NEW MEXICO ENVIRONMENT DEPARTMENT

Surface Water Quality Bureau

2014 Water Quality Monitoring for Lakes in the Gila, Rio Puerco, and Zuni Watersheds

Addendum to:
Lakes 2011
FIELD SAMPLING PLAN

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4/01/14

Approvals

4/11/2014

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During the 2011 water quality survey of the lakes in the Gila, Rio Puerco, and Zuni watersheds chlorophyll a and nutrient data were rejected for the fall dataset. Due to this rejection the number of samples used in the nutrient listing is an n = 3. An n of < 4 results in a 5C listing which requires additional data before a TMDL can be scheduled. The following monitoring will be conducted in 2014 in order to fill these data gaps.

Table 1. 2011 Lake data needs.

Station	Data Needs	Reason for data needs	2014 work
Bluewater Creek Abv Bluewater	4 complete sets of nutrient variables for listings and TMDLs	Fall 2011 chlorophyll a and nutrient samples were rejected	1 sampling event for nutrient variables
Bluewater Lake Deep			
Bluewater Creek Below			
McGaffey			
Ramah Lake Deep			
Snow Lake Deep			
Quemado Lake Deep			
Roberts Lake Deep			
Sapollio Below Roberts			

Table 2. Lake parameters to be monitored 2014.

Station	Nutrient	Chlorophyll a	Phytoplakton
Bluewater Creek Abv Bluewater	1		
Bluewater Lake Deep	1	1	1
Bluewater Creek Below	1		
McGaffey	1	1	1
Ramah Lake Deep	1	1	1
Snow Lake Deep	1	1	1
Quemado Lake Deep	1	1	1
Roberts Lake Deep	1	1	1
Sapollio Below Roberts	1		
Quality Control	2		
Total	11	6	6

Rio Puerco/Little Colorado and Gila Watersheds

Lake Studies 2011

Water Quality Surveys
for
Bluewater, McGaffey, Quemado, Ramah, and San Gregorio Reservoirs in the Rio Puerco/Little Colorado Watersheds
and
Lake Roberts and Snow Reservoirs in the Gila Watersheds

Field Sampling Plan Draft

Surface Water Quality Bureau Approvals:

_____ Date: 4.15.11
James Hogan, Program Manager, Monitoring & Assessment

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TABLE OF CONTENTS

INTRODUCTION 3
1.0 PERSONNEL ROLES AND RESPONSIBILITIES 4
Table 1. Project Team and Responsibilities
2.0 PROJECT DESCRIPTION 5
2.1 Background 5
2.2 Lake Descriptions 5
Figure 1. Map of the Survey
Table 2. Lake impairment status and general information
2.3 Objectives 8
Table 3. Project Objectives and Outcomes
2.4 Schedule 9
Table 4. Project schedule
3.0 DOCUMENTATION 10
4.0 SAMPLING PLAN
4.1 Chemistry Sampling 11
Table 5. Planned chemical and bacterial sampling
4.2 Biology Sampling 12
Table 6. Number of Planned Biological and Physical Sampling
5.0 PROJECT RESOURCE 13
Table 7. Estimated Water Quality Sample Expenditures
Table 8. Vehicle Costs
Table 9. Per Diem and Salary Estimates
Table 10. Total Cost Estimates

6.0 REFERENCES 15
7.0 APPENDIX A 16

INTRODUCTION

This Field Sampling Plan (FSP) served to document the 2011 Lakes Water Quality Survey planning process described in Element 7 of the current New Mexico Environment Department (NMED) Surface Water Quality Bureau (SWBQ) Quality Management Plan (NMED/SWQB 2010b). This FSP provides a detailed description of the water quality monitoring efforts to be conducted on Bluewater, McGaffey, Lake Roberts, Quemado, Ramah, San Gregorio, and Snow Reservoirs during 2011 by SWQB (see Figure 1). The project goals and decision criteria are included along with a summary of the sampling design, including sampling locations, parameters, and sampling frequencies for physical, chemical, and biological data to be collected as part of the survey.

This Field Sampling Plan is a companion document to the *New Mexico Environment Department Surface Water Quality Bureau Quality Assurance Project Plan for Water Quality Management Programs* (NMED/SWQB 2011). All of the policies and procedures specified in the Quality Assurance Project Plan will be followed for this project. This plan is a guideline for conducting the water quality study and may be amended as the need arises throughout the course of the study. Amendments will be documented and justified in a post-survey summary report.

1.0 Project Personnel

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).

Table 1. Project Team and Responsibilities

Team Member	Role	Responsibilities
Charles Dentino 505-827-0101 Donald Carlson 505-827-0596	Project Coordinator Project Assistant	• Coordinates survey planning efforts (integrates the documentation of various team members information into the field sampling plan and planning spreadsheet); • Coordinates the planning of physical, chemical, and biological data needs for the survey; • Participates in data collection activities; • Maintains physical, chemical, and biological data for study (forms, database entry, and analysis); • Provides physical, chemical, and biological results for final report; and • Coordinates development of final survey report.
Mike Matush 505-827-0505 *(Bluewater, McGaffey, Ramah)* Matthew Schultz 575-956-1550 David Menzie 575-956-1548 *(Quemado, Robert, Snow)*	Watershed Protection Section (WPS) Liaison	• Helps to coordinate planning of data needs for the survey and provides this information to Project Lead; • Provides general survey planning support based on local knowledge of watershed; • Participates in data collection activities; • Provides information and data needs pertaining to nonpoint sources of pollution and BMPs located within the study area; and • Assists with development of final survey report, as needed.
Erin Trujillo 505-827-0418	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.

2.0 Project Description

The overall strategy is based on sampling at one station located at the deepest location in the waterbody over an 8 month time period starting in March. Sampling will also occur at the inlets and outlets when possible. San Gregorio Lake will only be sampled three times due to limited resources.

2.1 Project Background

Planning for the 2011 Lake Water Quality Survey began in December 2010 when SWQB staff were assigned responsibilities associated with the Rio Puerco/Little Colorado and Gila Watershed studies. See Figure 1 for project locations. The Project Lead coordinated with the local community, New Mexico State Parks, NM Game and Fish and project team members throughout the winter of 2011 to develop this Field Sampling Plan. Current water quality attainment status for individual lakes was considered during FSP development (Table 2).

Table 2. Lake water quality attainment status and general information.

Water Name	Aquatic Life Use[a]	Ecoregion	IR Category[b]	Water Quality Impairments[c]	Current Size Estimate (acres)	Elevation (ft)	Previous Surveys
Bluewater Lake	Coldwater Aquatic Life	23e	2	None	610	7375	2004
Lake Roberts	Coldwater Aquatic Life	23b	2	None	68	6035	1983, 1996
McGaffey Lake	Warmwater Aquatic Life	23c	5/5A	Nutrients, pH	11	7821	1991, 2004 (was almost dry – data not used)
Quemado Lake	Coldwater Aquatic Life	23c	2	None	112	7630	1982, 1995, 2004
Ramah Reservoir	Coldwater Aquatic Life	23e	2	None	250	6942	1995, 2004
San Gregorio Lake	High Quality Coldwater Aquatic Life (fish culture)	21b	3	Not Assessed	36	9410	2004
Snow Lake	Coldwater Aquatic Life	23c/e	3	Not Assessed	100	7425	1982, 1996

a From NMAC 20.6.4
b See Appendix A for definitions of Integrated Report (IR) categories.
c From NMED/SWQB 2010a (available at: http://www.nmenv.state.nm.us/swqb/303d-305b/2010-2012/)

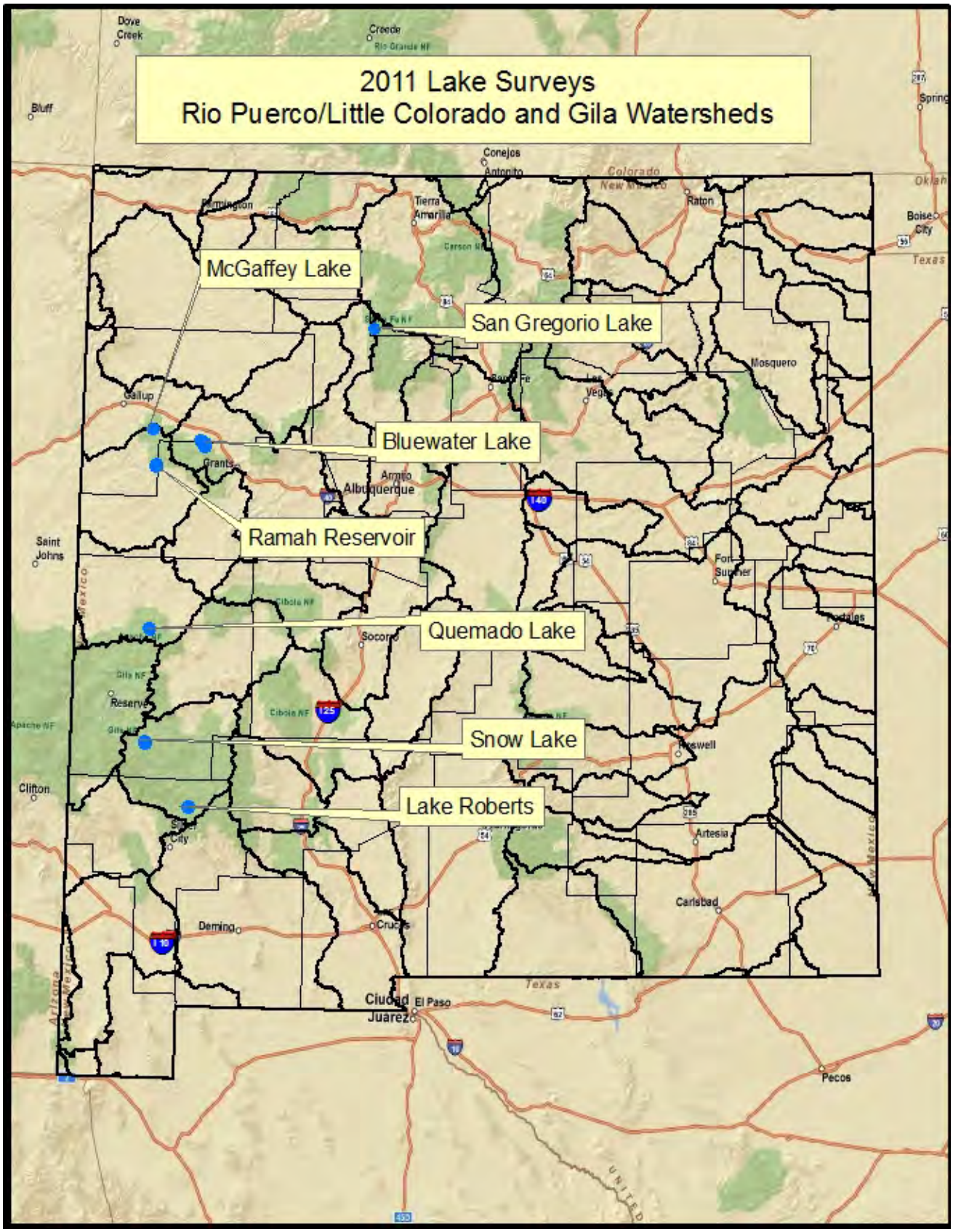

Figure 1. 2011 lake sampling locations Rio Puerco/Little Colorado and Gila Watersheds.

2.2 Lake Descriptions

Bluewater Lake

Bluewater Lake is approximately a 610 acre lake with a watershed of approximately 201 square miles (520.6 km^2). There are multiple inputs to the lake however most of them are intermittent. The two most significant inputs are Bluewater Creek and Cottonwood Creek. Sampling will likely only occur at Bluewater Creek as Cottonwood Creek is intermittent. This sampling will allow for determination of nutrient load to the lake. Sampling will also occur at the outlet to aid in load and lake mass balance calculations. Sampling in the lake will occur at the deep station over an 8 month time period starting in March. The 2004 survey found exceedences of water quality standards for temperature, dissolved oxygen, and total phosphorus. However, Bluewater Lake was found to be in full support due to the low frequency of exceedences. The 2004 survey was conducted during drought and low water levels, which may explain those exceedences (NMED/SWQB 2004).

Lake Roberts

Lake Roberts is approximately 68 acres with a watershed of approximately 226 square miles (558.3 km^2). There are multiple inputs to the lake however most of them are intermittent. The most significant input is Sapillo Creek. Sampling will occur at the deep station over an eight month time period starting in March. Sampling will also occur at the lake inlets and outlets as flows allow to better estimate load and lake mass balance calculations. Data collected during the 1996 survey, the last time Lake Roberts was sampled, did not result in any documented impairments.

McGaffey Lake

McGaffey Lake is about 11 acres lake with a watershed of approximately 4.2 square miles (10.9 km^2). The inlet and outlet to the lake are intermittent. Sampling will occur every other month at the deep station over an 8 month time period starting in March. McGaffey Lake was characterized from April 11, 1990 to April 4, 1991 (NMED/SWQB 1994). McGaffey Lake is highly productive as evidenced by extensive macrophyte beds, high phytoplankton density and occasional fish die-offs. McGaffey Lake's ephemeral tributary system provide unpredictable water input to the impoundment. In 2002 the lake dried and then was dredged in 2003. Since then the lake has filled and conditions are currently adequate to support fish year round without the use of the aerator system (Castel pers. com 2011). Although the data for this lake are dated, it is listed in the State's 305(b) Report as impaired for pH and nutrients until new data are collected to either verify the listing or warrant a delisting action.

Quemado Lake

Quemado Lake is approximately 112 acre lake with a watershed of about 79.5 square miles (206 km^2). Sampling will occur at the deep station over an eight month time period starting in March. Sampling will also occur at the lake inlets and outlet as flows allow to better estimate load and lake mass balance calculations. The lake exceeded the temperature criterion during the 1995 survey (NMED/SWQB 1995a), but was found to be in full support due to the low frequency of exceedences. Quemado Lake was previously listed for sedimentation and nutrients; however these listings were removed in 2006 because no documentation or justification for these listings were provided. The July 7th 2004 survey resulted in no exceedences of any chemical water quality parameters (NMED/SWQB 2004).

Ramah Reservoir

Ramah Lake is about 250 acres lake with a watershed of approximately 44.8 square miles (116 km²). Sampling will occur at the deep station over an eight month time period starting in March. Sampling will also occur at the lake inlets and outlets as flows allow to better estimate load and lake mass balance calculations. Previous surveys in1995 and 2004 resulted in no impairments (NMED/SWQB 1995, 2004).

San Gregorio Lake

San Gregorio Lake is approximately 35 acres lake with a watershed of about 4.8 square miles (12.5 km²). Sampling will occur at the deep station during the spring, summer, and fall seasons. Sampling will also occur at the lake inlets and outlets to better estimate load and lake mass balance calculations. The previous 2004 survey resulted in no documented impairments (NMED/SWQB 2004).

Snow Lake

Snow Lake is approximately 100 acres lake with a watershed of 90.8 square miles (235.4 km²). Sampling will occur at the deep station over an eight month time period starting in March. Sampling will also occur at the lake inlets and outlets as flows allow to better estimate load and lake mass balance calculations. The previous surveys in1982 and 1996 resulted in no listings, however the 1996 survey documented two exceedences of the acute standard for dissolved aluminum (NMED/SWQB 1998).

2.3 Project Objectives

The Bluewater, McGaffey, Roberts, Quemado, Ramah, San Gregorio, and Snow Reservoirs Water Quality Surveys are designed to address the objectives listed below. The basis for any environmental decisions is provided along with any associated products or outcomes (Table 3).

Table 3. Project Objectives and Outcomes

	SWQB Collects Water Quality Data to:	Question to be answered	Products/ Outcomes	Decision Criteria
Primary Objective	Assess designated use attainment for the *Integrated List* and provide information to the public on the condition of surface water quality	Are sampled waterbodies meeting WQS criteria?	Survey Report; *Integrated Report*	WQS as interpreted by the Assessment Protocols
Secondary Objectives	Compile all necessary chemical, physical and biological data necessary for future Lake TMDL development.	What is the maximum pollutant load a waterbody can receive and meet the requirements of the WQS?	Basis for future TMDL development	WQS as interpreted by the Assessment Protocols
	Evaluate the effectiveness of 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 Integrated Report (De-Listing)	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?

Abbreviations: WQS = "water quality standards", NPS = "non-point source" pollution, WQCC = "water quality control commission", N/A = "not applicable"

As part of the planning process, two public meetings are planned, one each in the Rio Puerco and Gila Watersheds. These meetings serve to inform interested parties about SWQB's sampling plans and TMDL process as well as receive public input on specific water quality concerns and suggestions for changes to the FSP. These meetings will be held in Reserve, NM on February 10 and in Cuba, NM on March 8 of 2011. In addition the FSP will be posted on SWQB's website (http://www.nmenv.state.nm.us/swqb/) for public review and comment. This FSP will be revised based on input received before being finalized.

2.4 Project Schedule

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

Table 4. Project schedule.

Time Period	Task
January – March 2011	Planning and identifying data needs
March – October 2011	Data collection
February 2012	All data received from laboratories
February 2012 – September 2012	Data validation/verification completed
October 2012 – December 2012	Final survey report developed
January 2013	Assessment of lake conditions
April 2014	Incorporation assessment conclusions on 2014-2016 Integrated List

3.0 Documentation

Project documents include this field sampling plan, calibration records, sonde download data, validation and verification records, sample collection data, records of analytical data in hard copy or in electronic form and QC records. Documents will be maintained in accordance with the requirements of the Bureau QAPP (NMED/SWQB 2011).

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 or 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 SWQB database and eventually moved to STORET WQX. The project is completed with the completion of the Survey Report.

4.0 Sampling Plan

Sampling will be conducted monthly from March through October for all stations except San Gregorio. San Gregorio will only be sampled three times due to available resources. Samples will be collected at one deep station within the lake. If a lake appears to have different characteristics, such as an arm with an input or a confined area more stations may be needed and sampling will be adjusted. Lake inlet and outlet sampling will include water chemistry, physical measurements (DO, pH, conductivity, temperature, turbidity, and salinity) and flow to get data needed for load calculations and TMDL development. Water quality (WQ) samples will be collected and analyzed in accordance with the *Quality Assurance Project Plan for Water Quality Management Programs 2011* [QAPP] (NMED/SWQB 2011a) and associated *Standard Operating Procedures for Data Collection* [SOPs] (NMED/SWQB 2007 or most recent) to ensure consistency in sample collection, transport, and analysis. Laboratory analyses of water quality samples will be performed by the New Mexico Department of Health Scientific Laboratory Division (SLD) or processed in the SWQB laboratory. Diatom and phytoplankton samples will be sent to EcoAnalysts, Inc., or similar contract lab, for identification and enumeration. Sampling stations and station rationales for this study are provided in Table 5.

*** Number of sampling events and/or samples collected may need to be reduced due to budget constraints! Inlet and outlet stations may not have any sampling listed but are still included in Table 5 in case flows change and samples can be taken***

4.1 CHEMICAL AND BACTERIAL DATA COLLECTION

Table 5. Planned chemical and bacterial sampling (# of samples per variable). Number of sampling events may be reduced due to budget constraints.

Number of samples to be collected during sampling season (March - October).							
Lake	TSS	Nutrients[1]	Dissolved Metals[2]	Total Metals Al, Se, Hg[3]	Bacteria	Organics[4]	Radionuclides sequential[5]
Bluewater	8	8	3	3	8	2	2
Bluewater Creek (inlet)	8	8	0	0	8	0	0
Bluewater Creek outlet	8	8	0	0	8	0	0
Cottonwood Creek	0	0	0	0	0	0	0
Ramah	8	8	3	3	8	2	2
Ramah inlet	5	5	0	0	5	0	0
Ramah outlet	6	6	0	0	6	0	0
McGaffey	4	4	3	3	4	0	0
McGaffey inlet	3	3	0	0	3	0	0
McGafey outlet	0	0	0	0	0	0	0
Snow	8	8	3	3	8	0	0
Snow inlet	0	0	0	0	0	0	0
Snow outlet	4	4	0	0	4	0	0
Quemado	8	8	3	3	8	2	2
Quemado inlet	2	2	0	0	2	0	0
Quemado outlet	0	0	0	0	0	0	0
Roberts	8	8	3	3	8	2	2
Roberts inlet	0	0	0	0	0	0	0
Roberts outlet	8	8	2	2	8	0	0
San Gregorio	3	3	2	2	3	0	0
San Gregorio inlet	3	3	0	0	3	0	0
San Gregorio outlet	3	3	0	0	3	0	0
QC*	0	16	7	0	16	4	0
Total Samples	97	113	29	22	113	12	8
WTU cost per sample	12	76	182	100		370	162
Total wtu cost per run per analyte	1164	8588	5278	2200	0	4440	1296
Total WTU estimate for survey							22966

1 Total nutrients include nitrate + nitrite, ammonia, total Kjeldahl nitrogen, and total phosphorus.
2 Total metals include mercury, selenium and aluminum.
3 Dissolved metals include aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, lead, mercury, molybdenum, nickel, selenium, silver, thallium, uranium, vanadium, and zinc.
4 Refer to 40CFR136 for the list of parameters analyzed using methods 8270 (Base/Neutral Acid Extractables) and 8260 (Volatile Organic Compounds).
5 Radionuclides generally include gross alpha/beta and depending on detections may include Uranium mass and Radium 226 + 228.
* For QC purposes when sampled, 1 blank per run for nutrients, dissolved metals, E. coli, and organics.

4.2 BIOLOGICAL AND PHYSICAL DATA COLLECTION

Measuring biological response indicators concurrent to physical and chemical parameters allows for an overall interpretation of the biological integrity of the lake and may provide enough information to investigate or eliminate potential sources of stress. SWQB is currently collecting phytoplankton, diatom community composition, and chlorophyll data to contribute to the lake assessment process for overall biological condition and trophic state determination (Table 6). Sampling methods are conducted in accordance with the SOP (NMED/SWQB 2007 or most recent).

Table 6. Number of Planned Biological and Physical Sampling.

Station Name	Physical Measurements[1]	Phytoplankton[2]	Diatoms[3]	Chlorophyll[4]
Bluewater Lake	8	2	1	8
McGaffey Lake	4	2	1	4
Ramah Reservoir	8	2	1	8
Snow Lake	8	2	1	8
Quemado Lake	8	2	1	8
Lake Roberts	8	2	1	8
San Gregorio Lake	3	2	1	3

1 Physical measurements will be taken at one-meter intervals for temperature, salinity, specific conductance, hydrogen ion concentration, dissolved oxygen and oxygen saturation.
2 Phytoplankton samples will be collected during the growing season for community composition analysis and correlation with nutrient enrichment.
3 Multi-substrate diatom sample will be collected during the growing season for community composition analysis.
4 Concentrations of chlorophyll *a*, *b*, *c*, and phaeophyton will be measured.

5.0 PROJECT RESOURCES

Because SLD is a state entity, samples processed there are invoiced using work time units (WTU's). For this project, all samples, except *E. coli*, chlorophyll, diatom, and phytoplankton samples, will be processed by SLD (Table 7). *E. coli* and chlorophyll samples are processed in the SWQB laboratory by SWQB staff using materials purchased specifically for these procedures. Currently, diatom and phytoplankton analyses are contracted to EcoAnalysts, Inc. for identification and enumeration.

Table 7. Estimated Water Quality Sample Expenditures.

Analyte	Total # Samples	Cost per Sample (WTU or $)	Total Expenditure (WTU or $)
TSS	97	12	1164 WTU's
Nutrients	113	76	8588 WTU's
Dissolved Metals	29	182	5278 WTU's
Total Hg, Se & Al	22	100	2200 WTU's
E. coli	113	$5.09	$575
Organics (VOC's and BNA's)	12	370	4440 WTU's
Gross alpha, beta & U mass	8	162	1296 WTU's
Phytoplankton	14	$175	$2,450
Diatoms	7	$310	$2,100
Chlorophyll	47	$23	$1,081
TOTAL	--	--	± 22,966 WTU's and $6,206

A round trip to Roberts, Snow and Quemado reservoirs is approximately 700 miles and requires 2 nights out. Sampling of Bluewater, McGaffey, and Ramah reservoirs is roughly 500 miles round trip and requires 2 nights out. San Gregorio will be done in cooperation with the stream survey and was not included in fuel and travel cost estimates. Summer gasoline costs have been estimated at $4.00 per gallon. A 2007 Chevrolet Suburban is typically used for lake surveys, averaging approximately 15 miles per gallon (mpg). Eight sampling trips have been planned for the 2011 lake work. Additional driving may be required to deliver samples to SLD in Albuquerque. Table 8 shows estimated fuel costs.

Table 8. Vehicle Costs.

Month	Approximate Miles	Estimated MPG	Est. Cost of Gasoline	Total Fuel Costs
March	1200	15	$4.00	$320.00
April	1200	15	$4.00	$320.00
May	1200	15	$4.00	$320.00
June	1200	15	$4.00	$320.00
July	1200	15	$4.00	$320.00
August	1200	15	$4.00	$320.00
September	1200	15	$4.00	$320.00
October	1200	15	$4.00	$320.00
TOTAL	**9,600**	--	--	**$2,560.00**

Water quality sampling trips will require two staff per monthly survey to stay up to 7 days / 5 nights out of Santa Fe per sampling event. Staff receive $85 per night per diem for travel costs. (Tables 9 and 10).

Table 9. Per Diem and Salary Estimates.

Expense	Days required	Total
Per Diem	32 nights x 2	**64 nights**
Salary Days	48 days x 2	**96 days**

Total costs not included below (Table 10) may involve general sampling supplies such as WQ sample containers, filters, preservatives, and sonde calibration solutions. Vehicles will require standard preventative maintenance and unforeseen costs may arise at any time.

Table 10. Total Cost Estimates.

WTUs	Biological Sample $	Fuel $	Per Diem $	Staff Field Days
± 22,966	**$6,206**	**$2,560**	**$5,440**	**96**

Note: Trip expense for ice add $50.00 for entire survey.

6.0 REFERENCES

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7.0 APPENDIX A

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 (NMED/SWQB 2010a):

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 Category5/5C	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.