

**WATER QUALITY ASSESSMENT SUMMARY OF THE
MIMBRES WATERSHED
MARCH-DECEMBER 2002**

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SUMMARY ASSESSMENT OF THE WATER QUALITY SURVEY OF THE MIMBRES WATERSHED, MARCH - DECEMBER, 2002

Introduction

From March 5 to December 5, 2002, the Silver City office of the Watershed Protection Section with minimal assistance from the Surveillance and Standards Section in Santa Fe, conducted an intensive survey of the Mimbres River and its tributaries (Fig.1). The survey consisted of eight separate water chemistry-sampling events over the above time period and was designed to coincide with the significant cyclical flow events of the river's historic hydrograph. In addition, inventories of habitat, stream channel morphology, stream channel substrate, benthic macroinvertebrates and fish were made at selected sites to supplement the chemistry data in evaluating the watershed (418 mi² or 1085 km²). Historic and current land uses in the watershed include agriculture, silviculture, recreation, mining and municipal related activities (Silver City). Much of the land ownership adjacent to the river is private with the exception of headwater reaches that are located within the Gila National Forest. The Nature Conservancy owns a limited number of small tracts along the middle reaches of the Mimbres, which it manages as conservation protection easements. The Bureau of Land Management and the State of New Mexico also own and manage sizable tracts of public lands in the upland portions of the watershed. The upper and middle reaches of the Mimbres watershed are located in Omerick ecoregion 23 (Arizona/New Mexico Mountains) while the lower reaches are in ecoregion 24 (Chihuahuan Desert). The elevation range for the various sampling sites in the survey was 7048' to 4964'. The surrounding geology can be characterized as volcanic. This water quality survey and assessment was completed in fulfillment of work plan commitments of the *FY 2002 Section 106 Work Program for Water Quality Management* and was partially funded by a grant from United States Environmental Protection Agency.

New Mexico Water Quality Standards

The Mimbres River is classified as a closed river basin under the New Mexico water quality standards. General and segment specific numeric and narrative criteria along with designated uses for the Mimbres River and its tributaries are set forth in State of *New Mexico Standards for Interstate and Intrastate Surface Waters*, 20.6.4.12, 20.6.4.803, 20.6.4.804 and 206.4.900 (20.6.4 NMAC, December 2001). Designated uses listed for segment 20.6.4.803, which includes the perennial reaches of the Mimbres River and its tributaries downstream of the USGS gaging station at Mimbres, are listed as coldwater fishery, irrigation, livestock watering, wildlife habitat, and secondary contact. Designated uses for segment 20.6.4.804, which includes the Mimbres River and its tributaries upstream of the USGS gaging station at Mimbres, are listed as high quality coldwater fishery, irrigation, livestock watering, wildlife habitat, secondary contact and domestic water supply. San Vicente Arroyo is currently an unclassified stream reach, which is only covered under the general standards for livestock watering and wildlife habitat.

Methods

Water quality sampling methods were in accordance with the United States Environmental Protection Agency (USEPA)-approved Quality Assurance Project Plan for Water Pollution

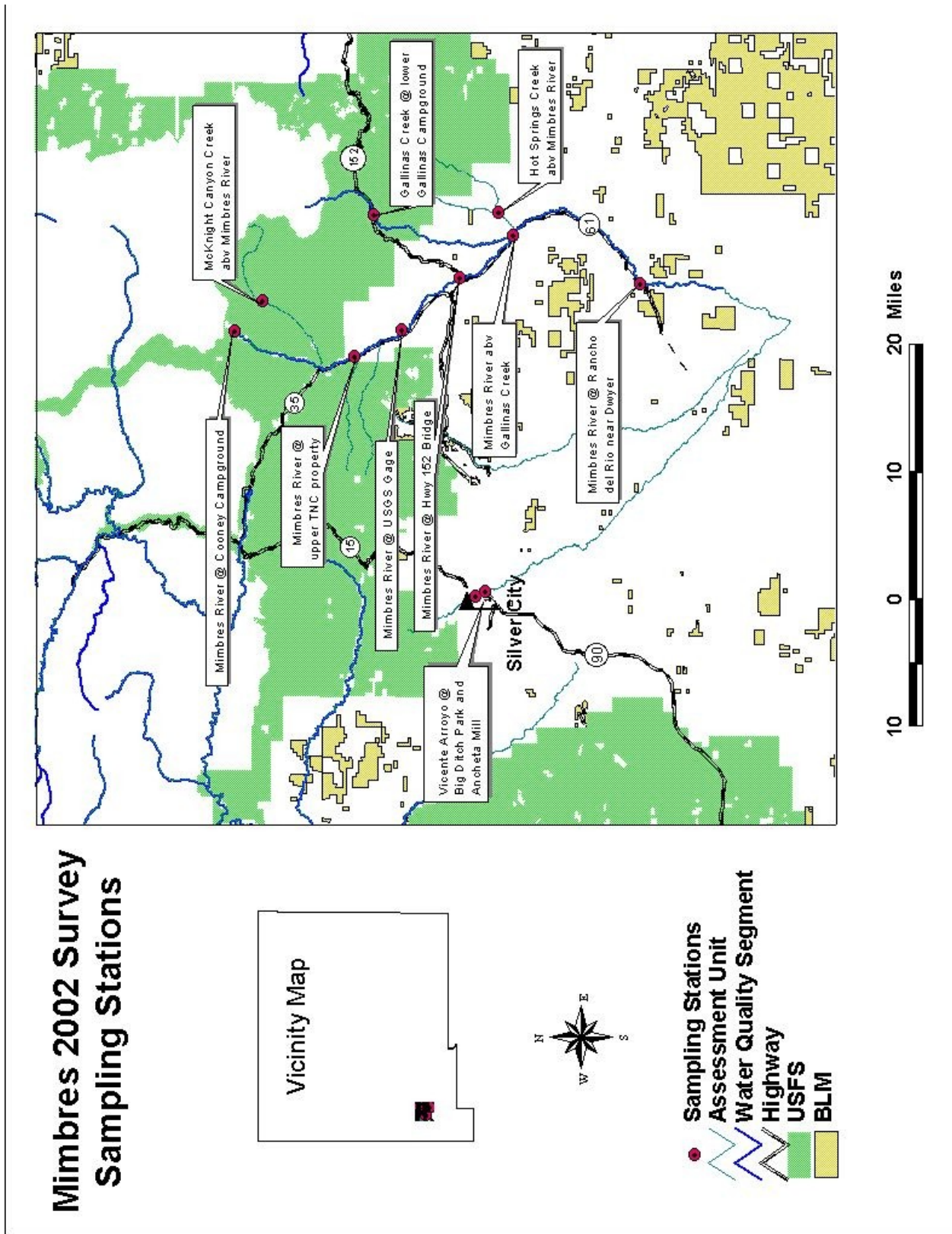


Figure 1. Map of Survey Area

Programs (QAPP) (NMED, 2000). Benthic macroinvertebrate and fish methods were in accordance with protocols for EPA’s Rapid Bioassessment Protocols for use in Wadeable Streams and Rivers (Barbour *et al.*, 1999) and the SWQB QAPP. Fluvial geomorphic measurements were also in accordance with protocols for the SWQB QAPP and Rosgen (1999). Water Chemistry (nutrients, anion-cations, metals) along with accompanying physical measurements (temperature, pH, conductivity, turbidity, flow and dissolved oxygen) were done each time at all sites while bacteria samples for fecal coliform and *Escherichia coli* were collected seven times at selected sites. Water samples submitted for cyanide, organics/pesticides and radionuclides were collected at selected sites only once. The process for evaluating and/or assessing all data collected in this survey for the purposes of the § 303(d) list and the § 305(b) report (listing and de-listing), can be found in *State of New Mexico Procedures for Assessing Standards Attainment for § 303(d) list and § 305(b) report, New Mexico Standards for Interstate and Intrastate Surface Water*, and selected assessment protocols (temperature, stream bottom deposits).

Sampling Stations

The station numbers, STORET identification codes (where available), elevations and location descriptions of the sampling sites selected for this survey are given below. A map of the study area is presented in figure 1.

Station	Legacy STORET Code	Location Description	Elevation in feet (meters)
1	SWC804.006048	Mimbres River at Cooney Campground (FR 150A)	7070 (2156)
2		McKnight Canyon Creek (AKA E. Fork Mimbres) above the Mimbres River	6873 (2096)
3		Mimbres River at upper Nature Conservancy property	6089 (2101)
4	SWC804.003035	Mimbres River at USGS gage near Mimbres	5920 (1805)
5	SWC803.002530	Mimbres River at State Highway 152 bridge at Lorenzo	5630 (1717)
6		Gallinas Creek at lower Gallinas Campground near Highway 152	6568 (2003)
7	SWC803.002501	Mimbres River above Gallinas Creek near Royal John Bridge	5465 (1666)
8	SWC803.002001	Gallinas Creek above the Mimbres River near Royal John Bridge	5470 (1668)
9		Hot Springs Creek above the Mimbres River (Dry entire survey)	
10		Mimbres River at Rancho del Rio near Dwyer	4964 (1514)
11		San Vicente Arroyo at Big Ditch Park in Silver City	5804 (1770)
12		San Vicente Arroyo at Ancheta Mill	5646 (1722)

The following water quality assessment summary for the Mimbres River study is divided into assessment units according to the 2002-2004 § 303(d) list. The assessment units, water quality segment number, its listing and the survey sampling station (s) for the assessment unit are given below. These are the listings for the Mimbres Watershed prior to the survey.

Assessment Unit	Standards Segment	Listed for the following analyte	Sampling Station Number
Mimbres River from Sheppard Canyon to Cooney Campground. NM-2804_00	20.6.4.804	Dissolved oxygen, temperature, stream bottom deposits	1,2,3,
*Mimbres River below Sheppard Canyon. NM-2803_00	20.6.4.803 20.6.4.804	Temperature, stream bottom deposits.	4,5,7,10
Gallinas Creek from Mimbres River to headwaters. NM-2803_20	20.6.4.803	Temperature	6,8 Dry most of the time.
Hot springs Creek from the Mimbres River to headwaters NM-2803_10	20.6.4.803	Unknown	9 Dry
Cold Springs Creek from Hot Springs Creek to headwaters NM-2803_11	20.6.4.803	Metals	Unable to obtain access

* Do to an oversight; this assessment unit overlaps two completely separate and different water quality stream segments.

Stream Standard Exceedances

All of the data collected (biological, chemical, physical) during the survey are available upon request.

Mimbres (2002)

Chem/phys exceedances

This report lists physical/chemical exceedances of standards for a given watershed study. These data are broken out by Stream Standard Segments, then "Citations, then sampling stations. The "citations" are designated uses, with these additions:

- Segment-specific criteria.
- Criteria common to various fisheries (cold and warm, acute and chronic).

McKnight Canyon (USGS Mimbres gage to headwaters and all perennial tributaries thereto)

20.6.4.804. The Mimbres River upstream of the USGS gaging station at Mimbres and all perennial tributaries thereto. There are no use-specific numeric criteria for secondary contact (20.6.4.900.I).

Segment specific criteria

pH, lower limit

McKnight Canyon Creek (AKA East Fork of Mimbres) above the Mimbres.

Exceeds:	Analyte:	LessThan:	Result:	Standard:	Units:	Sampling date:
Yes	pH, lower limit	No	6.39	6.6	su	08/06/2002

Mimbres River (downstream of USGS Mimbres gage)

20.6.4.803. The Mimbres River downstream of the USGS gaging station at Mimbres. There are no use-specific numeric criteria for secondary Contact (20.6.4.900.I).

Fishery (chronic)

Dissolved aluminum

Mimbres River at State Highway 90 bridge(AKA NM 152) near San Lorenzo

Exceeds:	Analyte:	LessThan:	Result:	Standard:	Units:	Sampling date:
Yes	aluminum	No	0.09	0.087	mg/L	08/06/2002

Total recoverable selenium

Mimbres River at State Highway 90 bridge(AKA NM 152) near San Lorenzo

Exceeds:	Analyte:	LessThan:	Result:	Standard:	Units:	Sampling date:
Yes	selenium	No	0.008	0.005	mg/L	12/04/2002
	No	490	100	/100 mL		10/24/2002

Fecal coliform, single sample

Mimbres below Dwyer at Ranch del Rio

Exceeds:	Analyte:	LessThan:	Result:	Standard:	Units:	Sampling date:
Yes	fecals	No	2700	200	/100 mL	07/25/2002
Yes	fecals	No	520	200	/100 mL	08/08/2002
Yes	fecals	No	2500	200	/100 mL	09/12/2002

Mimbres River above the confluence with the Gallinas River near Royal John Bridge

Exceeds:	Analyte:	LessThan:	Result:	Standard:	Units:	Sampling date:
Yes	fecals	No	210	200	/100 mL	08/08/2002
Yes	fecals	No	730	200	/100 mL	09/12/2002
Yes	fecals	No	490	200	/100 mL	10/24/2002

Mimbres River at State Highway 90 bridge(AKA NM 152) near San Lorenzo

Exceeds:	Analyte:	LessThan:	Result:	Standard:	Units:	Sampling date:
Yes	fecals	No	820	200	/100 mL	09/12/2002

Temperature *

Mimbres below Dwyer at Ranch del Rio

Exceeds:	Analyte:	LessThan:	Result:	Standard:	Units:	Sampling date:
Yes	Temperature	No	20.68	20	C	07/23/2002

Mimbres River above the confluence with the Gallinas River near Royal John Bridge

Exceeds:	Analyte:	LessThan:	Result:	Standard:	Units:	Sampling date:
Yes	Temperature	No	20.15	20	C	04/10/2002
Yes	Temperature	No	24.37	20	C	07/23/2002

Mimbres River at State Highway 90 bridge(AKA NM 152) near San Lorenzo

Exceeds:	Analyte:	LessThan:	Result:	Standard:	Units:	Sampling date:
Yes	Temperature	No	22.16	20	C	06/19/2002
Yes	Temperature	No	25.92	20	C	07/24/2002
Yes	Temperature	No	24.54	20	C	08/06/2002

Wildlife habitat

Total recoverable selenium

Mimbres River at State Highway 90 bridge(AKA NM 152) near San Lorenzo

Exceeds:	Analyte:	LessThan:	Result:	Standard:	Units:	Sampling date:
Yes	selenium	No	0.008	0.005	mg/L	12/04/2002

Mimbres River (USGS Mimbres gage to headwaters)

20.6.4.804. The Mimbres River upstream of the USGS gaging station at Mimbres and all perennial tributaries thereto. There are no use-specific numeric criteria for secondary contact (20.6.4.900.I).

Fishery (chronic)

Dissolved aluminum

Mimbres River at Mimbres near USGS gage

Exceeds:	Analyte:	LessThan:	Result:	Standard:	Units:	Sampling date:
Yes	aluminum	No	0.17	0.087	mg/L	09/11/2002
Yes	aluminum	No	0.26	0.087	mg/L	09/11/2002

Mimbres River at upper Nature Conservancy Property

Exceeds:	Analyte:	LessThan:	Result:	Standard:	Units:	Sampling date:
Yes	aluminum	No	0.6	0.087	mg/L	09/11/2002

Total mercury

Mimbres River at Mimbres near USGS gage

Exceeds:	Analyte:	LessThan:	Result:	Standard:	Units:	Sampling date:
Yes	mercury	No	0.0003	0.000012	mg/L	09/11/2002

high quality coldwater fishery

Dissolved oxygen

Mimbres River at upper Nature Conservancy Property

Exceeds:	Analyte:	LessThan:	Result:	Standard:	Units:	Sampling date:
Yes	Dissolved oxygen	No	5.85	6	mg/L	03/05/2002
Yes	Dissolved oxygen	No	4.72	6	mg/L	08/06/2002

segment specific criteria

Conductivity

Mimbres River at Mimbres near USGS gage

Exceeds:	Analyte:	LessThan:	Result:	Standard:	Units:	Sampling date:
Yes	Specific conductance	No	322	300	umhos	06/19/2002

Fecal coliform, single sample

Mimbres River at Mimbres near USGS gage

Exceeds:	Analyte:	LessThan:	Result:	Standard:	Units:	Sampling date:
Yes	fecals	No	260	200	/100 mL	07/25/2002
Yes	fecals	No	220	200	/100 mL	09/12/2002

pH, upper limit

Mimbres River at Mimbres near USGS gage

Exceeds:	Analyte:	LessThan:	Result:	Standard:	Units:	Sampling date:
Yes	pH, upper limit	No	8.9	8.8	su	03/05/2002
Yes	pH, upper limit	No	8.97	8.8	su	04/09/2002

Temperature *

Mimbres River at Mimbres near USGS gage

Exceeds:	Analyte:	LessThan:	Result:	Standard:	Units:	Sampling date:
Yes	Temperature	No	20.47	20	C	04/09/2002
Yes	Temperature	No	20.57	20	C	06/19/2002
Yes	Temperature	No	28.4	20	C	07/24/2002
Yes	Temperature	No	27.61	20	C	08/06/2002

Mimbres River (USGS Mimbres gage to headwaters) continued

20.6.4.804. The Mimbres River upstream of the USGS gaging station at Mimbres and all perennial tributaries thereto. There are no use-specific numeric criteria for secondary contact (20.6.4.900.I).

Mimbres River at upper Nature Conservancy Property

Exceeds:	Analyte:	LessThan:	Result:	Standard:	Units:	Sampling date:
Yes	Temperature	No	20.2	20	C	07/24/2002

Turbidity

Mimbres River at Mimbres near USGS gage

Exceeds:	Analyte:	LessThan:	Result:	Standard:	Units:	Sampling date:
Yes	Turbidity	No	999	10	ntu	09/11/2002

Mimbres River at upper Nature Conservancy Property

Exceeds:	Analyte:	LessThan:	Result:	Standard:	Units:	Sampling date:
Yes	Turbidity	No	999	10	ntu	09/11/2002

* Exceedances of temperature are evaluated using thermographs and a bureau temperature protocol.

Water Quality Assessment (assessment unit)[standards segment]. Both are shown due to overlap of assessment unit NM-2803_00 with stream standard segments 20.6.4.803 and 20.6.804.

Note. **Partial** and **non-supporting** designations become part of the § 303(d) list and § 305(b) report.

McKnight Canyon Creek (NM-2804_30) [20.6.4.804]:

Analyte: pH, Full support, impacts observed.

Mimbres River, USGS gage to headwaters (NM-2804_00) [20.6.4.804]:

Analyte: Dissolved Aluminum, Full Support, impacts observed.

Analyte: Dissolved Oxygen (previously listed), **Partial Support**.

Analyte: Turbidity, Full Support, impacts observed.

Analyte: Temperature (previously listed), **Non-supporting**.

Analyte: Stream bottom deposits, (previously listed), Full Support

Mimbres River, Mimbres USGS gage to headwaters (NM-2803_00) [20.6.4.804]:

Analyte: Dissolved Aluminum, Full Support, impacts observed.

Analyte: Total Mercury, Full Support, impacts observed.

Analyte: Turbidity, Full Support, impacts observed.

Analyte: Fecal coliform bacteria, **Non-supporting**

Analyte: pH, Full Support.

Analyte: Conductivity, Full Support.

Analyte: Temperature, (previously listed), **Non-supporting**.

Analyte: Stream bottom deposits, (previously listed), Full support.

Mimbres River, downstream of Mimbres USGS (NM-2803_00) [20.6.4.803]:

Analyte: Total Selenium, Full Support, impacts observed.

Analyte: Fecal coliform bacteria, **Non-supporting**

Analyte: Temperature (previously listed), **Non-supporting**

Analyte: Stream bottom deposits (previously listed), Supporting

Gallinas River from Mimbres to headwaters (NM-2803_20) [20.6.4.803]:

Analyte: Temperature (previously listed), **Unable to assess**, stream was dry at both sampling sites for 14 out of 16 sampling events.

Hot Springs Creek from Mimbres River to headwaters (NM-2803_10) [20.6.4.803]

Analyte: Unknown, **Unable to assess**, Dry entire survey.

Cold Springs Creek from Hot Springs Creek to headwaters (NM-2803_10) [20.6.4.803]

Analyte: Metals, **Unable to assess**, private property access denied by owner.

San Vicente Arroyo (NM-9000.A_025) [20.6.4.10A]. Currently, this stream is unclassified and is supporting for livestock watering and wildlife habitat under the general standards. Data for full classification (temperature and fishery data) will be collected in 2004.