemented polluted runoff programs of their own." Id.

Even though EPA is well-aware of this fact, the "protection" Agency is allowing states to use the voluntary, incentive-based program under section 319 of the CWA, without any upgrades, to implement TMDLs. Once again, the results are predictable. A 1998 study of 55 TMDLs approved by EPA, many with voluntary implementation plans, showed a "near-total avoidance of implementation measures." Oliver A. Houck TMDLs IV: The Final Frontier, 29 ELR 10469, 10481 (August, 1999). Today, EPA is aware of hundreds of "purely voluntary" TMDLs that are not being implemented.

Indeed, it was the "purely voluntary" nature of the 1965 Water Qaulity Act that led to the 1972 amendments and the birth of the TMDL program. See H.R. 11896 at 68, 69, 106, 107, 92nd Cong. (1972); S. Rep. No. 92-414, at 3675 (1972). Similar congressional concerns over the futility of voluntary measures prompted the 1935 amendments to the Federal Power Act, 16 U.S.C. §§ 797-817, the 1977 and 1990 amendments to the Clean Air Act ("CAA"), 42 U.S.C. §§ 7401-7671q, and the 1990 amendments to the Coastal Zone Management Act, 16 U.S.C. §§ 1451 to 1465 ("CZMA").

As one court noted, the 1935 amendment to the Federal Power Act, "made licensing a mandatory requirement" for all new projects. Cooley v. F.E.R.C., 843 F.2d 1464 (D.C. Cir. 1988) (citing S. Rep. No. 621, 74th Cong., 1st Sess. (1935) and First Iowa Hydro- Electric Coop. v. FPC, 328 U.S. 152 (1946)). The earlier, purely voluntary scheme "had proven inadequate for the development of a comprehensive system of water power regulation." Id.

In the 1977 amendments to the CAA, Congress again recognized the ineffectiveness of voluntary compliance. As the Sixth Circuit noted, "although some voluntary compliance and cooperation was achieved under the former version of the [CAA], Congress clearly found the earlier provisions an inadequate answer to the problem of interstate air pollution. Air Pollution Control Dist. of Jefferson County, Ky. v. U.S.E.P.A., 739 F.2d 1071,1091 (6th Cir.1984) (citing H. R. Rep. No. 294, 95th Cong., 1st Sess. 329). The new mandatory CAA provisions, "were intended to establish an effective mechanism for prevention, control, and abatement of interstate air pollution." Id. at 1091. In 1990, Congress amended the CAA once again, this time replacing a failing "discretionary" state permitting program with a mandatory federally enforceable permitting scheme. See 42 U.S.C. §§ 7661-7661d.

In addition, in 1990 Congress passed the "Coastal Zone Reauthorization Amendments of 1990" (CZARA), amending the 1972 CZMA, because the earlier program of providing federal grant money for "voluntary" state programs to was failing to protect coastal resources from nonpoint source pollution. Under the new approach, participating states are now required to prepare

and submit to EPA for approval, a program to protect coastal waters from nonpoint source pollution. 16 U.S.C. § 1455b(a)(1). Before any federal money is dispersed, each state program must, at a minimum, include "enforceable policies and mechanisms to implement" the program. 16 U.S.C. § 1455(d)(16). CZMA defines "enforceable policy" to mean "State policies which are legally binding through constitutional provisions, laws, regulations, land use plans, ordinances, or judicial or administrative decisions, by which a State exerts control over private and public land and water uses and natural resources."16 U.S.C. § 1453(6a). The existence of an "enforceable policy" provides the requisite assurance that plans will, in fact, be implemented and pollution reductions achieved.

In amending all of these environmental statutes Congress repeatedly and consistently has recognized the futility of "purely voluntary" programs in achieving Congressional goals. Today, a number of states are following Congress' lead by recognizing the need for enforceable policies and abandoning the voluntary approach towards controlling nonpoint source pollution. In Idaho, for instance, the state's water pollution control law imposes an affirmative duty on nonpoint source polluters to implement BMPs in order to meet and implement water quality standards for all waters with TMDLs. See Idaho Code § 39-3618. Failure to implement BMPs in such waters, may result in a civil action from the state agency. See Idaho Code § 39-3622. The enforceable program is working. The TMDLs for Idaho's South Fork of the Salmon River provide a good illustration. These TMDLs, which include mandatory BMPs to minimize sediment inputs from forestry operations (e.g., slope stabilization projects, grass seeding) are succeeding in returning a highly valued Chinook salmon and steelhead population to the once polluted River.

In Maryland, the State's Department of the Environment has the authority to require enforceable permits for certain nonpoint source discharges. See Md. Code. Ann., Envir. § 9- 323(b). In addition, all soil and sediment pollution is prohibited, except for agricultural activities conducted in accordance with soil conservation and water quality plans. See Md. Code. Ann., Envir. § 9-322. A violation of these provisions may result in corrective action orders, injunctions, civil penalties, and even criminal prosecution. See Md. Code. Ann., Envir. §§ 9-334, 9-335, 9- 338, 9-342, 9-343. Other states such as California, Oregon, Georgia, Vermont, and Wisconsin have adopted similar, enforceable approaches towards remedying nonpoint source pollution problems.

As described above, there is an overwhelming amount of evidence suggesting that "purely voluntary" measures are generally ineffective and unreliable. As such, a purely voluntary plan of implementation clearly does not belong in the TMDL. As a last resort measure there must be "reasonable assurances" that all TMDLs will be implemented to improve water quality and, voluntary plans, by themselves, fail to provide such assurances. In fact, NMED even concedes in other TMDLs that even with implementation of numerous BMPs, the waterway at issue may not be able to meet water quality standards.

Therefore, this purely voluntary approach does not belong in this TMDL because, unlike other clean up programs under the CWA, a TMDL comes with a mandate–there must be "reasonable assurances" that the TMDL will be implemented and will improve water quality. We urge the State to adopt measures similar to the ones outlined above and adopted by other States that are effective. We also urge NMED to pressure the Water Quality Control Commission to “promulgate and publish regulations to prevent or abate water pollution in the state” as authorized by New Mexico’s Water Quality Act. This authority is listed as an “Assurance” in the TMDL, and we feel is much more likely to reasonably assure that the TMDL actually leads to the attainment of WQS.

II. Impacts of Grazing

Very little, if any, of the discussion in the permit concerning sources of non-attainment includes a reference to grazing activities on the watershed and their devastating impact on water quality. To the contrary, grazing is primarily mentioned in the section entitled "Other BMP Activities in the Watershed". This section refers to "…the Forest Service and private landowners *actively* manage grazing activities…" (emphasis added). The proposed TMDL is written in reliance on this statement- that the entities involved with grazing are actively managing their activities. Our experience with monitoring grazing allotments on Forest Service lands leads to the complete opposite conclusion: that the entities involved with grazing on Forest service lands are not actively managing their allotments, and are in fact not complying with their management plans, if they have a current one. This is not merely a theory of ours either, as we have filed several lawsuits on the recent past concerning this exact issue in an attempt to force the Forest Service and the allotment holders to comply with their management plans and protect natural resources, including riparian areas and their waterways.

By not addressing impacts of grazing in the TMDL and at the very least developing BMPs to account for the potentially devastating effects of grazing on water quality, we believe the proposed TMDL is deficient and will not effectively reach it's goals. Unless *all* sources of non-point source pollution are addressed in a TMDL, the waterway will continue to be impaired and in need of scarce monetary and physical resources in order to restore it to it's proper condition, and the Clean Water Act's goals will never be realized.

III. Impacts of Water Diversions and Their Maintenance

Again, there is very little to no mention of the impacts of water diversions on this waterway and how they may adversely impact water quality. Thus, there are no strategies which address this source of pollution and no mitigative measures; therefore we seriously doubt that if this water is actually impacted by diversions, it will be able to improve and re-attain water quality standards as required by the Clean Water act.

IV. Impacts of Roads and Road Maintenance Activities

There is similarly very little discussion of roads and their potential or real impacts on the waterway and those effects are not addressed in the BMPs. Again, we question how NMED can seriously attempt to bring this water back into attainment of standards if *all* of the pollution sources are not properly accounted for.

V. Conclusion

We feel that this TMDL, as written, will not lead to a re-attainment of water quality standards in a timely and efficient manner, if at all. Our biggest concern is with the implementation of voluntary BMPs, which we fear will result in non-implementation. History shows that voluntary BMPs and similar measures rarely result in on the ground implementation, and that mandatory measures are the correct steps to take if the State is serious about cleaning up New Mexico's imperiled waters. We also find that the lack of thorough analysis and resultant paucity of corrective measures to address the adverse impacts of water diversions, grazing, and roads on this water is not in line with the Clean Water Act's goals and objectives.

We hope that when the final TMDL is written, you will reconsider this draft and remedy the problems that we have outlined above. Nothing less than the future of New Mexico's imperiled waters is at stake, and this resource is too important to not re-evaluate this potentially high impact document. Thank you for your consideration, and please contact us if you have any questions or concerns with our comments.

Sincerely,

Scott C. Cameron
Clean Water Coordinator
Forest Guardians

NMED Response

Several comments were received from the Forest Guardians. The following are responses by the SWQB to the Forest Guardians comments on the draft TMDL.

The SWQB would like to thank the Forest Guardians for their comments on this TMDL document. Presently, there is no requirement under the federal Clean Water Act for reasonable assurances for implementation of nonpoint source TMDLs. As stated in existing guidance (Guidance for Water Quality-Based Decisions: The TMDL Process, EPA 440/4-91-001, April 1991) implementation of nonpoint source TMDLs is through voluntary programs, such as section 319 of the Clean Water Act. According to the proposed regulations for TMDLs (40CFR part 130.2[p]), site-specific or watershed-specific voluntary actions are mechanisms which may provide reasonable assurances for nonpoint sources. The SWQB has implemented TMDLs statewide through a strong Watershed Protection Program. This program will continue to provide for the implementation of nonpoint source TMDLs.

Pursuant to Section (e)1 of the Clean Water Act (CWA), the Surface Water Quality Bureau (SWQB) has established appropriate monitoring methods to evaluate the effectiveness of controls or Best Management (BMP) activities. In order to optimize the efficiency of this monitoring effort, the SWQB has adopted a rotating basin monitoring strategy. This strategy is based on a 5-7 year return interval, and provides improved coordination and monitoring of BMP effectiveness.

Implementation plans are included in every TMDL in New Mexico. As stated in the TMDL document, this is a general implementation plan for activities to be established in the watershed. The SWQB will further develop the details of the plan with the help and cooperation of the stakeholders and other interested parties in the watershed. Detailed watershed management plans that include specific best management practices (BMPs) should be developed by and for watershed stakeholders. In this watershed, public awareness and involvement will be crucial to the successful implementation of this plan and improved water quality. Staff from the SWQB will work with stakeholders to provide the guidance in developing the Watershed Restoration Action Strategy (WRAS). The WRAS is a written plan intended to provide a long-range vision for various activities and management of resources in a watershed. It includes opportunities for private landowners and public agencies to reduce and prevent impacts to water quality. This long-range

strategy will become instrumental in coordination, reducing, and preventing further water quality impacts in the watershed. SWQB staff assists with technical assistance such as the selection and application of BMPs needed to meet WRAS goals.

The watershed management plans would include any specific BMPs for activities, such as grazing or road runoff and maintenance, that are identified as contributing to the water quality impairment. It is not the intention of the SWQB to provide an all inclusive watershed management plan in the TMDL documents. In order to obtain reasonable assurances for implementation in watersheds with multiple landowners including Federal, State, and private land, the SWQB has established Memoranda of Understanding (MOUs) with various Federal and State agencies. These MOUs provide for co-ordination and consistency in dealing with Nonpoint source issues.

Milestones are also used in the implementation plans in the TMDL documents to determine if BMPs are implemented and standards attained.

The SWQB does not regulate water quantity issues for the State of New Mexico. All inquiries related to water rights should be directed to the Office of the New Mexico State Engineer. The SWQB programs include a focus on upland source controls

COMMENTS SUBMITTED BY LANL

General Comments on all TMDLs

- In each of these documents, TMDLs are established based on knowledge of watershed-specific conditions, including monitoring data. However, in several cases the sections entitled "Linkage of Water Quality and Pollutant Sources" did not include a discussion of how the identified pollutant sources cause the water quality problems. For example, in the TMDL for conductivity in Centerfire Creek the section entitled "Linkage of Water Quality and Pollutant Sources" is a description of riparian Best Management Practices that have been implemented. It does not explain how the pollutant source (listed as "rangeland") causes the increase in conductivity. In addition, the sections entitled "Implementation Plan" were written at a level of generality that made it difficult to track suggested best management practices (BMPs) back to the specific watershed.

NMED Response

During the regularly scheduled watershed sampling, as well as any other water quality sampling, the NMED works to examine and document potential sources of water quality impairment along 303(d) listed waters. Unlike point sources, nonpoint source pollution in not always easily identified and tracked in a watershed. The SWQB follows a Source Documentation Protocol (found in the appendix section of the documents). The completed field sheets that are used following the Protocol were not included for the draft TMDLs. In the final version of the TMDL documents the completed field assessment sheets are provided. The SWQB makes no attempt to identify individual landowners as causing any water quality impairments. Categories of land ownership and land use are used to characterize potential sources of impairment. It is the intention of the SWQB to work together with all landowners in the watershed to implement activities such as best management practices in response to this TMDL document.

Presently, there is no requirement under the federal Clean Water Act for reasonable assurances for implementation of nonpoint source TMDLs. As stated in existing guidance (Guidance for Water Quality-Based Decisions: The TMDL Process, EPA 440/4-91-001, April 1991) implementation of nonpoint source TMDLs is through voluntary programs, such as section 319 of the Clean Water Act. According to the proposed regulations for TMDLs (40CFR part 130.2[p]), site-specific or watershed-specific voluntary actions are mechanisms that may provide reasonable assurances for nonpoint sources. The SWQB has implemented TMDLs statewide through a strong Watershed Protection Program. This program will continue to provide for the implementation of nonpoint source TMDLs.

Pursuant to Section (e)1 of the Clean Water Act (CWA), the Surface Water Quality Bureau (SWQB) has established appropriate monitoring methods to evaluate the effectiveness of controls or Best Management (BMP) activities. In order to optimize the efficiency of this monitoring effort, the SWQB has adopted a rotating basin monitoring strategy. This strategy is based on a 5-7 year return interval, and provides improved coordination and monitoring of BMP effectiveness.

Implementation plans are included in every TMDL in New Mexico. As stated in the TMDL document, this is a general implementation plan for activities to be established in the watershed. The SWQB will further develop the details of the plan with the help and cooperation of the stakeholders and other interested parties in the watershed. Detailed watershed management plans that include specific best management practices (BMPs) should be developed by and for watershed stakeholders. In this watershed, public awareness and involvement will be crucial to the successful implementation of this plan and improved water quality. Staff from the SWQB will work with stakeholders to provide the guidance in developing the Watershed Restoration Action Strategy (WRAS). The WRAS is a written plan intended to provide a long-range vision for various activities and management of resources in a watershed. It includes opportunities for private landowners and public agencies to reduce and prevent impacts to water quality. This long-range strategy will become instrumental in coordination, reducing, and preventing further water quality impacts in the watershed. SWQB staff assists with technical assistance such as the selection and application of BMPs needed to meet WRAS goals. The watershed management plans would include any specific BMPs for activities, such as grazing or road runoff and maintenance that are identified as contributing to the water quality impairment. It is not the intention of the SWQB to provide an all inclusive watershed management plan in the TMDL documents. In order to obtain reasonable assurances for implementation in watersheds with multiple landowners including Federal, State, and private land, the SWQB has established Memoranda of Understanding (MOUs) with various Federal and State agencies. These MOUs provide for co-ordination and consistency in dealing with nonpoint source issues.

- The selection of a margin of safety (MOS) has a significant impact on the calculation of load allocations. Though each of these documents includes qualitative discussion of uncertainties in the data used to derive the TMDLs, the overall result seems to be quite arbitrary, in that each MOS is either 10% or 15%. The recently released National Academy of Sciences report on the TMDL program recognizes that this is a nationwide issue, and recommends that "EPA should end the practice of arbitrary selection of the MOS and instead require uncertainty analysis as the basis for MOS determination."

NMED Response

SWQB has been consistent in its application of MOS throughout the development of TMDLs. Much of the consideration for developing MOS values is based on information available in the New Mexico Quality Assurance Project Plan (QAPP) for Water Quality Management Programs (2001). The QAPP is approved by EPA annually and provides the framework for water quality monitoring and data collection for the SWQB. This includes the use of precision and accuracy information as an explicit MOS value. Implicit MOS use conservative assumptions and critical conditions, which are consistent with nationally available MOS information.

NMED is in the process of developing a MOS Protocol that will further explore the science and rationale behind the development of specific MOS values for the TMDL documents. This document is expected to be completed in 2002 and will be available on the SWQB website.

Technical Comments on Draft TMDLs

Chronic Aluminum TMDLs

Specific Comments:

- Gila East Fork and Taylor Creek TMDLs, p.5 – The field data summarized in Table 2 are not provided in an appendix or elsewhere in this document.

NMED Response

The field data summarized in Table 2 were added to the document as an Appendix. The figures in Table 2 and Table 4 were also changed to reflect the geometric mean.

December 7, 2001

VIA FACSIMILE AND U.S. MAIL

Mr. David Hogge
New Mexico Environment Department
Surface Water Quality Bureau
P.O. Box 26110
Santa Fe, New Mexico 87502

Dear Mr. Hogge:

Re: ***Phelps Dodge Tyrone, Inc. Comments on Draft TMDLs and De-Listing Letters for Waterbodies in the Gila and San Francisco Watersheds***

Phelps Dodge Tyrone, Inc. ("PDTI") strongly supports NMED's draft TMDL and de-listing letters for waterbodies in the Gila and San Francisco watersheds. PDTI reviewed the draft documents and believes that they are technically and legally valid.

PDTI appreciates the opportunity to review the draft documents and encourages NMED to finalize the decisions represented by the documents. If we may be of any further assistance, please contact Mr. Ty Bays at (505) 538-7157.

Very truly yours,

Robert I. Pennington

cc: T. L. Shelley
T. R. Bays

Certified Mail 7000 0600 0025 0867 3819
Return Receipt Requested

Mr. David Hogge
NMED SWQB
PO Box 26110
Santa Fe, NM 87502

September 28, 2001

Dear Mr. Hogge;

The New Mexico Association of Conservation Districts would like to submit the following comments for the proposed TMDL for the San Francisco and Gila Watersheds. The soil and water conservation districts applaud the efforts of the New Mexico Environment Department to de-list water bodies based on credible scientific data.

The soil and water conservation districts are authorized under NMSA 1978 73-20-25 thru 73-20-49 to work with landowners to conserve and develop the natural resources in New Mexico. All of our programs are voluntary, incentive-based and definitely should be utilized to work with land owners to meet specific, water quality goals in a particular watershed.

We look forward to continuing our "on the ground" conservation work to gather "credible scientific data" and to assist landowners with best management practices that will meet water quality goals.

Please contact NMACD or the local district if we can assist with this effort.

Sincerely,

Debbie Hughes