# Colfax Regional Water Plan


July 2016

State of New Mexico
Interstate Stream Commission
Office of the State Engineer

*Cover photograph:* Lake Dorothy in the Sugarite watershed, 2008

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*Note: Appendix designations indicate corresponding section in plan.*

## List of Acronyms

| | |
|---|---|
| °F | degrees Fahrenheit |
| ac-ft/yr | acre-feet per year |
| AMO | Atlantic multidecadal oscillation |
| BBER | Bureau of Business and Economic Research |
| BLM | Bureau of Land Management |
| DBS&A | Daniel B. Stephens & Associates, Inc. |
| EPA | U.S. Environmental Protection Agency |
| FEMA | Federal Emergency Management Agency |
| ft amsl | feet above mean sea level |
| FY | fiscal year |
| GIS | geographic information system |
| gpcd | gallons per capita per day |
| GWQB | Ground Water Quality Bureau [New Mexico Environment Department] |
| ICIP | Infrastructure Capital Improvement Plan |
| in/yr | inches per year |
| IPCC | Intergovernmental Panel on Climate Change |
| LQ | location quotient |
| MDWCA | mutual domestic water consumers association |
| NASS | National Agricultural Statistics Service |
| NCDC | National Climatic Data Center |
| NEPA | National Environmental Policy Act |
| NMAC | New Mexico Administrative Code |
| NMBGMR | New Mexico Bureau of Geology & Mineral Resources |
| NMED | New Mexico Environment Department |
| NMG&F | New Mexico Department of Game and Fish |
| NMISC | New Mexico Interstate Stream Commission |
| NMOSE | New Mexico Office of the State Engineer |
| NMSA | New Mexico Statutes Annotated |
| NMSU | New Mexico State University |
| NMWQCC | New Mexico Water Quality Control Commission |
| NOAA | National Oceanic and Atmospheric Administration |

| | |
|---|---|
| NPDES | National Pollutant Discharge Elimination System |
| NPL | National Priorities List |
| NRCS | Natural Resources Conservation Service |
| NWS | National Weather Service |
| PCB | polychlorinated biphenyl |
| PDO | Pacific decadal oscillation |
| PDSI | Palmer Drought Severity Index |
| PPP | project, program, and policy |
| PSTB | Petroleum Storage Tank Bureau (NMED) |
| RTI | Resource Technology, Inc. |
| RWP | regional water plan |
| SNOTEL | snowpack telemetry |
| SWFSC | Southwest Fire Science Consortium |
| TDS | total dissolved solids |
| TMDL | total maximum daily load |
| U.S. EPA | U.S. Environmental Protection Agency |
| UNM | University of New Mexico |
| USBR | U.S. Bureau of Reclamation |
| USDA | U.S. Department of Agriculture |
| USFS | U.S. Forest Service |
| USGCRP | U.S. Global Change Research Program |
| USGS | U.S. Geological Survey |
| UST | underground storage tank |
| UWB | underground water basin |
| WBP | watershed based plan |
| WRCC | Western Regional Climate Center |
| WSD | water and sanitation district |
| WUA | water users association |
| WWTP | wastewater treatment plant |

## Executive Summary

The Colfax Water Planning Region, which includes Colfax County (Figure ES-1), is one of 16 water planning regions in the State of New Mexico. Regional water planning was initiated in New Mexico in 1987, its primary purpose being to protect New Mexico water resources and to ensure that each region is prepared to meet future water demands. Between 1987 and 2008, each of the 16 planning regions, with funding and oversight from the New Mexico Interstate Stream Commission (NMISC), developed a plan to meet regional water needs over the ensuing 40 years. The *Colfax Regional Water Plan* was completed March 2003 and accepted by the NMISC in April 2003.

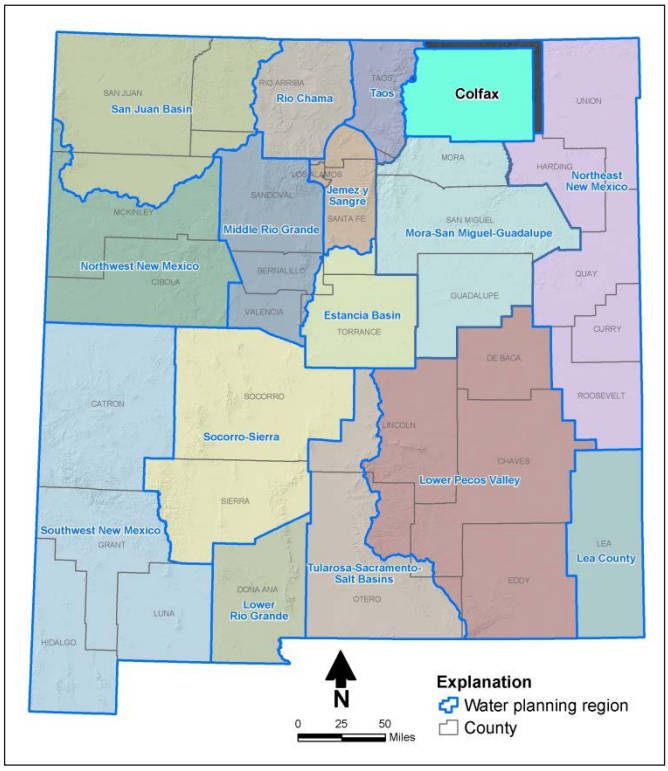



*Figure ES-1. Colfax Water Planning Region*

The purpose of this document is to provide new and changed information related to water planning in the Colfax region and to evaluate projections of future water supply and demand for the region using a common technical approach applied to all 16 planning regions statewide. Accordingly, this regional water plan (RWP) update summarizes key information in the 2003 plan and provides updated information regarding changed conditions and additional data that have become available.

Based on the updated water demand (Figure ES-2) data, Figure ES-3 illustrates the total projected regional water demand under high and low demand scenarios, and also shows the administrative water supply and the drought-adjusted water supply. Due to an anticipated declining economy, future water demand projections do not reflect substantial growth. However, in the Colfax region surface water supplies agriculture and many municipal users, making up more than 90 percent of the total supply in 2010; thus, the region is very vulnerable to drought. Even without significant growth in demand, the estimated shortage in drought years is expected to range from 52,000 to 53,000 acre-feet (Figure ES-3). Strategies that the region identified to address drought shortages included aquifer mapping to characterize additional groundwater supplies, watershed projects to minimize forest fire impacts and protect water quality, efficiency measures to limit losses during drought, and development of a drought contingency plan. The region also identified dam safety and drinking water infrastructure as key implementation issues.

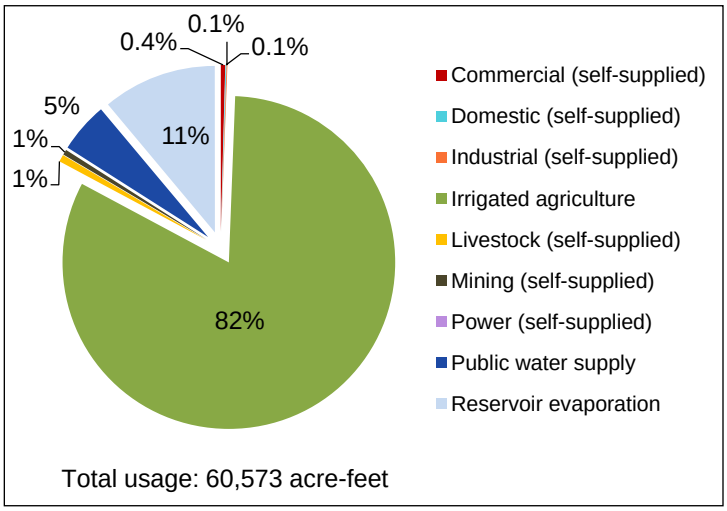



*Figure ES-2. Total Regional Water Demand, 2010*

Note: Tribes and Pueblos in New Mexico are not required to provide water use data to the State. Therefore, tribal water use data are not necessarily reflected in this figure.

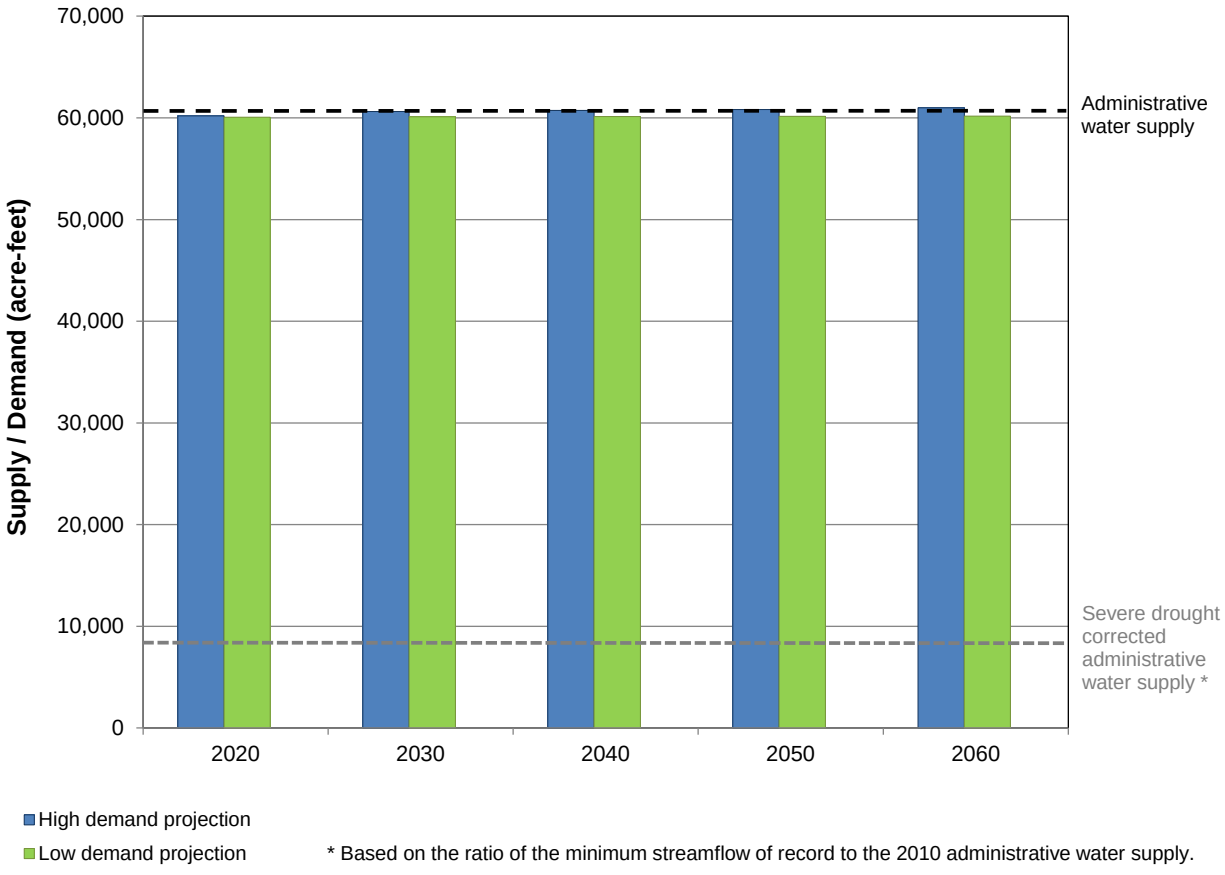



*Figure ES-3. Available Supply and Projected Demand*

Note: Tribes and Pueblos in New Mexico are not required to provide water use data to the State. Therefore, tribal water use data are not necessarily reflected in this figure.

## Planning Method

For this RWP , water supply and demand information was assessed in accordance with a common technical approach, as identified in the *Updated Regional Water Planning Handbook: Guidelines to Preparing Updates to New Mexico Regional Water Plans* (where it is referred to as a common technical *platform*) (Handbook). This common technical approach outlines the basis for defining the available water supply and specifies methods for estimating future demand in all categories of water use:

**Common Technical Approach**

To prepare both the regional water plans and the state water plan, the State has developed a set of methods for assessing the available supply and projected demand that can be used consistently in all 16 planning regions in New Mexico. The objective of applying this common technical approach is to be able to efficiently develop a statewide overview of the balance between supply and demand in both normal and drought conditions, so that the State can move forward with planning and funding water projects and programs that will address the State's pressing water issues.

- The method to estimate supply (referred to as the *administrative water supply* in the Handbook) is based on withdrawals of water as reported in the *New Mexico Water Use by Categories 2010* report prepared by the New Mexico Office of the State Engineer (NMOSE). Use of the 2010 data provides a measure of supply that considers both physical supply and legal restrictions (i.e., the water is physically available for withdrawal, and its use is in compliance with water rights policies) and thus reflects the amount of water available for use by a region.

- An estimate of supply during future droughts is also developed by adjusting the 2010 withdrawal data based on physical supplies available during historical droughts.

- Projections of future demands in nine categories of water use are based on demographic and economic trends and population projections. Consistent methods and assumptions for each category of water use are applied across all planning regions.

## Public Involvement

The updated Handbook specifies that the RWP update process "shall be guided by participation of a representative group of stakeholders," referred to as the steering committee. Steering committee members provided direction for the public involvement process and relayed information about the planning effort to the water user groups they represent and other concerned or interested individuals.

In addition to the steering committee, the water planning effort included developing a master stakeholder list of organizations and individuals interested in the water planning update. This list was developed from the previous round of water planning and then expanded through efforts to identify representatives from water user groups and other stakeholders. Organizations and

individuals on the master stakeholder list were sent announcements of meetings and the RWP update process and progress.

Over the two-year update process, eight meetings were held in the Colfax region. These meetings identified the program objectives, presented draft supply and demand calculations for discussion and to guide strategy development, and provided an opportunity for stakeholders to provide input on the strategies that they would like to see implemented. All steering committee meetings were open to the public and interested stakeholders, and participation from all meeting attendees was encouraged.

## Key Water Issues

The key water supply updates and issues currently impacting the Colfax region include the following:

- Much of the Colfax region relies on surface water and is therefore vulnerable to drought. In addition to the many agricultural surface water users, many public water systems rely on surface water and are particularly vulnerable to drought.
- Many irrigation ditches within the Springer Ditch Company network, Antelope Valley Irrigation District, Miami Water Users Association, and Vermejo Conservancy District, and at other locations within the region, are faced with large losses of water from inefficient irrigation delivery systems. Many of the irrigation works include unlined ditches that traverse long distances between the diversion points and the end uses. As there is little groundwater use in the area of most of these ditches, seepage losses do not result in groundwater recharge and thus provide no benefit to the region. Improving irrigation efficiency is therefore a key issue in the region.
- Due to the large amount of forested land in the region, coupled with the recent drought conditions, the threat of wildfire and subsequent sedimentation impacts on streams and reservoirs remains a key planning issue.
- Previous fires in the region, including the 2011 Track fire and the 2002 Ponil Complex fire, have created the need for ongoing rehabilitation and monitoring efforts.
- The City of Raton is faced with a major infrastructure issue in that the spillway at Lake Maloya is only 10 percent of the required size to route stormwater runoff. The City is also faced with loss of population, meaning that there is declining revenue without declines in base costs. State funding is not adequate to address the current dam safety regulations.
- Colfax County is seeking funding to conduct aquifer mapping to better define groundwater resources in the County.

- A 2011 Preliminary Engineering Report (PER) for the Village of Angel Fire Water System indicated that approximately $16 million is needed for infrastructure upgrades.
- Water for the Village of Angel Fire municipal water system is supplied from wells located in and around the Village. The Village adopted an emergency drought proclamation in 2011.
- The Village of Cimarron is working on an upgrade of its wastewater treatment facility that will address discharge compliance issues associated with wastewater reuse. The upgrades will allow the Village to reuse 100 percent of its wastewater for irrigation/land application.
- The Village of Cimarron will also be completing a PER for repairs of the Cimarroncito Dam.
- The Village of Maxwell is experiencing problems with their wells. The wells are shallow and have been experiencing shortages due to drought.
- The Village of Eagle Nest has two wells that provide adequate supply, but is in need of additional storage.
- The New Mexico Environment Department (NMED) Surface Water Bureau completed a wetland map of the watershed using remote sensing.
- Because of the large surface water dependence in Colfax County, there is considerable interest in watershed protection and restoration. In 2011 the Cimarron Watershed Alliance completed a watershed based plan to address water quality impairment.
- Hydraulic fracturing has been conducted in older coalbed methane wells in Colfax County. The potential for adverse water quality impacts resulting from improperly managed surface or casing operations associated with hydraulic fracturing for oil and gas extraction has been of concern to some in the region.
- The region encompasses 59, mostly small, drinking water systems. These small systems face challenges in financing infrastructure maintenance and upgrades and complying with water quality monitoring and training standards.
- Though most of the region is heavily dependent on surface water, in areas such as the Moreno Valley and the Capulin basin where there is significant groundwater use, available spatial and temporal data are inadequate to accurately track water level trends; additional groundwater monitoring is needed.
- The *Agreement for Settlement of Pending Litigation and Other Disputes Concerning State Engineer Permit No. 71,* which was recorded with the Colfax County Clerk on September 11, 2006, determines the amount of water from Eagle Nest Reservoir to which each Party is entitled. The agreement limits diversions by junior surface and groundwater

users during times of drought to ensure delivery to downstream water users. Parties include downstream users of Eagle Nest surface water as well as groundwater users in the Moreno Valley. In low water years this can severely affect deliveries, and is of particular concern to the Village of Angel Fire, which does not hold sufficient water rights to meet demand during the low water years.

- The accepted water plan identified potential contamination of shallow groundwater and domestic wells due to septic tanks in the Ute Park area in Cimarron Canyon between Eagle Nest Reservoir and the Village of Cimarron as a potential water quality concern; this issue is still of concern to the region.
- Fish consumption advisories have been issued for Eagle Nest and other lakes in the region. The source of the mercury is most likely atmospheric deposition outside of the planning region.
- The Federal Emergency Management Administration released new floodplain maps of Colfax County in 2009. Minimizing flood risk is a key issue in the region.

## Strategies to Meet Future Water Demand

An important focus of the RWP update process is to both identify strategies and processes for meeting future water demand and consider their implementation. To help address the implementation of new strategies, a review of the implementation of previous strategies was first completed.

The 2003 *Colfax Regional Water Plan* recommended the following strategies for meeting future water demand:

- Agricultural water conservation
- Drought contingency planning
- Watershed management
- Dredging for improved reservoir storage
- Municipal and County water conservation ordinances
- Water rights transfers or leases
- Appropriating and reserving groundwater
- Developing 40-year plans (local entities)
- County-wide septic/water quality ordinances
- Municipal reuse for agriculture or recreation

- Growth management and land use planning
- Public outreach and education

The Colfax Steering Committee reviewed each of the strategies and indicated that they are all still relevant, though some are being refocused as new recommended strategies.

During the two-year update process the Colfax Steering Committee and stakeholders identified projects, programs, and policies (PPPs) to address their water issues. Some water projects were already identified through the State of New Mexico Infrastructure Capital Improvement Plan, Water Trust Board, Capital Outlay, and NMED funding processes; these projects are also included in a comprehensive table of PPP needs. The information was not ranked or prioritized; it is an inclusive table of all of the PPPs that regional stakeholders are interested in pursuing. In the Colfax region, projects identified on the PPP table are primarily water system infrastructure, irrigation system upgrades, and watershed restoration projects.

At steering committee meetings held in 2015 and 2016, the group discussed projects that would have a larger regional or sub-regional impact and for which there is interest in collaboration to seek funding and for implementation. The following key collaborative projects were identified by the steering committee and Colfax region stakeholders:

- *Forest and Watershed Health*. Continued landscape-scale forest and watershed restoration in Colfax County is needed to limit catastrophic fires, mitigate negative effects of wildfire, and protect/restore water quality. The project includes logging/small-diameter timber extraction for forest health, invasive species treatment, stream and river restoration, rangeland health, and grazing management.

- *Conveyance System Efficiencies*. The efficiency of all irrigation systems in Colfax County can be increased significantly by updating diversion works, measuring devices, cleaning the ditches, and checking the grades for proper slope. The ditches can also be lined with an impervious barrier or replaced with pipelines. Long ditches, such as the Springer Ditch, where there is little groundwater use, are affected by significant losses without a corresponding recharge benefit. Multiple water users, including those with junior water rights, may benefit by minimizing ditch losses.

- *Eagle Nest Release Management*. The Middle Cimarron River supports a vibrant fishery between Eagle Nest Dam and the Village of Cimarron. Arranging for voluntary transactions to support sufficient flow during winter months would provide for a sustainable trout habitat in this region. A study commissioned by New Mexico Department of Game and Fish in 2014 determined that "New Mexico has more than 160,000 resident and nonresident anglers who spent $268 million a year on fishing related activities." The Middle Cimarron River provides an economic net benefit for all of Colfax County and much of Taos, Mora, and San Miguel counties. Release

management also considers voluntary transactions and release arrangements to support flow during summer months adequate to maintain temperature requirements for the designated use.

- *Regional Collaboration for Drinking Water Systems*. This project would involve collaboration to help small water systems in the region build capacity by sharing resources on issues such as accounting, use of equipment, planning, and, where feasible, water supply.

- *Drought Contingency Plan*. A drought contingency plan for Colfax County would identify prior appropriation arrangements for purchase/leasing of water, identify "triggers" for implementation of plan, identify conservation methods and requirements, and explore alternative water resources for both agriculture and potable use.

- *Dam Safety*. Multiple dams in the Colfax region have regulatory compliance issues and aging infrastructure, which in some cases represent a safety hazard. While repairs and upgrades are needed, sufficient funding to complete the upgrades required to comply with current regulations may not be available.

- *Aquifer Mapping.* The proposed project is to complete a study to determine groundwater resources and quality in the Colfax region and the surrounding counties of Harding, Mora, and Union. The policy intent is to identify groundwater resources for future development, identify areas that should not see further development, and educate the public about groundwater resources, management, and conservation.

The 2016 Regional Water Plan characterizes supply and demand issues and identifies strategies to meet the projected gaps between water supply and demand. This plan should be added to, updated, and revised to reflect implementation of strategies, address changing conditions, and continue to inform water managers and other stakeholders of important water issues affecting the region.

# 1. Introduction

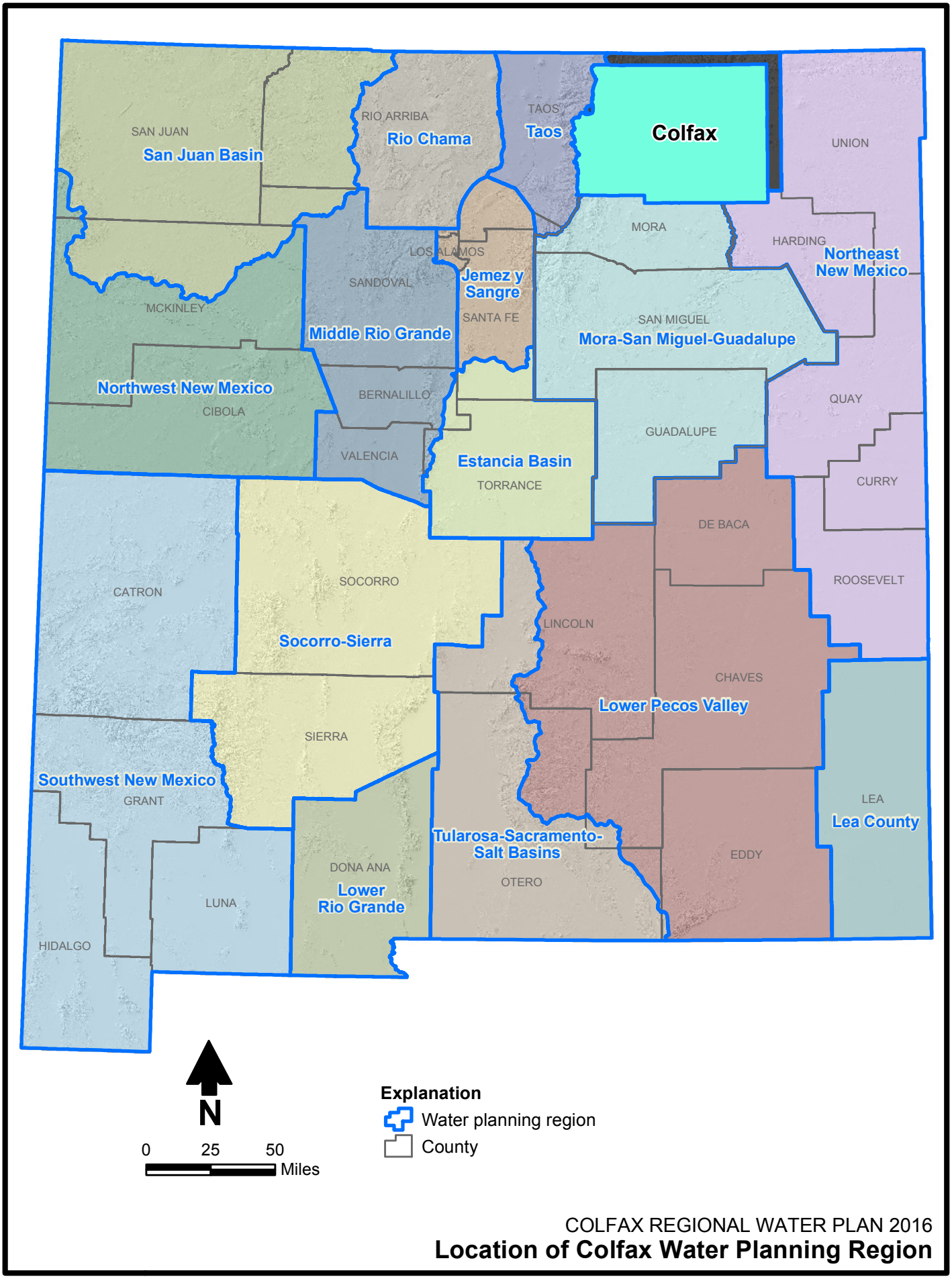
The Colfax Water Planning Region, which includes all of Colfax County (Figure 1-1), is one of 16 water planning regions in the State of New Mexico. Regional water planning was initiated in New Mexico in 1987, its primary purpose being to protect New Mexico water resources and to ensure that each region is prepared to meet future water demands. Between 1987 and 2008, each of the 16 planning regions, with funding and oversight from the New Mexico Interstate Stream Commission (NMISC), developed a plan to meet regional water needs over the ensuing 40 years. The *Colfax Regional Water Plan* was completed in March 2003 (DBS&A, 2003) and accepted by the NMISC in April 2003.

The purpose of this document is to provide new and changed information related to water planning in the Colfax region, as listed in the bullets below, and to evaluate projections of future water supply and demand for the region using a common technical approach applied to all 16 planning regions statewide. Accordingly, the following sections summarize key information in the 2003 plan and provide updated information regarding changed conditions and additional data that have become available. Specifically, this update:

- Identifies significant new research or data that provide a better understanding of current water supplies and demands in the Colfax region.
- Presents recent water use information and develops updated projections of future water demand using the common technical approach developed by NMISC, in order to facilitate incorporation into the New Mexico State Water Plan.
- Identifies strategies, including infrastructure projects, conservation programs, watershed management policies, or other types of strategies that will help to balance supplies and projected demands and address the Colfax region's future water management needs and goals.
- Discusses other goals or priorities as identified by stakeholders in the region.

The water supply and demand information in this regional water plan (RWP) is based on current published studies and data and information supplied by water stakeholders in the region. Tribes and pueblos in New Mexico are not required to provide water use data to the State, and so tribal water use data are not necessarily reflected in this RWP update.

The organization of this update follows the template provided in the *Updated Regional Water Planning Handbook: Guidelines to Preparing Updates to New Mexico Regional Water Plans* (NMISC, 2013) (referred to herein as the Handbook):

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COLFAX REGIONAL WATER PLAN 2016

**Location of Colfax Water Planning Region**

Figure 1-1

- Information regarding the public involvement process followed during development of this RWP update and entities involved in the planning process is provided in Section 2.
- Section 3 provides background information regarding the characteristics of the Colfax planning region, including an overview of updated population and economic data.
- The legal framework and constraints that affect the availability of water are briefly summarized in Section 4, with recent developments and any new issues discussed in more detail.
- The physical availability of surface water and groundwater and water quality constraints was discussed in detail in the 2003 RWP; key information from that plan is summarized in Section 5, with new information that has become available since 2003 incorporated as applicable. In addition, Section 5 presents updated monitoring data for temperature, precipitation, drought indices, streamflow, groundwater levels, and water quality, and an estimate of the administrative water supply including an estimate of drought supply.
- The information regarding historical water demand in the planning region, projected population and economic growth, and projected future water demand was discussed in detail in the 2003 RWP. Section 6 provides updated population and water use data, which are then used to develop updated projections of future water demand.
- Based on the current water supply and demand information discussed in

**Common Technical Approach**

To prepare both the regional water plans and the state water plan, the State has developed a set of methods for assessing the available supply and projected demand that can be used consistently in all 16 planning regions in New Mexico. This common technical approach outlines the basis for defining the available water supply and specifies methods for estimating future demand in all categories of water use:

- The method to estimate the available supply (referred to as the *administrative water supply* in the Handbook) is based on withdrawals of water as reported in the *NMOSE Water Use by Categories 2010* report, which provide a measure of supply that considers both physical supply and legal restrictions (i.e., the water is physically available for withdrawal, and its use is in compliance with water rights policies) and thus reflects the amount of water available for use by a region. An estimate of supply during future droughts is also developed by adjusting the 2010 withdrawal data based on physical supplies available during historical droughts.
- Projections of future demands in nine categories of water use are based on demographic and economic trends and population projections. Consistent methods and assumptions for each category of water use are applied across all planning regions.

The objective of applying this common technical approach is to be able to efficiently develop a statewide overview of the balance between supply and demand in both normal and drought conditions, so that the State can move forward with planning and funding water projects and programs that will address the State's pressing water issues.

* *Tribes and Pueblos in New Mexico are not required to provide water use data to the State. Therefore, tribal water use data are not necessarily reflected in this plan.*

Sections 5 and 6, Section 7 updates the projected gap between supply and demand of the planning region.

- Section 8 outlines new strategies (water programs, projects, or policies) identified by the region as part of this update, including additional water conservation measures.

Water supply and demand information (Sections 5 through 7) is assessed in accordance with a common technical approach, as identified in the Handbook (NMISC, 2013) (where it is referred to as a common technical *platform*). This common technical approach is a simple methodology that can be used consistently across all regions to assess supply and demand, with the objective of efficiently developing a statewide overview of the balance between supply and demand for planning purposes.

Four terms frequently used when discussing water throughout this plan have specific definitions related to this RWP:

- *Water use* is water withdrawn from a surface or groundwater source for a specific use. In New Mexico water is accounted for as one of the nine categories of use in the *New Mexico Water Use by Categories 2010* report prepared by the New Mexico Office of the State Engineer (NMOSE).

- *Water withdrawal* is water diverted or removed from a surface or groundwater source for use.

- *Administrative water supply* is the amount of water withdrawals in 2010 as outlined in the *New Mexico Water Use by Categories 2010* report.

- *Water demand* is the amount of water needed at a specified time.

## 2. Public Involvement in the Planning Process

During the past two years, the regional water planning steering committees, interested stakeholders, NMISC, and consultants to the NMISC have worked together to develop regional water plan updates. The purpose of this section is to describe public involvement activities during the regional water plan update process, guided by the Handbook, which outlined a public involvement process that allowed for broad general public participation combined with leadership from key water user groups.

## 2.1 The New Mexico Interstate Stream Commission's Role in Public Involvement in the Regional Water Plan Update Process

The NMISC participated in the public involvement process through a team of contractors and NMISC staff that assisted the regions in conducting public outreach. The NMISC's role in this process consisted of certain key elements:

- Setting up and facilitating meetings to carry out the regional water plan update process.
- Working with local representatives to encourage broad public involvement and participation in the planning process.
- Working to re-establish steering committees in regions that no longer had active steering committees.
- Supporting the steering committees once they were established.
- Facilitating input from the stakeholders and steering committees in the form of compiling comments to the technical sections drafted by the State and developing draft lists of projects, programs, and policies (PPPs) based on meeting input, with an emphasis on projects that could be implemented.
- Finalizing Section 8, Implementation of Strategies to Meet Future Water Demand, by writing a narrative that describes the key collaborative strategies based on steering committee direction.

This approach represents a change in the State's role from the initial round of regional water planning, beginning in the1990s through 2008, when the original regional water plans were developed. During that phase of planning, the NMISC granted regions funding to form their own regional steering committees and hire consultants to write the regional water plans, but NMISC staff were not directly involved in the process. Over time, many of the regional steering committees established for the purpose of developing a region's water plan disbanded. Funding for regional planning decreased significantly, and regions were not meeting to keep their plans current.

In accordance with the updated Handbook (NMISC, 2013), the NMISC re-established the regional planning effort in 2014 by working with existing local and regional stakeholders and organizations, such as regional councils of government, water providers, water user organizations, and elected officials. The NMISC initiated the process by hosting and facilitating meetings in all 16 regions between February and August of 2014. During these first months, through its team of consultants and working with contacts in the regions, the NMISC prepared "master stakeholder" lists, comprised of water providers and managers, local government

representatives, and members of the public with a general interest in water, and assisted in developing updated steering committees based on criteria from the Handbook and recommendations from the stakeholders. (The steering committee and master stakeholder lists for the Colfax region are provided in Section 2.2.1 and Appendix 2-A, respectively.) These individuals were identified through research, communication with other water user group representatives in the region, contacting local organizations and entities, and making phone calls. Steering committees members represent the different water users groups identified in the Handbook and have water management expertise and responsibilities.

The steering committee was tasked with four main responsibilities:

- Provide input to the water user groups they represent and ensure that other concerned or interested individuals receive information about the water planning process and meetings.
- Provide direction on the public involvement process, including setting meeting times and locations and promoting outreach.
- Identify water-related PPPs needed to address water management challenges in the region and future water needs.
- Comment on the draft *Colfax Regional Water Plan 2016*, as well as gather public comments. (Appendix 2-B includes a summary of comments on the technical and legal sections of the document that were prepared by NMISC [Sections 1, 3, 4, 5, 6 and 7]).

In 2016, the NMISC continued to support regional steering committees by facilitating three additional steering committee meetings open to the public in each of the 16 regions. The purpose of these meetings was to provide the regions with their draft technical sections that the NMISC had developed and for the regions to further refine their strategies for meeting future water challenges.

Throughout the regional water planning process all meetings were open to the public. Members of the public who have an interest in water were invited directly or indirectly through a steering committee representative to participate in the regional water planning process

Section 2.2 provides additional detail regarding the public involvement process for the Colfax 2016 regional water plan.

## 2.2 Public Involvement in the Colfax Planning Process

This section documents the steering committee and public involvement process used in updating the plan and documenting ideas generated by the region for future public involvement in the implementation of the plan.

### 2.2.1 Identification of Regional Steering Committee Members

The Handbook (NMISC, 2013) specifies that the steering committee membership include representatives from multiple water user groups. Some of the categories may not be applicable to a specific region, and the regions could add other categories as appropriate to their specific region. The steering committee representation listed in the Handbook includes:

- Agricultural – surface water user
- Agricultural – groundwater user
- Municipal government
- Rural water provider
- Extractive industry
- Environmental interest
- County government
- Local (retail) business
- Tribal entity
- Watershed interest
- Federal agency
- Other groups as identified by the steering committee

Steering committee members were identified and asked to participate through interviews, public meetings, recommendations, and outreach to specific interests. Through this outreach, the Colfax County Water Planning Region established a representative steering committee, the members of which are listed in Table 2-1.

The steering committee includes several state and federal agency representatives who participate as technical resources to the region. These individuals are generally knowledgeable about water issues in the region and are involved with many of the PPPs related to water management in the region. The list also includes non-profit groups who are involved in local water-related initiatives and or expertise such as watershed restoration or mutual domestic concerns and issues. The steering committee identified Dave Kenneke, New Mexico Rural Water Association/Miami Water Users Association, as Chair and Dan Campbell, Raton Utilities Director, as Co-chair.

The steering committee discussed the value of developing subcommittees and determined that a Watershed Subcommittee would be a useful means of enhancing the planning effort and ensuring implementation of the RWP while addressing major areas of concern. The Watershed Subcommittee was formed with Gus Holm of the Cimarron Watershed Alliance named as Chair.

## Table 2-1. Steering Committee Members, Colfax Water Planning Region

| Water User Group | Name | Organization / Representation |
|---|---|---|
| Agricultural – groundwater user | Gus Holm | Vermejo Park |
| Agricultural – surface water user | Julia Davis Stafford | CS Ranch |
| County government | Bill Sauble | County Commissioner, Colfax County |
| Environmental interest | Jim Morgan | Trout Unlimited |
| | Toner Mitchell | Trout Unlimited |
| Federal agency (technical support to the region) | Kenneth Alcon | Natural Resources Conservation Service (NRCS) |
| | John Littlefield | U.S. Forest Service |
| State agency (technical support to the region) | Ernie Lopez | New Mexico State Forestry |
| | Mark Sullivan | New Mexico State Parks |
| | Jan Dye | New Mexico Environment Department |
| | Jason Blakney | New Mexico Game & Fish |
| Local (retail) business | Paul Jenkins | GrowRaton! |
| | Mark Anderson | Philmont Ranch |
| Municipal government | Richard Cordova | Village of Eagle Nest |
| | Richard Johnson | Village of Eagle Nest |
| | Dan Campbell, Vice Chair of the RWP effort | Utilities Director, Raton |
| | Joanna Taylor, Mayor | Maxwell |
| | Laura Danielson | Water Superintendent<br>Town of Springer |
| | Rick Tafoya | Village Manager, Angel Fire |
| Other groups as identified by the steering committee - Sustainability | Jack Chatfield | Canadian River Riparian Restoration Project |
| Other groups as identified by the steering committee - Home Owners Association | John Clark | Ute Park Homeowners Association |
| Other groups as identified by the steering committee - Ranching | John Caid | Express UU Bar Ranch |
| Other groups as identified by the steering committee – Small Water System | Mike Vigil | Miami Water Users Association |
| Rural water provider | Dave Kenneke, Chair of the RWP effort | New Mexico Rural Water Association<br>Miami Water Users Association |
| Tribal (as applicable) | Invited<br>Bennie Grine | Taos Pueblo<br>Sandia Pueblo/Bobcat Ranch |
| Watershed interest | Kareyl Vatlestad | Colfax Soil and Water Conservation District (SWCD) |
| | Rick Smith | Cimarron Watershed Alliance |

The Watershed Subcommittee met and developed strategies that were incorporated into the regional strategies and developed ideas for immediate funding. Specifically, the Subcommittee developed a Collaborative Forest Restoration Program (CFRP) project that has been submitted for panel consideration in 2016 and meets one of the strategies developed by the steering committee.

### 2.2.2 Regional Water Plan Update Meetings

All steering committee meetings and NMISC-facilitated water planning meetings were open to the public and interested stakeholders. Meetings were announced to the master stakeholder list by e-mail, and participation from all meeting attendees was encouraged. Steering committee members served as a conduit of information to others and, through their own organizational communications with other agencies, encouraged participation in the process, and steering committee members were asked to share information about the process with other stakeholders in the region. Generally, steering committee members ensured that other concerned or interested individuals received the announcements and recommended key contacts to add to the master stakeholder list throughout the planning process.

The steering committee discussed and made the following recommendations regarding meeting times and locations that would maximize public involvement. The group decided that Cimarron was the best place to hold meetings, because it is central to the region and it was felt that participation would be maximized by not requiring anyone to drive to the further reaches of the region. The group also felt that many of the steering committee representatives were already participating in the Cimarron Watershed Alliance and were more likely to be able to attend if the meetings were held on the same day as Alliance meetings when possible. In general, daytime and weekdays were thought to work best for the group. Both the agricultural sector and those involved in water related work are better able to attend during the work day than in evenings.

Over the two-year update process, eight meetings were held in the Colfax region. A summary of each of the meetings is provided in Table 2-2.

### 2.2.3 Current and Future Ideas for Public Outreach during Implementation of the Regional Water Plan Update

The steering committee identified the following process for additional public outreach:

- The Chair(s) of the Watershed Subcommittee will continue to organize meetings with subcommittee members. These meetings will not be facilitated by the NMISC contractors. Steering committee members will continue to assist with outreach.
- The steering committee will conduct outreach through KRTN, a Raton radio station that has a large local following.

## Table 2-2. Colfax Region Public Meetings



| Date | Location | Purpose | Meeting Summary |
|---|---|---|---|
| ***FY 2014*** | | | |
| 4/23/2014 | Cimarron Watershed Alliance office, Cimarron, NM | Kickoff meeting: Present the regional water planning update process to the region and continue to conduct outreach to begin building the steering committee. | Representatives from many of the water user groups attended the meeting and were instrumental in identifying other individuals as potential representatives for a particular group. Many of the meeting attendees were not on the master stakeholder list, and those individuals were added to the list. |
| ***FY 2015*** | | | |
| 10/29/2014 | Cimarron, NM | Present the technical data compiled and synthesized for the region. | Data presented included population and economic trends through a series of tables, the administrative water supply, the projected future water demand, and the gap between supply and demand for both normal and drought years. In addition, the presentation reaffirmed the development of a steering committee to guide the process as outlined in the Handbook. |
| 1/28/2015 | Cimarron Watershed Alliance office, Cimarron, NM | Review the update process and the timeline for completing the regional water plan (RWP)update. | The group discussed new information from the region and/or the projects, policies, programs (PPPs) that had been implemented since the 2003 plan. The steering committee membership and leadership were affirmed, with alternates named as appropriate. The group further discussed where future meetings would be held and the time that worked the best for getting the most attendance. A date was set for the next meeting and a summary of the discussion was sent to the master stakeholder list with information about the next meeting including agenda items and location, date, and time and next steps. |

## Table 2-2. Colfax Region Public Meetings



| Date | Location | Purpose | Meeting Summary |
|---|---|---|---|
| 3/18/2015 | Cimarron Watershed Alliance office, Cimarron, NM | Review projects completed since submission of the accepted plan and provide additional input. Discuss potential collaborative projects. | The group reviewed projects completed since submission of the accepted plan and provided additional input. The Watershed Subcommittee chair reported on ideas generated relative to PPPs or other issues. The group further discussed potential collaborative projects such as water system regionalization/cooperation, monitoring/data collection, watershed restoration, drought contingency planning, local and state water policy recommendations, and water quality protection. |
| 5/20/2015 | Cimarron, NM | Discuss elements that would be included in the public involvement chapter and ideas for FY 2015-2016 outreach. Review and discuss future project checklist discussed at previous meeting and sent to stakeholders. | The Watershed Subcommittee presented information. The future project checklist was reviewed and discussed, and a deadline for sending information to the consultants was confirmed. The group participated in a brainstorming activity that helped to identify regional projects that held the potential for the greatest collaboration and effort, ranking the level of interest, although it was noted that there is no official ranking of projects for funding priority as part of the regional water planning update process. The consultants affirmed the next steps for the RWP update effort and a general idea for meeting again in FY 2015-2016.<br>The group indicated that the Watershed Subcommittee would continue to meet as needed to work on the PPPs that pertain to their area of interest, though NMISC contractors will not facilitate these meetings. The subcommittee will provide the NMISC contractors additional information as needed on the PPPs. |

## Table 2-2. Colfax Region Public Meetings



| Date | Location | Purpose | Meeting Summary |
|---|---|---|---|
| ***FY 2016*** | | | |
| 12/2/2015 | Philmont Scout Ranch, Cimarron, NM | Review steering committee membership and leadership. Focus on the PPPs to be included in the update. | The group reviewed the steering committee membership and suggested additional members to fill vacancies and decided that steering committee leadership would be two co-chairs, Dave Kenneke and Dan Campbell. The steering committee and interested stakeholders present participated in a brainstorming activity that helped to identify and rank (although ranking of projects for funding priority is not part of the regional water planning update process) regional projects that held the potential for the greatest collaboration and effort. The consultants affirmed the next steps for the RWP update effort and a general idea for meeting again in FY 2015-2016. |
| 1/27/2016 | Philmont Scout Ranch, Cimarron, NM | Refine the key collaborative PPP recommendations specific to Section 8. | The group identified a number of projects that would potentially have greater interest and benefit multiple stakeholders, and added additional information in a small group format using worksheets. The final meeting was scheduled for April 27, 2016. |
| 4/27/2016 | Philmont Scout Ranch, Cimarron, NM | Review the Public Involvement section (2) and the Section 8 key strategies and PPP list. | The group reviewed the Executive Summary, Public Involvement Section 2, Section 8 Key Strategies, consolidated comments and PPP list. Edits were made to some of the documents presented. The group decided on representatives to present the plan to the NMISC and developed ideas for implementation of their RWP. |

- A flier for meetings was developed by the contractor and will be used as a template for future meetings and distribution by the steering committee.
- The Raton Chamber (include Weekend Raton) will be contacted about meetings.
- The Springer Chamber of Commerce will be contacted for listing information about the regional water planning implementation effort.

# 3. Description of the Planning Region

This section provides a general overview of the Colfax Water Planning Region. Detailed information, including maps illustrating the land use and general features of the region, was provided in the 2003 RWP; that information is briefly summarized and updated as appropriate here. Additional detail regarding the climate, water resources, and demographics of the region is provided in Sections 5 and 6.

## 3.1 General Description of the Planning Region

Colfax County is located in northern New Mexico between Taos and Union counties and just south of the Colorado border (Figure 1-1). The region is bounded on the north by the New Mexico-Colorado state line, on the east by the Northeast New Mexico Planning Region (Union County), on the west by the Taos Planning Region (Taos County), and on the south by the Mora-San Miguel-Guadalupe and Northeast New Mexico water planning regions (Mora and Harding counties) (Figure 1-1).

The total area of Colfax County is 3,765 square miles. The terrain ranges from the Rocky Mountains in the western part of the county to the High Plains in the east, with elevations from over 12,000 feet above mean sea level (ft amsl) to about 5,000 feet. Vegetation in the county is greatly influenced by the elevation differences and ranges from the spruce, fir, pine, and aspen forests of the mountains through a transition of open piñon-juniper to the grasslands of the plains. Natural resources in the area include coal and methane gas.

## 3.2 Climate

The varied terrain of Colfax County results in significant climate variations. Temperatures range from lows that are well below 0 degrees Fahrenheit (°F) in the mountains to highs in excess of 100°F in the plains. Precipitation is influenced by location and somewhat by elevation; average annual precipitation, including both snowmelt and rainfall, ranges from about 14 to more than 30 inches.

As noted in the 2003 RWP, drought is an important factor for water planning in the region. During the past century, severe droughts have occurred in the early 1900s, the 1950s, the early

2000s, and in 2011 through 2013. The wet period of the 1980s into the 1990s was just as anomalous as the severe droughts (Gutzler, 2003) and should not be used as a "normal" standard in terms of precipitation expectations.

## 3.3 Major Surface Water and Groundwater Sources

Colfax County lies almost entirely within the Canadian River Basin, which is shared with the Mora-San Miguel-Guadalupe and Northeast New Mexico water planning regions. Surface water, which supplies about 92 percent of the water currently used in Colfax County, originates primarily in the mountains in the western and northern parts of the county and flows generally east and south to the Canadian River, through which it flows out of the county (Figure 3-1). Surface water availability varies greatly from year to year, depending on the amount of precipitation in the region.

Development of groundwater resources in Colfax planning region has occurred primarily in the Moreno Valley area around Angel Fire and Eagle Nest. Groundwater also supplies smaller water systems and domestic and livestock wells throughout the region. The region is underlain primarily by the Canadian River Declared Underground Water Basin (UWB), which is shared with the Mora-San Miguel-Guadalupe and Northeast New Mexico water planning regions. Small parts of the Clayton and Tucumcari UWBs are present beneath the eastern part of the region and are shared with the Northeast New Mexico region. (A declared UWB is an area of the state proclaimed by the State Engineer to be underlain by a groundwater source having reasonably ascertainable boundaries. By such proclamation the State Engineer assumes jurisdiction over the appropriation and use of groundwater from the source.) A map showing the UWBs in the region is provided in Section 4.7.2.

Additional information on administrative basins and surface and groundwater resources of the region is included in Section 4 and Sections 5.2 and 5.3, respectively.

## 3.4 Demographics, Economic Overview, and Land Use

The total population of Colfax County has fluctuated between 12,000 and 14,000 over the last 40 years and is currently about 13,000 (U.S. Census Bureau, 2014a) (Table 3-1). As shown in Table 3-1, from 2000 to 2013 the population declined by 1,095 persons.

The county is largely rural and includes six small incorporated areas: Raton, Springer, Cimarron, Maxwell, Eagle Nest, and Angel Fire. Sizable seasonal population fluctuations (at times totaling many times the resident population) occur throughout the year due to tourism in the Angel Fire-Eagle Nest area as well as at the Philmont Boy Scout Ranch, the National Rifle Association (NRA) Whittington Center, and two state parks (Sugarite Canyon and Cimarron Canyon).

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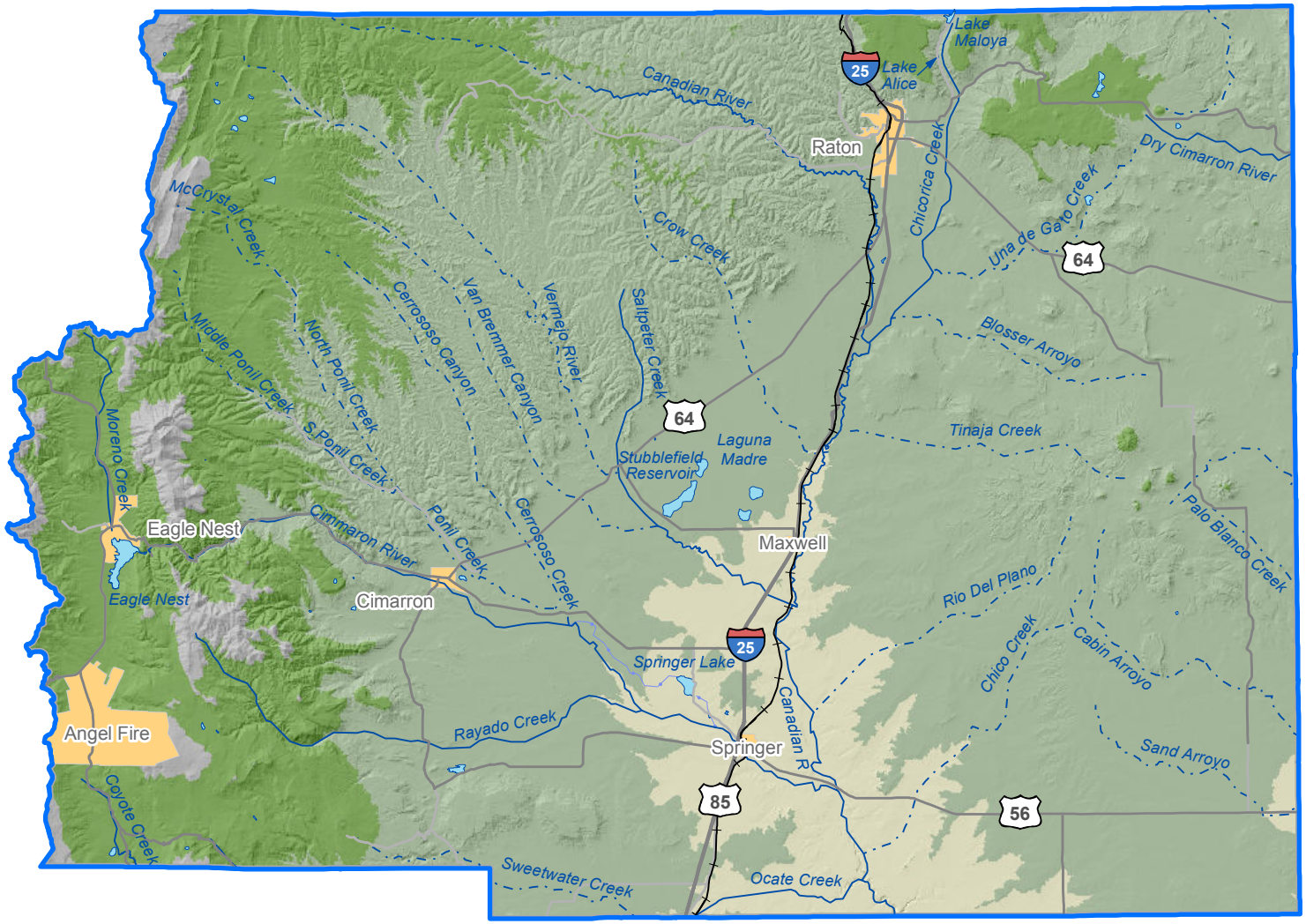


COLFAX
REGIONAL WATER PLAN 2016
**Regional Map**

Figure 3-1

## Table 3-1. Summary of Demographic and Economic Statistics for the Colfax Water Planning Region

### a. Population

| County | 2000 | 2010 | 2013 |
|---|---|---|---|
| Colfax | 14,189 | 13,750 | 13,094 |
| Total Region | 14,189 | 13,750 | 13,094 |

Source: U.S. Census Bureau, 2014a

### b. Income and Employment

| County | 2012 Income [a] | | Labor Force Annual Average 2013 [b] | | |
|---|---|---|---|---|---|
| | Per Capita ($) | Percentage of State Average | Number of Workers | Number Employed | Unemployment Rate (%) |
| Colfax | 21,087 | 89 | 6,425 | 5,979 | 6.9 |

[a] U.S. Census Bureau, 2014c
[b] New Mexico Department of Workforce Solutions, 2014

### c. Business Environment

| County | Industry | Number Employed | Number of Businesses |
|---|---|---|---|
| | *2008-2012* [a] | | *2012* [b] |
| Colfax | Education/Healthcare | 1,221 | 482 |
| | Entertainment, recreation, arts, hospitality, restaurant | 813 | |
| | Retail trade | 772 | |
| | Public Administration | 443 | |

[a] U.S. Census Bureau, 2014b
[b] U.S. Census Bureau, 2014c

### d. Agriculture

| County [a] | Farms / Ranches | | | Most Valuable Agricultural Commodities |
|---|---|---|---|---|
| | Number | Acreage | | |
| | | Total | Average | |
| Colfax | 290 | 1,962,965 | 6,769 | Cattle, calves<br>Other animals |

[a] USDA NASS, 2014 (some sales data withheld to avoid disclosure for individual operations)

Most of the land in Colfax County is privately owned, although federal and state entities own some land in the county (some smaller parcels of land in the Moreno Valley are tribal-owned, but these are not reservation lands so are shown as private), as illustrated on Figure 3-2 and outlined below:

- Federal agencies: 124 square miles
- State agencies: 429 square miles
- Private entities: 3,212 square miles

Tourism is the primary industry, in the mountainous areas, while significant livestock grazing and agriculture take place in the eastern plains area of the county.

Although agriculture is a significant industry in Colfax County, the number of people employed is small relative to other industries in the county. The largest employment category in the county is education and healthcare, followed by entertainment and hotel and food service industries, retail trade, and public administration.

Current statistics on the economy and land use in Colfax County, compiled from the U.S. Census Bureau and the New Mexico Department of Workforce Solutions, are summarized in Table 3-1. Additional detail on demographics, economics, and land use within the region is provided in Section 6.

# 4. Legal Issues

## 4.1 Relevant Water Law

### 4.1.1 State of New Mexico Law

Since the accepted regional water plan for the Colfax Water Planning Region was published in 2003, there have been significant changes in New Mexico water law through case law, statutes, and regulations. These changes address statewide issues including, but not limited to, domestic well permitting, the State Engineer's authority to regulate water rights, administrative and legal review of water rights matters, use of settlements to allocate water resources, the rights appurtenant to a water right, and acequia water rights. New law has also been enacted to address water project financing and establish a new strategic water reserve. These general state law changes are addressed by topic area below. State law more specific to the Colfax region is discussed in Section 4.1.2.

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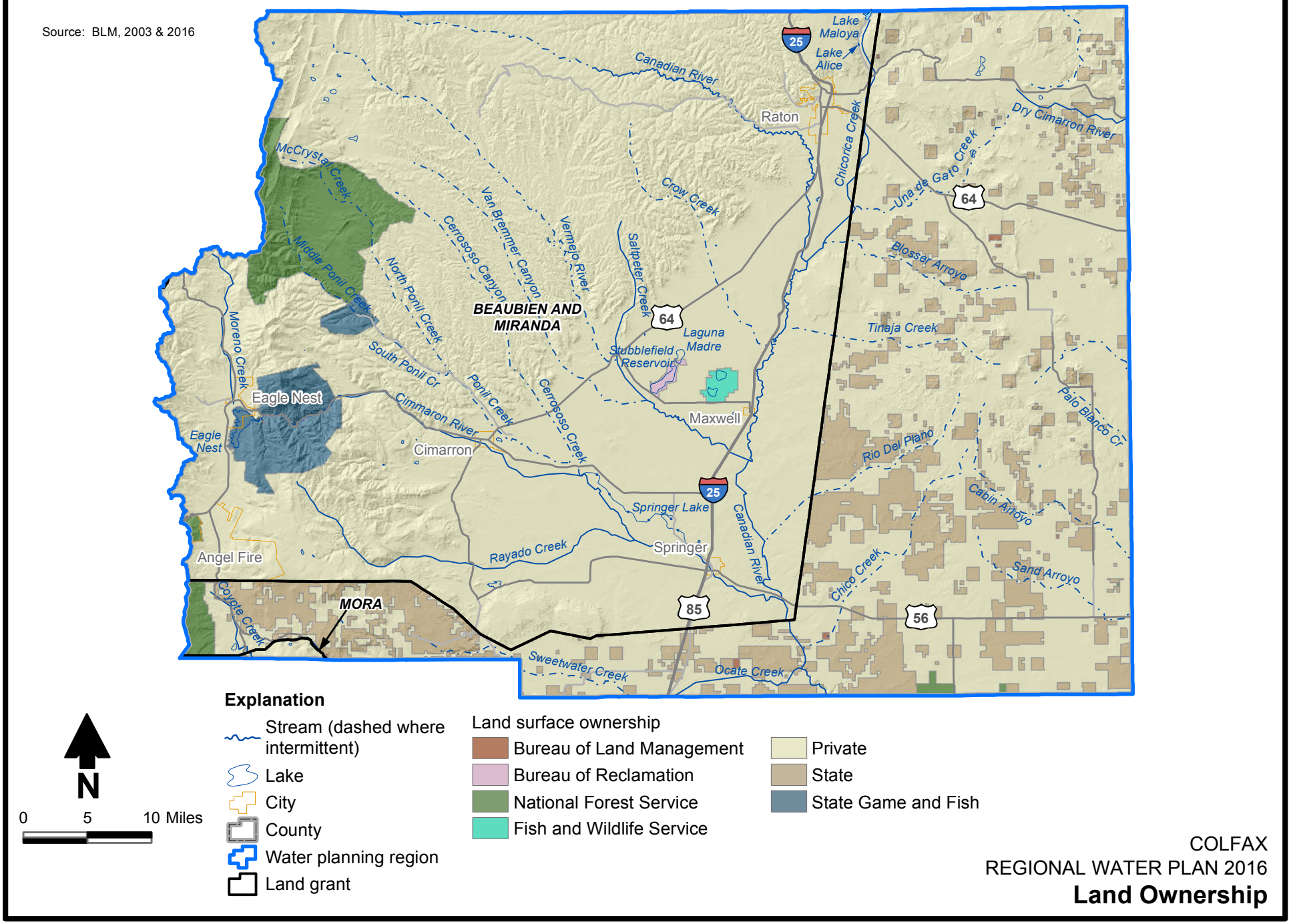


Figure 3-2

COLFAX
REGIONAL WATER PLAN 2016
**Land Ownership**

#### *4.1.1.1 Regulatory Powers of the NMOSE*

In 2003, the New Mexico Legislature enacted NMSA 1978, § 72-2-9.1, relating to the administration of water rights by priority date. The legislature recognized that "the adjudication process is slow, the need for water administration is urgent, compliance with interstate compacts is imperative and the state engineer has authority to administer water allocations in accordance with the water right priorities recorded with or declared or otherwise available to the state engineer." Section 72-2-9.1(A). The statute authorized the State Engineer to adopt rules for priority administration in a manner that does not interfere with future or pending adjudications, creates no impairment of water rights other than what is required to enforce priorities, and creates no increased depletions.

Based on Section 72-2-9.1, the State Engineer promulgated the Active Water Resource Management (AWRM) regulations in December 2004. The regulation's stated purpose is to establish the framework for the State Engineer "to carry out his responsibility to supervise the physical distribution of water to protect senior water right owners, to assure compliance with interstate stream compacts and to prevent waste by administration of water rights." 19.25.13.6 NMAC. In order to carry out this purpose, the AWRM regulations provide the framework for the promulgation of specific water master district rules and regulations. No district-specific AWRM regulations have been promulgated in the Colfax region at the time of writing.

The general AWRM regulations set forth the duties of a water master to administer water rights in the specific district under the water master's control. Before the water master can take steps to manage the district, AWRM requires the NMOSE to determine the "administrable water rights" for purposes of priority administration. The State Engineer determines the elements, including priority date, of each user's administrable water right using a hierarchy of the best available evidence, in the following order: (A) a final decree or partial final decree from an adjudication, (B) a subfile order from an adjudication, (C) an offer of judgment from an adjudication, (D) a hydrographic survey, (E) a license issued by the State Engineer, (F) a permit issued by the State Engineer along with proof of beneficial use, and (G) a determination by the State Engineer using "the best available evidence" of historical, beneficial use. Once determined, this list of administrable water rights is published and subject to appeal, 19.25.13.27 NMAC, and once the list is finalized, the water master may evaluate the available water supply in the district and manage that supply according to users' priority dates.

The general AWRM regulations also allow for the use of replacement plans to offset the depletions caused by out-of-priority water use. The development, review, and approval of replacement plans will be based on a generalized hydrologic analysis developed by the State Engineer.

The general AWRM regulations were unsuccessfully challenged in court in *Tri-State Generation and Transmission Ass'n, Inc. v. D'Antonio,* 2012-NMSC-039. In this case, the New Mexico

Supreme Court analyzed whether Section 72–2–9.1 provided the State Engineer with the authority to adopt regulations allowing it to administer water rights according to interim priority determinations developed by the NMOSE.

In *Tri-State* the Court held that (1) the Legislature delegated lawful authority to the State Engineer to promulgate the AWRM regulations, and (2) the regulations are not unconstitutional on separation of powers, due process, or vagueness grounds. Specifically, the Court found that establishing such regulations does not violate the constitutional separation of powers because AWRM regulations do not go beyond the broad powers vested in the State Engineer, including the authority vested by Section 72–2–9.1. The Court further found that the AWRM regulations did not violate the separation of powers between the executive and the judiciary despite the fact that the regulations allow priorities to be administered prior to an *inter se* adjudication of priority. Rather, the Legislature chose to grant quasi-judicial authority in administering priorities prior to final adjudication to the NMOSE, which was well within its discretion to do.

The Court further held that the AWRM regulations do not violate constitutional due process because they do not deprive the party challenging the regulations of a property right. As explained by the Court, a water right is a limited, usufructuary right providing only a right to use a certain amount of water established through beneficial use. As such, based on the long-standing principle that a water right entitles its holder to the use of water according to priority, regulation of that use by the State does not amount to a deprivation of a property right.

In addition to *Tri-State*, several cases that address other aspects of the regulatory powers of the NMOSE have been decided recently. Priority administration was addressed in a case concerning the settlement agreement entered into by the United States, New Mexico (State), the Carlsbad Irrigation District (CID), and the Pecos Valley Artesian Conservancy District (PVACD) related to the use of the waters of the Pecos River. *State ex rel. Office of the State Engineer v. Lewis*, 2007-NMCA-008, 140 N.M. 1. The issues in the case revolved around (1) the competing claims of downstream, senior surface water users in the Carlsbad area and upstream, junior groundwater users in the Roswell Artesian Basin and (2) the competing claims of New Mexico and Texas users. Through the settlement agreement, the parties sought to resolve these issues through public funding, without offending the doctrine of prior appropriation and without resorting to a priority call. The settlement agreement was, in essence, a water conservation plan designed to augment the surface flows of the lower Pecos River in order to (1) secure the delivery of water within the CID, (2) meet the State's obligations to Texas under the Pecos River Compact (Compact), and (3) limit the circumstances under which the United States and CID would be entitled to make a call for the administration of water right priorities. The agreement included the development of a well field to facilitate the physical delivery of groundwater directly into the Pecos River under certain conditions, the purchase and transfer to the well field of existing groundwater rights in the Roswell UWB by the State, and the purchase and retirement of irrigated land within PVACD and CID.

The Court of Appeals framed the issue as whether the priority call procedure is the exclusive means under the doctrine of prior appropriation to resolve existing and projected future water shortage issues. The Court held that Article XVI, Section 2 of the Constitution, which states that "[p]riority of appropriation shall give the better right," and Article IX of the Compact, which states that "[i]n maintaining the flows at the New Mexico-Texas state line required by this compact, New Mexico shall in all instances apply the principle of prior appropriation within New Mexico," do not require a priority call as the sole response to water shortage concerns. The Court found it reasonable to construe these provisions to permit flexibility within the prior appropriation doctrine in attempting to resolve longstanding water issues. Thus, the more flexible approach pursued by the settling parties through the settlement agreement was not ruled out in the Constitution, the Compact, or case precedent.

In relation to the NMOSE's regulatory authority over supplemental wells, in *Herrington v. State of New Mexico ex rel. State Engineer*, 2006-NMSC-014, 139 N.M. 368, the New Mexico Supreme Court clarified certain aspects of the *Templeton* doctrine. The *Templeton* doctrine allows senior surface water appropriators impaired by junior wells to drill a supplemental well to offset the impact to their water right. *See Templeton v. Pecos Valley Artesian Conservancy District*, 1958-NMSC-131, 65 N.M. 59. According to *Templeton,* drilling the supplemental well allows the senior surface right owner to keep their surface water right whole by drawing upon groundwater that originally fed the surface water supply. Although the New Mexico prior appropriation doctrine theoretically does not allow for sharing of water shortages, the *Templeton* doctrine permits both the aggrieved senior surface appropriator and the junior user to divert their full share of water. The requirements for a successful *Templeton* supplemental well include (1) a valid surface water right, (2) surface water fed in part by groundwater (baseflow), (3) junior appropriators intercepting that groundwater by pumping, and (4) a proposed well that taps the same groundwater source of the applicant's original appropriation.

In *Herrington* the Court clarified that the well at issue would meet the *Templeton* requirements if it was dug into the same aquifer that fed the surface water. The Court also clarified whether a *Templeton* well could be drilled upstream of the surface point of diversion. The Court determined that the proper placement of a *Templeton* well must be considered on a case-by-case basis, and that these supplemental wells are not necessarily required to be upstream in all cases.

Lastly, the Court addressed the difference between a *Templeton* supplemental well and a statutory supplemental well drilled under NMSA 1978, §§ 72–5–23, -24 (1985). The Court found that a statutory transfer must occur within a continuous hydrologic unit, which differs from the narrow *Templeton* same-source requirement. Although surface to groundwater transfers require a hydrologic connection, this may be a more general determination than the *Templeton* baseflow source requirement. Further, *Templeton* supplemental wells service the original parcel, while statutory transfers may apply to new uses of the water, over significant distances.

Also related to the NMOSE's regulatory authority, the Court of Appeals addressed unperfected water rights in *Hanson v. Turney*, 2004-NMCA-069, 136 N.M. 1. In *Hanson*, a water rights permit holder who had not yet applied the water to beneficial use sought to transfer her unperfected water right from irrigation to subdivision use. The State Engineer denied the application because the water had not been put to beneficial use. The permit holder argued that pursuant to NMSA 1978, § 72-12-7(A) (1985), which allows the owner of a "water right" to change the use of the water upon application to the State Engineer, the State Engineer had wrongly rejected her application. The Court upheld the denial of the application, finding that under western water law the term "water right" does not include a permit to appropriate water when no water has been put to beneficial use. Accordingly, as used in Section 72-12-7(A) the term "water right" requires the perfection of a water right through beneficial use before a transfer can be allowed.

#### *4.1.1.2 Legal Review of NMOSE Determinations*

In *Lion's Gate Water v. D'Antonio*, 2009-NMSC-057, 147 N.M. 523, the Supreme Court addressed the scope of the district court's review of the State Engineer's determination that no water is available for appropriation. In *Lion's Gate*, the applicant filed a water rights application, which the State Engineer rejected without publishing notice of the application or holding a hearing, finding that no water was available for appropriation. The rejected application was subsequently reviewed in an administrative proceeding before the State Engineer's hearing examiner. The hearing examiner upheld the State Engineer's decision on the grounds that there was no unappropriated water available for appropriation.

This ruling was appealed to the district court, which determined that it had jurisdiction to hear all matters either presented or that might have been presented to the State Engineer, as well as new evidence developed since the administrative hearing. The NMOSE disagreed, arguing that only the issue of whether there was water available for appropriation was properly before the district court. The Supreme Court agreed with the NMOSE. The Court found that the comprehensive nature of the water code's administrative process, its mandate that a hearing must be held prior to any appeal to district court, and the broad powers granted to the State Engineer clearly express the Legislature's intent that the water code provide a complete and exclusive means to acquire water rights. Accordingly, the NMOSE was correct that the district court's *de novo* review of the application was limited to what the State Engineer had already addressed administratively, in this case whether unappropriated water was available.

The Court also held that the water code does not require publication of an application for a permit to appropriate if the State Engineer determines no water is available for appropriation, because no third-party rights are implicated unless water is available. If water is deemed to be available, the State Engineer must order notice by publication in the appropriate form.

Based in large part on the holding in *Lion's Gate*, the New Mexico Court of Appeals in *Headon v. D'Antonio*, 2011-NMCA-058, 149 N.M. 667, held that a water rights applicant is required to proceed through the administrative process when challenging a decision of the State Engineer. In *Headon* the applicant challenged the NMOSE's determination that his water rights were forfeited. To do so, he filed a petition seeking declaratory judgment as to the validity of his water rights in district court, circumventing the NMOSE administrative hearing process. 2011-NMCA-058, ¶¶ 2-3. The Court held that the applicant must proceed with the administrative hearing, along with its *de novo* review in district court, to challenge the findings of the NMOSE.

Legal review of NMOSE determinations was also an issue in *D'Antonio v. Garcia*, 2008-NMCA-139,145 N.M. 95, where the Court of Appeals made several findings related to NMOSE administrative review of water rights matters. *Garcia* involved an NMOSE petition to the district court for enforcement of a compliance order after the NMOSE hearing examiner had granted a motion for summary judgment affirming the compliance order. 2008-NMCA-139, ¶¶ 2-5. The Court first found that the right to a hearing granted in NMSA 1978, § 72-2-16 (1973), did not create an absolute right to an administrative hearing. Rather, the NMOSE hearing contemplated in Section 72-2-16 could be waived if a party did not timely request such a hearing. *Id*. ¶ 9. In *Garcia* the defendant had not made such a timely request and therefore was not entitled to a full administrative hearing prior to issuance of an order by the district court.

The Court also examined the regulatory powers of the NMOSE hearings examiner, specifically, whether 19.25.2.32 NMAC allows the hearing examiner to issue a final order without the express written consent of the State Engineer. *Id*. ¶¶ 11-15. The Court held that the regulation allowed the hearing examiner to dismiss a case without the express approval of the State Engineer. *Id*. ¶ 14. Finally, the Court held that the NMOSE hearing examiner may dismiss a case without full hearing when a party willfully fails to comply with the hearing examiner's orders. *Id*. ¶¶ 17-18. Accordingly, the Court in *Garcia* upheld the NMOSE hearing examiner's action to issue a compliance order without a full administrative hearing or final approval by the State Engineer. As such, the district court had the authority to enforce that compliance order.

#### *4.1.1.3 Beneficial Use of Water – Non-Consumptive Use*

*Carangelo v. Albuquerque-Bernalillo County Water Utility Authority*, 2014-NMCA-032, addressed whether a non-consumptive use of water qualifies as a beneficial use under New Mexico law and, accordingly, can be the basis for an appropriation of such water. In *Carangelo*, the NMOSE granted the Albuquerque-Bernalillo County Water Utility Authority's (Authority) application to divert approximately 45,000 acre-feet per year of Rio Grande surface water, to which the Authority had no appropriative right. The Authority intended to use the water for the non-consumptive purpose of "carrying" the Authority's own San Juan-Chama Project water, Colorado River Basin water to which the Authority had contracted for use of, to a water

treatment plant for drinking water purposes. The Court of Appeals found the NMOSE erred in granting the application because the application failed to seek a new appropriation. The Authority's application sought to divert water, to which the Authority asserted no prior appropriative right, which required a new appropriation. Moreover, the Authority affirmatively asserted no beneficial use of the water. The Court remanded the matter to the NMOSE to issue a corrected permit.

The Court's decision included the following legal conclusions:

- A new non-consumptive use of surface water in a fully appropriated system requires a new appropriation of water. A "non-consumptive use" is a type of water use where either there is no diversion from a source body or there is no diminishment of the source. Neither the New Mexico Constitution nor statutes governing the appropriation of water distinguish between diversion of water for consumptive and non-consumptive uses. Because both can be beneficial uses, New Mexico's water law applies equally to either.

- The Authority did not need to file for a change in place or purpose of use for the diversion of its San Juan-Chama Project water. The Court stated that the San Juan-Chama Project water does not come from the Rio Grande Basin, and the Authority's entitlement to its beneficial use is not within the administrative scope of the Rio Grande Basin. Accordingly, the Authority already had an appropriative right to that water and did not need to file an application with the NMOSE for its use.

#### *4.1.1.4 Impairment*

*Montgomery v. Lomos Altos, Inc.*, 2007-NMSC-002, 141 N.M. 21, involved applications to transfer surface water rights to groundwater points of diversion in the fully appropriated Rio Grande stream system. In order for a transfer to be approved, an applicant must show, among other factors, that the transfer will not impair existing water uses at the move-to location. In *Lomos Altos*, several parties protested the NMOSE's granting of the applications, arguing that surface depletions at the move-to location caused by the applications should be considered *per se* impairment of existing rights. The Court found that questions of impairment are factual and cannot be decided as a matter of law, but must be determined on a case-by-case basis. In doing so, the Court held that surface depletions in a fully appropriated stream system do not result in *per se* impairment, but the Court noted that under some circumstances, even *de minimis* depletions can lead to a finding of impairment. The Court further found that in order to determine impairment, all existing water rights at the "move-to" location must be considered.

#### *4.1.1.5 Rights Appurtenant to Water Rights*

The New Mexico Supreme Court has issued three recent opinions dealing with appurtenancy. *Hydro Resources Corp. v. Gray*, 2007-NMSC-061, 143 N.M. 142, involved a dispute over ownership of water rights developed by a mining lessee in connection with certain mining claims

owned by the lessor. The Supreme Court held that under most circumstances, including mining, water rights are not considered appurtenant to land under a lease. The sole exception to the general rule that water rights are separate and distinct from the land is water used for irrigation. Therefore, a lessee can acquire water rights on leased land by appropriating water and placing it to beneficial use. Those developed rights remain the property of the lessee, not the lessor, unless stipulated otherwise in an agreement.

In a case examining whether irrigation water rights were conveyed with the sale of land or severed prior to the sale (*Turner v. Bassett*, 2005-NMSC-009, 137 N.M. 381), the Supreme Court examined New Mexico's transfer statute, NMSA 1978, § 72-5-23 (1941), along with the NMOSE regulations addressing the change of place or purpose of use of a water right, 19.26.2.11(B) NMAC. The Court found that the statute, coupled with the applicable regulations and NMOSE practice, requires consent of the landowner and approval of the transfer application by the State Engineer for severance to occur. The issuance of a permit gives rise to a presumption that the water rights are no longer appurtenant to the land. A landowner who holds water rights and follows the statutory and administrative procedures to effect a severance and initiate a transfer may convey the land severed from its former water rights, without necessarily reserving those water rights in the conveyance documents.

In *Walker v. United States*, 2007-NMSC-038, 142 N.M. 45, the New Mexico Supreme Court examined the issue of whether a water right includes an implicit right to graze. After the United States Forest Service canceled the Walkers' grazing permits, the Walkers filed a complaint arguing that the United States had taken their property without just compensation in violation of the Fifth Amendment to the United States Constitution. The Walkers asserted a property right to the allotments under New Mexico state law. Specifically, the Walkers argued that the revocation of the federal permit resulted in the loss of "water, forage, and grazing" rights based on New Mexico state law and deprived them of all economically viable use of their cattle ranch.

The Court found that a stock watering right does not include an appurtenant grazing right. In doing so, the Court addressed in depth the long understood principle in western water law that water rights, unless utilized for irrigation, are not appurtenant to the land on which they are used. The Court also clarified that the beneficial use for which a water right is established does not guarantee the water right owner an interminable right to continue that same beneficial use. The Walkers could have transferred their water right to another location or another use if they could not continue with the original uses. For these reasons, the Court rejected the Walkers attempt to make an interest in land incident or appurtenant to a water right.

#### *4.1.1.6 Deep, Non-Potable Aquifers*

In 2009 the New Mexico Legislature amended NMSA 1978, § 72-12-25 (2009), to provide for administrative regulation of deep, non-potable aquifers. These groundwater basins are greater than 2,500 deep and contain greater than 1,000 parts per million of total dissolved solids.

Drilling wells into such basins had previously been unregulated. The amendment requires the NMOSE to conduct hydrologic analysis on well drilling in these basins. The type of analysis required by the NMOSE depends on the use for the water.

#### *4.1.1.7 Domestic Wells*

New Mexico courts have recently decided several significant cases addressing domestic well permitting, and the NMOSE also recently amended its regulations governing domestic wells.

In *Bounds v. State ex. rel D'Antonio*, 2013-NMSC-037, the New Mexico Supreme Court upheld the constitutionality of New Mexico's Domestic Well Statute (DWS), NMSA 1978, § 72–12–1.1 (2003). Bounds, a rancher and farmer in the fully appropriated and adjudicated Mimbres basin, and the New Mexico Farm and Livestock Bureau (Petitioners), argued that the DWS was facially unconstitutional. The DWS states that the NMOSE "shall issue" domestic well permits, without determining the availability of unappropriated water or providing other water rights owners in the area the ability to protest the well. The Petitioners argued that this practice violated the New Mexico constitutional doctrine of prior appropriation to the detriment of senior water users, as well as due process of law. The Court held that the DWS does not violate the doctrine of prior appropriation set forth in the New Mexico Constitution. The Court also held that Petitioners failed to adequately demonstrate any violation of their due process rights.

In addressing the facial constitutional challenge, the Court rejected the Petitioners' argument that the New Mexico Constitution mandates that the statutory requirements of notice, opportunity to be heard, and a prior determination of unappropriated waters or lack of impairment be applied to the domestic well application and permitting process. The Court reasoned that the DWS creates a different and more expedient permitting procedure for domestic wells and the constitution does not require a particular permitting process, or identical permitting procedures, for all appropriations. While holding that the DWS was valid in not requiring the same notice, protest, and water availability requirements as other water rights applications, the court confirmed that domestic well permits can be administered in the same way as all other water rights. In other words, domestic wells do not require the same rigors as other water rights when permitted but, when domestic wells are administered, constitutionally mandated priority administration still applies. Thus the DWS, which deals solely with permitting and not with administration, does not conflict with the priority administration provisions of the New Mexico Constitution.

The Court also found that the Petitioners failed to prove a due process violation because they did not demonstrate how the DWS deprived them of their water rights. Specifically, Bounds failed to show any actual impairment, or imminent future impairment, of his water rights. Bounds asserted that any new appropriations must necessarily cause impairment in a closed and fully appropriated basin, and therefore, granting any domestic well permit had the potential to impair his rights. The Court rejected this argument, finding that impairment must be proven using

scientific analysis, not simply conclusory statements based on a bright line rule that impairment always occurs when new water rights are permitted in fully appropriated basins.

Two other significant domestic well decisions addressed domestic well use within municipalities. In *Smith v. City of Santa Fe*, 2007-NMSC-055, 142 N.M. 786, the Supreme Court examined the authority of the City of Santa Fe to enact an ordinance restricting the drilling of domestic wells. The Court held that under the City's home rule powers, it had authority to prohibit the drilling of a domestic well within the municipal boundaries and that this authority was not preempted by existing state law.

Then in *Stennis v. City of Santa Fe*, 2008-NMSC-008, 143 N.M. 320, Santa Fe's domestic well ordinance was tested when a homeowner (Stennis) applied for a domestic well permit with the NMOSE, but did not apply for a permit from the City. In examining the statute allowing municipalities to restrict the drilling of domestic wells, the Court found that municipalities must strictly comply with NMSA 1978, § 3–53–1.1(D) (2001), which requires cities to file their ordinances restricting the drilling of domestic water wells with the NMOSE. On remand, the Court of Appeals held that Section 3-53-1.1(D) does not allow for *substantial* compliance. *Stennis v. City of Santa Fe*, 2010-NMCA-108, 149 N.M. 92. Rather, strict compliance is required and the City must have actually filed a copy of the ordinance with the NMOSE.

In addition to the cases addressing domestic wells, the regulations governing the use of groundwater for domestic use were substantially amended in 2006 to clarify domestic well use pursuant to NMSA 1978, § 72-12-1.1. 19.27.5.1 et seq. NMAC. The regulations:

1. Limit the amount of water that can be used pursuant to a domestic well permit to:

    - 1.0 acre-foot per year for a single household use (can be increased to up to 3.0 acre-feet per year if the applicant can show that the combined diversion from domestic wells will not impair existing water rights).

    - 1.0 acre-foot per year for each household served by a well serving more than one household, with a cap of 3.0 acre-feet per year if the well serves three or more households.

    - 1.0 acre-foot per year for drinking and sanitary purposes incidental to the operations of a governmental, commercial, or non-profit facility as long as no other water source is available. The amount of water so permitted is subject to further limitations imposed by a court or a municipal or county ordinance.

    The amount of water that can be diverted from a domestic well can also be increased by transferring an existing water right to the well. 19.27.5.9 NMAC.

2. Require mandatory metering of all new domestic wells under certain conditions, such as when wells are permitted within a domestic well management area, when a court imposes a metering requirement, when the water use is incidental to the operations of a governmental, commercial, or non-profit facility, and when the well serves multiple households. 19.27.5.13(C) NMAC.

3. Allow for the declaration of domestic well management areas when hydrologic conditions require added protections to prevent impairment to valid, existing surface water rights. In such areas, the maximum diversion from a new domestic well cannot exceed, and may be less than, 0.25 acre-foot per year for a single household and up to 3.0 acre-feet per year for a multiple household well, with each household limited to 0.25 acre-feet per year. The State Engineer has not declared any domestic well management areas in the planning region.

#### *4.1.1.8 Water Project Financing*

The Water Project Finance Act, Chapter 72, Article 4A NMSA 1978, outlines different mechanisms for funding water projects in water planning regions. The purpose of the Act is to provide for water use efficiency, resource conservation, and the protection, fair distribution, and allocation of New Mexico's scarce water resources for beneficial purposes of use within the State. The Water Project Finance Act creates two funds: the Water Project Fund, NMSA 1978, § 72-4A-9 (2005), and the Acequia Project Fund, NMSA 1978, § 72-4A-9.1 (2004). Both funds are administered by the New Mexico Finance Authority. The Water Trust Board recommends projects to the Legislature to be funded from the Water Project Fund.

The Water Project Fund may be used to make loans or grants to qualified entities (broadly defined to include public entities and Indian tribes and pueblos). To qualify for funding, the project must be approved by the Water Trust Board for one of the following purposes: (1) storage, conveyance or delivery of water to end users, (2) implementation of federal Endangered Species Act of 1973 collaborative programs, (3) restoration and management of watersheds, (4) flood prevention, or (5) water conservation or recycling, treatment, or reuse of water as provided by law. NMSA 1978, § 72-4A-5(B) (2011). The Water Trust Board must give priority to projects that (1) have been identified as being urgent to meet the needs of a regional water planning area that has a completed regional water plan accepted by the NMISC, (2) have matching contributions from federal or local funding sources, and (3) have obtained all requisite state and federal permits and authorizations necessary to initiate the project. NMSA 1978, § 72-4A-5.

The Acequia Project Fund may be used to make grants to acequias for any project approved by the Legislature.

The Water Project Finance Act directed the Water Trust Board to adopt regulations governing the terms and conditions of grants and loans recommended by the Board for appropriation by the

Legislature from the Water Project Fund. The Board promulgated implementing regulations, 19.25.10.1 et seq. NMAC, in 2008. The regulations set forth the procedures to be followed by the Board and New Mexico Finance Authority for identifying projects to recommend to the Legislature for funding. The regulations also require that financial assistance be made only to entities that agree to certain conditions set forth in the regulations.

#### *4.1.1.9 The Strategic Water Reserve*

In 2005, the New Mexico Legislature enacted legislation to establish a Strategic Water Reserve, NMSA 1978, § 72-14-3.3 (2007). Regulations implementing the Strategic Water Reserve statute were also implemented in 2005. 19.25.14.1 et seq. NMAC.

The statute authorizes the Commission to acquire water rights or storage rights to compose the reserve. Section 72-14-3.3(A). Water in the Strategic Water Reserve can be used for two purposes: (1) to comply with interstate stream compacts and (2) to manage water for the benefit of endangered or threatened species or to avoid additional listing of species. Section 72-14-3.3(B). The NMISC may only acquire water rights that have sufficient seniority and consistent, historical beneficial use to effectively contribute to the purpose of the Reserve. The NMISC must annually develop river reach or groundwater basin priorities for the acquisition of water rights for the Strategic Water Reserve. The reach of the Canadian River below Ute Reservoir has been designated as a priority basin; however, this reach lies outside of the planning region.

#### *4.1.1.10 Acequia Water Use*

Two recent cases by New Mexico courts address the issue of acequia water use. *Storm Ditch v. D'Antonio*, 2011-NMCA-104, 150 N.M. 590, examined the process for transferring a landowner's water rights from a community acequia to a municipality. The Court found that actual notice of the transfer application to the acequia was not mandated by statute; instead, publication of the landowner's transfer application provided sufficient notice to the acequia to inform it of the proposed transfer. Further, the statute requiring that the transfer applicant file an affidavit stating that no rules or bylaws for a transfer approval had been adopted by the acequia was not intended to prove notice. Rather, the statute was directed at providing the State Engineer with assurance that the applicant had met all requirements imposed by acequia bylaws before action was taken on the application, not in providing notice.

*Pena Blanca Partnership v. San Jose Community Ditch*, 2009-NMCA-016, 145 N.M. 555, involved attempts to transfer water rights from agricultural uses appurtenant to lands served by two acequias to non-agricultural uses away from the acequias. The acequias denied the water rights owners' (Owners) requests to make these changes pursuant to their authority under NMSA 1978, § 73-2-21(E) (2003). The Owners appealed the acequias decision to district court. On appeal, the standard of review listed in Section 73–2–21(E) only allowed reversal of the acequia

commissioners if the court found they had acted fraudulently, arbitrarily or capriciously, or not in accordance with law.

The Owners challenged this deferential standard of review in the Court of Appeals based on two grounds. First, the Owners argued that the *de novo* review standard in Article XVI, Section 5 of the New Mexico Constitution applied to the proposed transfers at issue, not the more deferential standard found in Section 73-2-21(E). The Court disagreed and found that the legislature provided for another review procedure for the decisions of acequia commissioners by enacting Section 73–2–21(E).

The Owners second assertion was that the deferential standard of review in Section 73-2-21(E) violated the equal protection clause of Article II, Section 18 of the New Mexico Constitution. The Owners argued that their equal protection guarantees were violated because water rights transfers out of acequias were treated differently than other water rights transfers. The court again disagreed, finding that although other determinations of water rights are afforded a *de novo* hearing in the district court, since the Owners still had access to the courts and the right of appeal, there were no equal protection violations.

#### *4.1.1.11 Water Conservation*

Guidelines for drafting and implementing water conservation plans are set forth in NMSA 1978, § 72-14-3.2 (2003). By statute, neither the Water Trust Board nor the New Mexico Finance Authority may accept an application from a covered entity (defined as municipalities, counties, and any other entities that supply at least 500 acre-feet per annum of water to its customers, but excluding tribes and pueblos) for financial assistance to construct any water diversion, storage, conveyance, water treatment, or wastewater treatment facility unless the entity includes a copy of its water conservation plan.

The water conservation statute primarily supplies guidance to covered entities, as opposed to mandating any particular action. For example, the statute provides that the covered entity determines the manner in which it will develop, adopt, and implement a water conservation plan. The statute further states that a covered entity "shall consider" either adopting ordinances or codes to encourage conservation, or otherwise "shall consider" incentives to encourage voluntary compliance with conservation guidelines. The statute then states that covered entities "shall consider, and incorporate in its plan if appropriate, . . . a variety of conservation measures," including, in part, water-efficient fixtures and appliances, water reuse, leak repairs, and water rate structures encouraging efficiency and reuse. Section 72-14-3.2(D).

#### *4.1.1.12 Municipal Condemnation*

NMSA 1978, § 3-27-2 (2009) was amended in 2009 to prohibit municipalities from condemning water sources used by, water stored for use by, or water rights owned or served by an acequia, community ditch, irrigation district, conservancy district, or political subdivision of the state.

#### *4.1.1.13 Subdivision Act*

The Subdivision Act, NMSA 1978, § 47-6-11.2 (2013), was amended in 2013 to require proof of water availability prior to final approval of a subdivision plat. Specifically, the subdivider must (1) present the county with NMOSE-issued water use permits for the subdivision or (2) prove that the development will hook up to a water provider along with an opinion from the State Engineer that the subdivider can fulfill the water use requirements of the Subdivision Act. Previously the county had discretion to approve subdivision plats without such proof that the water rights needed for the subdivision were readily available. These water use requirements apply to all subdivisions of ten or more lots. The Act was also amended to prohibit approval of a subdivision permit if the water source for the subdivision is domestic wells.

### 4.1.2 State Water Laws and Administrative Policies Affecting the Region

In New Mexico, water is administered generally by the State Engineer, who has the "general supervision of waters of the state and of the measurement, appropriation, distribution thereof and such other duties as required." NMSA 1978, § 72-2-1 (1982). To administer water throughout the state the State Engineer has several tools at its disposal, including designation of water masters, declaration of UWBs, and use of the AWRM rules, all of which are discussed below, along with other tools used to manage water within regions.

#### *4.1.2.1 Water Masters*

The State Engineer has the power to create water master districts or sub-districts by drainage area or stream system and to appoint water masters for such districts or sub-districts. NMSA 1978, § 72-3-1 (1919). Water masters have the power to apportion the waters in the water master's district under the general supervision of the State Engineer and to appropriate, regulate, and control the waters of the district to prevent waste. NMSA 1978, § 72-3-2 (2007). Within the planning region there is a water master for the Cimarron-Rayado Water Master District.

#### *4.1.2.2 Groundwater Basin Guidelines*

The NMOSE has declared UWBs and implements guidelines in those basins for the purpose of carrying out the provisions of the statutes governing underground waters. *See* NMAC 19.27.48.6. The Colfax Water Planning Region includes the Canadian River UWB and portions of the Tucumcari and Clayton UWBs (Figure 4-1). No basin guidelines have been formally adopted for the basins within the planning region.

#### *4.1.2.3 AWRM Implementation in the Basin*

No AWRM regulations have been issued for the basin and none of the basins in the region have been designated as a priority basin for AWRM implementation.

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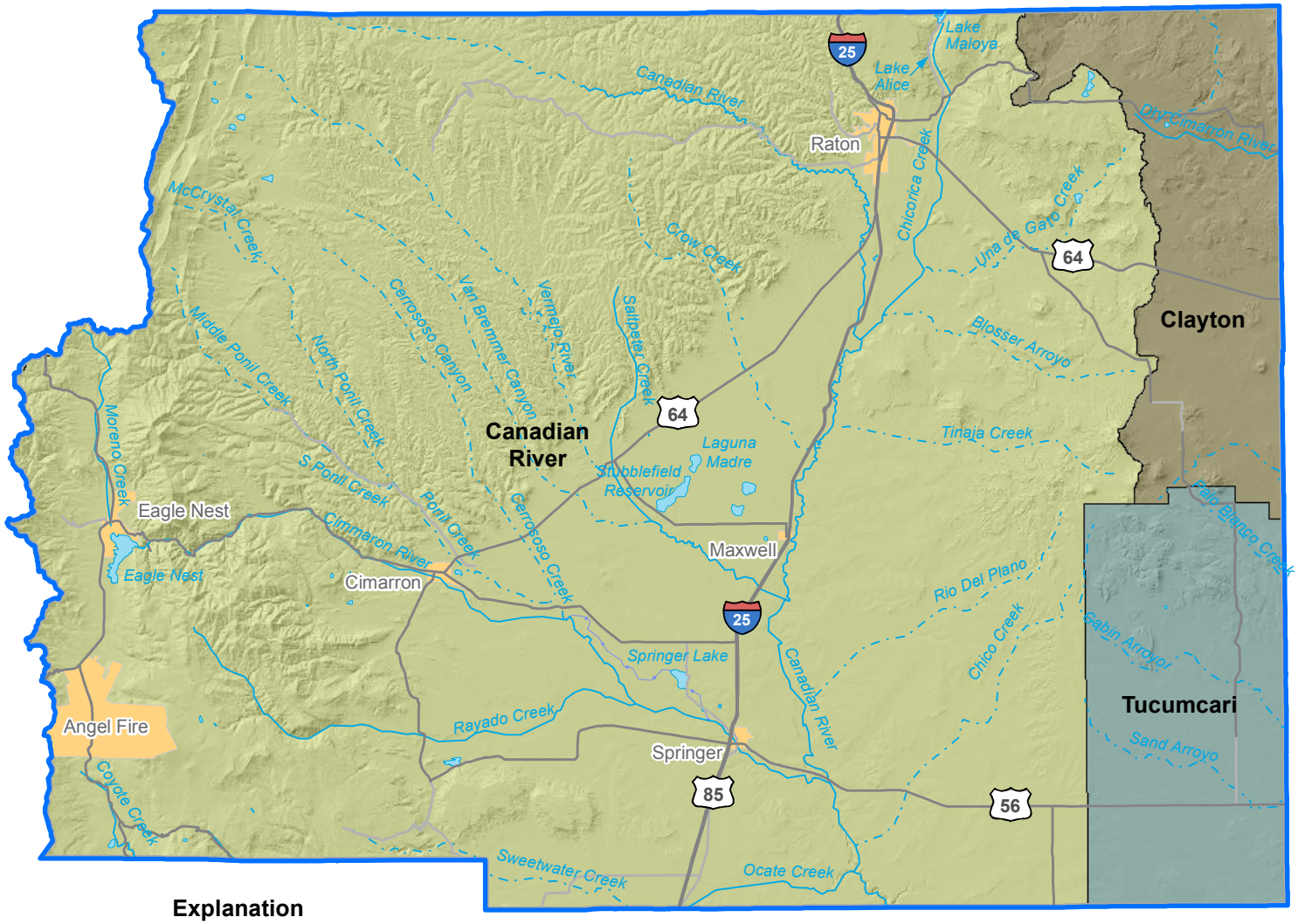


**Explanation**

- Stream (dashed where intermittent)
- Lake
- City
- County
- Water planning region

NMOSE-declared groundwater basin

- Canadian River
- Clayton
- Tucumcari

Note: There are no NMOSE groundwater models in this region.
Source: NMOSE, 2014a

N

0 5 10 Miles

Figure 4-1

COLFAX
REGIONAL WATER PLAN 2016

**NMOSE-Declared Groundwater Basins and Groundwater Models**

#### *4.1.2.4 Special Districts in the Basin*

Special districts are various districts within the region having legal control over the use of water in that district. All are subject to specific statutes or other laws concerning their organization and operation. In the Colfax Water Planning region, there are several special districts, including irrigation districts, acequias, water users associations, and soil and water conservation districts.

#### *4.1.2.5 State Court Adjudications in the Basin*

Adjudications in the Colfax Water Planning Region are discussed in depth in the 2003 plan, Section 4.4.1.

#### *4.1.2.6 Permit No. 71*

As discussed in depth in the 2003 Plan, the water rights in Eagle Nest Reservoir are defined in NMOSE License Number 71, more commonly referred to as Permit No. 71 (refer to the 2003 plan for background information on Permit No. 71). In 2006 the water users who historically contracted to use the water rights in the reservoir—the State of New Mexico, the State Game Commission, the New Mexico Department of Game and Fish, and the NMISC—entered into a settlement agreement to address disputes over management of the reservoir and administration of Permit No. 71. The settlement agreement is an extremely important component of water management in the region. In addition to establishing how the various State entities interested in the reservoir handle reservoir operations, the settlement agreement outlines the following basic terms:

- All users share shortages, in amounts determined by how much water is in the lake on June 1 of each year.
- All users are treated equally, including the Tier-Two users.
- Adjustment of allocations and reductions in private storage protect the original vested users.

### 4.1.3 Federal Water Laws

The law of water appropriation has been developed primarily through decisions made by state courts. Since the accepted plan was published in 2003 several federal cases have been decided examining various water law questions. These cases are too voluminous to include here, and many of the issues in the cases will not apply directly to the region. However, New Mexico is a party to one original jurisdiction case in the U.S. Supreme Court involving the Rio Grande Compact and waters of the Lower Rio Grande. Because of its importance to the entire state it is included here.

In *Texas v. New Mexico and Colorado*, No. 141 Original (U.S. Supreme Court, 2014), Texas alleges that New Mexico has violated the Rio Grande Compact by intercepting water Texas is entitled to under the Compact through groundwater pumping and surface diversions downstream of Elephant Butte Reservoir but upstream of the New Mexico-Texas state line. Colorado is also a defendant in the lawsuit as it is a signatory to the Rio Grande Compact. The United States has intervened as a Plaintiff in the case. Elephant Butte Irrigation District and El Paso County Water Improvement District Number One have both sought to intervene in the case as well, claiming that their interests are not fully represented by the named parties. The motions to intervene along with a motion to dismiss filed by New Mexico are currently pending.

#### *4.1.3.1 Federal Reservations*

The doctrine of federally reserved water rights was developed over the course of the 20th Century. Simply stated, federally reserved rights are created when the United States sets aside land for specific purposes, thereby withdrawing the land from the general public domain. In doing so, there is an implied, if not expressed, intent to reserve an amount of water necessary to fulfill the purpose for which the land was set aside. Federally reserved water rights are not created, or limited, by State law. Federally reserved lands with the Colfax planning region include the following:

- Carson National Forest
- Maxwell National Wildlife Refuge
- A small portion of the Kiowa National Grasslands

#### *4.1.3.2 Interstate Stream Compacts*

Interstate compacts become federal law once ratified by Congress. The Canadian River Compact and the associated Amended Supreme Court Degree issued in 1993 govern water use on the Canadian River. The Canadian River Compact is discussed at length in Section 4.2.2 of the 2003 plan.

#### *4.1.3.3 Treaties*

Not applicable.

#### *4.1.3.4 Federal Water Projects*

Not applicable.

#### *4.1.3.5 Federal Adjudications in the Basin*

Not applicable.

### 4.1.4 Tribal Law

Not applicable.

### 4.1.5 Local Law

Local laws addressing water use have been implemented by both Colfax County and municipalities within the planning region.

#### *4.1.5.1 Colfax County*

Water use in Colfax County is guided by *A Comprehensive Plan for Colfax County* (CommunityByDesign/Planners Ink, 2004) and regulated through ordinances.

The comprehensive plan sets forth a number of goals, objectives, and strategies relating to water use within the County:

- Maintaining high water quality standards through protecting surface and groundwater supplies
- Encouraging responsible ownership and monitoring of septic systems to protect water quality
- Recognizing and protecting existing water rights as new water demands occur, which would include developing guidelines on new domestic well use and encouraging designation of a water master for the Canadian River
- Implementing water conservation practices to preserve the rural/ranching customs and cultures, which would include reducing per capita water use and developing conservation and drought plans
- Requiring new developments to have adequate water available to meet their water demands
- Protecting and enhancing areas with high natural resource values such as riparian and wildlife habitats
- Strengthening the County's role in state and federal decisions that affect natural resources, endangered species, and water
- Developing water use restrictions on oil and gas development and pumping.

Colfax County Ordinance No. 1999-1 (as amended by Ordinance No. 2013-01) governs the subdivision of land in the County. Related to water use, the ordinance requires that a subdivider provide sufficient information for the County to determine that (1) there is sufficient water

quantity to fulfill the maximum annual water requirements of the subdivision, (2) the water is of an acceptable quality for human consumption, and (3) measures are taken to protect the water supply from contamination, Article 4, Section 5. The ordinance also requires that for all subdivisions containing 20 or more parcels, any one of which is two acres or less in size, the subdivider must provide a copy of the water permit issued by the State Engineer for subdivision water use.

Although not a binding County law, the Colfax County Oil & Gas Ad Hoc Steering Committee issued recommendations on March 6, 2013, in which it recommended that the County pass an oil and gas ordinance that establishes guidelines for setbacks from surface water and wetlands and required baseline water sampling for oil and gas operations.

#### *4.1.5.2 City of Raton*

Water use in the City of Raton is regulated through its Code of Ordinances. Chapter 54 of the City Code regulates water shortages and includes provisions for restriction on water use during drought or other emergencies (Section 54.01), the ability to declare a water shortage emergency (Section 54.17), and the ability to set certain rates during water shortage emergencies (Section 54.18). Chapter 154 of the Code regulates subdivisions and contains provisions for documenting the water supply for subdivisions outside of the City limits (Section 154.046(A)(2)(g)).

#### *4.1.5.3 Town of Springer*

The Town of Springer has passed an ordinance establishing a water conservation plan for the town. The ordinance sets forth the criteria for declaring a water service emergency and provides for specific responses to that emergency based on its severity. The responses include limitations on the amount of water to be used and other various water and building restrictions.

#### *4.1.5.4 Village of Angel Fire*

Water use in the Village of Angel Fire is guided by the *Village of Angel Fire Comprehensive Plan* (Consensus Planning, Inc., 2008) and the Angel Fire 40-Year Water Plan (1997). Water use is regulated through ordinances and a Village proclamation.

One of the overall stated goals of the comprehensive plan is to promote development principles that promote the efficient use of water resources. One weakness of the Village noted in the plan is its lack of water storage and delivery capabilities. Section 3(E) of the plan focuses on increasing the Village's ability to use reclaimed water from its wastewater treatment facility and notes the desire to expand the service area of the Village's water system. Relating to the water system, the plan sets forth several goals related to the system, including purchase of a new water tank and purchase of additional water rights. Another stated goal of the plan is to develop a comprehensive conservation plan to sustain and safeguard the natural environment, including

following the Angel Fire 40-Year Water Plan, developed in 1997, and continuing to buy water rights based on projected population growth and commercial development, Section 10(D).

The Angel Fire, New Mexico Village Code requires subdividers to make water rights available to the Village either through the transfer of water rights (0.333 acre-feet for each dwelling unit) or payment in lieu of such transfer, Section 10-3C-5.

The Village's Proclamation 2012-01 (Declaration of Drought Emergency) calls for certain water use restrictions for all metered customers of the Village's water utility during drought.

#### *4.1.5.5 Village of Cimarron*

The Village of Cimarron regulates water use through its Municipal Code. Chapter 13-15 contains a number of provisions relating to water use and water conservation.

- The Village makes available a water conservation incentive for the purchase of certain water saving products, Chapter 13.15.050.
- The waste of water is prohibited, Chapter 13.15.070.
- The Code authorizes the mayor and Village council to declare a water emergency, impose water restrictions, and implement a water emergency management plan, Chapters 13.15.080, 13.15.100.
- The Code sets forth several water emergency management stages depending on the severity of the water shortage, Chapter 13.15.120.

#### *4.1.5.6 Village of Eagle Nest*

The Village has no specific ordinances or comprehensive plan relating to water use.

#### *4.1.5.7 Village of Maxwell*

The Village has no specific ordinances or comprehensive plan relating to water use.

## 4.2 Relevant Environmental Law

### 4.2.1 Species Protection Laws

#### *4.2.1.1 Federal Endangered Species Act*

The Endangered Species Act (ESA) can have a tremendous influence on the allocation of water, especially of stream and river flows. 16 U.S. C.§§ 1531 to 1544. The ESA was enacted in 1973 and, with limited exceptions, has remained in its current form since then. The goal of the Act is to protect threatened and endangered species and the habitat on which they depend. 16 U.S.C.

§ 1531(b). The Act's ultimate goal is to "recover" species so that they no longer need protection under the Act.

The ESA provides several mechanisms for accomplishing these goals. It authorizes the U.S. Fish and Wildlife Service (USFWS) to list "threatened" or "endangered" species, which are then protected under the Act, and to designate "critical habitat" for those species. The Act makes it unlawful for anyone to "take" a listed species unless an "incidental take" permit or statement is first obtained from the Department of the Interior. 16 U.S.C. §§ 1538, 1539. To "take" is defined as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or to attempt to engage in any such conduct." 16 U.S.C. § 1532(19).

In addition, federal agencies must use their authority to conserve listed species. 16 U.S.C. § 1536(a)(1). They must make sure, in consultation with USFWS, that their actions do not jeopardize the continued existence of listed species or destroy or harm habitat that has been designated as critical for such species. 16 U.S.C. § 1536(a)(2). This requirement applies whenever a private or public entity undertakes an action that is "authorized, funded, or carried out," wholly or in part by a federal agency. *Id.* As part of the consultation process, federal agencies must usually prepare a biological assessment to identify endangered or threatened species and determine the likely effect of the federal action on those species and their critical habitat. 16 U.S.C. § 1536(c). At the end of the consultation process, the USFWS prepares a biological opinion stating whether the proposed action will jeopardize the species or destroy or adversely modify its critical habitat. 16 U.S.C. § 1536(c)(4). USFWS may also recommend reasonable alternatives that do not jeopardize the species. *Id.*

The species in the Colfax Water Planning Region (Colfax County) that are subject to protection under the ESA are as follows:

- Yellow-billed cuckoo (threatened; no recovery plan yet)
- Mexican spotted owl (threatened, final recovery plan)
- Southwestern willow flycatcher (endangered, final recovery plan)
- Black-footed ferret (endangered, final recovery plan)
- Canada lynx (threatened, recovery plan outline)
- New Mexico meadow jumping mouse (endangered; recovery plan outline)

Of the threatened and endangered species found in the region, the protection and recovery of the yellow-billed cuckoo, southwestern willow flycatcher, and New Mexico meadow jumping mouse are most likely to affect water planning within the region. Any actions that are likely to harm the habitat used by this species will be subject to strict review and possible limitation.

#### *4.2.1.2 New Mexico Wildlife Conservation Act*

The New Mexico Wildlife Conservation Act, enacted in 1974, provides for the listing and protection of threatened and endangered wildlife species in the state. NMSA 1978, §§ 17-2-37 to 17-2-46. In enacting the law, the Legislature found that indigenous New Mexico species that are threatened or endangered "should be managed to maintain and, to the extent possible, enhance their numbers within the carrying capacity of the habitat." Section 17-2-39(A).

The Act authorizes the New Mexico Department of Game and Fish to conduct investigations of indigenous New Mexico wildlife species suspected of being threatened or endangered to determine if they should be listed. Section 17-2-40(A). Based on the investigation, the director then makes listing recommendations to the Game and Fish Commission. *Id.* The Act authorizes the Commission to issue regulations listing wildlife species as threatened or endangered based on the investigation and recommendations of the Department. Section 17-2-41(A). Once a species is listed, the Department of Game and Fish, "to the extent practicable," is to develop a recovery plan for that species. Section 17-2-40.1. The Act makes it illegal to "take, possess, transport, export, process, sell or offer for sale[,] or ship" any listed endangered wildlife species. Section 17-2-41(C). However, enforcement of this provision of the Act is very limited.

Pursuant to the Act, the Commission has listed over 100 wildlife species—mammals, birds, fish, reptiles, amphibians, crustaceans, and mollusks—as endangered or threatened. 19.33.6.8 NMAC. As of August 2014, 62 species were listed as threatened, and 56 species were listed as endangered. *Id.* In the Colfax Water Planning Region, all of the federally listed species discussed above are protected also under the New Mexico Act, along with several others.

### 4.2.2 Water Quality Laws

#### *4.2.2.1 Clean Water Act*

The most significant federal law addressing water quality is the Clean Water Act (CWA), 33 U.S.C. §§ 1251 to 1387, which Congress enacted in its modern form in 1972, overriding President Nixon's veto. The stated objective of the CWA is to "restore and maintain the chemical, physical and biological integrity" of the waters of the United States. 33 U.S.C. § 1251(a).

##### *4.2.2.1.1 NPDES Permit Program (Section 402)*

The CWA makes it unlawful for any person to discharge any pollutant into waters of the United States without a permit. 33 U.S.C. § 1311(a). Generally, a "water of the United States" is a navigable water, a tributary to a navigable water, or an adjacent wetland, although the scope of the term has been the subject of considerable controversy as described below.

The heart of the CWA regulatory regime is the National Pollutant Discharge Elimination System (NPDES) permitting program under Section 402 of the Act. Any person—including a corporation, partnership, state, municipality, or other entity—that discharges a pollutant into waters of the United States from a point source must obtain an NPDES permit from EPA or a delegated state. 33 U.S.C. § 1342. A point source is defined as "any discernible, confined, and discrete conveyance," such as a pipe, ditch, or conduit. *Id*. § 1362(14). NPDES permits include conditions setting effluent limitations based on available technology and, if needed, effluent limitations based on water quality.

The CWA provides that each NPDES permit issued for a point source must impose effluent limitations based on application of the best practicable, and in some cases the best available, pollution control technology. 33 U.S.C. § 1311(b). The Act also requires more stringent effluent limitations for newly constructed point sources, called new source performance standards. *Id*. § 1316(b). EPA has promulgated technology-based effluent limitations for dozens of categories of new and existing industrial point source dischargers. 40 C.F.R. pts. 405-471. These regulations set limits on the amount of specific pollutants that a permittee may discharge from a point source.

The CWA requires the states to develop water quality standards for individual segments of surface waters. 33 U.S.C. § 1313. Water quality standards have three components. First, states must specify designated uses for each body of water, such as public recreation, wildlife habitat, water supply, fish propagation, or agriculture. 40 C.F.R. § 131.10. Second, they must establish water quality criteria for each body of water, which set a limit on the level of various pollutants that may be present without impairing the designated use of the water body. *Id.* § 131.11. And third, states must adopt an antidegradation policy designed to prevent the water body from becoming impaired such that it cannot sustain its designated use. *Id.* § 131.12.

Surface water segments that do not meet the water quality criteria for the designated uses must be listed as "impaired waters." 33 U.S.C. § 1313(d)(l)(C). For each impaired water segment, states must establish "total maximum daily loads" (TMDLs) for those pollutants causing the water to be impaired, allowing a margin of safety. *Id*. § 1313(d)(1). The states must submit to EPA for approval the list of impaired waters and associated TMDLs. *Id*. § 1313(d)(2). The TMDL process, in effect, establishes a basin-wide budget for pollutant influx to a surface water. The states must then develop a continuing planning process to attain the standards, including effluent limitations for individual point sources. *Id*. § 1313(e).

New Mexico has taken steps to implement these CWA requirements. As discussed in Section 4.2.2.3, the New Mexico Water Quality Control Commission has adopted water quality standards for surface waters. The standards include designated uses for specific bodies of water, water quality criteria, and an antidegradation policy. 20.6.4 NMAC. The New Mexico Environment Department (NMED) has prepared a report listing impaired surface waters

throughout the state. *State of New Mexico Clean Water Act Section 303(d)/Section 305(b) Integrated Report – 2014-2016* (Nov. 18, 2014). In the Colfax planning region, numerous segments of the Upper Canadian, Cimarron, Dry Cimarron, and Vermejo rivers are on the impaired list.

EPA can delegate the administration of the NPDES program to individual states. 33 U.S.C. § 1251(b). New Mexico is one of only a handful of states that has neither sought nor received delegation to administer the NPDES permit program. Accordingly, EPA administers the NPDES program in New Mexico.

#### *4.2.2.1.2 Dredge and Fill Permit Program (Section 404)*

The CWA establishes a second important permitting program under Section 404, regulating discharges of "dredged or fill material" into waters of the United States. 33 U.S.C. § 1344. Although the permit requirement applies to discharges of such material into all waters of the United States, most permits are issued for the filling of wetlands. The program is administered primarily by the Army Corps of Engineers, although EPA has the authority to veto permits and it shares enforcement authority with the Corps.

Like the section 402 NPDES permit program, the CWA allows the section 404 permit program to be delegated to states. 33 U.S.C. § 1344(g). Again, New Mexico has not received such delegation, and the program is implemented in New Mexico by the Corps and EPA.

#### *4.2.2.1.3 Waters of the United States*

The term "waters of the United States" delineates the scope of CWA jurisdiction, both for the section 402 NPDES permit program, and for the section 404 dredge and fill permit program. The term is not defined in the CWA, but is derived from the definition of "navigable waters," which means "waters of the United States including the territorial seas." 33 U.S.C. § 1362(7). In 1979, EPA promulgated regulations defining the term "waters of the United States." *See* 40 C.F.R. § 230.3(s) (2014) (between 1979 and 2014, the term remained substantially the same). This definition, interpreted and implemented by both EPA and the Corps, remained settled for many years.

In 2001, however, the Supreme Court began to cast doubt on the validity of the definition as interpreted by EPA and the Corps. The Court took up a case in which the Corps had asserted CWA jurisdiction over an isolated wetland used by migratory birds, applying the Migratory Bird Rule. The Court ruled that the Corps had no jurisdiction under the CWA, emphasizing that the CWA refers to "navigable waters," and that the isolated wetland had no nexus to any navigable-in-fact water. *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers,* 531 U.S.159 (2001).

The Court muddied the waters further in its 2006 decision in *Rapanos v. United States*, 547 U.S. 715 (2006) (consolidated with *Carabell v. U.S. Army Corps of Engineers*). Both these cases challenged the Corps' assertion of CWA jurisdiction over wetlands separated from traditional navigable waters by a man-made ditch. In a fractured 4-1-4 decision, the Court ruled that the Corps did not have CWA authority to regulate these wetlands. The plurality opinion, authored by Justice Scalia, held that CWA jurisdiction extends only to relatively permanent standing or flowing bodies of water that constitute rivers, streams, oceans, and lakes. *Id.* at 739. Nevertheless, jurisdiction extends to streams or lakes that occasionally dry up, and to streams that flow only seasonally. *Id.* at 732, n.3. And jurisdiction extends to wetlands with a continuous surface connection to such water bodies. *Id.* at 742. The concurring opinion, written by Justice Kennedy, stated that CWA jurisdiction extends to waters having a "significant nexus" to a navigable water, but the Corps had failed to show such nexus in either case. *Id.* at 779-80. In dissent, Justice Stevens would have found CWA jurisdiction in both cases. *Id.* at 787.

There has been considerable confusion over the proper application of these opinions. Based on this confusion, EPA and the Corps recently amended the regulatory definition of "waters of the United States" to conform to the *Northern Cook County* and *Rapanos* decisions. Final Rule, 80 Fed. Reg. 37054 (June 29, 2015) codified at 33 C.F.R. pt 328; 40 C.F.R. pts 110, 112, 116, 117, 122, 230, 232, 300, 302, and 401. The new definition covers (1) waters used for interstate or foreign commerce, (2) interstate waters, (3) the territorial seas, (4) impounded waters otherwise meeting the definition, (5) tributaries of the foregoing waters, (6) waters, including wetlands, adjacent to the foregoing waters, (7) certain specified wetlands having a significant nexus to the foregoing waters, and (8) waters in the 100-year floodplain of the foregoing waters. 40 C.F.R. § 302.3.

Several states and industry groups have challenged the new definition in federal district courts and courts of appeal. In one such challenge, the district court granted a preliminary injunction temporarily staying the rule. *North Dakota v. EPA*, 127 F. Supp. 3d 1047 (D.N.D. 2015). Because the NMED and the NMOSE are plaintiffs in this case, the stay is effective—and the new definition does not now apply—in New Mexico. The United States has filed a motion asking the district court to dissolve the injunction and dismiss the case. This case is likely to be appealed.

#### *4.2.2.2 Federal Safe Drinking Water Act*

Enacted in 1974, the Safe Drinking Water Act (SDWA) regulates the provision of drinking water in the United States. 42 U.S.C. §§ 300f to 300j-26. The act's overriding purpose is "to insure the quality of publicly supplied water." *Arco Oil & Gas Co. v. EPA*, 14 F.3d 1431, 1436 (10th Cir. 1993). The SDWA requires EPA to promulgate national primary drinking water standards for protection of public health and national secondary drinking water standards for protection of public welfare. *Id.* § 300g-1. To provide this protection, the SDWA requires EPA, as part of the

national primary drinking water regulations, to establish maximum contaminant level goals (MCLGs) and maximum contaminant levels (MCLs) for drinking water contaminants. *Id*. § 300g-1(b)(1). The regulations apply to all "public water systems." *Id*. § 300g.

EPA has promulgated primary and secondary drinking water regulations. 40 C.F.R. pts. 141, 143. Most significantly, the agency has set MCLGs and MCLs for a number of drinking water contaminants, including 16 inorganic chemicals, 53 organic chemicals, turbidity, 6 microorganisms, 7 disinfectants and disinfection byproducts, and 4 radionuclides. *Id*.§§ 141.11, 141.13, 141.61-66. As noted above, New Mexico has incorporated these primary and secondary regulations into the State regulations. 20.7.10.100 NMAC, 20.7.10.101 NMAC.

#### *4.2.2.3 Federal Comprehensive Environmental Response, Compensation, and Liability Act*

Congress enacted the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), or the "Superfund" law, in 1980 to address the burgeoning problem of uncontrolled hazardous waste sites. 42 U.S.C. §§ 9601 to 9675. CERCLA authorizes EPA to prioritize hazardous waste sites according to the degree of threat they pose to human health and the environment, including surface water and groundwater. EPA places the most serious sites on the National Priorities List (NPL). *Id*. § 9605. Sites on the NPL are eligible for federal funds for long-term remediation, which most often includes groundwater remediation.

#### *4.2.2.4 New Mexico Water Quality Act*

The most important New Mexico law addressing water quality is the New Mexico Water Quality Act (WQA), NMSA 1978, §§ 74-6-1 to 74-6-17. The New Mexico Legislature enacted the WQA in 1967. The purpose of the WQA is "to abate and prevent water pollution." *Bokum Res. Corp. v. N.M. Water Quality Control Comm'n*, 93 N.M. 546, 555, 603 P.2d 285, 294 (1979).

The WQA created the Water Quality Control Commission to implement many of its provisions. NMSA 1978, § 74-6-3. The WQA authorizes the Commission to adopt State water quality standards for surface and groundwaters and to adopt regulations to prevent or abate water pollution. NMSA 1978, § 74-6-4(C) and (D). The WQA also authorizes the Commission to adopt regulations requiring persons to obtain from the NMED a permit for the discharge into groundwater of any water contaminant. Section 74-6-5(A). The Department must deny a discharge permit if the discharge would cause or contribute to contaminant levels in excess of water quality standards "at any place of withdrawal of water for present or reasonably foreseeable future use." Section 74-6-5(E)(3). The WQA also authorizes the Commission to adopt regulations relating to monitoring and sampling, record keeping, and Department notification regarding the permit. Section 74-6-5(I). Permit terms are generally limited to five years. Section 74-6-5(H).

Accordingly, the Commission has adopted groundwater quality standards, regulations requiring discharge permits, and regulations requiring abatement of groundwater contamination. 20.6.2

NMAC. The water quality standards for groundwater are published at Sections 20.6.2.3100 through 3114 NMAC, and the regulations for discharge permits are published at Sections 20.6.2.3101 to 3114 NMAC.

An important part of these regulations are those addressing abatement. 20.6.2.4101 - .4115 NMAC. The purpose of the abatement regulations is to "[a]bate pollution of subsurface water so that all groundwater of the state of New Mexico which has a background concentration of 10,000 milligrams per liter or less total dissolved solids is either remediated or protected for use as domestic or agricultural water supply." 20.6.2.4101.A(1) NMAC. The regulations require that groundwater pollution must be abated to conform to the water quality standards. 20.6.2.4103.B NMAC. Abatement must be conducted pursuant to an abatement plan approved by the Department, 20.6.2.4104.A NMAC, or pursuant to a discharge permit, 20.6.2.3109.E NMAC.

In addition, the Commission has adopted standards for surface water. 20.6.1 NMAC. The objective of these standards, consistent with the federal Clean Water Act (Section 4.2.2.1) is "to establish water quality standards that consist of the designated use or uses of surface waters of the [S]tate, the water quality criteria necessary to protect the use or uses[,] and an antidegradation policy." 20.6.4.6.A NMAC. The standards include designated uses for specific bodies of water within the state, 20.6.4.50 to 20.6.4.806 NMAC; general water quality criteria, 20.6.4.13 NMAC; water quality criteria for specific designated uses, 20.6.4.900 NMAC; and water quality criteria for specific bodies of water, 20.6.4.50 to 20.6.4.806 NMAC. The standards also include an antidegradation policy, applicable to all surface waters of the state, to protect and maintain water quality. 20.6.4.8 NMAC. The antidegradation policy sets three levels of protection, closely matched to the federal regulations.

Lastly, the Commission has also adopted regulations limiting the discharge of pollutants into surface waters. 20.6.2.2100 to 2202 NMAC.

#### *4.2.2.5 New Mexico Drinking Water Standards*

The New Mexico Environmental Improvement Act created an Environmental Improvement Board, and it authorizes the Board to promulgate rules and standards for water supply. NMSA 1978, § 74-1-8(A)(2). The Board has accordingly adopted State drinking water standards for all public water systems. 20.7.10 NMAC. The State regulations incorporate by reference the federal primary and secondary drinking water standards, 40 C.F.R. parts 141 and 143, established by the EPA under the Safe Drinking Water Act (Section 4.2.2.2). 20.7.10.100 NMAC, 20.7.10.101 NMAC.

## 4.3 Legal Issues Unique to the Region and Local Conflicts Needing Resolution

Continued implementation of the 2006 Eagle Nest Reservoir Water Rights Settlement Agreement, discussed in Section 4.1.2.6, will continue to be important to the distribution of water in the region.

# 5. Water Supply

This section provides an overview of the water supply in the Colfax Water Planning Region, including climate conditions (Section 5.1), surface water and groundwater resources (Sections 5.2 and 5.3), water quality (Section 5.4) and the administrative water supply used for planning purposes in this regional water plan update (Section 5.5). Additional quantitative assessment of water supplies is included in Section 7, Identified Gaps between Supply and Demand.

The Handbook specifies that each of the 16 regional water plans briefly summarize water supply information from the previously accepted plan and provide key new or revised information that has become available since submittal of the accepted regional water plan. The information in this section regarding surface and groundwater supply and water quality is thus drawn largely from the accepted *Colfax Regional Water Plan* (DBS&A, 2003) and where appropriate, updated with more recent information and data from a number of sources, as referenced throughout this section.

Currently some of the key water supply updates and issues impacting the Colfax region are:

- Much of the Colfax region relies on surface water and is thus vulnerable to drought. In addition to the many agricultural surface water users, many public water systems rely on surface water, including Raton Water Works, Cimarron Water System, Miami Water Users Association, Philmont Boy Scout Ranch Headquarters, Carisbrook Property Owners (Raton area), French Mutual Domestic Water Consumers Association (MDWCA) (Springer area), Springer Water System, and Springer Correctional Facility (NMED, 2014c). These systems are particularly vulnerable to drought.

- Many irrigation ditches within the Springer Ditch Company network, Antelope Valley Irrigation District, Miami Water Users Association, and Vermejo Conservancy District, and at other locations within the region, are faced with large losses of water from inefficient irrigation delivery systems. Many of the irrigation works include unlined ditches that traverse long distances between the diversion points and the end uses. As there is little groundwater use in the area of most of these ditches, seepage losses do not result in groundwater recharge and thus provide no benefit to the region. Improving irrigation efficiency is therefore a key issue in the region.

- Due to the large amount of forested land in the region, coupled with the recent drought conditions, the threat of wildfire and subsequent sedimentation impacts on streams and reservoirs remains a key planning issue. Continued and expanded efforts to reduce catastrophic fire risk through forest management, as well as additional information on the quantitative benefits of various management techniques, are needed. In particular, to support well-informed decisions, further study is needed to quantify the effectiveness of riparian vegetation removal, upland conifer thinning, and other water salvage methods.

- Previous fires in the region have created the need for ongoing rehabilitation and monitoring efforts. In particular, the Track fire started near Raton in June 2011 and within the first 24 hours burned almost 22,000 acres (SWFSC, 2014). Due to extreme fire conditions, there was severe burning in the Schwachheim and Segerstrom watersheds, which provide the water supply for the City of Raton. Substantial post-fire watershed rehabilitation efforts to protect the Raton water supply have taken place over the last few years. Since the original plan was published, considerable effort has also been expended to restore the Ponil watershed following the 2002 Ponil Complex Fire, which burned 92,000 acres, mostly on the Philmont Scout Ranch.

- The City of Raton is faced with a major infrastructure issue in that the spillway at Lake Maloya is only 10 percent of the required size to route stormwater runoff. The City is also faced with loss of population, so has declining revenue without equivalent declines in base costs.

- Colfax County is seeking funding to conduct aquifer mapping to better define groundwater resources in the County that can be developed to provide more reliable supplies during drought conditions.

- A 2011 Preliminary Engineering Report (PER) for the Village of Angel Fire Water System indicated that approximately $16 million is needed for infrastructure upgrades. The upgrades will address freezing and pressure issues (due to the steep geographic terrain), provide for larger water lines where needed, and provide for improved storage for fire flows (Village of Angel Fire, 2011b).

- The Village of Cimarron is working on an upgrade of its wastewater treatment facility that will address discharge compliance issues associated with wastewater reuse. The upgrades will allow the Village to reuse 100 percent of its wastewater for irrigation/land application. A PER was prepared in 2007 (Nolte Associates, Inc., 2007), and the Village is currently seeking funding for the project.

- The Village of Cimarron will also be completing a PER for repairs of the Cimarroncito Dam. The NMED asserted that the Village violated the State drinking water act, and a

2012 settlement agreement. The settlement agreement required that within 3 years of the agreement, either additional total organic carbon removal would need to be achieved or an alternative surface water treatment system would need to be installed.

- The Village of Maxwell is experiencing problems with their wells. The wells are shallow and have been experiencing shortages due to drought.

- The Village of Eagle Nest has two wells that provide an adequate supply, but is in need of additional storage.

- The New Mexico Environment Department Surface Water Bureau completed a wetland map of the watershed using remote sensing. The map can be used to help future project planning.

- Because of the large surface water dependence in Colfax County, there is considerable interest in watershed protection and restoration. In 2011 the Cimarron Watershed Alliance completed a watershed based plan (WBP) (Hilton, 2012), the primary focus of which was to address the root causes of impairment that affect designated uses of water within the watershed. The plan followed U.S. Environmental Protection Agency (EPA) guidance for nine elements of watershed based planning and included an active public involvement process.

- Hydraulic fracturing has been conducted in older coalbed methane wells in Colfax County. The potential for adverse water quality impacts resulting from improperly managed surface or casing operations associated with hydraulic fracturing for oil and gas extraction has been of concern to some in the region, though there have not been any reported problems at this time.

- The region encompasses 59, mostly small, drinking water systems (NMED, 2014c). These small systems face challenges in financing infrastructure maintenance and upgrades and complying with water quality monitoring and training standards.

- Water for the Village of Angel Fire municipal water system is supplied from wells located in and around the Village. The Village has adopted an emergency drought proclamation (Village of Angel Fire, 2011a) that during drought conditions restricts the timing of outdoor water use, recommends no planting of new turf or filling of hot tubs, prohibits cleaning of outdoor hard surfaces, and prohibits water waste.

- Though most of the region is heavily surface water-dependent, in areas such as the Moreno Valley and the Capulin basin where there is significant groundwater use, available spatial and temporal data are inadequate to accurately track water level trends, and additional groundwater monitoring is needed.

- Since the original plan was published in 2003, an agreement has been reached regarding operations on the Cimarron River/Eagle Nest releases. The Agreement for Settlement of Pending Litigation and Other Disputes Concerning State Engineer Permit No. 71, which was recorded with the Colfax County Clerk on September 11, 2006, determines the amount of water each Party is entitled to from Eagle Nest Reservoir. The agreement limits diversions of all users during times of drought to ensure delivery to downstream water users. Parties include downstream users of Eagle Nest surface water as well as groundwater users in the Moreno Valley. Each Party's Annual Delivery Amount is based on an estimate prepared by the NMISC on March 1 that projects the amount of inflow into the reservoir through June 1. These allocations are modified as necessary on June 1 based on the actual amount of storage in the Shared Permit 71 Pool, after accounting for deliveries of Shared Pool water already made. If the estimate is more than 20,000 acre-feet, each Party will receive its maximum Delivery Right. With lower amounts of water estimated, each Party to the agreement will receive a lower annual delivery on a pro rata basis and considering conveyance losses. In low water years this can severely affect deliveries and is of particular concern to the Village of Angel Fire, which does not hold sufficient water rights to meet demand during the low water years. Water users with private storage rights in the reservoir must use their shared pool allocations before using their storage rights.

- The accepted water plan identified potential contamination of shallow groundwater and domestic wells due to septic tanks in the Ute Park area in Cimarron Canyon between Eagle Nest Reservoir and the Village of Cimarron as a potential water quality concern, and this issue is still of concern to the region.

- The NMED periodically tests fish in New Mexico lakes and reservoirs for mercury, which in the form of methylmercury can be very toxic at low levels. Due to mercury detected in some fish at concentrations that could lead to significant adverse human health effects, fish consumption advisories have been issued for Eagle Nest and other lakes in the region (NMG&F et al., 2012). The source of the mercury is most likely atmospheric deposition outside of the planning region.

- The Federal Emergency Management Administration released new floodplain maps of Colfax County in 2009 (FEMA, 2009). The new maps define hazard areas and indicated flood insurance rate boundaries.

## 5.1 Summary of Climate Conditions

The accepted regional water plan (DBS&A, 2003) included an analysis of historical temperature and precipitation in the region. This section provides an updated summary of temperature, precipitation, snowpack conditions, and drought indices pertinent to the region (Section 5.1.1).

Studies relevant to climate change and its potential impacts to water resources in New Mexico and the Colfax region are discussed in Section 5.1.2.

### 5.1.1 Temperature, Precipitation, and Drought Indices

Table 5-1 lists the periods of record for weather stations in Colfax County and identifies two stations that were used for analysis of weather trends. The two stations, Eagle Nest and the Raton Filter Plant, were selected based on completeness of their historical records and the representativeness of geographic variability (Eagle Nest is located at a higher elevation in the Moreno Valley and the Raton Filter Plant is on the plains). In addition to the climate stations, data were available from four snow course and/or snowpack telemetry (SNOTEL) stations (Table 5-1). The locations of the climate stations for which data were analyzed are shown in Figure 5-1.

Long-term minimum, maximum, and average temperatures for the two climate stations are detailed in Table 5-2 and indicate that temperatures are slightly higher at Raton than at Eagle Nest. Average summer and winter temperatures for each year of record at the two stations are shown on Figure 5-2.

Precipitation varies considerably across the planning region and is influenced by both location and elevation. The average precipitation distribution across the entire region is shown on Figure 5-3, and Table 5-2 lists the minimum, maximum, and long-term average annual precipitation (rainfall and snowmelt) at the Eagle Nest and Raton Filter Plant Stations. The long-term averages do not reflect the considerable variability of precipitation, which creates a direct challenge for water supply planning. The variability in total annual precipitation at the Eagle Nest and Raton Stations is shown in Figure 5-4 and is also reflected in the snow data and drought indices discussed below. In addition to annual variability, monthly variability in precipitation and resulting streamflow also presents a challenge: snowmelt and/or monsoon flows may not occur at times when water is most needed for agriculture or other uses.

The Natural Resources Conservation Service (NRCS) operates one SNOTEL station and four snow course stations in the planning region; these stations provide snow depth and snow water equivalent data in the Sangre de Cristo Mountains above the headwaters of the Canadian River (Figure 5-5) (NRCS, 2014a):

- The Aztec Snow Course site is located northeast of Eagle Nest at 9,880 ft amsl and has been operational since 1993.
- The Palo Snow Course site is located northwest of Angel Fire at 9,300 ft amsl and has been operational since 1972.

## Table 5-1. Colfax Climate Stations



| Climate Stations [a] | Latitude | Longitude | Elevation | Precipitation | | Temperature | |
|---|---|---|---|---|---|---|---|
| | | | | Data Start | Data End | Data Start | Data End |
| Abbott 1 SE | 36.30 | –104.25 | 6,150 | 7/1/1909 | Present | 9/1/1977 | 10/31/1981 |
| Aurora | 36.27 | –105.05 | 8,136 | 7/1/1909 | 8/31/1960 | — | — |
| Black Lake | 36.31 | –105.27 | 8,645 | 7/1/1909 | 11/30/2008 | 8/1/1947 | 11/30/2008 |
| Cimarron 4 SW | 36.47 | –104.95 | 6,540 | 5/1/1904 | Present | 5/1/1904 | Present |
| Cimarron 7 SE | 36.45 | –104.80 | 6,204 | 5/1/1904 | 7/31/1957 | 5/1/1904 | 12/31/1904 |
| Cunico Ranch | 36.68 | –104.12 | 6,824 | 6/1/1940 | 8/31/1970 | — | — |
| Dawson | 36.67 | –104.78 | 6,404 | 6/1/1909 | 6/30/1961 | 6/1/1912 | 12/31/1951 |
| **Eagle Nest** | 36.56 | –105.26 | 8,280 | 4/1/1929 | Present | 5/1/1929 | Present |
| Elizabethtown | 36.62 | –105.28 | 8,474 | 1/31/1948 | 10/31/1948 | 1/1/1905 | 1/31/1948 |
| Johnsons Park | 36.80 | –104.25 | 6,550 | 10/1/1909 | 10/31/1923 | 1/1/1913 | 10/31/1923 |
| Lake Alice Near | 36.95 | –104.38 | 6,955 | 3/1/1909 | 11/30/1941 | 3/1/1929 | 11/30/1941 |
| Lake Maloya | 36.98 | –104.38 | 7,400 | 9/1/1942 | Present | 9/1/1942 | Present |
| Maxwell | 36.57 | –104.57 | 6,024 | 4/1/1905 | Present | 1/1/1945 | Present |
| Miami | 36.35 | –104.77 | 6,306 | 11/1/1907 | 11/30/1959 | 2/1/1908 | 11/30/1959 |
| Philmont Ranch | 36.62 | –105.05 | 7,605 | 4/1/1941 | 5/31/1961 | 4/1/1941 | 4/30/1961 |
| Raton | 36.90 | –104.43 | 6,683 | 3/1/1894 | 8/31/1953 | 3/1/1894 | 8/31/1953 |
| **Raton Filter Plant** | 36.92 | –104.43 | 6,932 | 9/1/1953 | Present | 9/1/1953 | Present |
| Raton KRTN Radio | 36.89 | –104.44 | 6,640 | 12/1/1978 | Present | 12/1/1978 | Present |
| Raton Near | 36.87 | –104.42 | 6,493 | 4/1/1917 | 12/31/1941 | 4/1/1917 | 11/30/1941 |
| Raton Wb Airport | 36.75 | –104.50 | 6,385 | 1/1/1941 | Present | 2/1/1946 | Present |
| Springer | 36.36 | –104.59 | 5,888 | 1/1/1892 | Present | 2/1/1892 | Present |
| Taylor | 36.33 | –104.50 | 5,661 | 7/1/1909 | 7/31/1932 | 8/1/1911 | 7/31/1932 |
| Vermejo Park | 36.88 | –104.95 | 7,526 | 7/1/1904 | 11/30/1981 | 7/1/1904 | 11/30/1981 |

Source: WRCC, 2014

[a] Stations in **bold** type were selected for detailed analysis. — = Information not available

## Table 5-1. Colfax Climate Stations

Page 2 of 2

| Climate Stations [a] | Latitude | Longitude | Elevation | Precipitation | | Temperature | |
|---|---|---|---|---|---|---|---|
| | | | | Data Start | Data End | Data Start | Data End |
| ***Snow Course/SNOTEL Stations*** | | | | | | | |
| **Aztec #2 – Snow** | 36.63 | –105.18 | 9,880 | 1993 | present | NR | NR |
| **Palo – Snow** | 36.40 | –105.32 | 9,300 | 1972 | present | NR | NR |
| **Shuree – Snow** | 36.78 | –105.23 | 10,097 | 1998 | present | NR | NR |
| Tolby – Snow | 36.47 | –105.18 | 10,180 | 1992 | present | NR | NR |
| **Tolby – SNTL** | 36.47 | –105.19 | 10,180 | 9/24/1998 | present | NR | NR |

Source: WRCC, 2014

[a] Stations in **bold** type were selected for detailed analysis.

— = Information not available

NR = Temperature is not recorded at snow course/SNOTEL stations.

S:\PROJECTS\WR12.0165_STATE_WATER_PLAN_2012\GIS\MXDS\FIGURES_2016\COLFAX\FIG5-1_CLIMATE_STATIONS.MXD 4/28/2016

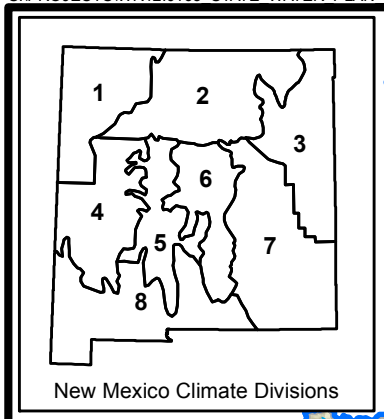





Figure 5-1

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**Climate Stations**

## Table 5-2. Temperature and Precipitation for Selected Climate Stations Colfax Water Planning Region

| Station Name | Precipitation (inches) | | | | Temperature | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Average (°F) | | | |
| | Average Annual [a] | Minimum [b] | Maximum [b] | % of Possible Observations [c] | Annual [d] | Minimum [e] | Maximum [e] | % of Possible Observations [c] |
| Eagle Nest | 15.38 | 6.94 | 23.12 | 96.1 | 40.1 | 22.3 | 57.8 | 79.8 |
| Raton Filter Plant | 17.62 | 9.62 | 28.74 | 99.3 | 49.8 | 36.3 | 63.2 | 99.2 |

Source: Statistics computed by Western Regional Climate Center (2014)

ft amsl = Feet above mean sea level

°F = Degrees Fahrenheit

[a] Average of annual precipitation totals for the period of record at each station.

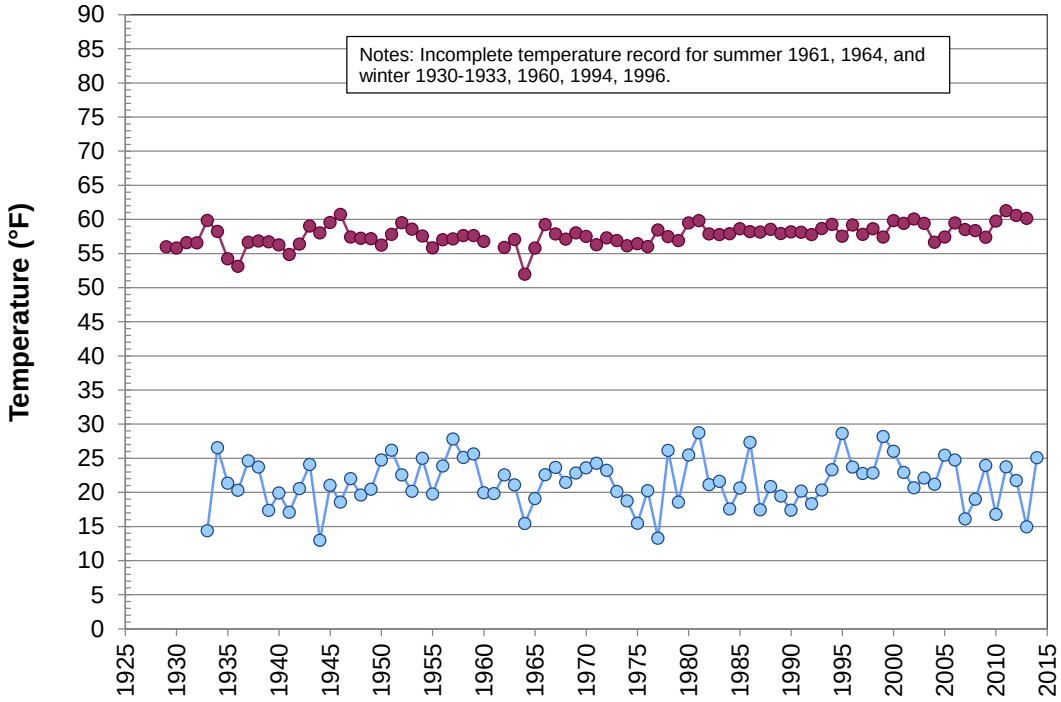
[b] Minimum and maximum recorded annual precipitation amounts for each station.

[c] Amount of completeness in the daily data set that was recorded at each station (e.g., 99% complete means there is a 1% data gap).

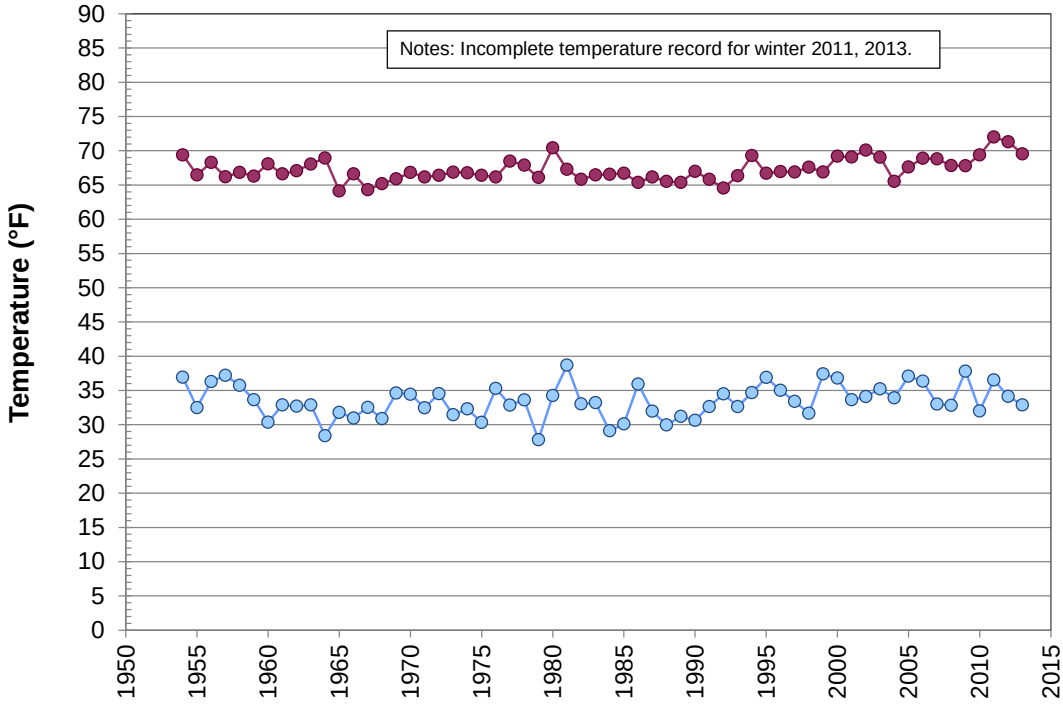
[d] Average of the daily average temperatures calculated for each station.

[e] Average of the daily minimum (or maximum) temperature recorded daily for each station.

## Eagle Nest




## Raton Filter Plant

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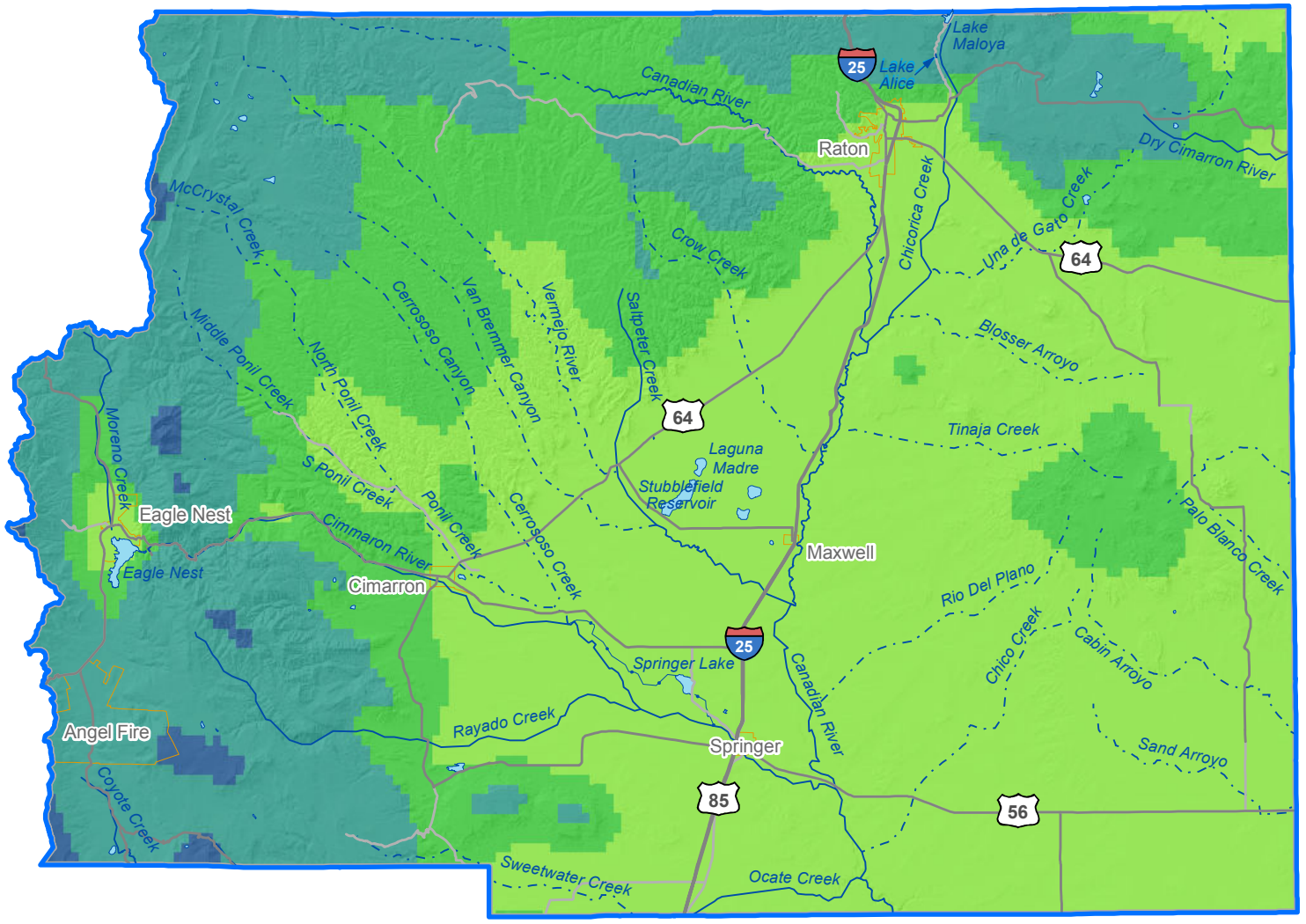
**Average Temperature, Eagle Nest and Raton Filter Plant Climate Stations**

Figure 5-2

P:_WR12-165\RWPs_2014\9_Colfax\Figures\Fig5-2_Reg 9_Temp.docx 6/6/16

S:\PROJECTS\WR12.0165_STATE_WATER_PLAN_2012\GIS\MXDS\FIGURES_2016\COLFAX\FIG5-3_PRECIP.MXD 4/29/2016




N

0 5 10 Miles

**Explanation**

- Stream (dashed where intermittent)
- Lake
- City
- County
- Water planning region

Normal annual precipitation (in/yr)

- 14 - 18
- 18 - 20
- 20 - 30
- 30 - 33

Source: PRISM, 2012

Figure 5-3

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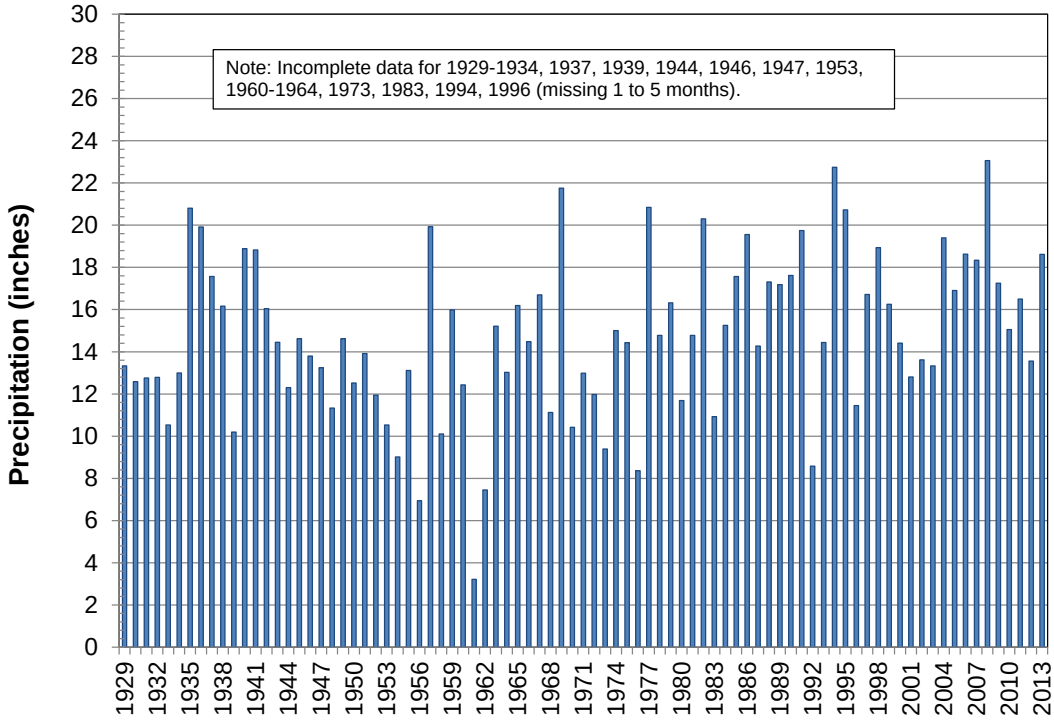
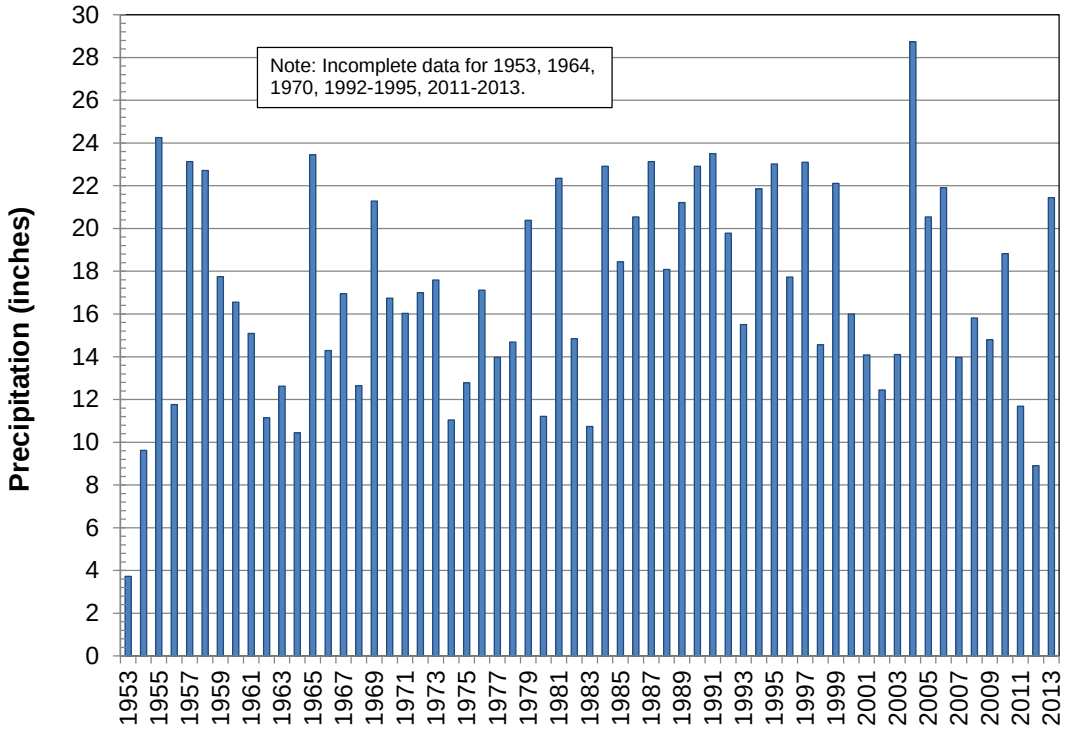
**Average Annual Precipitation (1980 to 2010)**

## Eagle Nest




## Raton Filter Plant

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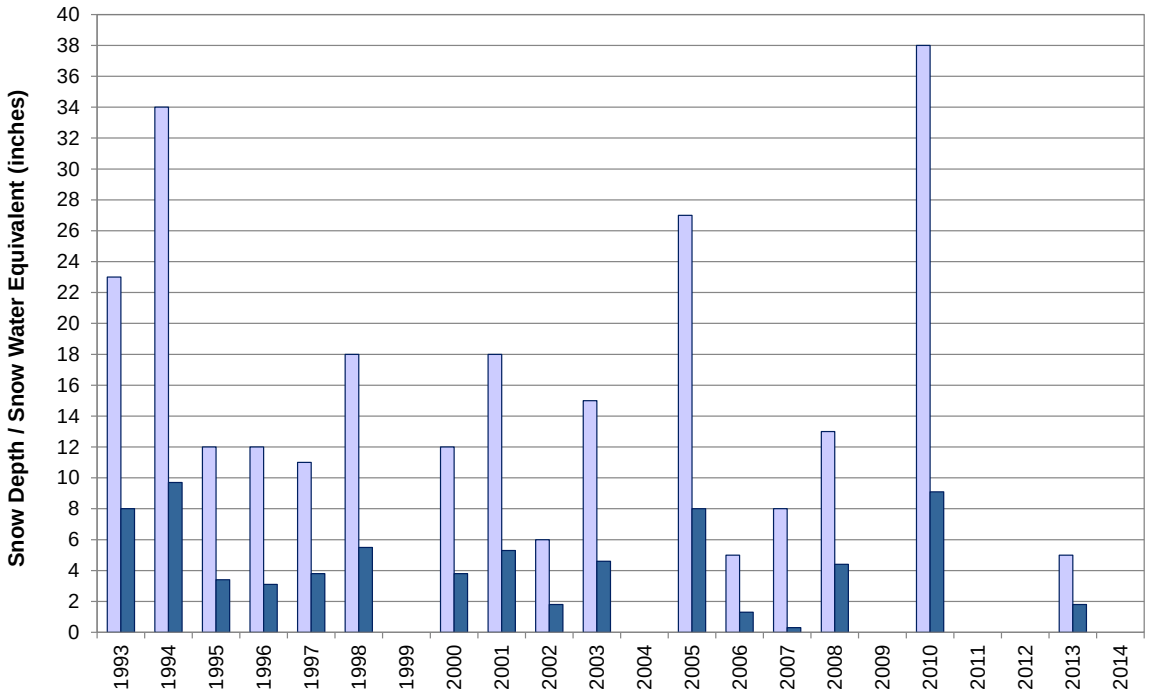
**Annual Precipitation, Eagle Nest and Raton Filter Plant Climate Stations**

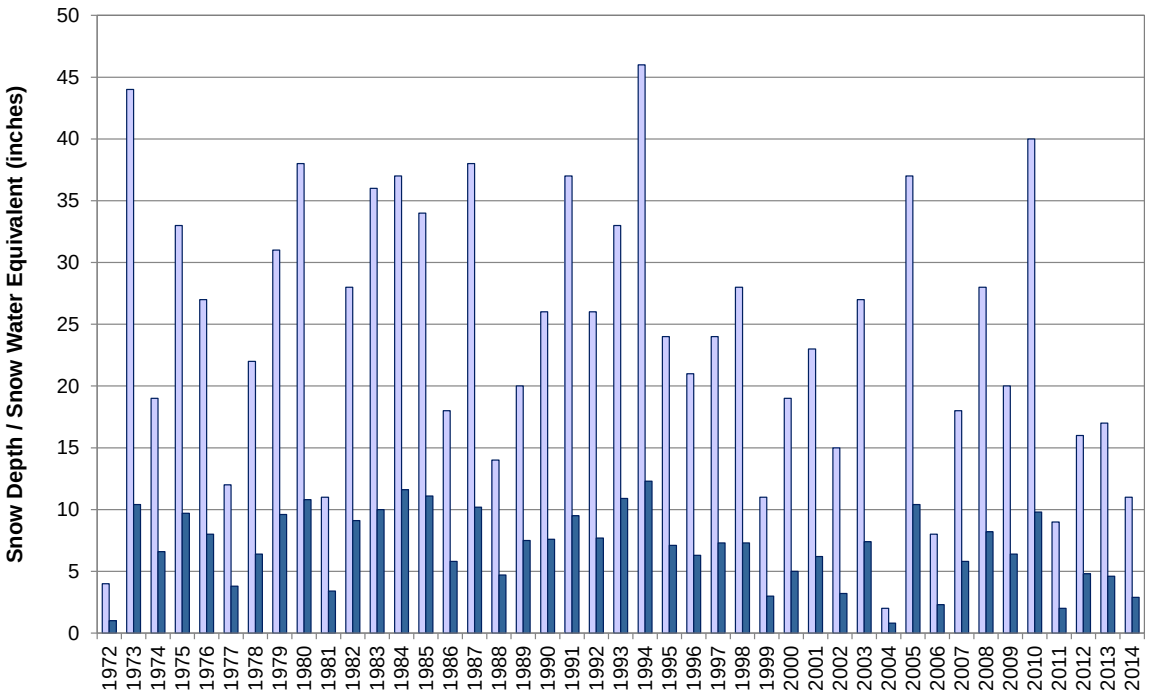
Figure 5-4

P:_WR12-165\RWPs_2014\9_Colfax\Figures\Fig5-04_Reg 9_Precip.docx 6/6/16

## Aztec SNOW Station w/Aerial Marker




## Palo Snow Course with Aerial Marker




Snow depth

Snow water equivalent (the amount of water that would result if the snowpack were instantly melted)

**Notes:** 1. Measurements made in the last few days of March or first few days of April.
2. Years with no bars visible are years with zero snow depth (unless otherwise noted).

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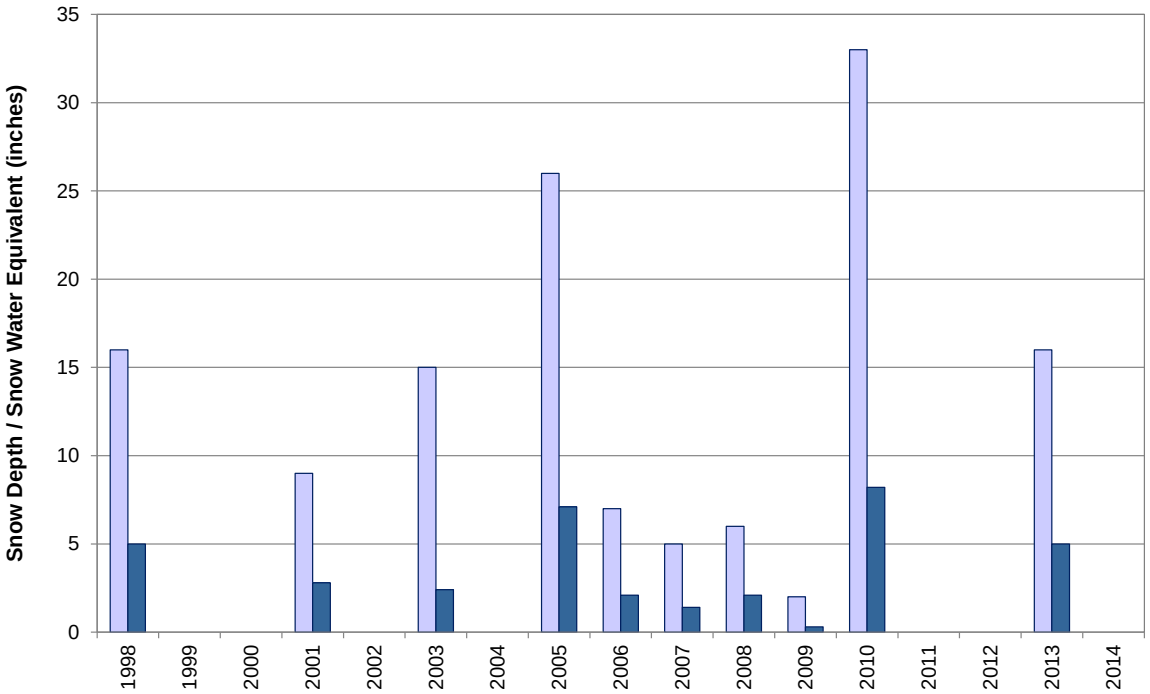
**Snow Depth and Snow Water Equivalent for April**

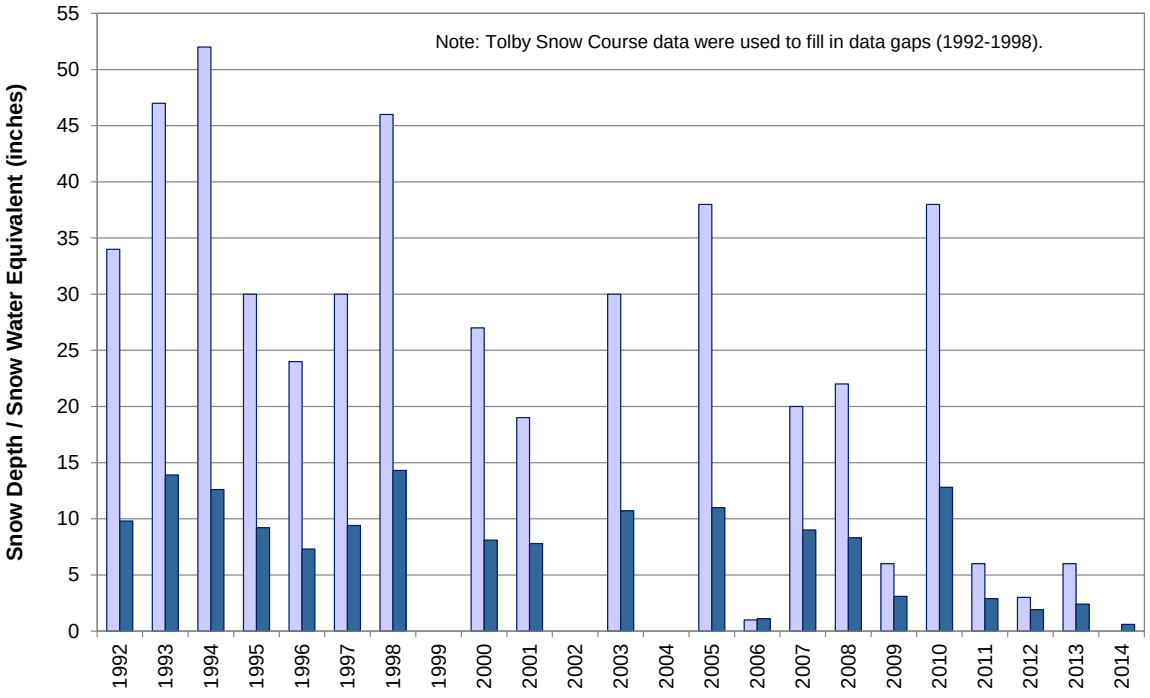
Figure 5-5a

P:_WR12-165\RWPs_2014\9+Colfax\Fig5-05a_SNOTEL_Aztec-Palo.docx 6/6/16

## Shuree Snow Course and Aerial Marker




## Tolby SNOTEL




Snow depth

Snow water equivalent (the amount of water that would result if the snowpack were instantly melted)

**Notes:** 1. Measurements made in the last few days of March or first few days of April.
2. Years with no bars visible are years with zero snow depth (unless otherwise noted).

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**Snow Depth and Snow Water Equivalent for April**

Figure 5-5b

P:_WR12-165\RWPs_2014\9+Colfax\Fig5-05b_SNOTEL_Shuree-Tolby.docx 6/6/16

- The Shuree Snow Course site is located north of Eagle Nest at 10,100 ft amsl and has been operational since 1998.
- The Tolby Station, located southwest of Eagle Nest at 10,180 ft amsl, was a snow course site starting in 1992 and telemetry (SNOTEL) was added in 1998.

The snow water equivalent is the amount of water, reported in inches, within the snowpack, or the amount of water that would result if the snowpack were instantly melted (NRCS, 2014b). The end of season snowpack is a good indicator of the runoff that will be available to meet water supply needs. A summary of the early April (generally measured within a week of April 1) snow depth and snow water equivalent information at the four stations is provided on Figure 5-5. The figure shows that the snowpack and snow water equivalent varies greatly, from 0 to more than 40 inches.

Another way to review long-term variations in climate conditions is through drought indices. A drought index consists of a ranking system derived from the assimilation of data—including rainfall, snowpack, streamflow, and other water supply indicators—for a given region. The Palmer Drought Severity Index (PDSI) was created by W.C. Palmer (1965) to measure the variations in the moisture supply and is calculated using precipitation and temperature data as well as the available water content of the soil. Because it provides a standard measure that allows comparisons among different locations and months, the index is widely used to assess the weather during any time period relative to historical conditions. The PDSI classifications for dry to wet periods are provided in Table 5-3.

## Table 5-3. Palmer Drought Severity Index Classifications

| PDSI Classification | Description |
|---|---|
| + 4.00 or more | Extremely wet |
| +3.00 to +3.99 | Very wet |
| +2.00 to +2.99 | Moderately wet |
| +1.00 to +1.99 | Slightly wet |
| +0.50 to +0.99 | Incipient wet spell |
| +0.49 to –0.49 | Near normal |
| –0.50 to –0.99 | Incipient dry spell |
| –1.00 to –1.99 | Mild drought |
| –2.00 to –2.99 | Moderate drought |
| –3.00 to –3.99 | Severe drought |
| –4.00 or less | Extreme drought |

There are considerable limitations when using the PDSI, as it may not describe rainfall and runoff that varies from location to location within a climate division and may also lag in indicating emerging droughts by several months. Also, the PDSI does not consider groundwater or reservoir storage, which can affect the availability of water supplies during drought conditions. However, even with its limitations, many states incorporate the PDSI into their drought monitoring systems, and it provides a good indication of long-term relative variations in drought conditions, as PDSI records are available for more than 100 years.

The PDSI is calculated for climate divisions throughout the United States. Colfax County falls primarily within New Mexico Climate Division 2 (the Northern Mountains Climate Division) with a small portion of the south-central part of the County in Division 3 (the Northeastern Plateau Climate Region) (Figure 5-1). Figure 5-6 shows the long-term PDSI for these two regions. Of interest are the large variations from year to year in both divisions, which are similar in pattern though not necessarily in magnitude.

The chronological history of drought, as illustrated by the PDSI, indicates that the most severe droughts in the last century occurred in the early 1900s, the 1950s, the early 2000s, and in recent years (2011 to 2013). In 2013 the PDSI in Climate Division 2, which covers most of Colfax County, dipped to its lowest index value in almost 50 years (Figure 5-6).

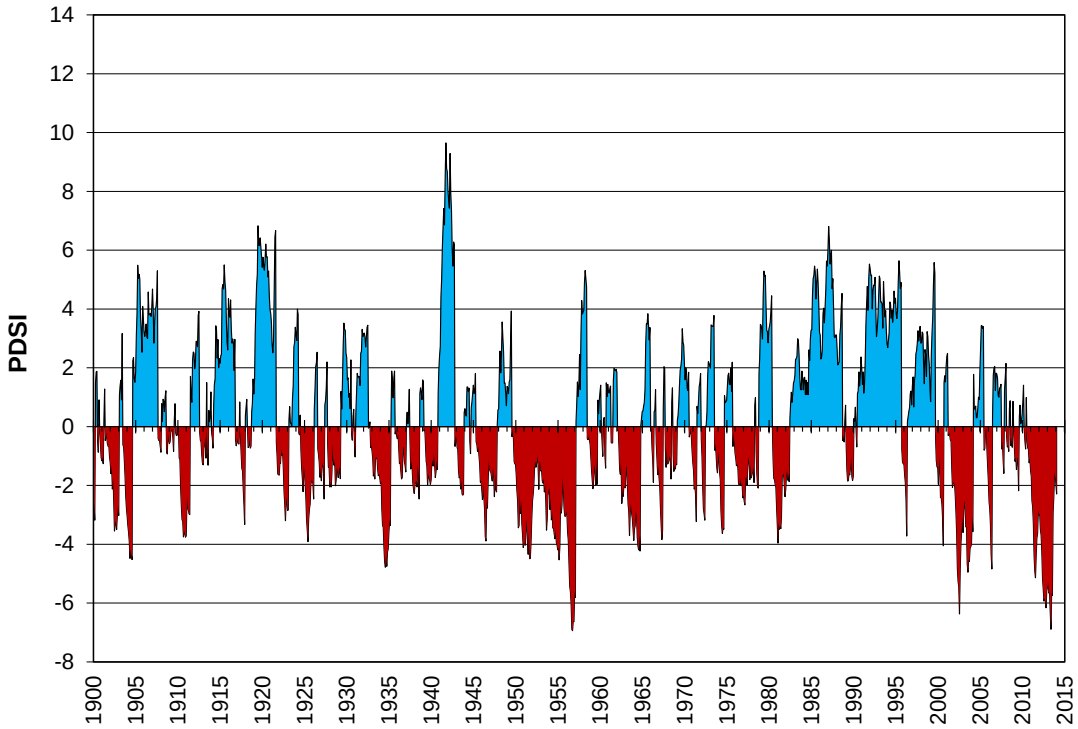
The likelihood of drought conditions developing in New Mexico is influenced by several weather patterns:

- *El Niño/La Niña:* El Niño and La Niña are characterized by a periodic warming and cooling, respectively, of sea surface temperatures across the central and east-central equatorial Pacific. Years in which El Niño is present are more likely to be wetter than average in New Mexico, and years with La Niña conditions are more likely to be drier than average, particularly during the cool seasons of winter and spring.

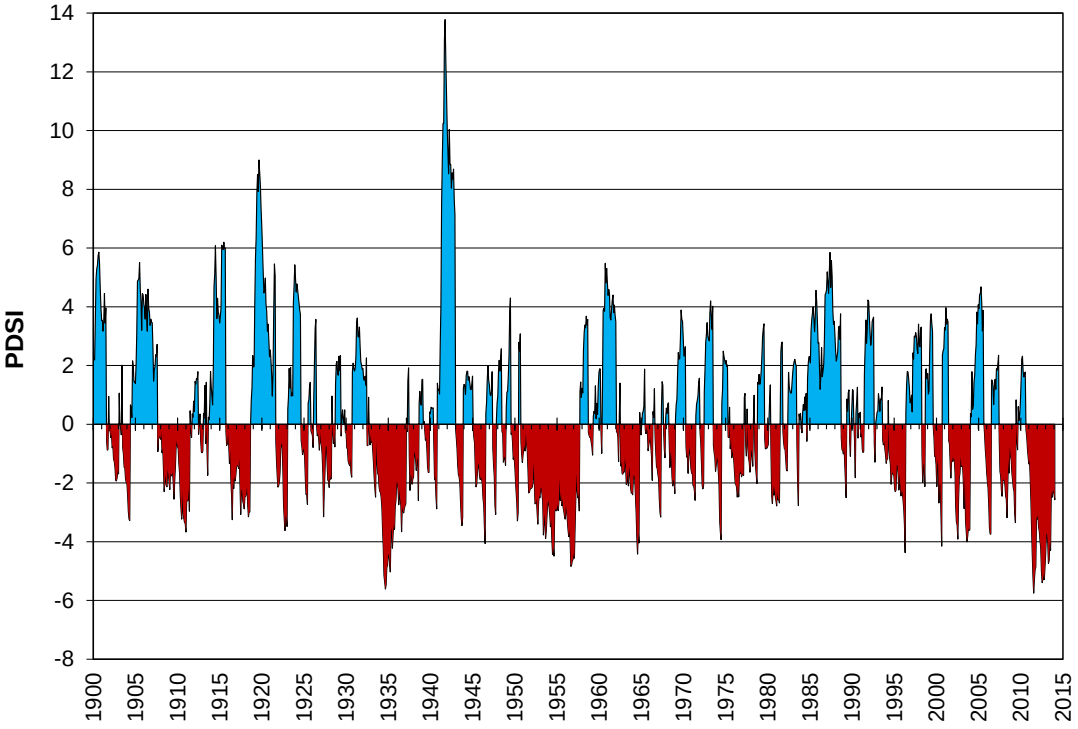
- *The Pacific Decadal Oscillation (PDO):* The PDO is a multi-decadal pattern of climate variability caused by shifting sea surface temperatures between the eastern and western Pacific Ocean that cycle approximately every 20 to 30 years. Warm phases of the PDO (shown as positive numbers on the PDO index) correspond to El Niño-like temperature and precipitation anomalies (i.e., wetter than average), while cool phases of the PDO (shown as negative numbers on the PDO index) correspond to La Niña-like climate patterns (drier than average). It is believed that since 1999 the planning region has been in the cool phase of the PDO.

- *The Atlantic Multidecadal Oscillation (AMO).* The AMO refers to variations in surface temperatures of the Atlantic Ocean which, similarly to the PDO, cycle on a multi-decade frequency. The pairing of a cool phase of the PDO with the warm phase of the AMO is typical of drought in the southwestern United States (McCabe et al., 2004; Stewart, 2009). The AMO has been in a warm phase since 1995. It is possible that the AMO may be shifting to a cool phase but the data are not yet conclusive.

**Climate Division 2**




**Climate Division 3**




Note: Blue indicates wetter than average conditions and red indicates drier than average conditions, as described on Table 5-3.

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**Palmer Drought Severity Index**
**New Mexico Climate Divisions 2 and 3**

Figure 5-6

P:_WR12-165\RWPs_2015-2016\9_Colfax\Fig5-06_Reg 9_PDSI Div 2&3.docx 6/6/16

- *The North American Monsoon* is characterized by a shift in wind patterns in summer, which occurs as Mexico and the southwest U.S. warm under intense solar heating. As this happens, the flow reverses from dryland areas to moist ocean areas. Low-level moisture is transported into the region primarily from the Gulf of California and eastern Pacific. Upper-level moisture is transported into the region from the Gulf of Mexico by easterly winds aloft. Once the forests of the Sierra Madre Occidental green up from the initial monsoon rains, evaporation and plant transpiration can add additional moisture to the atmosphere that will then flow into the region. If the Southern Plains of the U.S. are unusually wet and green during the early summer months, that area can also serve as a moisture source. This combination causes a distinct rainy season over large portions of western North America (NWS, 2015).

### 5.1.2 Recent Climate Studies

New Mexico's climate has historically exhibited a high range of variability. Periods of extended drought, interspersed with relatively short-term wetter periods, are common. Historical periods of high temperature and low precipitation have resulted in high demands for irrigation water and higher open water evaporation and riparian evapotranspiration. In addition to natural climatic cycles (i.e., El Niño/La Niña, PDO, AMO [Section 5.1.1]) that affect precipitation patterns in the southwestern United States, there has been considerable recent research on potential climate change scenarios and their impact on the Southwest and New Mexico in particular.

The consensus on global climate conditions is represented internationally by the work of the Intergovernmental Panel on Climate Change (IPCC), whose Fifth Assessment Report, released in September 2013, states, "Warming of the climate system is unequivocal, and since the 1950s many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased" (IPCC, 2013). Atmospheric concentrations of greenhouse gases are rising so quickly that all current climate models project significant warming trends over continental areas in the 21st century.

In the United States, regional assessments conducted by the U.S. Global Change Research Program (USGCRP) have found that temperatures in the southwestern United States have increased and are predicted to continue to increase, and serious water supply challenges are expected. Water supplies are projected to become increasingly scarce, calling for trade-offs among competing uses and potentially leading to conflict (USGCRP, 2009). Most of the major river systems in the southwestern U.S. are expected to experience reductions in streamflow and other limitations to water availability (Garfin et al., 2013).

Although there is consensus among climate scientists that global temperatures are warming, there is considerable uncertainty regarding the specific spatial and temporal impacts that can be expected. To assess climate trends in New Mexico, the New Mexico Office of the State

Engineer (NMOSE) and NMISC (2006) conducted a study of observed climate conditions over the past century and found that observed wintertime average temperatures had increased statewide by about 1.5°F since the 1950s. Predictions of annual precipitation are subject to greater uncertainty "given poor representation of the North American monsoon processes in most climate models" (NMOSE/NMISC, 2006).

A number of other studies predict temperature increases in New Mexico from 5° to 10°F by the end of the century (Forest Guild, 2008; Hurd and Coonrod, 2008; USBR, 2011). Predictions of annual precipitation are subject to greater uncertainty, particularly regarding precipitation during the summer monsoon season in the southwestern U.S.

Based on these studies, the effects of climate change that are likely to occur in New Mexico and the planning region include (NMOSE/NMISC, 2006):

- Temperature is expected to continue to rise.
- Higher temperatures will result in a longer and warmer growing season, resulting in increased water demand on irrigated lands and increased evapotranspiration from riparian areas, grasslands, and forests, and thus less recharge to aquifers.
- Reservoir and other open water evaporation are expected to increase. Soil evaporation will also increase.
- Precipitation is expected to be more concentrated and intense, leading to increased frequency and severity of flooding.
- Streamflows in major rivers across the Southwest are projected to decrease substantially during this century (e.g., Christensen et al., 2004; Hurd and Coonrod, 2008; USBR, 2011, 2013) due to a combination of diminished cold season snowpack in headwaters regions and higher evapotranspiration in the warm season. The seasonal distribution of streamflow is projected to change as well: flows could be somewhat higher than at present in late winter, but peak runoff will occur earlier and be diminished. Late spring/early summer flows are projected to be much lower than at present, given the combined effects of less snow, earlier melting, and higher evaporation rates after snowmelt.
- Forest habitat is vulnerable to both decreases in cold-season precipitation and increases in warm-season vapor pressure deficit (Williams et al., 2010). Stress from either of these factors leave forests increasingly susceptible to insects, forest fires, and desiccation. Greater temperatures increase insect survivability and fire risk.

To minimize the impact of these changes, it is imperative that New Mexico plan for variable water supplies, including focusing on drought planning and being prepared to maximize storage from extreme precipitation events while minimizing their adverse impacts.

## 5.2 Surface Water Resources

Surface water supplied about 92 percent of the water used in Colfax County in 2010. The surface water that supplies the county originates primarily in the mountains in the western and northern parts of Colfax County and flows generally east and south to the Canadian River before exiting the county. The Canadian River is the dominant waterway in the region, originating in southern Colorado and flowing east, then south through the county (Figure 5-7). Major tributaries to the Canadian River are the Vermejo River and Cimarron River, which originate in the northern and/or western parts of the county. Ponil and Rayado Creeks are important tributaries to the Cimarron River below Eagle Nest Reservoir. Most of the surface water supply in Colfax County is associated with these major drainages. Though smaller, Chicorico, Schwachheim, and Segerstrom Creeks feed into Lake Dorothy, Lake Maloya, and Lake Alice which provide the municipal water supply for the City of Raton. Major surface drainages and watersheds in Colfax County are shown on Figure 5-7.

Surface water availability varies greatly from year to year, with the highest flow years supplying many times more water than the drier years. Therefore, an understanding of the frequency of flows of various magnitudes is essential in evaluating the water supply in Colfax County, and detailed analysis of the flow distribution was included in the accepted water plan (DBS&A, 2003). When evaluating surface water information, it is important to note that streamflow does not represent available supply, as there are also water rights limitations. The administrative water supply discussed in Section 5.5 is intended to represent supply considering both physical and legal limitations. The information provided in this section is intended to illustrate the variability and magnitude of streamflow, and particularly the relative magnitude of streamflow in recent years since the 2003 plan was submitted.

Streamflow data are collected by the USGS and various cooperating agencies at several stream gage sites in the planning region. Table 5-4a lists the locations and periods of record for data collected at these stream gages, as well as the drainage area and estimated irrigated acreage for surface water diversions upstream of the station. Table 5-4b provides the minimum, median, and maximum annual yield for all gages that have 10 or more years of record. Table 5-4b shows large differences between the median flows and the minimum flows, which indicate drought conditions. (This large gap is not seen for the Cimarron River gages since the flow variability at those gages is regulated by releases from Eagle Nest Dam).

In addition to the large variability in annual yield, streamflow also varies from month to month within a year, and monthly variability or short-term storms can have flooding impacts, even when annual yields are low. Table 5-5 provides monthly summary statistics for each of the stations with 10 or more years of record, and indicates that most of the streamflow occurs in the March to June snowmelt runoff period, with some additional larger flows at some gages occurring in the July to September monsoon season. Relatively low flows are observed in October through February.

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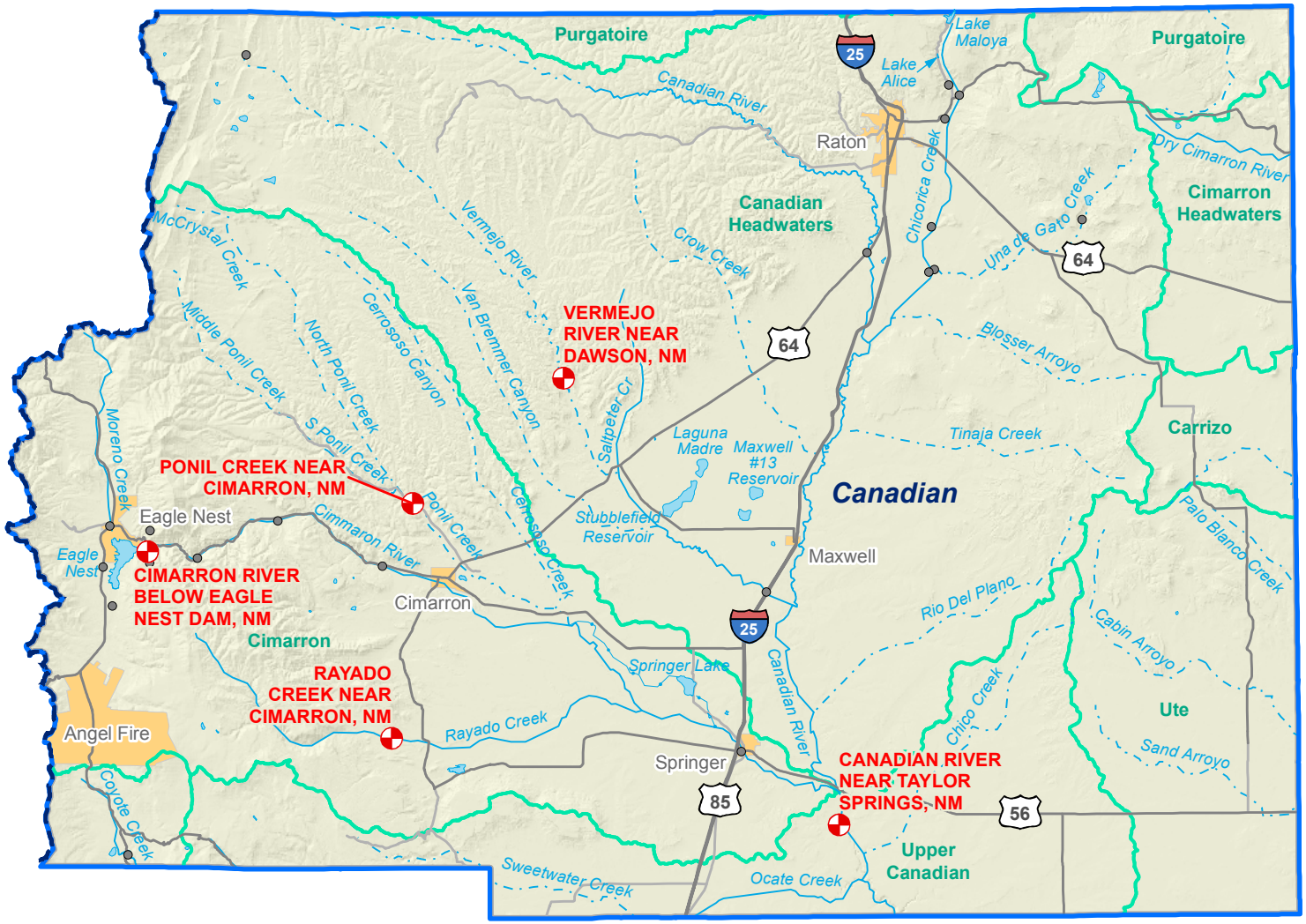


**Explanation**

- Selected USGS stream gage
- USGS stream gage
- Stream (dashed where intermittent)
- Lake
- River basin
- Watershed
- City
- County
- Water planning region

CANADIAN RIVER NEAR SANCHEZ, NM

28 miles

Source: USGS, 2014c and 2014d

Note: Only those USGS stream gages with daily data are shown.

N

0 5 10 Miles

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**Major Surface Drainages, Stream Gages, Reservoirs, and Lakes**

Figure 5-7

## Table 5-4a. USGS Stream Gage Stations



| USGS Station [a] | | | | | | | Period of Record | |
|---|---|---|---|---|---|---|---|---|
| Name [b] | Number | Latitude | Longitude | Elevation (ft amsl) | Drainage Area (sq mi) | Irrigated Upstream Land [c] (acres) | Start Date | End Date |
| ***Colfax County*** | | | | | | | | |
| Canadian River Near Hebron, NM | 07199000 | 36.7872491 | –104.46221 | 6,248 | 229 | — | 10/1/1946 | 9/30/1986 |
| Chicorica Creek Near Yankee, NM | 07199600 | 36.9305799 | –104.373873 | 6,795 | 33 | — | 5/14/1975 | 9/30/1987 |
| East Fork Chicorica Cr Nr Yankee, NM | 07199650 | 36.9216911 | –104.362762 | — | — | — | 10/1/1983 | 9/30/1987 |
| Chicorica Bl Ef N Raton, NM | 07200000 | 36.9014137 | –104.378318 | 6,580 | 71 | — | 10/1/1945 | 6/30/1951 |
| Chicorica Creek Near Raton, NM | 07200500 | 36.8089152 | –104.393597 | 6,265 | — | — | 10/1/1983 | 9/30/1987 |
| Una de Gato Creek Bl Throttle Dam Near Raton, NM | 07201420 | 36.81447 | –104.233036 | 6,635 | 50 | — | 5/14/1975 | 10/19/1983 |
| Una de Gato C Nr Hebron, NM | 07201500 | 36.7722491 | –104.390819 | 6,210 | 224 | — | 10/1/1946 | 6/30/1950 |
| Chicorica Creek Near Hebron, NM | 07202000 | 36.7703047 | –104.396375 | 6,200 | 381 | — | 2/1/1945 | 9/30/1987 |
| Vermejo River at Vermejo Park, NM | 07202400 | 36.9578031 | –105.124169 | — | 37 | — | 10/1/1985 | 9/30/1993 |
| **Vermejo River Near Dawson, NM** | 07203000 | 36.6810278 | –104.786394 | 6,360 | 301 | NA | 10/1/1915 | Present |
| Vermejo River Near Maxwell, NM | 07203525 | 36.4966998 | –104.571379 | 5,880 | 486 | — | 11/25/1983 | 9/30/1994 |
| Moreno Creek at Eagle Nest, N. Mex. | 07204000 | 36.5538722 | –105.267981 | 8,197 | 74 | — | 4/1/1928 | 6/21/2010 |
| Cieneguilla Cr Nr Eagle Nest, NM | 07204500 | 36.4852167 | –105.265381 | 8,200 | 56 | — | 4/1/1928 | 6/21/2010 |
| Sixmile Creek Near Eagle Nest, NM | 07205000 | 36.518525 | –105.275247 | 8,195 | 11 | — | 8/1/1958 | 6/21/2010 |
| **Cimarron River Below Eagle Nest Dam, NM** | 07206000 | 36.532125 | –105.228144 | 8,080 | 167 | 2,500 | 5/1/1950 | Present |
| McEvoy C Nr Eagle Nest, NM | 07206200 | 36.5500325 | –105.225562 | 8,600 | 2 | — | 10/1/1961 | 9/30/1968 |
| Tolby C Nr Eagle Nest, NM | 07206300 | 36.5222549 | –105.225563 | 8,400 | 9 | — | 10/1/1961 | 9/30/1968 |
| Clear C Nr Ute Park, NM | 07206400 | 36.5263889 | –105.175 | 7,860 | 7 | NA | 10/1/1961 | 9/30/1968 |
| Cimarron River at Ute Park, NM | 07206500 | 36.5583673 | –105.089449 | 7,400 | 260 | — | 10/1/1907 | 9/30/1950 |
| Cimarron River Near Cimarron, NM | 07207000 | 36.5198333 | –104.978611 | 6,600 | 294 | 3,500 | 6/1/1950 | Present |

Source: USGS, 2014c (unless otherwise noted)

[a] Only those USGS stream gages with daily data are shown.

[b] **Bold** indicates gages in key locations selected for additional analysis.

[c] Source: DBS&A, 2003; USGS, 2014a

USGS = U.S. Geological Survey

ft amsl = Feet above mean sea level

sq mi = Square miles

NA = Not available

— = Data not available from current source(s).

## Table 5-4a. USGS Stream Gage Stations



| USGS Station [a] | | | | | | | Period of Record | |
|---|---|---|---|---|---|---|---|---|
| Name [b] | Number | Latitude | Longitude | Elevation (ft amsl) | Drainage Area (sq mi) | Irrigated Upstream Land [c] (acres) | Start Date | End Date |
| ***Colfax County (cont.)*** | | | | | | | | |
| **Ponil Creek Near Cimarron, NM** | 07207500 | 36.5736944 | –104.946806 | 6,630 | 171 | 250 | 1/1/1916 | Present |
| **Rayado Creek Near Cimarron, NM** | 07208500 | 36.3723444 | –104.969289 | 6,720 | 65 | 0 | 10/1/1911 | Present |
| Cimarron River at Springer, NM | 07211000 | 36.3603112 | –104.5986 | 5,770 | 1,032 | — | 10/1/1907 | 9/30/2004 |
| **Canadian River Near Taylor Springs, NM** | 07211500 | 36.2975694 | –104.495472 | 5,640 | 2,850 | 30,000 | 10/1/1939 | Present |
| Coyote Creek Below Black Lake, NM | 07217000 | 36.2722558 | –105.247788 | 8,450 | 48 | — | 1/1/1953 | 9/30/1963 |
| ***San Miguel County*** | | | | | | | | |
| **Canadian River near Sanchez, NM [d]** | 07221500 | 35.6548333 | –104.378611 | 4,500 | 6,015 | 56,000 | 10/1/1912 | Present |

Source: USGS, 2014c (unless otherwise noted)

[a] Only those USGS stream gages with daily data are shown.

[b] **Bold** indicates gages in key locations selected for additional analysis.

[c] Source: DBS&A, 2003; USGS, 2014a

[d] Located outside region, included to illustrate Canadian River flow variability near Maxwell.

USGS = U.S. Geological Survey

ft amsl = Feet above mean sea level

sq mi = Square miles

NA = Not available

— = Data not available from current source(s).

## Table 5-4b. USGS Stream Gage Annual Statistics for Stations with 10 or More Years of Record

| USGS Station Name [a] | Annual Yield [b] (acre-feet) | | | Number of Years [c] |
|---|---|---|---|---|
| | Minimum | Median | Maximum | |
| ***Colfax County*** | | | | |
| Canadian River Near Hebron, NM | 948 | 2,541 | 19,620 | 11 |
| **Vermejo River Near Dawson, NM** | 1,332 | 11,221 | 61,827 | 85 |
| Vermejo River Near Maxwell, NM | 1,158 | 4,032 | 13,900 | 10 |
| Sixmile Creek Near Eagle Nest, NM | 702 | 1,303 | 3,490 | 16 |
| **Cimarron River Below Eagle Nest Dam, NM** | 4,257 | 10,389 | 40,325 | 62 |
| Cimarron River at Ute Park, NM | 15,638 | 23,529 | 51,112 | 29 |
| Cimarron River Near Cimarron, NM | 5,184 | 15,819 | 59,220 | 62 |
| Moreno Creek at Eagle Nest, N. Mex. [d] | - | - | - | 1 |
| **Ponil Creek Near Cimarron, NM** | 640 | 7,746 | 29,321 | 71 |
| **Rayado Creek Near Cimarron, NM** | 1,803 | 7,674 | 31,131 | 85 |
| Cimarron River at Springer, NM | 258 | 6,139 | 104,396 | 75 |
| **Canadian River Near Taylor Springs, NM** | 1,557 | 30,443 | 396,879 | 66 |
| Coyote Creek Below Black Lake, NM | 363 | 1,578 | 11,728 | 10 |
| ***San Miguel County*** | | | | |
| **Canadian River near Sanchez, NM [e]** | 1,955 | 80,071 | 833,286 | 77 |

Source: USGS, 2014c

[a] Stations with complete years of data only
**Bold** indicates gages in key locations selected for additional analysis.

[b] Based on calendar years

[c] Number of years used in calculation of annual yield statistics

[d] Moreno creek has only 1 year with complete data, statistics could not be calculated.

[e] Located outside region, included to illustrate Canadian River flow variability near Maxwell.

## Table 5-5. USGS Stream Gage Average Monthly Streamflow for Stations with 10 or More Years of Record

| USGS Station [a] | Complete Years [b] | Average Monthly Streamflow [c] (acre-feet) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| ***Colfax County*** | | | | | | | | | | | | | |
| Canadian River Near Hebron, NM | 11 | 42 | 40 | 52 | 48 | 1,772 | 219 | 596 | 568 | 218 | 45 | 26 | 51 |
| **Vermejo River Near Dawson, NM** | 85 | 323 | 334 | 424 | 1,225 | 3,117 | 1,988 | 1,630 | 2,269 | 1,036 | 529 | 401 | 331 |
| Vermejo River Near Maxwell, NM | 10 | 149 | 164 | 179 | 142 | 2,057 | 1,312 | 451 | 902 | 258 | 150 | 189 | 161 |
| Sixmile Creek Near Eagle Nest, NM | 16 | 74 | 75 | 143 | 407 | 585 | 209 | 94 | 111 | 90 | 88 | 77 | 75 |
| **Cimarron River Below Eagle Nest Dam, NM** | 62 | 53 | 114 | 493 | 1,269 | 2,019 | 1,850 | 2,190 | 1,446 | 1,027 | 1,034 | 314 | 91 |
| Cimarron River at Ute Park, NM | 29 | 561 | 617 | 1,337 | 3,617 | 6,736 | 4,172 | 3,202 | 2,118 | 1,194 | 1,113 | 787 | 512 |
| Cimarron River Near Cimarron, NM | 62 | 258 | 267 | 718 | 2,058 | 3,823 | 2,731 | 2,248 | 1,696 | 1,169 | 1,131 | 589 | 329 |
| **Ponil Creek Near Cimarron, NM** | 71 | 126 | 129 | 350 | 1,595 | 2,955 | 996 | 441 | 889 | 321 | 219 | 189 | 143 |
| **Rayado Creek Near Cimarron, NM** | 85 | 223 | 226 | 498 | 1,838 | 3,030 | 1,241 | 605 | 678 | 424 | 348 | 293 | 242 |
| Cimarron River at Springer, NM | 75 | 477 | 445 | 649 | 1,929 | 5,454 | 2,489 | 695 | 1,026 | 720 | 518 | 498 | 466 |
| **Canadian River Near Taylor Springs, NM** | 66 | 1,189 | 1,252 | 1,638 | 6,903 | 13,261 | 7,341 | 4,810 | 6,444 | 3,896 | 1,955 | 1,195 | 1,122 |
| Coyote Creek Below Black Lake, NM | 10 | 95 | 156 | 269 | 675 | 746 | 261 | 103 | 248 | 143 | 169 | 166 | 124 |
| ***San Miguel County*** | | | | | | | | | | | | | |
| **Canadian River near Sanchez, NM [d]** | 77 | 2,998 | 3,206 | 3,497 | 11,377 | 22,761 | 19,779 | 12,591 | 17,549 | 12,823 | 5,704 | 3,193 | 2,839 |

Source: USGS, 2014c

[a] **Bold** indicates gages in key locations selected for additional analysis.

[b] Monthly statistics are for complete months with locations where 10 or more years of complete data were available.

[c] Data from USGS monthly statistics averaged over the entire period of record, converted to acre-feet (from cubic feet per second) and rounded to the nearest acre-foot.

[d] Located outside region, included to illustrate Canadian River flow variability near Maxwell.

USGS = U.S. Geological Survey

For this water planning update, six stream gages, shown on Figure 5-8, were analyzed in more detail. These stations were chosen because of their locations in the hydrologic system, completeness of record, and representativeness as key sources of supply. Figure 5-8 shows the minimum and median annual water yield for these gages, and Figures 5-9a through 5-9c show the annual water yield from the beginning of the period of record through 2013 for the six gages. As shown in these figures, streamflow varies greatly from year to year, with the highest-flow years supplying many times more water than the drier years. The exceptionally low flows in 2011, 2012, and 2013 can be observed on Figures 5-9a through 5-9c.

Several lakes and reservoirs are present in the planning region (Figure 5-7). Table 5-6 summarizes the characteristics of the larger lakes and reservoirs (i.e., storage capacity greater than 5,000 acre-feet, as reported in the *New Mexico Water Use by Categories 2010* report [Longworth et al., 2013]); information on the smaller lakes was included in the original water plan (DBS&A 2003, Appendix B). Only one of these, Eagle Nest Reservoir, is of sufficient size to significantly affect the timing and magnitude of runoff.

The NMOSE conducts periodic inspections of non-federal dams in New Mexico to assess dam safety issues. Dams that equal or exceed 25 feet in height that impound 15 acre-feet of storage or dams that equal or exceed 6 feet in height and impound at least 50 acre-feet of storage are under the jurisdiction of the State Engineer. These non-federal dams are ranked as being in good, fair, poor, or unsatisfactory condition. Dams with unsatisfactory conditions are those that require immediate or remedial action. Dams identified in recent inspections as being deficient, with high or significant hazard potential, are summarized in Table 5-7. In Colfax County there are 11 dams with a high hazard potential ranking, with considerable funding needed to correct the problems (Table 5-7).

## 5.3 Groundwater Resources

Groundwater accounted for only about 8 percent of all water diversions in the year 2010 (Longworth et al., 2013). Nevertheless, groundwater is important to the region as it provides the sole source of drinking water for many communities, including the numerous small drinking water systems in the region (Section 6.4). In the Colfax Water Planning Region, the Villages of Angel Fire, Eagle Nest, and Maxwell water systems are supplied by groundwater, as are numerous smaller systems and domestic and livestock wells.

### 5.3.1 Regional Hydrogeology

The geology that controls groundwater occurrence and movement within the planning region was described in the accepted *Colfax Regional Water Plan* (DBS&A, 2003), based on studies by Ballance (1967), Roberts et al. (1976), Herkenhoff and Summers (1977), and Griggs (1948). A map illustrating the surface geology of the planning region, derived from a geologic map of the entire state of New Mexico by the New Mexico Bureau of Geology & Mineral Resources (2003), is included as Figure 5-10.

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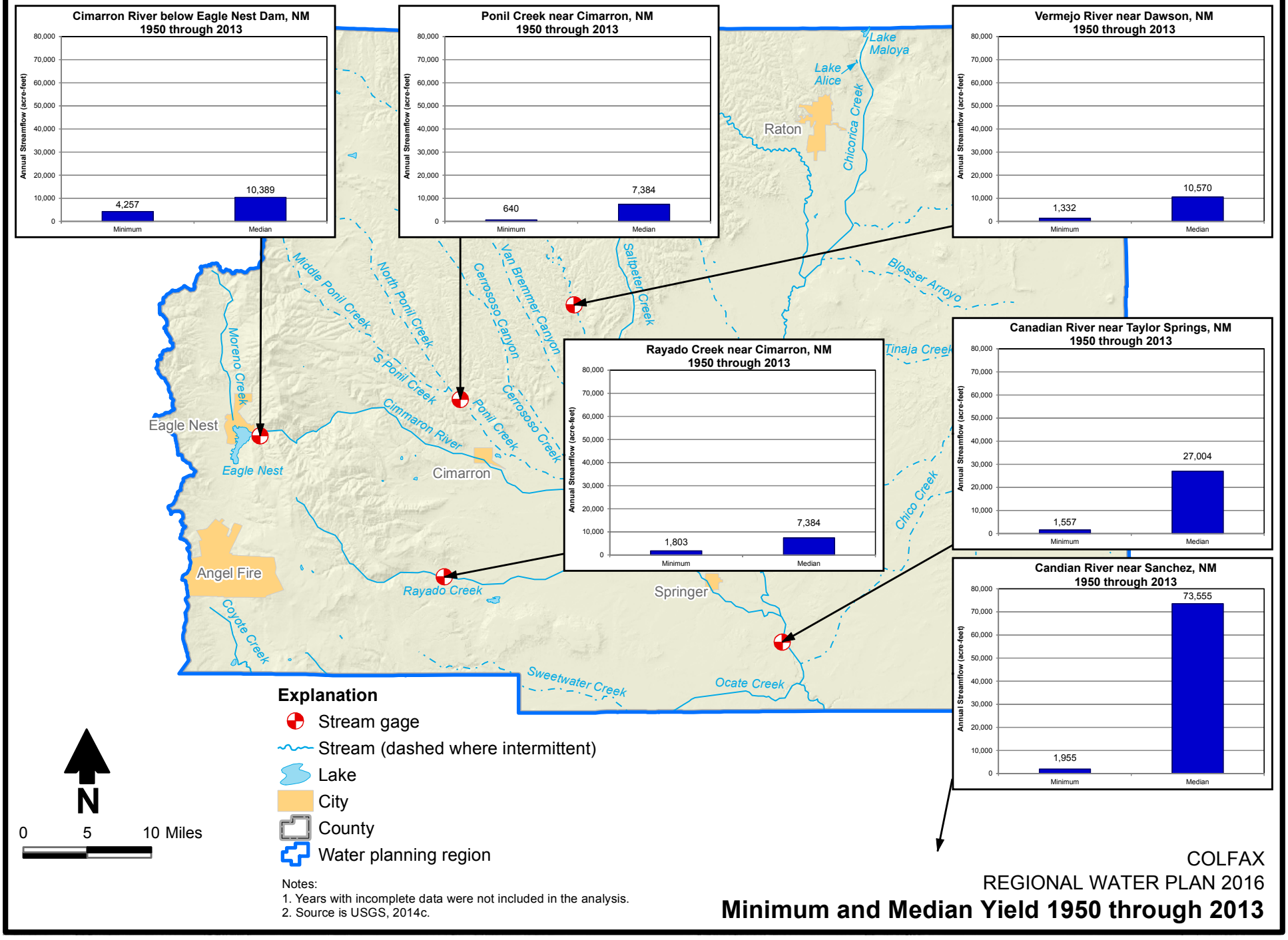


Notes:
1. Years with incomplete data were not included in the analysis.
2. Source is USGS, 2014c.

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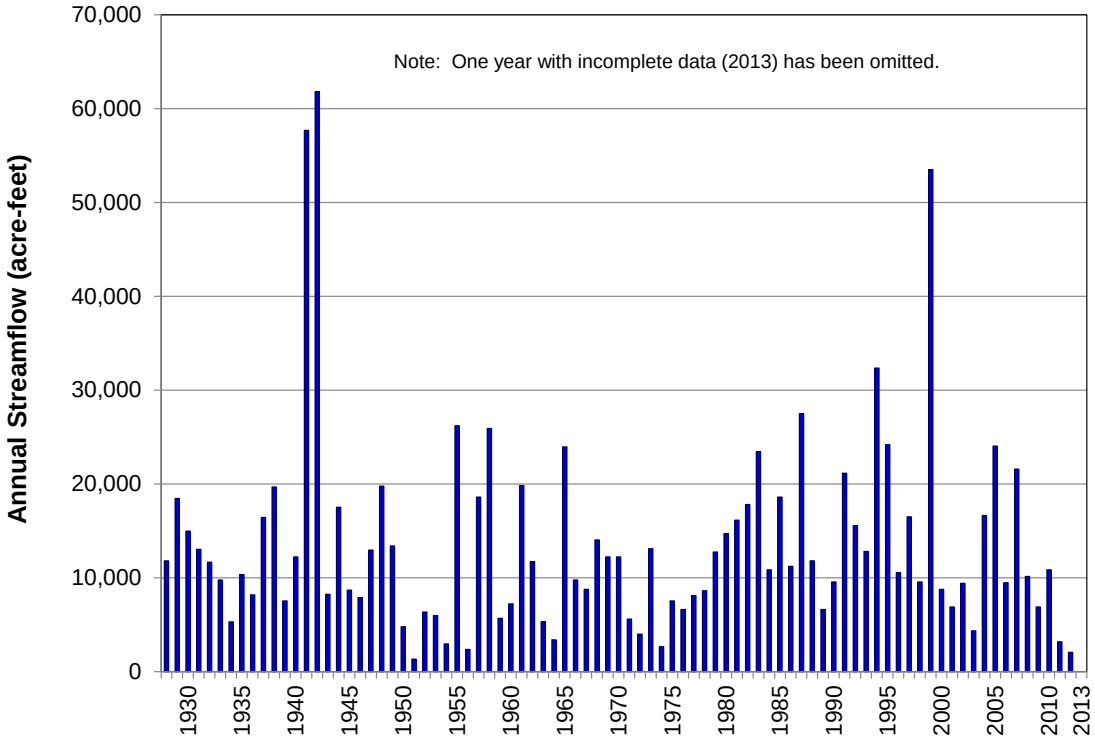
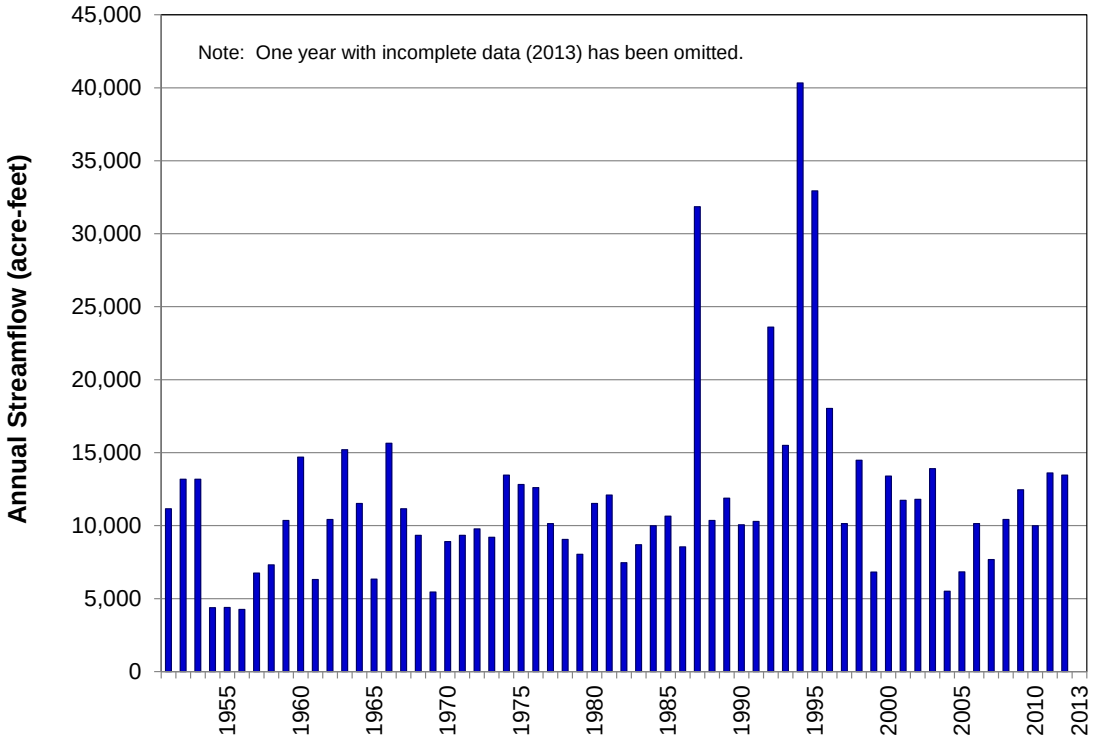
**Minimum and Median Yield 1950 through 2013**

Figure 5-8

## Vermejo River near Dawson, NM




## Cimarron River below Eagle Nest Dam, NM

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**Annual Streamflow for Selected Gaging Stations on the Vermejo and Cimarron Rivers**

Figure 5-9a

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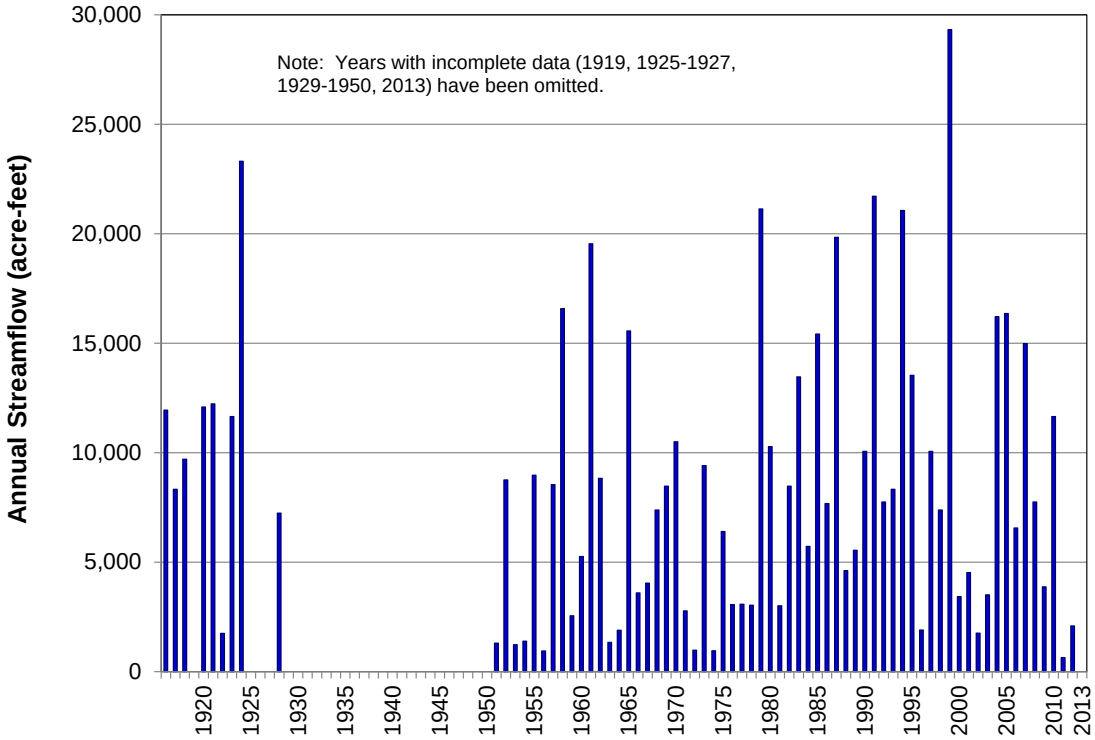
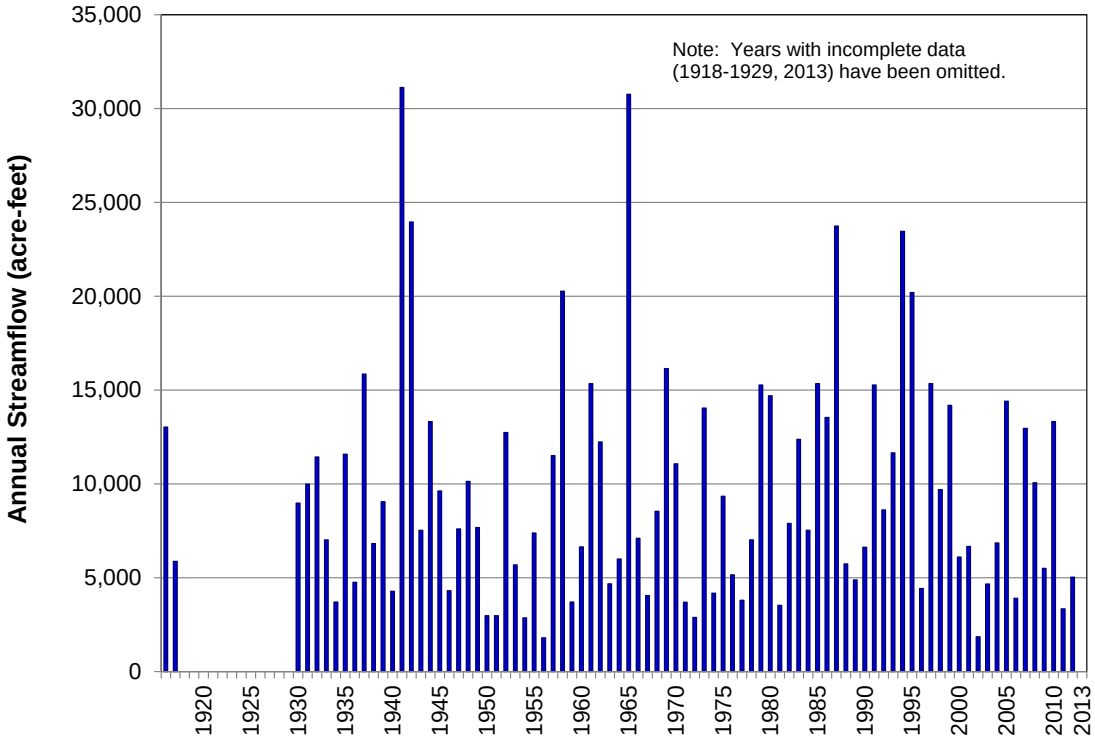
## Ponil Creek near Cimarron, NM




## Rayado Creek near Cimarron, NM

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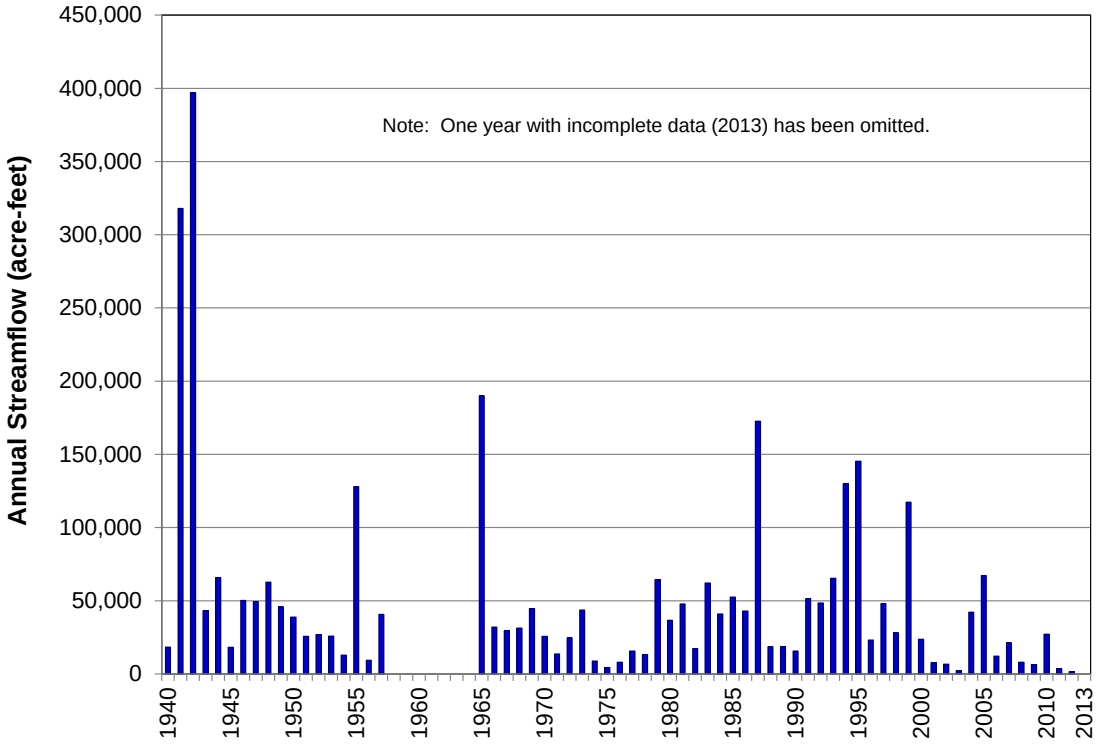
**Annual Streamflow for Selected Gaging Stations on Ponil and Rayado Creeks**

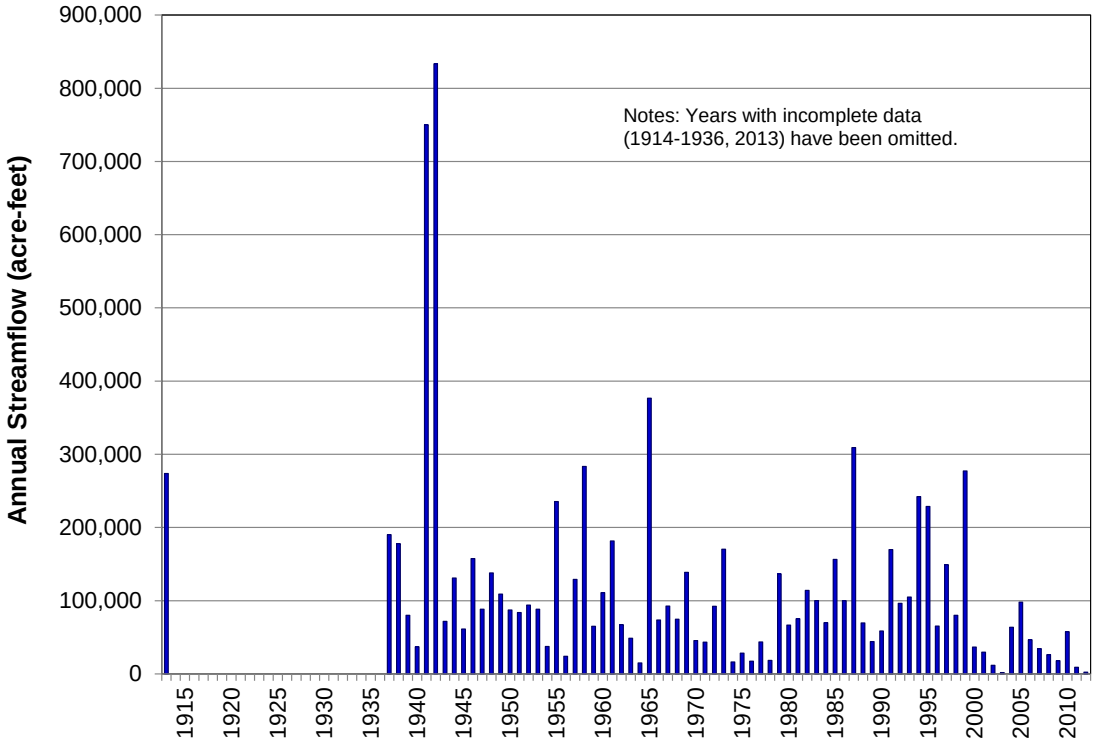
Figure 5-9b

P:_WR12-165\RWPs_2014\9_Colfax\Figures\Figure 5-09b_Ponil-Rayado.docx 6/6/16

## Canadian River near Taylor Springs, NM




## Canadian River near Sanchez, NM

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**Annual Streamflow for**
**Selected Gaging Stations on the Canadian River**

Figure 5-9c

P:_WR12-165\RWPs_2014\9_Colfax\Figures\Figure 5-09c_Canadian.docx 6/6/16

## Table 5-6. Reservoirs and Lakes (greater than 5,000 acre-feet) in or Supplying the Colfax Water Planning Region

| River | Reservoir | Primary Purpose [a] | Operator | Date Completed | Total Storage Capacity (acre-feet) | Surface Area (acres) | Dam Height (feet) | Dam Length (feet) |
|---|---|---|---|---|---|---|---|---|
| ***Union County*** | | | | | | | | |
| Cimarron River | Clayton Lake [b] | REC | New Mexico Department of Game and Fish | 1955 | 6,900 | 175 | 82 | 720 |
| ***Colfax County*** | | | | | | | | |
| Cimarron River | Eagle Nest Lake | IRR | New Mexico Department of Fish and Game | 1918 | 98,000 | 2,768 | 140 | 452 |
| | Springer Lake | IRR | Springer Ditch Company | 1920 | 7,800 | 453 | 29 | 4,190 |
| Chicorico Creek | Lake Maloya | PWS | City of Raton | 1914 | 5,030 | 147 | 100 | 1,250 |
| Vermejo River (Offstream) | Maxwell # 13 Reservoir | IRR | Vermejo Conservancy District | 1955 | 4,951 | 336 | 32 | 8,237 |
| Vermejo River | Stubblefield Reservoir | IRR | Vermejo Conservancy District | 1955 | 16,074 | 904 | 43 | 10,119 |

Source: USACE, 1999

[a] REC = Recreation
IRR = Irrigation
PWS = Public water supply

[b] Reservoir is outside of Colfax region, but is included because of its relevance to the region.

## Table 5-7. Dams with Dam Safety Deficiency Rankings



| Dam | Condition Assess-ment [a] | Deficiency | Hazard Potential [b] | Estimated Cost to Repair ($) |
|---|---|---|---|---|
| ***Colfax County*** | | | | |
| Antelope Valley Dam No. 2 | Poor | Erosion of upstream slope<br>Conduit plugged<br>Lack of design information | Low | $200,000 |
| Antelope Valley Dam No. 3 | Unsatis-factory | Order limiting storage<br>Trees on embankment<br>Erosion of upstream slope<br>Cracks on crest | Low | $1,500,000 |
| Cimarroncito Dam | Poor | Spillway capacity 24% of required flood<br>Maintenance needed<br>Lack of design data | High | $3,000,000 |
| Davis Reservoir Dam | Poor | Spillway capacity 14% of required storm<br>Maintenance needed<br>No design data | Low | $2,500,000 |
| Eagle Nest Dam | Fair | Downstream scour potential<br>Gates need rehab<br>Undersized spillway | High | $1,500,000 |
| French Lake Dam | Poor | Spillway capacity 88% of 100-yr flood event<br>Maintenance needed | Low | $500,000 |
| Hagardon Reservoir No. 5 | Fair | Woody vegetation on embankment | Low | $100,000 |
| Jaritas Dam No. 2 | Poor | Spillway capacity unknown<br>Erosion of dam crest | Low | $2,500,000 |
| Jaritas Reservoir B Dam | Poor | Spillway capacity 13% of required flood<br>Deficient outlet | High | $3,500,000 |
| Koehler Dam | Poor | Spillway capacity 62% of required flood<br>Unauthorized change<br>No design information | Low | $2,500,000 |
| Lake Alice Dam | Poor | Spillway capacity 13% of required flood<br>Rodents<br>Woody vegetation<br>Lack of design information | Significant | $3,000,000 |
| Lake Maloya Dam | Poor | Spillway capacity 9% of required flood but can pass the 100-yr<br>Lack of maintenance & geotech design | High | $6,500,000 |

Source: NMOSE, 2014b

[a] Assessment criteria are attached at the end of this table.

[b] Hazard potential classifications are attached at the end of this table.

PMF = Probable maximum flood

## Table 5-7. Dams with Dam Safety Deficiency Rankings

Page 2 of 4

| Dam | Condition Assess-ment [a] | Deficiency | Hazard Potential [b] | Estimated Cost to Repair ($) |
|---|---|---|---|---|
| Lewis Reservoir Dam | Poor | Trees on embankment<br>Poor maintenance<br>No design information | Low | $500,000 |
| Maxwell Dam No. 11 | Poor | Spillway ~ 35% of required flood<br>Slope erosion<br>Excavation in downstream slope<br>Rodents | Low | $1,500,000 |
| Maxwell Dam No. 12 | Poor | Spillway 72% of required flood event<br>Slope erosion<br>Degraded wave protect<br>Rodents | Low | $1,500,000 |
| Maxwell Dam No. 13 | Poor | Minor upstream slope erosion<br>Lack of design information | Low | $200,000.00 |
| Maxwell Dam No. 14 | Poor | Spillway capacity 36% of required flood<br>Severe upstream slope erosion<br>Inadequate wave protection | Low | $500,000 |
| Maxwell Dam No. 2 | Poor | Lack of design information | Low | $200,000 |
| Miami Lake Dam No. 2 | Fair | Spillway capacity questionable<br>Foundation seepage<br>Riprap deteriorated | High | $2,000,000 |
| Monte Verde Dam | Poor | Lack of design information | Significant | $100,000.00 |
| Rito Del Plano Reservoir | Poor | Spillway capacity 89% of required flood<br>Lack of documentation<br>Outlet works inoperable | Low | $3,500,000 |
| Saltpeter Creek Site 1A | Poor | Spillway capacity 82% of required flood<br>Crack on dam crest<br>Lack of design information | Significant | $1,000,000 |
| Springer Dam No. 1 | Poor | Spillway capacity 25% of required flood<br>Stability issues<br>Maintenance needed | High | $500,000 |
| Springer Dam No. 2 | Poor | Spillway capacity 22% of required flood<br>Stability issues<br>Maintenance needed | High | $6,400,000 |
| Springer Lake Dam | Poor | Spillway capacity 30% of required flood<br>Outlet partially obstructed<br>Seepage | High | $3,000,000 |

Source: NMOSE, 2014b

[a] Assessment criteria are attached at the end of this table.

[b] Hazard potential classifications are attached at the end of this table.

PMF = Probable maximum flood

## Table 5-7. Dams with Dam Safety Deficiency Rankings



| Dam | Condition Assess-ment [a] | Deficiency | Hazard Potential [b] | Estimated Cost to Repair ($) |
|---|---|---|---|---|
| Stubblefield Dam | Poor | Spillway capacity 50% of required flood<br>Lack of design information | Significant | $2,500,000 |
| Throttle Dam No. 2 | Poor | Spillway 28% of required flood<br>Deteriorated spillways<br>Downstream outlet control<br>No design information | Significant | $3,000,000 |
| Urraca Dam | Poor | Spillway capacity 18% of required flood<br>Lack of geotech documentation | High | $3,000,000 |
| Ute Creek Dam | Poor | Lack of design information | High | $100,000 |
| Van Bruggen Reservoir Dam | Poor | Spillway capacity unknown<br>Embankment slopes severely eroded<br>Crest not uniform<br>Lack of design information | Low | $3,500,000 |
| Webster Dam | Poor | Spillway capacity 15% of required flood<br>Wave erosion<br>Rodents<br>Lack of design information | High | $3,000,000 |

Source: NMOSE, 2014b

[a] Assessment criteria are attached at the end of this table.

[b] Hazard potential classifications are attached at the end of this table.

PMF = Probable maximum flood

## Table 5-7. Dams with Dam Safety Deficiency Rankings



[a] Condition assessment:

| | *2008 US Army Corps of Engineers Criteria (adopted by NM OSE in FY09)* | *NMOSE Spillway Risk Guidelines* |
|---|---|---|
| Fair: | No existing dam safety deficiencies are recognized for normal loading conditions. Rare or extreme hydrologic and/or seismic events may result in a dam safety deficiency. Risk may be in the range [for the owner] to take further action. | Spillway capacity < 70% but ≥ 25% of the SDF. |
| Poor: | A dam safety deficiency is recognized for loading conditions, which may realistically occur. Remedial action is necessary. A poor condition is also used when uncertainties exist as to critical analysis parameters, which identify a potential dam safety deficiency. Further investigations and studies are necessary. | Spillway capacity < 25% of the SDF. |
| Unsatisfactory: | A dam safety deficiency is recognized that requires immediate or emergency remedial action for problem resolution. | |

[b] Hazard Potential Classifications:

| | |
|---|---|
| High: | Dams where failure or mis-operation would likely result in loss of human life. |
| Significant: | Dams where failure or mis-operation would likely not result in loss of human life but could cause economic loss, environmental damage, disruption of lifeline facilities, or could impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but may be located in populated areas with significant infrastructure. |
| Low: | Dams where failure or mis-operation would likely not result in loss of life but may result in minimal economic or environmental losses. Losses would be principally limited to the dam owner's property |

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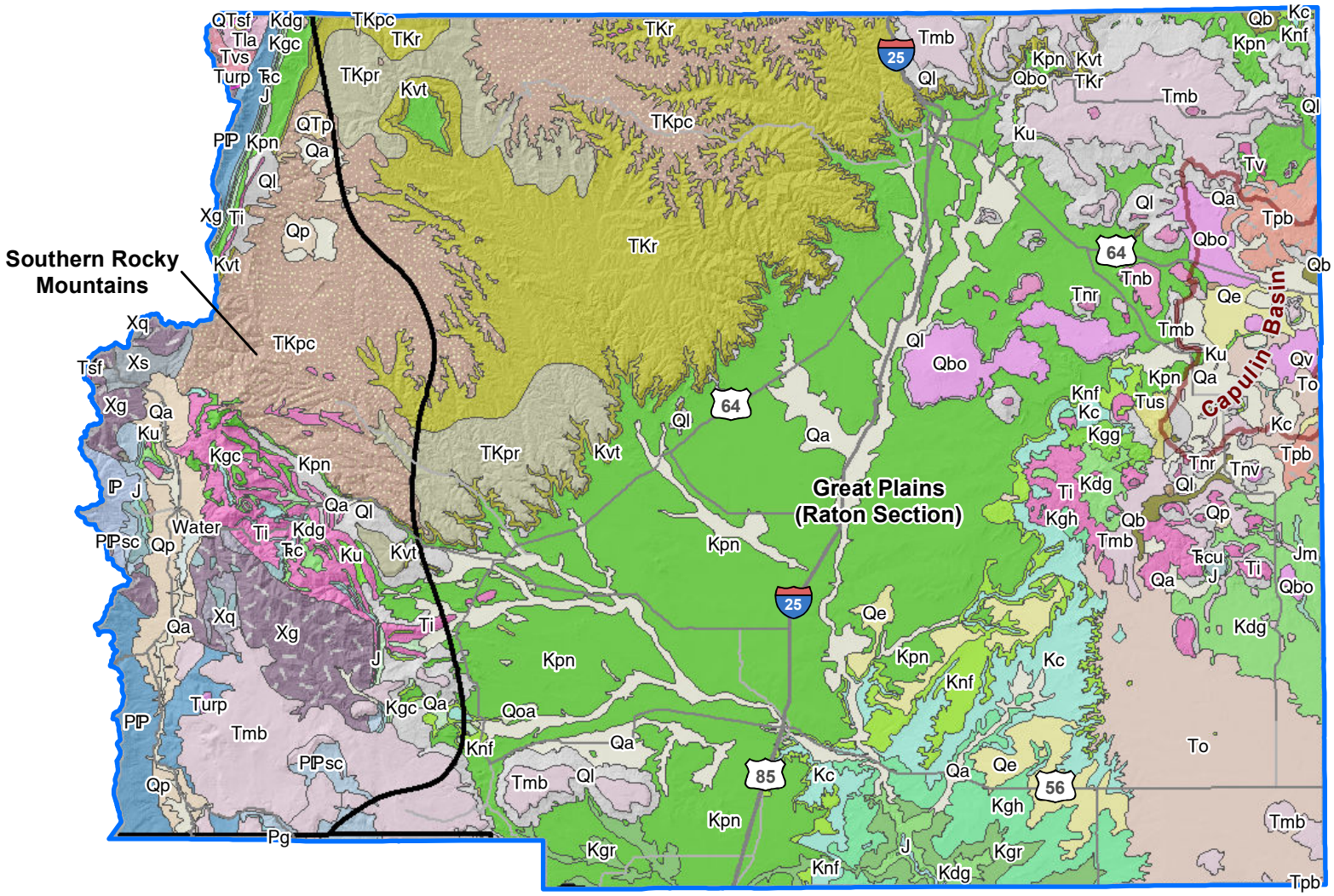


N

0 5 10 Miles

**Explanation**

- Physiographic province
- County
- Water planning region

Sources:
1. NMBGMR, 2003
2. Hawley, 1986
3. Trauger and Kelley, 1987

Figure 5-10a

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**Geology and Physiographic Provinces**

## Geology Explanation

- IP - Pennsylvanian rocks undivided
- J - Upper and Middle Jurassic rocks, undivided
- Jm - Morrison Formation
- Kc - Carlile Shale
- Kdg - Dakota Group
- Kgc - Greenhorn Formation and Carlile Shale, undivided
- Kgg - Greenhorn Formation and Graneros Shale
- Kgh - Greenhorn Formation
- Kgr - Graneros Shale
- Knf - Fort Hays Limestone Member of Niobrara Formation
- Kpn - Pierre Shale and Niobrara Formation
- Ku - Upper Cretaceous Rocks of southwestern New Mexico, undivided
- Kvt - Vermejo Formation and Trinidad Sandstone
- PIP - Permian and Pennsylvanian rocks, undivided
- PIPsc - Sangre de Cristo Formation
- Pg - Glorieta Sandstone
- QTp - Older piedmont alluvial deposits and shallow basin fill
- QTsf - Santa Fe Group, undivided
- Qa - Alluvium
- Qb - Basaltic to andesitic lava flows
- Qbo - Basaltic to andesitic lava flows
- Qe - Eolian deposits
- Ql - Landslide deposits and colluvium
- Qoa - Older alluvial deposits of upland plains and piedmont areas, and calcic soils and eolian cover sediments of High Plains region
- Qp - Piedmont alluvial deposits
- Qv - Basaltic tephra and lavas near vents
- TKpc - Poison Canyon Formation
- TKpr - Poison Canyon and Raton Formations
- TKr - Raton Formation
- Ti - Tertiary intrusive rocks of intermediate to silicic composition
- Tim - Tertiary mafic intrusive rocks
- Tla - Lower middle Tertiary andesitic to dacitic lavas and pyroclastic flow breccias
- Tmb - Basaltic to andesitic lava flows
- Tnb - Basaltic to andesitic lava flows
- Tnr - Silicic to intermediate volcanic rocks
- Tnv - Intermediate to silicic volcanic rocks
- To - Ogallala Formation
- Tpb - Basaltic to andesitic lava flows
- Tsf - Lower Santa Fe Group
- Tual - Lower-upper middle Tertiary basaltic andesites and andesites of the Mogollon Group
- Turp - Upper middle Tertiary rhyolitic pyroclastic rocks of the Mogollon Group, ash-flow tuffs
- Tus - Upper Tertiary sedimentary units
- Tv - Middle Tertiary volcanic rocks
- Tvs - Middle Tertiary volcaniclastic sedimentary units
- Water - Water
- Xg - Paleoproterozoic granitic plutonic rocks
- Xq - Paleoproterozoic quartzite
- Xs - Paleoproterozoic metasedimentary rocks
- Xvm - Paleoproterozoic mafic metavolcanic rocks with subordinate felsic metavolcanic rocks
- Trc - Chinle Group
- Trcu - Upper Chinle Group, Garita Creek through Redonda Formations, undivided

Source: NMBGMR, 2003

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**Geology Explanation**

Figure 5-10b

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Colfax County includes parts of two major physiographic provinces:

- The westernmost portion of the county encompasses part of the Southern Rocky Mountains Province, including the Cimarron Range and the eastern slopes of the Taos Range within the Sangre de Cristo Mountains. This province is characterized by high mountain areas with elevations ranging from 7,000 to more than 12,000 ft amsl.

- The remainder of the county falls within the Raton Section of the Great Plains Province. This area is characterized by pediments, plains, and high plateaus dissected by the Canadian, Vermejo, and Cimarron River systems; surface elevations range from 5,500 to 7,000 ft amsl. This topography is punctuated by volcanic cindercones and mantled by basalt flows in parts of the northeast and eastern portions of the county.

Figure 5-10 shows the approximate extents of these areas within the planning region.

The occurrence of groundwater in each of these provinces is controlled by their varying hydrogeologic conditions, which are dependent upon localized geologic structures, stratigraphy, and geologic formation lithologies. A generalized stratigraphic section for the county, as derived by Ballance (1967), was provided in the original water plan (DBS&A, 2003). Structural geology within Colfax County is principally defined by three major tectonic features: the Sangre de Cristo Uplift in the western part, the Raton Basin in the central part, and the Sierra Grande Arch in the southeastern part.

### 5.3.2 Aquifer Conditions

As reported in the accepted regional water plan (DBS&A, 2003), the largest and most viable source of groundwater is in the Moreno Valley in the southwestern corner of the county, where Mesozoic and Paleozoic sandstone and siltstones serve as aquifers. The Moreno Valley aquifer system is recharged by snowmelt and rainfall along the mountains that bound the valley and by return flows from pumped groundwater and surface water diversions.

The Moreno Valley is located in the southern Sangre de Cristo Mountains and includes the resort communities of Angel Fire and Eagle Nest (Figure 3-1), which derive their supply from Moreno Valley aquifers. In particular, the Sangre de Cristo Formation is the main source of groundwater for the Village of Angel Fire. Though Angel Fire has an adequate physical water supply, they have had infrastructure challenges due to the steep terrain in the Village. Also, development of the Moreno Valley resources is limited by water rights constraints. Prior NMOSE water rights hearings have ruled that Moreno Valley groundwater is stream-connected to Eagle Nest Lake and the Cimarron drainage, and hence NMOSE does not allow new appropriations other than domestic wells authorized under NMSA 72-12-1. Additionally, pumping is limited in drought years to protect downstream senior water rights holders, in accordance with the *Agreement for Settlement of Pending Litigation and Other Disputes Concerning State Engineer Permit No. 71*.

Other groundwater resources in the region with potential for future groundwater development are alluvial deposits near stream channels, the Ogallala Formation, the Dakota Sandstone Formation, and intermixed alluvial and volcanic deposits of the Capulin Basin.

- Alluvial deposits in Colfax County occur in present stream channels and adjacent floodplains, as well as in an upland plain areal deposit in the Capulin Basin west of Capulin Peak near the east-central county boundary. Because alluvial saturation along the present stream channels is dependent upon streamflow conditions, this water source will be diminished during periods of drought and low runoff. Due to drought and water quality concerns, alluvial groundwater is not a major dependable water supply resource, but may provide adequate water supplies on a limited basis in specific local areas. The alluvial deposits are used primarily for domestic and stock wells. The Village of Maxwell also relies on shallow alluvial wells along the Canadian River and has experienced drought shortages in recent years.

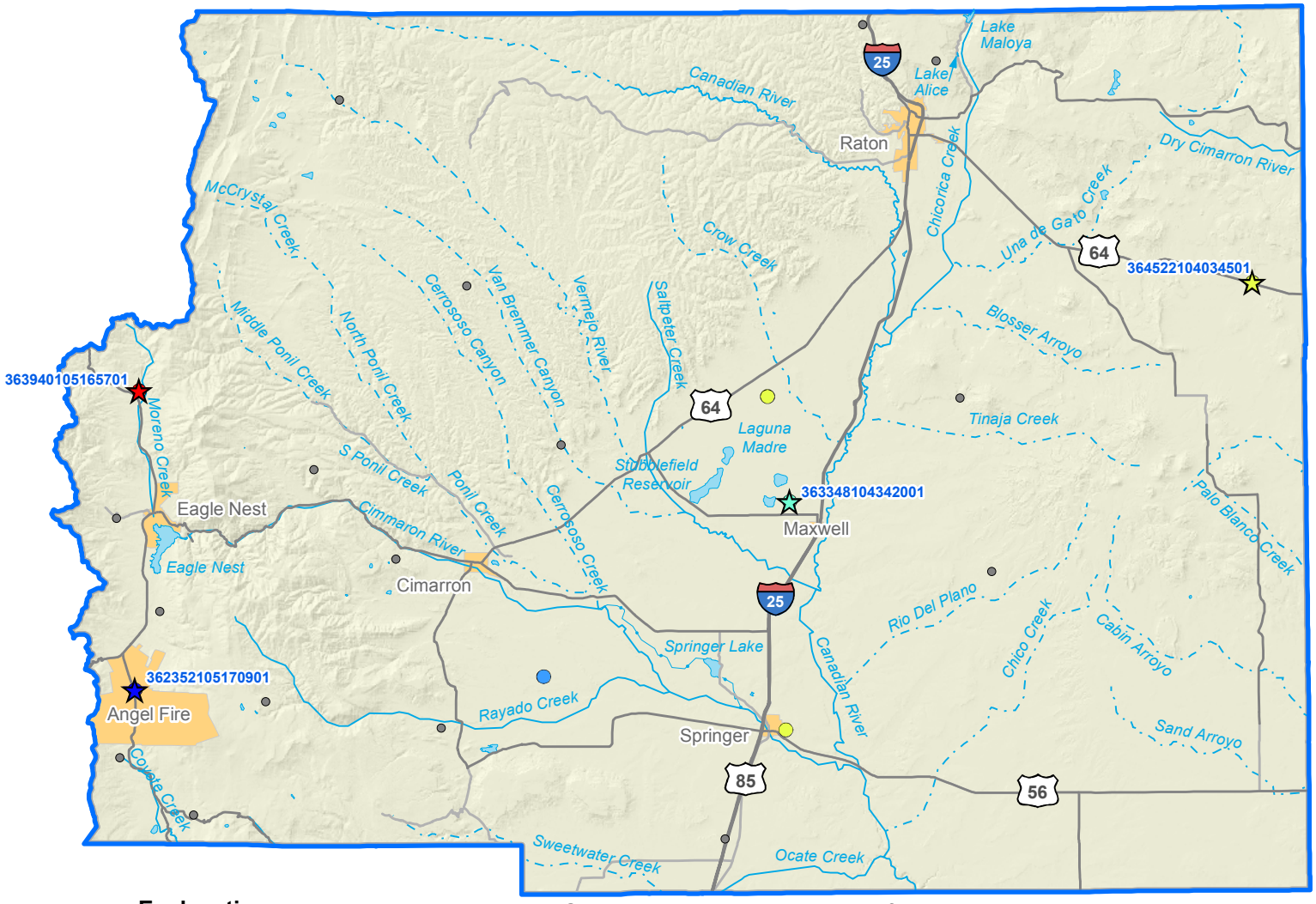
- The Ogallala Formation is a well-known and highly developed aquifer that covers an extensive area of the Great Plains. Its occurrence in the southeast corner of Colfax County represents only a small outlier of the formation (Figure 5-10). The Ogallala supplies domestic and livestock wells in Colfax County.

- The Lower Cretaceous age Dakota Sandstone underlies most of Colfax County, but is mostly buried beneath younger rocks, at depths up to 5,000 feet. Water can be found at shallower depths in areas of the county east of the Canadian River and within the Maxwell Grant. The aquifer has potential for development in the area east of Laughlin Peak (northeast of Maxwell), where the depths to water are relatively shallow and water quality is good (Resource Technology, Inc., 1991). The Dakota Sandstone is used primarily for domestic and livestock wells.

- The Capulin Basin is located south of Johnson Mesa and southwest of Capulin National Monument in eastern Colfax County, extending into western Union County. It is a closed topographic basin that drains to its interior. Volcanics and alluvial deposits make up the primary aquifer in the basin (Trauger and Kelly, 1987). The volcanic features and alluvium are highly porous and serve as recharge conduits capable of transmitting large amounts of precipitation into the subsurface, where it is trapped as groundwater within the closed basin. Wells in the Capulin Basin are used for agriculture and domestic use.

In order to evaluate changes in water levels over time, the USGS monitors groundwater wells throughout New Mexico (Figure 5-11). Hydrographs illustrating groundwater levels versus time, as compiled by the USGS (2014b), were selected for four monitor wells with longer periods of record and are shown in Figure 5-12. The water level data shown on these hydrographs are insufficient to identify clear trends, since the wells may be impacted by nearby pumping; additional monitoring is needed to identify trends. Water levels in the well north of U.S. Highway 64 in the Capulin Basin and the well near Maxwell appear to be declining.

S:\PROJECTS\WR12.0165_STATE_WATER_PLAN_2012\GIS\MXDS\FIGURES_2016\COLFAX\FIG5-11_USGS_WELLS.MXD 4/28/2016




**Explanation**

- Selected USGS-monitored well
- Other USGS-monitored well
- Stream (dashed where intermittent)
- Lake
- City
- County
- Water planning region

Groundwater elevation change (ft)

- Decreased more than 20 ft
- Decreased 10 to 20 ft
- Decreased 1 to 10 ft
- Changed less than 1 ft
- Increased 1 to 10 ft
- Increased more than 10 ft

N

0 5 10 Miles

Note: Groundwater elevation change calculated by comparing median measurements for each well from the time period 1985 through 1995 with those from 2005 through 2014.

Source: USGS, 2014b

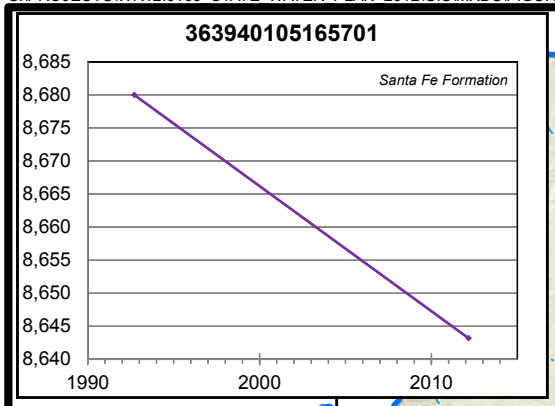
COLFAX

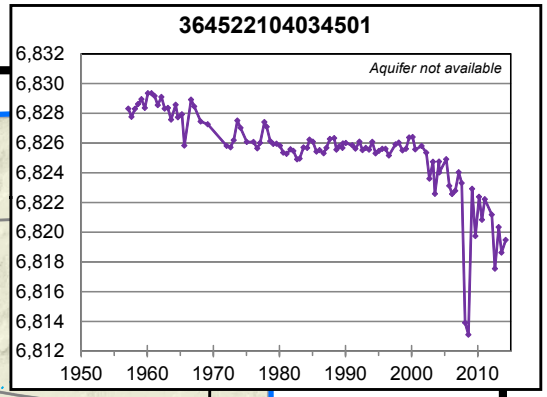
REGIONAL WATER PLAN 2016

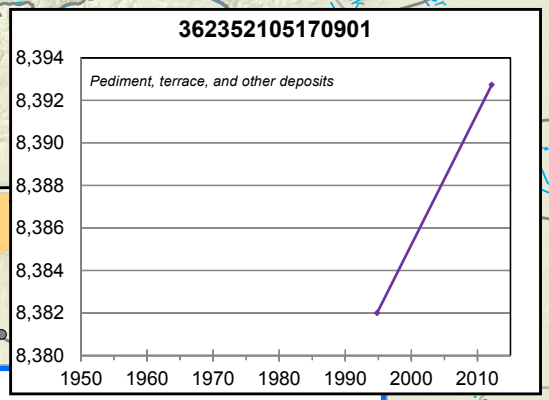
**U.S. Geological Survey Wells and Recent Groundwater Elevation Change**

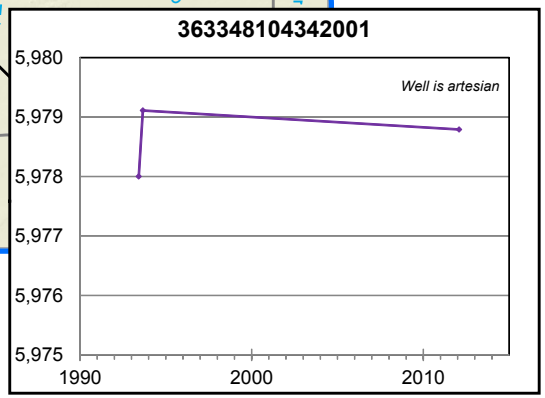
Figure 5-11

S:\PROJECTS\WR12.0165_STATE_WATER_PLAN_2012\GIS\MXDS\FIGURES_2016\COLFAX\FIG5-12_USGS_WELLS_HYDROGRAPHS.MXD 4/28/2016




Raton
Lake Maloya
Lake Alice
Canadian River
Chicorica Creek
Crow Creek
Cerrososo Canyon
Van Bremmer Canyon
Vermejo River
Saltpeter Creek
Middle Ponil Creek
North Ponil Creek
S Ponil Creek
Ponil Creek
Moreno Creek
Cimmaron River
Eagle Nest
Laguna Madre
Stubblefield Reservoir
Maxwell
Blosser Arroyo
Tinaja Creek
Palo Blanco Creek
Rio Del Plano
Cabin Arroyo
Cieneguilla Creek
Springer Lake
Springer
Angel Fire
Coyote Creek
Ocate Creek
64
25
85
56

**Explanation**

- Selected USGS-monitored well
- Other USGS-monitored well
- Stream (dashed where intermittent)
- Lake
- City
- County
- Water planning region

Source: USGS, 2014b

Note: Completion aquifer of well noted on each hydrograph.

N

0 5 10 Miles

Figure 5-12

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REGIONAL WATER PLAN 2016

**Hydrographs of Selected Wells**

The major well fields in the planning region, along with the basins they draw from, are:

- City of Angel Fire's well field in the Moreno Valley, with 5 wells
- The Town of Eagle Nest wells in the Moreno Valley, with 2 wells

In addition, the Village of Maxwell has two wells that pump from shallow alluvium along the Canadian River, and there are a number of smaller water systems that rely on groundwater from individual wells.

## 5.4 Water Quality

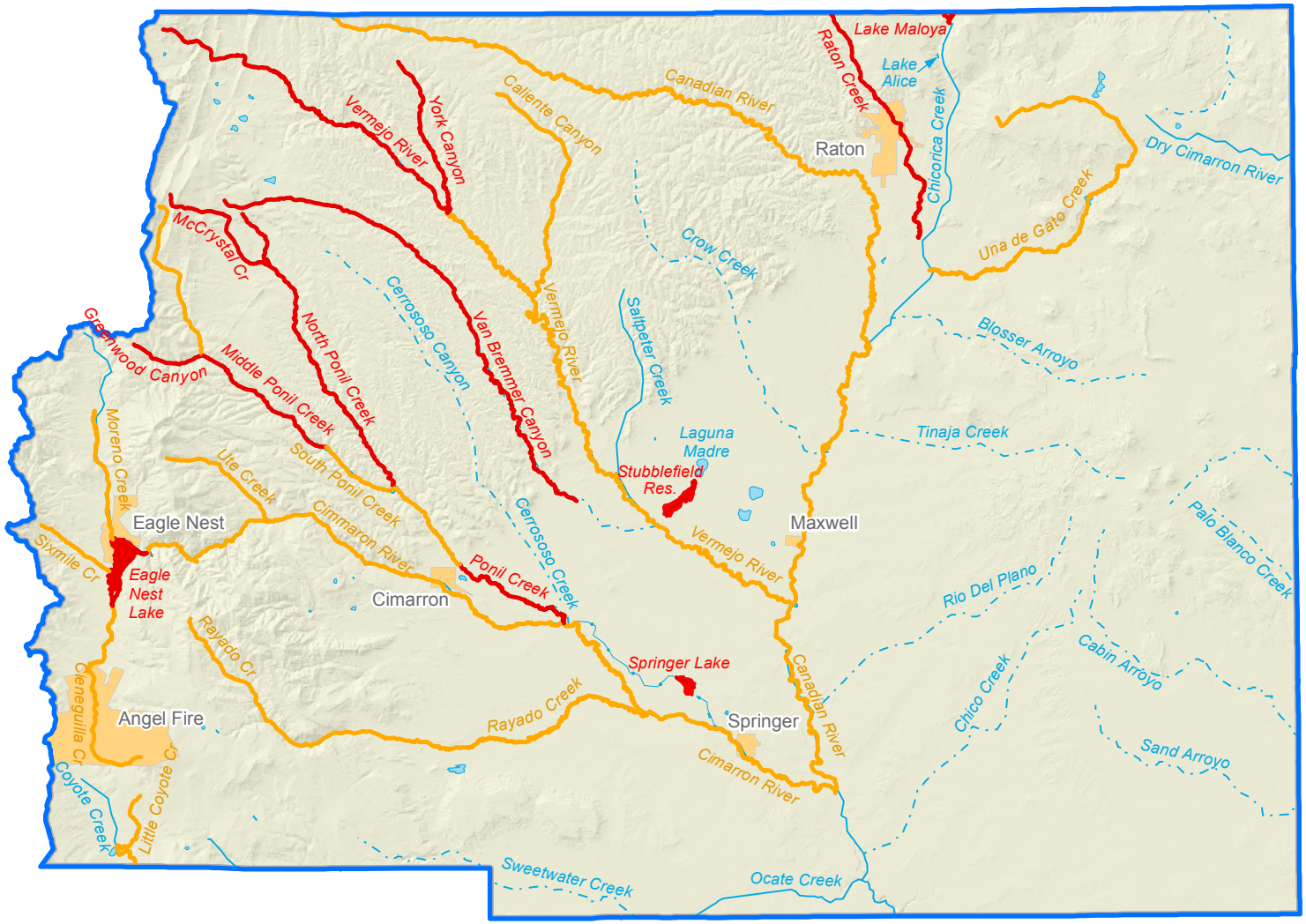
Assurance of ability to meet future water demands requires not only water in sufficient quantity, but also water that is of sufficient quality for the intended use. This section summarizes the water quality assessment that was provided in the accepted regional water plan and updates it to reflect new studies of surface and groundwater quality and current databases of contaminant sources. The identified water quality concerns should be a consideration in the selection of potential projects, programs, and policies to address the region's water resource issues.

Surface water quality in the Colfax Water Planning Region is evaluated through periodic monitoring and comparison of sample results to pertinent water quality standards. In general, surface water quality is good throughout the planning region with some exceptions. Several reaches of rivers within the planning region have been listed on the 2014-2016 New Mexico 303(d) list (NMED, 2014a). This list is prepared every two years by NMED and approved by the NMWQCC to comply with Section 303(d) of the federal Clean Water Act, which requires each state to identify surface waters within its boundaries that do not meet water quality standards (see Section 4.2.2.1.1).

Section 303(d) further requires the states to prioritize their listed waters for development of total maximum daily load (TMDL) management plans, which document the amount of a pollutant a waterbody can assimilate without violating a state water quality standard and allocates that load capacity to known point sources and nonpoint sources at a given flow. Common causes of impairment in the Colfax region include E. coli bacteria, nutrient/eutrophication, temperature, sediment/siltation, turbidity, and mercury in fish tissue. Figure 5-13 shows the locations of lakes and stream reaches with impaired water quality. Table 5-8 provides details of impairment for those reaches.

In evaluating the impacts of the 303(d) impaired waters list on the regional water planning process, it is important to consider that impairments are tied to designated uses. Some problems can be very disruptive to a healthy aquatic community, while others reduce the safety of water recreation or increase the risk of fish consumption. Impairments will not necessarily make the water unusable for irrigation or even for domestic water supply, but the water may need treatment prior to use and the costs of this should be recognized.

S:\PROJECTS\WR12.0165_STATE_WATER_PLAN_2012\GIS\MXDS\FIGURES_2016\COLFAX\FIG5-13_WQ_IMPAIRED_REACHES.MXD 4/28/2016




N

0 5 10 Miles

**Explanation**

- Impaired stream (IR category 4)
- Impaired stream (IR category 5)
- Impaired lake (IR category 5)
- Stream (dashed where intermittent)
- Other lake
- City
- County
- Water planning region

Source: NMED, 2014a and 2014c
Note: See Table 5-8 for IR Category definitions.

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REGIONAL WATER PLAN 2016

**Water Quality-Impaired Reaches**

Figure 5-13

## Table 5-8. Total Maximum Daily Load Status of Streams in the Colfax Water Planning Region



| Waterbody Name [a] (basin, segment) | Assessment Unit ID | Affected Reach (miles [b]) | Probable Sources of Pollutant | Uses Not Fully Supported [c] | Specific Pollutant | IR Category [d] |
|---|---|---|---|---|---|---|
| ***Colfax County*** | | | | | | |
| Bonito Creek<br>(Rayado Creek to headwaters) | NM-2305.1.A_20 | 5.68 | Not assessed | — | — | 3/3A |
| Bracket Canyon<br>(Vermejo R to hdwtrs) | NM-97.A_008 | 2.8 | Not assessed | — | — | 3/3A |
| Caliente Canyon<br>(Vermejo River to headwaters) | NM-2306.A_151 | 17.39 | Source unknown, natural sources | HQColdWAL | Specific conductance | 4A |
| Canadian River<br>(Cimarron River to CO border) | NM-2305.A_200 | 96.39 | Animal feeding operations (NPS)<br>Rangeland grazing<br>Flow alterations from water diversions | MWWAL | Nutrient/Eutrophication<br>Biological indicators | 4A |
| Cieneguilla Creek<br>(Eagle Nest Lake to headwaters) | NM-2306.A_065 | 14.71 | Municipal point source discharges<br>Recreational pollution sources<br>Loss of riparian habitat<br>Rangeland grazing<br>Streambank modifications/destabilization | HQColdWAL<br>PC | Escherichia coli<br>Nutrient/Eutrophication<br>Biological indicators<br>Sedimentation/siltation<br>Temperature, water<br>Turbidity | 4A |
| Cimarron River<br>(Canadian River to Cimarron Village) | NM-2305.1.A_10 | 37.83 | On-site treatment systems (septic)<br>impervious surface/parking lot runoff<br>rangeland grazing<br>flow alterations from water diversions | WWAL | Nutrient/Eutrophication<br>Biological iIndicators | 4A |

Source: NMED, 2014a

[a] Only waterbodies assigned to IR categories 3 and above are included.

[b] Unless otherwise noted.

[c] ColdWAL = Coldwater aquatic life
DWS = Domestic water supply
HQColdWAL = High quality coldwater aquatic life
MCWAL = Marginal coldwater aquatic life
MWWAL = Marginal warmwater aquatic life
PC = Primary contact
WWAL = Warm water aquatic life

[d] Impairment (IR) category definitions are attached as the last page of this table.

[e] Acres

— = No information provided (reach was not assessed).

## Table 5-8. Total Maximum Daily Load Status of Streams in the Colfax Water Planning Region



| Waterbody Name [a] (basin, segment) | Assessment Unit ID | Affected Reach (miles [b]) | Probable Sources of Pollutant | Uses Not Fully Supported [c] | Specific Pollutant | IR Category [d] |
|---|---|---|---|---|---|---|
| Cimarron River<br>(Cimarron Village to Turkey Creek) | NM-2306.A_040 | 4.27 | Source unknown<br>Loss of riparian habitat<br>Baseflow depletion<br>Rangeland grazing | HQColdWAL<br>DWS | Arsenic<br>Temperature, water | 4A |
| Cimarron River<br>(Turkey Creek to Eagle Nest Lake) | NM-2306.A_130 | 18.24 | On-site treatment systems (septic)<br>Source unknown<br>Recreational pollution sources<br>Wildlife other than waterfowl<br>Dam or impoundment | HQColdWAL<br>PC<br>DWS | Arsenic<br>Nutrient/Eutrophication<br>Biological indicators | 4A |
| Coyote Creek<br>(Mora River to Black Lake) | NM-2306.A_020 | 35.32 | Natural sources<br>Rangeland grazing | HQColdWAL | Specific conductance<br>Temperature water | 4A |
| Eagle Nest Lake | NM-2306.B_00 | 1332 [e] | Source unknown | HQColdWAL<br>DWS | Arsenic<br>Oxygen dissolved | 5/5A |
| Gachupin Canyon<br>(Vermejo R to w trib nr mine outfall) | NM-97.A_010 | 2.9 | Not assessed | — | — | 3/3A |
| Greenwood Canyon<br>(Middle Ponil Creek to headwaters) | NM-2306.A_122 | 4.63 | Source unknown | HQColdWAL | Aluminum | 5/5C |
| Lake Maloya | NM-2305.B_20 | 117.57 [e] | Source unknown | ColdWAL | Temperature water | 5/5C |
| Leandro Creek<br>(Vermejo River to headwaters) | NM-2306.A_161 | 11.25 | Not assessed | — | — | 3/3A |

Source: NMED, 2014a

[a] Only waterbodies assigned to IR categories 3 and above are included.

[b] Unless otherwise noted.

[c] ColdWAL = Coldwater aquatic life
DWS = Domestic water supply
HQColdWAL = High quality coldwater aquatic life
MCWAL = Marginal coldwater aquatic life
MWWAL = Marginal warmwater aquatic life
PC = Primary contact
WWAL = Warm water aquatic life

[d] Impairment (IR) category definitions are attached as the last page of this table.

[e] Acres

— = No information provided (reach was not assessed).

## Table 5-8. Total Maximum Daily Load Status of Streams in the Colfax Water Planning Region



| Waterbody Name [a] (basin, segment) | Assessment Unit ID | Affected Reach (miles [b]) | Probable Sources of Pollutant | Uses Not Fully Supported [c] | Specific Pollutant | IR Category [d] |
|---|---|---|---|---|---|---|
| Little Coyote Creek (Black Lake to headwaters) | NM-2306.A_024 | 4.66 | Source unknown<br>Rangeland grazing<br>Natural sources | HQColdWAL | Nutrient/Eutrophication<br>Biological indicators<br>pH | 4A |
| McCrystal Creek (North Ponil to headwaters) | NM-2306.A_112 | 8.84 | Source unknown | HQColdWAL | Temperature water<br>Turbidity | 5/5A |
| Middle Ponil Creek (Greenwood Creek to headwaters) | NM-2306.A_124 | 10.96 | On-site treatment systems (septic)<br>Source unknown<br>Wildlife other than waterfowl<br>Watershed runoff following forest fire<br>Rangeland grazing | HQColdWAL | Nutrient/Eutrophication<br>Biological Indicators | 4A |
| Middle Ponil Creek (South Ponil to Greenwood Creek) | NM-2306.A_121 | 10 | Source unknown<br>Loss of riparian habitat | HQColdWAL | Benthic-macroinvertebrate bioassessments<br>Temperature water | 5/5C |
| Moreno Creek (Eagle Nest Lake to headwaters) | NM-2306.A_060 | 10.16 | On-site treatment systems (septic)<br>Wastes from pets<br>Rangeland grazing | HQColdWAL | Nutrient/Eutrophication<br>Biological indicators<br>Temperature water | 4A |
| North Ponil Creek (Seally Canyon to headwaters) | NM-2306.A_162 | 7.04 | Low water crossing<br>Source unknown<br>Wildlife other than waterfowl<br>Habitat modification<br>Watershed runoff following forest fire<br>Rangeland grazing | DWS<br>HQColdWAL | Aluminum<br>Gross alpha<br>Radium 226<br>Radium 228<br>Temperature water<br>Turbidity | 5/5A |

Source: NMED, 2014a

[a] Only waterbodies assigned to IR categories 3 and above are included.

[b] Unless otherwise noted.

[c] ColdWAL = Coldwater aquatic life
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HQColdWAL = High quality coldwater aquatic life
MCWAL = Marginal coldwater aquatic life
MWWAL = Marginal warmwater aquatic life
PC = Primary contact
WWAL = Warm water aquatic life

[d] Impairment (IR) category definitions are attached as the last page of this table.

[e] Acres

— = No information provided (reach was not assessed).

## Table 5-8. Total Maximum Daily Load Status of Streams in the Colfax Water Planning Region



| Waterbody Name [a] (basin, segment) | Assessment Unit ID | Affected Reach (miles [b]) | Probable Sources of Pollutant | Uses Not Fully Supported [c] | Specific Pollutant | IR Category [d] |
|---|---|---|---|---|---|---|
| North Ponil Creek (South Ponil Creek to Seally Canyon) | NM-2306.A_110 | 14.78 | Low water crossing<br>Forest roads (road construction and use)<br>Source unknown<br>Silviculture harvesting<br>Habitat modification<br>Rangeland grazing | PC<br>HQColdWAL | Escherichia coli<br>Nutrient/Eutrophication<br>Biological indicators<br>Temperature water<br>Turbidity | 5/5A |
| Ponil Creek (Cimarron River to US 64) | NM-2306.A_100 | 9.74 | Waterfowl<br>On-site treatment systems (septic)<br>Source unknown<br>Wastes from pets | WWAL<br>PC | Benthic-macroinvertebrate bioassessments<br>Escherichia coli | 5/5C |
| Ponil Creek (US 64 to confl of North & South Ponil) | NM-2306.A_101 | 6.76 | Livestock (grazing or feeding operations)<br>On-site treatment systems (septic)<br>Wastes from pets<br>Loss of riparian habitat<br>Rangeland grazing<br>Streambank modifications/destabilization | PC<br>HQColdWAL | Escherichia coli<br>Nutrient/Eutrophication<br>Biological indicators<br>Temperature water<br>Turbidity | 4A |
| Raton Creek (Chicorica Creek to headwaters) | NM-2305.A_253 | 17.6 | Source unknown | PC<br>MWWAL | Escherichia coli<br>Nutrient/Eutrophication<br>Biological indicators | 5/5A |

Source: NMED, 2014a

[a] Only waterbodies assigned to IR categories 3 and above are included.

[b] Unless otherwise noted.

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MCWAL = Marginal coldwater aquatic life
MWWAL = Marginal warmwater aquatic life
PC = Primary contact
WWAL = Warm water aquatic life

[d] Impairment (IR) category definitions are attached as the last page of this table.

[e] Acres

— = No information provided (reach was not assessed).

## Table 5-8. Total Maximum Daily Load Status of Streams in the Colfax Water Planning Region



| Waterbody Name [a] (basin, segment) | Assessment Unit ID | Affected Reach (miles [b]) | Probable Sources of Pollutant | Uses Not Fully Supported [c] | Specific Pollutant | IR Category [d] |
|---|---|---|---|---|---|---|
| Rayado Creek<br>(Cimarron River to Miami Lake Diversion) | NM-2305.3.A_80 | 18.85 | Habitat modification<br>Loss of riparian habitat<br>Road/bridge runoff<br>Rangeland grazing<br>Dam or impoundment | WWAL<br>MCWAL | Nutrient/Eutrophication<br>Biological indicators<br>Sedimentation/Siltation<br>Sedimentation/Siltation | 4A |
| Rayado Creek<br>(Miami Lake Diversion to headwaters) | NM-2306.A_051 | 20.74 | On-site treatment systems (septic)<br>Wildlife other than waterfowl<br>Baseflow depletion<br>Rangeland grazing | HQColdWAL<br>PC | Escherichia coli<br>Temperature water | 4A |
| Seally Canyon<br>(North Ponil to headwaters) | NM-2306.A_111 | 4.74 | Not assessed | — | — | 3/3A |
| Sixmile Creek<br>(Eagle Nest Lake to headwaters) | NM-2306.A_064 | 5.12 | On-site treatment systems (septic)<br>Livestock (grazing or feeding operations)<br>Wildlife other than waterfowl<br>Animal feeding operations (NPS)<br>Habitat modification<br>Natural sources<br>Rangeland grazing | HQColdWAL<br>PC | Escherichia coli<br>Nutrient/Eutrophication<br>Biological indicators<br>Temperature water<br>Turbidity | 4A |
| South Ponil Creek<br>(Ponil Creek to Middle Ponil Creek) | NM-2306.A_120 | 5.24 | Rangeland grazing | HQColdWAL | Temperature water | 4A |
| Springer Lake | NM-2305.1.B_10 | 459.1 [e] | Source unknown | WWAL | Mercury in fish tissue | 5/5C |
| Stubblefield Lake | NM-9000.B_101 | 907.96 [e] | Source unknown | WWAL | Mercury in fish tissue | 5/5C |

Source: NMED, 2014a

[a] Only waterbodies assigned to IR categories 3 and above are included.

[b] Unless otherwise noted.

[c] ColdWAL = Coldwater aquatic life
DWS = Domestic water supply
HQColdWAL = High quality coldwater aquatic life
MCWAL = Marginal coldwater aquatic life
MWWAL = Marginal warmwater aquatic life
PC = Primary contact
WWAL = Warm water aquatic life

[d] Impairment (IR) category definitions are attached as the last page of this table.

[e] Acres

— = No information provided (reach was not assessed).

## Table 5-8. Total Maximum Daily Load Status of Streams in the Colfax Water Planning Region



| Waterbody Name [a] (basin, segment) | Assessment Unit ID | Affected Reach (miles [b]) | Probable Sources of Pollutant | Uses Not Fully Supported [c] | Specific Pollutant | IR Category [d] |
|---|---|---|---|---|---|---|
| Tinaja Creek (Canadian River to headwaters) | NM-9000.A_018 | 25.42 | Not assessed | — | — | 3/3A |
| Una de Gato Creek (Chicorica Creek to HWY 64) | NM-2305.A_254 | 10.62 | Wildlife other than waterfowl<br>Drought-related impacts<br>Rangeland grazing | MWWAL | Nutrient/Eutrophication<br>Biological indicators | 4A |
| Una de Gato Creek (HWY 64 to headwaters) | NM-2305.A_030 | 20.84 | Wildlife other than waterfowl<br>Drought-related impacts<br>Rangeland grazing | MWWAL | Nutrient/Eutrophication<br>Biological indicators | 4A |
| Unnamed tributary (Bracket Cny to mine area) | NM-97.A_009 | 2 | Not assessed | — | — | 3/3A |
| Ute Creek (Perennial prt Cimarron River to headwaters) | NM-2306.A_068 | 8.06 | On-site treatment systems (septic)<br>Rangeland grazing | PC | Escherichia coli | 4A |
| VanBremmer Creek (HWY 64 to headwaters) | NM-2306.A_140 | 34.79 | Source unknown | HQColdWAL | Specific conductance<br>Temperature water<br>Turbidity | 5/5B |
| Vermejo River (Canadian River to Rail Canyon) | NM-2305.A_210 | 25.38 | Sources not listed | MWWAL | Low flow alterations | 4C |
| Vermejo River (Rail Canyon to York Canyon) | NM-2305.A_220 | 23.53 | Source unknown<br>Habitat modification<br>Rangeland grazing | HQColdWAL | Specific Conductance<br>Temperature water | 4A |

Source: NMED, 2014a

[a] Only waterbodies assigned to IR categories 3 and above are included.

[b] Unless otherwise noted.

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MCWAL = Marginal coldwater aquatic life
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PC = Primary contact
WWAL = Warm water aquatic life

[d] Impairment (IR) category definitions are attached as the last page of this table.

[e] Acres

— = No information provided (reach was not assessed).

## Table 5-8. Total Maximum Daily Load Status of Streams in the Colfax Water Planning Region



| Waterbody Name [a] (basin, segment) | Assessment Unit ID | Affected Reach (miles [b]) | Probable Sources of Pollutant | Uses Not Fully Supported [c] | Specific Pollutant | IR Category [d] |
|---|---|---|---|---|---|---|
| Vermejo River<br>(York Canyon to headwaters) | NM-2305.A_230 | 25.09 | Source unknown<br>Rangeland grazing<br>Streambank modifications/destabilization | HQColdWAL | Benthic-macroinvertebrate bioassessments<br>Temperature water | 5/5C |
| York Canyon<br>(Vermejo River to headwaters) | NM-2306.A_153 | 11.1 | Source unknown<br>Abandoned mine lands | HQColdWAL | Specific conductance<br>Turbidity | 5/5C |

Source: NMED, 2014a

[a] Only waterbodies assigned to IR categories 3 and above are included.

[b] Unless otherwise noted.

[c]
ColdWAL = Coldwater aquatic life
DWS = Domestic water supply
HQColdWAL = High quality coldwater aquatic life
MCWAL = Marginal coldwater aquatic life
MWWAL = Marginal warmwater aquatic life
PC = Primary contact
WWAL = Warm water aquatic life

[d] Impairment (IR) category definitions are attached as the last page of this table.

[e] Acres

— = No information provided (reach was not assessed).

## Table 5-8. Total Maximum Daily Load Status of Streams in the Colfax Water Planning Region



[d] Impairment (IR) categories are determined for each assessment unit (AU) by combining individual designated use support decisions. The applicable unique assessment categories for New Mexico (NMED, 2013) are described as follows:

Category 3: No reliable monitored data and/or information to determine if any designated or existing use is attained. AUs are listed in this category where data to support an attainment determination for any use are not available, consistent with requirements of the assessment and listing methodology.

Category 3A: Limited data (n = 0 to 1) available, no exceedences. AUs are listed in this subcategory when there are no exceedences in the limited data set. These are considered low priority for follow up monitoring (NMED, 2013).

Category 4A: Impaired for one or more designated uses, but does not require development of a TMDL because TMDL has been completed. AUs are listed in this subcategory once all TMDL(s) have been developed and approved by USEPA that, when implemented, are expected to result in full attainment of the standard. Where more than one pollutant is associated with the impairment of an AU, the AU remains in IR Category 5A (see below) until all TMDLs for each pollutant have been completed and approved by USEPA.

Category 4C: Impaired for one or more designated uses but does not require development of a TMDL because impairment is not caused by a pollutant. AUs are listed in this subcategory if a pollutant does not cause the impairment. For example the U.S. Environmental Protection Agency (EPA) considers flow alteration to be “pollution” vs. a “pollutant.”

Category 5/5A: Impaired for one or more designated or existing uses and a TMDL is underway or scheduled. AUs are listed in this category if the AU is impaired for one or more designated uses by a pollutant. Where more than one pollutant is associated with the impairment of a single AU the AU remains in Category 5A until TMDLs for all pollutants have been completed and approved by U.S. EPA.

Category 5/5B: Impaired for one or more designated or existing uses and a review of the water quality standard will be conducted. AUs are listed in this category when it is possible that water quality standards are not being met because one or more current designated use is inappropriate. After a review of the water quality standard is conducted, a Use Attainability Analysis (UAA) will be developed and submitted to USEPA for consideration, or the AU will be moved to IR Category 5A and a TMDL will be scheduled.

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

Though groundwater use in the planning region is low (8 percent of the total use), it does supply many drinking water systems and wells for private domestic consumption, and thus groundwater quality is an important consideration in the region. Much of the groundwater in the region has naturally high concentrations of total dissolved solids and minerals. Additionally, although the high concentration of septic tanks in the Ute Park area is a potential water quality concern, little groundwater monitoring has taken place in that area.

Several types and sources of contaminants that have the potential to impact either surface or groundwater quality are discussed below. Sources of contamination are considered as one of two types: (1) point sources, if they originate from a single location, or (2) nonpoint sources, if they originate over a more widespread or unspecified location. Information on both types of sources is provided below.

### 5.4.1 Potential Sources of Contamination to Surface and Groundwater

Specific sources that have the potential to impact either surface or groundwater quality in the future are discussed below. These include municipal and industrial sources, leaking underground storage tanks, landfills, and nonpoint sources.

#### *5.4.1.1 Municipal and Industrial Sources*

As discussed in Section 4.2.2, a person or facility that discharges a pollutant from a point source to a surface water that is a water of the United States must obtain an NPDES permit. An NPDES permit must assure compliance with the New Mexico Water Quality Standards. A person or facility that discharges contaminants that may move into groundwater must obtain a groundwater discharge permit from the New Mexico Environment Department. A groundwater discharge permit ensures compliance with New Mexico groundwater quality standards. The NMWQCC regulations also require abatement of groundwater contamination that exceeds standards.

NPDES-permitted discharges in the planning region are summarized in Table 5-9 and shown on Figure 5-14; details regarding NPDES permits in New Mexico are available on the NMED's website (http://www.nmenv.state.nm.us/swqb/Permits/). The permitted discharges are primarily water and domestic wastewater treatment plants. There are also permitted discharges from two mining operations. As discussed in Section 6, these mines are not currently operating, but do maintain their discharge permits.

A summary list of current groundwater discharge permits in the planning region is provided in Table 5-10; their locations are shown in Figure 5-14. Details indicating the status, waste type, and treatment for discharge permits for industrial and domestic waste can be obtained from the NMED Ground Water Quality Bureau website (https://www.env.nm.gov/gwb/NMED-GWQB-PollutionPrevention.htm#PPSlist).

## Table 5-9. Municipal and Industrial NPDES Permittees in the Colfax Water Planning Region

| Permit No | Municipality/Industry [a] | Permit Type [b] |
|---|---|---|
| NM0030503 | Angel Fire, Village of / WWTP | Municipal (POTW) |
| NM0030180 | Chevron Mining Inc./Ancho Mine | Coal mine |
| NM0000205 | Chevron Mining Inc./York Canyon Mine | Coal mine |
| NM0031038 | Cimarron Village of WWTP | Municipal (POTW) |
| NM0029149 | Maxwell, Village of'/WWTP | Municipal (POTW) |
| NM0029891 | Raton Water Filtration Facility/Raton, City of | Utility |
| NM0020273 | Raton, City of/WWTP | Municipal (POTW) |
| NM0030627 | Springer, City of / WTP | Utility |
| NM0030295 | Springer, City of / WWTP | Municipal (POTW) |

Source: NMED, 2016c

[a] Names appear as listed in the NMED database.

[b] Facilities and activities covered under the 2015 U.S. EPA NPDES Multi-Sector General Permit (MSGP) for Stormwater Discharges Associated with Industrial Activity (e.g., mining, timber products, scrap recycling facilities, as listed in Appendix D of the MSGP [U.S. EPA, 2015]) are not included due to the large number of facilities.

NPDES = National Pollutant Discharge and Elimination System
WWTP = Wastewater treatment plant
POTW = Publicly owned treatment works
WTP = Water treatment plan

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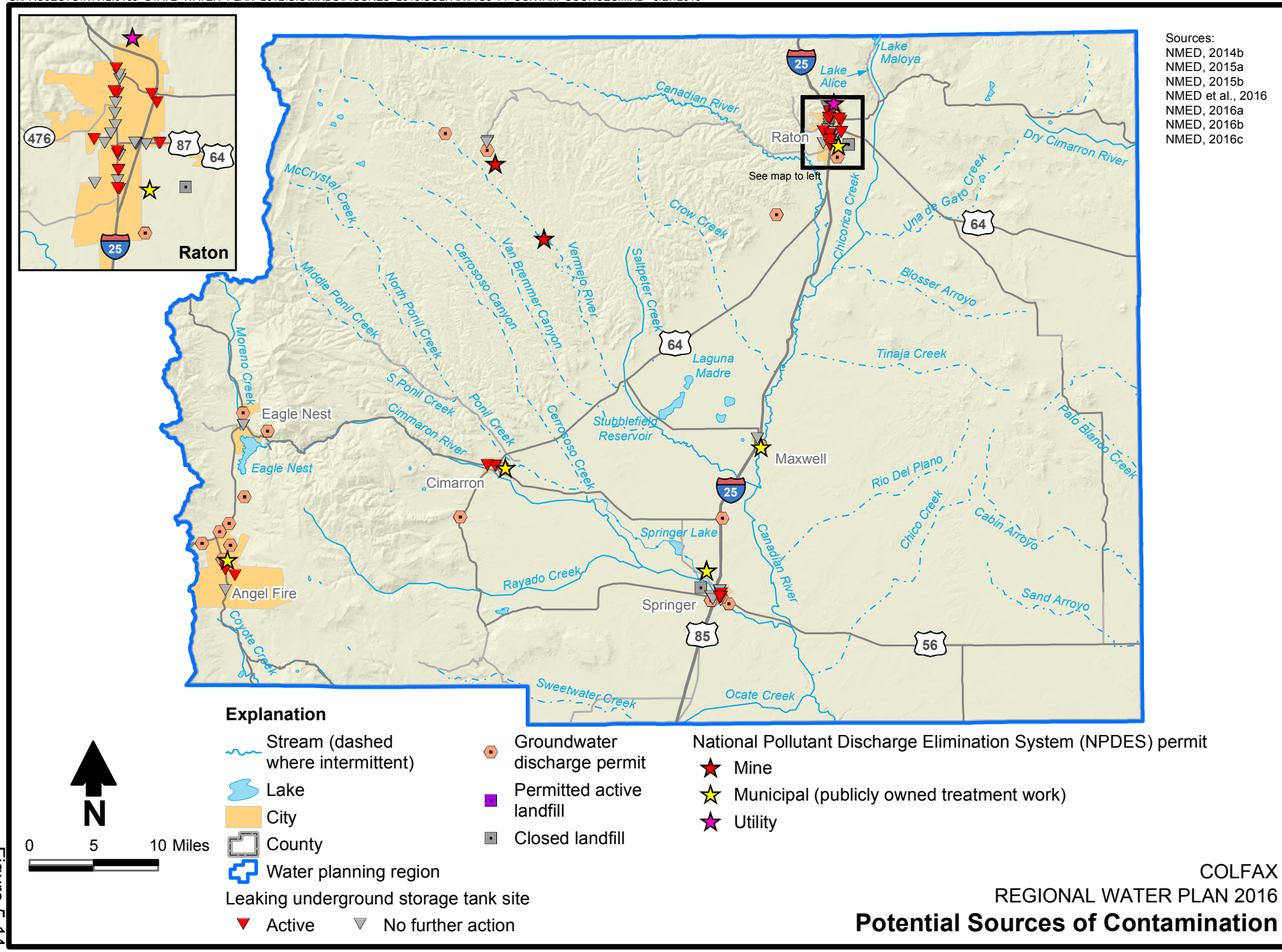


Figure 5-14

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**Potential Sources of Contamination**

## Table 5-10. Groundwater Discharge Permits in the Colfax Water Planning Region

| County | Facility Name [a] | Permit No. | Status [b] | Permitted Discharge Amount (gpd) |
|---|---|---|---|---|
| Colfax | Angel Fire (Village of) - Wastewater Treatment Plant | DP-156 | Active | 3,000,000 |
| | Angel Fire Mobile Home Estates | DP-128 | Active | 9,000 |
| | Angel Nest Apartments | DP-366 | Active | 6,000 |
| | Cimarron (Village of) - Wastewater Treatment Plant | DP-1252 | Active | 175,000 |
| | Eagle Nest (Village of) - Wastewater Treatment Facility | DP-1213 | Active | 91,000 |
| | Eagle Nest Reintegration Center | DP-1161 | Active | 4,027 |
| | Maxwell (Village of) - Wastewater Treatment Plant | DP-238 | Active | 22,000 |
| | Mr Gas 282 | DP-1807 | Active | 11,520 |
| | NRA Whittington Center | DP-1707 | Active | 55,000 |
| | Philmont Scout Ranch | DP-1831 | Active | 49,900 |
| | Raton (Town of) - Wastewater Treatment Plant | DP-254 | Active | 720,000 |
| | Russell's Truck and Travel Center | DP-1300 | Active | 6,000 |
| | Russell's Truck and Travel Center | DP-1171 | Active | 7,400 |
| | Springer (Town of) - Wastewater Treatment Plant | DP-1113 | Active | 300,000 |
| | Val Verde Trailer Court | DP-1586 | Active | 6,750 |
| | Vermejo Park Ranch | DP-261 | Active | 22,197 |

Source: NMED, 2014b, 2016b; NMED et al., 2016

gpd = Gallons per day

[a] Names appear as listed in the NMED database.

[b] Facilities with an NMED-designated status of active or pending are shown. Inactive facilities are not included; they can be identified on the NMED website.

#### *5.4.1.2 Remediation Sites*

No site in the planning region is listed on the National Priorities (Superfund) List under CERCLA (U.S. EPA, 2016b); thus Table 5-11 is not provided in this regional water plan update for Colfax County.

Sites undergoing investigation or cleanup pursuant to other federal authorities or state authority can be found on the EPA website (https://www.epa.gov/superfund/national-priorities-list-npl-sites-state#NM).

#### *5.4.1.3 Leaking Underground Storage Tanks*

Leaking underground storage tank (UST) sites present a potential threat to groundwater, and the NMED maintains a database of registered USTs. Many of the facilities included in the UST database are not leaking, and even leaking USTs may not necessarily have resulted in groundwater contamination or water supply well impacts. These USTs could, however, potentially impact groundwater quality in and near the population centers in the future. UST sites in the Colfax region are identified on Figure 5-14. Many of the UST sites listed in the NMED database require no further action and are not likely to pose a water quality threat. Sites that are being investigated or cleaned up by the state or a responsible party, as identified on Table 5-12, should be monitored for their potential impact on water resources. Additional details regarding any groundwater impacts and the status of site investigation and cleanup efforts for individual sites can be obtained from the NMED database, which is accessible on the NMED website (https://www.env.nm.gov/ust/lists.html).

#### *5.4.1.4 Landfills*

Landfills used for disposal of municipal and industrial solid waste often contain a variety of potential contaminants that may impact groundwater quality. Landfills operated since 1989 are regulated under the New Mexico Solid Waste Management Regulations. Many small landfills throughout New Mexico, including landfills in the planning region, closed before the 1989 regulatory enactment to avoid more stringent final closure requirements. Other landfills have closed as new solid waste regulations became effective in 1991 and 1995. Three closed landfills are present in the planning region (Table 5-13, Figure 5-14).

#### *5.4.1.5 Nonpoint Sources*

Contaminants from nonpoint sources that affect surface water quality in the planning region include turbidity, sediment and siltation, temperature, bacteria, nutrients, and mercury in fish tissue. Potential sources include grazing, agriculture, recreation, hydromodification, streambank destabilization/modification, removal of riparian vegetation, road and highway maintenance, silvicultural activities, land disposal, resource extraction, road runoff, septic tanks, and natural and unknown sources (Table 5-8).

## Table 5-12. Leaking Underground Storage Tank Sites in the Colfax Water Planning Region



| City [a] | Release/Facility Name [b,c] | Release ID | Facility ID | Physical Address [c] | Status [d] |
|---|---|---|---|---|---|
| Angel Fire | Angel Fire Mini Mart | 436 | 26605 | 3394 Mountain View Blvd | Aggr Cleanup Completed, Resp Party |
| | Angel Fire Resort Asts | 4077 | 53133 | 10 Miller Drive | Cleanup, Responsible Party |
| | Chevron Service Station 6191, Romeros Chevron | 389 | 1043 | Hwy 38 | Cleanup, Responsible Party |
| | Chevron AF | 866 | 1043 | Hwy 38 | Cleanup, Responsible Party |
| | Lowes Pay & Save #60 | 4643 | 30279 | Hwy 434 and Angel Fire Rd | Investigation, Responsible Party |
| | Ski Lift | 4373 | 26606 | 31 Ski Lift Drive | Cleanup, Responsible Party |
| Cimarron | Chevron #70704 | 3052 | 1044 | Hwy 58 US 64 Intersection | Cleanup, Responsible Party |
| | Crockett Don DBA, Kit Carson Texaco | 3512 | 27573 | 31029 Hwy 64 | Cleanup, Responsible Party |
| | Dave Heck DBA, Western Trails Texaco | 3053 | 27635 | Hwy 64 10th St | Cleanup, Responsible Party |
| | Russells One Stop | 25 | 30358 | Hwy 64 | Aggr Cleanup Completed, Resp Party |
| Eagle Nest | Golden Eagle RV Park | 1190 | 28352 | Hwy 64 | Investigation, Responsible Party |
| Maxwell | Maxwell Gulf | 578 | 1510 | Old Hwy 85 | Investigation, Responsible Party |
| Raton | Alta Convenience #6253 | 4722 | 28699 | 248 E 8th St | Pre-Investigation, Confirmed Release |
| | Pendleton 66 Truck Stop Raton | 4721 | 29908 | S Hwy 85 | Pre-Investigation, Confirmed Release |
| | Upholstery by Tony | 2615 | 54570 | 400 N. 2nd Street | Cleanup, State Lead with CAF |
| | Former Mobil Station | 2616 | 53741 | Unknown | Pre-Investigation, Suspected Release |

Source: NMED, 2014b, 2016a; NMED et al., 2016

[a] Determined according to latitude/longitude information in NMED database. In some cases this information was inconsistent with the facility address, and where such an inconsistency was identified, county and city were instead determined based on the facility address.

[b] Sites with No Further Action status (release considered mitigated) are not included. Information regarding such sites can be found on the NMED website (http://www.nmenv.state.nm.us/ust/lists.html

[c] Information appears as listed in the NMED database.

[d] Pre-Investigation, Suspected Release: Release not confirmed by definition
Pre-Investigation, Confirmed Release: Confirmed release as by definition
Investigation: Ongoing assessment of environmental impact
Cleanup: Physical removal of contamination ongoing
Aggressive Cleanup Completed (Aggr Cleanup Completed): Effective removal of contamination complete
Responsible Party (Resp Party): Owner/Operator responsible for mitigation of release
State Lead: State has assumed responsibility for mitigation of release
Federal Facility: Responsibility under the Federal Govt
CAF: Corrective action fund

## Table 5-12. Leaking Underground Storage Tank Sites in the Colfax Water Planning Region



| City [a] | Release/Facility Name [b,c] | Release ID | Facility ID | Physical Address [c] | Status [d] |
|---|---|---|---|---|---|
| Raton (cont.) | Cunico Tire | 4532 | 53741 | Unknown | Investigation, Responsible Party |
| | 87 Express B&W Auto/Truck Stop | 2006 | 943 | 931 Clayton Rd | Cleanup, Responsible Party |
| | Kolb Oil Co (A) | 4387 | 28980 | 200 Canyon Dr | Cleanup, Responsible Party |
| | La Mesa Gulf | 1604 | 1453 | 1550 S Second St | Cleanup, Responsible Party |
| | NMDOT Raton Patrol Yard 44 54, Nmshtd Raton | 747 | 29872 | PO Box 1333 | Cleanup, Responsible Party |
| | Pendleton 66 Truckstop | 3571 | 29908 | S Hwy 85 | Pre-Investigation, Confirmed Release |
| | Sav-O-Mat #9 | 1862 | 30490 | 745 S 2nd St | Cleanup, Responsible Party |
| | Taylor Food Mart | 4102 | 31022 | 236 S 2nd St | Cleanup, Responsible Party |
| | Value-Mat | 333 | 1982 | 713 S Second St | Cleanup, Responsible Party |
| Springer | Alta Convenience #6254 | 4723 | 31603 | 419 Colbert Ave | Pre-Investigation, Confirmed Release |
| | Angel Edmundo, Sky Chief Texaco | 1540 | 917 | 723 Maxwell Ave | Investigation, Responsible Party |
| | Hooter Browns Country Store | 4165 | 1413 | 323 Maxwell Ave | Cleanup, Responsible Party |
| | Lemat Distributing Wholesale | 2085 | 29080 | Maxwell Ave & 2nd St | Cleanup, Responsible Party |
| | Mr Gas 282 | 4439 | 29497 | 405 Cimarron Ave | Cleanup, Responsible Party |
| | Springer Auto Co | 1321 | 30735 | 824 Fourth St | Cleanup, Responsible Party |

Source: NMED, 2014b, 2016a; NMED et al., 2016

[a] Determined according to latitude/longitude information in NMED database. In some cases this information was inconsistent with the facility address, and where such an inconsistency was identified, county and city were instead determined based on the facility address.

[b] Sites with No Further Action status (release considered mitigated) are not included. Information regarding such sites can be found on the NMED website (http://www.nmenv.state.nm.us/ust/lists.html

[c] Information appears as listed in the NMED database.

[d] Pre-Investigation, Suspected Release: Release not confirmed by definition
Pre-Investigation, Confirmed Release: Confirmed release as by definition
Investigation: Ongoing assessment of environmental impact
Cleanup: Physical removal of contamination ongoing
Aggressive Cleanup Completed (Aggr Cleanup Completed): Effective removal of contamination complete
Responsible Party (Resp Party): Owner/Operator responsible for mitigation of release
State Lead: State has assumed responsibility for mitigation of release
Federal Facility: Responsibility under the Federal Govt
CAF: Corrective action fund

## Table 5-13. Landfills in the Colfax Water Planning Region

| County | Landfill Name [a] | Landfill Operating Status | Landfill Closure Date |
|---|---|---|---|
| Colfax | Maxwell Landfill | Closed | — |
| | Raton Municipal Landfill | Closed | 2015 [b] |
| | Springer Landfill | Closed | — |

Sources: NMED, 2014b, 2015a, 2015b; DBS&A, 2003

[a] Names appear as listed in the NMED database.

— = Information not available

[b] Closure plan submitted and approved, final closure construction greater than 80% completed. Final in 2015.

One approach to addressing nonpoint source pollution is through Watershed Based Planning or other watershed restoration initiatives that seek to restore riparian health and to address sources of contamination. NMED encourages cooperative planning efforts in watersheds where TMDLs (Section 4.2.2.1.1) are established (https://www.env.nm.gov/swqb/wps/WBP/index.html). In the Colfax region, the Cimarron Watershed Alliance prepared a Watershed Based Plan in 2012 to address sources and remedies for nonpoint source pollution. The Cimarron Watershed Alliance projects included:

- Reducing high instream temperatures by limiting livestock and wildlife access to riparian areas and re-planting riparian habitats
- Mitigating wildland fires through forest thinning and re-planting burned areas
- Reducing sediment transport through bank stabilization, in-stream, and low-water crossing remediation
- Restoring river channels and wetlands habitat
- Improving wastewater management
- Establishing alternative watering sources for wildlife and game
- Implementing conservation education programs

Water quality in the Sugarite watershed, which supplies the City of Raton, is monitored by the City. Water quality following the Track fire has been carefully monitored and has been adequate for intake into the drinking water treatment plant.

Because septic systems are generally spread out over rural areas, they are considered a nonpoint source. Collectively, septic tanks and other on-site domestic wastewater disposal systems constitute the single largest known source of groundwater contamination in New Mexico

(NMWQCC, 2002), with many of these occurrences in areas with shallow water tables. As noted previously, this is a particular concern in Ute Park, and it may be an issue in the Moreno Valley also.

## 5.5 Administrative Water Supply

The Handbook describes a common technical approach (referred to there as a *platform)* for analyzing the water supply in all 16 water planning regions in a consistent manner. As discussed in the Handbook (NMISC, 2013), many methods can be used to account for supply and demand, but some of the tools for implementing these analyses are available for only parts of New Mexico, and resources for developing them for all regions are not currently available. Therefore, the State has developed a simple method that can be used consistently across all regions to assess supply and demand for planning purposes. The use of this consistent method will facilitate efficient development of a statewide overview of the balance between supply and demand in both normal and drought conditions, so that the State can move forward with planning and funding water projects and programs that will address the regions' and State's pressing water issues.

The method to estimate the available supply, referred to as the *administrative water supply* in the Handbook, is based on withdrawals of water as reported in the *New Mexico Water Use by Categories 2010* report, which provide a measure of supply that considers both physical supply and legal restrictions (i.e., the water is physically available for withdrawal, and its use is in compliance with water rights policies) and thus reflects the amount of water available for use by a region. An estimate of supply during future droughts is also developed by adjusting the 2010 withdrawal data based on physical supplies available during historical droughts, as discussed in Section 5.5.2.

### 5.5.1 2010 Administrative Water Supply

The administrative water supply (i.e., total withdrawals) in 2010 for the Colfax region, as reported in the *New Mexico Water Use by Categories 2010* report (Longworth et al., 2013), was 60,573 acre-feet. Of this total, 55,549 acre-feet were surface water withdrawals and 5,024 acre-feet were groundwater. The breakdown of these withdrawals among the various categories of use detailed in *New Mexico Water Use by Categories 2010* report is discussed in Section 6.1.

### 5.5.2 Drought Supply

The variability in surface water supply from year to year is a better indicator of how vulnerable a planning region is to drought in any given year or multi-year period than is the use of long-term averages.. As discussed in Section 5.1.1, the PDSI is an indicator of whether drought conditions exist and if so, what the relative severity of those conditions is. For the two climate divisions

present in the Colfax region, the PDSI classifications for 2010 were near normal (Climate Division 2) and incipient wet spell (Division 3). Given that the water use data for 2010 represent a normal to slightly wet year, it cannot be assumed that this supply will be available in all years; it is important that the region also consider potential water supplies during drought periods.

There is no established method or single correct way of quantifying a drought supply given the complexity associated with varying levels of drought and constantly fluctuating water supplies. For purposes of having an estimate of drought supplies for regional and statewide water planning, the State has developed and applied a method for regions with both stream-connected and non-stream-connected aquifers. The method adopted for stream-connected aquifers is described below:

- The drought adjustment is applied only to the portion of the administrative water supply that derives from surface water, as it is assumed that groundwater supplies will be available during drought due to the relatively stable thicknesses of groundwater aquifers that are continuously recharged through their connection to streams. While individual wells may be depleted due to long-term drought, this drought adjustment does not include an evaluation of diminished groundwater supplies.

- The minimum annual yield for key stream gages on mainstem drainages (Table 5-4b) was compared to the 2010 yield, and the gage with the lowest ratio of minimum annual yield to 2010 yield was selected.

- The 2010 administrative surface water supply for the region was then multiplied by that lowest ratio to provide an estimate of the surface water supply adjusted for the maximum drought year of record.

For the Colfax region, the gage with the minimum ratio of annual yield to 2010 yield is the Canadian River at Taylor Springs with a ratio of 0.06 for minimum annual yield (1,557 acre-feet in 2012) to 2010 yield (27,148.8 acre-feet). Based on the region's total administrative surface water supply of 55,549 acre-feet (Section 5.5.1), the drought-adjusted surface water supply is 3,333 acre-feet. With the 5,024 acre-feet of groundwater supply, the total drought supply is 8,357 acre-feet, or about 14 percent of a normal year administrative water supply.

Though the adjustment is based on the minimum year of streamflow recorded to date, it is possible that drought supplies could be even lower in the future. Additionally, water supplies downstream of reservoirs may be mitigated by reservoir releases in early drought phases, while longer-term droughts can potentially have greater consequences. This approach does not evaluate mitigating influences of reservoir storage in early phases of a drought when storage is available or potential development of new groundwater supplies. Nonetheless, the adjusted drought supply provides a rough estimate of what may be available during a severe to extreme drought year.

# 6. Water Demand

To effectively plan for meeting future water resource needs, it is important to understand current use trends as well as future changes that may be anticipated. This section includes a summary of current water use by category (Section 6.1), an evaluation of population and economic trends and projections of future population (Sections 6.2 and 6.3), a discussion of the approach used to incorporate water conservation in projecting future demand (Section 6.4), and projections of future water demand (Section 6.5).

Four terms frequently used when discussing water throughout this plan have specific definitions related to this RWP:

- *Water use* is water withdrawn from a surface or groundwater source for a specific use. In New Mexico water is accounted for as one of the nine categories of use in the *New Mexico Water Use by Categories 2010* report prepared by the New Mexico Office of the State Engineer (NMOSE).
- *Water withdrawal* is water diverted or removed from a surface or groundwater source for use.
- *Administrative water supply* is the amount of water withdrawals in 2010 as outlined in the *New Mexico Water Use by Categories 2010* report.
- *Water demand* is the amount of water needed at a specified time.

## 6.1 Present Uses

The most recent assessment of water use in the region was compiled by NMOSE for 2010, as discussed in Section 5.5. The *New Mexico Water Use by Categories 2010* report (Longworth et al., 2013) provides information on total withdrawals for nine categories of water use:

- Public water supply
- Domestic (self-supplied)
- Irrigated agriculture
- Livestock (self-supplied)
- Commercial (self-supplied)
- Industrial (self-supplied)
- Mining (self-supplied)
- Power (self-supplied)
- Reservoir evaporation

The total surface water and groundwater withdrawals in Colfax County for each category of use are shown on Table 6-1 and Figure 6-1.

## Table 6-1. Total Withdrawals in the Colfax Water Planning Region in 2010

| Water Use Category | Withdrawals (acre-feet) [a] | | |
|---|---|---|---|
| | Surface Water | Groundwater | Total |
| Commercial (self-supplied) | 124 | 134 | 258 |
| Domestic (self-supplied) | 0 | 56 | 56 |
| Industrial (self-supplied) | 0 | 49 | 49 |
| Irrigated agriculture | 46,091 | 3,712 | 49,803 |
| Livestock (self-supplied) | 199 | 219 | 418 |
| Mining (self-supplied) | 308 | 0 | 308 |
| Power (self-supplied) | 0 | 0 | 0 |
| Public water supply | 2,103 | 853 | 2,956 |
| Reservoir evaporation | 6,725 | 0 | 6,725 |
| Total | 55,549 | 5,024 | 60,573 |

Source: Longworth et al., 2013

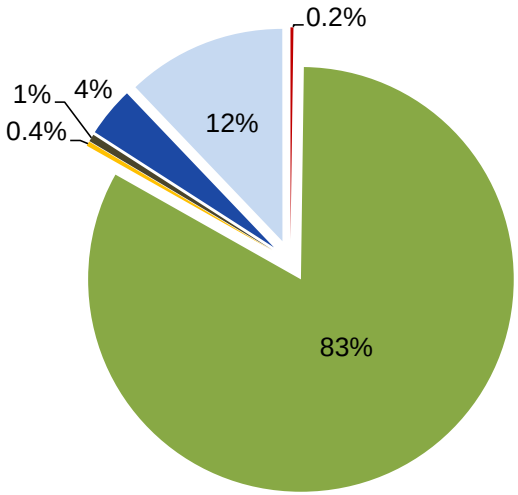
[a] Tribes and pueblos in New Mexico are not required to provide water use data to the State. Therefore, tribal water use data are not necessarily reflected in this table.

The predominant water use in 2010 in the Colfax region was for irrigated agriculture, with the vast majority of agriculture being supplied with surface water. The second largest category of surface water use is reservoir evaporation, followed by public water supply.

The largest category of groundwater use is irrigated agriculture, followed by public water supply. Groundwater points of diversion are shown in Figure 6-2.

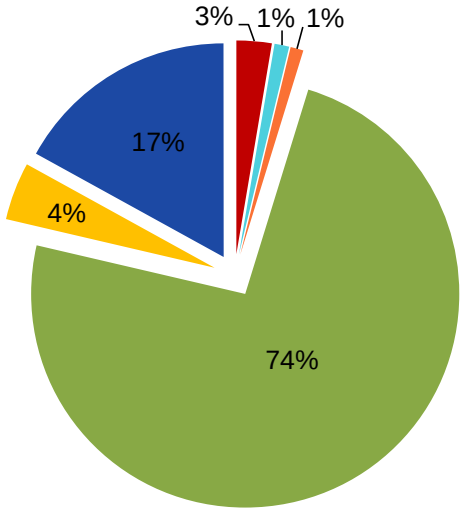
The categories included in the *New Mexico Water Use by Categories 2010* report and shown on Figure 6-1 and Table 6-1 represent the total withdrawals in the planning region. Tribes and Pueblos in New Mexico are not required to provide water use data to the State; therefore, tribal water use data are not necessarily reflected in this plan. There are also some unquantified additional categories of water use, including riparian evapotranspiration, instream flow, and produced water.

## Surface Water



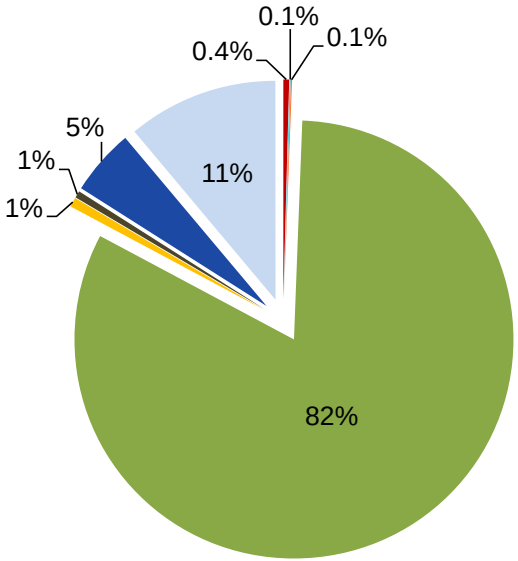

Total usage: 55,549 acre-feet

## Groundwater




Total usage: 5,024 acre-feet

## Total




Total usage: 60,573 acre-feet

**Explanation**

- Commercial (self-supplied)
- Domestic (self-supplied)
- Industrial (self-supplied)
- Irrigated agriculture
- Livestock (self-supplied)
- Mining (self-supplied)
- Power (self-supplied)
- Public water supply
- Reservoir evaporation

**Source:** Longworth et al., 2013

**Notes:**
1. Only categories with usage above 0.1% are shown.
2. Tribes and pueblos in New Mexico are not required to provide water use data to the State. Therefore, tribal water use data are not necessarily reflected in this figure.

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**Total Regional Water Demand, 2010**

Figure 6-1

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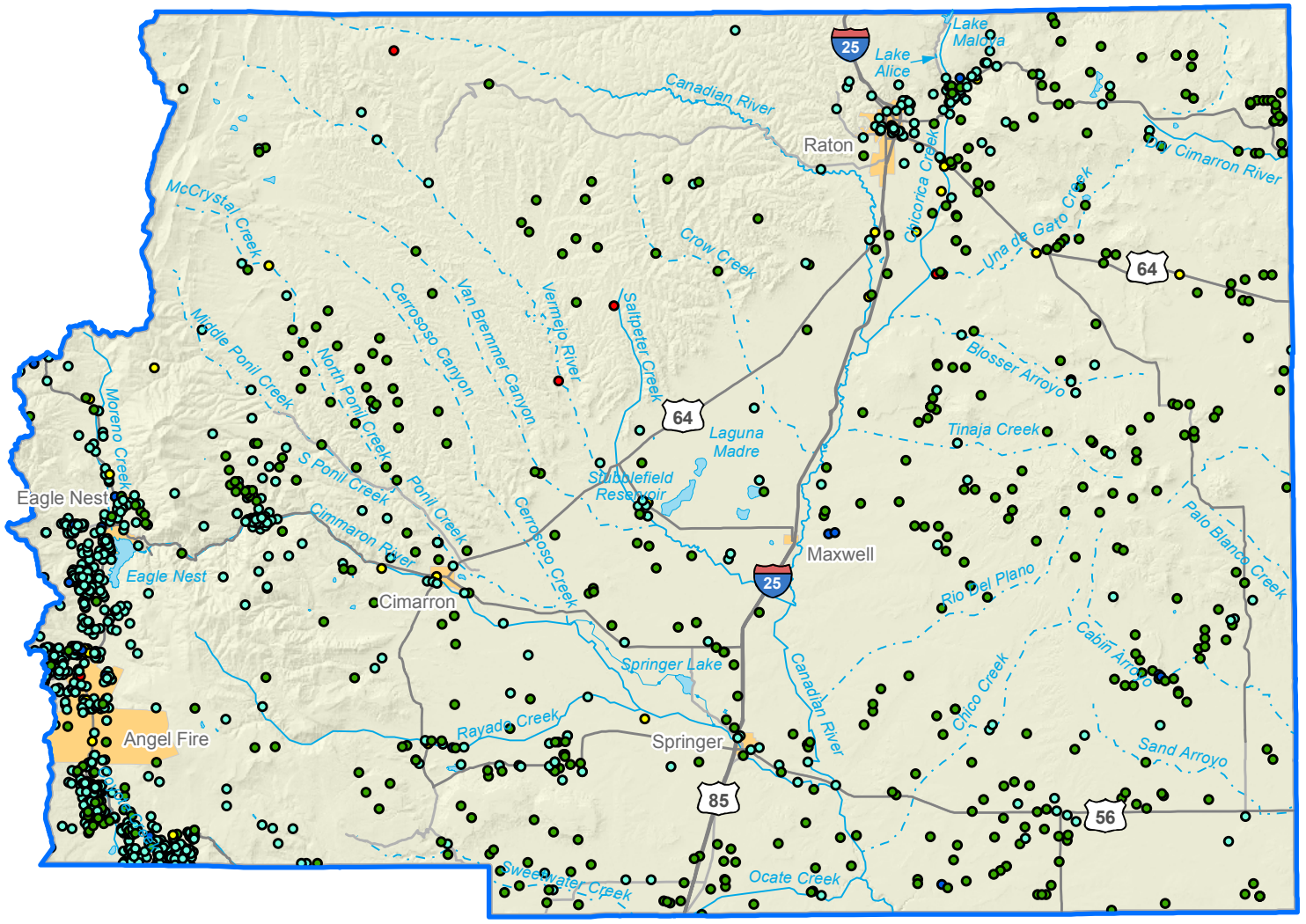


N

0 5 10 Miles

**Explanation**

- Stream (dashed where intermittent)
- Lake
- City
- County
- Water planning region

Well (use)

- Agriculture/irrigation
- Commercial/industrial/recreation
- Domestic
- Mining/oil/gas
- Public water supply

Source: NMOSE, 2014d

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REGIONAL WATER PLAN 2016

**Groundwater Points of Diversion**

Figure 6-2

- *Riparian evapotranspiration:* Some research and estimates have been made for riparian evapotranspiration in selected areas, such as along the middle and lower Rio Grande (Thibault and Dahm, 2011; Coonrod and McDonnell, Undated; Bawazir et al., 2009), but riparian evapotranspiration has not been quantified statewide. The New Mexico Water Resources Research Institute is currently developing those estimates but the results are not yet available. Though riparian evapotranspiration is anticipated to consume a relatively large quantity of water statewide, it will not affect the calculation of the gap between supply and demand using the methods in this report, because the gap reflects the difference between future anticipated demands and present uses, and if both present and future uses do not include the riparian evapotranspiration category, then the difference will not be affected. The only impact to the gap calculation would be if evapotranspiration significantly changes in the future. There is potential for such a change due to warming temperatures, but anticipated changes have not been quantified and would be subject to considerable uncertainty. Anticipated changes in riparian and stream evapotranspiration are areas that should be considered in future regional and state water plan updates.

- *Instream flow:* The analysis of the gap between supply and demand relies on the largest use categories that reflect withdrawals for human use or reservoir storage that allows for withdrawals downstream upon release of the stored water. It is recognized that there is also value in preserving instream water for ecosystem and habitat and tourism purposes. Though this value has not been quantified in the supply/demand gap calculation, it may still be an important use in the region, and if the region chooses, it may recommend instream flow protections in its policy, program, and project recommendations.

- *Produced water*: There is significant oil and gas development in the region and produced water for oil and gas development is not included in the *New Mexico Water Use by Categories 2010* report. Produced water is generally high in total dissolved solids and is withdrawn from formations that are deeper than those that supply groundwater as part of the oil and gas extraction process. Approximately 8 to 10 barrels of water are produced for every barrel of oil produced (Otton, 2006). The produced water is generally treated and re-injected or discharged to the surface. Since this water is not applied to beneficial use, it is not considered as part of the administrative water supply.

In addition to the special conditions listed above, the data provided in the *New Mexico Water Use by Categories 2010* report are available for withdrawals only; depletions have not been quantified. In many cases, some portion of diverted water returns to surface or groundwater, for example from agricultural runoff or seepage or discharge from a wastewater treatment plant. In those locations where there is such return flow, the use of withdrawal data for planning purposes will add a margin of safety; thus the use of withdrawal data is a conservative approach for planning purposes.

## 6.2 Demographic and Economic Trends

To project future water demand in the region, it is important to first understand demographics, including population growth and economic and land use trends as detailed below. This information was used to project population, economic growth, and future water demand, as presented in Sections 6.3 and 6.5. The information provided in this section was obtained primarily from telephone interviews with government officials and other parties with knowledge of demographic and economic trends; the list of interviewees is provided in Appendix 6-A.

The population of Colfax County has fluctuated greatly over time. Population declined from a peak of 21,550 in 1920 to a low of 12,170 in 1970, before increasing to 14,189 in 2000. Since 2000, population has been declining, to 13,750 in 2010, a decline of 3.1 percent from 2000 to 2010, and to 13,094 in 2013 (U.S. Census Bureau, 2014a), a decline of 4.5 percent from 2010 to 2013. The reported population does not include part-time residents of Angel Fire who maintain primary residences in other locations.

The economy of Colfax County has traditionally been driven by agriculture, tourism, and coal mining, although the Pittsburg & Midway mine has been closed. The largest employment categories are education/healthcare, tourism-related services (arts, entertainment, recreation, hospitality, food services), retail trade, and public administration. However, agriculture is the largest water user in the region.

Representatives of the public and private sectors concur that the recovery from the recession has been slow, and that no major increases in economic activity are anticipated in the foreseeable future. Wage and salary employment has generally decreased since 2003 and stood at 5,979 in 2013. The economy of the county can be divided into the eastern portion, including Raton, and the western portion, including Angel Fire.

- Raton is a commercial center on I-25 that has been losing population and school enrollment since the recession, as well as several major employers (e.g., the S M Stoller Corporation). Tourism has declined, the proposed racetrack is currently not operating, and the Amtrak line, which is important to the community and the Philmont Scout Ranch, could be shut down permanently.

- Angel Fire is a resort community that includes a ski area. A majority of the homes are seasonally occupied by owners of second homes and visitors. The real estate market has taken a major hit since the recession. Whereas 429 lots with utilities were sold in Angel Fire in 2006, this figure dropped to 23 lots in 2012 and 33 lots in 2013. The average list price for such lots has dropped from $71,436 in January 2009 to $41,075 in April 2014. The number of condominiums sold dropped from a peak of 121 in 2005 to 36 in 2013, with the average sales price declining from a peak of $158,403 in 2008 to $112,812 in 2013. Housing units constructed dropped from a peak of 111 units in 2004 to 56 units in

2013. School enrollment in the western portion of the county (in Cimarron, Eagle Nest, and Angel Fire) has been steadily declining from a peak of 705 in 1996-97 to less than 600 in every school year since 2001-02.

The Arrowhead Center at New Mexico State University (NMSU) analyzed the economy of Colfax County and identified the basic industries that support the economy (Arrowhead Center, 2013). Basic industries bring outside dollars into the economy. A basic industry frequently has a location quotient (LQ) greater than 1.0, which means that its relative share of the local economy is greater than that industry's relative share of the state economy. In Colfax County, the primary basic industries in 2011 were accommodations and food services (LQ of 1.97), agriculture (LQ of 2.24), and other services (LQ of 2.01). Other services reflect the impact of the many outdoor recreational areas located within the county, including Angel Fire Resorts and the Philmont Boy Scout Ranch, and their importance to the local economy. Mining, which had had a LQ of 0.51 in 2007, has subsequently declined with the loss of the coal mine (Arrowhead Center, 2013). Agriculture now accounts for less than 6 percent of all employment within the county.

According to the Census of Agriculture, the most valuable agricultural commodities in Colfax County are cattle and calves and other livestock (USDA NASS, 2014). Aside from ranching, farming is largely limited to growing alfalfa and grasses.

The number of farms and ranches decreased by 4 percent, from 302 in 2007 to 290 in 2012, and the amount of land in farms and ranches declined by 8.8 percent. Also, during that same five-year period, irrigated acreage declined by 51 percent, from 21,091 acres to 10,328 acres. Some of the fields that were irrigated are no longer in use, for example in the Antelope Valley Irrigation District. In 2012, farmers participating in governmental agricultural support programs received an average of $13,706, up 245 percent from 2007 with a total of $918,000 in government payments going to farmers in Colfax County. The average farm had a net cash operating loss of $37,468.

Recent drought had a significant impact on cattle herds in Colfax County. Because so little hay was available, the supply was limited and very expensive, and the rangeland was not producing much grass. Therefore ranchers have sold off a large portion of their herds. It is estimated by the local rancher that herds are down 75 percent from their peak level during the 1995-2005 period. The difficult ranching conditions have discouraged people in their twenties and thirties from pursuing this livelihood, and some are leaving Colfax County to pursue employment elsewhere. The average age of a farmer in 2012 was 62.7. The school-age population has been declining for the past few years as persons of childbearing age leave the county.

## 6.3 Projected Population Growth

The population projections for the 2003 Regional Water Plan (DBS&A, 2003) encompassed two forecasts, a high and a low, each covering the period from 2000 through 2040. The Bureau of Business and Economic Research (BBER) at the University of New Mexico (UNM) prepared county-level population forecasts using data and historical trends from 1960 up to the 2000 Census. BBER projections formed a basis for the forecasts in the water plan, as adjusted by information from community representatives.

Since 2002, drought, the national recession that started in 2007, and the closing of the coal mine have resulted in population growth that was slower than anticipated. Given these changes, the 2002 water plan high and low growth scenarios were each too optimistic (Table 6-2). The BBER has continued to revise its population projections downward during the past 12 years to reflect slower growth than originally anticipated (BBER, 2012, 2008).

### Table 6-2. Comparison of Projected and Actual 2010 Population

| County | 2003 Regional Water Plan Projected Population [a] | | Actual Population 2010 U.S. Census [b] |
|---|---|---|---|
| | High | Low | |
| Colfax | 19,189 | 15,397 | 13,750 |
| Total Region | 19,189 | 15,397 | 13,750 |

[a] DBS&A, 2003

[b] U.S. Census Bureau, 2014a

There was a virtual consensus among those interviewed that growth, if it occurs at all, will be slow over the next decade. No major changes are foreseen by two of the major employers, Vermejo Park and the Philmont Scout Ranch. Vermejo Park currently hosts about 250 trophy hunters and 3,000 fishermen per year, a figure that is not expected to change significantly over the next 20 to 30 years. The Philmont Ranch hosts about 23,000 back country campers in the summer, with another 5,000 at the training center. While these numbers are not expected to change, the annual number of off-season scouts could increase from 4,000 to 8,000 over the next 5 years. On the other hand, if Amtrak service to Raton is lost, that could have a detrimental effect on the number of scouts in attendance.

A few positive developments include a new Veterans Administration clinic, expansion of the hospital and, a new tractor supply outlet. The Greater Raton Economic Development Corporation (also known as Grow Raton!) is currently working on an economic development plan. Some initiatives that could bear fruit include developing an artist community and promoting high tech industry to take advantage of good internet access. Some potential concerns

besides the potential loss of Amtrak service include the potential for a catastrophic wildfire and the possible need for water rationing.

Based on these expected trends, two forecasts of population through 2060 were developed: one based on a moderately optimistic view of the economy for this region over the long term and one that portrays a more pessimistic picture (Table 6-3). The current (2012) BBER population projections through 2040 (Appendix 6-B) were used as a starting point for the population projection, extrapolated through 2060. In the low forecast, the BBER growth rates were deemed to be too optimistic and were dampened for the 2010 to 2020 period to take into account the actual slower rate of growth that has occurred since 2010, compared to the forecast for 2020; therefore, the rate of growth was decreased to show a greater population decline than that projected by the BBER. Under the low forecast, county population will decline to 9,257 in 2060.

### Table 6-3. Colfax Water Planning Region Population Projections July 1, 2010 to July 1, 2060

### a. Annual Growth Rate

| County | Projection | Growth Rate (%) | | | | |
|---|---|---|---|---|---|---|
| | | 2010-2020 | 2020-2030 | 2030-2040 | 2040-2050 | 2050-2060 |
| Colfax | High | –0.49 | 0.00 | 0.00 | 0.00 | 0.00 |
| | Low | –1.00 | –0.73 | –0.73 | –0.73 | –0.73 |

### b. Projected Population

| County | Projection | Population | | | | | |
|---|---|---|---|---|---|---|---|
| | | 2010 | 2020 | 2030 | 2040 | 2050 | 2060 |
| Colfax | High | 13,750 | 13,094 | 13,094 | 13,094 | 13,094 | 13,094 |
| | Low | 13,750 | 12,375 | 11,509 | 10,703 | 9,954 | 9,257 |

Source: Poster Enterprises, 2014

The high population projections are more optimistic (and exceed the BBER forecast), assuming a full recovery from the recession and drought and an eventual return of coal mining and/or an equivalent amount (in terms of water use) of oil and gas drilling. Under the high forecast, the population of the county will remain at the current (2013) level of 13,094 through 2060 (Table 6-3).

## 6.4 Water Conservation

Water conservation is often a cost-effective and easily implementable measure that a region may use to help balance supplies with demands. The State of New Mexico is committed to water conservation programs that encourage wise use of limited water resources. In support of that commitment, the Water Use and Conservation Bureau of the NMOSE developed the *New Mexico Water Conservation Planning Guide for Public Water Suppliers*. When evaluating water rights transfers or 40-year water development plans that hold water rights for future use, the NMOSE considers whether adequate conservation measures are in place. However, the 40 year water development plans are not incorporated into the RWP updates as the resources needed to complete this work are not currently available. It is therefore important when planning for meeting future water demand to consider the potential for conservation.

To develop demand projections for the region, some simplifying assumptions regarding conservation have been made. These assumptions were made only for the purpose of developing an overview of the future supply-demand balance in the region and are not intended to guide policy regarding conservation for individual water users. The approach to considering conservation in each category of water use for developing water demand projections is discussed below. Specific recommendations for conservation programs and policies for the Colfax region, as identified by the regional steering committee, are provided in Section 8.

*Public water supply.* Public water suppliers that have large per capita usage have a greater potential for conservation than those that are already using water more efficiently. Through a cooperative effort with seven public water suppliers, the NMOSE developed a GPCD (gallons per capita per day) calculation to be used statewide, thereby standardizing the methods for calculating populations, defining categories of use, and analyzing use within these categories. The GPCD calculator was used to arrive at the per capita uses for public water systems in the region, shown in Table 6-4. These rates are provided to assist the regional steering committee in considering specific conservation measures.

The system-wide per capita usage for each water supplier includes uses such as golf courses, parks, and commercial enterprises that are supplied by the system. Hence there can be large variability among the systems. For purposes of developing projections, a county-wide per capita rate was calculated as the total public supply use in the county divided by the total county population (or portion of the county within the region), excluding those served by domestic wells. For future projections (Section 6.5), a consistent method is being used statewide that assumes that conservation would reduce future per capita use in each county by the following amounts:

## Table 6-4. 2010 Water Withdrawals for Drinking Water Supply Systems and Rural Self-Supplied Homes

| OSE Declared Groundwater Basin(s) [a] | Water Supplier [b] | Population | Per Capita Use (gpcd) | Withdrawals (acre-feet) | |
|---|---|---|---|---|---|
| | | | | Surface Water | Groundwater |
| ***Colfax County*** | | | | | |
| Canadian River | Angel Fire MHE | 43 | 52 | 0 | 2 |
| | Angel Fire Services Corporation | 2,382 | 218 | 0 | 732 |
| | Angel Nest Apartments | 57 | 22 | 0 | 1 |
| | Cimarron Water System (Canadian) | 874 | 103 | 101 | 0 |
| | Eagle Nest, Village of | 291 | 151 | 0 | 49 |
| | Maxwell Cooperative Water | 314 | 143 | 0 | 50 |
| | Maxwell Water System (Canadian) | 361 | 91 | 37 | 0 |
| | Miami WUA (Canadian) | 107 | 64 | 8 | 0 |
| | Raton Water Works (Canadian) | 7,310 | 178 | 1,460 | 0 |
| | Springer Water System (Canadian) [c] | 1,140 [c] | 389 [c] | 497 [c] | 0 |
| | Val Verde 2 Water Association | 75 | 80 | 0 | 7 |
| | Val Verde 5 Property Owners Association | 100 | 80 | 0 | 9 |
| | Valverde Water Association [d] | 73 | 24 | 0 | 2 |
| *Colfax County public water supply totals* | | *13,126* | | *2,103* | *853* |
| *County-wide public water supply per capita use [e]* | | | *201* | | |
| Canadian River<br>Clayton<br>Tucumcari | Rural self-supplied homes (Canadian) | 624 | 80 | 0 | 56 |
| *Colfax County domestic self-supplied totals* | | *624* | | *0* | *56* |
| *County-wide domestic self-supplied per capita use [e]* | | | *80* | | |

Source: Longworth et al., 2013, unless otherwise noted.

gpcd = Gallons per capita per day

[a] Determined based on NMED Drinking Water Bureau water supply source locations (NMOSE water use database doesn't distinguish groundwater basin).

[b] For systems supplied by surface water withdrawals, the river basin is provided in parentheses. Rural self-supplied homes are located in the river basin specified in parentheses.

[c] The Springer Water System supplies water to 40 homes in Springer Tract, 25 homes outside of the city limits, and 300 inmates at the Springer Correctional Facility; this population was not included in the 2010 water use report. The withdrawal reported by Longworth et al. was based on metered inflow prior to Springer Lake; actual withdrawal for the system was 223 acre-feet. Taking into account the estimated additional population (444 people) and revised withdrawal reduces the per capita use to 126 gpcd.

[d] Groundwater basin assumed based on geographic location of water supplier.

[e] County-wide per capita use, calculated as the total population divided by total withdrawals.

- For current average per capita use greater than 300 gpcd, assume a reduction in future per capita use to 180 gpcd.
- For current average per capita use between 200 and 300 gpcd, assume a reduction in future per capita use to 150 gpcd.
- For current average per capita use between 130 and 200 gpcd, assume a reduction in future per capita use to 130 gpcd.
- For current average per capita use less than 130 gpcd, no reduction in future per capita use is assumed.

For the Colfax region, current per capita use in Colfax County is just under 201 gpcd (Table 6-4), so the future per capita use is assumed to be reduced to 150 gpcd. In the projections, these reductions are phased in over time.

*Self-supplied domestic.* Homeowners with private wells can achieve water savings through household conservation measures. These wells are not metered, and current water use estimates were developed based on a relatively low per capita use assumption (Table 6-4; Longworth et al., 2013). Therefore, no additional conservation savings were assumed in developing the water demand projections. For purposes of developing projections, a county-wide per capita rate was calculated as the total self-supplied domestic use in the county divided by the total county population (or portion of the county within the region), excluding those served by a public water system.

*Irrigated agriculture.* As the largest water use in the region, conservation in this sector may be beneficial. However, when considering the potential for improved efficiency in agricultural irrigation systems, it is important to consider how potential conservation measures may affect the region's water supply.

Withdrawals in both surface and groundwater irrigation systems include both consumptive and non-consumptive uses and incidental losses:

- Consumptive use occurs when water is permanently removed from the system due to crop evapotranspiration (i.e., evaporation and transpiration). Evapotranspiration is determined by factors that include crop and soil type, climate and growing season, on-farm management, and irrigation practices.
- Non-consumptive use occurs when water is temporarily removed from the stream system for conveyance requirements and is returned to the surface or groundwater system from which it was withdrawn.

- Incidental losses from irrigation are irrecoverable losses due to seepage and evapotranspiration during conveyance that are not directly attributable to crop consumptive use.
    - Seepage losses occur when water leaks through the conveyance channel or below the root zone after application to the field and is either lost to the atmosphere or remains bound in the soil column.
    - Evapotranspiration occurs as a result of (1) evaporation during water conveyance in canals or with some irrigation methods (e.g., flood, spray irrigation) and (2) transpiration by ditch-side vegetation.

Some agricultural water use efficiency improvements (commonly referred to as agricultural water conservation) reduce the amount of water diverted, but may not reduce depletions or may even have the effect of increasing consumptive use per acre on farms (Brinegar and Ward, 2009; Ward and Pulido-Velazquez, 2008). These efforts can result in economic benefits, such as increased crop yield, but may have the adverse effect of reducing return flows and therefore downstream water supply. For example, methods such as canal lining or piping may result in reduction of seepage losses associated with conveyance, but that seepage will no longer provide return flow to other users. In portions of Colfax County, where geologic formations are relatively poor transmitters of water, there may be a benefit to ditch lining without affecting return flows to other users. Other techniques such as drip irrigation and center pivots may reduce the amount of water diverted, but if the water saved from such reductions is applied to on-farm crop demands, water supplies for downstream uses will be reduced.

Due to the complexities in agricultural irrigation efficiency, no quantitative estimates of savings are included in the projections. However, the regions are encouraged to explore strategies for agricultural conservation, especially those that result in consumptive use savings through changes in crop type or fallowing of land while concentrating limited supplies for greater economic value on smaller parcels. Section 8 outlines strategies developed by the Colfax steering committee to achieve savings in agricultural water use within the region.

*Self-supplied commercial, industrial, livestock, mining, and power*. Conservation programs can be applicable to these sectors, but since uses are expected to be zero to very low in these categories within the region, no additional conservation savings are assumed in the water demand projections.

*Reservoir evaporation*. In many parts of New Mexico, reservoir evaporation is one of the highest consumptive water uses, and in the Colfax region it is the second highest water use. To reduce usage in this category, some areas outside of the region have considered aquifer storage and recovery to replace some reservoir storage, and it may also be possible in some circumstances to gain some reduction in evaporation by storing more water at higher elevations

or constructing deeper reservoirs with less surface area for evaporation. However, due to the legal, financial, and other complexities of implementing these techniques, no conservation savings are assumed in developing the reservoir evaporation demand projections for this region.

## 6.5 Projections of Future Water Demand for the Planning Horizon

To develop projections of future water demand a consistent method was used statewide. Section 6.5.1 provides a comprehensive discussion of the methods applied consistently throughout the state to project water demand in all the categories reported in the *New Mexico Water Use by Categories* reports, and some of the categories may not be applicable to the Colfax region. The projections of future water demand determined using this consistent method, as applicable, for the Colfax region are discussed in Section 6.5.2.

### 6.5.1 Water Demand Projection Methods

The Handbook provides the time frame for the projections; that is, they should begin with 2010 data and be developed in 10-year increments (2020, 2030, 2040, 2050, and 2060). Projections will be for withdrawals in each of the nine categories included in the *New Mexico Water Use by Categories 2010* report (Longworth et al., 2013) and listed in Section 6.1.

To assist in bracketing the uncertainty of the projections, low- and high-water demand estimates were developed for each category in which growth is anticipated, based on demographic and economic trends (Section 6.2) and population projections (Section 6.3), unless otherwise noted. The projected growth in population and economic trends will affect water demand in eight of the nine water use categories; the reservoir evaporation water use category is not driven by these factors.

The 2010 administrative water supply (Section 5.5.1) was used as a base supply from which water demand was projected forward. As discussed in Section 5.5, the administrative water supply is based on withdrawals of water as reported in the *New Mexico Water Use by Categories 2010* report, which provide a measure of supply that considers both physical supply and legal restrictions (i.e., the water is physically available for withdrawal, and its use is in compliance with water rights policies) and thus reflects the amount of water available for use by a region.

The assumptions and methods used statewide to develop the demand projections for each water use category follow. Not all of these categories are applicable to every planning region. The specific methods applied in the Colfax region are discussed in Section 6.5.2.

*Public water supply* includes community water systems that rely on surface water and groundwater diversions other than from domestic wells permitted under 72-12-1.1 NMSA 1978 and that consist of common collection, treatment, storage, and distribution facilities operated for the delivery of water to multiple service connections. This definition includes municipalities

(which may serve residential, commercial, and industrial water users), mutual domestic water user associations, prisons, residential and mixed-use subdivisions, and mobile home parks.

For regions with anticipated population increases, the increase in projected population (high and low) was multiplied by the per capita use from the *New Mexico Water Use by Categories 2010* report (Longworth et al., 2013) (reduced for conservation as specified above), times the portion of the population that was publicly supplied in 2010 (calculated from Longworth et al., 2013); the resulting value was then added to the 2010 public water supply withdrawal amount. Current surface water withdrawals were not allowed to increase above the 2010 withdrawal amount unless there is a new source of available supply (i.e., water project or settlement). Both the high and low projections incorporated conservation for counties with per capita use above 130 gpcd, as discussed in Section 6.4, on the assumption that some of the new demand would be met through reduction of per capita use.

For planning purposes, in counties where a decline in population is anticipated (in either the high or low scenario or both), as a conservative approach it was assumed that public water supply would remain constant at 2010 withdrawal levels based on the 2010 administrative water supply (the water is physically available for withdrawal, and its use is in compliance with water rights policies). Likewise, in regions where the population growth is initially positive but later shows a decline, the water demand projection was kept at the higher rate for the remainder of the planning period.

The *domestic (self-supplied)* category includes self-supplied residences with well permits issued by the NMOSE under 72-12-1.1 NMSA 1978 (Longworth et al., 2013). Such residences may be single-family or multi-family dwellings. High and low projections were calculated as the 2010 domestic withdrawal amount plus a value determined by multiplying the projected change in population (high and low) times the domestic self-supplied per capita use from the *New Mexico Water Use by Categories 2010* report (Longworth et al., 2013) times the calculated proportion of the population that was self-supplied in 2010 (calculated from Longworth et al., 2013). In counties where the high and/or low projected growth rate is negative, the projection was set equal to the 2010 domestic withdrawal amount. This allows for continuing use of existing domestic wells, which is anticipated, even when there are population declines in a county. In regions where the population growth is initially positive but later shows a decline, the water demand projection was kept at the higher level for the remainder of the planning period, based on the assumption that domestic wells will continue to be used even if there are later population declines.

The *irrigated agriculture* category includes all withdrawals of water for the irrigation of crops grown on farms, ranches, and wildlife refuges (Longworth et al., 2013). To understand trends in the agricultural sector, interviews were held with farmers, farm agency employees, and others with extensive knowledge of agriculture practices and trends in each county. Additionally, the

New Mexico agriculture census data for 2007 and 2012 were reviewed and provided helpful agricultural data such as principal crops, irrigated acreage, farm size, farm subsidies, and age of farmers (USDA NASS, 2014). Comparison of the two data sets shows a downward trend in the agricultural sector across New Mexico. This decline was in all likelihood related at least in part to the lack of precipitation in 2012: in most of New Mexico 2007 was a near normal precipitation year (ranging from mild drought to incipient wet spell across the state), while in 2012 the PDSI for all New Mexico climate divisions indicated extreme to severe drought conditions. Based on the interviews, economic factors are also thought to be a cause of the decline.

In much of the state, recent drought and recession are thought to be driving a decline in agricultural production. However, that does not necessarily indicate that there is less demand for water. In areas where irrigation is supplied by surface water, there are frequent supply limitations, with many ditches having no or limited supply later in the season. This results in large fluctuations in agricultural water use and productivity from year to year. While it is possible that drought will continue over a longer term, it is also likely that drought years will be interspersed with wetter years, and there is some potential for renewed agricultural activity as a result. With infrastructure and water rights in place, there is a demand for water if it becomes available.

In regions that use surface water for agriculture withdrawals, the 2010 administrative water supply used as the starting point for the projections reflects a near normal water year for the region. For the 2020 through 2060 projections, therefore, it was generally assumed that the surface water demand is equal to the 2010 administrative water supply for both the high and low scenarios. Even if some farmers cease operations or plant less acreage, the water is expected to be used elsewhere due to surface water shortages. Conversely, if increased agricultural activity is anticipated, water demand in this sector was still projected to stay at 2010 administrative water supply levels unless there is a new source of available supply (i.e., water project or settlement).

In areas where 10 percent or more of groundwater withdrawals are for agriculture and there are projected declines in agricultural acreage, the low projection assumes that there will be a reduced demand in this sector. The amount of decline projected is based on interviews with individuals knowledgeable about the agricultural economy in each county (Section 6.2). Even in areas where the data indicate a decline in the agricultural economy, the high projection assumes that overall water demand will remain at the 2010 administrative water supply levels since water rights have economic value and will continue to be used

The livestock category includes water used to raise livestock, maintain self-supplied livestock facilities, and support on-farm processing of poultry and dairy products (Longworth et al., 2013). High and low projections for percentage growth or declines in the livestock sector were developed based on interviews with ranchers, farm agency employees, and others with extensive

knowledge of livestock trends in each county (Section 6.2). The growth or decline rates were then multiplied by the 2010 water use to calculate future water demand.

The commercial (self-supplied) category includes self-supplied businesses (e.g., motels, restaurants, recreational resorts, and campgrounds) and public and private institutions (e.g., public and private schools and hospitals) involved in the trade of goods or provision of services (Longworth et al., 2013). This category pertains only to commercial enterprises that supply their own water; commercial businesses that receive water through a public water system are not included. To develop the commercial self-supplied projections, it was assumed that commercial development is proportional to other growth, and the high and low projections were calculated as the 2010 commercial water use multiplied by the projected high and low population growth rates. In regions where the growth rate is negative, both the high and low projections were assumed to stay at the 2010 administrative water supply level based on water rights having economic value. In regions where the population growth is initially positive but later shows a decline, the water demand projection will remain at the higher level for the remainder of the planning period, again based on the administrative water supply and the value of water rights. This method may be modified in some regions to consider specific information regarding plans for large commercial development or increased use by existing commercial water users.

The industrial (self-supplied) category includes self-supplied water used by enterprises that process raw materials or manufacture durable or nondurable goods and water used for the construction of highways, subdivisions, and other construction projects (Longworth et al., 2013). To collect information on factors affecting potential future water demand, economists conducted interviews with industrial users and used information from the New Mexico Department of Workforce Solutions (2014) to determine if growth is expected in this sector. Based on these interviews and information, high and low scenarios were developed to reflect ranges of possible growth. If water use in this category is low and limited additional demand is expected, both the high and low projections are the same.

The mining category includes self-supplied enterprises that extract minerals occurring naturally in the earth's crust, including solids (e.g., potash, coal, and smelting ores), liquids (e.g., crude petroleum), and gases (e.g., natural gas). Anticipated changes in water demand in this category were based on information gathered during interviews with individuals involved in or knowledgeable about the mining sector. If water use in this category is low and limited additional demand is expected, both the high and low projections are the same.

The power category includes all self-supplied power generating facilities and water used in conjunction with coal-mining operations that are directly associated with a power generating facility that owns and/or operates the coal mines. Anticipated changes in water demand in this category were based on interviews with individuals involved in or knowledgeable about the

power sector. If water use in this category is low and limited additional demand is expected, both the high and low projections are the same.

Reservoir evaporation includes estimates of open water evaporation from man-made reservoirs with a storage capacity of approximately 5,000 acre-feet or more. The amount of reservoir evaporation is dependent on the surface area of the reservoir as well as the rate of evaporation. Evaporation rates are partially dependent on temperature and humidity; that is, when it is hotter and drier, evaporation rates increase. Surface areas of reservoirs are variable, and during extreme drought years, the low surface areas contribute to lower total evaporation, even though the rate of evaporation may be high.

The projections of reservoir evaporation for each region were based on evaporation rates reported in the Upper Rio Grande Impact Assessment (USBR, 2013), which evaluated potential climate change impacts in New Mexico. This report predicted considerable uncertainty, but some increase in evaporation rates and lower evaporation totals overall due to predicted greater drought frequency and resultant lower reservoir surface areas. Although it is possible that total evaporation will be lower in drought years, since the projections are to be compared to 2010 use, assuming lower reservoir evaporation would give a false impression of excess water. Thus, the low projection assumes 2010 evaporation amounts. For the high projection, the same surface areas as 2010 were assumed, but higher evaporation rates, derived from the Upper Rio Grande Impact Assessment (USBR, 2013), were used to reflect potentially warmer temperatures. The high scenario projected using this approach represents a year in which there is a normal amount of water in storage but the evaporation rates have increased due to increasing temperatures.

In reality the fluctuations in reservoir evaporation are expected to be much greater than the high/low range projected using this method. To evaluate the balance between supply and demand, the projections are being compared to the administrative water supply, including reservoir evaporation. It is important to not show an unrealistic scenario of excess available water. Therefore the full range starting with potentially very low reservoir surface areas was not included in the projections.

### 6.5.2 Colfax Projected Water Demand

Table 6-5 summarizes the projected water demands for each water use category, which were developed by applying the methods discussed in Section 6.5.1. As discussed in Section 6.3, population is projected to decline under the low projection. For the high growth scenario, population is projected to drop initially and then to remain steady. The total projected water demand in the county in 2060 ranges slightly, from 60,181 to 60,991 acre-feet per year. Surface water supplies may be considerably lower in drought years, as discussed in Section 5.5.2, but the demand for water does not necessarily decrease when the supply is diminished.

## Table 6-5. Projected Water Demand, 2020 through 2060 Colfax Water Planning Region

| Use Sector | Projection | Water Demand (acre-feet) [a] | | | | | |
|---|---|---|---|---|---|---|---|
| | | 2010 [b] | 2020 | 2030 | 2040 | 2050 | 2060 |
| ***Colfax County*** | | | | | | | |
| Public water supply | Low/High [c] | 2,956 | 2,956 | 2,956 | 2,956 | 2,956 | 2,956 |
| Domestic (self-supplied) | Low/High [c] | 56 | 56 | 56 | 56 | 56 | 56 |
| Irrigated agriculture | Low/High | 49,803 | 49,803 | 49,803 | 49,803 | 49,803 | 49,803 |
| Livestock (self-supplied) | High | 418 | 272 | 314 | 334 | 355 | 376 |
| | Low | 418 | 209 | 251 | 293 | 314 | 334 |
| Commercial (self-supplied) | High [d] | 258 | 259 | 260 | 261 | 262 | 264 |
| | Low [c] | 258 | 258 | 258 | 258 | 258 | 258 |
| Industrial (self-supplied) | Low/High | 49 | 49 | 49 | 49 | 49 | 49 |
| Mining (self-supplied) | High | 308 | 0 | 308 | 308 | 308 | 308 |
| | Low | 308 | 0 | 0 | 0 | 0 | 0 |
| Power (self-supplied) | Low/High | 0 | 0 | 0 | 0 | 0 | 0 |
| Reservoir evaporation | High | 6,725 | 6,808 | 6,889 | 6,970 | 7,028 | 7,179 |
| | Low | 6,725 | 6,725 | 6,725 | 6,725 | 6,725 | 6,725 |
| Total regional demand | High | 60,573 | 60,203 | 60,635 | 60,737 | 60,817 | 60,991 |
| | Low | 60,573 | 60,056 | 60,098 | 60,140 | 60,160 | 60,181 |

[a] Tribes and pueblos in New Mexico are not required to provide water use data to the State. Therefore, tribal water use data are not necessarily reflected in this table.

[b] Actual withdrawals (Longworth et al., 2013)

[c] Projected future water demand in this sector is based on projected population. Where projected population is lower than the 2010 level, projected demand is set at 2010 withdrawals. The withdrawals in 2010 represent water that has been put to beneficial use and thus represent a valid water right. For planning purposes it is assumed that valid water rights are maintained and will be used in the future.

[d] Additional estimated demand for Angel Fire Resort was added to the high projection.

Projected water demand in the *domestic* and *public water supply* categories assumes current levels of use. While population is expected to decline or remain steady, it is anticipated that existing water rights and domestic wells will continue to be used at the 2010 administrative water supply level.

Projected water demand in the *commercial* category under the high water use scenario reflects anticipated growth due to outdoor recreational areas located within the county. The low projection assumes the current level of use for the commercial category.

The *agricultural* projections are based on the assumption that the current observed declining trend for agriculture will continue for the short trend, through 2020. However, recent drought and recent recession are thought to be driving the decline, and it would therefore not be prudent to assume declining demand for agricultural water in the long-term future. While it is possible that drought will continue over a longer term, it is also likely that drought years will be interspersed with wetter years, and there is some potential for renewed agricultural activity as a result. With the many adjudicated water rights in the region (Section 4), there is clearly a demand for agricultural water if it is available. Hence the amount of water devoted to irrigated agriculture is expected to remain at 2010 levels under the assumption that the available surface water will always be put to some use. The agricultural sector in Colfax County is heavily reliant on federal government payments. If these were to be reduced or eliminated, it could have a detrimental effect on the agricultural sector.

For the livestock segment in Colfax County a steep decline in 2020 is projected, but by 2060 this category is expected to recover to 80 percent and 90 percent of 2010 water usage, respectively, in the low and high projections. In the low scenario, it is expected that some ranches will go out of business because younger people, who do not view ranching as a desirable or economically viable career choice, will not replace the older generation of ranchers.

The *mining* category in Colfax County has consisted of primarily one mine, the Pittsburg & Midway mine, which is currently closed. Under the low projection, the coal mine is projected to remain closed through 2060, resulting in a 100 percent reduction in water use in the mining category. Under the high projection, it is assumed that either the mine reopens at historical production levels prior to 2030 or that there is an equivalent amount of water demand for hydraulic fracturing from 2030 and beyond. The 308 acre-feet per year of projected future usage would be equivalent to 77 to 103 new wells per year, at the annual rate of 3 to 4 acre-feet per well (Martin, 2013). Such water demand would be dependent on natural gas prices increasing well beyond their current levels.

There is no current or projected water use in the *power* sector, and *industrial* activity in the region is very low. To collect information on factors affecting potential future water demand, economists conducted interviews to determine if growth is expected in these sectors. Based on these interviews, no significant activity is expected; therefore, the projected water demand for both the high and low projections in these categories is the same.

The Colfax region projections include significant water demand in the *reservoir evaporation* category due to the presence of Eagle Nest and smaller reservoirs near Raton, Springer, and Maxwell (Section 5.2). As discussed in Section 6.5.1, the projected demand is based on 2010 reservoir surface areas so that it can accurately be compared to the 2010 administrative water supply. The reservoir evaporation category is included for statewide accounting, but it is difficult to manage reservoir evaporation losses because they are dependent on precipitation and the amount of water in storage.

## 7. Identified Gaps between Supply and Demand

Estimating the balance between supply and demand requires consideration of several complex issues, including:

- Both supplies and demands vary considerably over time, and although long-term balanced supplies may be in place, the potential for drought or, conversely, high flows and flooding must be considered. In general, storage, including the capture of extreme flows for future use, is an important aspect of allowing surface water supplies to be used when needed to meet demand during drought periods (i.e., reservoir releases may sustain supplies during times when surface water supplies are inadequate).

- In wet years when more water is available than in 2010, irrigators can increase surface water diversions up to their water rights and reservoirs will fill when inflow exceeds downstream demand, provided that compact requirements are satisfied, to increase storage for subsequent years. Thus, though not quantified, the withdrawals in wet years may be greater than the high projection.

- Supplies in one part of the region may not necessarily be available to meet demands in other areas, particularly in the absence of expensive infrastructure projects. Therefore comparing the supplies to the demands for the entire region without considering local issues provides only a general picture of the balance.

- As discussed in Section 6.5.1, the fluctuations in reservoir evaporation are expected to be much greater than the high/low projected range developed for this balance. When comparing the projected demands to the administrative water supply, which is based on 2010 water withdrawals, 2010 surface areas of reservoirs were used to avoid an unrealistic scenario of excess available water. The actual amount of water that will be used for reservoir evaporation is dependent on the surface area of the reservoir and temperatures. During the first year of a drought when there is surface water in storage, the reservoir evaporation could be similar to 2010 use, but after subsequent years of drought, when storage and surface areas are lower, reservoir evaporation would be lower.

- As discussed in Section 4, there are considerable legal limitations on the development of new surface and groundwater resources, given that surface and surface-connected groundwater supplies are fully appropriated, which affects the ability of the region to prepare for shortages by developing new supplies.

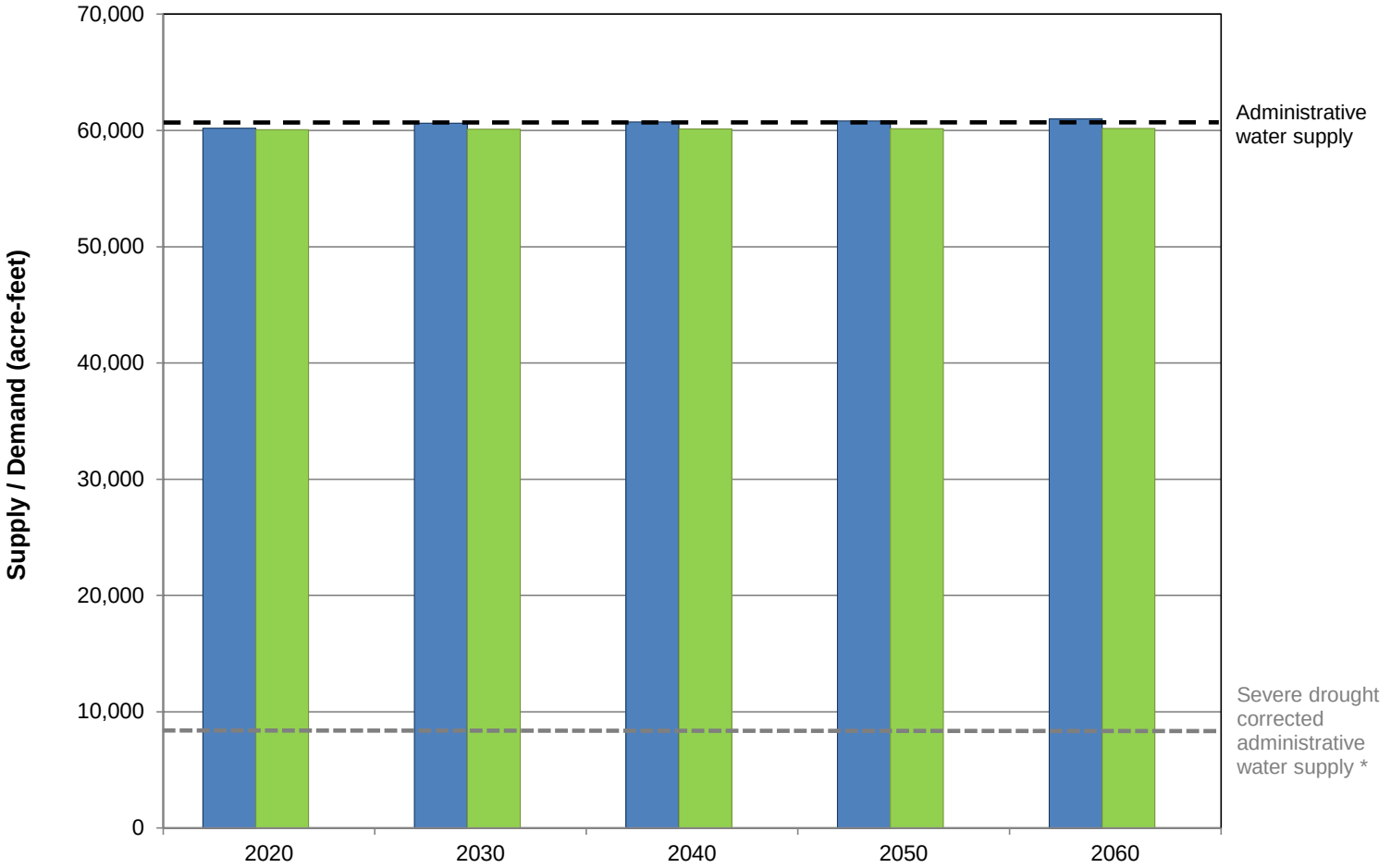
- Besides quantitative estimates of supply and demand, numerous other challenges affect the ability of a region to have adequate water supplies in place. Water supply challenges include the need for adequate funding and resources for infrastructure projects, water quality issues, location and access to water resources, limited productivity of certain aquifers, and protection of source water.

Despite these limitations, it is useful to have a general understanding of the overall balance of the supply and demand. Figure 7-1 illustrates the total projected regional water demand under the high and low demand scenarios, and also shows the administrative water supply and the drought-adjusted water supply. As presented in Section 5.5, the region's administrative water supply is 60,573 acre-feet and the drought supply is 8,357 acre-feet, or about 14 percent of a normal year administrative water supply. Future water demand projections do not reflect substantial growth in water use (Figure 7-1), due to the declining economy discussed in Sections 3 and 6. However, even without significant growth in demand, major supply shortages are indicated in drought years. Because of its reliance on surface water, the region has a very high degree of vulnerability to drought, and the estimated shortage in drought years is expected to range from 52,000 to 53,000 acre-feet. Consequently, increasing storage, developing shortage-sharing agreements, protecting watershed health for the region's surface water supplies, and identifying alternative groundwater supplies are high priorities for the region.

# 8. Implementation of Strategies to Meet Future Water Demand

An objective of the regional water planning update process is to identify strategies that will help the region prepare to balance the gap between supply and demand and address other future water management challenges, including infrastructure needs, protection of existing resources and water quality, and the need to maximize limited resources through water conservation and reuse. The Colfax region considered a variety of strategies for addressing these water management challenges. As discussed in Sections 5 and 7, the Colfax region is very vulnerable to drought, and there is a large gap between projected demands and drought supplies. Consequently, the Colfax effort focused on drought planning in addition to overall water resource planning.

This RWP is building on the 2003 water plan and is considering strategies that will enhance and update, rather than replace, the strategies identified in the accepted water plan. The status of strategies from the previous regional water plan is assessed in Section 8.1. Additional strategies recommended in this RWP update—including a comprehensive table of projects, programs, and policies, key collaborative projects, and recommendations for the state water plan—are discussed in Section 8.3




* Based on the ratio of the minimum streamflow of record to the 2010 administrative water supply.

**Note:** Tribes and pueblos in New Mexico are not required to provide water use data to the State. Therefore, tribal water use data are not necessarily reflected in this figure.

Figure 7-1

COLFAX
REGIONAL WATER PLAN 2016
**Available Supply and Projected Demand**

## 8.1 Implementation of Strategies Identified in Previously Accepted Regional Water Plan

An important focus of the RWP update process is to both identify strategies and processes and consider their implementation. To help address the implementation of new strategies, a review of the implementation of previous strategies was first completed.

The 2003 Colfax Regional Water Plan recommended the following strategies for meeting future water demand:

- Agricultural water conservation
- Drought contingency planning
- Watershed management
- Dredging for improved reservoir storage
- Municipal and County water conservation ordinances
- Water rights transfers or leases
- Appropriating and reserving groundwater
- Developing 40-year plans (local entities)
- County-wide septic/water quality ordinances
- Municipal reuse for agriculture or recreation
- Growth management and land use planning
- Public outreach and education

The steering committee reviewed each of the strategies and indicated that they are all still relevant, though some are being refocused as new recommended strategies (Appendix 8-A). Actions that have been completed to implement the strategies are summarized on Table 8-1.

## 8.2 Water Conservation

Municipal water use is generally low in the Colfax Water Planning Region, and water conservation programs are already in place, many having been implemented as recommended in the 2003 accepted plan (Section 8.2); therefore, few new water conservation projects are included in this RWP update. However, water providers in the region will continue to implement their existing water conservation programs and drought contingency ordinances. As shown in Table 8-1, several water conservation and water reuse projects have been completed since the original plan was accepted in 2003.

## Table 8-1. Implementation Status of Strategies Identified in Accepted Plan Colfax Water Planning Region



| Strategy | Status |
|---|---|
| Agricultural water conservation | Pivots were installed on some farms. |
| | Improvements such as cleaning and dredging were made on some ditch systems. |
| Drought contingency planning | A drought agreement was reached among Permit 71 water rights owners. |
| | The Forest Service has implemented active management on the Valle Vidal. |
| | Municipalities have developed water restrictions/emergency ordinances. |
| Watershed management | Section 319 funding was received for watershed restoration work. |
| | A watershed based plan was developed. |
| | The CFRP project for Sugarite was funded. |
| | Water testing by NMED continues. |
| | Selective thinning has occurred on small-diameter timber. |
| | Forest Service is doing prescribed burning in the Valle Vidal. |
| | CFRP-funded project is being developed for landscape-scale restoration |
| | Game and Fish project for thinning 100 acres in the wildlife management area was completed. |
| | State Forestry watershed restoration project in the Black Lake area was completed |
| | Colfax County is thinning vegetation on private lands |
| | Canadian River restoration for salt cedar removal is ongoing. |
| | Timber sales have occurred on 10,000 acres. |
| | State Forestry is thinning for watershed restoration |
| | Coyote Creek restoration was completed. |
| | New Mexico State Land Office is conducting prescribed burning on Trust lands. |
| | Whites Peak is a project with multiple agencies involved. |
| Dredging for improved reservoir storage | Lake Alice dredging was completed using funding from the Water Trust Board and other sources. |
| Municipal and County water conservation ordinances | Raton developed a water conservation ordinance and completed a water audit. |
| | Cimarron, Springer, and Angel Fire developed water conservation ordinances. |
| Water rights transfers or leases | Angel Fire is seeking funding for water rights purchases. |

## Table 8-1. Implementation Status of Strategies Identified in Accepted Plan Colfax Water Planning Region



| Strategy | Status |
|---|---|
| Appropriating and reserving groundwater | Capulin Basin has developed an application for additional wells. |
| Developing 40-year plans | Raton is updating their 40 year plan. |
| County-wide septic/water quality ordinances | A Colfax County septic ordinance was developed. |
| Municipal reuse for agriculture or recreation | NMGF completed a recreation study.<br>Economic impact is based on water use (skiing, Philmont Ranch, hunting, fishing) |
| | Raton is reusing water on golf course and parks with a long-term goal is to determine how to reuse water for agricultural purposes. |
| | Angel Fire is reusing water. |
| Growth management and land use planning | The Colfax County Comprehensive Plan update process is continuing.<br>A draft oil and gas ordinance that will include infrastructure and setbacks has been developed but not yet enacted; the County first wants to complete the Comprehensive Plan process. |
| Public outreach and education | CWA workshops have been conducted. |
| | State Parks conducts educational programs |
| | Cimarron Watershed Alliance conducts regular open meetings |
| | Philmont Ranch provided volunteer workshops |
| | Cimarron High School is monitoring water quality |
| | A Trout in the Classroom program is ongoing at Cimarron Schools. |
| | Sugarite Park conducts a class on fire management, water quality, etc. |
| | Vermejo Park hosts spring time ecosystem workshops. |
| | UNM students conducted a flora/fauna class and a water quality study. |
| | NMED periodically tests surface water quality and updates the list of impaired waters. |

## 8.3 Proposed Strategies (Water Programs, Projects, or Policies)

In addition to continuing with strategies from the previous plan, the Colfax region discussed and compiled new project, program, and policy (PPP) information, identified key collaborative projects, and provided recommendations for the state water plan. The recommendations included in this section were prepared by the Colfax Regional Water Planning Steering Committee and other stakeholders and reflect their interest and intent. The recommendations made by the steering committee and other stakeholders have not been evaluated or approved by NMISC. Regardless of the NMISC's acceptance of this RWP, inclusion of these recommendations in the plan shall not be deemed to indicate NMISC support for, acceptance of, or approval of any of the recommendations, PPP information, and collaborative strategies included by the regional steering committee and other stakeholders.

### 8.3.1 Comprehensive Table of Projects, Programs and Policies

Over the two-year update process, eight meetings were held with stakeholders in the Colfax region. These meetings identified the program objectives, presented draft supply and demand calculations for discussion and to guide strategy development, and provided an opportunity for stakeholders to provide input on the PPPs that they would like to see implemented (Section 2). A summary of the PPP information, obtained primarily from input supplied directly by stakeholders, is included in Appendix 8-A. Information was requested during several open meetings and requests for input were also e-mailed to all stakeholders that had expressed interest in the regional water planning process.

Some water projects were already identified through the State of New Mexico Infrastructure Capital Improvement Plan (ICIP) process, and those projects are also included in the Colfax PPP table. The projects included are from the 2017-2021 ICIP list (http://nmdfa.state.nm.us/ICIP.aspx, accessed March 2016), which is updated on an annual basis. Therefore, other infrastructure projects that are important to the region may be identified before this RWP is updated again. In general, the region is supportive of water and wastewater, dam safety, and other water-related infrastructure projects.

The PPP list also contains several watershed restoration projects, including some identified in the New Mexico Forest Action Plan. New Mexico State Forestry Division provides annual updates to the recommended watershed restoration projects in the New Mexico Forest Action Plan, and the region is supportive of those ongoing watershed restoration projects, even those that are not specifically identified in the PPP list.

The information in Appendix 8-A has not been ranked or prioritized; it is an inclusive table of all of the PPPs that regional stakeholders are interested in pursuing. It includes projects both regional in nature (designated R in Appendix 8-A) and those that are specific to one system

(designated SS in Appendix 8-A). The table identifies each PPP by category, including water and wastewater system infrastructure, water conservation, watershed restoration, flood prevention, water reuse, water rights, water quality, and data collection.

In the Colfax region, projects identified on the PPP table are primarily water system infrastructure, irrigation system upgrades, and watershed restoration projects. Because municipal water use is generally low and water conservation programs are already in place, few water conservation projects are included. However, water providers in the region will continue to implement their water conservation programs and drought contingency ordinances.

### 8.3.2 Key Projects for Regional Collaboration

Prioritizing projects for funding is done by each funding agency/program, based on their current criteria, and projects are reviewed in comparison to projects from other parts of the state. Consequently, the regional water planning update program did not attempt to rank or prioritize projects that are identified in Appendix 8-A. However, identifying larger regional collaborative projects is helpful to successful implementation of the regional plan. At steering committee meetings held in 2015 and 2016, the group discussed projects that would have a larger regional or sub-regional impact and for which there is interest in collaboration with entities in other water planning regions to seek funding and for implementation.

The group used an informal process of discussing and refining the definition of potential collaborative projects and voting to determine the projects of greatest interest and to identify opposition to proposed projects. Key collaborative projects identified by the steering committee and Colfax region stakeholders are shown on Table 8-2.

In order to move forward with implementing the key collaborative projects, additional technical, legal, financial, and political feasibility assessment may be required. A detailed feasibility assessment was beyond the scope and resources for this RWP update.

### 8.3.3 Key Program and Policy Recommendations

The legislation authorizing the state water plan was passed in 2003. This legislation requires that the state plan shall "integrate regional water plans into the state water plan as appropriate and consistent with state water plan policies and strategies" (§ 72-14-3.1(C) (10)). For future updates of the state water plan, NMISC has asked the regions to provide recommendations for larger programs and policies that would be implemented on a state level. These are distinct from the regional collaborative projects listed in Table 8-2 and the PPPs listed in Appendix 8-A in that they would be implemented on a state, rather than a regional or system-specific level. The State will consider the recommendations from all of the regions, in conjunction with state-level goals, when updating the state water plan.

**Table 8-2. Key Collaborative Programs, Projects, and Policies**
**2016 Colfax Regional Water Plan**
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| Project Description | Project Lead | Project Partners | Probable Funding Source(s) | Cost Range | Major Implementation Issues |
|---|---|---|---|---|---|
| ***Forest and Watershed Health*** | | | | | |
| Continued landscape-scale forest and watershed restoration in Colfax County to limit catastrophic fires, mitigate negative effects of wildfire, and protect/restore water quality. The project includes:<br>• Logging/small-diameter timber extraction for forest health<br>• Invasive species treatment<br>• Stream and river restoration<br>• Rangeland health + grazing management | • CWA<br>• Colfax SWCD<br>• USFS<br>• Large private landowners<br>• City of Raton<br>• Vermejo<br>• Philmont<br>• Colfax County<br>• Local municipalities<br>• Colfax County Firewise<br>• State land office<br>• Taos Pueblo | • Vermejo<br>• Philmont<br>• CS Ranch<br>• UU Bar/Express<br>• Local municipalities<br>• County government<br>• Local landowners | • CFRP<br>• CFLRP<br>• NM State Forestry<br>• NMED 319 and River Stewardship Program<br>• Water Trust Board | Unlimited: $500-$5,000/acre | • Lack of funding<br>• Engaging landowners, keeping them interested<br>• Legal/permitting and social obstacles to using prescribed fire<br>• Climate and weather (i.e., drought, major wildfires, flooding)<br>• The cost of logging vs. value of timber |
| ***Conveyance System Efficiencies*** | | | | | |
| The efficiency of all irrigation systems in Colfax County can be increased signifi-cantly by updating diversion works, measuring devices, cleaning the ditches, and checking the grades for proper slope. The ditches can also be lined with an impervious barrier such as | • Springer Ditch Association,<br>• Vermejo Conservancy<br>• Permit 71 Water Users<br>• Miami water users Assn<br>• Antelope Valley<br>• Philmont Scout Ranch | • NRCS<br>• FSA | • NRCS<br>• FSA<br>• Water Trust Board<br>• Irrigation works projects (ISC),<br>• USDA<br>• Conservation groups | Millions (full implementation would probably require $500K to $1 million per system). Prioritization of key areas/ projects is essential | • Funding, in particular legal issues with anti-donation clause that limit funding options for shared public/private ditches.<br>• Destroying or reducing wet areas/ecosystems that have developed |

**Table 8-2. Key Collaborative Programs, Projects, and Policies**
**2016 Colfax Regional Water Plan**
Page 2 of 5

| Project Description | Project Lead | Project Partners | Probable Funding Source(s) | Cost Range | Major Implementation Issues |
|---|---|---|---|---|---|
| ***Conveyance System Efficiencies (cont.)*** | | | | | |
| concrete or some other hard surface. Augmenting the normal ditch capacity with pipelines would dramatically eliminate conveyance loss during the majority of the diversion season on all systems. Long ditches, such as the Springer Ditch, where there is little ground-water use, are affected by significant losses without a corresponding recharge benefit. Multiple water users, including those with junior water rights, may benefit by minimizing ditch losses. | • CS Ranch<br>• Vermejo Park Ranch<br>• Solvanjen Farms<br>• UU Ranch | | | | around existing earthen ditches.<br>• Watering points for livestock + wildlife would be reduced or eliminated.<br>• Higher efficiency does not equal conservation. System improvements should not result in increased use. |
| ***Eagle Nest Release Management*** | | | | | |
| The Middle Cimarron River supports a vibrant fishery between Eagle Nest Dam and the Village of Cimarron. Arranging for voluntary transactions to support sufficient flow during winter months would provide for a sustainable trout habitat in | Trout Unlimited | • Cimarron Watershed Alliance<br>• New Mexico Department of Game and Fish<br>• OSE | Not established to date, may be possi-ble to accomplish through policy/ management practices. | If a purchaser or lease arrange-ment would be required, the cost would depend on the amount of water leased or bought and the market price. | The major obstacles/ issues relate to the question of whether instream flow is consi-dered to be identified as a beneficial use in New Mexico. |

**Table 8-2. Key Collaborative Programs, Projects, and Policies**
**2016 Colfax Regional Water Plan**
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| Project Description | Project Lead | Project Partners | Probable Funding Source(s) | Cost Range | Major Implementation Issues |
|---|---|---|---|---|---|
| ***Eagle Nest Release Management (cont.)*** | | | | | |
| this region. A study commissioned by New Mexico Game and Fish in 2014 determined that "New Mexico has more than 160,000 resident and non-resident anglers who spent $268 million a year on fishing related activities." The Middle Cimarron River provides an economic net benefit for all of Colfax County and much of Taos, Mora, and San Miguel Counties. Release management also considers voluntary leasing and release arrangements to support flow during summer months adequate to maintain temperature requirements for the designated use. | | | | | There is also the matter of how to manage such a policy without infringing on adjudicated allocation of water rights in the Cimarron River System. |

**Table 8-2. Key Collaborative Programs, Projects, and Policies**
**2016 Colfax Regional Water Plan**
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| Project Description | Project Lead | Project Partners | Probable Funding Source(s) | Cost Range | Major Implementation Issues |
|---|---|---|---|---|---|
| ***Regional Collaboration for Drinking Water Systems*** | | | | | |
| This project would involve collaboration to help small water systems in the region build capacity by sharing resources on issues such as accounting, use of equipment, planning, and, where feasible, water supply. | City of Raton/Raton Water Works | • Springer<br>• Maxwell<br>• Cimarron<br>• Smaller community systems<br>• Possible separate effort in Angel Fire/Eagle Nest | State + Local | Unknown | • Population is wide-spread across county.<br>• Water treatment issues can make sharing of physical resources difficult.<br>• Funding, capacity to move forward. |
| ***Drought Contingency Plan*** | | | | | |
| A drought contingency plan for Colfax County would<br>• Identify prior appropriation arrangements for purchase/leasing of water<br>• Identify "triggers" for implementation of plan<br>• Identify conservation methods and requirements<br>• Explore alternative water resources for both agriculture and potable use | County Emergency Manager | • Municipalities and agricultural producers<br>• Local economic development organizations | • Federal grants<br>• State funds<br>• County resources<br>• Private sources | • $50K for plan<br>• Additional funding for implementation | • Availability of funds<br>• Approval of transfers/leases of water rights |

**Table 8-2. Key Collaborative Programs, Projects, and Policies**
**2016 Colfax Regional Water Plan**
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| Project Description | Project Lead | Project Partners | Probable Funding Source(s) | Cost Range | Major Implementation Issues |
|---|---|---|---|---|---|
| ***Dam Project Safety*** | | | | | |
| Multiple dams in the Colfax Region have regulatory compliance issues and aging infrastructure which in some cases presents a safety hazard. While repairs and upgrades are needed, based on the current regulations, the required upgrades may not be realistic. | • Dan Campbell – City of Raton<br>• Laura Danielson – Town of Springer | | • Federal<br>• State<br>• Local | Unknown – Millions | Federal + State mandatory regulations |
| ***Aquifer Mapping*** | | | | | |
| The proposed project is to complete a study to determine groundwater resources and quality in the Colfax region and the surrounding counties of Harding, Mora, and Union. The policy intent is to identify groundwater resources for future development, identify areas that should not see further development, and educate the public about groundwater resources, management, and conservation of such. | • Colfax County<br>• Colfax SWCD<br>• Adelante RC+D (501©(3)) | See attached list of MOU Parties | • NM Legislative appropriation<br>• SWCD grant<br>• Capital outlay<br>• Private donations<br>• Water Trust Board | $450K for Colfax | Limited State funds |

After group discussion, the Colfax region identified the following recommendations for PPPs to be considered in the state water plan:

- Explore alternative water sources (e.g., produced brackish water) to identify additional new supplies.
- Develop programs and policies that encourage locally produced small-diameter timber use and support landscape-level forest restoration.
- Clarify the definition of beneficial use and the use of water rights for instream flow purposes.
- Provide support for small water systems (especially for Water Trust Board funding applications). Many small systems have difficulty completing financial auditing and preliminary engineering tasks needed to even apply for funding, and programmatic support is needed.
- Address anti-donation clauses related to funding for public/private projects (to allow for shared ditch lining) where ditches serve both agricultural associations and public water systems. Current anti-donation restrictions prohibit funding for public entities that will provide public benefit when they share resources with private entities.
- Review dam safety regulations for both unnecessary requirements and for areas where additional safety is needed, and provide funding and resources to address safety issues.
- Provide resources and follow-up to link and implement state and local drought planning including:
    - Emergency preparedness
    - Long-term planning
    - Development of options for drought contingency responses, including lease/purchase of water in emergency situations.
    - Explore alternative water resources for both agricultural and potable uses.
- Support policies that promote water reuse.

The 2016 Regional Water Plan characterizes supply and demand issues and identifies strategies to meet the projected gaps between water supply and demand. This plan should be added to, updated, and revised to reflect implementation of strategies, address changing conditions, and continue to inform water managers and other stakeholders of important water issues affecting the region.

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# Appendix 2-A

# Master Stakeholder List

# Colfax Region 9 RWP Master Stakeholder List

Updated May 24, 2016

| Last | First | Affiliation/Category |
|---|---|---|
| Alcon | Kenneth | NRCS |
| Anderson | Mark | Philmont Scout Ranch |
| Barrios | Kris | NMED<br>Monitoring, Assessment, & Standards Section<br>Surface Water Quality Bureau |
| Berglund | Mary | Administrator for the Village of Eagle Nest |
| Berry | Michael | Cimarron Watershed Alliance |
| Berry | Scott | City Manager, Raton |
| Blaine | Tom | State Engineer |
| Bogar | Matt | Cimarron Watershed Alliance |
| Bordegaray | Angela | Water Planner, ISC |
| Boyce | Christina | Tourism Coordinator, Chamber of Commerce |
| Brown | Kay | Kay Brown |
| Burleson | HM | President of the Raton Chamber of Commerce |
| Cahill | Mindy | Village of Angel Fire<br>Cimarron Representative |
| Caid | John | Express UU Bar Ranch |
| Caid | Teri | Express UU Bar Ranch |
| Campbell | Dan | Utilities Director, City of Raton |
| Carlisle | Greg | ISC<br>Eagle Nest Dam |
| Celley | John | Philmont Ranch |
| Celley | Randa | CWA |
| Chatfield | Jack | Canadian River Riparian Restoration Project |
| Chavez | Alfred “Buster” | OSE |
| Chavez | Margaret | Cimarron Watershed Alliance |
| Clark | John | Ute Park Homeowners Association |
| Conn | Rachel | Amigos Bravos |
| Cordova | Richard A. | Mayor  Eagle Nest |
| Danielson | Laura | Town of Springer<br>Water Superintendent |
| Dean | Michael | Cimarron Watershed Alliance |
| Dixon | Deborah | Director, ISC |
| Dorman | Sheldon | Cimarron Watershed Alliance<br>OSE |
| Dye | Jan | NMED |
| Deines | Cody | Cimarron Watershed Alliance<br>Silver Dollar |

Note: Those interested in developing collaborative projects or ongoing planning efforts may contact the NMISC Regional Water Planning Manager for further information about the region’s stakeholders.

# Colfax Region 9 RWP Master Stakeholder List

Updated May 24, 2016

| Last | First | Affiliation/Category |
|---|---|---|
| Dorman | Sheldon | OSE |
| Estrada | Adán | District Superintendent |
| Farmer | Tim | OSE |
| Ford | Linda and Troy | Cimarron Watershed Alliance |
| Friedt | Arnie | NM State Forestry |
| Galli | Richard | Mayor, Maxwell |
| Garcia | Fernando | |
| Gibson | Hoot | |
| Goebel | Jeff | |
| Gray | Jody | Cimarron Watershed Alliance |
| Grine | Bennie | Pueblo of Sandia<br>Bobcat Ranch |
| Grogan | Sterling | Biophilia Foundation |
| Higgins | Florence | Higgins Environmental Solutions |
| Hilton | Joanne | Global Hydrologic Solutions |
| Hirsch | Jim | |
| Holm | Gus | Vermejo Park Ranch |
| Howe | Chuck | |
| Jenkins | Paul | President of the Greater Raton Economic Development Organization dba GrowRaton! |
| Johnson | Richard | Adelante Resource Conservation & Development Council<br>Village of Eagle Nest |
| Kenneke | Dave | NM Rural Water Association |
| Kern | Mary Lou | Colfax Soil & Water Conservation District<br>Vermejo Conservancy District |
| Kostelnik | Kim | NM Forest Industry Association |
| Kretzmann | Eliza | NM State Forestry |
| Lagasse | Bob | Cimarron Watershed Alliance |
| LeDoux | Judy | Mayor Cimarron |
| Lew | Rosemary | A/Cattle Co. |
| Littlefield | John | US Forest Service |
| Lloyd | Tommy | Rancher<br>Colfax SWCD |
| Long | George | US Forest Service – Carson National Forest |
| Lowery | Bill | Mayor Pro-Tem, Eagle Nest |
| Lopez | Ernie | NM State Forestry |
| Maldonado | Jim | Chairman, Colfax County Commission |

Note: Those interested in developing collaborative projects or ongoing planning efforts may contact the NMISC Regional Water Planning Manager for further information about the region's stakeholders.

# Colfax Region 9 RWP Master Stakeholder List

Updated May 24, 2016

| Last | First | Affiliation/Category |
|---|---|---|
| Mattorano | Mike | Atlas Energy |
| Mantz | Sandra | Mayor, City of Raton |
| Martinez | Jean | Trustee, Springer |
| Martinez | Jonathan | ISC |
| Martinez | Leo | Cimarron Schools |
| Mascarenas | Fabian | Village of Angel Fire |
| Mastel | Jerry | US Forest Service |
| McCaslin | Jamie | Councilor, Eagle Nest |
| Mitchell | Jay | City of Raton |
| Mitchell | Toner | CWA<br>Trout Unlimited |
| Morgan | Jim | Trout Unlimited |
| Mutz | Dave | |
| Muirhead | G | |
| Navarette | Cheryl | Interim County Manager |
| Newton | James “Landon” | County Commissioner, Colfax County |
| Piper | Judy | |
| Prothrop | Adam | |
| Rinde | Candee | Executive Secretary, Cimarron Chamber of Commerce |
| Rockenfield | James | Ute Creek Ranch<br>Atmore Ranch |
| Romero | Rosemary | Rosemary Romero Consulting |
| Sauble | Bill | Colfax County Commissioner |
| Sawyer | Chris | Philmont Scout Ranch |
| Scheinbaum | Mark | Cimarron Watershed Alliance |
| Shaffer | Scott | Cimarron Watershed Alliance |
| Smith | Rick | Cimarron Watershed Alliance |
| Smith | Virginia | Cimarron Watershed Alliance |
| Stafford | Julia Davis | CS Cattle |
| Stehling | Joe | |
| Stewart | John | OSE |
| Stocton | Luke | RV Manager, Angel Fire Resort |
| Sullivan | Mark | NM State Parks |
| Sultemeier | Jon | Public Works Water Operator, Village of Eagle Nest |
| Tafoya | Rick | Village of Angel Fire, Village Manager |
| Taylor | Joanna | Village of Maxwell |
| Torres | Amos | Village of Angel Fire, Public Works Director |

Note: Those interested in developing collaborative projects or ongoing planning efforts may contact the NMISC Regional Water Planning Manager for further information about the region’s stakeholders.

# Colfax Region 9 RWP Master Stakeholder List

Updated May 24, 2016

| Last | First | Affiliation/Category |
|---|---|---|
| Torres | David | Drinking Water Bureau Source Water Protection Specialist. |
| Tracy | Jessica | Pueblo of Sandia Environment Department, Water Resources Manager<br>Coalition of Six Middle Rio Grande Basin Pueblos, Secretary |
| Trujillo | Richard | Office of the State Engineer |
| Valasquez | Randy | USDA |
| Vatlestad | Kareyl | Colfax SWCD |
| VeneKlasen | Garrett | Executive Director, New Mexico Wildlife Federation |
| Vigil | Daniel | Miami MDWCA |
| Vigil | Mike | Miami MDWCA |
| Vigil | Thomas | Colfax County, NM<br>E-911/Rural Addressing<br>Floodplain Management<br>Emergency Management |
| Vigil | Travis | Acting District Conservationist, NRCS |
| Walsh | Pat | Cimarron Watershed Alliance |
| Ward | Ryan | Water Policy Analyst, New Mexico Department of Agriculture |
| Welker | Don | City of Raton |
| Whitacre | Andy | Mountain Manager, Angel Fire Resort |
| Wilber | Scott | NM Land Conservancy |
| Whiting | Mely | Trout Unlimited |
| Yates | Andy | |

Note: Those interested in developing collaborative projects or ongoing planning efforts may contact the NMISC Regional Water Planning Manager for further information about the region's stakeholders.

# Appendix 2-B

# Single Comment Document: Summary of Comments on Technical and Legal Sections

## Summary of Comments on Technical and Legal Sections, Colfax RWP

| NO. | Comment Souce | Location (Section/ Page/ Paragraph) | COMMENTS |
|---|---|---|---|
| **1** | Jim Morgan | Section 3, Table 3-1 | There is not agreement in the Numbers Employed data in tables b. and c.<br>Table b.: Number Employed 5,979<br>Table c.: Number Employed-total in various categories 3,250 |
| **2** | Jim Morgan | Section 3, Table 3-1 | Comment for table d.:<br>A simple averaging of acreage size of farms/ranches is not very informative. It would be better to have a frequency distribution chart of farms/ranches as per size. |
| **3** | Laura Danielson | Section 4 | In the legal section it shows no ordinances for the town of Springer. We have a emergency water management ordinance and a general water ordinance, |
| **4** | Jim Morgan | Section 5 | Regarding hydraulic fracturing operations: is there any monitoring of sites for quality impacts post drilling operations? |
| **5** | Jim Morgan | Section 5 | With respect to Permit 71, it is important to note that the use of Private Storage Right amounts likely precedes any amounts taken from the Shared Pool, yearly. |
| **6** | Jim Morgan | Section 5.4 | There is question as to whether the stated 2012-2014 New Mexico 303(d) list (NMED, 2014a) is actually current. There have been changes in assessment protocols and/or water quality standards since the last NMED SWQB measurements in 2006. This in particular for: nutrients, turbidity and aluminum determinations of impairment. Having the correct listing of impairments is essential to an organization such as the Cimarron Watershed Alliance when applying for grants to remediate impairments, such as those listed in SECTION 5.4.2 Nonpoint Sources. |
| **7** | Jim Morgan | Section 6.1 | Regarding instream flow, the committee needs to have further discussion. |
| **8** | Jim Morgan | Section 6.1 | As to quantifying depletions, it would seem important to have OSE, Cimarron Office, quantify depletions due to conveyance losses, which may be quite significant. |
| **9** | Jim Morgan | Section 6.2 | Comment: Although maybe not to be included in a trend category, there should be, somewhere, a quantification of the importance of Outdoor Recreation Activities to the economy of Colfax County in terms of employment and economic benefits, generally. Entities which could provide such information:<br>Angel Fire Resorts<br>NM State Parks<br>NMDGF<br>Philmont Boy Scout Ranch<br>Vermejo Park Ranch<br>NRA Whittington Center<br>Carson National Forest<br>It is likely that these entities are major contributors to the Colfax County economy, and all require adequate water supplies for their operations. |

## Summary of Comments on Technical and Legal Sections, Colfax RWP

| NO. | Comment Souce | Location (Section/ Page/ Paragraph) | COMMENTS |
|---|---|---|---|
| **10** | Jim Morgan | Section 6.4, Table 6-4 | The gpcd listed for Springer Water System of 389 can't be correct. |
| **11** | Jim Morgan | Section 6.4, Table 6-4 | Irrigated agriculture: Do not agree that conveyance does not result in loss. |
| **12** | Jim Morgan | Section 6.4, Table 6-4 | Irrigated agriculture: What evidence is there that any return flow occurs? |
| **13** | Jim Morgan | Section 6.4, Table 6-4 | Irrigated agriculture: There is discussion regarding downstream water yield. But, effectively, there is no downstream requirement beyond the last Cimarron diversion. |
| **14** | Jim Morgan | Section 6.4, Table 6-4 | Irrigated agriculture: If, as suggested, that no water savings are possible in the agricultural sector, the whole issue of water conservation in Colfax County is moot. Savings in municipal usage would only be a percent or two of total usage. |
| **14** | Laura Danielson | Section 6.4, Table 6-4 | In section 6.4 Under public water supply they used incorrect calculation. They didn't use all the population served by the community's. example Springer's plant serves French track, Springer Track and the prison plus about 25 customers outside city limits. This use accounts for over 50% of the water that is produce by the springer plant. Just using the towns population give a false high per capita rate. which makes the assumption that how much much water can be save by conservation wrong. |
| **15** | Jim Morgan | Section 6.5 | The discussion in this section seems to reiterate the view that: because demand in the agriculture will always meet supply, existing water rights will always be exercised to take advantage of any available supply. |
| **16** | Jim Morgan | Section 7 | Surface and surface-connected groundwater supplies are fully appropriated, and will be used if available. This presents a real quandary as to how to plan for emergency situations which might affect human health. |

# Appendix 6-A

# List of Individuals Interviewed

## Appendix 6-A. List of Individuals Interviewed Colfax Water Planning Region

| Name | Title | Organization | City |
|---|---|---|---|
| Paul Jenkins | President | Greater Raton Economic Development Corp. | Raton |
| Rich Kuhns | Board Member | Greater Raton Economic Development Corp. | Raton |
| David Stafford | Board Member | Greater Raton Economic Development Corp. | Raton |
| Julia Davis Stafford | Owner | CS Ranch | Raton |
| Dan Campbell | Director | Raton Water Works | Raton |
| Mark Anderson | Assistant Manager | Philmont Scout Ranch | Philmont |
| Gus Holm | General Manager | Vermejo Park | Vermejo Park |
| Tim O'Neill | Owner | O'Neill Land LLC | Cimarron |
| Mark Rivera | Village Planner | Village of Angel Fire | Angel Fire |
| Don Borgeson | Associate Broker | Monte Verde Realty | Angel Fire |
| Stuart Hamilton | Broker | Keller Williams Real Estate | Angel Fire |
| Kenneth Alcon | Conservationist | USDA NRCS | Raton |
| Steve Henke | Executive Director | NM Oil & Gas Association | Santa Fe |

# Appendix 6-B

# Projected Population Growth Rates 2010 to 2040

## Appendix 6-B. BBER Projected Five-Year Population Growth Rates, 2010 to 2040 Colfax Water Planning Region

| County | Five-Year Growth Rate (%) | | | | | |
|---|---|---|---|---|---|---|
| | 2010-2015 | 2015-2020 | 2020-2025 | 2025-2030 | 2030-2035 | 2035-2040 |
| Colfax | –0.31 | –0.58 | –0.92 | –1.55 | –2.24 | –2.74 |

Source: New Mexico County Population Projections, July 1, 2010 to July 1, 2040. Geospatial and Population Studies Group, Bureau of Business & Economic Research, University of New Mexico. Released November 2012.

# Appendix 8-A

# Recommended Projects, Programs, and Policies

# Regional Water Planning Update

*Projects, Programs, and Policies 5/26/2016*

Water Planning Region: Colfax

| County | Regional (R) or System-Specific (SS) | Strategy Type (Project, Program or Policy) | Category | Project Name | Description | Source of Project Information [a] | Project Lead (Entity or Organization) | Partners (Other Entities or Participants) | Timeframe (Fiscal Year) | Planning Phase | Cost | Need or Reason for Project, Program, or Policy | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Colfax | R | Project | Watershed Restoration | Forest and Watershed Health | Continued landscape-scale forest and watershed restoration in Colfax County to limit catastrophic fires, mitigate negative effects of wildfire, and protect/restore water quality. The project includes:<br>• Logging/small-diameter timber extraction for forest health<br>• Invasive species treatment<br>• Stream and river restoration<br>• Rangeland health + grazing management | Steering Committee; see Table 8-2 | A key collaborative project from the Steering Committee, project leads are CWA, Colfax SWCD, USFS, large private landowners, City of Raton, Vermejo, Philmont, Colfax County, local municipalities, Colfax County Firewise, State land office, Taos Pueblo | Vermejo, Philmont, CS Ranch, UU Bar/Express, local municipalities, County government, local landowners | | | Unlimited:<br>$500-$5,000/acre | | See Table 8-2 |
| Colfax | R | Project | Drought Contingency/ Water Conservation | Conveyance System Efficiencies | The efficiency of all irrigation systems in Colfax County can be increased significantly by updating diversion works, measuring devices, cleaning the ditches, and checking the grades for proper slope. The ditches can also be lined with an impervious barrier such as concrete or some other hard surface. Augmenting the normal ditch capacity with pipelines would dramatically eliminate conveyance loss during the majority of the diversion season on all systems. Long ditches, such as the Springer Ditch, where there is little groundwater use, are affected by significant losses without a corresponding recharge benefit. Multiple water users, including those with junior water rights, may benefit by minimizing ditch losses. | Steering Committee; see Table 8-2 | A key collaborative project from the Steering Committee, project leads are Springer Ditch Association, Vermejo Conservancy, Permit 71 Water Users, Miami water users Assn, Antelope Valley, Philmont Scout Ranch, CS Ranch, Vermejo Park Ranch, Solvanjen Farms, UU Ranch | NRCS, FSA | | | Millions (full implementation would probably require $500K to $1 million per system). Prioritization of key areas/projects is essential | | See Table 8-2 |
| Colfax | R | Project | Watershed Restoration | Eagle Nest Release Management | The Middle Cimarron River supports a vibrant fishery between Eagle Nest Dam and the Village of Cimarron. Arranging for voluntary transactions to support sufficient flow during winter months would provide for a sustainable trout habitat in this region. A study commissioned by New Mexico Game and Fish in 2014 determined that "New Mexico has more than 160,000 resident and non-resident anglers who spent $268 million a year on fishing related activities." The Middle Cimarron River provides an economic net benefit for all of Colfax County and much of Taos, Mora, and San Miguel Counties. Release management also considers voluntary leasing and release arrangements to support flow during summer months adequate to maintain temperature requirements for the designated use. | Steering Committee; see Table 8-2 | A key collaborative project from the Steering Committee, project lead is Trout Unlimited | Cimarron Watershed Alliance, New Mexico Department of Game and Fish, OSE | | | If a purchaser or lease arrangement would be required, the cost would depend on the amount of water leased or bought and the market price. | | See Table 8-2 |
| Colfax | R | Project | Drought Contingency | Drought Contingency Plan | A drought contingency plan for Colfax County would<br>• Identify prior appropriation arrangements for purchase/leasing of water<br>• Identify "triggers" for implementation of plan<br>• Identify conservation methods and requirements<br>• Explore alternative water resources for both agriculture and potable use | Steering Committee; see Table 8-2 | A key collaborative project from the Steering Committee, project lead is County Emergency Manager | Municipalities and agricultural producers, local economic development organizations | | | $50K for plan; additional funding for implementation | | See Table 8-2 |
| Colfax | R | Project | Water System Infrastructure | Regional Collaboration for Drinking Water Systems | This project would involve collaboration to help small water systems in the region build capacity by sharing resources on issues such as accounting, use of equipment, planning, and, where feasible, water supply. | Steering Committee; see Table 8-2 | A key collaborative project from the Steering Committee, project lead is City of Raton/Raton Water Works | Springer, Maxwell, Cimarron, smaller community systems, possible separate effort in Angel Fire/Eagle Nest | | | Unknown | | See Table 8-2 |

[a] ICIP = Infrastructure Capital Improvement Plan (Some projects may be duplicative of more detailed listings submitted directly by the individual system; all projects are listed for completeness.)

# Regional Water Planning Update

*Projects, Programs, and Policies 5/26/2016*

Water Planning Region: Colfax

| County | Regional (R) or System-Specific (SS) | Strategy Type (Project, Program or Policy) | Category | Project Name | Description | Source of Project Information [a] | Project Lead (Entity or Organization) | Partners (Other Entities or Participants) | Timeframe (Fiscal Year) | Planning Phase | Cost | Need or Reason for Project, Program, or Policy | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Colfax | R | Project | Dam Safety | Dam Project Safety | Multiple dams in the Colfax Region have regulatory compliance issues and aging infrastructure which in some cases presents a safety hazard. While repairs and upgrades are needed, based on the current regulations, the required upgrades may not be realistic. | Steering Committee; see Table 8-2 | A key collaborative project from the Steering Committee, project leads are Dan Campbell – City of Raton, Laura Danielson – Town of Springer | | | | Unknown – Millions | | See Table 8-2 |
| Colfax | R | Project | Drought Contingency | Aquifer Mapping | The proposed project is to complete a study to determine groundwater resources and quality in the Colfax region and the surrounding counties of Harding, Mora, and Union. The policy intent is to identify groundwater resources for future development, identify areas that should not see further development, and educate the public about groundwater resources, management, and conservation of such. | Steering Committee; see Table 8-2 | A key collaborative project from the Steering Committee, project leads are Colfax County, Colfax SWCD, Adelante RC+D (501(c)(3)) | See Table 8-2 | | | $450K for Colfax | | See Table 8-2 |
| Colfax | R | Project | Watershed Restoration | Canadian River Riparian Watershed Restoration | The Canadian River Riparian Restoration Project's goal is to restore the riparian corridors of the Canadian River, both on the main stem and on its tributaries, to a healthy productive state that will provide native habitat for a variety of wildlife and improve water for communities, agriculture, and recreation throughout the course of the watershed. This project is a multi-phase, multi-year, multi-partnered watershed-scale project using a headwaters-down approach on over 2,000 miles of river corridor. Since 2004, CRRP has mapped 880,000 acres of infested riparian area, aerially treated over 15,000 acres of salt cedar, accomplished biological renovation on 435 acres of treated area, mulched over 800 acres, used cut stump method to treat 78 acres, revegetated over 600 acres with native trees and shrubs, and installed riparian fencing. Funding of this project will allow us to continue the successful efforts already invested by its partners. | Canadian River Riperian Restoration Project, Jack Chatfield | Canadian River Riparian Restoration Project | 8 Soil & Water Conservation Districts, NRCS, FSA, State Forestry, USDA Forest Service, NMSU, NMDGF, NM Department of Ag., NMENV | Canadian River Riparian Restoration is multi-phased and ongoing. Funding request: NMFA WTB 15-16, NMENV 15-16, USDA Forest Srv 15-16, RCPP 15-16 | Planning completed, Successful Watershed Project since 2004 | Approx. $4 million received on grant funding for 15-16. | | |
| Colfax | R | Project | Watershed Restoration | Riparian Watershed Restoration | Riparian watershed restoration. | Water Trust Board Database | Canadian SWCD | | FY2015 | | $600,000 | | |
| Colfax | SS | Project | Watershed Restoration | Ponil Creek Restoration Project, Phase II | | NMED | Cimarron Watershed Alliance | | 1/31/2018 | | $255,106 | | State Project #: 14-D |
| Colfax | SS | Project | Water System Infrastructure | Wastewater Treatment Facility Upgrades | Wastewater Treatment Facility Upgrades: Aging infrastructure and additional processes for regulatory compliance. | City of Raton, Dan Campbell, Water Utility Director | City of Raton | | Within 5 years | | $5,000,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Rehabilitation of Outlet Conduits and Upgrade of Emergency Bypass Spillway at Lake Maloya | Lake Maloya is the primary water supply for the City of Raton. The outlet conduits are over 75 years old and require rehabilitation. The emergency bypass spillway is severely undersized for the current regulations and will require a substantial upgrade to comply with New Mexico Dam Safety Bureau requirements. Lake Maloya is a high-hazard reservoir and both projects are required. | City of Raton, Dan Campbell, Water Utility Director | City of Raton | New Mexico Office of the State Engineer, Dam Safety Bureau | Implementation to begin as soon as possible based on funding availability. Funding request: Office of State Engineer, Legislative, and Water Trust Board. | The Preliminary Engineering Report was completed by AECOM, Denver Colorado (URS Engineering, Inc.) | $40,000,000 | Lake Maloya is the primary water supply for the City of Raton. Lake Maloya is a high-hazard reservoir and both projects are required. | |
| Colfax | SS | Project | Water System Infrastructure | Water Treatment Facility Upgrades | Upgrade of facility equipment, process control, and structures for compliance with regulatory requirements. Funding sources will be local, state, and federal. | City of Raton, Dan Campbell, Water Utility Director | City of Raton | | Implementation to begin when funding is secured. | Preliminary design is complete | $2,500,000 | | |
| Colfax | SS | Project | Water System Infrastructure | RWW-Lake Maloya Dam Safety Improvements | RWW-Lake Maloya Dam Safety Improvements | ICIP 2016-2020 | City of Raton | | 2016-2019 | | $8,050,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Drainage and Storm Drain System Improvements | Drainage and Storm Drain System Improvements | ICIP 2016-2020 | City of Raton | | 2016-2020 | | $1,400,000 | | |
| Colfax | SS | Project | Water System Infrastructure | RWW-Filter Plant Remodel | RWW-Filter Plant Remodel | ICIP 2016-2020 | City of Raton | | 2016-2017 | | $1,050,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Storm Drainage Channel Restoration | Storm Drainage Channel Restoration | ICIP 2016-2020 | City of Raton | | 2016-2020 | | $250,000 | | |

[a] ICIP = Infrastructure Capital Improvement Plan (Some projects may be duplicative of more detailed listings submitted directly by the individual system; all projects are listed for completeness.)

# Regional Water Planning Update

*Projects, Programs, and Policies 5/26/2016*

Water Planning Region: Colfax

| County | Regional (R) or System-Specific (SS) | Strategy Type (Project, Program or Policy) | Category | Project Name | Description | Source of Project Information [a] | Project Lead (Entity or Organization) | Partners (Other Entities or Participants) | Timeframe (Fiscal Year) | Planning Phase | Cost | Need or Reason for Project, Program, or Policy | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Colfax | SS | Project | Water System Infrastructure | RWW-Highway 555 Lift Station/Force Main | RWW-Highway 555 Lift Station/Force Main | ICIP 2016-2020 | City of Raton | | 2016 | | $150,000 | | |
| Colfax | SS | Project | Water System Infrastructure | RWW-Sugarite Canyon Watershed Rehabilitation | RWW-Sugarite Canyon Watershed Rehabilitation | ICIP 2016-2020 | City of Raton | | 2016-2020 | | $2,625,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Westside Storm Drainage Improvements | Westside Storm Drainage Improvements | ICIP 2016-2020 | City of Raton | | 2017-2020 | | $800,000 | | |
| Colfax | SS | Project | Water System Infrastructure | RWW-Collection System Improvement | RWW-Collection System Improvement | ICIP 2016-2020 | City of Raton | | 2017-2019 | | $150,000 | | |
| Colfax | SS | Project | Water System Infrastructure | RWW-Cimarron Filtration Facility | RWW-Cimarron Filtration Facility | ICIP 2016-2020 | City of Raton | | 2017 | | $5,000,000 | | |
| Colfax | SS | Project | Water System Infrastructure | RWW-Water Distribution Improvement | RWW-Water Distribution Improvement | ICIP 2016-2020 | City of Raton | | 2017-2018 | | $250,000 | | |
| Colfax | SS | Project | Water System Infrastructure | RWW-Reclaim Lake and Pumps | RWW-Reclaim Lake and Pumps | ICIP 2016-2020 | City of Raton | | 2018-2020 | | $21,000,000 | | |
| Colfax | R | Project | Other | Colfax County Geohydrology Study | Colfax County Geohydrology Study | ICIP 2017-2021 | City of Raton | | 2017 | | $50,000 | Identify alternative water sources for drought contingency and general use | |
| Colfax | SS | Project | Water System Infrastructure | RWW-Lake Maloya Dam Safety Improvements | RWW-Lake Maloya Dam Safety Improvements | ICIP 2017-2021 | City of Raton | | 2017-2020 | | $8,000,000 | OSE mandated changes to comply with Dam Safety regulations | |
| Colfax | SS | Project | Water System Infastructure | Raton Drainage System Improvements | To plan, design, repair, construct, and improve the storm drain system in Raton | Legislative Council Service, 52nd Legislature, 2nd Session, 2016 | City of Raton | | | | $300,000 | | |
| Colfax | SS | Project | Water System Infastructure | Raton Water Treatment Facility Renovation | To plan, design, construct, renovate, and equip the water treatment facility in Raton | Legislative Council Service, 52nd Legislature, 2nd Session, 2016 | City of Raton | | | | $1,585,000 | | |
| Colfax | SS | Project | Watershed Restoration | Track Fire Burn Area Perennial Stream Restoration Project (RSP) | | NMED | City of Raton | | 6/30/2018 | | $149,990 | | State Project #: 15-I |
| Colfax | SS | Project | Investigation | Colfax County Geohydrology Study | Colfax County Geohydrology Study | ICIP 2016-2020 | Colfax County | | 2016 | | $28,000 | | |
| Colfax | R | Policy | Water Quality | Develop policies that address oil and gas development that protect water quality | Oil and Gas Policies | Steering Committee Meeting | Colfax County | | 2017-2021 | | | | |
| Colfax | R | Project | Groundwater Investigation | Investigation of Colfax County Groundwater Resources and Quality | The proposed project is to complete a study to determine groundwater resources and quality in the Colfax region and the surrounding counties of Harding, Mora, and Union. The policy intent is to identify groundwater resources for future development, identify areas that should not see further development, and educate the public about groundwater resources, management, and conservation. The program will be carried out by professional hydrogeologic consulting firms retained by the Colfax SWCD and Colfax County Commission. | Colfax County, Bill Sauble, Colfax County Commissioner | Colfax County Commision and Colfax SWCD | MOU with multiple parties | There is a 3-year time frame to complete the groundwater survey. Funds are being sought to start the project in FY16 with completion in FY18. | Initial planning has been completed. Documents have been prepared outlining the scope of work over a 3-year period for each of the SWCDs within the four-county region. | Total cost over a 3-year period for the 4-county region is $1.723 million. Cost for Colfax County for year 1 is $125,120, year 2 is $125,945, and year 3 is $125,945, with a 15% contingency fee of $56,552. The total cost to the county is $433,562. | | |
| Colfax | R | Project | Watershed Restoration | Riparian Watershed Restoration | Riparian watershed restoration. | Water Trust Board Database | Colfax SWCD | | FY2015 | | $400,000 | | |

[a] ICIP = Infrastructure Capital Improvement Plan (Some projects may be duplicative of more detailed listings submitted directly by the individual system; all projects are listed for completeness.)

# Regional Water Planning Update

*Projects, Programs, and Policies 5/26/2016*

Water Planning Region: Colfax

| County | Regional (R) or System-Specific (SS) | Strategy Type (Project, Program or Policy) | Category | Project Name | Description | Source of Project Information [a] | Project Lead (Entity or Organization) | Partners (Other Entities or Participants) | Timeframe (Fiscal Year) | Planning Phase | Cost | Need or Reason for Project, Program, or Policy | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Colfax | SS | Project | Irrigation Diversion Upgrade | North Side Diversion on Rayado Creek | This diversion provides surface water for agricultural irrigation use for the Express UU Bar Ranch. The existing diversion structure is inefficient, requires excessive and frequent maintenance, negatively impacts stream and riparian habitat, and is a barrier to fish passage. | Watershed Subcommittee via Gus Holm, Vermejo Park Ranch | Express UU Bar Ranch | Cimarron Watershed Alliance, NM Office of the State Engineer, Philmont Scout Ranch | FY 2017 | Under Development | $60,000 | This diversion provides surface water for agricultural irrigation use for the Express UU Bar Ranch. The existing diversion structure is inefficient, requires excessive and frequent maintenance, negatively impacts stream and riparian habitat, and is a barrier to fish passage. | |
| Colfax | SS | Project | Irrigation Diversion Upgrade | Jackson Hickman Diversion on the Cimarron River | This diversion provides surface water for agricultural irrigation use for the Express UU Bar Ranch and other private landowners. The existing diversion structure is inefficient, requires excessive and frequent maintenance, negatively impacts stream and riparian habitat, and is a barrier to fish passage. | Watershed Subcommittee via Gus Holm, Vermejo Park Ranch | Express UU Bar Ranch | Cimarron Watershed Alliance, NM Office of the State Engineer | FY 2017 | Under Development | $70,000 | This diversion provides surface water for agricultural irrigation use for the Express UU Bar Ranch and other private landowners. The existing diversion structure is inefficient, requires excessive and frequent maintenance, negatively impacts stream and riparian habitat, and is a barrier to fish passage. | |
| Colfax | SS | Project | Water System Infrastructure | 4-mile Pipeline | In 2001, the Miami Domestic Water Users Association (provides drinking water to residents) obtained an emergency drinking water grant and installed a 6-inch raw water line from Miami Lake to the filter plant pond (approx. 7 miles). Prior to that, to fill the filter plant, pond water would be released into the canal. During the irrigation periods, the canal provides water to all who have water shares in the lake and 4 residents upstream from and not connected to the treated water distribution system would fill their ponds, which supplied drinking water via their treatment systems. During drought winter and summer months, filling the canal to supply drinking water to 4 residents resulted in an extremely large water loss, which, if consistently maintained through the winter and summer months, would threaten the water reserved in the lake for communtiy drinking water use. Attempts to tap the 6-inch water line for the 4 residents was prohibited by NMED. The alternative being researched is to replace 4 miles of the canal with a pipeline that would provide and save water. | Miami Domestic Water Users, Gayle McBrayer, President, Miami Water Users Assoc.; Mike Vigil, President | Miami Water Users Association | Miami Domestic Water Users Association | Too early to determine time frame and plan implementation. Funding request: As a private, non-profit corporation, MWUA does not qualify for State grants or loans. Researching other alternatives for funding. | MWUA and MDWUA are in the very early stages of researching to ensure that a 20-inch pipe will provide the volume needed for multiple users' irrigation. Although an early cost of the project has been estimated, ongoing research is being done to detemine all costs that need to be finalized, i.e. head gated, cleanouts, Preliminary Engineering Report cost, highway easment/engineering costs, equipment costs, equipment costs, etc. | Approx. $920,000. Annual budget not yet established. | | |
| Colfax | SS | Project | Irrigation Diversion Upgrade | Upper Diversion on Ponil Creek | This diversion provides surface water for agricultural irrigation use for the Chase Ranch. The existing diversion structure is inefficient, requires excessive and frequent maintenance, negatively impacts stream and riparian habitat, and is a barrier to fish passage. | Watershed Subcommittee via Gus Holm, Vermejo Park Ranch | Philmont Scout Ranch | Chase Ranch Foundation, Cimarron Watershed Alliance, Vermejo Park Ranch, NM Office of the State Engineer | FY 2016 | Under Development | $60,000 | This diversion provides surface water for agricultural irrigation use for the Chase Ranch. The existing diversion structure is inefficient, requires excessive and frequent maintenance, negatively impacts stream and riparian habitat, and is a barrier to fish passage. | |
| Colfax | SS | Project | Irrigation Diversion Upgrade | Middle Diversion on Ponil Creek | This diversion provides surface water for agricultural irrigation use for the Chase Ranch. The existing diversion structure is inefficient, requires excessive and frequent maintenance, negatively impacts stream and riparian habitat, and is a barrier to fish passage. | Watershed Subcommittee via Gus Holm, Vermejo Park Ranch | Philmont Scout Ranch | Chase Ranch Foundation, Cimarron Watershed Alliance, NM Office of the State Engineer | FY 2016 | Under Development | $60,000 | The proposed upgrades to this irrigation diversion structure will improve system efficiency, reduce maintenance costs, and improve stream habitat and function. | |
| Colfax | SS | Project | Irrigation Diversion Upgrade | South Side Diversion on Rayado Creek | This diversion provides surface water for agricultural irrigation use for Philmont Scout Ranch and the Express UU Bar Ranch. The existing diversion structure is inefficient, requires excessive and frequent maintenance, negatively impacts stream and riparian habitat, and is a barrier to fish passage. | Watershed Subcommittee via Gus Holm, Vermejo Park Ranch | Philmont Scout Ranch | Cimarron Watershed Alliance, NM Office of the State Engineer, Express UU Bar Ranch | FY 2017 | Under Development | $60,000 | This diversion provides surface water for agricultural irrigation use for Philmont Scout Ranch and the Express UU Bar Ranch. The existing diversion structure is inefficient, requires excessive and frequent maintenance, negatively impacts stream and riparian habitat, and is a barrier to fish passage. | |
| Colfax | SS | Project | Dam Safety | Dam Safety/ Repairs and Upgrades | | RWP Update Table 5-7, OSE Dam Safety Bureau | See Table 5-7 | See Table 5-7 | | | See Table 5-7 | | |
| Colfax | SS | Project | Water System Infrastructure | Drill Replacement Well | Drill Replacement Well | ICIP 2017-2021 | Town of Maxwell | | 2017 | | $1,000,000 | The Village is currently purchasing water from Maxwell water users in order to keep up with demand. The wells are pumping 24 hours a day, 7 days a week, to keep up. | |
| Colfax | SS | Project | Water System Infrastructure | Water System Improvements | Water System Improvements | ICIP 2016-2020 | Town of Springer | | 2016 | | $1,175,000 | | |

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# Regional Water Planning Update

*Projects, Programs, and Policies 5/26/2016*

Water Planning Region: Colfax

| County | Regional (R) or System-Specific (SS) | Strategy Type (Project, Program or Policy) | Category | Project Name | Description | Source of Project Information [a] | Project Lead (Entity or Organization) | Partners (Other Entities or Participants) | Timeframe (Fiscal Year) | Planning Phase | Cost | Need or Reason for Project, Program, or Policy | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Colfax | SS | Project | Water System Infrastructure | Rehabilitation DAM 1&2 | Rehabilitation DAM 1&2 | ICIP 2016-2020 | Town of Springer | | 2016 | | $8,410,270 | | |
| Colfax | SS | Project | Water System Infrastructure | Wastewater Treatment Plant | Wastewater Treatment Plant | ICIP 2016-2020 | Town of Springer | | 2018-2019 | | $1,850,000 | | |
| Colfax | SS | Project | Wastewater System Infrastructure | Wastewater Treatment Plant | Wastewater Plant and System Improvements | ICIP 2017-2021 | Town of Springer | | 2017 | | $1,015,000 | Springer currently under compliance order to upgrade wastewater treatment plant. | |
| Colfax | SS | Project | Water System Infrastructure | Rehabilitation DAM 1&2 | Rehabilitation Dam 1&2 | ICIP 2017-2021 | Town of Springer | | 2017 | | $8,975,850 | Designed permanent spillway needed | |
| Colfax | SS | Project | Water System Infrastructure | Water System Improvements | Water System Improvements | ICIP 2017-2021 | Town of Springer | | 2017 | | $1,175,000 | Dirt lined system needs upgrade for Safe Drinking Water | |
| Colfax | SS | Project | Water System Infrastructure | Springer wastewater plant upgrades | Springer wastewater plant upgrades | Legislative Capital Outlay Database | Town of Springer | | FY2015 | | $20,000 | | Fund: STB |
| Colfax | SS | Project | Water System Infastructure | Springer Wastewater Treatment Plant | To plan, design, construct, and renovate the wastewater treatment plant in Springer | Legislative Council Service, 52nd Legislature, 2nd Session, 2016 | Town of Springer | | | | $300,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Disinfection Byproducts Treatment | Disinfection byproducts treatment - install preozonation | Town of Springer, Laura Danielson, Water/Wastewater Manager | Town of Springer | | First phase will begin when the dam is complete, fall 2015. The next depends on the results of phase I. Funding request: $75,000 of Capital Outlay 2015. Fund form several sources 2016. | Look at in the water system Preliminary Engineering Report. | $344,000 annual cost $32,400 | | |
| Colfax | SS | Project | Water System Infrastructure | Wastewater Plant Upgrade | Wastewater plant upgrade, fix current wastewater plant, line lagoons, install monitoring wells. | Town of Springer, Laura Danielson, Water/Wastewater Manager | Town of Springer | | Have $75,000 Capital Outlay 2014, request 2016 RUS, state, etc. | Have gone out for RFP for Engineering (PER). | $1.5 million | | |
| Colfax | SS | Project | Water System Infrastructure | Backwash Disposal Ponds | Backwash disposal ponds. | Town of Springer, Laura Danielson, Water/Wastewater Manager | Town of Springer | | Hope to go out for bid in the fall. Completion by spring 2016. Funding request: 2014 capital outlay. | Project designed and ready for constiution bidding | $156,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Distribution Improvements | Distribution improvements, replace deficient lines, fire safety (increase size of lines to fire hydrants), new fire hydrants, flushing valves on dead ends. | Town of Springer, Laura Danielson, Water/Wastewater Manager | Town of Springer | | One year. Funding request: will be submitted 2016 & 2017. | Preliminary Engineering Report done. | $946,300 | | |
| Colfax | R | Project | Irrigation Diversion Upgrade | Springer Ditch Improvements | The Springer Ditch begins as a point of diversion off the Cimarron River and supplies water for municipal use and irrigation. The ditch is approximately 10.9 miles long. The ditch is earthen and water is lost along the entire length due to the soils the ditch is constructed in and through. The efficiency of Springer Ditch can be increased significantly by cleaning the ditch and checking the grade for proper slope. The ditch can also be lined with an impervious barrier such as concrete or some other hard surface. The efficiency can also be increased by augmenting the normal ditch capacity with a pipeline. The current project being explored is to install pipe to convey the normal ditch flow (defined as 50 cfs) and use the earthen ditch for periods of high flow. This would dramatically eliminate conveyance loss during the majority of the diversion season. | Watershed Subcommittee via Gus Holm, Vermejo Park Ranch | Town of Springer and Springer Ditch Company | Cimarron Watershed Alliance | FY 2017 | Development | $2,955,768 | The Springer Ditch begins as a point of diversion off the Cimarron River and supplies water for municipal use and irrigation. The ditch is approximately 10.9 miles long. The ditch is earthen and water is lost along the entire length due to the soils the ditch is constructed in and through. The efficiency of Springer Ditch can be increased significantly by cleaning the ditch and checking the grade for proper slope. The ditch can also be lined with an impervious barrier such as concrete or some other hard surface. The efficiency can also be increased by augmenting the normal ditch capacity with a pipeline. The current project being explored is to install pipe to convey the normal ditch flow (defined as 50cfs) and utilize the earthen ditch for periods of high flow. This would dramatically eliminate conveyance loss during the majority of the diversion season. | |

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# Regional Water Planning Update

*Projects, Programs, and Policies 5/26/2016*

Water Planning Region: Colfax

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| Colfax | R | Project | Habitat Improvement | Middle Cimarron River Low Flow | The Middle Cimarron River supports vibrant fisheries between Eagle Nest Dam and the Village of Cimarron. Providing for a minimum low flow during winter months would provide for a sustainable trout habitat in this reach. A study commission by New Mexico Game and Fishing in 2014 determined that "New Mexico has more than 160,000 resident and nonresident anglers who spend $268 million a year on fishing related activates." The Middle Cimarron River provides an economic net benefit for all of Colfax County and much of Taos, Mora, and San Miguel Counties. | Watershed Subcommittee via Gus Holm, Vermejo Park Ranch | Trout Unlimited | Cimarron Watershed Alliance, NM Game & Fish, Village of Cimarron, Community of Ute Park | FY2018 | Under Development | $100,000 | The Middle Cimarron River supports vibrant fisheries between Eagle Nest Dam and the Village of Cimarron. Providing for a minimum low flow during winter months would provide for a sustainable trout habitat in this reach. A study commission by New Mexico Game and Fishing in 2014 determined that "New Mexico has more than 160,000 resident and nonresident anglers who spend $268 million a year on fishing related activates." The Middle Cimarron River provides an economic net benefit for all of Colfax County and much of Taos, Mora, and San Miguel Counties. | |
| Colfax | SS | Project | Irrigation Diversion Upgrade | Old Mill Diversion on the Cimarron River | This diversion provides surface water for agricultural irrigation use for Vermejo Park Ranch and other private landowners. The existing diversion structure is inefficient, requires excessive and frequent maintenance, negatively impacts stream and riparian habitat, and is a barrier to fish passage. | Watershed Subcommittee via Gus Holm, Vermejo Park Ranch | Vermejo Park Ranch | Cimarro Watershed Alliance, NM Office ot the State Engineer | FY 2017 | Under Development | $70,000 | This diversion provides surface water for agricultural irrigation use for Vermejo Park Ranch and other private landowners. The existing diversion structure is inefficient, requires excessive and frequent maintenance, negatively impacts stream and riparian habitat, and is a barrier to fish passage. | |
| Colfax | SS | Project | Water System Infrastructure | Wastewater Plant Upgrade | Wastewater Plant Upgrade | ICIP 2016-2020 | Village of Angel Fire | | 2016 | | $610,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Village Water Tank Repair | Village Water Tank Repair | ICIP 2016-2020 | Village of Angel Fire | | 2016, 2018 | | $1,850,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Extend Sewer System | Extend Sewer System | ICIP 2016-2020 | Village of Angel Fire | | 2016 | | $3,350,000 | | |
| Colfax | SS | Project | Water System Infrastructure | SCADA (Supervisory Control And Data Acquisition) | SCADA (supervisory control and data acquisition) | ICIP 2016-2020 | Village of Angel Fire | | 2016 | | $300,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Storm Drain Master Plan | Storm Drain Master Plan | ICIP 2016-2020 | Village of Angel Fire | | 2016-2018 | | $1,130,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Water Rights Acquisition | Water Rights Acquisition | ICIP 2016-2020 | Village of Angel Fire | | 2016 | | $500,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Drill New NW Well/Storage Tank | Drill New NW Well/Storage Tank | ICIP 2016-2020 | Village of Angel Fire | | 2017-2019 | | $1,330,000 | | |
| Colfax | SS | Project | Water System Infrastructure | West Side Country Club Area Water Well | West Side Country Club Area Water Well | ICIP 2016-2020 | Village of Angel Fire | | 2018-2020 | | $1,160,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Water Reuse Project | Water Reuse Project | ICIP 2016-2020 | Village of Angel Fire | | 2018 | | $2,055,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Mobile Home Estates Sewer Line | Mobile Home Estates Sewer Line | ICIP 2016-2020 | Village of Angel Fire | | 2018 | | $207,000 | | |
| Colfax | SS | Project | Wastewater System Infrastructure | Wastewater Plant Equipment | Wastewater Plant Equipment | ICIP 2017-2021 | Village of Angel Fire | | 2017 | | $800,000 | Upgrades needed to comply with EPA standards | |
| Colfax | SS | Project | Water System Infrastructure | Village Water Tank Repair | Village Water Tank Repair | ICIP 2017-2021 | Village of Angel Fire | | 2017, 2019 | | $1,850,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Water Rights Acquisition | Water Rights Acquisition | ICIP 2017-2021 | Village of Angel Fire | | 2017 | | $3,000,000 | | |

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# Regional Water Planning Update

*Projects, Programs, and Policies 5/26/2016*

Water Planning Region: Colfax

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Colfax | SS | Project | Water System Infrastructure | Storm Drain Master Plan | Storm Drain Master Plan | ICIP 2017-2021 | Village of Angel Fire | | 2017 | | $1,130,000 | | |
| Colfax | SS | Project | Water System Infastructure | Angel Fire Water Storage Tanks | To plan, design, construct, and repair water storage tanks in Angel Fire | Legislative Council Service, 52nd Legislature, 2nd Session, 2016 | Village of Angel Fire | | | | $1,850,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Wastewater Plant Upgrade; Renovate/Repair Policies | Federal statutory change (proposed new NPDES Permit changes) Construct and purchase upgrades to the Wastewater Treatment Plant to include; 1. Replacement of the existing mechanical nar screen with an improved cold weather model needed for this region. 2. Replacement of the existing UV disinfection system. Existing system is in need of major repairs and no technical support is available in State or Region. Installation of both projects will be completed by Village of Angel Fire personnel.Projects will improve the treatment of final effluent of the Wastewater Treatment facility in order to remain compliant with State and EPA requirements. | Village of Angel Fire, Amos Torrez, Public Works Director | Village of Angel Fire | | This project will begin summer of 2016 and is scheduled for completion summer of 2020. Funding request has been submitted, and will be resubmitted to the Water Trust Board. | The project is in the planning phase. | $610,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Repair Storage Tanks | Master Plan- Repair water storage tanks using BID process. Phase 1: tanks #1, 2, 3 4, 5, 6, & 8. Phase 2: tanks #2, 5, 7, 9, &10. These are old tanks, 20 years or older and are in need of repair and refurbishing. These tanks have been inspected with underwater remote cameras. Tanks have developed pockets of oxidation that have to be removed. Tanks have to be emptied, walls scraped, filled with epoxy and completely re-coated. Repairs have to occur in warm summer months. | Village of Angel Fire, Amos Torrez, Public Works Director | Village of Angel Fire | | This project will begin summer of 2016 and is scheduled for completion summer of 2020. | The project is in the planning phase and ready to begin the BID process. | The total cost would be $1,850,000; the current funded amount is $100,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Coffey Well #2 | Coffey Well #2 | Water Trust Board Database | Village of Angel Fire | | FY2015 | | $564,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Water System Improvements | Water system improvements - tank rehabilitation. | Water Trust Board Database | Village of Angel Fire | | FY2015 | | $998,000 | | |
| Colfax | SS | Project | Water System Infrastructure | SCADA | SCADA | Water Trust Board Database | Village of Angel Fire | | FY2015 | | $889,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Wastewater Treatment Facility Zero | Wastewater Treatment Facility Zero | ICIP 2016-2020 | Village of Cimarron | | 2016-2017 | | $5,715,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Filter Plant | Filter Plant | ICIP 2016-2020 | Village of Cimarron | | 2016-2017 | | $1,800,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Wastewater Line Replacement | Wastewater Line Replacement | ICIP 2016-2020 | Village of Cimarron | | 2016-2020 | | $1,750,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Cimarroncito Dam | Cimarroncito Dam | ICIP 2016-2020 | Village of Cimarron | | 2016-2019 | | $1,875,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Water Line Replacement | Water Line Replacement | ICIP 2016-2020 | Village of Cimarron | | 2016-2020 | | $1,750,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Water Rights | Water Rights | ICIP 2016-2020 | Village of Cimarron | | 2016-2020 | | $550,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Water Transmission Line, Phase V | Water Transmission Line, Phase V | ICIP 2016-2020 | Village of Cimarron | | 2016-2018 | | $2,565,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Wastewater Treatment Facility Zero Discharge | Wastewater Treatment Facility Zero Discharge | ICIP 2017-2021 | Village of Cimarron | | 2017-2018 | | $5,715,000 | This project eliminates groundwater and land contamination from failing lagoon linings | |
| Colfax | SS | Project | Water System Infrastructure | Filter Plant | Filter Plant | ICIP 2017-2021 | Village of Cimarron | | 2017-2018 | | $1,800,000 | Project needed to meet regulatory requirements | |
| Colfax | SS | Project | Water System Infrastructure | Waterline Replacement | Waterline Replacement | ICIP 2017-2021 | Village of Cimarron | | 2017-2021 | | $1,750,000 | Ensure safe drinking water | |

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Water Planning Region: Colfax

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| Colfax | SS | Project | Water System Infrastructure | Wastewater Line Replacement | Wastewater Line Replacement | ICIP 2017-2021 | Village of Cimarron | | 2017-2021 | | $1,750,000 | Protect groundwater from leakage and breakage of wastewater pipes | |
| Colfax | SS | Project | Water System Infrastructure | Cimarroncito Dam | Cimarroncito Dam | ICIP 2017-2021 | Village of Cimarron | | 2018-2020 | | $1,860,000 | Increase security and protect the water supply | |
| Colfax | SS | Project | Water System Infastructure | Cimarron Wastewater Lines Replace | To plan, design, and construct wastewater line replacements in Cimarron | Legislative Council Service, 52nd Legislature, 2nd Session, 2016 | Village of Cimarron | | | | $350,000 | | |
| Colfax | SS | Project | Water System Infastructure | Cimarron Wastewater Treatment Facility | To plan, design, construct, furnish, and equip a wastewater treatment facility in Cimarron | Legislative Council Service, 52nd Legislature, 2nd Session, 2016 | Village of Cimarron | | | | $4,240,000 | | |
| Colfax | SS | Project | Water System Infastructure | Cimarron Water Filter Plant | To plan, design, and construct a water filter plant in Cimarron | Legislative Council Service, 52nd Legislature, 2nd Session, 2016 | Village of Cimarron | | | | $350,000 | | |
| Colfax | SS | Project | Water System Infastructure | Cimarroncito Dam Improvement - Cimarron | To plan, design, construct and renovate the Cimarroncito dam in Cimarron | Legislative Council Service, 52nd Legislature, 2nd Session, 2016 | Village of Cimarron | | | | $310,000 | | |
| Colfax | SS | Project | Water System Infastructure | Reuse Portion of New Zero Discharge Water | Reuse portion of new zero discharge water, reuse wastewater treatment plant. | Village of Cimarron, Mindy Cahill, Clerk Administrator Village of Cimarron | Village of Cimarron | WTB | 6 months. Funding request: 2016-2017 WTB, Capital Outlay, CDBG | Shovel ready | $1,350,000 | | |
| Colfax | SS | Project | Water System Infrastructure | New Wastewater Treatment Facility | To construct, equip, furnish, and secure a new wastewater treatment facility with no discharge and water reuse. This project is shovel-ready. This is the most CRITICAL infrastructure need of the Village. The current system was built in the 1960's. In 2008, the Village was mandated by EPA Region 6 to apply for a NPDES permit since the discharge receiving waters of French Lake was declared US Waters, which is a tributary of the Cimarron River in segment number 20.6.4.306 of the Canadian River Basin. Vermejo Park Ranch owns French Lake and has requested that the Village stop it's discharge as soon as possible. Funding to-date has this project shovel-ready and NMED has approved the final design. This project is critically needed for the safety and health of the residents, business ant tourists in Cimarron. | Village of Cimarron, Mindy Cahill, Clerk Administrator Village of Cimarron | Village of Cimarron | | Funding request: total amount being requested (capital outlay) is $3,900,000 | Has been thoroughly planned, is ready to begin. Has received prior funding. | $5,715,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Final Design, Environmental Studies, Construction and Bid Documents for a New Water Treatment System | Final Design, Environmental Studies, Construction and Bid Documents for a New Water Treatment System | Village of Cimarron, Mindy Cahill, Clerk Administrator Village of Cimarron | Village of Cimarron | | 6 months. Funding request: $350,000 2016 2017 WTB, CDBG, capital outlay | Final design and construction documents | $1,750,000 | | |
| Colfax | SS | Project | Water System Infrastructure | New Microfiltration Water Treatment Plant | New Microfiltration Water Treatment Plant | Village of Cimarron, Mindy Cahill, Clerk Administrator Village of Cimarron | Village of Cimarron | | 6 months. Funding request: 2016-2017 CDBG, capital outlay, WTB | Needs final design and construction documents | $1,400,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Replacement of Waterlines | Replacement of water lines. | Village of Cimarron, Mindy Cahill, Clerk Administrator Village of Cimarron | Village of Cimarron | | 6 months. Funding request: $350,000 2016-2017 | Shovel ready | $1,750,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Replace Wastewater Lines | Replace wastewater lines. | Village of Cimarron, Mindy Cahill, Clerk Administrator Village of Cimarron | Village of Cimarron | | 6 months. Funding request: $350,000 2016-2017 CDBG, capital outlay | Shovel ready | $1,750,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Upgrades to Cimarroncito Dam | Upgrades to Cimarroncito dam. | Village of Cimarron, Mindy Cahill, Clerk Administrator Village of Cimarron | Village of Cimarron | Dam Safety Bureau | 1 year. Funding request: $1,575,000 2016-2017 WTB, capital outlay CDBG | Currently an analysis of needs assessment is being done. | $1,875,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Micro-filtration Water Improvements | Micro-filtration water treatment system. | Water Trust Board Database | Village of Cimarron | | FY2015 | | $350,000 | | |

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| Colfax | SS | Project | Water System Infastructure | New micro-filtration water treatment plant | Survey and Design | Water Trust Board 2016 Recommendations | Village of Cimarron | | | | $350,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Decommission Lagoons | Decommission Lagoons | ICIP 2016-2020 | Village of Eagle Nest | | 2016-2017 | | $1,200,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Water System Improvements, Phase II | Water System Improvements, Phase II | ICIP 2016-2020 | Village of Eagle Nest | | 2016 | | $1,344,500 | | |
| Colfax | SS | Project | Water System Infrastructure | Sewer to Annexed Areas | Sewer to Annexed Areas | ICIP 2016-2020 | Village of Eagle Nest | | 2017 | | $2,255,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Water System Improvements, Phase III | Water System Improvements, Phase III | ICIP 2017-2021 | Village of Eagle Nest | | 2017-2018 | | $1,075,875 | | |
| Colfax | SS | Project | Water System Infrastructure | Decommission Lagoons | Decommission Lagoons | ICIP 2017-2021 | Village of Eagle Nest | | 2017-2018 | | $1,188,000 | Prevent contamination of Eagle Nest Lake | |
| Colfax | SS | Project | Water System Infrastructure | Eagle Nest water system improve | Eagle Nest water system improve | Legislative Capital Outlay Database | Village of Eagle Nest | | FY2015 | | $50,000 | | Fund: STB |
| Colfax | SS | Project | Water System Infastructure | Eagle Nest Water System Improvements | To plan, design, and construct water system improvements in Eagle Nest | Legislative Council Service, 52nd Legislature, 2nd Session, 2016 | Village of Eagle Nest | | | | $1,075,875 | | |
| Colfax | SS | Project | Water System Infrastructure | Water System Improvements | Project 1 - Water System Improvements Phase II: Installation of new waterlines, fire hydrants, and valves and reconnection of existing meters. This project will replace asbestos/cement and aging and deteriorating waterlines. In addition, valves will be installed to provide operational control of the system, minimizing impact to the users during waterline breaks and maintenance. Improved flow and increased fire supression capabilities. CDBG application in process. Project 2 Phase II of Water System Improvement. Installation of new welded steel storage tank, refurbishing an existing tank, new distribution lines, and appurtenances to provide a complete and functional project. Applied for Water Trust Board funding. Funding not granted. | Village of Eagle Nest, Mary Berglund, Administrator | Village of Eagle Nest | | The project will begin upon funding. Estimate: approximately 9 months (5 months for professional services, followed by 5 months of construction services.). Funding request: CDBG. | The Preliminary Engineering Report has been completed, as well as the application to CDBG with cost analysis of the project. Number 2 on the current ICIP. A full set of contract documents and drawings will be prepared upon notification of funding. | $500,000.00 | | |
| Colfax | SS | Project | Water System Infastructure | Water System Improvement Ph. III | Design and Construction | Water Trust Board 2016 Recommendations | Village of Eagle Nest | | | | $1,000,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Water System Improvements - Phase II | Water system improvements - phase II. | Water Trust Board Database | Village of Eagle Nest | | FY2015 | | $965,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Drill Replacement Well | Drill Replacement Well | ICIP 2016-2020 | Village of Maxwell | | 2016 | | $1,000,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Water Distribution System Improvements | Water Distribution System Improvements | ICIP 2016-2020 | Village of Maxwell | | 2016 | | $804,500 | | |
| Colfax | SS | Project | Water System Infrastructure | Water Storage Tank Replacement | Water Storage Tank Replacement | ICIP 2016-2020 | Village of Maxwell | | 2016 | | $500,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Sewer Lagoon Liner Replacement/ Repair | Sewer Lagoon Liner Replacement/Repair | ICIP 2016-2020 | Village of Maxwell | | 2017 | | $100,000 | | |
| Colfax | SS | Project | Water System Infrastructure | Maxwell sewer lagoon liners | Maxwell sewer lagoon liners | Legislative Capital Outlay Database | Village of Maxwell | | FY2015 | | $50,000 | | Fund: STB |
| Colfax | SS | Project | Water System Infastructure | Maxwell Water Storage Tank Install | To plan, design, construct, purchase, and install a water storage tank in Maxwell | Legislative Council Service, 52nd Legislature, 2nd Session, 2016 | Village of Maxwell | | | | $500,000 | | |

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| Colfax | SS | Project | Drill New Well | Maxwell Water Well Project | The Village of Maxwell will be utilizing $1,000,000 capital outlay/SAP funds for this Maxwell Water Well Project. The project location is the Village of Maxwell Well field, within the existing 175-acre easement. The Village water source is a shallow aquifer, less than fifty feet below the ground surface. Historically, the Village sited wells near artesian springs, and developed the wells with piping water 2.5 miles to the Village. Recent prolonged drought conditions have led to a reduction of the saturated thickness of the shallow aquifier, and several of the municipal wells have gone dry, whilst others flow with less than 18 gallons/minute. The community currently uses more water than is provided by the well field. Areas that need to be performed are as follows: Plan, design and drill a deep water well for the village of Maxwell. As part of the planning process, a hydro geological study needs to be included (analyses to determine a preferred alternative for improving the water supply). Additional information contained within the PER should include: Review if existing aerial photography, and topographic data to determine a potential well site within the existing easement. Specifying an exploratory well drilled at that site to confirm subsurface strata at the shallow aquifer as well as the deeper aquifer, collecting and submitting samples for laboratory testing to gain confidence in physical properties of the aquifer(s) as well as determine preliminary water quality characteristics. The PER shall follow RUS Bulletin 1780-2 format. In addition to developing a new well, the PER, which evaluates alternatives, will require other alternatives for providing a potable water source to the Village of Maxwell. | Village of Maxwell, Joanna Taylor, Village Clerk | Village of Maxwell | NMED | 2014-2018. Funding request: Capital Outlay 2014 | PER will be the first stage. | The Village of Maxwell received a $1,000,000 capital outlay in 2014. | Historically, the Village sited wells near artesian springs, and developed the wells with piping water 2.5 miles to the Village. Recent prolonged drought conditions have led to a reduction of the saturated thickness of the shallow aquifier, and several of the municipal wells have gone dry, while others flow with less than 18 gpm. The community currently uses more water than is provided by the well field. | |

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