

# Discovery Report

Animas Watershed, Colorado and New Mexico  
*HUC-8 No. 14080104*

**Colorado:** La Plata and San Juan Counties; City of Durango and Town of Silverton;  
Southern Ute Indian Tribe

**New Mexico:** San Juan County; Cities of Aztec and Farmington

October 12, 2016



FEMA



## Accreditation Page

This Animas Watershed Discovery Report is a result of a joint effort across two states and two Federal Emergency Management Agency (FEMA) Regions. The Colorado Water Conservation Board (CWCB) and their consultant, AECOM, conducted Discovery efforts in Colorado. FEMA and their cooperating technical partner, the University of New Mexico (UNM) Earth Data Analysis Center (EDAC), conducted Discovery efforts in New Mexico. A number of federal, state, and local agencies, as well as watershed coalitions and initiatives, supported this Discovery Process, as described in Section 3.1 of this Report. For consistency purposes, where portions are discussed separately, Colorado is discussed first, followed by New Mexico. The communities addressed in this Report are listed in the table below.

Community Name	FEMA Community Identification Number (CID)
<b><i>La Plata County Communities (CO)</i></b>	
Durango, City of	080099
La Plata County (Unincorporated Areas)	080097
Southern Ute Indian Tribe*	N/A
<b><i>San Juan County Communities (CO)</i></b>	
Silverton, Town of	080165
San Juan County (Unincorporated Areas)	080267
<b><i>San Juan County Communities (NM)</i></b>	
Aztec, City of	350065
Farmington, City of	350067
San Juan County (Unincorporated Areas)	350064

\*This report considers the entire extent of the Southern Ute Indian Tribe, which includes areas outside of the Animas HUC-8 Watershed in La Plata and Archuleta counties.

# TABLE OF CONTENTS

---

<b>Section 1</b>	<b>Introduction and Discovery Overview .....</b>	<b>1-1</b>
1.1	Risk MAP and Discovery Process Overview .....	1-1
1.2	Animas Watershed Selection and Project Objectives .....	1-4
1.3	Report Organization .....	1-4
<b>Section 2</b>	<b>General Watershed Information .....</b>	<b>2-1</b>
2.1	Geography and Hydraulic Characteristics .....	2-1
2.2	Population and Communities .....	2-2
2.3	Disaster Declarations .....	2-6
<b>Section 3</b>	<b>Watershed Stakeholder Coordination .....</b>	<b>3-1</b>
3.1	Partners .....	3-1
3.2	Communities .....	3-26
<b>Section 4</b>	<b>Summary of Obtained Data .....</b>	<b>4-1</b>
4.1	Information Useful for Flood Risk Analysis .....	4-1
4.1.1	Hydrologic Analysis .....	4-1
4.1.2	Hydraulics and Floodplain Analysis .....	4-8
4.1.3	Fluvial Erosion Hazards .....	4-11
4.1.4	Levees and Dams .....	4-12
4.1.5	Topographic Data .....	4-12
4.1.6	CNMS Review .....	4-15
4.2	Information Useful for Non-Flood Hazard Evaluation .....	4-18
4.2.1	Wildfire Hazards .....	4-18
4.2.2	Wind and Severe Weather .....	4-25
4.2.3	Debris Flow Hazards .....	4-26
4.2.4	Other Geologic Hazards .....	4-27
4.2.5	Environmental Considerations .....	4-27
4.2.6	Avalanche Information .....	4-34
4.3	Financial and Damage Related Information .....	4-37
4.3.1	Loss and Insurance Claims .....	4-37
4.3.2	Funding and Grants .....	4-40
4.4	Other Available Mitigation Information .....	4-43
4.4.1	Letters of Map Change (LOMC) .....	4-43
4.4.2	Vegetation Information .....	4-46
4.4.3	Inventory of Ongoing Studies and Coordination Efforts .....	4-49
4.4.4	Local Ordinance Review .....	4-52
4.4.5	Mitigation Plan Status and Available Actions .....	4-52
4.4.6	CACs/CAVs/Other Engagement .....	4-56
4.4.7	Mitigation Action Tracker .....	4-57

# TABLE OF CONTENTS

---

<b>Section 5</b>	<b>Discovery Meeting and Follow Up.....</b>	<b>5-1</b>
5.1	Discovery Meeting Summary .....	5-1
5.1.1	Colorado Discovery Meetings .....	5-1
5.1.2	New Mexico Discovery Meeting.....	5-2
5.2	Project Planning .....	5-3
<b>Section 6</b>	<b>Community Profiles and Action Items .....</b>	<b>6-1</b>
6.1	Potential Mitigation Actions – Overview and Watershed Wide.....	6-1
6.2	Potential Mitigation Actions – By Community .....	6-4
6.2.1	La Plata County .....	6-4
6.2.2	San Juan County (CO) .....	6-8
6.2.3	City of Durango .....	6-11
6.2.4	Town of Silverton.....	6-13
6.2.5	Southern Ute Indian Tribe.....	6-15
6.2.6	City of Aztec.....	6-18
6.2.7	City of Farmington.....	6-19
6.2.8	San Juan County (NM).....	6-21
<b>Section 7</b>	<b>References.....</b>	<b>7-1</b>
<b>Section 8</b>	<b>Exhibits and Appendices.....</b>	<b>8-1</b>

## List of Tables

Table 1:	NFIP Status of Project Area Communities .....	2-6
Table 2:	Disaster Declarations in the Watershed.....	2-7
Table 3:	Partner Information for Colorado and New Mexico Discovery Efforts.....	3-3
Table 4:	Information for and Discussions with Colorado and New Mexico Communities .....	3-27
Table 5:	Stream Gage Data.....	4-3
Table 6:	Comparison of Log-Pearson Type III Gage Analysis Results to Effective Discharges .....	4-7
Table 7:	CNMS Approximate Stream Mileage in the Watershed .....	4-15
Table 8:	CNMS Streams Analysis of Watershed.....	4-16
Table 9:	NPL-Related Environmental Sites in San Juan County .....	4-28
Table 10:	Total NFIP Insurance Claims .....	4-37
Table 11:	Local Ordinances.....	4-52
Table 12:	Mitigation Plan Status.....	4-53
Table 13:	History of Engagement .....	4-56
Table 14:	Watershed-Wide Mitigation Actions.....	6-1
Table 15:	Hazard Vulnerability Rating Summary – Risk Rankings.....	6-3
Table 16:	LPC Mitigation Actions.....	6-4
Table 17:	San Juan County (CO) Mitigation Actions.....	6-8
Table 18:	City of Durango Mitigation Actions.....	6-11
Table 19:	Town of Silverton Mitigation Actions.....	6-13
Table 20:	Southern Ute Indian Tribe Mitigation Actions .....	6-15
Table 21:	City of Aztec Mitigation Actions .....	6-18
Table 22:	City of Farmington Mitigation Actions .....	6-19

# TABLE OF CONTENTS

---

Table 23: San Juan County (NM) Mitigation Actions .....	6-21
---	------

## List of Figures

Figure 1: Animas Watershed and Communities .....	1-3
Figure 2: Population Density .....	2-3
Figure 3: Land Use .....	2-4
Figure 4: Population Change (2012 – 2017) .....	2-5
Figure 5: Extent of Effective Special Flood Hazard Areas within Watershed .....	4-10
Figure 6: Topographic Coverage .....	4-14
Figure 7: CNMS Streams .....	4-17
Figure 8: Wildfire Risk .....	4-19
Figure 9: Wildfire Suppression Difficulty .....	4-20
Figure 10: Rate of Wildfire Spread .....	4-21
Figure 11: Values at Risk Rating .....	4-22
Figure 12: Urban Interface Risk .....	4-23
Figure 13: Drinking Water Importance Areas .....	4-24
Figure 14: Summary of Protected Species in Animas Watershed Area (2010) .....	4-30
Figure 15: Draining Mine Sites and Sensitive Habitats .....	4-31
Figure 16: Mine Inventory and Downstream Groundwater Wells .....	4-32
Figure 17: Historic Avalanche Pathways along Transportation Corridor .....	4-36
Figure 18: NFIP Policies .....	4-38
Figure 19: NFIP Claims .....	4-39
Figure 20: HMGP Application Process .....	4-40
Figure 21: FIRM Status .....	4-45
Figure 22: Vegetation Cover in Animas Watershed .....	4-47
Figure 23: Vegetation Cover in San Juan County .....	4-48
Figure 24: Animas Watershed Project Coordination .....	4-51
Figure 25: Photos of Colorado Discovery Meetings .....	5-2
Figure 26: Photo of New Mexico Discovery Meeting .....	5-3
Figure 27: Risk MAP Lifecycle .....	5-4

## List of Appendices

See attached

# LIST OF ACRONYMS

---

amsl	above mean sea level
ARCF	Animas River Community Forum
ARSG	Animas River Stakeholders Group
AWP	Animas Watershed Partnership
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BMP	best management practices
BOR	Bureau of Reclamation
CACs	Community Assistance Contact
CAVs	Community Assistance Visits
CDBG	Community Development Block Grant
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CDSN	Colorado Data Sharing Network
CERC	Community Engagement Risk Communications
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
CGS	Colorado Geological Survey
CID	Community Identification
CIS	Community Information System
CLOMR	Conditional Letter of Map Revision
CNMS	Coordinated Needs Management Strategy
CO-WRAP	Colorado Wildfire Risk Assessment Portal
CRS	Community Rating System
CSFS	Colorado State Forest Service
CTP	cooperating technical partner
CWCB	Colorado Water Conservation Board
CWPP	Community Wildfire Protection Plan
DEM	Digital Elevation Model
DFIRMs	Digital Flood Insurance Rate Maps
DHSEM	Division of Homeland Security and Emergency Management
DOD	Department of Defense
DOLA	Department of Local Affairs
DNR	Colorado Department of Natural Resources
DRMS	Division of Reclamation and Mining Safety
EDAC	Earth Data Analysis Center
EMPG	Emergency Management Performance Grant
EWP	Emergency Watershed Protection
FEMA	Federal Emergency Management Agency
FMA	Flood Mitigation Assistance
FHZ	Fluvial Hazard Zone

# LIST OF ACRONYMS

---

FIRMs	Flood Insurance Rate Maps
FIS	Flood Insurance Study
FY	Fiscal Year
GIS	Geographic Information System
HEC-2	Hydrologic Engineering Center – Hydraulic Model Program
HEC-RAS	Hydrologic Engineering Center – River Analysis System
HEC-SSP	Hydrologic Engineering Center – Statistical Software Package
HMA	Hazard Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HMP	Hazard Mitigation Plan
HUC	Hydrologic Unit Code
HVRAs	Highly Valued Resources and Assets
INSTAAR	Institute of Arctic & Alpine Research
LiDAR	Light Detection and Ranging
LOMA	Letter of Map Amendment
LOMC	Letter of Map Change
LOMR-F	Letter of Map Revision based on Fill
LOMR-FW	Letter of Map Revision-Floodway
LPC	La Plata County
MAP	Mapping, Assessment, and Planning
MXDs	Map Exchange Documents
NFHL	National Flood Hazard Layer
NFIP	National Flood Insurance Program
NHD	National Hydrography Dataset
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priorities List
NPS	National Park Service
NRCS	Natural Resources Conservation Service
OEM	Office of Emergency Management
PDM	Pre-Disaster Mitigation
PMR	Physical Map Revision
POS	Parks and Open Space
SEMS	Superfund Enterprise Management System
SEO	Office of the State Engineer
SFHA	Special Flood Hazard Area
SHMO	State Hazard Mitigation Officer
SJBH	San Juan Basin Health
SJC	San Juan County
SJRCDC	San Juan Resource Conservation and Development Council
SRL	Severe Repetitive Loss
SSURGO	Soil Survey Geographic Database

# LIST OF ACRONYMS

---

STORET	Storage and Retrieval Data Warehouse
SUIT	Southern Ute Indian Tribe
SWCD	Southwestern Water Conservation District
T&E	threatened and endangered
THIRA	Threat and Hazard Identification and Risk Assessment
TIGER	Topologically Integrated Geographic Encoding and Referencing
TMDL	total maximum daily load
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WQCD	Water Quality Control Division (of CDPHE)



This section outlines the contents of this Draft Discovery Report (Report), describes the Discovery process and the Risk Mapping, Assessment, and Planning (Risk MAP) Program, and provides rationale for why this project and watershed were selected.

## **1.1 RISK MAP AND DISCOVERY PROCESS OVERVIEW**

The Federal Emergency Management Agency (FEMA) is currently implementing the Risk MAP Program across the nation. The purpose of the Risk MAP Program is to continue improvement of flood hazard information for the National Flood Insurance Program (NFIP), to promote increased national awareness and understanding of flood risk, and to support federal, state, and local mitigation actions to reduce risk. Hazard Mitigation is any action taken to reduce or eliminate long term risk to people and property from natural disasters. Hazard Mitigation planning is a process used by State, tribal, and local governments to identify risks and vulnerabilities associated with natural disasters and develop mitigation strategies to reduce or eliminate long term risks.

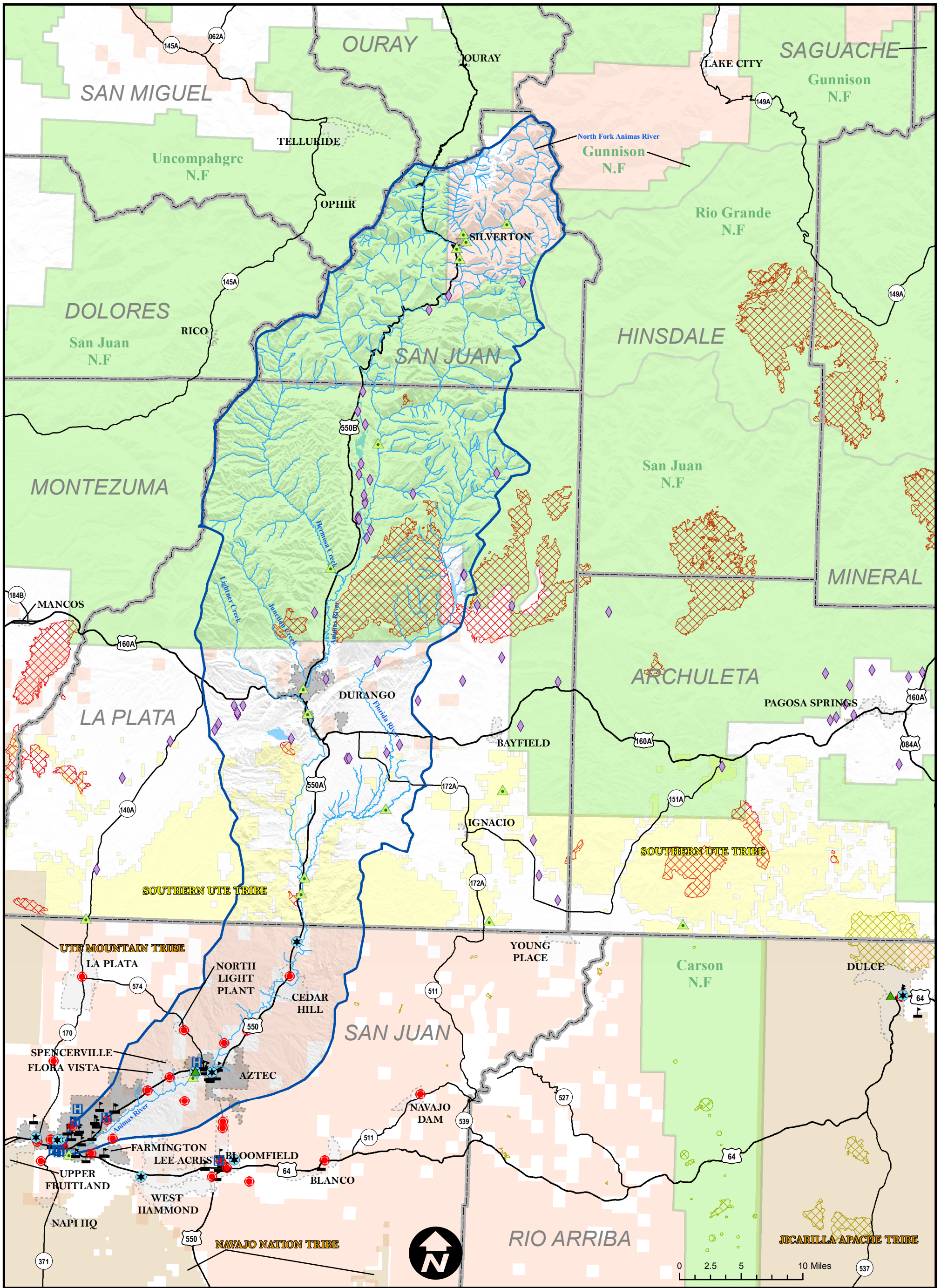
The Colorado Department of Natural Resources (DNR) Colorado Water Conservation Board (CWCB) partnered with the Earth Data Analysis Center (EDAC) in New Mexico to complete a multi-state Discovery effort. CWCB funded this Risk MAP project within Colorado and is leading the project in accordance with FEMA guidelines. FEMA Region VI is funding the New Mexico effort through EDAC acting as a cooperating technical partner (CTP). The CWCB has contracted with AECOM under Contract No. 72809, Task Order 2016-6 to assist in this Discovery process, which includes community engagement, comprehensive data collection, mitigation initiatives and Risk MAP opportunities for the communities within this watershed. This Discovery Report summarizes their findings and includes non-regulatory products for future use by local, state, and federal agencies.

The vision and intent of the Risk MAP Program is to deliver quality data that increases public awareness and leads to mitigation actions that reduce risk to life and property through collaboration with state and local entities. To achieve this vision, Discovery involves an integrated process to more accurately identify, assess, communicate, plan, and mitigate flood and non-flood risks. Risk MAP attempts to address gaps in hazard data and form a solid foundation for risk assessment, floodplain management, hazard mitigation, and provide state and local entities with information needed to mitigate flood and non-flood related risks. A Risk MAP project may include regulatory mapping, risk assessment, mitigation planning, technical assistance, and outreach and communications assistance.

Discovery is the process of evaluating a watershed to determine what components of a flood risk project may be appropriate, by which FEMA can determine what efforts may or will be funded for further flood risk identification and assessment in a collaborative manner, taking into consideration the information collected from local communities during this process. Discovery initiates open lines of communication and relies on local involvement for productive discussions about flood and non-flood risk. The process provides a forum for a watershed-wide effort to understand how an individual community's risks are related to various risks present throughout the watershed. Through Risk MAP, projects are analyzed on a watershed basis, so Discovery Meetings target numerous stakeholders from throughout the watershed on local, regional, state, and federal levels.

Discovery is divided into the following main activities: watershed stakeholder coordination, data collection and analysis, hazard and mitigation evaluation, Discovery Meeting, post-meeting coordination, database updates, and project refinement.

Additional information on the Risk MAP process can be found at [http://www.fema.gov/media-library-data/20130726-1731-25045-5094/what\\_is\\_risk\\_map.pdf](http://www.fema.gov/media-library-data/20130726-1731-25045-5094/what_is_risk_map.pdf). Additional information on the Discovery process can be found at [http://www.fema.gov/media-library-data/20130726-1808-25045-6204/risk\\_map\\_discovery\\_brochure.pdf](http://www.fema.gov/media-library-data/20130726-1808-25045-6204/risk_map_discovery_brochure.pdf), with guidance and standards for Discovery detailed at [https://www.fema.gov/media-library-data/1406747117372-744b6bd203c18ada4806ad4e90c18b81/Discovery\\_Guidance\\_May\\_2014.pdf](https://www.fema.gov/media-library-data/1406747117372-744b6bd203c18ada4806ad4e90c18b81/Discovery_Guidance_May_2014.pdf).



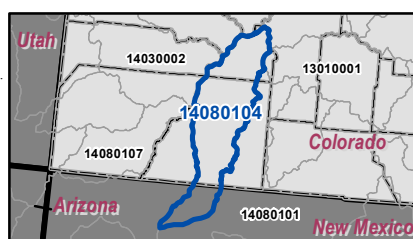
**MAP SYMBOLOLOGY**

- |                                |                               |
|--------------------------------|-------------------------------|
| Animas HUC-8 Watershed         | Waterbody                     |
| County Boundary                | Stream Gages                  |
| City Boundary (Unincorporated) | Dams                          |
| City Boundary (Incorporated)   | Wildfire Burn Areas 2000-2014 |
| Interstate                     | Wildfire Burn Areas 1911-2014 |
| State Highway                  | Emergency Operations Center   |
| Perennial Streams and Rivers   | Hospital                      |
| Southern Ute Land              | Law Enforcement               |
| National Forest                | Fire Departments              |
| BLM                            | Public Schools K-12           |

**NOTES TO USERS**

All information on this map came from public data. Imagery, roads, and political boundaries were supplied by the Colorado Department of Transportation, New Mexico Department of Transportation and ESRI. Hydrographic Features (Streams and HUC Boundaries) were provided by the NRCS, USGS National Hydrography Dataset (NHD) or delineated using USGS NED data.

**WATERSHED LOCATOR**



**Figure 1**  
ANIMAS WATERSHED AND COMMUNITIES

**ANIMAS WATERSHED COLORADO** HUC-8 Code  
14080104

**FEMA**

**COLORADO**  
Colorado Water Conservation Board  
Department of Natural Resources

**EDAC**

**AECOM**

## **1.2 ANIMAS WATERSHED SELECTION AND PROJECT OBJECTIVES**

In early summer 2015, representatives of the states of Colorado (CWCB) and New Mexico (EDAC) selected the Animas Hydrologic Unit Code 8 (HUC-8) Watershed (ID 14080104) for Fiscal Year 2016 (FY16) for a joint-effort Discovery project. The watershed is located in southwestern Colorado and northwestern New Mexico, encompassing parts of La Plata County (LPC) and San Juan County (SJC) in Colorado and San Juan County in New Mexico. Shortly after selecting the Animas HUC8 Watershed for study, the watershed was significantly impacted by the August 2015 Gold King Mine spill, where contaminated wastewater was spilled from the mine near the watershed's headwaters, receiving national attention. The watershed location is presented on Figure 1.

This collaborative effort was coordinated across the two states and two FEMA Regions. This report consists of Discovery efforts for both Colorado and New Mexico communities within the Animas Watershed. Discovery efforts pertaining to Colorado portion of the Animas Watershed were conducted by CWCB and AECOM, whereas FEMA and EDAC conducted Discovery efforts in the New Mexico portion of the watershed.

This Discovery process included proactive community engagement along with watershed data collection regarding flood and non-flood hazards, ongoing mitigation initiatives, and opportunities for Risk MAP-driven action in each of the communities. The Discovery process began in the spring of 2016 with gathering local information and readily available data to determine project viability and the need for Risk MAP products to assist in the movement of communities towards resilience. CWCB and EDAC identified and met with partners in May/June 2016, contacted communities in June/July 2016, and held Discovery Meeting(s) in late July for New Mexico and early August 2016 for communities within Colorado. During Discovery, each partner reached out to local communities to:

- Gather information about local flood risk and flood hazards, as well as non-flood risk and hazards (e.g., wildfire or severe weather).
- Review and discuss current mitigation plans to understand local mitigation capabilities and priorities, hazard risk assessments, and current or future mitigation activities.
- Include multidisciplinary staff from communities to evaluate watershed-wide risks, challenges, and priorities, as well as specific actions and objectives for their respective communities.

## **1.3 REPORT ORGANIZATION**

The results of the Discovery process are presented in this Report. In addition, the Discovery process also produced other non-regulatory products including flood risk maps and databases. The digital data submitted with this Report contain correspondence, exhibits used at the Discovery Meeting, geographic information system (GIS) data, mapping documents (PDF, shapefiles, personal geodatabases and ESRI ArcGIS map exchange documents [MXDs]), or other supplemental digital information. Graphics in this Report are available upon request as larger format graphics files for printing and as GIS data that may be printed and used at any map scale.

This Report is presented according to the following sections:

1. **Introduction and Discovery Overview:** states the purpose and scope of the Discovery and Risk MAP processes.
2. **General Watershed Information:** provides relevant general information about the watershed regarding major waterways and hydraulic characteristics, population, topographic data availability, and major disaster declarations.
3. **Watershed Stakeholder Coordination:** provides an overview of the coordination that took place with the watershed stakeholders, presents their contact information and summarizes their roles or involvement in the process.
4. **Summary of Obtained Data:** contains a summary and analysis of the data and information collected from data gathering efforts and stakeholder engagement.
5. **Discovery Meeting and Follow Up:** provides an overview of the details, content, and outcomes from the meeting, including post-meeting coordination, database updates, and project refinement.
6. **Community Profiles and Action Items:** outlines potential risks or hazards from obtained datasets and recommends potential mitigation actions or considerations for each community.
7. **References**
8. **Exhibits and Appendices:** includes referenced resources and information that was used in compiling this Report and during the Discovery process.

This Section presents general watershed information obtained from various public sources prior to contacting partners or communities.

## 2.1 GEOGRAPHY AND HYDRAULIC CHARACTERISTICS

The Animas HUC-8 Watershed extends approximately 96 miles, from the headwaters in the San Juan Mountains above Silverton Colorado to the confluence of the San Juan River in northern New Mexico, encompassing parts of LPC and SJC in Colorado and San Juan County New Mexico. The Animas River is the largest tributary to the San Juan River, which is one of the many tributaries to the Colorado River. The Animas travels from high alpine to semi-desert environments, undergoing many changes in its physical, chemical, and biological attributes. The Animas River extends 126 miles from its headwaters in the highly-mineralized San Juan Mountains at elevations as great as 14,000 feet above mean sea level (amsl) to its confluence with the San Juan River in the semi-desert sage-brush scrublands of Farmington, New Mexico, at approximately 5,500 feet amsl, draining a total area of 1,357 square miles. The Colorado segment of the Animas Watershed covers approximately 6,000 feet of vertical relief and drains approximately 1,132 square miles. The portion of the Animas Watershed within Colorado is predominantly mountainous terrain, turning to plains in the south within New Mexico. The Animas Watershed is drained by numerous streams, all of which empty into either the Animas River or the Florida River to the east.

The Animas River drains approximately 912 of the total 1,132 square miles that encompass the Colorado portion of the Animas HUC-8 Watershed. The Animas River headwaters drain from the Southern slopes of the San Juan Mountains and join with several tributaries including Cascade Creek, Hermosa Creek, Junction Creek, Lightner Creek and Florida River. The Animas River continues in a primarily south by southwest direction from the confluence with Florida River for four miles until it reaches the state border with New Mexico. From the state border with New Mexico, the Animas River flows another 30 miles southwest through the City of Aztec before reaching a confluence with the San Juan River just south of the City of Farmington, New Mexico. From its origins, the largest contribution to the Animas River is from the Florida River, which contributes a drainage area of approximately 220 square miles.

The rate and volume of stream flow in the Animas vary greatly by season and year. The typical seasonal minimum stream flow occurs during the winter months of November through March. The seasonal maximum occurs during the spring snowmelt period of late April through early June. The greatest stream flows in the Animas have occurred not as a result of the spring snowmelt but during the occasional late summer and early fall floods, which result from the monsoon rains this area receives. The largest of these floods on record came on October 5, 1911. (<http://coloradoencyclopedia.org/article/animas-river>).

Within the Colorado portion of the Animas HUC-8 Watershed, the predominant land ownership is the United States Forest Service (USFS) San Juan National Forest, comprising approximately 55.5% of the area, followed by private land owners, which account for approximately 27% of the land. The Bureau of Land Management owns around 7.4% of the watershed area, while the Southern Ute Indian Tribe (SUIT) owns around 7% of the land. Colorado state-owned and locally owned lands comprise approximately 2.4 % of the watershed area and approximately 0.02% of the lands are owned by the United States Department of Defense (DOD).

Approximately 66% of the land within the Animas Watershed within Colorado is government-

owned and unlikely to be developed or inhabited in the future. This is a considerable portion and notable as development tends to influence risk (e.g., flooding). The land ownership within the New Mexico portion of the Animas River Watershed is approximately 52% BLM, 40% private, and 8% State land.

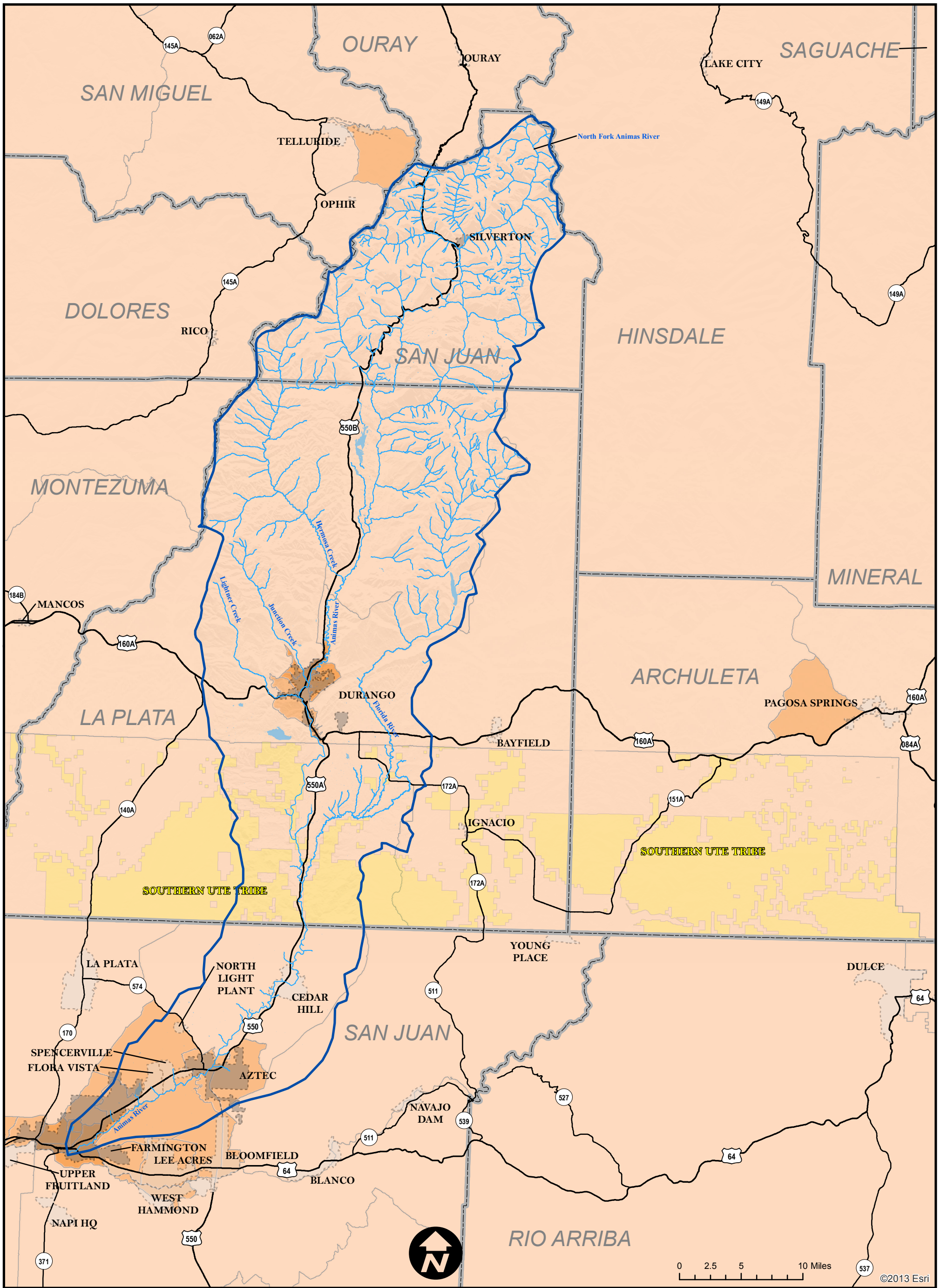
The SUIT is located within the Animas HUC8 Watershed. According to 2013 Topologically Integrated Geographic Encoding and Referencing (TIGER) shapefiles, American Indian Area Geography, and the most recent National Atlas of the United States Indian Lands data, there are no other Tribal Lands located in this watershed.

## **2.2 POPULATION AND COMMUNITIES**

There are a total of five communities inside this watershed within Colorado; these are LPC, SJC, the City of Durango, the Town of Silverton, and the SUIT. The population within the Animas HUC-8 Watershed within Colorado totals approximately 52,033 people, based on the 2010 census. The City of Durango is the watershed's highest population center with an estimated population in 2015 of 18,006 people within the watershed. Figure 2 shows the population densities within the Animas Watershed based on U.S. Census Data 2010. Land use is shown on Figure 3, along with locations of bridges/stream crossings.

Larger Colorado communities (by population) include the City of Durango and LPC unincorporated areas. Significant growth has occurred in the areas surrounding the City of Durango over the last several decades since the housing boom of the 1980s and 1990s. Average annual population growth from 2012 through 2017 (anticipated) is shown on Figure 4.

Within New Mexico, the Animas Watershed is located in the northwestern corner of the State in San Juan County and has a watershed population of approximately 38,200 people. The two New Mexico communities with jurisdictional authority within the watershed are Aztec and Farmington. In addition to these communities, the watershed also includes Aztec Ruins National Monument, local parks, Farmington Lake, and local reservoirs.



**MAP SYMBOLOLOGY**

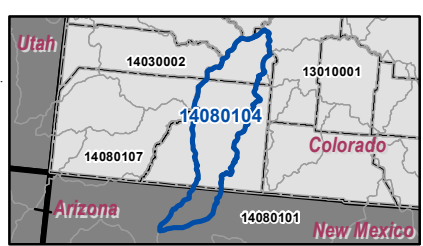
- Animas HUC-8 Watershed
- County Boundary
- City Boundary (Unincorporated)
- City Boundary (Incorporated)
- Interstate
- State Highway
- Perennial Streams and Rivers
- Waterbody

Population Density (People)	
	100,001 or more
	25,001 to 100,000
	10,001 to 25,000
	1,001 to 10,000
	101 to 1,000
	100 or less
	No population

**NOTES TO USERS**

All information on this map came from public data. Imagery, roads, and political boundaries were supplied by the Colorado Department of Transportation, New Mexico Department of Transportation and ESRI. Hydrographic Features (Streams and HUC Boundaries) were provided by the NRCS, USGS National Hydrography Dataset (NHD) or delineated using USGS NED data.

**WATERSHED LOCATOR**



**Figure 2**  
POPULATION DENSITY

**ANIMAS WATERSHED COLORADO**

HUC-8 Code: 14080104

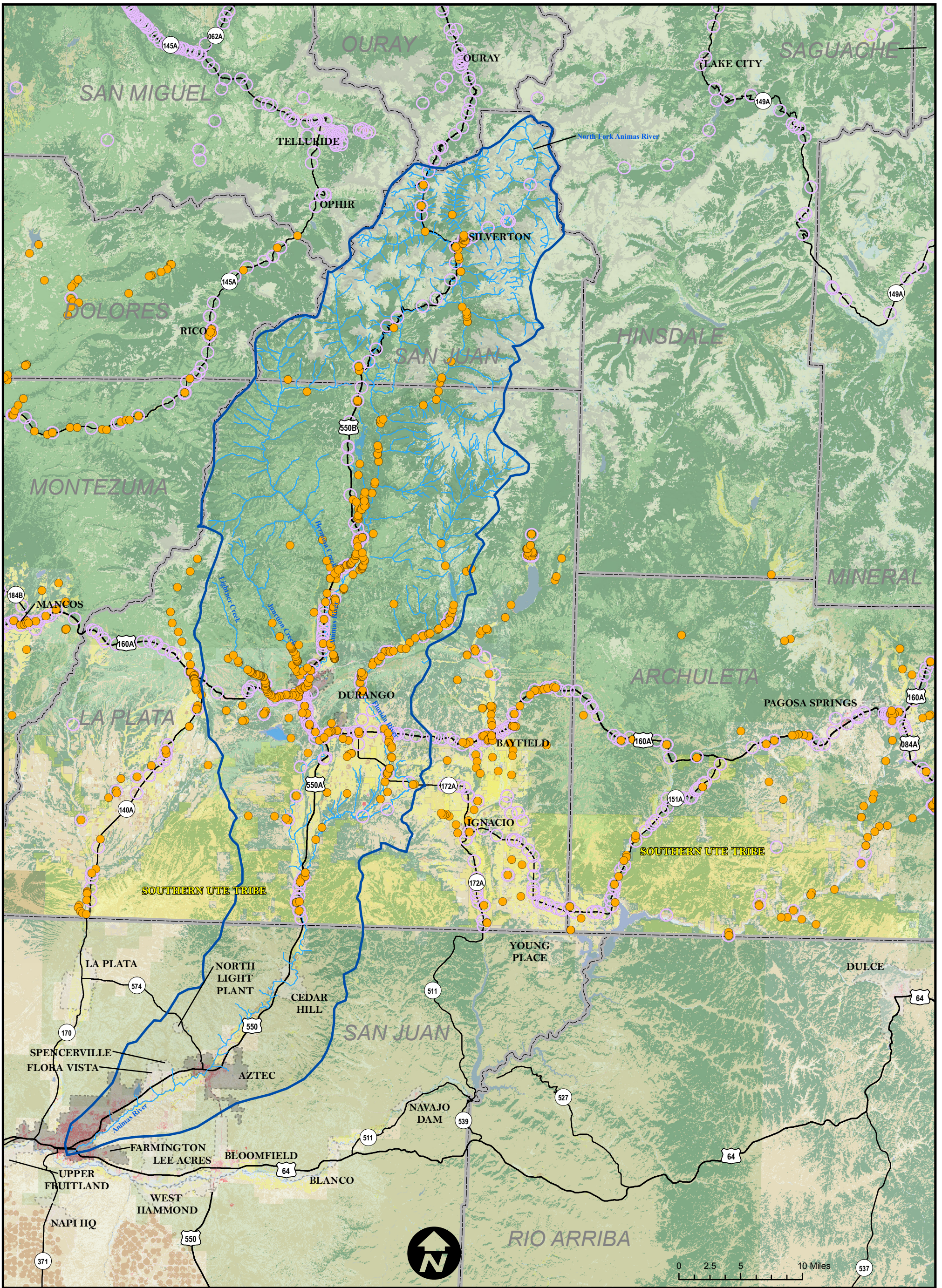
**FEMA**

**COLORADO**  
Colorado Water Conservation Board  
Department of Natural Resources

**EDAC**

**AECOM**





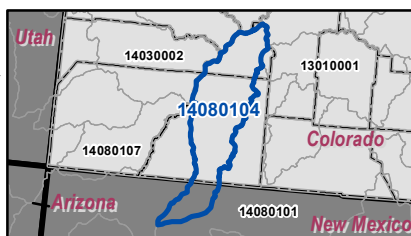
**MAP SYMBOLOLOGY**

Animas HUC-8 Watershed	Open Water
County Boundary	Perennial Ice/Snow
City Boundary (Unincorporated)	Developed, Open Space
City Boundary (Incorporated)	Developed, Low Intensity
Interstate	Developed, Medium Intensity
State Highway	Developed, High Intensity
Perennial Streams and Rivers	Barren Land (Rock/Sand/Clay)
Waterbody	Deciduous Forest
Red Cross Structure Crossing	Evergreen Forest
CDOT Structure Crossing	Mixed Forest
	Shrub/Scrub
	Grassland/Herbaceous
	Pasture/Hay
	Cultivated Crops
	Woody Wetlands
	Emergent Herbaceous Wetlands

**NOTES TO USERS**

All information on this map came from public data. Imagery, roads, and political boundaries were supplied by the Colorado Department of Transportation, New Mexico Department of Transportation and ESRI. Hydrographic Features (Streams and HUC Boundaries) were provided by the NRCS, USGS National Hydrography Dataset (NHD) or delineated using USGS NED data.

**WATERSHED LOCATOR**



**Figure 3**  
LAND USE

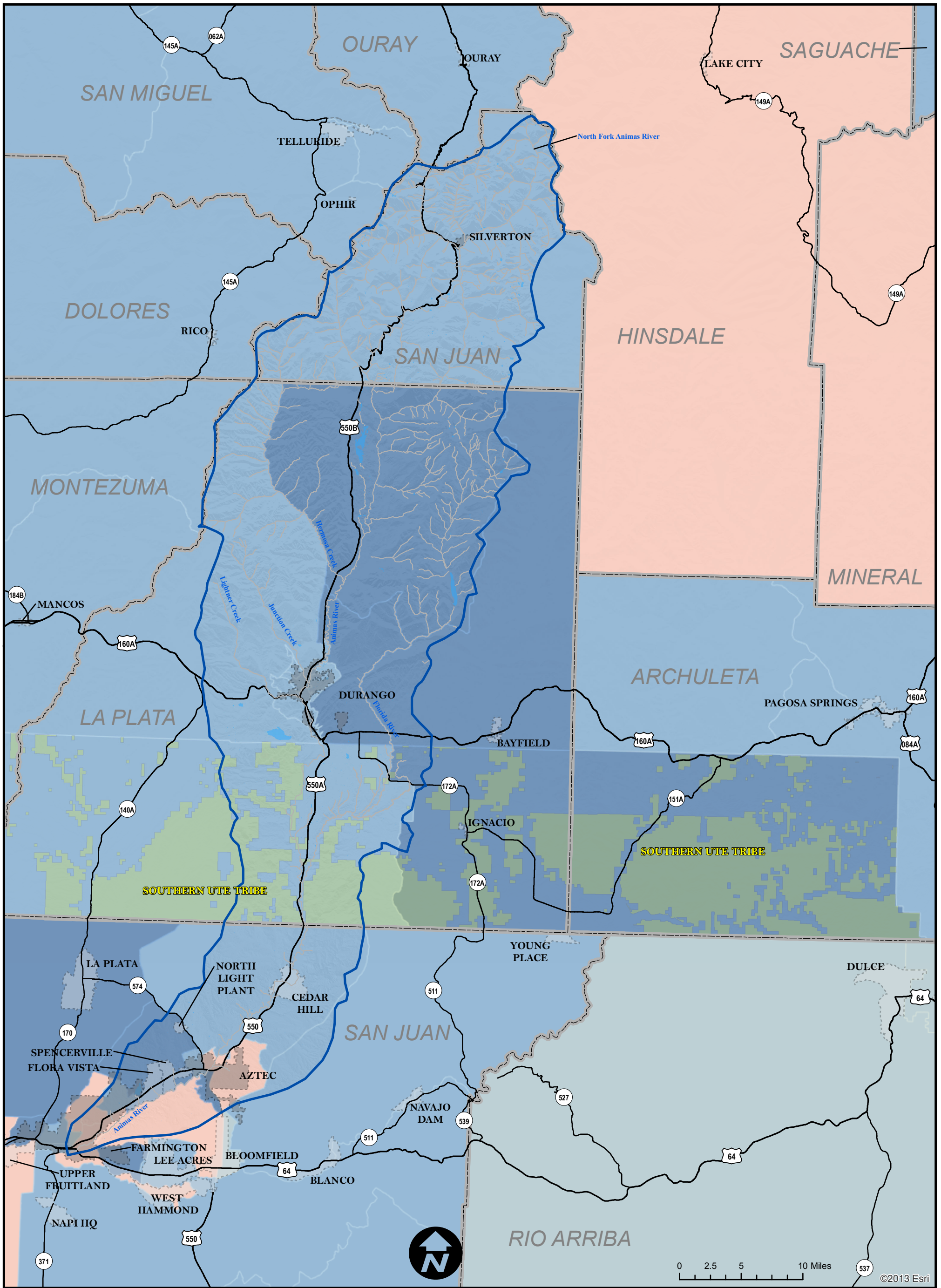
**ANIMAS WATERSHED COLORADO** HUC-8 Code  
14080104

**FEMA**

**COLORADO**  
Colorado Water Conservation Board  
Department of Natural Resources

**EDAC**

**AECOM**



**MAP SYMBOLOLOGY**

- Animas HUC-8 Watershed
- County Boundary
- City Boundary (Unincorporated)
- City Boundary (Incorporated)
- Interstate
- State Highway
- Perennial Streams and Rivers
- Waterbody

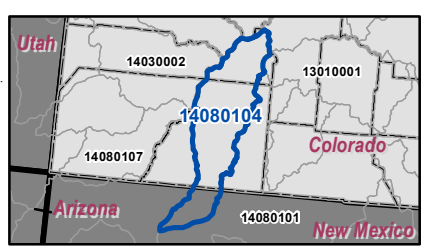
Population Annual Growth Rate

- 2.6% or more
- 1.3% to 2.5%
- 0.4% to 1.2%
- 0.1% to 0.3%
- 0% or negative
- No population

**NOTES TO USERS**

All information on this map came from public data. Imagery, roads, and political boundaries were supplied by the Colorado Department of Transportation, New Mexico Department of Transportation and ESRI. Hydrographic Features (Streams and HUC Boundaries) were provided by the NRCS, USGS National Hydrography Dataset (NHD) or delineated using USGS NED data.

**WATERSHED LOCATOR**



**Figure 4**  
POPULATION CHANGE (2012 - 2017)

**ANIMAS WATERSHED COLORADO** HUC-8 Code 14080104

**FEMA**

**COLORADO**  
Colorado Water Conservation Board  
Department of Natural Resources

**EDAC**

**AECOM**

Table 1 provides a status update for each community’s NFIP participation, the Community Rating System (CRS) rating, and current FIRMs. All of the communities are participating in the NFIP except for the SUIT.

**Table 1: NFIP Status of Project Area Communities**

County	Community Name	CID Number	Participating Community?	CRS Rating	Current FIRM Date	FIRM Status	Population * (2010 Census)	Population * (2015 Census**)
LPC	Durango	080099	Y	9	8/19/2010	Revised	16,887	18,006
LPC	Unincorporated Areas	080097	Y	NR	8/19/2010	Revised	51,334	54,688
SJC (CO)	Silverton	080165	Y	NR	9/1/1978	Original	637	637
SJC (CO)	Unincorporated Areas	080267	Y	NR	9/1/1978	Original	699	701
San Juan (NM)	Aztec	350065	Y	NR	8/5/2010	Revised	6,763	6,147
San Juan (NM)	Farmington	350067	Y	9	8/5/2010	Revised	45,877	42,871
San Juan (NM)	Unincorporated Areas	350064	Y	8	8/5/2010	Revised	130,044	118,737
LPC / Archuleta	SUIT	N/A	N	N/A	8/19/2010 (LPC) 9/25/2009 (Archuleta)	Revised	1,038 ***	

\* Population within the entire community and not just the portion within the watershed  
 \*\* Estimated population based on the Census Bureau’s Population Estimates Program, July 1, 2015  
 \*\*\* Data reflects 2000 Census as 2010 or 2015 (estimated) Census data are not available.

**2.3 DISASTER DECLARATIONS**

The Animas HUC-8 Watershed has a history of presidential disaster declarations that include flooding, severe storms, and wildfires. Since 1970, a total of 16 FEMA disaster declarations have been made. Wildfires can increase flooding risk due to changes in vegetation cover and ground conditions; for example, ground that is charred from a wildfire is unable to absorb heavy rainfall, creating conditions that are prime for flash flooding to occur.

The LPC Hazard Mitigation Plan (HMP) lists historic flooding events dating all the way back to 1896, and indicates that jurisdictions in this area are susceptible to flash floods in particular. Between 1896 and 2011, LPC reported a total of 34 damaging flood events that resulted in several deaths and over \$4 million in property damages. The LPC HMP estimates that the County sustained approximately \$1 million in property damage from an October 2006 flooding

event alone, which caused significant damage north of Durango and in the area surrounding the Vallecito Reservoir.

Table 2 lists recent and historic disaster declarations for multiple types of hazards within the watershed. Several state and U.S. Department of Agriculture (USDA) emergency declarations have also been made within LPC since 1970, as listed in their HMP. Those declarations are presented in Table 2.

**Table 2: Disaster Declarations in the Watershed**

Date of Declaration	Description	Watershed Counties Declared	For Hazard
9/22/1970	Heavy Rains and Flooding	LPC & SJC (CO)	Flood
7/6/1973	Flooding and Landslides	LPC & SJC (CO)	Flood
1/29/1977	Drought	LPC	Drought
3/2/1977	Drought	San Juan (NM)	Drought
9/22/1999	Severe Ice Storms, Flooding and Heavy Rains	San Juan (NM)	Severe Storms
5/10/2000	Severe Fire Threats	San Juan (NM)	Fire
5/13/2000	Severe Forest Fire	San Juan (NM)	Fire
6/7/2002	Ute Pass Fire	LPC	Fire
6/11/2002	Missionary Ridge Fire	LPC	Fire
6/19/2002	Wildfires	LPC & SJC (CO)	Fire
6/25/2002	Valley Fire	LPC	Fire
2002	Wildfires (Colorado Disaster)	All counties (CO)	Fire
2002	Drought (Colorado Disaster)	All counties	Drought
2002	Drought (USDA Disaster)	LPC	Drought
2003	Drought, Insects (USDA Disaster)	LPC	Drought
2003	Snow Emergency (Colorado Disaster)	All counties (CO)	Winter Storm
9/5/2005	Hurricane Katrina Evacuation	LPC & SJC (CO)	Coastal Storm
9/7/2005	Hurricane Katrina Evacuation	San Juan (NM)	Hurricane
2006	Drought, High Winds (USDA Disaster)	LPC	Drought
2006	Drought, Wildfires, High Winds, Excessive Heat (USDA Disaster)	LPC	Multiple
2006	Drought, Insects, High Winds, Excessive Heat, Winter Storm (USDA Disaster)	LPC	Multiple
2006	Winter Storm (USDA Disaster)	LPC	Winter Storm

Date of Declaration	Description	Watershed Counties Declared	For Hazard
2009	Severe Blizzard (Colorado Disaster)	All counties (CO)	Winter Storm
2009	Severe Spring Snowstorm (Colorado Disaster)	All counties (CO)	Winter Storm
9/13/2010	Severe Storms and Flooding	San Juan (NM)	Flood
6/18/2012	Blanco (CR 4901) Fire	San Juan (NM)	Fire
2012	Drought, High Winds, Excessive Heat (USDA Disaster)	LPC	Drought
10/29/2013	Severe Storms, Flooding and Mudslides	San Juan (NM)	Flood

This Watershed Stakeholder Coordination section provides an overview of the coordination that took place between the watershed stakeholders including partners such as coalitions and agencies), and community contacts such as government officials, city engineers, town planners, emergency coordinators, etc. Stakeholder engagement involved up-front coordination among the Project Team (CWCB and their consultant AECOM, and EDAC) to plan the Discovery effort, identify roles and responsibilities, and plan the level of stakeholder engagement. In addition to collecting data from national and state datasets and local mitigation plans, pertinent information about communities was collected from local community officials, specifically the community contacts mentioned above, prior to the Discovery Meeting.

The Project Team was in contact with all identified watershed stakeholders via phone calls and emails prior to the Discovery Meeting to request local participation. In addition to assistance in scheduling the meeting, locals were asked to help identify additional key individuals who should be included in the process and acquire any data that will assist in the risk identification and assessment for the Animas HUC-8 Watershed. A detailed list of communities, local officials, federal, state and regional agencies that were invited to participate in the Discovery process is included with the supplemental digital data accompanying this report.

### **3.1 PARTNERS**

For Discovery to be successful, multiple agencies, organizations, and watershed coalitions were contacted that may have a role in the project. This list was created at the onset of Discovery and modified as the project continued. These partners were included in the Project Team efforts in one or more of the following roles:

- Contribute data to be used by the Project Team and/or communities to assess hazards and better plan for resiliency;
- Provide messaging by casting a vision for watershed resiliency and communicating risks and/or preventive measures to prepare for hazards; and/or
- Assist in outreach to communities and presenting at the Discovery Meeting.

The initial list of partners was contacted by the Project Team at the outset of the project. Partners continued to be added to the team throughout the project and the state and AECOM called and emailed partners to solicit their involvement in the process. The Project Team held a meeting for Colorado partners on June 9, 2016 to discuss the Discovery process, project objectives, and potential roles, during which partners indicated their planned level of involvement. Action items and roles were identified for each participant, after which the state and AECOM followed up with each participant regarding data, messaging, and/or coordination for the Discovery Meeting.

The New Mexico CTP held a pre-meeting conference call on July 20, 2016 to walk community stakeholders through the Discovery process to provide guidance on what type of information the team was looking for, as well as to address any questions that they may have about the Discovery Process. EDAC gave a short presentation on the process and requested that participants bring any and all relevant data to the Discovery Meeting on July 28, 2016.

Table 3 below summarizes pertinent information for the partners contacted and their roles in this Discovery Project in the Colorado and New Mexico efforts. There were various levels of coordination and discussion with partners, with the Colorado kickoff meeting held on June 9, 2016 and the New Mexico pre-meeting webinar held July 20, 2016, for which meeting minutes and list of attendees are included in attached digital data. Data obtained from the partners are summarized and analyzed in Section 4.

**Table 3: Partner Information for Colorado and New Mexico Discovery Efforts**

Organization	Partner Role	Name	Title	Email & Phone	Involvement/ Contribution	Comment
<i>Partners Supporting Colorado Efforts</i>						
CWCB	Study Lead Partner	Thuy Patton	Floodplain Mapping Coordinator	<a href="mailto:thuy.patton@state.co.us">thuy.patton@state.co.us</a> 303.866.3441 x3230	Study Lead	Attended Discovery meetings
		Stephanie DiBetitto	Community Assistance Program Coordinator	<a href="mailto:stephanie.dibetitto@state.co.us">stephanie.dibetitto@state.co.us</a> 303.866.3441 x3221	Study Lead	
		Corey Elliott	Hazard Mapping Coordinator	<a href="mailto:corey.elliott@state.co.us">corey.elliott@state.co.us</a> 303.866.3441 x3215	Awareness	
		Kevin Houck	Chief of Watershed & Flood Protection	<a href="mailto:kevin.houck@state.co.us">kevin.houck@state.co.us</a> 303.866.3441 x3219	Support from Division	--
		Joe Busto	Weather Mod. & South Platte River Program Coordinator	<a href="mailto:Joe.Busto@state.co.us">Joe.Busto@state.co.us</a> 303.866.3441 x3209	Provide data and awareness	--
		Chris Sturm	Stream Restoration Coordinator	<a href="mailto:chris.sturm@state.co.us">chris.sturm@state.co.us</a> 303.866.3441 x3236	Provide data	Ongoing and future stream restoration projects
FEMA	Partner	David Sutley	FEMA Region VIII	<a href="mailto:david.sutley@fema.dhs.gov">david.sutley@fema.dhs.gov</a> 303.235.4809	Active partner representing FEMA	Would like to support Discovery Meeting and subsequent Risk MAP projects.
		Margaret Doherty	Community Planner	<a href="mailto:margaret.doherty2@fema.dhs.gov">margaret.doherty2@fema.dhs.gov</a> 303.854.4887	Tracking mitigation actions	Awareness level



# SECTION THREE

## Watershed Stakeholder Coordination

Organization	Partner Role	Name	Title	Email & Phone	Involvement/ Contribution	Comment
FEMA	Partner	Scott Roscoe	Tribal Specialist for Hazard Mitigation – Region VIII	<a href="mailto:Scott.Roscoe@fema.dhs.gov">Scott.Roscoe@fema.dhs.gov</a> 303.235.4876	Tribal liaison and provide information and messaging	Provide tribe contact information, and HMPs. Would like to remain involved with interactions with the SUIT.
		Jerry Clark	Civil Engineer for Risk Analysis – Region VI	<a href="mailto:Jerry.clark@fema.dhs.gov">Jerry.clark@fema.dhs.gov</a> 940.898.5270	Active partner representing FEMA	Supported Discovery Meeting
		Matt Buddie	CRS & Floodplain Management Specialist	<a href="mailto:matthew.buddie@fema.dhs.gov">matthew.buddie@fema.dhs.gov</a> 303.235.4730	Support and awareness	Wants to remain involved and likely to have greater involvement with resulting projects than upfront in Discovery
		Kerry Redente	ISO CRS Specialist	<a href="mailto:kredente@verisk.com">kredente@verisk.com</a> 719.207.0121	Unknown	Not active, but keep informed
Animas River Community Forum (ARCF)	Partner	Shannon Manfredi	Coordinator	<a href="mailto:animasriverforum@gmail.com">animasriverforum@gmail.com</a> 970.799.0616	Messaging and Coordination	Networked with many groups and aware of many initiatives or ongoing efforts.
Animas River Stakeholders Group (ARSG)	Unknown	Peter Butler	AGRS Coordinator	<a href="mailto:Butlerpeter2@gmail.com">Butlerpeter2@gmail.com</a> 970.259.0986	--	--
Animas Watershed Partnership (AWP)	Partner	Ann Oliver	AWP Coordinator	<a href="mailto:annsoliver@gmail.com">annsoliver@gmail.com</a> 970.903.9361	Awareness and support	Would like to remain informed and works with several other groups. Aware of water quality data and grants for local water projects.
Building Science	None	Brooke Buchanan Conner	FEMA Region VIII Senior Engineer	<a href="mailto:brooke.buchanan@dhs.gov">brooke.buchanan@dhs.gov</a>	Not involved	Works mostly in South Dakota and Wyoming
Bureau of Indian Affairs (BIA)	Unknown	Vickie Begay	SUIT BIA Representative	<a href="mailto:Vickie.begay@bia.gov">Vickie.begay@bia.gov</a> 970.563.9484	--	--

# SECTION THREE

## Watershed Stakeholder Coordination

Organization	Partner Role	Name	Title	Email & Phone	Involvement/Contribution	Comment
Bureau of Reclamation's (BOR's) Eastern Colorado Area Office	Unknown	Howard Bailey	Security and Emergency Management Specialist	<a href="mailto:HBailey@usbr.gov">HBailey@usbr.gov</a> 970.962.4355	--	--
Colorado Department of Public Health and Environment (CDPHE)	Partner	Andrew Ross	Water Quality Control Division	<a href="mailto:andrew.ross@state.co.us">andrew.ross@state.co.us</a> 303.692.3500	Provide data	Water quality data and information on streams impaired by mining
		Patrick Pfaltzgraff	Grants	<a href="mailto:patrick.j.pfaltzgraff@state.co.us">patrick.j.pfaltzgraff@state.co.us</a> 303.692.3653		
Colorado Department of Local Affairs (DOLA)	Unknown	KC McFerson	CDBG-DR Watershed Program Manger	<a href="mailto:kc.mcferson@state.co.us">kc.mcferson@state.co.us</a> 303.864.7887	--	Information on potential grants
		Ken Charles	Southwestern Regional Manager (Durango Office)	<a href="mailto:ken.charles@state.co.us">ken.charles@state.co.us</a> 970.247.7311	--	--
Dam Safety Branch of Office of the State Engineer (SEO)	Partner	Kallie Bauer	Dam Safety Engineer – Division 1	<a href="mailto:kallie.bauer@state.co.us">kallie.bauer@state.co.us</a> 970.352.8712 x1218	Provide data and messaging	Spatial data of dam locations and information, as well as an informational brochure to share with communities
		Matt Gavin	Dam Safety Engineer – Durango	<a href="mailto:matthew.gavin@state.co.us">matthew.gavin@state.co.us</a> 970.247.1845 x7003		
Colorado Division of Reclamation	Partner	Tony Waldron	Supervisor of Minerals Program	<a href="mailto:tony.waldron@state.co.us">tony.waldron@state.co.us</a> 303.866.3567 x8150	Awareness and provide data	Pointed to spatial data online for inventoried active and inactive mines, as well as draining mines.

# SECTION THREE

## Watershed Stakeholder Coordination

Organization	Partner Role	Name	Title	Email & Phone	Involvement/ Contribution	Comment
Mining and Safety (DRMS)		Jeff Graves	Supervisor of Inactive Mines Program	<a href="mailto:jeff.graves@state.co.us">jeff.graves@state.co.us</a> 303.866.3567 x8122		
Colorado Mountain College	Unknown	Krysta Brubaker	CMC Foundation Executive Assistant	<a href="mailto:kbrubaker@coloradomtn.edu">kbrubaker@coloradomtn.edu</a> 970.947.8378	--	--
		Steve Rozanski	Director of Risk Management	<a href="mailto:srozanski@coloradomtn.edu">srozanski@coloradomtn.edu</a> 970.384.8533	--	--
Colorado Parks and Wildlife (CPW)	Unknown	Jim White	Aquatic Biologist out of Durango	<a href="mailto:j.white@state.co.us">j.white@state.co.us</a> 970.375.6712	--	--
		Matt Thorpe	Durango Area Wildlife Manager	<a href="mailto:matt.thorpe@state.co.us">matt.thorpe@state.co.us</a> 970.375.6770		--
United States Environmental Protection Agency (EPA)	Partner	Cynthia Peterson	Community Involvement Coordinator, Region 8	<a href="mailto:peterston.cynthia@epa.gov">peterston.cynthia@epa.gov</a> 303.312.6879	Awareness and messaging support	Would like to stay informed and review products.
		Peter Ismert	Healthy Watersheds Coordinator; Non-point Source Runoff Contact	<a href="mailto:ismert.peter@epa.gov">ismert.peter@epa.gov</a> 303.312.6215		
		Nat Miullo	Long-term community resiliency coordinator	<a href="mailto:miullo.nat@epa.gov">miullo.nat@epa.gov</a> 303.518.9906		

# SECTION THREE

## Watershed Stakeholder Coordination

Organization	Partner Role	Name	Title	Email & Phone	Involvement/ Contribution	Comment
Mountain Studies Institute	Partner	Marcie Bidwell	Executive Director	<a href="mailto:Marcie@mountainstudies.org">Marcie@mountainstudies.org</a> 970.387.5161	Awareness and provide data	Aware of water quality data and community surveying (social poll) efforts. Provided information on climate change assessments of the area.
Colorado State Forest Service (CSFS)	Partner	Rich Edwards	Assistant Staff Forester	<a href="mailto:rich.edwards@colostate.edu">rich.edwards@colostate.edu</a> 970.491.8036	Provide data and messaging	<p>Provided wildfire risk and vegetation spatial information through the Colorado Wildfire Risk Assessment Portal (CO-WRAP). Made aware of forestry and wildfire-related grants, as well as other collaboratives and initiatives that are similar in nature outside of the Animas Watershed.</p> <p>Kent and Dan are also very aware of beetle kill conditions and wildfire hazards. Dan is a good contact for coordinating upcoming LiDAR.</p>
		Kent Grant	Durango District Forester	<a href="mailto:Kent.grant@colostate.edu">Kent.grant@colostate.edu</a> 970.247.5250		
		Dan Wand	Assistant District Forester	<a href="mailto:dan.wand@colostate.edu">dan.wand@colostate.edu</a> 970.247.5250		
USFS	Partner	Carl Chambers	Forest Hydrologist	<a href="mailto:cchambers@fs.fed.us">cchambers@fs.fed.us</a> 970.295.6633	No further involvement	Referred to CSFS.
		Kelly Palmer	Forest Hydrologist	<a href="mailto:kapalmer@fs.fed.us">kapalmer@fs.fed.us</a> 970.385.1232	Support and awareness	Presently conducting a wildfire risk assessment and can provide information upon completion.
		Cary Newman	Forest Hydrologist	<a href="mailto:cnewman01@fs.fed.us">cnewman01@fs.fed.us</a> 970.385.1388		
		Chris Tipton	Zone Fire Management Officer - Division Chief 8	<a href="mailto:ctipton@fs.fed.us">ctipton@fs.fed.us</a> 970.799.1167	Interested in process but couldn't attend Discovery meetings	--

# SECTION THREE

## Watershed Stakeholder Coordination

Organization	Partner Role	Name	Title	Email & Phone	Involvement/ Contribution	Comment
		Ben Martinez	San Juan National Forest Engineer	<a href="mailto:bsmartinez@fs.fed.us">bsmartinez@fs.fed.us</a> 970.385.1202	Awareness	Aware of mine inventory by CGS and DRMS
		Dan Jirón	Regional Forester	<a href="mailto:djiron@fs.fed.us">djiron@fs.fed.us</a> 303.275.5350	--	--
Division of Homeland Security and Emergency Management (DHSEM), Wildfire	Unknown	Scott Baldwin	Deputy State Hazard Mitigation Officer	<a href="mailto:scott.baldwin@state.co.us">scott.baldwin@state.co.us</a> 720.852.6696	--	Information on potential grants
EDAC, University of New Mexico	Lead Partner	Shawn Penman	GIS Specialist/ Manager	<a href="mailto:spenman@edac.unm.edu">spenman@edac.unm.edu</a> 505.277.3622 x227	Leading the New Mexico discovery efforts.	Collaborative efforts
		Brian Keller	GIS Manager	<a href="mailto:bkeller@edac.unm.edu">bkeller@edac.unm.edu</a> 505.277.3622 x228		
		Mike Camponovo	GIS Specialist/ Programmer	<a href="mailto:mcamponovo@edac.unm.edu">mcamponovo@edac.unm.edu</a> 505.277.3622 x228		
Colorado Resiliency and Recovery Office	Unknown	Iain Hyde	Deputy Director	<a href="mailto:iain.hyde@state.co.us">iain.hyde@state.co.us</a> 720.852.6696	--	Information on potential grants
		Katie Delmonico	Admin Assistant	<a href="mailto:Katie.delmonico@state.co.us">Katie.delmonico@state.co.us</a> 720.415.3094		
Bureau of Land Management (BLM)	Unknown	Connie Clementson	Tres Rios District Manager	<a href="mailto:cclementson@blm.gov">cclementson@blm.gov</a> 970.882.6808	--	Provide data (subscribe data sharing, and collaboration online)
		John Smeins	Hydrologist	<a href="mailto:jsmeins@blm.gov">jsmeins@blm.gov</a> 719.269.8581		

# SECTION THREE

## Watershed Stakeholder Coordination

Organization	Partner Role	Name	Title	Email & Phone	Involvement/ Contribution	Comment
Federal Highways (Central Federal Lands)	Awareness	Scott Hogan	Hydraulic Engineer	<a href="mailto:scott.hogan@dot.gov">scott.hogan@dot.gov</a> 720.963.3742	Awareness level	Able to help with specific requests
National Park Service (NPS)	Unknown	Sue Masica	Intermountain Regional Director	<a href="mailto:sue_masica@nps.gov">sue_masica@nps.gov</a> 303.969.2500	--	--
USDA Natural Resources Conservation Service (NRCS)	Partner	Sterling Moss	District Conservation-ist Durango Field Office	<a href="mailto:sterling.moss@co.usda.gov">sterling.moss@co.usda.gov</a> 970.259.3289 x3	Awareness and provided data	NRCS provides conservation planning assistance on private lands and administers the Emergency Watershed Protection (EWP) Program that provides technical and financial assistance for watershed recovery following disaster events (fire, flood, etc.). NRCS provided a rapid watershed assessment report from 2010.
		Clint Evans	State Conservation-ist	<a href="mailto:Clint.evans@co.usda.gov">Clint.evans@co.usda.gov</a> 970.544.2802		
		Laura Knapp	District Conservation-ist	<a href="mailto:Laura.knapp@co.usda.gov">Laura.knapp@co.usda.gov</a> 719.672.3673 x106		
		Martin Moses	Private Lands Wildlife Biologist <i>Bird Conservancy of the Rockies</i>	<a href="mailto:martin.moses@co.usda.gov">martin.moses@co.usda.gov</a> 970.259.3289x113		Familiar with completed stream bank stabilization/restoration projects within the Animas Watershed. Provided guides for streambank bioengineering and restoration planning.
New Mexico Division of Homeland Security and Emergency Management (DHSEM)	Partner	Bill Borthwick	State Floodplain Coordinator	<a href="mailto:william.borthwick@state.nm.us">william.borthwick@state.nm.us</a> 505.476.9617	State partner, may attend meetings	--

# SECTION THREE

## Watershed Stakeholder Coordination

Organization	Partner Role	Name	Title	Email & Phone	Involvement/Contribution	Comment
San Juan Basin Health (SJBH)	Partner	Brian Devine	Surface and Drinking Water Manager	<a href="mailto:BDevine@sjbhd.org">BDevine@sjbhd.org</a> 970.335.2030	Provide data and messaging	<p>Active in several discussion groups and committees around the Animas River, Emergency Preparedness and Response, and Community Resilience. Produce messaging around water quality, emergency preparedness, and environmental health. Collect and share data with partners on water chemistry, sediment chemistry, and indicators of water quality.</p> <p>Primary focus is on assessing water quality and relating it to how people use the Animas River. There is a lot of available data, but not much interpretation of risk. SJBH has partnered with the water quality division of CDPHE to conduct long-term monitoring efforts to assess community risk and prepare for emergencies – see Section 4.2.5.3 for additional information. Discussed project activities and advised to visit their website after August 1, 2016 to download project documents.</p>
San Juan Citizens Alliance	Awareness	Chris Wilkins	President	<a href="mailto:susan@sanjuancitizens.org">susan@sanjuancitizens.org</a> 970.259.3583	Awareness	--
		Jimbo Buickerood	Lands and Forest Protection Program Manager	<a href="mailto:jimbo@sanjuancitizens.org">jimbo@sanjuancitizens.org</a> 970.259.3583 x2		

# SECTION THREE

## Watershed Stakeholder Coordination

Organization	Partner Role	Name	Title	Email & Phone	Involvement/Contribution	Comment
San Juan Resource Conservation and Development Council (SJRCDC)	Unknown	Jim Smith	Council Chair (Main Office contact info)	<a href="mailto:sjrcdc@hotmail.com">sjrcdc@hotmail.com</a> 970.382.9371	--	--
San Juan Soil and Water Conservation District	Partner	Melissa May	Natural Resource Specialist	<a href="mailto:Melissa.may@sanjuanswcd.com">Melissa.may@sanjuanswcd.com</a> 505.334.3090	Provide data	Data mostly pertains to New Mexico: has nutrient data, stormwater quality and non-point source information; mapping irrigation structure crossings; have historical flood control data; and doing Arroyo study.
San Juan Watershed Group	Unknown	David Tomko	Watershed Coordinator	<a href="mailto:Jtomko73@msn.com">Jtomko73@msn.com</a> 505.632.8008	--	Potentially interested
Southwestern Water Conservation District (SWCD)	Awareness	Bruce Whitehead	Executive Director	<a href="mailto:brucew@swgcd.org">brucew@swgcd.org</a> 970.247.1302	Awareness & Messaging	Makes available grant funding for local water-related projects— accessible at: <a href="http://swgcd.org/programs/financial-assistance-program">http://swgcd.org/programs/financial-assistance-program</a>
		Laura Spann	Office Manager	<a href="mailto:lauras@swgcd.org">lauras@swgcd.org</a> 970.247.1302		
Trout Unlimited	Awareness	Drew Peternell	State Level	<a href="mailto:dpeternell@tu.org">dpeternell@tu.org</a> 303.204.3057	Not interested	The biggest threats to the Animas fishery are primarily water quality related, from the Gold King spill and draining mines into the headwaters.
		Ty Churchwell	San Juan Mountain Coordinator	<a href="mailto:tchurchwell@tu.org">tchurchwell@tu.org</a> 970.903.3010	Not actively participating, but would like to remain informed	
		Buck Skillen	President of Five Rivers Chapter	<a href="mailto:bskillen759@gmail.com">bskillen759@gmail.com</a> 970.759.2726		



# SECTION THREE

## Watershed Stakeholder Coordination

Organization	Partner Role	Name	Title	Email & Phone	Involvement/ Contribution	Comment
Colorado Geological Survey (CGS)	Partner	Matt Morgan	Senior Research Geologist	<a href="mailto:mmorgan@mines.edu">mmorgan@mines.edu</a> 303.384.2647	Provide data and messaging	Geologic maps not in Soil Survey Geographic Database (SSURGO). Also general information about debris/mud-flow susceptibility and hazards. Interested in obtaining Light Detection and Ranging (LiDAR) and information from historical events.
		Kevin McCoy	Geologist	<a href="mailto:kemccoy@mines.edu">kemccoy@mines.edu</a> 303.384.2632		
		Scot Fitzgerald	Hazards Analyst	<a href="mailto:ffitger@mines.edu">ffitger@mines.edu</a> 303.384.2644		
Colorado Department of Transport (CDOT) Region 5	Supportive	Matt Muraro	Environmental Specialist and Regional Planner	<a href="mailto:matt.muraro@state.co.us">matt.muraro@state.co.us</a> 970.385.1433	Provide Data	Provide general spatial data.
		Gary Aucott	GIS Data & Support Specialist	<a href="mailto:Gary.Aucott@dot.state.co.us">Gary.Aucott@dot.state.co.us</a> 303.512.4444	Provide Data	Provide spatial data on crossings/bridges.
Colorado Avalanche Information Center	Supportive	Spencer Logan	Forecaster	<a href="mailto:spencer.logan@state.co.us">spencer.logan@state.co.us</a> 303.859.3416	Provide Data	Provide spatial data on historic avalanche paths along transportation corridors.

# SECTION THREE

## Watershed Stakeholder Coordination

Organization	Partner Role	Name	Title	Email & Phone	Involvement/ Contribution	Comment
Red Cross	Supportive	Ed Bulloch	Retired Soil Scientist	<a href="mailto:hedward@bullochgallery.com">hedward@bullochgallery.com</a> 505.325.2428	Interested in attending Discovery Meetings and would like to be a resource to emergency managers.	Involved with San Juan Watershed Group that works with the Animas Watershed Partnership. Previously assisted in disaster recovery efforts with the Red Cross. One task involved documenting coordinates for bridges and most road crossings in five counties, including La Plata and San Juan. Also looked at some of the forest roads and noted those that needed repairs. Communities may be interested this dataset for use in their transportation groups.
La Plata Open Space Conservancy	Unknown	TBD	TBD	<a href="mailto:info@lposc.org">info@lposc.org</a> 970.259.3415	--	May be interested in wildfire hazards

# SECTION THREE

## Watershed Stakeholder Coordination

Organization	Partner Role	Name	Title	Email & Phone	Involvement/ Contribution	Comment
FireWise	Partner	Pam Wilson	Executive Director	<a href="mailto:swcoloradofirewise@gmail.com">swcoloradofirewise@gmail.com</a> 970.385.8909	<p>Interested in process – efforts dovetail well.</p> <p>Unable to attend meeting and LPC coordinator is out of town on August 9<sup>th</sup>, but Montezuma Coordinator (Rebecca Samulski) may be able to attend. Will try to send representative to Discovery Meeting.</p>	<p>Non-profit began in 2003 and primarily did education. Pam started in 2008 and now focused more so on planning and implementation. FireWise has regional coordinators and applies for grants to implement projects. FireWise usually engages 5 or 6 communities per funding cycle.</p> <p>Projects are typically centered on reducing hazardous fuels and increasing people’s wildfire preparedness. Some have included improving evacuating procedures and street signage to better navigate routes.</p> <p>There is not much of a wildland-urban interface in SJC, so don’t have as much wildfire risk and FireWise does not have a coordinator for SJC.</p> <p>Pam is starting a community assistance team comprised of wildland urban interface specialists to enhance community programs and increase their capacity. Community Wildfire protection plans were done for each county in 2001.</p>
		Rebecca Samulski	Montezuma County Coordinator	<a href="mailto:montezumafirewise@gmail.com">montezumafirewise@gmail.com</a> 970.564.4007	Attended the LPC/Durango Discovery Meeting	--

# SECTION THREE

## Watershed Stakeholder Coordination

Organization	Partner Role	Name	Title	Email & Phone	Involvement/ Contribution	Comment
DHSEM	Partner	Marilyn Gally	State Hazard Mitigation Officer (SHMO)	<a href="mailto:marilyn.gally@state.co.us">marilyn.gally@state.co.us</a> 720.852.6694	--	Information on potential grants
		Trevor Denney	Southwest Field Manager	<a href="mailto:Trevor.denney@state.co.us">Trevor.denney@state.co.us</a> 970.247.7674	Interested in participating – routinely involved in area.	Involved in interagency coordination and grant seeking for hazard evaluation and mitigation activities in this region.
		Patricia Gavelda	Local Hazard Mitigation Planning Program Manager	<a href="mailto:Patricia.Gavelda@state.co.us">Patricia.Gavelda@state.co.us</a> 970.385.1675	Interested in participating. Provided information	Interested in natural hazard mitigation actions in the watershed. LPC will update their HMP in the near future (submitted a DR-4229 Planning Grant application), and SJC is currently developing their initial HMP, with a draft required by September 30, 2016. Provided HMP approval letters.
U.S. Fish and Wildlife Service (USFWS)	Partner	Gregory Gerlich	Assistant Regional Director for Fish and Aquatic Conservation	<a href="mailto:Gregory_gerlich@fws.gov">Gregory_gerlich@fws.gov</a> 303.236.4580	Support and awareness	Would like to remain informed. Provided information on fish habitat mapping opportunities and tracking structures/passages for fish.
		William Rice	Fish Passage Program and National Fish Habitat Program Coordinator	<a href="mailto:william_rice@fws.gov">william_rice@fws.gov</a> 303.236.4219		

# SECTION THREE

## Watershed Stakeholder Coordination

Organization	Partner Role	Name	Title	Email & Phone	Involvement/ Contribution	Comment
United States Army Corps of Engineers (USACE)	Awareness	Kara Hellige	Senior Regulatory Project Manager	<a href="mailto:Kara.a.hellige@usace.army.mil">Kara.a.hellige@usace.army.mil</a> 970.259.1604	Messaging	Provided information on regulatory process and coordination
		Craig Lykins	Albuquerque Office - Emergency Management Specialist	<a href="mailto:Craig.m.lykins@usace.army.mil">Craig.m.lykins@usace.army.mil</a> 505.342.3686	--	--
		Joshua Carpenter	Southern Colorado Regulatory Office	<a href="mailto:Joshua.G.Carpenter@usace.army.mil">Joshua.G.Carpenter@usace.army.mil</a> 719.543.6914		
		Stephen Scissons	Hydraulic Engineer – Albuquerque Office	<a href="mailto:Stephen.K.Scissons@usace.army.mil">Stephen.K.Scissons@usace.army.mil</a> 505.342.3328		
United States Geological Survey (USGS)	Partner	Bob Kimbrough	Associate Director for Hydrologic Data	<a href="mailto:rakimbro@usgs.gov">rakimbro@usgs.gov</a> 303.236.6902	Support and awareness	Made aware of stream gage data, including archived locations, for download, as well as investigation reports containing water quality data.
		Suzanne Paschke	Assistant Director for Hydrologic Investigations	<a href="mailto:spaschke@usgs.gov">spaschke@usgs.gov</a> 303.236.6904		
AECOM	Study Lead Partner	Remmet deGroot	Senior Project Manager	<a href="mailto:remmet.degroot@aecom.com">remmet.degroot@aecom.com</a> 303.796.4633	Leading Colorado Discovery process with CWCB, and collaborating with EDAC for the New Mexico Discovery process	Supporting Discovery Process
		Rigel Rucker	Project Manager	<a href="mailto:rigel.rucker@aecom.com">rigel.rucker@aecom.com</a> 575.545.1107		Attended Colorado and New Mexico Discovery Meetings
		Geoffrey Uhlemann	Civil/ Environmental Engineer	<a href="mailto:geoffrey.uhlemann@aecom.com">geoffrey.uhlemann@aecom.com</a> 303.796.4783		Attended Colorado Discovery Meetings

# SECTION THREE

## Watershed Stakeholder Coordination

Organization	Partner Role	Name	Title	Email & Phone	Involvement/ Contribution	Comment
		Brie Hurwitch	Project Manager	<a href="mailto:brie.hurwitch@aecom.com">brie.hurwitch@aecom.com</a> 801.904.4050		Supporting Discovery Process
		Tim Benenati	GIS Specialist	<a href="mailto:tim.benenati@aecom.com">tim.benenati@aecom.com</a> 303.794.4748		Supporting Discovery Process
<i>Partners Supporting New Mexico Efforts</i>						
San Juan Soil and Water Conservation District	Partner	Melissa May	Natural Resource Specialist	<a href="mailto:Melissa.may@sanjuanswcd.com">Melissa.may@sanjuanswcd.com</a> 505.334.3090	Provide data	Data mostly pertains to New Mexico: has nutrient data, stormwater quality and non-point source information; mapping irrigation structure crossings; have historical flood control data; and doing Arroyo study.
Four Corners Economic Development	Awareness	Sally Burbage	CEO	505.566.3720	Support	Sally is also the Mayor of Aztec and was very pleased that the Discovery Process was taking place.
Farmington Chamber of Commerce	Awareness	Jeff Smith	Chairman	<a href="mailto:chamber@gofarmington.com">chamber@gofarmington.com</a> 505.325.0279	--	--
Aztec Chamber of Commerce	Awareness	Theresa Bailey	President	<a href="mailto:info@aztecchamber.com">info@aztecchamber.com</a> 505.334.7646	--	--
Realtors Association of New Mexico	Awareness	Sandylee Pasquale	President	<a href="mailto:patfell@remax.net">patfell@remax.net</a> 505.982.2442	--	--
New Mexico Bankers Association	Awareness	Paul Dipaola	President	<a href="mailto:paul.dipaola@usbank.com">paul.dipaola@usbank.com</a> 505.822.7900	--	--

# SECTION THREE

## Watershed Stakeholder Coordination

Organization	Partner Role	Name	Title	Email & Phone	Involvement/ Contribution	Comment
New Mexico Association of Conservation Districts	Awareness	Debbie Hughes	Executive Director	<a href="mailto:conserve@hughes.net">conserve@hughes.net</a> 575.981.2400	--	--
New Mexico Forest and Watershed Restoration Institute	Supportive	Kent Reid	Director	<a href="mailto:rkreid@nmhu.edu">rkreid@nmhu.edu</a> 505.426.2145	Data Provider and Support	Kent's primary concern is post-wildfire flooding in the upper reaches of the watershed. His organization works towards forest treatments and prevention of risk to forests/watersheds.
New Mexico Forest and Watershed Health Program	Supportive	Susan Rich	Forest and Watershed Health Coordinator	505.476.3200	Support	Susan said she will pass along meeting information to relevant staff in her organization.
New Mexico Association of Counties	Awareness	Steve Kopelman	Executive Director	<a href="mailto:skopelman@nmcountries.org">skopelman@nmcountries.org</a> 505.983.2101	Awareness	Will disseminate notification and newsletter to appropriate staff. Did not have a representative attend the meeting
San Juan County Extension Office	Awareness	TBD	County Program Director/ Extension Agent	<a href="mailto:sanjuan@nmsu.edu">sanjuan@nmsu.edu</a> 505.334.9496	--	--
The Nature Conservancy	Awareness	Laura McCarthy	Director	<a href="mailto:lmccarthy@tnc.org">lmccarthy@tnc.org</a> 505.988.3867	--	--
The Nature Conservancy	Awareness	Lara Wood-Miller	GIS	505.988.3867	--	--
Natural Heritage New Mexico	Awareness	Elizabeth Milford	Assistant Ecologist	<a href="mailto:emilford@unm.edu">emilford@unm.edu</a> 505.277.3822	--	--

# SECTION THREE

## Watershed Stakeholder Coordination

Organization	Partner Role	Name	Title	Email & Phone	Involvement/Contribution	Comment
Northwest New Mexico Council of Governments	Awareness	Jeffery Kiely	Executive Director	505.722.4327	Support	Did not attend meeting.
USACE	Supportive	John Peterson	Geospatial Unit Leader	<a href="mailto:John.L.Peterson@usace.army.mil">John.L.Peterson@usace.army.mil</a> 505.685.4371	Support	EDAC works closely with John Peterson, John will ensure proper staff is made aware of the discovery process occurring in the region.
		Stephen Scissons	Floodplain Management Services Coordinator	<a href="mailto:Stephen.K.Scissons@usace.army.mil">Stephen.K.Scissons@usace.army.mil</a> 505.685.4371	--	--
		John D'Antonio	Deputy District Engineer	505.685.4371	--	--
		Dennis Garcia	Reservoir Control	505.685.4371	--	--
		Curtis McFadden	Pecos River Basin Coordinator	505.685.4371	--	--
USGS	Supportive	Anne Tillery	Hydrologist	<a href="mailto:atillery@usgs.gov">atillery@usgs.gov</a> 505.830.7900	--	--
		Linda Weiss	Director	505.830.7900	--	--
		Sarah McKean	Hydrologist	505.830.7900	--	--
		Mark Gunn	Anne Tillery Supervisor	<a href="mailto:mgunn@usgs.gov">mgunn@usgs.gov</a> 505.830.7900	--	--
		Matt Ely	Sarah McKean Supervisor	505.830.7900	--	--



# SECTION THREE

## Watershed Stakeholder Coordination

Organization	Partner Role	Name	Title	Email & Phone	Involvement/Contribution	Comment
		Anne Marie Matherne	Reports Specialist	<a href="mailto:matherne@usgs.gov">matherne@usgs.gov</a> 505.830.7900	--	--
USFWS	Awareness	George Dennis III	Aquatics Branch Chief	<a href="mailto:George_Dennis@fws.gov">George_Dennis@fws.gov</a> 505.346.2525	--	--
NWS	Awareness	Chuck Jones	Senior Meteorologist	505.243.0702	--	--
		Kerry Jones	Warning Coordination Meteorologist	<a href="mailto:kerry.jones@noaa.gov">kerry.jones@noaa.gov</a> 505.243.0702	--	--
		Royce Fontenot	Senior Service Hydrologist	<a href="mailto:Royce.fontenot@noaa.gov">Royce.fontenot@noaa.gov</a> 505.543.0702	Support	Royce attended the meeting on behalf of NWS.
BLM	Supportive	Richard Fields	Field Manager	<a href="mailto:charles.h.jones@noaa.gov">charles.h.jones@noaa.gov</a> 505.954.2000	--	--
NM DHSEM	Partner	M. Jay Mitchell	Cabinet Secretary	505.476.9600	--	--
		Karen Takai	PIO		--	--
		Bill Borthwick	NFIP Coordinator		Awareness, Support, Messaging	Bill is the primary point of contact for DHSEM and is also the State NFIP Coordinator.
		Wendy Blackwell	SHMO		--	--
		Susan Walker	Preparedness Bureau Chief		--	--
		Valli Wasp	Response & Recovery Bureau Chief		--	--
		Brian Williams	Recovery Unit Manager		--	--

# SECTION THREE

## Watershed Stakeholder Coordination

Organization	Partner Role	Name	Title	Email & Phone	Involvement/ Contribution	Comment
		Vacant	Operations Unit Manager		--	--
NM State Forest	Awareness	Mary Stuever	District Forester	505.867.2334	--	--
		Pablo Montenegro	Fire Management		--	--
		Joe Carrillo	Timber Management		--	--
Office of State Engineer	Supportive	Charles Thompson	Dam Safety Bureau Chief	505.827.6175	--	--
Regional OSE	Supportive	Blaine Watson	District Supervisor	<a href="mailto:Blaine.Watson@state.nm.us">Blaine.Watson@state.nm.us</a> 505.827.6175	Provide Data	Provided comments on ditches/acquias within the watershed. Highlighted areas of concern on numerous arroyos.
NMDOT	Supportive	Paul Brasher	District 5 Engineer	<a href="mailto:Paul.Brasher@state.nm.us">Paul.Brasher@state.nm.us</a> 505.827.6175	--	--
NMFMA	Supportive	Grant Pinkerton	Executive Director	575.937.1691	Support	Grant is the Executive Director of the New Mexico floodplain managers association, he had no comment or concern personally. EDAC had heavy involvement from local FPMs.
NM State Forest	Awareness	Andrew Frederick	State Timber Management Officer	505.867.2334	--	--
NM State Land Office	Supportive	Aubrey Dunn	Commissioner	505.827.5760	--	--

# SECTION THREE

## Watershed Stakeholder Coordination

Organization	Partner Role	Name	Title	Email & Phone	Involvement/Contribution	Comment
NM State Land Office	Supportive	Brandon Foley	Farmington District Resource Manager	<a href="mailto:bfoley@slo.state.nm.us">bfoley@slo.state.nm.us</a> 505.827.5760	Provide Data	Attended Meeting and provided Comments on wildfire risk in Cox Canyon, as well as issues with stormwater infrastructure on public roads near Farmington lake. He also has concerns around the Flora Vista Wash.
NRCS Aztec Service Center	Supportive	Chambliss Lantana	Soil Conservation-ist	<a href="mailto:chambliss.lantana@nm.usda.gov">chambliss.lantana@nm.usda.gov</a> 505.334.6888	Data Provider	Attended meeting and can provide soils data, archival aerial imagery dating back to 1960's. Issues with sedimentation on agricultural land. Farm Service Agency has potential grant dollars through the EWP Program for agricultural lands.
		Jose Pino	Soil Conservation Technician	<a href="mailto:jose.pino@nm.usda.gov">jose.pino@nm.usda.gov</a> 505.334.6888	Support	Jose was contacted by phone and had no specific concerns or comments.
NMED	Awareness	James Hogan	Surface Water Quality Bureau Chief	505.827.2855	--	--
		Ryan Flynn	Cabinet Secretary		--	--
Aztec Ruins National Monument	Awareness	Lawrence Turk	Superintendent	505.334.6174	--	--
NMSEO, Interstate Stream Commission, District 5	Supportive	Shawn Williams	San Juan Basin Water Master	<a href="mailto:shawn.williams@state.nm.us">shawn.williams@state.nm.us</a> 505.334.4571	Provide Data	Provided comments on ditches/acquias within the watershed. Highlighted areas of concern on numerous arroyos.
		Jimmy Hodges	San Juan Basin Water Master	<a href="mailto:jimmy.hodges@state.nm.us">jimmy.hodges@state.nm.us</a> 505.334.4571	--	--

# SECTION THREE

## Watershed Stakeholder Coordination

Organization	Partner Role	Name	Title	Email & Phone	Involvement/ Contribution	Comment
San Juan Agricultural Water Users Association	Awareness	Jimmy Rogers	Member	505.330.0047	--	--
Farmer's Ditch, Special Irrigation District	Supportive	Dennis Taylor	Ditch Rider	505.330.0274	--	--
Governor's Office	Awareness	Chris Sanchez	PIO	<a href="mailto:ChrisJ.Sanchez3@state.nm.us">ChrisJ.Sanchez3@state.nm.us</a> 505.819.1398	Awareness	DHSEM PIO will forward meeting information to Chris Sanchez so the Governor's office is aware that the Discovery process is taking place.
NM Senate, District 2	Awareness	Steven Neville	State Senator	<a href="mailto:steven.neville@nmlegis.gov">steven.neville@nmlegis.gov</a> 505.327.5460	Support	Planned on attending July 28 <sup>th</sup> meeting, but could not make it.
NM Senate, District 1	Awareness	William Sharer	State Senator	<a href="mailto:bill@williamsharer.com">bill@williamsharer.com</a> 505.986.4381	--	--
NM Senate, District 22	Awareness	Benny Shendo, Jr	State Senator	<a href="mailto:benny.shendo@nmlegis.gov">benny.shendo@nmlegis.gov</a> 505.986.4310	--	--
NM Senate, District 3	Awareness	John Pinto	State Senator	505.986.4835	--	--
NM House of Representatives, District 1	Awareness	Rod Montoya	State Representative	<a href="mailto:roddmontoya@gmail.com">roddmontoya@gmail.com</a> 505.986.4211	--	--
NM House of Representatives, District 2	Awareness	James Strickler	State Representative	<a href="mailto:jamesstrickler@msn.com">jamesstrickler@msn.com</a> 505.986.4333	--	--
NM House of Representatives, District 3	Awareness	Paul Brandy	State Representative	<a href="mailto:paul@paulbandy.org">paul@paulbandy.org</a> 505.986.4451	--	--

# SECTION THREE

## Watershed Stakeholder Coordination

Organization	Partner Role	Name	Title	Email & Phone	Involvement/ Contribution	Comment
NM House of Representatives, District 4	Awareness	Sharon Clahchischiliage	State Representative	<a href="mailto:sharon.clahchischill@nmlegis.gov">sharon.clahchischill@nmlegis.gov</a> 505.986.4453	--	--
NM House of Representatives, District 65	Awareness	James Roger Madalena	State Representative	<a href="mailto:james.madalena@nmlegis.gov">james.madalena@nmlegis.gov</a> 505.986.4227	--	--
U.S. Senate	Awareness	Martin Heinrich	US Senator	505.346.6601	Awareness	Jim Dummont from Sen. Martin Heinrich's office attended the meeting and recorded the names of those in attendance. He was pleased at the effort being put forth in the region.
		Tom Udall	US Senator	<a href="mailto:calvert_curley@tomudall.senate.gov">calvert_curley@tomudall.senate.gov</a> 505.346.6791	Awareness	Mr. Calvert Curley of Sen. Tom Udall's office was briefed by NFIP coordinator on the Discovery Process and was pleased at the effort being put forth in the region.
U.S. House of Representatives, State District 3	Awareness	Ben Ray Lujan	US Representative	505.984.8950 <a href="mailto:pete.valencia@mail.house.gov">pete.valencia@mail.house.gov</a>	Awareness and support	Pete Valencia attended meeting on behalf of representative Lujan and was thankful for the support and focus the discovery process was bringing to the region.

# SECTION THREE

## Watershed Stakeholder Coordination

Organization	Partner Role	Name	Title	Email & Phone	Involvement/ Contribution	Comment
Red Cross	Supportive	Ed Bulloch	Retired Soil Scientist	<a href="mailto:hedward@bullochgallery.com">hedward@bullochgallery.com</a> 505.325.2428	Interested in attending Discovery Meetings and would like to be a resource to emergency managers.	Involved with San Juan Watershed Group that works with the Animas Watershed Partnership. Previously assisted in disaster recovery efforts with the Red Cross. One task involved documenting coordinates for bridges and most road crossings in five counties, including La Plata and San Juan. Also looked at some of the forest roads and noted those that needed repairs. Communities may be interested this dataset for use in their transportation groups.

### 3.2 COMMUNITIES

As part of the initial community outreach process, a list of key local contacts was developed to include local stakeholders. The state and AECOM made initial contact by phone to introduce the project, establish relationships, answer questions, and encourage local community representatives to engage in the Discovery process early and often. In the event that contact could not be made by phone after several attempts, a summary of the project process and objectives was emailed. During the calls, some community members suggested an additional contact or department be included. The contact list was updated appropriately in these cases, and is a living document that continues to evolve throughout the project.

The New Mexico team began its outreach with a mailed document and Discovery newsletter, followed up by a phone call to each identified stakeholder. The meeting time and location was given, as well as information regarding the pre-meeting webinar (held on July 20, 2016). A separate webinar was held for congressional representatives.

During the calls, the following topics were generally discussed:

- An overview of the project objectives and Discovery process;
- A summary of partners contacted and types of data available;
- Any identified mitigation actions;
- Perceived hazards to the community;
- The data that the Project Team has available and whether the community would be interested in its use and also if the community had any additional data that would be valuable to contribute; and
- Items or assistance that would help implement planned mitigation actions or to identify additional mitigation actions, as well as hindrances to their implementation.

The contact information for community members contacted, as well as their anticipated involvement or interest in the process, is summarized in Table 4 below. Contact information gathered from this project will be used to update the Community Information System (CIS). In general, most of the community members that the Project Team spoke with were interested in attending the Discovery Meeting and felt that they could use support in identifying additional mitigation actions, as well as funding mechanisms to implement already identified actions. Communities frequently indicated that they had a wish list of mitigation actions to implement, but had limited funding. Overall, most of the mitigation actions prioritized by communities were to address flooding and severe weather hazards.

Data obtained from the communities are summarized and analyzed in Section 4. Mitigation actions and community goals are discussed in Section 6.

**Table 4: Information for and Discussions with Colorado and New Mexico Communities**

Entity	Name	Title	Email & Phone	Involvement or Interest	Comment
<i>Colorado Communities</i>					
La Plata County (LPC)	Tom McNamara	Emergency Management Coordinator	<a href="mailto:mcnamaratr@co.laplata.co.us">mcnamaratr@co.laplata.co.us</a> 970-382-6275o 970-749-3484c	Attended June 9 <sup>th</sup> partner call and attended August 9 <sup>th</sup> Discovery Meeting.	<p>Stated LPC recently flew very detailed LiDAR within a 2 mile buffer from the river corridor. AECOM received this data on a hard drive June 29, 2016.</p> <p>LPC has extensive data on past events, including frequency and types of severity. Data includes historical accounts, photography, and numerical.</p> <p>Current HMP reflects 2013 priorities, but little action has occurred since. Looking to update their HMP in 2017 and asking for \$100,000 to do so - will need contractor assistance. Expecting limited funding next three years, so may need a grant. Will develop in conjunction with a Threat and Hazard Identification and Risk Assessment (THIRA)</p> <p>LPC has been working with the National Weather Service, USGS, and Colorado's DOLA to find project money and support for a radar station in LPC to evaluate how much water they are receiving in the watershed.</p>



# SECTION THREE

# Watershed Stakeholder Coordination

Entity	Name	Title	Email & Phone	Involvement or Interest	Comment
	Butch Knowlton	Building Department Director, Emergency Manager, and Flood Plain Administrator	<a href="mailto:butch.knowlton@co.lapлата.co.us">butch.knowlton@co.lapлата.co.us</a> 970.382.6270	Attended June 9 <sup>th</sup> partner call and attended August 9 <sup>th</sup> Discovery Meeting.	<p>LPC was highly impacted from the 2002 Missionary Ridge wildfires and debris flows; so they are interested in impacts from wildfire coupled with flood.</p> <p>Floodplains are mapped from Durango south to the New Mexico line. LPC would like to remap this section with recent topographic data as most is from 1960s/1970s using highly inaccurate topography where the floodplain isn't even on the river. Much is Zone A without elevations, making it difficult to assess future development. Would like detailed studies with depth grids.</p> <p>Interested in proposed Base Level Engineering analysis for streams having LiDAR coverage, including areas with effective Zone AE mapping.</p> <p>Would like a library of effective floodplain models from FEMA so do not have to wait and pay fee associated with a library request in preparation for letters of map revision. Unlikely to be interested in CRS, due to time commitment.</p> <p>Also interested in development guidance for debris fans and areas with debris flow potential as there are existing lots for future development in debris fans. Similarly, interested in the fluvial hazard zone development guidance. Interested in debris flow susceptibility modeling that CGS is doing and would use to initiate detailed studies.</p> <p>Recommended contacting FireWise.</p>

# SECTION THREE

# Watershed Stakeholder Coordination

Entity	Name	Title	Email & Phone	Involvement or Interest	Comment
	Leslie Jakoby	Environmental Specialist	<a href="mailto:leslie.jakoby@co.laplata.co.us">leslie.jakoby@co.laplata.co.us</a> 970-382-6376	Attended June 9 <sup>th</sup> partner call and attended August 9 <sup>th</sup> Discovery meeting.	--
	Victoria Schmitt	Planning Engineer	<a href="mailto:victoria.schmitt@co.laplata.co.us">victoria.schmitt@co.laplata.co.us</a> <a href="mailto:Planning@co.laplata.co.us">Planning@co.laplata.co.us</a> 970.382.6438	Interested, but unable to attend the Discovery meeting.	Interest in watershed resiliency relates primarily to erosion, sediment, and stormwater controls and management. May benefit from educational assistance in erosion and sediment control BMPs; planning regional stormwater control measures; and incorporating water quality control volumes for stormwater detention/management into the land use code for development guidance.
	Carrie Woodson	Chief Appraiser	<a href="mailto:Carrie.Woodson@co.laplata.co.us">Carrie.Woodson@co.laplata.co.us</a> 970.382.6225	Attended August 9 <sup>th</sup> Discovery meeting.	Coordinating LiDAR flight in Spring 2017. Interested in partnering with State efforts.
	Jerome Bernard	GIS Technician	<a href="mailto:Jerome.Bernard@co.laplata.co.us">Jerome.Bernard@co.laplata.co.us</a> 970.382.6236	Attended August 9 <sup>th</sup> Discovery meeting.	--
	David Kirk	GIS Analyst	<a href="mailto:David.Kirk@co.laplata.co.us">David.Kirk@co.laplata.co.us</a> 970.382.6257	Attended August 9 <sup>th</sup> Discovery meeting.	--
	Joe Kerby	County Manager	<a href="mailto:Joe.Kerby@co.laplata.co.us">Joe.Kerby@co.laplata.co.us</a> 970.382.6220	Attended August 9 <sup>th</sup> Discovery meeting.	--
	Sarah Jacobson	County Administrative Assistant	<a href="mailto:Sarah.Jacobson@co.laplata.co.us">Sarah.Jacobson@co.laplata.co.us</a> 970.382.6220	Interested, but unable to attend the Discovery meeting.	Coordinating other's involvement.
	Brad Blake	District 1 (Western) Commissioner	<a href="mailto:Brad.Blake@co.laplata.co.us">Brad.Blake@co.laplata.co.us</a> 970.382.6216	Attended August 9 <sup>th</sup> Discovery meeting.	--
	Gwen Lachelt	District 2 (Central) Commissioner	<a href="mailto:Gwen.Lachelt@co.laplata.co.us">Gwen.Lachelt@co.laplata.co.us</a> 970.382.6215	Attended August 9 <sup>th</sup> Discovery meeting.	--

# SECTION THREE

## Watershed Stakeholder Coordination

Entity	Name	Title	Email & Phone	Involvement or Interest	Comment
	Julie Westendorff	District 3 (Eastern) Commissioner	<a href="mailto:Julie.Westendorff@co.laplata.co.us">Julie.Westendorff@co.laplata.co.us</a> 970.382.6217	Attended August 9 <sup>th</sup> Discovery meeting.	--
San Juan County, CO (SJC)	Peter McKay	District 1 (Southeast) Commissioner	<a href="mailto:bocc@sanjuancountycolorado.us">bocc@sanjuancountycolorado.us</a> 970.387.5671	Spoke with receptionist – the commissioners have no voicemail; sent email as recommended	--
	Scott Fetchenhier	District 2 (Northern) Commissioner			Recommended to participate by Jim Donovan, but could not attend.
	Ernest Kuhlman	District 3 (Western) Commissioner			--
	Willy Tookey	County Administrator	<a href="mailto:sanjuancounty@frontier.net">sanjuancounty@frontier.net</a> 970.387.5766	Attended August 9 <sup>th</sup> Discovery meeting.	SJC does not have an HMP nor any official way of tracking, prioritizing, or planning future projects. Recommended contacting Bob Nevins and Jim Donovan. Requested an email summary.

# SECTION THREE

## Watershed Stakeholder Coordination

Entity	Name	Title	Email & Phone	Involvement or Interest	Comment
	Bob Nevins	Planning Director (for Silverton & SJC)	<a href="mailto:bnevins@silverton.co.us">bnevins@silverton.co.us</a> 970.769.6522	Attended August 9 <sup>th</sup> Discovery meeting.	<p>Construction has been ongoing along Animas River, Cement Creek, and Mineral Creek. There is future development potential along each of these corridors, but the FEMA FIRMs are old and likely inaccurate. The County uses hazard mapping to inform development decisions, which was last done in 1976 as part of the in-star program. These are hand drawn edits on USGS maps and have not been updated or digitized. The maps include avalanche pathways, geologic hazards (rockfall and debris fan), and wildfire hazards. There is a summary risk ranking map showing areas from 1 to 5. The County heavily relies on these maps and would like updated maps in electronic form.</p> <p>Interested in mapping alpine tundra as it restricts development. Perhaps Forest Service or BLM has this information? The county typically looks at the tree line from Google Aerials. Overall, it would be valuable to have a list of resources, databases, and online tools.</p> <p>In the wintertime, only Highway 50 is useable, which at times is closed both directions, isolating the Town of Silverton for days at a time. Wildfire hasn't been much of an issue historically, but may have increased potential due to recent pine beetle kill. Flooding is less frequent, but there is potential for brief, but intense flooding that leads to mudflows.</p>

# SECTION THREE

## Watershed Stakeholder Coordination

Entity	Name	Title	Email & Phone	Involvement or Interest	Comment
	Jim Donovan	Emergency Manager	<a href="mailto:oem@SanJuanCountyColorado.us">oem@SanJuanCountyColorado.us</a> 970.903.7039	Attended August 9 <sup>th</sup> Discovery meeting.	<p>Currently spearheading the development of the County’s first HMP. Serves as an opportunity to plan and prioritize mitigation projects and foci. Goal with HMP is to have a data layer associated with each of the identified hazards. Approximately halfway through the HMP (as of early July 2016) and planning to complete by September 30, 2016, when the grant’s period of performance expires.</p> <p>Updated floodplains are a big priority as they currently have 1978 delineations on paper maps; therefore, would like revised floodplains in GIS format.</p> <p>Interested in obtaining more data in general as the County does not have much compiled and would like to establish a robust database.</p> <p>Landslides are a concern, but have been documented where occurred and are planning accordingly.</p> <p>Interested in direct access to avalanche path mapping data from the Colorado Avalanche Information Center. Would like access to layers to plan for future development and infrastructure.</p> <p>Another priority is wildfire mitigation, response, and planning.</p>

# SECTION THREE

## Watershed Stakeholder Coordination

Entity	Name	Title	Email & Phone	Involvement or Interest	Comment
Town of Silverton	Christine Tookey	Mayor	<a href="mailto:chris@frontier.net">chris@frontier.net</a> 970.387.5409	Interested in process but unable to attend Discovery meeting.	Silverton does not have an HMP, but the Town would be interested in creating one. Recently, the Gold King Mine incident has consumed considerable time and energy to where little else has progressed, but now they are more available and capable of being more proactive.  The Town and SJC share an emergency management plan, which is maintained by Jim Donovan. The plan is rather lengthy and serves as a living document.
	Bob Nevins	See SJC entry – also Planner for Town of Silverton. The Town of Silverton and San Juan have an intergovernmental agreement that if a disaster occurs, the County takes charge for the whole Town. The Town adopts the County’s plans.			
	Andrew Rapiejko	Town Engineer with SGM	<a href="mailto:andrewr@sgm-inc.com">andrewr@sgm-inc.com</a> 970.385.2340	Interested in the Discovery process, but unable to attend the Discovery Meeting.	Andrew has been working with the Town since September 2015, so is not thoroughly familiar with their concerns. However, he believes Silverton would have an interest in debris flow hazards and mitigation; wildfire, though it is the surrounding area that is at risk (not the town); updating floodplain maps, as the mapping is out of date and they could use better data; and emergency preparedness as they have isolated infrastructure with limited roads coming in and out, making it easy to be cut off during a blizzard.
	Bill Gardner	Town Administrator	<a href="mailto:bgardner@silverton.co.us">bgardner@silverton.co.us</a> 970.946.9408	Likely not involved in planning or mitigation-related activities.	Referred to Bob Nevins (the Town’s Planner) and Andrew Rapiejko (the Town’s Consultant).

# SECTION THREE

## Watershed Stakeholder Coordination

Entity	Name	Title	Email & Phone	Involvement or Interest	Comment
City of Durango	Terry Hoecker	Emergency Operations Coordinator	<a href="mailto:terry.hoecker@durangogov.org">terry.hoecker@durangogov.org</a> 970.375.4739	<p>Interested in process and attended the Discovery Meeting</p> <p>Experiencing many inquiries related to the Gold King Mine incident so needs to follow protocol and get approval before discussing.</p> <p>Limiting factor to mitigation planning and implementation is City staff. It would be ideal to leverage grants to fund contractors. Durango is interested in AECOM's capabilities and outcomes from previous mitigation and Discovery projects. Terry would like to review the Draft Discovery Report before the Discovery meeting.</p>	<p>Oversees disaster response and resilience. Involved in the Animas River Review Committee and Plan that was established with San Juan Basin Health, LPC, SJC, Durango, and SUIT in response to of Gold King Mine incident. The main focus of the River Review Plan is on emergency response. It is funded by the Clean Water Act and includes leveraging existing USGS gages. A majority of Durango's drinking water comes from surface water intakes along the Florida River and then a portion is drawn from the Animas River, as needed.</p> <p>Durango has used mitigation funding for erosion projects (have one going on now). They are co-sponsors and co-authors of the LPC HMP and adopt the same mitigation actions. The HMP was modeled after Boulder County's HMP as LPC has similar urban wildland interface risks. Durango intends to complete a THIRA this year that evaluates the following hazards: electrical, cyber, flood, wildfire, and weather.</p> <p>Terry recommended additional contacts including Tom Johnson with SUIT, Brian Devine with San Juan Basin Health, Randy Black with Durango's Fire District, Steve Salka with Durango Utilities, and Nicol Killian with Durango Planning.</p>

# SECTION THREE

## Watershed Stakeholder Coordination

Entity	Name	Title	Email & Phone	Involvement or Interest	Comment
	Craig Roser	Principal Planner & Floodplain Manager	<a href="mailto:craig.rosier@durangogov.org">craig.rosier@durangogov.org</a> 970.375.4853	Attended August 9 <sup>th</sup> Discovery Meeting.	Durango does not have many floodplain issues as the City has acquired much of the floodplain for parks and recreational use, with little development anticipated in floodplain.
	Vicki Vandegrift	Planner	<a href="mailto:vicki.vandegrift@durangogov.org">vicki.vandegrift@durangogov.org</a>	Did not attend Discovery meeting.	Deals primarily with long range planning and comprehensive planning issues.
	Cathy Metz	Parks and Recreation Director	<a href="mailto:Cathy.Metz@durangogov.org">Cathy.Metz@durangogov.org</a> 970.375.7329	Did not attend Discovery meeting.	--
	Scott McClain	Landscape Architect - Parks and Trails Development at City of Durango	<a href="mailto:scott.mcclain@durangogov.org">scott.mcclain@durangogov.org</a> 970.375.7322	Interested, but could not attend Discovery meeting.	Durango's Parks and Recreation department conducts stream restoration projects and is interested in developing a river corridor management plan. They are interested in the Discovery process to see what resources, data, and funding are available for leveraging.
	Steve Salka	Utilities Director	<a href="mailto:steve.salka@durangogov.org">steve.salka@durangogov.org</a> 970.375.4809	Did not attend Discovery meeting.	--
	Nicol Killian	Deputy Director of Planning Department	<a href="mailto:Nicol.killian@durangogov.org">Nicol.killian@durangogov.org</a> <a href="mailto:plansrvcs@durangogov.org">plansrvcs@durangogov.org</a> 970.375.4850	Did not attend Discovery meeting.	--
	Dean Brookie	City Councilor	<a href="mailto:DeanBrookie@DurangoGov.org">DeanBrookie@DurangoGov.org</a> 970.749.3189	Did not attend Discovery meeting.	Experienced in architecture and planning; a leader in community development and environmental sustainability.
	Dick White	Mayor Pro Tem/City Councilor	<a href="mailto:DickWhite@DurangoGov.org">DickWhite@DurangoGov.org</a> 970.382.0049	Attended August 9 <sup>th</sup> Discovery Meeting.	Interested in policy
	Sherri Dugdale	Assistant to the City Manager	<a href="mailto:sherri.dugdale@durangogov.org">sherri.dugdale@durangogov.org</a> 970.375.5002	Did not attend Discovery meeting.	--



# SECTION THREE

## Watershed Stakeholder Coordination

Entity	Name	Title	Email & Phone	Involvement or Interest	Comment
	Rick Szmajter	GIS Analyst City of Durango	<a href="mailto:rick.szmajter@durangogov.org">rick.szmajter@durangogov.org</a> 970.375.5076	Attended August 9 <sup>th</sup> Discovery Meeting.	Has access to a considerable amount of data. High resolution aeriels were flown for Durango during the last Pictometry flight, but no LiDAR for generating contours. Durango did have a LiDAR flight in 2001, from which the City has developed contours. There have been some changes along the river banks and corridor since 2001, but the surrounding ground should be similar.  Mentioned that high-water marks were also surveyed after much of the construction was complete and these could be obtained from Gregg Boysen with the City's Engineering.
	Gregg Boysen	City Engineer	<a href="mailto:gregg.boysen@durangogov.org">gregg.boysen@durangogov.org</a> 970.375.4810	Did not attend Discovery meeting.	--

# SECTION THREE

## Watershed Stakeholder Coordination

Entity	Name	Title	Email & Phone	Involvement or Interest	Comment
	Lance Frisby	GIS Supervisor City of Durango	<a href="mailto:Lance.Frisby@durangogov.org">Lance.Frisby@durangogov.org</a> 970.375.5075	Interested in data sharing and specific project discussions. Did not attend Discovery meeting.	<p>The LiDAR was focused on urbanized corridors. The group paid for flights on Mesa South. Weren't interested in public lands area.</p> <p>Pictometry flew LiDAR in April/May 2015 teamed with LPC, Durango, and Southern Ute. Flew 3-inch resolution for aerial photography and 9-inch resolution for larger scale, which should cover Durango. Durango is interested in generating 2-foot contours from recent data.</p> <p>Recommended talking with Carrie Woodson with LPC's Assessors Office as she helped arrange the LiDAR acquisition. GIS points of contact at LPC include Jerome Bernard, Robbie, and David Kirk.</p>
	Ron LeBlanc	City Manager	<a href="mailto:citymanager@durangogov.org">citymanager@durangogov.org</a> 970.375.5005	Interested in process, but unable to attend the Discovery Meeting	<p>Stated that Durango has an aggressive field program to reduce fuels conducted by the Fire District to manage fires. Durango's recreation department is an important part of economy and may be interested.</p> <p>Durango adopts LPC's HMP and operates as one hazard mitigation team and jointly identifies projects; however, some of the 31 projects do not apply to Durango.</p> <p>Deferred to the GIS department regarding why the LPC LiDAR dataset omits Durango. Stated that the City staff is very busy and many are on vacation in August.</p>

# SECTION THREE

# Watershed Stakeholder Coordination

Entity	Name	Title	Email & Phone	Involvement or Interest	Comment
	Christina Rinderle	Mayor/City Councilor	<a href="mailto:christinarinderle@durangogov.org">christinarinderle@durangogov.org</a> <a href="mailto:citycouncil@durangogov.org">citycouncil@durangogov.org</a> 970.946.2279	Requested contact by email. Did not attend Discovery meeting.	--
Durango Fire and Rescue	Randy Black	Deputy Chief of Operations for Durango's Fire Protection District	<a href="mailto:blackrk@durangofirerescue.org">blackrk@durangofirerescue.org</a> 970.382.6036	Unable to attend Discovery meeting.	--
	Jeff Harris	Battalion Chief	<a href="mailto:harrisjw@durangofirerescue.org">harrisjw@durangofirerescue.org</a> 970.579.0970	Attended August 9 <sup>th</sup> Discovery Meeting.	--
Durango & Silverton Narrow Gauge Railroad	John Harper	General Manager	<a href="mailto:johnharper@durangotrains.com">johnharper@durangotrains.com</a> 970.259.0274 x8826	Interested, but out of town. Will send a representative to Discovery Meeting(s).	<p>They have been very proactive with wildfire mitigation efforts and currently working on their third fuels mitigation project along the train's right of way.</p> <p>The train has historically caused wildfires and in 2002, the train was unable to operate for a period of time due to existing drought conditions and the high wildfire danger, which was a significant financial impact to both the Durango and Silverton communities.</p> <p>The train follows the Animas River (and a few creeks) from Durango to Silverton. They have approximately 30 miles of track in LPC and 20 in SJC, so they work regularly with both and would like to attend both the Durango and Silverton meetings.</p>
	Evan Buchanan	V.P of Operations	<a href="mailto:ebuchanan@durangotrains.com">ebuchanan@durangotrains.com</a> 970.946.7599	Attended August 9 <sup>th</sup> Discovery Meeting.	Provided information on the Railroad's ongoing mitigation efforts (see Section 4.4.3)
	TBD	Tribal Government Leaders	TBD	No coordination was held with tribal leaders.	

# SECTION THREE

## Watershed Stakeholder Coordination

Entity	Name	Title	Email & Phone	Involvement or Interest	Comment
Southern Ute Indian Tribe (SUIT)	Ken Van Zee	BIA Forestry	970.563.4572	Shares office with Brian Gideon. Brian will be the point of contact.	
	Brian Gideon	Head of Forestry Division	<a href="mailto:bgideon@southernute-nsn.gov">bgideon@southernute-nsn.gov</a> 970.563.2911	Interested for awareness purposes, but not seeking support.  Attended August 8 <sup>th</sup> Discovery Meeting.	SUIT has an active wildfire suppression team and plan. They conduct a significant amount of fuels reduction and restoration work. They have a large forestry shop (11 employees) and tribal lands and the BIA forestry group is also located on the tribal lands. SUIT has not experienced a large fire on the tribal land in a long time, with the largest wildfire in last decade being approximately 500 acres. The SUIT team has a fuels specialist and wildfire technician and is actively performing considerable restoration work and taking proactive measures to make their forests more resilient.
	Theresa Ancell	Head of Water Resources Division	<a href="mailto:tancell@southernute-nsn.gov">tancell@southernute-nsn.gov</a> 970.563.2931	Attended August 8 <sup>th</sup> Discovery Meeting	Concurred that flooding and wildfire are the biggest hazards posed to SUIT. She deferred to her staff for specifics on mitigation efforts.
	Cathy Condon	SUIT Representative, Attorney at Law	<a href="mailto:ccondon@mmwclaw.com">ccondon@mmwclaw.com</a> 303.442.2021	Attended August 8 <sup>th</sup> Discovery Meeting	--
	Travis Wheeler	Water Resources Technician	<a href="mailto:twheeler@southernute-nsn.gov">twheeler@southernute-nsn.gov</a> 970.563.0100	Attended August 8 <sup>th</sup> Discovery Meeting	--
	Steve Whiteman	Division Head of Wildlife Resource Management	<a href="mailto:swhitema@southernute-nsn.gov">swhitema@southernute-nsn.gov</a> 970.563.0130	Cannot attend the Discovery Meeting	--

# SECTION THREE

## Watershed Stakeholder Coordination

Entity	Name	Title	Email & Phone	Involvement or Interest	Comment
	Tom Johnson	Division Head of Environmental Program	<a href="mailto:tojohns@southernute-nsn.gov">tojohns@southernute-nsn.gov</a> 970.563.0100	Attended August 8 <sup>th</sup> Discovery Meeting	Focused on water quality program. Involved in Animas River Review effort following the Gold King Mine incident. Recommended involving tribal government leaders in process.
	Lena Atencio	Director of Department of Natural Resources	<a href="mailto:latencio@southernute-nsn.gov">latencio@southernute-nsn.gov</a> 970.563.2263	Attended August 8 <sup>th</sup> Discovery Meeting	--
	Kathi Gurule	Risk and Emergency Manager	<a href="mailto:kgurule@southernute-nsn.gov">kgurule@southernute-nsn.gov</a> 970.563.0100 ext. 2449	Interested in the Discovery process but did not attend the Discovery Meeting.	<p>She indicated that the ideal first step would be to have updated floodplains and develop FIRMs for the whole SUIT land so that the Tribe can join the NFIP. In the 17 years that she has been the Tribe's emergency manager, she recalls two flooding events where roads were washed out.</p> <p>The SUIT's HMP was last updated in 2013, but none of the projects or actions has moved forward due to a lack of resources and staffing. The plan is fairly comprehensive, but she has not done any internal training or community outreach. Although mitigation projects might be identified, there are insufficient staff and time to complete them; therefore, would need to hire a contractor to implement them if funding were available.</p> <p>Perhaps the Tribe's most significant hazard is from wildfire, as the Tribe's residential areas are surrounded by juniper, pinyon, and cedar in a hot and dry climate. All wildfire suppression is done by the SUIT and BIA. Recommended contacting Ken Van Zee</p>

# SECTION THREE

## Watershed Stakeholder Coordination

Entity	Name	Title	Email & Phone	Involvement or Interest	Comment
					<p>with BIA forestry.</p> <p>She is uncertain whether debris flow or erosion hazards would be of concern or if any SUIT staff considers these.</p> <p>She recommended contacting Teresa Ancell (Water Resources) and Lena Atencio (Director of DNR).</p>
	Shelly Riddle	GIS Manager	<a href="mailto:sriddle@southernute-nsn.gov">sriddle@southernute-nsn.gov</a> 970.563.0125 ext. 2226	Attended August 8 <sup>th</sup> Discovery Meeting	<p>Stated the biggest priority for SUIT is to join the NFIP; however, there is a chunk of river that has never had its floodplains mapped. Only a portion of the tribal lands were mapped the last time floodplains were delineated, because the tribal government denied access to a portion of the Pine River in LPC. However, the tribal government would now like to map this missing portion and improve their floodplain maps.</p> <p>The Tribe teamed with LPC (did a cost share) to fly LiDAR within LPC and the tribal lands. The LiDAR covering tribal lands within LPC is available from LPC. The Tribe also flew LiDAR for a portion of tribal lands in Archuleta County, which may be available upon written formal request explaining its use and benefit to SUIT. This portion covers the San Juan River and Piedra River in Archuleta County.</p> <p>The Tribe might also be interested in wildfire mitigation and is presently fighting two wildfires. The Tribe's forestry division fights wildfires (Brian Gideon) and works closely with BIA.</p>

# SECTION THREE

## Watershed Stakeholder Coordination

Entity	Name	Title	Email & Phone	Involvement or Interest	Comment
	Jason Mietchen	Range Division Head	<a href="mailto:jmietchen@southernute-nsn.gov">jmietchen@southernute-nsn.gov</a> 970.563.4780	Attended August 8 <sup>th</sup> Discovery Meeting.	--
	Germaine Ewing	Lands Division Head	<a href="mailto:Gewing@wouthernute-nsn.gov">Gewing@wouthernute-nsn.gov</a> 970.563.2228	Attended August 8 <sup>th</sup> Discovery Meeting.	--
	Jody Rosier	Tribal Planner	<a href="mailto:jrosier@southernute-nsn.gov">jrosier@southernute-nsn.gov</a> ext 2270	Attended August 8 <sup>th</sup> Discovery Meeting.	--
<i>New Mexico Communities</i>					
San Juan County (NM)	Wallace Charley	County Commissioner	505.419.6631	--	--
	Margaret McDaniel	County Commissioner	505.860.7997	--	--
	Scott Eckstein	County Commissioner	505.334.9481	--	--
	Jack Fortner	County Commissioner	505.334.4271	--	--
	Keith Johns	County Commissioner	505.334.4271	--	--
	Kim Carpenter	Executive Officer	<a href="mailto:kcarpenter@sjcounty.net">kcarpenter@sjcounty.net</a> 505.334.4271	--	--
	Mike Stark	Chief Operations Officer	<a href="mailto:mstark@sjcounty.net">mstark@sjcounty.net</a> 505.334.4582	--	--
	Michele Truby	Floodplain Manager	<a href="mailto:trubym@sjces.net">trubym@sjces.net</a> 505.334.4719	Attended Discovery Meeting	Michele is the SJC floodplain manager and our local POC for the watershed. Her main concern is a lack of Base Flood Elevations throughout the county.
	Dave Keck	Public Works Administrator	<a href="mailto:dkeck@sjcounty.net">dkeck@sjcounty.net</a> 505.334.4520	--	--

# SECTION THREE

## Watershed Stakeholder Coordination

Entity	Name	Title	Email & Phone	Involvement or Interest	Comment
	Craig Daugherty	Fire Chief	<a href="mailto:daughterc@sices.net">daughterc@sices.net</a> 505.334.1180	--	--
	Ken Douglas	Building Official	<a href="mailto:kdouglas@sjcounty.net">kdouglas@sjcounty.net</a> 505..333.3129	--	--
	Larry Hathaway	Community Development Administrator	<a href="mailto:lhathaway@sjcounty.net">lhathaway@sjcounty.net</a> 505.334.4550	--	--
	Jimmy Voita	County Assessor	<a href="mailto:assessor@sjcassessor.net">assessor@sjcassessor.net</a> 505.334.6157	--	--
	Don Cooper	Emergency Manager	<a href="mailto:cooperd@sices.net">cooperd@sices.net</a> 505.334.1180	--	--
	Evan O'Keefe	GIS Supervisor	<a href="mailto:eokeefe@sjcounty.net">eokeefe@sjcounty.net</a> 505.334.4585	Attended Discovery Meeting	Provided GIS data of problem flooding areas from public works staff. Would be interested in a Hydraulic model for the Animas River.
	Fran Fillerup	Public Works	<a href="mailto:ffillerup@sjcounty.net">ffillerup@sjcounty.net</a> 505-334-7864	Attended Discovery Meeting	Provided data highlighting problem flooding areas in the county. Would like grant assistance to clear out vegetation in arroyos which leads to flooding and sedimentation.
	Sherice Snell	Public Works	<a href="mailto:ssnell@sjcounty.net">ssnell@sjcounty.net</a> 505-334-4264	Attended Discovery Meeting	Provided information on County Road 5500 Bridge which has been "topped" nearly three times in 2016 alone. 5-mile Bridge in Largo Canyon also has experienced multiple flooding issues.
City of Aztec	Joshua Ray	City Manager	<a href="mailto:jray@aztecnm.gov">jray@aztecnm.gov</a> 505.334.7606	--	--
	Austin Randall	Commissioner	<a href="mailto:arandall@aztecnm.gov">arandall@aztecnm.gov</a> 505.334.7606	--	--



# SECTION THREE

## Watershed Stakeholder Coordination

Entity	Name	Title	Email & Phone	Involvement or Interest	Comment
	Sally Burbridge	Mayor	<a href="mailto:sburbridge@aztecnm.gov">sburbridge@aztecnm.gov</a> 505.334.7606	Interested	Did not attend meeting but was excited to see the process taking place in her area.
	Sherri Sipe	Mayor Pro-Tem	<a href="mailto:ssipe@aztecnm.gov">ssipe@aztecnm.gov</a> 505.334.7606	--	--
	Katee McClure	Commissioner	<a href="mailto:kmclure@aztecnm.gov">kmclure@aztecnm.gov</a> 505.334.7606	--	--
	Sheri Rogers	Commissioner	<a href="mailto:srogers@aztecnm.gov">srogers@aztecnm.gov</a> 505.334.7606	--	--
	William Watson	City Engineer/Public Works Director	<a href="mailto:wwatson@aztecnm.gov">wwatson@aztecnm.gov</a> 505.334.7660	--	--
	William Homka	Community Development Director	<a href="mailto:whomka@aztecnm.gov">whomka@aztecnm.gov</a> 505.334.7605	--	--
	Robert Carman	Compliance Officer	<a href="mailto:rcarman@aztecnm.gov">rcarman@aztecnm.gov</a> 505.334.7697	--	--
	Kevin Simpson	Fire Chief	<a href="mailto:ksimpson@aztecnm.gov">ksimpson@aztecnm.gov</a> 505.334.7620	--	--
City of Farmington	Tommy Roberts	Mayor	<a href="mailto:troberts@fmtn.org">troberts@fmtn.org</a> 505.599.1100	--	--
	Lisa Hale-BlueEyes	Public Works	<a href="mailto:lhblueeyes@fmtn.org">lhblueeyes@fmtn.org</a> 505.579.1312	Attended Discovery Meeting	Gave information regarding non-compliant homeowner in Farmington not having proper venting on concrete wall. The community is working with FEMA Region VI to get the owner in compliance.
	Rob Mayes	City Manager	<a href="mailto:rmayes@fmtn.org">rmayes@fmtn.org</a> 505.599.1100	--	--
	Linda Rodgers	City Councilor	<a href="mailto:lrodgers@fmtn.org">lrodgers@fmtn.org</a> 505.599.1155	--	--

# SECTION THREE

## Watershed Stakeholder Coordination

Entity	Name	Title	Email & Phone	Involvement or Interest	Comment
	Sean Sharer	City Councilor	<a href="mailto:ssharer@fmtn.org">ssharer@fmtn.org</a> 505.599.1112	--	--
	Gayla McCulloch	City Councilor	<a href="mailto:gmcculloch@fmtn.org">gmcculloch@fmtn.org</a> 505.599.1111	--	--
	Nate Duckett	City Councilor	<a href="mailto:nduckett@fmtn.org">nduckett@fmtn.org</a> 505.599.1105	--	--
	Terry Page	Fire Chief	<a href="mailto:tpage@fmtn.org">tpage@fmtn.org</a> 505.599.1430	--	--
	Mary Holton	Community Development Director	<a href="mailto:mholton@fmtn.org">mholton@fmtn.org</a> 505599.1285	Did not plan on attending meeting.	Will pass along info to relevant staff.
	David Sypher	Public Works Director	<a href="mailto:dsypher@fmtn.org">dsypher@fmtn.org</a> 505.599.1062	--	--
	Nica Westerling	Engineer	<a href="mailto:nwesterling@fmtn.org">nwesterling@fmtn.org</a> 505.599.1308	Attended Discovery Meeting	--
	Bobby Kimball	GIS Supervisor	<a href="mailto:rkimball@fmtn.org">rkimball@fmtn.org</a> 505.599.1252	Attended Discovery Meeting	Is interested in obtaining landcover and critical habitat data. Would also like topo data for the upper animas watershed. Bobby also provided a disc of city GIS data for inclusion into this report.
	Jaclynn Fallon	GIS Technician	<a href="mailto:jfallon@fmtn.org">jfallon@fmtn.org</a>	Attended Discovery Meeting	Provided GIS Data for the City of Farmington.

This Report and the maps contained herein summarize and analyze the data and information collected from online databases, partners, and communities during the stakeholder engagement phase. The data collected includes effective and preliminary FIRM databases, the Coordinated Needs Management Strategy (CNMS) tool and community GIS data, available topographic data, details on ongoing studies and flood recovery efforts, letter of map change (LOMC) data, mitigation plans and grants, repetitive loss information, claims data, historical flooding, declared disasters, and hazard information. The CNMS is explained in detail in Subsection 4.1.7.

In addition to data obtained by the Project Team, there is a considerable amount of information concerning risks and hazards in the LPC and SUT HMPs (2013), as well as the State of Colorado Natural Hazards Mitigation Plan (2013). Data were also pulled from the State of New Mexico and San Juan County HMPs. The information in this section is organized by data used for flood risk analysis, non-flood hazard information, financial and damages related information, and other available mitigation information. [Planningforhazards.org](http://www.planningforhazards.org) and <http://www.nmdhsem.org/> are great sources of information on hazards that should be utilized.

## **4.1 INFORMATION USEFUL FOR FLOOD RISK ANALYSIS**

These data may be used in FEMA Risk MAP products, both regulatory (FIRMs and Flood Insurance Study [FIS] reports) and non-regulatory (Flood Risk Databases, Flood Risk Reports, and Flood Risk Maps). The data are detailed in the subsections below and include floodplain information, levees and dams, topographic data, hydrology and hydraulics information, and data from the CNMS.

### **4.1.1 Hydrologic Analysis**

Similar to other streams in the Rocky Mountains, stream flow in the Animas Watershed primarily originates from snow melt, is highest between April and July, and is sustained by groundwater the remainder of the year. There are 47 stream gages located within the project study area, as shown on Figure 5, of which 31 are active and 16 are archived with historical data. Eight gages actively monitor the Animas River with one location having records dating back to 1897. Real-time and historical flow data are accessible by interactive maps maintained by USGS for Colorado and New Mexico at <http://waterwatch.usgs.gov/?m=real&r=co&w=map> and <http://waterwatch.usgs.gov/?m=real&r=nm&w=real%2Cmap>, respectively. In addition to flow data, many of the gages also record water quality information. The median and mean daily discharges through Durango are 1,800 and 2,140 cfs, respectively, based on more than 100 years of records, with a maximum of 6,900 cfs observed in 1917 (<http://waterdata.usgs.gov/nwis/uv?09361500>). Stream gage data are presented in Table 5.

Of the 47 stream gages presented in Table 5, seven locations spatially matched, or nearly matched, flow change locations noted in the effective FIS reports for LPC (FEMA 2010a) and SJC (FEMA 1978) in Colorado, and San Juan (FEMA 2010b) county in New Mexico. The data from these seven gage locations were used to conduct a basic log-Pearson Type III gage analysis to assess the validity of the effective discharges presented in the FIS reports, as some of the values have not been updated since the 1970s. A comparison of the discharges at the seven gages determined to be applicable are presented in Table 6.

Overall, the effective discharges tend to be larger than the discharges determined from the log-Pearson Type III gage analysis performed in the United States Army Corps of Engineers (USACE) Hydrology Engineering Center's Statistical Software Package (HEC-SSP) by AECOM (Table 6). In every instance, the effective discharge for the 1% annual chance event was higher than the gage analysis value for the 1% annual chance event discharge, ranging from a factor of 14 to 55% higher. There are several potential reasons why the effective discharges are consistently larger than the gage analysis results. First, the gage analysis conducted by AECOM includes a longer period of record than was considered in the development of the effective discharges. In some cases, most notably the gages located on the Animas River and Hermosa Creek in LPC (USGS gages 09361500 and 09361000, respectively), the gage analysis performed by AECOM includes nearly 40 additional years of record, which could reduce the peaks estimated in the effective datasets. Second, the effective FIS reports for LPC and SJC, and San Juan County in New Mexico note that the effective discharges were typically determined from discharge-frequency analyses derived from stream gage records. Several gages within the study area have relatively short records (less than 20 years) and may not have been included in the original discharge-frequency analyses used to determine the effective discharges. As a result, the restudied gage analysis may present more accurate results as they are developed from a larger gage sample size.

In addition to gage information, a number of hydrologic and water quality investigation reports pertaining to the Animas Watershed are available for download on USGS's website at <https://pubs.er.usgs.gov/> (<https://pubs.er.usgs.gov/search?q=Animas+watershed>). A number of USGS studies have been published pertaining to SJC, and in particular the Animas Watershed, including a hydrologic study of the upper Animas River watershed near the Town of Silverton, water quality studies of the San Juan Mountains, mining-related impacts to the upper Animas Watershed, a 2007 study of the environmental effects of historical mining in the Animas River watershed, and an interim report on the scientific investigations in the Animas River Watershed to facilitate remediation decisions by the BLM and USFS published in 2000.

Related to hydrology, LPC is currently pursuing the placement of a weather radar station to evaluate how much precipitation they are receiving in the watershed, as described further in Section 4.2.2. Several of the primary tributaries to the Animas in LPC do not have gauges, or only just above their confluence with the Animas (e.g., Needle, Hermosa, Junction, Lightner, Florida). Following the installation and operation of a radar station, improved precipitation records and forecasting could be used to develop rainfall-runoff based hydrology.

**Table 5: Stream Gage Data**

Station Information				Location (decimal degrees)		Period of Record	Website for More Information
USGS ID	Name	Data Source	Status	Latitude	Longitude		
09361500	ANIMAS RIVER AT DURANGO	USGS	Active	37.279169	-107.880345	1897-2016	<a href="http://waterdata.usgs.gov/nwis/uv?09361500">http://waterdata.usgs.gov/nwis/uv?09361500</a>
09364500	ANIMAS RIVER AT FARMINGTON, NM	USGS	Active	36.721392	-108.202018	NR	<a href="http://waterdata.usgs.gov/nwis/uv?site_no=09364500">http://waterdata.usgs.gov/nwis/uv?site_no=09364500</a>
09357500	ANIMAS RIVER AT HOWARDSVILLE, CO	DWR	Active	37.833054	-107.599503	1935-2016	<a href="http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=ANIHOWCO&amp;MTYPE=DISCHRG">http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=ANIHOWCO&amp;MTYPE=DISCHRG</a>
09358000	ANIMAS RIVER AT SILVERTON	USGS	Active	37.811108	-107.659228	1991-2016	<a href="http://waterdata.usgs.gov/nwis/uv?09358000">http://waterdata.usgs.gov/nwis/uv?09358000</a>
09359500	ANIMAS RIVER AT TALL TIMBER RESORT ABOVE TACOMA CO	USGS	Active	37.570277	-107.780620	1945-2016	<a href="http://waterdata.usgs.gov/nwis/uv?09359500">http://waterdata.usgs.gov/nwis/uv?09359500</a>
09364010	ANIMAS RIVER BELOW AZTEC, NM	USGS	Active	36.817861	-108.024444	NR	<a href="http://waterdata.usgs.gov/nwis/uv?09364010">http://waterdata.usgs.gov/nwis/uv?09364010</a>
09362520	ANIMAS RIVER BELOW DURANGO PUMP HOUSE NR DURANGO, CO	USGS	Active	37.249264	-107.872583	NR	<a href="http://waterdata.usgs.gov/nwis/uv?09362520">http://waterdata.usgs.gov/nwis/uv?09362520</a>
09359020	ANIMAS RIVER BELOW SILVERTON, CO.	USGS	Active	37.790275	-107.667561	1991-2016	<a href="http://waterdata.usgs.gov/nwis/uv?09359020">http://waterdata.usgs.gov/nwis/uv?09359020</a>
09363500	ANIMAS RIVER NEAR CEDAR HILL, NM	USGS	Active	37.036569	-107.875333	1933-2016	<a href="http://waterdata.usgs.gov/nwis/uv?09363500">http://waterdata.usgs.gov/nwis/uv?09363500</a>
BASMOU CO	BASIN CREEK AT THE MOUTH NEAR DURANGO, CO	DWR	Active	0.000000	0.000000	NR	<a href="http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=BASMOUCO&amp;MTYPE=DISCHRG">http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=BASMOUCO&amp;MTYPE=DISCHRG</a>
3000523	CASCADE CANAL ABOVE CASCADE RESERVOIR	DWR	Active	37.621661	-107.812294	1991-2016	<a href="http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=CASCANCO&amp;MTYPE=DISCHRG">http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=CASCANCO&amp;MTYPE=DISCHRG</a>
09359080	CASCADE CR ABV CASCADE CR DIVERSION NR ROCKWOOD CO	USGS	Active	37.667278	-107.822625	NR	<a href="http://waterdata.usgs.gov/nwis/uv?09359080">http://waterdata.usgs.gov/nwis/uv?09359080</a>
09359082	CASCADE CR BLW CASCADE CR DIVERSION NR ROCKWOOD CO	USGS	Active	37.667000	-107.822250	NR	<a href="http://waterdata.usgs.gov/nwis/uv?09359082">http://waterdata.usgs.gov/nwis/uv?09359082</a>

# SECTION FOUR

## Summary of Obtained Data

Station Information				Location (decimal degrees)		Period of Record	Website for More Information
USGS ID	Name	Data Source	Status	Latitude	Longitude		
09358550	CEMENT CREEK AT SILVERTON, CO	USGS	Active	37.819719	-107.663672	1991-2016	<a href="http://waterdata.usgs.gov/nwis/uv?09358550">http://waterdata.usgs.gov/nwis/uv?09358550</a>
--	CHERRY CREEK AT THE MOUTH NEAR RED MESA	DWR	Active	37.117498	-108.198685	1988-2016	<a href="http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=CHEREDCO&amp;MTYPE=DISCHRG">http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=CHEREDCO&amp;MTYPE=DISCHRG</a>
09366000	CHERRY CREEK NEAR RED MESA, CO.	USGS	Historic	37.118888	-108.198689	1928-1950	<a href="http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=1261&amp;sfType=StreamFlow&amp;freq=Monthly&amp;sTab=1&amp;sValue=09366000">http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=1261&amp;sfType=StreamFlow&amp;freq=Monthly&amp;sTab=1&amp;sValue=09366000</a>
3001000	DURANGO CITY PIPELINE	DWR	Active	37.343882	-107.720621	1999-2016	<a href="http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=DURPIPCO&amp;MTYPE=DISCHRG">http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=DURPIPCO&amp;MTYPE=DISCHRG</a>
3001931	ELBERT CREEK ABOVE CASCADE RESERVOIR	DWR	Active	37.621660	-107.812300	2000-2015	<a href="http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=ELACASCO&amp;MTYPE=DISCHRG3">http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=ELACASCO&amp;MTYPE=DISCHRG3</a>
09361200	FALLS CREEK NEAR DURANGO, CO.	USGS	Historic	37.367223	-107.866456	1959-1965	<a href="http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=620&amp;sfType=StreamFlow&amp;freq=Monthly&amp;sTab=1&amp;sValue=09361200">http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=620&amp;sfType=StreamFlow&amp;freq=Monthly&amp;sTab=1&amp;sValue=09361200</a>
3001013	FLORIDA CANAL	DWR	Active	37.312780	-107.772005	1994-2016	<a href="http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=FLOCANCO&amp;MTYPE=DISCHRG">http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=FLOCANCO&amp;MTYPE=DISCHRG</a>
3001011	FLORIDA FARMERS CANAL	DWR	Active	37.139717	-107.753405	1999-2016	<a href="http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=FARMERCO&amp;MTYPE=DISCHRG">http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=FARMERCO&amp;MTYPE=DISCHRG</a>
09362750	FLORIDA RIVER ABOVE LEMON RESERVOIR NEAR DURANGO	DWR	Active	37.426666	-107.674444	1972-2016	<a href="http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=FLOALECO&amp;MTYPE=DISCHRG">http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=FLOALECO&amp;MTYPE=DISCHRG</a>
09363200	FLORIDA RIVER AT BONDAD	DWR	Active	37.056667	-107.869789	1956-2016	<a href="http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=FLOBONCO&amp;MTYPE=DISCHRG">http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=FLOBONCO&amp;MTYPE=DISCHRG</a>
09363050	FLORIDA RIVER BELOW FLORIDA FARMERS CANAL NEAR DURANGO	DWR	Active	37.295002	-107.791733	1967-2016	<a href="http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=FLOFARCO&amp;MTYPE=DISCHRG">http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=FLOFARCO&amp;MTYPE=DISCHRG</a>
--	FLORIDA RIVER BELOW LEMON RESERVOIR	DWR	Active	37.380556	-107.662559	1972-2016	<a href="http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=FLOBLECO&amp;MTYPE=DISCHRG">http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=FLOBLECO&amp;MTYPE=DISCHRG</a>

# SECTION FOUR

## Summary of Obtained Data

Station Information				Location (decimal degrees)		Period of Record	Website for More Information
USGS ID	Name	Data Source	Status	Latitude	Longitude		
09362900	FLORIDA RIVER BELOW LEMON RESERVOIR NR DURANGO, CO	USGS	Historic	37.379169	-107.661727	1955-1963	<a href="http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=737&amp;sfType=StreamFlow&amp;req=Monthly&amp;sTab=1&amp;sValue=09362900">http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=737&amp;sfType=StreamFlow&amp;req=Monthly&amp;sTab=1&amp;sValue=09362900</a>
09363000	FLORIDA RIVER NEAR DURANGO, CO.	USGS	Historic	37.325280	-107.748952	1910-1960	<a href="http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=1069&amp;sfType=StreamFlow&amp;freq=Monthly&amp;sTab=1&amp;sValue=09363000">http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=1069&amp;sfType=StreamFlow&amp;freq=Monthly&amp;sTab=1&amp;sValue=09363000</a>
09361000	HERMOSA CREEK NEAR HERMOSA, CO.	DWR	Historic	37.421944	-107.845070	1920-1993	<a href="http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=951&amp;sfType=StreamFlow&amp;req=Monthly&amp;sTab=2&amp;sValue=HERHERCO">http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=951&amp;sfType=StreamFlow&amp;req=Monthly&amp;sTab=2&amp;sValue=HERHERCO</a>
09363070	HIGHWAY SPRING NEAR LOMA LINDA, CO	USGS	Historic	37.188615	-107.754229	1995-1997	<a href="http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=2150&amp;sfType=StreamFlow&amp;freq=Monthly&amp;sTab=1&amp;sValue=09363070">http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=2150&amp;sfType=StreamFlow&amp;freq=Monthly&amp;sTab=1&amp;sValue=09363070</a>
09361400	JUNCTION CREEK NEAR DURANGO, CO.	USGS	Historic	37.334168	-107.909513	1959-1965	<a href="http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=952&amp;sfType=StreamFlow&amp;req=Monthly&amp;sTab=1&amp;sValue=09361400">http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=952&amp;sfType=StreamFlow&amp;req=Monthly&amp;sTab=1&amp;sValue=09361400</a>
09366500	LA PLATA RIVER AT COLORADO-NEW MEXICO STATE LINE	USGS	Active	36.999722	-108.188688	Not Reported	<a href="http://waterdata.usgs.gov/usa/nwis/uv?09163500">http://waterdata.usgs.gov/usa/nwis/uv?09163500</a>
--	LA PLATA RIVER BELOW MOUTH OF CHERRY CREEK NEAR RED MESA	DWR	Active	37.115276	-108.200279	Not Reported	<a href="http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=LAPCHECO&amp;MTYPE=DISC HRG">http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=LAPCHECO&amp;MTYPE=DISC HRG</a>
09362800/3003581	LEMON RESERVOIR NEAR DURANGO	USGS	Active	37.382502	-107.662838	Not Reported	<a href="http://waterdata.usgs.gov/nwis/uv?09362800">http://waterdata.usgs.gov/nwis/uv?09362800</a>
09362000	LIGHTNER CREEK NEAR DURANGO, CO	USGS	Historic	37.270558	-107.893678	1927-1949	<a href="http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=1471&amp;sfType=StreamFlow&amp;freq=Monthly&amp;sTab=1&amp;sValue=09362000">http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=1471&amp;sfType=StreamFlow&amp;freq=Monthly&amp;sTab=1&amp;sValue=09362000</a>
09359100	LIME CREEK NEAR SILVERTON, CO.	USGS	Historic	37.678053	-107.750897	1956-1961	<a href="http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=1160&amp;sfType=StreamFlow&amp;freq=Monthly&amp;sTab=1&amp;sValue=09359100">http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=1160&amp;sfType=StreamFlow&amp;freq=Monthly&amp;sTab=1&amp;sValue=09359100</a>
09353800	LOS PINOS RIVER NEAR IGNACIO, CO	USGS	Active	37.166111	-107.582500	1999-2016	<a href="http://waterdata.usgs.gov/nwis/uv?09353800">http://waterdata.usgs.gov/nwis/uv?09353800</a>
09358900	MINERAL CREEK ABOVE SILVERTON, CO.	USGS	Historic	37.851107	-107.725895	1968-1975	<a href="http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=1470&amp;sfType=StreamFlow&amp;freq=Monthly&amp;sTab=1&amp;sValue=09358900">http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=1470&amp;sfType=StreamFlow&amp;freq=Monthly&amp;sTab=1&amp;sValue=09358900</a>

# SECTION FOUR

## Summary of Obtained Data

Station Information				Location (decimal degrees)		Period of Record	Website for More Information
USGS ID	Name	Data Source	Status	Latitude	Longitude		
09359010	MINERAL CREEK AT SILVERTON	USGS	Active	37.802774	-107.672839	1991-2016	<a href="http://waterdata.usgs.gov/nwis/uv?09359010">http://waterdata.usgs.gov/nwis/uv?09359010</a>
09359000	MINERAL CREEK NEAR SILVERTON, CO	USGS	Historic	37.814750	-107.695889	1936-1949	<a href="http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=1159&amp;sfType=StreamFlow&amp;freq=Monthly&amp;sTab=1&amp;sValue=09359000">http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=1159&amp;sfType=StreamFlow&amp;freq=Monthly&amp;sTab=1&amp;sValue=09359000</a>
--	MULTA-TRINA DITCH NEAR SILT CO	DWR	Active	37.459721	-107.625275	Not Reported	<a href="http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=MULTRICO&amp;MTYPE=DISC HRG">http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=MULTRICO&amp;MTYPE=DISC HRG</a>
09362600	RAINBOW SPRINGS TROUT RANCH NEAR BONDAD, CO	USGS	Historic	37.147225	-107.869510	1995-1997	<a href="http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=2149&amp;sfType=StreamFlow&amp;freq=Monthly&amp;sTab=1&amp;sValue=09362600">http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=2149&amp;sfType=StreamFlow&amp;freq=Monthly&amp;sTab=1&amp;sValue=09362600</a>
09363100	SALT CREEK NEAR OXFORD, CO.	DWR	Equipm	37.139725	-107.753395	1956-2011	<a href="http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=SALTOXCO&amp;MTYPE=DISC HRG">http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=SALTOXCO&amp;MTYPE=DISC HRG</a>
09346400	SAN JUAN RIVER NEAR CARRACAS, CO.	USGS	Active	37.013617	-107.312267	Not Reported	<a href="http://waterdata.usgs.gov/usa/nwis/uv?09346400">http://waterdata.usgs.gov/usa/nwis/uv?09346400</a>
09355000	SPRING CREEK AT LA BOCA, CO	USGS	Historic	37.015278	-107.595333	1951-2011	<a href="http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=1259&amp;sfType=StreamFlow&amp;freq=Monthly&amp;sTab=1&amp;sValue=09355000">http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=1259&amp;sfType=StreamFlow&amp;freq=Monthly&amp;sTab=1&amp;sValue=09355000</a>
SPCDITCO/3101045	SPRING CREEK DITCH (PINE RIVER CANAL) NEAR BAYFIELD, CO	DWR	Active	37.178334	-107.573056	NR	<a href="http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=SPCDITCO&amp;MTYPE=DISC HRG">http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=SPCDITCO&amp;MTYPE=DISC HRG</a>
VOSDITCO/3300550	WARREN VOSBERG DITCH, CO	DWR	Active	37.139170	-108.162220	NR	<a href="http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=VOSDITCO&amp;MTYPE=DISC HRG">http://www.dwr.state.co.us/SurfaceWater/data/detail_graph.aspx?ID=VOSDITCO&amp;MTYPE=DISC HRG</a>
09362550	WILSON GULCH NEAR DURANGO, CO	USGS	Historic	37.226667	-107.842861	1995-2002	<a href="http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=2148&amp;sfType=StreamFlow&amp;freq=Monthly&amp;sTab=1&amp;sValue=09362550">http://www.dwr.state.co.us/streamflow/StreamFlow.aspx?station_num=2148&amp;sfType=StreamFlow&amp;freq=Monthly&amp;sTab=1&amp;sValue=09362550</a>



**Table 6: Comparison of Log-Pearson Type III Gage Analysis Results to Effective Discharges**

Log-Pearson Type III Gage Analysis							Effective FIS Discharges							Percent Difference, 1% Annual-Chance Event
USGS ID	Name	Drainage Area (mi <sup>2</sup> )	Discharge (cfs) <sup>5</sup>				Flooding Source	Location	Drainage Area (mi <sup>2</sup> )	Discharge (cfs)				
			10%	2%	1%	0.2%				10%	2%	1%	0.2%	
09358000	Animas River at Silverton, CO <sup>2,3</sup>	70.5	1,548	1,927	2,081	2,428	Animas River	Power Plant (1 Mile Upstream of Silverton)	72.5	1,870	3,160	3,910	6,740	47
09359020	Animas River below Silverton, CO <sup>2,3</sup>	146.0	3,205	3,970	4,279	4,975	Animas River	At Confluence with Mineral Creek	149.8	3,050	5,180	6,460	11,280	34
09361500	Animas River at Durango, CO	701.7	9,153	14,211	16,813	24,132	Animas River	At Durango Northern Corporate Limits	649.0	9,800	17,500	22,500	38,000	25
09364500	Animas River at Farmington, NM <sup>1,4</sup>	1369.0	10,365	14,392	16,108	20,131	Animas River	At Gaging Station No. 09364500	1090.0	--	--	18,700	--	14
09358550	Cement Creek at Silverton, CO <sup>2,3</sup>	20.1	497	670	744	918	Cement Creek	At Confluence with Animas River	20.7	800	1,340	1,640	2,760	55
09359010	Mineral Creek at Silverton, CO <sup>2,3</sup>	52.6	1,388	1,776	1,936	2,302	Mineral Creek	U.S. Highway 550	51.6	1,490	2,500	3,090	5,300	37
09361000	Hermosa Creek near Hermosa, CO	168.5	1,793	2,470	2,718	3,220	Hermosa Creek	At Confluence with Bucks Creek	--	2,200	3,600	4,400	6,300	38

1. USGS data records for gage 09364500 note that the gage values were affected by an unknown degree of regulation after 1963. Despite the unknown degree of regulation, the full data record was used to perform the gage analysis because it had limited impact on the discharges predicted.
2. USGS data records for gages 09358000, 09359020, 09358550, and 09359010 note the values were affected by an unknown degree of regulation; however, the entire record was affected so the dataset was considered homogeneous.
3. USGS gages 09358000, 09359020, 09358550, and 09359010 had approximately 20 years of records; therefore, a regional skew coefficient was used in the Log-Pearson Type III analysis as determined from USGS Bulletin 17b.
4. Despite a difference of approximately 300 sq. mi. in their respective drainage areas, gage 09364500 was compared against the FIS location noted at "Gaging Station No. 09364500" based on the description listed in the effective FIS report.
5. Gage records were not adjusted based on timing of peak discharges. As a result, some records may include both snowmelt and rainfall induced peak flows.

### 4.1.2 Hydraulics and Floodplain Analysis

An initial countywide study was completed for LPC and Incorporated Areas on August 19, 2010. In San Juan County, NM DFIRMS were last updated on August 5, 2010. In addition to the digital conversion of community-based FIRMs and FISs, several streams were studied by detailed and approximate hydraulic modeling methods including the Florida, La Plata, and Animas Rivers. Hydraulic modeling was done using a combination of the USACE HEC-2 (Animas River, Hermosa Creek, Junction Creek in the City of Durango, Dry Gulch Creek, and Lightner Creek) and HEC-RAS 3.1.2 (Los Pinos River, Vallecito Creek, Grimes Creek, and Junction Creek outside of Durango), and HEC-RAS 3.1.3 (Animas River, Florida River, La Plata River) computer models. AECOM filed a FEMA Library Request for hydraulic models covering the counties in the Animas River Watershed. Received models and data are included in the supplemental data to this Report, along with a list of flood studies.

The La Plata Countywide digital FIRM (DFIRM) conversion project included flood hazard information located within the SUIT, although the Tribe is not a participant in the NFIP. The level of study and the date the streams were studied varies greatly throughout LPC, with a study of the Animas River dating back to the 1970s.

There have been several dozen Letters of Map Amendment (LOMAs) and Letters of Map Revision (LOMRs) within LPC and SJC (NM), mostly along the Animas River, indicating potential inaccuracies or other issues with the current effective floodplains.

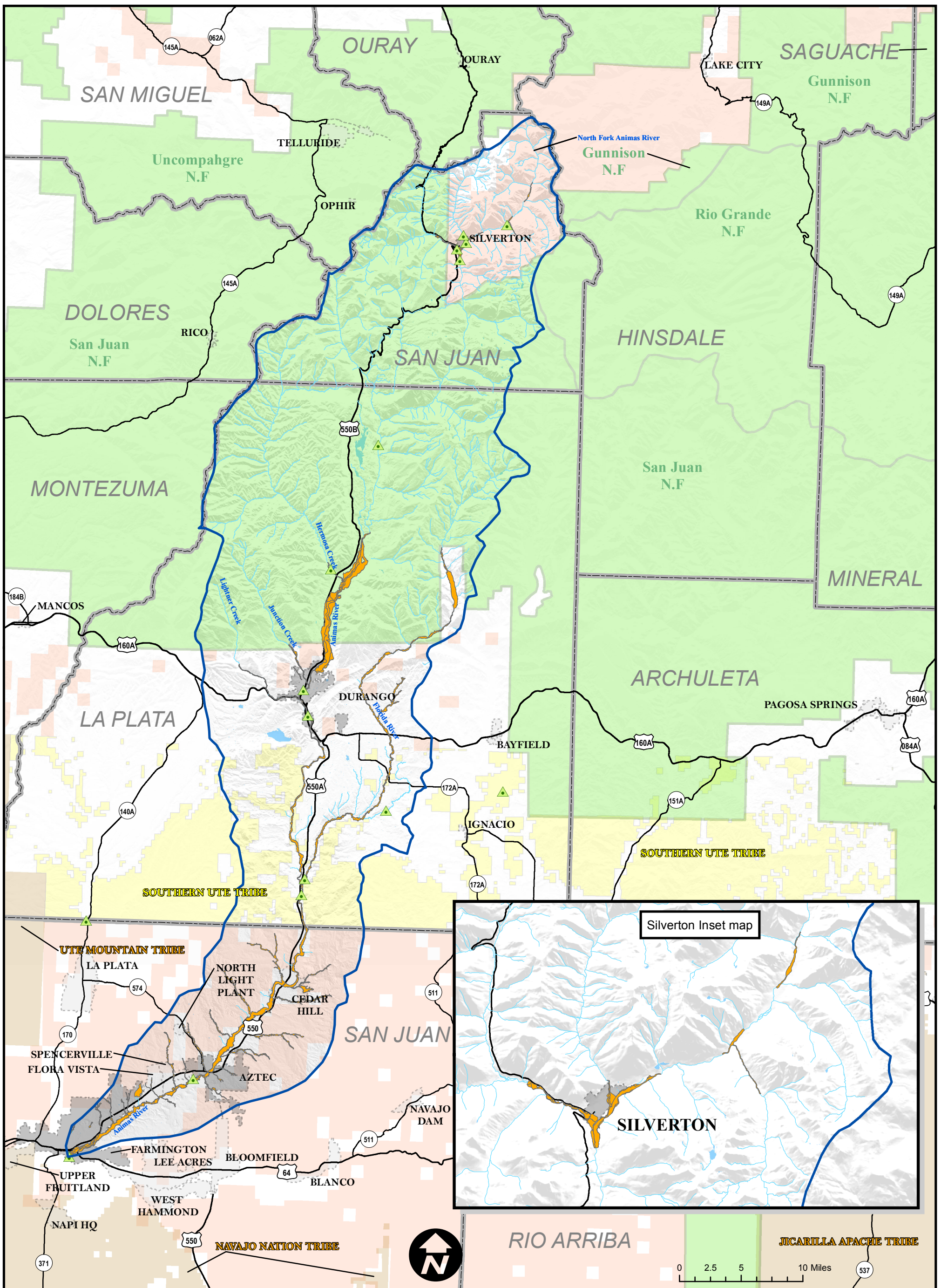
SJC within Colorado is still in paper format with an original FIRM date of September 1, 1978. Mapped floodplain areas include the Town of Silverton and portions of unincorporated SJC along the Animas River and the South Fork Animas River. Hydraulic modeling was done using the USACE HEC-2 computer model. The Town of Silverton and unincorporated areas of SJC FIS and FIRMs are referenced to the NGVD 1929 datum and should be converted to NAVD 88.

No floodplain boundary tie-in mismatches or disconnects at corporate limits, county boundaries, or state lines are apparent from the current floodplain mapping data. Large data holes and gaps exist within the floodplain mapping throughout the watershed, mostly through the forested lands within LPC along several rivers including the Animas and Florida. Very little has been mapped in the watershed within SJC, and large gaps occur where mapping does exist along the Animas River and the South Fork Animas River northeast of the Town of Silverton. On the New Mexico side, both San Juan County and The City of Farmington are CRS Communities. Aztec is an NFIP participant but is not involved with the CRS Program.

Due to the age of the mapping, gaps in data, and the varying levels of studies, the flood risks depicted on the FEMA FIRMs no longer provide the level of accuracy desired. Revised mapping is therefore warranted in SJC and identified areas within LPC to delineate more accurate data that can be used for planning, permitting, and design decisions along with emergency response, infrastructure rebuilding, and private development and reconstruction. Revised mapping would provide more accurate delineations of flood risk, which may have economic implications depending on influences to the potential for construction and homeowner cost and mandatory flood insurance requirements within the regulatory floodplain.

Figure 5 displays the extent of the current effective floodplains, including those from the National Flood Hazard Layer (NFHL). Since SJC (CO) has not been modernized, the effective

floodplains are not contained in the NFHL, but have been digitized for the purposes of this Discovery. The Colorado Project Team is also conducting a Base Level Engineering analysis of select streams in the watershed using HEC-RAS where topographic data are available. If topographic data are obtained in a timely manner, this information will be presented at the Discovery Meeting and can be shared with communities and partners for use.



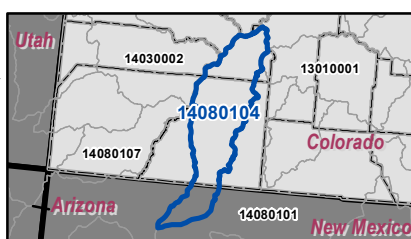
**MAP SYMBOLOLOGY**

- Animas HUC-8 Watershed
- County Boundary
- City Boundary (Unincorporated)
- City Boundary (Incorporated)
- Interstate
- State Highway
- Perennial Streams and Rivers
- Waterbody
- Stream Gages
- Effective Floodplain
- NHD Flowlines

**NOTES TO USERS**

All information on this map came from public data. Imagery, roads, and political boundaries were supplied by the Colorado Department of Transportation, New Mexico Department of Transportation and ESRI. Hydrographic Features (Streams and HUC Boundaries) were provided by the NRCS, USGS National Hydrography Dataset (NHD) or delineated using USGS NED data.

**WATERSHED LOCATOR**



**Figure 5**

EXTENT OF EFFECTIVE SPECIAL FLOOD HAZARD AREAS WITHIN WATERSHED

**ANIMAS WATERSHED COLORADO** HUC-8 Code 14080104

**FEMA**

**COLORADO** Colorado Water Conservation Board Department of Natural Resources

**EDAC** **AECOM**

### 4.1.3 Fluvial Erosion Hazards

New guidance on erosion mapping has been released and is available from the CWCB Hazard Mapping and Risk MAP Portal at:

<http://coloradohazardmapping.com/hazardMapping/phaseOneErosionMapping>. Alluvial Hazards are also outlined in detail in the NMDHSEM Hazard Mitigation Plan (2013) at <http://www.nmdhsem.org/uploads/files/NM%20HMP%20Final%2009-30-13.pdf>

Special Flood Hazard Areas (SFHA) generally represent a static condition assuming fixed channel boundaries; however, river channels are dynamic in nature and significant damage to property and infrastructure can occur on lands outside the boundaries of SFHA maps. These damages are typically a result of fluvial erosion hazards—erosion, deposition, channel degradation, lateral migration, and avulsions. Taking fluvial erosion hazards and the potential for river channel changes into account is important for river corridor management and risk-based planning. Mapping the fluvial hazard zone (FHZ) involves identifying the area of land most vulnerable to fluvial hazards and determining the corridor that a stream has recently occupied, could occupy, or could physically influence as it stores and transports sediment and debris during flood events.

The *Fluvial Erosion Hazard Area Regulatory Guidelines Memorandum* prepared for the CWCB in January 2016 identifies best practices for land use and development in FHZs that can be implemented by local and state agencies to manage fluvial hazard areas. The memorandum states:

*A fluvial hazard zone program will promote river planning and management on a watershed scale to ensure the protection of public health, safety, welfare, and property by encouraging communities to map fluvial hazard zones in order to:*

- *reduce property loss and damage in particular to those properties not included in SFHA zones but vulnerable to severe destruction during a flood due to fluvial hazards unrelated to the elevation of the property;*
- *reduce public expenditures for disaster response and recovery by locating critical infrastructure and evacuation routes outside of fluvial hazard zones;*
- *increase long-term channel stability by improving floodplain connection and the natural process of sediment and large wood transport; and*
- *encourage protection and multiple use of riparian areas.*

This memorandum provides guidance on protecting against and regulating risk in FHZs and is available online at: <http://www.coloradohazardmapping.com/File/8ace2783-c250-4225-a95a-afce1cc14ba3>. Additionally, *A Framework for Mapping Channel Migration and Erosion Hazard Areas in Colorado* provides guidance on FHZ delineation and is a useful tool for conducting FHZ analyses and producing maps for planning. This document was prepared for CWCB in January 2016 and is also available online at: <http://www.coloradohazardmapping.com/File/ae1aba61-3398-4314-a3f1-90afbca69465>.

The State of New Mexico Hazard Mitigation Plan identifies the following:

*According to FEMA, “an alluvial fan is a sedimentary deposit located at a topographic break such as the base of a mountain front, escarpment, or valley side, that is composed of stream*

*flow and/or debris flow/sediments and has the shape of a fan, either fully or partially extended.”*

*Over 15-25% of the arid West is covered by alluvial fans,” reports FEMA. New Mexico has more alluvial plains than alluvial fans due to the natural apex, according to Paul Dugie, NM Floodplain Managers Association.*

*Though the intense rainstorms which produce fan floods occur randomly, they nevertheless can develop very rapidly at any time and can recur with frequency. The California Alluvial Fan Task Force states, “When alluvial fan flooding occurs, it is flashy and unpredictable and variable in magnitude. This type of flooding does not necessarily occur as the result of large amounts of rain. Often, it is triggered by intense rainfall over short periods of time. The natural flooding process that drives alluvial fan sedimentation tends to produce thick deposits of sand and gravel, particularly near the apex of the fan, with relatively minor proportions of fine-grained particles.” According to Dr. David Love, New Mexico Bureau of Geology and Mining Resources, in the State of New Mexico, there have been no confirmed studies specific to alluvial fan flooding risk.*

*According to multiple studies, alluvial fan flood risk can cause high velocity flow (as high as 15-30 feet per second) producing significant hydrodynamic forces, erosion/scour to depths of several feet, deposition of sediment and debris (to depths of several feet), deposition of sediment and debris ( depths of 15 – 20 feet have been observed), debris flows/impact forces, mudflows, inundation, producing hydrostatic/buoyant forces (pressure against buildings caused by standing water), flash flooding with little, if any, warning times.*

*Alluvial fans are often an overlooked as hazards and there is a tendency to underestimate both the potential and severity of alluvial fan flood events. The infrequent rainfall, gently sloping terrain, and often long time spans between successive floods contribute to a sense of complacency regarding the existence of possible flood hazards.*

#### **4.1.4 Levees and Dams**

Upon review of the DFIRMs in the Animas HUC-8 Watershed, there are no regulated levees that are shown to provide protection from the base flood.

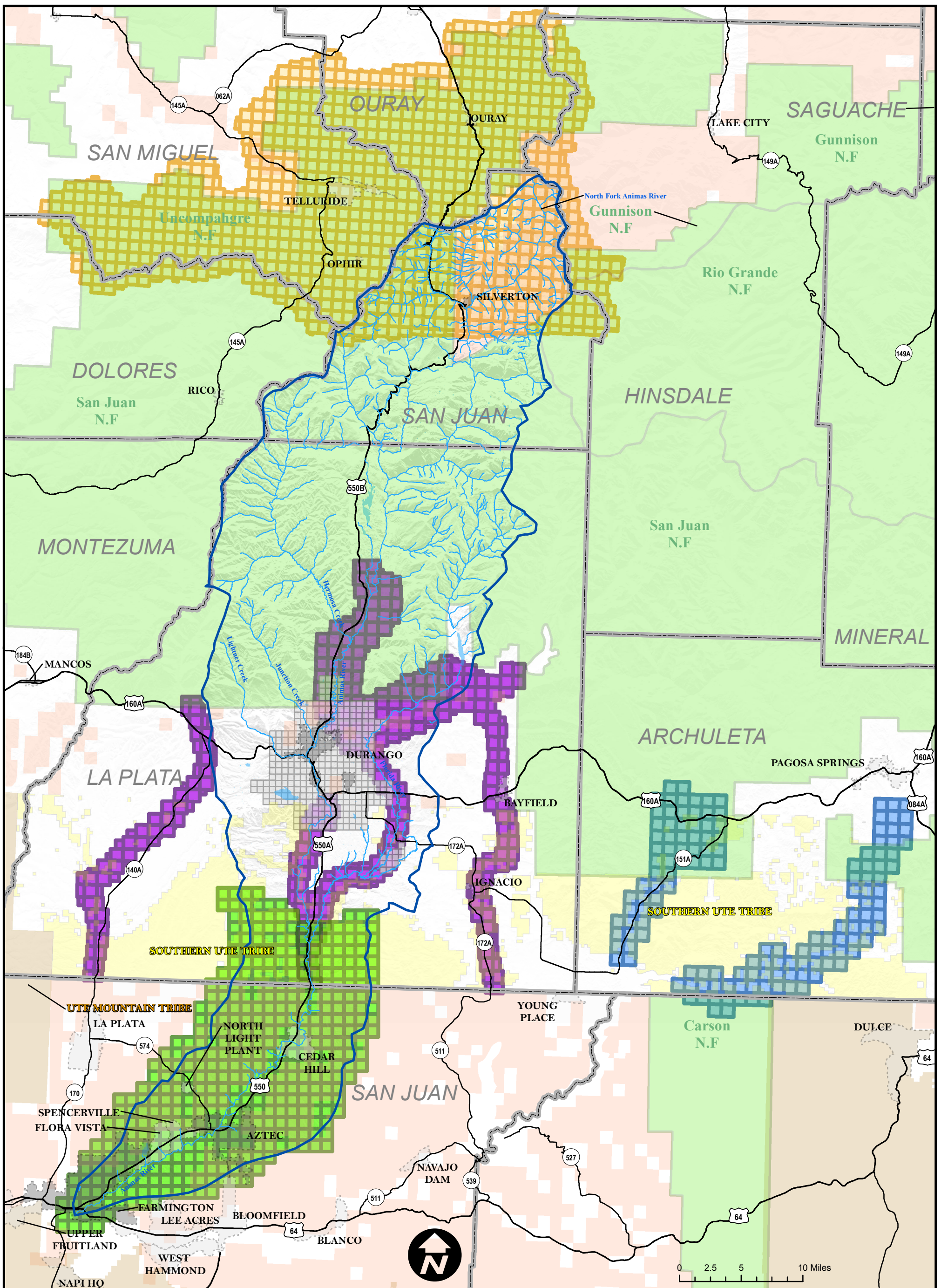
To locate dams within the watershed, AECOM reached out to the Dam Safety Branch of the Office of the State Engineer (SEO) for spatial information. They provided a shapefile of coordinates and properties for 36 dams in their database located within the Animas HUC-8 Watershed within Colorado. Dam Safety also has information showing inundation areas from dam breach analyses, however, the majority of delineated inundation areas are recorded on paper maps that can be reviewed in person at the SEO’s library. For homeland security reasons, inundation maps cannot be published for most dams in the watershed.

Dam locations in the Animas HUC-8 Watershed are shown on Figure 1. The dam height for those identified in the SEO’s database in the Animas HUC-8 Watershed within Colorado range from 5 to 272.7 feet, with a median height of 24 feet.

#### **4.1.5 Topographic Data**

Topographic data sources for the watershed include 2012 LiDAR flown for Durango and its immediate vicinity, 2015 LiDAR flown by LPC that generally follows major stream systems that have been previously mapped for flood hazards, 2016 NASA topography, and the 1/3 arc-second

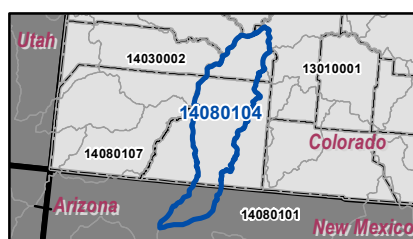
(approximately 10-meter) resolution 2013 USGS digital elevation model (DEM) topographic data for the Animas Watershed. New Mexico has full coverage LiDAR for the watershed at a QL2 level which was purchased by FEMA in 2015. USGS LiDAR standards can be viewed here: <https://pubs.usgs.gov/tm/11b4/pdf/tm11-B4.pdf>. Figure 6 below presents the topographic coverage available in the watershed.



**MAP SYMBOLOLOGY**

- Animas HUC-8 Watershed
- County Boundary
- City Boundary (Unincorporated)
- City Boundary (Incorporated)
- Interstate
- State Highway
- Perennial Streams and Rivers
- Waterbody
- La Plata County LIDAR Coverage 10/2015
- New Mexico LIDAR Coverage 8/2015
- Southern Ute LIDAR Coverage (Archuleta County) 10/2015
- Durango LIDAR Coverage 11/2012
- NASA LIDAR Coverage 08/2016

**WATERSHED LOCATOR**



**Figure 6**  
TOPOGRAPHIC COVERAGE

**ANIMAS WATERSHED COLORADO** HUC-8 Code 14080104

**FEMA**

**COLORADO**  
Colorado Water Conservation Board  
Department of Natural Resources

**EDAC**

**AECOM**



## 4.1.6 CNMS Review

The CNMS Inventory provides a snapshot of the status and attributes of currently studied streams existing within FEMA’s floodplain study inventory. In general, the stream mileage shown in CNMS reflects streams with an effective SFHA designated for them.

In addition to listing the miles of studied streams within a watershed, CNMS documents certain physiological, climatological, or engineering methodological factors that may have changed since the date of the effective study. The stream miles shown in CNMS are attributed with an evaluation of a validation status and status type that allows an examination of the condition of a given study or group of studies. The validation categories for CNMS include:

- Valid – The mapping of the stream reach meets FEMA’s current technical standards for technical floodplain mapping.
- Unverified – The validity evaluation identified deficiencies in the mapping of the stream reach that prevent it from meeting FEMA’s current technical standards for floodplain mapping. A category of ‘unverified’ typically indicates that some factor of change may exist since the SFHA became effective or the study may have a deficiency warranting restudy.
- Unknown – The mapping of the stream reach is currently being evaluated or is planned to be evaluated.
- Requires Assessment - requires further input to determine their validity, often because the segment represents paper inventory or non-modernized studies (e.g., SFHA areas are not accessible electronically).

CNMS aids in identifying areas to consider for study during the Discovery process by highlighting needs on a map, quantifying them (mileage), and providing further categorization of these needs to differentiate factors that identify the needs. Table 7 compares the National Hydrography Dataset (NHD) to the CNMS data and Table 8 summarizes the validated stream mileage from CNMS for the watershed.

**Table 7: CNMS Approximate Stream Mileage in the Watershed**

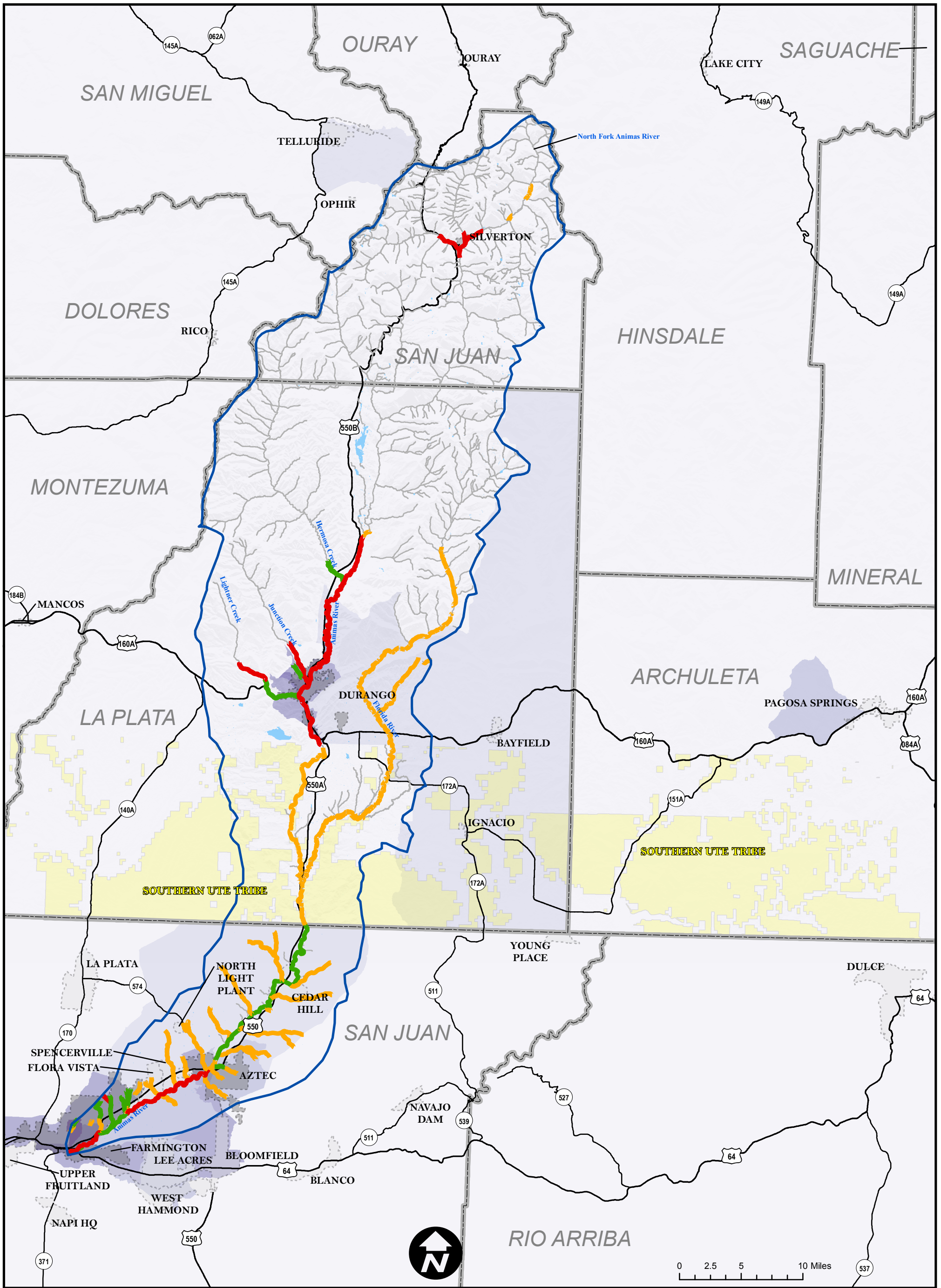
New, Validated, or Updated Engineering Status	Stream Miles
NHD Streams (streams with a drainage area of greater than one square mile)	425.0
CNMS Streams (streams with effective SFHA)	235.9
<b>Stream Miles not accounted for in CNMS</b>	189.1
CNMS Valid Zone AE / AO	22.8
CNMS Valid Zone A	17.8
CNMS Unverified Zone AE	53.2
CNMS Unverified Zone A	0

New, Validated, or Updated Engineering Status	Stream Miles
CNMS Zone AE / AH Requiring Further Assessment or in the process of being studied	0
CNMS Zone A Requiring Further Assessment or in the process of being studied	142.1

Using these criteria from CNMS, there were 53.2 stream miles identified as being unverified within the Animas Watershed. The unverified stream miles consist of 13 total stream segments, 9 of which are within Colorado and 4 within New Mexico. CNMS does not reflect the total potential number of stream miles to be studied within a watershed. Mapping requests can be entered at any time at <https://msc.fema.gov/cnms>. The CNMS data are shown in Figure 7 below.

**Table 8: CNMS Streams Analysis of Watershed**

Validation Status	Stream Miles
Unverified	53.2
Unknown	142.1
Verified	40.6



**MAP SYMBOLOLOGY**

- Animas HUC-8 Watershed
- County Boundary
- City Boundary (Unincorporated)
- City Boundary (Incorporated)
- Interstate
- State Highway
- Perennial Streams and Rivers
- Waterbody

**CNMS Validation Status**

- Streams not in CNMS
- Unverified
- Unknown
- Valid

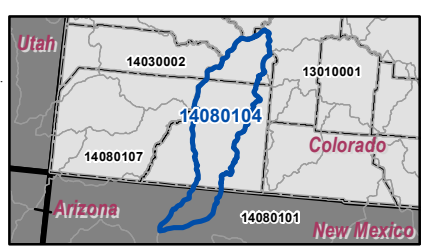
**Population Density**

- Low
- High

**NOTES TO USERS**

All information on this map came from public data. Imagery, roads, and political boundaries were supplied by the Colorado Department of Transportation, New Mexico Department of Transportation and ESRI. Hydrographic Features (Streams and HUC Boundaries) were provided by the NRCS, USGS National Hydrography Dataset (NHD) or delineated using USGS NED data.

**WATERSHED LOCATOR**



**Figure 7**  
CNMS STREAMS

**ANIMAS WATERSHED**  
COLORADO

HUC-8 Code  
14080104

**FEMA**

**COLORADO**  
Colorado Water Conservation Board  
Department of Natural Resources

**EDAC**

**AECOM**

## 4.2 INFORMATION USEFUL FOR NON-FLOOD HAZARD EVALUATION

This subsection discusses datasets pertaining to non-flooding risks.

### 4.2.1 Wildfire Hazards

This section discusses wildfire risk including datasets that characterize risk, ongoing assessments, and Community Wildfire Protection Plans (CWPPs). On the much less forested New Mexico portion of the watershed, wildfire danger is of significantly lower risk. Although hazards do exist within the riparian zone along the Animas River itself, those areas do not pose the high degree of post-wildfire flooding danger that occurs in the upper reaches of the watershed in Colorado. As such this section primarily focuses on the Colorado side.

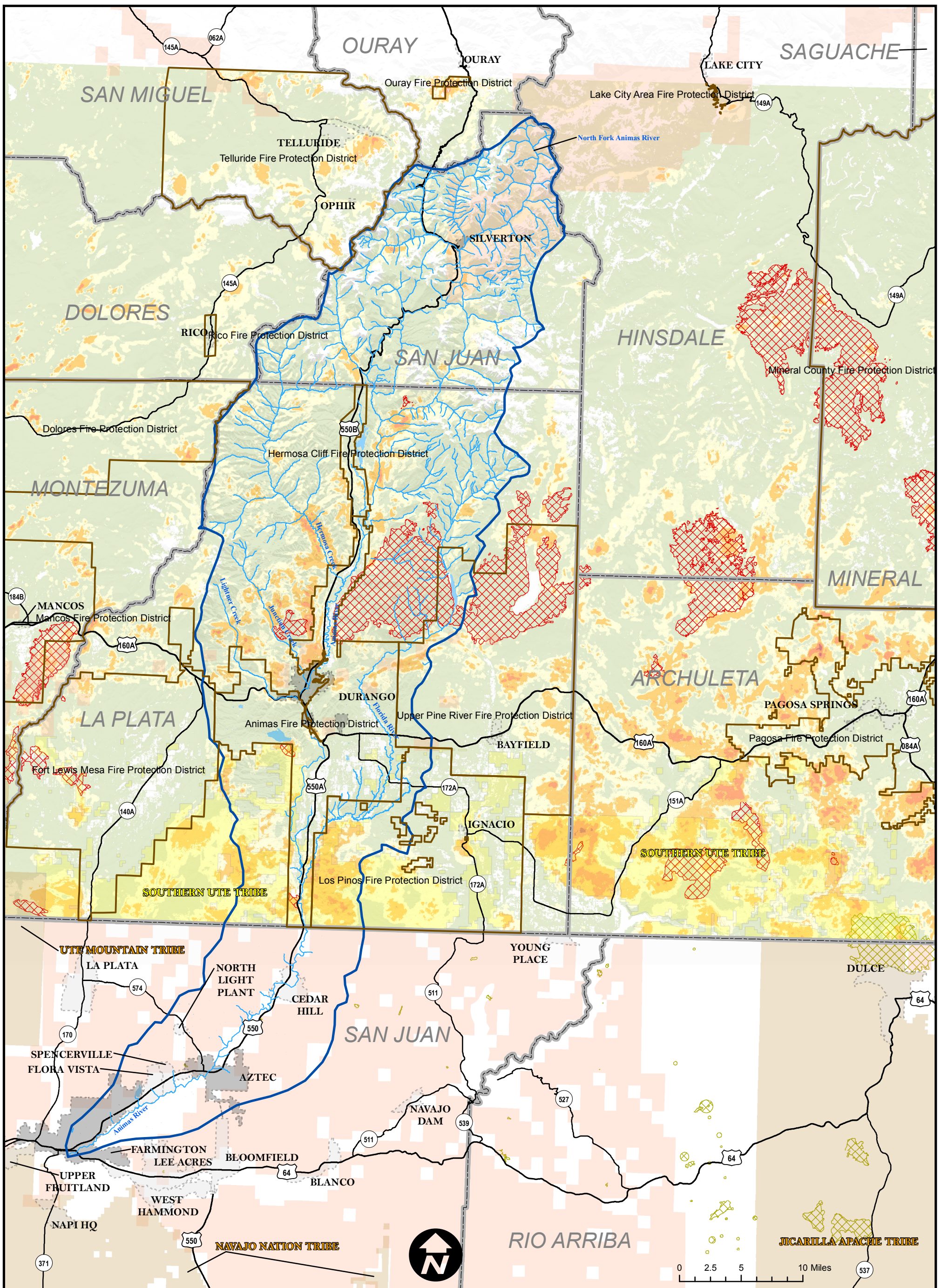
#### 4.2.1.1 Risk Datasets

Various datasets maintained by the CSFS were accessed via the Colorado Wildfire Risk Assessment Portal (CO-WRAP) at <http://csfs.colostate.edu/wildfire-mitigation/cowrap/>, including information pertaining to historic wildfires, base layers, and wildfire-related risk assessment. The data includes layers such as vegetation, forest assets, drinking water risk, flame rate of spread, and wildfire risk. These data provide a comprehensive look at risks associated with wildfire and can aid in planning and mitigation for communities. Several figures utilize this data as follows:

- Figure 8 presents wildfire risk, which represents the possibility of loss or harm occurring from a wildfire and accounts for the probability of a wildfire occurring with associated potential impacts.
- Figure 9 presents wildfire suppression difficulty, which is the difficulty or relative cost to suppress a wildfire given the terrain and vegetation conditions that may impact machine operability.
- Figure 10 presents the rate of how quickly a wildfire might spread given the land use.
- Figure 11 presents the values at risk rating, which represent values or assets that would be adversely impacted by a wildfire.
- Figure 12 presents the urban interface risk, which is a measure of the potential impact on people and their homes from wildfire.
- Figure 13 presents the drinking water importance areas, which is a relative measure of quality and quantity of public surface drinking water categorized by subwatershed. CSFS uses this information to assess drinking water risk from wildfires based on potential impacts to areas of varying importance.

Additional CSFS datasets not presented herein are included in the Supplemental Data appendix.

The largest wildfire to impact Durango in the last couple decades was the Missionary Ridge Fire in 2002 that burned approximately 71,000 acres, a portion of which burned again in 2012. This area will likely continue to be susceptible to wildfires. Prior burn areas are shown on Figure 8 through Figure 13.



**MAP SYMBOLOLOGY**

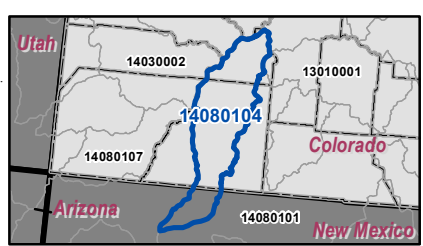
- Animas HUC-8 Watershed
- County Boundary
- City Boundary (Unincorporated)
- City Boundary (Incorporated)
- Interstate
- State Highway
- Perennial Streams and Rivers
- Waterbody
- Wildfire Burn Areas 2000-2014
- Wildfire Burn Areas 1911-2014
- Fire Protection Districts

**NOTES TO USERS**

All information on this map came from public data. Imagery, roads, and political boundaries were supplied by the Colorado Department of Transportation, New Mexico Department of Transportation and ESRI. Hydrographic Features (Streams and HUC Boundaries) were provided by the NRCS, USGS National Hydrography Dataset (NHD) or delineated using USGS NED data.

- Wildfire Risk**
- Lowest Risk
  - Low Risk
  - Moderate Risk
  - High Risk
  - Highest Risk

**WATERSHED LOCATOR**



**Figure 8**  
WILDFIRE RISK

**ANIMAS WATERSHED**  
COLORADO

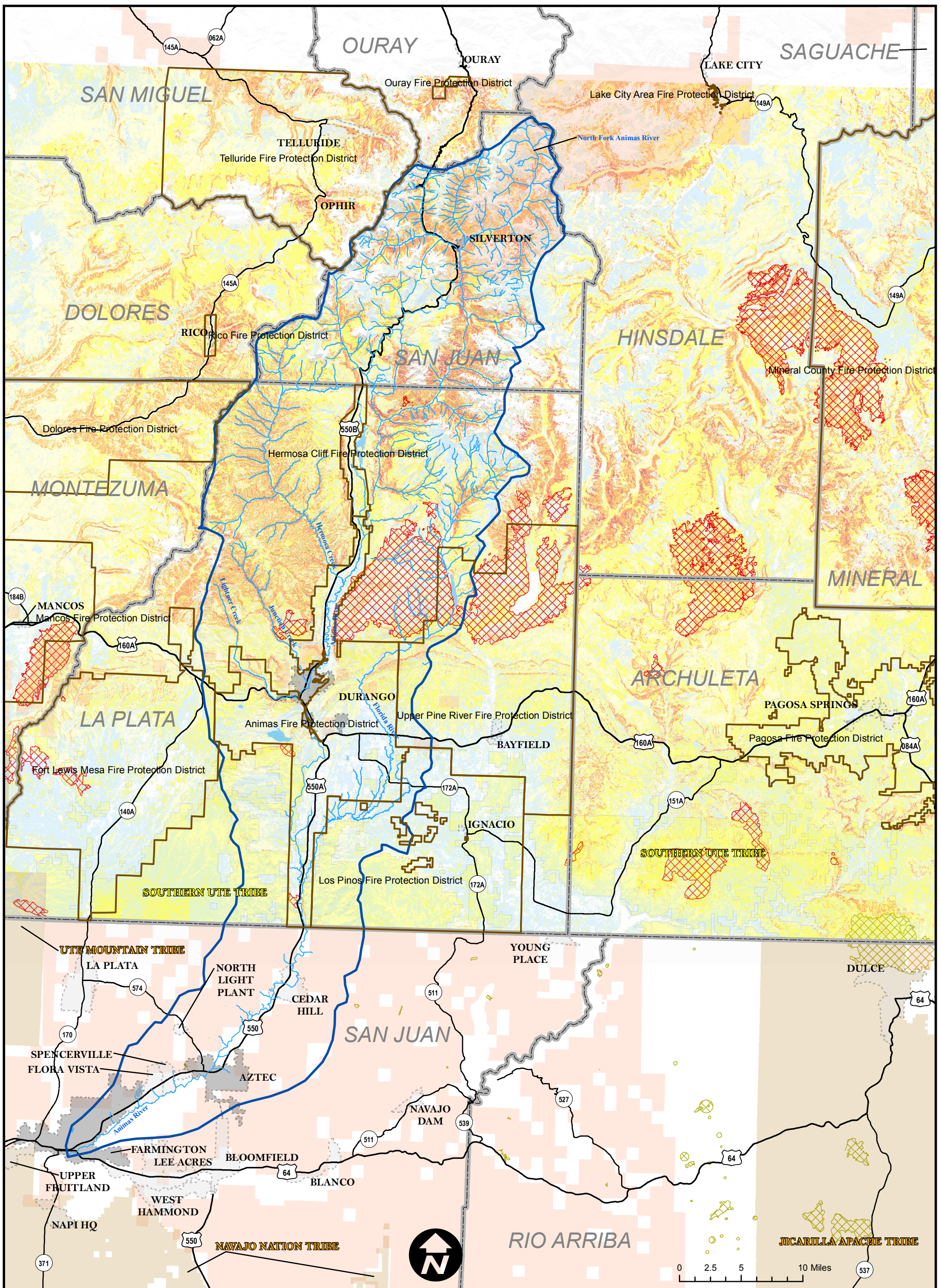
HUC-8 Code  
14080104

**FEMA**

**COLORADO**  
Colorado Water Conservation Board  
Department of Natural Resources

**EDAC**

**AECOM**

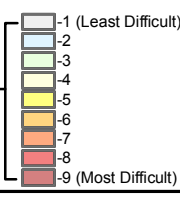


**MAP SYMBOLOLOGY**

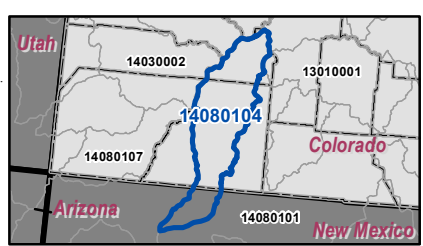
- Animas HUC-8 Watershed
- County Boundary
- City Boundary (Unincorporated)
- City Boundary (Incorporated)
- Interstate
- State Highway
- Perennial Streams and Rivers
- Waterbody
- Stream Gages
- Dams
- Wildfire Burn Areas 2000-2014
- Wildfire Burn Areas 1911-2014
- Fire Protection Districts

**NOTES TO USERS**

All information on this map came from public data. Imagery, roads, and political boundaries were supplied by the Colorado Department of Transportation, New Mexico Department of Transportation and ESRI. Hydrographic Features (Streams and HUC Boundaries) were provided by the NRCS, USGS National Hydrography Dataset (NHD) or delineated using USGS NED data.



**WATERSHED LOCATOR**



**Figure 9**  
WILDFIRE SUPPRESSION DIFFICULTY

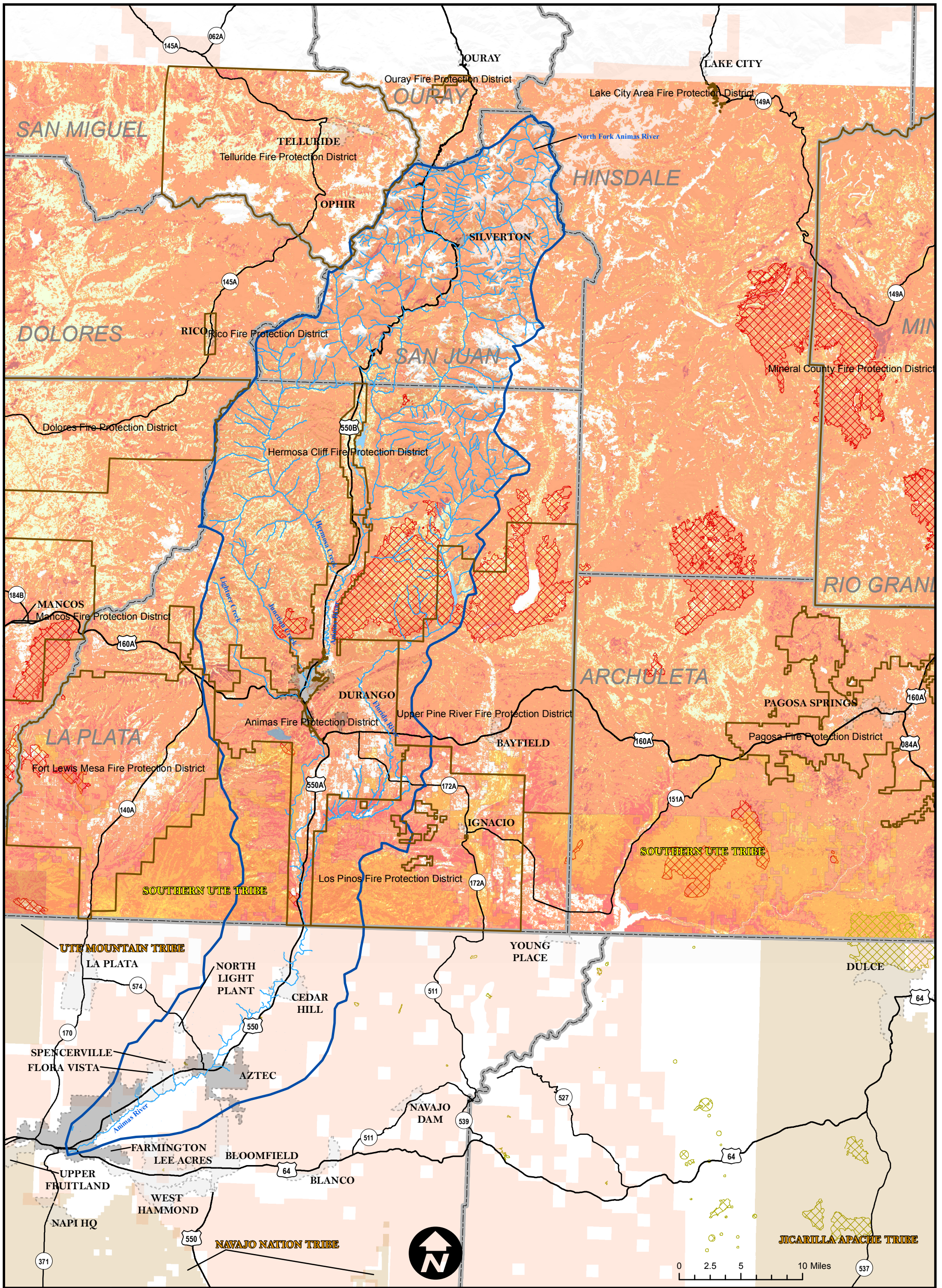
**ANIMAS WATERSHED**  
COLORADO

HUC-8 Code  
14080104

FEMA

COLORADO  
Colorado Water Conservation Board  
Department of Natural Resources

EDAC AECOM



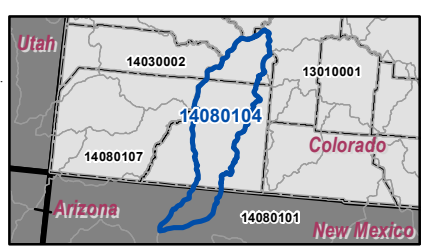
**MAP SYMBOLOGY**

- Animas HUC-8 Watershed
  - County Boundary
  - City Boundary (Unincorporated)
  - City Boundary (Incorporated)
  - Interstate
  - State Highway
  - Perennial Streams and Rivers
  - Waterbody
  - Stream Gages
  - Dams
  - Wildfire Burn Areas 2000-2014
  - Wildfire Burn Areas 1911-2014
  - Fire Protection Districts
- | Characteristic Rate of Spread | Color        |
|-------------------------------|--------------|
| Non-burnable                  | White        |
| 0 - 2 chains/hr               | Light Green  |
| 2 - 4 chains/hr               | Light Yellow |
| 4 - 12 chains/hr              | Yellow       |
| 12 - 40 chains/hr             | Orange       |
| 40 - 60 chains/hr             | Red-Orange   |
| >60 chains/hr                 | Red          |

**NOTES TO USERS**

All information on this map came from public data. Imagery, roads, and political boundaries were supplied by the Colorado Department of Transportation, New Mexico Department of Transportation and ESRI. Hydrographic Features (Streams and HUC Boundaries) were provided by the NRCS, USGS National Hydrography Dataset (NHD) or delineated using USGS NED data.

**WATERSHED LOCATOR**



**Figure 10**  
RATE OF WILDFIRE SPREAD

**ANIMAS WATERSHED**  
COLORADO

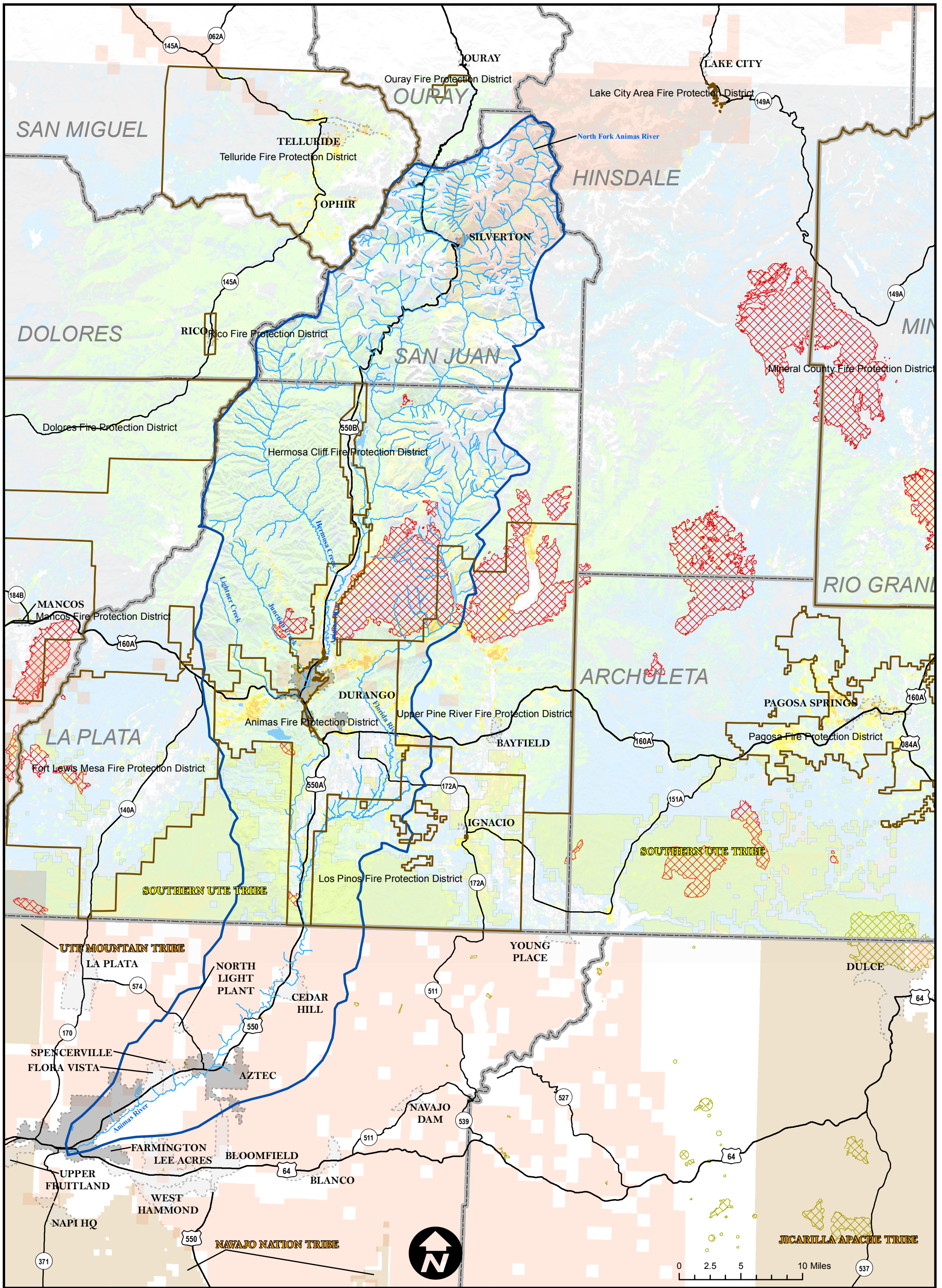
HUC-8 Code  
14080104

**FEMA**

**COLORADO**  
Colorado Water Conservation Board  
Department of Natural Resources

**EDAC**

**AECOM**

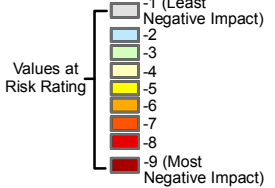


**MAP SYMBOLOLOGY**

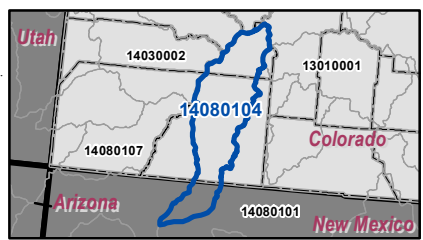
- Animas HUC-8 Watershed
- County Boundary
- City Boundary (Unincorporated)
- City Boundary (Incorporated)
- Interstate
- State Highway
- Perennial Streams and Rivers
- Waterbody
- Stream Gages
- Dams
- Wildfire Burn Areas 2000-2014
- Wildfire Burn Areas 1911-2014
- Fire Protection Districts

**NOTES TO USERS**

All information on this map came from public data. Imagery, roads, and political boundaries were supplied by the Colorado Department of Transportation, New Mexico Department of Transportation and ESRI. Hydrographic Features (Streams and HUC Boundaries) were provided by the NRCS, USGS National Hydrography Dataset (NHD) or delineated using USGS NED data.



**WATERSHED LOCATOR**



**Figure 11**  
VALUES AT RISK RATING

**ANIMAS WATERSHED COLORADO**

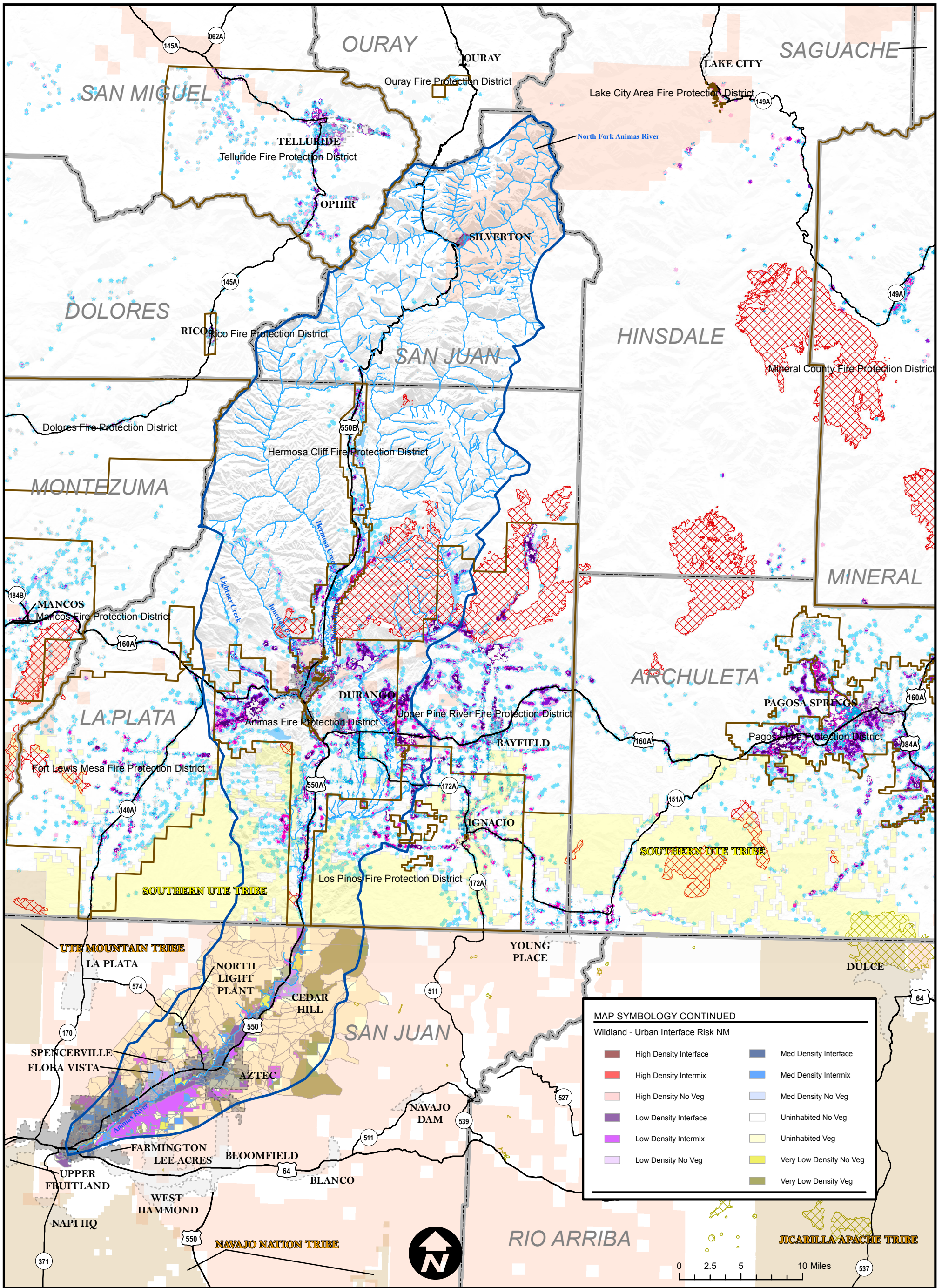
HUC-8 Code: 14080104

FEMA

COLORADO Colorado Water Conservation Board Department of Natural Resources

EDAC AECOM





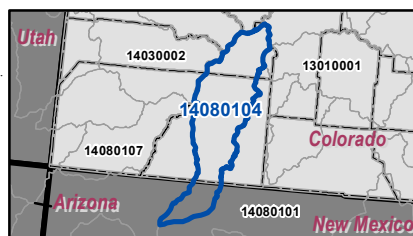
**MAP SYMBLOGY**

- Animas HUC-8 Watershed
- County Boundary
- City Boundary (Unincorporated)
- City Boundary (Incorporated)
- Perennial Streams and Rivers
- Interstate
- State Highway
- Waterbody
- Stream Gages
- Dams
- Wildfire Burn Areas 2000-2014
- Wildfire Burn Areas 1911-2014
- Fire Protection Districts
- Less than 1 house/40 ac
- 1 house/40 ac to 1 house/20 ac
- 1 house/20 ac to 1 house/10 ac
- 1 house/10 ac to 1 house/5 ac
- 1 house/5 ac to 1 house/2 ac
- 1 house/2 ac to 3 houses/ac
- More than 3 houses/ac

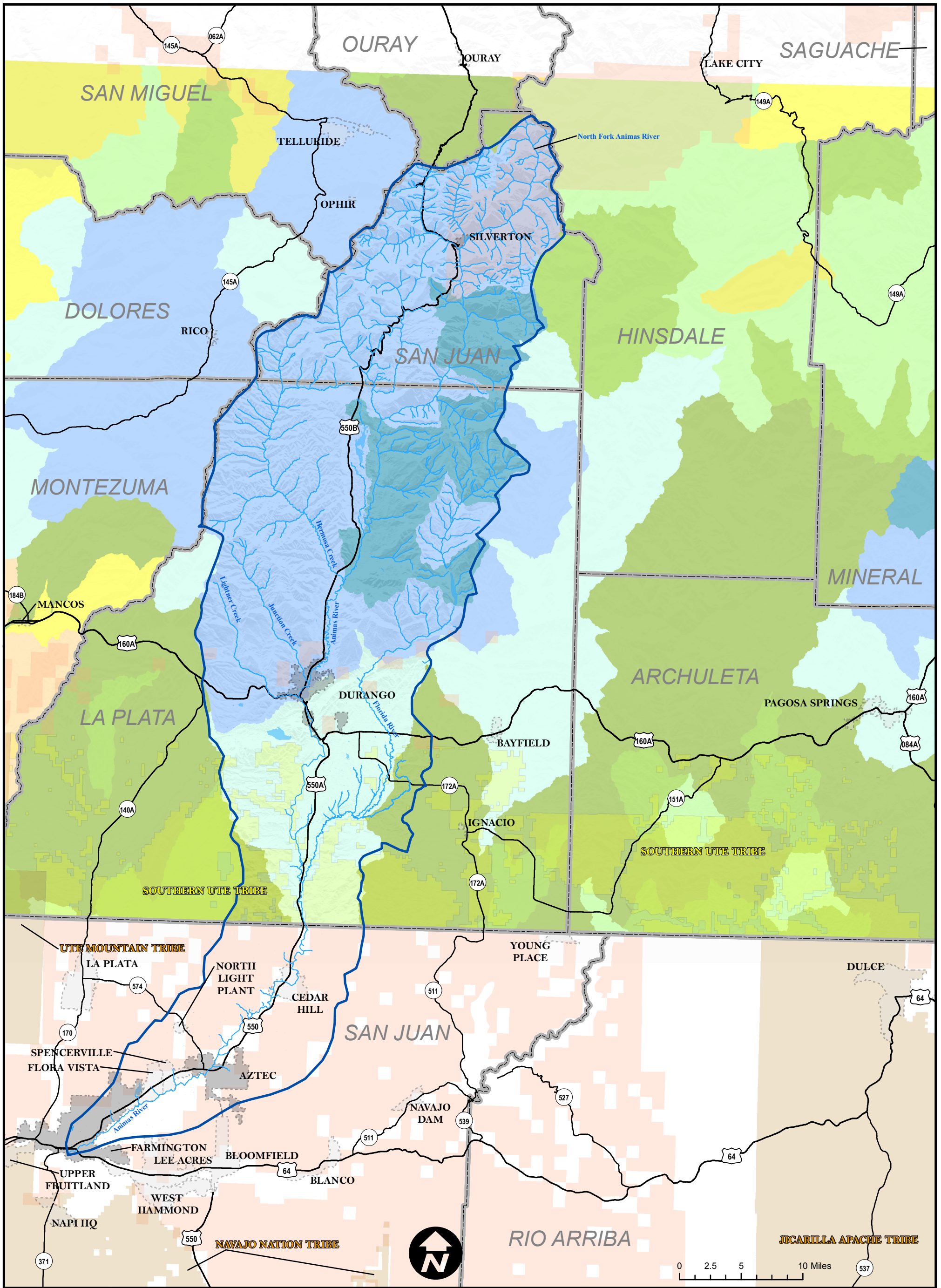
**NOTES TO USERS**

All information on this map came from public data. Imagery, roads, and political boundaries were supplied by the Colorado Department of Transportation, New Mexico Department of Transportation and ESRI. Hydrographic Features (Streams and HUC Boundaries) were provided by the NRCS, USGS National Hydrography Dataset (NHD) or delineated using USGS NED data.

**WATERSHED LOCATOR**



**Figure 12**  
**URBAN INTERFACE RISK**  
**ANIMAS WATERSHED**  
**COLORADO**  
 HUC-8 Code 14080104  
 FEMA  
 COLORADO  
 Colorado Water Conservation Board  
 Department of Natural Resources  
 EDAC  
 AECOM



**MAP SYMBOLOLOGY**

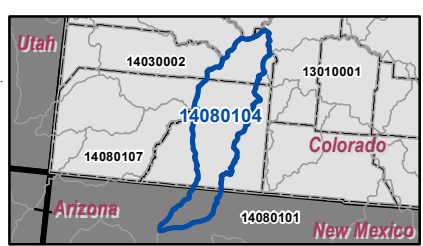
- Animas HUC-8 Watershed
- County Boundary
- City Boundary (Unincorporated)
- City Boundary (Incorporated)
- Interstate
- State Highway
- Perennial Streams and Rivers
- Waterbody

- Drinking Water Importance Areas
- 1 Lowest
  - 2
  - 3
  - 4
  - 5
  - 6
  - 7
  - 8
  - 9
  - 10 Highest

**NOTES TO USERS**

All information on this map came from public data. Imagery, roads, and political boundaries were supplied by the Colorado Department of Transportation, New Mexico Department of Transportation and ESRI. Hydrographic Features (Streams and HUC Boundaries) were provided by the NRCS, USGS National Hydrography Dataset (NHD) or delineated using USGS NED data.

**WATERSHED LOCATOR**



**Figure 13**  
DRINKING WATER IMPORTANCE AREAS

**ANIMAS WATERSHED**  
COLORADO

HUC-8 Code  
14080104

FEMA

COLORADO  
Colorado Water Conservation Board  
Department of Natural Resources

EDAC

AECOM

**4.2.1.2 Wildfire Assessments and Protection Plans**

Within the project area, CWPPs are available for Archuleta County, Durango, La Plata County, San Juan County (CO), and San Juan County (NM) and can be downloaded at <http://csfs.colostate.edu/wildfire-mitigation/colorado-community-wildfire-protection-plans/> (CSFS 2016) and at [http://www.sjcoem.com/images/San\\_Juan\\_County\\_HMP\\_Final\\_with\\_sig\\_3.14.pdf](http://www.sjcoem.com/images/San_Juan_County_HMP_Final_with_sig_3.14.pdf).

A CWPP enables a community to plan how it will reduce its risk of wildfire. The plan identifies strategic sites for fuel reduction projects as well as other efforts that can improve wildfire preparedness in the community and across jurisdictional boundaries. They provide guidance and best management practices for wildfire preparedness, overview the wildfire protection and firefighting services in the County, describe the forest conditions, fuels, wildfire hazards, evacuation measures, county mitigation recommendations, and building/homeowner tips and standards for reducing wildfire hazards. Some of the county-specific recommendations from the CWPPs are captured in the potential mitigation actions for communities in Section 6.2. For more information on CWPPs please visit <http://www.southwestcoloradofires.org/cwpp/> (FireWise 2016).

The USFS is conducting a wildfire risk assessment over a considerable project area, which encompasses the Animas River Watershed. The assessment evaluates modeled likelihood and intensity of wildfire over a large landscape and the susceptibility of highly valued resources and assets (HVRAs) within the landscape to the effects of wildfire (both negative and positive). The USFS teamed with the Rocky Mountain Research Station for wildfire behavior modeling, and is identifying and characterizing HVRAs and their susceptibility to wildfire locally. The assessment is currently in progress and anticipates nearing completion by late September or early October 2016. The assessment is being conducted using guidance titled *A Wildfire Risk Assessment Framework for Land and Resource Management*, which is available at: [http://www.fs.fed.us/rm/pubs/rmrs\\_gtr315.pdf](http://www.fs.fed.us/rm/pubs/rmrs_gtr315.pdf).

**4.2.2 Wind and Severe Weather**

No data were collected or provided by partners during this Discovery process pertaining to wind or severe weather. Considerable evaluation on the risk from wind and severe weather, including hail, lightning, thunderstorms, and tornadoes to communities is included in the LPC and SJC (NM) HMPs.

LPC is currently seeking project funding and support for the placement of a 150-mile radius, Dual Pole Doppler Weather Radar Station to evaluate how much precipitation they are receiving in the watershed. La Plata County sits at the far end or just out of reach of several NOAA weather radars making this entire area poorly covered.

The closest any radar “sees” to the ground is between 10,000 and 20,000 feet above ground level. Forecasting, rain/snowfall estimations and real-time observations are based on best guesses and much is missed. These guesses contributed to the emergency dam releases in the spring of 2015. Without quality radar coverage, the Durango-LPC Airport regularly diverts aircraft during the winter due to possible weather conditions or lack of observations. Additionally, radar aircraft tracking is ineffective in this region due to lack of coverage. The data acquired through the proposed radar can be used for weather forecasting, severe weather

tracking, climate research, real-time weather monitoring, quantitative water forecasts, aircraft tracking, airport conditions, bird and insect migrations, among many other functions.

The Mountain Studies Institute partnered with San Juan National Forest and the Colorado Natural Heritage Program to develop climate projections of downscaled information for the San Juan Mountain Region. They are evaluating future community projections under different scenarios for climate change in the Animas Watershed. Additional information is provided in the Supplemental Data appendix and available at: <http://www.mountainstudies.org/cip>.

Climate Resilient Mitigation Activities are eligible under FEMA's Hazard Mitigation Assistance programs to support communities in reducing the risks associated with climate change. Such activities include aquifer storage and recovery, floodplain and stream restoration, flood diversion and storage, and green infrastructure methods. These activities can mitigate any natural hazard; however, the activities are focused on mitigating the impacts of flood and drought conditions. Multiple tools have been developed to assist with the development of the Climate Resilient Mitigation Activities, which can be found at <http://www.fema.gov/media-library/assets/documents/110202>.

### **4.2.3 Debris Flow Hazards**

Debris flows and debris fans are of particular concern within the Animas Watershed. The Missionary Ridge Fire caused significant damage within LPC in 2002, and post-fire flooding and debris flows are of concern. Debris flows and mud flows are common hazards in many mountainous areas of Colorado. They are a potentially deadly combination of fast moving water and a great volume of sediment and debris with a consistency similar to pancake batter or wet concrete that surges down slope with tremendous force. They can destroy structures, cover roads, fill basements with mud and debris, block culverts, and temporarily dam channels, potentially increasing the damaging effects of flooding near populated areas.

Debris flows and mud flows commonly occur in steep drainages and can cause significant damage outside of mapped floodplains in narrow mountain valleys and on fans at the mouths of small tributary streams. Conditions required for debris-flow generation include steep channelized slopes, loose soils or disaggregated rock, and significant amounts of water from precipitation runoff and/or saturated ground conditions. Most Colorado mud flows occur in the spring and summer, during the months of great snowmelt runoff and rainfall. Similar to flash floods, debris flows and mud flows are triggered by intense rainfall or rapid snowmelt, and can occur suddenly without time for adequate warning. In the first few years after a wildfire, debris flows can be triggered by relatively common rainstorms, leading to a temporary increase in the likelihood of debris-flows until the natural system recovers.

Risk to local residents can be reduced by identifying areas that susceptible to producing debris flows, educating residents in the vicinity, limiting development in prone areas, and developing a debris flow mitigation plan. Information about debris flows and mud flows in Colorado, including useful definitions and an informational video can be found at: <http://coloradogeologicalsurvey.org/geologic-hazards/debris-flows-fans-mudslides/>. Additional information is also available from the USGS at: <https://pubs.usgs.gov/fs/fs-176-97/fs-176-97.pdf>. Additional information on New Mexico debris flow hazards are available from the New Mexico

Water Science Center at <http://nm.water.usgs.gov/projects/post.wildfire.debris-flow.hazards/index.html> The CGS is currently developing maps that illustrate generalized debris-flow susceptibility in the mountainous regions of Colorado. These regions have been organized into 13 Priority Areas to guide mapping efforts. The CGS recently completed their study of their first identified region (Larimer and Boulder counties) and is working on the second priority region. The Animas Watershed falls within the 5<sup>th</sup> of the 13 identified regions, as shown in their presentation at: <http://www.coloradohazardmapping.com/File/30ec6cdf-0eef-4e38-9e24-1302ef1f8879>. The medium-scale maps, which depict debris-flow susceptibility over large areas, are intended as tools to identify where debris flows and mud flows can be expected to occur, and as screening tools to identify areas for detailed local studies. The maps are not suitable for evaluating hazards or risks to specific sites, lots, facilities, or structures. CGS's methodology is summarized in a brief memorandum available at: <http://www.coloradohazardmapping.com/File/9c6323a0-c71d-4e44-8804-2f75f14eecb6>.

Additional information on debris flow products from CGS can be found on their debris-flow hazards page at <http://coloradogeologicalsurvey.org/geologic-hazards/debris-flows-fans-mudslides/>, as well as a video by CGS explaining debris-flow hazards in Colorado at <https://www.youtube.com/watch?v=EXtBCR9ySyA&feature=youtu.be>.

#### **4.2.4 Other Geologic Hazards**

The SSURGO database contains information about soil as collected by the National Cooperative Soil Survey and maintained by NRCS at [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2\\_053627](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_053627). The information can be used to identify areas susceptible to erosion and other geologic hazards.

A number of geological hazard studies have been published by CGS and USGS. CGS published six studies pertaining to LPC and/or SJC between the years 1978 and 1985 ranging in topics from faults, earthquakes, mine tailings, hazardous waste, and seismicity, and one study in 2000 on earthquakes. USGS has a number of published geological hazard studies pertaining to LPC and SJC. Of note in LPC are two USGS studies on potential debris flow peak discharges related to the Missionary Ridge Fire (2002, 2003); a web-based flood database for Colorado for the water years 1867 through 2011; and a number of surface water quality, mining drainage hazard, and landslide studies, including a 2006 assessment of landslides along the Florida River downstream from Lemon Reservoir in LPC. USGS reports pertaining to the Animas Watershed are available for download on USGS's website at <https://pubs.er.usgs.gov/>.

An index of the 1:24,000-scale (quadrangle) CGS geologic maps is available at: <http://coloradogeologicalsurvey.org/wp-content/uploads/2015/12/Geoquad-index-name-number-12-15.jpg>. Additional geological hazard maps and data can be downloaded from the USGS National Geologic Map Database: [http://ngmdb.usgs.gov/ngmdb/ngmdb\\_home.html](http://ngmdb.usgs.gov/ngmdb/ngmdb_home.html).

#### **4.2.5 Environmental Considerations**

This subsection briefly presents several environmental components that may be of interest to communities and/or partners when considering hazards and resiliency. This subsection discusses potential sources of contamination, such as environmental sites and mine sites (both active and

inactive); potential receptors, including drinking water sources, sensitive habitats, and protected species; and datasets for use in assessing watershed conditions, such as water quality.

The following excerpt from the executive summary to the Animas River Watershed Based Plan prepared for AWP in 2011 (B.U.G.S. Consulting 2011) provides a detailed and concise overview of the environmental factors related to the Animas River moving downstream:

*There are numerous impacts to the Animas River beginning with pollution from historical hardrock mining in the upper basin. Near Baker’s Bridge, diversions of water from the Animas River for irrigation begin and continue with regularity to the confluence with the San Juan River. Just downstream of Baker’s Bridge there are large impacts from current and historical in-stream gravel mining. Near Trimble Lane the effects of eutrophication begin to show up with effluent from Hermosa Sanitation District, runoff from lawns and golf courses and water from leaky septic tanks. Continuing through the Animas Valley the effects of improper grazing practices (both historical and current), sand mining and bank-hardening practices can be seen. In the Durango area the effects of urban runoff begin and immediately below Durango is the historical ore processing smelter (now a Uranium Mill Tailings Remedial Action site), the diversion of the Animas La Plata Project, effluent from the city of Durango’s waste water treatment plant, more urban runoff from the Bodo Park commercial/industrial area and effluent from the South Durango sewage treatment plant where the river enters the checkerboard reservation of the Southern Ute Indian Tribe. Within the reservation boundaries and extending into New Mexico is extensive agricultural development that has resulted in a myriad number of inflows to the Animas that are high in nitrogen, phosphorus and sediments. Also in this reach are nutrient and sediment impacts from coal-bed methane extraction due to poorly designed pipeline crossings and poorly designed/maintained roads and well pads. At Aztec, New Mexico there is urban runoff and effluent from a sewage treatment plant. Continuing through Flora Vista, NM there is urban runoff as well as faulty septic tanks. At Farmington, NM, where the Animas flows into the San Juan River, there are further impacts from urban runoff.*

**4.2.5.1 Potential Contaminant Sources**

Spatial data and site information for environmental and mining sites were obtained from several different sources, including EPA, CDPHE, and DRMS. AECOM searched for environmental sites on the Superfund Enterprise Management System (SEMS), which is an online database maintained by EPA as part of the Superfund program found at <https://cumulis.epa.gov/supercpad/CurSites/srchsites.cfm>. SEMS has replaced EPA’s former Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS), both of which contain information on the current status of cleanup efforts, cleanup milestones reached, and amounts of liquid and solid media treated at sites on the National Priorities List (NPL) or under consideration for the NPL. No Sites were found in LPC; however, nine sites were located in SJC, associated with mining in the upper portion of the watershed, as shown in Table 9.

**Table 9: NPL-Related Environmental Sites in San Juan County**

EPA ID	Site Name	City/Town	Non-NPL Status	Non-NPL Status Date	NPL Status
CON000802497	BONITA PEAK MINING DISTRICT	UNINCORPORATED	None	4/7/2016	P

EPA ID	Site Name	City/Town	Non-NPL Status	Non-NPL Status Date	NPL Status
CON000802484	BULLION KING RAM	SILVERTON	RO	6/11/2015	N
CON000802460	GOLD KING MINE RELEASE	SILVERTON	RO	8/6/2015	N
CO0000075200	KENDRICK & GELDER SMELTING CO	SILVERTON	AC	8/1/2013	N
CON000802803	MOGUL/GRAND MOGUL MINE(S)	SILVERTON	None	4/7/2016	A
CON000802811	RED AND BONITA MINE	SILVERTON	AX	11/9/2011	N
CO0000075259	RED MOUNTAIN PASS ZINC	SILVERTON	RO	1/4/2000	N
CO0001411347	UPPER ANIMAS MINING DISTRICT	SILVERTON	None	4/7/2016	A
CON000802893	UPPER CEMENT CREEK	SILVERTON	None	4/7/2016	A

Non-NPL Status Codes: AC = Assessment Complete - Decision Needed; AX = Addressed as Part of Another non-NPL Site; RO = Removal Only Site (No Site Assessment Work Needed); NPL Status Code: A = Site is part of NPL; N =Not on the NPL; P = Proposed for NPL.

DRMS has compiled a list of draining mines that impact stream quality, which are presented on Figure 15, and available for download at:

[https://www.colorado.gov/pacific/sites/default/files/Draining\\_Mines\\_GISData-DRMS\\_08-18-15.pdf](https://www.colorado.gov/pacific/sites/default/files/Draining_Mines_GISData-DRMS_08-18-15.pdf). DRMS maintains inventories of active and inactive mines, which are presented on

Figure 16 and the data can be downloaded at:

<http://mining.state.co.us/Reports/Pages/GISData.aspx>. For a statewide map of CDPHE’s efforts in mines stream impacts and restoration efforts see the following website:

[https://www.colorado.gov/pacific/sites/default/files/Animas\\_LegacyMineWork.pdf](https://www.colorado.gov/pacific/sites/default/files/Animas_LegacyMineWork.pdf).

**4.2.5.2 Potential Receptors**

Potential receptors considered in this Discovery effort include habitats for protected species (e.g., threatened and endangered [T&E]), wetlands, and drinking water wells. Locations of public drinking surface water intakes are not available to the public for safety reasons. Several T&E animals have critical habitats in or around the Animas Watershed, as summarized on Figure 14 and Figure 15. These habitats as well as wetlands are exposed to potential threats from mines with draining adits or potential releases. Wetlands are areas where water covers soil all or part of the time. Wetlands are protected areas because they protect and improve water quality, provide fish and wildlife habitats, store floodwaters and maintain surface water flow during dry periods. These are mapped by the USFWS and their spatial data are accessible at:

<https://www.fws.gov/wetlands/>, as displayed on Figure 15.

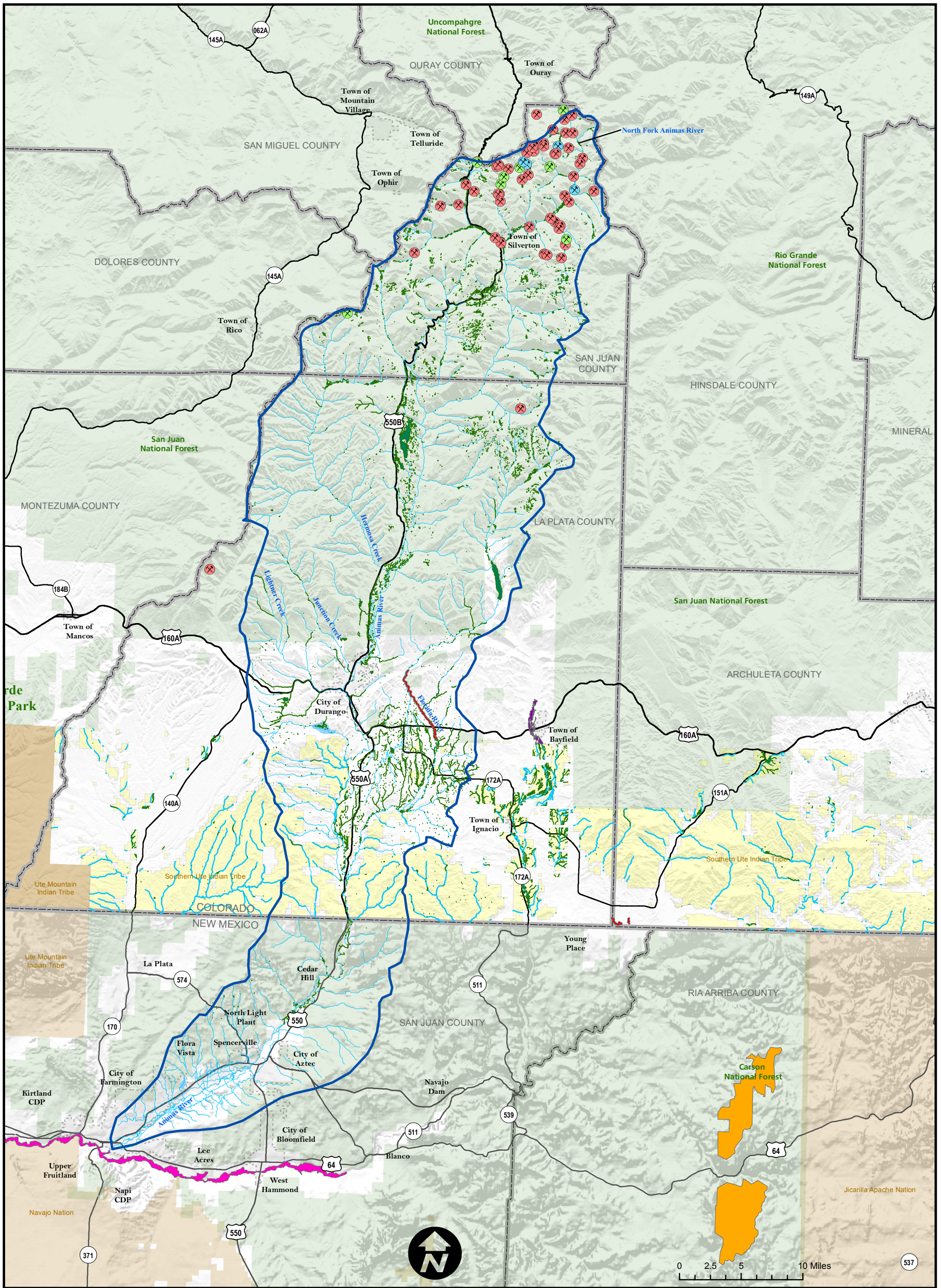
**Figure 14: Summary of Protected Species in Animas Watershed Area (2010)**

	Common Name	Scientific Name	Class	State Status	Federal Status	Comments
	American Peregrine Falcon	<i>Falco peregrinus anatum</i>	Birds	Concern		Occurs and nests in the watershed
	Bald Eagle	<i>Haliaeetus leucocephalus</i>	Birds	Threatened	None	Year-round resident of the watershed
	Canada Lynx	<i>Lynx canadensis</i>	Mammals	Endangered	Threatened	Occurs in the watershed
	Colorado Pikeminnow	<i>Ptychocheilus lucius</i>	Fish	Threatened	Endangered	Water depletions in the watershed may affect downstream habitats/fish
	Colorado River Cutthroat Trout	<i>Oncorhynchus clarki pleuriticus</i>	Fish	Concern	None	Occurs in the watershed
	Gunnison's Prairie Dog	<i>Cynomys gunnisoni</i>	Mammals	None	Candidate	Occurs in the watershed
	Northern River Otter	<i>Lutra canadensis</i>	Mammals	Threatened		Occurs in the watershed
	Razorback Sucker	<i>Xyrauchen texanus</i>	Fish	Endangered	Endangered	Water depletions in the watershed may affect downstream habitats/fish
	Southwestern Willow Flycatcher	<i>Empidonax traillii extimus</i>	Birds	Endangered	Endangered	May occur at low elevations in the watershed
	Townsend's Big-eared Bat	<i>Corynorhinus townsendii pallescens</i>	Mammals	Concern	None	Occurs in the watershed
NO PHOTO AVAILABLE	Uncompahgre Fritillary Butterfly	<i>Boloria acrocnema</i>	Insects	None	Endangered	May occur in the watershed
	Western Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Birds	Concern	Candidate	May occur in the watershed
	Wolverine	<i>Gulo gulo</i>	Mammals	Endangered	None	Suitable habitat in watershed; No current records of occurrence

The above Figure 14 is taken from a Watershed Assessment conducted by NRCS (USDA, NRCS 2010) and reflects T&E species from 2010. Since then, the New Mexico Meadow Jumping Mouse was listed as an endangered species on June 10, 2014, and its critical habitat was designated on March 16, 2016 (USFS 2016). This rare subspecies is currently found in parts of New Mexico, southern Colorado, and eastern Arizona where there is tall herbaceous riparian habitat with moist-saturated soils. The mouse likes to nest in areas upland of wetlands and its critical habitat lies outside of the Animas Watershed, including portions of the Apache-Sitgreaves, Lincoln, and Santa Fe National Forests; however, critical habitat was proposed along the Florida River.

For current information on protected species, as well as recovery plans, please visit the USFWS website at: [http://ecos.fws.gov/tess\\_public/reports/species-by-current-range-county?fips=08067](http://ecos.fws.gov/tess_public/reports/species-by-current-range-county?fips=08067).





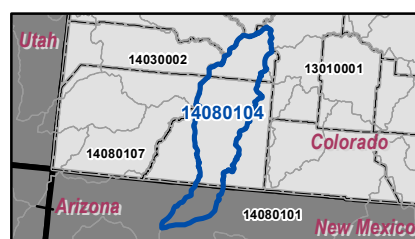
**MAP SYMBOLOLOGY**

- Animas HUC-8 Watershed
- County Boundary
- City Boundary
- Interstate
- State Highway
- Perennial Streams and Rivers
- Waterbody
- Wetlands
- Mexican Spotted Owl Critical Habitat
- Draining mine with active water treatment
- Draining mine being remediated
- Draining mine that likely impact water quality with no active treatment
- Southwestern Willow Flycatcher Critical Habitat
- New Mexico Meadow Jumping Mouse Critical Habitat
- Yellow-Billed Cuckoo Critical Habitat

**NOTES TO USERS**

All information on this map came from public data. Imagery, roads, and political boundaries were supplied by the Colorado Department of Transportation and ESRI. Hydrographic Features (Streams and HUC Boundaries) were provided by the NRCS, USGS National Hydrography Dataset (NHD) or delineated using USGS NED data.

**WATERSHED LOCATOR**

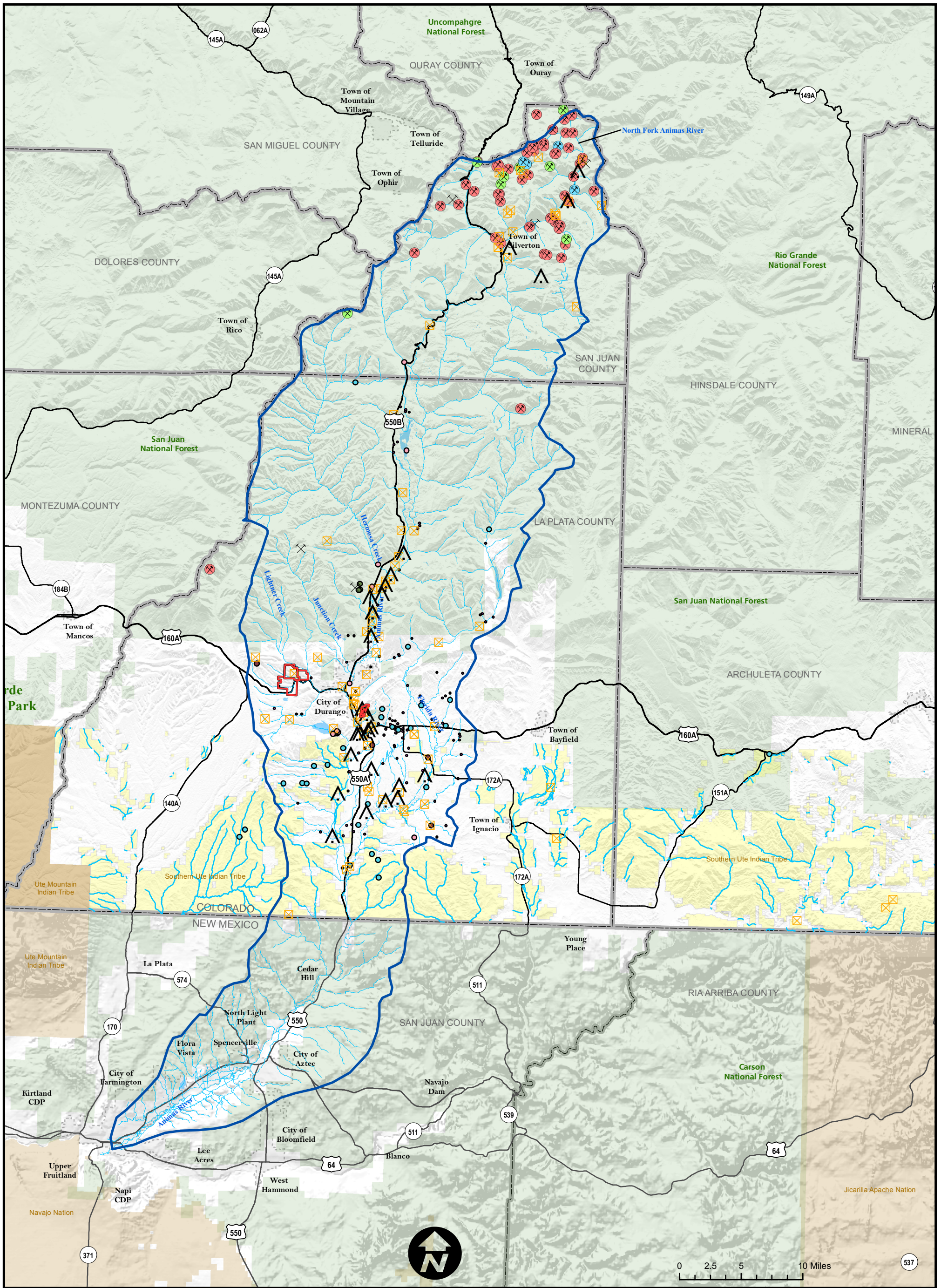


**FIGURE 15**  
**DRAINING MINE SITES AND SENSITIVE HABITATS**  
**ANIMAS WATERSHED**  
**COLORADO**

HUC-8 Code  
**14080104**

**FEMA**  
**COLORADO**  
 Colorado Water Conservation Board  
 Department of Natural Resources

**EDAC**  
**AECOM**



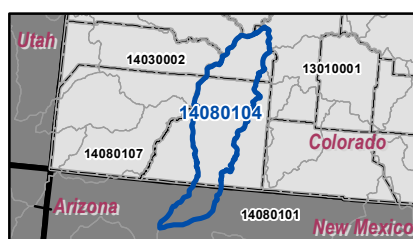
**MAP SYMBOLOLOGY**

- |                              |   |
|------------------------------|---|
| Animas HUC-8 Watershed       | Draining mine with active water treatment                               |
| County Boundary              | Draining mine being remediated  |
| City Boundary                | Draining mine that likely impact water quality with no active treatment |
| Interstate                   | Commercial Well   |
| State Highway                | Domestic Well   |
| Perennial Streams and Rivers | Other Well  |
| Waterbody                    | Irrigation Well   |
| Coal Permit Boundary         | Municipal Well  |
| Active Construction Permit   |   |
| Active Hardrock Permit       |   |
| Inactive Permit              |   |

**NOTES TO USERS**

All information on this map came from public data. Imagery, roads, and political boundaries were supplied by the Colorado Department of Transportation and ESRI. Hydrographic Features (Streams and HUC Boundaries) were provided by the NRCS, USGS National Hydrography Dataset (NHD) or delineated using USGS NED data.

**WATERSHED LOCATOR**



**FIGURE 16**  
MINE INVENTORY AND DOWNSTREAM GROUNDWATER WELLS

**ANIMAS WATERSHED**  
COLORADO

HUC-8 Code  
14080104

**FEMA**

**COLORADO**  
Colorado Water Conservation Board  
Department of Natural Resources

**EDAC**

**AECOM**

**4.2.5.3 Monitoring Data & Alert Plan**

CDPHE monitors water quality at various stream locations throughout the watershed to evaluate the addition of contaminants to waterways and has a relatively robust monitoring network. Most of their data are available through EPA's Storage and Retrieval Data Warehouse (STORET).

Additional information on STORET and to download data, please visit:

<https://www.epa.gov/waterdata/storage-and-retrieval-and-water-quality-exchange>. Data from the Water Quality Control Division (WQCD) of CDPHE includes stream water quality standards and lists of impaired waters requiring a total maximum daily load (TMDL) for select constituents, which are available for download at <https://www.colorado.gov/pacific/cdphe/clean-water-gis-maps>.

CDPHE in conjunction with DRMS has compiled maps and spatial data of mining related impacts to streams for the Animas River Watershed. These maps and data are available for download at: <https://www.colorado.gov/pacific/cdphe/animas-river-spill-maps>. Water quality sampling data collected in association with the Gold King Mine release is also maintained by CDPHE at: <https://www.colorado.gov/pacific/cdphe/animas-river-water-quality-sampling-and-data>.

The SJBH and CDPHE are currently evaluating water quality and risk to human health and the environment for Cement Creek and portions of the Animas Watershed outside of SUIT lands. Within tribal lands, monitoring is conducted by the SUIT Water Quality Program. Water and sediment is sampled at multiple locations and compared to metals concentrations to criteria for different exposure scenarios (e.g., municipal, residential, recreational, aquatic, and agricultural). SJBH also employs instruments that routinely measure water quality parameters and report measurements in real time. These parameters have been correlated to analytical results and are used to trigger alerts as part of emergency preparedness. Several groups prepared an Animas River Alert and Notification Plan (SJBH et. al. 2016) for advanced warning and evacuation purposes. The impetus for the plan resulted primarily from the Gold King Mine incident and contains guidance for sharing information as situations develop on the Animas River Watershed including annual spring run-off/high water, mud, land and rock-slides, flash flooding and other manmade or naturally occurring events. The plan describes emergency response actions, travel times under different river flow conditions, and how to coordinate, communicate and share information with local emergency managers and responding agencies.

Some of the results are also being leveraged to assess constituent loading from non-point source contributions that may be potential locations for restoration or mitigation. The funding for this particular study resulted from the Gold King Mine incident and the SJBH has released several documents from their study on August 1, 2016, approximately 1 year after the Gold King Mine incident. These documents include a one-page info-graphic summary for public consumption, an interactive display that graphs data, and a report summarizing monitoring activities and results, which are posted at [www.sjbhd.org](http://www.sjbhd.org). Frequently asked questions and tips regarding public health and safety concerning water quality are also available at: <http://sjbhd.org/public-health-news/animas-river-health-updates/frequently-asked-questions/> (SJBH 2016).

The Animas Watershed Partnership (AWP) and Mountain Studies Institute, among other groups, routinely collect and manage water quality data for the watershed, which are available on the Colorado Data Sharing Network (CDSN) at: <http://www.coloradowaterdata.org/>.

#### 4.2.5.4 Critical Areas and Potential Projects

The Animas River Watershed Based Plan identified the critical areas or potential projects for scoping based on water quality issues as of 2011, as well as best management practices (BMPs) to reduce constituent loading to the Animas River. The following excerpt details the seven actions identified in the plan (P. 28 and 29 of B.U.G.S. Consulting, 2011):

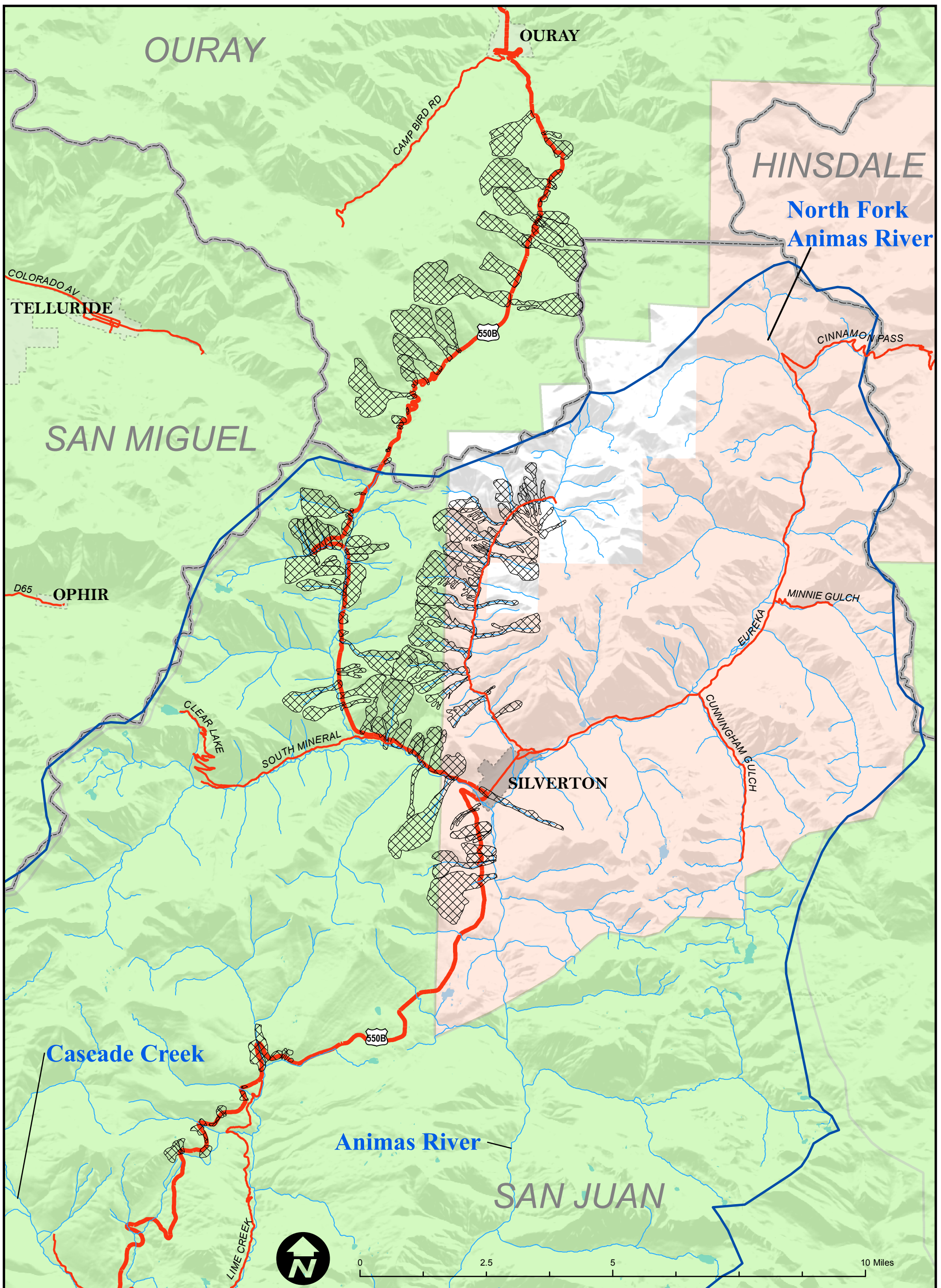
- 1. Between Baker's Bridge and Trimble Lane there are approximately 3 miles of abandoned in-stream gravel pits that need repaired in order to restore the functioning capacity of the river. This reach is particularly important for reducing the impacts of historical mining from the upper Animas River to the lower Animas River and sources of nutrients from Silverton, Cascade Village, Durango Mountain Resort and Fairfield Resort.*
- 2. The river reach between Trimble Lane and 32<sup>nd</sup> street has approximately 20 miles of eroding stream bank resulting in an almost 100% disconnect between the riparian ecosystem and the river that requires repair to reduce loading of nutrients and to restore the functioning capacity of the river in this reach. Trimble Lane to 32<sup>nd</sup> street will require at least 25 miles of reconnection of the river to the riparian ecosystem and 5 miles of repairing stream banks as well as reducing nutrient loading from subdivisions, the Dalton Ranch Golf Course and the effluent of the Hermosa Sanitation District.*
- 3. The river reaches between 32<sup>nd</sup> street and Basin Creek are impacted primarily by urban runoff from the City of Durango. The river reach through Durango will require reducing sediment and pollutants from storm water urban runoff, protecting the riparian community as much as possible and reducing nitrogen and phosphorus loading from the Durango and South Durango Waste Water Treatment Plants.*
- 4. Near the middle of Durango Reach is a perennial tributary, Lightner Creek, which has been the focus of recent efforts to reduce sediment deposition. Lightner Creek has been identified as a major loader of nutrients to the Animas River.*
- 5. The functioning capacity of the river reach within the SUIT Reservation, between Basin Creek and the State Line, is in good shape. There are a myriad number of inflows with significant amounts of nutrient loading from the flood irrigation practices on Florida Mesa and the floodplains of the Animas River and within the Florida River watershed, a perennial tributary to the Animas River.*
- 6. The Florida River, a perennial tributary to the Animas River contains significant amounts of flood irrigated agricultural land containing trans-basin irrigation water from the Pine River resulting in high loading of sediment and nutrients to the Animas River.*
- 7. The reach between Aztec, NM and the confluence with the San Juan River will require from 20 to 25 sites having BMPs implemented along with significantly reducing the effects of urban runoff from the City of Farmington and eliminating faulty septic tanks near the Animas River. Small tributaries of the Animas River, such as Kiffen Canyon, NM where a BMP project has been completed, will require repairing road and pipeline crossings that negatively impact the geomorphology of these tributaries leading to loading of nutrients especially during storm events.*

#### 4.2.6 Avalanche Information

Since 1950 avalanches have killed more people in Colorado than any other natural hazard, and in the United States, Colorado accounts for one-third of all avalanche deaths. Avalanches are a type of slope failure that sometimes occurs on slopes steeper than about 20 to 30 degrees.

Avalanches can reach speeds of 200 miles per hour and can exert enough force to destroy buildings and uproot large and healthy trees. Avalanche-prone areas can be determined with some accuracy, since under normal circumstances avalanches tend to run down the same paths year after year. However, exceptional weather conditions sometimes produce avalanches that overrun normal path boundaries or create new paths. Unlike other forms of slope failure, snow avalanches can build up and be triggered on more than one occasion during a single winter season.

The Colorado Avalanche Warning Center began issuing public avalanche forecasts in 1973 as part of a research program in the USDA-Forest Service Rocky Mountain Research Station. Avalanche information is maintained by the CAIC, whose mission is to provide avalanche information, education and promote research for the protection of life, property and the enhancement of the state's economy. The CAIC provided avalanche spatial information for Figure 17 showing historic pathways crossing interstates.

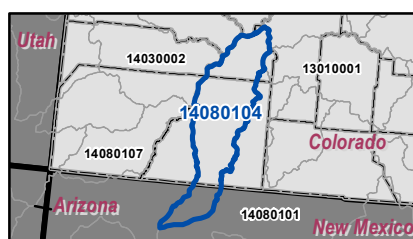


**MAP SYMBOLOLOGY**

- Animas HUC-8 Watershed
- County Boundary
- City Boundary (Unincorporated)
- City Boundary (Incorporated)
- Major Roads
- U.S. Highways
- Perennial Streams and Rivers
- Waterbody
- Historic Avalanche Path\*

\*Source of avalanche pathways is 2016 data from the Colorado Avalanche Information Center (CAIC) and is confined to transportation corridors.

**WATERSHED LOCATOR**



**Figure 17**  
HISTORIC AVALANCHE PATHWAYS ALONG TRANSPORTATION CORRIDOR

**ANIMAS WATERSHED COLORADO** HUC-8 Code 14080104

**FEMA**

**COLORADO**  
Colorado Water Conservation Board  
Department of Natural Resources

**EDAC**

**AECOM**

**4.3 FINANCIAL AND DAMAGE RELATED INFORMATION**

This subsection presents information pertaining to loss or damages, as well as funding opportunities for mitigation actions.

**4.3.1 Loss and Insurance Claims**

Table 10 lists the number of existing NFIP insurance claims for the communities within the watershed. The majority of the claims have been filed within LPC. The SUIT is not participating in the NFIP and is therefore not listed in the table below.

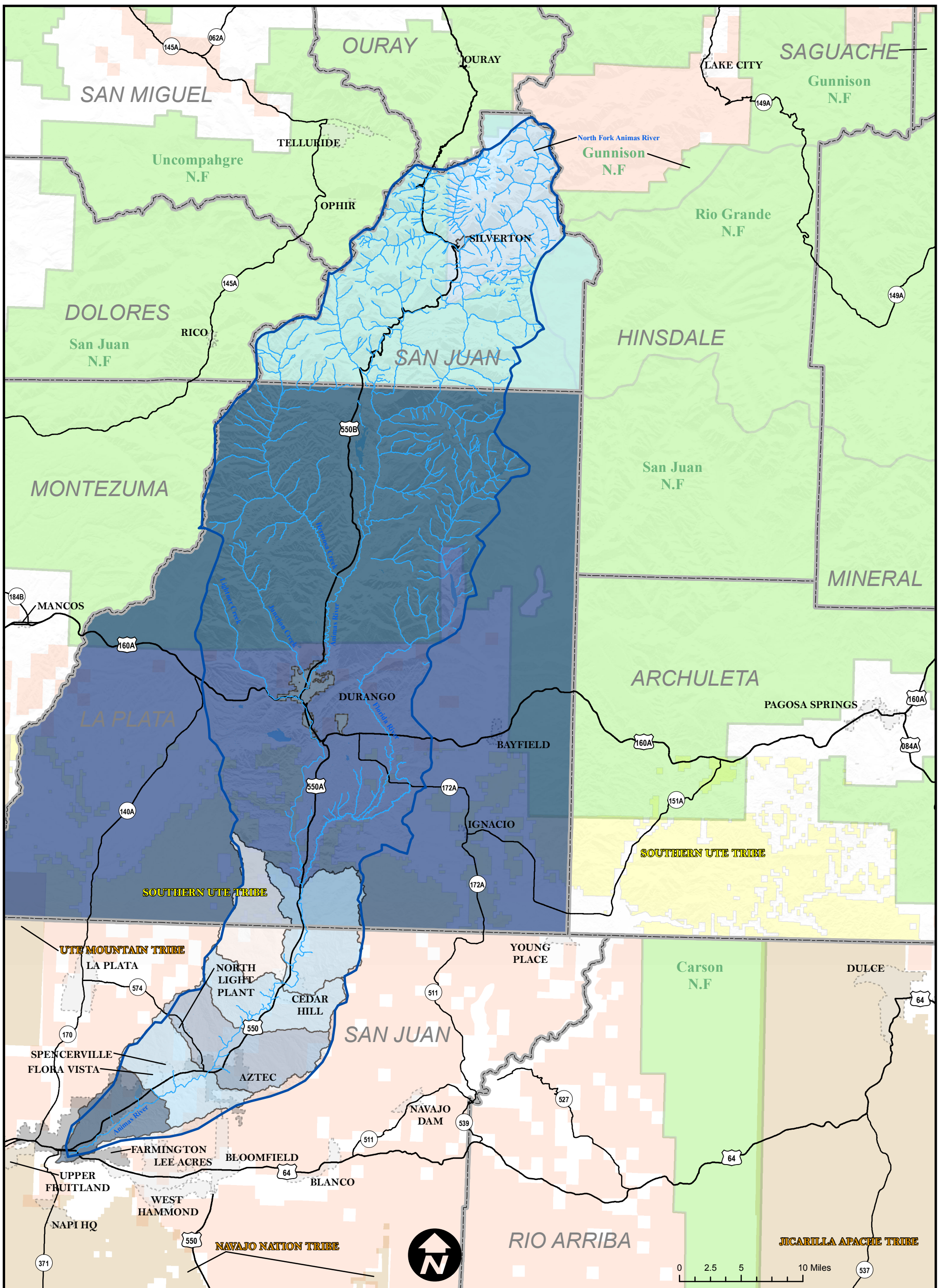
**Table 10: Total NFIP Insurance Claims**

Community	Claims	Policies
Aztec, City of (NM)	14	22
Durango, City of (CO)	3	127
Farmington, City of (NM)	7	111
Silverton, Town of (CO)	1	4
LPC Unincorporated Areas (CO)	19	617
SJC Unincorporated Areas (CO)	-	1
San Juan Unincorporated Areas (NM)	7	112

\*Number of properties is for the whole community and not just in watershed

\*\*The claims and policies reflected in the La Plata County HMP (La Plata County 2013) are 24 and 634, respectively, for La Plata County and 5 and 123, respectively, for the City of Durango

No severe repetitive loss (SRL) structures were identified within the watershed. As of 2010, there was one repetitive loss property (non-residential), located within the City of Durango in LPC. The CIS currently indicates that two repetitive losses have occurred in Durango, one of which was a structure and the other of which did not have information associated with the event.



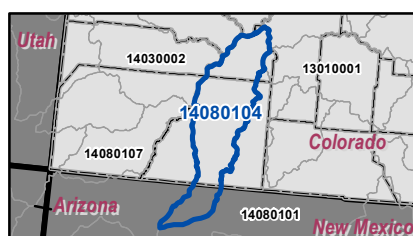
**MAP SYMBOLOLOGY**

- Animas HUC-8 Watershed
- County Boundary
- City Boundary (Unincorporated)
- City Boundary (Incorporated)
- Interstate
- State Highway
- Perennial Streams and Rivers
- Waterbody

**NFIP Policies**

- |  |          |
|--|----------|
|  | 0        |
|  | 1 - 20   |
|  | 21 - 50  |
|  | 51 - 150 |
|  | 151+     |

**WATERSHED LOCATOR**



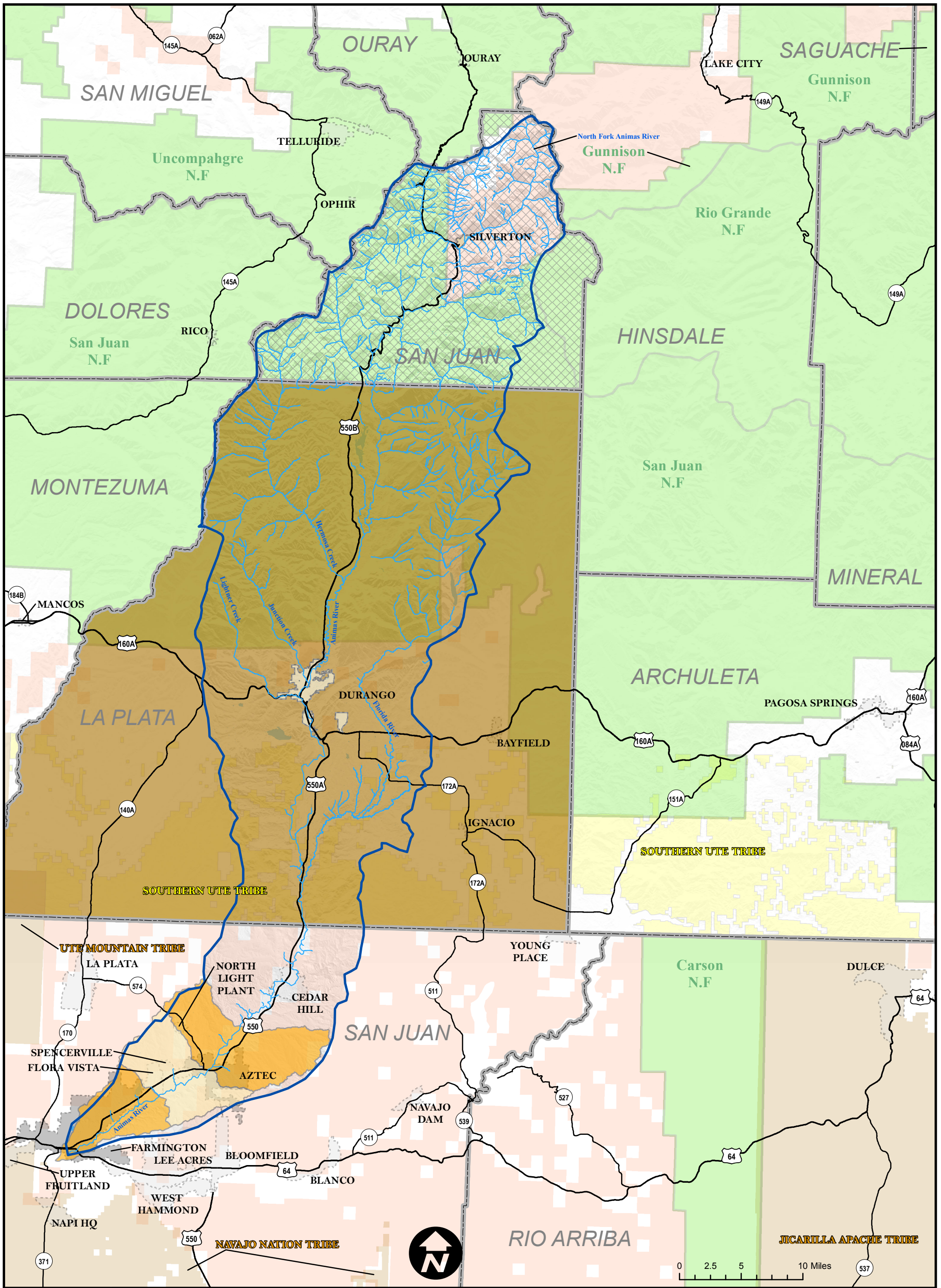
**Figure 18**  
NFIP POLICIES

**ANIMAS WATERSHED**  
COLORADO

HUC-8 Code  
14080104



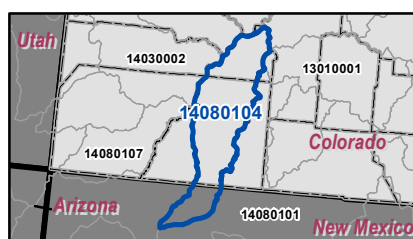




**MAP SYMBOLOLOGY**

Animas HUC-8 Watershed	NFIP Claims
County Boundary	0
City Boundary (Unincorporated)	1 - 5
City Boundary (Incorporated)	6 - 10
Interstate	11 - 20
State Highway	
Perennial Streams and Rivers	
Waterbody	

**WATERSHED LOCATOR**



**Figure 19**  
NFIP CLAIMS

**ANIMAS WATERSHED**  
COLORADO

HUC-8 Code  
14080104

FEMA

COLORADO  
Colorado Water Conservation Board  
Department of Natural Resources

EDAC

AECOM

**4.3.2 Funding and Grants**

In addition to providing technical assistance and guidance, one of the goals of Discovery is to identify opportunities to support community mitigation action through grants. The subsections below include, but are not limited to, potential sources of hazard mitigation funding to communities for eligible mitigation projects through various grant programs. Grants are also available through the led Partners to this effort: CWCB and NM DHSEM offer numerous loans and grants for a variety of water-related projects, studies, planning documents, and other activities. More information on funding opportunities through CWCB and DHSEM can be found on their websites: <http://cwcb.state.co.us/LoansGrants/Pages/LoansGrantsHome.aspx> & <http://www.nmdhsem.org/Grants.aspx>, respectively.

**4.3.2.1 FEMA Financial Programs**

Currently, FEMA administers three programs that provide funding for eligible mitigation planning and projects that reduces disaster losses and protect life and property from future disaster damages. These three programs include:

Hazard Mitigation Grant Program (HMGP)

HMGP assists in implementing long-term hazard mitigation planning and projects following a Presidential major disaster declaration. The program may provide a state with up to 15 percent of the total disaster grants awarded by FEMA following a major disaster declaration. Figure 20 is a flowchart explaining the process individual homeowners, businesses, subapplicants and applicants must go through in order to apply for HMGP and how this process leads to FEMA.

**Figure 20: HMGP Application Process**



Source: [https://www.fema.gov/sites/default/files/images/hmgpapplicationprocess\\_1.jpg](https://www.fema.gov/sites/default/files/images/hmgpapplicationprocess_1.jpg)

Additional information can be found at <http://www.fema.gov/hazard-mitigation-grant-program>.

#### Pre-Disaster Mitigation (PDM) Program

PDM provides funds for hazard mitigation planning and projects on an annual basis. PDM funding depends on the amount appropriated each year to the program and is competitive nationwide. The total amount of funds distributed under the FY 2016 PDM Grant Program will be \$90,000,000 ([http://www.fema.gov/media-library-data/1455711373912-17d561db31cc299667dc5c60811165d1/FY16\\_PDM\\_Fact\\_Sheet.pdf](http://www.fema.gov/media-library-data/1455711373912-17d561db31cc299667dc5c60811165d1/FY16_PDM_Fact_Sheet.pdf)). Additional information can be found at <http://www.fema.gov/pre-disaster-mitigation-grant-program>.

#### Flood Mitigation Assistance (FMA) Program

FMA provides funds for projects to reduce or eliminate risk of flood damage to buildings that are insured under the NFIP on an annual basis. FMA funding depends on the amount appropriated each year to the program. The total amount of funds distributed under the FY 2016 FMA Grant Program will be \$199,000,000 ([http://www.fema.gov/media-library-data/1455710459301-048a67862580037b30cd640a802a9053/FY16\\_FMA\\_Fact\\_Sheet.pdf](http://www.fema.gov/media-library-data/1455710459301-048a67862580037b30cd640a802a9053/FY16_FMA_Fact_Sheet.pdf)). Additional information can be found at <http://www.fema.gov/flood-mitigation-assistance-grant-program>.

#### Public Assistance, Section 406

This is a federal discretionary grant program that provides funds to incorporate hazard mitigation measures into the repair, restoration, and replacement of facilities damaged by presidentially declared disasters. The program is administered by DHSEM and awards funds from FEMA on a cost-reimbursement basis. Additional information can be found at <http://www.dhsem.state.co.us/emergency-management/grant-programs/public-assistance-grant>.

FEMA's news page (<http://www.fema.gov/latest-news>) provides information on the latest news and updates for FEMA's Hazard Mitigation Assistance grant programs. The Notice of Funding Opportunity announcements are posted on <http://www.grants.gov/>.

#### **4.3.2.2 USACE Programs**

The USACE has a variety of authorities to provide technical assistance and/or planning, design, funding, and construction of projects to address both small and large scale water resource issues. Technical assistance programs can provide scientific and engineering data and analysis related to water resources issues where Corps participation in construction is not required. Project specific planning, design, and construction assistance programs are generally geared towards long-term risk reduction or restoration measures, and not towards emergency response or time-sensitive recovery measures. These programs include, but are not limited to:

- Flood Damage Reduction;
- Emergency Streambank and Shoreline Protection;
- Aquatic Ecosystem Restoration;
- Navigation Improvements;
- Channel Clearing for Flood Control;
- Product Modifications for Improvement of the Environment; and
- Hurricane and Storm Damage Reduction

USACE programs are summarized at <http://silverjackets.nfrmp.us/Get-Involved/More-Information/Silver-Jackets-Newsletter/The-Buzz-August-2014/USACE> and explained in detail at <http://planning.usace.army.mil/toolbox/library/ERs/a-f.pdf>.

#### 4.3.2.3 Other Funding Resources for Planning and Projects

This section lists additional funding sources for planning and projects, providing the fund or program name along with an accompanying website address to find more information. Many of these programs and grants are summarized in greater detail in DOLA's recently published guide *Planning for Hazards – Land Use Solutions for Colorado* (P. 220-224 of DOLA 2016) and are detailed on their website at: <https://planningforhazards.org/available-resources>.

##### General Land Use Planning

- DOLA's Energy and Mineral Impact Assistance Fund: [colorado.gov/pacific/dola/energymineral-impact-assistance-fund-eiaf](http://colorado.gov/pacific/dola/energymineral-impact-assistance-fund-eiaf)
- DOLA's Community Development Block Grant – Disaster Recovery (CDBG-DR): [colorado.gov/pacific/dola/disaster-recovery](http://colorado.gov/pacific/dola/disaster-recovery)
- Economic Development Administration Planning and Local Technical Assistance Programs: [eda.gov/funding-opportunities](http://eda.gov/funding-opportunities)
- CSFS's Natural Resources Grants and Assistance Database: [nrdb.csfs.colostate.edu](http://nrdb.csfs.colostate.edu)

##### Hazard Mitigation Planning and Projects

- NRCS's EWP Program: [nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp](http://nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp)
- NRCS's Watershed Rehabilitation Program: [nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/wr](http://nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/wr)
- BLM's Wildland-Urban Interface Community and Rural Fire Assistance: <http://www.federalgrantswire.com/wildland-urban-interface-community-and-rural-fire-assistance.html#.V6NbxvkrJhF>
- The Southwestern Water Conservation District's Grant program: <http://swwcd.org/programs/financial-assistance-program>
- USFWS's Wildlife & Sport Fish Restoration Program: <http://wsfprograms.fws.gov/Subpages/GrantPrograms/SWG/SWG.htm>
- USGS's Water Resources National Competitive Grants: <http://water.usgs.gov/wrri/national-competitive-grants.php>

##### Parks and Open Space Planning

- Great Outdoors Colorado Planning Grants: [goco.org/grants/apply/planning](http://goco.org/grants/apply/planning)
- CPW's Non-Motorized Trails Grant Program: [cpw.state.co.us/aboutus/Pages/TrailsGrantsNM.aspx](http://cpw.state.co.us/aboutus/Pages/TrailsGrantsNM.aspx)
- DOLA's Colorado Conservation Trust Fund: [colorado.gov/pacific/dola/conservation-trust-fund-ctf](http://colorado.gov/pacific/dola/conservation-trust-fund-ctf)

## Land Acquisition

- The Conservation Fund: Conservation Acquisition: [conservationfund.org/what-we-do/conservation-acquisition/our-revolving-fund](http://conservationfund.org/what-we-do/conservation-acquisition/our-revolving-fund)
- CPW's Land and Water Conservation Fund: [cpw.state.co.us/aboutus/Pages/TrailsLWCF.aspx](http://cpw.state.co.us/aboutus/Pages/TrailsLWCF.aspx)
- NRCS's Agricultural Conservation Easement Program: [nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/easements/acep/?cid=stelprdb1242695](http://nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/easements/acep/?cid=stelprdb1242695)
- DOLA's Conservation Trust Fund: [colorado.gov/pacific/dola/conservation-trust-fund-ctf](http://colorado.gov/pacific/dola/conservation-trust-fund-ctf)

## Drought Planning

- CWCB's Water Efficiency Grant Program & Drought Mitigation Planning Grants: [cwc.state.co.us/LoansGrants/water-efficiency-grants/Pages/main.aspx](http://cwc.state.co.us/LoansGrants/water-efficiency-grants/Pages/main.aspx); and [cwc.state.co.us/LoansGrants/water-efficiency-grants/Pages/DroughtMitigationPlanningGrants.aspx](http://cwc.state.co.us/LoansGrants/water-efficiency-grants/Pages/DroughtMitigationPlanningGrants.aspx)
- BoR's WaterSMART Drought Response Program: [usbr.gov/drought](http://usbr.gov/drought)
- NRCS's Watershed and Flood Prevention Operations Program: [nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/wfpo](http://nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/wfpo)

### **4.3.2.4 Examples of Grants Received by Animas Communities**

Examples of communities receiving grants and other funding within the Animas HUC-8 Watershed include LPC and the City of Durango. The WQCD provided \$220,000 in grant funding to the Florida Water Conservancy District. The City of Durango and LPC have received grants and technical assistance from CDBG. LPC is currently working with the National Weather Service, USGS, and DOLA to seek project funding and support for the placement of a the Radar Station (mentioned in Section 4.2.2), which is anticipated to cost between \$2,000,000 and \$5,000,000. There may be a need to be a fiscal agent and the 50% match would likely be shared among numerous agencies. CWCB has also provided several grants for projects within the Animas Watershed, including channel restoration, fen restoration, and watershed master planning as described in more detail in section 4.4.3.

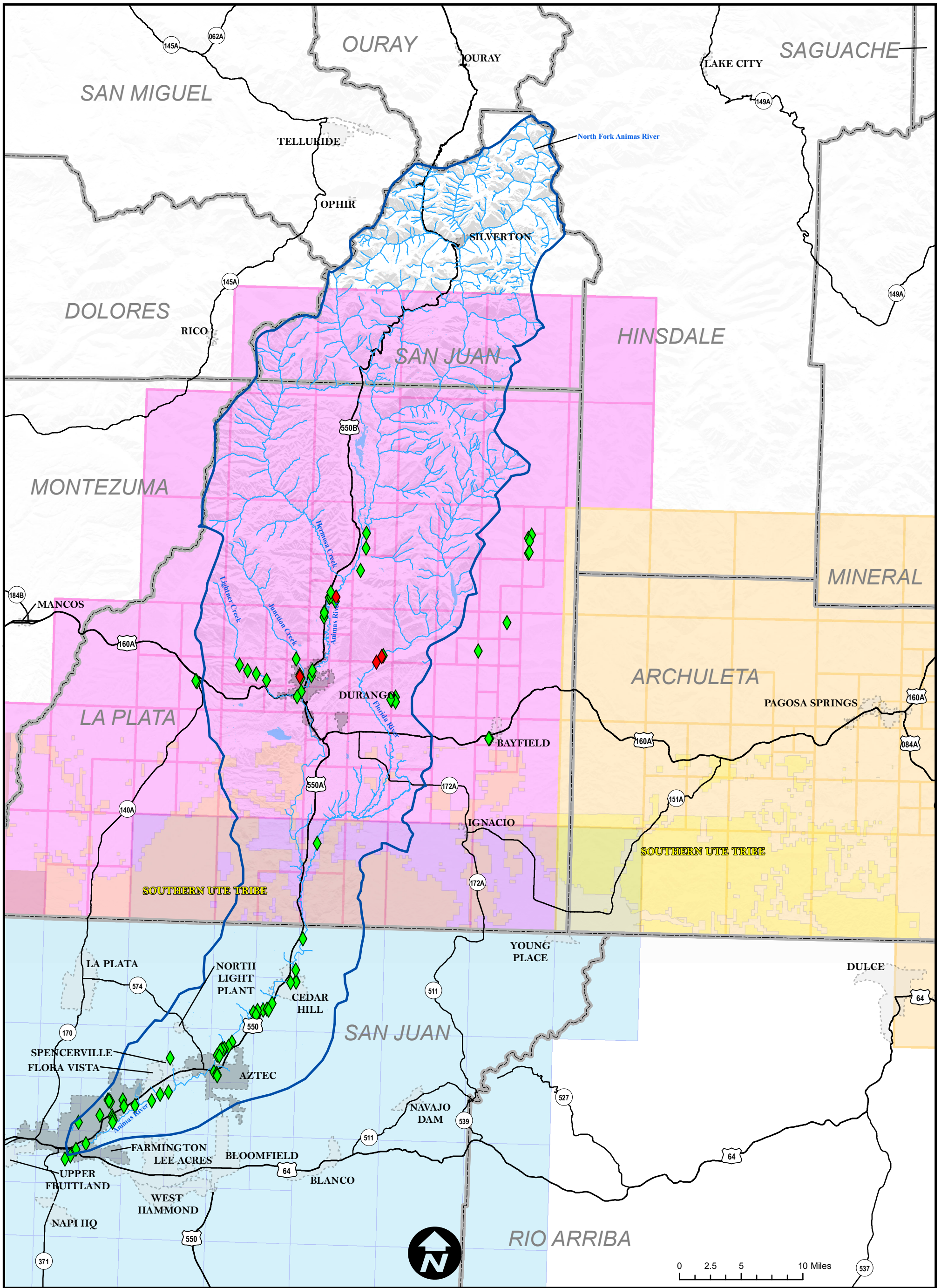
## **4.4 OTHER AVAILABLE MITIGATION INFORMATION**

This subsection contains information pertaining to regulations that can be used for planning mitigation actions.

### **4.4.1 Letters of Map Change (LOMC)**

Over the past 6 years, there have been several dozen approved LOMCs in LPC. The LOMCs predominately comprise letters of map amendment (LOMAs) and four letters of map revision (LOMRs). The majority of the LOMCs have been in the unincorporated areas of the county along various flooding sources including the Animas River, Florida River, and Lightner Creek; and in the City of Durango along the Animas River, Junction Creek, and Dry Gulch Creek. There are no approved LOMCs in SJC or the Town of Silverton.

There are no active physical map revisions (PMRs) currently taking place within the Animas HUC-8 Watershed. Previous FIRM updates and LOMR/LOMA locations can be seen on Figure 21 below.



**MAP SYMBOLOLOGY**

- Animas HUC-8 Watershed
- County Boundary
- City Boundary (Unincorporated)
- City Boundary (Incorporated)
- Interstate
- State Highway
- Perennial Streams and Rivers
- Waterbody

**FIRM Status - Effective Date**

- 8/19/2010
- 9/25/2009
- 8/5/2010

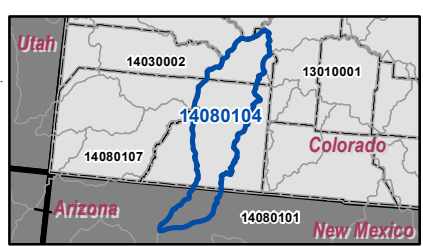
**LOMR / LOMC Activity**

- Letter of Map Amendment
- Letter of Map Revision

**NOTES TO USERS**

All information on this map came from public data. Imagery, roads, and political boundaries were supplied by the Colorado Department of Transportation, New Mexico Department of Transportation and ESRI. Hydrographic Features (Streams and HUC Boundaries) were provided by the NRCS, USGS National Hydrography Dataset (NHD) or delineated using USGS NED data.

**WATERSHED LOCATOR**



**Figure 21**  
FIRM STATUS

**ANIMAS WATERSHED**  
COLORADO

HUC-8 Code  
14080104

**FEMA**

**COLORADO**  
Colorado Water Conservation Board  
Department of Natural Resources

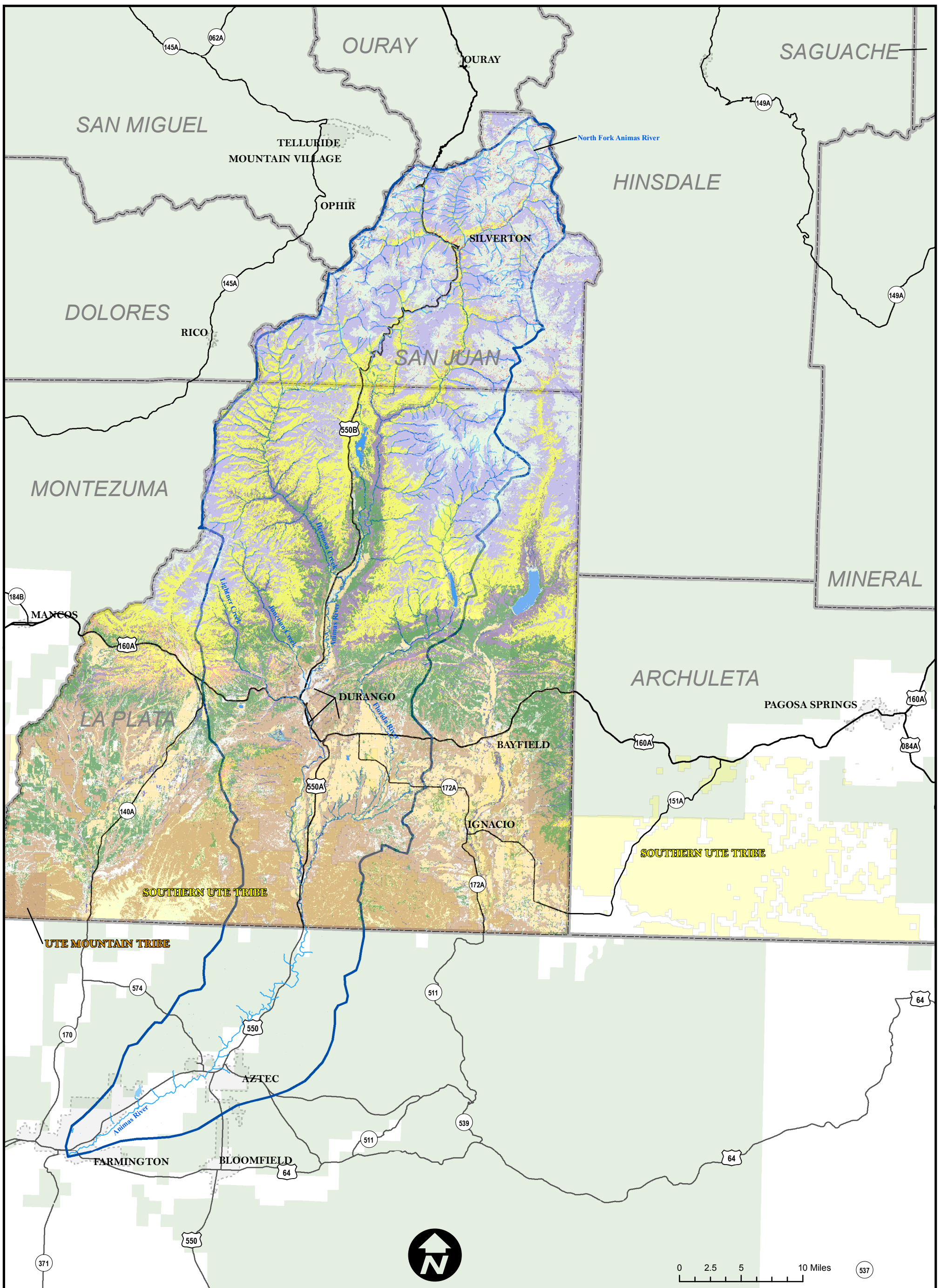
**EDAC**

**AECOM**

## 4.4.2 Vegetation Information

The CO-WRAP maintained by the CSFS also includes a vegetation layer that presents the general vegetation and land cover types across the state of Colorado (conditions as of 2008). This dataset is mostly used to assess wildfire risk based on fuel information (canopy cover, height, and density); however, it can be of use to inform development with building restrictions in sensitive environments. For example, SJC has additional restrictions on building or development in alpine tundra above tree line. Therefore, the interface between grasslands and forests can assist in approximately delineating this boundary. Vegetation cover for the Animas Watershed is shown on Figure 22 and vegetation cover for SJC is shown on Figure 23.





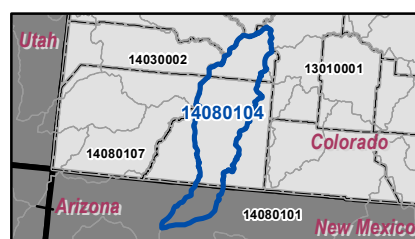
**MAP SYMBOLOLOGY**

- Animas HUC-8 Watershed
  - County Boundary
  - City Boundary
  - Interstate
  - State Highway
  - Perennial Streams and Rivers
  - Waterbody
- 
- Vegetation**
- Agriculture
  - Aspen
  - Grassland
  - Introduced Riparian
  - Lodgepole Pine
  - Mixed Conifer
  - Oak Shrubland
  - Open Water
  - Pinon-Juniper
  - Ponderosa Pine
  - Riparian
  - Shrubland
  - Spruce-Fir
  - Urban & Community

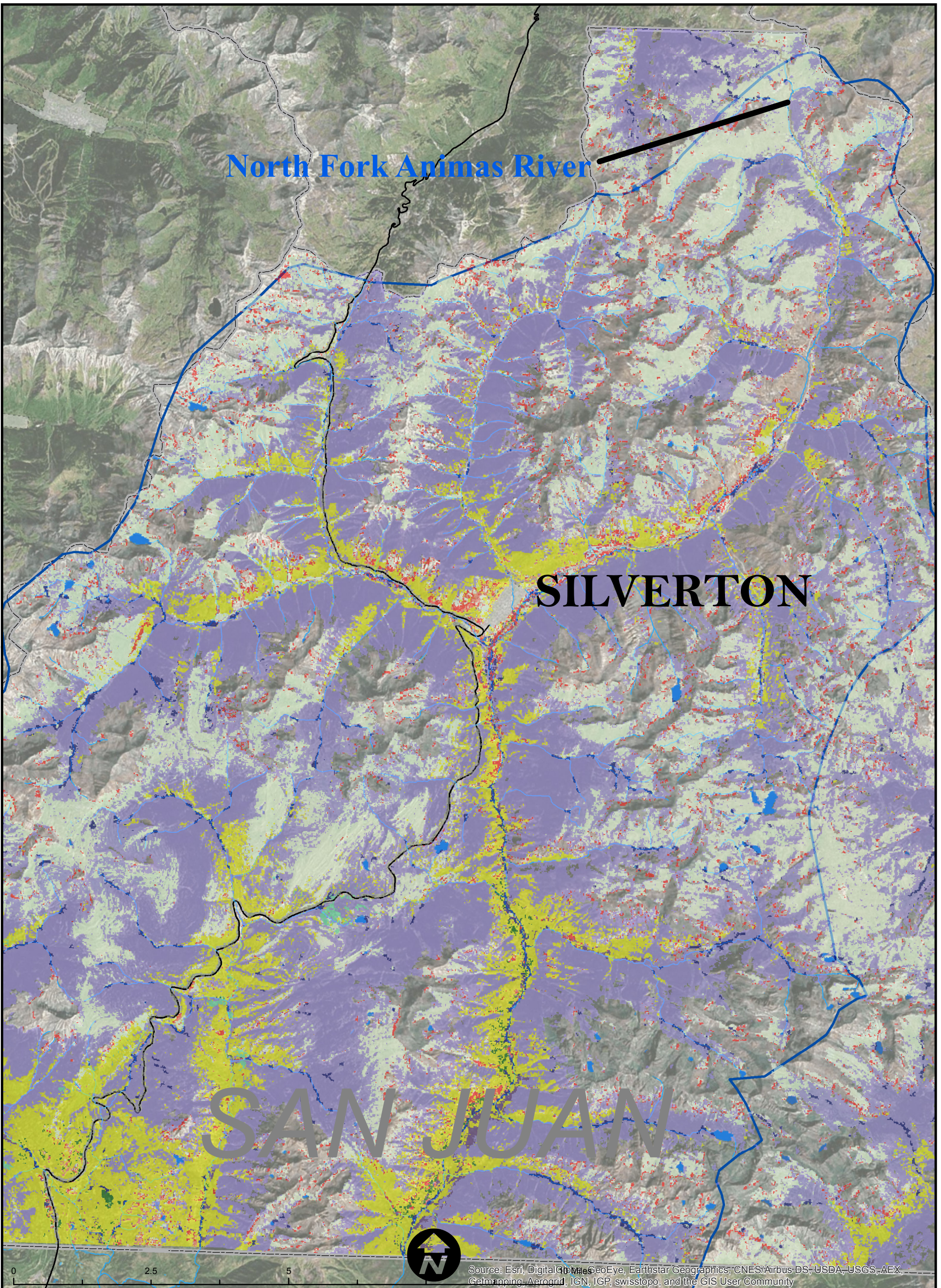
**NOTES TO USERS**

All information on this map came from public data. Imagery, roads, and political boundaries were supplied by the Colorado Department of Transportation and ESRI Hydrographic Features (Streams and HUC Boundaries) were provided by the NRCS, USGS National Hydrography Dataset (NHD) or delineated using USGS NED data.

**WATERSHED LOCATOR**



**FIGURE 22**  
**VEGETATION COVER IN ANIMAS WATERSHED**  
**ANIMAS WATERSHED**  
**COLORADO**  
 HUC-8 Code  
 14080104



**MAP SYMBOLOLOGY**

- Animas HUC-8 Watershed
- County Boundary
- City Boundary
- Interstate
- State Highway
- Perennial Streams and Rivers
- Waterbody

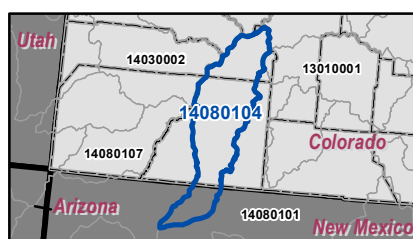
**Vegetation**

- Agriculture
- Aspen
- Grassland
- Introduced Riparian
- Lodgepole Pine
- Mixed Conifer
- Oak Shrubland
- Open Water
- Pinon-Juniper
- Ponderosa Pine
- Riparian
- Shrubland
- Spruce-Fir
- Urban & Community

**NOTES TO USERS**

All information on this map came from public data. Imagery, roads, and political boundaries were supplied by the Colorado Department of Transportation and ESRI. Hydrographic Features (Streams and HUC Boundaries) were provided by the NRCS, USGS National Hydrography Dataset (NHD) or delineated using USGS NED data.

**WATERSHED LOCATOR**



**FIGURE 23**  
VEGETATION COVER IN SAN JUAN COUNTY

ANIMAS WATERSHED COLORADO HUC-8 Code 14080104



### 4.4.3 Inventory of Ongoing Studies and Coordination Efforts

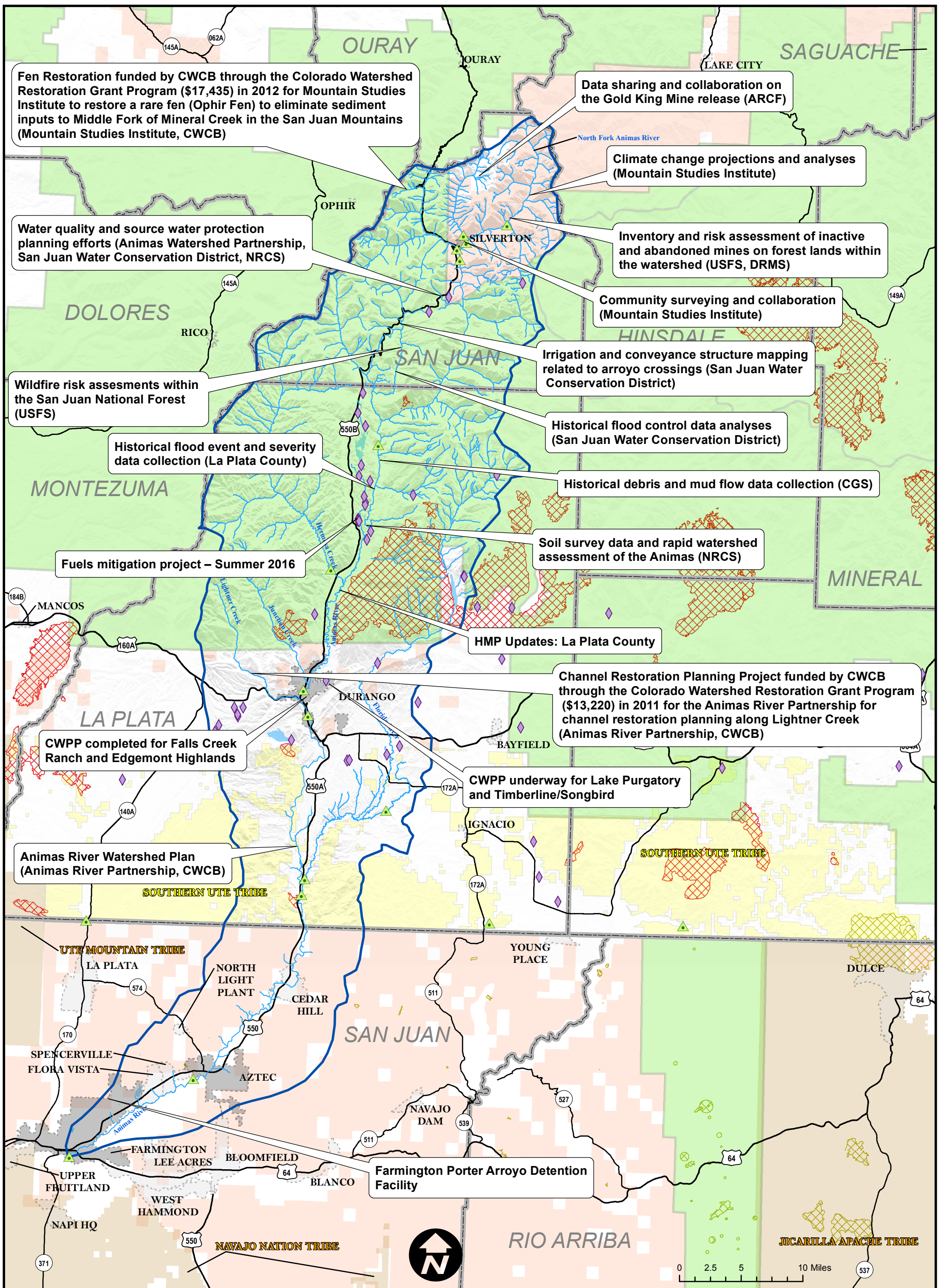
The Project Team has been made aware of numerous other efforts occurring in the Animas HUC-8 Watershed, including:

- HMP update(s) (LPC);
- Wildfire risk assessments within the San Juan National Forest (USFS);
- Farmington Porter Arroyo Detention Facility (SJC NM);
- Inventory and risk assessment of inactive and abandoned mines on forest lands within the watershed (USFS, DRMS);
- Data sharing and collaboration on the Gold King Mine release ( ARCF);
- Water quality and source water protection planning efforts (Animas Watershed Partnership, San Juan Soil and Water Conservation District [San Juan SWCD], NRCS);
- Community surveying and collaboration (Mountain Studies Institute);
- Climate change projections and analyses (Mountain Studies Institute);
- Irrigation and conveyance structure mapping related to arroyo crossings (San Juan SWCD);
- Historical flood control data analyses (San Juan SWCD);
- Historical debris and mud flow data collection (CGS);
- Historical flood event and severity data collection (LPC);
- Soil survey data and rapid watershed assessment of the Animas (NRCS);
- Animas River Watershed Plan (Animas River Partnership, CWCB);
- Channel Restoration Planning Project funded by CWCB through the Colorado Watershed Restoration Grant Program (\$13,220) in 2011 for the Animas River Partnership for channel restoration planning along Lightner Creek (Animas River Partnership, CWCB); and
- Fen Restoration funded by CWCB through the Colorado Watershed Restoration Grant Program (\$17,435) in 2012 for Mountain Studies Institute to restore a rare fen (Ophir Fen) to eliminate sediment inputs to Middle Fork of Mineral Creek in the San Juan Mountains (Mountain Studies Institute, CWCB).
- FireWise has completed a CWPP for Falls Creek Ranch and Edgemont Highlands near County Road 240 and is currently preparing a CWPP for Lake Purgatory and Timberline/Songbird along County Road 240. They are conducting a fuels mitigation project in the summer of 2016 in the Rockwood area in coordination with a few communities. FireWise indicated that the Durango & Silverton Narrow Gauge Railroad is currently working on their third fuels mitigation project along the train's right of way. FireWise also noted a few other wildfire mitigation efforts along the CR 240 corridor up to Lemon

Reservoir and then the Vallecito Reservoir area, which though outside the watershed would impact erosion and debris flows to the Florida River if there were a large wildfire.

- The Durango & Silverton Narrow Gauge Railroad is committed to the protection of the watershed and the forest conditions in the Animas River Canyon and seeks to do so through several ongoing mitigation efforts. The Railroad:
  - Installs and maintains a culverting system to allow unimpeded flow of water on their right of way to reduce erosion.
  - Installs and maintains a series of riprap projects within the high water mark of the Animas River itself to mitigate erosion. This work is completed under guidelines dictated by the Army Corps of Engineers, and suggested directives from contracted engineers.
  - Removes excess vegetation along the right of way to reduce wildfire hazards, particularly unwanted undergrowth and ladder fuels, and utilizes weed removal contractors to further control vegetation on Railroad property.
  - Has been awarded \$90,000 in 50/50 matching wildfire mitigation and forest health grants for the years 2014, 2015, and 2016. With help from partners including LPC, USFS, and the Southwest Colorado Conservation Corps, wildfire mitigation work has exceeded 20 miles during the past three years and fire starts have been reduced dramatically.

CWCB's above mentioned Colorado Watershed Restoration Grant Program provides grants for watershed/stream restoration and flood mitigation projects throughout the state. A map of 33 grant projects in Colorado from 2009-2012 is available at <http://cwcb.state.co.us/LoansGrants/colorado-watershed-restoration-grants/Documents/CWRPPProjectHistory.pdf>. Two of the projects are in the Animas Watershed, as described in the list above. To reduce redundancy and facilitate collaboration, these coordination efforts are being tracked as shown on Figure 24 for the Animas Watershed.



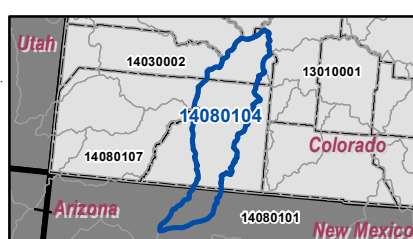
**MAP SYMBOLOLOGY**

- Animas HUC-8 Watershed
- County Boundary
- City Boundary (Unincorporated)
- City Boundary (Incorporated)
- Interstate
- State Highway
- Southern Ute Land
- Federal Land
- Perennial Streams and Rivers
- Waterbody
- Stream Gages
- Dams
- Wildfire Burn Areas 2000-2014
- Wildfire Burn Areas 1911-2014

**NOTES TO USERS**

All information on this map came from public data. Imagery, roads, and political boundaries were supplied by the Colorado Department of Transportation, New Mexico Department of Transportation and ESRI. Hydrographic Features (Streams and HUC Boundaries) were provided by the NRCS, USGS National Hydrography Dataset (NHD) or delineated using USGS NED data.

**WATERSHED LOCATOR**



**Figure 24**  
ANIMAS WATERSHED PROJECT COORDINATION

**ANIMAS WATERSHED COLORADO** HUC-8 Code 14080104

**4.4.4 Local Ordinance Review**

Table 11 provides a brief summary of the local floodplain ordinances. The SUIT does not participate in the NFIP and therefore does not have a flood ordinance.

**Table 11: Local Ordinances**

Community Name	Ordinance Higher Standards	Ordinance Location
Durango, City of	1 foot of freeboard	Online
LPC	1 foot of freeboard	State (CWCB)
SJC	1 foot of freeboard	Online
SJC (NM)	None	Online
Aztec	None	Online
Farmington	None	Online
Silverton, Town of	1 foot of freeboard	Online

**4.4.5 Mitigation Plan Status and Available Actions**

Developing hazard mitigation plans enables state, tribal, and local governments to:

- Increase education and awareness around threats, hazards, and vulnerabilities;
- Build partnerships for risk reduction involving government, organizations, businesses, and the public;
- Identify long-term, broadly-supported strategies for risk reduction;
- Align risk reduction with other state, tribal, or community objectives;
- Identify implementation approaches that focus resources on the greatest risks and vulnerabilities; and
- Communicate priorities to potential sources of funding.

Moreover, a FEMA-approved hazard mitigation plan is a condition for receiving certain types of non-emergency disaster assistance, including funding for mitigation projects. Ultimately, hazard mitigation planning enables action to reduce loss of life and property, lessening the impact of disasters. The Project Team reviewed mitigation plans to understand local mitigation capabilities, hazard risk assessments, current or future mitigation activities, and areas of mitigation interest, as summarized in Table 12 below.

**Table 12: Mitigation Plan Status**

Plan Information	Community Mitigation Action
<i>Colorado Communities</i>	
City of Durango	Shared with LPC
<p>LPC Hazard Mitigation Plan</p> <p><i>Status</i> Current</p> <p><i>Approved</i> October 17, 2013</p> <p><i>Expires</i> October 16, 2018</p>	<ul style="list-style-type: none"> <li>• Coordinate interagency planning for natural hazard mitigation.</li> <li>• Develop sheltering/public services strategies by jurisdiction for populations impacted by natural hazard events.</li> <li>• Complete hazardous fuels reduction projects.</li> <li>• Inventory locations/access points and create fire clear zones around substations, repeaters, cell phone towers, and other communications sites on federal/state lands.</li> <li>• Relocate Durango Fire Station #2 (1235 Camino Del Rio) out of the floodplain into strategic location in downtown Durango response area.</li> <li>• Initiate wildfire mitigation projects on federal lands and assist other wildfire managers with wildfire management activities in their jurisdictions.</li> <li>• Investigate feasibility and funding for a levee protecting Meadowbrook Mobile Home Park from flooding on the Pine River.</li> <li>• Evaluate and update reverse 911 system.</li> <li>• Update the county and municipal Comprehensive Plans to address natural hazards.</li> <li>• Update the county and municipal Land Use Codes and Development Regulations to address natural hazards.</li> <li>• Inventory, evaluate, update, and coordinate/standardize physical addressing and GIS data.</li> <li>• Develop a county-wide system by jurisdiction (or streamline existing efforts) to monitor the success of awareness and mitigation programs.</li> <li>• Evaluate current hazard mitigation education/outreach efforts and develop an outreach strategy by jurisdiction.</li> <li>• Secure a backup power supply for Bayfield water and sanitary sewer pumping systems.</li> <li>• Procure back-up power generators for Upper Pine River FPD Stations No. 1, 2, and 5.</li> <li>• Procure back-up power generators for county, fire districts, and municipal critical facilities/infrastructure.</li> <li>• Relocate Upper Pine River Fire Protection District Station 4 from floodplain.</li> <li>• Improve reliability and coverage of communications systems.</li> <li>• Pursue flood mitigation projects in the Vallecito drainage: levees, weirs, and two new bridges.</li> <li>• Continue participation in the NFIP by continuing to enforce floodplain management requirements, including regulating new construction in Special Flood Hazard Areas (SFHAs), and by continuing to encourage property owners to purchase flood insurance.</li> <li>• Continue/begin participation in the CRS. Work with Flood Plain Manager to identify and pursue actions that improve the CRS rating.</li> <li>• Continue working collaboratively across jurisdictions to institute policies that, if implemented, will reduce the chances of catastrophic wildfires on private lands, and lands in the WUI, including adoption of driveway standards and wildfire mitigation policies as drafted in the proposed LPC Land Use Code Update.</li> <li>• Utilize the LPC Firewise Council to educate local governments, builders, architects and other stakeholders about Firewise construction techniques, materials, and private contractors who are able to complete Firewise prevention projects on homeowners' properties.</li> <li>• Build the capacity of the Firewise Council of Southwest Colorado's Neighborhood Ambassador Program through recruitment, training, and utilization, and by helping the program via ongoing development and capacity building.</li> <li>• Streamline the process for prescribed burns to occur.</li> <li>• Use the Public Safety GIS Users Group as the technology arm of county-wide hazards</li> </ul>

Plan Information	Community Mitigation Action
	<p>planning.</p> <ul style="list-style-type: none"> <li>• Integrate GIS/technology into Southwest All-Hazards Advisory Council.</li> <li>• Expand the storage capacity of the Bayfield water system reservoir.</li> <li>• Replace twin bridges in Bayfield (bridges over Upper Pine River on Hwy 160B/Bayfield Parkway).</li> <li>• Take steps to improve resiliency of water treatment facilities to handle impacts from hazard events (such as wildfire or flooding).</li> <li>• Provide infrastructure and stockpile equipment for the Animas Watershed Subarea Contingency Plan (EPA).</li> </ul>
<p>SJC Town of Silverton</p>	<p>No existing HMP – presently drafting joint HMP for SJC and Silverton.</p>
<p>Southern Ute Indian Tribe Hazard Mitigation Plan</p> <p><i>Status</i> Current</p> <p><i>Approved</i> March 20, 2014</p> <p><i>Expires</i> March 19, 2019</p>	<ul style="list-style-type: none"> <li>• Develop an assessment of risks to culturally significant sites. A more thorough inventory and assessment in a risk context will help ensure the long-term protection of cultural sites. Part of the output is an inventory of cultural sites in a GIS format.</li> <li>• Develop a multi-hazard warning system. Consider multiple approaches including connecting with existing reverse 911. Specific hazards of concern to be addressed include tornado, dam failure, and flash floods.</li> <li>• Develop education programs for senior populations, school populations, and large employers with the goal of improving knowledge of natural hazards and public safety response.</li> <li>• Conduct intergovernmental training and exercises and develop scenario trainings specific to the hazards of concern.</li> <li>• Seek and sign memoranda of understanding concerning the exchange of information by agencies. Currently much of the information regarding properties and other development is fragmented between the counties, SUIT, and the state. An accurate inventory of all assets, their locations and values is of use in a multitude of planning and response activities.</li> <li>• Develop Continuity of Government plans.</li> <li>• Develop a Drought Mitigation Study that addresses at a minimum: cultural impacts, agricultural impacts.</li> <li>• Develop a study of water rationing and the development of underground resources, specifically to determine if water from oil and gas activities can be re-utilized. Assess if adequate information exists to quantify useable groundwater resources for the future.</li> <li>• Develop educational outreach to community, specifically educating the public on xeriscaping and water use reduction strategies.</li> <li>• Limit outdoor watering to specific times of the day, limit watering days per week, require car washes to install water recycling technology and/or BMPs.</li> <li>• Build new facilities to enhance water diversion or divert new supplies.</li> <li>• Implement cloud seeding program.</li> <li>• Research joining the NFIP.</li> <li>• Obtain complete DFIRM data. Current DFIRM data either does not cover the tribal lands or is incomplete.</li> <li>• Identify risk areas for flash floods in GIS format (small watersheds). The acquisition of DFIRM data will not help identify many areas of the tribal lands prone to flash flooding.</li> <li>• Determine small watershed infrastructure impact. Small washes, arroyos and creeks that are prone to flooding need to be identified as well as at-risk infrastructure and properties.</li> <li>• Coordinate flood response issues to include at a minimum: transportation and emergency services.</li> <li>• Develop a dam failure response plan.</li> <li>• Conduct prescribed burns.</li> <li>• Perform mechanical treatments for wildfire.</li> </ul>



Plan Information	Community Mitigation Action
	<ul style="list-style-type: none"> <li>• Have a Tribal Representative be part of the Wildland Fire Incident Management Team.</li> </ul>
<i>New Mexico Communities</i>	
City of Aztec	Same as San Juan County, NM
City of Farmington	
<p>San Juan County (NM) Multi-Jurisdictional Natural Hazard Mitigation Plan</p> <p><i>Status</i> Current</p> <p><i>Approved</i> March 18, 2014</p> <p><i>Expires</i> March 18, 2019</p>	<ul style="list-style-type: none"> <li>• Control future structural encroachment in identified floodplains in San Juan County</li> <li>• Enact Legislation for San Juan County restricting construction within identified county floodplains</li> <li>• Seek an update of floodplain maps</li> <li>• Reduce the damage caused by flash flooding</li> <li>• Enact building codes to reduce construction in floodplains</li> <li>• Purchase land within floodplains and convert to recreational use</li> <li>• Refuse to annex lands within identified floodplains</li> <li>• Incorporate all future comprehensive planning into mitigation project</li> <li>• Develop a plan for reducing or eliminating the risk of flooding at the Navajo crossing of the glade arroyo</li> <li>• Develop a plan for reducing or eliminating the risk of flooding at the Crestwood Drive crossing of the hood arroyo</li> <li>• Keep all waterways in Farmington clear of debris and unwanted vegetation.</li> <li>• Public education program</li> <li>• Reverse 911 system</li> <li>• Bank stabilization projects. The banks of arroyos, rivers, and other waterways in San Juan County will be inspected for erosion. Once an inventory of these areas has been made, a priority list will be created for the stabilization of problem banks based on the potential to cause damage due to further erosion.</li> <li>• Design Flood Hazard Mitigation website for the City to provide existing and future residents and business owners with easy access to vital information, data and maps, and forms on Flood Hazard Mitigation regulations and activities.</li> <li>• Conduct regular inspections of private properties traversed by waterways to identify obstruction or overgrowth hazards</li> <li>• Complete riverbank stabilization projects along the Animas River in areas experiencing erosion and severe stream change that has the potential to impact structures and public facilities</li> <li>• Repair existing gabions utilized for bank stabilization</li> <li>• Install a local Emergency Warning System</li> <li>• Construct a detention pond along the porter arroyo</li> <li>• Construct a detention pond along the Carl Arroyo</li> <li>• Construct a detention pond along the Hood Arroyo, or upgrade the crossing</li> <li>• Develop a plan for additional protection of both the streambed and the newly installed Box Culvert Structure at the Pinon Hills Crossing of the La Plata River.</li> <li>• Develop a plan and install storm sewer system that can adequately handle the currently developed surrounding areas near the old downtown Farmington area.</li> <li>• Inspect and ensure that waterways on privately-held lands are clear of debris and unwanted vegetation.</li> <li>• Enact legislation regarding water use during drought conditions that raises the level of restriction as drought conditions become more severe.</li> <li>• Create a public education program concerning the use of drought resistant landscaping vegetation.</li> <li>• Establish a public education and awareness program to provide residents with information concerning drought and water conservation</li> </ul>

Plan Information	Community Mitigation Action
	<ul style="list-style-type: none"> <li>• Identify all unlined irrigation ditches within San Juan County and develop a plan to line them</li> <li>• Provide rebates for the conversion of existing home toilets and showerheads to low flow systems and the retrofitting of gray water recovery systems</li> <li>• Replace the City of Aztecs failing water storage tank to ensure the City maintains an adequate reserve of treated water</li> <li>• Identify areas of the river bottom in the public domain and create priorities and thinning projects to reduce the potential for wildfire throughout the county</li> <li>• Provide private landowners in the river bottom area with information concerning the necessity for clearing potential fuel from their land and instructions for creating defensible space around all structures</li> <li>• Clear the public property identified as the “Swire-Townsend” land preserve and complete invasive species mitigation to ensure fire loading does not continue to pose a threat in this area of Aztec.</li> <li>• Implement a maintenance program to maintain previously thinned areas. The program may include fire training on fuel removal techniques, prescribed burning, and a yearly chemical application to prevent excess growth.</li> <li>• Continue regular wildland urban interface training for firefighters.</li> <li>• Code enforcement on private property to reduce hazardous fuels.</li> <li>• Implement FireWise community program</li> </ul>

**4.4.6 CACs/CAVs/Other Engagement**

Table 13 summarizes the past four years of FEMA and state engagement within the watershed communities, showing the history of Community Assistance Contacts (CACs) and Community Assistance Visits (CAVs), by community. CACs and CAVs are conducted with communities participating in the NFIP to ensure that they are achieving the flood loss reduction objectives of the NFIP program. Through this outreach, floodplain management issues are more likely to be identified, prevented, and resolved before they develop into problems that require enforcement actions.

**Table 13: History of Engagement**

Community Name	Type of Engagement	Date*	Agency	Summary
City of Aztec	Meeting	6/18/2015	FEMA	CAV conducted in coordination with USFWS Specialist, Mr. George Dennis, on the Endangered Species Act and its impact on floodplain management enforcement procedures.
City of Aztec	CAC	9/3/2015	State	Floodplain Administrator feels some arroyos that are designated Zone A need a detailed study.
City of Durango	CAC	5/20/2014	FEMA & State	Assistance was provided to educate the city on making substantial improvement determinations on structures. Follow up correspondence and technical assistance to be provided to address deficiencies.
City of Farmington	CAC	9/14/2015	State	FEMA feels a need to make a more restrictive ordinance.

Community Name	Type of Engagement	Date*	Agency	Summary
LPC	Meeting	5/21/2014	Other	The county had not adopted the State Rules and Regulations for Floodplains. However, as of 8/5/2014, the County adopted new floodplain regulations that comply with the State Floodplain Rules. Also, discussion on new construction and subdivision proposals that are increasing in the county.

\* Meetings or other FEMA engagement activities that have occurred in the watershed in the past 4 years.

**4.4.7 Mitigation Action Tracker**

FEMA’s Mitigation Action Tracker is a web-based tool to document and report local mitigation actions influenced by Risk MAP (or non-Risk MAP) processes. Data captured will support measuring performance, as well as providing stakeholders general mitigation information, that can be leveraged by future planning or other risk reduction efforts. No mitigation actions are currently logged in FEMA’s Mitigation Action Tracker for communities or counties within the Colorado portion of the Animas HUC-8 Watershed.

This section summarizes the Discovery Meeting and outcome, as well as follow up activities.

## 5.1 DISCOVERY MEETING SUMMARY

The Discovery Meeting is an important time to bring together the state project partners, local officials, agencies, and community members to validate information and identify community needs and priorities prior to the development of a project scope or selection of a study area. Another goal of Discovery is to help communities move their mitigation projects from the planning phase to the action phase. The Animas Discovery process is uniquely tailored to the needs of communities that had recently completed their county hazard mitigation plans, some of which were developing local plans as well.

After a series of pre-meeting calls between the state and some of the communities, the Project team met with representatives from the communities during Discovery Meetings with mitigation actions and priorities fresh in their minds, ready to ask questions about how to move forward with their mitigation goals. Each meeting is described below and additional information (e.g., sign-in sheets, agendas, invites, etc.) is included with the supplemental digital data accompanying this Report.

### 5.1.1 Colorado Discovery Meetings

The Colorado Discovery Meetings were conducted in a community-based roundtable format, with three separate meetings taking place to accommodate the major communities as follows:

- With SUIT on August 8, 2016 at 1:30 PM in Ignacio
- With LPC and the City of Durango on August 9, 2016 at 9:00 AM in Durango
- With SJC and the Town of Silverton on August 9, 2016 at 1:30 PM in Silverton

Figure 25 includes a picture of these three Discovery Meetings. Conversations were held with the majority of attendees in the weeks prior to the meeting, as documented in Section 3.2, and generally the following community officials were represented:

- Emergency Managers
- Floodplain Administrators
- Building Director
- Planning Engineer
- GIS Specialists
- Planners
- County/City Manager
- County Commissioners
- Program, Department, or Division Heads/Directors

Discussion items and identified potential mitigation actions from each meeting were summarized in meeting minutes and action summaries distributed to the communities on August 12, 2016, which are included as attachments to this Report. Identified mitigation actions or items of interest from the Discovery Meetings and follow up correspondence are also documented in the respective community tables in Section 6. Items of interest by Discovery Meeting generally included:

- SUIT: joining the NFIP, mapping flood risk, updating FIRMs for tribal lands, and obtaining additional LiDAR.
- LPC & Durango: collecting LiDAR over an expanded footprint throughout the County, remapping flood risk and updating FIRMs, evaluating fuels for wildfire risk, and assessing debris flows and erosion hazards.

- *SJC & Silverton*: digitizing existing hazard-risk maps developed by the Institute of Arctic & Alpine Research (INSTAAR), collecting LiDAR and infrared data from the County, updating floodplains, delineating alpine tundra, and evaluating debris flow and rock fall susceptibility.



**Figure 25: Photos of Colorado Discovery Meetings**

*Top: SUIT Meeting; Middle: LPC & Durango Meeting; Bottom: SJC & Silverton Meeting*

## 5.1.2 New Mexico Discovery Meeting

The New Mexico Discovery Meeting was held on July 28, 2016 in Aztec in an open house format, as shown in Figure 26. The Discovery Meeting was attended by local stakeholders, some of which included:

- Local City and County Staff from Public Works, Planning, and Emergency Management

- National Weather Service Staff
- Watershed experts from NM Highlands University
- Representative for US Senator Martin Heinrich
- Representative for US Congressman Ben Ray Lujan

The Workshop afforded personal, interactive communication with attendees at each station. The New Mexico Project Team interviewed attendees and discussed areas of positive mitigation and areas of continuing concern for the Watershed as a whole. As attendees visited each station, they not only discussed their own local concerns, but also listened to the concerns of others in the Watershed. Items of interest identified at the Discovery Meeting generally included:

- Finding funding mechanisms to improve arroyo conditions and address sedimentation;
- Creation of Base Flood Elevations for the entire length of the Animas River; and
- Improved Topographic data (available now due to LiDAR coverage).



**Figure 26: Photo of New Mexico Discovery Meeting**

### 5.2 PROJECT PLANNING

Moving forward, the Project Team will continue working with Animas communities to assist with mitigation projects, risk assessment, capacity building, and community engagement. The team's mission is to continue promoting resiliency and improved quality of life throughout the Risk MAP lifecycle, and to equip each county and its local communities with the resources they need to achieve their mitigation goals.

**Figure 27: Risk MAP Lifecycle**



*The Risk MAP Process could take from 3 to 5 years from beginning to end*

Using the county and local hazard mitigation plans, along with guidance from the communities, the Project Team believes that the prioritized mitigation actions and resources that have been identified will help communities reduce their hazard risks. Recommended mitigation actions, items or study areas with the potential to reduce risk to life and property are described by county and community in Section 6.

As the Discovery process ends and the risk analysis process begins, the Project Team will continue to engage with local communities to ensure that the project remains on the most appropriate path forward. The team will also assist communities by compiling a list of the most important projects based on the findings from this Discovery process.

This section provides profiles and potential mitigation action items for counties and communities in the Animas HUC-8 Watershed. Hazard Mitigation is any action taken to reduce or eliminate long term risk to people and property from natural disasters. Hazard Mitigation planning is a process used by State, tribal, and local governments to identify risks and vulnerabilities associated with natural disasters and develop mitigation strategies to reduce or eliminate long term risks. FEMA produced a guidance document (*Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*) as a resource that communities can use to identify and evaluate a range of potential mitigation actions for reducing risk to natural hazards and disasters, which is available at [http://www.fema.gov/media-library-data/20130726-1904-25045-0186/fema\\_mitigation\\_ideas\\_final508.pdf](http://www.fema.gov/media-library-data/20130726-1904-25045-0186/fema_mitigation_ideas_final508.pdf). The tables in their respective subsections below highlight information gathered during the Discovery processes both prior to and during the Discovery Meeting.

**6.1 POTENTIAL MITIGATION ACTIONS – OVERVIEW AND WATERSHED WIDE**

The purpose of this effort is to enable communities to prioritize and focus their efforts on the hazards of greatest concern, as well as structures or areas facing the greatest risk. This process has identified the following potential risks:

- Winter Storm
- Erosion/Deposition
- Wildfire
- Drought
- Flood (Seasonal/Flash)
- Avalanche
- Landslide/Rockslide/Rockfall
- Severe Weather
- Tornado
- Earthquake

Watershed-wide mitigation actions are presented in Table 14. Hazards are summarized by county and community in Table 15.

**Table 14: Watershed-Wide Mitigation Actions**

Hazard Type	Mitigation Action	Action By	Potential Funding Source or Support
Debris Flow	Identify debris flow risk in area - Identify whether additional risk analysis is needed - Identify whether non-regulatory products would be beneficial - Discuss potential to adopt higher standards in high risk areas	Emergency Management Coordinator	CGS
Dam	Identify dam risk in area - Identify whether additional risk analysis is needed - Identify whether non-regulatory products would be beneficial - Discuss potential to adopt higher standards in dam risk areas -Consider potential for dam emergency action plans if not already in place	Emergency Management Coordinator	Dam Safety, DHSEM, FEMA, CWCB



# SECTION SIX

# Community Profiles and Action Items

Hazard Type	Mitigation Action	Action By	Potential Funding Source or Support
Erosion	Work with state to identify potential erosion risk zones based on new state guidance. Incorporate higher flood standards based on new risk zones.	Floodplain Administrator	State
Flood	Identify flood hazard areas on FIRMs that no longer depict flood risk to the level of accuracy desired and update the CNMS.	Floodplain Administrator	FEMA/State
Flood	Restudy the 53.2 miles of stream identified as unverified Zone AE in CNMS for the watershed.	Floodplain Administrator	FEMA/State
Flood	Restudy the 142.1 miles of CNMS Zone A requiring further assessment or in the process of being studied.	Floodplain Administrator	FEMA/State
Flood	Identify claims hot spots and implement mitigation strategies such as buy outs and drainage improvement projects.	Floodplain Administrator and Emergency Manager	FEMA/State
Flood	Work with ongoing efforts to review and adopt new flood risk analyses.	Floodplain Administrator	FEMA/State
Wildfire and Flooding	Evaluate flood simulations between pre- and post-wildfires for counties.	Floodplain Administrator and Emergency Manager	FEMA/State, CSFS/USFS
Wildfire	Form a wildfire mitigation group/coalition for the watershed to coordinate efforts.	Emergency Manager	Fire Protection Districts and FireWise, USFS, CSFS, Open Space
Wildfire	Implement mitigation actions provided in CWPPs.	Emergency Manager	Fire Protection Districts and FireWise, USFS, CSFS, Open Space
Wildfire and Flooding	Support a collaborative group to prioritize and scale up forest treatments to reduce wildfire, post-fire flooding, and forest health impacts to community values within the Animas watershed. Leverage San Juan National Forest High Valued Resources and Assets modeling and adding community values for each participating jurisdiction and debris flow modeling being done by CGS.	Emergency Manager	San Juan National Forest, CSFS, FireWise of Southwest Colorado, Mountain Studies Institute, The Nature Conservancy, CWCB, FEMA, DNR, and USFS.
Wildfire and Debris	Evaluate debris flow susceptibility or hazards between pre- and post-fires for counties.	Emergency Manager and Building Director	FireWise, CSFS, CGS
Environmental	Discuss with all communities developing emergency action plans for contamination releases based on travel times developed from velocity information.	Emergency Manager	State, CDPHE, SJBH

**Table 15: Hazard Vulnerability Rating Summary – Risk Rankings**

County or Community	Avalanche	Dam/Levee Failure	Drought	Earthquake	Expansive Soils	Extreme Temperatures	Fire	Flood	Hailstorm	Landslide/Mud/Debris Flow	Lightning	Subsidence	Tornado	Windstorm	Winter Storm
LPC	Medium	Varied	Medium	Medium	None/Low	Low	High	High	Low	Medium	Medium	None/Low	Low	Medium	High
SJC (CO)	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
SUIT	*	High	High	Low	*	Low	High	High	Medium	*	*	Medium	High	*	Medium
Aztec	*	High	High	Low	*	Low	Medium	High	Low	Low	*	*	*	*	Medium
Farmington	*	High	High	Low	*	Low	Medium	High	Low	Low	*	*	*	*	Medium
SJC (NM)	*	High	High	Low	*	Low	Medium	High	Low	Low	*	*	*	*	Medium

\* No Vulnerability or Not Analyzed  
Summarized from State HMP (2013)

**6.2 POTENTIAL MITIGATION ACTIONS – BY COMMUNITY**

This subsection includes information about each county in the Animas HUC-8 Watershed. The main hazards identified in the County’s HMP were included, if applicable, as well as identified mitigation actions. The purpose of this report is to use the information and data sets compiled to successfully implement these identified mitigation actions.

**6.2.1 La Plata County**

LPC is situated in the southwest “Four Corners” area of Colorado and encompasses approximately 1,700 square miles, much of which is under public land ownership. The county has two distinct regions: 1) the southern half located on the Colorado Plateau, a warmer, drier area of lower elevation, and 2) the northern half located in the Colorado Rocky Mountains, a wetter area of higher elevations and cooler temperatures. LPC encompasses vast areas of land controlled by federal and state agencies, including the USFS, BLM, BOR, and the State of Colorado. Approximately 176,000 acres of Southern Ute and Ute Mountain tribal lands are located in the southern portion of the county. During the last four decades, LPC has transitioned from a rural county focused on mining and agriculture to a more urban environment with tourism as the primary industry.

Four rivers begin in the northern portion of the county within the high mountains and flow south through mountain valleys, continuing into New Mexico. Developments along the rivers and tributaries are at risk during flooding events, particularly the Vallecito Creek drainage basin, which ranges in elevation from 7,000 feet to nearly 14,000 feet amsl.

LPC is vulnerable to a wide range of natural hazards with the greatest risks from wildfire, flood, severe weather (windstorm, lightning, hail, thunderstorm, tornado), and winter storm. The 2002 Missionary Ridge and Valley Fires devastated LPC north of Durango, burning more than 70,000 acres of land, 56 homes, and 22 structures over a period of 37 days. The wildfire caused approximately \$40.8 million dollars in damage, 52 injuries, and one death.

**Table 16: LPC Mitigation Actions**

Hazard Type	Mitigation Action	Action By	Potential Funding Source or Support
Flood	Consider joining CRS.	Floodplain Administrator	CWCB
Flood	Review CRS website and identify additional actions and training beneficial to improve CRS rating.	Floodplain Administrator	CWCB
All Hazards	Update HMP and include THIRA.	Emergency Manager	State/FEMA. Anticipating request of \$100k.
Flood Hazard or Debris Flow	Analyze post-fire flooding and debris flows to increase resiliency.	Floodplain Administrator	State/FEMA, CSFS, CGS
Flood	Animas restudy/PMR based on considerable number of LOMRs in LPC.	Floodplain Administrator	State/FEMA
Flood	Update floodplain mapping along Animas River and potentially other areas within county using updated topographic data.	Floodplain Administrator	State/FEMA

# SECTION SIX

# Community Profiles and Action Items

Hazard Type	Mitigation Action	Action By	Potential Funding Source or Support
Flood	Estimate 1% annual chance flooding event elevations for Zone A and AE reaches and generate depth grids to inform development and risk.	Emergency Manager and Floodplain Administrator and Builder Director	CWCB/FEMA
Flood	Obtain library of effective floodplain models from FEMA.	Floodplain Administrator and Builder Director	CWCB/FEMA
Flood	Restudy the streams identified as unverified or requiring further assessment in CNMS.	Floodplain Administrator	State/FEMA
Debris	Delineate debris fans and associated hazards to inform development. Can use CGS susceptibility modeling to identify areas for detailed study.	Building Department Director	CGS
Debris/Erosion	Review guidance for developing infrastructure on a debris fan and/or area with fluvial erosion hazards.	Building Department Director	CGS, State
Flood & Debris Flow	Conduct engineering analyses that evaluate flood risk for waters bulked with sediment (not standard clear water conditions), as this would provide more conservative/protective.	Emergency Manager and Floodplain Administrator	State/FEMA, CGS
Flood	Evaluate the Florida and Pine River reservoirs for flood control capability based on reservoir capacity.	Emergency Manager and Floodplain Administrator	CWCB/FEMA, Dam Safety
Wildfire and Flooding	Create a library of bridges/culvert crossings to inform potential evacuation routes. Knowing the load bearing capacities would assist the Fire department in assessing whether their equipment can safely cross the bridges.	Emergency Manager	Red Cross
All Hazards	Collect recent LiDAR along stream corridors within Durango and in various areas of La Plata County. One primary use would be leveraging the updated topographic data for revised floodplains.	County Assessor	CWCB
Wildfire	Collect infrared measurements during LiDAR flight to assess fuels.	Emergency Manager, County Assessor	USFS, CSFS, and CWCB
Wildfire	Create a wildfire watershed protection group for the Animas Watershed.	Fire Protection District, Emergency Manager	USFS, CSFS, FireWise
Erosion & Water Quality	Educational assistance in erosion and sediment control BMPs; planning regional stormwater control measures; and incorporating water quality control volumes for stormwater detention/management into the land use code for development guidance.	Planning	State
Severe weather	Construct a radar station within LPC to better predict and evaluate storms.	Emergency Manager	National Weather Service, USGS, and Colorado's DOLA

# SECTION SIX

# Community Profiles and Action Items

Hazard Type	Mitigation Action	Action By	Potential Funding Source or Support
Environmental	Between Baker’s Bridge and Trimble Lane there are approximately 3 miles of abandoned in-stream gravel pits that need to be repaired to restore the functioning capacity of the river. This reach is particularly important for reducing the impacts of historical mining from the upper Animas River to the lower Animas River and sources of nutrients from Silverton, Cascade Village, Durango Mountain Resort and Fairfield Resort.	Emergency Manager	CDPHE, SJBH
Environmental	The river reach between Trimble Lane and 32nd street has approximately 20 miles of eroding stream bank resulting in an almost 100% disconnect between the riparian ecosystem and the river that requires repair to reduce loading of nutrients and to restore the functioning capacity of the river in this reach. Trimble Lane to 32nd street will require at least 25 miles of reconnection of the river to the riparian ecosystem and 5 miles of repairing stream banks as well as reducing nutrient loading from subdivisions, the Dalton Ranch Golf Course and the effluent of the Hermosa Sanitation District.	Emergency Manager	CDPHE, SJBH
Environmental	Address some of the numerous inflows impacted by mining nutrient loading that degrade water quality along the Animas River.	Emergency Manager	CDPHE, SJBH
Wildfire	Leverage USFS and CSFS data to identify project locations to implement hazardous fuels reduction projects, as well as prioritizing the inventory of locations/access points to create fire clear zones around substations, repeaters, cell phone towers, and other communications sites on federal/state lands.	Emergency Manager	USFS, CSFS
Flood	Training for levee certification and enhancement to assist in a levee protecting Meadowbrook Mobile Home Park.	Floodplain Administrator	State/FEMA
Flood	Update flood risk data so that current data can be leveraged and integrated into updating the county and municipal Comprehensive Plans and Land Use Codes to address natural hazards.	Floodplain Administrator, Planning	State/FEMA
All hazards	Provide training on outreach and hazard mitigation strategy.	Various	Various

# SECTION SIX

# Community Profiles and Action Items

Hazard Type	Mitigation Action	Action By	Potential Funding Source or Support
Flood	Provide updated flood risk information as base data to evaluate flood mitigation projects in the Vallecito drainage including levees, weirs, and two new bridges.	Floodplain Administrator	State/FEMA
Flood	Update flood risk information to continue enforcing floodplain management requirements associated with NFIP participation.	Floodplain Administrator	State/FEMA
Wildfire	Review example policies that would reduce the chances of catastrophic wildfires on private lands, including adoption of driveway standards and wildfire mitigation policies.	Emergency Manager	CSFS, FireWise
Environmental	Provide estimates of constituent loading during a post-fire flooding event to improve resiliency of water treatment facilities to handle impacts from such events.	Emergency Manager	CDPHE, SJBH
Wildfire	Reduce wildland-urban interface risk by: <ul style="list-style-type: none"> <li>Using mapping data with local, state and federal firefighting entities and public land management</li> <li>Build the capacity of the FireWise Council of Southwest Colorado's Neighborhood Ambassador Program</li> <li>Initiate wildfire mitigation projects on Federal Lands identified in the CWPP planning process</li> </ul>	Fire Protection District, Emergency Manager	USFS, CSFS, FireWise
Wildfire	Increase public involvement in wildfire prevention and education		
Wildfire	Reduce Ignitability of Structures		
Wildfire	Increase and strengthen the tools for local governments and fire departments to encourage Firewise policies and practices.		
Wildfire	Increase the number of fuel reduction projects on federal lands.		

**6.2.2 San Juan County (CO)**

SJC is a mountainous county with an area of 388 square miles, making it the 5th smallest county by area within Colorado. The Town of Silverton is the sole municipality within SJC, which accounts for more than 90% of the county population. With a total population of 699, it is the least populated county within Colorado. The climate is typically alpine subarctic, with cold snowy winters and cool to warm summers. There are multiple mountains within the county that have 14,000-foot+ peaks, with the mean elevation being 11,240 feet amsl, making SJC the highest within the United States. The Animas River and smaller tributaries have their sources within SJC and flow to the south and west, into LPC.

**Table 17: San Juan County (CO) Mitigation Actions**

Hazard Type	Mitigation Action	Action By	Potential Funding Source or Support
Flood	Join CRS.	Floodplain Administrator	State/FEMA
All Hazards	Develop a HMP in conjunction with Silverton; could use the emergency management plan as a starting point.	Emergency Manager	State/FEMA
All Hazards	Develop robust database with hazard information and data layers to accompany HMP.	Emergency Manager	Various
All Hazards	Develop a list of emergency contacts for various hazards and for the multiple jurisdictions in the area.	Emergency Manager	Various
All Hazards	Update hazard maps from former INSTAAR program to show current data and in electronic form to inform development.	Planning and Emergency Manager	State, FEMA, CAIC, and CGS
Flood	Modernize (digitize) floodplains within County (DFIRM).	Floodplain Administrator	CWCB
Flood	Update floodplain mapping where there is an area of need, particularly in areas of anticipated future development.	Floodplain Administrator	State/FEMA
Flood	PMR to update FIRMs. Generate spatial files.	Floodplain Administrator	State/FEMA
Flood	Restudy the streams identified as unverified or requiring further assessment in CNMS.	Floodplain Administrator	State/FEMA
Debris Flow	Map debris flow susceptibility areas in County for informing future development and infrastructure.	Planning and Emergency Manager	CGS
Avalanche	Map historical avalanche pathways and identify susceptible/probable areas to inform future development.	Emergency Manager	CAIC, CDOT
Building Restriction	Delineate alpine tundra/tree line as it restricts development.	Planning/Building Director	--

Hazard Type	Mitigation Action	Action By	Potential Funding Source or Support
Environmental	Map tailing piles and mining debris near or within the floodplain to evaluate potential sources of contamination.	Emergency Manager/Planning Director	DRMS or CDPHE
Blizzard & Rock fall	Evaluate alternative routes and emergency measures if snowed-in or rock fall covers road and the Town becomes isolated for a considerable period of time. Rock fall is also an issue with potentially cutting off the train route, especially while passengers are aboard.	Emergency Manager	CAIC, CDOT
Wildfire	Leverage USFS and CSFS data to identify project locations to implement hazardous fuels reduction projects, as well as prioritizing the inventory of locations/access points to create fire clear zones around substations, repeaters, cell phone towers, and other communications sites on federal/state lands.	Emergency Manager	USFS, CSFS, FireWise
Wildfire	Collect infrared measurements during LiDAR flight to assess fuels.	Emergency Manager	USFS, CSFS, and CWCB
Wildfire	Conduct public education programs for county residents and make FireWise brochures available to property owners.	Emergency Manager	USFS, CSFS, FireWise
Wildfire	Discuss wildfire mitigation training and proactive fuels management.		
Wildfire	Review example policies that would reduce the chances of catastrophic wildfires on private lands, including adoption of driveway standards and wildfire mitigation policies.		
Wildfire	Place better signage in the backcountry, and improve communication mechanisms between San Juan County personnel and federal agencies when federal fire bans are put in effect that impact the county.		
Wildfire	Seek grant funding to obtain a pop car with trailer so reliable transportation is available on the train tracks south of Silverton when an emergency arises.		



Hazard Type	Mitigation Action	Action By	Potential Funding Source or Support
Wildfire	Consider wildfire prevention and mitigation projects identified in the CWPP including: subdivisions in the lower part of the county; along Cascade and Lime Creeks; and Bear Creek drainage that provides Silverton’s water supply	Emergency Manager	USFS, CSFS, FireWise, BLM

**6.2.3 City of Durango**

The City of Durango, located in the Animas River Valley, is the LPC seat and the county’s largest municipality. Durango is accessed by U.S. Highway 160, which runs east-west through LPC, and U.S. Highway 550, which runs north-south and provides access to Albuquerque, New Mexico. Durango sits at an elevation of 6,512 feet amsl and displays typical mountain town characteristics with an average snowfall of 71 inches and an average rainfall of 19 inches. Rivers and reservoirs are fed by melting snow originating in the San Juan Mountains.

**Table 18: City of Durango Mitigation Actions**

Hazard Type	Mitigation Action	Action By	Potential Funding Source or Support
Flood	Improve CRS rating. Review CRS website and identify additional actions and training to improve CRS rating.	Floodplain Administrator	State/FEMA
Wildfire	Show information on fire setbacks based on high urban interface risk rating.	Emergency Manager	FireWise
Flood	Restudy the streams identified as unverified or requiring further assessment in CNMS.	Floodplain Administrator	State/FEMA
Environmental	The river reaches between 32nd street and Basin Creek are impacted primarily by urban runoff from the City of Durango. The river reach through Durango will require reducing sediment and pollutants from storm water urban runoff, protecting the riparian community as much as possible and reducing nitrogen and phosphorus loading from the Durango and South Durango Waste Water Treatment Plants.	Emergency Manager	SJBH and CDPHE
Environmental	Near the middle of Durango Reach is a perennial tributary, Lightner Creek, which has been the focus of recent efforts to reduce sediment deposition. Lightner Creek has been identified as a major loader of nutrients to the Animas River.		
Multiple hazards	Collect recent LiDAR for the City limits for use in multiple manners. One primary use would be leveraging the updated topographic data for revised floodplains.	GIS, City Manager	LPC, CWCB
All hazards	Provide training on outreach and hazard mitigation strategy.	Emergency Manager	Various

Hazard Type	Mitigation Action	Action By	Potential Funding Source or Support
All hazards	Develop a HMP with LPC and complete a THIRA that evaluates the following hazards: electrical, cyber, flood, wildfire, and weather.	Emergency Manager	FEMA/State
Flood	Develop a river corridor management plan.	Parks & Rec	FEMA/State
Flood	Update flood risk information to continue enforcing floodplain management requirements associated with NFIP participation.	Floodplain Administrator	State/FEMA
Wildfire	Implement projects set forth in the CWPPs for Durango West One and Two Subdivisions.	Emergency Manager	FireWise and Fire Protection Districts

**6.2.4 Town of Silverton**

The Town of Silverton is situated in the central portion of SJC at an elevation of 9,318 feet amsl. Though small, the Town of Silverton has maintained a fairly steady population and has an economy that depends heavily on tourism. The town can be accessed from U.S. Highway 550, known as the Million Dollar Highway. The Animas River flows through the southeast part of the town where it has confluences with both Cement Creek and Mineral Creek. The Animas River watershed above Silverton covers 75 square miles in area. The elevation ranges from 9,300 feet to 12,000 feet. The entire town of Silverton is located within the Animas HUC-8 Watershed.

**Table 19: Town of Silverton Mitigation Actions**

Hazard Type	Mitigation Action	Action By	Potential Funding Source or Support
Flood	Join CRS.	Floodplain Administrator	State/FEMA
Flood	Modernize (digitize) floodplains within County (DFIRM).	Floodplain Administrator	State/FEMA
All Hazards	Develop a Hazard Mitigation Plan in conjunction with SJC; could use the emergency management plan as a starting point.	Emergency Manager	State/FEMA
All Hazards	Update hazard maps from former INSTAAR program to show current data and in electronic form to inform development.	Planning and Emergency Manager	State, FEMA, CAIC, and CGS
Flood	Update floodplain mapping where there is an area of need, particularly in areas of anticipated future development. Also, the seasonal population fluctuates considerably, especially in campgrounds.	Floodplain Administrator	State/FEMA
Flood	PMR to update FIRMs. Generate spatial files.		
Flood	Conduct HAZUS runs to evaluate flood impact in town.		
Flood	Restudy the streams identified as unverified or requiring further assessment in CNMS.		
Debris	Consider debris flow mapping and risk assessment to inform future development and emergency preparedness.	Emergency Manager	CGS

# SECTION SIX

## Community Profiles and Action Items

Hazard Type	Mitigation Action	Action By	Potential Funding Source or Support
Blizzard & Rock fall	Evaluate alternative routes and emergency measures if snowed-in or rock fall covers road and the Town becomes isolated for a considerable period of time. Rock fall is also an issue with potentially cutting off the train route, especially while passengers are aboard.	Emergency Manager	CAIC, CDOT
Wildfire	Wildfire dataset indicates high values at risk—discuss wildfire mitigation training and proactive fuels management.	Emergency Manager	FireWise, CSFS, USFS

**6.2.5 Southern Ute Indian Tribe**

The SUIT is located in southwestern Colorado adjacent to the New Mexico border between the rugged San Juan Mountains to the north and east and the high deserts of the Colorado Plateau to the south and west. The SUIT is rooted in deep history and cultural traditions. The tribal land crosses three counties in Colorado, including La Plata, Archuleta, and Montezuma, totaling 1,059 square miles. The tribal land is broken up into noncontiguous and irregular tribal holdings and generally encompasses an area about 15 miles wide by 72 miles long. Elevations range from approximately 6,000 feet amsl along the La Plata River near the southwest corner to 8,551 feet at Piedra Peak. The topography of the tribal land generally consists of rugged terrain, rolling hills, open mesas, and river valleys. The climate consists of four distinct seasons, and averages nearly 15 inches of precipitation annually with 38 inches of snowfall. The main rivers on the tribal land are the Animas, Florida, La Plata, San Juan, and Piedra. The SUIT is vulnerable to a wide range of natural hazards with the greatest risks from wildfire, winter weather, drought, flood, tornado, and subsidence.

**Table 20: Southern Ute Indian Tribe Mitigation Actions**

Hazard Type	Mitigation Action	Action By	Potential Funding Source or Support
Flood	Join the NFIP in the emergency phase under current conditions. Can update to regular phase once floodplain mapping is complete.	Floodplain Administrator/ Emergency Manager	FEMA/State
Flood	Join CRS.		
Flood	Restudy the streams identified as unverified or requiring further assessment in CNMS. Particularly interested in Los Pinos River and impacts to Vallecito Reservoir. Flooding typically occurs near the confluence of Animas River and Florida River, as well as along the Animas River by La Posta, the San Juan River, and along Los Pinos River by Ignacio and the New Mexico border. Updated flood risk will inform planning/development.		
Flood	Provide FIRM updates and Base Level Engineering analysis for all streams. Current FIRM data either does not cover the tribal land or is incomplete. Would use updated FIRMs to inform planning and to join the NFIP.		
All Hazards	Obtain complete LiDAR coverage for the SUIT lands.	Emergency Manager/GIS	CWCB
Wildfire	Collect infrared measurements during LiDAR flight to assess fuels.	SUIT Forestry	USFS, CSFS, and CWCB

# SECTION SIX

## Community Profiles and Action Items

Hazard Type	Mitigation Action	Action By	Potential Funding Source or Support
Wildfire	SUIT has a robust fire-fighting and planning team; however, perhaps they could use training from CSFS or USFS.	SUIT Forestry	CSFS Grants
All Hazards	Revisit and potentially update their hazard mitigation plan, prioritizing projects and identifying resources.	Emergency Manager	FEMA/State
All Hazards	Provide hazard mitigation training to other SUIT staff.		CERC/State
All Hazards	Develop community outreach on hazards and emergency measures to improve awareness and preparedness. Recommend outreach through leaders. Can also utilize social media.		--
All Hazards	Develop a reverse 911 notification system.		DHSEM, Various
All Hazards	Apply for grants to contract out mitigation work.		
Environmental	Address some of the numerous inflows with significant amounts of nutrient loading from the flood irrigation practices on Florida Mesa and the floodplains of the Animas River and within the Florida River watershed, a perennial tributary to the Animas River.	SUIT Environmental	SJBH, CDPHE
Environmental	Address the Florida River, a perennial tributary to the Animas River that contains significant amounts of flood irrigated agricultural land containing trans-basin irrigation water from the Pine River resulting in high loading of sediment and nutrients to the Animas River.		
Cultural	Evaluate flood risk posed to culturally significant sites.	Emergency Manager	FEMA, State Historic Preservation Officer
Cultural	Identify and implement mitigation techniques based on identified risks to culturally significant sites.		
Flood	Develop new flood hazard information, along with associated velocity and depth grids, to be leveraged to enhance/inform an early warning system.	Floodplain Administrator/ Emergency Manager to team with FEMA/State	

# SECTION SIX

## Community Profiles and Action Items

Hazard Type	Mitigation Action	Action By	Potential Funding Source or Support
All Hazards	Develop/provide materials and train trainers to assist in education programs for senior populations, school populations, and large employers with the goal of improving knowledge of natural hazards and public safety response.	Floodplain Administrator/ Emergency Manager	CWCB/FEMA
All Hazards	Develop/provide materials and train trainers to assist in conducting intergovernmental training and exercises and develop scenario trainings specific to the hazards of concern.		
Drought	Conduct study that will provide mitigation techniques for drought mitigation, including educational outreach to the community on xeriscaping; water use reduction strategies; water timing restrictions; and a cloud seeding program.		--
Flash Flood	Conduct watershed-wide Base Level Engineering analysis to identify areas of tribal lands prone to flash flooding.		CWCB/FEMA
Flood	Conduct watershed-wide Base Level Engineering analysis to determine small watershed infrastructure impact.		
Flood Response	Identify flood prone emergency service routes to improve bridges and evaluate velocity/depth information to inform response times for flood response.		
Erosion	Airport Hill along the Florida River frequently washes out. Significant erosion occurs along Spring Creek. Interested in mapping erosion/fluvial hazard areas with Mancos Shale, on Spring Creek to Beaver Creek, and on the Pine.	Emergency Manager	CWCB
Erosion	Sediment issues occur along the Piedra River west and northwest of Sandoval Mesa.		
Rockfall	Rock slides occur along HWY 160 north of Capote Lake.		CGS



**6.2.6 City of Aztec**

Aztec is located on the Animas River in the northwest part of San Juan County, east of Farmington and north of Bloomfield. Aztec began as a community of traders and fur trappers in the early 1820’s. Founded in 1887, the City of Aztec is the official seat of San Juan County. Aztec is traversed by U.S. 550 from the Colorado border through town and south to Bloomfield, is intersected by NM 173 on the east, and is connected to Farmington by N.M. 516 on the west.

Aztec is governed by a City Commission, with a City Manager running the City’s day-to-day operations. The City’s public safety needs are provided by a municipal Police Department and a Volunteer Fire Department. These services are augmented by the San Juan County Sheriff’s Department, the New Mexico State Police, and various municipal and volunteer fire departments. Aztec’s present population is 6,763, which is a 6% increase over the Year 2000, having 6,378 residents (Table 1). Presently 2,892 housing units exist in Aztec, with a vacancy of approximately 215 units. Aztec’s population is expected to grow at a modest rate for the next ten years, with growth predicted between 0.3% and 0.5%.

**Table 21: City of Aztec Mitigation Actions**

Hazard Type	Mitigation Action	Action By	Potential Funding Source or Support
HAZMAT	Creation of a designated HAZMAT route through the City of Aztec for all vehicles carrying hazardous materials.	Emergency Manager	NM DOT/State
Flood	Complete riverbank stabilization projects along the Animas River in areas experiencing erosion and severe stream change that has the potential to impact structures and public facilities.	Public Works	FEMA/State
Drought	Secure Funding for the replacement of the failing water storage tank.	Public Works	State
Flood	Regulate, Inspect and Clear Waterways & Arroyos	Public Works / Floodplain Manager	FEMA/State
Wildfire	Public Land Clearing Program – Identify areas of the river bottom in the public domain and create priorities and thinning projects to reduce the potential for wildfire throughout the City.	Public Works	NM Forest and Watershed Restoration Institute/State
Flood	Public Education Campaign	Floodplain Manager	FEMA/State/NMFMA
HAZMAT	Public Education Programs	Emergency Manager	NM DHSEM
Drought	Commercial Landscape Regulations	Planning and Zoning	DHSEM
Drought	Conversion Rebate Program	City Government	DHSEM
Flood	Inspect, Inventory and Mitigate Floodplain Fill/Obstructions	Floodplain Manager	FEMA/State
Drought	Public Education Campaign	Emergency Manager	DHSEM

**6.2.7 City of Farmington**

Farmington is located in the northwestern part of San Juan County and is the county’s largest metropolitan area. It was established in 1876 at the confluence of the Animas, La Plata, and San Juan Rivers. Originally called Junction City, it was later renamed Farmingtown, due to its largely agricultural economy. The City was incorporated in 1901 and the “w” was dropped from its name, finally becoming Farmington. The 1950’s proved to be a major economic boom for Farmington due to the development of the oil and gas industry. Between 1950 and 1960, Farmington’s population went from 3,637 to 23,786 (Table 1). Although the community continues to grow, it is not presently expected that there will be a rapid population increase anytime soon.

The Farmington Metropolitan Planning Organization (MPO) published a document, adopted on April 15, 2010, titled the Existing and Future Population & Employment Conditions, which estimated the population growth of Farmington through 2035 for use with planning of future transportation needs. The document estimated that Farmington will reach a population of 51,929 in 2015, 54,147 in 2020, 58,072 in 2030, and 59,900 in the year 2035. Farmington consists of 33.1 square miles, is located at an elevation of 5,625 feet, and has a population density of 1,386 persons per square mile.

**Table 22: City of Farmington Mitigation Actions**

Hazard Type	Mitigation Action	Action By	Potential Funding Source or Support
HAZMAT	Farmington HAZMAT Public Education	Emergency Manager	NM DHSEM
HAZMAT	Creation of a designated HAZMAT route through the City of Farmington for all vehicles carrying hazardous materials.	Emergency Manager	NMDOT/DHSEM
Flood	Lakewood Detention Pond which will capture the flows from the west spur of the Carl Arroyo. This portion of the arroyo by Tuscany Estates runs uncontrolled to the small pond on Hawkeye Street, through San Juan Country Club Development paralleling Hawkeye, through Pueblo De Farmington and Green Acres Subdivisions, under Main Street between Mickey Drive and Country Club flowing open channel to the Animas River.	Floodplain Manager	FEMA/State
Drought	Public education	Emergency Manager	DHSEM
Flood	Reduce the risk of flooding in arroyos with documented historical damage.	Floodplain Manager	FEMA/State

# SECTION SIX

## Community Profiles and Action Items

Hazard Type	Mitigation Action	Action By	Potential Funding Source or Support
Flood	Develop a plan for reducing or eliminating the risk of flooding at the Crestwood Drive Crossing of the Hood Arroyo	Floodplain Manager	FEMA/State
Flood	Develop a plan for additional protection of both the streambed and the Box Culvert Structure at the Pinon Hills Crossing of the La Plata River.	Floodplain Manager	FEMA/State
Flood	Develop a plan for reducing or eliminating the risk of flooding at the Navajo Crossing of the Glade Arroyo.	Floodplain Manager	FEMA/State
Flood	Comprehensive planning	Floodplain Manager	FEMA/State
Drought	Required installation of gray water recovery systems	Emergency Manager	--
Wildfire	Public Land Clearing	Public Works	FEMA/State
Flood	Porter Arroyo Detention Pond	Floodplain Manager	FEMA/State
HAZMAT	Farmington HAZMAT transport survey	Emergency Manager	NMDOT, NM DHSEM

**6.2.8 San Juan County (NM)**

San Juan County is located in the northwest corner of New Mexico. The northwest corner of the county forms the “Four Corners” area where it borders Colorado, Utah, and Arizona (Figure 1). It takes its name from the San Juan River, which has its headwaters in the nearby San Juan Mountains. Ancient Anasazi ruins are located in Aztec, the county seat, at Aztec Ruins National Park. Large parts of Chaco Canyon National Monument and the Navajo Reservation are also contained within county boundaries. Farmington is its largest city and the county's economy is largely based on natural resources, power production, agriculture, and regional trade. San Juan County contains 5,514 square miles and has a population density of 23.6 persons per square mile.

Transportation routes located in San Juan County include U.S. 491 (formerly U.S. 666), running on a north-south axis in the western portion of the county from Cortez, Colorado in the north through Shiprock and into McKinley County to the south. U.S. 550 enters the county from Durango, Colorado in the north and runs through Aztec and Bloomfield and into Sandoval County to the southeast. N.M. 170 starts at the Colorado border, and ends in Farmington. N.M. N. M. 371 runs south from Farmington and into McKinley County. In addition, San Juan County is traversed along an east/west axis by U.S. 64, which runs from Rio Arriba County to the east to Arizona to the west.

San Juan County is governed by a county commission, with a county manager handling the county’s day-to-day operations. The county’s law enforcement is provided by municipal police departments in Aztec, Bloomfield, and Farmington; the County Sheriff’s Department; and the New Mexico State Police. Fire protection is provided by municipal fire departments in Farmington, and various volunteer departments located throughout the county. According to the U.S. Census Bureau, the population of San Juan County increased by more than 14% between 2000 and 2010 (113,801 to 128,200), Table 1. The Census Bureau projected the population to be 164,012 by the year 2030.

According to the 2010 U.S. Census, there were 49,341 housing units in San Juan County during 2010. Of these units, 44,404 are occupied, with a vacancy rate of 2.3% for rental units. San Juan County has shown consistent growth based on building permits. Over the past six years, an average of 80 building permits per year has been issued in the county’s unincorporated area until a decline in 2009 probably due to the nationwide economic downturn.

**Table 23: San Juan County (NM) Mitigation Actions**

Hazard Type	Mitigation Action	Action By	Potential Funding Source or Support
Flood	Local Special Flood Hazard Areas-specific small projects to address	Floodplain Manager	FEMA/State
Flood	Flood Hazard Education/Outreach Plan	Floodplain Manager	FEMA/State/NMFMA
Flood, Drought, Wildfire, Hazmat	Land Use Management Plan Buffer Zones for HAZMAT Defensible Space	Emergency Manager / Planning and Zoning	FEMA/State/DHSEM

# SECTION SIX

## Community Profiles and Action Items

Hazard Type	Mitigation Action	Action By	Potential Funding Source or Support
Wildfire	Provide private landowners in the river bottom area with information concerning the necessity for clearing potential fuel from their land and instructions for creating defensible space around all structures	Emergency Manager	NM Forest and Watershed Restoration Institute
HAZMAT	Public education program	Floodplain Manager	NM DHSEM
HAZMAT	Creation of a designated HAZMAT route through the county for all vehicles carrying hazardous materials.	Emergency Manager	NM DHSEM, NMDOT
Flood	Identify and plan for bank stabilization projects along waterways in the county	Public Works	FEMA/State
Wildfire	Identify areas of the river bottom in the public domain and create priorities and thinning projects to reduce the potential for wildfire throughout the county	Public Works	NM Forest and Watershed Restoration Institute
Flood	Enact legislation for San Juan County concerning the responsibility for keeping waterways clear of debris and vegetation that can magnify the effects of flooding.	Floodplain Manager	FEMA/State
Drought	Enact legislation regarding water use during drought conditions that raises the level of restriction as drought conditions become more severe.	Emergency Manager	DHSEM
Drought	Establish a public education and awareness program to provide residents with information concerning drought and water conservation	Emergency Manager	DHSEM
Drought	Identify all unlined irrigation ditches within San Juan County and develop a plan to line them	Public Works	DHSEM
Drought	Provide rebates for the conversion of existing home toilets and showerheads to low flow systems and the retrofitting of gray water recovery systems	Emergency Manager	DHSEM
Flood	Improve flooding issues at the County Road 5500 Bridge (*not in watershed)	Public Works	FEMA/State

# SECTION SIX

## Community Profiles and Action Items

Hazard Type	Mitigation Action	Action By	Potential Funding Source or Support
Flood	Improve flooding issues at the 5 Mile Bridge in Largo Canyon (*not in watershed)	Public Works	FEMA/State

- B.U.G.S. Consulting (Bioassessment, Underwater, GIS, and Stats). 2011. *Animas River Watershed Based Plan*. Prepared for the Animas Watershed Partnership. August. Accessed July 2016 at: <http://animaswatershedpartnership.org/wp-content/uploads/2012/10/Final-Animas-Watershed-Management-Plan-12-22-11.pdf>.
- Colorado Department of Public Health and Environment (CDPHE). *Animas River spill maps*. Accessed July 2016. <https://www.colorado.gov/pacific/cdphe/animas-river-spill-maps>.
- CDPHE. *Animas River water quality sampling and data*. Accessed July 2016. <https://www.colorado.gov/pacific/cdphe/animas-river-water-quality-sampling-and-data>.
- CDPHE. *Clean water: GIS maps*. Accessed July 2016. <https://www.colorado.gov/pacific/cdphe/clean-water-gis-maps>.
- CDPHE. 2015. *Colorado Mining Stream Impacts and Restoration Efforts*. August 13. Accessed July 2016 at: [https://www.colorado.gov/pacific/sites/default/files/Animas\\_LegacyMineWork.pdf](https://www.colorado.gov/pacific/sites/default/files/Animas_LegacyMineWork.pdf).
- Colorado Division of Reclamation Mining & Safety (DRMS). *GIS Data*. Accessed July 2016 at: <http://mining.state.co.us/Reports/Pages/GISData.aspx>.
- Colorado State Forest Service (CSFS). 2016. *Colorado Community Wildfire Protection Plans*. Accessed July 2016 at: <http://csfs.colostate.edu/wildfire-mitigation/colorado-community-wildfire-protection-plans/>
- CSFS. 2016. *CO-WRAP Database*. <http://csfs.colostate.edu/wildfire-mitigation/cowrap/>.
- Colorado Geological Survey (CGS). 2015. *Index of 1:24,000-Scale Colorado Geological Survey Geologic Maps*. Updated December. Accessed July 2016 at: <http://coloradogeologicalsurvey.org/wp-content/uploads/2015/12/Geoquad-index-name-number-12-15.jpg>
- CGS. *Foothill and Mountainous Regions in Boulder County, Colorado that may be Susceptible to Earth and Debris/Mud Flows during Extreme Precipitation Events*. CGS Open-file Report 14-02. Accessed July 2016 at: <http://www.coloradohazardmapping.com/File/9c6323a0-c71d-4e44-8804-2f75f14eecb6>.
- CGS. 2016. *County-Scale Debris-/Mud-Flow Susceptibility Mapping*. Presentation given March 9. <http://www.coloradohazardmapping.com/File/30ec6cdf-0eef-4e38-9e24-1302ef1f8879>
- CGS. *Debris Flow Events in Colorado*. Video accessed July 2016 at: <https://www.youtube.com/watch?v=EXtBCR9ySyA&feature=youtu.be>.
- CGS. *Debris Flows-Fans / Mudslides*. Accessed July 2016 at: <http://coloradogeologicalsurvey.org/geologic-hazards/debris-flows-fans-mudslides/>.
- Colorado Water Conservation Board (CWCB). 2016. *Fluvial Erosion Hazard Area Regulatory Guidelines Memorandum*. January 14. <http://www.coloradohazardmapping.com/File/8ace2783-c250-4225-a95a-afce1cc14ba3>.
- CWCB. 2016. *A Framework for Mapping Channel Migration and Erosion Hazard Areas in Colorado*. January 14. <http://www.coloradohazardmapping.com/File/ae1aba61-3398-4314-a3f1-90afbca69465>.

- Colorado Water Quality Monitoring Council. *Colorado Data Sharing Network*. Accessed July 2016 at: <http://www.coloradowaterdata.org/>.
- Federal Emergency Management Agency (FEMA). 1978. *Flood Insurance Study, Town of Silverton and Unincorporated Areas of San Juan County, Colorado*. Effective March.
- Federal Emergency Management Agency (FEMA). 2010a. *Flood Insurance Study #08067C, La Plata County, Colorado*. Effective August 19.
- Federal Emergency Management Agency (FEMA). 2010b. *Flood Insurance Study #35045C, San Juan County, New Mexico*. Effective August 5.
- FireWise. 2016. *Community Wildfire Protection Plans (CWPPs)*. Accessed July 2016 at: <http://www.southwestcoloradofires.org/cwpp/>.
- La Plata County. 2013. *La Plata County Hazard Mitigation Plan*.
- Mountain Studies Institute. *San Juan Climate Initiative*. Accessed July 2016 at: <http://www.mountainstudies.org/cip>.
- San Juan Basin Health (SJBH). 2016. *Frequently Asked Questions - Animas River Health Updates*. Accessed July 2016 at: <http://sjbhd.org/public-health-news/animas-river-health-updates/frequently-asked-questions/>.
- SJBH et. al. 2016. *Animas River Alert and Notification Plan - A Communication, Notification and Information Sharing Plan*. April 6.
- Southern Ute Indian Tribe. 2013. *Southern Ute Indian Tribe Hazard Mitigation Plan*.
- State of Colorado, Division of Homeland Security and Emergency Management, Department of Public Safety. 2013. *Colorado Natural Hazards Mitigation Plan*.
- U.S. Environmental Protection Agency (EPA). *Search Superfund Site Information*. Accessed July 2016 at: <https://cumulis.epa.gov/supercpad/CurSites/srchsites.cfm>.
- USEPA. *STorage and RETrieval and Water Quality eXchange*. Accessed July 2016 at: <https://www.epa.gov/waterdata/storage-and-retrieval-and-water-quality-exchange>.
- U.S. Fish and Wildlife Service (USFW). *Environmental Conservation Online System, Species by County Report*. Accessed July 2016 at: <http://ecos.fws.gov/ecp0/reports/species-by-current-range-county?fips=08067>.
- USFW. *National Wetlands Inventory*. Last updated July 11, 2016. Accessed July 2016 at: <https://www.fws.gov/wetlands/>.
- U.S. Geological Survey. 2016. *NLCD 2011 Land Cover (2011 Edition, amended 2014) National Geospatial Data Asset Land Use Land Cover*.
- U.S. Department of Agriculture (USDA), Forest Service (USFS). 2013. *A Wildfire Risk Assessment Framework for Land and Resource Management*. Tech. Rep. RMRS-GTR-315. October. Accessed July 2016 at: [http://www.fs.fed.us/rm/pubs/rmrs\\_gtr315.pdf](http://www.fs.fed.us/rm/pubs/rmrs_gtr315.pdf)
- USFS. 2016. *NM Meadow Jumping Mouse: Home Page*. Accessed July 2016 at: <http://www.fs.usda.gov/detail/r3/home/?cid=stelprd3809040>
- USDA, Natural Resources Conservation Service (NRCS). *SSURGO Database*. Accessed July 2016 at: [http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2\\_053627](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/survey/?cid=nrcs142p2_053627).



USDA, NRCS. 2010. *Rapid Assessment – Animas Watershed, Hydrologic Unit Code 14080104*. April. Accessed July 2016 at:

[http://www.nrcs.usda.gov/wps/portal/nrcs/detail/co/technical/dma/rwa/?cid=nrcs144p2\\_062797](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/co/technical/dma/rwa/?cid=nrcs144p2_062797)

U.S. Geological Survey (USGS). 2016. *The National Geologic Map Database*. Accessed July 2016 at: [http://ngmdb.usgs.gov/ngmdb/ngmdb\\_home.html](http://ngmdb.usgs.gov/ngmdb/ngmdb_home.html).

USGS. *Debris-Flow Hazards in the United States*. Fact Sheet 176-97. Accessed July 2016 at: <https://pubs.usgs.gov/fs/fs-176-97/fs-176-97.pdf>.

See attached digital data for additional information