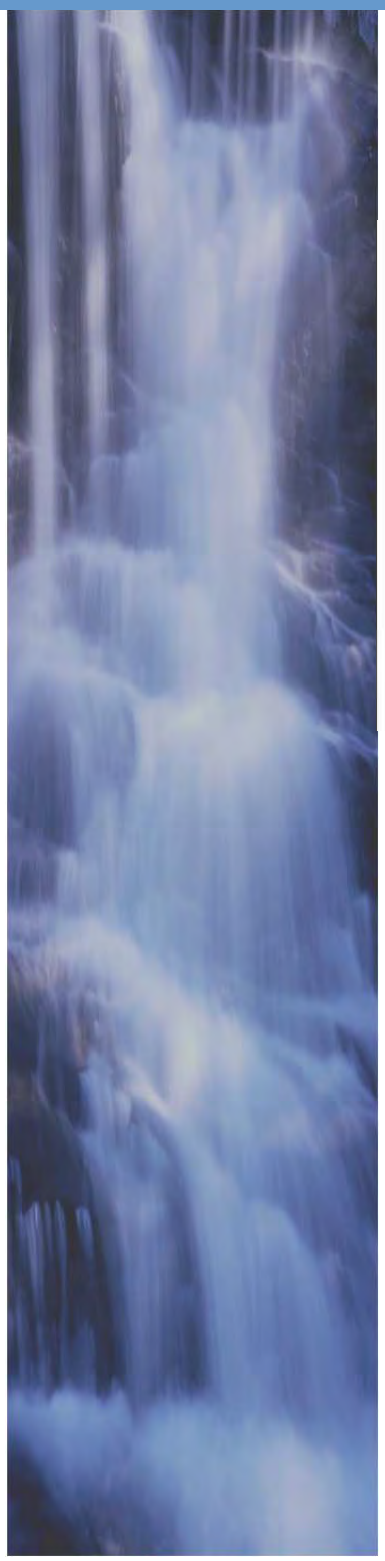
State of New Mexico

Water Quality Control Commission



# 2014 - 2016

# State of New Mexico Clean Water Act Section 303(d)/Section 305(b) Integrated Report

**FINAL**

**November 18, 2014**


Prepared by:
New Mexico Environment Department
Surface Water Quality Bureau
1190 St. Francis Dr.
Santa Fe, NM 87505
**www.nmenv.state.nm.us/swqb**

# New Mexico Water Quality Control Commission (as of September 2014)

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| | |
|---|---|
| ACWA | Association of Clean Water Administrators |
| ADB | Assessment Database |
| AU | Assessment Unit |
| BLM | Bureau of Land Management |
| BMP | Best Management Practice |
| CERTMAN | Certification Management System |
| CFR | Code of Federal Regulations |
| CPB | Construction Programs Bureau |
| CWA | Clean Water Act |
| CWSRF | Clean Water State Revolving Fund |
| DDT | dichlorodiphenyltrichloroethane |
| DO | Dissolved Oxygen |
| DOE | Department of Energy |
| DWB | Drinking Water Bureau |
| DWSRLF | Drinking Water State Revolving Loan Fund |
| *E. coli* | *Escherichia coli* |
| ECHO | Enforcement Compliance History Online Database |
| EMAP | Environmental Monitoring and Assessment Program |
| FY | Fiscal Year |
| GIS | Geographic Information System |
| GRTS | Grant Reporting and Tracking System |
| GWUDI | Ground Water Under the Direct Influence |
| GWQB | Ground Water Quality Bureau |
| HP | Hydrology Protocol |
| HUC | Hydrologic Unit Code |
| IBI | Indices of Biotic Integrity |
| ISC | Interstate Stream Commission |
| LANL | Los Alamos National Laboratory |
| LANS | Los Alamos National Security, LLC |
| LRG | Lower Rio Grande |
| MASS | Monitoring, Assessment and Standards Section |
| MCL | Maximum Contaminant Level |
| NARS | National Aquatic Resources Surveys |
| NMAC | New Mexico Administrative Code |
| NMDGF | New Mexico Department of Game and Fish |
| NMDOH | New Mexico Department of Health |
| NMED | New Mexico Environment Department |
| NMEDAS | New Mexico Ecological Data Application System |
| NMRAM | New Mexico Rapid Assessment Method |
| NMSA | New Mexico Statutes Annotated |
| NPDES | National Pollutant Discharge Elimination System |
| NPS | Nonpoint Source |
| NRCS | Natural Resources Conservation Service |
| ONRW | Outstanding National Resource Water |
| OSE | Office of the State Engineer |
| PCB | Polychlorinated Biphenyls |
| PSRS | Point Source Regulation Section |
| QA/QC | Quality Assurance/ Quality Control |
| QAPP | Quality Assurance Project Plan |
| QMP | Quality Management Plan |

| | |
|---|---|
| RBP | Rapid Bioassessment Protocol |
| RCRA | Resource Conservation and Recovery Act |
| RERI | River Ecosystem Restoration Initiative |
| RLWTF | Radioactive Liquid Waste Treatment Facility |
| ROD | Record of Decision |
| SDWA | Safe Drinking Water Act |
| SLD | State Laboratory Division |
| SQUID | Surface water QUality Information Database |
| STORET | Storage and Retrieval System |
| SWCD | Soil and Water Conservation District |
| SWPP | Source Water Protection Plan |
| SWQB | Surface Water Quality Bureau |
| SWWS | Sanitary Waste Water System |
| TMDL | Total Maximum Daily Load |
| TSI | Trophic State Index |
| UOC | Utility Operator Certification |
| USACE | United States Army Corp of Engineers |
| USDA | United States Department of Agriculture |
| USEPA | United States Environmental Protection Agency |
| USFS | United States Forest Service |
| USFWS | United States Fish and Wildlife Service |
| USGS | United States Geological Survey |
| WBP | Watershed-Based Plan |
| WPP | Wetlands Program Plan |
| WPS | Watershed Protection Section |
| WQA | Water Quality Act (New Mexico) |
| WQCC | Water Quality Control Commission |
| WQMP/CPP | Water Quality Management Plan / Continuing Planning Process |
| WQS | Water Quality Standards |
| WQX | Water Quality Exchange |
| WRAS | Watershed Restoration Action Strategies |
| WRDA | Water Resources Development Act |

# EXECUTIVE SUMMARY

## New Mexico's Water Quality Management Programs

Under the New Mexico Water Quality Act (WQA or Act), the New Mexico Water Quality Control Commission (WQCC or Commission) is the water pollution control agency for New Mexico. The Commission is responsible for developing water quality standards (WQS) and adopting regulations in New Mexico consistent with the broader intent expressed by the legislature in passing the Act. In implementing the Act, the Commission adopts water quality standards intended to protect waters of the State, as well as regulations aimed at achieving those standards. In addition to its formal rulemaking role, the Commission serves as a forum to facilitate and advance a statewide dialogue on a variety of important water quality issues through the review and approval of this Report. The responsibilities for the administration of water quality management are assigned to constituent agencies.

The New Mexico Environment Department (NMED or Department) is the constituent agency with primary responsibility for implementing and enforcing the regulations and standards adopted by the Commission. Moreover, the Department provides the principal source of technical expertise available to the Commission in its rulemaking and adoption of a comprehensive water quality management program and continuing planning processes. Through the *State of New Mexico Statewide Water Quality Management Plan and Continuing Planning Process* (WQMP/CPP), the Commission has designated the Department as the constituent agency to assist in:

- Maintaining, restoring, and improving the quality of the State's waters;
- Evaluating discharges for compliance with regulations and standards;
- Developing water quality classifications and standards;
- Performing site application and design and specification reviews of new or expanding wastewater treatment facilities;
- Undertaking monitoring and enforcement of the statutes and permits pertinent to water quality;
- Coordinating water quality management planning;
- Managing state and federal construction grant and loan assistance programs which provide financial support to municipalities for construction or improvement of wastewater treatment facilities;
- Managing the ground water quality protection program with the goal of protecting the public health and beneficial use of ground water; and
- Providing technical assistance to local governments regarding water and wastewater treatment.

## Surface Water Quality Protection in New Mexico

The protection of water quality in New Mexico is vitally important to the health and well-being of all New Mexicans and the aquatic life and wildlife that inhabit its waters. New Mexico uses a variety of mechanisms, including state, federal, and local programs, to protect and restore the quality of its surface and ground waters. The basic underpinnings of surface water protection as provided in the United States Clean Water Act (CWA) and the New Mexico WQA are found in

the *State of New Mexico Standards for Interstate and Intrastate Surface Waters* [20.6.4 NMAC]. The purpose of the regulations is to establish water quality standards that consist of the designated use or uses of surface waters of the state, the water quality criteria necessary to protect the use or uses and an antidegradation policy. Designated uses include fish culture, public water supply, industrial water supply, domestic water supply, irrigation, primary and secondary contact (including cultural, religious or ceremonial purposes), livestock watering, wildlife habitat, and aquatic life. To protect these uses and fulfill the requirements set forth in the law, coordinated programs have been developed to monitor, assess, protect, and restore surface water quality throughout New Mexico. The implementation of these programs is detailed in the WQMP/CPP, which serves as an important planning tool for the prevention and correction of water quality issues.

Like most states, New Mexico has utilized a targeted, rotational watershed approach to monitor and assess ambient surface water quality while still achieving comprehensive coverage of waters of the state. This approach was adopted in 1998 and has proven effective at achieving New Mexico's monitoring objectives given the level of financial and staff resources, and has provided:

- A systematic and detailed collection and review of water quality data that allows for more efficient use of human and budget resources;
- Information at a spatial scale where implementation of corrective actions is feasible;
- An established order of rotation and predicted sampling year for each watershed, which allows for easier coordination efforts with other programs and entities interested in water quality; and
- Enhanced program efficiency.

The process of addressing impairments begins with the identification of an impaired waterbody on the CWA Section 303(d) *List of Impaired Waterbodies*. Once a waterbody is listed, the impaired waterbody is evaluated to determine if changes to the standard may be appropriate, whether more data collection is necessary to confirm the impairment, or whether a total maximum daily load (TMDL) should be developed. If a TMDL is developed and assigned to the waterbody, it will provide a pollutant budget for both permitted discharges (point sources) and non-point sources and it is incorporated into the WQMP/CPP.

The principal mechanism used to protect waters from the adverse effects of municipal and industrial point source discharges is the federal National Pollutant Discharge Elimination System (NPDES) program. The U.S. Environmental Protection Agency (USEPA) Region 6 office in Dallas, Texas, issues and enforces these permits for discharges in New Mexico. As one of only four states in the nation without USEPA authorization to implement the permitting program, New Mexico's role is limited to certification of the permits pursuant to the CWA Section 401. Nevertheless, State certification ensures that permit limits for discharges into surface waters implement federal CWA and New Mexico WQA requirements, protect state water quality standards, and implement the WQMP/CPP. Once the NPDES permit is issued, New Mexico assists the USEPA with permit compliance tracking and on-site inspections.

The Department implements the New Mexico Utility Operators Certification Act for the Commission. The Act and its regulations require that all public drinking water and wastewater treatment facilities are operated by qualified operators. Wastewater treatment facilities discharging to impaired surface waters are required to meet water quality based effluent limitations, which may increase the complexity of the treatment facility. Having qualified

operators at wastewater treatment facilities is a key factor in determining the quality of effluent discharge to a waterbody.

The State's Nonpoint Source Management Program works to prevent and correct water quality impairments from nonpoint sources of surface water pollution. The Department is the lead agency for this program, which uses a variety of state, local, and federal agency programs to achieve implementation of Best Management Practices (BMPs) to prevent and abate nonpoint source pollution. The program annually prioritizes its efforts by ensuring that waterbodies listed as impaired receive greater consideration for funding under the CWA Section 319. The Nonpoint Source Management (NPS) Program also ensures that water quality standards are protected and the water quality management plan is implemented through the State certification of CWA Section 404 dredge-or-fill permits issued by the United States Army Corps of Engineers (USACE).

The Department's Wetlands Program administers and directs wetland projects that serve to restore, protect, and reserve water quality pertinent to wetlands. All water quality programs have an associated outreach component to provide education and outreach for schools and interest groups wherever possible to help maintain, protect, and restore New Mexico's water quality.

## *Surface Water Quality in New Mexico*

Knowledge about current surface water quality in New Mexico is based primarily on chemical, physical, biological and habitat data collected by the Department's Surface Water Quality Bureau (SWQB) during the following activities:

- Rotational surveys;
- Water quality monitoring of projects under the State's NPS Pollution Management Program;
- TMDL surveys and studies;
- Special studies conducted to address specific localized water quality concerns;
- Analysis of fish tissues for development of Fish Consumption Advisories;
- Water quality compliance monitoring conducted under the NPDES program; and
- Long-term water quality monitoring collected by the U.S. Geological Survey (USGS) at stream gages.

Additionally, other entities are invited to contribute quality environmental data to be used for assessment purposes during a public data solicitation effort that is part of the development of this Integrated Report (Report).

From the approximately 7,710 stream miles in New Mexico, nearly 4,170 assessed miles, or 54%, have identified impairment(s) where water quality does not support the designated uses. Approximately 66,143 out of 94,415 (65%), categorized publically-owned lake, reservoir, or playa acres do not fully support designated uses either. The State has issued fish consumption advisories for a variety of fish species in 26 lakes and reservoirs and three (3) rivers due to elevated concentrations of various contaminants, including mercury, dichlorodiphenyltrichloroethane (DDT), and polychlorinated biphenyls (PCBs).
Using all available data assessed against current designated, existing, or attainable uses utilizing established Assessment Protocols, the Department has found that temperature, nutrient/eutrophication, and *E. coli* are the three most common causes of river and stream water

quality impairments in New Mexico. The vast majority of surface water quality impairments identified in New Mexico are due to nonpoint sources of water pollution. Rangeland grazing, onsite treatment systems and loss of riparian habitat are the leading sources of impairment in New Mexico's rivers and streams. The three most common causes of water quality impairments in lakes and reservoirs are mercury in fish tissue, PCB in fish tissue, and temperature.

## *Ground Water Quality Protection in New Mexico*

New Mexico's ground water resources are of vital importance and must be preserved for present and future generations. Approximately 78% of New Mexicans depend on ground water for drinking water. As with surface water, New Mexico relies on several programs established under a variety of statutory authorities to protect and maintain ground water quality. The New Mexico Water Quality Act authorizes the WQCC to adopt ground water quality protection regulations and standards. The New Mexico Oil and Gas Act, Hazardous Waste Act, Ground Water Protection Act, Solid Waste Act, Emergency Management Act, Voluntary Remediation Act, Mining Act, and Environmental Improvement Act also contain provisions which are designed to protect ground water quality and which implement the ground water regulations and water quality standards directly or by reference. In addition, the State cooperates with local and federal governments on various programs relevant to ground water pollution control.

The predominant nonpoint sources of ground water contamination in New Mexico are household septic tanks or cesspools. Nonpoint source contamination may be caused by large numbers of small septic tanks spread over a subdivision, residual minerals from evapotranspiration, animal feedlot operations, areas disturbed by mineral exploration or storage of waste products, urban runoff, or application of agricultural chemicals. Point source contributions to ground water contamination include publicly- and privately-owned sewage treatment plants, dairy lagoons, mines, food processing operations, industrial discharges, landfills, and spills or leaks.

## *Integrated Report Highlights*

On August 15, 2013 the intention for a new state-funded stream restoration program called the River Stewardship Program was announced. The River Stewardship Program has the overall goal of addressing the root causes of poor water quality and stream habitat. Objectives of the River Stewardship Program include: restoring or maintaining hydrology of streams and rivers to better handle overbank flows and thus reduce flooding downstream; enhancing economic benefits of healthy river systems such as improved opportunities to hunt, fish, float or view wildlife; and providing state matching funds required for federal CWA grants. The New Mexico Legislature provided $2.3 million in the state FY2015 budget to support for this initiative. Responsibility for the program will be assigned to NMED, and staff will develop and administer the program. These funds will also serve to match federal funds New Mexico receives under the CWA.

In 2013 the USEPA recognized Comanche Creek as a Success Story for the CWA Section 319 Nonpoint Source Pollution Prevention Program. USEPA recognizes nonpoint source success stories to highlight restoration efforts that result in water quality improvements in nonpoint source impaired waterbodies. Comanche Creek was nominated because of water quality improvements from projects conducted by the Taos Soil and Water Conservation District, Carson National Forest, Quivira Coalition, NMED, and other partners. Additional nominations were submitted for Willow Creek and Sitting Bull Creek, which are currently in review.

In 2012, USEPA accepted the updated Wetlands Program Plan (WPP) for New Mexico as meeting the four required elements for such plans: monitoring and assessment; regulation; voluntary restoration and protection; and water quality standards for wetlands. New Mexico's was the first accepted WPP in USEPA Region 6. The monitoring and assessment goals of the WPP include developing an inventory of wetlands resources that classify wetland types and identify functions and ecosystem services by wetland type. Wetlands restoration is a crucial component of the WPP. Several restoration projects are occurring throughout New Mexico, which include the assistance and collaboration of a variety of project partners, and are funded by the USEPA Region 6 through CWA Section 104(b)(3) Program Development grants.

New Mexico completed its last comprehensive water quality standards revision (triennial review) in November 2010, and the USEPA approved the amendments adopted by the WQCC as of June 18, 2012. Since the last triennial review, NMED established water quality standards for 62 lakes in the Rio Grande, Pecos, Canadian, Gila, San Juan and Little Colorado Basins in New Mexico, approved by USEPA on July 10, 2012. NMED also revised the water quality standards on the Galisteo and Santa Fe Rivers- these revised standards were adopted by the WQCC on December 11, 2012 and approved by USEPA on June 5, 2013. NMED has initiated the current triennial review with a scoping period for public input during April and May of 2014. Proposed standards revisions include the identification of a number of ephemeral waters that support only limited aquatic life and secondary contact based on a *Hydrology Protocol* analysis – ensuring that appropriate standards apply to the regulated entities discharging to these waters.

State certification of federal permits is required under CWA Section 401 and ensures the permits are compatible with state and federal laws, protect the State's WQS and implement the WQMP/CPP. A significant regulatory change occurred in 2011 when the WQCC adopted regulations addressing certification. The new regulations codified for the first time the procedures, including required opportunities for public comment and opportunities for appeal, to be used by NMED for certification of CWA Section 402 and Section 404 permits. The new regulations (20.6.2 NMAC) went into effect on May 18, 2011, making state FY 2012 the first full year during which these regulations were used.

New Mexico continually works to improve the effectiveness of the ground water discharge permit program. Improved permit conditions have been developed to address issues identified as needing additional attention, such as contingency and closure plans, lining dairy lagoons with synthetic liners, septic system maintenance, the use of reclaimed wastewater, and a provision of financial assurance. The program has created new permit templates for particular types of facilities such as car washes and grease trap waste disposers. The Ground Water Quality Bureau (GWQB) of NMED has also entered into a professional services contract with a consultant to evaluate, develop improvement recommendations, and develop an implementation process for managing discharge permits. The evaluation and development phases of work are anticipated to be completed by the end of state FY2014.

# PART A - INTRODUCTION

The *State of New Mexico Clean Water Act (CWA) Section 303(d)/ Section 305(b) Integrated Report* (Integrated Report or IR) is designed to satisfy the statutory requirements of Sections 303(d), 305(b), and 314 of the federal Water Pollution Control Act [33 U.S.C. 1251 *et seq*.], commonly known as the Clean Water Act (CWA). The Integrated Report also includes basic information on water quality and water pollution control programs in New Mexico to the United States Environmental Protection Agency (USEPA) and the United States Congress, as well as to the general public.

**Folsom Falls in the Dry Cimarron Watershed**

In accordance with the statutory requirements of the CWA, the Integrated Report contains:

- An assessment of water quality;
- An analysis of the extent to which the CWA Section 101(a)(2) goal of surface water quality -- protection and propagation of fish, shellfish, and wildlife and recreation in and on the water -- is being achieved;
- An overview of progress in water pollution control and recommendations for further action; and
- A description of the nature of nonpoint source pollution and programs for nonpoint source pollution control.

In accordance with current USEPA integrated listing guidance, New Mexico uses the designated use determinations of Fully Supporting, Not Supporting, and Not Assessed for each individually designated use to determine an IR category for every assessment unit on the Integrated List. New Mexico's IR categories are defined in Table 1. Waterbodies classified as Category 5 constitute the *CWA Section 303(d) List of Impaired Waters,* however, the state of New Mexico also recognizes waterbodies classified as Category 4 as being impaired. In this latter case, a new TMDL is typically not required to address the impairment because the impairment is not caused by a pollutant, the TMDL has already been completed or other pollution control requirements are reasonably expected to result in attainment of the water quality standard. The IR categories document attainment of applicable water quality standards, and enable the development of monitoring and corrective action strategies that effectively respond to the needs identified in the assessment process.

The format of the Integrated Report has not changed significantly from the 2006-2008 version that was developed in accordance with USEPA's Integrated Report Guidance (USEPA 2005). The common organizational structure and method of reporting water quality status from year to year facilitates the review that Congress and members of the public conduct on state reports and lists. Additionally, this 2014 - 2016 version adheres to the guidance in USEPA's most recent recommendations (USEPA 2013).

**Table 1. New Mexico's Integrated Report Categories**

| Category | Description |
|---|---|
| 1 | All designated uses are supported. |
| 2 | Available data and/or information indicate that some, but not all, designated or existing uses are supported based on numeric and narrative parameters that were tested. |
| 3 | There are insufficient available data and/or information to make a support determination. |
| 4A | Available data and/or information indicate that at least one designated or existing use is not being supported, but a Total Maximum Daily Load (TMDL) is not needed because TMDLs have been already been established. |
| 4B | Available data and/or information indicate that at least one designated or existing use is not being supported, but a TMDL is not needed because other pollution control requirements are reasonably expected to result in attainment of the water quality standard in the near future. |
| 4C | Available data and/or information indicate that at least one designated or existing use is not being supported, but a TMDL is not needed because impairment is not caused by a pollutant. |
| 5A | Available data and/or information indicate that at least one designated or existing use is not being supported and necessary TMDLs are underway or scheduled. |
| 5B | Available data and/or information indicate that at least one designated or existing use is not being supported and a review of the water quality standard will be conducted to verify appropriateness. |
| 5C | Available data and/or information indicate that at least one designated or existing use is not being supported but additional data are necessary to verify the listing before TMDLs are scheduled. |

# PART B - BACKGROUND

## B.1 Scope of Waters Included in Integrated Report

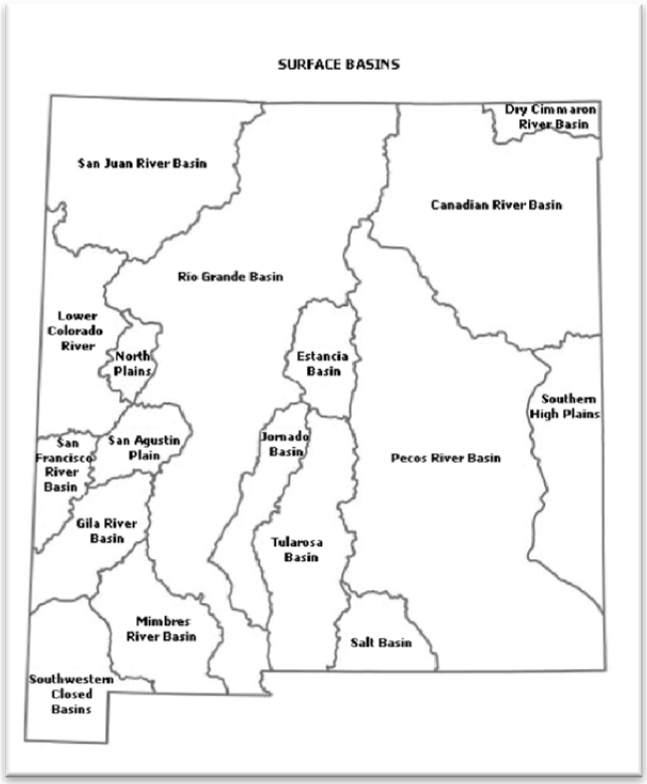



**Figure 1. New Mexico Surface Water Basins**

New Mexico is characterized by high mountains, expansive plains and plateaus, river gorges, and broad valleys. Land surface elevations in New Mexico vary from just under 3,000 feet above sea level at the Texas border in the southeastern portion of the state to just over 13,000 feet in the northern mountains. New Mexico is the fifth largest of the fifty states, with a total area of 121,607 square miles. Of this, 33.9% is federal land, 11.7% is State land, 10.4% is Native American land, and 44.0% is privately owned (BLM 2005). While the state's climate is generally arid to semiarid, New Mexico's mountainous areas impart a cooler and wetter climate in a significant portion of the state. Average annual precipitation ranges from less than eight inches in desert valleys to over 30 inches in the mountains. About half of annual precipitation is received during the summer period with brief but intense summer storms, commonly referred to as the "monsoon season." Much of the winter precipitation falls as snow in the high mountains and as snow or rain at lower elevations. Average annual snowfall ranges from approximately 3 inches in desert and plains regions to well over 100 inches in mountain areas. Statewide, the annual average precipitation is much less than evaporation from open water surfaces (BOR 1976).

New Mexico's surface waters are located within basins (Figure 1) as defined by the New Mexico Office of the State Engineer (OSE). These surface waters include headwater portions of three of the nation's principal drainage systems: the San Juan River, Lower Colorado River and Gila River basins contribute to the Colorado River, drainage from the Arkansas-White-Red River Basin contributes to the Mississippi River, and the three Rio Grande basins and the Pecos River basin contribute discharge to the Rio Grande. Other streams are in topographically closed basins and drain internally, but are still considered waters of the state. Table 2 summarizes water resource information.

Total annual stream flow averages over 5.7 million acre-feet. Precipitation falling within the state boundaries accounts for 3.3 million acre-feet of this total. Observed average precipitation

for water years (October – September) during the period from 1971-2000 was 14.5 inches (NMOSE/ISC 2006). Other states, principally Colorado via the Rio Grande and the San Juan River, contribute the rest. Downstream states receive 3.6 million acre-feet from New Mexico (BOR 1976). The state's surface water supply is considered almost fully appropriated to beneficial uses under existing water rights (or reserved for specified beneficial uses under water rights filings), or is needed to meet interstate compact obligations (NMOSE/ISC, 2003).

**Table 2. Summary of New Mexico's Surface Water Resources**

| Topic | Value |
|---|---|
| State population[1] | 2,085,287 |
| State Surface Area | 121,607 sq mi |
| Number of water quality basins | 11 |
| Total number of stream miles[2] | 108,649 mi |
| Perennial stream miles[2] | 6,554 mi |
| Intermittent/Ephemeral stream miles[2] | 99,332 mi |
| Ditch/canal miles[2] | 2,727 mi |
| Stream miles bordering other states[2] | 0 mi |
| Number of public lakes/reservoirs[2,3] | 196 |
| Acres of public lakes/reservoirs[2,3] | 108,905 acres |
| Acres of freshwater wetlands[4] | 740,600 acres |

[1]United States Census Bureau 2013 estimate. This represents a 1.3% increase since the 2010 census.
[2]Derived by SWQB and based on the lengths of arc segments and areas of polygons from the USGS National Hydrography Dataset (USGS 2012). Established Assessment Units do not cover every waterbody in the NHD dataset. Water resource information reported by USEPA may also differ from information reported by SWQB. These differences can be attributed to the different topographical map scales each agency uses to develop these estimates. Additionally, the two agencies may have used GIS information updated from satellite or aerial photos taken at different times.
[3]This includes publicly-owned high-altitude natural lakes, playa lakes, and sink holes as well as lakes and reservoirs based on the USGS National Hydrography Dataset. Large reservoir areas are based on the conservation pool.
[4]United States Department of Agriculture Natural Resources Conservation Service (USDA/NRCS) 2000

Approximately 78% of the population of New Mexico relies on groundwater for their drinking water supply. In some areas with significant ground water use, ground water levels have declined in part due to withdrawals in excess of recharge. In some areas with significant ground water use, ground water levels have declined. Ground water withdrawals from an aquifer by pumping must be balanced by some combination of increased recharge, decreased discharge, and removal from storage (or depletion) (Bartolino and Cunningham, 2003). Ground water levels may decline in the vicinity of pumping even when withdrawals do not exceed basin recharge because pumping ground water draws down aquifer storage, which can only be replenished by recharge over time once pumping decreases or stops.

## B.2 Water Pollution Control in New Mexico's Surface Waters

The New Mexico Water Quality Act (WQA) was adopted in 1967 to protect water quality in New Mexico. The New Mexico Legislature has revised the WQA [NMSA 74-6-1 *et seq*.] numerous times to improve the management and protection of New Mexico's water resources. Several of the revisions expanded the duties and powers of the New Mexico Water Quality Control Commission (WQCC). These duties include adoption of water quality standards and the adoption of regulations to prevent or abate water pollution in the state or in any specific geographic area or watershed of the state or for any class of waters. Under the WQA, water is defined as "all water, including water situated wholly or partly within or bordering upon the state, whether surface or subsurface, public or private, except private waters that do not combine with other surface or subsurface water." The WQCC is the State water pollution control agency for all purposes of the federal CWA and may take all necessary actions under the WQA to secure the benefits of the WQA. [NMSA 74-6-3(E)]

Under the authority of the WQA and the CWA, the WQCC has adopted the basic framework for water quality management in New Mexico (Figure 2). A detailed description of this framework is provided in the *State of New Mexico Statewide Water Quality Management Plan/Continuing Planning Process* (WQMP/CPP) (NMWQCC 2011). The WQMP/CPP is the umbrella document that incorporates by reference the following reports and regulations adopted by the WQCC:

- Ground and Surface Water Protection Regulations [20.6.2 NMAC];
- New Mexico Nonpoint Source Management Program;
- Standards for Interstate and Intrastate Surface Waters [20.6.4 NMAC]; and
- State of New Mexico Integrated Clean Water Act Section 303(d)/Section 305(b) Report.

Responsibilities for water quality management activities are assigned by the WQCC to the constituent agencies, primarily the New Mexico Environment Department (NMED). Within NMED, the Secretary has delegated the responsibilities for water quality management activities involving surface waters to NMED's Surface Water Quality Bureau (SWQB). NMED's Ground Water Quality Bureau (GWQB) has the responsibility for activities involving protection and restoration of ground water quality. A significant exception is that the WQCC assigned the New Mexico Oil Conservation Division of the Energy, Minerals and Natural Resources Department as responsible as lead for the regulation of ground water quality protection associated with oil and gas production. Several other state agencies conduct activities related to water quality, including but not limited to: Office of the State Engineer; Interstate Stream Commission; Department of Game and Fish; Energy, Minerals and Natural Resources Department; Oil Conservation Commission; Soil and Water Conservation Districts; and Department of Agriculture.

The State conducts water quality planning on a statewide level. Nevertheless, some individual programs use a watershed-level focus to augment and better support statewide planning efforts. NMED strives to use an integrated planning and management strategy to protect or attain the desired uses and levels of water quality within a watershed. The fundamental components within this water quality management approach are listed and described in Figure 2. Within the SWQB, the iterative process implemented to identify water quality problems, develop solutions to address them, and assess the effectiveness of the implemented solutions in shown in Figure 3. Problem identification begins with establishing water quality standards and follows with collecting data to identify impaired waters. Problem solving involves the development of Total

Maximum Daily Loads (TMDLs) which help guide NPDES permit limits and Section 319 restoration projects to help a waterbody achieve water quality standards. Each program is an integral part of this approach.


**Figure 2. New Mexico's Water Quality Management Framework Adopted by the WQCC in the WQMP/CPP**

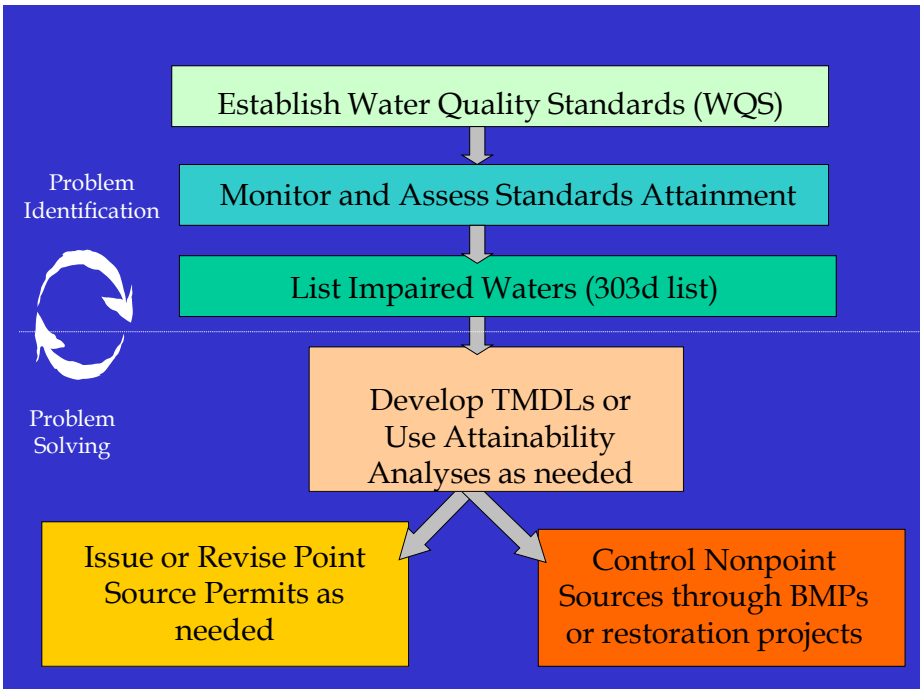



**Figure 3. General Framework for Identifying and Restoring New Mexico's Surface Waters Employed by SWQB**

## *Surface Water Quality Standards Program*

New Mexico's Surface Water Quality Standards Program maintains and refines the State's surface WQS. The WQS define the water quality goals for a waterbody by designating its uses, setting criteria to protect those uses, and establishing provisions to preserve water quality. New Mexico continually evaluates the WQS using applicable guidance documents, data, and other sources of information to identify provisions that may need to be modified or added. In accordance with CWA Section 303(c)(1), the State must hold a hearing to examine the WQS on a three-year basis. This process is known as the "triennial review" and is also governed by the WQA which assigns authority for the adoption of WQS to the WQCC.

**Rio Nambe in the Pecos Wilderness**

The SWQB completed its last triennial review for the WQCC in November 2010, and the USEPA approved the amendments adopted by the WQCC as of June 18, 2012. Since the last triennial review there have been amendments to the water quality standards (20.6.4 NMAC). In addition, the WQCC and USEPA have also approved related revisions to the Water Quality Management Plan/Continuing Planning Process (WQMP/CPP) detailing the implementation of these standards changes. These changes include:

- SWQB's Hydrology Protocol (HP) for ephemeral waters added to the WQMP/CPP (Section II.C and Appendix C);
- 18 stream segments determined by HP application to be ephemeral (USEPA technical approval granted);
- Aquatic life use changes on the lower Dry Cimarron River;
- 19 new classified segments for 62 lakes in the Rio Grande, Pecos, Canadian, Gila, San Juan and Little Colorado basins;
- Antidegradation provisions for outstanding natural resource waters (ONRWs) in the WQS and WQMP (Appendix A);
- Rulemaking designating 29 lakes, 1,045 wetlands and 700 miles of perennial streams on U.S. Forest Service (USFS) lands as ONRWs; and
- Revisions to water quality standards for the Santa Fe River and Galisteo Creek watershed.

The SWQB initiated its current triennial review with a scoping period for public input during April and May of 2013. Revisions to the WQS under consideration by SWQB include:

- Segment-specific standards for appropriate aquatic life protections in the Mimbres and San Juan River basins
- A new temporary standards provision
- Secondary contact uses and criteria updates to primary contact uses and criteria in some segments based on USEPA's most recent recommendations
- Listing of ephemeral waters under Section 20.6.4.97 NMAC pursuant to Subsection C of Section 20.6.4.15 NMAC
- Clarifications of criteria applicability or methods, and corrections of grammatical errors

**For additional information on New Mexico's water quality standards, visit: http://www.nmenv.state.nm.us/swqb/Standards/**

## *Monitoring and Assessment Program*

The purpose of SWQB's Monitoring and Assessment Program is to ensure relevant water quality data for all of New Mexico's surface waters are collected and assessed with the most robust scientific methods in a way that is transparent to water quality agencies and the public. The Program serves all surface water quality management needs to the extent possible given available resources, NMED priorities, and strategic goals. The waterbody types monitored by the program include streams, rivers, lakes, reservoirs, and wetlands.

New Mexico has adopted a strategy to maintain up-to-date evaluations of the State's surface waters with fewer resources than were available a decade ago. This strategy is summarized in *State of New Mexico Surface Water Quality 10-Year Monitoring and Assessment Strategy* (NMED/SWQB 2010). Surface water quality data collected during rotational water quality surveys are integral to implementing this framework for identifying and restoring impaired surface waters, and protecting unimpaired surface waters. This process is described in greater detail in Part C of this document.

**For additional information on New Mexico's water quality monitoring and assessment, visit: http://www.nmenv.state.nm.us/swqb/MAS/**

## *Total Maximum Daily Load Program*

As discussed earlier, CWA Section 303(d)(1) requires that states develop a list of waters within the state that are not supporting their designated uses established in the WQS and to establish a total maximum daily load (TMDL) for each pollutant for those "impaired waters." To accomplish this latter requirement, New Mexico develops a TMDL planning document -- a comprehensive plan for a given pollutant and waterbody starting from the relevant WQS, discussing existing water quality data and developing plan to ensure that WQS are achieved and maintained for that waterbody. At the core of a TMDL is the allocation of pollutant loads to existing and reasonably foreseeable increases from point sources and nonpoint sources in the watershed. As such, TMDLs are an integral part of New Mexico's WQMP/CPP. They also inform the USEPA in developing effluent limits for NPDES permits, and help guide NMED in prioritizing watershed protection and restoration projects funded under the CWA Section 319.

Outside groups also recognize the importance of TMDL development in protecting New Mexico's surface waters. In 1996, the USEPA was sued by two citizen groups to force the development of TMDLs in New Mexico. A settlement agreement and consent decree were negotiated in 1997 to settle the litigation, and established a 20-year timeline for developing TMDLs for waters identified as impaired on the 1996-1998 *List of Impaired Waterbodies*. NMED received USEPA approval of the final TMDL under the Consent Decree in 2007 and the Consent Decree was officially dismissed on April 21, 2009. New Mexico has continued to develop TMDLs. Since the previous listing cycle, New Mexico has completed TMDLs for the Upper Rio Grande watershed (9), Upper Pecos River watershed (7), and the Animas River watershed (4). NMED also received USEPA approval to remove a TMDL for aluminum on the Red River.

The NMED is actively involved in national conversations with USEPA and the Association of Clean Water Administrators (ACWA) regarding the new Long Term Vision for the Clean Water Act Section 303(d) Program and will integrate those goals into the New Mexico TMDL program. This Vision is designed to allow states greater flexibility to develop state-specific programs that reflect the specific ecological and hydrologic conditions within their borders and maximizing on-the-ground water quality benefits based on the specific needs and available resources of each state.

**All of New Mexico's TMDLs are incorporated into the state's WQMP/CPP and available on the SWQB web site: http://www.nmenv.state.nm.us/swqb/TMDL/List/.**

**San Juan River at the Bloomfield Municipal Outfall**

## *Point Source Regulation Program*

The NPDES Program as established in CWA Section 402 is responsible for the protection of surface water quality by regulating point source discharges of pollutants to surface watercourses. Point source pollution results from discharge of contaminants through discrete conveyances such as pipes. The overarching goal of the Point Source Regulation Section (PSRS) is to protect public health and the environment by assuring that regulated point source discharges to surface waters of the State comply with appropriate State and federal statutes and regulations.

The USEPA develops, issues and enforces NPDES permits in New Mexico. Although the State of New Mexico does not have the authority to implement the CWA Section 402 program for discharges, the Department's PSRS has been certified by USEPA to conduct compliance inspections on behalf of USEPA and to serve as a local point of contact for providing information to operators and other agencies regarding the federal regulatory program. Figure 4 illustrates the distribution of NPDES permitted facilities by type, number, and distribution. The inspections help to ensure compliance with applicable effluent limitations and permit conditions, and are carried out in accordance with the USEPA NPDES Compliance Inspection Manual (USEPA 2004) using current, USEPA-approved forms and checklists. The data collected are used in compliance evaluation and in support of state or federal enforcement and permitting activities. The Department's PSRS conducted 151 NPDES storm water and waste water compliance inspections in state fiscal year (FY) 2012 (July 1, 2011 – June 30, 2012) and 132 in state FY2013 (July 1, 2012 – June 30, 2013).

In addition to conducting individual permit inspections, the Department's PSRS also conducts both construction site and industrial facility stormwater inspections in accordance with the Construction General Permit or the Multi Sector General Permit. The Department's PSRS conducts outreach to construction site and industrial facility owners and operators to inform them of requirements under the CWA. The Department's PSRS also assists with implementation of the MS4 permitting program in New Mexico. PSRS has assisted USEPA over the past three years in implementing the Watershed-Based MS4 permitting pilot in the Middle Rio Grande and will provide assistance conducting audits of these programs as needed.

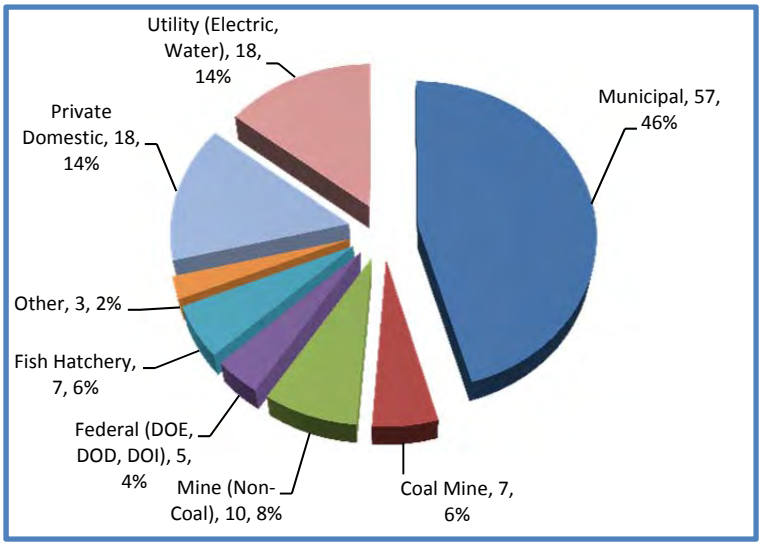



**Figure 4. Distribution of NPDES permits in New Mexico (125 permits total)**

State certification of federal permits is required under CWA Section 401 and ensures the permits are compatible with state and federal laws, protect the State's WQS and implement the WQMP/CPP. In New Mexico the most common federal permits are issued under Section 402 (NPDES) and Section 404 (Dredge-or-fill issued by USACE). The PSRS fulfills this responsibility for New Mexico for 402 permits, certifying 18 NPDES permits in state FY 2012 and 17 permits in state FY 2013. A significant regulatory change occurred in 2011 when the WQCC adopted regulations addressing certification. The new regulations codified for the first time the procedures to be used by NMED for certification of CWA Section 402 and Section 404 permits. The new regulations 20.6.2 NMAC went into effect on May 18, 2011, making state FY 2012 the first full year during which these regulations were used.

As noted above enforcement of Section 402 NPDES permits in New Mexico is the responsibility of USEPA. USEPA conducted 16 NPDES enforcement actions in state FY 2012 and 41 in FY 2013, most of which were based on State inspection reports. State enforcement of NPDES permitted discharge is possible but has not occurred. State enforcement would be based in large part upon meeting the applicability requirement of NMAC 20.6.2.2100 of the regulations, on the discharge resulting in a violation of a state water quality standard or regulation, or both. The regulatory applicability clause is designed to prevent dual regulation by state and federal government, while still allowing the state to act in cases where the federal program has been unable to gain compliance within a prescribed time. The state may also enforce provisions of the regulations prohibiting disposal of refuse in a watercourse 20.6.2.2201 NMAC, which are not subject to the applicability clause. The Department has authority to issue compliance orders, including penalties, for any discharge that results in a violation of a water quality standard or regulation under 20.6.2.1220 NMAC.

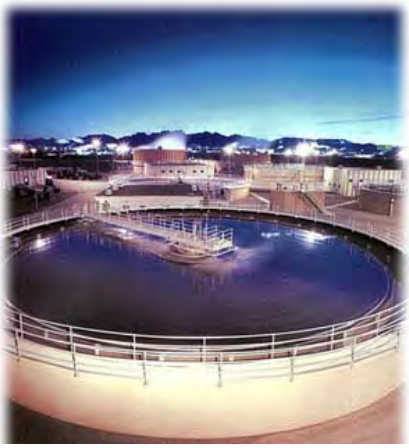
The PSRS has been successful over the years in improving and protecting water quality, in that today a very small percentage of New Mexico's surface water quality impairments are attributed to point sources of water pollution. However, poorly operated or maintained treatment plants continue to cause adverse effects on water quality in local areas, in part due to limited funding to implement technological improvements or upgrades to treatment facilities.

**For more information on the Point Source Regulation Program, see http://www.nmenv.state.nm.us/swqb/PSR/.**

## *Utility Operators Certification Program*

NMED administers the Utility Operators Certification (UOC) Program pursuant to the New Mexico Utility Operators Certification Act, NMSA 1978, Section 61-33-1 to 10. This program is responsible for training, testing, and certification of public water and wastewater system operators.

The Utility Operator Certification Program ensures that the roughly 3200 active operators of Drinking Water Systems and Wastewater Treatment Systems in New Mexico are appropriately trained and qualified through:



**Las Cruces' Wastewater Treatment Facility**

a) Tracking of required continuing education credit hours (10 hours/year) – over 46,500 and 48,000 hours of continuing education credit were recorded in state FY12 and state FY13 respectively;

b) Increasing the number of certifications through examinations that ensure the necessary knowledge and ability of all operators – a total 1,231 and 1,251 exams were conducted resulting in 579 and 470 new levels of certification awarded in state FY12 and state FY13 respectively; and

c) Tracking the number of certified operators who renew each certificate held (renewal required every three years) – a total of 1,164 and 1,026 operators renewed their certification in state FY12 and state FY13 respectively.

The UOC Program has developed four study manuals for operators that comprehensively cover the technical aspects of water and wastewater treatment operations to assist them in studying for certification examinations. They include the Wastewater Study Guide, Water Study Guide, Wastewater Laboratory Study Guide, and Water Sampling Study Guide. The Program has made these study manuals available on-line. In addition, each year UOC Program staff provide approximately 40 hours of instruction at training events for certification of new operators and renewal of certification for existing operators. The UOC Program also provides technical assistance to operators and treatment facilities throughout New Mexico.

**For more information on the Utility Operators Certification program, see http://www.nmenv.state.nm.us/swqb/UOCP/.**

## *Nonpoint Source Management Program*

While the focus of regulation under the Clean Water Act for surface water quality pollution is on point sources, the majority of water quality impairments identified in New Mexico's streams and rivers continues to be due to nonpoint sources of water pollution. Nonpoint source (NPS) pollution can be directly related to land use practices on a broad geographic scale and is generally caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up natural and human-caused pollutants, which are deposited into rivers, lakes, wetlands and ground water. In New Mexico, nonpoint sources of pollution include, but are not limited to: agriculture, construction activities, grazing, malfunctioning septic systems, recreational activities resource extraction riparian habitat modification, roads, silviculture/forest management, streamflow modification, and stormwater run-off from developed areas.

NMED's Nonpoint Source Management Program is designed as a cooperative effort among watershed stakeholders and NMED to educate and implement best management practices (BMPs) to reduce nonpoint pollutants entering surface and ground waters. A plan for the Nonpoint Source Management Program was developed and approved in 2009 (NMED/SWQB 2009), and a draft revised plan is currently under development. Both the current and draft revised plans state an overall goal of meeting and maintaining water quality standards and designated uses of surface water and ground water resources in New Mexico. The plan's objectives are directed toward meeting this goal, and are related to planning, restoring and protecting surface and ground water quality, education, and interagency cooperation.

The NPS Management Program emphasizes watershed-based planning, as described in USEPA's *Nonpoint Source Program and Grants Guidelines for States and Territories* (USEPA, 2013). Such planning is a tool that NMED encourages to be used by any watershed restoration program whose intent is to benefit water quality. NMED underscored its encouragement by making watershed-based planning a requirement for significant restoration activities to be funded with CWA Section 319(h) funds. The focus of planning and implementation is on impaired waters with approved TMDLs, and on a limited group of impaired waters for which TMDL development is not required because the impairment is thought to be caused by insufficient flow (*i.e.,* Category 4C streams). Watershed-based plans are used by local watershed groups to build on the TMDL process with more detailed characterization of pollutant sources, management measures, information and education programs, and monitoring. The approach facilitates coordinated watershed restoration efforts, the development of effective watershed associations, engaged stakeholders, and the implementation of effective BMPs to reduce NPS pollution. Through a combination of funding programs, partnerships, education and outreach activities, New Mexico is able to get interested parties to implement BMPs to control or reduce the degree of water quality impairments. Table 3 provides some examples of best management practices encouraged by the Program.

Since 1998, the NPS Management Program has implemented over 100 watershed restoration projects, developed 34 Watershed Restoration Action Strategies, and helped foster the formation of 28 focused watershed groups in communities throughout New Mexico. The state currently has approximately 17 Section 319-funded planning or restoration projects in progress. Typically restoration projects take at least three years to complete and several more years to see the full benefits. Of the ongoing projects, two projects are funded with FY 2010 funds, six projects are funded with 2011 funds, one project is funded with FY 2012 funds, three projects are funded with FY 2013 funds, and two new projects are funded with FY 2014 funds. See Figure 5 for locations of Section 319 projects completed and initiated in calendar year 2013.

The NPS Management Program includes other activities that protect water quality. One such activity is the Program's coordination with the United States Army Corps of Engineers to implement the State's CWA Section 401 certification responsibilities for Section 404 permits. These federal permits are required for persons conducting "dredge or fill" activities in a water of the United States, and are designed to protect the waters from degradation due to NPS pollution associated with such activities. In 2012, NMED certified a new set of Nationwide Section 404 Permits. One-hundred, fourteen CWA Section 401 water quality certifications or actions were completed in 2012 and 102 in 2013. The Program also coordinates with the New Mexico Energy, Minerals, and Natural Resources Department to implement portions of the New Mexico Mining Act pertaining to water quality. Finally, the Program supports or implements several outreach activities throughout the year, including publication of the quarterly newsletter *Clearing the Waters*, development and maintenance of SWQB web pages devoted to NPS pollution, conducting wetlands roundtable meetings and technical meetings on topics such as beaver management and playa science, numerous workshops through individual 319 projects, and presentations for school and community groups.

The NPS Management Program also relies on established resource protection programs, national and state NPS pollution prevention programs, and activities of other land management and resource protection agencies to address NPS pollution. New Mexico identifies programs and activities that will facilitate the achievement of surface water quality criteria, using a voluntary approach to implement water quality improvements. For example, coordination between the U.S. Forest Service and the SWQB's Watershed Protection Section (WPS)

continues to be an integral part of the NPS Management Program and has facilitated cooperation on many successful NPS pollution reduction projects.

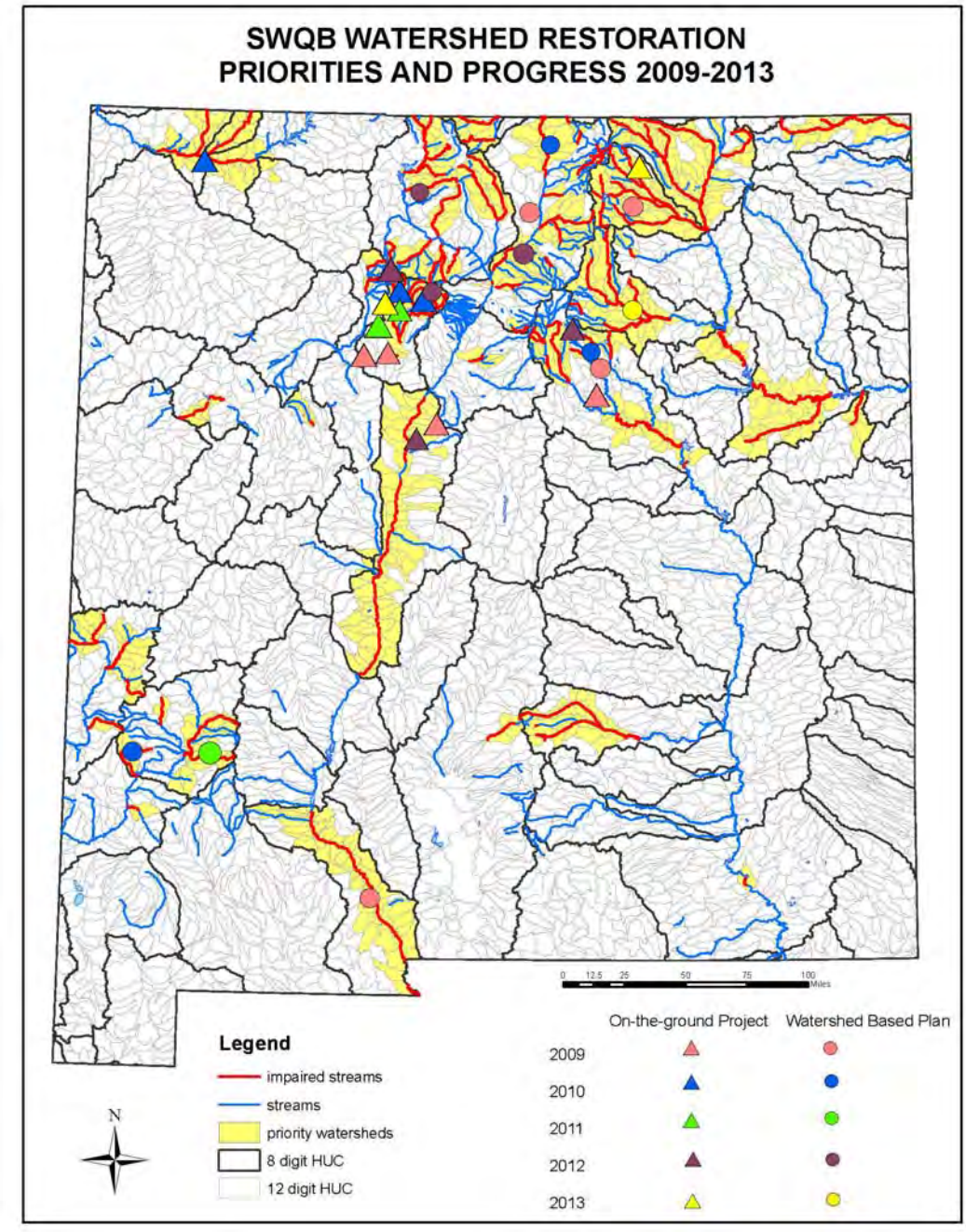



**Figure 5. CWA Section 319(h) Funded Projects Started in Years 2009-2013**

**(NPS Management Program priority watersheds and priority impaired streams are highlighted)**

## Table 3. Example BMPs Implemented Throughout New Mexico

| NPS Pollution Category | Examples of BMPs implemented in New Mexico to address Specified Type of NPS Pollution |
|---|---|
| Agriculture | • Residue Management (Contour strip cropping, stubble munching, conservation tillage)<br>• Improved irrigation practices (low output sprinklers, tailwater recovery, vegetation control)<br>• Agricultural Chemical Handling Facilities<br>• Nutrient Management (split fertilizer applications, nutrient balancing, crop rotation)<br>• Minimize pesticide impacts (biological control mechanisms, using least toxic substances, apply in accordance with label instructions and legal requirements) |
| Construction | • Sediment Control Structures (silt fences, hay bales, sediment retention ponds)<br>• Heavy equipment cleaning and spill kits<br>• Conduct construction activities during no-flow or low-flow conditions<br>• Composted mulch berms and socks |
| Fire Suppression/Fuels Management | • Forest thinning / fuels reduction<br>• Post wildfire watershed rehabilitation<br>• Meadow rehabilitation |
| Grazing | • Alternate watering sources (trick tanks, upland dirt tanks, and upland wells)<br>• Planned/rotational grazing<br>• Fencing (pasture cross fencing and creation of additional pastures for improved stock rotation methods and riparian exclosure fencing)<br>• Development of springs<br>• Cattle guards<br>• Herding<br>• Creating ponds<br>• Forest thinning/brush clearing |
| Loss of Riparian Habitat | • Habitat restoration and rehabilitation<br>- Removal of non-native plant species<br>- Planting native vegetation<br>• Grazing exclosures or planned grazing |
| Recreational Activities | • Revegetation of impacted areas<br>• Trail maintenance/reconstruction<br>• Provide and maintain waste and sanitation facilities<br>• Limit off road vehicle use<br>• Restrict vehicular access to riparian areas<br>• Recreational area closure or relocation<br>• Education/Outreach |
| Resource Extraction | • Sediment Control Structures (silt fences, hay bales, sediment retention ponds)<br>• Treatment of acid mine drainage<br>• Stabilizing, relocating, and channeling runoff around mine and mill tailings |

**Table 3. Example BMPs Implemented Throughout New Mexico (continued)**

| NPS Pollution Category | Examples of BMPs implemented in New Mexico to address Specified Type of NPS Pollution |
|---|---|
| Septic Systems | • Identify and replace malfunctioning systems<br>• Outreach to encourage preventative maintenance<br>• Connect to centralized wastewater treatment system |
| Streambank Modification/ Hydromodification | • Streambank Stabilization<br>- Revetment (e.g. vanes, j-hooks)<br>- Grade control (e.g. cross vanes)<br>- Grazing exclosures or planned grazing<br>- Terracing / revegetation of slopes<br>- Installing vortex weirs<br>- Replacing culverts<br>- Brush control |
| Urban Stormwater | • Education/Outreach activities<br>• Develop stormwater management plan at local level<br>• Propose new ordinance and/or development codes<br>• Propose new construction standards<br>• Install swales, French drains, detention ponds<br>• Collect and treat runoff |

New Mexico received approximately $2.3 million in federal CWA Section 319(h) funds per year for several years to administer and implement the NPS Management Program. This support decreased by 18% in state FY2013 and is expected to remain approximately at that level in 2014. These funds are enhanced through the 40% non-federal match required for all recipients of CWA Section 319(h) grants. The contractor for one relatively large watershed-based planning project developed in 2012 withdrew their proposal, and a similar project was developed in 2013 using funds that would have been obligated in 2012, accounting for the larger total in 2013 and relatively high proportion of funding directed to watershed-based planning in 2013 (see Figure 6). "On-the-ground" projects are an increasing priority of the program, as watershed-based plans are completed. Watershed-based planning projects will remain a significant component in future fiscal years, but are expected to be initiated at a lower rate. The "Planning and Education" category in Figure 6 includes approximately $80,000 in funds obligated in state FY 2012 for the New Mexico Watershed Forum; the remainder in all three years is for watershed-based planning projects. Figure 7 depicts the funding distribution for projects completed in calendar year 2013. Other funding for implementation of the Program is obtained from a combination of federal, state (including River Stewardship Program; see below section), local, and private sources. CWA Section 319 projects that are beginning in calendar year 2014 are listed in Table 4.

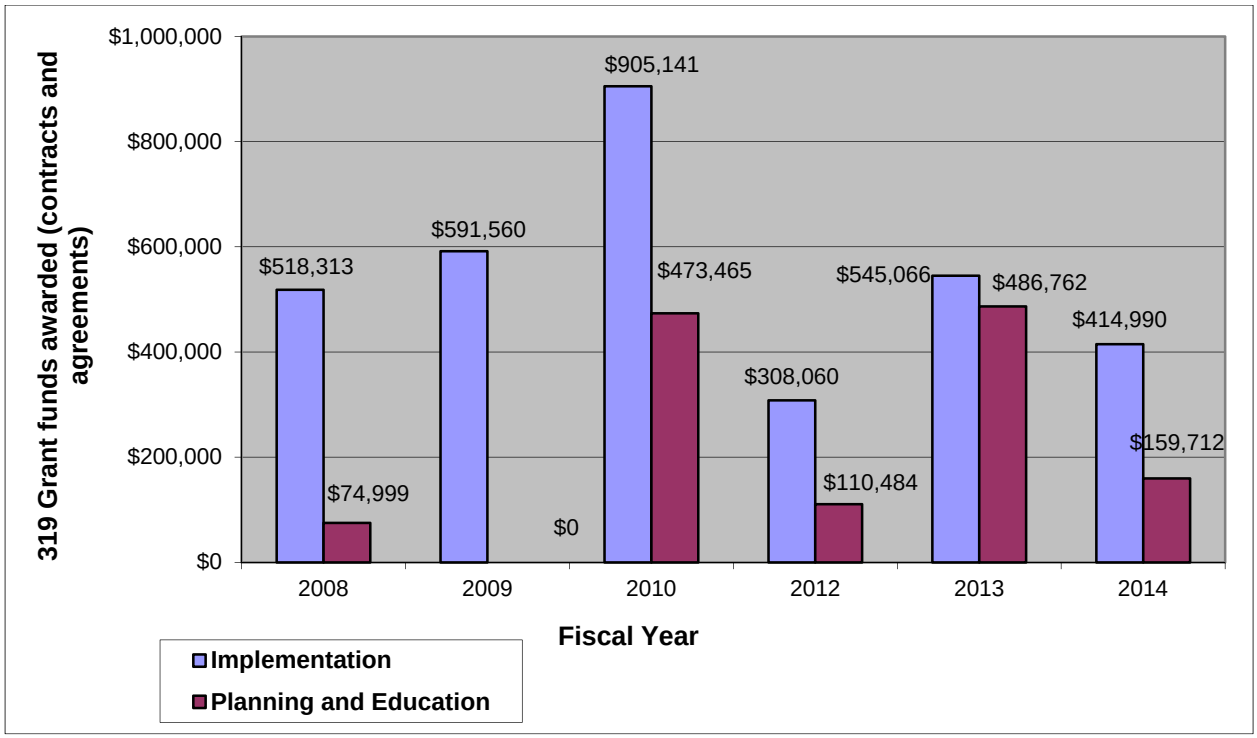



**Figure 6. CWA Section 319(h) Funding Distribution by NPS Pollution Category**

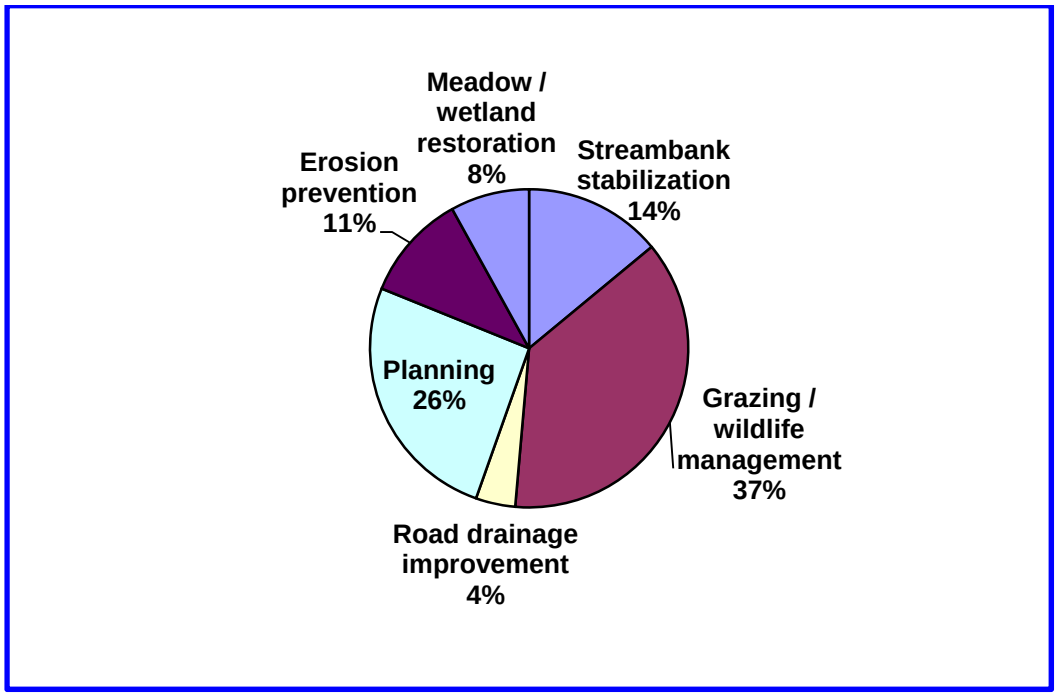



**Figure 7. CWA Section 319(h) Funding Allocation (Based on Calendar Year 2013)**

By implementing the NPS Management Program, New Mexico is working to achieve measurable results in the areas of 1) reduced NPS pollutant loadings and reduced number of NPS impaired waterbodies, 2) successful implementation of TMDLs and watershed-based plans, and 3) protected ground water resources for municipal, domestic and agricultural uses. Due to the widespread distribution and dynamic nature of nonpoint source pollution, reducing pollution sources requires the concerted effort of all people who spend time in the watershed. Individuals and communities must understand how human activities affect water quality and learn how to actively participate in reducing sources of pollution to protect water resources. Additional information about how the NPS Management Program is coordinated and implemented throughout the state can be found in the *New Mexico Nonpoint Source Management Program Plan* (NMED/SWQB 2009).

**Table 4. CWA Section 319(h) Projects Beginning in Calendar Year 2014**

| Project Name | Project Description | Combined Cost |
|---|---|---|
| Watershed Based Plan for the Mora River – Upper Canadian Plateau | This project will develop a watershed-based plan to address the nine planning elements in USEPA's *Nonpoint Source (NPS) Program and Grants Guidelines for States and Territories* for the portion of the Mora River watershed within the Upper Canadian Plateau ecoregion. The Mora River from the USGS gage east of Shoemaker upstream to Highway 434 does not support its designated use for marginal coldwater aquatic life. Probable causes of impairment are nutrient enrichment and low dissolved oxygen. Total Maximum Daily Loads (TMDL) approved in 2007 recommend a total load reduction of 34% for nitrogen and 58% for phosphorus. This project will characterize the problem in greater detail, with an emphasis on non-point source pollutant loading, and identify solutions with quantitative estimates of nutrient load reductions that may be achieved with different management measures. | Hermit's Peak Watershed Alliance (a Las Vegas-based nonprofit) will work with the Rio Mora National Wildlife Refuge, Denver Zoo, and local landowners to implement the project for a combined cost (Section 319 and match) of $300,222. |
| Middle Rio de las Vacas Water Quality Improvement Project | This project is located along 3.5 miles of the Rio de las Vacas on Santa Fe National Forest land upstream of the Rancho Chaparral Girl Scout Camp, east of Cuba. The goal of the project is to increase the shade cast by vegetation from the current estimate of 15% to approximately 30%, to meet the goal developed with the temperature TMDL, within the project area. The project is expected to reduce nutrient loading as well. Native woody riparian vegetation will be planted throughout the project corridor, and approximately two dozen exclosures will be constructed to protect the plantings from elk, livestock, and off-highway vehicles (OHVs). Three water tanks will be constructed outside the riparian corridor to eliminate the need for livestock to access the river as a water source, and a section of fencing will be rebuilt to prevent livestock trespass from an adjacent grazing allotment. Buck and pole fencing | The project is being implemented by the WildEarth Guardians in cooperation with the Santa Fe National Forest, for a combined cost of $476,160. |

| | | |
|---|---|---|
| | will be constructed to further reduce OHV and livestock access to the Rio de las Vacas and its riparian corridor. | |
| Ponil Creek Restoration Project, Phase II: Cimarron Watershed-Based Plan Implementation | This project will implement portions of the recently completed Cimarron Watershed-Based Plan, available at: www.nmenv.state.nm.us/swqb/Cimarron/WBP. This project will use a combination of active and passive restoration to lower stream temperatures along 5.2 miles of Middle Ponil Creek, and reduce loading of suspended sediment and plant nutrients to downstream stream reaches. A short reach of the stream will be re-aligned to restore stable stream channel morphology to a currently entrenched stream reach. Approximately 50 cottonwood poles will be planted, and one dozen small elk exclosures will be built. Two low-water road crossings will be stabilized, and a section of abandoned road will be reclaimed with vegetation and proper drainage. | The project is being implemented by the Cimarron Watershed Alliance, for a combined cost of $255,106. |

**Additional information describing the Nonpoint Source Management Program can be found in the *New Mexico Nonpoint Source Management Program* (2009).**
**http://www.nmenv.state.nm.us/swqb/wps/Plan/index.html**

**Information on work completed in specific years can be found in *State of New Mexico Nonpoint Source Management Program Annual Reports*.**
**http://www.nmenv.state.nm.us/swqb/wps/AnnualReports/index.html**

**Information on projects funded through Section 319 is available on USEPA's Grants Reporting and Tracking System. Current projects appear under grants awarded in federal fiscal years 2008, 2010, 2011, and 2012.**
**http://iaspub.epa.gov/grts/projects**

## *Effectiveness Monitoring Program*

Calendar year 2013 was the fifth year of WPS Effectiveness Monitoring to document the water quality improvements from NPS pollution control projects. These projects are primarily funded under Section 319, but also include projects funded by RERI and the New Mexico Wetlands Program.

An initiative undertaken in 2013 was a review of the 2012-2014 State of New Mexico 303(d)/305(b) Integrated List for Assessed Surface Waters, with an emphasis on delistings associated with NPS pollution control projects. A table of delistings was compiled from a query of the SWQB Surface water QUailty Information Database (SQUID). Comanche Creek was identified by the USEPA as a candidate for official success story recognition, and additional candidates are under review

A Success Story nomination for Comanche Creek was submitted to USEPA during 2013, and following review by USEPA staff, it was accepted and published in the national NPS Success Story webpage. The basis for the success story was the sedimentation delisting and an analysis of cross section survey data that showed decreases in bankfull width and width-to-depth ratio. Additional nominations were submitted for Willow Creek and Sitting Bull Creek, which are currently in review.

In 2013, thermographs were deployed in nine recent restoration sites located across the State to record hourly temperature upstream and downstream of project reaches and additional sites where tributary inputs could have significant effects. Results from the data analysis indicate that peak summer temperatures in many streams have improved but still exceed the associated water quality criterion of 20°C for coldwater aquatic life in many cases. However, the projects are expected to have beneficial effects which will continue to increase as vegetation continues to grow. Further data collection and analysis will be conducted to account for the lag time.

**Clean Water Act Success Story: Comanche Creek**
**Controlling Sediment Improves a Native Cutthroat Trout Stream**

**A cut bank on Comanche Creek, before and after treatment.**

The U.S. Environmental Protection Agency recognized Comanche Creek as a Success Story for the Clean Water Act (CWA) Section 319 NPS Pollution Prevention Program. USEPA recognizes nonpoint source success stories to highlight restoration efforts that result in water quality improvements in nonpoint source impaired waterbodies. Comanche Creek was nominated because of water quality improvements from projects conducted by the Carson National Forest, Quivira Coalition, New Mexico Environment Department (NMED), Taos Soil and Water Conservation District, and other partners.

Comanche Creek is a scenic trout stream in the Valle Vidal unit of the Carson National Forest in northern New Mexico. Historical overgrazing by cattle and elk herds damaged riparian areas and streambanks along Comanche Creek. Water quality surveys in 2000 and 2002 documented that Comanche Creek was failing to support its high-quality coldwater aquatic life designated use because of excessive sediment and temperature, which prompted NMED to add the creek to the state's CWA 303(d) list of impaired waters. Management changes and stream restoration projects described below improved water quality. In response, NMED removed sedimentation as a cause of impairment of Comanche Creek in 2008. Although the creek is still impaired because of temperature, data show significant improvements.

In 1991, NMED and Carson National Forest cooperated on a 319 project that stabilized erosion along Comanche Creek. In addition, the Forest Service has closed approximately 300 miles of unpaved access road in the Valle Vidal area. In 2001 and 2004, NMED awarded 319 grants to the Quivira Coalition (a nonprofit organization) and the Taos Soil and Water Conservation District to implement restoration work in Comanche Creek. The project work included installing more than 50 small exclosures to restrict elk and cattle grazing, 130 post vanes (a series of posts pounded into the streambed to direct water flow away from the streambank), several Zuni bowl rock structures (rock-lined step pools) to arrest headcut migration, and 75 upland structures to control erosion. Project partners also improved drainage and culverts on eight miles of road, planted willows and sedges, and conducted planning, design, coordination, and monitoring

The Quivira Coalition conducts annual workshops that engage volunteers in maintaining the exclosures and other structures. In 2008, similar restoration work in Comanche Creek continued under the state River Ecosystem Restoration Initiative (RERI). The Quivira Coalition initiated a new project in 2012 to improve and protect wetlands on slopes within the headwaters of Comanche Creek. The Comanche Creek watershed restoration projects have been conducted in the context of two watershed plans developed by the Quivira Coalition. Other partners included the Albuquerque Wildlife Federation (contributed volunteers), New Mexico Department of Game and Fish, Trout Unlimited (contributed volunteers), the Santa Clara Fire Crew, and the Gallup Youth Conservation Corps.

These restoration projects improved water quality and habitat for Rio Grande cutthroat trout. The creek was surveyed in 2000 and again in 2006. Pebble counts showed that the percent of fine sediment decreased over that period, indicating probable sediment load reductions. Benthic macroinvertebrate surveys were also conducted, and these surveys showed a change from an "impaired" category before restoration to a "non-impaired, full support" category after restoration. On the basis of these data, NMED removed sedimentation as a cause of impairment for Comanche Creek on the 2008 CWA section 303(d) list. Furthermore, comparisons of cross sections before and after restoration show statistically significant decreases in bankfull widths and width-to-depth ratios, indicating a decline in bank erosion. Although Comanche Creek still exceeds the water quality standard for temperature, statistical analysis has indicated that summer maximum temperatures in Comanche Creek have decreased, and temperature will continue to be monitored for trend analysis and standards attainment.

**For more information on this and other EPA Success Story, visit http://water.epa.gov/polwaste/nps/success319.**

## *River Stewardship Program*

On August 15, 2013 the intention for a new state-funded stream restoration program called the River Stewardship Program was announced. The River Stewardship Program has the overall goal of addressing the root causes of poor water quality and stream habitat. Objectives of the River Stewardship Program include: restoring or maintaining hydrology of streams and rivers to better handle overbank flows and thus reduce flooding downstream; enhancing economic benefits of healthy river systems such as improved opportunities to hunt, fish, float or view wildlife; and providing state matching funds required for federal CWA grants. The New Mexico Legislature provided $2.3 million in the FY15 budget to support for this initiative. Responsibility for the program will be assigned to NMED, and WPS and SWQB Finance Section staff will develop and administer the program. These funds will also serve to match federal funds New Mexico receives under the CWA.

The River Stewardship Program builds on the success of the River Ecosystem Restoration Initiative (RERI), a multi-agency state effort to restore in-stream ecosystem and watershed health to major New Mexico river basins. RERI is restoring approximately 95 river miles and 3,345 acres of riparian area in 48 projects throughout the state (see Figure 8). Projects have been implemented along the Rio Puerco, Rio Chama, the upper, middle and lower Rio Grande, and the San Juan, Gila, Canadian, Pecos, and Santa Fe rivers, as well as numerous tributaries. A total of $8.2 million in capital outlay funding was appropriated for RERI by the state legislature

over a four year period from 2007-2010. RERI complements both NMED's CWA 319(h) Program and the Wetlands Program that have the goals of improving surface water quality and restoring wetlands respectively. Many of these projects address primary causes of NPS pollution in New Mexico: sediment and temperature. Several RERI projects are co-located in the vicinity of Section 319(h) or Section 104(b)(3) restoration projects, serving to leverage funds and increase project success. RERI has engaged a diverse group of stakeholders, including: tribes and pueblos; federal and state agencies; local government; soil and water conservation districts; elementary and secondary schools; universities; community groups and organizations; private entities and citizen volunteers. These stakeholders bring to these projects not only a diverse set of skills, but diverse sources of private and public funding. RERI has remained a critical component of the NPS Management Program, and a critical source of nonfederal match for Section 319 funds in 2013 and 2014. The remaining RERI projects will be complete at the end of State FY 2014.

**Two of the hand constructed rock weirs in Black Canyon that focus streamflow to encourage scour pool development, enhance fine sediment deposition and riparian vegetation recruitment.**

**Volunteers planting vegetation at San Antonio Creek (May 2013)**

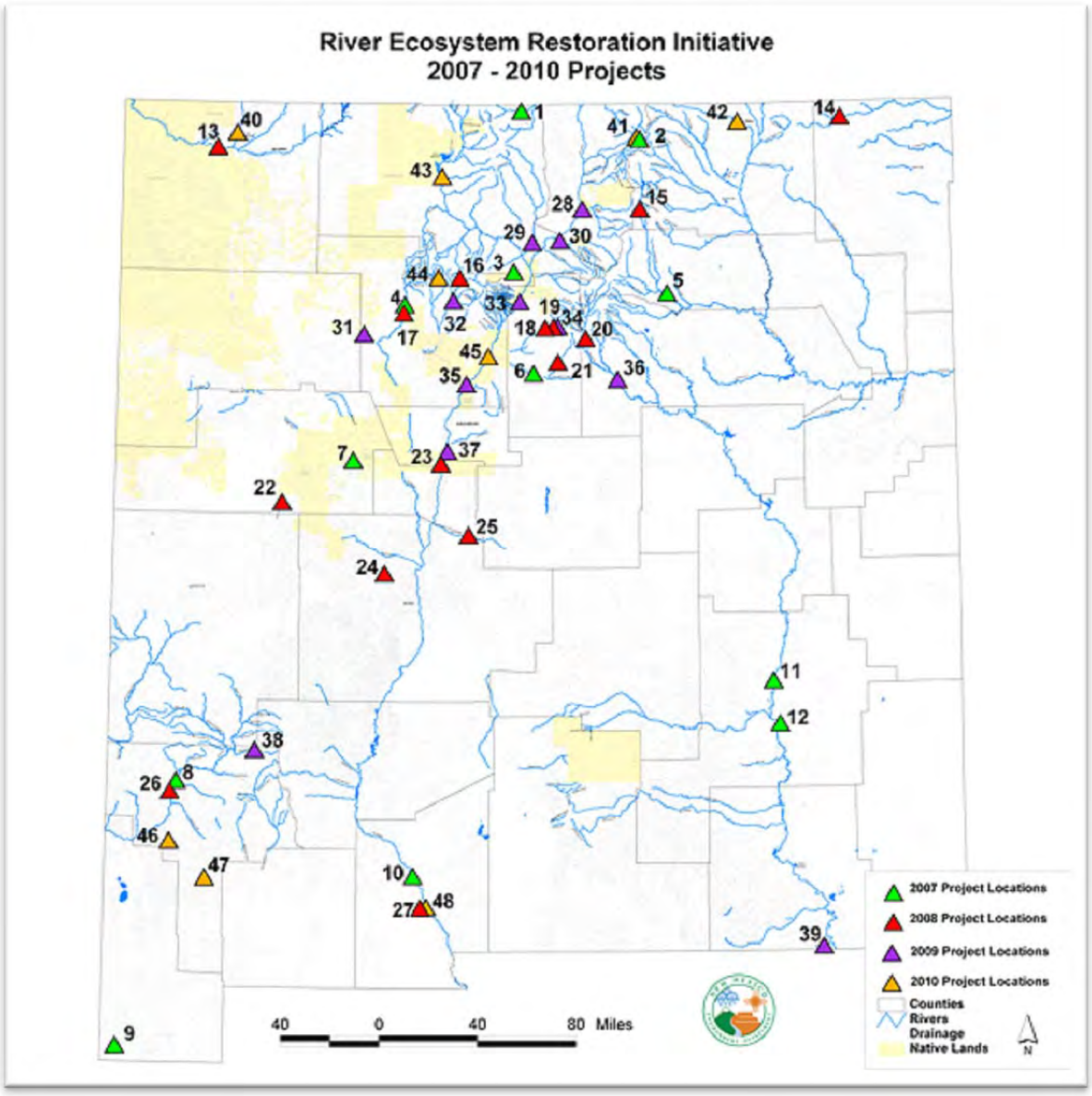



**Figure 8. RERI 2007 – 2010 Project Locations**

**For more information on RERI, refer to SWQB's webpage at:**
**http://www.nmenv.state.nm.us/swqb/RERI/**

**For a fact sheet and other information describing the River Stewardship Program:**
**http://www.nmenv.state.nm.us/swqb/RiverStewards/index.html**

## *Lower Rio Grande Program*

NMED and the Interstate Stream Commission (ISC) are working cooperatively to develop solutions to concerns regarding the quality of the water in the Lower Rio Grande LRG) of New Mexico. Elevated salinity in the Rio Grande Project area, which extends from above Elephant Butte Reservoir, New Mexico, to Fort Quitman, Texas, has long been recognized. The problems associated with elevated salinity are increasing due to rapid urban growth in the El Paso/Ciudad Juárez International Border area and increasing demand for potable water. The utilization of water resources in the Rio Grande Project area is restricted where highly saline water results in reduced potable water supplies, smaller crop yields, as well as soil and groundwater deterioration.

The SWQB designed and implemented a salinity monitoring network in the LRG from 2005 to present. The network is designed to improve our understanding of salinity and the processes effecting changes in salinity in the Rio Grande from above Elephant Butte Reservoir at San Marcial, downstream to Courchesne Bridge near El Paso, Texas. The LRG Program conducts water quality investigations targeted on salinity control solutions; identifying sources of salinity; focusing response efforts in this critical border region; and providing the technical basis for an effective salinity control program.

NMED and ISC facilitated the formation of Rio Grande Salinity Management Coalition consisting of water managers from Texas and New Mexico, the Rio Grande Compact Commission, and water user groups from Colorado, New Mexico and Texas that are actively working together to reduce and manage salinity in the Rio Grande Project area. In 2009 the US Army Corps of Engineers completed the first phase of a Water Resources Development Act (WRDA) Section 729 Rio Grande Salinity Management Program which included a geospatial salinity database; a USGS Rio Grande Salinity Assessment Study; and Rio Grande Economic Impact Assessment study.

Building on these efforts, in 2010 the Coalition funded a second phase designed to evaluate which of six specific locations/sources of salinity to the Río Grande would be most promising for a pilot project. This evaluation, which considered a number of factors including the size of the contribution, the concentration of the salinity source, the hydrogeologic uncertainty of capture, and treatment costs, identified the southern end of the Mesilla Basin near Sunland Park, New Mexico, as the most promising location for further investigation. In 2013 a conceptual model for this Distal Mesilla Basin location was developed to gain a better understanding of the salinity sources and to identify data gaps that need to be filled to support selection and location of a potential salinity control project. Results of this analysis suggest that two sites associated with the Distal Mesilla source may be targeted for a potential salinity capture project. The next step is to conduct a complete cost benefit analysis of potential capture projects at these two locations.

**For more information on Lower Rio Grande salinity issues, refer to SWQB's webpage at:**
http://www.nmenv.state.nm.us/swqb/LowerRioGrande/

## *New Mexico's Wetlands Program*

Approximately 1,000,000 acres of wetlands exist in New Mexico, which represents only a portion of the wetlands thought to be in existence in the early 1800's. Historically, the value of wetlands and their functions or natural processes were not fully appreciated and wetlands were used for what were considered more productive uses: agriculture; flood control structures; stockyards and livestock production areas; residential and industrial development; and oil and gas production. As a result, New Mexico has lost a significant portion of its wetlands in the last 200 years.

Wetlands are important features of the natural landscape because they function as filters that trap excess sediment, nutrient runoff and other pollutants, thereby improving water quality. They also mitigate catastrophic weather events common to New Mexico, such as drought and flashfloods by allowing water to slow down and infiltrate, thus augmenting ground water storage and aquifer recharge. Wetlands support vegetation that provides a moist green fire break in the event of wildfires. They serve as the headwater sources of perennial streams including some of our State's outstanding streams and fisheries. Wildlife benefit greatly from wetlands, which support greater diversity of terrestrial and aquatic species than do cropped or heavily grazed land. Their presence can also enhance property values in residential areas, as they provide a barrier to noise and urbanization.

**Wetlands are important habitat for wildelife**

Among the modern threats to New Mexico's wetlands are development, ground water pumping that lowers shallow water tables, the use of wetlands for storm water control, gravel and potash mining, invasive exotic plants and animals, agriculture, and channelization. This latter threat has severely impacted many of New Mexico's wetlands by limiting, and in many cases eliminating, the water/land relationship that would normally have allowed the establishment of wetland vegetation and ecosystems along river corridors. Instead, river banks and floodplains are starved of overbank flooding events, natural river shifting and meandering processes are interrupted, materials transport and deposition processes are accelerated, and vegetation communities are altered. The results include the loss of natural flood attenuation, nutrient cycling, habitat connectivity, particulate retention, carbon sequestration, dynamic and long-term surface water storage, moderation of ground water flow or discharge, and maintenance of vertebrate and invertebrate communities and habitat structure. Channelization can also result in severe bank erosion and gully formation causing sediment build up in rivers and reservoirs and the loss of habitat for native fisheries, waterfowl, and other wildlife.

Another area of concern relating to the condition of wetland areas is New Mexico's playas. In the southeastern part of New Mexico, there are many economically and ecologically valuable playas that serve as critical oasis-like over-wintering habitat for migratory birds within the North American Central Flyway. These waters provide habitat for the Northern Pintail which is a highest priority waterfowl species according to the North American Waterfowl Management Plan (USFWS 2004). They also provide habitat for 15 priority species of shorebirds listed in the US

Shorebird Conservation Plan for the Central Plains/Playa Lakes (Brown et al. 2001). These playas are used by other wildlife such as pronghorn antelope, and for irrigation and livestock watering. They provide recreational opportunities such as hunting and bird-watching. Recent research has also shown that these playas serve as ground water recharge zones, and so serve to sustain local water sources.

The SWQB's Wetlands Program administers wetland restoration and program development grants received from the USEPA under the CWA Section 104(b)(3). The overall goals of the Wetlands Program are to protect and restore New Mexico's remaining wetlands and riparian areas and to prevent additional wetland losses. The Wetlands Program works to increase self-sustaining and naturally functioning wetlands to historic amounts especially targeting threatened, impacted and scarce wetlands types. The Wetlands Program emphasizes the role of wetlands in prevention and reduction of water quality impairments and providing habitat and life requirements for protected species and other wildlife. The objectives of the Program include:

- Conducting identification of wetland types and baseline assessment throughout New Mexico;
- Implementing and administering wetlands restoration projects;
- Conducting an inventory of wetlands resources through landscape level mapping and classification, and working through a statewide mapping consortium;
- Promoting maintenance of instream flow to support streamside and floodplain wetlands and provide other water quality benefits;
- Promoting agricultural water use management and supporting wetlands as filtration systems for agricultural runoff;
- Promoting land management techniques to restore wetland-supporting beaver habitat;
- Increasing wetland acreage in New Mexico through the restoration and protection of wetland corridors;
- Determining the ecological condition of wetlands in New Mexico through the development and implementation of wetlands rapid assessment method;
- Ensuring adequate protection of closed basin and isolated wetlands at the state level; and
- Participating in wetland/riparian education and outreach for schools and interest groups.

Key Program activities include:

- Implementing the "Wetlands Program Plan for New Mexico" (2012);
- Developing and testing new methods that restore wetlands;
- Helping local watershed groups and communities develop Wetlands Action Plans throughout New Mexico to monitor, restore and protect wetlands, riparian and buffer areas at the local level;
- Implementing the "State of New Mexico Assessment and Monitoring Program Strategy for Wetlands" (2013);
- Collecting and analyzing wetlands data using the New Mexico Rapid Assessment Method (NMRAM), and validating our results using indices of biotic integrity (IBI) for select subclasses of wetlands;
- Continuing to map and classify all wetlands in New Mexico including playas, isolated wetlands, and seeps and springs;
- Continuing to explore the relationship of ground water and surface flows that sustain wetlands; and
- Improving water quality standards that apply to wetlands.

In 2012, USEPA accepted the updated Wetlands Program Plan for New Mexico (WPP) as meeting the four required elements for such plans: monitoring and assessment; regulation; voluntary restoration and protection; and water quality standards for wetlands. New Mexico's was the first accepted WPP in USEPA Region 6.

The monitoring and assessment goals of the WPP include developing an inventory of wetlands resources that classifying wetland types and identifying functions and ecosystem services by wetland type. The results of these monitoring efforts have been and will be used to help refine the State water quality standards to include narrative and numeric criteria and designated uses that are specific to wetlands. For example in 2010, nearly 5,000 acres of New Mexico wetlands in USFS wilderness areas were designated as ONRWs. This designation applies the highest level of antidegradation protection afforded under State water quality standards. The Wetlands Program is working with USFS to review and improve current best management practices and ensure the application of these practices to protect wetlands from degradation by human activities that commonly occur in wilderness wetlands. These measures will be used to ensure that the biological, chemical, and physical integrity of all New Mexico wetlands are adequately protected.

Wetlands restoration is a crucial component of the WPP. Several restoration projects are occurring throughout New Mexico which include the assistance and collaboration of a variety of project partners, and are funded by the USEPA Region 6 CWA Section 104(b)(3) Program Development grants and the River Ecosystem Restoration Initiative (RERI). Table 5 and Figure 9 depict active wetland projects in New Mexico. Project activities include restoration of wet meadows and waterfowl habitat, restoration of wetlands on private land parcels, reestablishment of natural flooding, increasing wetland plant diversity and habitat diversity, removal of exotic vegetation, restoration of springs, planning for open-space and conservation easements to protect wetland resources and buffer, restoring high mountain fen wetlands, development and demonstration of slope wetland restoration techniques, and conservation of playas and closed basin wetlands. Other Wetlands Program projects include mapping beaver habitat on federal lands, and studying the potential effects of ground water withdrawal and aquifer recharge on spring-fed wetlands. The Wetlands Program coordinates and facilitates both the New Mexico Agency Wetlands Roundtable (consisting of state, federal, and tribal agency participants), and the New Mexico non-Governmental Organization Wetlands Roundtable in cooperation with partners such as the New Mexico Riparian Council, Albuquerque Wildlife Federation and the New Mexico Wildlife Federation.

**Table 5. Active Wetland Projects in New Mexico, by County**

| Project | County |
|---|---|
| Valles Caldera Sulphur Creek | Sandoval |
| Wetlands Action Plan Phase 3 | Statewide, San Miguel, Colfax |
| Rapid Assessment Methods Gila-Mimbres | Grant, Catron |
| Curry County Playas Restoration | Curry, Roosevelt |
| La Cienega San Vicente Restoration | Grant |
| Cebolla Canyon Wetlands Restoration | Cibola |
| Eastern New Mexico Mapping and Classification | Mora, Colfax, San Miguel, Taos, Rio Arriba, Harding |
| Restoring Slope Wetlands | Taos |
| Assessing Beaver Habitat on Federal Lands, and North Central Map and Class | Statewide<br>Rio Arriba, Santa Fe, Sandoval, Los Alamos |
| Rapid Assessment Methods Upper Rio Grande | Taos, Rio Arriba |
| Rapid Assessment Methods Rio Grande, Pecos | Bernalillo, Valencia, Socorro, Sierra, Dona Ana, Guadalupe, deBaca, Chaves, Eddy |
| Rapid Assessment Methods Playas | Curry, Quay, Harding, Roosevelt, Union, Lea |

**New Mexico's Wetlands Program Plan is available at http://water.epa.gov/type/wetlands/wpp.cfm**

**The "State of New Mexico Assessment and Monitoring Strategy for Wetlands" and additional information on New Mexico's Wetlands Program can be found at http://www.nmenv.state.nm.us/swqb/Wetlands/**

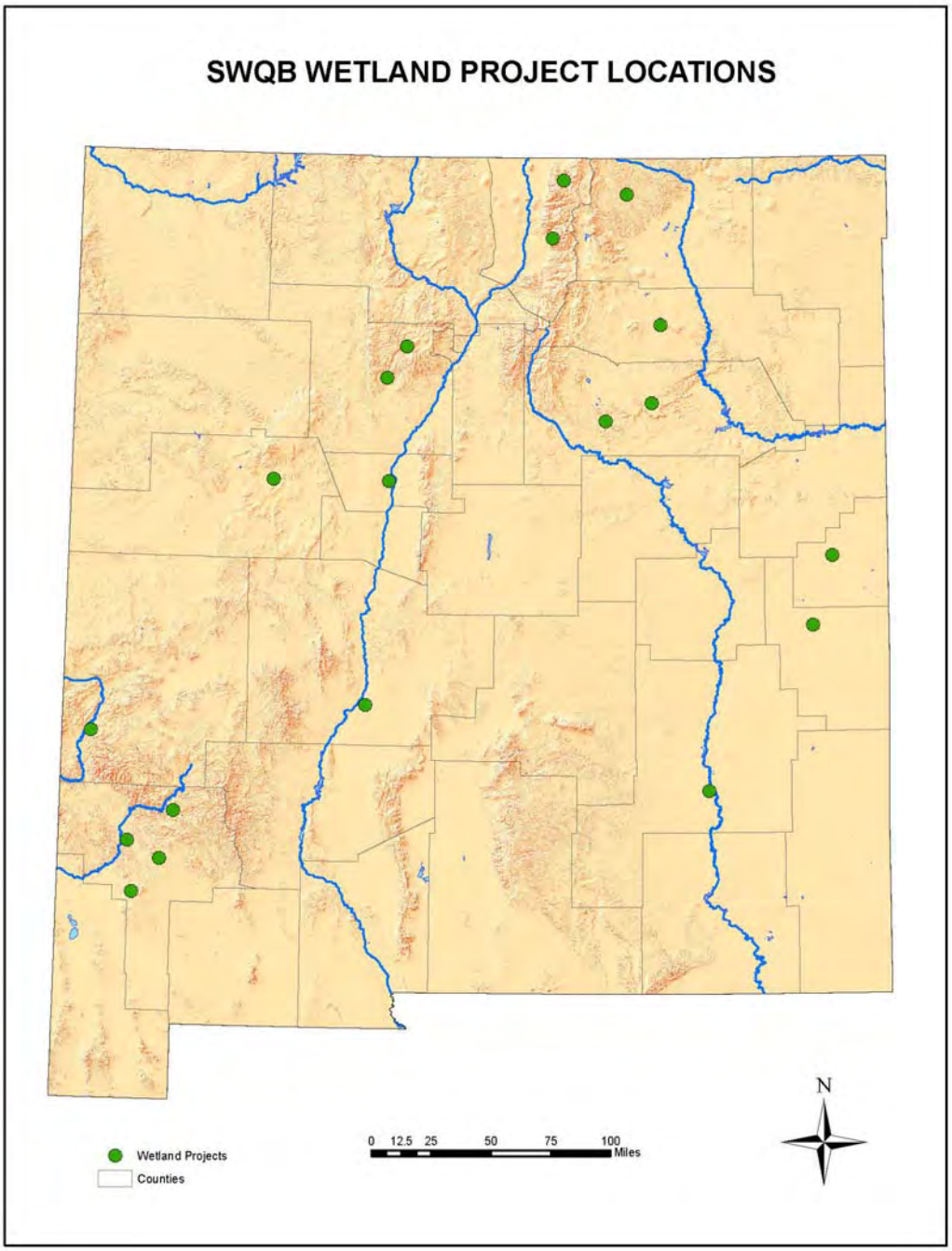



**Figure 9. Approximate Location of Active Wetland Projects in New Mexico.**

## *Drinking Water Program*

NMED's Drinking Water Bureau (DWB) is responsible for preserving, protecting, and improving New Mexico's drinking water quality for present and future generations. This is accomplished by implementing the requirements of New Mexico's Drinking Water Regulations (20.7.10 NMAC) and the federal Safe Drinking Water Act (SDWA) which establish the standards for drinking water throughout the state. These standards set limits for harmful contaminants such as pesticides, volatile organics, and radiochemical, chemical, and bacteriological contaminants.

The SDWA originally focused on treatment as the means of providing safe drinking water at the tap. The 1996 amendments greatly enhanced the existing law by recognizing source water protection, operator training, funding for water system improvements, and public information as important components of safe drinking water. This approach, adopted by the DWB, ensures the quality of drinking water in NM by protecting it from source to tap. See inset box for additional information on recent primacy activities.

All public water systems must monitor the water for regulated contaminants and ensure compliance with state drinking water regulations and the SDWA. Water samples are collected at each public water system after treatment, and analyzed for contaminants according to an established schedule. The DWB provides oversight to all of New Mexico's public water systems and reviews these data, periodically inspects the system according to a rotating schedule depending on the type of system, and takes action whenever a

**NEW MEXICO IMPLEMENTS THREE ADDITIONAL DRINKING WATER RULES**

On February 9, 2011 the State of New Mexico received authority from the U.S. Environmental Protection Agency to implement three more drinking water rules:

1. Ground Water Rule (GWR): This rule affects most public drinking water systems in New Mexico and requires water systems that use a ground water source to determine the susceptibility of that source to contamination by *E. coli*. Sampling the source for *E. coli* is required when total coliform bacteria are detected in routine samples collected in the distribution system. If *E. coli* is also detected in the source, the water system is required to notify its customers within 24 hours. The water system then takes corrective action or collects more samples before it takes corrective action.
2. Long Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR): The purpose of this rule is to reduce illness linked with the contaminant *Cryptosporidium* and other pathogenic microorganisms in drinking water. The LT2ESWTR will supplement existing regulations by targeting additional *Cryptosporidium* treatment requirements to higher risk systems. This rule also contains provisions to reduce risks from uncovered finished water reservoirs and provisions to ensure that systems maintain microbial protection when they take steps to decrease the formation of disinfection byproducts that result from chemical water treatment. Current regulations require filtered water systems to reduce source water *Cryptosporidium* levels by 2-log (99%). Recent data on Cryptosporidium infectivity and occurrence indicate that this treatment requirement is sufficient for most systems, but additional treatment is necessary for certain higher risk systems. These higher risk systems include filtered water systems with high levels of *Cryptosporidium* in their water sources and all unfiltered water systems, which do not treat for *Cryptosporidium*. This rule impacts approximately 3 systems in NM.
3. Stage 2 Disinfectants/Disinfection Byproducts Rule (DBP): This Rule requires water systems to balance the benefit of disinfection to control microbiological contaminants with the health risk posed by chemical byproducts of the disinfection process. Systems served by surface water sources are more likely to have organic matter that fosters formation of disinfection byproducts.

system is out of compliance. These actions typically include providing technical, managerial or financial assistance to help improve the overall capacity of a system and encouraging systems to regionalize and combine resources when possible; however, enforcement action may be taken to return the system to compliance. In addition to providing oversight to systems, DWB's Source Water and Wellhead Protection Program staff works with systems to identify potential sources of contamination that might have adverse effects on the source waters and to develop a plan to protect those source waters.

**New Mexico Rivers and Streams Used for Drinking Water:**

Animas River
Bluewater Creek
Cimarron River
Eagle Creek
El Rito Creek
Gallinas River
La Jara Creek
La Luz Creek
Little Tesuque Creek
Los Pinos River
Navajo River
Pecos River
Rayado Creek
Rio Bonito
Rio Brazos
Rio Chama
Rio Grande
Rio Pueblo
Rio Ruidoso
Rio Vallecitos
San Juan River
Santa Fe River
Tularosa Creek
Ute Creek
Vallecito Creek

As drinking water standards become increasingly more stringent, ground water that can meet regulatory requirements with little or no treatment becomes less available. During recent years, many ground water systems have had particular difficulty complying with new arsenic and uranium maximum contaminant levels (MCLs). While ground water continues to be the source for the majority of public water systems in the state, two of the largest systems (Albuquerque and Santa Fe) have added surface water as a significant source of drinking water.

Systems utilizing surface water sources require more sampling of treated water than systems using a ground water source due to the potential for rapid changes in source water quality. While the quality of the source water does not impact the required quality of the produced drinking water, the quality of the source water will influence treatment considerations and associated costs.

As of February 2014, out of 1028 public water systems, approximately 65 public water systems use or purchase water obtained from either surface water or ground water under the direct influence (GWUDI) of surface water. When chlorine is used as part of surface water treatment, disinfection byproducts can form when organic carbon reacts with the chlorine. Typically, systems can adjust treatment and operation return to compliance relative quickly; however, additional infrastructure is sometimes required to remove organic carbon. A system is required to notify the public whenever violations of the SDWA occur.

The DWB's Source Water and Wellhead Protection Program works with public water systems to protect surface water sources as well as ground water sources. The DWB assists systems to conduct assessments of surface water sources' vulnerability to contamination for all public water

**New Mexico Lakes/Reservoirs used for Drinking Water:**

Navajo Lake
Conchas Lake
Bonito Lake
Nichols & McClure Reservoir (City of Santa Fe)
El Vado Lake
Lake Maloya
Eagle Nest Lake
Storrie Lake
Cimarroncita Reservoir
Miami Lake
Uracca and Phillips Reservoirs (Philmont Scout Ranch)
Lake Farmington (Beeline Reservoir)
Grindstone Canvon Reservoir

systems utilizing surface water sources. The Source Water and Wellhead Protection Program recommends that systems evaluate surface water sources on the following criteria: 1) stream flow rate or reservoir size; 2) surface water intake construction and integrity; 3) intake method (direct or indirect); and 4) average daily turbidity of the surface water source. Sources of contamination are also typically identified within a ten-mile segment upstream of each intake, to a distance of one half mile on either side of the source. The identified sources of contamination are evaluated based on the chemical properties of the associated contaminants, their likelihood of release, the number of contaminants, their proximities to the surface water source, and chemical monitoring history.

Recognizing the need to protect public health and provide safe drinking water, the DWB and New Mexico Finance Authority administer the Drinking Water State Revolving Loan Fund (DWSRLF), which provides low-cost loans to eligible water systems. In state FY2013 DWSRLF funded sixteen water system projects in New Mexico for a total of $25,526,000. Six projects for $26,678,600 have been funded so far in state FY2014 with an additional four projects totaling $1,600,000 anticipated before the end of the fiscal year on June 30, 2014. Representative projects include repair and replacement of failing distribution lines, water treatment upgrades to maintain compliance with the Safe Drinking Water Act, and the construction and rehabilitation of wells to ensure an adequate water supply.

**Additional information on NMED's Drinking Water Bureau is available at:**
**http://www.nmenv.state.nm.us/dwb/Index.htm**

## *New Mexico Department of Health*

The New Mexico Department of Health (NMDOH) plays a vital role by examining the contaminants in drinking water supplies that can cause adverse health effects, primarily excess nitrate and biological contamination. Nitrate above the MCL can cause methemoglobinemia (also known as "blue baby syndrome) which occurs when the ingested nitrate interferes with the ability for blood to carry oxygen to body tissues. A NMDOH analysis of the New Mexico Safe Drinking Water Information System indicated that for 2012-2013, four (12%) of the 33 counties in New Mexico had one or more public water systems that violated the MCL for nitrate (NM SDWIS, 2014). There were no reported cases of methemoglobinemia from 2002 through 2013. Infant methemoglobinemia and other suspected environmentally-induced health conditions were added to the notifiable diseases or conditions list in 2006, thus enhancing surveillance efforts. The current list of notifiable conditions for the NMDOH can be found here: http://nmhealth.org/erd/healthdata/documents/NotifiableDiseasesConditions022912final.pdf.

Biological contamination of drinking water systems is monitored by routinely checking for total coliforms. The presence of total coliforms in drinking water could indicate the presence of fecal coliforms, or *E. coli*, one of the fecal coliform organisms. Fecal coliforms are organisms that are present in intestinal systems of all warm-blooded animals. Most are not dangerous to humans, but some may cause adverse health effects such as vomiting and diarrhea. Additionally, fecal contamination may indicate the presence of other disease-causing organisms (e.g., bacteria, parasites, and viruses). Enterohemorrhagic *E. coli* was first identified in 1982 and became a nationally reportable disease in 1993. The most commonly reported serotype is *E. coli* O157:H7. This type of *E. coli* produces a Shiga toxin that can cause severe damage to the lining of the intestine, and complications can result in serious kidney damage (Hemolytic Uremic Syndrome). Infection with this organism is most commonly associated with the ingestion of undercooked beef and other foods contaminated by cattle feces. However, waterborne transmission has also been documented.

The NMDOH monitors reported diseases and organisms that are potentially water-related in an effort to help ensure the safety of New Mexico's public drinking water. These diseases and organisms include Camplyobacteriosis, Cryptosporidiosis, *E.coli*, Giardiasis, Hepatitis A, Salmonellosis, and Shigellosis. These diseases and organisms can also be transmitted through food or person-to-person contact. There were 1957 cases (probable and confirmed) of infectious diseases reported to the New Mexico Electronic Disease Surveillance System (NM-EDSS) that could be carried via water in 2012-2013 (NMDOH Weekly Infectious Disease Report, 2014). However, none of these cases were confirmed as being associated with a contaminated drinking water source, despite "boil water" advisories being administered in about twenty New Mexico counties during 2012-2013. When a boil water advisory is issued by NMED, the NMDOH provides educational materials for the public and advises district public health officials to be on alert for cases of gastrointestinal illness. New Mexico remains vigilant for any potential incidents, paying particular attention to water systems with a history of problems meeting federal drinking water quality standards.

**For more information water related public health concerns, refer to the NMDOH's water quality webpage at http://www.health.state.nm.us/eheb/waterQ.shtml and at https://nmtracking.unm.edu**

## *Fish Consumption Advisory Program*

Fish are a lean, low-calorie source of protein, and can be an important part of a balanced diet. However, some fish may contain contaminants that when consumed in certain quantities could pose health risks. When contaminant levels may be unsafe, consumption advisories recommend that people limit or avoid eating certain species of fish caught in certain places. The New Mexico Department of Health (NMDOH), New Mexico Department of Game and Fish (NMDGF) and NMED work together to implement New Mexico's Fish Consumption Advisory Program.

**Electrofishing in a New Mexico River**

The Program's monitoring strategy involves screening a select number of sites for chemical contamination where sport, subsistence, or commercial fishing is conducted. Site selection is prioritized based on areas where it is known that a large number of fish are harvested or where there are known or suspected contamination issues. This screening helps identify those waters where fish tissue contamination may pose unacceptable health risks to human consumers.

Fish consumption advisories relay fish tissue contamination information to the public. These advisories are only guidelines and do not constitute legal restrictions that prevent people from eating contaminated fish from New Mexico lakes and streams. Fish consumption advisories pertain to consumption of fish only. There are no known contaminant-related health risks associated with activities such as camping, swimming, boating, or handling fish in area where there are fish consumption advisories.

Currently, advisories have been issued for mercury, DDT and PCBs in fish tissue at several reservoirs, lakes and rivers (NMDOH *et al*., 2011). In 2006, as a result of the fish tissue contaminant data analysis from Brantley Reservoir, the New Mexico Game Commission restricted fishing in Brantley Reservoir and the Pecos River in the Brantley Wildlife Management Area to "catch and release" only.

**All New Mexico fish consumption advisories are available online at:**
**http://www.nmenv.state.nm.us/swqb/advisories/**

## Other NMED Programs Addressing Surface Water Concerns

The WQA governs most of the programs that address water pollution control in New Mexico. However, because surface water quality is affected in so many diverse ways by so many different activities, NMED has numerous other programs that deal with water quality protection, including:

- Clean Water State Revolving Fund (CWSRF) Program (see Section B.3 for details);
- Department of Energy (DOE) Environmental Oversight and Monitoring Program implemented by the NMED DOE Oversight Bureau;
- Drinking Water State Revolving Loan Fund (DWSRLF);
- Ground Water Management Program (see Part D below for details);
- Hazardous Waste Management, Petroleum Storage Tank and Solid Waste Management programs of the federal Resource Conservation and Recovery Act (RCRA); and
- Underground Injection Control and Public Water Supply Programs of the Safe Drinking Water Act (SDWA) (see Section C.7 below for details).

## Coordination with Other State, Tribal and Local Government Agencies

Successful surface water quality management and protection is founded on cooperative interaction between the federal, state, local, and tribal levels of government, and between the public and private sectors. In addition to NMED, numerous other New Mexico and federal agencies conduct activities that impact surface water quality, including but not limited to:

- NM Office of the State Engineer (OSE);
- NM Interstate Stream Commission (ISC);
- NM Department of Game and Fish (NMDGF);
- NM Department of Agriculture;
- NM Energy, Minerals, and Natural Resources Department;
- NM Oil Conservation Commission;
- US Army Corps of Engineers (USACE);
- US Bureau of Reclamation (USBOR);
- US Forest Service (USFS);
- Natural Resources Conservation Service (NRCS); and
- Soil and Water Conservation Districts (SWCDs).

**What is a Stakeholder?**
*For the purposes of this report, stakeholder is defined as any organization, governmental entity, or individual that has a vested interest in or may be impacted by a state directed approach to environmental regulation, pollution prevention, or energy conservation.*

These and other agencies work with stakeholders during development and implementation of water quality management activities. Coordination is crucial and focuses on informing and including stakeholders on water quality management related activities, seeking input, soliciting data and information, and working with stakeholders to implement solutions to water quality problems and concerns. Additionally, numerous stakeholder focus groups have been developed for specific issues and meet on a regular basis to coordinate efforts. NMED participates in many of these groups to address a variety of water quality issues. Examples of such groups include the New Mexico Municipal League, Environmental Quality Association, the New Mexico Forest and Watershed Health Coordinating Group, and individual watershed groups' regular meetings, such as the Middle Rio Grande Water Quality Workgroup.

## B.3 Resource Assessment of New Mexico's Surface Water Quality Management Programs

Protecting and preserving water quality to ensure adequate, safe, and reliable water resources for the long term is a top priority for New Mexico. Each year New Mexico makes significant investments in water quality management programs and water quality improvements. These investments are an expression of the value we put on New Mexico's precious water resources. The quality of the state's water resources has an impact on every citizen and is linked to the economic vitality and quality of life New Mexicans cherish.

Like most states, New Mexico is faced with the challenge of addressing an array of complex surface water quality issues with limited financial resources. As federal and state funding to address water quality issues becomes even more limited, and as the complexity of environmental needs continues to increase, there is an expectation that NMED will continue to meet the mandates of state and federal legislative and regulatory requirements with fewer resources to do so. This pressure makes it essential that New Mexico evaluate information regarding the fiscal implications and potential benefits of its water quality programs. While most are implemented by NMED, they are largely funded by the federal government. However, and as referenced throughout this report, there are also significant local, state, and even private resources that directly or indirectly affect the state's water quality.

### *Resources Applied to Surface Water Quality Management*

Water quality management programs enable New Mexico to better understand the quality of our waters, identify water quality problems, implement measures to address those problems, and improve water quality in a systematic, organized, and economically efficient manner. Table 6 summarizes the estimated amount of funds expended annually to implement NMED's comprehensive water quality management program, and is based on actual expenditures for state FY2013. Match of state or federal funding, provided locally as in-kind support for nonpoint source and wetland projects, or by the New Mexico Department of Health's Scientific Laboratory Division (SLD) for analysis of water quality samples, are not included in this table.

**Table 6. Estimated State FY2013 Expenditures on New Mexico's Surface Water Quality Management Implemented Through NMED SWQB**

| Water Quality Management Program | Federal | State | Total |
|---|---|---|---|
| Monitoring & Assessment Section (Includes TMDL Development, Water Quality Management Program & State Fish Advisories,) | $611,427.58 | $480,422 | $1,091,850 |
| Point Source Regulation Section (includes NPDES and Utility Operators Certification Program) | $437,689 | $307,277 | $744,966 |
| Nonpoint Source Management Section* | $1,970,668 | $223,947 | $2,194,615 |
| Wetlands Program* | $673,931 | $100,574 | $774,505 |
| Water Quality Standards Program (includes planning and reporting activities) | $115,044 | $75,264 | $190,308 |
| NMED-Lower Rio Grande Project** | -- | $11,478 | $11,478 |
| River Ecosystem Restoration Initiative (RERI)** | -- | $768,259 | $768,259 |
| **Total** | **$3,808,761** | **$1,967,221** | **$5,775,981** |

NOTES: The above numbers are based on NMED state FY2013 actual expenditures.
* = The grant programs under which these federal funds were allocated require a 40% non-federal match, which is not included in this analysis
* * = These projects are state-funded special initiatives whose continued funding is uncertain.

## *Capital Investments in Municipal Facilities*

The estimated annual costs for operating and maintaining various sizes of wastewater treatment facilities in New Mexico is summarized in Table 7. Most of these operation and maintenance costs are funded through fees included in monthly water/sewer rates. Many entities do not include replacement cost in their rate structure; therefore, New Mexico is encouraging communities

**Table 7. Estimated Annual Operation and Maintenance Costs for Wastewater Treatment Facilities in New Mexico**

| Wastewater Treatment Plant Facility Size | Estimated Annual Operation and Maintenance Costs |
|---|---|
| Small WWTP < 1 MGD | $300,000 per year |
| Med WWTP 1-4 MGD | $780,000 per year |
| Large WWTP > 5 MGD | $1,500,000 per year |

Source: Utility Operator Certification Program

to utilize the Asset Management approach to rate setting. Asset Management helps wastewater treatment systems prepare for both anticipated and unexpected problems by evaluating the system's current physical, financial, and managerial situation. It requires entities to make fundamental decisions about the water system's purpose, structure, and functions. For more information refer to the *Asset Management: A Handbook for Small Water Systems* (USEPA 2003a).

To address funding of construction and improvement for treatment facilities owned by municipalities, New Mexico has established a comprehensive program to provide funds through both loan and grant mechanisms to local governments. The program is administered through the NMED Construction Programs Bureau (CPB), and is responsible for managing the timely construction and administrative completion of publicly funded water, wastewater, and solid waste projects. In addition, the CPB ensures that projects are environmentally sound, of high quality, and free of waste, fraud, and abuse. Investments in infrastructure to improve the quality of waste streams are a critical component of the State's water quality management program. Table 8 summarizes the programs and shows the amounts distributed in state FY2012 and FY2013.

**Table 8. Summary of Improvement and Construction Costs for New Mexico Water, Wastewater, and Solid Waste Facilities**

| Program | Description | Funds Disbursed in FY 2012 | Funds Disbursed in FY 2013 |
|---|---|---|---|
| **State Appropriations Program** | State Legislature capital outlay appropriated for the construction of community water supply, wastewater facility, and solid waste facility projects. | $14,238,773 | $10,400,705 |
| **Clean Water State Revolving Fund (CWSRF) Program** | Revolving loan fund to provide a source of low-cost financing for a wide range of wastewater or storm drainage projects that protect surface and ground water quality and public health. Funds may also be used for nonpoint source water pollution control projects, such as solid waste projects and septic tank installations | $12,917,791 | $11,431,223 |
| **Rural Infrastructure Program** | Revolving loan fund to provide financial assistance to local authorities for the planning, design, and construction or modification of water supply, wastewater, and solid waste facilities. | $1,408,168 | $2,348,595 |
| | **Water Related Projects TOTAL** | **$28,564,732** | **$24,180,523** |

Benefits of these expenditures can be seen in direct and indirect improvements in the quality of life in New Mexico communities. The state's water quality programs, including expenditures for pollutant-reducing infrastructure, result in prevention of water quality degradation from point and NPS sources of pollution, protection of aquatic life and habitat in receiving streams, reduction of pollutant loads that could have financial and public health impacts in areas where surface water is a source of drinking water, increased public awareness regarding the need for water quality protection, and sustainable resource management practices.

**For more information on water and wastewater construction programs, refer to the Construction Programs Bureau webpage at http://www.nmenv.state.nm.us/cpb**

### *Clean Water State Revolving Fund Program*

Through the CWSRF program, NMED maintains a revolving loan fund to provide a source of low-cost financing for a wide range of wastewater and storm drainage projects that protect surface and ground water. Funds may also be used for projects that control NPS water pollution, such as those associated with landfills and septic tank installations.

The CWSRF program was established in 1986 pursuant to the Wastewater Facility Construction Loan Act and the CWA, and provides very attractive low-interest loans that spread project costs over a repayment period of up to twenty years. Repayments are cycled back into the Fund and used to pay for additional clean water projects.

USEPA capitalization funds that have been appropriated to New Mexico since state F2010 have allowed NMED to subsidize CWSRF loans on a small scale. This enabled NMED to fund two communities that have not borrowed from the program before and three repeat borrowers that have been operating under enforcement actions for many years, but whose projects had languished due to the lack of funds.

## B.4 Significant Surface Water Issues

Agencies and other stakeholders that implement New Mexico's water management programs work tirelessly to protect our water resources. However, there are still many challenges in meeting the objectives of the CWA and the WQA that remain, and some issues that seem intractable. Below is a list of the more significant surface water issues in New Mexico.

### *Pending Triennial Review of Water Quality Standards*

New Mexico's water quality standards now include the amendments adopted by the WQCC and the USEPA during the triennial review as of June 18, 2012, as well as the Outstanding National Resource Waters designated in December 2010. The SWQB initiated its current triennial review with a scoping period for public input during April and May of 2013. Revisions to the WQS under consideration include:

- Segment-specific standards for appropriate aquatic life protections in the Mimbres and San Juan River basins
- A new temporary standards provision
- Secondary contact uses and criteria updates to primary contact uses and criteria in some segments based on EPA's most recent recommendations
- Listing of ephemeral waters under Section 20.6.4.97 NMAC pursuant to Subsection C of Section 20.6.4.15 NMAC
- Clarifications of criteria applicability or methods, and corrections of grammatical errors

### *Clarifying the Application of the Clean Water Act*

In an effort to clarify the authority for waters of the United States under the CWA, USEPA recently issued proposed rule (Docket No. EPA-HQ-OW- 2011-0880) and associated supporting draft scientific assessment titled *Connectivity of Streams and Wetlands to Downstream Waters* (EPA/600/R-11/098B). Like Colorado and Nevada, New Mexico is very concerned that this rule making was developed without sufficient consultation with states and that the rule making could impinge upon state authority in water management. Regardless of any changes at the federal

level, all waters of the state will continue to be protected under the New Mexico Water Quality Act.

Very few of the waters in the arid southwest are navigable in a traditional sense yet these waters are valuable as natural resources in NM and are vital to the health, welfare, and economy of the state. Closed basins cover approximately 20% of the land area, and as much as 90% of the State's surface waters are non-perennial. These closed basins and non-perennial waters are important resources, providing water for domestic, municipal and industrial supply, recreation, irrigation, livestock, aquatic life, and wildlife. These resources are important not only locally, but contribute significantly to the State's economy by supporting the production and sale of goods (e.g., agricultural products) or through providing recreational (tourism) opportunities. Many also are important sources of ground water recharge, and impact not only residential growth but treaty deliverables.

## *Monitoring Effects of Nonpoint Source Improvements*

Congress and USEPA have been seeking more effective ways of measuring the success of nonpoint source pollution programs based on full attainment of all designated uses. In the West, the majority of nonpoint source concerns are associated with runoff from vast areas of mountains, rangelands, irrigated farmlands, and extensive road networks in rural areas. Additionally, establishment or reestablishment of adequate groundcover to prevent overland flows of sediment-laden waters is dependent upon adequate precipitation, proper land management, and other factors that may be beyond the control of water quality agencies. Depending on the specific sources of impairment, it can take decades to realize the effects of BMPs designed to control nonpoint source pollution.

Effectiveness of nonpoint source pollution prevention and restoration programs should be measured based on incremental improvements in the health of the watershed and the quality of receiving waters not strictly on delisting actions as is presently the case. Appropriate reporting tools should allow photo documentation and other qualitative assessments in addition to analytical data. Congress and USEPA should allocate sufficient funding for effectiveness monitoring.

## *Adequate Funding of Water Quality Programs*

State and federal funding for water quality programs has decreased to a point where some basic services can no longer be sustained. The most recent and significant impact has been from the 10% federal rescission that impact funds provided to New Mexico under Section 106 of the CWA. Even funding cuts in other agencies that are often thought of a peripheral to water quality management have an adverse effect on water quality programs. For example, budget cuts in the Department of Health have resulted in a 45% reduction in analytical services provided by the SLD to NMED. Other areas where budget cuts or flat funding levels that have not kept up with inflation have reduced water quality services include ambient water quality monitoring and assessment (especially for lakes), ground water quality protection permits, field inspections, and watershed project implementation. In addition, as the Southwest continues to experience drought conditions, water quality management programs become all the more important. Elected officials, land managers, and other stakeholders have higher expectations of water quality agencies. These pressures run contrary to the funding profiles these agencies are experiencing.

In addition, NMED, OSE, U.S. Bureau of Reclamation, and the City of Albuquerque collectively funded the USGS to conduct ambient monitoring at approximately 20 stations that comprised the State's long-term surface water quality surveillance network in the past. These USGS stations were located on the major stream systems of New Mexico, and support a variety of projects across the state. Unfortunately due to cuts to NMED's operating budget, USGS sampling previously funded by the state was discontinued starting in state FY2012, as NMED was the principal source of funding for several parameters at USGS gauges. This is a large loss to the state water quality monitoring community.

## *Nutrient Reduction Strategy*

The USEPA, through its National Water Program Guidance, continues to places a high priority on states addressing excess nutrients through adoption of numeric water quality criteria for nitrogen and phosphorous in lakes, reservoirs, rivers, and streams although it has allowed appropriate flexibility to State to make incremental improvements to address excess nutrients through other measures (Stoner, 2011). As documented in the *New Mexico Nutrient Reduction Strategy* (NMED/SWQB 2014), New Mexico is currently not pursuing adoption of numeric nutrient criteria. Instead New Mexico is pursuing the continued development and implementation of assessment protocols for wadeable streams, rivers and lakes that acknowledge that nutrients exist in all waters of the State but that excessive levels lead to impairment of designated uses. Further, New Mexico seeks to adopt nutrient TMDLs that recognize the threshold concentrations necessary to be protective of designated uses while developing approaches for implementation of the waste load allocations that are technologically achievable and are neither over- nor under-protective. The State is currently evaluating alternative approaches to the implementation of TMDL waste load allocations for point-source discharges that are scientifically based, environmentally sound, and consider the existing facility design, facility age and local economic factors. As New Mexico does not have delegated authority for the NPDES program this effort will require significant support from USEPA in how such permits are issued and implemented.

## *Wildfires*

In recent years New Mexico has experienced a growing number of wildfires of increased in size and severity. Wildfires can produce significant watershed changes that may impact water quality, fish and other aquatic organisms, drinking water supplies and wastewater treatment systems. The primary water quality concerns after a wildfire are: (1) the introduction of sediment and debris into the surface waters; (2) the increase of nitrate and other plant nutrients from burned vegetation; (3) the introduction of radionuclides and heavy metals from ash, soils and geologic sources; and (4) the introduction of fire retardant chemicals into waterbodies. The magnitude of these effects is largely dependent on the size, intensity, and severity of the fire, and on the condition (e.g., healthy or poor) of the watershed at the time of burning.

A watershed may take decades to completely recover from the effects of a wildfire, during which time the waters may exceed water quality standards for one or more pollutants. While natural, with the recent drought in the Southwestern portion of the country, wildfires have been more frequent, and thus a standard approach for assessing and listing wildfire affected areas needs to be developed.

# PART C - SURFACE WATER MONITORING AND ASSESSMENT

## C.1 Statewide Water Quality Monitoring

### *Monitoring Goals and Objectives*

The purpose of SWQB's Monitoring Program is to ensure relevant water quality data for all of New Mexico's surface waters are collected and assessed with the most robust scientific methods in a way that is transparent to water quality agencies and the public.

Clear goals and objectives are required to implement an effective monitoring program. To meet federal (USEPA 2003b) and state requirements and expectations, the goal of the Program is to answer five questions:

1. What is the overall quality of waters?
2. To what extent is water quality changing over time?
3. What are the problem areas, and which of those areas need protection?
4. What level of protection is needed?
5. How effective are CWA projects and programs?

The first step in developing a monitoring strategy to achieve the stated goals is defining a clear set of water quality data objectives. These objectives must be met to address the five questions identified above, and can be placed into the following broad monitoring categories:

- Determination of designated use attainment;
- Status and trend monitoring;
- Monitoring for TMDL development;
- Monitoring for standards refinement;
- Effectiveness monitoring and NPDES compliance monitoring; and
- Wetlands monitoring.

A detailed discussion of these objectives is provided in SWQB's Monitoring and Assessment Strategy (2010).

### *Monitoring Design*

The Monitoring Program integrates targeted and fixed-station sampling designs to address the goals and the monitoring objectives. This creates the most efficient combination of monitoring designs, given current funding, while still meeting the required objectives.

Like most states, New Mexico utilizes a targeted, rotational watershed approach to ambient water quality monitoring. This integrative watershed approach enhances program efficiency by providing:

- A systematic, detailed review of water quality data;
- More efficient use of human and budget resources;
- Information on a scale where implementation of corrective actions is feasible; and
- An established order of rotation and predicted sampling year for each watershed, which allows easier coordination efforts with other programs and other entities interested in water quality.

**Water Quality Sampling for basic field parameters**

Watershed surveys are developed through establishment of targeted sampling sites throughout a watershed of interest. Program personnel serve as survey leads and co-leads, and ensure all necessary chemical, biological, and physical data are collected during the survey year. Pre- and post-survey planning meetings are held with other SWQB personnel working on point source and nonpoint source issues and TMDL development in the watershed. The SWQB strives to establish at least one sampling station in each assessment unit (i.e., identified stream reach or lakes/reservoir on the Integrated List). Exact sample site location, sampling frequency, and type of data collected are established so as to allow determination of attainment of New Mexico surface water quality standards. This information is detailed in the *Quality Assurance Project Plan for Water Quality Management Programs* (QAPP) and standard operating procedures (NMED/SWQB 2013a, 2013b), and is an adaptive, on-going management approach; watersheds will not be ignored between survey years. The current 8-year rotational monitoring schedule is shown in Figure 10.

Because New Mexico is a large state with relatively little perennial water compared to total land area, and given the level of and recent trends in financial and staff resources, SWQB considers the targeted approach to be the most appropriate to meet New Mexico's monitoring objectives. SWQB has sampled nearly all of New Mexico's perennial waters during its watershed surveys. Approximately 83% of all identified stream miles have been assessed and 76% of public lake acres have been assessed to date, including all of New Mexico's large mainstem reservoirs. The targeted approach has proven effective at fulfilling monitoring objectives and allowing for general conclusions to be drawn about the status of the State's waters.

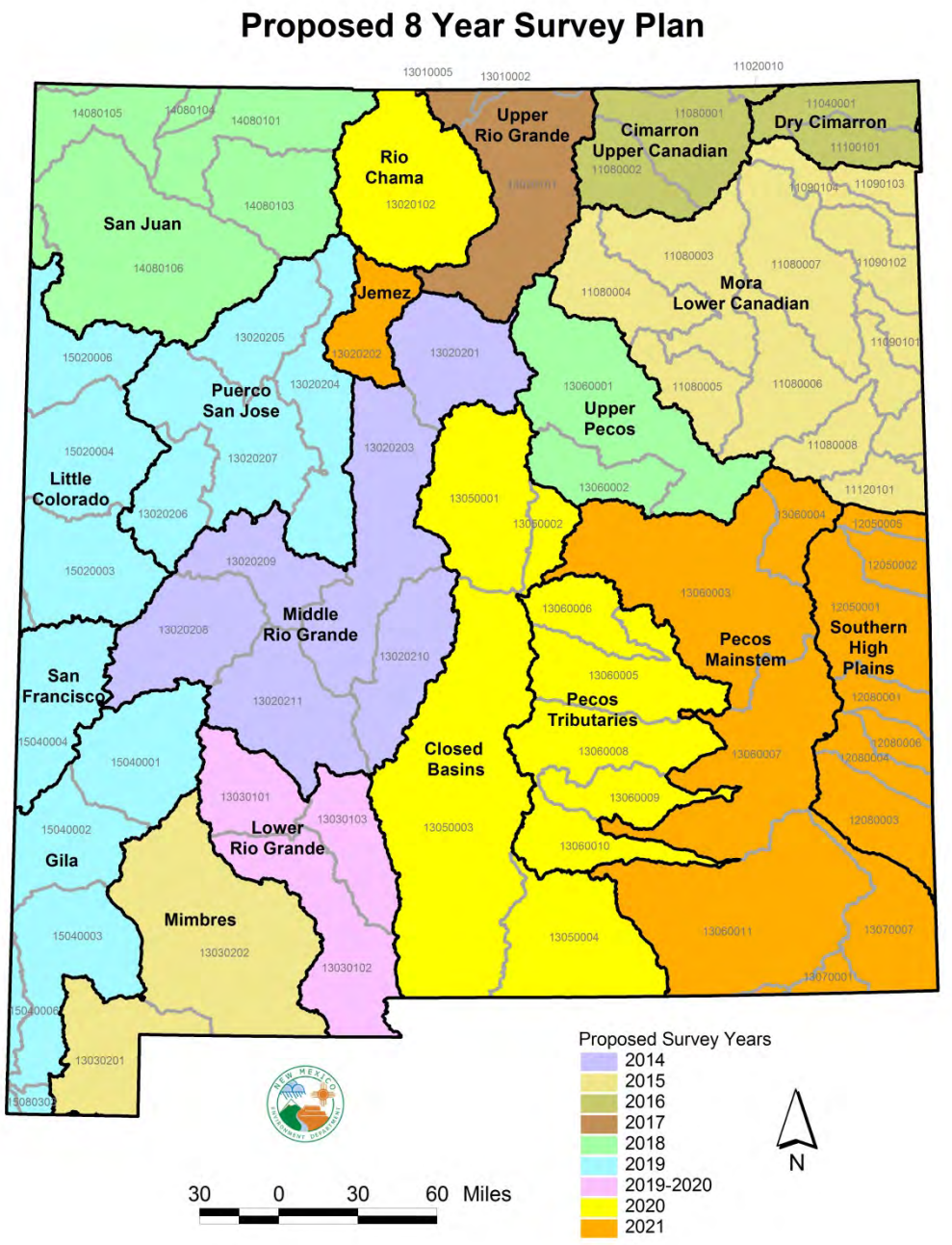



**Figure 10. New Mexico's Surface Water Quality Monitoring Schedule**

In the past, NMED, OSE, U.S. Bureau of Reclamation, and the City of Albuquerque collectively funded the USGS to conduct ambient monitoring at approximately 20 stations that comprised the State's long-term surface water quality surveillance network. These USGS stations were located on the major stream systems of New Mexico, and support a variety of projects across the state. Unfortunately due to cuts to NMED's operating budget, USGS sampling previously funded by the state was discontinued starting in state FY2012, as NMED was the principal source of funding for several parameters at USGS gauges. This is a large loss to the state water quality monitoring community.

USEPA has encouraged states to incorporate probabilistic sampling designs into their monitoring programs to potentially enable them to generate statistically-based conclusions regarding the overall state of water quality. Accordingly, some states have begun to incorporate probabilistic monitoring into their core monitoring strategies. However, successful sampling of random stations in the semiarid west is challenging due to a high percentage of intermittent and ephemeral waters, lack of hydrologic maps that accurately indicate perennial versus non-perennial waters, and difficult access logistics for many perennial waters located in remote mountainous headwaters. Although probabilistic-based monitoring can allow states to reach conclusions about surface water quality status as a whole, this type of monitoring cannot tell a state or tribal jurisdiction which specific water bodies are impaired or where to target CWA Section 319 watershed restoration funds, and do not provide the targeted data necessary for TMDL development. Therefore, many states -- including New Mexico -- continue to rely primarily on targeted sampling to answer these specific questions. See Section C.5 for additional details.

## *Core Water Quality Indicators*

Water quality trends and impairments are generally determined based on four broad types of monitoring data: biological, chemical, physical, and habitat. Each type of data yields an assessment that may then be integrated with other data types for an overall assessment. Depending on the designated use, one data type may be more informative than others for making an assessment. See inset box for details on the core indicators used by New Mexico to determine designated use impairments.

***New Mexico's Core Water Quality Indicators***

Chemical data include measurements of key chemical constituents in water and fish tissue. Examples of these measurements include metals, oils, pesticides, and nutrients such as nitrogen and phosphorus. Monitoring for specific chemicals helps states identify the causes for impairment and helps trace the source of the impairment.

Physical data include characteristics of water such as temperature, flow, dissolved oxygen, and pH. Physical attributes are useful screening indicators of potential problems, often because they can have an impact on the effects of chemicals.

Habitat assessments include descriptions of sites and surrounding land uses, condition of streamside vegetation, and measurement of features such as stream width, depth, flow and substrate. These data are used to supplement and interpret other kinds of data.

Biological integrity data are objective measurements of aquatic biological communities (usually aquatic insects, fish, or algae) used to evaluate the condition of an aquatic ecosystem. Biological data are most useful in deciding whether waters support aquatic life uses.

## *New Mexico's Lake Monitoring*

Lake and reservoir monitoring in New Mexico is conducted to: (1) assess for attainment of applicable water quality standards; (2) collect information for standards development and to determine the trophic status for lakes or reservoirs where little or no physical, chemical, or biological information exits; and (3) update information with regard to trophic status of previously studied lakes or reservoirs. Lake surveys generally consist of three-season sampling efforts from one or two stations following the same rotation shown in Figure 10. Surveys for small lakes are usually conducted during the period of maximum stress to the aquatic ecosystem.

There are 196 publically-owned lakes, reservoirs, and playas that cover approximately 108,900 acres. These waterbodies consist of large main stem reservoirs, high-altitude natural lakes, and small fishing impoundments ranging in size from less than one acre up to 40,000 acres (Elephant Butte Reservoir at maximum storage pool). Regardless of size, all lakes are used

extensively in water-scarce New Mexico. Even the smaller lakes provide water for livestock watering and habitat for wildlife, are used by migratory waterfowl, and can provide important recreational opportunities for boating, swimming, fishing, and aesthetic pleasure in municipal, rural, and wilderness settings.

Although all surface waters are considered important, NMED has prioritized the following publically-owned lakes, reservoirs, and playas as significant for monitoring purposes as funding resources allow:

- Lakes over 20 acres due to their many and varied uses;
- Lakes smaller than 20 acres where fish kills or pollutants threaten designated use attainment;
- Various playa lakes in New Mexico due to their unique ecological character and location in some of the most arid portions of the State; and
- High-altitude natural lakes that serve as sensitive indicators of potential acidic precipitation as well as nonpoint sources of pollution. Difficult access restricts sampling efforts at these lakes.

**Lake Surveys are performed at the deepest point of each lake**

## *Quality Assurance*

The SWQB is committed to maintaining a quality assurance program that provides confidence in the environmental data produced by its various water quality programs. Water quality management programs are implemented in accordance with the current USEPA approved version of the Department's Quality Management Plan (QMP), which documents the quality system for planning, implementing, documenting, and assessing the effectiveness of activities supporting water quality management programs. In addition all data collected by the SWQB are handled in accordance with the most current version of the USEPA-approved QAPP (NMED/SWQB 2013b). The QAPP describes the quality assurance procedures, quality control specifications, and other technical activities that must be implemented to ensure that the results of the project or task to be performed will meet project specifications. By establishing a quality system, New Mexico ensures that water quality management decisions are based on a systematic process and on data of known and acceptable quality. This also ensures that the public funds expended in these efforts are soundly invested. Further, in order for SWQB to utilize data collected by outside agencies or stakeholder groups a review of the quality assurance procedures is conducted to ensure that data is of equality or greater quality to those collected by SWQB under the QAPP.

## *Data Management*

Numerous data management tools are utilized by the different water quality management programs in New Mexico. The tools consist primarily of database, geographic information systems (GIS), spreadsheet, statistical, and word processing computer software packages. To facilitate the integration of these tools, waterbodies are georeferenced based on geographic location and categorized based on waterbody type. Additional categories such as assessment

unit (AU), watershed size/area, designated uses, ecoregion, elevation, and habitat type are applied to facilitate data comparability and communication within and among the data management tools used by various water quality management programs. Once a surface waterbody has been sufficiently georeferenced and categorized, all available data and pertinent information can be integrated and used by all programs to guide water quality monitoring priorities, assessment activities, and management decisions. Databases currently utilized by SWQB include:

- Surface water QUality Information Database (SQUID) – On June 21, 2013, SWQB began using this new database, which houses water and fish tissue chemical data, as well as biological and habitat data. It combines the historical functionality of the Assessment Database (ADB), which is a relational database application for tracking water quality assessment data, including use attainment, and causes and sources of impairment and the New Mexico Ecological Data Application System (NMEDAS), which is a data management and analysis tool used for water surface quality monitoring data. SQUID has recently been updated to allow for automated assessment of water quality data, functionality that will save time and errors during the generation of Section 303(d) listings.

- STORET (short for STOrage and RETreival) and WQX (Water Quality Exchange) - The USEPA data management system that contains water quality information for the nation's waters, populated with biological, chemical, and physical data on surface and ground water collected by federal, state and local agencies, tribal governments, volunteer groups, academics and others. All 50 States, territories, tribes and jurisdictions of the U.S. are represented in the system. SWQB uploads all validated and verified chemical/physical data to STORET/WQX on an annual basis through automated XML exchange process in SQUID. All validated SWQB data used for assessment are available on WQX, which is publically available at: http://www.epa.gov/STORET/wqx/index.html.

- Grants Reporting and Tracking System (GRTS) - The Nonpoint Source Program's main reporting vehicle for the CWA Section 319 program. GRTS is a data management system that enables USEPA and the states to describe the progress they have made in implementing the national Nonpoint Source Pollution program. GRTS electronically tracks projects and activities funded with CWA Section 319(h) funds.

- Enforcement and Compliance History Online (ECHO) - USEPA's database that provides integrated compliance and enforcement information for approximately 800,000 regulated facilities nationwide. Information available through this database includes, but is not limited to: status of compliance inspections; detected violations; information regarding enforcement actions. As New Mexico does not have primacy over the NPDES program all data in ECHO for New Mexico facilities are entered by USEPA.

- SWQB's PSRS/NPDES database – This Oracle-based, web platform database that helps the Department's PSRS track the status of NPDES permits and certifications. The database contains information about individual permits in relation to receiving water and Water Quality Standards Segments for integration into Bureau projects such as TMDL development and watershed assessment/planning activities. This database does not contain all of the data available through USEPA's NPDES data management systems.

- The CERTMAN (CERTification MANagement System) - Web-based application and database containing information pertaining to the Utility Operator Certification Program, which is maintained by NMED. Users can access operator contact information, certification status, and exam results.

### *Data Analysis/Assessment*

Data are analyzed in a variety of manners depending on the objectives. Computer database and spreadsheet programs are used to examine water quality trends, relationships, and results. Data are assessed against the most current version of the *State of New Mexico Standards for Interstate and Intrastate Surface Waters* [20.6.4 NMAC]. All data available that are considered to be of acceptable quality are assessed to determine designated use attainment status by using the protocols described in the *State of New Mexico Procedures for Assessing Standards Attainment for the Integrated 303(d)/305(b) Water Quality Monitoring and Assessment Report* [Assessment Protocol] (NMED/SWQB 2013b). See Section C.2 below for additional details.

### *Reporting*

Data analysis and assessment results are reported in numerous documents. The most comprehensive and inclusive reporting mechanism is this biennial Integrated Report, the *State of New Mexico CWA Section 303(d)/Section 305(b) Integrated Report*. Other documents that report results include, but are not limited to the following:

- Survey summaries (results of rotational watershed surveys);
- TMDL planning documents (wasteload and load allocations);
- Special project summaries (results from special projects);
- Nonpoint Source Annual Report and project summary reports (results pertaining to the impacts of NPS Implementation Projects);
- Watershed Restoration Action Strategies (WRAS) and Watershed-Based Plans (WBPs); and
- Use attainability analyses (present information regarding attainable designated uses).

### *General Support and Infrastructure Planning*

Currently New Mexico receives resources to support a basic monitoring effort that enables all watersheds to be intensively monitored approximately once every eight years. Occasionally, limited supplemental funding is received for special monitoring projects or emergency situations. Each year, the SWQB strives to monitor two to three watersheds at the USGS 8-digit Hydrologic Unit Code (HUC) level.

Additional resources may allow SWQB to:

- Incorporate probabilistic sampling design components into the statewide monitoring strategy;
- Collect more data to update and maintain the fish consumption advisory program;
- Restore NPDES compliance monitoring activities;
- Expand lake and reservoir monitoring efforts;
- Refine and expand numeric translators for nutrients, bottom deposits, and benthic macroinvertebrate bioassessments;
- Refine monitoring methods and assessment protocols for non-wadeable rivers;

- Increase sampling frequencies to improve statistical confidence of listings;
- Shorten the assessment return interval; and
- Contract with non-government analytical laboratories to increase the scope of analyses conducted and to replace services that had previously been provided by SLD.

## C.2 Assessment Methodology

The assessment methodology described in the Assessment Protocol (NMED/SWQB 2013c) constitutes the decision process that New Mexico employs to determine which attainment category a segment belongs. The Assessment Protocol describes how all readily available data and information are identified and considered, the basic quality assurance and quality control criteria used to evaluate outside sources of data, and the analytical approaches used to infer segment condition. The assessment methodologies described in the Assessment Protocol are reviewed each reporting cycle to ensure the methods are consistent with applicable water quality standards, incorporate new guidance provided by USEPA, and clarify assessment protocols. For the 2014-2016 reporting cycle, enhancements included major revisions to the turbidity and the lake nutrient assessment protocols.

Prior to development of the draft Integrated List for each listing cycle, the public has an opportunity to provide comments to the Assessment Protocols through a public participation process that includes a minimum 30-day public comment period with public notification as defined in the WQMP/CPP (NMWQCC 2011). The Assessment Protocols used to develop the 2014-2016 Integrated List (Appendix A) were released for public comment in this manner.

In general, all readily available data less than five years old that have been assess for consistency with the SWQB's data collection activities and quality assurance procedures are used to determine whether the applicable water quality standards are attained. Data older than five years will be given a lower priority in assessment than newer data, particularly if new data indicate a change in water quality or the older data fail to meet data quality requirements. If there are only data greater than five years old available for a particular assessment unit, the assessment conclusions based on these older data will be carried over to the next list until more current data are available to assess. Outside sources of data are solicited via a public notice process prior to developing the CWA Section 303(d) *List of Impaired Waterbodies*. All data submitted from outside sources must meet the State's QA/QC requirements to be used in assessment process.

Quality data sources could include, but are not limited, to the following:

- NMED SWQB chemical/physical, biological, habitat, bacteriological, or toxicological data
- collected during intensive watershed surveys using approved or otherwise accepted quantitative methods;
- Chemical/physical data from recent studies by NMED or other organizations, contractors, tribes, or individuals;
- USGS water quality data (provisional data shall not be used to make designated use support determinations);
- Chemical/physical data collected by LANL and NMED Oversight Bureau (publically available for download from *Intellus New Mexico (http://www.intellusnmdata.com/reporting/home_reporting.cfm)*;

- Benthic macroinvertebrate, fish community, and/or fish tissue data collected by NMED or other organizations, contractors, tribes, or individuals;
- USEPA-recognized protocols such as Environmental Monitoring and Assessment Program (EMAP), Rapid Bioassessment Protocols (RBP), or other biological/habitat data collected by NMED and other organizations, contractors, tribes, or individuals;
- In-stream (i.e., receiving water) data collected during NMED effluent monitoring efforts;
- NPDES storm water permit compliance monitoring data for receiving waters;
- In-stream water quality data from other NMED bureaus such as the Drinking Water Bureau, and Ground Water Bureaus; and
- Citizen or volunteer monitoring data.

## Nutrient Assessment Protocol Development for Lakes and Reservoirs

The presence of some aquatic vegetation is normal in lakes and reservoirs. Algae and macrophytes provide habitat and food for other aquatic organisms. However, excessive aquatic vegetation is not beneficial to most aquatic life and may change the associated community structure. High nutrient concentrations may promote an overabundance of algae and floating or rooted macrophytes. The types and amounts of aquatic vegetation often reflect the level of nutrient enrichment. Algae are either the direct (excessive periphyton mats or surface plankton scums) or indirect (diurnal swings of dissolved oxygen and pH as well as high turbidity) cause of most problems related to excessive nutrient enrichment. In addition, algal blooms can cause taste and odor problems in drinking water supplies. One of the most expensive problems caused by nutrient enrichment is increased treatment required for drinking water. Blooms of certain types of blue-green (cyanobacteria) and golden (*Prymnesium spp.*) algae can produce toxins that are detrimental to fisheries in addition to animal and human health.

Due to the pervasiveness and potential severity of nutrient-related problems, accurate and efficient monitoring and assessment of nutrient impairment is essential. An assessment protocol has been developed to use New Mexico's narrative "plant nutrients" criterion to determine the nutrient impairment status of lakes and reservoirs. This protocol uses multiple lines of evidence from both causal (total nitrogen [TN] and total phosphorus [TP] concentrations) and response variables (algal biomass, DO concentration, and Secchi depth). Threshold values for each variable are used to translate the narrative criterion into quantifiable endpoints. Impairment threshold values were derived from NMED water quality standards, statistical analyses of existing data, and published literature. If a lake or reservoir is determined to be impaired due to nutrients, it will be noted on New Mexico's Clean Water Act Section 303(d)/Section 305(b) Integrated List.

**For additional information, visit http://www.nmenv.state.nm.us/swqb/protocols/.**

## C.3 Water Quality Assessment Results

New Mexico maintains assessment information in SQUID as of 2013 (assessment data were previously housed in NM's version of the Assessment Database). Use of this database allows SWQB to automatically generate the complete Integrated List, the associated Record of Decision (ROD) which provides additional information on impaired waters, the Category 5 *CWA Section 303(d) List of Impaired Waters*, as well as a variety of cause, source and impairment category summary reports. The results are organized by water body type (Rivers/Streams followed by Lakes/Reservoirs) and presented in the following sections.

# Rivers and Streams

### *Water Quality Attainment Status and Categorization of New Mexico's Rivers and Streams*

**Table 9. Integrated Report Categories for New Mexico's Rivers and Streams**

| Category | Total Size (miles) | Number of River/Stream Assessment Units |
|---|---|---|
| 1 | 925 | 53 |
| 2 | 1,310 | 127 |
| 3 | 1,305 | 120 |
| 4A | 1,365 | 74 |
| 4B | 0 | 0 |
| 4C | 151 | 13 |
| 5 | 2,654 | 197 |

**NOTE**: This information was generated using SQUID. Category 5 above is a composite of New Mexico Categories 5A, 5B, and 5C.

New Mexico's surface waters assigned to one of the five integrated reporting categories (defined in Table 1) are summarized in Table 9. Individual Report categories for every assessment unit on the Integrated List are presented in Appendix A.

The largest grouping of assessed lotic (i.e., flowing) waters are Category 5. These 197 assessment units cover approximately 2,654 stream miles, and along with the Category 5 lake/reservoir water bodies, comprise New Mexico's CWA Section 303(d) waters. A list of Category 5-only waters was generated from SQUID and is included in the beginning of Appendix A.

The second largest group is Category 4A, which represents stream reaches where TMDL planning documents have been developed. These 74 stream reaches, covering approximately 1,365 stream miles, are technically still noted as impaired even though they are not technically considered to be part of the Clean Water Act Section 303(d) list by USEPA. Several of these stream reaches also have TMDLs for more than one parameter.

The third largest grouping of assessed lotic assessment units is Category 2. These 127 assessment units cover approximately 1,310 stream miles. Assessment units 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 are no reliable monitoring data with which to make a determination.

There are 120 stream reaches (covering approximately 1,305 stream miles) identified as Category 3. Assessment units are listed in this category when data to support an attainment determination for any designated use are not available according to the requirements of the State's assessment and listing methodology. Reasons include access, monitoring and/or analytical logistics (such as the need for automated sampling equipment), and staff and financial resource constraints.

## New Mexico's Summary of Designated Use Support for Rivers and Streams

A summary of the river/stream attainment status for each designated use, as found in New Mexico's WQS, is presented in Table 10. These summaries are primarily based on water quality monitoring conducted by the SWQB as part of intensive watershed surveys and targeted monitoring.

In New Mexico, the CWA goal of "fishable" is now reported under the various aquatic life uses currently in New Mexico's WQS (20.6.4. NMAC), and the "swimmable" goal is reported under primary and secondary contact uses. USEPA developed this method to reduce inconsistencies in states' reports. Overall, 13 of the State's 16 assessed designated uses in streams and rivers have been identified as impaired in at least one river/stream segments by point and/or nonpoint sources of pollutants.

## Table 10. Designated Use Support for New Mexico's Rivers and Streams

| Designated Use | Total Size (mi) | Size Assessed (mi) | Size Fully Supporting (mi) | Size Not Supporting (mi) | Size Not Assessed (mi) |
|---|---|---|---|---|---|
| Coldwater Aquatic Life | 923 | 722 | 179 | 543 | 201 |
| Coolwater Aquatic Life | 200 | 132 | 23 | 109 | 68 |
| Domestic Water Supply | 2,661 | 2,247 | 2,196 | 51 | 414 |
| Fish Culture* | 1,272 | - | - | - | 1,272 |
| High Quality Coldwater Aquatic Life | 2,563 | 2,305 | 810 | 1,495 | 258 |
| Industrial Water Supply | 422 | - | - | - | 422 |
| Irrigation | 6,522 | 5,596 | 5,434 | 161 | 926 |
| Limited Aquatic Life | 186 | 97 | 17 | 79 | 89 |
| Livestock Watering | 7,718 | 5,526 | 5,419 | 107 | 2,193 |
| Marginal Coldwater Aquatic Life | 1,028 | 948 | 411 | 537 | 80 |
| Marginal Warmwater Aquatic Life | 2,133 | 1,471 | 842 | 629 | 662 |
| Primary Contact | 6,805 | 4,347 | 3,199 | 1,148 | 2,458 |
| Public Water Supply | 762 | - | - | - | 762 |
| Secondary Contact | 913 | 455 | 429 | 26 | 459 |
| Warmwater Aquatic Life | 1,817 | 1,562 | 939 | 623 | 255 |
| Wildlife Habitat | 7,718 | 6,024 | 5,835 | 189 | 1,694 |

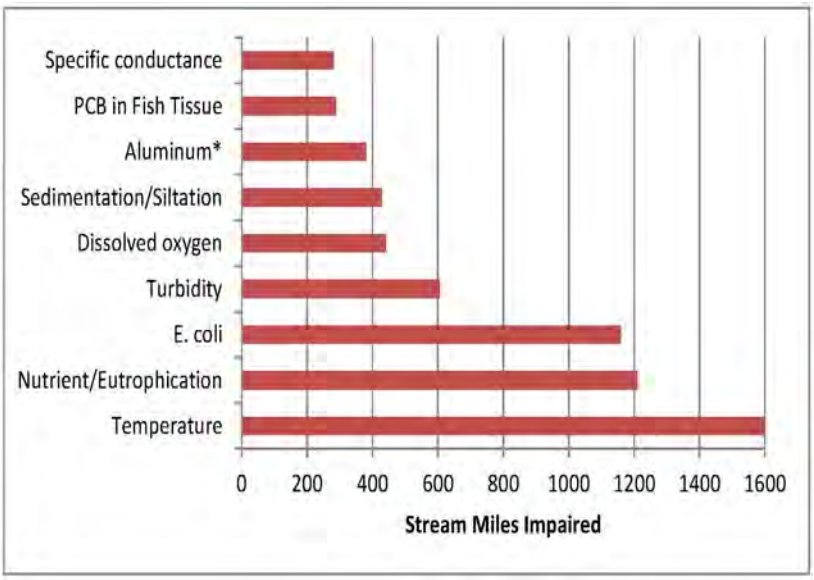
* = All Fish Culture, Public Water Supply, and Industrial Water Supply designated uses were defaulted to “Not Assessed” because no numeric criteria apply uniquely to these uses per 20.6.4.900 Subsection A NMAC.

## Causes of Surface Water Impairment for Rivers and Streams

A summary of the impairment causes for New Mexico's rivers and streams is presented in Figure 10. The conclusions are primarily based on water quality monitoring conducted by the NMED as part of rotational watershed surveys, fixed station monitoring, and targeted monitoring. The SQUID-generated summary report is provided in Appendix B. Standard USEPA impairment cause categories included in SQUID were used to label the graphic. See Appendix B for subcategory information.

Excessive temperature, nutrient/eutrophication, and *E. coli* are identified as the top three causes of impairment of designated uses in New Mexico's streams and rivers based on current WQS (20.6.4 NMAC), available data, and applicable assessment protocols. Dissolved oxygen (DO) and nutrient/eutrophication impairments may be redundant in some cases as DO impairment is often a response variable as a result of excessive nutrients. The SWQB is implementing several nutrient criteria development projects that will address some of this redundancy through improved monitoring and assessment methodologies (see http://www.nmenv.state.nm.us/swqb/Nutrients/ for additional details).

*E. coli* sampling during watershed surveys has been a SWQB priority since the 2006 listing cycle, using a mobile *E. coli* sampling unit that resolved a chronic issue with meeting the 6-hour holding time. Implementation of this sampling method continues to result in the identification of additional contact use impairments, due to exceedence of the *E. coli* criteria, each listing cycle.




*Aluminum includes past listings with non-hardness based criteria, as well as acute and chronic listings

| Cause of Impairment (from SQUID) | Stream Miles Impaired |
|---|---|
| Temperature, water | 1,601 |
| Nutrient/Eutrophication Biological Indicators | 1,210 |
| *Escherichia coli* | 1,160 |
| Turbidity | 606 |
| Dissolved Oxygen | 441 |
| Sedimentation/Siltation | 429 |
| Aluminum* | 382 |
| PCB in Fish Tissue | 288 |
| Specific Conductance | 282 |
| PCB in Water Column | 251 |

NOTE:
* Aluminum includes past listings with non-hardness based criteria, as well as acute and chronic listings
See Appendix B for complete list of categories and subcategories generated from SQUID.

**Figure 11. Top 10 Causes of Surface Water Impairment for Rivers and Streams**

## Sources of Surface Water Impairment for Rivers and Streams

A summary of the top 10 impairment sources as documented in TMDLs for New Mexico's for rivers and streams is presented in Figure 12. The SQUID-generated report that was used to generate the below figure is included in Appendix B. Standard USEPA source categories included in SQUID were used to label the graphic. See Appendix B for subcategory information.

"Sources" are defined as activities that may contribute pollutants or stressors to a water body (USEPA 1997). The probable source list included with any cause of impairment includes any and all activities that could be contributing to the identified impairment. It is not intended to single out any particular land owner or single land management activity, and has therefore been labeled "Probable" and generally includes several possible items. Probable sources listed for any particular water body have not been proven to be a source or the only sources of the identified impairment. It is based on qualitative field observations made by field staff for assessment units sampled during rotational watershed surveys and watershed restoration projects. This is combined with knowledge of known land management activities that have the potential to contribute to the identified impairment.

The approach for identifying "Probable Sources of Impairment" was modified by the SWQB starting with the 2012 listing cycle. Any new impairment listings are assigned a Probable Source of "Source Unknown." For the 2014 listing cycle, SWQB removed previously-reported non-TMDL Probable Source lists from the Report List, and replaced them with "Source Unknown" for consistency throughout the list with respect to this approach. Therefore, all reported Probable Source lists on the Integrated List now have been through the TMDL process. Probable Source Sheets will continue to be completed during rotational watershed surveys and watershed restoration activities by SWQB staff. Information gathered from the Probable Source Sheets will be used to generate a draft Probable Source list in consequent TMDL planning documents. These draft Probable Source lists will be finalized with watershed group/stakeholder input received during any one of the following: pre-survey public meeting, TMDL public meeting, watershed-based planning activities, and various public comment periods. The SWQB has also created a web site to further solicit input on Probable Sources (http://www.nmenv.state.nm.us/swqb/PS/), and has developed a standard operating procedure for this topic (available at: http://www.nmenv.state.nm.us/swqb/SOP/). The final Probable Source list in the approved TMDL process will be incorporated into the next Integrated List.

For development of the Integrated List, identified probable sources are incorporated into SQUID, which allows the stream miles for each particular probable source assigned to an impaired assessment unit to be totaled. SQUID generates summary reports that break down probable sources of impairment into major categories and subcategories. This metric is imprecise as it does not contain information on the relative concentrations of any of the given probable sources as this level of detail is not available given current source identification resources. The complete report is contained in Appendix B. In most instances, more than a single probable source contributes to water quality impairment.

As shown in Figure 12, the leading probable source of impairment in New Mexico's rivers and streams is rangeland grazing, which is consistent with the widespread use occurrence of this activity in New Mexico, and is more than twice as common a source than the next most common probable source (On-Site treatment systems). Other probable sources include loss of riparian habitat, streambank modification, wildlife other than waterfowl, drought-related impacts, flow alterations from water diversions, waterfowl, municipal point source discharges and

road/bridge runoff. These occurrences are believed to contribute to localized water quality problems in certain areas of the state.

On-site treatment systems (i.e., septic tanks) are primarily domestic liquid waste disposal systems (under state regulations, treat 5,000 gallons per day or less) can lead to water quality impairments if they are installed in close proximity to other systems or water bodies, improperly installed, or poorly maintained. To help address these problems, the regulations applicable to these systems were significantly revised in 2005. Additional information is available at: http://www.nmenv.state.nm.us/fod/LiquidWaste/.

Like other western states, point source discharges play a quantitatively minor role with respect to pollutant loading compared to nonpoint sources in the impairment of New Mexico's streams and rivers. While poorly operated or maintained wastewater treatment plants may have significant adverse localized effects on water quality, the available data indicate that New Mexico, working with USEPA and NPDES permittees, has been largely successful in reducing point source impacts on the state's surface waters.

| Probable Sources of Impairment (from SQUID) | Stream Miles Impaired |
|---|---|
| Rangeland Grazing | 1,464 |
| On-site Treatment Systems (Septic) | 679 |
| Loss of Riparian Habitat | 632 |
| Streambank Modifications/destabilization | 555 |
| Wildlife Other than Waterfowl | 513 |
| Drought-related Impacts | 474 |
| Flow Alterations from Water Diversions | 470 |
| Waterfowl | 451 |
| Municipal Point Source Discharges | 422 |
| Road/Bridge Runoff | 414 |
| | |

NOTE: See Appendix B for complete list of categories and subcategories generated from ADB.

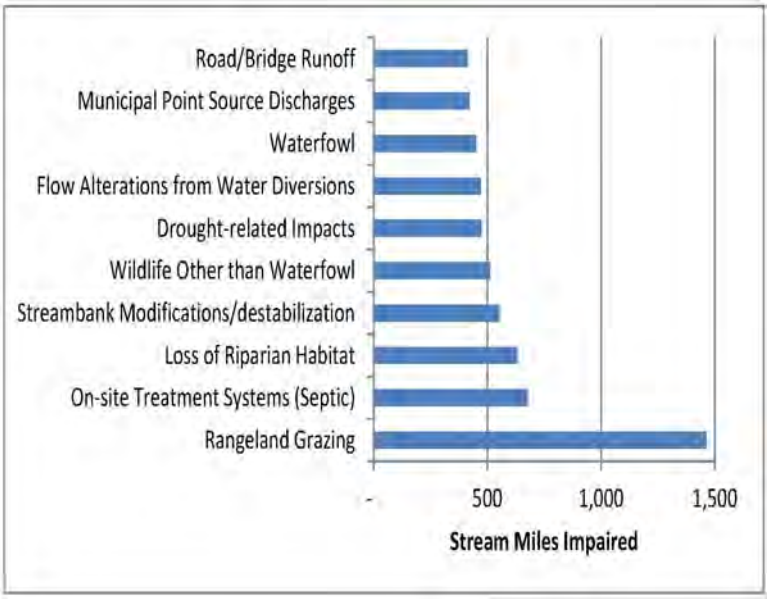



**Figure 12. Top 10 Probable Sources of Surface Water Impairment for Rivers and Streams in TMDLs**

# Lakes and Reservoirs

## *Water Quality Attainment Status and Categorization of New Mexico's Lakes and Reservoirs*

The development of an adequate monitoring and assessment program for lakes still lags behind that for New Mexico's rivers and streams. One major challenge regarding both lake monitoring and lake TMDL development has been the loss of specific CWA Section 314 funds to address this need. In the past, states received this funding specifically targeted for lake monitoring. States must now carve out their own funding for lake monitoring from core CWA Section 106 funds. New revenue sources must be identified to increase lake and reservoir monitoring in order to support future TMDL development and provide water quality information to the public who utilize these lakes and reservoirs. A more robust program could confirm the current cause and source impairment information regarding lakes and reservoirs with more scientifically rigorous data and information.

**Table 11. Summary of Impairment Report Categories for New Mexico's Lakes and Reservoirs**

| Category | Total Size (acres) | Number of Assessment Units |
|---|---|---|
| 1 | 1,145 | 13 |
| 2 | 5,542 | 17 |
| 3 | 21,585 | 130 |
| 4A | 0 | 0 |
| 4B | 0 | 0 |
| 4C | 0 | 0 |
| 5 | 66,143 | 37 |

**NOTE**: This information was generated using New Mexico's version of USEPA's ADB database. Category 5 above is a composite of New Mexico Categories 5A, 5B, and 5C.

Table 11 shows the number of New Mexico's lakes and reservoirs assigned to each Report category as defined in Table 1. Individual Report categories are presented for every assessment unit on the Integrated List in Appendix A.

By acreage, the majority of assessed lentic (i.e., not flowing) assessment units in New Mexico fall under Category 5. These 37 waterbodies comprise over 66,100 acres. Over 90% of these acres are freshwater reservoirs (as opposed to natural lakes). New Mexico has very few natural lakes compared to on-line and off-line reservoirs. These assessment units, along with the Category 5 river/stream water bodies, comprise New Mexico's CWA Section 303(d) waters. A list of Category 5-only waters was generated from SQUID and is included in Appendix A. New Mexico has yet to develop lake TMDLs, as noted by the absence of lakes or reservoirs in Category 4A.

Over 21,500 acres (130 lakes or reservoirs) are grouped under Category 3. Assessment units are listed in this category when current data are not available to support an attainment determination. Reasons for this generally include access issues, monitoring and/or analytical

logistics, and staff and financial resource constraints. Many of these lakes that are "Not Assessed" are very small in size, such as high elevation natural lakes. These lakes are logistically difficult to sample because they require long, steep hikes. SWQB sampled a representative subset of these lakes during 2007 as part of a nutrient criteria development grant. Also included in this category are a large portion of the over 23,000 acres of playa lakes that were part of a SWQB special study in the late 1980s and early 1990s when the USEPA provided specific CWA Section 314 monitoring funding. Attainment status for playas or lakes where adequate resources have not been available to re-monitor in more recent years were changed to "Not Assessed" during the 2008 listing cycle because these data were over 15 years old. Playas or lakes where data from only one sampling event were previously used to make Full Support determinations were changed to "Not Assessed" during the 2014 listing cycle because this is considered to be insufficient data to make attainment determinations under current assessment protocols (NMED/SWQB 2013c).

## *New Mexico's Summary of Designated Use Support for Lakes and Reservoirs*

A summary of the lake/reservoir attainment status for each designated use, as found in New Mexico's WQS, is presented in Table 12. These results are primarily based on targeted water quality monitoring conducted by the SWQB as part of rotational watershed surveys, best professional judgment, and qualitative assessments. Overall, 6 of the State's 16 assessed designated uses in lakes and reservoirs have been identified as impaired in at least one lake/reservoir by point or nonpoint sources of pollutants.

**Table 12. Individual Designated Use Support Summary for New Mexico Lakes and Reservoirs**

| Designated Use | Total Size (acre) | Size Assessed (acre) | Size Fully Supporting (acre) | Size Not Supporting (acre) | Size Not Assessed (acre) |
|---|---|---|---|---|---|
| Coldwater Aquatic Life | 31,092 | 30,981 | 110 | 30,871 | 111 |
| Coolwater Aquatic Life | 2,618 | 181 | 70 | 111 | 2,437 |
| Domestic Water Supply | 2,505 | 2,190 | 858 | 1,332 | 315 |
| Fish Culture* | 42 | - | - | - | 42 |
| High Quality Coldwater Aquatic Life | 1,896 | 1,605 | 93 | 1,513 | 291 |
| Industrial Water Supply | 17,142 | - | - | - | 17,142 |
| Irrigation | 5,970 | 4,750 | 4,750 | - | 1,220 |
| Irrigation Storage | 55,805 | 55,805 | 55,805 | - | - |
| Livestock Watering | 94,395 | 67,280 | 67,280 | - | 27,115 |
| Marginal Coldwater Aquatic Life | 740 | 615 | 615 | - | 125 |
| Marginal Warmwater Aquatic Life | 24,965 | 1,774 | - | 1,774 | 23,191 |
| Primary Contact | 93,324 | 65,328 | 65,328 | - | 27,996 |
| Public Water Supply | 32,055 | - | - | - | 32,055 |
| Secondary Contact | 1,091 | 594 | 594 | - | 498 |
| Warmwater Aquatic Life | 58,163 | 55,505 | 15,242 | 40,263 | 2,658 |
| Wildlife Habitat | 94,415 | 72,807 | 72,807 | - | 21,609 |

* = All Fish Culture, Public Water Supply, and Industrial Water Supply designated uses are defaulted to “Not Assessed” because no numeric criteria apply uniquely to these uses per 20.6.4.900 Subsection A NMAC.

## *Causes of Surface Water Impairment for Lakes and Reservoirs*

A summary of the impairment causes for New Mexico’s lakes and reservoirs is presented in Figure 13. These determinations are primarily based on water quality monitoring conducted by the SWQB as part of rotational watershed surveys and targeted monitoring. The SQUID-generated report that was used to generate the below figure is included in Appendix B. Standard USEPA cause categories included in SQUID were used to label the graphic. See the Appendix B for subcategory information.

| Cause of Impairment (from SQUID) | Acres Impaired |
|---|---|
| Mercury in Fish Tissue | 60,348 |
| PCB in Fish Tissue | 24,490 |
| Temperature | 18,160 |
| Nutrient/Eutrophication Biological Indicators | 8,652 |
| Aluminum | 3,768 |
| DDT in Fish Tissue | 3,059 |
| Arsenic | 1,667 |
| Dissolved Oxygen | 1,332 |
| Mercury, total | 198 |

NOTE: See Appendix B for complete list of categories and subcategories generated from SQUID.

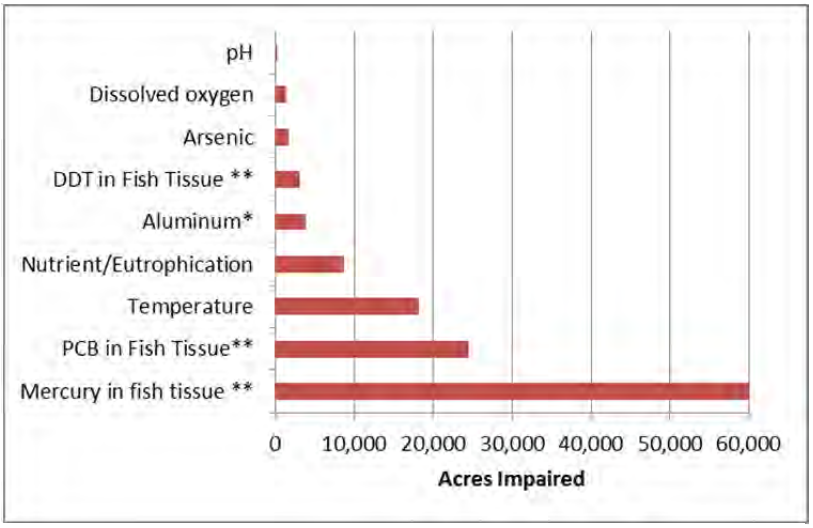



**Figure 12. Top 9 Causes of Surface Water Impairment for Lakes and Reservoirs**

Mercury and PCBs in fish tissue, and temperature are the top three causes of impairment of designated uses in New Mexico's lakes and reservoirs based on current WQS, available data, and current assessment procedures. USEPA considers fish or shellfish consumption advisories and supporting fish tissue data to be existing and readily available data that demonstrate non-attainment of CWA goals stating that waters should be "fishable" (CWA Section 101(a), USEPA 2005). New Mexico currently has fish consumption advisories based on mercury, DDT, and PCB levels in fish tissue (NMDOH *et al*. 2012). All waterbodies listed in the advisory are listed as impaired except waterbodies where available mercury in fish tissue data are below the New Mexico water quality criterion of 0.3 mg/kg. The dissolved oxygen impairment listing may be related to excessive nutrients.

SWQB recently developed nutrient assessment protocols for lakes and reservoirs, which were used in the 2014 listing cycle. In general, the total impaired acreages for individual pollutants remained fairly close to the 2012 listing, however nutrient/eutrophication impairments doubled from 2012, likely due to the newly developed assessment protocol as is expected to increase as this new nutrient assessment protocol is applied to future lakes and reservoirs around the state.

## *Sources of Surface Water Impairment for Lakes and Reservoirs*

Based on SWQB's revised approach for determining probable sources, and the fact that the state has not yet written any lake TMDLS, all impairments have been given a probably source of "source unknown". However, it is likely that atmospheric deposition of toxics will continue to be the dominant probable source, as was indicated in the 2012 Integrated Report (http://www.nmenv.state.nm.us/swqb/303d-305b/2012-2014/2012-2014USEPA-ApprovedNMReport.pdf).

## Lake Acidification

No lakes in New Mexico are known to have pH values consistently less than 5.0 standard units; therefore, there is no current need to develop methods to neutralize or restore buffering capacity in New Mexico lakes. Lakes most likely to be susceptible to acidic precipitation are characterized by alkalinities less than 5-10 mg $CaCO_3$/L, have small watersheds, and are located on granitic bedrock at high elevations. Data from fourteen such lakes indicate that the Truchas Lakes and Santa Fe Lake are the most susceptible to acidification due to low buffering capacity (Lynch *et al*., 1988). Further data for these and other high altitude natural lakes are needed to establish acidification trends that may be present in New Mexico. The high elevation natural lakes in New Mexico are all contained within National Forest boundaries.

## Blue-Green Algae

Blue-green algae, or cyanobacteria, are aquatic, photosynthetic, microscopic organisms that are naturally-occurring in lakes and streams. Algae forms when conditions include the presence of nutrient rich water that receives abundant sunlight. Toxic algae blooms are usually localized, sporadic, short-lived, and occur primarily in the summer and fall.

Though not naturally a toxin, algae can produce toxins which can make animals (except for fish) sick when consumed. Algae toxins have been shown to attack the nervous system of animals which can lead to death if not immediately treated. When swimming near algae blooms, people can develop skin rashes and might experience symptoms similar to that of food poisoning.

The presence of blue-green algae and reported illnesses from persons using these waters prompted the New Mexico State Parks and New Mexico Department of Game and Fish to post swimming advisories for Elephant Butte and Bill Evans Lake in recent years. NMED documented the presence of naturally-occurring blue-green algae species that are known to cause toxic effects, although the specific toxins were not identified through this qualitative review.

The SWQB recognizes concerns regarding the presence of blue-green algae toxins as a potential impairment to the swimmable goals of the CWA. The SWQB does not presently have assessment protocols regarding the conversion of swimming advisories due to toxic algae into CWA Section 303(d) impairment listings. The presence of blue-green algae above nutrient assessment threshold values found in assessed lakes has nevertheless been noted in the AU Comments for these waterbodies. SWQB is investigating how to best incorporate the presence of swimming advisories such as these into future integrated lists and reports.

## C.4 CWA Section 303(d) List – Impaired Waters in New Mexico

Assessment units noted as Category 5A, 5B, or 5C on the Integrated List comprise New Mexico's CWA Section 303(d) list of impaired waters. A listing of Category 5-only waters was generated from ADB and is included in the beginning of Appendix A. To see details on a particular impaired assessment unit, refer to the particular assessment unit entry on the full Integrated List (Appendix A). The causes and sources of these impairments are summarized by waterbody type (rivers/streams vs. lakes/reservoirs) in the section C.3 above. The associated Record of Decision (ROD) document maintained by the SWQB is a historical record of impaired surface waters (i.e., Category 5 waters) provided to reviewers and users of the list -- including USEPA -- to help track listing and de-listing information used in the development of New Mexico's Integrated List. USEPA does not require this document and does not take action to approve or disapprove of its contents. All assessment units do not have ROD entries because the ROD generally does not contain entries on assessment units that have not been assessed or have never been found to be impaired.

New Mexico's Integrated List also includes a projected "TMDL Schedule" for all assessment unit–parameter impairment pairs. This field contains either 1) estimated TMDL development year primarily based on SWQB's rotational monitoring schedule, consent decree deadlines, date since last intensively surveyed, upcoming permit renewals, severity of the pollution, which designated use(s) are impaired, etc.; or 2) the USEPA TMDL approval date (MM/DD/YYYY) if a TMDL has already been developed and approved. This date, as well as the "Monitoring Schedule" date, is ultimately dependent upon personnel and financial resources which change on an annual basis. Incorporation of the new Long Term Vision for the Clean Water Act Section 303(d) Program into SWQB's monitoring, assessment, and TMDL strategies will be reflected in the "TMDL Schedule" in the future.

**CWA Section 303d List of Impaired Water Record of Decision is available at:**
**http://www.nmenv.state.nm.us/SWQB/303d-305b/2008-2010/index.html**

## C.5 Evaluation of Statistical Surveys in New Mexico

Recently USEPA completed a statistical survey of the nation's rivers and streams as part of the National Aquatic Resource Surveys (NARS). Given USEPA's focus on statistical surveys, this evaluation provides and compares the data and assessment conclusions collected via EPA NARS statistical surveys and SWQB data collected via our census based watershed survey. The goals of this comparison was to determine: (1) if the collected dataset can provide statistically valid conclusions regarding the quality of New Mexico's streams and rivers, and (2) how these results compare with the conclusions of New Mexico's Section 303(d) List of Assessed Waters.

### Overall Comparison

The first comparison performed looked at the entire dataset from USEPA NARS and SWQB to determine the extent of impaired waters, statewide, implied by each dataset. In this case, any water impaired for any single parameter was considered impaired and the results are listed in Table 13. Based on the USEPA analysis, there was a total of 10,270 perennial stream miles targeted in New Mexico during their 2008-2009 survey. USEPA defined perennial streams as streams with flowing water between May and September, and they consider New Mexico to have 12,388 total miles of streams and rivers. This total may include waters on tribal and private lands. SWQB considers there to be 7,710 miles of streams within the public lands of the state, with 1,145 miles of these being ephemeral or intermittent streams. Of these, 83% (6,405 miles) have been assessed. According to USEPA's analysis, every mile of stream in New Mexico is impaired (rating of "poor") for at least one parameter. In contrast, SWQB data indicate that 4,170 miles of streams are impaired (54% of all streams, based on 7,710 total stream miles) for at least one parameter.

**Table 13. Percentage of Waters Impaired for at Least One Water Quality Parameter**

| | |
|---|---|
| EPA NARS | 100%[1] |
| SWQB 2014 303(d) List | 54%[2] |

[1] Based on 10,270 stream miles
[2] Based on 7,710 stream miles

One explanation for this disparity in results is that not all parameters used by USEPA to determine impairment are also used by SWQB. While SWQB does monitor and assess for a large number of water quality parameters, not all of them overlap with those selected by USEPA for NARS. It should be noted that while SWQB does have ecoregional nutrient thresholds, nutrient impairments are currently based on a weight-of-evidence approach to determine attainment of SWQB's narrative nutrient water quality criteria and a limited number of segment-specific criteria for total phosphorous. USEPA used the following parameters to determine impairment. Those with asterisks are assessed by SWQB as well, albeit with slightly to significantly different impairment-determination procedures:

Benthic*
Periphyton
Specific Conductance*
Total Nitrogen*
Total Phosphorous*
Bed Sediment*
Instream Cover
Riparian Vegetation
Riparian Disturbance
*E. coli**
Fish

When a comparison of common parameters was conducted, 8,451 miles of streams were impaired based on a USEPA NARS rating of "poor", which is about 82% of all streams in New

Mexico. If a rating of "fair" was also considered to indicate impairment, then 9,763 miles (95%) of streams are impaired. In contrast, SWQB data indicate that 2,565 miles (33%) of streams are listed as impaired for at least one of these parameters. The results are summarized in Table 14.

**Table 14. Percentage of Waters Impaired for at Least One Common Water Quality Parameter**

| | |
|---|---|
| EPA NARS | 82% - 95%[1] |
| SWQB 2014 303(d) List | 33%[2] |

[1] Range of values based on whether or not "fair" implies full support
[2] Based on 7,710 stream miles

## Parameter Comparison

The second comparison performed was done on a parameter-by-parameter basis. SWQB and USEPA NARS data were compared for the common chemical parameters listed above. Common non-chemical parameters were excluded from the comparison since the standards for these are qualitative and thus more difficult to compare. The results of the comparison are listed in Table 15. A direct comparison is difficult to make for two primary reasons:

1. SWQB only has specific conductance standards for high quality cold water streams, which is only a small percentage of those streams included in NARS.

2. In many cases, SWQB's nutrient eco-regional thresholds did not align with any of the thresholds for NARS. For example, in the Southwestern Tablelands Ecoregion, the maximum TN and TP thresholds (for warmwater) were 0.45 mg/L and 0.03 mg/L, respectively. The NARS thresholds for TN and TP for "good" in this same Ecoregion were 0.698 mg/L and 0.052 mg/L. One explanation for this discrepancy may be that USEPA used the value at the 25$^{th}$ percentile of the reference distribution to define the "good"-"fair" boundary. SWQB, in contrast, used the 50$^{th}$ percentile to define their thresholds.

**Table 15. Comparison of Impaired Waters Based on Individual Water Quality Parameters**

| | SWQB | | USEPA NARS |
|---|---|---|---|
| | Miles Impaired or Above Threshold Value | % Impaired[1] | % Impaired |
| Specific Conductance | 325 | 4% | 25% |
| *E. Coli* | 1,159 | 15% | 17% |
| Total Phosphorous | 24[2] / 1,327[3] | 0.3%[2] / 91%[4] | 72% |
| Total Nitrogen | 2,902[3] | 94%[5] | 46% |

[1] Based on 7,710 stream miles per SWQB analysis
[2] SWQB impairment based on segment-specific criteria
[3] Miles above eco-regional threshold
[4] Based on 1,464 stream miles assessed for TP (100 sites were sampled for TP)
[5] Based on 3,089 stream miles assessed for TN (156 sites were sampled for TN)

## Site Comparison

The last comparison performed was done on a site by site basis to determine if the USEPA sites were actually representative of the entire state. A total of 31 sites were sampled in New Mexico as part of USEPA's assessment. SWQB staff compared these locations to those where SWQB has collected water quality data in the past ten years and found that all but 13 sites were within two miles of an existing SWQB station. Only three sites, all in wilderness or very remote locations, were more than five miles from an existing station. The results of this comparison are listed in Table 16.

In general, USEPA's data suggest that a much larger number of the sites are impaired than is indicated by SWQB data, with the exception of nutrients and *E. coli*. For nutrients, the SWQB sites listed as "impaired" are actually those in which the Total Nitrogen or Total Phosphorous levels were higher than the eco-regional threshold. New Mexico currently has narrative nutrient criteria, and determines nutrient impairment through a weight of evidence approach. For comparison of NARS to SWQB data, however, the ecoregional thresholds were used as a surrogate for numeric criteria.

Even with information provided by USEPA on how their "good", "fair" and "poor" thresholds were established, it was difficult to draw clear parallels to SWQB thresholds and standards. This was particularly true for the biological and riparian parameters, since the state only assesses for some of these parameters in limited ecoregions and water types, or does not assess for them at all (e.g. instream cover, riparian vegetation, riparian disturbance). For purposes of comparison between the NARS and SWQB data, however, USEPA's categories of "good" and "fair" were used to describe full-support sites.

**Table 16. Comparison of Individual Site Data from USEPA NARS and SWQB**

| | | Number of Impaired Sites | |
|---|---|---|---|
| | | USEPA NARS | SWQB |
| Biological | Benthic[1] | 17 | 1 |
| | Periphyton | 11 | 0 |
| | *E. Coli* | 1 | 7 |
| | Fish[2] | 4 | 3 |
| Chemical | TN[3] | 14 | 27 |
| | TP[3] | 18 | 29 |
| | Specific Conductance[4] | 5 | 1 |
| Riparian | Bed Sediment | 10 | 4 |
| | Instream Cover[5] | 10 | 0 |
| | Riparian Vegetation[5] | 14 | 0 |
| | Riparian Disturbance[5] | 23 | 0 |

[1] Benthic macroinvertebrates are only assessed by SWQB in limited ecoregions and water types
[2] SWQB fish impairment is based on fish tissue samples and concentrations of mercury or PCBs
[3] SWQB sites listed had a TN or TP value that exceeded the eco-regional threshold
[4] SWQB's specific conductance standard only applies to High Quality Coldwater streams
[5] SWQB does not have an assessment protocol or water quality standard for this parameter

# PART D - GROUND WATER MONITORING AND ASSESSMENT

## D.1 Ground Water in New Mexico

New Mexico's ground water resources are of vital importance in sustaining life, and must be preserved and protected for both present and future generations. Approximately 78% of New Mexicans depend on ground water for drinking water. This is a decrease from 90% four years ago due to the recent addition of surface water to augment the Cities' of Albuquerque and Santa Fe public water supply. 81% of New Mexicans are served by public systems with water derived from ground water sources and over 170,000 New Mexicans depend on private wells for drinking water. Nearly half of the total water annually withdrawn for all uses in New Mexico, including agriculture and industry, is ground water, the only practicable source of water in many areas of the state. Overall, the quality of these waters is assumed to be good, although there are significant pollution problems known to affect certain areas of New Mexico.

New Mexico's hydrogeology is highly variable and complex, and ground water quality and availability is also highly variable. Sedimentary deposits (mainly sandstone, limestone, or unconsolidated sand and gravel) are the most productive and widespread aquifers in New Mexico. Valley-fill aquifers of major importance occur along the Rio Chama, the San Juan River, and the Pecos River. These aquifers are typically less than 200 feet thick and commonly provide water containing less than 1,000 milligrams per liter of total dissolved solids. A major aquifer occurs in the Rio Grande Valley where basin-fill deposits attain thicknesses of up to 20,000 feet, although only the uppermost several thousand feet contain fresh water. This aquifer provides a source of water for Albuquerque, Rio Rancho, and Santa Fe. Significant basin-fill aquifers also occur in the southwestern area of the state. The High Plains aquifer (primarily the Ogallala Formation) is a major water source along the eastern border of New Mexico. Major sandstone aquifers are also located in the San Juan Basin in the northwestern part of the state and limestone aquifers are of importance in the south-eastern part and locally in the central and western parts. In some areas with significant ground water use, ground water levels have declined due to withdrawals in excess of recharge (Bartolino and Cunningham, 2003).

## D.2 Ground Water Monitoring and Protection Programs

New Mexico relies on several programs established under a variety of statutory authorities to protect and maintain ground water quality which are primarily conducted by the NMED Ground Water Quality Bureau (GWQB). The primary statute dealing with ground water quality management is the WQA. This Act created the WQCC and authorized it to adopt ground water quality protection regulations and standards. Key features of the Act and regulations relating to ground water include:

- A requirement for dischargers to obtain a ground water discharge permit to prevent ground water contamination from discharges that have the potential to impact ground water quality;
- Requirements for reporting and addressing spills and releases;
- Development of ground water quality standards for ground water contaminants (20.6.2.3103 NMAC);
- Development of ground water pollution assessment and abatement regulations and underground injection control requirements; and
- Provisions for civil and criminal penalties for violation of the regulations and standards.

Programs established under the WQA, as well as under the New Mexico Oil and Gas Act, Hazardous Waste Act, Ground Water Protection Act, Solid Waste Act, Emergency Management Act, Voluntary Remediation Act, and Environmental Improvement Act, also contain provisions which are designed to protect ground water quality and which implement the ground water regulations and water quality standards directly or by reference. In addition, the State cooperates with local and federal governments on various programs relevant to ground water pollution control.

Ground water quality monitoring is typically required at permitted facilities to determine baseline ground water quality, serve as a leak detection method, and as part of remediation efforts to determine whether or not remediation efforts are effective. The GWQB also offers free well water quality screening at water fairs routinely held around New Mexico.

## D.3 Ground Water Quality Status

In the late 1970s following promulgation of the WQCC regulations, the NMED began evaluating existing information on vulnerable aquifers and major known and potential contamination sources. This evaluation has become an ongoing process, as the focus has shifted from identification of major potential sources of contamination to specific questions about known or suspected ground water contamination problems.

Approximately 278 facilities with ground water discharge permits have confirmed ground water contamination, based on data from the second quarter of state FY2014. These facilities are required to take corrective actions to address the contamination pursuant to permit conditions or abatement plans. An additional 236 sites with potential or confirmed ground water contamination are being addressed under spill response regulations, the voluntary remediation program or abatement regulations.

**Ground Water Sampling**

## D.4 Ground Water Contamination Sources

More than half of ground water contamination issues in the state have been caused by nonpoint sources. While household septic tanks or cesspools are the predominant source of nonpoint source contamination of ground water in New Mexico, such degradation may also be caused by other diffuse sources such as residual minerals from evapotranspiration, areas disturbed by mineral exploration, urban runoff, or application of agricultural chemicals. Point source categories include publicly and privately owned sewage treatment plants with flows over 5,000 gallons per day (anticipated Environmental Improvement Board approval in July 2014), dairy operations, mines, food processing operations, industrial discharges, landfills, above and underground storage tanks, petroleum processing and storage, and accidental spills or leaks.

**Synthetically-lined Dairy Wastewater Lagoon**

## D.5 Significant Ground Water Issues

### *Dairy Discharge Permit Regulations*

The WQA was amended in 2009 to require the consideration and adoption of industry-specific dairy wastewater discharge regulations by the WQCC. NMED completed development of these regulations pursuant to a schedule adopted by the WQCC. The process included numerous public meetings, meetings of an NMED-created advisory committee, and negotiations with interested stakeholders. A petition for rule change and proposed dairy discharge regulations were filed with the WQCC in December 2009 and a hearing on the proposed regulations was held by the WQCC in April and June 2010. After an appeal from the dairy industry and negotiations between the dairy industry and NMED, the WQCC approved amended rules in December 2011 and the rule became effective on December 31, 2011. NMED issued 126 draft permits under the Dairy Rule between January 2012 and June 2013, finalized 21 permits and received comments on the remaining 105 draft permits.

### *Copper Rule Permit Regulations*

Amendments to the WQA in 2009 also included a requirement that the WQCC consider and adopt industry-specific copper mine discharge regulations following the promulgation of the Dairy Rules. NMED completed development of these regulations pursuant to a schedule adopted by the WQCC. The process included several public meetings, meetings of NMED-created advisory and technical committees and negotiations with interested stakeholders. A petition for rule change and proposed copper mine rule discharge regulations were filed with the WQCC in January 2012 and a hearing on the proposed regulations was held by the WQCC in April and June 2013. The rules were approved by the WQCC and became effective in on December 1, 2013. The Copper Mine Rule was appealed to the New Mexico Court of Appeals. Motions to Stay the Copper Mine Rule pending appeal were denied by the NM Court of Appeals on May 7, 2014.

### *Regulation of Discharges from Los Alamos National Laboratory (LANS)*

Los Alamos National Security, LLC (LANS) has numerous operations at Los Alamos National Laboratory in which discharges of wastewater to the environment occur. Several regulatory agencies oversee activities at LANS including the Ground Water Quality Bureau in collaboration with other Federal and State agencies to ensure appropriate regulatory oversight and reduce dual regulation where applicable. Because of the historical and geographical extent of LANS's operations under the DOE there is considerable public interest as it pertains to environmental protection.

Unplanned and unauthorized releases into the environment are reported to NMED for its review and the GWQB responds to any corrective actions taken by LANS to address these releases and in 2013, NMED responded to 27 reportable releases. NMED also responded to four Notices of Intent for proposed planned discharges at the facility during 2013. LANS currently has four discharges which have been deemed to be under the authority of the WQCC regulations and are in various stages of the permitting process: the Radioactive Liquid Waste Treatment Facility (RLWTF); the Sanitary Waste Water System (SWWS); Septic Tank/Leachfield Systems; and on-site treatment of contaminated ground water.

NMED required LANS to submit a comprehensive and up-to-date discharge permit application for the RLWTF that reflects changes that have occurred during the lengthy WQA permitting process and planned future upgrades to the facility, which LANS has complied with. LANS and DOE have appealed the issuance of their Hazardous Waste Facility Permit, including certain provisions related to the RLWTF. Therefore, the discharge permit addresses regulation of the RLWTF and is a critical element of the negotiations to settle the litigation.

NMED received an application for renewal and modification of the SWWS discharge permit in July 2010. The facility is the central domestic wastewater treatment system for domestic wastewater generated at LANS and discharges to permitted NPDES outfalls or recirculates the treated effluent through other process control systems at the laboratory. NMED is working on the draft discharge permit which is anticipated to be sent out for public comment in early summer 2014.

LANS has numerous facilities which are not connected to the central SWWS and still discharge domestic wastewater to multiple treatment and disposal septic tank/leachfield systems throughout LANS. NMED has determined that these discharges are under the authority of the WQCC Regulations and are required to be regulated under a discharge permit. LANS submitted a discharge permit application in April 2006 and NMED has been in ongoing communication with LANS to obtain information on the extent of the systems in order to draft a discharge permit. There have been several updates and modifications from the original application to which NMED required an updated application be submitted. LANS submitted an updated application in 2010 that has formed the basis of NMED's draft discharge permit, which is anticipated to be sent out for public comment in early summer 2014.

Upon review of a Notice of Intent submitted to NMED for the on-site treatment and land application of contaminated ground water, NMED has determined that such processes and discharges are required to be regulated under a discharge permit. LANS submitted its application in December 2011 and NMED is currently in the process of acquiring additional information from LANS in order to develop a draft permit. NMED is working on the draft discharge permit which is anticipated to be sent out for public comment in early summer 2014.

## *Ground Water Protection Program Evaluation*

Prevention of ground water contamination is more cost effective and technically achievable than remediation. Consequently, New Mexico continually works to improve the effectiveness of the ground water discharge permit program. Improved permit conditions have been developed to address issues identified as needing additional attention, such as contingency and closure plans, lining dairy lagoons with synthetic liners, septic system maintenance, the use of reclaimed wastewater and provision of financial assurance. The program has created new permit templates for particular types of facilities such as car washes and grease trap waste disposers. The GWQB has also entered into a professional services contract with a consultant to evaluate, develop improvement recommendations, and develop an implementation process for managing discharge permits. The evaluation and development phases of work are anticipated to be completed by the end of state FY2014.

The State continues to work cooperatively with industry groups. Many facilities now view the permitting process as a routine part of their business startup and day-to-day operations. Furthermore, many lending institutions are working closely with the State to ensure that the facilities have obtained necessary permits before business loans are approved or renewed.

Ground water protection program effectiveness is documented through site-specific monitoring at permitted facilities and facilities that are abating ground water contamination. Although there is no overall index to determine the rate at which ground waters are polluted or remediated, state programs that protect the quality of the State's ground water have been successful in ground water quality protection. Based on ground water monitoring data maintained by NMED, approximately 70% of facilities with ground water discharge permits have not caused exceedences of state ground water quality standards.

## *Assessment of Grants Mining District*

In 2010, NMED and USEPA, in conjunction with federal, state, and tribal governmental entities developed a five-year plan to assess uranium mining impacts in the Grants Mining District in northwestern New Mexico, identify future work that may be required, and coordinate, guide and maximize available agency resources of the many federal, state and tribal government entities.

The GWQB and EPA assessed the public health and environmental impacts resulting from extraction, processing, disposal and releases from legacy uranium mining and milling activities in the Grants Mining District. The Bureau's Superfund Oversight Section screening assessments of 78 of the identified 97 legacy uranium mine sites in the District, sampled approximately 60 existing wells in the San Mateo Creek Basin, and reassessed potential impacts from two uranium mill sites that are currently under the DOE Long Term Stewardship Program.

Based on assessments of the Anaconda Company Bluewater and Ambrosia Lake Phillips former mill sites, DOE agreed to perform additional site characterization to address concerns identified during the assessments. Similarly, the Bureau of Land Management (BLM) agreed to review the findings of the screening assessments of mines on BLM-managed lands.

In addition to mining/milling facility assessments, USEPA has assessed 451 exterior structures and has completed radon surveys for 209 interior structures, with an emphasis on residences that may have been affected by legacy mining and milling activities where there may be a threat to human health and the environment. Based on these assessments, initial removal and radon abatement activities are planned for 13 properties in the communities of Bibo, Seboyeta, and San Mateo. The Superfund Oversight Section is developing strategies for assessment and cleanup criteria, as necessary, for sources of sediment, surface and ground water, and air contamination originating from these mines. This plan acknowledges that impacts from uranium mining and milling extend beyond the Grants Mineral Belt. The proposed actions may therefore be extended to areas with similar activities.

# PART E – PUBLIC PARTICIPATION

All individuals living and working in the State affect water quality and are affected by water quality. Public awareness and involvement is therefore crucial to the successful implementation of water quality programs. New Mexico's water quality programs promote a multi-stakeholder, consensus-based public participation process. By actively pursuing and considering public input and involvement, New Mexico can more effectively effect changes in behavior and actively improve decision-making concerning water quality with greater public acceptance and support for those decisions.

The public participation requirements of specific water quality programs are specified in 40 CFR Section 25.4 and described in the WQMP/CPP *(*NMWQCC 2011). At a minimum, the public participation process for New Mexico's water quality programs consists of the following:

- Providing the public with the information and assistance necessary for meaningful involvement;
- Providing a central location of reports, studies, plans, and other documents;
- Maintaining a list of affected or interested parties and stakeholders; and
- Notifying stakeholders in a timely fashion prior to consideration of major decisions (generally at least 30 days).

The public participation associated with the development of this Integrated Report and associated Integrated List (Appendix A) was conducted in accordance with these principles, and included notifying stakeholders of a 60-day public comment period on the draft 2014-2016 Integrated Report and List. Public notice on the Integrated List is also a CWA requirement. Responses to public comments on the Integrated Report and List are included in Appendix C.

**The State of New Mexico Statewide Water Quality Management Plan and Continuing Planning Process are available at: http://www.nmenv.state.nm.us/swqb/Planning/WQMP-CPP/**

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