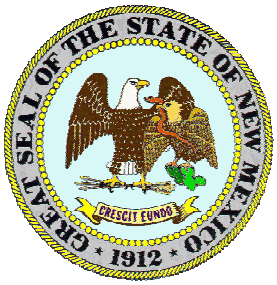
WATER QUALITY SURVEY SUMMARY

FOR THE

LOWER RÍO CHAMA WATERSHED

(BETWEEN EL VADO DAM AND SAN JUAN PUEBLO)

1999



Prepared by

Surface Water Quality Bureau
New Mexico Environment Department

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1.0 EXECUTIVE SUMMARY

Water quality surveys and assessments are completed in fulfillment of Section 106 of the Clean Water Act (CWA), *Work Program for Water Quality Management.* The purpose of the water quality survey is to collect water quality data to identify and prioritize water quality problems within a watershed and to evaluate the effectiveness of water quality based controls. The data collected as part of the survey are compared to current United State Environmental Protection Agency (USEPA) approved water quality standards to determine if waterbodies throughout the watershed are supporting their designated uses, such as the fishable and swimmable goals set forth in the CWA §102(a).

Water Quality Survey Summary Reports focus on information and data collected by the New Mexico Environment Department's (NMED) Surface Water Quality Bureau (SWQB) pertaining to stream reaches that were identified as NOT meeting water quality standards. All data collected as part of a survey are available upon request to the SWQB and can be downloaded from USEPA's computerized environmental data system known as STORET (http://www.epa.gov/storet/). The data collected as part of this study are later combined with all other readily available or submitted data that meet state quality assurance/quality control requirements to form the basis of designated use attainment determinations summarized in the *Integrated CWA §303(d)/305(b) Water Quality Monitoring and Assessment Report*.

Overall, the water quality of the lower Rio Chama watershed was good, although some water quality problems were observed. The mainstem of the Rio Chama is not considered to be impaired, however a few exceedences of the dissolved oxygen and pH standards did occur. The western portion of the watershed had water quality impairments due to temperature, turbidity and aluminum along the Rio Vallecitos and stream bottom deposit impairments on the Rio Tusas. The only water quality impairment observed in the northern portion of the watershed was due to turbidity on the Rio Nutrias. The most impaired portion of the watershed was the southwestern area where stream bottom deposits were the cause of impairment in the headwaters of the Rio Gallina along Clear Creek and Cecelia Canyon Creek, as well as in Rio Puerco de Chama and Rito Resumidero. Rio Puerco de Chama was also impaired due to temperature and fecal coliform. Poleo Creek, also in the southwestern portion of thewatershed was impaired due to turbidity. In the southern portion of the watershed Canones Creek was found to be impaired due to aluminum, fecal coliform, and turbidity; Polvadera Creek was impaired due to temperature; and finally, Abiquiu Creek was impaired due to dissolved oxygen.

2.0 INTRODUCTION

From 19 April to 6 October 1999, the Surface Water Quality Bureau (SWQB) of the New Mexico Environment Department (NMED) conducted a three season, multiple-day intensive water quality surveys of the lower Río Chama watershed. The survey included the main stem of the Río Chama from just below El Vado Dam to the San Juan Pueblo, just upstream of the confluence with the Río Grande, and many tributaries that enter the Río Chama in that reach. The area of the portion of the watershed that was surveyed is 5905 km^2, of which 5734 km^2 (97.1%) is in Río Arriba County, 151 km^2 (2.6%) is in Taos County, and 20 km^2 (0.3%) is in Sandoval County. Historic and current land uses in the lower Río Chama watershed include agriculture (range, pasture, and cropland), silviculture, recreation, and mining. Land ownership in the watershed includes the Carson National Forest, Santa Fe National Forest, Bureau of Land Management, Pueblo of San Juan, State Land Office, and various private parcels. Additionally, Abiquiu Reservoir, managed and maintained by the U.S. Army Corps of Engineers, is on the main stem of the Río Chama and was also surveyed in 1999 by the SWQB.

3.0 NM WATER QUALITY STANDARDS

General standards and standards applicable to attainable or designated uses for portions of the lower Río Chama watershed that were surveyed in this study are set forth in sections 20.6.4.12 and 20.6.4.900, of *Standards for Interstate and Intrastate Surface Waters* (20.6.4 NMAC, October 11, 2002). Segment specific standards for the lower Rio Chama watershed are set forth in Sections 20.6.4.115, 20.6.4.116, 20.6.4.118, and 20.6.4.119 and read as follows:

20.6.4.115 RIO GRANDE BASIN - The perennial reaches of Rio Vallecitos and its tributaries, and Rio del Oso, and El Rito creek above the town of El Rito.

A. Designated Uses: domestic water supply, irrigation, high quality coldwater fishery, livestock watering, wildlife habitat, and secondary contact.

B. Standards:

(1) In any single sample: conductivity shall not exceed 300 μmhos, pH shall be within the range of 6.6 to 8.8, temperature shall not exceed 20°C (68°F), and turbidity shall not exceed 10 NTU. The use-specific numeric standards set forth in 20.6.4.900 NMAC are applicable to the designated uses listed above in Subsection A of this section.

(2) The monthly geometric mean of fecal coliform bacteria shall not exceed 100/100 mL; no single sample shall exceed 200/100 mL (see Subsection B of 20.6.4.13 NMAC).

[20.6.4.115 NMAC – Rp 20 NMAC 6.1.2112, 10-12-00]

20.6.4.116 RIO GRANDE BASIN - The Rio Chama from its mouth on the Rio Grande upstream to Abiquiu reservoir, the Rio Tusas, the Rio Ojo Caliente, Abiquiu creek, and El Rito creek below the town of El Rito.

A. Designated Uses: irrigation, livestock watering, wildlife habitat, coldwater fishery, warmwater fishery, and secondary contact.

B. Standards:

(1) In any single sample: pH shall be within the range of 6.6 to 8.8, and temperature shall not exceed 31°C (87.8°F). The use-specific numeric standards set forth in 20.6.4.900 NMAC are applicable to the designated uses listed above in Subsection A of this section.

(2) The monthly geometric mean of fecal coliform bacteria shall not exceed l,000/100 mL; no single sample shall exceed 2,000/100 mL (see Subsection B of 20.6.4.13 NMAC).

[20.6.4.116 NMAC – Rp 20 NMAC 6.1.2113, 10-12-00]

20.6.4.118 RIO GRANDE BASIN - The Rio Chama from the headwaters of Abiquiu reservoir upstream to El Vado reservoir and the Rio Gallina and Rio Puerco de Chama north of state highway 96.

A. Designated Uses: irrigation, livestock watering, wildlife habitat, coldwater fishery, warmwater fishery, and secondary contact.

B. Standards:

(1) In any single sample: pH shall be within the range of 6.6 to 8.8, and temperature shall not exceed 26°C (78.8°F). The use-specific numeric standards set forth in 20.6.4.900 NMAC are applicable to the designated uses listed above in Subsection A of this section.

(2) The monthly geometric mean of fecal coliform bacteria shall not exceed 200/100 mL; no single sample shall exceed 400/100 mL (see Subsection B of 20.6.4.13 NMAC).

[20.6.4.118 NMAC – Rp 20 NMAC 6.1.2115, 10-12-00]

20.6.4.119 RIO GRANDE BASIN - All perennial reaches of tributaries to the Rio Chama above Abiquiu dam except the Rio Gallina and Rio Puerco de Chama north of state highway 96 and the main stem of the Rio Chama from the headwaters of El Vado reservoir upstream to the New Mexico-Colorado line.

A. Designated Uses: domestic water supply, fish culture, high quality coldwater fishery, irrigation, livestock watering, wildlife habitat, and secondary contact.

B. Standards:

(1) In any single sample: conductivity shall not exceed 500 µmhos (1,000 µmhos for Coyote creek), pH shall be within the range of 6.6 to 8.8, temperature shall not exceed 20°C (68°F), and turbidity shall not exceed 25 NTU. The use-specific numeric standards set forth in 20.6.4.900 NMAC are applicable to the designated uses listed above in Subsection A of this section.

(2) The monthly geometric mean of fecal coliform bacteria shall not exceed 100/100 mL; no single sample shall exceed 200/100 mL (see Subsection B of 20.6.4.13 NMAC).

[20.6.4.119 NMAC – Rp 20 NMAC 6.1.2116, 10-12-00]

4.0 METHODS

Water quality sampling methods were in accordance with the approved Quality Assurance Project Plan for Water Pollution Control Programs (QAPP) (NMED, 1999). Benthic macroinvertebrate and fish sampling methods conformed to protocols established by EPA's Regional Environmental Monitoring and Assessment Program (REMAP) (EPA, 1998). Instream habitat data were collected in accordance with the *Protocol for the Assessment of Stream Bottom Deposits (Sedimentation/Siltation) on Wadeable Streams (*NMED, 2002)

Water chemistry samples were collected on four consecutive days in spring (19-22 April), and two consecutive days in each of summer (27-28 July) and fall (5-6 October). Biological data and associated instream habitat data were collected on various dates in order to determine stream bottom deposit impairment.

5.0 SAMPLING SUMMARY

A map of the study area is presented in Figure 1. The station numbers, STORET identification codes (where available), and location descriptions of sampling stations selected for this survey are provided in Table 1. Stations where replicate samples were collected for quality assurance purposes are indicated by "**QA**" following the station name.

Figure 1. Lower Rio Chama Watershed and Sampling Station Locations

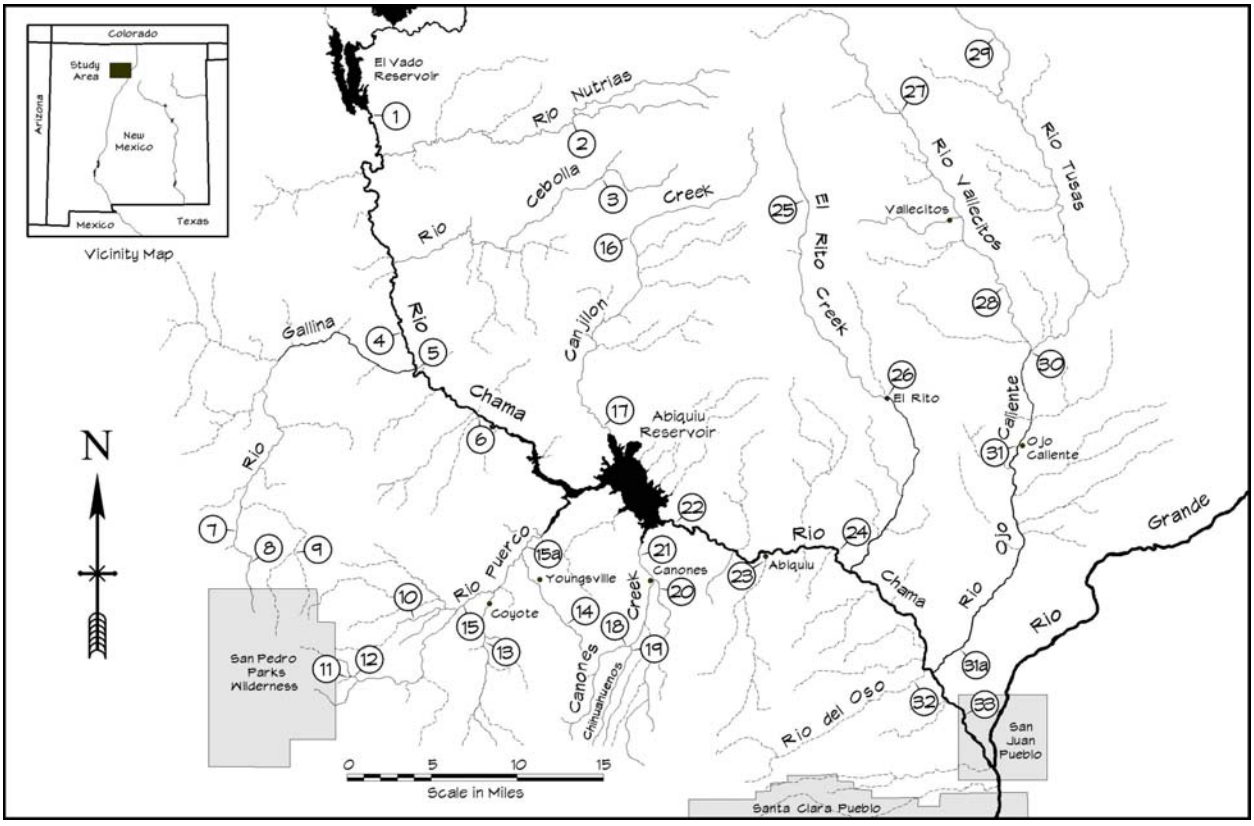

Table 1. Sampling Stations

Station	STORET Code	Location Description
1		Río Chama @ USGS gage below El Vado dam
2		Río Nutrias @ Hwy 84
3		Río Cebolla @ Hwy 84
4		Río Chama @ monastery
5		Río Gallina @ confluence with Río Chama **QA**
6		Río Chama above Abiquiu Reservoir, one mile above USGS station **QA**
7	URG116.012030	Río Gallina @ Forest Road 76
8		Clear Creek @ Forest Road 76
9		Cecilia Canyon Creek @ Forest Road 171
10	URG116.010050	Poleo Creek @ Forest Road 103
11		Rito Redondo @ Forest Road 93
12		Rito Resumidero @ Forest Road 93
13	URG116.010030	Coyote Creek @ Forest Road 316
14	URG116.010020	Rito Encino @ Forest Road 100Z
15	URG116.010040	Río Puerco de Chama @ Forest Road 103 (upper station)
15a		Río Puerco de Chama @ County Road 211 in Youngsville
16	URG116.010515	Canjilon Creek @ bridge below Canjilon
17	URG116.010505	Canjilon Creek @ US 84 above Abiquiu Reservoir
18		Cañones Creek above confluence with Chihuahueños Creek
19		Chihuahueños Creek above confluence with Cañones Creek
20		Polvadera Creek @ Forest Road 27 (County Road 95)
21	URG115.009010	Cañones Creek @ Forest Road 167 below Cañones
22	URG113.008025	Río Chama below Abiquiu Dam @ USGS gage
23	URG113.008015	Abiquiu Creek @ US 84 bridge
24	URG113.008005	Río Chama @ Hwy 554
25	URG112.007550	El Rito above inholding 1.3 miles above Forest Road 106
26	URG112.007510	El Rito @ bridge in El Rito 400 feet from Hwy 554
27		Río Vallecitos 8.4 miles above Vallecitos where road crosses river (FS boundary)
28		Río Vallecitos 3.9 miles above town of La Madera @ bridge
29		Río Tusas @ Forest Road 712
30	URG113.005510	Río Tusas above confluence with Río Vallecitos
31	URG113.005020	Río Ojo Caliente @ Hwy 414 @ Hot Springs bridge **QA**
31a		Río Ojo Caliente 3.4 miles above confluence with Río Chama
32		Río del Oso upstream from Cañoncito
33		Río Chama @ Hwy 74 bridge on San Juan Pueblo **QA**

6.0 WATER QUALITY ASSESSMENT (RESULTS AND DISCUSSION)

6.1 Stream Discharge

Stream discharge, measured in spring, summer, and/or fall at twenty stations, is given in Table 2.

Table 2. Stream Discharge (ft^3/sec)

Site (Stream)	20-22 April	27-28 July	5-6 October
2 (Río Nutrias)	24.7	5.53	1.3
3 (Río Cebolla)	1.97	0.441	0.077
7 (Río Gallina)	3.39	2.77	1.86
8 (Clear Creek)		0.74	
9 (Cecilia Canyon Creek)	4.51	2.4	0.57
13 (Coyote Creek)	1.81	0.383	0.286
15 (Río Puerco de Chama)		6.36	3.58
15a (Río Puerco de Chama)	14.73	10.56	4.37
16 (Canjilon Creek)	1.58	0.7	0.54
17 (Canjilon Creek)	6.25	1.48	0.31
18 (Cañones Creek)	4.22	3.06	1.55
19 (Chihuahueños Creek)	1.21	0.12	0.1
20 (Polvadera Creek)	2.33	1.42	1.4
21 (Cañones Creek)	10.74	3.34	4.84
23 (Abiquiu Creek)	0.51	0.18	0.251
26 (El Rito)	14.21	1.175	0.93
27 (Río Vallecitos)		9.52	8.17
28 (Río Vallecitos)	179	11.21	4.75
30 (Río Tusas)	10.03	5	
32 (Río del Oso)	0.84	0.56	0.728

6.2 Assessment Units (Stream Reach)

The following water quality assessment summary is divided into Assessment Units (also known as waterbody or stream reaches). Assessment Units and their associated sampling stations are given in Table 3.

Table 3. Assessment Units and Associated Sampling Stations

Assessment Unit	Sampling Stations
Río Chama (San Juan Pueblo to Abiquiu Dam)	22, 24, 33
Canjilon Creek (Abiquiu Reservoir to headwaters)	16, 17

Assessment Unit	Sampling Stations
Río Nutrias (Río Chama to headwaters)	2
Río Cebolla (Río Chama to headwaters)	3
Abiquiu Creek (Río Chama to headwaters)	23
Río del Oso (Río Chama to headwaters)	32
El Rito Creek (HWY 554 to headwaters)	25, 26
Río Vallecitos (Río Tusas to headwaters)	27, 28
Río Tusas (Río Vallecitos to headwaters)	29, 30
Río Ojo Caliente (Río Chama to Río Vallecitos)	31, 31a
Cañones Creek (Abiquiu Reservoir to headwaters)	18, 21
Chihuahueños Creek (Cañones Creek to headwaters)	19
Polvadera Creek (Cañones Creek to headwaters)	20
Río Gallina (Río Capulin to headwaters)	7
Clear Creek (Río Gallina to headwaters)	8
Cecilia Canyon Creek (Río Capulin to USFS bnd)	9
Rito Resumidero (Río Puerco de Chama to headwaters)	12
Río Puerco de Chama (Abiquiu Reservoir to Poleo Creek)	15a
Río Puerco de Chama (Poleo Creek to headwaters)	15
Poleo Creek (Río Puerco de Chama to headwaters)	10
Rito Encino (Río Puerco de Chama to headwaters)	14
Coyote Creek (Río Puerco de Chama to headwaters)	13
Rito Redondo (Rito Resumidero to headwaters)	11
Rio Chama (Abiquiu Reservoir to EL Vado Reservoir)	1,4,5,6

For many water quality parameters, the State of New Mexico maintains numeric water quality standards. However, for several parameters (e.g., plant nutrients, stream bottom deposits), only narrative standards exist. Data are assessed for designated use attainment status for both numeric and narrative water quality standards by application of the Assessment Protocol and associated appendices (NMED/SWQB, 2004a).

6.3 Discussion of Exceedences of Water Quality Standards

For many water quality parameters, the State of New Mexico maintains numeric water quality standards. However, for several parameters (e.g., plant nutrients, stream bottom deposits), only narrative standards exist. Data are assessed for designated use attainment status for both numeric and narrative water quality standards by application of the *Assessment Protocol* and associated appendices (NMED/SWQB, 2004a).

The following discussion includes information pertaining to all exceedences of water quality standards found during the intensive watershed survey. The purpose of this section of the report is to provide the reader with information on where current water quality standards are being exceeded within the watershed. These exceedences are used to determine designated use impairment status. Final assessment determinations as to whether or not a stream reach is considered to be meeting its designated uses depend on the overall amount and type of data

available during the assessment process (Refer to NMED/SWQB's Assessment Protocol for additional information on the assessment process, NMED/SWQB 2004a). When available, outside sources of data that meet quality assurance requirements are combined with data collected by SWQB during intensive watershed survey to determine final impairment status. Final designated use impairment status is housed in the Assessment Database (ADB) and is reported in *Appendix B* of the *Integrated Clean Water Act §303(d)/ §305(b) Report* (NMED/SWQB, 2004b).

6.3.1 Río Chama (San Juan Pueblo to Abiquiu Dam)

Exceedences of the water quality standard for dissolved oxygen (DO) (6.0 mg/L) were recorded once in summer and twice in fall at Station 22 (immediately below Abiquiu Dam). This is likely a result of hypolimnetic anoxic water release from the reservoir. One exceedence of the pH standard (6.6-8.8) was recorded in summer at the same station.

A de-list letter was approved for this reach in 2004 for an incorrect listing of aluminum.

6.3.2 Canjilon Creek (Abiquiu Reservoir to headwaters)

The temperature standard (20º C) was exceeded at Stations 16 and 17 on both days of summer sampling. Exceedences of the water quality standard for DO (6.0 mg/L) were recorded on both days of sampling in summer at Station 17. The conductivity standard (500 µmhos) was exceeded at each sampling event except during spring at Station 16. The turbidity standard (25 NTUs) was exceeded at every sampling event during spring and summer at Station 17. Phosphorus levels were elevated in spring and summer at Station 17. This reach was previously identified as impaired due to all of the above in addition to plant nutrients and stream bottom deposits.

Based on this and other studies, this reach goes dry, and therefore the only designated uses applicable to this reach are livestock watering and wildlife habitat, the standards of which were not exceeded during the course of this study.

6.3.3 Río Nutrias (Río Chama to headwaters)

The temperature standard (20º C) was exceeded once during summer. Exceedences of the turbidity standard (25 NTUs) were recorded once per season, for a total of three out of eight exceedences. Phosphorus was elevated during spring.

A total maximum daily load (TMDL) for turbidity was approved for this reach in 2004.

6.3.4 Río Cebolla (Río Chama to headwaters)

The temperature standard (20º C) was exceeded once during the summer. The conductivity standard (500 µmhos) was exceeded once each during summer and fall.

Based on this and other studies, this reach goes dry, and therefore the only designated uses applicable to this reach are livestock watering and wildlife habitat, the standards of which were not exceeded.

6.3.5 Abiquiu Creek (Río Chama to headwaters)

The DO standard (6.0 mg/L) was exceeded on both days of summer sampling. The fecal coliform bacteria standard (2000/100 mL) was exceeded in spring. The narrative standards for plant nutrients and stream bottom deposits were also exceeded, however the collection of additional data in 2002 in support of TMDL development revealed that plant nutrients and stream bottom deposits were no longer impairing in this reach.

In 2004 a TMDL for DO was approved for this reach and two de-list letters were approved for plant nutrients and stream bottom deposits.

6.3.6 Río del Oso (Río Chama to headwaters)

The temperature standard (20º C) was exceeded on both summer sampling days. The DO standard (6.0 mg/L) was exceeded once during summer. The turbidity standard (10 NTUs) was slightly exceeded once in spring (10.5 NTUs), and greatly exceeded twice in summer (72.1, 63.6) in response to a precipitation event. Phosphorus levels were slightly elevated on two of four spring sampling days, and on both summer sampling days. The narrative standard for stream bottom deposits was also exceeded.

Based on this and other studies, this reach goes dry, and therefore the only designated uses applicable to this reach are livestock watering and wildlife habitat, which were not exceeded.

6.3.7 El Rito Creek (HWY 554 to headweaters)

The turbidity standard (10 NTUs) was slightly exceeded (12.6, 14.3) on two of four spring samples at Station 25. The narrative standard for plant nutrients was also exceeded at Station 25. Additional data were collected in 2002 where no exceedences were observed for either turbidity or plant nutrients at this sampling station. The only exceedence reported for Station 26 was the chronic standard (87 μg/L) for dissolved aluminum in spring.

De-listing letters were approved for this reach in 2004 for turbidity, plant nutrients, and aluminum.

6.3.8 Río Vallecitos (Río Tusas to headwaters)

Thermographs were installed at both stations (27 and 28) in this water body. The lower station (28) recorded frequent temperature exceedences (instantaneous exceedences of 23º C and exceedences of 20º C for more than four hours for three consecutive days) in summer; the upper station (27) had no temperature exceedences. The turbidity standard (10 NTUs) was exceeded on all four spring sampling days at both sites. Phosphorus was

slightly elevated once in summer at Station 28. The acute standard for dissolved aluminum (750 mg/L) was exceeded once at both stations in spring. The turbidity and dissolved aluminum exceedences are likely related to increased runoff from spring snowmelt.

TMDLs were approved for this reach in 2004 for temperature, turbidity, and aluminum.

6.3.9 Río Tusas (Río Vallecitos to headwaters)

The only exceedence of numeric standards in this water body was for DO (6.0 mg/L), once in the summer at Station 30. The narrative standard for stream bottom deposits was also exceeded.

6.3.10 Río Ojo Caliente (Río Chama to Río Vallecitos)

The temperature standard (31º C) was exceeded once in the summer at Station 31a. The pH standard (< 6.6 or > 8.8) was exceeded (9.65) at Station 31a once in spring. The chronic standard for dissolved aluminum (87 µg/L) was exceeded at Station 31 in spring, however, the location where samples were collected on this reach was not perennial, and therefore the only designated uses applicable to this reach are livestock watering and wildlife habitat, which were not exceeded. The narrative standard for stream bottom deposits was also exceeded, however re-evaluation of the data determined that the reach was not impaired due to stream bottom deposits.

De-listing letters were approved for this reach in 2004 for aluminum and stream bottom deposits.

6.3.11 Cañones Creek(Abiquiu Reservoir to headwaters)

The temperature standard (20º C) at Station 21 was exceeded on both summer sampling days. Station 18 had a thermograph installed. The temperature standard where thermograph data are available is as follows: instantaneous temperature of > 23º C or > 20º C for more than four hours for three consecutive days. The instantaneous temperature standard was exceeded seven times at Station 18 during summer, however, it was discovered that the thermograph was out of the water during the period when exceedences were observed.

The turbidity standard (25 NTUs) was exceeded at Station 21 twice in summer and once in fall. Phosphorus was slightly elevated at Station 21 once in spring and twice in summer. The fecal coliform bacteria standard (200/100mL) was exceeded at Station 21 in spring and summer. The chronic standard for dissolved aluminum (87 µg/L) was exceeded at Station 21 in spring.

A de-list letter was approved for this reach in 2004, and TMDLs were approved for turbidity, fecal coliform, and aluminum.

6.3.12 Chihuahueños Creek (Cañones Creek to headwaters)

The narrative standard for stream bottom deposits was exceeded for this reach, however, re-evaluation of the data indicated that this reach is not impaired due to stream bottom deposits.

A de-list letter was approved for this reach in 2004 for stream bottom deposits.

6.3.13 Polvadera Creek (Cañones Creek to headwaters)

The temperature standard (20º C) was exceeded on both days of summer sampling. The narrative standard for stream bottom deposits was also exceeded, however, re-evaluation of the data indicated that this reach is not impaired due to stream bottom deposits.

In 2004 a TMDL was approved for this reach for temperature and a de-list letter was approved for stream bottom deposits.

6.3.14 Río Gallina (Río Capulin to headwaters)

No exceedences of numeric standards were reported in this reach. The narrative standard for stream bottom deposits was exceeded, however, re-evaluation of the data and collection of additional data indicated that this reach is not impaired due to stream bottom deposits.

6.3.15 Clear Creek (Río Gallina to headwaters)

No exceedences of numeric standards were reported in this reach. The narrative standard for stream bottom deposits was exceeded.

6.3.16 Cecilia Canyon Creek (Río Capulin to USFS bnd)

No exceedences of numeric standards were reported in this reach. The narrative standard for stream bottom deposits was exceeded.

6.3.17 Rito Resumidero (Río Puerco de Chama to headwaters)

No exceedences of numeric standards were reported in this reach. The narrative standard for stream bottom deposits was exceeded.

6.3.18 Río Puerco de Chama (Abiquiu Reservoir to Poleo Creek)

The temperature standard (26º C) was exceeded on both summer sampling days. The DO standard (6.0 mg/L) was exceeded once in fall. The fecal coliform bacteria standard (400/100mL) was exceeded in spring and summer.

6.3.19 Río Puerco de Chama (Poleo Creek to headwaters)

No exceedences of numeric standards were reported in this reach. The narrative standard for stream bottom deposits was exceeded.

6.3.20 Poleo Creek (Río Puerco de Chama to headwaters)

The turbidity standard (25 NTUs) was exceeded on all four days of spring sampling, and one of two days in summer. Phosphorus was slightly elevated one day each in spring and summer.

A TMDL was approved for this reach in 2004 for turbidity.

6.3.21 Rito Encino (Río Puerco de Chama to headwaters)

The conductivity standard (500 μmhos) was exceeded once in fall. The turbidity standard (25 NTUs) was exceeded once in spring. Phosphorus was slightly elevated once in spring.

6.3.22 Coyote Creek (Río Puerco de Chama to headwaters)

The temperature standard (20º C) was exceeded once in summer. The narrative standard for stream bottom deposits was also exceeded, however, re-evaluation of the data indicated that this reach is not impaired due to stream bottom deposits.

A de-list letter was approved for this reach in 2004 for stream bottom deposits

6.3.23 Rito Redondo from mouth on Rito Resumidero to headwaters

There were no water quality standards exceedences fro this reach.

7.0 CONCLUSIONS

Overall, the water quality of the lower Rio Chama watershed was good, although some water quality problems were observed. The mainstem of the Rio Chama is not considered to be impaired, however a few exceedences of the dissolved oxygen and pH standards did occur. The western portion of the watershed had water quality impairments due to temperature, turbidity and aluminum along the Rio Vallecitos and stream bottom deposit impairments on the Rio Tusas. The only water quality impairment observed in the northern portion of the watershed was due to turbidity on the Rio Nutrias. The most impaired portion of the watershed was the southwestern area where stream bottom deposits were the cause of impairment in the headwaters of the Rio Gallina along Clear Creek and Cecelia Canyon Creek, as well as in Rio Puerco de Chama and Rito Resumidero. Rio Puerco de Chama was also impaired due to temperature and fecal coliform. Poleo Creek, also in the southwestern portion of thewatershed was impaired due to turbidity. In the southern portion of the watershed Canones Creek was found to be impaired due

to aluminum, fecal coliform, and turbidity; Polvadera Creek was impaired due to temperature; and finally, Abiquiu Creek was impaired due to dissolved oxygen.

8.0 REFERENCES

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