1.0 BACKGROUND INFORMATION

1.1 Location Description and History

The Rio Chama watershed (USGS Hydrologic Unit Code 13020102) is a subbasin of the Rio Grande Basin, in north-central New Mexico. The entire Rio Chama watershed encompasses 3,150 square miles. For practical purposes, the Rio Chama watershed was divided into upper and lower sampling units in 1999. The Surface Water Quality Bureau of the New Mexico Environment Department (SWQB/NMED) defines the Lower Rio Chama watershed (approximately 1725 square miles) as the Rio Chama watershed below El Vado Reservoir to the Rio Grande. Tributaries in the Lower Rio Chama watershed include Abiquiu Creek, El Rito Creek, Vallecitos Creek, Rio Tusas, Rio Nutrias, Canjilon Creek, Rio Ojo Caliente, Rio del Oso, Cañones Creek, Chihuahuenos Creek, Polvadera Creek, Rio Gallina, Clear Creek, Cecilia Canyon Creek, Rito Resumidero, Rio Puerco de Chama, Poleo Creek, Rito Encinco, Coyote Creek, and Rito Redondo.

1.2 Water Quality Standards

Water quality standards for all assessment units in this document are set forth in sections 20.6.4.115, 20.6.4.116, 20.6.4.119 and 20.6.4.900 of the 2001 New Mexico Standards for Interstate and Intrastate Surface Waters (20.6.4 NMAC).

20.6.4.115 NMAC reads as follows:

> **RIO GRANDE BASIN**—All 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 ºC (68 ºF), and turbidity shall not exceed 10 NTU. The use-specific numeric standards set forth in 20.6.4.900 NMAC are applicable to 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).

In addition, according to the New Mexico water quality standards (20.6.4.900.M NMAC), the dissolved aluminum chronic criterion is 87 µg/L and the dissolved aluminum acute criterion is 750 µg/L for aquatic life uses.

20.6.4.116 NMAC reads as follows:

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 ºC (87.8 ºF). The use-specific numeric standards set forth in 20.6.4.900 NMAC are applicable to designated uses listed above in Subsection A of this section.

(2) The monthly geometric mean of fecal coliform bacteria shall not exceed 1,000/100 mL; no single sample shall exceed 2,000/100 mL (see Subsection B of 20.6.4.13 NMAC).

20.6.4.119 NMAC reads as follows:

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 ºC (68 ºF), and turbidity shall not exceed 25 NTU. The use-specific numeric standards set forth in 20.6.4.900 NMAC are applicable to 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).

In addition, according to the New Mexico water quality standards (20.6.4.900.M NMAC), the dissolved aluminum chronic criterion is 87 µg/L and the dissolved aluminum acute criterion is 750 µg/L for aquatic life uses.

1.3 Intensive Water Quality Sampling

The Lower Rio Chama watershed was intensively sampled by SWQB/NMED in 1999. Water quality samples were collected during spring (April 19–22), summer (July 27–28), and fall (October 5–6). Select follow-up monitoring was completed in October 2001 and June–September 2002. Surface water quality monitoring stations were selected in this watershed to characterize water quality of the stream reaches (Table 1.1, Figure 1.1). Stations were positioned to evaluate the impact of tributary streams and to establish

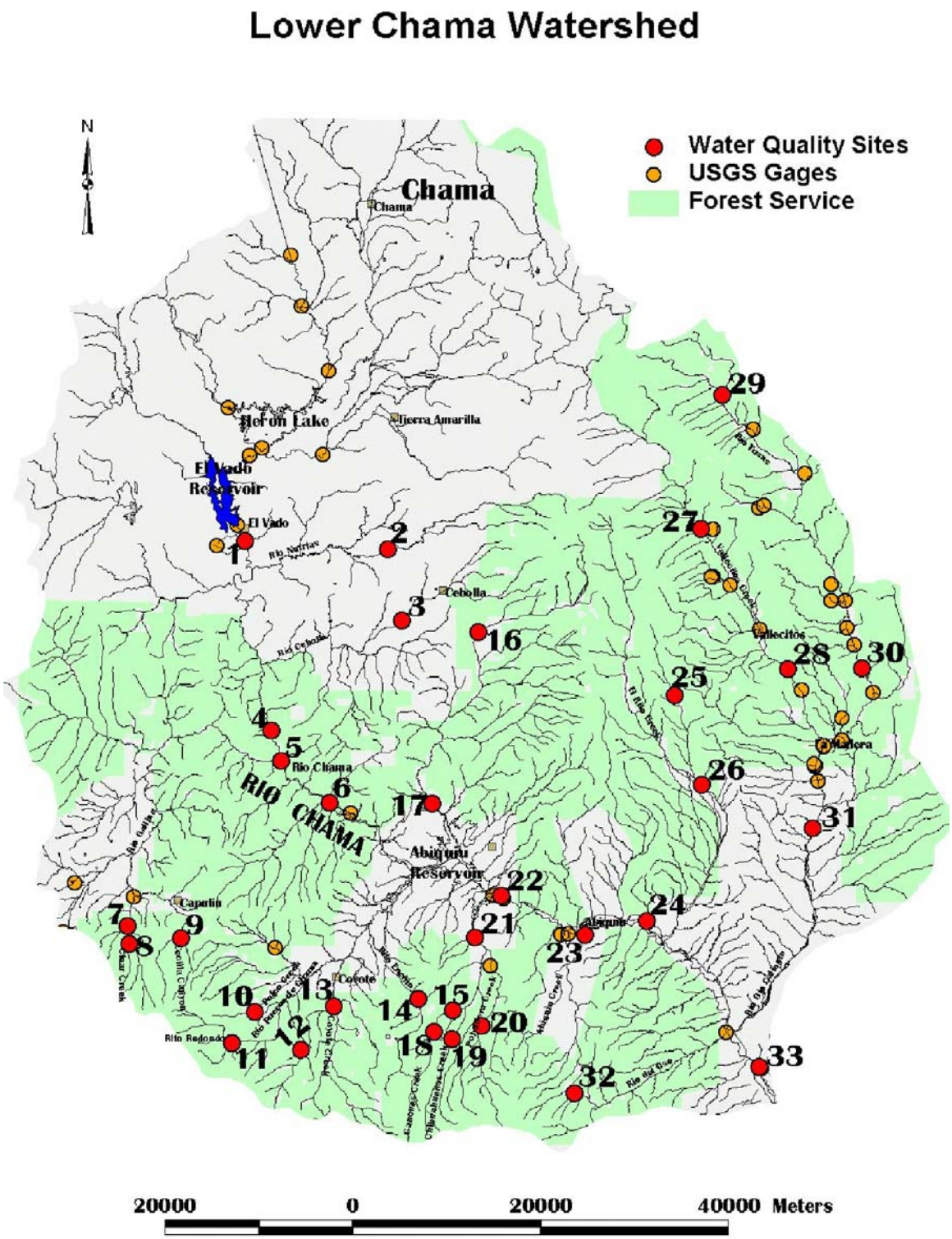

Figure 1.1. Water Quality Monitoring Sites for Lower Chama Watershed (1999)

background conditions. Because of the large percentage of private land in the Lower Rio Chama watershed, selection of sampling stations was often limited to road/bridge right-of-way locations, while some stations were situated with permission on private lands. The results of the survey were summarized in a water quality survey report (SWQB/NMED 2001a).

Table 1.1 SWQB/NMED 1999 Lower Rio Chama Watershed Sampling Stations

SWQB Station	STORET Reference	Station Location
1	29RChama120.6	Rio Chama @ USGS gage below El Vado dam
2	29RNutri028.4	Rio Nutrias @ Hwy 84
3	29RCebol027.0	Rio Cebolla @ Hwy 84
4	29RChama089.7	Rio Chama @ monastery
5	29RGalli000.5	Rio Gallina @ confluence with Rio Chama (QA)
6	29RChama079.5	Rio Chama above Abiquiu Reservoir, 1 mile above USGS station (QA)
7	29RGalli045.1	Rio Gallina @ Forest Road 76
8	29ClearC000.1	Clear Creek at Forest Road 76
9	29CeciliC000.1	Cecilia Canyon Creek @ Forest Road 171
10	29PoleoC009.5	Poleo Creek @ Forest Road 103
11	29RRedon000.2	Rito Redondo @ Forest Road 93
12	29RResum001.7	Rito Resumidero @ Forest Road 93
13	29Coyote005.6	Coyote Creek @ Forest Road 316
14	29REncin009.7	Rito Encino @ Forest Road 100Z
15	29RPuerc037.5	Rio Puerco de Chama @ Forest Road 103 (upper station)
15a	29RPuerc011.0	Rio Puerco de Chama @ County Road 211 in Youngsville
16	29Canjil035.0	Canjilon Creek @ bridge below Canjilon
17	29Canjil006.2	Canjilon Creek @ US 84 above Abiquiu Reservoir

SWQB Station	STORET Reference	Station Location
18	29Canone007.0	Cañones Creek above confluence with Chihuahuenos Creek
19	29Chihua000.1	Chihuahuenos Creek above confluence with Cañones Creek
20	29Polvad008.8	Polvadera Creek @ Forest Road 27 (County Road 95)
21	29Canone004.6	Cañones Creek @ Forest Road 167 below Canones
22	29RChama050.4	Rio Chama below Abiquiu Dam @ USGS gage
23	29Abique001.8	Abiquiu Creek @ US 84 bridge
24	29RChama038.3	Rio Chama @ Hwy 554
25	29ElRito044.0	El Rito above inholding 1.3 miles above Forest Road 106
26	29ElRito021.0	El Rito @ bridge in El Rito 400 feet from Hwy 554
27	29RValle030.5	Rio Vallecitos 8.4 miles above Vallecitos where road crosses river (USFS boundary)
28	29RValle007.9	Rio Vallecitos 3.9 miles above town of La Madera @ bridge
29	29RTusas000.2	Rio Tusas @ Forest Road 712
30	29RTusas000.1	Rio Tusas above confluence with Rio Vallecitos
31	29RojoCa026.1	Rio Ojo Caliente @ Hwy 414 @ Hot Springs bridge (QA)
31a	29RojoCa005.1	Rio Ojo Caliente 3.4 miles above confluence with Rio Chama
32	29RioOso001.9	Rio del Oso upstream from Canoncito
33	29RChama004.8	Rio Chama @ Hwy 74 bridge on San Juan Pueblo (QA)

QA – Stations were replicate samples were collected for quality assurance purposes.

In addition to the water quality survey, more detailed physical, biological, and chemical data were collected for this site using methods from the Regional Environmental Monitoring and Assistant Program (REMAP) study. These data were collected in conjunction with the water quality survey, and were used in the physical and biological assessment of this stream segment.

There are several USGS gaging stations in the Lower Rio Chama watershed (Table 1.2).

Table 1.2. USGS Gages in the Lower Chama Watershed

Site Number	Site Name	From (yyyy-mm-dd)	To (yyyy-mm-dd)
08288000	EL RITO NEAR EL RITO, NM	1931-10-01	1950-09-30
08286500	RIO CHAMA ABOVE ABIQUIU RESERVOIR, NM	1961-08-01	2001-09-30
08287000	RIO CHAMA BELOW ABIQUIU DAM, NM	1961-11-01	2001-09-30
08285500	RIO CHAMA BELOW EL VADO DAM, NM	1935-10-30	2001-09-30
08287500	RIO CHAMA NEAR ABIQUIU, NM	1941-10-01	1967-09-30
08289000	RIO OJO CALIENTE AT LA MADERA, NM	1932-10-01	2001-09-30

All temperature, chemical/physical, and stream bottom deposits sampling and assessment techniques are detailed in the Quality Assurance Project Plan (SWQB/NMED 2001b). As a result of the 1999 monitoring effort and subsequent assessment of results, several exceedances of New Mexico water quality standards for several streams were documented. Accordingly, these impairments were added to New Mexico's CWA Integrated §303(d)/§305(b) list. This TMDL document addresses each assessment unit by constituent (or pollutant) the standard(s) for which have been exceeded.