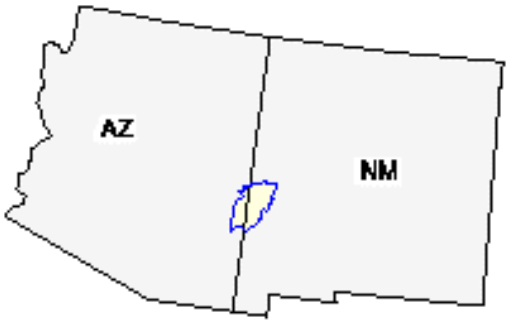
TOTAL MAXIMUM DAILY LOAD FOR CONDUCTIVITY ON THE TULAROSA RIVER



Summary Table

New Mexico Standards Segment	San Francisco River Basin, 20.6.4.603, formerly 2603
Waterbody Identifier	Tularosa River from the mouth on the San Francisco River to Apache Creek, 22.5 mi.
Parameters of Concern	Conductivity
Uses Affected	Domestic Water Supply, Fish Culture, High Quality Coldwater Fishery, Irrigation, Livestock Watering, Wildlife Habitat, and Secondary Contact.
Geographic Location	San Francisco River Basin (SFR4-20600)
Scope/size of Watershed	640.18 mi^2 (Tularosa River drainage area)
Land Type	Ecoregion: Arizona/New Mexico Mountains
Land Use/Cover	Forest (72%), Rangeland (27%), Agriculture (1%)
Identified Sources	Rangeland, Natural
Watershed Ownership	Forest Service (99%), Private (1%)
Priority Ranking	1
Threatened and Endangered Species	Loach Minnow
TMDL for: **Conductivity** (using Total Dissolved Solids (TDS))	WLA + LA + MOS 0 + 4,626.11 + 514.01 = **5,140.12 lb/day TDS**

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List of Abbreviations

4Q3	4-Day, 3-Year Low Flow Frequency
BMP	Best Management Practice
CFS	Cubic Feet per Second
CWA	Clean Water Act
CWAP	Clean Water Action Plan
CWF	Coldwater Fishery
EPA	Environmental Protection Agency
FS	United States Department of Agriculture Forest Service
HQCWF	High Quality Coldwater Fishery
ISI	Interstitial Space Index
LA	Load Allocation
MGD	Million Gallons per Day
mg/L	Milligrams per Liter
MOS	Margin of Safety
MOU	Memorandum of Understanding
NMED	New Mexico Environment Department
NMSHD	New Mexico State Highway and Transportation Department
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
NTU	Nephelometric Turbidity Units
SBD	Stream Bottom Deposits
SC	Specific Conductance
SWQB	Surface Water Quality Bureau
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
TDS	Total Dissolved Solids
UWA	Unified Watershed Assessment
WLA	Waste Load Allocation
WQLS	Water Quality Limited Segment
WQCC	New Mexico Water Quality Control Commission
WQS	Water Quality Standards
WPS	Watershed Protection Section
WRAS	Watershed Restoration Action Strategy

EXECUTIVE SUMMARY

Section 303(d) of the Federal Clean Water Act requires states to develop 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.

The San Francisco River stations were located throughout the San Francisco watershed basin to evaluate the impact of tributary streams and to establish background conditions. As a result of this monitoring effort, several exceedences of New Mexico water quality standards for conductivity were documented on Tularosa River from its mouth on the San Francisco River to its Apache Creek (22.5 mi.). This Total Maximum Daily Load (TMDL) document addresses conductivity.

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 (SWQB/WPS) 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 may be generated. 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

Tularosa River upstream of confluence with San Francisco River

The Gila-San Francisco River Watershed covers an area in New Mexico of over 6,000 mi^2. The San Francisco River, the major tributary of the Gila system in New Mexico, originates in eastern Arizona from the Mogollon rim south of Alpine and from the Colorado Plateau and isolated volcanic mountain ranges to the north. The San Francisco River enters New Mexico and flows in a 99-mile arc through the Apache and Gila National Forests before re-entering Arizona. The San Francisco River from the confluence with Centerfire Creek to the New Mexico Arizona Border is located in southwestern New Mexico. The river enters New Mexico west of the town of Luna, in Catron County, and flows east southeast for approximately 15 miles before confluencing with Centerfire Creek.

Surface water quality monitoring stations were used to characterize the water quality stream reaches. Stations were located to evaluate land use impacts on the stream. Several sample results exceeded the New Mexico water quality standard for conductivity. These exceedances were observed on the Tularosa River from the mouth on the San Francisco River to Apache Creek.

The Tularosa River watershed is approximately ninety-four square miles. Land use/cover consists of 75% forest, 25% rangeland, and <1% wetland (Figure 1). The U.S. Forest Service has jurisdiction over 90% of this area while the other 10% is privately owned (Figure 2).

Endpoint Identification

Target Loading Capacity

Overall, the target values are 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 the target value for conductivity is based on numeric criteria.

Conductivity

The New Mexico Water Quality Control Commission (WQCC) has adopted numeric water quality standards for conductivity to protect the designated use of high quality coldwater fishery (HQCWF). These water quality standards have been set at a level to protect cold-water aquatic life. The HQCWF use designation requires that a stream have water quality, streambed characteristics, and other attributes of habitat sufficient to protect and maintain a HQCF. The primary standard leading to an assessment of use impairment is the numeric criteria for conductivity of 400 µmhos/cm.

Flow

Conductivity in a stream can vary as a function of flow. As flow decreases, the concentration of total dissolved solids (TDS) can increase, thereby increasing the conductivity. Similarly, as flows decline temperatures have a tendency to increase, thus affecting conductivity values. These TMDLs are calculated for each reach at a **specific flow**. The flow value used to calculate the TMDL for conductivity on the Tularosa River was the lowest monthly mean flow from USGS gage station # 09442692 from 1966 – 1996 (USGS 1998).

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

Specific conductance (SC) may be used to estimate the total ion concentration of a surface water sample, and is often used as an alternative measure of dissolved solids. In order to calculate a load in lbs/day, TDS is used as a surrogate for conductivity. Correlation between total dissolved solids and specific conductance ranges from 0.5 to 0.9 mg/L/µmhos/cm (American Public Health Association, 1997). Specific correlation should be derived by site, if TDS values are available.

TDS to SC ratio values were calculated, and averaged, for the Tularosa River, with a correlation of 0.8 mg/L/µmhos/cm used for these TMDL calculations (Appendix B). State Standards to protect the designated use of HQCWF states that SC for the Tularosa River shall not exceed 400µmhos/cm. Using the above mentioned reference correlation; Equation 1 gives a correlation for the Tularosa River:

Equation 1. TDS (mg/L)≅SC (µmhos/cm)*(0.8)
Specific Conductance to achieve state standards= 400 µmhos/cm
400 µmhos/cm * (0.8 correlation factor)≅ 320 mg/L of TDS

For the purpose of TMDL development, a TDS criterion of 320 mg/L was used. This TMDL was developed based on simple dilution calculations using average flow and the State TDS criterion of 320 mg/L (from equation 1). The TMDL calculation includes wasteload allocations, load allocations, and a margin of safety.

Target loads for total dissolved solids (TDS) are calculated based on a flow, the current water quality standards, and a unit-less conversion factor of 8.34, that is used to convert mg/L units to lbs/day (see Appendix A for Conversion Factor Derivation). The target loading capacity is calculated using Equation 2.

Equation 2. *critical flow (mgd) x standard (mg/L) x 8.34 (conversion factor) = target loading capacity*

The target loads (TMDLs) predicted to attain standards were calculated using Equation 2 and are shown in Table 1.

Table 1: Calculation of Target Loads

Location	Flow* (mgd)	Standard** TDS (mg/L)	Conversion Factor	Target Load Capacity (lbs/day)
Tularosa	1.926	320	8.34	5,140.12

*Flow is the lowest monthly mean flow from USGS station #09442692 from 1966-1996 (USGS 1998) (Appendix C).

**TDS is used as a surrogate measure for conductivity in order to calculate a load in lbs/day. The actual standard is 400(µmho/cm). This value is the converted value into TDS.

Background loads were not possible to calculate in this sub-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.

Table 2: Calculation of Measured Loads

Location	Flow* (mgd)	Field Measure TDS (mg/l)**	Conversion Factor	Measured Load (lbs/day)
Tularosa	1.926	325.4	8.34	5226.85

* Flow is the lowest monthly mean flow from USGS station #09442692 from 1966-1996 (USGS 1998) (Appendix C).

**The actual field measure was for specific conductance measuring 406.75(µmho/cm). This value is the converted value into TDS (Appendix B).

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, background, and margin of safety (MOS) were subtracted from the target capacity (TMDL) following Equation 3.

Equation 3. $WLA + LA + MOS = TMDL$

Figure 1

HUC 5 NAME

Tularosa River

HUC	ACRES	MI^2
4020010	15,685	24.51
4020020	14,492	22.64
4020030	28,736	44.90
4020040	22,248	34.76
4020050	17,286	27.00
4020060	29,589	46.23
4020070	22,893	35.77
4020080	24,060	37.59
4020090	29,237	45.68
		303.48

HUC 5 NAME

Negrito Creek

HUC	ACRES	MI^2
4060010	26,052	40.71
4060030	32,558	50.87
4060040	38,915	60.80
4060050	25,641	40.06
4060060	19,865	31.04
4060070	18,424	28.79
4060080	25,095	39.21
		336.70

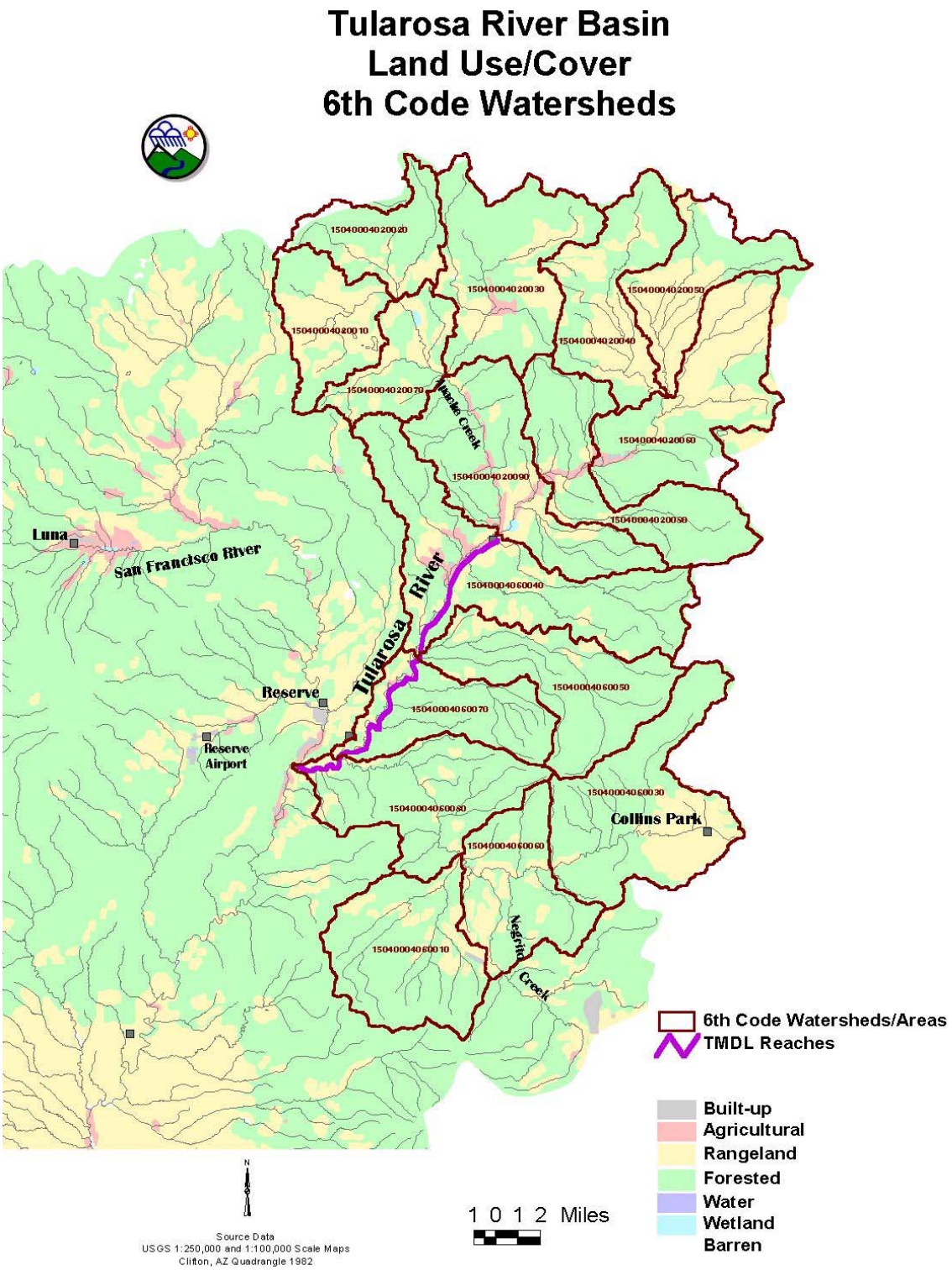
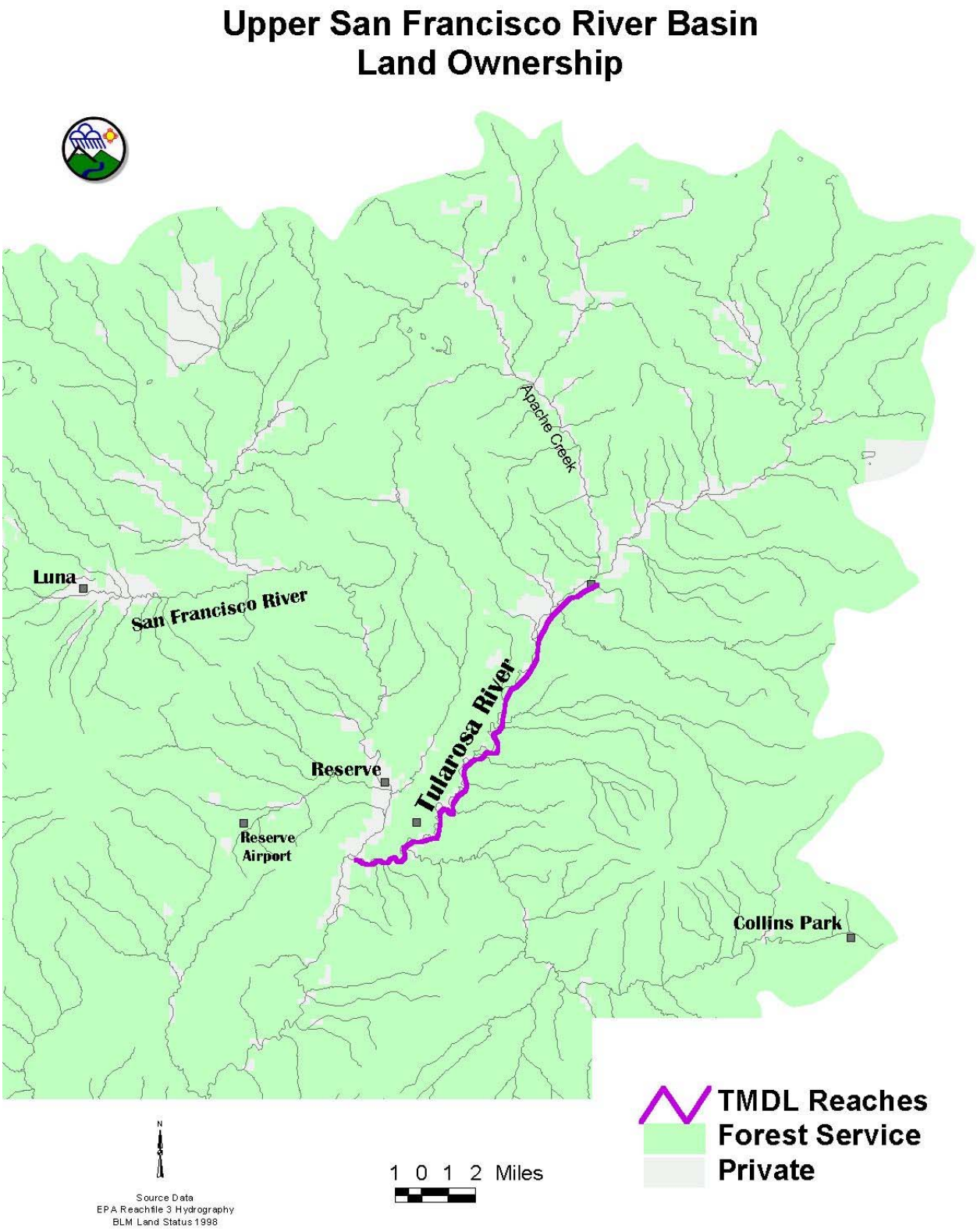


Figure 2


Upper San Francisco River Basin
Land Ownership
Apache Creek
Luna
San Francisco River
Tularosa River
Reserve
Reserve Airport
Collins Park
N
1 0 1 2 Miles
Source Data
EPA Reachfile 3 Hydrography
BLM Land Status 1998
TMDL Reaches
Forest Service
Private

Results are presented in Table 3 (Calculation of TMDL for Specific Conductance (TDS Surrogate).

Table 3: Calculation of TMDL for Specific Conductance (TDS Surrogate)

Location	WLA (lbs/day)	LA (lbs/day)	MOS (10%) (lbs/day)	TMDL (lbs/day)
Tularosa River	0	4,626.108	514.012	5,140.12

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).

Table 4: Calculation of Load Reductions for TDS (Specific Conductance), in lbs/day

Location	Target Load	Measured Load	Load Reductions
Tularosa River	5140.12	5226.85	86.73

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%): Total Dissolved Solids (TDS)	5140.12	Tularosa River	Rangeland, Natural

Linkage of Water Quality and Pollutant Sources

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 D, 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.

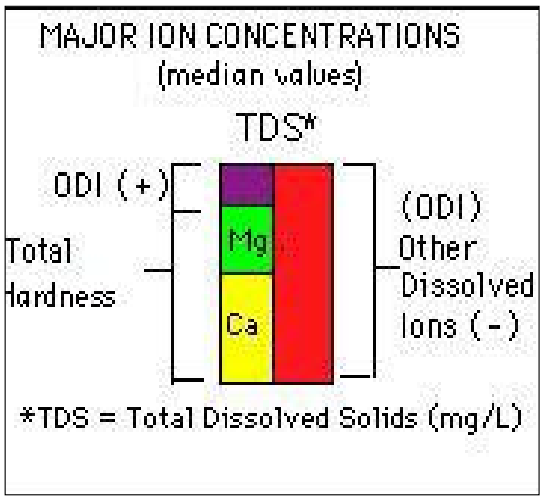
Table 5 (Pollutant Source Summary) identifies and quantifies potential sources of nonpoint source impairments along each reach as determined by field reconnaissance and assessment. A further explanation of the sources follows.

Tularosa River

The Gila National Forest has been and continues to be involved in management activities on lands in the upper reaches of the Tularosa River watershed. Grazing and logging were all historic uses made of the land. Currently, the area is forestry and privately managed with an emphasis focused on recreation, wildlife, fisheries and grazing.

Currently, the forest service and private landowners actively manage grazing activities, which impact this 22.5 mile segment of the Tularosa River. Riparian cattle fencing and elk exclosures are recommended, which are prerequisite to willow planting, which is also recommended. At the present time, private landowner management varies between holders.
Private landowners are encouraged to re-seed and mitigate along riparian areas that have been affected by uncontrolled grazing.

Allocation of loads across these varied sources is problematic, particularly when these sources are naturally occurring. Of particular concern are various stream reaches throughout the state listed for excessive SC. Specific conductance is a measure of the ability of water to pass an electrical current. SC in surface water is affected by the presence of inorganic dissolved solids, such as chloride, nitrate, sulfate and phosphate anions or sodium, magnesium, calcium, iron and aluminum cations. The law of electroneutrality states that for a solution to be electrically neutral, the total charge on all positive ions (cations) must equal the total charge on all negative ions (anions) (see diagram). When any electrolyte dissociates, the resulting ions interact with surrounding solvent molecules or ions, to form charged clusters known as solvated ions. These ions can move through a water column under the influence of an externally applied electric field (conductivity meter) (Standard Methods, 1997). The sensor simply consists of two metal electrodes that are exactly 1.0 cm apart and protrude into the water. A constant voltage (V) is applied across the electrodes. An electrical current (I) flows through the water due to this voltage and is proportional to the concentration of dissolved ions in the water - the more ions, the more conductive the water resulting in a higher electrical current which is measured electronically.



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 for Specific Conductance is estimated to be an addition of **10%** of the TMDL, 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. Techniques used for measuring specific conductance concentrations in stream water have a (±)10% precision (SWQB/NMED, 1999b). Accordingly, a conservative margin of safety increases the TMDL by **10%**.

•*Errors in calculating flow*

Flows were taken from USGS records, therefore are not assessed a margin of error.

Consideration of Seasonal Variation

Data used in the calculation of this TMDL were collected during high and low flow seasons in order to ensure coverage of any potential seasonal variation in the system. Exceedances were observed during low flow (October, 1998) and summer monsoonal rains (June 9 and 11, 1998 and again on August 13, 1998). Exceedances were not seen, however, during the spring runoff (May, 1999). The critical condition used for calculating the TMDL was low flow. Data that exceeded the standard for conductivity (Appendix B) 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 conductivity that cannot be controlled with best management practice implementation in this watershed.

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 to seven years.

The SWQB maintains current quality assurance and quality control plans to cover all monitoring activities. This document, "Quality Assurance Project Plan for Water Quality Management Programs" (QAPP) is updated annually.

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 waterbodies, including biological assessments, and compliance monitoring of industrial, federal and municipal dischargers, and are specified in the SWQB Assessment Protocol (SWQB/NMED 1998c).

Long term monitoring for assessments will be accomplished through the establishment of sampling sites that are representative of the water body and which can be revisited every five to seven 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:

- An unbiased assessment of the water body and establishes a long term monitoring record for trend analyses.
- A systematic, detailed review of water quality data and allows for a more efficient use of resources.
- Information at a scale useful to the implementation of corrective activities.
- An established order of rotation and predictable sampling in each basin. This allows easier coordination efforts with other programs and water quality entities.
- Enhanced program efficiency and improved basis for management decisions.

It should be noted that a basin would not be ignored during its sampling hiatus. 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 implement. 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 and 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

Conductivity is an indication of the number of inorganic dissolved ions in the water column. Conductivity is affected by temperature; warmer water will measure relatively higher conductivity results.

Conductivity is used as a measure of stream water quality as this measure tends to have a relatively constant range within a stream. Significant changes from baseline data can indicate that a discharge or an activity resulting in nonpoint source discharge has entered the stream system. For example, a return flow from an irrigated field may contribute a dissolved salt load from groundwater sources or from the soil. A system impacted with higher than normal conductivity levels can have a detrimental affect on the biota of a natural system. Just as an excess of soil salinity damages agricultural crops, salts in streams can be detrimental to aquatic flora and fauna.

Under natural conditions, the conductivity of the stream is generally based on the geology of the watershed. Water coming in contact with soils and erodible source rock material will dissolve salts especially when soil drainage is poor. As mentioned earlier, temperature factors in the process of dissolving salts. Naturally occurring geothermal activity can contribute to high conductivity levels. All these factors determine baseline data. Additional sources, such as point sources from a failing septic systems, or drainage from confined animal operations, will change the conductivity, depending the constituents of the runoff.

Examples of sources that can cause excessive conductivity levels include but are not limited to:

- nonpoint source contributions of additional salts include agricultural field runoff or irrigation return,
- extensive use of deicing salts or dust reduction compounds on roads,

- mining activities.

Actions to be Taken

For this watershed the primary focus will be the control of specific conductance or the conductivity of water.

During the TMDL process in this watershed, the point sources have been reviewed and will be addressed through the permit process. The nonpoint source contributions will need to address conductivity exceedences through BMP implementation. In addition, a TMDL may be developed for plant nutrients along this reach.

BMPs can be implemented to address and remediate conductivity exceedences. They include but are not limited to:

1. The use of a filter strip or vegetated buffer. This is particularly advantageous for runoff from agricultural fields, road de-icing, road erosion, storm drains and resource extraction activities by filtering and reducing the temperature of the water. This BMP would also prevent sediment loading and turbidity in the river system. (Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, 1993, US EPA.)

2. The management of the application of fertilizers or any other field additive and the application of road salts. An over-supply of applied material in crops not used by plants will dissolve in rainwater and will become mobilized in runoff, or will be carried in irrigation return flow. In road maintenance, management of road deicers, including sodium and magnesium chlorides, is economically advantageous. Education on the application of road salts, to minimize extensive runoff should be approached immediately, especially in areas where highways and roads are adjacent to river systems. (Field Agricultural Runoff Monitoring (FARM) Manual, 1985, US EPA, and Highway Deicing, Comparing Salt & Calcium Magnesium Acetate, 1991, Transportation Research Board, National Research Council).

3. Address the placement of mine tailings and holding ponds away from potential runoff if conductivity is contributed through a resource extraction activity. Segregating easily erodible tailings and holding ponds can reduce the impacts to a river system by keeping sediments out of the runoff to a stream. (Technical Manual for the Design and Operation of a Passive Mine Drainage Treatment System, 1992, Cohen, R.R.H., and S. W. Staub.)

Additional sources of information for BMPs to address conductivity 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.

Agriculture

Internet websites:

- http://www.nm.nrcs.usda.gov/

- http://www.sci.sdsu.edu/salton/TheSalinityofRivers.html

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  Section 6, Improving Household Wastewater Management
  Section 7, Improving Livestock Waste Storage
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  Chapter 9 – Restoration implementation, Monitoring, and Management

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- Coleman, M.W., 2000, Rio Puerco Watershed Mining Impacts. New Mexico Environment Department, Clean Water Act Section 319(h) Grant Project Summary Report to USEPA Region 6, Dallas, New Mexico Environment Department Surface Water Quality Bureau Watershed Protection Section, Santa Fe, 46 pp. plus Appendix

- Filas, B., and T. Wildeman, 1992, The Use of Wetlands for Improving Water Quality to Meet Established Standards. Nevada Mining Association Annual Reclamation Conference, Sparks, NV.

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Riparian and Streambank Stabilization

- Colorado Department of Natural Resources, Streambank Protection Alternatives. State Soil Conservation Board.

- Meyer, Mary Elizabeth, 1989, A Low Cost Brush Deflection System for Bank Stabilization and Revegetation.

- Missouri Department of Conservation, Restoring Stream Banks With Willows, (pamphlet).

- New Mexico State University, Revegetating Southwest Riparian Areas. College of Agriculture and Home Economics, Cooperative Extension Service, (pamphlet).

- State of Pennsylvania, 1986, A Streambank Stabilization And Management Guide for Pennsylvania Landowners. Department of Environmental Resources, Division of Scenic Rivers.

- State of Tennessee, 1995, Riparian Restoration and Streamside Erosion Control Handbook. Nonpoint Source Water Pollution Management Program.

Roads and Construction

- New Mexico Natural Resources Department, 1983, Reducing Erosion from Unpaved Rural Roads in New Mexico, A Guide to Road Construction and Maintenance Practices. Soil and Water Conservation Division.

- New Mexico Environment Department, 1993, Erosion and Sediment Control Manual. Surface Water Quality Bureau.

- State of Kentucky, 1994, Kentucky Best Management Practices for Construction Activity. Division of Conservation and Division of Water.

- State of New Mexico, 1994, Road Construction and Maintenance Practices To Reduce Erosion from Low-Volume Unpaved Rural Roads in New Mexico. Natural Resources Department, Soil & Water Conservation Division.

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- Transportation Research Board, 1991, Highway Deicing, Comparing Salt & Calcium Magnesium Acetate, Special Report 235. National Research Council

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  Section 23, Recreation Management
  Section 24, Timber Management
  Section 25, Watershed Management
  Section 26, Wildlife and Fisheries Management
  Section 41, Access and Transportation Systems and Facilities

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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 sources, which are contributing to erosion or other nonpoint source issues impacting the Tularosa River.

The upper watershed along this TMDL segment has numerous gullies, spanning several allotments, which will/have be checked either by earthen dams or gabion baskets. At the present time, private landowner management varies between holders. Private landowners are encouraged to re-seed and mitigate along riparian areas that have been affected by uncontrolled grazing.

The Gila National Forest is planning prescribed burning and timber stand improvements, namely thinning, in the San Francisco watershed to reduce fuels and improve watershed conditions and wildlife habitat. These efforts will continue within program priorities and funding levels.

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 adding to the forest's 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 conductivity 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.

The SWQB will work with stakeholders in this watershed to encourage the implementation of BMPs such as pinon and juniper thinning in areas that have had excessive encroachment of these trees and which are an obvious source of surface runoff and gully formation. The SWQB will also work with the Gila National Forest to determine impacts from recreational use of the San Francisco River, or possible irrigation diversion enhancements can be put into effect. In addition the SWQB will encourage landowners to implement, if applicable, new grazing management to address riparian and watershed issues. Lastly, the SWQB will encourage all landowners in the watershed to address road issues such as dirt roads, and low water crossings, that have been constructed (or maintained) without proper drainage controls to prevent sediment from reaching watercourses.

Stakeholders in this process will include SWQB, and other members of the Watershed Restoration Action Strategy such as the Gila National Forest, Catron County Citizens Group, the area residents and the New Mexico State Highway Department, and private landowners.

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. Stakeholder public outreach and involvement in the implementation of this TMDL will be ongoing.

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 Watershed Protection Program will target efforts to this and other watersheds with TMDLs. The Watershed Protection 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.

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:

- percentage reduction of sediment into the stream.
- increased educational efforts to agencies that manage roads to promote better management of road salt dispersal.
- reduction of salts in return flow irrigation systems.

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 Tularosa Creek 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 this TMDL. See Appendix E for flow chart of the public participation process. The draft TMDL was made available for a 30-day comment period starting **August 14, 2001**. Response to comments is attached as Appendix F of this document. The draft document notice of availability was extensively advertised via newsletters, email distribution lists, web page 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: Data Used to Calculate Measured Load

Appendix C: USGS Data Used to Calculate Flow

Appendix D: Pollutant Source(s) Documentation Protocol

Appendix E: Public Participation Process Flow Chart

Appendix F: Public Comments and Bureau Responses

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: Conductivity Data Used to Calculate the TMDL

Number of Times Sampled	Location	Date	Specific Conductance (umho/cm)	Total Dissolved Solids (mg/l)	TDS to SC* Ratio (Site Specific)
1	Upper Tularosa	***6/8/98***	229.1	230	1.0
2	Middle Tularosa (FR 233)		361.3	292	0.81
3	Lower Tularosa		265.6	242	0.91
4	Upper Tularosa	***6/9/98***	236.9	231	0.98
5	**Middle Tularosa (FR 233)**		**402.2**	**252**	**0.63**
6	Lower Tularosa		290.4	268	0.92
7	Upper Tularosa	***6/10/98***	232.1	242	1.0
8	Middle Tularosa (FR 233)		374	312	0.83
9	Lower Tularosa		286	274	0.96
10	Upper Tularosa	***6/11/98***	234.9	218	0.93
11	**Middle Tularosa (FR 233)**		**405.8**	**304**	**0.75**
12	Lower Tularosa		284	234	0.82
13	Upper Tularosa	***8/13/98***	230.9	164	0.71
14	**Middle Tularosa (FR 233)**		**405**	**246**	**0.61**
15	Lower Tularosa		330.7	222	0.67
16	Upper Tularosa	***8/14/98***	233.1	154	0.66
17	Middle Tularosa (FR 233)		396.8	232	0.58
18	Lower Tularosa		328	208	0.63
19	Upper Tularosa	***10/20/98***	234.8	204	0.87
20	**Middle Tularosa (FR 233)**		**414**	**316**	**0.76**
21	Lower Tularosa		319.8	256	0.80
22	Upper Tularosa	***5/17/99***	231.2	N/a	N/a
23	Middle Tularosa (FR 233)		382.8	N/a	N/a
24	Lower Tularosa		335.24	N/a	N/a

* The acceptable criteria for this ratio are from 0.55 to 0.9. If the ratio of TDS to EC is outside these limits, an unmeasured constituent such as ammonia or nitrate may be present in significant concentrations (Standard Methods, 1997). All of the sample stations in this reach displayed nitrates in the water quality samples. The site-specific average for the TDS to EC ratio was 0.8. This individual, calculated ratios that were outside the limit given by Standard Methods, are most probable due to nitrate concentrations that are present in every sample. The site-specific ratio of 0.8 was used to calculate the TMDL to accurately reflect stream conditions. For the purposes of this document, EC (electrical conductivity) and SC are used interchangeably.

The geometric mean of field data that exceeded the state standard is: **406.75 umho/cm**

Appendix C: USGS Gage Data Used to Calculate Flow

Source: USGS
Gage: Tularosa Above Aragon (#09442692)
Period of Record is 1966-1996

1966-1996	Jan	Feb	Mar	April	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Mean of Monthly Flows (ft^3/sec) for period of record	3.29	4.14	4.99	4.88	3.02	*2.98*	3.02	*2.98*	3.00	3.34	3.02	3.42

ft^3/sec X 0.646272 = million gallons per day

2.98 ft^3/sec X 0.646272 = 1.926 million gallons per day

Appendix D: 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:

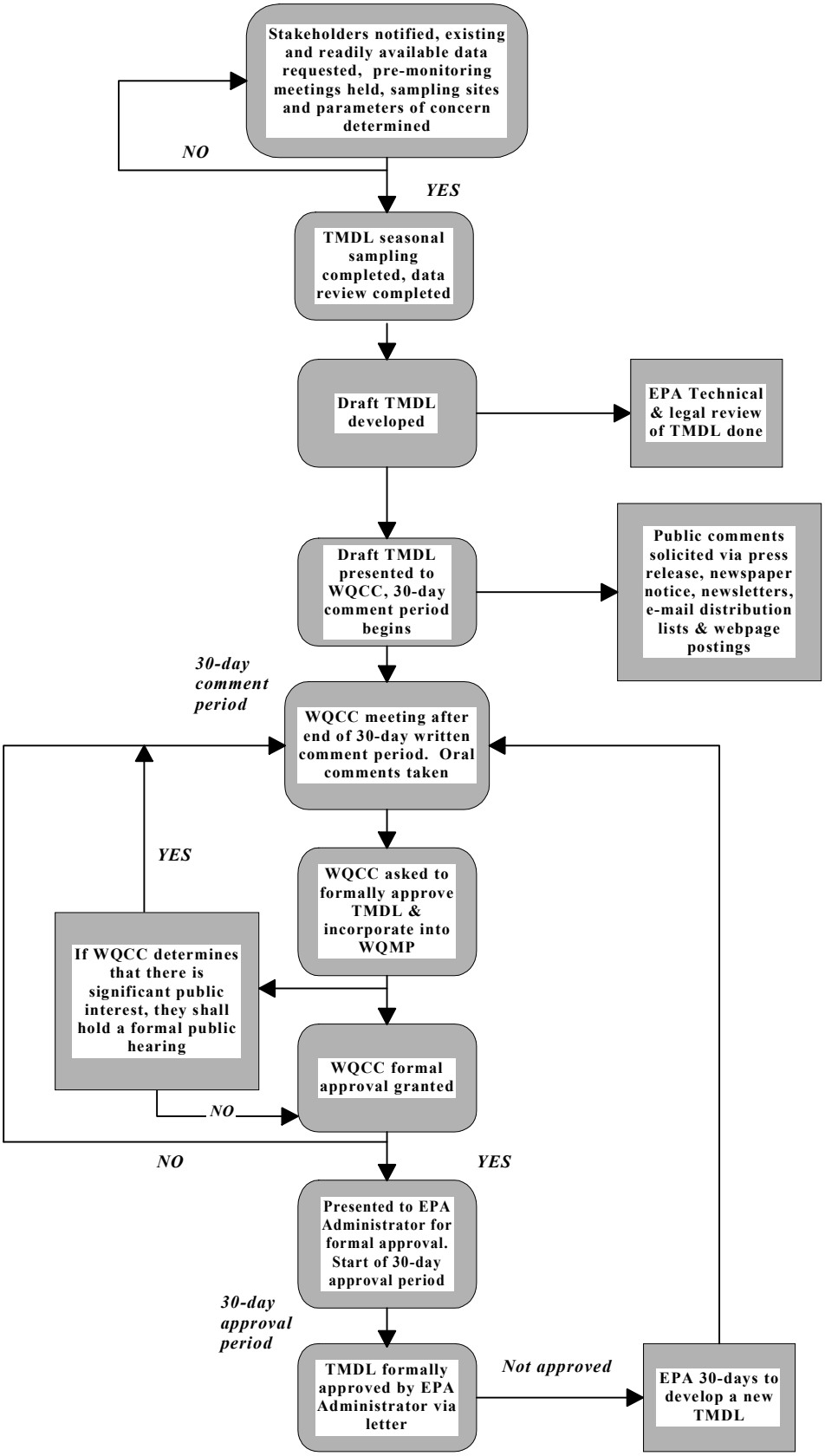
STAFF MAKING ASSESSMENT:

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	☐	5800	ROAD CONSTRUCTION/MAINTENANCE 8400	☐	8400	SPILLS
		(e.g., truck farming and orchards)	☐	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	☐	8705	SKI SLOPE RUNOFF
☐	2000	SILVICULTURE			(septic tanks, etc.)	☐	8800	UPSTREAM IMPOUNDMENT
☐	2100	HARVESTING, RESTORATION, RESIDUE	☐	6600	HAZARDOUS WASTE	☐	8900	SALT STORAGE SITES
		MANAGEMENT	☐	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 E: Public Participation Flowchart



Appendix F: 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

Tularosa River: Conductivity

- On page 1, the *Background Information* section should contain more detailed information about the Tularosa River.

NMED Response

Additional text was added to the document to provide more detailed information about the river. A photo was also added (page 1) to the text to provide a visual image for the reader.

- On page 2, in the second paragraph, the draft TMDL states that "TDS to EC ratio values were calculated …" The paragraph should include a reference to the actual measured values used to calculate these ratios (in Appendix B to the draft TMDL).

NMED Response

The reference to Appendix B was added to the text.

- The draft TMDL language should be consistent throughout in its use of the term specific conductance ("SC") or electrical conductivity ("EC") to avoid reader confusion.

NMED Response

EC and SC are used interchangeably in this document. Clarification was added to Appendix B.

- On page 5, Table 2 should include a reference to the data in Appendix B that was used to compute the average field measure for TDS.

NMED Response

The reference to Appendix B was added to the text under Table 2.

- On page 5, in Table 2, a geometric mean of measured TDS values corresponding to conductivity measures 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 TDS 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, in Table 2, the apparent location for calculation of measured loads is Centerfire Creek. It is assumed that the error is typographical.

NMED Response

The reference to Centerfire Creek has been changed to read Tularosa River.

- On page 5, under the heading *Load Allocation (LA)*, there should be a discussion about how the 10% margin of safety was determined. References to scientific publications justifying the selected MOS are strongly advised.

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 7, there is no apparent reference in the discussion to the Major Ion Concentrations diagram, and the purpose of diagram is therefore somewhat confusing.

NMED Response

A reference to the Major Ions Concentrations diagram was added to the text.

- On page 16, in the first paragraph, the sentence that states "This long-range strategy will become instrumental in coordinating and achieving a reduction of metals levels …" seems irrelevant to a TMDL for conductivity.

NMED Response

This text has been updated to replace the word metals with conductivity.

- On page 18, under the *Milestones* heading, the first paragraph contains a reference to "examples of milestones for metals" and the second paragraph includes a reference to the "assistance of Centerfire Creek Watershed stakeholders". Both references appear irrelevant to a conductivity TMDL for the Tularosa River.

NMED Response

This text has been updated to replace the word metals with conductivity. This has also been updated to replace the words Centerfire Creek with the Tularosa River.

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

September 13, 2001

RE: Comments on Proposed TMDL for Conductivity for the Tularosa River

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 source of water quality problems. It's the main reason that approximately 40 percent of surveyed 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, not instream flow, in the form of BMPs to protect and improve water quality statewide.

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

Conductivity TMDLs

General Comments:

- The relationship between conductivity and TDS is not clear in these documents. The field data underlying these TMDLs were primarily direct measurements of specific conductance. It is understood that SC values need to be translated into TDS to be expressed as a load. However, the TMDL should specify if the future monitoring for achievement of the TMDLs will rely on measurement of SC or TDS. Also, the basis for selecting the TDS/SC correlation was not clear in these TMDLs. For example, for Centerfire Creek, a TDS/SC correlation of 0.7 was selected in the absence of data, whereas in Tularosa River the TDS/SC correlation was 0.8 based on measurement data. This leads to a counterintuitive result that the TDS standard for the lesser priority Centerfire Creek (280 mg/L) is lower than that for the higher priority Tularosa Creek (320 mg/L).

NMED Response

Future monitoring and water quality assessment for standards attainment will be based on measures of specific conductance. TDS values will also be taken to develop a relationship that will allow a TMDL to be expressed as a load. According to *Standard Methods for the Examination of Water and Wastewater 23rd edition* (1997), the correlation between TDS and SC ranges from 0.5-0.9 mg/L/umhos/cm. In the case of Centerfire Creek, TDS values were not available so the mean of the recommended range was used. This was done under the recommendation of the head of water chemistry of the State Laboratory Division (2001). Actual TDS and SC data were available for the Tularosa River so the estimate was not needed in this case. The TMDLs are calculated using available data for each reach or estimates based on professional input. Recommendations for possible implementation activities will not change based on the slight difference in calculated target loads between Centerfire Creek and Tularosa River.

The priority ranking for stream reaches on the 303(d) list do not influence the target load calculations. Calculations are based on applicable State water quality standards and a critical flow condition. The priority ranking is done in order to provide a framework for the TMDL development schedule.

Specific Comments:

- Tularosa TMDL, p.2: The section titled "Flow" describes use of a regression model to determine the applicable low flow. However, a footnote to Table 2 states that the flow value was based on the lowest monthly mean flow at a USGS gaging station. This source of the low flow value should be confirmed and documented in the TMDL. In addition, please clarify why NMED chose to base its flow estimate on data from a single month in a single year, rather than using a broader array of data or perhaps a model.

NMED Response

The flow value used in the analysis is the lowest monthly mean flow from USGS station #09442692 from 1966-1996. An appendix was added to clarify the flow calculation. The section titled "Flow" was corrected.

- Tularosa TMDL, p.6-7: Table 5 lists rangeland as the potential source, though the Summary Table lists "unknown" and "natural" sources, and indicates that only 27% of the area is rangeland. Furthermore, the discussion following the table section entitled "Linkage of Water Quality and Pollutant Sources" focuses on riparian areas, not rangeland. The Laboratory recommends that these inconsistencies be rectified.

NMED Response

The summary table (cover sheet of the TMDL) was updated to reflect the potential source of rangeland. Unknown and natural were removed from this table.

<u>Tularosa River Conductivity TMDL</u>

p.1,5,18 – Several references to Centerfire Creek should be changed to Tularosa.

NMED Response

Several references to Centerfire Creek have been corrected to read Tularosa throughout the document.

p.2,23,24 – Specific conductance (SC) is identified, but the term "EC" is used without clarification. Please clarify whether NMED is using these terms interchangeably.

NMED Response

EC and SC are used interchangeably in this document. Clarification was added to Appendix B.

p.16 – The final paragraph includes the statement, "Reductions from point sources will be addressed in revisions to discharge permits." Since this area does not include point sources, this sentence should be deleted. (This comment also applies to a parallel statement in most of the other TMDLs.)

NMED Response

Although there are presently no point sources along the Tularosa River this statement is meant to cover any new dischargers to the river and will remain in the document.

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