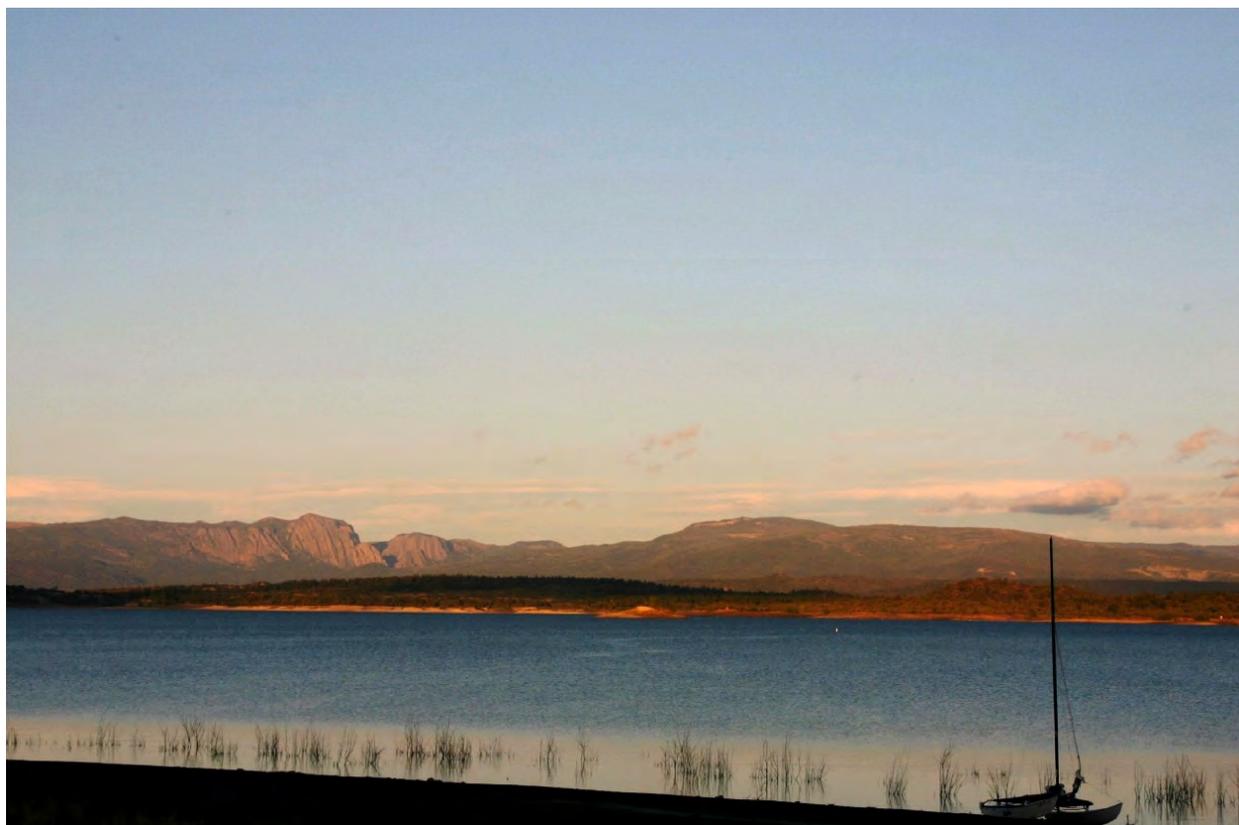


RIO CHAMA 2012 FIELD SAMPLING PLAN



April 13, 2012

Prepared by

Seva Joseph – Environmental Scientist/Specialist
Chuck Dentino - Environmental Scientist/Specialist

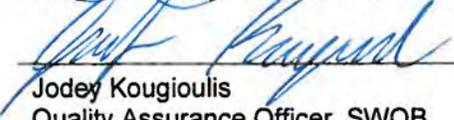
APPROVAL PAGE



James Hogan
Program Manager, SWQB Monitoring and Assessment Section

4.16.12

Date



Jodey Kougioulis
Quality Assurance Officer, SWQB

4/16/12

Date

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ACRONYMS

AU	Assessment Unit
Cl	Chlorine
DO	Dissolved Oxygen
Fl	Fluoride
Hg	Mercury
IR	State of New Mexico Clean Water Act §303(d)/305(b) Integrated Report
MAS	Monitoring and Assessment Section
MPG	Miles per gallon
NMED	New Mexico Environment Department
NPDES	National Pollutant Discharge Elimination System
NPS	Non-point Source
PSRS	Point Source Regulation Section
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
SLD	Scientific Laboratory Division
SC	Specific Conductance
SOP	Standard Operating Procedures
SWQB	Surface Water Quality Bureau
TDS	Total Dissolved Solids
TM	Total Metals
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
USEPA	United States Environmental Protection Agency
WPS	Watershed Protection Section
WQ	Water Quality
WQCC	Water Quality Control Commission
WQS	Water Quality Standard
WTU	Work Time Unit
WWTP	Wastewater Treatment Plant

INTRODUCTION

The purpose of this field sampling plan is to provide a detailed description of the Rio Chama Water Quality Survey to be conducted in the Rio Chama watershed during 2012 by the New Mexico Environment Department (NMED) Surface Water Quality Bureau (SWQB). It has been prepared in accordance with SOP 2.1, Field Sampling Plans. It describes project objectives and decision criteria, and includes the sampling plan with sampling locations, parameters and sampling frequencies for physical, chemical and biological data. It may be amended as the need arises. Amendments will be documented and justified in the survey report.

This plan is a companion document to the Surface Water Quality Bureau Quality Assurance Project Plan (QAPP) for Water Quality Management Programs (NMED/SWQB 2011a). Data will be collected according to the QAPP and the most recent version of the Standard Operating Procedures (SOPs) for Water Quality Data Collection (NMED/SWQB 2011b).

1.0 PROJECT PERSONNEL

1.1 Personnel Roles and Responsibilities

Table 1 details the responsibilities for this project. Each team member is responsible for implementing the assigned responsibilities. If an individual is unable to fulfill their duties it is that individual's responsibility to find assistance and/or a replacement, in coordination with appropriate supervisors.

Table 1. Personnel Roles and Responsibilities

Team Member	Position/Role	Responsibilities
Seva Joseph 505-827-0573	Project Coordinators	Coordinates survey planning efforts (integrates the documentation of various team members' information into the field sampling plan and planning spreadsheet); Coordinates and participates in the collection of chemical, biological, and habitat data including sonde and thermograph data collection efforts;
Chuck Dentino 505-827-0101		Manages chemical, biological, and habitat data for study (forms, data entry and analysis); Provides chemical, biological, and habitat results for final report and writes appropriate portions of the survey report; and Coordinates development of final survey report (integrates information from all team members into final survey report).
Barbara Cooney 505-827-0212	Point Source Regulation Section (PSRS) Liaison	Provides information and data needs pertaining to point source discharges located within the study area; Assists with development of final survey report, as needed.
Neal Schaeffer 505-476-3017	Watershed Protection Section (WPS) Liaisons	Provides information and data needs pertaining to nonpoint sources of pollution and BMPs located within the study area.
Delbert Trujillo 505-827-2867		
Heidi Henderson 505-827-2901	TMDL Liaison	Provides information and data needs pertaining to TMDL development to be conducted in the study area; Assists with development of final survey report, as needed; and develops TMDLs as needed.

1.2 Organization

For the responsibilities defined in this project, the Project Coordinators report to the Monitoring Lead within the Monitoring and Assessment Section.

2.0 PROJECT DESCRIPTION

2.1 Background

Table 2 shows stream assessment units within the study area and where the designated uses are not being attained based on data collected during the previous surveys (NMED/SWQB 2004, 2011c). IR Category refers to the New Mexico's Integrated Report categories (See Appendix A).

Table 2. Use Attainment Status

Assessment Unit	Water Quality Segment	Impairment	STATUS	IR Category (by AU)	CYCLE FIRST LISTED
Abiquiu Creek (Rio Chama to headwaters)	20.6.4.116	Oxygen, Dissolved	TMDL Completed	4A	1998
Abiquiu Reservoir	20.6.4.117	Mercury in Fish Tissue; PCBs in Fish Tissue; Oxygen, Dissolved	303(d) list	5/5C	2010; 2006; 2010
Arroyo del Toro (Rio Chama to headwaters)	20.6.4.98	PCBs	303(d) list	5/5A	2012
Cañada de Horno (Rio Chama to headwaters)	20.6.4.98	PCBs	303(d) list	5/5A	2012
Canjilon Creek (Perennial portions Abiquiu Rsvr to headwaters)	20.6.4.119	Nutrient/Eutrophication Biological Indicators; Turbidity	303(d) list	5/5C	2010; 2006
Canjilon Creek (Perennial portions Abiquiu Rsvr to headwaters)	20.6.4.119	Specific Conductance; Temperature, water; Turbidity	TMDL Completed	5/5C	2006
Cañones Creek (Abiquiu Rsvr to headwaters)	20.6.4.119	Aluminum; Fecal Coliform; Turbidity	TMDL Completed	4A	1998
Chavez Creek (Rio Brazos to headwaters)	20.6.4.119	Temperature, water	TMDL Completed	4A	2004
El Vado Reservoir	20.6.4.120	Oxygen, Dissolved	303(d) list	5/5C	2010
Poleo Creek (Rio Puerco de Chama to headwaters)	20.6.4.119	Turbidity	TMDL Completed	4A	1998
Polvadera Creek (Cañones Creek to headwaters)	20.6.4.119	Sedimentation/Siltation	303(d) list	5/5A	2006
Polvadera Creek (Cañones Creek to headwaters)	20.6.4.119	Temperature, water	TMDL Completed	5/5A	1998
Rio Brazos (Rio Chama to Chavez Creek)	20.6.4.119	Temperature, water	TMDL Completed	4A	1998

Assessment Unit	Water Quality Segment	Impairment	STATUS	IR Category (by AU)	CYCLE FIRST LISTED
Rio Capulin (Rio Gallina to headwaters)	20.6.4.119	E. coli	TMDL Completed	4A	2010
Rio Chama (El Vado Rsvr to Rio Brazos)	20.6.4.119	Aluminum	303(d) list	5/5A	2010
Rio Chama (El Vado Rsvr to Rio Brazos)	20.6.4.119	E. coli; Nutrient/Eutrophication Biological Indicators; Temperature, water	TMDL Completed	5/5A	2010
Rio Chama (Rio Brazos to Little Willow Crk)	20.6.4.119	Aluminum	303(d) list	5/5C	2010
Rio Chama (Rio Brazos to Little Willow Crk)	20.6.4.119	E. coli; Nutrient/Eutrophication Biological Indicators; Temperature, water	TMDL Completed	5/5C	2010; 2010; 1998
Rio Chama (Little Willow Crk to CO border)	20.6.4.119	Aluminum	303(d) list	5/5A	2010
Rio Chama (Little Willow Crk to CO border)	20.6.4.119	E. coli; Temperature, water	TMDL Completed	5/5A	2010
Rio Chamita (Rio Chama to CO border)	20.6.4.119	Turbidity	303(d) list	5/5A	2010
Rio Chamita (Rio Chama to CO border)	20.6.4.119	Aluminum; Ammonia (Un-ionized); E. coli; Nutrient/Eutrophication Biological Indicators; Temperature, water	TMDL Completed	5/5A	1998; 1998; 2010; 2006; 1998
Rio del Oso (Rio Chama to headwaters)	20.6.4.115	PCBs	303(d) list	5/5A	2012
Rio Nutrias (Rio Chama to headwaters)	20.6.4.119	Turbidity	TMDL Completed	4A	2004
Rio Puerco de Chama (Abiquiu Reservoir to HWY 96)	20.6.4.118	Aluminum; Nutrient/Eutrophication Biological Indicators	303(d) list	5/5C	2010

Assessment Unit	Water Quality Segment	Impairment	STATUS	IR Category (by AU)	CYCLE FIRST LISTED
Rio Puerco de Chama (Abiquiu Reservoir to HWY 96)	20.6.4.118	E. coli; Temperature, water	TMDL Completed	5/5C	2010; 1998
Rio Tusas (Rio Vallecitos to headwaters)	20.6.4.116	Nutrient/Eutrophication Biological Indicators	TMDL Completed	4A	2010
Rio Vallecitos (Rio Tusas to headwaters)	20.6.4.115	Aluminum; Temperature, water; Turbidity	TMDL Completed	4A	1998
Rito de Tierra Amarilla (Rio Chama to HWY 64)	20.6.4.119	Sedimentation/Siltation; Temperature, water; Turbidity	TMDL Completed	4A	1998
Rito Resumidero (Rio Puerco de Chama to headwaters)	20.6.4.119	Benthic-Macroinvertebrate Bioassessments (Streams)	303(d) list	5/5C	2010

The impairments listed in Table 2 were identified during the 1999 and 2007 water quality surveys of the Rio Chama watershed (NMED/SWQB 2004, 2011c). The exception is Rio del Oso, Cañada de Horno, and Arroyo del Toro, which are proposed listings in the 2012-2014 Integrated Report from data collected by DOE oversight bureau (NMED/SWQB 2011d). Data needs have been determined based on impairments from the previous studies, identified data gaps, and consultation with SWQB Monitoring and Assessment Section (MAS), Point Source Regulation Section (PSRS), and Watershed Protection Section (WPS) staff as well as other state agencies, federal agencies, tribes, local watershed groups, and interested parties.

2.2 Objectives

Table 3. Project Objectives

	Collect Water Quality Data to:	Question to be answered	Products/ Outcomes	Decision Criteria
Primary Objective	Assess designated use attainment for the <i>Integrated Report</i> and provide information to the public on the condition of surface water	Are sampled waterbodies meeting WQS criteria?	Survey Report; Integrated Report	WQS as interpreted by the Assessment Protocols
Secondary Objectives	Develop load and waste load allocations for TMDLs	What is the maximum pollutant load a waterbody can receive and meet the requirements of the WQS?	TMDL loading calculations and NPDES permit limits	WQS as interpreted by the Assessment Protocols
	Evaluate restoration and mitigation measures implemented to control NPS pollution	Have watershed restoration activities and mitigation measures improved water quality?	Project Summary Reports, NPS Annual Report, <i>Integrated Report (De-Listing)</i>	WQS as interpreted by the Assessment Protocols
	Develop or refine surface WQS	Are the existing uses appropriate for the waterbody?	Use Attainability Analyses (UAA); Amendments to NM WQS	Are data sufficient to support a petition to the WQCC to revise WQS?

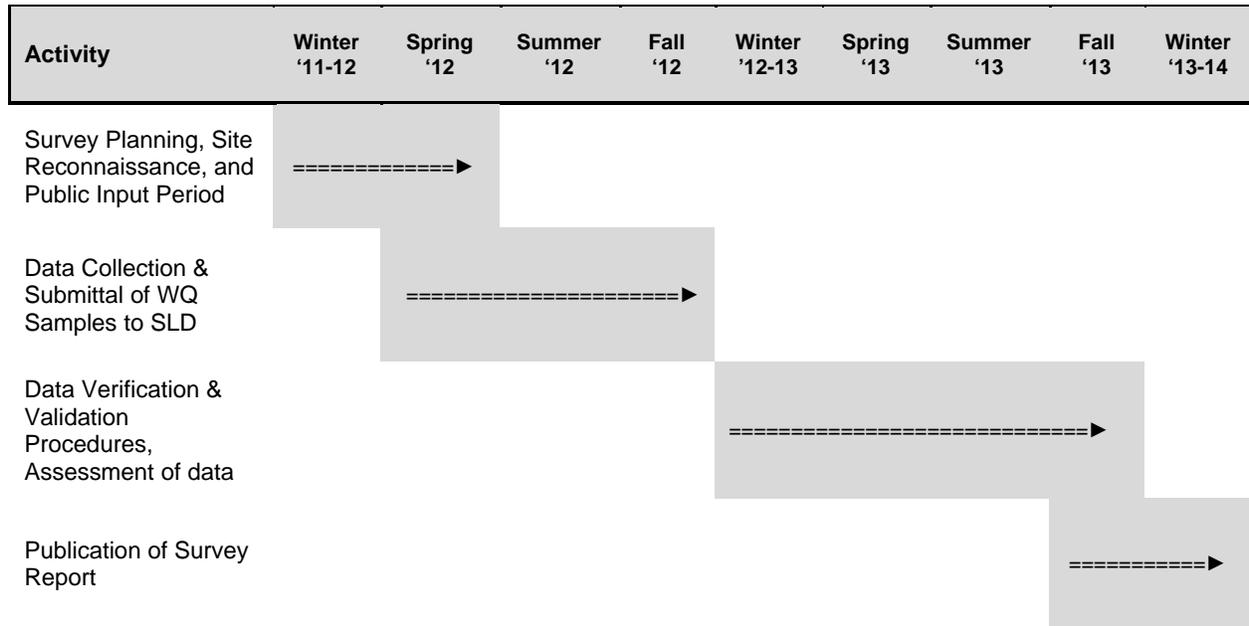
2.3 Schedule

As part of the survey planning process, public meetings are held to receive public input on any areas of concern within the assessment units surveyed and to inform interested parties about the general water quality survey, assessment and TMDL processes, as well as our specific sampling plans in the watershed this year. For this survey, one public meeting will be held on March 1, 2012 at the Rural Events Center, Abiquiu, NM from 6:30 to 8:00 pm.

Water quality data will be collected between March and December of 2012. Water chemistry results typically take several months to return from the analytical laboratory, Scientific Laboratory Division (SLD). When these data are received, they are verified and validated as described in NMED/SWQB 2011b. Once all data have been received they will be validated and verified then assessed according to the most recent version of the assessment protocols in time for incorporation into the 2014-2016 Integrated Report (IR). Once the assessments are complete, the TMDL development process will begin for any identified impairments. TMDLs are tentatively scheduled for completion in Fall 2015.

The progress of this project will be documented and tracked from its inception through implementation to ensure all sampling and analytical activities are performed in accordance with all applicable requirements and in a cost effective manner. Table 4 provides the project timeline.

Table 4. Project Schedule



2.4 Location

Project Area Description:

The project area includes the Rio Chama and tributaries from the Ohkay Owingeh boundary to the highest station below the Colorado state line at Sexto Creek (Figure 1). In addition to the mainstem of the Rio Chama, monitoring will occur on several tributaries to the Rio Chama, including Rio Puerco de Chama, Rio Gallina, Canijlon Creek, Rio Vallecitos, El Rito, Rio Ojo Caliente, Rio Brazos, as well as the reservoirs, Abiquiu Lake, Heron Lake, and El Vado Lake. For a complete list of all water quality stations see Table 5.

Table 5. SWQB Water Quality stations in the Rio Chama

Map ID	Storet ID	Station	Station Rationale
1	29SextoC000.1	Sexto Creek above Rio Chamita	Impaired
2	29NaborC000.1	Nabor Creek 5 yards upstream of Rio Chamita	Lowest Station in AU
3	29RChama183.4	Rio Chama at NM 17	Impaired
4	NM0027731	Chama WWTF effluent discharge	Impaired
5	29RChami002.7	Rio Chamita below Chama WWTP outfall	Impaired
6	29RChama174.0	Rio Chama below Chama Town	Impaired

Map ID	Storet ID	Station	Station Rationale
7	29Cannon002.4	Cañones Creek above US Hwy 84 (near Chama)	Lowest Station in AU
8	29RBrazo010.1	Rio Brazos 1 mile above Corkins Lodge	Lowest Station in AU
9	29Chavez000.1	Chavez Creek at Hwy 512 above Rio Brazos	Impaired
10	29RBrazo001.6	Rio Brazos above US Hwy 84 bridge	Impaired
11	NM0030139	Los Ojos Fish Hatchery Outfall #1	Point Source
12	NM0030139	Los Ojos Fish Hatchery Outfall #2	Point Source
13	29BurnsLakeDp	Burn's Lake (Laguna del Campo)	Never Assessed
14	29RTierr026.1	Rito de Tierra Amarilla at Hwy 64 bridge	Lowest Station in AU
15	29RTierr000.7	Rito de Tierra Amarilla at Hwy 112 bridge	Impaired
16	29Willow000.1	Willow Creek above Heron Lake	Monitor lake input
17	29RChama147.0	Rio Chama below Rito de Tierra Amarilla and above gage 08284100	Impaired
18	29HeronLakeSH	Heron Lake – shallow station	Monitor lake input
19	29HeronLDpDam	Heron Lake – deep station	Deep Station
20	29RChama137.5	Rio Chama above Heron Lake outfall	Lowest station in AU
21	29HeronOutfall	Heron Lake outfall	Monitor lake output
22	29RChama137.0	Rio Chama above El Vado	Monitor lake input
23	29ElVadoResSH	El Vado Reservoir – shallow station	Monitor lake input
24	29ElVadoResDP	El Vado – deep station	Deep Station
25	29RChama120.6	Rio Chama at USGS gage 08285500 below El Vado Dam	Monitor lake output
26	29RNutri005.4	Rio Nutrias above Rio Chama	Lowest Station in AU
27	29RCebol027.0	Rio Cebolla at US 84	Lowest Station in AU
28	29ClearC000.1	Clear Creek at FR 76	Lowest Station in AU
29	29RGalli045.1	Rio Gallina at FR 76	Lowest Station in AU

Map ID	Storet ID	Station	Station Rationale
30	29RCapul010.3	Rio Capulin above Cecilia Canyon Creek	Impaired
31	29Cecili000.1	Cecilia Canyon Creek at FR 171	Lowest Station in AU
32	29RGalli000.5	Rio Gallina at confluence with Rio Chama	Lowest Station in AU
33	29RChama079.5	Rio Chama above Abiquiu Reservoir at USGS gage	Lowest Station in AU
34	29RResum001.9	Rito Resumidero below Resumidero Spring	Impaired
35	29RRedon000.2	Rito Redondo at FR 93	Lowest Station in AU
36	29RPuerc037.5	Rio Puerco de Chama at FR 103	Lowest Station in AU
37	29PoleoC009.5	Poleo Creek at FR 103	Impaired
38	29Coyote005.6	Coyote Creek at FR 316 at Coyote Creek Campground	Lowest Station in AU
39	29RPuerc011.0	Rio Puerco de Chama at CR 211	Impaired
40	29REncin009.7	Rito Encino at FR 100Z	Lowest Station in AU
41	29AbiqReInlet	Abiquiu Reservoir – shallow (Rio Chama inlet)	Impaired, monitor lake input
42	29Canjilon(a)	Canjilon Lake (a)	Impaired
43	29Canjil039.5	Canjilon Creek above Canjilon	Impaired
44	29Canjil006.2	Canjilon Creek above Abiquiu Reservoir at US 84	Lowest Station in AU
45	29AbiquiuRDam	Abiquiu Reservoir – deep station	Impaired
46	29Canone007.1	Cañones Creek above Chihuahueños Creek	Impaired; Placeholder in case lower station goes dry
47	29Chihua005.8	Chihuahueños Creek at FR 449	Lowest Station for access
48	29Polvad008.8	Polvadera Creek at FR 27 (CR 95)	Impaired
49	29Canone004.6	Cañones Creek at FR 167 below Cañones	Impaired
50	29RChama050.4	Rio Chama below Abiquiu Dam at USGS 08287000 gage	Monitor lake output
51	29Abique001.8	Abiquiu Creek at US Hwy 84 bridge	Impaired
52	NM0024830	Abiquiu WWTP effluent discharge	Point Source

Map ID	Storet ID	Station	Station Rationale
53	29EIRito021.0	El Rito at bridge in El Rito 400 feet from Hwy 554	Lowest Station in AU
54	29EIRito000.7	El Rito Creek 0.5 mile above Rio Chama	Lowest Station in AU
55	29RChama019.3	Rio Chama at NM Hwy 233 three miles below El Rito Creek	Lowest Station in AU
56	29RioOso004.7	Rio del Oso above Rio Chama	Impaired
57	29Placer005.1	Placer Creek at NM 64	Lowest Station in AU
58	29HopewellLk	Hopewell Lake	Deep Station
59	29Placer001.0	Placer Creek above box	Monitor lake output
60	29Placer000.1	Placer Creek above Rio Vallecitos	Lowest Station in AU
61	29RValle007.9	Rio Vallecitos 3.9 miles above La Madera at bridge	Impaired
62	29RTusas000.1	Rio Tusas above Rio Vallecitos	Impaired
63	29ROjoCa026.1	Rio Ojo Caliente at Hwy 414 (Hot Springs) bridge	Placeholder in case lower station goes dry
64	29ROjoCa005.1	Rio Ojo Caliente 3.4 miles above confluence with Rio Chama	Lowest Station in AU

3.0 DOCUMENTATION

Project documents include this field sampling plan, calibration records, sonde and thermograph deployment and retrieval sheets, validation and verification records, field forms and laboratory submittal sheets, records of analytical, sonde, and thermograph data in hard copy or in electronic form and QC records. Documents will be maintained in accordance with the requirements of the Bureau QAPP.

Project documentation will include narrative descriptions of progress throughout the life of the project relating to planning and implementation efforts, including deviations from the original plan and issues that arise along with any associated corrective actions.

Project activities will be documented in SWQB Monitoring Section Field Sheets. Information from the field sheets is entered in the SWQB database (NMEDAS) and maintained in the Survey Lead files which are placed in the survey files at the conclusion of the project. Analytical results are electronically transferred into the NMEDAS database and eventually moved to STORET/WQX. The project is completed with the completion of the Survey Report.

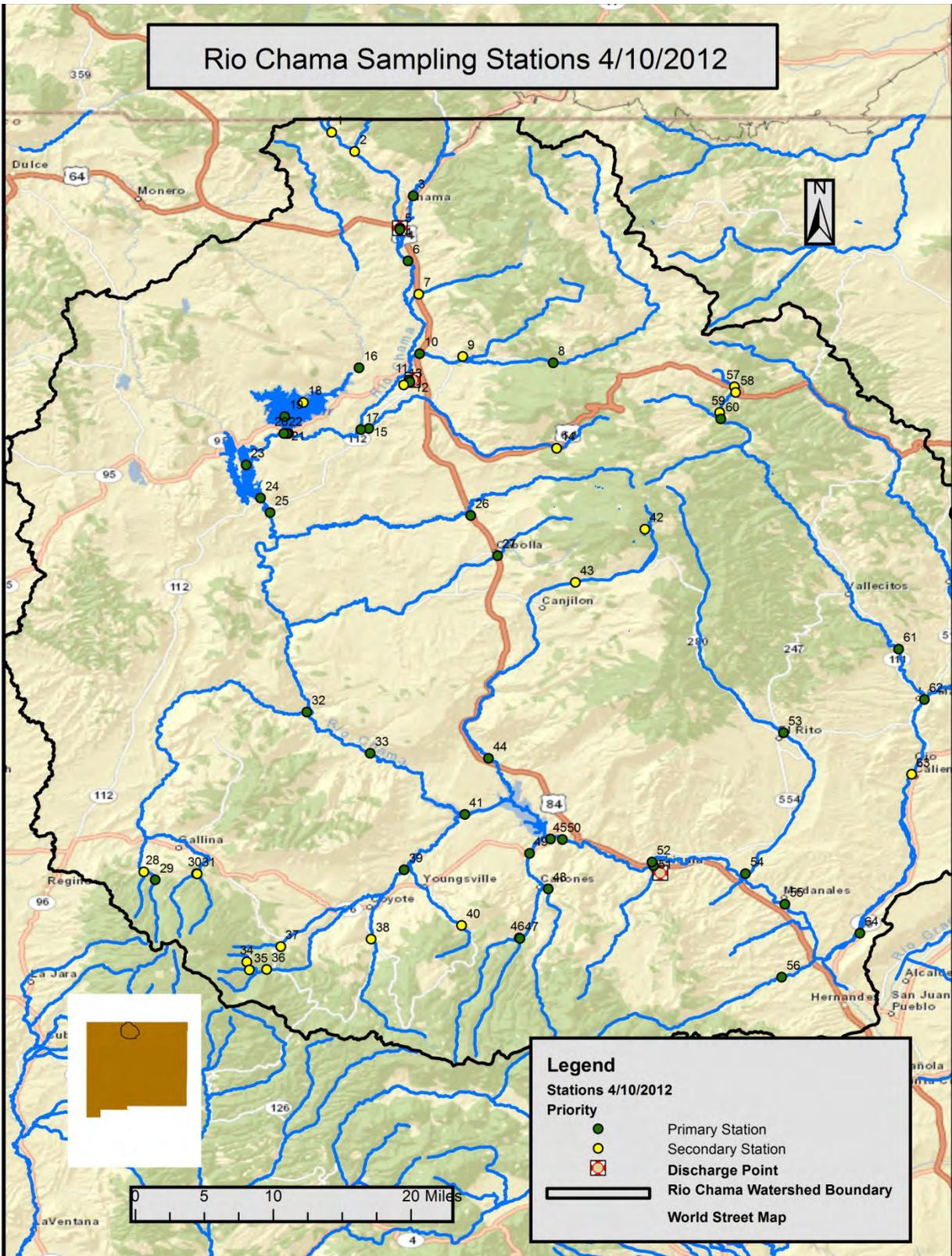


Figure 1. Project area and sampling locations.

4.0 SAMPLING PLAN

4.1 Chemistry Sampling

Water quality samples will be collected and submitted to the New Mexico Scientific Laboratory Division (SLD) or processed in the SWQB laboratory in accordance with procedures as outlined in the SWQB Standard Operating Procedures for Data Collection (SOPs) (NMED/SWQB 2011b).

Table 6 outlines water quality variables to be measured and the sampling frequency at each station. In addition to the variables listed, field parameters (temperature, specific conductance, salinity, dissolved oxygen concentration, dissolved oxygen saturation, pH, turbidity) will be measured at each site during each visit using a multiparameter sonde. Flow will be measured on streams where gage data are not available.

Chemistry sampling site locations are chosen to monitor each assessment unit and based on existing or potential point or non-point sources of pollution. Existing and potential sources of pollution are identified from point source permits, historical data, information from other agencies, and local residents. Sampling stations were selected at locations that bracket perceived pollution sources, allow access to the waterbody and represent each of the assessment units in the watershed except for very small or mostly ephemeral systems. Where possible, the use of established stations allows for the examination of trends.

Table 6. Number of water chemistry samples to be collected at each station*.

Map ID	Station	Assessment Unit	TSS	TSS/TDS	Nutrients ¹	Dissolved Metals ²	Total Metals	E. coli	Total Residual Chlorine	Volatile Organic Compounds ³	Semi-Volatile Organics ³	Radionuclides ⁴
1	Sexto Creek above Rio Chamita	Sexto Creek (Rio Chamita to CO border)	0	4	4	0	0	4	0	0	0	0
2	Nabor Creek 5 yards upstream of Rio Chamita	Nabor Creek (Rio Chamita to CO border)	0	4	4	0	0	4	0	0	0	0
3	Rio Chama at NM 17	Rio Chama (Little Willow Creek to CO border)	0	8	8	4	4	8	0	2	2	2
4	Chama WWTP effluent discharge	NPDES permit # NM0027731	0	8	8	0	4	8	8	0	0	0
5	Rio Chamita below Chama WWTP outfall	Rio Chamita (Rio Chama to CO border)	0	8	8	4	4	8	0	2	2	2
6	Rio Chama Below Chama Town	Rio Chama (Rio Brazos to Little Willow Creek)	0	8	8	4	4	8	0	2	2	2
7	Cañones Creek above HWY 84 (near Chama)	Cañones Creek (Rio Chama to Jicarilla Apache bnd)	0	4	4	4	4	4	0	0	0	0
8	Rio Brazos 1 mile above Corkin Lodge	Rio Brazos (Chavez Creek to Jicarilla Apache bnd)	0	8	8	4	4	8	0	0	0	0
9	Chavez Creek at hwy 512 above Rio Brazos	Chavez Creek (Rio Brazos to headwaters)	0	4	4	4	4	4	0	0	0	0
10	Rio Brazos above hwy 84 bridge	Rio Brazos (Rio Chama to Chavez Creek)	0	8	8	4	4	8	0	2	2	2

Map ID	Station	Assessment Unit	TSS	TSS/TDS	Nutrients ¹	Dissolved Metals ²	Total Metals	E. coli	Total Residual Chlorine	Volatile Organic Compounds ³	Semi- Volatile Organics ³	Radionuclides ⁴
11	Los Ojos Fish Hatchery outfall #1	NPDES permit # NM0030139	0	8	8	0	0	8	0	0	0	0
12	Los Ojos Fish Hatchery outfall #2	NPDES permit # NM0030139	0	8	8	0	0	8	0	0	0	0
13	Burn's Lake (Laguna del Campo)	Burn's Lake (Laguna del Campo)	0	3	3	3	3	3	0	0	0	0
14	Rito de Tierra Amarilla at Hwy 64	Rito de Tierra Amarilla (Hwy 64 to headwaters)	0	4	4	4	4	4	0	0	0	0
15	Rito de Tierra Amarilla at Hwy 112 bridge	Rito de Tierra Amarilla (Rio Chama to Hwy 64)	0	8	8	4	4	8	0	2	2	2
16	Willow Creek abv Heron	Willow Creek (Heron Lake to Jicarilla Apache Bnd)	0	4	4	0	0	4	0	0	0	0
17	Rio Chama below Rito de Tierra Amarilla above gage 08284100	Rio Chama (El Vado Reservoir to Rio Brazos)	0	4	4	0	0	4	0	1	1	1
18	Heron Lake - shallow station	Heron Reservoir	4	0	4	0	0	4	0	0	0	0
19	Heron Lake - deep station	Heron Reservoir	4	0	4	4	4	4	0	2	2	2
20	Rio Chama abv Heron	Rio Chama (El Vado Reservoir to Rio Brazos)	0	4	4	4	4	4	0	1	1	1
21	Heron Lake outfall	Rio Chama (El Vado Reservoir to Rio Brazos)	4	0	4	0	0	4	0	0	0	0
22	Rio Chama abv El Vado	Rio Chama (El Vado Reservoir to Rio Brazos)	0	4	4	0	0	4	0	0	0	0
23	El Vado - shallow station	El Vado Reservoir	4	0	4	0	0	4	0	0	0	0
24	El Vado - deep station	El Vado Reservoir	4	0	4	4	4	4	0	2	2	2
25	Rio Chama at USGS gage 08285500 blw El Vado Dam	Rio Chama (Abiquiu Rsvr to El Vado Rsvr)	4	0	4	0	0	4	0	0	0	0
26	Rio Nutrias abv Rio Chama	Rio Nutrias (Rio Chama to headwaters)	0	8	8	4	4	8	0	2	2	2
27	Rio Cebolla at US 84	Rio Cebolla (Rio Chama to headwaters)	0	8	8	4	4	8	0	2	2	2
28	Clear Creek at FR 76	Clear Creek (Rio Gallina to headwaters)	3	4	4	0	0	4	0	0	0	0
29	Rio Gallina at FR 76	Rio Gallina (Hwy 96 to headwaters)	8	0	8	0	0	8	0	0	0	0

Map ID	Station	Assessment Unit	TSS	TSS/TDS	Nutrients ¹	Dissolved Metals ²	Total Metals	E. coli	Total Residual Chlorine	Volatile Organic Compounds ³	Semi- Volatile Organics ³	Radionuclides ⁴
30	Rio Capulin above Cecilia Canyon Creek	Rio Capulin (Rio Gallina to headwaters)	0	8	8	0	0	8	0	0	0	0
31	Cecilia Canyon Creek at FR 171	Cecilia Canyon Creek (Rio Capulin to USFS bnd)	0	4	4	0	0	4	0	0	0	0
32	Rio Gallina at confluence with Rio Chama	Rio Gallina (Rio Chama to Hwy 96)	8	0	8	4	4	8	0	2	2	2
33	Rio Chama above Abiquiu Reservoir at USGS gage	Rio Chama (Abiquiu Rsvr to El Vado Rsvr)	8	0	8	4	4	8	0	2	2	2
34	Rito Resumidero below Resumidero Spring	Rito Resumidero (Rio Puerco de Chama to headwaters)	0	4	4	0	0	4	0	0	0	0
35	Rito Redondo at FR 93	Rito Redondo (Rito Resumidero to headwaters)	0	4	4	0	0	4	0	0	0	0
36	Rio Puerco de Chama at FR 103	Rio Puerco de Chama (HWY 96 to headwaters)	0	4	4	4	4	4	0	0	0	0
37	Poleo Creek at FR 103	Poleo Creek (Rio Puerco de Chama to headwaters)	0	4	4	4	4	4	0	0	0	0
38	Coyote Creek at FR 316 at Coyote Creek Campground	Coyote Creek (Rio Puerco de Chama to headwaters)	0	4	4	4	4	4	0	0	0	0
39	Rio Puerco de Chama at CR 211	Rio Puerco de Chama (Abiquiu Reservoir to HWY 96)	8	0	8	4	4	8	0	2	2	2
40	Rito Encino at FR 100Z	Rito Encino (Rio Puerco de Chama to headwaters)	0	4	4	4	4	4	0	0	0	0
41	Abiquiu Reservoir - shallow (Rio Chama inlet)	Abiquiu Reservoir	4	0	4	0	0	4	0	0	0	0
42	Canjilon Lake (a)	Canjilon Ck Lake (a)	3	0	3	3	3	3	0	0	0	0
43	Canjilon Creek near Echo	Canjilon Ck (Perennial portions Abiquiu Rsvr to hw)	0	0	0	0	0	0	0	0	0	0
44	Canjilon Creek above Abiquiu Reservoir at US 84	Canjilon Ck (Perennial portions Abiquiu Rsvr to hw)	0	8	8	4	4	8	0	3	3	3
45	Abiquiu Reservoir - deep station	Rio Chama (Ohkay Owingeh to Abiquiu Dam)	4	0	4	4	4	4	0	2	2	2
46	Cañones Creek above Chihuahueños Creek	Cañones Creek (Abiquiu Reservoir to headwaters)	0	0	0	<i>Will sample only if needed</i>			0	0	0	
47	Chihuahueños Creek at FR 449	Chihuahueños Creek (Cañones Crk to headwaters)	0	8	8	4	4	8	0	0	0	0
48	Polvadera Creek at FR 27 (CR 95)	Polvadera Creek (Cañones Creek to headwaters)	0	8	8	4	4	8	0	0	0	0

Map ID	Station	Assessment Unit	TSS	TSS/TDS	Nutrients ¹	Dissolved Metals ²	Total Metals	E. coli	Total Residual Chlorine	Volatile Organic Compounds ³	Semi- Volatile Organics ³	Radionuclides ⁴
49	Cañones Creek at FR 167 below Cañones	Cañones Creek (Abiquiu Reservoir to headwaters)	0	8	8	4	4	8	0	2	2	2
50	Rio Chama below Abiquiu Dam at USGS 08287000 gage	Rio Chama (Ohkay Owingeh to Abiquiu Dam)	4	0	4	1	0	4	0	0	0	0
51	Abiquiu Creek at US 84 bridge	Abiquiu Creek (Rio Chama to headwaters)	8	0	8	4	4	8	0	2	2	2
52	Abiquiu WWTP	NM0024830	8	0	8	0	0	8	8	0	0	0
53	El Rito at bridge in El Rito 400 Ft. from Hwy 554	El Rito Creek (Hwy 554 to headwaters)	0	8	8	4	4	8	0	2	2	2
54	El Rito Creek 0.5 mile above Rio Chama	El Rito Creek (Perennial reaches below Hwy 554)	8	0	8	4	4	8	0	2	2	2
55	Rio Chama at NM Highway 233	Rio Chama (Ohkay Owingeh to Abiquiu Dam)	8	0	8	4	4	8	0	2	2	2
56	Rio del Oso above Rio Chama	Rio del Oso (Rio Chama to headwaters)	0	8	8	4	4	8	0	0	0	0
57	Placer Creek at NM 64	Placer Creek (Hopewell Lake to headwaters)	0	4	4	4	4	4	0	0	0	0
58	Hopewell Lake - deep station	Hopewell Lake	0	3	3	3	3	3	0	0	0	0
59	Placer Creek above Box	Placer Creek (Rio Vallecitos to Hopewell Lake)	0	3	3	2	2	3	0	0	0	0
60	Placer Creek above Rio Vallecitos	Placer Creek (Rio Vallecitos to Hopewell Lake)	6	8	8	4	4	8	0	2	2	2
61	Rio Vallecitos 3.9 miles above La Madera at bridge	Rio Vallecitos (Rio Tusas to headwaters)	6	8	8	4	4	8	0	0	0	0
62	Rio Tusas above Rio Vallecitos	Rio Tusas (Rio Vallecitos to headwaters)	8	0	8	4	4	8	0	0	0	0
63	Rio Ojo Caliente at Hwy 414 at Hot Springs bridge	Rio Ojo Caliente (Rio Chama to Rio Vallecitos)	0	0	0	<i>Will sample only if needed</i>				0	0	0
64	Rio Ojo Caliente 3.4 miles above confl with Rio Chama	Rio Ojo Caliente (Rio Chama to Rio Vallecitos)	8	0	8	4	4	8	0	2	2	2
Quality Control samples			0	0	23	18	0	23	0	7	0	0
Total Number of Samples			134	241	383	174	159	383	16	52	45	45
Work Time Unit (WTU) Cost Per Sample			12	24	76	207	100	n/a	n/a	150	220	120
Total Survey WTU Costs Per Sample			1608	5784	29,108	36,018	15,900	0	0	7800	9900	5400
Total WTUs			111,518									

- * This table represents the maximum number of water chemistry samples to be collected at each station. Actual numbers may vary depending on personnel constraints.
1. Suite includes total Kjeldahl nitrogen, nitrate+nitrite, ammonia and total phosphorus.
 2. Suite includes aluminum, antimony, arsenic, barium, boron, cadmium, calcium, chromium, cobalt, copper, iron, magnesium, manganese, molybdenum, nickel, silicon, silver, tin, vanadium, zinc, and hardness.
 3. See Appendix B for a complete list of analytes.
 4. A radionuclide sample will include gross alpha and gross beta and depending on detections may include Uranium mass and Radium 226 + 228.

4.2 Biology/Habitat Sampling

Measuring biological response indicators concurrent to physical habitat and water chemistry gives an overall interpretation of the biological integrity of a reach, provides more complete information on characteristics of sediment and nutrients currently cycling through the stream and may provide enough information to investigate or eliminate specific potential sources of water quality stress. SWQB is currently collecting fish, periphyton, macroinvertebrates and physical habitat data at select sites to assess waterbodies for potential impairment from increased temperatures, sediment deposition, nutrient enrichment and toxic pollutants. Sampling methods are conducted in accordance with the SOPs (NMED/SWQB 2011b). Biological sampling is conducted within a biological index period, August 15 through November 15, for appropriate comparability of samples and life history requirements. Sondes are deployed at select sites in the stream for 3-10 days to record field variables in at least one hour intervals to document dissolved oxygen, pH, and turbidity fluctuations. Thermographs (data logging thermometers) are deployed from May through September at select sites throughout the watershed to measure temperature fluctuations.

Resources such as staff and budgets and other issues, such as property ownership, do not allow for the collection of biological and habitat data at all stations. Stations are selected for biological and habitat monitoring based on 1) current Integrated List status, 2) results of any preliminary assessments, 3) observations of the surrounding land use including upland and riparian habitat conditions. Additional sites determined, or considered, to be in "reference" or "best available condition" will also be selected for biological and habitat monitoring for inclusion in development and refinement of biological and habitat criteria. Table 7 summarizes the biological and habitat sampling that is planned for this survey.

Table 7. Biological and habitat sampling summary.
 1 = Sample will be collected one time during the survey.

Map ID	Station	Assessment Unit	Macroinvertebrates	Nutrient Level 1	Chlorophyll a ¹	Sonde	Physical Habitat ^{2,3}	Thermograph	Fish ⁴	Phytoplankton	Periphyton - diatoms
1	Sexto Creek above Rio Chamita	Sexto Creek (Rio Chamita to CO border)	-	1	-	-	1	1	-	-	-
2	Nabor Creek 5 yards upstream of Rio Chamita	Nabor Creek (Rio Chamita to CO border)	-	1	-	-	1	1	-	-	-
3	Rio Chama at NM 17	Rio Chama (Little Willow Creek to CO border)	-	1	-	-	1	1	1	-	-
4	Chama WWTP effluent discharge	NPDES permit # NM0027731	-	-	-	-	-	-	-	-	-
5	Rio Chamita below Chama WWTP outfall	Rio Chamita (Rio Chama to CO border)	1	1	1	1	1	1	1	-	-
6	Rio Chama below Chama Town	Rio Chama (Rio Brazos to Little Willow Creek)	-	1	1	1	1	1	1	-	-
7	Cañones Creek above Hwy 84 (near Chama)	Cañones Creek (Rio Chama to Jicarilla Apache bnd)	-	1	-	1	1	1	-	-	-
8	Rio Brazos 1 mile above Corkin Lodge	Rio Brazos (Chavez Creek to Jicarilla Apache bnd)	1	1	-	-	1	1	-	-	-
9	Chavez Creek at Hwy 512 above Rio Brazos	Chavez Creek (Rio Brazos to headwaters)	-	1	-	-	1	1	1	-	-
10	Rio Brazos above Hwy 84 bridge	Rio Brazos (Rio Chama to Chavez Creek)	-	1	-	-	1	1	1	-	-
11	Los Ojos Fish Hatchery outfall #1	NPDES permit # NM0030139	-	-	-	-	-	-	-	-	-
12	Los Ojos Fish Hatchery outfall #2	NPDES permit # NM0030139	-	-	-	-	-	-	-	-	-
13	Burn's Lake (Laguna del Campo)	Burn's Lake (Laguna del Campo)	-	-	3	-	-	-	-	3	-
14	Rito de Tierra Amarilla at Hwy 64	Rito de Tierra Amarilla (HWY 64 to headwaters)	-	1	-	-	1	1	-	-	-
15	Rito de Tierra Amarilla at Hwy 112	Rito de Tierra Amarilla (Rio Chama to HWY 64)	1	1	-	1	1	1	1	-	-
16	Willow Creek abv Heron	Willow Creek (Heron Lake to Jicarilla Apache Bndy)	-	-	-	-	-	-	-	-	-
17	Rio Chama blw Rito de Tierra Amarilla abv gage 08284100	Rio Chama (El Vado Reservoir to Rio Brazos)	1	1	1	1	1	1	1	-	-
18	Heron Lake - shallow station	Heron Reservoir	-	-	4	-	-	-	-	-	-
19	Heron Lake - deep station	Heron Reservoir	-	-	4	-	-	-	-	4	-

Map ID	Station	Assessment Unit	Macroinvertebrates	Nutrient Level 1	Chlorophyll a ¹	Sonde	Physical Habitat ^{2,3}	Thermograph	Fish ⁴	Phytoplankton	Periphyton - diatoms
20	Rio Chama abv Heron	Rio Chama (El Vado Reservoir to Rio Brazos)	-	-	-	-	-	-	-	-	-
21	Heron Lake outfall	Rio Chama (El Vado Reservoir to Rio Brazos)	-	-	-	-	-	-	-	-	-
22	Rio Chama abv El Vado	Rio Chama (El Vado Reservoir to Rio Brazos)	-	-	-	-	-	-	-	-	-
23	El Vado - shallow station	El Vado Reservoir	-	-	4	-	-	-	-	-	-
24	El Vado - deep station	El Vado Reservoir	-	-	4	-	-	-	-	4	-
25	Rio Chama at USGS gage 08285500 below El Vado Dam	Rio Chama (Abiquiu Rsvr to El Vado Rsvr)	-	-	-	-	-	-	-	-	-
26	Rio Nutrias abv Rio Chama	Rio Nutrias (Rio Chama to headwaters)	1	1	-	1	1	1	-	-	-
27	Rio Cebolla at US 84	Rio Cebolla (Rio Chama to headwaters)	-	1	-	-	1	1	-	-	-
28	Clear Creek at FR 76	Clear Creek (Rio Gallina to headwaters)	-	1	-	-	1	1	-	-	-
29	Rio Gallina at FR 76	Rio Gallina (HWY 96 to headwaters)	1	1	-	-	1	1	-	-	-
30	Rio Capulin above Cecilia Canyon Creek	Rio Capulin (Rio Gallina to headwaters)	-	1	-	-	1	1	-	-	-
31	Cecilia Canyon Creek at FR 171	Cecilia Canyon Creek (Rio Capulin to USFS bnd)	-	1	-	-	1	1	-	-	-
32	Rio Gallina at confluence with Rio Chama	Rio Gallina (Rio Chama to HWY 96)	-	1	-	-	1	1	1	-	-
33	Rio Chama above Abiquiu Reservoir at USGS gage	Rio Chama (Abiquiu Rsvr to El Vado Rsvr)	1	1	1	-	1	1	-	-	1
34	Rito Resumidero below Resumidero Spring	Rito Resumidero (Rio Puerco de Chama to headwaters)	1	1	-	-	1	1	-	-	-
35	Rito Redondo at FR 93	Rito Redondo (Rito Resumidero to headwaters)	-	1	-	-	1	1	-	-	-
36	Rio Puerco de Chama at FR 103	Rio Puerco de Chama (HWY 96 to headwaters)	-	1	-	-	1	1	-	-	-
37	Poleo Creek at FR 103	Poleo Creek (Rio Puerco de Chama to headwaters)	1	1	-	1	1	1	-	-	-
38	Coyote Creek at FR 316 at Coyote Creek Campground	Coyote Creek (Rio Puerco de Chama to headwaters)	-	1	-	-	1	1	-	-	-
39	Rio Puerco de Chama at CR 211	Rio Puerco de Chama (Abiquiu Reservoir to Hwy 96)	-	1	1	1	1	1	1	-	-

Map ID	Station	Assessment Unit	Macroinvertebrates	Nutrient Level 1	Chlorophyll a ¹	Sonde	Physical Habitat ^{2,3}	Thermograph	Fish ⁴	Phytoplankton	Periphyton - diatoms
40	Rito Encino at FR 100Z	Rito Encino (Rio Puerco de Chama to headwaters)	-	1	-	1	1	1	-	-	-
41	Abiquiu Reservoir - shallow (Rio Chama inlet)	Abiquiu Reservoir	-	-	4	-	-	-	-	-	-
42	Canjilon Lake (a)	Canjilon Ck Lake (a)	-	-	3	-	-	-	-	3	-
43	Canjilon Creek near Echo	Canjilon Ck (Perennial portions Abiquiu Rsrv to hw)	1	1	1	1	-	1	1	-	-
44	Canjilon Creek above Abiquiu Reservoir at US 84	Canjilon Ck (Perennial portions Abiquiu Rsrv to hw)	1	-	-	-	1	1	-	-	-
45	Abiquiu Reservoir - deep station	Rio Chama (Ohkay Owingeh to Abiquiu Dam)	-	-	4	-	-	-	-	4	-
46	Cañones Creek above Chihuahueros Creek	Cañones Creek (Abiquiu Reservoir to headwaters)	-	-	-	-	-	-	-	-	-
47	Chihuahueros Creek at FR 449	Chihuahueros Creek (Cañones Crk to headwaters)	-	1	-	-	1	1	-	-	-
48	Polvadera Creek at FR 27 (CR 95)	Polvadera Creek (Cañones Creek to headwaters)	1	1	-	-	1	1	-	-	-
49	Cañones Creek at FR 167 below Cañones	Cañones Creek (Abiquiu Reservoir to headwaters)	1	1	-	1	1	1	-	-	-
50	Rio Chama below Abiquiu Dam at USGS 08287000 gage	Rio Chama (Ohkay Owingeh to Abiquiu Dam)	-	-	1	-	-	-	-	-	1
51	Abiquiu Creek at US 84 bridge	Abiquiu Creek (Rio Chama to headwaters)	-	1	-	1	1	1	-	-	-
52	Abiquiu WWTP	NPDES Permit # NM0024830	-	-	-	-	-	-	-	-	-
53	El Rito at bridge in El Rito 400 ft. from Hwy 554	El Rito Creek (HWY 554 to headwaters)	-	1	-	-	1	1	1	-	-
54	El Rito Creek 0.5 mile above Chama River	El Rito Creek (Perennial reaches below HWY 554)	-	1	-	-	1	1	1	-	-
55	Chama River at NM Hwy 233	Rio Chama (Ohkay Owingeh to Abiquiu Dam)	-	1	-	-	1	1	-	-	1
56	Rio del Oso above Rio Chama	Rio del Oso (Rio Chama to headwaters)	1	1	-	-	1	1	-	-	-
57	Placer Creek at NM 64	Placer Creek (Hopewell Lake to headwaters)	1	1	-	-	1	1	-	-	-
58	Hopewell Lake - deep station	Hopewell Lake	-	-	3	-	-	-	-	3	-
59	Placer Creek above box	Placer Creek (Rio Vallecitos to Hopewell Lake)	-	1	-	-	1	1	-	-	-

Map ID	Station	Assessment Unit	Macroinvertebrates	Nutrient Level 1	Chlorophyll a ¹	Sonde	Physical Habitat ^{2,3}	Thermograph	Fish ⁴	Phytoplankton	Periphyton - diatoms
60	Placer Creek above Rio Vallecitos	Placer Creek (Rio Vallecitos to Hopewell Lake)	1	1	-	-	1	1	-	-	-
61	Rio Vallecitos 3.9 miles above La Madera at bridge	Rio Vallecitos (Rio Tusas to headwaters)	1	1	-	1	1	1	1	-	-
62	Rio Tusas above Rio Vallecitos	Rio Tusas (Rio Vallecitos to headwaters)	-	1	1	1	1	1	1	-	-
63	Rio Ojo Caliente at Hwy 414 at Hot Springs bridge	Rio Ojo Caliente (Rio Chama to Rio Vallecitos)	-	-	-	-	-	-	1	-	-
64	Rio Ojo Caliente 3.4 miles above conflu with Rio Chama	Rio Ojo Caliente (Rio Chama to Rio Vallecitos)	1	1	-	-	1	1	-	-	-
Quality Control Samples			-	-	-	-	1	-	-	-	-
Totals			17	41	41	14	42	43	15	21	3

1. Additional stations will be added as indicated by the preliminary (Level 1) nutrient assessment.
2. If sedimentation data (pebble counts) exceed the threshold value for percent sand/fines at a site, more extensive habitat data are collected.
3. If preliminary analysis of thermograph data indicates potential for impairment - cross-section, flow, canopy cover, and slope data required to use SSTEMP temperature modeling software will be collected.
4. Fish sampling will be determined by interagency cooperation and the availability of river shocking equipment.

5.0 RESOURCE REQUIREMENTS

Sample analysis costs include WTUs (work-time units) for chemical analysis performed at SLD and provided to SWQB through a Joint Powers Agreement between these State agencies as well as analysis costs for biological samples sent to contract labs and *E. coli* analysis performed by SWQB. These costs are summarized in Table 8.

A round trip for this survey is approximately 900 miles. Summer gasoline costs have been estimated at \$3.76 per gallon. A 2002 Chevrolet Suburban is typically used for surveys, averaging approximately 17 miles per gallon (mpg). Eight water quality sampling trips have been planned for this survey depending on conditions. Bio/physical surveys are required during the index period (Aug 15-Nov 15). These are expected to be completed in three days with water chemistry samples being delivered to SLD in Albuquerque the following day (Table 9).

The staff time and travel costs (Tables 9 and 10) are estimated based on the following:

- Sites that are visited 8 times during the water quality survey will require two staff for three days/two nights out of Santa Fe per month.
- Sites that are visited 4 times and to deploy/remove thermographs or sample small lakes will require 2 additional runs every other month utilizing two staff for 2days/1night and 3 days / 2 nights respectively
- Reservoir sampling runs will require 4 sample trips with two staff for 3 days/2 nights
- Biological/habitat survey maximum requirements are two staff surveying one to two sites per day. Therefore, twelve biological survey sites may take up to ten days, or over two weeks.

Staff receive \$85 per night per diem for travel costs. Costs not included below may involve general sampling supplies such as water quality sample containers and preservatives, sonde calibration solutions, and periphyton, macroinvertebrate, fish, and habitat sampling/monitoring equipment. Vehicles will require standard preventative maintenance and unforeseen costs may arise at any time (Table 11).

Table 8. Biological and Chemical Cost Summary.

Analyte	Total # Samples	Cost per Sample (WTU or \$)	Total Expenditure WTUs	Total Expenditure Dollars
TSS	134	12	1,608	-
TDS/TSS	241	24	5,784	-
Nutrients	383	76	29,108	-
Dissolved Metals	174	207	36,018	-
Total Metals	159	100	15,900	-
Volatile Organic Compounds	52	150	7,800	-
Semi-Volatiles Organics	45	220	9,900	-
Radionuclides	45	120	5,400	-
<i>E. coli</i> (SWQB analysis)	383	\$5.08	-	\$1,946
Macroinvertebrates	17	\$175	-	\$2,975
Phytoplankton (lakes only)	21	\$165	-	\$3,465
Periphyton ¹	3	\$290	-	\$870
Chlorophyll a (contract lab 1)	41 ²	\$50	-	\$2,050
Chlorophyll a (contract lab 2)	41 ²	\$50	-	\$2,050
Chlorophyll a (SWQB analysis)	41 ²	\$45	-	\$1,845
Total			111,518	\$15,201

1. Periphyton samples are only collected at sites defined as large rivers.
2. This is an estimate as chlorophyll samples will be collected in waters that do not pass the level one nutrient assessment. The number of chlorophyll samples to be collected will be unknown until after 3 to 5 sampling runs.

Table 9. Vehicle Costs

Month	Approximate Miles	Estimated MPG	Estimated Cost of Gasoline per Gallon ¹	Total Fuel Costs
April	900	17	\$3.76	\$199.06
May	900	17	\$3.76	\$199.06
June	900	17	\$3.76	\$199.06
July	900	17	\$3.76	\$199.06
August	900	17	\$3.76	\$199.06
September	1100	17	\$3.76	\$243.29
October	1100	17	\$3.76	\$243.29
November	1100	17	\$3.76	\$243.29
TOTAL				\$1,725.17

¹ Estimated cost per gallon was based from average gas prices for 2/9/12 for Santa Fe at \$3.16 per gallon from NewMexicoGasPrices.com (2012). Sixty cents per gallon, which is the estimated increase per gallon for summer 2012 (Strauss 2012), was added to the average price.

Table 10. Per Diem Costs

Expense	Water Chemistry Survey	Biological Survey	Total
Per Diem (number of nights out)	\$6,120	\$1,700	\$7,820
Salary Days	112	40	152

Table 11. Total Cost Estimates

WTUs	Bio Sample \$	Fuel \$	Per Diem \$	Staff Field Days
111,518	\$15,201	\$1,725	\$7,820	152

* Per Diem estimates do not include partial day rates

6.0 REFERENCES

- New Mexico Environment Department Surface Water Quality Bureau (NMED/SWQB). 2012 *Procedures for Assessing Water Quality Standards Attainment for the State of New Mexico CWA §303(d) /§305(b) Integrated Report* (or more recent if available). Retrieved from: <http://www.nmenv.state.nm.us/swqb/protocols/>
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APPENDIX A INTEGRATED REPORT CATEGORIES

IR (Integrated Report) Category Overall water quality standards attainment category for each assessment unit as determined by combining individual designated use support decisions. The unique assessment categories for New Mexico are described as follows as follows:

- IR Category 1 Attaining the water quality standards for all designated and existing uses. AUs are listed in this category if there are data and information that meet all requirements of the assessment and listing methodology and support a determination that the water quality criteria are attained.
- IR Category 2 Attaining some of the designated or existing uses based on numeric and narrative parameters that were tested, and no reliable monitored data is available to determine if the remaining uses are attained or threatened. AUs are listed in this category if there are data and information that meet requirements of the assessment and listing methodology to support a determination that some, but not all, uses are attained based on numeric and narrative water quality criteria that were tested. Attainment status of the remaining uses is unknown because there is no reliable monitored data with which to make a determination.
- IR Category 3 No reliable monitored data and/or information to determine if any designated or existing use is attained. AUs are listed in this category where data to support an attainment determination for any use are not available, consistent with requirements of the assessment and listing methodology.
- IR Category 4A Impaired for one or more designated uses, but does not require development of a TMDL because TMDL has been completed. AUs are listed in this subcategory once all TMDL(s) have been developed and approved by USEPA that, when implemented, are expected to result in full attainment of the standard. Where more than one pollutant is associated with the impairment of an AU, the AU remains in Category 5A (see below) until all TMDLs for each pollutant have been completed and approved by USEPA.
- IR Category 4B Impaired for one or more designated uses, but does not require development of a TMDL because other pollution control requirements are reasonably expected to result in attainment of the water quality standard in the near future. Consistent with the regulation under 40 CFR 130.7(b)(i),(ii), and (iii), AUs are listed in this subcategory where other pollution control requirements required by local, state, or federal authority are stringent enough to implement any water quality standard (WQS) applicable to such waters.
- IR Category 4C Impaired for one or more designated uses, but does not require development of a TMDL because impairment is not caused by a pollutant. AUs are listed in this subcategory if a pollutant does not cause the impairment. For example, USEPA considers flow alteration to be “pollution” vs. a “pollutant.”
- IR Category 5/5A Impaired for one or more designated or existing uses and a TMDL is underway or scheduled. AUs are listed in this category if the AU is impaired for one or more designated uses by a pollutant. Where more than one pollutant is associated with the impairment of a single AU, the AU remains in Category 5A until TMDLs for all pollutants have been completed and approved by USEPA.
- IR Category 5/5B Impaired for one or more designated or existing uses and a review of the water quality standard will be conducted. AUs are listed in this category when it is

possible that water quality standards are not being met because one or more current designated use is inappropriate. After a review of the water quality standard is conducted, a Use Attainability Analysis (UAA) will be developed and submitted to USEPA for consideration, or the AU will be moved to Category 5A and a TMDL will be scheduled.

IR Category 5/5C

Impaired for one or more designated or existing uses and Additional data will be collected before a TMDL is scheduled. AUs are listed in this category if there is not enough data to determine the pollutant of concern or there is not adequate data to develop a TMDL. For example, AUs with biological impairment will be listed in this category until further research can determine the particular pollutant(s) of concern. When the pollutant(s) are determined, the AU will be moved to Category 5A and a TMDL will be scheduled. If it is determined that the current designated uses are inappropriate, it will be moved to Category 5B and a UAA will be developed. If it is determined that "pollution" is causing the impairment (vs. a "pollutant"), the AU will be moved to Category 4C.

APPENDIX B
ORGANIC ANALYTICAL SUITE PARAMETERS

Organics (semi-volatiles)	Organics (volatiles)
1,2,4-Trichlorobenzene	1,1,1,2-Tetrachloroethane
1,2-Dichlorobenzene	1,1,1-Trichloroethane
1,2-Dinitrobenzene	1,1,2,2-Tetrachloroethane
1,3-Dichlorobenzene	1,1,2-Trichloroethane
1,3-Dinitrobenzene	1,1-Dichloroethane
1,4-Dichlorobenzene	1,1-Dichloroethene
1,4-Dinitrobenzene	1,1-Dichloropropene
1-Methylnaphthalene	1,2,3-Trichlorobenzene
2,3,4,6-Tetrachlorophenol	1,2,3-Trichloropropane
2,3,5,6-Tetrachlorophenol	1,2,4-Trichlorobenzene
2,4,5-Trichlorophenol	1,2,4-Trimethylbenzene
2,4,6-Trichlorophenol	1,2-Dibromo-3-chloropropane (DBCP)
2,4-Dichlorophenol	1,2-Dibromoethane (EDB)
2,4-Dimethylphenol	1,2-Dichlorobenzene
2,4-Dinitrophenol	1,2-Dichloroethane
2,4-Dinitrotoluene	1,2-Dichloropropane
2,6-Dinitrotoluene	1,3,5-Trimethylbenzene
2-Chloronaphthalene	1,3-Dichlorobenzene
2-Chlorophenol	1,3-Dichloropropane
2-Methylnaphthalene	1,4-Dichlorobenzene
2-Methylphenol	1,4-Dioxane
2-Nitroaniline	2,2-Dichloropropane
2-Nitrophenol	2-Butanone (MEK)
3,3'-Dichlorobenzidine	2-Chloroethyl vinyl ether
3-Methylphenol & 4-Methylphenol	2-Chlorotoluene
3-Nitroaniline	2-Hexanone
4,4'-DDD	4-Chlorotoluene
4,4'-DDE	4-Isopropyltoluene
4,4'-DDT	4-Methyl-2-pentanone
4,6-Dinitro-2-methylphenol	Acetone
4-Bromophenyl Phenyl Ether	Acetonitrile
4-Chloro-3-methylphenol	Acrolein
4-Chloroaniline	Acrylonitrile
4-Chlorophenyl Phenyl Ether	Allyl chloride
4-Nitroaniline	Benzene
4-Nitrophenol	Bromobenzene
Acenaphthene	Bromochloromethane
Acenaphthylene	Bromodichloromethane
Alachlor	Bromoform
Aldrin	Bromomethane
alpha-BHC	Carbon disulfide
Aniline	Carbon tetrachloride
Anthracene	Chlorobenzene
Atrazine	Chloroethane
Azobenzene	Chloroform

Organics (semi-volatiles)	Organics (volatiles)
Benzidine	Chloromethane
Benzo(a)anthracene	Chloroprene
Benzo(a)pyrene	cis-1,2-Dichloroethene
Benzo(b)fluoranthene	cis-1,3-Dichloropropene
Benzo(g,h,i)perylene	cis-1,4-Dichloro-2-butene
Benzo(k)fluoranthene	Dibromochloromethane
Benzyl alcohol	Dibromomethane
beta-BHC	Dichlorodifluoromethane
bis(2-Chloroethoxy)methane	Ethyl methacrylate
bis(2-Chloroethyl)ether	Ethylbenzene
bis(2-Chloroisopropyl)ether	Hexachlorobutadiene
bis(2-Ethylhexyl)adipate	Iodomethane
bis(2-Ethylhexyl)phthalate	Isobutyl alcohol
Butyl Benzyl Phthalate	Isopropylbenzene
Carbazole	m- & p-Xylenes
Chrysene	Methyl methacrylate
cis-Chlordane	Methylacrylonitrile
Cyanazine	Methylene chloride (Dichloromethane)
delta-BHC	Naphthalene
Dibenz(a,h)anthracene	n-Butylbenzene
Dibenzofuran	Nitrobenzene
Dieldrin	o-Xylene
Diethylphthalate	Pentachloroethane
Dimethylphthalate	Propionitrile
Di-n-butyl Phthalate	Propylbenzene
Di-n-octyl phthalate	sec-Butylbenzene
Endosulfan I	Styrene
Endosulfan II	tert-Butyl methyl ether (MTBE)
Endosulfan sulfate	tert-Butylbenzene
Endrin	Tetrachloroethene
Endrin aldehyde	Tetrahydrofuran (THF)
Endrin ketone	Toluene
Fluoranthene	Total trihalomethanes
Fluorene	Total xylenes
gamma-BHC (lindane)	trans-1,2-Dichloroethene
Heptachlor	trans-1,3-Dichloropropene
Heptachlor epoxide	trans-1,4-Dichloro-2-butene
Hexachlorobenzene	Trichloroethene
Hexachlorobutadiene	Trichlorofluoromethane
Hexachlorocyclopentadiene	Vinyl acetate
Hexachloroethane	Vinyl chloride
Indeno(1,2,3-cd)pyrene	
Isophorone	
Methoxychlor	
Metolachlor	
Metribuzin	
Naphthalene	

Organics (semi-volatiles)	Organics (volatiles)
Nitrobenzene	
N-nitrosodimethylamine	
N-nitroso-di-n-propylamine	
N-nitrosodiphenylamine	
Pentachlorophenol	
Phenanthrene	
Phenol	
Prometryne	
Pyrene	
Pyridine	
Simazine	
trans-Chlordane	