



Annex A City of Biggs

A.1 Introduction

This Annex details the hazard mitigation planning elements specific to the City of Biggs, a previously participating jurisdiction to the 2014 Butte County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the City. This Annex provides additional information specific to the City of Biggs, with a focus on providing additional details on the risk assessment and mitigation strategy for this community.

A.2 Planning Process

As described above, the City of Biggs followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Butte County Hazard Mitigation Planning Committee (HMPC), the City formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table A-1. Additional details on plan participation and City representatives are included in Appendix A.

Table A-1 City of Biggs – Planning Team

Name	Position/Title	How Participated
Mark Sorenson	City Administrator	Provided historic hazards and hazard identification table. Attended meetings. Provided hazard input.

Coordination with other community planning efforts is paramount to the successful implementation of this Plan. This section provides information on how the City integrated the previously approved 2014 Plan into existing planning mechanisms and programs. Specifically, the City incorporated into or implemented the 2014 LHMP through other plans and programs shown in Table A-2.

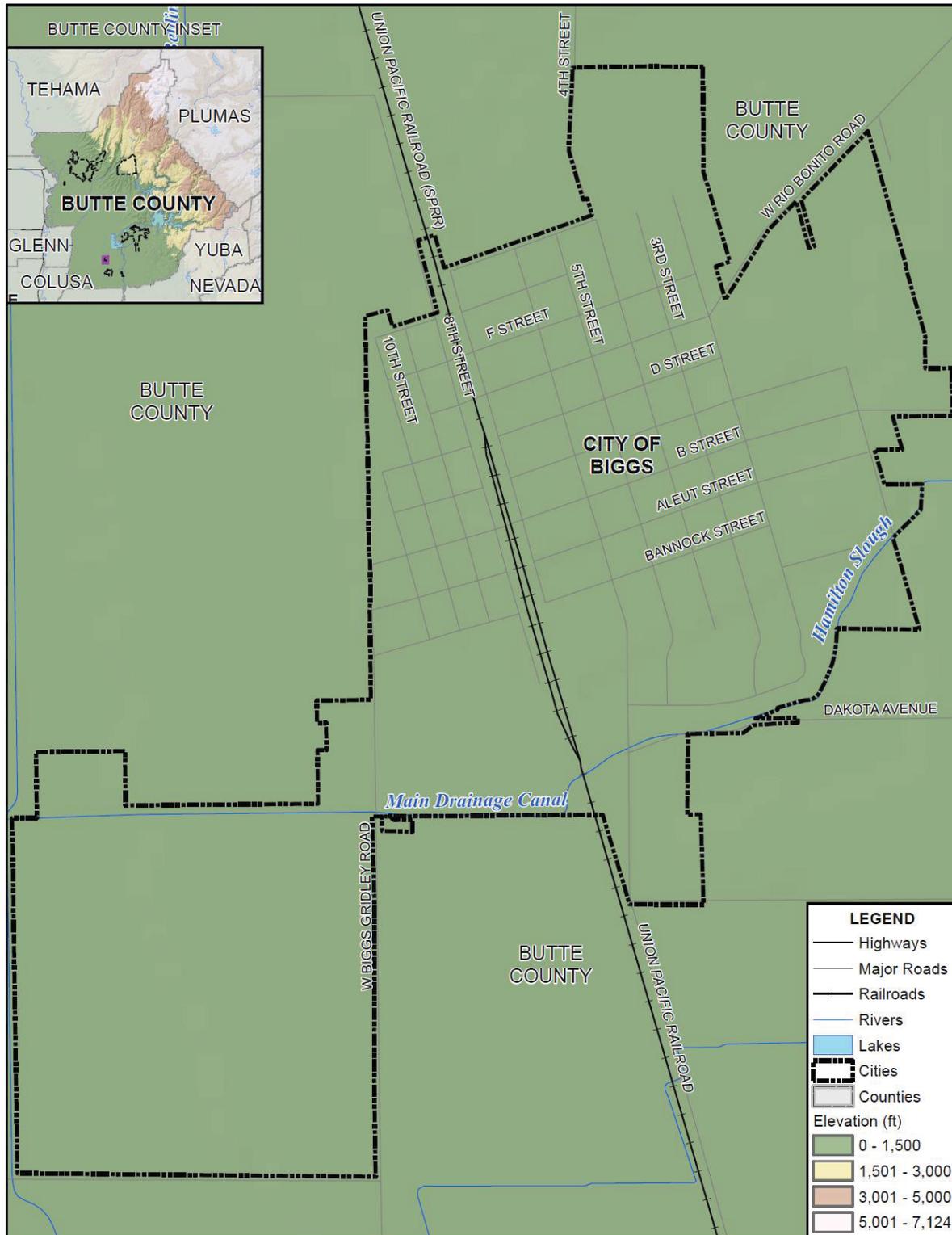
Table A-2 2014 LHMP Incorporation

Planning Mechanism 2014 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
None	The last General Plan was adopted in 2014 before the LHMP, there have been no other planning documents.

A.3 Community Profile

The community profile for the City of Biggs is detailed in the following sections. Figure A-1 displays a City map and the location of the City of Biggs within Butte County.

Figure A-1 City of Biggs



0 0.25 0.5 Miles



Data Source: Butte County GIS, Cal-Atlas; Map Date: 3/1/2019.

A.3.1. Geography and Climate

The City of Biggs is located in the southwest portion of Butte County, approximately five miles north of the City of Gridley. State Route 99 runs in a north-south direction east of the city, and the Union Pacific Railroad extends through the center of the City. The City encompasses approximately 414 acres, or 0.65 square miles. There are currently 1,929 total acres or 3.0 square miles within the Biggs Sphere of Influence (SOI).

The City is located in the fertile farmlands of the Sacramento Valley about an hour north of Sacramento. Known as the “heart of rice country,” Biggs is approximately 25 miles south of the City of Chico and 25 miles north of Yuba City, just off State Route 99, at an elevation of 93 feet.

A.3.2. History

The City of Biggs was incorporated in 1903 as a general law city intended to serve the agricultural commerce within the vicinity. The town was originally founded in 1871 by Mr. A.M. Pitts and Lewis Posey. It was named Biggs Station after Major Marion Biggs, a prominent local political leader. After two serious fires in the summer of 1878 a community water system was constructed. The town was rebuilt with brick stores and the word “Station” was dropped from the town name. By 1882 the town had 600 inhabitants and 280 registered voters.

A.3.3. Economy and Tax Base

US Census estimates show economic characteristics for the City of Biggs. These are shown in Table A-3 and Table A-4. Mean household income in the City was \$66,106. Median household income in the City was \$53,125.

Table A-3 City of Biggs – Civilian Employed Population 16 years and Over

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	172	22.6%
Construction	38	5.0%
Manufacturing	99	13.0%
Wholesale trade	4	0.5%
Retail trade	39	5.1%
Transportation and warehousing, and utilities	43	5.6%
Information	0	0.0%
Finance and insurance, and real estate and rental and leasing	0	0.0%
Professional, scientific, and management, and administrative and waste management services	70	9.2%
Educational services, and health care and social assistance	168	22.0%
Arts, entertainment, and recreation, and accommodation and food services	37	4.9%
Other services, except public administration	58	7.6%

Industry	Estimated Employment	Percent
Public administration	34	4.5%

Source: US Census Bureau American Community Survey 2013-2017 Estimates

Table A-4 City of Biggs – Income and Benefits

Income Bracket	Population	Percent
<\$10,000	5	0.8%
\$10,000 – \$14,999	30	5.0%
\$15,000 - \$24,999	90	15.1%
\$25,000 – \$34,999	87	14.6%
\$35,000 – \$49,999	67	11.3%
\$50,000 – \$74,999	154	25.9%
\$75,000 – \$99,999	85	14.3%
\$100,000 – \$149,999	36	6.1%
\$150,000 – \$199,999	27	4.5%
\$200,000 or more	14	2.4%

Source: US Census Bureau, 2010

The economy of Biggs has traditionally centered on agriculture; however, changing agricultural practices—such as mechanization, industrialization, and the centralization of capital—have resulted in negative economic impacts for many of California’s agricultural communities. The cost of transporting agricultural goods to market and the need to consolidate agricultural processing activities have changed the way agriculture operations function. While Biggs continues to benefit from the presence of local agricultural processing operations and its location in the northern Sacramento Valley’s agricultural zone, the City’s industrial base has become dependent on the fortunes of the local agricultural community.

A.3.4. Population

The California Department of Finance estimated the January 1, 2019 total population for the City of Biggs was 2,066.

A.4 Hazard Identification

Biggs’s identified the hazards that affect the City and summarized their location, extent, frequency of occurrence, potential magnitude, and significance specific to Biggs (see Table A-5).

Table A-5 City of Biggs—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/Severity	Significance	Climate Change Influence
Climate Change	Extensive	Likely	Limited	Low	–
Dam Failure	Limited	Unlikely	Critical	Medium	Medium
Drought & Water shortage	Extensive	Unlikely	Neg	Low	High
Earthquake and Liquefaction	Extensive	Occasional	Limited	Medium	Low
Floods: 100/200/500 year	Significant	Unlikely	Limited	High	Medium
Floods: Localized Stormwater	Limited	Likely	Limited	Medium	Medium
Hazardous Materials Transportation	Limited	Unlikely	Limited	Medium	Low
Invasive Species: Aquatic	Limited	Unlikely	Negligible	Low	Low
Invasive Species: Pests/Plants	Limited	Unlikely	Limited	Low	Low
Landslide, Mudslide, and Debris Flow	Significant	Unlikely	Negligible	Low	Medium
Levee Failure	Limited	Unlikely	Limited	Medium	Medium
Severe Weather: Extreme Heat	Extensive	Likely	Limited	Medium	High
Severe Weather: Freeze and Winter Storm	Extensive	Likely	Limited	Medium	Medium
Severe Weather: Heavy Rain and Storms (Hail, Lightning, Wind)	Extensive	Likely	Limited	Medium	Medium
Severe Weather: Wind and Tornado	Limited	Likely	Limited	Medium	Low
Stream Bank Erosion	Limited	Unlikely	Negligible	Low	Low
Volcano	Extensive	Unlikely	Limited	Low	Low
Wildfire	Significant	Likely	Limited	Medium	High
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area		Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid			
Likelihood of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.		Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact			
		Climate Change Influence Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact			

A.5 Hazard Profile and Vulnerability Assessment

The intent of this section is to profile Biggs's hazards and assess the City's vulnerability separate from that of the Planning Area as a whole, which has already been assessed in Sections 4.2 Hazard Profiles and 4.3 Vulnerability Assessment in the Base Plan. The hazard profiles in the Base Plan discuss overall impacts to the Planning Area and describes the hazard problem description, hazard location and extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. Hazard profile information specific to the City is included in this Annex. This vulnerability assessment analyzes the property, population, critical facilities, and other assets at risk to hazards ranked of medium or high significance specific to the City and also includes a vulnerability assessment to the three primary hazards to the State of California: earthquake, flood, and wildfire. For more information about how hazards affect the County as a whole, see Chapter 4 Risk Assessment in the Base Plan.

A.5.1. Hazard Profiles

Each hazard vulnerability assessment in Section A.5.3, includes a hazard profile/problem description as to how each medium or high significant hazard affects the City and includes information on past hazard occurrences. The intent of this section is to provide jurisdictional specific information on hazards and further describes how the hazards and risks differ across the Planning Area.

A.5.2. Vulnerability Assessment and Assets at Risk

This section identifies Biggs's total assets at risk, including values at risk, populations at risk, critical facilities and infrastructure, natural resources, and historic and cultural resources. Growth and development trends are also presented for the community. This data is not hazard specific, but is representative of total assets at risk within the community.

Values at Risk

The following data from the Butte County Assessor's Office is based on the 3/28/2019 (post-Camp Fire) Assessor's data. The methodology used to derive property values is the same as in Section 4.3.1 of the Base Plan. This data should only be used as a guideline to overall values in the County, as the information has some limitations. The most significant limitations are created by Proposition 13 and the Williamson Act as detailed in the Base Plan. With respect to Proposition 13, instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is most likely low and does not reflect current market value of properties within the County. It is also important to note, in the event of a disaster, it is generally the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. However, depending on the type of hazard and impact of any given hazard event, land values may be adversely affected; thus, land values are included as appropriate. Table A-6 shows the 3/28/2019 Assessor's values (e.g., the values at risk) broken down by property type for the City of Biggs.

It should be noted that the City of Biggs maps reflect the current jurisdictional boundary. The current boundary includes a 3-parcel annexation totaling approximately 160 acres in the southwestern portion of the City. It was noted by the HMPC that most of the 160 acres is for a \$9 million wastewater project which

is currently 75% complete. It doesn't change the risk profile for the City. However, the risk assessment analysis tables for the City of Biggs do not include this annexation area consisting of 3 unimproved parcels zoned for agricultural use, as this information was not included in the GIS data obtained for this project.

Table A-6 City of Biggs – Total Values at Risk by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Other Value	Estimated Contents Value	Total Value
Agricultural	6	3	\$151,112	\$151,082	\$810	\$151,082	\$854,126
Commercial	36	24	\$717,577	\$3,616,969	\$109,175	\$3,616,969	\$7,405,502
Industrial	14	8	\$1,727,064	\$12,707,659	\$10,439,743	\$19,061,489	\$46,918,515
Residential	691	639	\$23,426,560	\$52,713,156	\$6,630	\$26,356,578	\$100,246,973
Unknown	18	0	\$0	\$0	\$0	\$0	\$0
City of Biggs Total	765	674	\$26,022,313	\$69,188,866	\$10,556,358	\$49,186,118	\$155,425,116

Source: Butte County 3/28/2019 Parcel/Assessor's Data

Population and Special Populations at Risk

General Population

As previously described in the community profile, based on California Department of Finance estimates, the current January 1, 2019 total population for the City of Biggs was 2,066, all of which are potentially vulnerable to hazard events.

Special Populations and Disadvantaged Communities

The City of Biggs has a very diverse population including the elderly, infirm, homeless and low-income populations with special needs and considerations required to notify and assist during an emergency or disaster.

Critical Facilities and Infrastructure

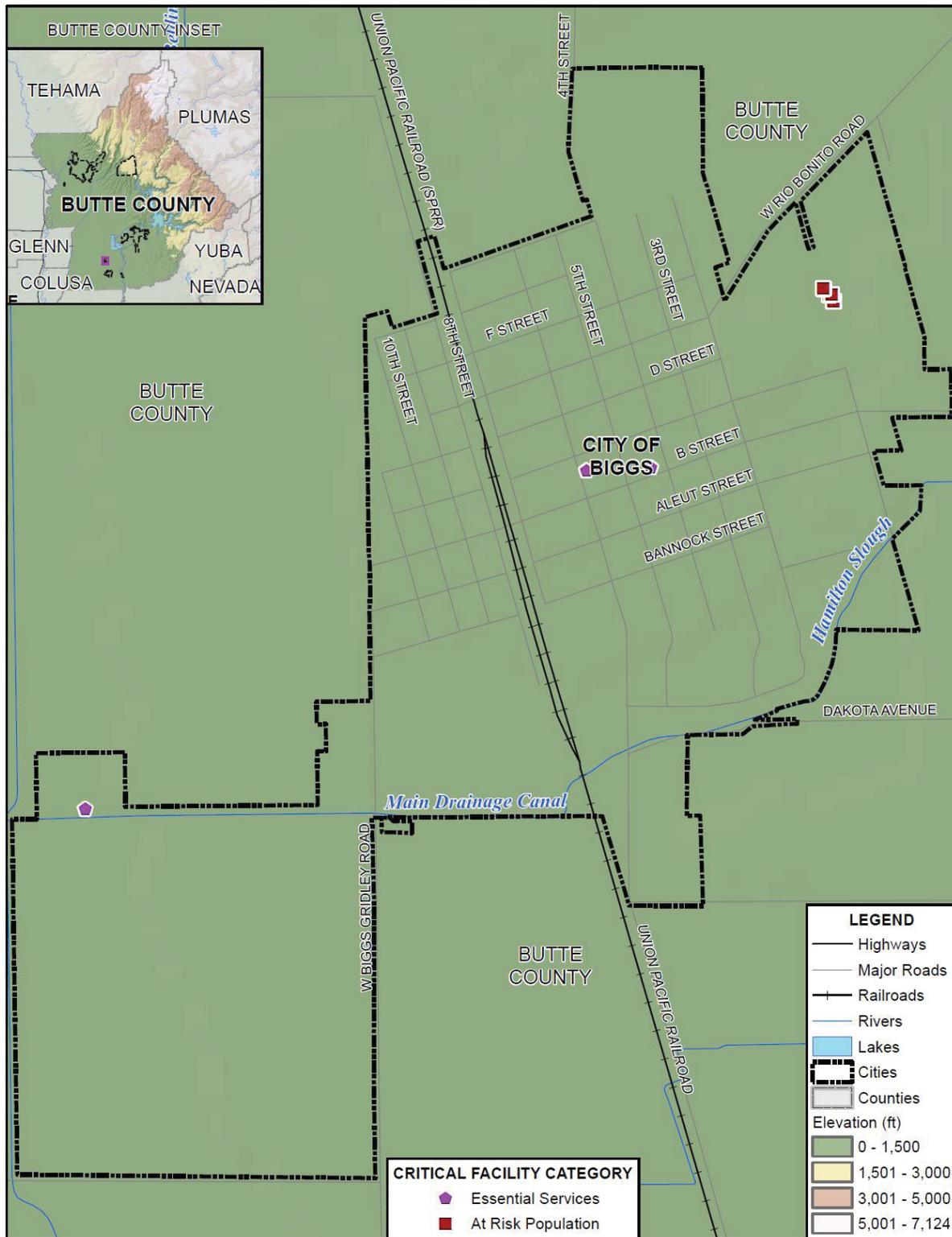
For purposes of this plan, a critical facility is defined as:

Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

A critical facility is classified by the following categories: (1) Essential Services Facilities, (2) At-Risk Populations Facilities, and (3) Hazardous Materials Facilities, as discussed in Section 4.3.1 of the Base Plan.

An inventory of critical facilities in the City of Biggs from Butte County GIS is shown on Figure A-2. Table A-7 gives summary information about the critical facilities in the City. Table A-8 details the facility categories and breaks them down by facility type. Details of critical facility definition, type, name, address, and jurisdiction by hazard zone are listed in Appendix F. The critical facility inventory and associated maps for the City only include the first two categories of facility types; a GIS layer of Hazardous Materials Facilities was not available.

Figure A-2 City of Biggs – Critical Facilities



Data Source: Butte County GIS, Cal-Atlas; Map Date: 7/1/2019.

Table A-7 City of Biggs Critical Facility Summary

Critical Facility Category	Facility Count
Essential Services Facilities	3
At Risk Population Facilities	4
City of Biggs Total	7

Source: Butte County GIS

Table A-8 City of Biggs – Critical Facilities by Facility Category and Type

Critical Facility Category / Facility Type	Facility Count
Essential Services Facilities	
Fire	3
Health Care	15
Law Enforcement	1
Public Assembly Point / Evacuation Center	2
Essential Services Facilities Total	21
At Risk Population Facilities	
School	12
At Risk Population Facilities Total	12
Grand Total	
	33

Source: Butte County GIS

Natural Resources

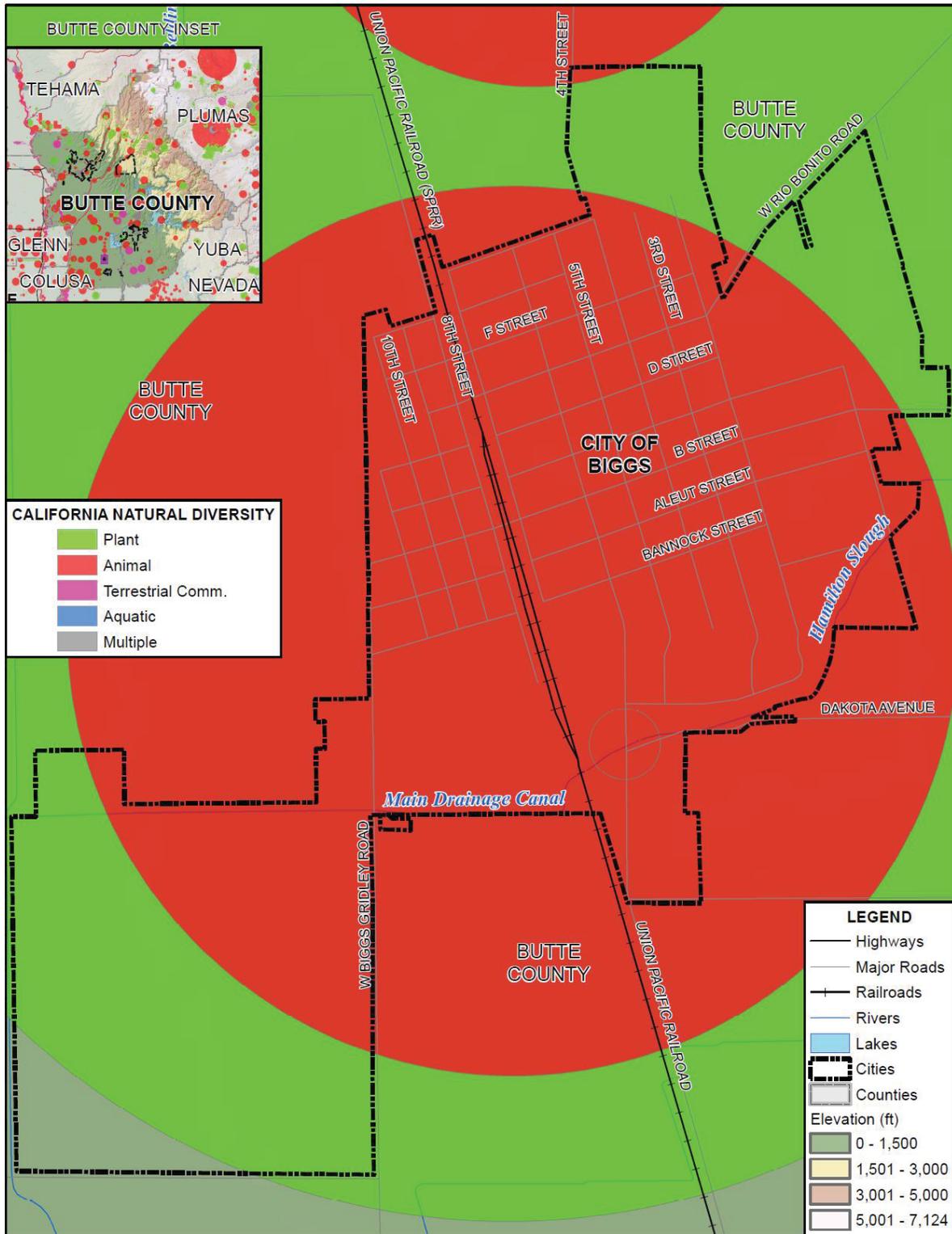
The City of Biggs and the areas surrounding it include a rich and diverse range of biological resources. Due to its location in the Sacramento Valley, Biggs is located in an area with high levels of waterfowl activity. However, the developed areas both inside and just outside of the City limits are generally less likely to contain significant wildlife resources or habitat.

There is limited evidence of protected species occurring within the developed areas of the City of Biggs. However, since detailed biological evaluations have generally not been conducted in the vicinity of Biggs, the lack of identified occurrences is not proof of the absence of protected species. While the City’s environment is not known to contain threatened or endangered species, various species, including the giant garter snake, the western pond turtle, and the Swainson’s hawk, are known to utilize habitats similar to those located within the Biggs Planning Area. Therefore, future development sites may require review by a qualified individual, to be approved by the City, to determine if species or habitats are present. If potential habitats or species are found, biological surveys may be required to determine the extent, viability, and approach to avoid or potentially mitigate a loss.

The California Natural Diversity Database (CNDDDB) is a "natural heritage program" and is part of a nationwide network of similar programs overseen by NatureServe (formerly part of The Nature Conservancy). All natural heritage programs provide location and natural history information on special

status plants, animals, and natural communities to the public, other agencies, and conservation organizations. The data help drive conservation decisions, aid in the environmental review of projects and land use changes, and provide baseline data helpful in recovering endangered species and for research projects. Spatial information regarding these program areas in the City of Biggs is shown on Figure A-3.

Figure A-3 City of Biggs – Natural Diversity Map



0 0.25 0.5 Miles



Data Source: California Natural Diversity Database - CA Fish and Wildlife, Butte County GIS, Cal-Atlas; Map Date: 3/1/2019.

Historic and Cultural Resources

The City of Biggs has a stock of historically significant homes, public buildings, and landmarks. To inventory these resources, the HMPC collected information from a number of sources. The California Department of Parks and Recreation Office of Historic Preservation (OHP) was the primary source of information. The OHP is responsible for the administration of federally and state mandated historic preservation programs to further the identification, evaluation, registration, and protection of California's irreplaceable archaeological and historical resources. OHP administers the National Register of Historic Places, the California Register of Historical Resources, California Historical Landmarks, and the California Points of Historical Interest programs. Each program has different eligibility criteria and procedural requirements. These requirements are detailed in Section 4.3.1 of the Base Plan. According to these sources, there are no buildings on these lists in the City of Biggs.

The National Park Service administers two programs that recognize the importance of historic resources, specifically those pertaining to architecture and engineering. While inclusion in these programs does not give these structures any sort of protection, they are valuable historic assets. The Historic American Buildings Survey (HABS) and Historic American Engineering Record (HAER) document America's architectural and engineering heritage. There are no HABS and HAER structures in the City of Biggs.

The City of Biggs does have a historic core to the City not listed by the OHP. Buildings the HMPC consider historic are:

- Doty Grain Storage
- Ditzler House, 3069 Eighth Street
- 3055 Ninth Street
- 3031 Ninth Street
- Doty House, 3009 Tenth Street
- Biggs Water Tower
- Biggs Jail House built by WPA, 3005 Eighth Street
- 2995 Tenth Street
- Diamond Match, 2687 Eighth Street
- 2967 Tenth Street
- A. J. Store House, 2970 Eighth Street
- South Side of B Street
- Hotel Colonia, Corner of B Street and Sixth Street
- Sacramento Valley Bank, 470 B Street
- Carnegie Library, B Street
- Albers House, 457 B Street
- Methodist Church, 441 C Street
- Hastings House, 429 B Street
- Cannoy House, 1871
- 403 C Street
- 395 C Street
- W. M. Smith, 394 B Street
- B Street and Second Street
- Caldwell House, 393 B Street
- Chatfield House, 372 B Street
- Brinks House, 369 B Street

- Mitchell House, 369 Aleut Street
- 359 B Street
- 353 B Street
- 347 B Street
- Biggs Grammar School (BUSD Administration Building), B Street

Growth and Development Trends

Biggs has generally seen slow and steady growth. Biggs has seen growth rates as shown in Table A-9. The City saw large growth between 1960 and 2000, with a dip between 2000 and 2010. Much of the 2019 growth is attributed to the movement of people into Biggs from Paradise due to the Camp Fire.

Table A-9 City of Biggs – Population Changes Since 1950

Year	Population	Change	% Change
1950	784	–	–
1960	831	47	6.0%
1970	1,115	284	34.2%
1980	1,413	298	26.7%
1990	1,581	168	11.9%
2000	1,793	212	13.4%
2010 ¹	1,707	-86	-4.8%
2019 ²	2,066	369	20.3%

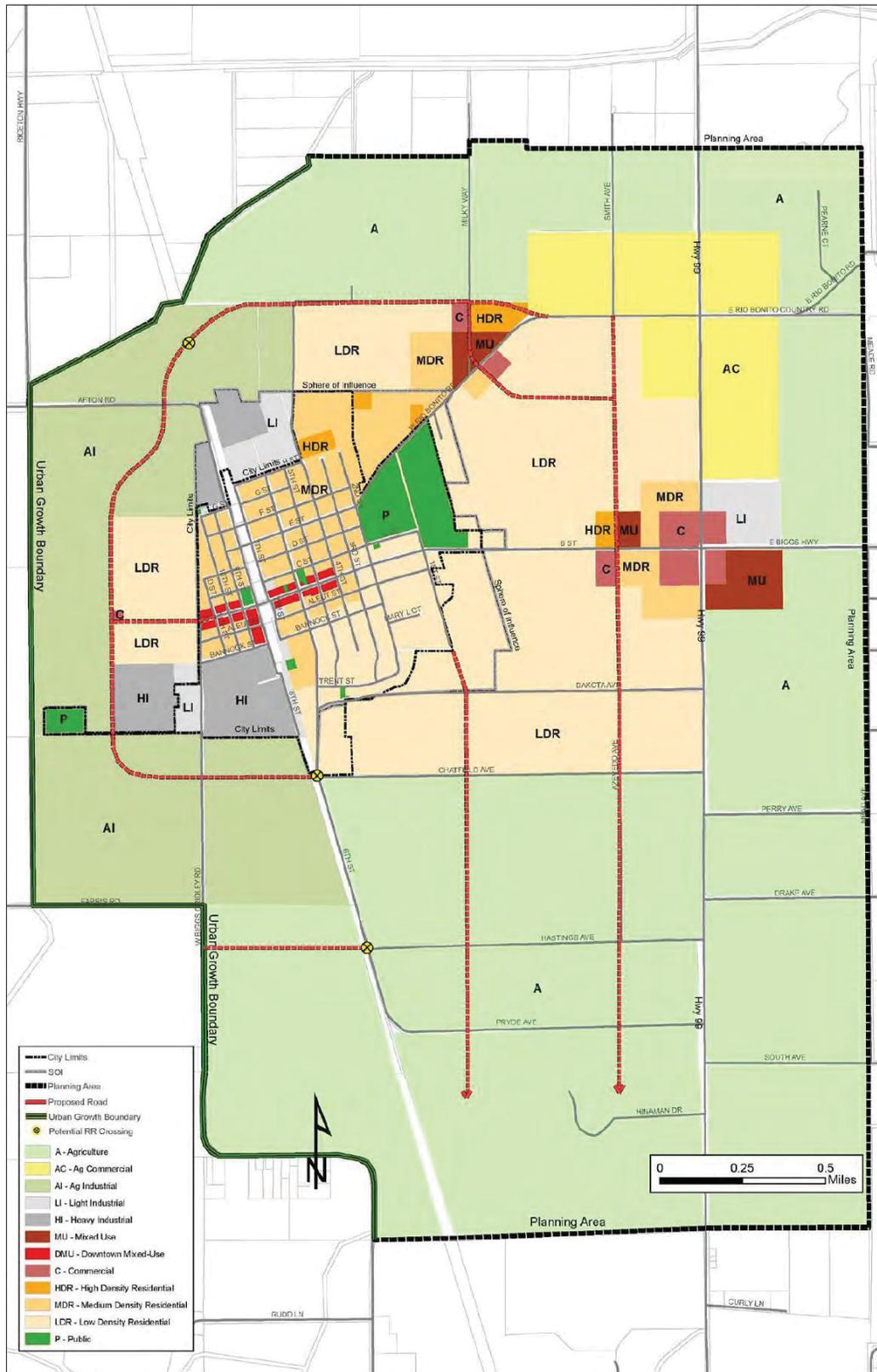
Source: ¹US Census Bureau, ²California Department of Finance

Land Use

State planning law requires that the land use element of a general plan include a statement of the standard population density, building intensity, and allowed uses for the various land use designations in the plan (Government Code Section 65302(a)). The City’s land use designations are generally described below and mapped on the Land Use Diagram (Figure A-4). Figure A-5 includes information on the permitted density ranges and floor area ratios, if applicable, for each designation. The Biggs Municipal Code provides detailed land use and development standards for development.

With this General Plan, a variety of new land use designations have been established to reflect the more mixed and, in some cases, more intense land uses envisioned for Biggs. New mixed-use designations provide the opportunity for a combination of residential, commercial, and office uses on a single site, depending on the designation. Future land use for the City of Biggs from the 2014 City of Biggs General Plan Land Use Element is shown on Figure A-4.

Figure A-4 City of Biggs – Land Use Diagram



Source: 2014 City of Biggs General Plan Land Use Element

Figure A-5 City of Biggs – Land Use Density and Intensity Standards

Land Use Designation	Residential Density Units per Gross Acre ¹	Nonresidential Intensity ²		
		Floor Area Ratio	Maximum Lot Coverage	Maximum Building Height
Agriculture	1 du per 10 gross acres		5%	50 feet
Agricultural Commercial	1 du per 10 gross acres		10%	60 feet
Agricultural Industrial	1 du per 10 gross acres		40%	65 feet
Low Density Residential	0–6 du/ac		40%	30 feet
Medium Density Residential	6–12 du/ac		50%	30 feet
High Density Residential	12–25 du/ac		60%	35 feet
Residential Mixed Use	6–16 du/ac			
Downtown Mixed Use	16–25 du/ac	.25–1.5		
Commercial		.25–.70		
Light Industrial		.10–.50		
Heavy Industrial		.10–.65		
Public			90%	

1. Gross acreage and net acreage are commonly used measurements of area in planning and zoning. A gross acre is all land (inclusive of streets and rights-of-way) designated for a particular use. Net acreage is the area of a parcel exclusive of streets, rights-of-way, and other areas not normally within lots. Gross acreage is utilized in this Plan to regulate density.

2. Please refer to the Zoning Ordinance contained within the Biggs Municipal Code for specific development standards for guidance on lot size, lot coverage, building height, and other development standards.

Note: It is noted herein that individual parcel lot coverages may exceed the maximum lot coverage listed in the table above when developed as part of a larger project meeting the lot coverage/intensity standards of the applicable land use designation.

Development since 2014 Plan

The City Building Department tracked total building permits issued since 2014 for the City. These are tracked by total development, property use type, and hazard risk area. These are shown in Table A-10 and Table A-11. With respect to development in hazard areas since 2014, it should be noted that there is no 1% annual chance floodplain in the City, the City is entirely within the 0.2% annual chance flood where all

development occurs. In addition, based on the mapped hazards within this LHMP, all development within the City occurs within the inundation areas of the Oroville and Thermalito Afterbay dams, the moderate liquefaction potential areas, and the non-wildland/non-urban and urban unzoned fire hazard severity zones.

Table A-10 City of Biggs – Total Development Since 2014

Property Use	2014	2015	2016	2017	2018
Agricultural	0	0	0	0	1
Commercial	3	2	2	1	0
Industrial	0	0	0	0	0
Residential	26	30	1	1	3
Unknown	0	0	0	0	0
Total	29	32	3	2	4

Source: City of Biggs Building Department

Table A-11 City of Biggs – Development in Hazard Areas since 2014

Property Use	1% Annual Chance Flood	Landslide Susceptibility Area	Wildfire Risk Area ¹	Other
Agricultural	0	0	0	–
Commercial	0	0	0	–
Industrial	0	0	0	–
Residential	0	0	0	–
Unknown	0	0	0	–
Total	0	0	0	–

Source: City of Biggs Building Department

¹Moderate or higher wildfire risk area

Future Development

Approximately every four years, the Butte County Association of Governments (BCAG) prepares long-term regional growth forecasts of housing, population, and employment for the Butte County area. The forecasts have been developed by BCAG in consultation with its Planning Directors Group which consists of representatives from each of BCAG’s local jurisdiction members and the Butte Local Agency Formation Commission. A low, medium, and high scenario has been developed for each forecast of housing, population, and employment. The 2018 process has been delayed due to the regional population redistribution and uncertain re-population timeline associated with the 2018 Camp Fire. At this time, it is anticipated that the new forecasts will be available near the end of 2019. The medium scenario for the City in the 2014-2040 Regional Transportation Plan is shown in Table A-12.

Table A-12 City of Biggs – Future Population Estimates

Jurisdiction	2020	2025	2030	2035	2040
Biggs	2,096	2,714	3,195	3,668	3,967

Source: Butte County Association of Governments 2014-2040 Regional Transportation Plan

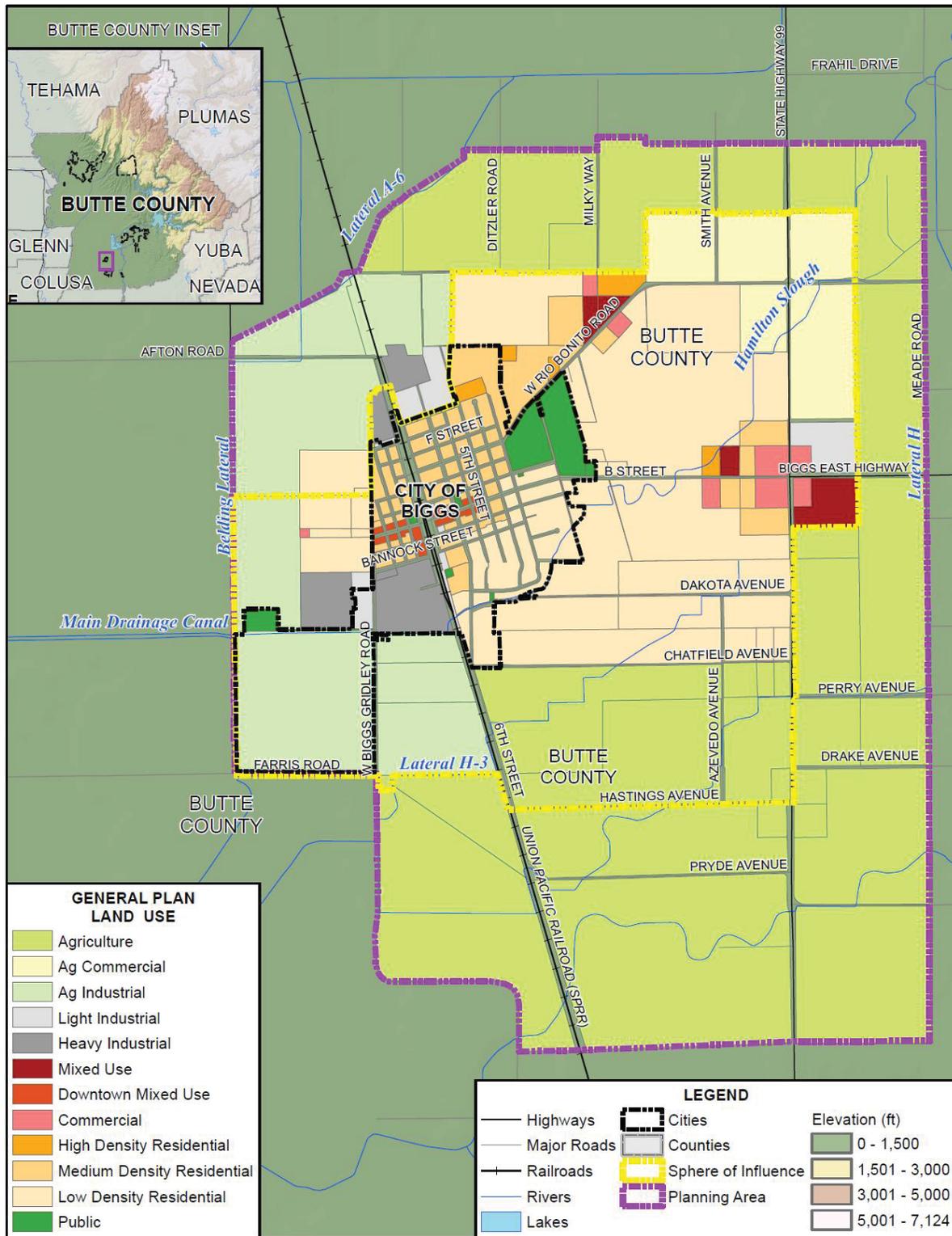
More general information on growth and development in Butte County as a whole can be found in “Growth and Development Trends” in Section 4.3.1 Butte County Vulnerability and Assets at Risk of the Base Plan.

GIS Analysis

Butte County’s 3/21/2019 Assessor Data and the County’s GIS parcel data and data provided by the City were used as the basis for the inventory of improved and unimproved parcels and acres for the available future development areas within the City. The City of Biggs has defined general growth areas through the City of Biggs’ General Plan Land Use Element. Specific project sites were not available. The data provided included a City Planning Area, the City’s Sphere of Influence, and available areas within the existing City boundaries. Using the GIS parcel spatial file with the available future development areas were identified.

Figure A-6 shows the locations of future development areas the City is planning to develop. Table A-13 shows the parcels and acreages of each future development area in the City. With no specific future development projects delineated for the City, hazard analyses for future development for Biggs include maps, but no tabular analysis.

Figure A-6 City of Biggs – Future Development



Data Source: City of Biggs General Plan Land Use 2014, Butte County GIS, Cal-Atlas; Map Date: 10/12/2019.

Table A-13 City of Biggs – Future Development Parcels and Acreages

Future Development Areas	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres
Biggs				
Ag Industrial	4	1	3	160.5
Downtown Mixed Use	49	42	7	9.4
Heavy Industrial	10	4	6	40.3
High Density Residential	6	0	6	3.3
Light Industrial	9	5	4	11.6
Low Density Residential	237	221	16	86.0
Medium Density Residential	423	400	23	100.2
Public	18	1	17	56.4
Unknown	9	0	9	9.4
Biggs Total	765	674	91	477.1
Biggs Sphere of Influence				
Ag Commercial	14	7	7	146.5
Ag Industrial	3	1	2	122.1
Agriculture	42	37	5	389.2
Commercial	5	4	1	21.9
Heavy Industrial	4	4	0	7.2
High Density Residential	1	1	0	5.5
Light Industrial	4	3	1	7.4
Low Density Residential	92	73	19	871.9
Medium Density Residential	7	5	2	30.5
Mixed Use	2	1	1	54.0
Unknown	4		4	10.7
Biggs Sphere of Influence Total	178	136	42	1,666.8
Biggs Planning Area				
Ag Industrial	12	8	4	273.4
Agriculture	133	105	28	1,901.1
Heavy Industrial	1	1	0	4.1
Light Industrial	5	5	0	31.3

Future Development Areas	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres
Low Density Residential	1	0	1	1.0
Unknown	4	0	4	12.2
Biggs Planning Area Total	156	119	37	2,223.2
Grand Total	1,099	929	170	4,367.2

A.5.3. Vulnerability to Specific Hazards

This section provides the vulnerability assessment, including any quantifiable loss estimates, for those hazards identified above in Table A-5 as high or medium significance hazards. Impacts of past events and vulnerability of the City to specific hazards are further discussed below (see Section 4.1 Hazard Identification in the Base Plan for more detailed information about these hazards and their impacts on the Butte County Planning Area). Methodologies for calculating loss estimates are the same as those described in Section 4.3 of the Base Plan.

An estimate of the vulnerability of the City to each identified priority hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections that follow. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

Depending on the hazard and availability of data for analysis, this hazard specific vulnerability assessment also includes information on values at risk, critical facilities and infrastructure, populations at risk, and future development.

Dam Failure

Likelihood of Future Occurrence—Unlikely

Vulnerability—Medium

Hazard Profile and Problem Description

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

Location and Extent

Biggs is downstream of multiple dams. Several dams located above Biggs are also located above Oroville Dam in the Feather River watershed (these are discussed in more detail and mapped in the vulnerability section below). Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, dam failure would most probably happen as a consequence of the natural disaster triggering the event. There is no scale with which to measure dam failure. While a dam may fill slowly with runoff from winter storms, a dam break has a very quick speed of onset. The duration of dam failure is not long – only as long as it takes to empty the reservoir of water the dam held back. The City would be affected for as long as the flood waters from the dam failure took to drain downstream. Geographic; flood extent from the Cal OES dam inundation zones is shown in Table A-14. Note, the Cal OES dam inundation data did not include inundation mapping of all dams of concern to the Butte County Planning Area; thus, the below analysis reflects information based on available data. Other dams may be identified as a concern to the City. Based on available data, Biggs falls within the inundation areas of Oroville and Thermalito AB dams.

Table A-14 City of Biggs – Geographical Dam Inundation Extents

Dam Inundation Area	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Oroville	474	100.0%	201	42.41%	272	57.38%
Thermalito AB	474	100.0%	201	42.41%	272	57.38%

Source: Cal OES

Past Occurrences

The City of Biggs was evacuated as a result of the Oroville Dam spillway incident of February 2017.

Vulnerability to Dam Failure

Dam failure flooding would vary by community depending on which dam fails and the nature and extent of the dam failure and associated flooding. The City of Biggs 2014 General Plan Safety Element noted that several dams located above Biggs are also located above Oroville Dam in the Feather River watershed. In the event of failure of one of these dams, floodwater would be contained in Lake Oroville. However, there are four dams that are located such that their failure might create flooding in the City. These are the Oroville Dam itself and the three structures that create the Thermalito complex: the Thermalito Diversion Dam, the

Thermalito Forebay Dam, and the Thermalito Afterbay Dam. Both the Oroville and the Thermalito Dam are extremely high hazard dams. The potential flood hazards associated with the catastrophic failure of these dams is the primary reason why Biggs was identified as having a high potential for dam failure flooding. Based on the vulnerability assessment in the Base Plan, it is apparent that a major dam failure could have a significant impact on the City.

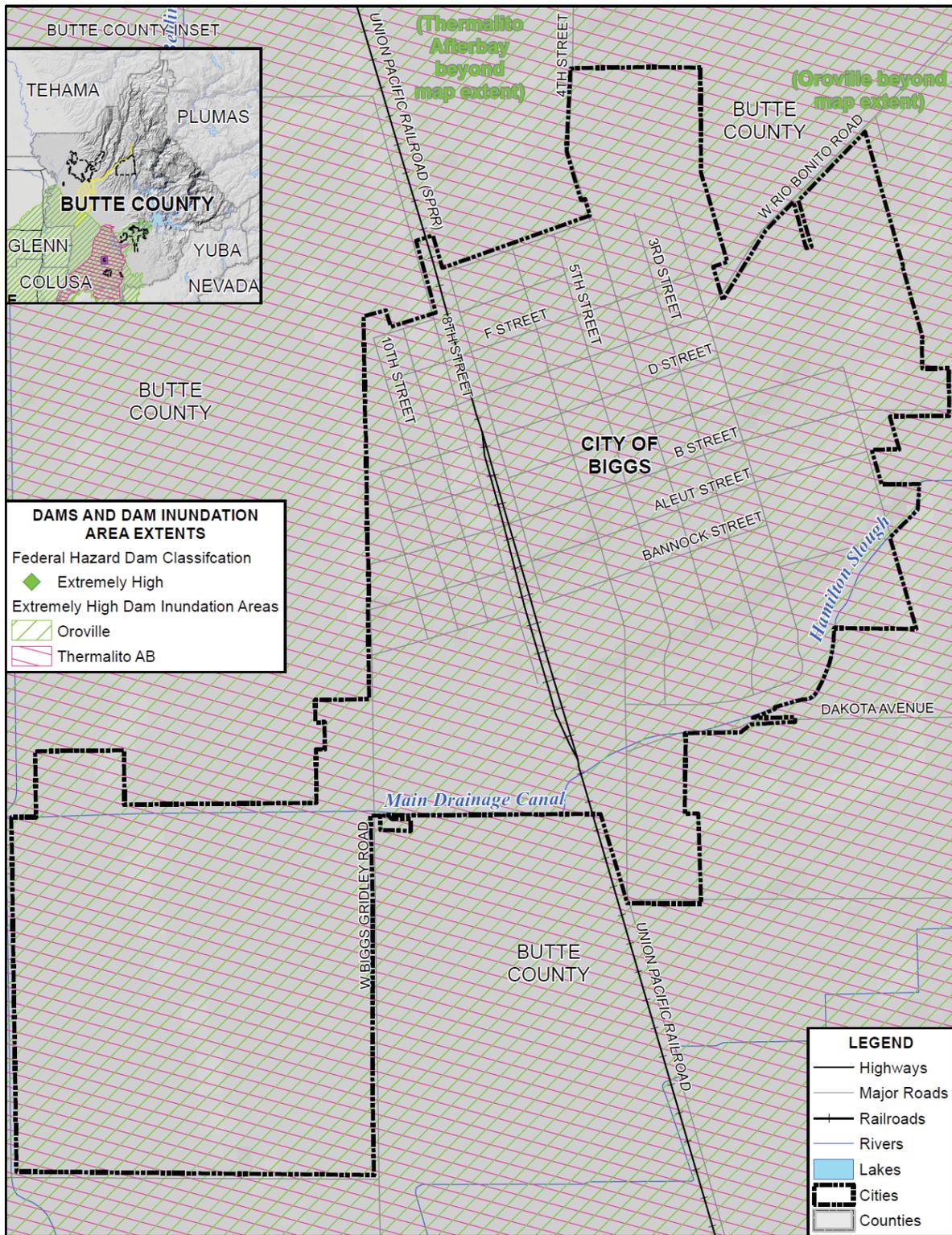
Impacts

Impacts to the City from a dam failure flood include damage to residential and commercial property, damage to critical facilities, damage to infrastructure, damage to levees that protect the City, and injuries deaths to citizens of the City. As noted, during the recent Oroville Spillway event, mass evacuations and associated economic losses can also be significant.

Values at Risk

Based on the vulnerability assessment in the Base Plan, it is apparent that a major dam failure could have a significant impact on the City. The City is located in two Cal OES mapped dam inundation areas, Oroville and Thermalito Afterbay, as described in Section 4.3.4 of the Base Plan. This can be seen on Figure A-7.

Figure A-7 City of Biggs – Dam Inundation Areas



0 0.25 0.5 Miles



Data Source: Cal OES Dam Status 10/2017, Butte County GIS, Cal-Atlas; Map Date: 7/1/2019.

GIS was used to determine the possible impacts of dam failure flooding within the City of Biggs. The methodology described in Section 4.3.4 of the Base Plan was followed in determining structures and values at risk. All values represent post-fire data. Multiple analysis tables were created:

- Table A-15 shows the total parcel counts, improved parcel counts, their improved structure and land values in both extremely high hazard dam inundation areas.
- Table A-16 shows the total parcel counts, improved parcel counts, their improved structure and land values in the Oroville inundation areas.
- Table A-17 shows the total parcel counts, improved parcel counts, their improved structure and land values in the Thermalito Afterbay dam inundation area

Table A-15 City of Biggs – Post-Fire Count and Value of Parcels in All Extremely High Hazard Dam Inundation Areas

Jurisdiction	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Other Value	Estimated Contents Value	Total Value
City of Biggs	765	674	\$26,022,313	\$69,188,866	\$10,556,358	\$49,186,118	\$155,425,116

Source: Cal OES, Butte County 3/28/2019 Parcel/Assessor's Data

Table A-16 City of Biggs – Count and Value at Risk in Oroville Dam Inundation Area by Property Use

Jurisdiction/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Other Value	Estimated Contents Value	Total Value
Agricultural	6	3	\$151,112	\$151,082	\$810	\$151,082	\$854,126
Commercial	36	24	\$717,577	\$3,616,969	\$109,175	\$3,616,969	\$7,405,502
Industrial	14	8	\$1,727,064	\$12,707,659	\$10,439,743	\$19,061,489	\$46,918,515
Residential	691	639	\$23,426,560	\$52,713,156	\$6,630	\$26,356,578	\$100,246,973
Unknown	18	0	\$0	\$0	\$0	\$0	\$0
City of Biggs Total	765	674	\$26,022,313	\$69,188,866	\$10,556,358	\$49,186,118	\$155,425,116

Source: Cal OES, Butte County 3/28/2019 Parcel/Assessor's Data

Table A-17 City of Biggs – Count and Value at Risk in Thermalito Afterbay Dam Inundation Area by Property Use

Property Use / Dam Inundation Area	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Other Value	Estimated Contents Value	Total Value
Agricultural	6	3	\$151,112	\$151,082	\$810	\$151,082	\$854,126
Commercial	36	24	\$717,577	\$3,616,969	\$109,175	\$3,616,969	\$7,405,502
Industrial	14	8	\$1,727,064	\$12,707,659	\$10,439,743	\$19,061,489	\$46,918,515
Residential	691	639	\$23,426,560	\$52,713,156	\$6,630	\$26,356,578	\$100,246,973
Unknown	18	0	\$0	\$0	\$0	\$0	\$0

Property Use / Dam Inundation Area	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Other Value	Estimated Contents Value	Total Value
City of Biggs Total	765	674	\$26,022,313	\$69,188,866	\$10,556,358	\$49,186,118	\$155,425,116

Source: Cal OES, Butte County 3/28/2019 Parcel/Assessor's Data

Population at Risk

The Cal OES dam inundation areas were overlaid on the parcel layer. Those residential parcel centroids that intersect the dam inundation areas were counted and multiplied by the 2010 Census Bureau average household factors for Biggs – 2.45. According to this analysis, there is a total population of 1,566 residents of the City at risk to dam failure flooding from both dams. This is shown in Table A-34.

Table A-18 City of Biggs – Count of Improved Residential Parcels and Population by Flood Zone

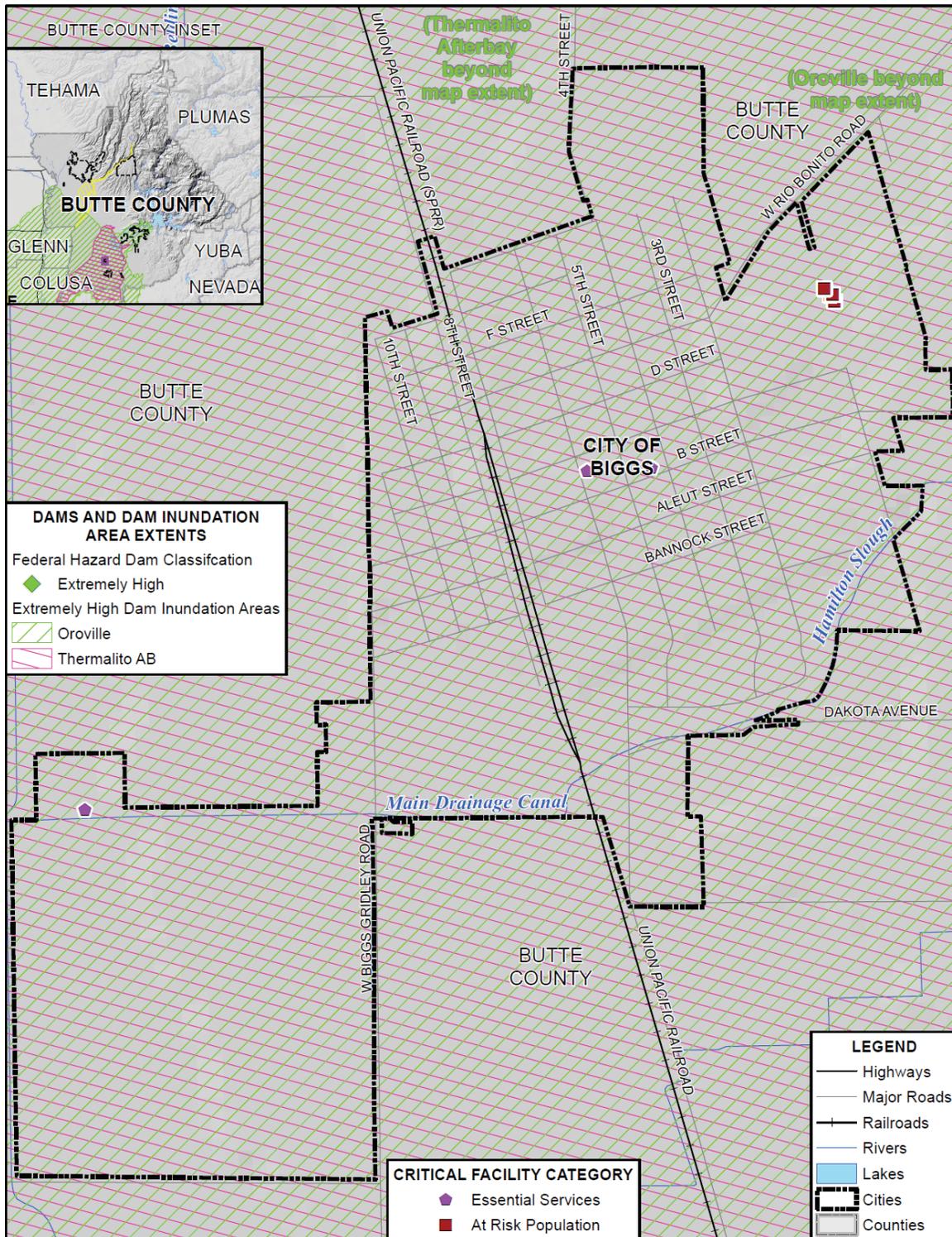
Jurisdiction	Oroville Dam Inundation Area		Thermalito Afterbay Dam Inundation Area	
	Improved Residential Parcels	Population	Improved Residential Parcels	Population
Biggs	639	1,566	639	1,566

Source: FEMA DFIRM 1/6/2011, Butte County 3/28/2019 Parcel/Assessor's Data, US Census Bureau

Critical Facilities at Risk

An analysis was performed on the critical facility inventory in Biggs in identified dam inundation areas. GIS was used to determine whether the facility locations intersects a Cal OES dam inundation area. Details of critical facilities in extremely high hazard dam inundation areas in the City of Biggs are shown in Figure A-8 and detailed in Table A-19. Details of critical facility definition, type, name and address and jurisdiction by flood zone are listed in Appendix F.

Figure A-8 City of Biggs – Critical Facilities in Extremely High Hazard Dam Inundation Areas



0 0.25 0.5 Miles



Data Source: Cal OES Dam Status 10/2017, Butte County GIS, Cal-Atlas; Map Date: 7/1/2019.

Table A-19 City of Biggs – Critical Facilities in Extremely High Hazard Dam Inundation Areas

Critical Facility Category/Dam Inundation Area	Facility Count
Essential Services Facilities	3
At Risk Population Facilities	4
City of Biggs Total	7

Source: Cal OES, Butte County GIS

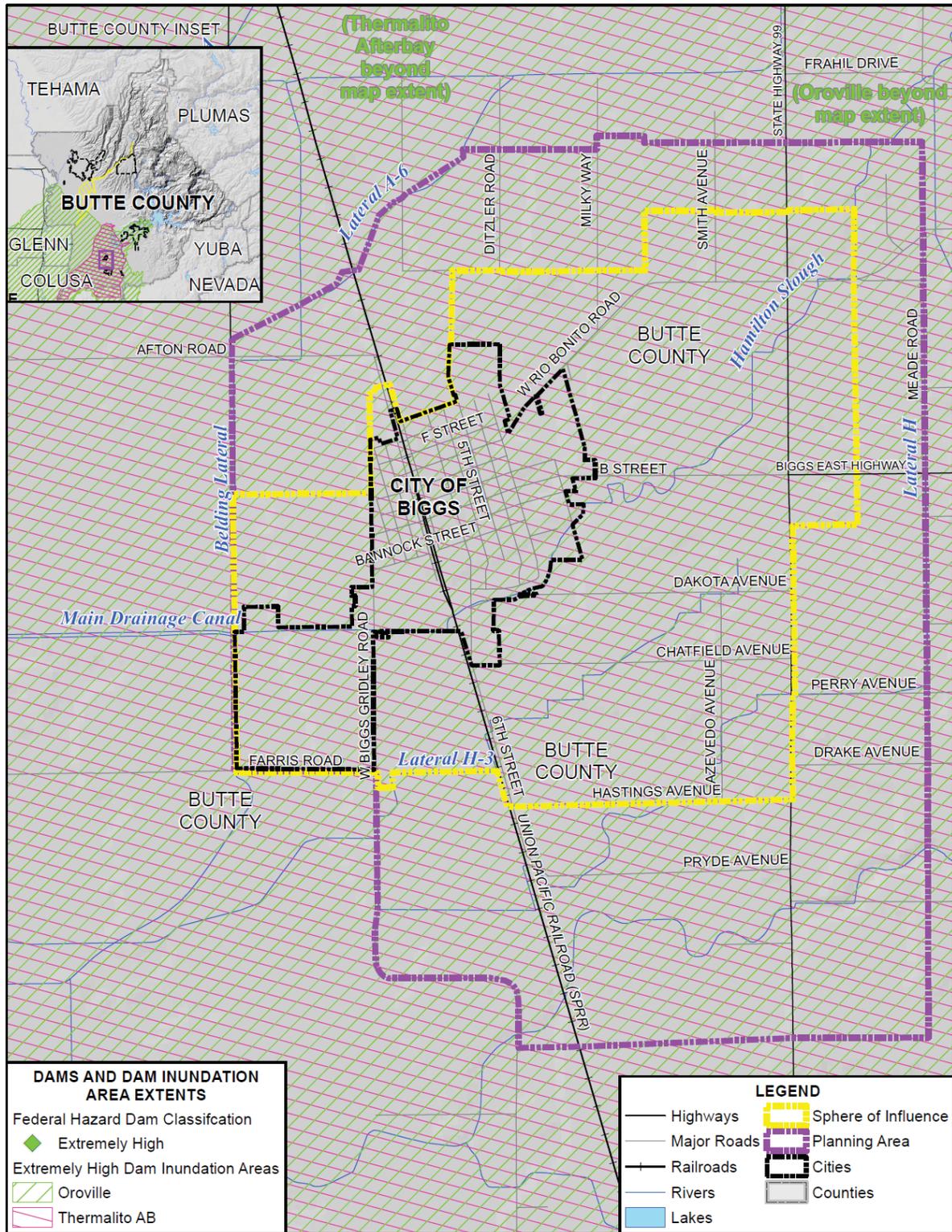
Future Development

Future dam failures are considered unlikely. However, given the high number of affected parcels, future development in the City could be affected by dam failures and associated flooding. The City enforces its floodplain ordinance, which helps to reduce risk to flooding by requiring structures to be above the base flood elevation, which depending on inundation depths may provide some relief. Siting of future development areas should take dam failure flooding into account.

GIS Analysis

The City of Biggs has defined general growth areas through the City of Biggs General Plan Land Use Element. Specific growth areas have not been delineated for the City. Due to this, hazard analysis for future development will include maps, but no tabular analysis. Figure A-9 shows the location of dam inundation areas overlaid on the future development areas the City has available to develop.

Figure A-9 City of Biggs – Future Development in Dam Inundation Areas



0 0.5 1 Miles



Data Source: Cal OES Dam Status 10/2017, Butte County GIS, Cal-Atlas; Map Date: 10/12/2019.

Earthquake (minor/major) and Liquefaction

Likelihood of Future Occurrence—Occasional/Unlikely
Vulnerability—Medium

Hazard Profile and Problem Description

The State of California has identified five areas of critical seismic concern including surface ruptures, ground shaking, ground failure, tsunamis, and seiches. Each of these is caused by earthquake activity thereby creating hazards for life and property, which has the potential anywhere in California. Biggs is not at risk for tsunamis or seiches due to its inland location and the absence of nearby large bodies of water. Due to the proximity of the City to the Cleveland Hills Fault, the City can expect low to medium intensity shocks from time to time. These earthquakes can cause liquefaction within the City. Liquefaction is a process whereby soil is temporarily transformed to a fluid formed during intense and prolonged ground shaking.

Location and Extent

Since earthquakes are regional events, the whole of the City is at risk to earthquake. Biggs and the surrounding area are relatively free from significant seismic and geologic hazards. There are no known or inferred active faults within the City.

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.2.10 of the Base Plan. The only known active fault in Butte County is the Cleveland Hills fault, the site of the August 1975 Oroville earthquake. This earthquake had a Richter magnitude of 5.7.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The City is located in an area where few earthquakes of significant magnitude occur, so both magnitude and intensity of earthquakes are expected to remain low. Geographical liquefaction potential extents for the City of Biggs from the Butte County 2030 General Plan are shown in Table A-20.

Table A-20 City of Biggs – Geographical Extents of Liquefaction Potential

Liquefaction Potential	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Generally High	0	0.00%	0	0.00%	0	0.00%
Generally Moderate	474	100.00%	201	42.41%	272	57.38%
Generally Low	0	0.00%	0	0.00%	0	0.00%

Liquefaction Potential	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
City of Biggs Total	474	100.00%	201	42.41%	272	57.38%

Source: Butte County General Plan 2030

Past Occurrences

As shown in the Base Plan, only the 1975 federal disaster declarations have occurred in the County due to earthquake. The HMPC noted no other past occurrences of earthquakes or liquefaction that affected the City in any meaningful way.

Vulnerability to Earthquake and Liquefaction

Seismic events can have particularly negative effects on older buildings constructed of unreinforced masonry (URM), including materials such as brick, concrete and stone. The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. The City of Biggs is within the less hazardous Zone 3.

Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable. There are minimal numbers of URM buildings within the City of Biggs and all of those buildings are privately owned.

Impacts from Earthquake and Liquefaction

The combination of plate tectonics and associated California coastal mountain range building geology essentially guarantees earthquake as a result of the periodic release of tectonic stresses. Butte County's mountainous terrain lies in the center of the North American and Pacific tectonic plate activity. There have been earthquakes as a result of this activity in the historic past, and there will continue to be earthquakes in the future of the California north coastal mountain region. The Cleveland Hills fault poses one of the more significant impacts to Butte County and the City as it has the capabilities of producing a quake in the upwards of 6.5 or greater.

Fault ruptures itself contributes very little to damage unless the structure or system element crosses the active fault; however, liquefaction can occur further from the source of the earthquake. In general, newer construction is more earthquake resistant than older construction due to enforcement of improved building codes. Manufactured housing is very susceptible to damage because their foundation systems are rarely braced for earthquake motions. Locally generated earthquake motions and associated liquefaction, even from very moderate events, tend to be more damaging to smaller buildings, especially those constructed of unreinforced masonry, as was seen in the Oroville earthquake.

Earthquake Analysis

Due to the limited amount of earthquake risk in the County and City, Hazus earthquake analysis was performed on a countywide basis only. This can be found in Section 4.3.6 of the Base Plan.

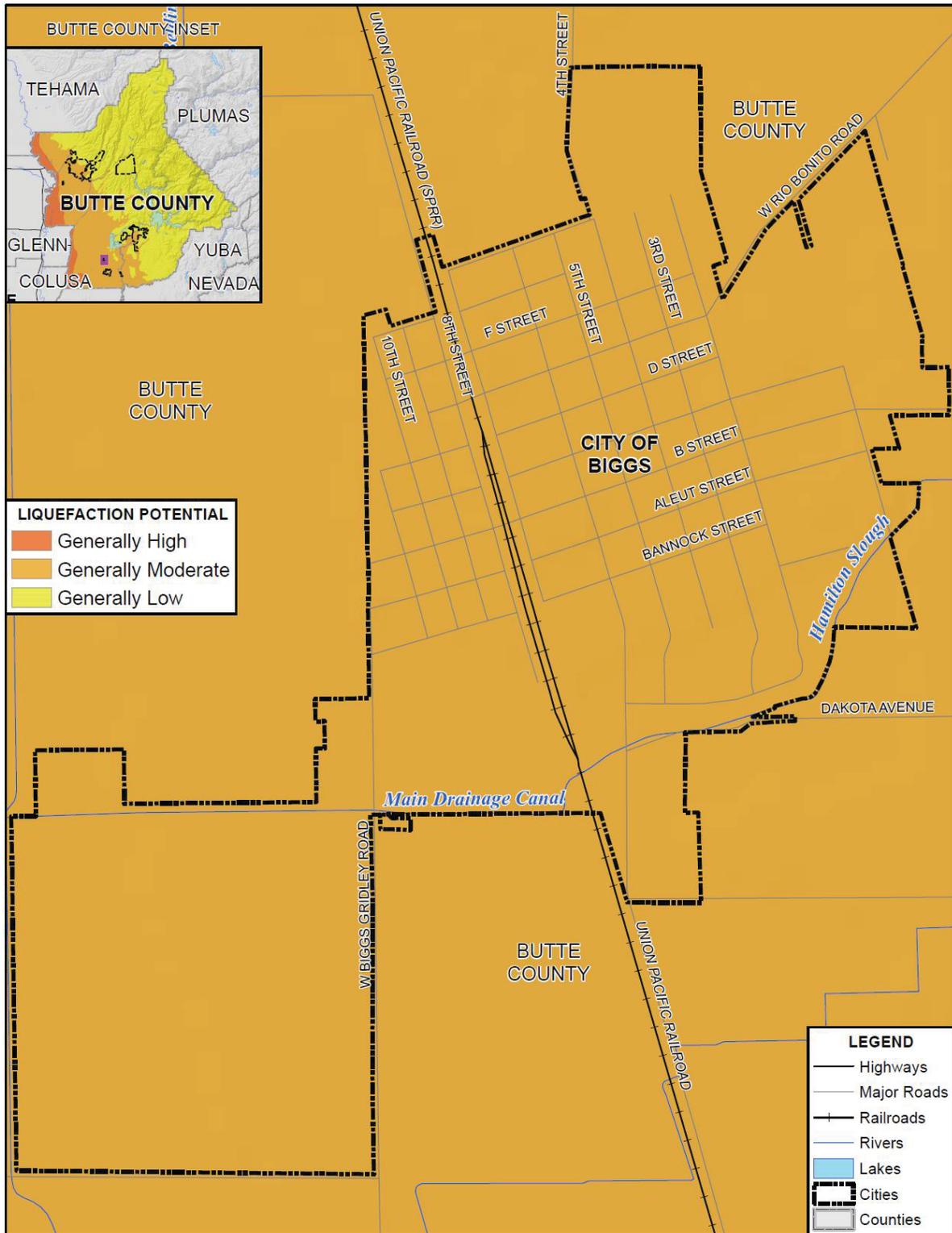
Liquefaction GIS Analysis

GIS was used to determine the possible impacts of liquefaction within the City of Biggs. The methodology described in Section 4.3.6 of the Base Plan was followed in determining structures and values at risk to earthquake-based liquefaction.

Values at Risk

Liquefaction potential areas for the City of Biggs are shown on Figure A-10. As seen on this map, all of the City is in the Generally Moderate liquefaction potential area. Table A-21 gives a summary of parcel counts and values in the liquefaction areas in the City of Biggs. Table A-22 shows the property use, improved parcel count, improved values, estimated contents, total values and estimated loss of parcels that fall in a liquefaction area in the City.

Figure A-10 City of Biggs – Liquefaction Potential



0 0.25 0.5 Miles



Data Source: Butte County General Plan 2030, Butte County GIS, Cal-Atlas; Map Date: 3/1/2019.

Table A-21 City of Biggs – County and Value of Parcels by Liquefaction Potential

Liquefaction Potential	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Other Value	Estimated Contents Value	Total Value
Generally Moderate	765	674	\$26,022,313	\$69,188,866	\$10,556,358	\$49,186,118	\$155,425,116
City of Biggs Total	765	674	\$26,022,313	\$69,188,866	\$10,556,358	\$49,186,118	\$155,425,116

Source: Butte County General Plan, Butte County 3/28/2019 Parcel/Assessor’s Data

Table A-22 City of Biggs – County and Value of Parcels by Liquefaction Potential and Property Use

Property Use / Liquefaction Potential	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Other Value	Estimated Contents Value	Total Value
Generally Moderate							
Agricultural	6	3	\$151,112	\$151,082	\$810	\$151,082	\$854,126
Commercial	36	24	\$717,577	\$3,616,969	\$109,175	\$3,616,969	\$7,405,502
Industrial	14	8	\$1,727,064	\$12,707,659	\$10,439,743	\$19,061,489	\$46,918,515
Residential	691	639	\$23,426,560	\$52,713,156	\$6,630	\$26,356,578	\$100,246,973
Unknown	18	0	\$0	\$0	\$0	\$0	\$0
Generally Moderate Total	765	674	\$26,022,313	\$69,188,866	\$10,556,358	\$49,186,118	\$155,425,116
City of Biggs Total	765	674	\$26,022,313	\$69,188,866	\$10,556,358	\$49,186,118	\$155,425,116

Source: Butte County General Plan, Butte County 3/28/2019 Parcel/Assessor’s Data

Population at Risk

The liquefaction potential areas were overlaid on the parcel layer. Those residential parcel centroids that intersect the liquefaction potential areas were counted and multiplied by the 2010 Census Bureau average household factors for Biggs – 2.45. According to this analysis, there is a total population of 1,566 residents of the City at risk to liquefaction in the Generally Moderate area, with no population in the Generally High area. This is shown in Table A-23. The remainder of the population falls in the Generally Low liquefaction potential area.

Table A-23 City of Biggs – Count of Improved Residential Parcels and Population by Liquefaction Area

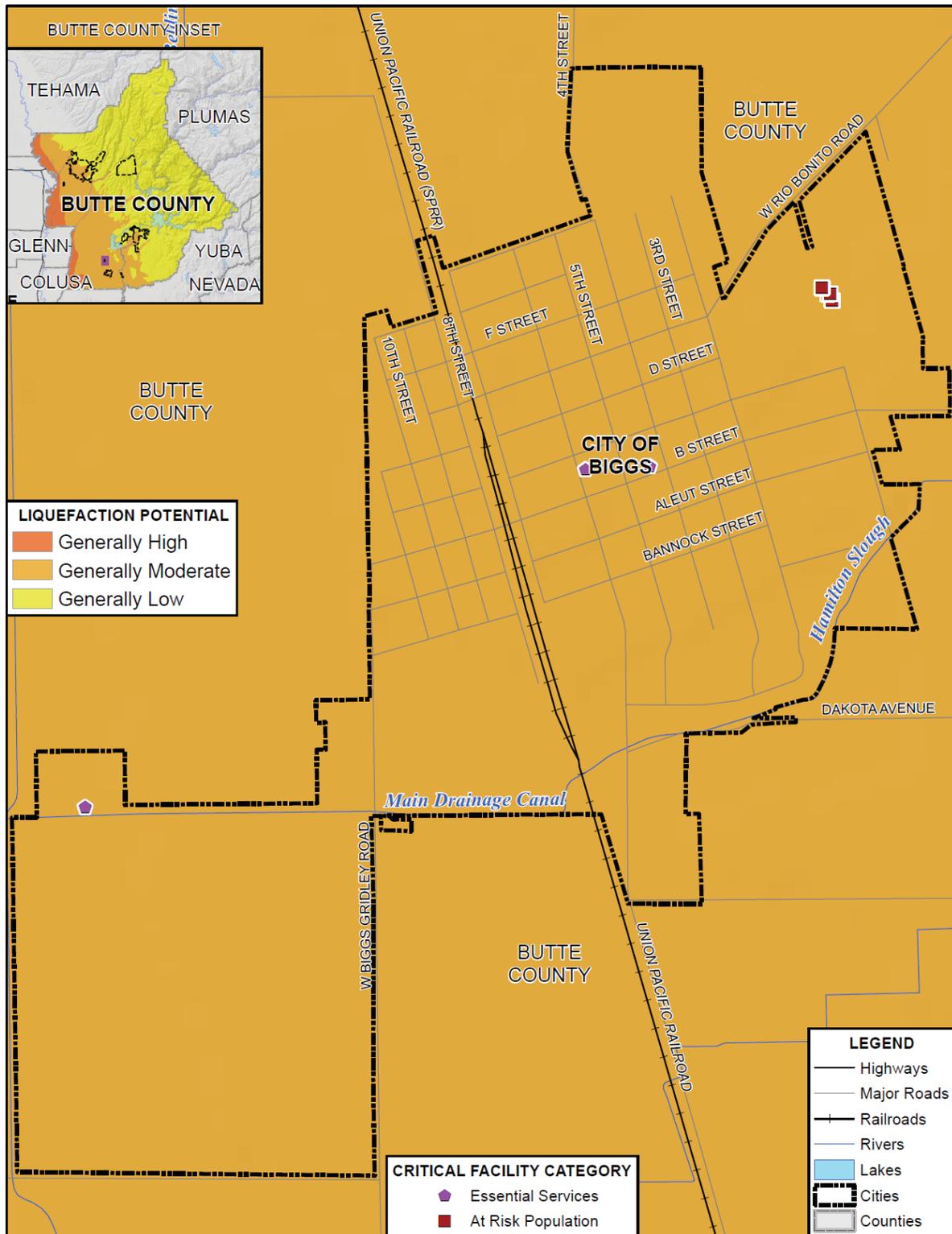
Jurisdiction	Generally Moderate		Generally High	
	Improved Residential Parcels	Population	Improved Residential Parcels	Population
Biggs	639	1,566	0	0

Source: Butte County General Plan, Butte County 3/28/2019 Parcel/Assessor’s Data, US Census Bureau

Critical Facilities at Risk

An analysis was performed on the critical facility inventory in Biggs in identified liquefaction potential areas. GIS was used to determine whether the facility locations intersects the liquefaction potential area. Details of critical facilities in a liquefaction potential areas in the City of Biggs are shown in Figure A-11 and detailed in Table A-24. Details of critical facility definition, type, name and address and jurisdiction by liquefaction potential are listed in Appendix F.

Figure A-11 City of Biggs – Critical Facilities in Liquefaction Potential Areas



0 0.25 0.5 Miles



Data Source: Butte County General Plan 2030, Butte County GIS, Cal-Atlas; Map Date: 7/1/2019.

Table A-24 City of Biggs – Critical Facilities by Liquefaction Potential

Liquefaction Potential / Critical Facility Category / Critical Facility Type	Facility Count
Generally Moderate	
Essential Services Facilities	
Wastewater Treatment Plant	1
Fire	1
Public Assembly Point / Evacuation Center	1
Essential Services Facilities Total	3
At Risk Population Facilities	
School	4
At Risk Population Facilities Total	4
Generally Moderate Total	7
Grand Total	7

Source: USGS, Butte County

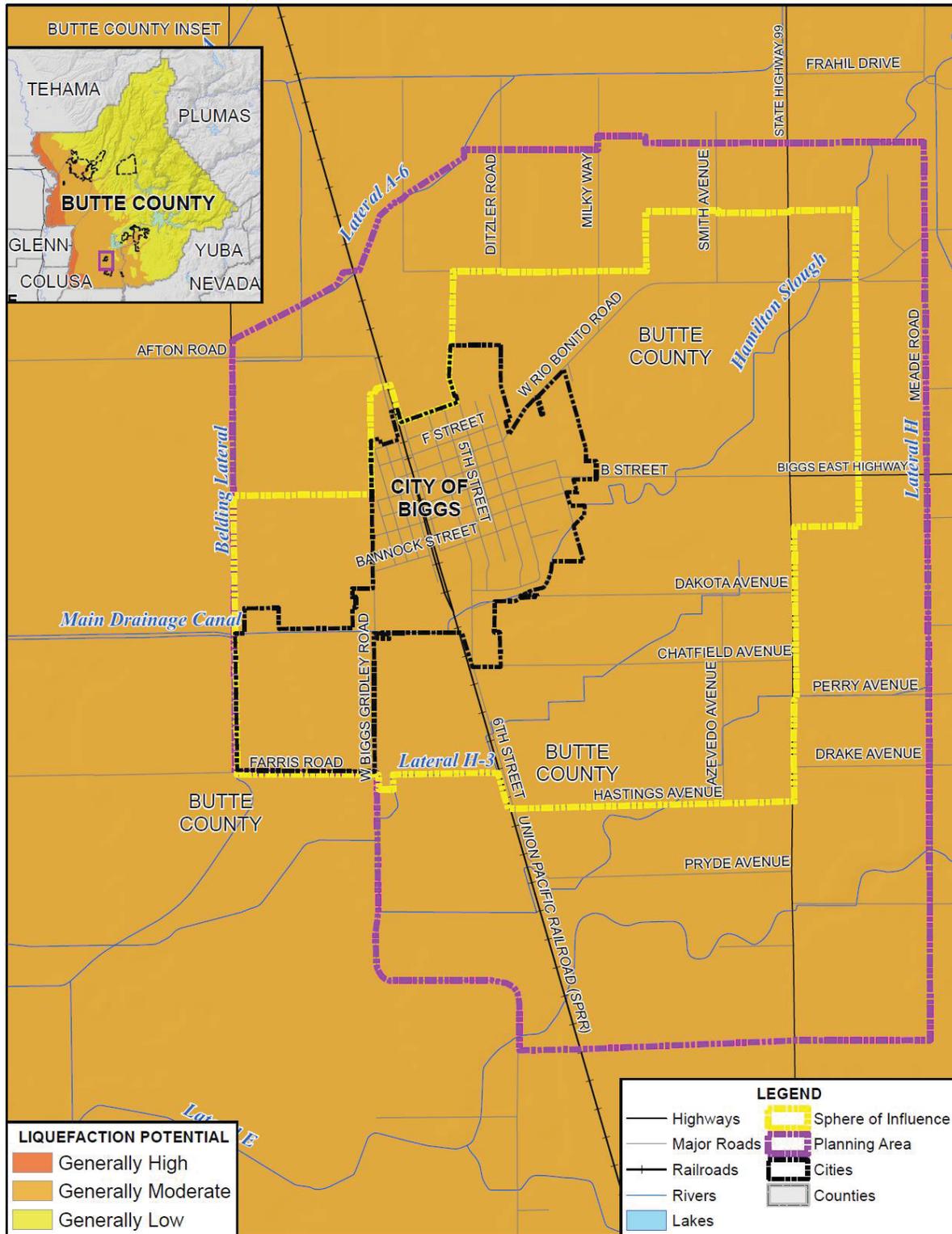
Future Development

Although new growth and development corridors would fall in the area affected by earthquake and liquefaction, given the small chance of major earthquake and the building codes in effect, development in the earthquake area will continue to occur. The City enforces the state building code, which mandates construction techniques that minimize seismic hazards. Future development in the City is subject to these building codes.

GIS Analysis

The City of Biggs has defined general growth areas through the City of Biggs General Plan Land Use Element. Specific growth areas have not been delineated for the City. Due to this, hazard analysis for future development will include maps, but no tabular analysis. Figure A-9 shows the location of liquefaction potential areas overlaid on the future development areas the City has available to develop.

Figure A-12 City of Biggs – Future Development in Liquefaction Potential Areas



Data Source: Butte County General Plan 2030, Butte County GIS, Cal-Atlas; Map Date: 10/12/2019.

Flood: 100/200/500-Year

Likelihood of Future Occurrence—Occasional/Unlikely

Vulnerability—High

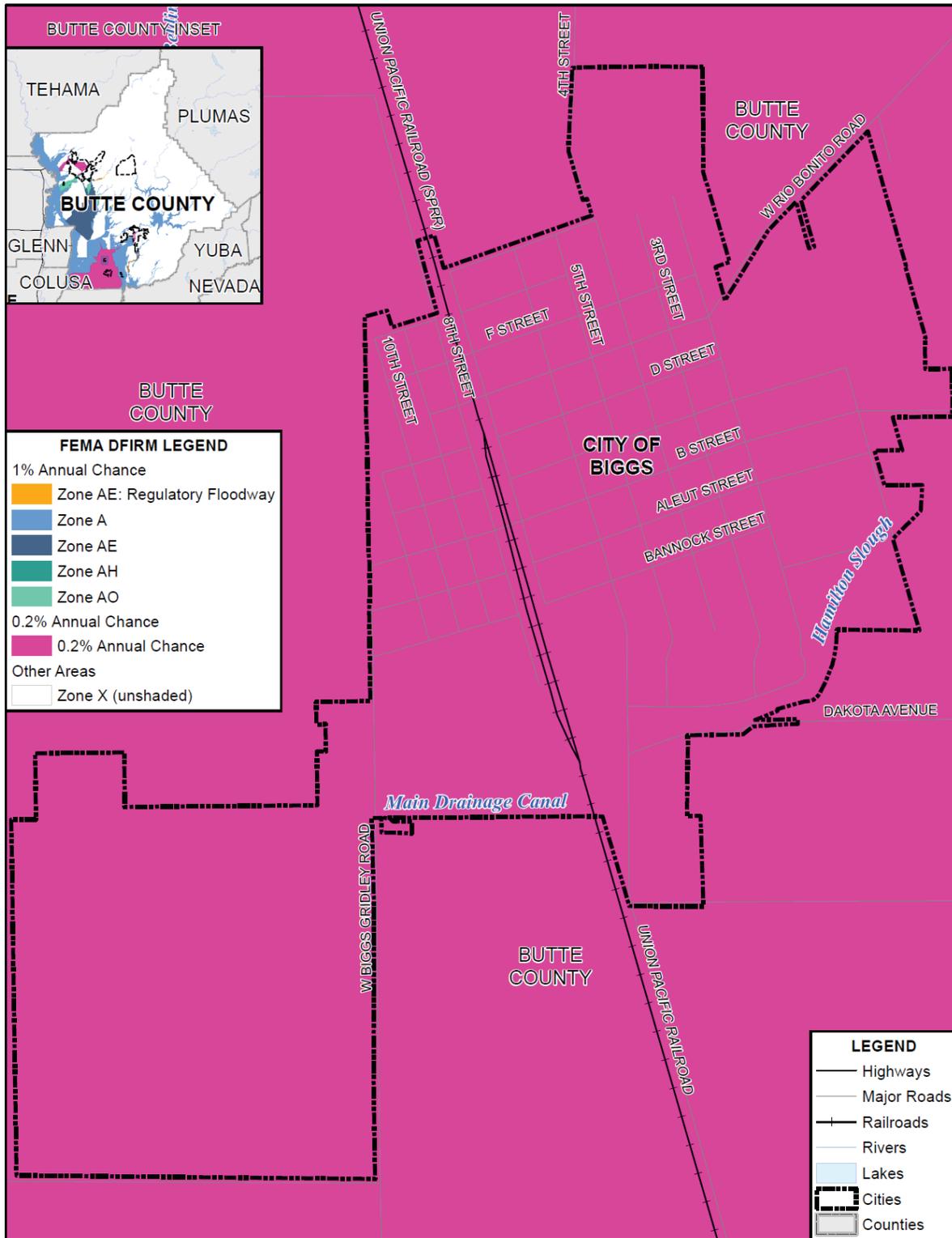
Hazard Profile and Problem Description

The probability and potential severity of flooding in Biggs is considered to be occasional and medium, respectively. This is due in part to the City's location downstream of Lake Oroville and the Thermalito Afterbay as well as the city's flat topography and proximity to the Feather River. As previously described in Section 4.2.11 of the Base Plan, the Butte County Planning Area and the City of Biggs have been subject to historical flooding. Biggs is traversed by several stream systems and is at risk to the 0.2% flood as well as to localized stormwater flooding.

Location and Extent

The entire City of Biggs is located outside of the 1% annual chance flood zone as defined by FEMA, due to protection provided by the Oroville Dam. However, the entire City is located in the 0.2% annual chance floodplain. This is seen in Figure A-13.

Figure A-13 City of Biggs – FEMA DFIRM Flood Zones



0 0.25 0.5 Miles



Data Source: FEMA DFIRM 1/6/2011, Butte County GIS, Cal-Atlas; Map Date: 3/1/2019.

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the City vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the City tends to have a shorter speed of onset, due to the amount of water that flows through the City. Geographical flood extent from the FEMA DFIRMs is shown in Table A-25.

Table A-25 City of Biggs – Geographical Flood Hazard Extents in FEMA DFIRM Flood Zones

Flood Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
1% Annual Chance Flood Hazard	0	0.00%	0	0.00%	0	0.00%
0.2% Annual Chance Flood Hazard	474	100.0%	201	42.41%	272	57.38%
Other Areas	0	0.00%	0	0.00%	0	0.00%
City of Biggs Total	474	100.0%	201	42.41%	272	57.38%

Source: Butte County 1/16/2011 DFIRM

Past Occurrences

A list of state and federal disaster declarations for Butte County from flooding is shown on Table A-26. These events also affected Biggs.

Table A-26 Butte County – State and Federal Disaster Declarations from Flood 1950-2018

Disaster Type	Federal Declarations		State Declarations	
	Count	Years	Count	Years
Flood (including heavy rain and storms)	17	1955, 1958, 1962, 1964, 1969, 1970, 1982, 1986, 1995 (twice), 1997, 1998, 2005, 2017 (three times), 2019	17	1950, 1955, 1958 (twice), 1962, 1963, 1969, 1970, 1982, 1986, 1990, 1995 (twice), 1997, 1998, 2008, 2017

Source: Cal OES, FEMA

The City noted no other past occurrences of flooding.

Vulnerability to Flood

The General Plan Safety Element noted that the probability and potential severity of flooding in Biggs is considered to be high. This is due in part to the City’s location downstream of Lake Oroville and the Thermalito Afterbay as well as the City’s flat topography and proximity to the Feather River. In response to the various ongoing regional and statewide efforts to study and address flood safety and levee stability issues, and FEMA’s process to reevaluate designated flood hazard areas, the City of Biggs prepared a local

flood hazard evaluation study that identified Biggs as being outside of the designated 100-year (1% annual chance flood) flood hazard zone. The City's preliminary flood hazard study determined that floodwaters moving westward from the Feather River would be diverted in part by the Sutter Butte Canal located east of the city and east of State Route 99, with additional diversions of water being made by Hamilton Slough located east of the City and west of State Route 99. As a result of this study and the various ongoing efforts to evaluate the stability of the levees along the Feather River, the City of Biggs was not identified by FEMA as being within a 100-year flood hazard area as part of its regional flood hazard remapping effort occurring in 2011.

Impacts

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. A car will float in less than two feet of moving water and can be swept downstream into deeper waters. This is one reason floods kill more people trapped in vehicles than anywhere else. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures, such as dam spillways. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Where flooding occurs in populated areas, warning and evacuation will be of critical importance to reduce life and safety impacts from any type of flooding.

Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures in the City. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred both within 0.2% annual chance floodplains and in other localized areas within the City. The vulnerability of the City to severe flooding is high as it can result in significant life safety, property damage, environmental, and economic impacts to the City.

Based on the vulnerability of Biggs to the flood hazard, the sections that follow describes significant assets at risk in the City of Biggs.

Values at Risk

GIS was used to determine the possible impacts of flooding within the City of Biggs. The methodology described in Section 4.3.7 of the Base Plan was followed in determining structures and values at risk to the 1% (100-year) and 0.2% (500-year) annual chance flood event. Analysis is presented in two parts:

- Summarized for the City by DFIRM Flood Zone
- Grouped by watershed and DFIRM Flood Zone

Values for Biggs Summarized by DFIRM Flood Zone

Table A-27 is a summary table for the City of Biggs. Parcel counts, values, estimated contents, and total values in the City are shown for the 1% and 0.2% annual chance flood zones, as well as for those properties that fall outside of the mapped FEMA DFIRM flood zones. As previously mentioned, there are no areas of the City within the 1% annual chance flood. Table A-28 breaks down Table A-27 and shows the property use, improved parcel count, improved values, estimated contents, and total values that fall in each floodplain in the City.

Table A-27 City of Biggs – Count and Value of Parcels at Risk in Summary DFIRM Flood Zones

Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Other Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard	0	0	\$0	\$0	\$0	\$0	\$0
0.2% Annual Chance Flood Hazard	766	674	\$26,022,313	\$69,188,866	\$10,556,358	\$49,186,118	\$154,953,655
Other Areas	0	0	\$0	\$0	\$0	\$0	\$0
City of Biggs Total	765	674	\$26,022,313	\$69,188,866	\$10,556,358	\$49,186,118	\$155,425,116

Source: FEMA /6/2011 DFIRM, Butte County 3/28/2019 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table A-28 City of Biggs – Count and Values of Parcels at Risk by Detailed Flood Zone and Property Use

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Other Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard							
Agricultural	0	0	\$0	\$0	\$0	\$0	\$0
Commercial	0	0	\$0	\$0	\$0	\$0	\$0
Industrial	0	0	\$0	\$0	\$0	\$0	\$0
Residential	0	0	\$0	\$0	\$0	\$0	\$0
Unknown	0	0	\$0	\$0	\$0	\$0	\$0
1% Annual Chance Total	0	0	\$0	\$0	\$0	\$0	\$0
0.2% Annual Chance Flood Hazard							

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Other Value	Estimated Contents Value	Total Value
Agricultural	6	3	\$151,112	\$151,082	\$810	\$151,082	\$454,086
Commercial	36	24	\$717,577	\$3,616,969	\$109,175	\$3,616,969	\$8,060,690
Industrial	14	8	\$1,727,064	\$12,707,659	\$10,439,743	\$19,061,489	\$43,935,955
Residential	691	639	\$23,426,560	\$52,713,156	\$6,630	\$26,356,578	\$102,502,924
Unknown	19	0	\$0	\$0	\$0	\$0	\$0
0.2% Annual Chance Total	765	674	\$26,022,313	\$69,188,866	\$10,556,358	\$49,186,118	\$155,425,116
Other Areas							
Agricultural	0	0	\$0	\$0	\$0	\$0	\$0
Commercial	0	0	\$0	\$0	\$0	\$0	\$0
Industrial	0	0	\$0	\$0	\$0	\$0	\$0
Residential	0	0	\$0	\$0	\$0	\$0	\$0
Unknown	0	0	\$0	\$0	\$0	\$0	\$0
Other Areas Total	0	0	\$0	\$0	\$0	\$0	\$0
Grand Total							
Grand Total	765	674	\$26,022,313	\$69,188,866	\$10,556,358	\$49,186,118	\$155,425,116

Source: FEMA /6/2011 DFIRM, Butte County 3/28/2019 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table A-29 summarizes Table A-28 above and shows City of Biggs loss estimates and shows improved values at risk by FEMA 1% and 0.2% annual chance flood zones.

Table A-29 City of Biggs – Flood Loss Estimates

Flood Zone	Total Parcel Count	Improved Parcel Count	Improved Structure Value	Other Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance	0	0	\$0	\$0	\$0	\$0	\$0	0.00
0.2% Annual Chance	765	674	\$69,188,866	\$10,556,358	\$49,186,118	\$128,931,342	\$25,786,268	24.38%
Grand Total	765	674	\$69,188,866	\$10,556,358	\$49,186,118	\$128,931,342	\$25,786,268	24.38%

Source: FEMA /6/2011 DFIRM, Butte County 3/28/2019 Parcel/Assessor's Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

According to Table A-28 and Table A-29, the City of Biggs has no parcels or values in the 1% annual chance floodplain, and 674 improved parcels and \$129 million of structure and contents values in the 0.2% annual chance floodplain. These values can be refined a step further. Applying the 20 percent damage factor as previously described in Section 4.3.6 of the Base Plan, there is a 0.2% chance in any given year of a flood event causing \$25.8 million in damage in the City of Biggs. The loss ratio of 24.38% indicates that flood losses for 0.2% annual chance flooding would be overwhelming and difficult to recover from.

Values for Biggs by Watershed

Analysis was performed to determine DFIRM Flood Zones and which watershed they are located in. This analysis is presented in three tables:

- Table A-30 breaks the parcels and values of the City into the two watersheds that fall in the City.
- Table A-31 breaks down Table A-30 to show the parcels and values in each watershed in each FEMA DFIRM flood zone
- Table A-32 breaks down Table A-31 into property use categories. This table shows the watershed by both DFIRM flood zone and property use type.

Table A-30 City of Biggs – Count and Value of Parcels by Watershed

Watershed	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Other Value	Estimated Contents Value	Total Value
Dry Creek / Cherokee Canal Watershed	681	594	\$23,151,328	\$63,616,355	\$10,556,358	\$46,367,922	\$144,548,730
Feather River / Lower Honcut Creek Watershed	84	80	\$2,870,985	\$5,572,511	\$0	\$2,818,196	\$10,876,386
City of Biggs Total	765	674	\$26,022,313	\$69,188,866	\$10,556,358	\$49,186,118	\$155,425,116

Source: Butte County Assessor's Office

Table A-31 City of Biggs – Count and Value of Parcels by Watershed and Summary DFIRM Zones

Watershed / Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Other Value	Estimated Contents Value	Total Value
Dry Creek / Cherokee Canal Watershed							
1% Annual Chance Flood Hazard	0	0	\$0	\$0	\$0	\$0	\$0

Watershed / Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Other Value	Estimated Contents Value	Total Value
0.2% Annual Chance Flood Hazard	681	594	\$23,151,328	\$63,616,355	\$10,556,358	\$46,367,922	\$144,548,730
Other Areas	0	0	\$0	\$0	\$0	\$0	\$0
Dry Creek / Cherokee Canal Watershed Total	681	594	\$23,151,328	\$63,616,355	\$10,556,358	\$46,367,922	\$144,548,730
Feather River / Lower Honcut Creek Watershed							
1% Annual Chance Flood Hazard	0	0	\$0	\$0	\$0	\$0	\$0
0.2% Annual Chance Flood Hazard	84	80	\$2,870,985	\$5,572,511	\$0	\$2,818,196	\$10,876,386
Other Areas	0	0	\$0	\$0	\$0	\$0	\$0
Feather River / Lower Honcut Creek Watershed Total	84	80	\$2,870,985	\$5,572,511	\$0	\$2,818,196	\$10,876,386
City of Biggs Total							
City of Biggs Total	765	674	\$26,022,313	\$69,188,866	\$10,556,358	\$49,186,118	\$155,425,116

Source: Butte County Assessor's Office

Table A-32 City of Biggs – Count and Value of Parcels by Watershed, DFIRM Flood Zone, and Property Use

Watershed / Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Other Value	Estimated Contents Value	Total Value
Dry Creek / Cherokee Canal Watershed							
0.2% Annual Chance Flood Hazard							
Agricultural	5	2	\$105,709	\$87,201	\$810	\$87,201	\$680,961
Commercial	36	24	\$717,577	\$3,616,969	\$109,175	\$3,616,969	\$7,405,502
Industrial	14	8	\$1,727,064	\$12,707,659	\$10,439,743	\$19,061,489	\$46,918,515
Residential	609	560	\$20,600,978	\$47,204,526	\$6,630	\$23,602,263	\$89,543,752
Unknown	17	0	\$0	\$0	\$0	\$0	\$0
0.2% Annual Chance Flood Hazard Total	681	594	\$23,151,328	\$63,616,355	\$10,556,358	\$46,367,922	\$144,548,730
Dry Creek / Cherokee Canal Watershed Total	681	594	\$23,151,328	\$63,616,355	\$10,556,358	\$46,367,922	\$144,548,730
Feather River / Lower Honcut Creek Watershed							
0.2% Annual Chance Flood Hazard							

Watershed / Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Other Value	Estimated Contents Value	Total Value
Agricultural	1	1	\$45,403	\$63,881	\$0	\$63,881	\$173,165
Commercial	0	0	\$0	\$0	\$0	\$0	\$0
Industrial	0	0	\$0	\$0	\$0	\$0	\$0
Residential	82	79	\$2,825,582	\$5,508,630	\$0	\$2,754,315	\$10,703,221
Unknown	1	0	\$0	\$0	\$0	\$0	\$0
0.2% Annual Chance Flood Hazard Total	84	80	\$2,870,985	\$5,572,511	\$0	\$2,818,196	\$10,876,386
Feather River / Lower Honcut Creek Watershed Total	84	80	\$2,870,985	\$5,572,511	\$0	\$2,818,196	\$10,876,386
City of Biggs Total	765	674	\$26,022,313	\$69,188,866	\$10,556,358	\$49,186,118	\$155,425,116

Source: Butte County Assessor's Office

Flooded Acres

Also of interest is the land area affected by the various flood zones. The following is an analysis of flooded acres in the City in comparison to total area within the City limits. The same methodology, as discussed in Section 4.3.8 of the Base Plan, was used for the City of Biggs as well as for the County as a whole. Table A-33 represents a detailed and summary analysis of total acres for each FEMA DFIRM flood zone in the City.

Table A-33 City of Biggs – Flooded Acres

Flood Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
1% Annual Chance Flood Hazard	0	0.00%	0	0.00%	0	0.00%
0.2% Annual Chance Flood Hazard	474	0.03%	201	0.04%	272	0.03%
Other Areas	0	0.00%	0	0.00%	0	0.00%
City of Biggs Total	474	0.03%	201	0.04%	272	0.03%

Source: FEMA DFIRM 1/6/2011

Population at Risk

The DFIRM flood zones were overlaid on the parcel layer. Those residential parcel centroids that intersect the flood zones were counted and multiplied by the 2010 Census Bureau average household factors for Biggs – 2.45. According to this analysis, there is a total population of 0 and 1,566 residents of the City at risk to flooding in the 1% and 0.2% annual chance floodplains, respectively. This is shown in Table A-34.

Table A-34 City of Biggs – Count of Improved Residential Parcels and Population by Flood Zone

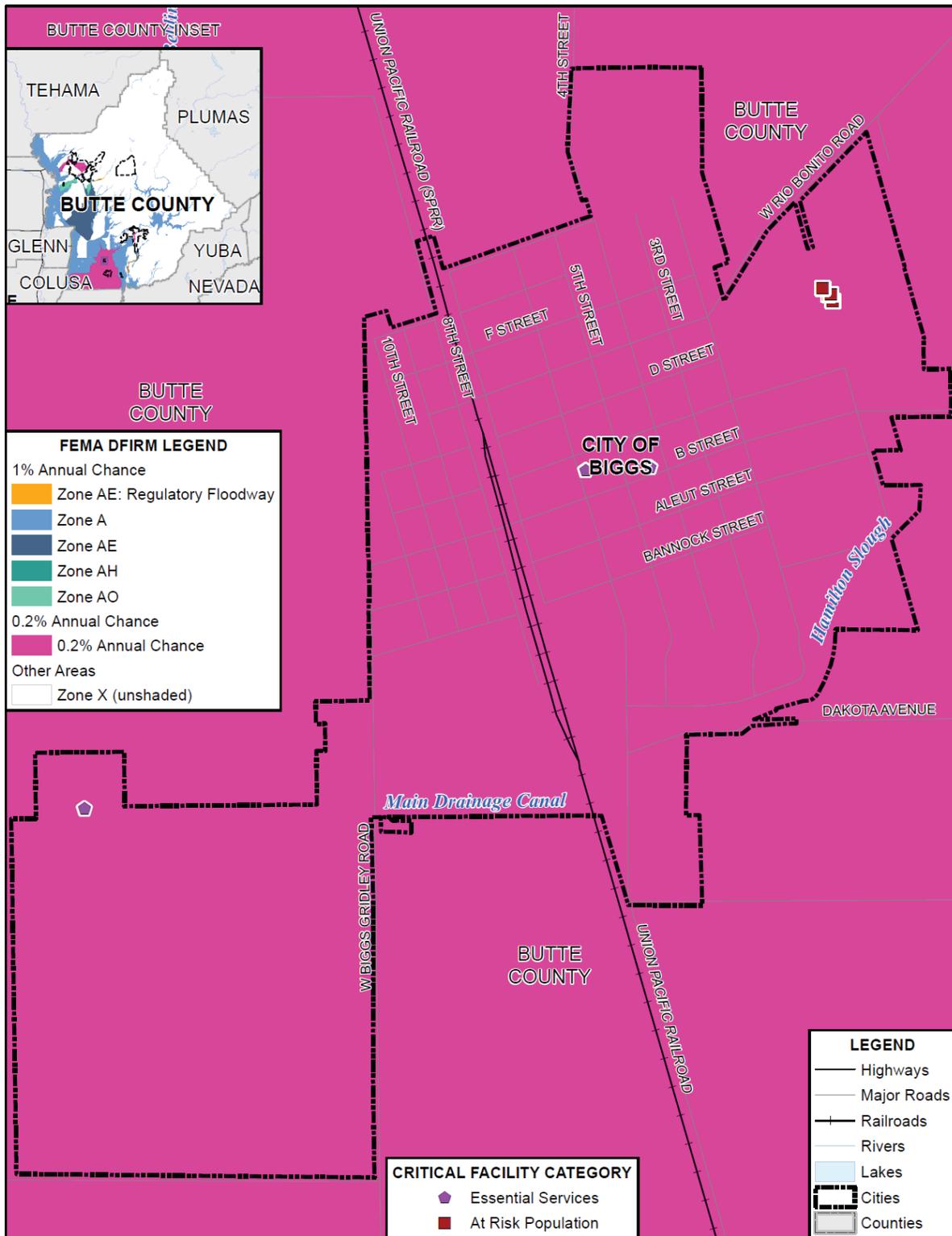
Jurisdiction	1 % Annual Chance Flooding		0.2% Annual Chance Flooding	
	Improved Residential Parcels	Population	Improved Residential Parcels	Population
Biggs	0	0	639	1,566

Source: FEMA DFIRM 1/6/2011, Butte County 3/28/2019 Parcel/Assessor's Data, US Census Bureau

Critical Facilities at Risk

An analysis was performed on the critical facility inventory in Biggs in DFIRM flood zones. GIS was used to determine whether the facility locations intersects a DFIRM flood zone and, if so, what zone it intersects. Details of critical facilities in a DFIRM flood zones in the City of Biggs are shown in Figure A-14 and detailed in Table A-35. Details of critical facility definition, type, name and address and jurisdiction by flood zone are listed in Appendix F.

Figure A-14 City of Biggs – Critical Facilities in DFIRM Flood Zones



0 0.25 0.5 Miles



Data Source: FEMA DFIRM 1/6/2011, Butte County GIS, Cal-Atlas; Map Date: 7/1/2019.

Table A-35 City of Biggs – Critical Facilities in DFIRM Flood Zones

Flood Zone/Critical Facility Category / Critical Facility Type	Facility Count
0.2% Annual Chance Flood Hazard	
Essential Services Facilities	
Wastewater Treatment Plant	1
Fire	1
Public Assembly Point / Evacuation Center	1
Essential Services Facilities Total	3
At Risk Population Facilities	
School	4
At Risk Population Facilities Total	4
Zone X (shaded) Total	7
0.2% Annual Chance Flood Hazard Total	7
Grand Total	
	7

Source: FEMA DFIRM 1/6/2011, Butte County

Insurance Coverage, Claims Paid, and Repetitive Losses

The City of Biggs joined the National Flood Insurance Program (NFIP) on June 4, 1989. The City does not participate in CRS program. NFIP data indicates that as of July 19, 2018, there were 24 flood insurance policies in force in the City with \$6,937,000 of coverage. Of the 24 policies, all were residential (single-family homes) in B, C, and X zones. The GIS parcel analysis detailed above identified no improved parcels in the 1% annual chance flood zone. There has been 1 historical claim for flood losses totaling \$6,481.97. NFIP data further indicates that there are no repetitive loss (RL) or severe repetitive loss (SRL) buildings in Biggs.

California Department of Water Resources Best Available Maps (BAM)

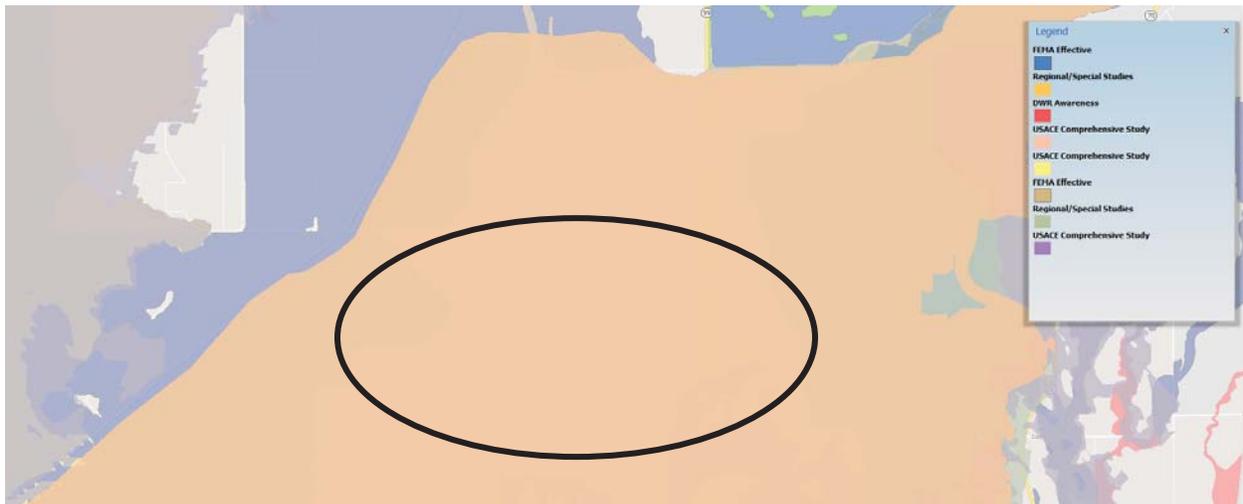
The FEMA regulatory maps provide just one perspective on flood risks in Butte County. Senate Bill 5 (SB 5), enacted in 2007, authorized the California DWR to develop the Best Available Maps (BAM) displaying 100- and 200-year floodplains for areas located within the Nevada-San Joaquin (SAC-SJ) Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 500-year floodplains.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and reflect only the 100-year event risk, the BAMs are provided for informational purposes and are intended to reflect current 100-, 200-(as applicable), and 500-year event risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 100-year floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 100-year floodplains. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 100-, 200-, and 500-year floodplain areas. These studies are used for different planning and/or

regulatory applications, and for each flood frequency may use varied analytical and quality control criteria depending on the study type requirements.

The value in the BAMs is that they provide a bigger picture view of potential flood risk to the City than that provided in the FEMA DFIRMs. This provides the community and residents with an additional tool for understanding potential flood hazards not currently mapped as a regulated floodplain. Improved awareness of flood risk can reduce exposure to flooding for new structures and promote increased protection for existing development. Informed land use planning will also assist in identifying levee maintenance needs and levels of protection. By including the FEMA 100-year floodplain, it also supports identification of the need and requirement for flood insurance. The BAM map for Biggs is shown in Figure A-15.

Figure A-15 City of Biggs – Best Available Map



Source: California DWR

Legend explanation: Blue - FEMA 1%, Orange – Local 1% (developed from local agencies), Red – DWR 1% (Awareness floodplains identify the 1% annual chance flood hazard areas using approximate assessment procedures.), Pink – USACE 1% (2002 Sac and San Joaquin River Basins Comp Study), Yellow – USACE 0.5% (2002 Sac and San Joaquin River Basins Comp Study), Tan – FEMA 0.2%, Grey – Local 0.2% (developed from local agencies), Purple – USACE 0.2%(2002 Sac and San Joaquin River Basins Comp Study).

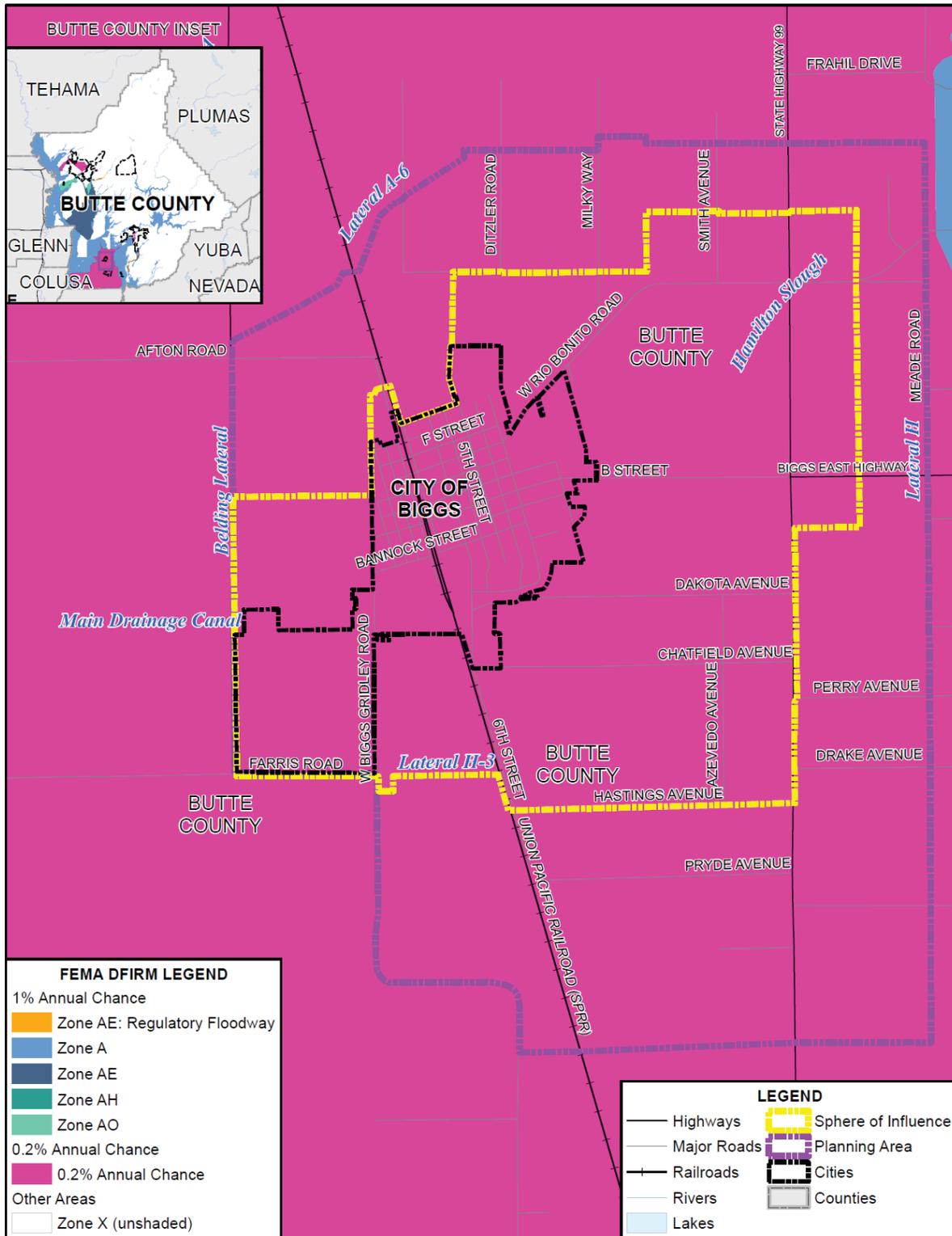
Future Development

Since the City has no 1% annual chance floodplain, all future development will happen outside of the 1% annual chance floodplain, and will occur within the 0.2% floodplain.

GIS Analysis

The City of Biggs has defined general growth areas through the City of Biggs General Plan Land Use Element. Specific growth areas have not been delineated for the City. Due to this, hazard analysis for future development will include maps, but no tabular analysis. Figure A-16 shows the location of DFIRM flood zones overlaid on the future development areas the City has available to develop.

Figure A-16 City of Biggs – Future Development in DFIRM Flood Zones



0 0.5 1 Miles



Data Source: FEMA DFIRM 1/6/2011, Butte County GIS, Cal-Atlas; Map Date: 10/12/2019.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Flooding and other issues caused by severe weather events, primarily heavy rains and severe storms, can often pose a risk to the community. Primary concerns include impacts to infrastructure that provides a means of ingress and egress throughout the community. Primary concerns include impacts to infrastructure that provides a means of ingress and egress throughout the community.

Location and Extent

As described above, the City is subject to localized flooding throughout the City. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the City vary by location. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the City tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

The City noted the following past occurrences of localized flooding:

- The City experiences localized flooding, primarily in the North and Northeast portions of the City a few times each decade. Including most recently in February 2019. During the February 2019 events City staff carried out vigorous efforts to pump water out of affected areas and prevented property loss and damage.

Vulnerability to Localized Flooding

There are two primary sources of stormwater runoff that are of concern to the City: regional runoff, which originates outside the City, and runoff from properties located inside the City. Regional runoff has historically posed the greatest threat of flooding to properties in the City; however, flood control facilities such as Oroville Dam have minimized this threat considerably. As a result, the more immediate concern for the City is the collection, conveyance, and discharge of stormwater from properties within the City.

Historically, the City experienced localized flooding issues at specific locations in the City. However, as a result of numerous stormwater drainage projects including the installation of a new stormwater drainage system on the west-side of the City, almost all of the areas that once presented issues in the City have been addressed.

Still existing is an area of local flooding located on the north end of Third Street and Second Street, and East end of C Street. This area of flooding encompasses some thirty residential lots. The high-water level reaches an elevation of about 8 to 10 inches above the street curb. Specific storm drainage projects will be required to minimize this issue, including improving and increasing the capacity of Reclamation District

833 drainage facilities. Also, when the Sacramento River floods, localized flooding is possible because water backs up into the drainage channels and cannot be evacuated and removed from the City.

The City tracks localized flooding areas. Affected localized flood areas identified by the County in the City of Biggs are summarized in Table A-36.

Table A-36 City of Biggs – Road List of Localized Flooding Problem Areas

Road Name	Flooding	Pavement Deterioration	Washout	High Water	Landslide/ Mudslide	Debris	Downed Trees
Afton Rd	X						
Central House Rd	X						
Colusa Hwy	X						
Lower Honcut Rd.	X						
Middle Honcut Rd	X						
Stimpson Rd.	X						
West Evans Reimer Rd.	X						

Source: City of Biggs

The role of Reclamation District 833 (RD 833) is of special significance to flood control in and around Biggs. RD 833 channels surround the City and serve the dual purposes of providing and conveying agricultural irrigation water as well as removing storm runoff from the City. Increases in development within the region, coupled with the nearly flat terrain, result in the potential for flooding miles “downstream” from Biggs to the southwest, which is known as the Butte Sink. Avoiding increases in stormwater runoff entering the RD 833 channels has become an important concern due to the potential for increase in downstream flooding.

Impacts

Localized flooding and other issues caused by severe weather events, primarily heavy rains and thunderstorms, can often pose a risk to the community. Primary concerns include impacts to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits.

Future Development

Future development in the City will add more impervious surfaces and need to drain those waters. The City has had an excellent track record of addressing localized flooding in the past with recent updates to their drainage infrastructure, and will continue those efforts in the future.

Hazardous Materials Transportation

Likelihood of Future Occurrence–Unlikely

Vulnerability–Medium

Hazard Profile and Problem Description

According to the Environmental Protection Agency (EPA), a hazardous material is any item or agent (biological, chemical, physical) which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. Hazardous materials can be present in any form; gas, solid, or liquid. Environmental or atmospheric conditions can influence hazardous materials if they are uncontained.

The significance of environmental or human exposure to hazardous materials depends on the type, location, and quantity of the material released. In the Biggs area, hazardous materials may be transported via roadways, railways, and airways. Hazardous materials and wastes are regulated by federal and state laws and are required to be recycled or properly disposed. Transport of hazardous materials is also heavily regulated. However, illegal storage and disposal and unintentional releases of hazardous materials from leaks and accidents can still occur.

The Union Pacific Railroad line passes through the City of Biggs between Seventh and Eighth streets. Hazardous materials are regularly shipped via the rail line and, while unlikely, an incident involving a rail accident within the City could have devastating effects.

The City has little control over the types of materials that are shipped via the rail line and State Route 99. With regard to government activities, the content of shipments may be confidential for reasons of security and/or is generally unknown to the City. While the City has little influence over the types of material transported via the rail line, the potential for rail incidents can be reduced by ensuring that at-grade crossings within the City are operating in a safe and effective manner.

One of the primary concerns is the safety of pedestrians along the tracks and vehicles utilizing at-grade crossings on B Street, E Street, and F Street. The second primary concern, while unlikely, is an incident involving derailment of a train in the vicinity of Biggs and the hazards that could result from spillage of the cargo which the train is transporting.

The 2014 General Plan Safety Element noted that several herbicides and insecticides that are classified by the California Department of Food and Agriculture as potentially harmful to humans are used in Butte County. Although injuries from agricultural chemicals are experienced predominantly in occupational situations, some hazards may occur on neighboring lands during application. For example, if crop spraying adjacent to urban uses occurs on a windy day, drift could create a hazard. The hazards that farming operations present for urban uses can be minimized by using organic farming practices, switching to crops with natural pest resistance, or maintaining buffer zones between urban and agricultural uses.

Location and Extent

In the City of Biggs, a mobile hazardous event is most likely to occur along the Union Pacific railroad tracks or on State Route 99. Trucks and rail cars that use these transportation corridors commonly carry a variety of hazardous materials including gasoline, other petroleum products, and other chemicals known to cause human health problems. As such, the speed on onset of hazardous materials spill is short. The duration of the event depends on multiple factors, including the type and amount of material spilled, and the volatility of the chemical spilled.

Past Occurrences

The United States Department of Transportation Pipeline and Hazardous Materials Safety Administration's (PHMSA) Office of Hazardous Materials Safety performs a range of functions to support the safe transport of hazardous material. One of these functions is the tracking of hazardous materials incidents in the United States. The database was searched for hazardous materials incidents in Biggs. The PHMSA database showed no past occurrences for the City.

Vulnerability to Hazardous Materials

It is often quite difficult to quantify the potential losses from human-caused hazards. While the facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified assets will vary from event to event and depend on the type, location, and nature of a specific hazardous material incident. Given the difficulty in quantifying the losses associated with technological hazards such as this, this section focuses on analyzing key City assets relative to the hazardous materials transportation corridors (highway and rail).

Impacts

Impacts from hazardous materials vary by location and severity of any given event and will likely only affect certain areas of the City during specific times. Impacts in the City include damage to properties, critical facilities, and infrastructure. In addition, injuries or deaths may result, depending on location and severity of the spill.

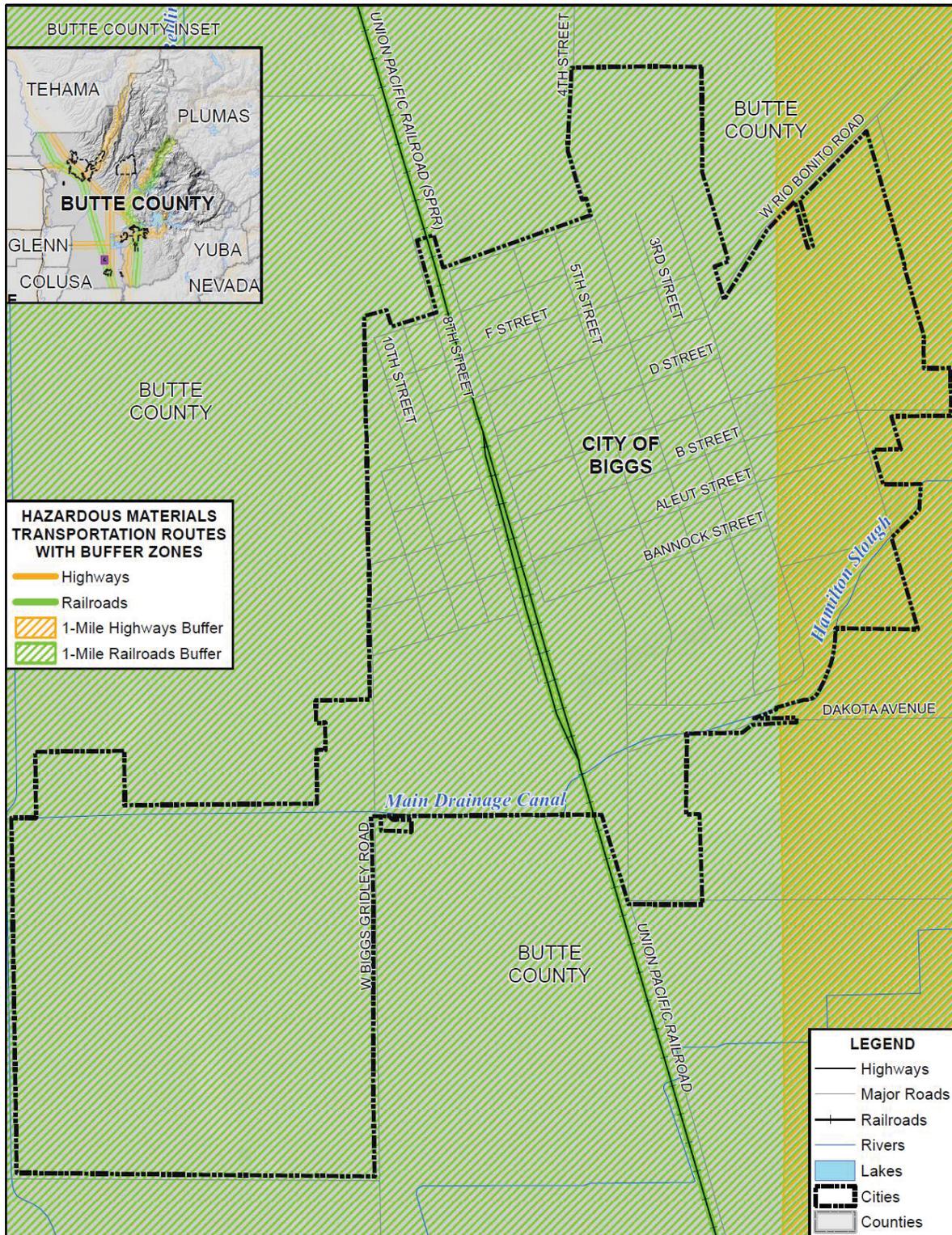
Values at Risk

It is often quite difficult to quantify the potential losses from human-caused hazards. While the facilities themselves have a tangible dollar value, loss from a human-caused hazard often inflicts an even greater toll on a community, both economically and emotionally. The impact to identified assets will vary from event to event and depend on the type, location, and nature of a specific hazardous material incident. Given the difficulty in quantifying the losses associated with technological hazards, this section focuses on analyzing key City assets relative to the hazardous materials sites and transportation corridors (highway and rail).

An analysis of the potential vulnerability of the City to a transportation-related hazardous materials release was conducted using GIS within identified transportation corridors. To evaluate the areas most vulnerable, a one-mile buffer was applied to both sides of State Route 99; as well as the Union Pacific railroad tracks. The result is a two-mile buffer zone around each transportation corridor that is used for risk-analysis. More

information on this methodology can be found in Section 4.3.9 of the Base Plan. The buffer zone is shown on Figure A-17. Results of the risk analysis are summarized on Table A-37. Table A-38 breaks down Table A-37 by to show parcels and values at risk broken down by property use type.

Figure A-17 City of Biggs – Hazardous Material Buffer Zones



0 0.25 0.5 Miles



Data Source: CalTrans Truck Network 12/2016, Butte County GIS, Cal-Atlas; Map Date: 3/1/2019.

Table A-37 City of Biggs – Count and Value of Parcels in Hazardous Material Buffer Zones by Route Type

Hazardous Materials Transportation Route	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Other Value	Estimated Contents Value	Total Value
Highways and Railroads	91	77	\$2,503,454	\$5,617,995	\$0	\$2,808,998	\$10,636,294
Railroads	674	597	\$23,518,859	\$63,570,871	\$10,556,358	\$46,377,120	\$144,788,822
City of Biggs Total	765	674	\$26,022,313	\$69,188,866	\$10,556,358	\$49,186,118	\$155,425,116

Source: CalTrans, Butte County 3/28/2019 Parcel/Assessor's Data

Table A-38 City of Biggs – Count and Value of Parcels in Hazardous Material Buffer Zones by Route Type and Property Use

Hazardous Materials Transportation Route / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Other Value	Estimated Contents Value	Total Value
Highways and Railroads							
Agricultural	0	0	\$0	\$0	\$0	\$0	\$0
Commercial	0	0	\$0	\$0	\$0	\$0	\$0
Industrial	0	0	\$0	\$0	\$0	\$0	\$0
Residential	86	77	\$2,503,454	\$5,617,995	\$0	\$2,808,998	\$10,636,294
Unknown	5	0	\$0	\$0	\$0	\$0	\$0
Highways and Railroads Total	91	77	\$2,503,454	\$5,617,995	\$0	\$2,808,998	\$10,636,294
Railroads							
Agricultural	6	3	\$151,112	\$151,082	\$810	\$151,082	\$854,126
Commercial	36	24	\$717,577	\$3,616,969	\$109,175	\$3,616,969	\$7,405,502
Industrial	14	8	\$1,727,064	\$12,707,659	\$10,439,743	\$19,061,489	\$46,918,515
Residential	605	562	\$20,923,106	\$47,095,161	\$6,630	\$23,547,581	\$89,610,680
Unknown	13	0	\$0	\$0	\$0	\$0	\$0
Railroads Total	674	597	\$23,518,859	\$63,570,871	\$10,556,358	\$46,377,120	\$144,788,822
City of Biggs Total							
City of Biggs Total	765	674	\$26,022,313	\$69,188,866	\$10,556,358	\$49,186,118	\$155,425,116

Source: Cal Trans, Butte County 3/28/2019 Parcel/Assessor's Data

Populations at Risk

To determine the populations at risk from a transportation-related hazardous materials release within identified transportation corridors, an analysis was performed using GIS to determine the residential

population that resides within the two-mile buffer zone of the highway and railroad corridors. Using GIS, the buffered corridor was overlaid on the improved residential parcel data and results tabulated for the City of Biggs as found in Table A-39. Those parcel centroids that intersect the buffered corridor were counted and multiplied by the 2010 Census Bureau average household factors for the City.

Table A-39 City of Biggs – Populations at Risk in Hazardous Material Buffer Zones

Route	Improved Residential Parcels	Population
Highways Only	0	0
Highways and Railroads	77	189
Railroads Only	562	1,377

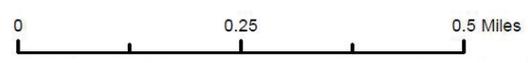
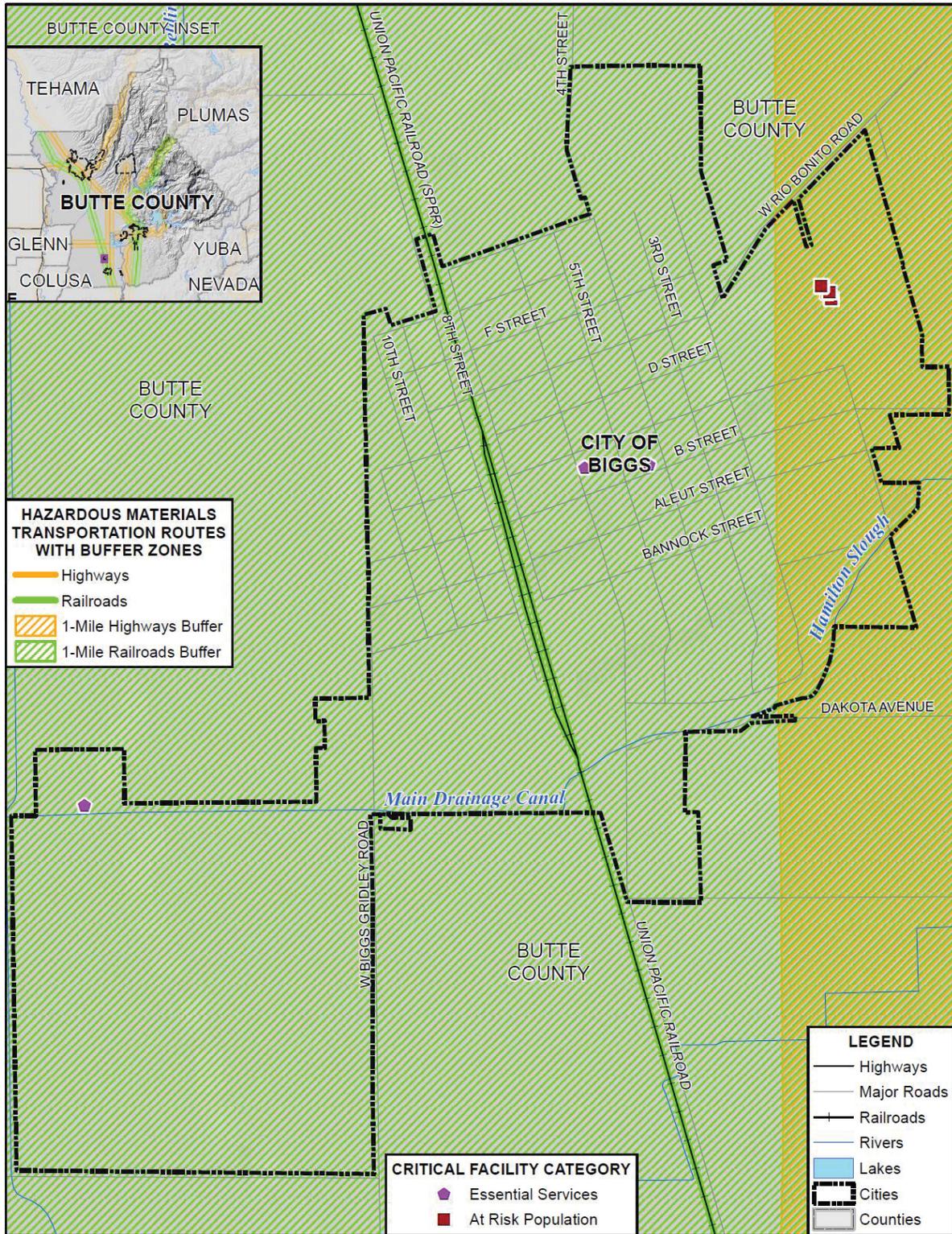
Source: Cal Trans, Butte County GIS, US Census Bureau

* Census Bureau 2010 average household sizes are: Biggs – 2.45

Critical Facilities

To determine the critical facilities at risk from a transportation-related hazardous materials release within identified transportation corridors, an analysis was performed using GIS to determine the facilities located within the two-mile buffer zone of the highway and railroad corridors. Using GIS, the buffered corridor was overlaid on the critical facilities layer and results tabulated for the City, shown in Figure A-18 and detail in Table A-40. There are 4 facilities in the buffered corridor in the City of Biggs.

Figure A-18 City of Biggs– Critical Facilities in Hazardous Material Buffer Zones



Data Source: CalTrans Truck Network 12/2016, Butte County GIS, Cal-Atlas; Map Date: 7/1/2019.

Table A-40 City of Biggs– Critical Facilities in Hazardous Material Buffer Zones

Hazardous Materials Route / Critical Facility Category / Critical Facility Type	Facility Count
Hwy 99	
At Risk Population Facilities	
School	4
At Risk Population Facilities Total	4
Hwy 99 Total	4
Grand Total	
	4

Source: Cal Trans, National Pipeline Mapping System 2016, Butte County GIS

Impacts

Impacts from hazardous materials vary by location and severity of any given event and will likely only affect certain areas of the City during specific times. Impacts in the City include damage to properties, critical facilities, and infrastructure. In addition, injuries or deaths may result, depending on location and severity of the spill.

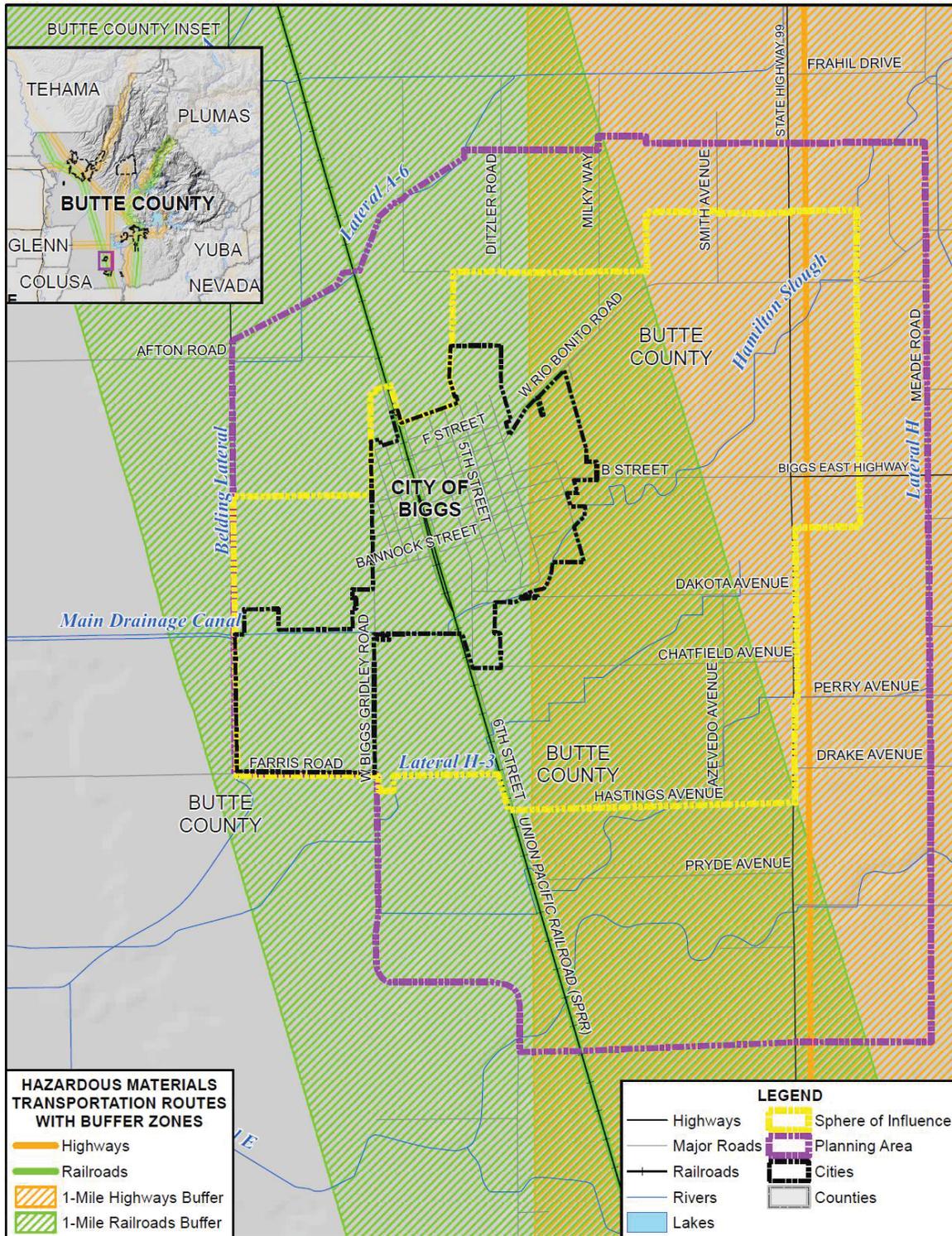
Future Development

Development will continue to happen within hazardous materials transportation zones. Those who choose to develop in these areas should be made aware of the risks associated with living within close proximity to a hazardous materials transportation route.

GIS Analysis

The City of Biggs has defined general growth areas through the City of Biggs General Plan Land Use Element. Specific growth areas have not been delineated for the City. Due to this, hazard analysis for future development will include maps, but no tabular analysis. Figure A-19 shows the location hazardous materials transportation buffer zones overlaid on the future development areas the City has available to develop.

Figure A-19 City of Biggs – Future Development in Hazardous Materials Transportation Buffer Zones



Data Source: CalTrans Truck Network 12/2016, Butte County GIS, Cal-Atlas; Map Date: 10/12/2019.

Levee Failure

Likelihood of Future Occurrence–Unlikely

Vulnerability–Medium

Hazard Profile and Problem Description

A levee is a raised area that runs along the banks of a stream or canal. Levees reinforce the banks and help prevent flooding by containing higher flow events to the main stream channel. By confining the flow to a narrower stream channel, levees can also increase the speed of the water. Levees can be natural or man-made. A natural levee is formed when sediment settles on the stream bank, raising the level of the land around the stream.

The City of Biggs General Plan Safety Element noted that in response to the various ongoing regional and statewide efforts to study and address flood safety and levee stability issues, and FEMA’s process to reevaluate designated flood hazard areas, the City of Biggs prepared a local flood hazard evaluation study that identified Biggs as being outside of the designated 100-year (1% annual chance) flood hazard zone. The City’s preliminary flood hazard study determined that floodwaters moving westward from the Feather River would be diverted in part by the Sutter Butte Canal located east of the city and east of State Route 99, with additional diversions of water being made by Hamilton Slough located east of the city and west of State Route 99. As a result of this study and the various ongoing efforts to evaluate the stability of the levees along the Feather River, the City of Biggs was not identified by FEMA as being within a 100-year flood hazard area as part of its regional flood hazard remapping effort.

Location and Extent

There is not a scientific scale or measurement system in place for levee failure. Maps showing inundation depths due to a levee failure in the County and the City can be seen in the Base Plan in Section 4.2.16. Expected flood depths in the City are not known. The speed of onset is slow as the river rises, but if a levee fails the warning times are short for those in the inundation area. The duration of levee failure risk times can be hours to weeks, depending on the river flows that the levee holds back. The HMPC noted that since dredging the river bottom has been limited in most areas, the bottom of the river has become higher, thus the water levels reach higher on the banks of the levees. When northern California reservoirs are nearing maximum capacity, they release water through the river systems, causing additional burdens on County levees. The potential for levee breaches and erosion damage has increased.

As noted above the City of Biggs General Plan Safety Element stated that a potential flooding threat to Biggs is the Hazelbrush Levee, which is the western levee of the Feather River below the Thermalito Afterbay spillway. This levee is located where the Feather River flow turns from a southwest to south flow path. Immediately downstream from this area, the Feather River channel is further constrained by remnant rock piles from past gold prospecting activity and cobble mining activities associated with the construction of Oroville Dam. According to the Butte County MHMP, the combinations of channel directional turn and blockage, along with the river’s physical location above Biggs, represents a potential threat to the City should a significant breach occur at that location. A proposal that has been discussed for Biggs is the reopening of passages beneath the Union Pacific Railroad tracks to allow water to flow to the west in the

event of a levee failure above the City. Originally built on trestles, the base of the railroad has been filled and now serves as a levee. Unfortunately, in the event of a levee breach northeast of Biggs, floodwater would flow in a generally southwest direction and upon meeting the rail tracks would be forced toward Biggs.

Past Occurrences

The City Planning Team noted no past occurrences of levee failures.

Vulnerability to Levee Failure

Two primary types of regional flood events have the potential to threaten Biggs. These are the failure of a dam located upstream from the City and the catastrophic failure of Feather River levees along the river's western side upstream from the City. Should the dams fail, the resultant flooding could cause the levees to fail. Levees provide strong flood protection, but they are not failsafe. Levees are designed to protect against a specific flood level and could be overtopped during severe weather events or dam failure. Levees reduce, not eliminate, the risk to individuals and structures located behind them.

Overtopping of Sacramento River levees is not considered to be a significant local concern due to the general topography of the region and the distance between Biggs and the Sacramento River. Levee failure or overtopping of the Sacramento River in areas north of Biggs would generally be directed to the lower elevation Butte Sink area and would most likely not directly affect the City. However, when the Sacramento River floods, localized flooding is possible due to water backing up into local drainage channels and thereby reducing the ability of the city's storm water drainage system to remove water from inside Biggs.

The DFIRM showed no levee protected areas in the City of Biggs. Biggs is a participant in with the Sutter Butte Flood Control Agency's Feather River West Levee Project.

Impacts

Should the levees fail, all of the area protected by the levees would be at risk to flooding causing property damage and life safety concerns. Business losses would be large as facilities would be flooded. Additional issues include dewatering of the levee protected areas, as well as the rebuilding of the levees. Road closures would occur, and would impede both evacuation routes and ability of first responders to quickly respond to calls for aid.

Future Development

Future development in levee protected areas may be affected by this hazard, thus there will always be some level of concern.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed and the body must work extra hard to maintain a normal temperature.” Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, and those who are sick or overweight are more likely to succumb to extreme heat. Conditions that can induce heat-related illnesses include stagnant atmospheric conditions and poor air quality. Consequently, people living in urban areas may be at greater risk from the effects of a prolonged heat wave than those living in rural areas. Also, asphalt and concrete store heat longer and gradually release heat at night, which can produce higher nighttime temperatures known as the urban heat island effect.

Location and Extent

Heat is a regional phenomenon and affects the whole of the City. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly take the lives of vulnerable populations. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more “typical” disaster scenarios.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.2.2 of the Base Plan.

Past Occurrences

The City Planning Team note that since extreme heat is a regional phenomenon, events that affected the County also affected the City. Those past occurrences were shown in the Base Plan in Section 4.2.2.

Vulnerability to Extreme Heat

The City experiences temperatures in excess of 100 degrees during the summer and fall months. The temperature moves to 105-115°F in rather extreme situations. Health impacts are the primary concern with this hazard, though economic impacts are also an issue.

Impacts

The elderly and individuals below the poverty level are the most vulnerable to extreme temperatures. Nursing homes and elder care facilities are especially vulnerable to extreme heat events if power outages occur and air conditioning is not available. In addition, individuals below the poverty level may be at increased risk to extreme heat if use of air conditioning is not affordable. This is especially true of homeless people and the transient population.

Reliance on air conditioning causes a strain on the electrical energy in the City. Occasionally peak demands outweigh supply and a condition known as brown-out occurs. This is an extremely dangerous situation for electrical equipment as it operates without the needed electricity causing damage to the systems. Days of extreme heat have been known to result in medical emergencies, civil unrest, and unpredictable human behavior. Periods of extended heat and dryness (droughts) can have major economic, agricultural, and water resources impacts. Extreme heat can also dry out vegetations, making it more vulnerable to wildfire ignitions. During periods of extreme heat (with high winds), PG&E can institute the Public Safety Power Shutoff.

Future Development

Vulnerability to extreme heat will increase as the average age of the population in each City shifts. The residents of nursing homes and elder care facilities are especially vulnerable to extreme temperature events. It is encouraged that such facilities have emergency plans or backup power to address power failure during times of extreme heat and in the event of a Public Safety Power Shutoff. Low income residents and homeless populations are also vulnerable. Cooling centers for these populations should be utilized when necessary. However, many of the residents of the City are accustomed to living with extreme heat and take precautions to guard against the threat of extreme heat.

Severe Weather: Freeze and Winter Storm

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile and Problem Description

According to the National Weather Service (NWS) and the Western Regional Climate Center (WRCC), extreme cold often accompanies a winter storm or is left in its wake. Winter snowstorms can include heavy snow, ice, and blizzard conditions.

Location and Extent

Freeze and winter storms are regional issues, meaning the entire City is at risk to freeze and winter storm. While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, temperature data from the County from the WRCC indicates that there are 21.8 days that fall below 32°F in western Butte County. Freeze has a slow onset and can be generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Snowfall is measured in snow

depths. It is rare for snow to fall in the City, and even rarer that snow accumulates in the City. Snowfall has an onset that is similar to freeze in the City.

Past Occurrences

The City Planning Team note that since freeze and winter storm is a regional phenomenon, events that affected the lower elevations of the County also affected the City. Those past occurrences were shown in the Base Plan in Section 4.2.3.

Vulnerability to Severe Weather: Freeze and Winter Storms

The City experiences temperatures below 32 degrees during the winter months. The temperature moves to the teens in rather extreme situations.

Impacts

Freeze normally does not impact structures, but can be a life safety issue. Secondary impacts of extreme cold can affect the supporting mechanisms or systems of a community's infrastructure. For example, when extreme cold is coupled with high winds or ice storms, power lines may be downed, resulting in an interruption in the transmission of that power shutting down electric furnaces, which may lead to frozen pipes in homes and businesses.

Occasionally, winter storms with snow and ice can affect the City. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets in the City. The ability for the City to continue to operate during periods of winter storm and freeze is paramount. The elderly population in the planning area is most vulnerable to temperature extremes. The residents of nursing homes and elder care facilities are especially vulnerable to extreme temperature events. It is encouraged that such facilities have emergency plans or backup power to address power failure during times of extreme cold. Transient and homeless populations are also at risk to freeze.

Future Development

Future development built to code should be able to withstand snow loads from severe winter storms. Pipes at risk of freezing should be mitigated by either burying or insulating them from freeze as new facilities are improved or added. Vulnerability to extreme cold will increase as the average age of the population in the County shifts. Greater numbers of future senior citizens will result from the large number of baby boomers in the planning area. The elderly are more at risk to the effects of freeze. However, many of the residents of the City are accustomed to living with freeze and take precautions to guard against the threat of freeze.

Severe Weather: Heavy Rain and Storms (Hail, Lightning, Wind)

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

Storms in the City of Biggs occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the City falls mainly in the fall, winter, and spring months.

Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the City. All portions of the City are at risk to heavy rains. Most of the severe rains occur during the winter months. There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of severe storms in California, Butte County, and the City is often short, ranging from minutes to hours. In some cases, rains can continue for days at a time. Information on precipitation extremes can be found in Section 4.2.4 of the Base Plan.

Past Occurrences

According to historical hazard data, severe weather is an annual occurrence in the City of Biggs. This is the cause of many of the federal disaster declarations related to flooding. No specific events causing damages or injuries could be recalled by the City Planning Team.

Vulnerability to Heavy Rain and Storms

According to historical hazard data, severe weather is an annual occurrence in the City. Damage and disaster declarations related to severe weather have occurred and will continue to occur in the future. Heavy rain and severe storms are the most frequent type of severe weather occurrences in the City. Wind and lightning often accompany these storms and have caused damage in the past. Hail is rare in the City.

Impacts

Actual damage associated with the primary effects of severe weather have been limited. It is the secondary hazards caused by weather, such as floods, fire, and agricultural losses that have had the greatest impact on the City. Impacts to property, critical facilities (such as utilities), and life safety are expected. The risk and vulnerability associated with these secondary hazards are discussed in the flood and localized flood sections of this Annex.

Future Development

New critical facilities such as communications towers and others should be built to withstand hail damage, lightning, and thunderstorm winds. While deaths have occurred in the planning area in the past due to lightning, it is difficult to quantify future deaths and injuries due to lightning. Future losses to new development should be minimal.

Severe Weather: Wind and Tornado

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

High winds can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss. High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration.

Tornadoes, though rare, are another severe weather hazard that, though rare, can affect areas in the Valley in the Butte County Planning Area, primarily during the rainy season in the late fall and early spring. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes are the most powerful storms that exist.

Location and Extent

The entire Planning Area is subject to significant, non-tornadic (straight-line), winds. Each area of the County is at risk to high winds. Magnitude of winds is measured often in speed and damages. These events are often part of a heavy rain and storm event, but can occur outside of storms. The speed of onset of winds can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of winds in California is often short, ranging from minutes to hours. The Beaufort scale is an empirical measure that relates wind speed to observed conditions at sea or on land. Its full name is the Beaufort Wind Force Scale. The Beaufort Scale was shown in Section 4.2.5 of the Base Plan.

Tornadoes, while rare, can occur at any location in the County. The areas in the Valley in the County tend to be at greater risk than the areas in the foothills and at elevation. Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. The F Scale and EF Scale were shown in Section 4.2.5 of the Base Plan.

Past Occurrences

The City Planning Team note that since high winds is a regional phenomenon, events that affected the lower elevations of the County also affected the City. Those past occurrences were shown in the Base Plan in Section 4.2.5.

Vulnerability to Severe Weather: Wind and Tornado

High winds are common occurrences in the City throughout the entire year. Straight line winds are primarily a public safety and economic concern. Windstorm can cause damage to structures and power lines which in turn can create hazardous conditions for people. Debris flying from high wind events can shatter windows in structures and vehicles and can harm people that are not adequately sheltered. Wind can also drive wildfire flames, spreading wildfires quickly. High winds are also a precursor to red flag days, which can cause PG&E to enact the Public Safety Power Shutdowns.

Impacts

Future losses from straight line winds include:

- Power line impacts and economic losses from power outages
- Occasional building damage, primarily to roofs

Campers, mobile homes, barns, and sheds and their occupants are particularly vulnerable as windstorm events in the region can be sufficient in magnitude to overturn these lighter structures. Livestock that may be contained in these structures may be injured or killed, causing economic harm to the rancher who owns both the structure and the livestock. Overhead power lines are vulnerable and account for the majority of historical damages. State highways can be vulnerable to high winds and dust storms, where high profile vehicles may be overturned by winds and lowered visibility can lead to multi-car accidents.

Future Development

Future development projects will consider windstorm hazards at the planning, engineering and architectural design stage with the goal of reducing vulnerability. The City enforces the state building code and other ordinances, which regulate construction techniques that minimize damage from windstorms. Future development in the City is subject to these building codes.

Wildfire

Likelihood of Future Occurrence–Likely

Vulnerability–Medium

Hazard Profile and Problem Description

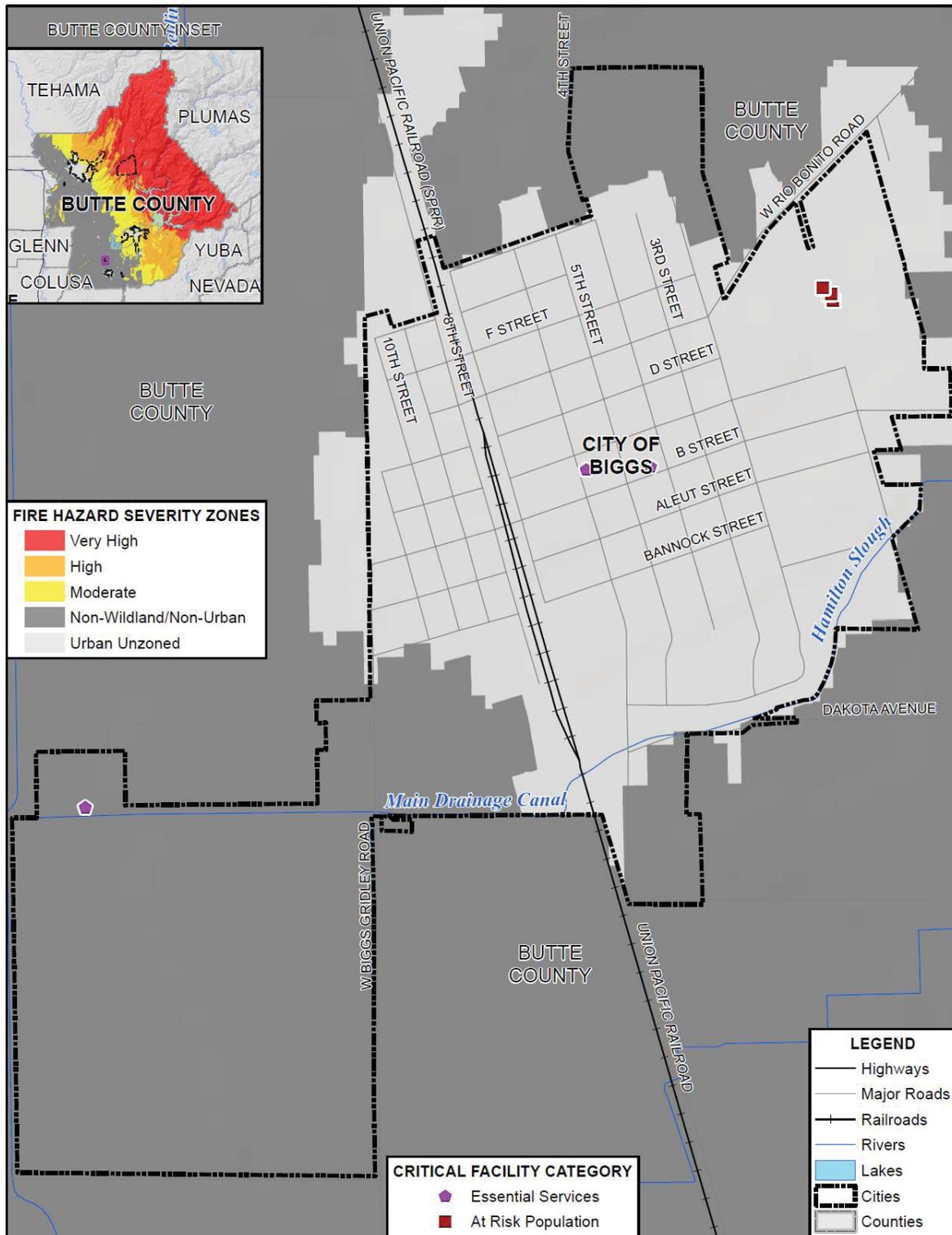
Major fires are generally categorized as either a conflagration or wildland/forestland. Wildland fire is an ongoing concern for the City of Biggs. Generally, the fire season extends from early spring through late fall of each year during the hotter, dryer months. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. Throughout

California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire suppression practices have affected the natural cycle of the ecosystem.

Location and Extent

Wildfire can affect all areas of the City. CAL FIRE has estimated that the risk varies across the Town and has created maps showing risk variance. Following the methodology described in Section 4.3.16 of the Base Plan, a wildfire maps for the City of Biggs were created. Figure A-20 shows the CAL FIRE FHSZ in the City. As shown on the maps, wildfire threat within the City is minimal.

Figure A-20 City of Biggs – Fire Hazard Severity Zones



0 0.25 0.5 Miles



Data Source: CAL FIRE (Adopted SRA 11/2007 - fhsz06_3_4, Draft 9/2007 - c4fhszl06_1),
Butte County GIS, Cal-Atlas; Map Date: 7/1/2019.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought. Fires can burn for a short period of time, or may have durations lasting for a week or more. Geographical FHSZ extent from CAL FIRE is shown in Table A-41.

Table A-41 City of Biggs – Geographical FHSZ Extents

Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	0	0.00%	0	0.00%	0	0.00%
High	0	0.00%	0	0.00%	0	0.00%
Moderate	0	0.00%	0	0.00%	0	0.00%
Non-Wildland/Non-Urban	228	48.10%	37	7.81%	191	40.30%
Urban Unzoned	246	51.90%	164	34.60%	64	13.50%
City of Biggs Total	474	100.00%	201	42.41%	255	53.80%

Source: CAL FIRE

Past Occurrences

The City Planning Team noted no wildfires that have affected the City of Biggs directly. The Camp Fire affected Biggs indirectly. The City was used as an evacuation area. In addition, many of those displaced by the Camp Fire moved to areas around Butte County, including Biggs. The population of Biggs has grown since the Camp Fire.

Vulnerability to Wildfire

A number of factors affect the behavior of wildland and interface fires, including terrain, weather, wind, fuels and seasons. It is well known that fire travels faster uphill than down and is more difficult to fight on steep slopes than on level ground. When weather is hot and the humidity is low, wildland fires can explode with intensity of rapid combustion. Even in the absence of strong winds, a fast-moving fire can generate its own updrafts, particularly in canyons, causing burning brands to be carried high in the air and drop a long distance ahead. This results in spot fires over a wide radius as the wind changes its direction.

Biggs is not immune to numerous types of grass and brush fires and any one of them may accelerate into an urban interface wildfire. Such a situation could lead to evacuation of large portions of the population and the potential for significant loss of personal property, structures, and rangeland. The natural fuels available in or near the City vary greatly in the rate and intensity of burning. Fires in heavy brush and stands of trees burn with great intensity but more slowly than in dry grass and leaves. Dense fuels will propagate fire better than sparse fuels.

The 2014 City of Biggs General Plan Safety Element noted that the highest probable fire threats in Biggs are structural fires in residences or businesses. Additionally, other types of fires have the potential for

resulting in major losses in and around the City. These include fire or explosion at one of the local agricultural processing plants, major operational failure of the rail service that passes through Biggs, and urban conflagration (multiple simultaneous structural fires).

Impacts

Wildfires can cause short-term and long-term disruption to the County and City of Biggs, as evidenced by the Camp Fire in Paradise and the resultant increase in the population in Biggs. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the County by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires may result in casualties and can destroy buildings and infrastructure.

Although the physical damages and casualties arising from wildland-urban interface fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. In some cases, the economic impact of this loss of services may be comparable to the economic impact of physical damages or, in some cases, even greater. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Fires can also cause major damage to power plants and power lines needed to distribute electricity to operate facilities.

Based on the vulnerability of the City of Biggs to the wildfire hazard, the sections that follow describes significant assets at risk in the City.

Values at Risk

GIS was used to determine the possible impacts of wildfire within the City of Biggs. The methodology described in Section 4.3.19 of the Base Plan was followed in determining structures and values at risk in fire hazard severity zones. Summary analysis results for Biggs are shown in Table A-42, which summarizes total parcel counts, improved parcel counts and their structure values by fire hazard severity zone.

Table A-42 City of Biggs – Count and Value of Parcels by Fire Hazard Severity Zone

Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Other Value	Estimated Contents Value	Total Value
Non-Wildland/Non-Urban	77	64	\$3,409,703	\$12,076,714	\$6,630	\$10,159,412	\$25,532,079
Urban Unzoned	688	610	\$22,612,610	\$57,112,152	\$10,549,728	\$39,026,706	\$129,893,037
City of Biggs Total	765	674	\$26,022,313	\$69,188,866	\$10,556,358	\$49,186,118	\$155,425,116

Source: Butte County 3/28/2019 Parcel/Assessor's Data, CAL FIRE

Table A-43 breaks out the Table A-42 by adding the property use details by fire hazard severity zone for the City. As shown in both of these tables, the City has no properties in the very high or high fire hazard severity zone. All of the City falls within the non-wildland/non-urban and urban unzoned fire hazard severity zones.

Table A-43 City of Biggs – Count and Value of Parcels by Fire Hazard Severity Zone and Property Use

Property Use / Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Other Value	Estimated Contents Value	Total Value
Non-Wildland/Non-Urban							
Agricultural	5	2	\$146,741	\$131,437	\$0	\$131,437	\$409,615
Commercial	1	0	\$0	\$0	\$0	\$0	\$0
Industrial	6	2	\$973,045	\$4,055,336	\$0	\$6,083,004	\$11,111,385
Residential	65	60	\$2,289,917	\$7,889,941	\$6,630	\$3,944,971	\$14,011,079
Unknown	0	0	\$0	\$0	\$0	\$0	\$0
Non-Wildland/Non-Urban Total	77	64	\$3,409,703	\$12,076,714	\$6,630	\$10,159,412	\$25,532,079
Urban Unzoned							
Agricultural	1	1	\$4,371	\$19,645	\$810	\$19,645	\$444,511
Commercial	35	24	\$717,577	\$3,616,969	\$109,175	\$3,616,969	\$7,405,502
Industrial	8	6	\$754,019	\$8,652,323	\$10,439,743	\$12,978,485	\$35,807,130
Residential	626	579	\$21,136,643	\$44,823,215	\$0	\$22,411,608	\$86,235,895
Unknown	18	0	\$0	\$0	\$0	\$0	\$0
Urban Unzoned Total	688	610	\$22,612,610	\$57,112,152	\$10,549,728	\$39,026,706	\$129,893,037
City of Biggs Total	765	674	\$26,022,313	\$69,188,866	\$10,556,358	\$49,186,118	\$155,425,116

Source: Butte County 3/28/2019 Parcel/Assessor’s Data, CAL FIRE

Population at Risk

The Fire Hazard Severity Zone dataset was overlaid on the parcel layer. Those residential parcel centroids that intersect the severity zones were counted and multiplied by the 2010 Census Bureau average household factors for the City of Biggs – 2.45. According to this analysis, there is a total population of 0 residents of Biggs at risk to moderate or higher FHSZs. This is shown in Table A-44.

Table A-44 City of Biggs – Count of Improved Residential Parcels and Population by Fire Hazard Severity Zone

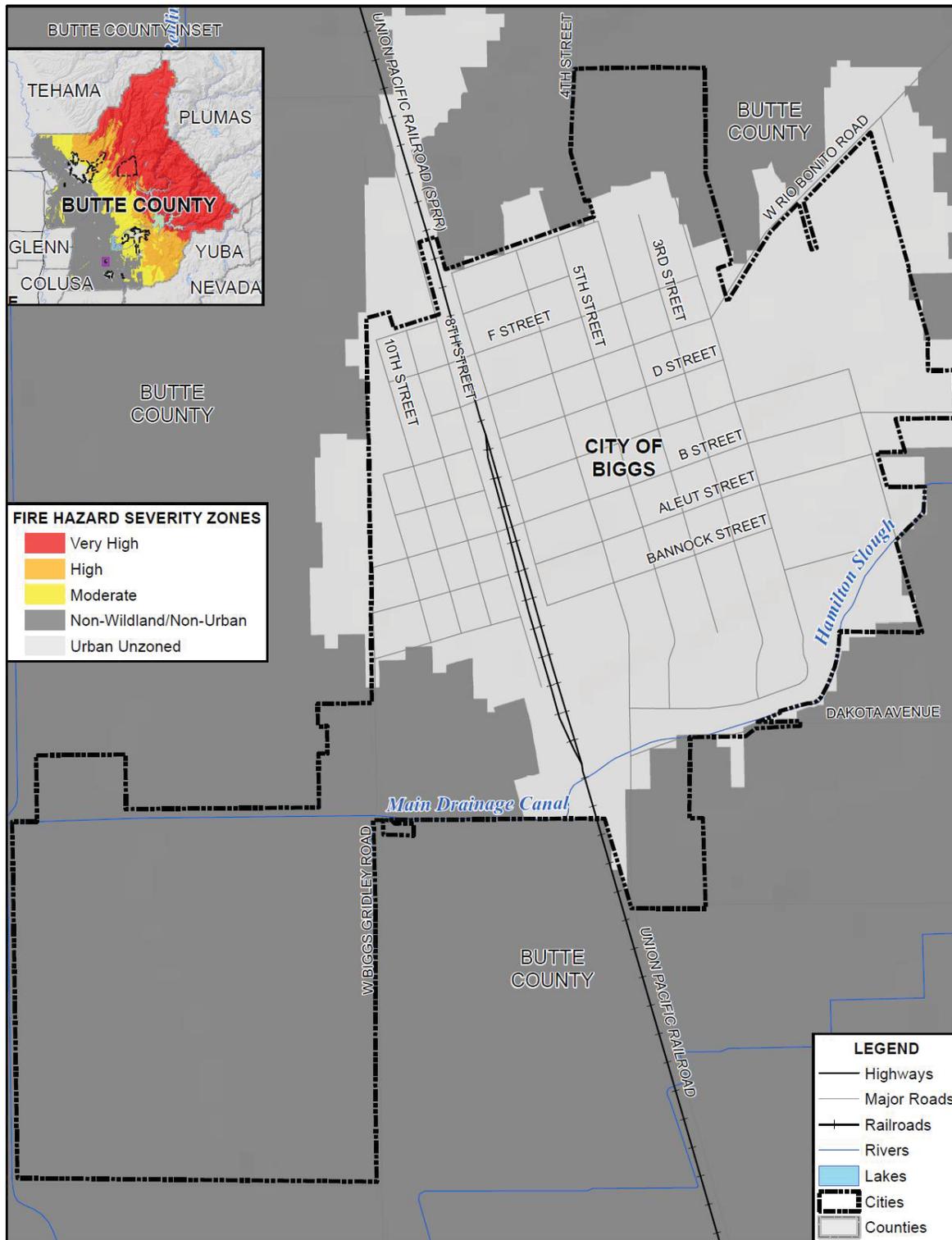
Jurisdiction	Moderate		High		Very High	
	Improved Residential Parcels	Population	Improved Residential Parcels	Population	Improved Residential Parcels	Population
Biggs	0	0	0	0	0	0

Source: Butte County 3/28/2019 Parcel/Assessor’s Data, CAL FIRE

Critical Facilities at Risk

An analysis was performed on the critical facility inventory in Biggs in identified FHSZs facilities in a FHSZ in the City of Biggs are shown in Figure A-21 and detailed in Table A-45. Details of critical facility definition, type, name and address and jurisdiction by fire hazard severity zone are listed in Appendix F.

Figure A-21 City of Biggs – Critical Facilities in Fire Hazard Severity Zones



0 0.25 0.5 Miles



Data Source: CAL FIRE (Adopted SRA 11/2007 - fhsz06_3_4, Draft 9/2007 - c4fhsz06_1), Butte County GIS, Cal-Atlas; Map Date: 3/1/2019.

Table A-45 City of Biggs – Critical Facilities by Fire Hazard Severity Zone

Fire Hazard Severity Zones Critical Facility Category / Critical Facility Type	Facility Count
Non-Wildland/Non-Urban	
Essential Services Facilities	
Wastewater Treatment Plant	1
Essential Services Facilities Total	1
Non-Wildland/Non-Urban Total	1
Urban Unzoned	
Essential Services Facilities	
Fire	1
Public Assembly Point / Evacuation Center	1
Essential Services Facilities Total	2
At Risk Population Facilities	
School	4
At Risk Population Facilities Total	4
Urban Unzoned Total	6
Grand Total	
	7

Source: CAL FIRE, Butte County

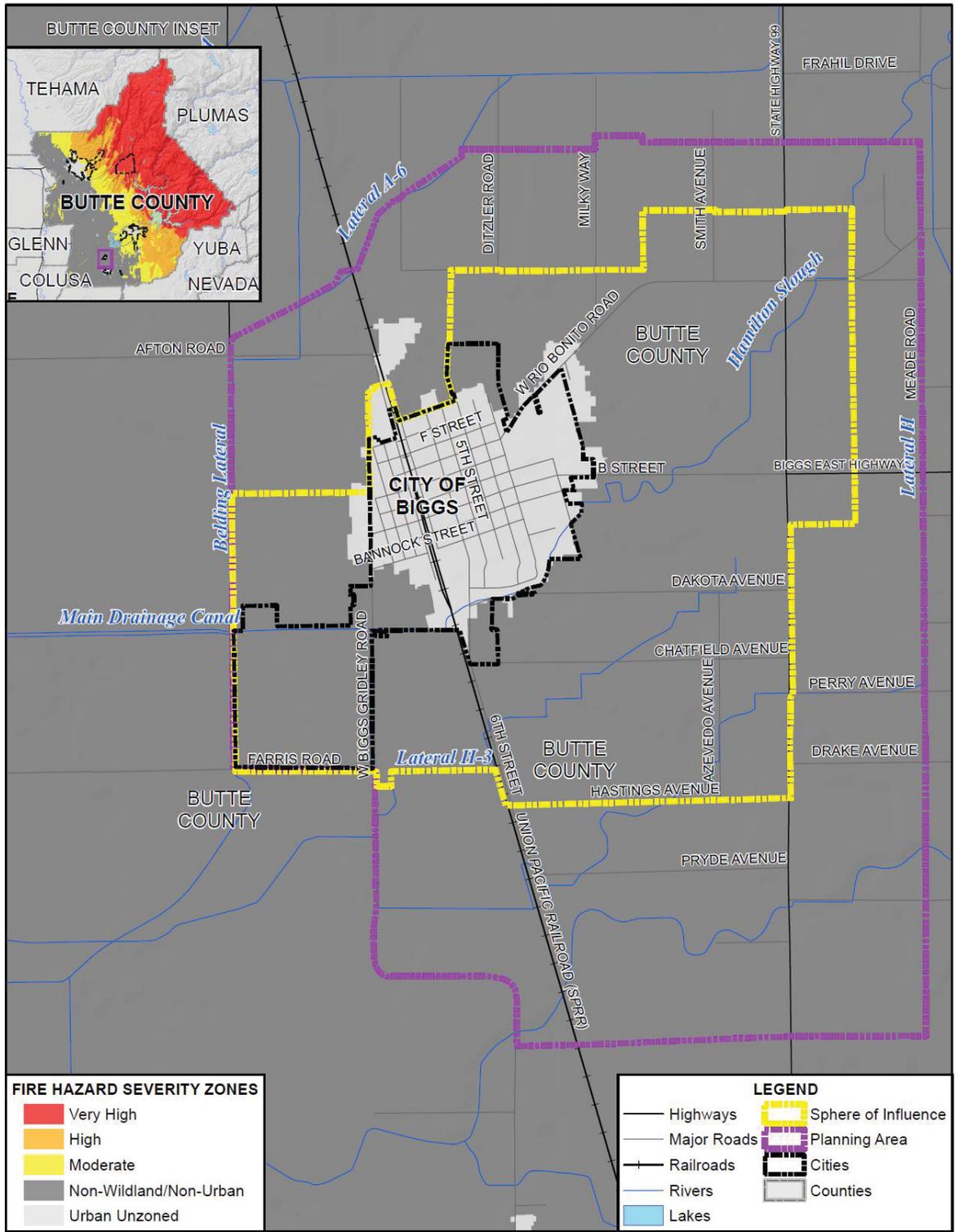
Future Development

Additional growth and development within moderate or higher fire hazard severity zones in the City would place additional values at risk to wildfire. City building codes are in effect and should continue to be updated as appropriate to reduce this risk.

GIS Analysis

The City of Biggs has defined general growth areas through the City of Biggs General Plan Land Use Element. Specific growth areas have not been delineated for the City. Due to this, hazard analysis for future development will include maps, but no tabular analysis. Figure A-22 shows the location of CAL FIRE FHSZs overlaid on the future development areas the City has available to develop.

Figure A-22 City of Biggs – Future Development in Fire Hazard Severity Zones



Data Source: CAL FIRE (Adopted SRA 11/2007 - fhszs06_3_4, Draft 9/2007 - c4fhszl06_1), Butte County GIS, Cal-Atlas; Map Date: 10/12/2019.

A.6 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

A.6.1. Regulatory Mitigation Capabilities

Table A-46 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the City of Biggs.

Table A-46 City of Biggs Regulatory Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan/General Plan	Y 2014	Yes
Capital Improvements Plan	N	
Economic Development Plan	N	
Local Emergency Operations Plan	Y	Yes
Continuity of Operations Plan	N	
Transportation Plan	Y	BCAG Regional Plan
Stormwater Management Plan/Program	Yes	Yes, plan an update in 2020
Engineering Studies for Streams	No	
Community Wildfire Protection Plan	No	
Other special plans (e.g., brownfields redevelopment, disaster recovery, coastal zone management, climate change adaptation)	No	
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	Y	Version/Year: Butte County Building Department
Building Code Effectiveness Grading Schedule (BCEGS) Score		Score:
Fire department ISO rating:	CAL FIRE	Rating:
Site plan review requirements	Y	

Land Use Planning and Ordinances	Y/N	Is the ordinance an effective measure for reducing hazard impacts?
		Is the ordinance adequately administered and enforced?
Zoning ordinance	Y	Yes/Yes
Subdivision ordinance	Y	Yes/Yes
Floodplain ordinance	N	
Natural hazard specific ordinance (stormwater, steep slope, wildfire)	N	
Flood insurance rate maps	N	
Elevation Certificates	N	
Acquisition of land for open space and public recreation uses		
Erosion or sediment control program	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Due to its small size, capabilities are difficult to expand. The City will continue to seek to join the County in efforts to expand mitigation abilities.		

Source: City of Biggs

2014 City of Biggs General Plan

The City of Biggs General Plan Program serves as the blueprint for future growth and development and provides comprehensive planning for the future. It encompasses what the City is now, and what it intends to be, and provides the overall framework of how to achieve this future condition (see the discussion in Section 4.3.1 Growth and Development Trends).

The General Plan includes a Safety Element that focuses on safety issues to be considered in planning for the present and future development of the Biggs Planning Area. Identified hazards include wildfire, geologic/seismic, flooding, and other natural and man-made hazards (such as hazardous materials). Mitigation-related actions and objective summaries are as follows:

- **GOAL S-1:** Minimize the loss of life and property resulting from natural and human-caused hazards.
 - ✓ Policy S-1.1 (Emergency Preparedness) – Promote public safety from hazards that may cause death, injury, or property damage through emergency preparedness and awareness.
- **GOAL S-2:** Minimize the threat to life and property from flooding and inundation.
 - ✓ Policy S-2.1 (Potential Flood Hazards) – When considering areas for development, analyze and consider potential impacts of flooding.
 - ✓ Policy S-2.2 (Drainage) – Ensure that adequate drainage exists for both existing and new development.
- **GOAL S-3:** Protect lives and property from seismic and geologic hazards.
 - ✓ Policy S-3.1 (Potential Damage to New Structures) – Prevent damage to new structures caused by seismic, geologic, or soil conditions.
 - ✓ Policy S-3.2 (Potential Damage to Existing Structures) – Encourage owners of buildings that are subject to seismic hazards to pursue structural improvements to remedy seismic-related hazards.

- **GOAL S-4:** Continue to provide effective and efficient fire protection and prevention services to Biggs area residents.
 - ✓ Policy S-4.1 (Fire Safety Staffing) – At a minimum, maintain current levels of service for fire protection by continuing to require development to provide and/or fund fire protection facilities, personnel, and operations and maintenance.
 - ✓ Policy S-4.2 (Fire Hydrants) – Ensure all fire hydrants within the city are maintained and can sufficiently provide fire suppression services.
 - ✓ Policy S-4.3 (ISO Rating) – Strive to achieve a minimum Insurance Service Office (ISO) rating of Protection Class 4.
 - ✓ Policy S-4.4 (Vegetation Management) – Support vegetation management and weed abatement programs that reduce fire hazards.
 - ✓ Policy S-4.5 (Interagency Coordination) – Continue to maintain interagency relationships to maximize fire protection services and support programs that reduce fire hazards.
 - ✓ Policy S-4.6 (Fire Safety Standards and Programs) – Support the development and implementation of standards and programs to reduce fire hazards, and review development and building applications for opportunities to ensure compliance with relevant codes.

- **GOAL S-5:** Continue to provide effective and efficient law enforcement services to Biggs residents.
 - ✓ Policy S-5.1 (Law Enforcement Service Level) – At a minimum, the city shall strive to maintain the current levels of coverage for law enforcement services by the city’s law enforcement provider.
 - ✓ Policy S-5.2 (Law Enforcement Service Provision) – Ensure that law enforcement services are provided in a manner that maximizes the use of the city’s limited financial resources while maximizing service coverage.
 - ✓ Policy S-5.3 (Visible Presence) – Law enforcement providers shall make all reasonable efforts to maintain a visible presence in the city.
 - ✓ Policy S-5.4 (Public Interaction) – Continue to encourage programs that present that city’s law enforcement personnel in a positive light and that encourage residents to interact with and “get to know” the city’s law enforcement providers.

- **GOAL S-6:** Design neighborhoods and buildings in a manner that prevents crime and provides security and safety for people and property.
 - ✓ Policy S-6.1 (CPTED) – Utilize Crime Prevention Through Environmental Design (CPTED) principles in the design of projects and buildings.

- **GOAL S-7:** Enhance the safety of railroad crossings.
 - ✓ Policy S-7.1 (Railroad Crossings) – Enhance the safety of railroad crossings in the city.

- **GOAL S-8:** Reduce the potential for public exposure to hazardous materials or the accidental releases of toxic or hazardous substances.
 - ✓ Policy S-8.1 (Hazardous Materials Safety Coordination) – Support efforts to reduce the potential for accidental releases of toxic and hazardous substances.
 - ✓ Policy S-8.2 (Reduce Toxic Materials Use) – Strive to reduce the use of hazardous and toxic materials in city operations.

Mitigation Related Ordinances

Emergency Organization (Chapter 2.25)

The declared purposes of this article are to provide for the preparation and carrying out of plans for the protection of persons and property within this city in the event of an emergency, the direction of the emergency organization, and the coordination of the emergency functions of this city with all other public agencies, corporations, organizations, and affected private persons. The city of Biggs disaster council is hereby created and shall consist of the following:

- The mayor, who shall be chairman;
- The assistant director of emergency services, who shall be vice chairman;
- Such chiefs of emergency services as are provided for in a current emergency plan of this city, adopted pursuant to this article;
- Such representatives of civic, business, labor, veterans, professional, or other organizations having an official emergency responsibility, as may be appointed by the director with the advice and consent of the city council.

It shall be the duty of the city of Biggs disaster council, and it is hereby empowered, to develop and recommend for adoption by the city council emergency and mutual aid plans and agreements and such ordinances and resolutions and rules and regulations as are necessary to implement such plans and agreements.

Public Burning (Chapter 6.10)

It shall be unlawful to remove or clean weeds, rubbish or other material from any property, lands or lots in the city of Biggs upon the street, sidewalk, or park area in front of any such property, lands or lots by setting fire to, igniting, or burning upon such lands or upon the street, sidewalk, or park area, or to knowingly permit or allow a fire to burn upon the street, sidewalk, or park area in front of any such property in violation of this chapter; provided, that the chief of the fire department, or his authorized assistant, may issue a written permit for the burning of weeds, rubbish or other material upon any portion of a lot or parcel of land if such weeds, rubbish or other material has been severed from the land and has been collected into one or more piles.

The chief of the fire department, or his authorized assistant, may issue such written permit upon such terms as conform to the provisions of this chapter, and other burning ordinances of the city of Biggs. It shall be the duty of such officer to incorporate in such permit such terms and conditions as in his opinion adequately safeguard the public safety and property. Such permit shall be issued in duplication and such officer shall keep one copy on file in his office.

In those cases where the property, lands or lots are situated or where the circumstances are such that it is impracticable to clear the same by hand or machinery, subject to the approval of the superintendent of public works and grounds and the chief of the fire department or their respective authorized representatives, the provisions of this chapter relating to the removal of weeds, rubbish or other material may be deemed complied with if a firebreak is cleared of all vegetation, stubble, chaff and flammable material for a distance not less than 25 feet from any building or structure and for a distance not less than 10 feet from the outer

circumference of any tree, shrub, hedge or vegetation, or from any street, highway, road or sidewalk. Additional firebreaks may be required by the chief of the fire department or his authorized representative when deemed necessary to safeguard property and prevent the spread of fire.

City of Biggs Water Conservation Program (Chapter 10.20)

The purpose of this chapter is to establish a water conservation program that will reduce water consumption within the city through conservation, enable effective water supply planning, assure reasonable and beneficial use of water, prevent waste of water, and maximize the efficient use of water within the city to avoid and minimize the effect and hardship of water shortage to the greatest extent possible. This chapter establishes permanent water conservation standards related to water use efficiency for nonshortage/nondrought conditions and further establishes conservation measures to be implemented during times of declared statewide water shortage/drought conditions, with increasing restrictions on water use in response to worsening drought or emergency conditions.

Building Codes (Chapter 11.05)

In order to provide minimum standards for the proper regulations of building construction, the Uniform Building Code, 1991 Edition, with Appendices Chapters 32, 35, 38, 49, 55, 57 and 70, and the Uniform Building Code Standards, 1991 Edition, prepared and published by the International Conference of Building Officials, except as specifically modified by the California Health and Safety Code, Division 13, Part 1.5 (State Housing Law), is hereby adopted, incorporated, and made a part of the City Code by reference without further publication as though set forth at length herein and is hereby declared to be the building code for the City and shall apply to and govern all building construction in the incorporated areas of the City.

Flood Damage Prevention (Chapter 12.05)

It is the purpose of this chapter to promote the public health, safety and general welfare, and to minimize public and private losses due to flood conditions in specific areas by methods and provisions designed for:

- Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion or flood heights or velocities;
- Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
- Controlling the alteration of natural floodplains, stream channels and natural protective barriers which help accommodate or channel floodwaters;
- Controlling filling, grading, dredging, and other development which may increase flood damage; and
- Preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters, or which may increase flood hazards in other areas.

Subdivisions (Title 14)

This title is enacted for the purpose of adopting standards, regulations and procedures for the subdivision and utilization of land in the incorporated area of the city, as authorized and directed by the Subdivision Map Act and other applicable provisions of law. This title provides for the subdivision of land, and also for the reversion to acreage of lands previously divided.

Pursuant to the authority conferred by Chapter 670, Statutes of 1937, known as the “Subdivision Map Act,” and amendments thereto, the following regulations and standards are hereby established and shall apply to all subdivisions or parts of subdivisions hereafter made of land wholly or partially within the incorporated territory of the city of Biggs. The provisions of this title are supplemental to those of said Map Act and all terms used herein which are defined in the Subdivision Map Act shall have the same as ascribed thereto in said Subdivision Map Act, and as the same may hereafter be amended. Wherever the term “standards of the city of Biggs” shall be used the same shall include all standards and specifications prepared by the department heads and approved by resolution of the city council. Such standards and specifications shall be subject to change by the department heads with approval of the city council by resolution from time to time, and shall be available for inspection by all interested persons in the office of the city clerk.

The planning commission of the city of Biggs is hereby designated as the “advisory agency” as said term is used in said Subdivision Map Act, and is charged with the duty of making investigations and reports on the design and improvements of proposed subdivisions.

Zoning (Title 14)

The purpose of this title is to promote and protect the public health, safety, and general welfare of the people of the city by adopting a zoning plan and regulations providing generally for:

- The classification of areas of the city, including further annexations thereto, into several zones;
- The protection of the established character of the various zoned areas within the city and to ensure orderly development by regulating the use of land and improvements thereon and the location, size, and character of structures or improvements to be erected or placed thereon, including alterations or additions to existing structures or improvements;
- The implementation of the policies and standards in the Biggs general plan to achieve the arrangement of uses described in that plan and foster convenient, harmonious and workable relationships among these land uses; and
- The promotion of economic stability of existing land uses consistent with the economic development policies of the general plan.

The city council is authorized by the Planning and Zoning Laws of the California State Government Code, Title 7, Planning and Land Use, Division 1, Planning and Zoning, Chapter 4, Zoning Regulations, to regulate the following:

- Use of land and buildings;
- Height, bulk and size of buildings and structures;
- Construction and use of signs and billboards;
- Intensity of land use;
- Establishment and maintenance of building setback lines.

The provisions of the State Government Codes relating to zoning codes provide only a minimum of limitation in order that counties and cities may exercise the maximum degree of control over local zoning matters.

A.6.2. Administrative/Technical Mitigation Capabilities

Table A-47 identifies the City department(s) responsible for activities related to mitigation and loss prevention in Biggs.

Table A-47 City of Biggs's Administrative and Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	No	City Council currently serves as the Planning Commission
Mitigation Planning Committee	No	
Maintenance programs to reduce risk (e.g., tree trimming, clearing drainage systems)	No	
Mutual aid agreements	No	
Other		
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Y	Contract Services: Butte County Building Department
Floodplain Administrator	N	
Emergency Manager	N	
Community Planner	Y	Contract Services: ECORP
Civil Engineer	Y	Contract Services: Bennett Engineering Services
GIS Coordinator	Y	Contract Services: Chico State GIS
Other		
Technical		
Warning systems/services (Reverse 911, outdoor warning signals)	N	Reliance on County Sheriff
Hazard data and information	N	
Grant writing	N	
Hazus analysis	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
As the utility (Water, Sewer, Garbage and Electric) provider we are working to improve our billing system, including gathering contact information that could be used for future warning and notification system deployment		

Source: City of Biggs

A.6.3. Fiscal Mitigation Capabilities

Table A-48 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table A-48 City of Biggs’s Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	Various infrastructure improvement projects.
Authority to levy taxes for specific purposes	Y	
Fees for water, sewer, gas, or electric services	Y	
Impact fees for new development	Y	
Storm water utility fee	Y	
Incur debt through general obligation bonds and/or special tax bonds	Y	
Incur debt through private activities	Y	
Community Development Block Grant	Y	
Other federal funding programs	Y	
State funding programs	Y	
Other		
How can these capabilities be expanded and improved to reduce risk?		
The City will continue to seek extra funding as stream are discovered or become available.		

Source: City of Biggs

A.6.4. Mitigation Education, Outreach, and Partnerships

Table A-49 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table A-49 City of Biggs’s Mitigation Education, Outreach, and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	No	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Yes	Social Media, City web site, City newsletters.
Natural disaster or safety related school programs	no	
StormReady certification	no	
Firewise Communities certification	no	
Public-private partnership initiatives addressing disaster-related issues	no	

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Other		
How can these capabilities be expanded and improved to reduce risk?		
Additional Staffing		

Source: City of Biggs

A.6.5. Other Mitigation Efforts

The City of Biggs has many other completed or ongoing mitigation efforts that include the following:

- The City of Biggs is a participant in with the Sutter Butte Flood Control Agency’s Feather River West Levee Project which will significantly reduce the threat to Biggs from failure of the Feather River levee below the Oroville Afterbay Dam. This project began construction in 2013 and has been completed.
- In 2009–2010, the city upgraded its potable water system, which will allow for increased water pressure in Biggs. These improvements included replacement of a significant percentage of the city’s water extraction and delivery infrastructure. A new pressure system and ground tank was installed at Family Park, which will increase water pressures in the system. Prior to these improvements, water pressure within the system was below 40 pounds per square inch. Improvements to this system have allowed an increase in water pressure to approximately 55 pounds per square inch. The increased pressure will significantly assist fire safety services throughout the City.
- The city has developed a preliminary project concept and is currently seeking project funding to add an additional municipal water well and a 1.5 million gallon above ground water storage tank to greatly enhance and improve firefighting capability and resiliency.
- The city is currently planning to update its storm water management plan to support the pursuit of projects to improve storm drainage capability and resiliency.

A.7 Mitigation Strategy

A.7.1. Mitigation Goals and Objectives

The City of Biggs adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

A.7.2. NFIP Mitigation Strategy

The City of Biggs joined the National Flood Insurance Program (NFIP) on June 4, 1989. As a participant of the NFIP, the City of Biggs has administered floodplain management regulations that meet the minimum requirements of the NFIP. The management program objective is to protect people and property within the City. The City of Biggs will continue to comply with the requirements of the NFIP in the future.

In addition, the City of Biggs actively participates with Butte County to address local NFIP issues through a regional approach. Many of the program activities are the same for the City of Biggs as for Butte County since participation at the County level includes all local jurisdictions.

The City of Biggs Planning and Engineering Department provides public outreach activities which include map information services, public awareness, public hazard disclosure, and flood protection information. This information is readily available to the public and consists of current and accurate flood mapping. In addition, the Planning and Engineering Department provides information about our stormwater management program and up-to-date information related to the maintenance of our drainage system.

The National Flood Insurance Program’s (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS which are to reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance. The City of Biggs is not a current participant in the CRS program.

More information about the floodplain administration in the City of Biggs can be found in Table A-50.

Table A-50 City of Biggs Compliance with NFIP

NFIP Topic	Comments
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	24 policies \$8,530 in premiums \$6,937,000 in coverage
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	1 paid claim \$6,482 in paid claims 0 substantial damage claims
How many structures are exposed to flood risk within the community?	0 in 1% annual chance floodplain 674 in 0.2% annual chance floodplain
Repetitive Loss (RL) and Severe Repetitive Loss Properties (SRL)	0 RL 0 SRL
Describe any areas of flood risk with limited NFIP policy coverage	None
Staff Resources	
Is the Community Floodplain Administrator or NFIP Coordinator certified?	No coordinator
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Since there is no 1% annual chance floodplain, there is not a need to enforce the floodplain ordinance.
What are the barriers to running an effective NFIP program in the community, if any?	Size of community and lack of 1% annual chance floodplains.
Compliance History	
Is the community in good standing with the NFIP?	Y
Are there any outstanding compliance issues (i.e., current violations)?	N
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	CAV 1/1/1972 GTA 5/16/2011
Is a CAV or CAC scheduled or needed?	N
Regulation	

NFIP Topic	Comments
When did the community enter the NFIP?	6/4/1989
Are the FIRMs digital or paper?	Digital
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Meet
Provide an explanation of the permitting process.	This is done through the Butte County Building Department, who take flood into account when approving projects.
Community Rating System	
Does the community participate in CRS?	NO
What is the community's CRS Class Ranking?	N/A
What categories and activities provide CRS points and how can the class be improved?	N/A
Does the plan include CRS planning requirements?	N/A

A.7.3. Mitigation Actions

The planning team for the City of Biggs identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Dam Failure
- Earthquake and Liquefaction
- Floods: 100/200/500 year
- Floods: Localized Stormwater
- Hazardous Materials Transportation
- Levee Failure
- Severe Weather: Extreme Heat
- Severe Weather: Freeze and Winter Storm
- Severe Weather: Heavy Rain and Storms (Hail, Lightning, Wind)
- Severe Weather: Wind and Tornado
- Wildfire

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to

implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Multi-Hazard Actions

Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Hazards Addressed: Multi-hazard (Climate Change, Dam Failure, Drought & Water shortage, Earthquake and Liquefaction, Floods: 100/200/500 year, Floods: Localized Stormwater, Hazardous Materials Transportation, Invasive Species: Aquatic, Invasive Species: Pests/Plants, Landslide, Mudslide, and Debris Flow, Levee Failure, Severe Weather: Extreme Heat, Severe Weather: Freeze and Winter Storm, Severe Weather: Heavy Rain and Storms (Hail, Lightning), Severe Weather: Wind and Tornado, Stream Bank Erosion, Volcano, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background: Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (AB 2140). Specifically, this section requires that each jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office: City of Biggs Planning Department

Priority (H, M, L): High

Cost Estimate: Jurisdictional board/staff time

Potential Funding: Local budgets

Benefits (avoided Losses): Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

Schedule: As soon as possible

Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness

Hazards Addressed: Multi-hazard (Climate Change, Dam Failure, Drought & Water shortage, Earthquake and Liquefaction, Floods: 100/200/500 year, Floods: Localized Stormwater, Hazardous Materials Transportation, Invasive Species: Aquatic, Invasive Species: Pests/Plants, Landslide, Mudslide, and Debris Flow, Levee Failure, Severe Weather: Extreme Heat, Severe Weather: Freeze and Winter Storm, Severe

Weather: Heavy Rain and Storms (Hail, Lightning), Severe Weather: Wind and Tornado, Stream Bank Erosion, Volcano, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6, 7, 8, 9

Issue/Background: The City and County play a key role in public outreach/education efforts to communicate the potential risk and vulnerability of their community to the effects of natural hazards. A comprehensive multi-hazard public education program will better inform the community of natural hazards of concern and actions the public can take to be better prepared for the next natural disaster event.

Project Description: A comprehensive multi-hazard outreach program will ascertain both broad and targeted educational needs throughout the community. The City will work with the County and other agencies as appropriate to develop timely and consistent annual outreach messages in order to communicate the risk and vulnerability of natural hazards of concern to the community. This includes measures the public can take to be better prepared and to reduce the damages and other impacts from a hazard event. The public outreach effort will leverage and build upon existing mechanisms, will include elements to meet the objectives of Goal 3 of this LHMP Update, and will consider:

- Using a variety of information outlets, including websites, local radio stations, news media, schools, and local, public sponsored events;
- Creating and distributing (where applicable) brochures, leaflets, water bill inserts, websites, and public service announcements;
- Displaying public outreach information in County office buildings, libraries, and other public places and events;
- Developing public-private partnerships and incentives to support public education activities.

Location of Project: Citywide

Other Alternatives: Continue public information activities currently in place.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing County outreach programs will be reviewed for effectiveness and leveraged and expanded upon to reach the broader region.

Responsible Office: City of Biggs in partnership with the County

Participating Jurisdictions: County and all cities.

Priority (H, M, L): High

Cost Estimate: Annual costs to be determined, and will depend on the scope and frequency of activities and events as well as volunteer participation

Benefits (Losses Avoided): Increase residents' knowledge of potential hazards and activities required to mitigate hazards and be better prepared. Protect lives and reduce damages, relatively low cost to implement.

Potential Funding: Local budgets, grant funds

Timeline: Ongoing/Annual public awareness campaign

Flood and Localized Flood Actions

Action 3. Storm Water Management Plan Update

Hazards Addressed: Dam Failure, Localized flooding, Flooding, Levee Failure, Heavy Rain and Storms

Goals Addressed: 1, 2, 3, 4, 6, 7, 9

Issue/Background: Certain sections of the City suffer from localized flooding during extreme weather events a few times each decade. Existing storm drain infrastructure is inadequate. Exact contributing factors must be identified and quantified so that solutions can be engineered.

Project Description: Storm Water Management Plan Update

Other Alternatives: none

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Responsible Office/Partners: City of Biggs, Reclamation District 833, Butte County.

Cost Estimate: \$100,000 - \$200,000

Benefits (Losses Avoided): Avoid property damage

Potential Funding: State, federal, City.

Timeline: 12-18 months

Project Priority: high

Action 4. Storm Water improvement projects

Hazards Addressed: Localized flooding, levee failure

Goals Addressed: 1, 2, 3, 4, 6, 7, 9

Issue/Background: Certain sections of the City suffer from localized flooding during extreme weather events a few times each decade. Existing storm drain infrastructure is inadequate.

Project Description: Storm Water improvement projects. Improvements to City of Biggs storm water infrastructure, including capacity upgrades and new methods of storm water retention and redirect to areas able to accept greater volumes. Projects to retain, delay or deflect storm water from running into the City from un-incorporated areas. Projects to improve the storm water capacity of Reclamation District 833 facilities.

Other Alternatives: none

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Office/Partners: City of Biggs, Reclamation District 833, Butte County.

Cost Estimate: unknown

Benefits (Losses Avoided): Avoid property damage

Potential Funding: State, federal, City

Timeline: 5 years

Project Priority: medium