

PRELIMINARY ENVIRONMENTAL HAZARD ASSESSMENT REPORT

October 2021

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City of Loyalton**

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1.0 BACKGROUND

1.1 PURPOSE

The purpose of this report is to provide a Preliminary Environmental Hazard Assessment, including floodplain mitigation options for development of specific vacant residentially zoned parcels within the 100-year floodplain. This report will enable the City to develop appropriate standards for mitigation and thus remove constraints and facilitate potential development of residential housing opportunities. This Report is being completed under a LEAP grant awarded to the City by the California Department of Housing and Community Development (HCD).

A Housing Element, one of seven state-mandated elements of a General Plan, addresses Loyalton's plans for housing needs. The Housing Element was updated to fulfill the 6th Cycle Regional Housing Needs Allocation (RHNA) and must include: (1) an identification and analysis of existing and projected local housing needs; (2) an identification of resources and constraints; and (3) goals, policies and implementation programs for the rehabilitation, maintenance, improvement and development of housing for all economic segments of the population. The Housing Element's identification of resources and constraints included a Flood Mitigation Program (Program 3-3-5) includes the preparation of this Preliminary Environmental Hazard Assessment with evaluation of select parcels the 100-year floodplain within the City of Loyalton and floodplain mitigation options. This Report provides recommendations for appropriate potential mitigation actions for development of housing within Loyalton to help reduce constraints to housing development.

Environmental constraints such as flooding, sensitive biological resources, and seismicity can affect the costs associated with the maintenance, improvement, and development of housing. Pursuant to California Assembly Bill (AB) 162 the City is required to amend the Safety Element of the General Plan to include analysis and policies regarding flood hazards and flood management to address flood-related constraints to housing development in the City. (California State Legislature, 2007) This Preliminary Environmental Hazard Assessment is intended to identify existing environmental resources and possible constraints to potential development within the City of Loyalton and to provide preliminary analysis and potential policies regarding flood hazards and flood management that could be used to address flood-related constraints to housing development in the City.

1.2 LOCATION

The City of Loyalton is located in the eastern portion of Sierra County, in the northeast quadrant of the State of California. The City covers approximately 225 acres, with an east-west width of approximately 0.66 miles and a north-south width approximately of 0.5 miles. Loyalton can be accessed year-round via California State Highways 49 and 89. Loyalton is the only incorporated City in Sierra County and is the most populous municipality, with a recent population count of 699 residents.

The semi-arid climate in Loyalton is characteristic of the eastern slope of the Sierra Nevada. Summers are commonly dry, with moderate to high daytime temperatures and cool nights. Winters are typically wet, with an average annual rainfall of approximately 25-30 inches per year. Almost all precipitation falls between November and May, most in the form of snow. Winter temperatures often fall below 32°F. Moderate to high winds occur during the summer months and strong down slope winds are not uncommon. Thunderstorms are also common during the summer.

Smithneck Creek is a central feature within the City. The Creek runs south to north dividing the City. The Creek provides essential recreational opportunities, but has also been the source of recurring flooding.

Agricultural lands surrounding the City are important both locally and have statewide significance. Conserving these lands is important in supporting continued economic development and maintaining the rural character and desirability of the City.

1.3 VACANT RESIDENTIAL PARCELS

Vacant parcels zoned for residential development within the City of Loyalton were identified in the 6th Cycle Regional Housing Needs Allocation (RHNA) Housing Element update, covering the period of 2019 to 2024. The Housing Element identified 7 vacant, residentially zoned parcels within the City of Loyalton for potential residential development. The parcels are listed below in Table 1 and shown on Figure 1.

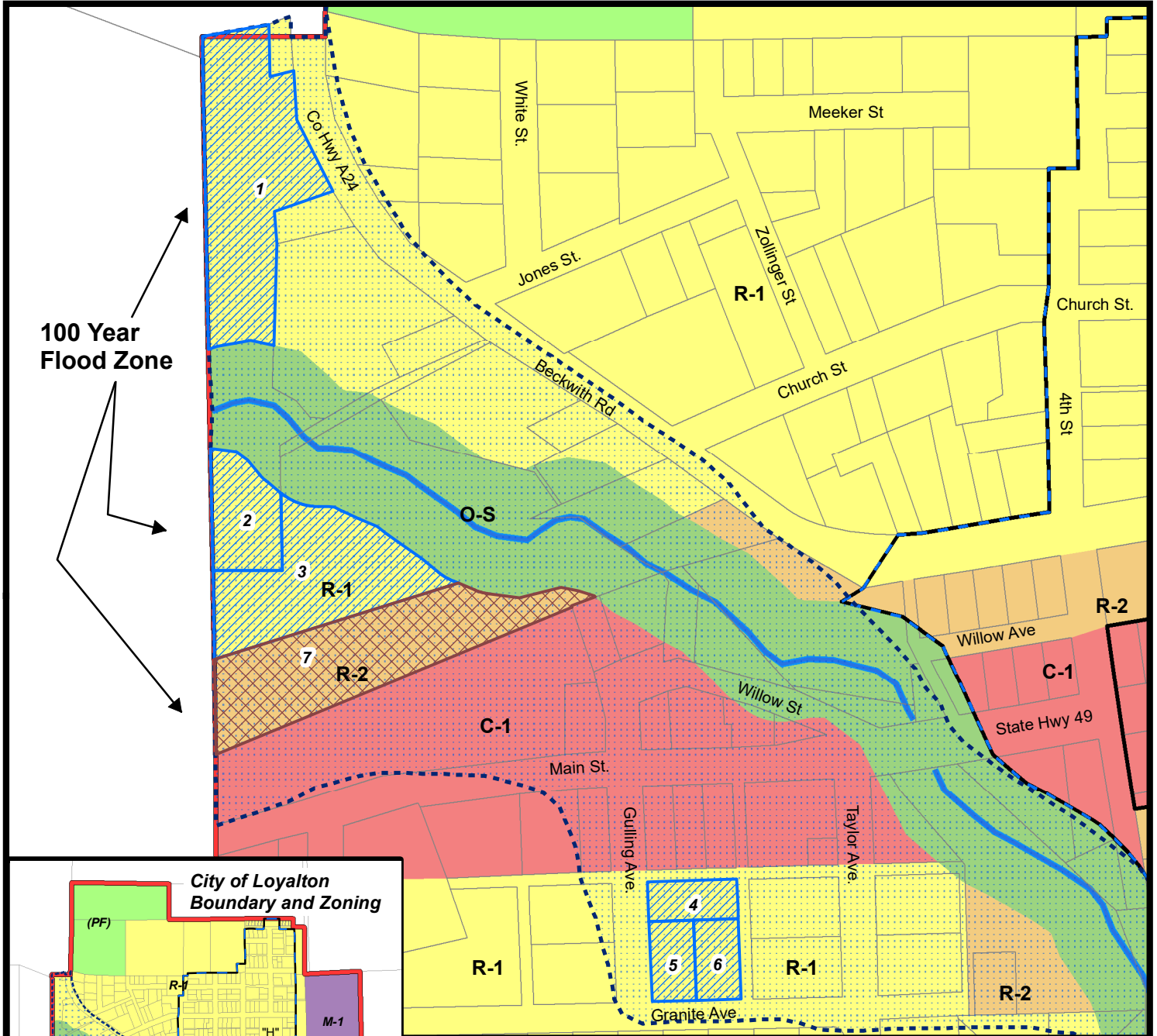
The City of Loyalton is making updates and amendments to the City’s Municipal Code for Zoning. Changes are anticipated to be approved and take effect in July 2021. Additional discussion of the Zoning code is in Sections 3.0 and 4.0 of this document.

The City of Loyalton Municipal Code Zoning includes several residential development zones. The R-1 zone applies to areas of the City designated for low density residential single-family uses identified in the General Plan. Any new development in the R1 zone is subject to development review. Permitted uses in the R1 zone include single family residential and accessory dwellings units, small residential care facilities, employee housing foster care homes and transitional housing. The R-2 zone is the multiple family residential zone district. Medium Density Residential single-family uses in the General Plan are allowed in this zone and are subject to development review. Permitted uses in the R-2 zone also include single family homes, manufactured homes, multiple family dwellings including but not limited to duplex, triplex, fourplex or townhouse housing, and accessory and junior accessory dwelling units. (City of Loyalton, 2021)

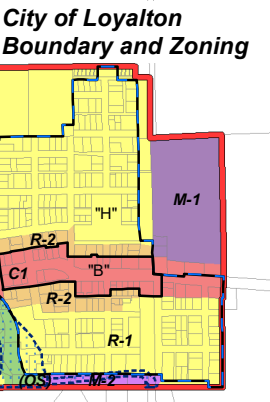
Table 1 Vacant Residentially Zoned parcels within the City of Loyalton

ID in Housing element	APN	Zoning
1	017-011-017	R-1
2	017-011-017	R-1
3	017-050-001	R-1
4	017-064-010	R-1
5	017-064-011	R-1
6	017-064-012	R-1
7	017-050-001	R-2

City of Loyalton Vacant R1 and R2 in 100 Year Flood Plain



100 Year Flood Zone



Vacant Properties containing R1 and R2 Zoning In Flood Plain

ID	APN	Acreage	Zoning	ID	APN	Acreage	Zoning
1*	017-011-017	1.69	R-1	5	017-064-011	0.23	R-1
2*	017-011-017	0.48	R-1	6	017-064-012	0.23	R-1
3*	017-050-001	1.26	R-1	7*	017-050-001	1.61	R-2
4	017-064-010	0.23	R-1				

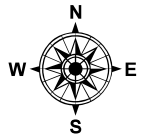
ZONING

- (O-S) Open Space
- (P-F) Public Facilities
- C-1 Commercial
- M-1 Light Industrial
- M-2 Heavy Industrial
- R-1 Residential Single Family
- R-2 Residential Multiple Family
- Combining District "B"
- 100 Year Flood Zone
- Historic Combining District "H"
- Vacant R1 Zoning
- Vacant R2 Zoning

* The sites identified with an (*) in the tables are only a portion of a larger parcel.

Legend

- City Boundary
- Parcels
- Smithneck Creek



2.0 ENVIRONMENTAL RESOURCES AND CONSTRAINTS

Environmental constraints to development of the identified vacant residentially zoned parcels in Loyalton are posed by the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA), and other federal, state, county local ordinances. A broad array of environmental resources must be evaluated and potential impacts must be determined for proposed projects. When CEQA or NEPA apply, they require evaluation of the potential impacts of a project on wetlands, floodplains, water resources, threatened and endangered species, wildlife resources, land uses, air quality, noise, environmental justice and health and human safety and more.

This Preliminary Environmental Hazards Assessment identifies potential constraints to development of the identified vacant residential zoned parcels within the City of Loyalton. Constraints identified in this report will require further additional site-specific analysis. Additional project information would be necessary for project specific determination of effects. Early identification of potential environmental constraints for a project can help streamline environmental clearances for development. Some housing development projects fall under CEQA exemptions so long as there are no unusual circumstances, and the project is shown to have no reasonable possibility of having a significant effect on the environment.

Preliminary assessments identifying potential biological and aquatic resources in the Loyalton area were conducted for this report. An assessment of natural hazards that may affect the Loyalton area was also completed. Existing studies were reviewed to identify other hazards in the Loyalton areas that have the potential to impact residential development projects. The results of these assessment and reviews are presented in this report, as well as possible constraints and recommendations for future actions.

2.1 ENDANGERED SPECIES

Under NEPA and CEQA, identification of a project's potential impacts to endangered or threatened species and, their associated critical habitats, is required. Research completed through the United States Fish and Wildlife Service (USFWS) Information for Planning And Consultation (IPAC) tool was used to identify endangered species, migratory birds, and wetlands within the City of Loyalton.

The USFWS IPAC tool identified 3 threatened species in the Loyalton area. One bird, the yellow-billed Cuckoo, and 2 fish species, Delta Smelt and Lahontan Cutthroat trout, were identified to potentially exist within the area. No critical habitat for these species was identified within the City. No engendered species were identified within the City of Loyalton. A copy of the IPAC report is included in Appendix A.

Migratory birds identified by IPAC that may exist within the area include the Bald Eagle, Brewer's Sparrow, Golden Eagle, Green-tailed Towhee, Lewis's Woodpecker, Long-billed curlew, Olive-sided Flycatcher, Sage Thrasher, Tricolored Blackbird, White Headed Woodpecker, Willet *Tringa semipalmata*, Williamson's Sapsucker, and Willow Flycatcher. The probability of presence of these migratory birds within a specific project area can be affected by the project location, time of year, breeding season of the species, and project conservation measures.

IPCA identified no wildlife refuges land or fish hatcheries located within the City of Loyalton.

2.1.1 Constraints

Constraints on residential development due to the existence of endangered species within the area are not likely for the identified vacant parcels. Neither endangered species nor critical habitat were identified within the study area. The presence of migratory birds, particularly Bald Eagles would need to be evaluated for a specific project location. If Bald Eagles are identified within the vicinity of a proposed project area, and the potential to disturb or kill an Eagle exists, a permit may be necessary to avoid violations of the Eagle Act.

2.2 WETLANDS AND AQUATIC RESOURCES

Smithneck Creek is a central feature within the City of Loyalton. The Creek runs south to north dividing the City. The Creek provides essential recreational opportunities, but has also been the source of recurring flooding, mainly due to general rainstorms. Smithneck creek runs adjacent to study parcels #1, #2 (APN 017-011-017), #3 (APN 017-050-001) and #7 (APN 017-050-001). See Figure 1.

According to the Federal Emergency Management Agency (FEMA), the most recent significant flooding in the area occurred in 1955, 1963, 1986, and 1995. (FEMA, 2019) In the upper 2 miles of FEMA’s detailed study area of Smithneck Creek, the floodplain uniformly parallels Smithneck Creek in a steep “U”-shaped valley. In 1986, a berm failure allowed flood waters from Smithneck Creek to flow down old channels toward the junction of West Sierra Brooks and Long Horn Drives. After that flood, the Natural Resources Conservation Service (NRCS) rebuilt the west bank of Smithneck Creek to repair the berm failure. This Berm is located southeast of the City and not within the study area for this report. (FEMA, 2019)

As Smithneck Creek approaches the City of Loyalton from the southeast, the channel slope diminishes and flood waters spread across the broad floodplain in the vicinity of the City of Loyalton. (FEMA, 2019) This area corresponds to the vicinity of vacant parcels #3, #4, and #5 in the Housing Element shown on Figure 1 Northwest and downstream of the City of Loyalton, the flood waters spread into a broad agricultural area. This area generally corresponds to parcels # 2, 3, and 7 of the study area for this report. See Figure 1

The National Wetlands Inventory (NWI) database was accessed to identify wetlands within the City of Loyalton. Freshwater Emergent Wetlands, Freshwater Forested/Shrub Wetland, and Riverine wetlands were identified within the City. The parcels identified for study in this report are located near Freshwater Forested/Shrub Wetland and Riverine wetlands. Mapping of the wetland areas is included in Appendix A.

Within the City of Loyalton 1.243 acres of Freshwater Forested/Shrub Wetland have been identified. The classification of these wetlands by NWI as type “PSSC” is described in Table 2.

Table 2 Freshwater Forested/Shrub Wetland Characteristics

P	System Palustrine: The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 ppt. It also includes wetlands lacking such vegetation, but with all of the following four characteristics: (1) area less than 8 ha (20 acres); (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 2.5 m (8.2 ft) at low water; and (4) salinity due to ocean-derived salts less than 0.5 ppt.
SS	Class Scrub-Shrub: Includes areas dominated by woody vegetation less than 6 m (20 feet) tall. The species include true shrubs, young trees (saplings), and trees or shrubs that are small or stunted because of environmental conditions.
C	Class Seasonally Flooded: Surface water is present for extended periods especially early in the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface.

Within the City of Loyalton 8.332 acres of Riverine Wetland have been identified. The classification of these wetlands by NWI as type “R2UBH” is described in Table 3.

Table 3 Riverine Wetland Characteristics

R	System Riverine: The Riverine System includes all wetlands and deepwater habitats contained within a channel, with two exceptions: (1) wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and (2) habitats with water containing ocean-derived salts of 0.5 ppt or greater. A channel is an open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of standing water.
2	Subsystem Lower Perennial: This Subsystem is characterized by a low gradient. There is no tidal influence, and some water flows all year, except during years of extreme drought. The substrate consists mainly of sand and mud. Oxygen deficits may sometimes occur. The fauna is composed mostly of species that reach their maximum abundance in still water, and true planktonic organisms are common. The gradient is lower than that of the Upper Perennial Subsystem and the floodplain is well developed.
UB	Class Unconsolidated Bottom: Includes all wetlands and deepwater habitats with at least 25% cover of particles smaller than stones (less than 6-7 cm), and a vegetative cover less than 30%.
H	Class Permanently Flooded: Water covers the substrate throughout the year in all years.

There are no Sole Source Aquifers for drinking water sources in the Loyalton area. (US EPA, 2021)

2.2.1 Constraints

The location of Wetlands and Smithneck Creek to the identified vacant parcels pose constraints to residential development on those parcels. Project specific evaluation would be necessary to determine the potential impacts to wetlands and aquatic resources and to ensure compliance with CEQA, NEPA, and State, County and City code requirements. Permitting through the US Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act and through the California EPA for Clean Water Act Section 401 Certification for work in wetlands may be required.

Flooding and Special Flood Hazard Area (SFHA) within the project area impose significant constraints on development. All 7 parcels identified in the Housing Element are within the SFHA designated by FEMA and any construction must meet special standards for flood mitigation. Flood related constraints and standards are discussed further in Section 3.6.

2.3 SOILS

A custom soil report was generated for the Loyalton area using the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil mapper web tool. This report is included in Appendix A. Two main soil types were identified in the area of the vacant residential parcels. The soil types are listed in Table 4.

Table 4 Soil Types

Soil Type	Characteristics
JcA: James Canyon silt loam	Prime farmland if irrigated and drained
CnA: Coolbirth silt loam	Prime farmland if irrigated

2.3.1 Constraints

The Prime Farmland capability of the soils in the project are important to the rural and agricultural setting in Loyalton. Development of the soils in the project area are consistent with the existing City of Loyalton Zoning the Housing Element and the General Plan. No zoning or land use changes would be necessary to develop the vacant residentially zoned properties in the Housing Element, therefore constraints on residential development due to existing soil resources are not anticipated.

3.0 HAZARD IDENTIFICATION AND CONSTRAINTS

The California Governor’s Office of Emergency Services (Cal OES) MyHazards tool was used for preliminary identification of natural hazards in the Loyalton area. MyHazards is a tool for the general public to discover hazards in their area (earthquake, flood, fire, and tsunami) and learn steps to reduce personal risk. The tool presents information on the risks identified within the search radius, and recommended actions. (myhazards.caloes.ca.gov). The MyHazards report is included in Appendix A.

Hazard risks most closely associated with the Loyalton area are fire, earthquake, and flood. Based on the MyHazards mapping tool, the greatest hazard risk in the City of Loyalton is due to flooding. Although MyHazards identifies the area as low hazard for flooding, the location of the vacant parcels identified in the Housing Element are all within the FEMA 100 year flood zone. This poses the most significant constraint on residential development on the vacant parcels.

3.1 EARTHQUAKE

Based on the Sierra County Hazard Mitigation Plan (HMP), the probability of occurrence of earthquakes in Sierra County is “occasional” to “likely” due to the seismically active nature of the region. There is an 80% or larger probability of a 6.0 or greater earthquake occurring. The probability approaches 90% within a 20-year time frame. Larger, 7.0 plus, earthquakes are also possible, but, in the Sierra Complex, tend to have long recurrence intervals between events. The probability of a 7.0 or greater earthquake in this area is 25% over the next 20 years, according to the USGS Report referenced in the HMP. (Sierra County, 2012)

3.1.1 Constraints And Mitigation

The MyHazards tool includes recommended actions to mitigate the risks to life and personal property posed by earthquakes and seismic activity. Recommendations include:

1. Secure water heaters
2. Secure tall furniture and bookcases, cabinets, wall mounted objects
3. Secure natural gas appliances
4. Secure garage storage
5. Secure unreinforced masonry chimneys and buildings
6. Secure propane tanks
7. Secure kitchen appliances
8. Secure shop or gym equipment

New residential construction should meet or exceed construction recommendations related to seismic activity in Sierra County and the City of Loyalton development codes.

3.2 FIRE

The Sierra Nevada Mountain Range bisects Sierra County creating two distinct geographic areas with some topographic differences. These areas are referred to as the ‘Westside’ and the ‘Eastside’. Both areas boast heavily forested and mountainous landscape. Loyalton is located within the Eastside Fire Protection District.

The MyHazards tool does not identify the Loyalton area as a high fire risk. However, that determination is made based on State Responsibility Areas (SRA), which do not include lands within city boundaries. Therefore, Loyalton is not included in the fire hazard risk through the MyHazards tool. Loyalton is surrounded by forested mountainous areas and cleared agricultural lands near the town boundaries. The My Hazards tool shows very high, high and moderate fire risk surrounding the City of Loyalton.

3.2.1 Constraints And Mitigation

Mitigation for wildfire risks should be considered in future planning for the City of Loyalton. Mitigation measures may include defensible space requirements for existing and new construction and building permits and improvements to water storage and flow available for firefighting.

3.3 FLOODING

The MyHazards tool identifies the Loyalton area as being “in or near an area of a low hazard flooding.” The Sierra County Hazard Mitigation Plan (HMP) identifies flooding as a potential natural hazard in Sierra County. The primary types of flood events in Sierra County are riverine. Flooding could also occur as a result of dam failure. The cause of flooding is often the result of severe weather and excessive rainfall, either in the flood area, upstream, or from winter snowmelt. The HMP provides extensive background on flood hazards in Sierra County. An excerpt from the HMP describing flood hazards in Sierra County is below.

Riverine flooding is the most common type of flood event and occurs when a watercourse exceeds its storage capacity. Riverine flooding generally occurs as a result of prolonged rainfall, or rainfall that is combined with already saturated soils from previous rain events. The duration of riverine floods may vary from a few hours (flash flood) to many days (slow-rise flooding). Factors that directly affect the amount of flood runoff include precipitation amount, intensity and distribution, the amount of soil moisture, seasonal variation in vegetation, snow depth, and the water resistance of the surface due to urbanization. The warning time associated with slow-rise floods assists with life and property protection.

As the slope of the river flattens, the velocity slows and the material is deposited. As a result, the lower reaches of many streams pass through the sandy alluvial plains that they have formed. Flood flows can cause these streams to migrate, resulting in a higher and wider floodplain. Developed areas on land originally outside the defined floodplain can later flood.

The area adjacent to a river channel is the floodplain. Floodplains are illustrated on inundation maps, which show areas of potential flooding and water depths. In its common usage, the floodplain most often refers to that area that is inundated by the 100-year flood, the flood that has a one percent chance in any given year of being equaled or exceeded. The 100-year flood is the national minimum standard to which communities regulate their floodplains through the National Flood Insurance Program (NFIP).

Urban flooding can occur in any terrain. It is particularly aggravated where natural cover has been removed to construct buildings, roads, and parking lots. Streets become rivers, inundating vehicles and causing damage to residential and industrial properties situated along stream channels.

The potential for flooding can change and increase through various land use changes and changes to land surface, which result in changes to the floodplain. Environmental changes can create localized flooding problems in and outside of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity.

Sierra Valley is an irregularly shaped, complexly faulted valley in eastern Plumas and Sierra Counties. The basin is bounded to the north by Miocene pyroclastic rocks of

Reconnaissance Peak, to the west by Miocene andesite of Beckwourth Peak, to the south and east by Tertiary andesite, and to the east by Mesozoic granitic rocks (Saucedo 1992). The Middle Fork Feather River heads in Sierra Valley is formed by the confluence of several streams draining the surrounding mountains. Most of the smaller tributaries flow north and northwest to join the Middle Fork Feather before it exits the valley at the northwest corner of the basin. Annual Precipitation ranges from 13 inches in the valley to 29 inches in the upland areas to the south and west. This basin with less than 5 feet of slope per mile behaves very differently to flood events than the western parts of the county.

With the flood history of Sierra County, annual probability of flooding is 20% or likely in any given year. The factors that consistently lead to flooding are heavier than normal rainfall, greater concentration of rainfall events, greater intensity of individual storms and late season warm storms that melt the expansive snowpack. Any combination of three or more of these factors will lead to flooding. (Sierra County, 2012) at pg. 58-59)

Sierra County's Initial Countywide Flood Insurance Study (FIS) Effective Date was September 1, 1988 which included the unincorporated areas in Sierra County and the City of Loyalton. FEMA flood mapping for Loyalton was updated in 2019. A revised countywide Flood Insurance Study (FIS) was issued with an effective date of April 19, 2019. The FIS includes a description of flooding that has occurred from Smithneck Creek near the City of Loyalton.

As Smithneck Creek approaches the City of Loyalton from the southeast, the channel slope diminishes and flood waters spread across the broad floodplain in the vicinity of the City of Loyalton. Flows divide east and west around the lumber mill, then rejoin at the southeast edge of the City's residential development. Overbank flooding is most significant upstream of the State Highway 49 bridge. The channel capacity through the City upstream of State Highway 49 is diminished due to a flattening channel slope, dense alders growing in the channel, a narrowing of the channel, and decreased depth of the channel. Northwest and downstream of the City of Loyalton, the flood waters spread into a broad agricultural area. (FEMA, 2019) at pg, 4)

Per the FEMA FIS study "No major flood-control structures exist within the County. There is a low-level berm along both sides of Smithneck Creek in the vicinity of the Sierra Brooks subdivision, which provides some protection. The berm, however, does not meet the protection guidelines stated in FEMA Procedure Memorandum No. 43 - Guidelines for Identifying Provisionally Accredited Levees issued on March 16, 2007. The berm along Smithneck Creek does not show compliance with 44 CFR Section 65.10 to provide protection against the 1-percent-annual-chance flood." (FEMA, 2019)

No changes were made to the FIRM for Smithneck Creek in the 2019 FIS. Smithneck Creek and the 100-year, or 1%, annual chance, flood area is identified on Flood Insurance Rate Maps (FIRM) as Zone AE. Zone AE is the flood insurance rate zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the FIS by detailed methods. In most instances, whole-foot base flood elevations derived from the detailed hydraulic analyses are shown at selected intervals within this zone. Because Zone AE has been identified but the regulatory floodway has not been determined by detailed methods, additional federal floodway standards are applicable. FEMA FIRMS are included in Appendix A.

A floodway fringe district, identified in the Loyalton Zoning Code runs through a portion of the City of Loyalton. (City of Loyalton, 2015) FEMA FIRMS for the area do not differentiate the Smithneck Creek floodway from the floodway fringe through the City of Loyalton. The FEMA FIS study explains that encroachment on floodplains, including structures and fill, reduces flood-carrying capacity, increases flood

heights and velocities, and increases flood hazards in areas beyond the encroachment itself. “Under this concept, the area of the 1-percent-annual-chance floodplain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the 1-percent-annual-chance flood can be carried without substantial increases in flood heights. Minimum Federal standards limit such increases to 1.0 foot, provided that hazardous velocities are not produced. (FEMA, 2019)

Along streams where floodways have not been computed, such as Smithneck Creek, the community must ensure that the cumulative effect of development in the floodplains will not cause more than a 1.0-foot increase in the Base Flood Elevation (BFE) at any point within the county. The area between the floodway and 1-percent-annual-chance floodplain boundaries is termed the floodway fringe. The floodway fringe encompasses the portion of the floodplain that could be completely obstructed without increasing the water-surface elevation of the 1-percent-annual-chance flood by more than 1.0 foot at any point. (FEMA, 2019)

In addition to FEMA reports, there is local evidence of flooding near Smithneck Creek. During the public review of the Housing Element, a local resident, and property owner, provided information regarding one of the vacant parcels that is partially zoned for residential purposes. The resident and property owner provided background information indicating frequent flooding that impacts the agricultural use of the property and an existing residence. The owner also indicated this property may have a high groundwater table. Photographs provided by the resident are included in Appendix A. Information provided by the public has not been verified by a flood study at this time of this report.

3.3.1 Constraints

Because flooding is the most likely hazard event to impact residential development in Loyalton, recommendations and mitigation options are presented in their own section of this report. Constraints to residential development within the floodplain include FEMA National Flood Insurance Program (NFIP) requirements, Sierra County and City of Loyalton Flood Administration regulations and City of Loyalton Municipal Code Zoning requirements.

All 7 of the vacant residentially zoned parcels identified in the Housing Element lie within the 100-year floodplain and are within the Special Flood Hazard Area (SFHA) identified by FEMA flood mapping. An area of Special Flood Hazard is the land in the floodplain within a community subject to a 1 percent or greater chance of flooding in any given year. (44 CFR §59.1 et al.) See Appendix A for FEMA flood maps for the area.

Federal, county and local criteria and recommendations are in place for development within SFHAs and floodplains. National Floodplain Insurance Program (NFIP) requirements include meeting FEMA standards for development in those areas. The NFIP broadly defines the term development to include new construction (buildings and structures), substantial improvement of existing construction (buildings and structures), and repair of existing construction (buildings and structures) that sustain substantial damage during flooding events. (FEMA, 2019) Federal regulations also include criteria for floodplain management. (44 CFR §60.3) An excerpt of the relevant regulations is in Appendix A.

NFIP’s 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: (1) Reduce flood damage to insurable property; (2) Strengthen and support the insurance aspects of the NFIP, and (3) Encourage a comprehensive approach to floodplain management.

Sierra County participates in the National Floodplain Insurance Program in order to promote public health, safety, and the general welfare of its citizens. The County Board of Supervisors adopted a resolution

outlining the rules, regulations, and guidelines to implement Part 32 of the Sierra County Code -Floodplain Management.

The Sierra County Floodplain Management ordinance includes the following methods and provisions:

- a) Restrict or prohibit uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion, flood heights or velocities;
- b) Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
- c) Control the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel flood waters;
- d) Control filling, grading, dredging, and other development which may increase flood damage; and
- e) Prevent or regulate the construction of flood barriers which will unnaturally divert flood waters or which may increase flood hazards in other areas.

Floodplain management in the City of Loyalton is governed by the regulations of the City of Loyalton Ordinance No. 414 Chapter 14.01 – Floodplain Management (City of Loyalton, 2015) Ordinance 414 contains similar provisions to Sierra County Code Part 32.

Section 14.01.13 of City of Loyalton Ordinance 414 requires a development permit be obtained before any construction or other development begins within any area of special flood hazard. Farr West reviewed the Federal Emergency Management Agency (FEMA) FIRM 06091C0236C effective 2/2/2012 and concluded that all seven parcels identified in the Housing Element for residential development are within the Special Flood Hazard Area (SFHA). (FEMA, 2012)

Section 14.01.15.001 of Ordinance 414 gives the Floodplain Administrator the power to “Review all development permits to determine that:

- (a) the permit requirements of this ordinance [Ordinance 414] have been satisfied; [...]
- (c) the site is reasonably safe from flooding; [and]
- (d) the proposed development [...] will not increase the water surface elevation of the base flood more than one foot at any point within Sierra County...”

(City of Loyalton, 2015)

The administrative review process for development within the floodplain described in Ordinance 414 is a constraint on the development of vacant residentially zoned parcels within the City of Loyalton. Ministerial review of development in the SFHA is not sufficient to evaluate the potential impacts of development in special flood hazard areas. This is considered a constraint on new development because administrative reviews and approvals fall outside of several CEQA exemptions carved out to streamline housing development, particularly lower income infill housing such as proposed in the Housing Element.

Section 14.01.14 of Ordinance 414 appoints the Sierra County Director of Planning and Public Works as the Floodplain Administrator for the City. Farr West previously reviewed this ordinance and collaborated with the Sierra County Assistant Planning Director, Brandon Pangman with respect to other floodplain issues. (Farr West Engineering, 2020) Based on these previous discussions with the Sierra County Planning Dept., the delegation of Sierra County authority as Floodplain Administrator was subject to a contract between the City and County that was rescinded in 2013. Currently, the Floodplain Administration program is not administered in the City of Loyalton. The City of Loyalton is in the process of updating Chapter 14 to comply with more recent FEMA mapping and regulations such as the updated FIS.

In addition to requirements for review of proposed development projects with the SFHA, there are requirements for development in the floodway. Loyalton FIRMS show the stream elevation and the 100-year flood zone. The floodway and floodway fringe is not differentiated on FEMA mapping for Smithneck Creek. (FEMA, 2012)

The Loyalton Zoning Code also imposes constraints on development of the vacant residentially zoned parcels identified in the Housing Element. The Zoning Code includes requirements that development within the Floodway Fringe Overlay Zone District confirm with the Floodplain Administration Ordinance 414 and Zoning Code Chapter 12.08.17. As referenced in the Zoning and Parcel Map in Figure 1, the vacant residentially zoned properties identified in the Housing Element are located within the Floodway Fringe, FF, Overlay District. (City of Loyalton, 2015). All projects located in this district are subject to administrative review by the City Council to assure compliance with Chapter 14.01 of the Municipal Code regarding Floodplain Management. If the project complies with Chapter 14.01, then the administrative review is not required. As noted herein, the administrative process was not used during the 2014-2019 Housing Element Planning Cycle. If the administrative review process is required, it has been designed to take no more than 30 days to complete. Although the City of Loyalton Code was recently updated to include provisions to streamline housing development, including ministerial project review and limited environmental review, that will not be applicable to lands within the FEMA flood zones, or the City's Floodway Fringe District.

The City of Loyalton's Zoning Code also identifies development guidelines for areas of Open Space (O-S zone). (City of Loyalton, 2015) This zone classification is intended to be applied to properties which are found most properly to be preserved in a natural state and/or to provide open space buffer areas in which uses are restricted to recreational, conservation or light agricultural types, and including accessory and public service uses. Principal permitted uses in the O-S zone are as follows:

- A. Measures to promote conservation or natural terrain and vegetation, and to reduce fire and erosion hazards;
- B. Riding and hiking trails, picnic sites;
- C. Public and private nonprofit riding stables, parks, golf courses, and tennis and swimming clubs;
- D. Farming and grazing;
- E. Uses which the City Council determines, by written findings, are similar to the above.

(City of Loyalton, 2015)

A designated O-S zone runs adjacent to vacant Parcels #1, #2 (APN 017-011-017), #3 (APN 017-050-001) and #7 (APN 017-050-001) identified in the Housing Element. See Figure 1. Residential development of these parcels is limited by the O-S zoning on a portion of the parcel. Under the current code there are conditional uses allowed requiring conditional use permits. Those conditional uses include farm dwellings on 10 acres or more and living quarters for caretakers or watchmen. Neither of these uses are consistent with RHNA of the Housing Element.

4.0 RECOMMENDATIONS

This section provides recommendations for potential mitigation measures to reduce constraints and streamline development of housing on existing, vacant, residentially zoned parcels within the City of Loyalton. Flood mitigation and flood control options for the City of Loyalton may range widely. Recommendations include flood studies and flood modeling of Smithneck Creek, conducting environmental review for the proposed areas, code updates, floodplain administration and FEMA approved mitigation measures for flooding. Ultimately, appropriate recommendations for mitigation for a housing project would be project and location specific.

4.1 ENVIRONMENTAL RESOURCES

Preliminary biological and environmental resources were identified and constraints on potential development due to the presence of resources were identified in this report. The most significant constraint to development of the identified parcels is the California Environmental Quality Act (CEQA). CEQA requires disclosure and mitigation of a wide range of environmental impacts for proposed projects. A project under CEQA is an action by a public agency that is subject to discretionary approval and has the potential to impact the environment. Approval of a development or construction permit by the City of Loyalton may fall under CEQA if the decision is discretionary and not ministerial. Development review by the floodplain administrator is required for development within the floodplain, and is also discretionary in nature.

Various exemptions and streamlining opportunities have been developed by the State of California to ease barriers to construction of low income and infill housing projects. However, because the vacant parcels identified in the Housing Element are all within the floodplain, streamlining development review and eliminating environmental reviews under CEQA are not applicable because the City must complete an administrative review of a project proposed to be constructed within the floodplain.

Additional study to determine any aesthetic impacts, identify any historical or cultural resources that may exist within a project area, or that may be impacted by a development in the area, will be required. No California scenic highways bisect the City of Loyalton. Other aesthetic considerations under CEQA are not addressed in this report and would need to be addressed in project specific reviews.

Recommendations for further action include a community level environmental review, or an preliminary study to determine whether an exemption to CEQA would apply for low-income housing development on the identified vacant, residentially zoned parcels. Completing one of these actions would streamline development of housing should any low income or infill housing projects be presented to the City for development consistent with the General Plan and Housing Element.

4.1.1 Community-Level Environmental Review

A community-level environmental review may allow for streamlined environmental review of housing projects. California Public Code (CPC), Public Resources Code (PRC) allows that if a previous Environmental Impact Report (EIR) has been completed on a community level, and a negative declaration or a mitigated negative declaration has been made, environmental review of a specified housing project included under that review is streamlined under the CEQA process.

California Public Code, Public Resources Code (PRC) Section 21159.20 defines Community-level environmental review as an environmental impact report certified on any of the following:

1. A general plan.
2. A revision or update to the general plan that includes at least the land use and circulation elements.
3. An applicable community plan.

4. An applicable specific plan.
5. A housing element of the general plan, if the environmental impact report analyzed the environmental effects of the density of the proposed project.

A negative declaration or mitigated negative declaration must have been adopted as a subsequent environmental review document, following and based upon an environmental impact report on any of the projects listed above. Community level review under the City of Loyalton General Plan or an environmental report prepared with the next housing element that analyzes the environmental effects of the density of the proposed project may satisfy a CEQA requirements under PRC 21159.25 streamlining. The legislation has specific requirements for evaluating the impacts of housing density and is due to expire in January of 2025.

4.1.2 Preliminary Environmental Review

If a proposed development is brought to the City of Loyalton for development review it is recommended that the developer supply a full environmental impact study for the project. To encourage residential infill development the City of Loyalton may consider securing funding to complete a preliminary environmental study for development of identified vacant residentially zoned parcels that would fulfill the requirements for documentation under a CEQA exemption, if one is applicable. The preliminary environmental review would also inform potential developers of constraints to residential projects and assist in planning for development.

One example of an exemption that may apply, but that requires additional review is Senate Bill 35 Streamlining Provisions. (California State Legislature, 2017) The City of Loyalton and Sierra County at large fall under the streamlining provisions of SB 35 which apply “When jurisdictions have insufficient progress toward their Above Moderate income RHNA and/or have not submitted the latest Housing Element Annual Progress Report (2018), these jurisdictions are subject to the streamlined ministerial approval process for proposed developments with at least 10% affordability.” (California State Legislature, 2017) SB 35 allows for streamlining housing and other affordable housing development in accordance with state law, which typically consists of multiple family housing is generally subject to ministerial review. The City of Loyalton Code which was recently amended, and is expected to be approved, allows for ministerial review, including no environmental review, on housing projects. (City of Loyalton, 2021) However, because the currently identified vacant residentially zoned parcels are within the floodplain for Smithneck Creek, development on those parcels is likely excluded from the exemption. Additional preliminary environmental review for CEQA is necessary to determine if this, or other exemptions, may apply.

4.2 FLOOD

General strategies to mitigate flood hazards are discussed in this section. The sub-sections that follow include program and agency specific recommendations for flood mitigation strategies. General strategies to mitigate flood hazards include:

1. Protecting the natural Floodplain function and values
2. Set higher regulatory standards
3. Collect flood data information and maintenance
4. Balance channel migration and bank erosion monitoring
5. Increase floodplain and flood hazard outreach and education
6. Reduce infrastructure impact
7. Minimize stormwater impacts

Several of these strategies are included in the recommendations below. Collecting additional flood data is recommended though flood modeling or a flood study for the City of Loyalton. Reducing impacts are addressed for existing structures within the floodplain. Updating regulatory standards and establishing an active Floodplain Administration Program is also recommended.

4.2.1 MYHazards Mitigation Measures

The California Governor's Office of Emergency Services (Cal OES) My Hazards tool identifies flood as a low hazard risk for many areas of Loyalton. MYHazards recommendations for flood mitigation measures for existing properties within the floodplain in City of Loyalton are listed below.

- Protecting wells from contamination by flooding
- Install sewer backflow valves
- Anchor Fuel tanks
- Raise electrical system components
- Raise floodproof/HVAC equipment
- Add waterproof veneer to exterior walls

4.2.2 FEMA Mitigation Measures

Farr West recommends the City of Loyalton follow all guidance and regulations issued by FEMA for construction with the floodplain and on lands under the NFIP. FEMA provides recommended flood mitigation measures for single family and multifamily residential buildings. The Housing Element identifies a maximum for low density housing of 45 feet and a maximum for high density housing of 30 feet in height. FEMA guidance identifies this size of building as low-rise Multi-Family Housing (MFH) which is "a building with less than four stories containing at least five dwelling units." (National Flood Insurance Program, 2019) All the vacant R1 and R2 parcels identified in the Housing Element lie within the 100-year flood zone, or special flood hazard area (SFHA). FEMA's National Flood Insurance Program (NFIP) provides design and construction standards for new construction within the SFHA, some of which is listed below.

- Perimeter floodwalls
- Wet floodproofing (parking access, above-grade storage areas)
- Wet floodproofing above the required elevation
- Dry proofing above the required elevation

(National Flood Insurance Program, 2019)

In addition to primary mitigation, secondary measures help improve resiliency of buildings and may help improve the performance of the primary measures. NFIP's secondary mitigation measures for MFH projects include:

- Isolating utilities to separate protected areas from the remainder of the building if the area is inundated with floodwaters. Automatic shutoff valves can be used for natural gas and water sensors can be used to turn off electricity. Circuits powering emergency sump pumps should not be shut off.
- Installing backflow prevention valves to help prevent water flowing from the exterior to the interior of a building through the sanitary sewer or water drainage systems.
- Installing ejector pumps can allow buildings with staff that are not required to evacuate to maintain operations, while sanitary sewer systems are pressurized by floodwater that would prevent normal gravity flow building drains to operate properly.
- Installing sump pumps with dedicated emergency power supply to handle seepage and dewater internal drainage systems and below-grade areas. In dry floodproofing applications, sump pumps are used to prevent accumulated water from causing damage to the building and handle the inevitable small leaks that occur around shields, sealed openings, or through adhered barrier-type waterproofing systems.
- Using flood damage-resistant materials below the Flood protection level.

- Identifying, evaluating, and addressing openings below the FPL, including louvers, window wells, utility connections, and all other openings such as pipe penetrations through walls.
- Implementing mitigation measures for conveyances—elevators and lifts—in accordance with NFIP Technical Bulletin 4, Elevator Installation for Buildings Located in Special Flood Hazard Areas in accordance with the National Flood Insurance Program (FEMA 2010c).
- Installing backup power systems to provide power during power loss. Generators should be sized in accordance with the appropriate energy load (operational load plus peak load) required for emergencies and may include power for elevator, emergency lighting, security systems, and plug-in load.
- Combining inspections of flood mitigation measures with routine inspections that are performed to assess and mitigate potential fire and life safety hazards in buildings. All flood shields and gaskets on shields and doors and all installed dry floodproofing measures, such as a barrier-type membrane system and/or a cavity drainage system, should be inspected and maintenance and repairs should be performed on a regular basis.
- Conducting at least annual training and exercising of the proper installation of flood shields and other measures that require human intervention.

(National Flood Insurance Program, 2019)

4.2.3 Floodplain Administration

Farr West recommends the City establish a formal Floodplain Administrator position qualified to oversee the duties as outlined in Section 14.01.15 of Ordinance 414. If possible, a renewed partnership with the County to provide the service to Loyaltown is recommended. Farr West recommends that the City work with Sierra County to potentially reassign the Floodplain Administrator position to the County. This reissuance of responsibilities would remove the burden from the City to enforce Floodplain Administrator duties in the future.

Alternately, funding for a part time planner or administrative position that includes floodplain management for the City is recommended, potential funding sources are discussed in Section 5.0 of this document.

4.2.4 City of Loyaltown Zoning Code Updates

Farr West recommends the Municipal Zoning Code be updated after such time that Chapter 14 of the Code, Floodplain Management, is updated to reflect new methods or administrative processes to review development and design standards for development within the floodplain. Updating of the Loyaltown floodplain ordinance and Code may also include criteria for landscaping, berms and fencing within the SFHA. Low impact development could be considered in relation to the floodplain. These potential ordinance changes may pose additional constraints on development within the floodplain in the future. Modifications to the municipal code to allow ministerial permitting for development plans within the floodplain that meet the criteria of the Floodplain Administration Program is also a possible way to streamline approvals for certain housing projects.

Additional recommendations related to the zoning code include requiring housing development plans that address actions to meet open space goals and incorporate permitted uses into the development design.

4.2.5 Engineering floodplain study and flood modeling

Floodplain studies of Smithneck Creek have not been conducted since the original one-dimensional FEMA flood study conducted in 1976. The FIRM effective data for this study was September 1, 1988. Detailed methods were used to study Smithneck Creek and were discussed in the 2012 FIS report. However, the regulatory floodway and floodway fringe district has not been identified for Smithneck Creek through the City of Loyaltown. Therefore, it cannot be determined with certainty the effects of any current or proposed development on raising the base flood elevation water surface level by more than one foot. An engineering

flood study, including flood modeling, is recommended for the entire floodway running through the City of Loyalton to determine potential impacts of flooding on improvement at existing developed parcels and on proposed new construction within the floodplain.

The existing berm that runs parallel with Smithneck Creek should also be included in the floodplain analysis. Although the Smithneck creek berm has not been identified as a protection levee by FEMA, improving the berm may provide additional flood protection for the City of Loyalton. Repairing the berm to meet FEMA standards as outlined in FEMA Procedure Memorandum No. 43 - Guidelines for Identifying Provisionally Accredited Levees, is recommended. The improved berm would allow for additional flood protection of the area and may include possible changes to the currently identified special flood hazard zone.

Flood modeling to support the Housing Element and next RHNA cycle should include Sierra County Assessor's Parcel No. 017-050-001, specifically the 1.61-acre portion recommended for residential development in the Housing Element. This parcel is located within the 100-year flood zone, and information was provided by a local resident and property owner regarding frequent flooding on the parcel and the potential for a high ground water table. A flood study, including flood modeling, to better understand the hydrology of the area and determine the effectiveness of flood mitigation on this parcel is recommended. Additional information on the nature of Smithneck Creek and the extent of flooding in the area may provide insight on mitigation strategies that would allow for potential residential development on the parcel.

FEMA recently issued new guidance for Flood Risk Analysis and Mapping for 2-Dimensional Analysis. (FEMA, 2020). A flood study and 2D modeling can provide more specific flood zones and a better defined SFHA through Loyalton. More complex 2D modeling can provide better defined areas appropriate for development of for flood hazard mitigation that may allow for in-fill development in the City of Loyalton.

Updated modeling may require a revised Letter of Map Revision (LOMR) for the Smithneck Creek. APN 017-050-001 is identified in the Housing Element for possible development which would satisfy the RHNA, and is located within the SFHA and the floodway fringe district. 2D modeling may provide indications for whether a LOMR would be appropriate for Smithneck Creek or other areas within the City of Loyalton.

Modeling may provide more accurate delineation of the floodway fringe area. The floodways in the FIS study are presented to local agencies as a minimum standard that can be adopted directly or that can be used as a basis for additional floodway studies. If areas identified for residential development are outside a flood hazard area or flood zone, ministerial permitting for housing projects is applicable under the proposed Municipal Code revisions as well as CEQA streamlining for some types of residential development within City of Loyalton boundaries.

Flood modeling may also be able to provide insight on other potentially developable parcels that may be less impacted by flooding. Conceptual engineering design alternatives for mitigation actions could be formulated based on modeling results. Conceptual designs would allow cost estimates and other evaluation of flood mitigation alternatives.

5.0 POTENTIAL FUNDING SOURCES

Potential funding sources for hazard planning, flood mitigation measures and housing planning are included in this section. Funding opportunities are often updated annually, and many have specific windows for application. Funding sources should be confirmed and researched before relying on the funding opportunity listed herein.

Funding opportunities available through FEMA including pre-disaster funding and flood mitigation assistance grants. FEMA funding in the State of California is administered by the California Governor's Office of Emergency Services (Cal OES). FEMA's pre-disaster funding, Building Resilient Infrastructure and Communities (BRIC) program, flood mitigation assistance and Cal OES mitigation planning is outlined in this section. Additional funding opportunities offered through various State agencies are also mentioned.

5.1 BUILDING RESILIENT INFRASTRUCTURE AND COMMUNITIES (BRIC)

Building Resilient Infrastructure and Communities (BRIC), authorized by Section 203 of the Stafford Act, supports states, local communities, tribes and territories' hazard mitigation projects, to help reduce the risks from disasters and natural hazards. BRIC is a new FEMA pre-disaster hazard mitigation program that replaces the existing Pre-Disaster Mitigation (PDM) program.

The Building Resilient Infrastructure and Communities (BRIC) program aims to provide proactive investment in community resilience. The BRIC program's guiding principles are supporting communities through capability- and capacity-building; encouraging and enabling innovation; promoting partnerships; enabling large projects; maintaining flexibility; and providing consistency. Building Resilient Infrastructure and Communities (BRIC) funds may be used for:

- Capability- and Capacity-Building (C&CB) Activities
- Mitigation Projects
- Management Costs

Capability- and Capacity-Building (C&CB) activities are meant to enhance the knowledge, skills, and expertise of the current workforce to expand or improve the administration of mitigation assistance. This includes activities in the following sub-categories:

- Building codes activities are a sub-category of C&CB activities, and applicants can apply their entire \$600,000 allocation for C&CB activities to building code activities under the State/Territory Allocation and Tribal Set-Aside.
- Project scoping (previously known as Advanced Assistance) is a sub-category of C&CB activities, and applicants can apply their entire \$600,000 allocation for C&CB activities to project scoping under the State/Territory Allocation and Tribal Set-Aside.
- Mitigation planning activities are a sub-category of C&CB activities and can be submitted under the State/Territory Allocation and Tribal Set-Aside. Under the allocation, only up to \$300,000 may be used for mitigation planning and planning-related activities. The Tribal Set-Aside includes \$20 million under which all Tribal governments (federally recognized) may apply. Under the Tribal Set-Aside, up to \$300,000 of the C&CB activities cap (federal share) may be used for mitigation planning and planning-related activities per Applicant.

Existing project types detailed in the Hazard Mitigation Assistance Guidance for the previous Pre-Disaster Mitigation grant program are still eligible under BRIC. The Notice of Funding Opportunity (NOFO) for BRIC/FEMA is expected in August 2021. (ca.gov, 2021) (Hazard Mitigation Pre Disaster Flood Mitigation)

5.2 FLOOD MITIGATION ASSISTANCE (FMA)

FMA is authorized by Section 1366 of the National Flood Insurance Act of 1968, as amended (NFIA), 42 U.S.C. 4104c, with the goal of reducing or eliminating claims under the National Flood Insurance Program

(NFIP). FMA was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994. The Biggert-Waters Flood Insurance Act of 2012 (Public Law 112-141) consolidated the Repetitive Flood Loss and Severe Repetitive Loss grant programs into FMA. FMA funding is available through the National Flood Insurance Fund (NFIF) for flood hazard mitigation projects as well as plan development and is appropriated by Congress. The Flood Mitigation Assistance Program is a competitive grant program that provides funding to states, local communities, federally recognized tribes and territories. Funds can be used for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the NFIP.

FEMA chooses recipients based on the applicant's ranking of the project and the eligibility and cost-effectiveness of the project. FEMA requires state, local, tribal and territorial governments to develop and adopt hazard mitigation plans as a condition for receiving certain types of non-emergency disaster assistance, including funding for hazard mitigation assistance projects.

Based on local information provided by residents of Loyalton, there is repetitive flooding in some of the flood areas in Loyalton. Additional research would be needed to understand if these areas are insured under NFIP, if the repetitive losses have occurred on any of the properties, and if so, what mitigation options are available for possible funding.

5.3 MITIGATION PLANNING

Cal OES has two departments focused on mitigation planning: State Mitigation Planning and Local Mitigation Planning. Funding under these programs requires a current Hazard Mitigation Plan. The Hazard Mitigation Grant Program (HMGP) funds plans and projects that reduce the effects of future natural disasters. Eligible sub-applicants include state agencies, local governments, special districts, and some private non-profits. (ca.gov, 2021) (Hazard Mitigation Hazard Mitigation Planning)

Sierra County's Hazard Mitigation Plan, completed in 2012, includes the City of Loyalton. The plan is due for updating. Grant funding can be obtained to pay for some or all of the cost to prepare or update an HMP. Planning funds may also be available for flood mitigation planning activities.

5.4 AFFORDABLE HOUSING AND SUSTAINABLE COMMUNITIES (AHSC)

The State of California's AHSC Program is administered by the California Strategic Growth Council. The program provides grants and/or loans for projects that achieve greenhouse gas emission reductions and benefit Disadvantaged Communities, Low-Income Communities, and Low-Income Households through increasing accessibility of affordable housing, employment centers and key destinations. Three Project Area types have been identified to implement this strategy: 1) Transit-Oriented Development (TOD) Project Areas, 2) Integrated Connectivity Project (ICP) Project Areas, or 3) Rural Innovation Project Areas (RIPA). The City of Loyalton projects may be eligible under the RIPA project type. These funds mainly support capital projects, not planning projects, the funding disbursement requires all environmental clearances including CEQA and NEPA, if necessary. For more information on the next funding cycle visit <https://www.sgc.ca.gov>.

5.5 CALIFORNIA STATE REVOLVING FUND (SRF)

The Infrastructure SRF (ISRF) Program provides financing to public agencies and non-profit corporations, sponsored by public agencies, for a wide variety of infrastructure and economic development projects excluding housing. ISRF Program funding is available in amounts ranging from \$50,000 to \$25 million with loan terms for the useful life of the project up to a maximum of 30 years. Eligible Applicants include, but are not limited to any subdivision of a local government, including cities, counties, special districts, assessment districts, joint powers authorities and non-profit corporations (as deemed eligible). Projects may include flood control.

Eligible Costs for financing include:

- All or any part of the cost of construction, renovation, and acquisition of all lands, structures, real or personal property.
- Rights, rights of way, franchises, licenses, easements, and interests acquired or used for a project.
- The cost of demolishing or removing any buildings or structures on land so acquired, including the cost of acquiring any lands to which the buildings or structures may be moved.
- The cost of machinery, and equipment.
- Provisions for working capital.
- Other expenses necessary or incidental to determining the feasibility of any project or incidental to the construction, acquisition, or financing of any project.
- The cost of architectural, engineering, financial and legal services, plans, specifications, estimates, and administrative expenses.
- Interest prior to, during, and for a period after, completion of construction, renovation, or acquisition, as determined by the IBank.
- Reserves for principal and interest and for extensions, enlargements, additions, replacement, renovations, and improvements.

5.6 FLOODPLAIN MANAGEMENT, PROTECTION AND RISK AWARENESS GRANT PROGRAM

The Floodplain Management, Protection and Risk Awareness Grant Program is administered by the Department of Water Resources and supports local agency efforts to prepare for flooding events by providing financial assistance for flood risk reduction activities related to stormwater flooding, mudslides, and other flash flood related protections. This Program will incorporate an increased focus on economically disadvantaged community assistance and multi-benefit project features. The Grant Program was established in the Budget Act of 2019 (Assembly Bill [AB] 74, Item 3860-101-6088) and funded by the California Drought, Water, Parks, Climate, Coastal Protection, and Outdoor Access For All Fund Act of 2018 (Proposition 68; Wat. Code, § 80000 et seq.).

Planning projects eligible for funding under this Program must include the planning and monitoring necessary for the successful selection and design of an implementation project authorized under these Guidelines. Examples of planning projects include, but are not limited to the following:

- Purchase and installation of data collection gages, i.e. precipitation and stream.
- Flood risk reduction mapping, alluvial fans or other landforms, burned areas, severity of burns and simulating burn severities, vegetation mapping.
- Evaluation of risks based on mapping and data collection efforts.
- Decision support tools that evaluate the benefits and costs of multi-benefit stormwater projects.
- Projects to implement a stormwater resource plan developed in accordance with Part 2.3 (commencing with section 10560) of Division 6 of the Water Code.
- Community Rating System (CRS) class advancement or application letter of interest submittal.
- Development and update of LHMPs in coordination with the California Governor's Office of Emergency Services (CalOES).
- Early warning notification systems. Design and/or construction of selected planning projects is not fundable under this subsection.

Implementation projects eligible for funding under this Program must address flood risk reduction with stormwater, mudslide, and flash flood-related protection, promote wise use of floodplains, and include multiple benefit features when applicable. Examples of stormwater flood risk reduction projects include, but are not limited to the construction or repair of:

- Structural projects like retention or detention basins,

- Stormwater management system upgrades,
- Floodwalls,
- Channel widening,
- Nature-based projects like runoff reduction / stormwater infiltration basins and bioswales,
- Administrative projects such as acquisition and relocation programs.

Funding is anticipated to open in summer of 2021 with award in fall of 2021 more information is available at <https://www.grants.ca.gov/> and <https://water.ca.gov/>

6.0 EXAMPLES

Development of the specific parcels identified in the Housing Element may be made more feasible with appropriate flood mitigation improvements in areas where previous flooding events have occurred. Mitigation projects may allow for development to meet the Regional Housing Needs Allocation. Successful collaborative efforts between public agencies and private interests have occurred in the region and are provided here as examples of possible future action by landowners, developers or the City of Loyalton. Example flood hazard reduction mitigation actions include detention basins, channelization, conveyance structures, and culvert design. These strategies could be combined in various ways to potentially reduce flood hazards at specific locations and potential project sites.

A regional example of successful flood hazard reduction collaboration in northern Nevada is the work of the Carson Watershed Subconservancy District (CWSD). (www.cwsd.org) CWSD became a Cooperative Technical Partner with FEMA. CWSD entered into a Risk Map Charter Agreement allowing the agency to work on a watershed basis with the many counties along the Carson River on flood hazard mitigation projects. CWSD has produced Watershed Floodplain management Plan for Carson River and Drainage Mater Plans for the Dayton Valley and North Carson City areas. Extensive modeling efforts, flood mapping and flood studies have been conducted as part of CWSD's work. Work in the Carson watershed so far has included Dayton Valley, South Dayton Valley, Lahontan Reservoir, Smelter Creek, North Carson City as well as Countywide Floodplain ordinance review.

A regional project example from northern California the is Petaluma River Flood Management and Enhancement Project in Sonoma County. The project was implemented by the Sonoma County Water Agency and included feasibility studies, preliminary project concept identification, flood modeling, project development and construction.

Dayton Valley and South Dayton Valley Drainage Master Plan

Southern Dayton Valley is in the Carson River watershed in Lyon County, Nevada. CWSD partnered with Lyon County to host planning sessions with community groups, landowners local governments and stakeholders regarding flooding in Dayton Valley. During the planning process initial mitigation concepts were discussed and project alternatives were identified for further study. Preliminary project alternatives included sediment detention basins, new collector and conveyance channels, and improvements to existing drainage infrastructure to safely detain and convey storm runoff. Categories of flood hazards were identified and included hazards to pedestrians, passenger vehicles and structures.

Comprehensive hydraulic modeling of culverts was completed including parameters related to inlet control, sediment blockage, shape, and clogging factors. Storm drains were evaluated and buildings that could act as potential flow obstructions were identified. Modeling results included floodplain cross-sections, depth and discharge parameters. Historical flooding locations were documented as well.

Conceptual 15% engineering designs were developed for 25 and 100-year flood mitigation structures identified as possible project alternatives. An engineering report was completed for these alternatives. In order to provide detailed examples for this report, the technical engineering report is an appendix to the Master Plan. Due to the length of these reports there are not replicated in this report but are available for download on the CWSD website: [Flood Hazard Reduction Plans and Documents – Carson Water Subconservancy District \(cwsd.org\)](http://www.cwsd.org). Concept designs outline costs and general characteristics of the proposed alternatives. A benefits summary was also created showing the benefits of flood protection for existing structures within the 25 and 100-year storm areas. The mitigation examples do not consider all final design and construction considerations. Upstream topography, channel and inlet locations, sediment delivery. Any mitigation system would require careful evaluation and design to ensure that adverse impacts do not occur during larger events. (Lyon County , 2020)

North Carson Area Drainage Plan

The North Carson Drainage Plan, completed in partnership between CWSD and the City of Carson City, expanded existing hydraulic and hydrologic modeling and used new and existing flood hazard data to identify improvement projects to mitigate flooding in the areas of Goni Canyon Creek Floodplain and Eagle Valley Golf Course Floodplain. Floodplain re-delineation projects were completed in 2020 for both areas. Additional modeling efforts were completed for two more areas to provide additional flood data for flood prone areas.

Based on the flood hazard analysis effort, Areas of Mitigation Interest were identified. Carson City Public Works staff were able to identify and quantify flood hazard areas outside FEMA designated floodplains. Modeling and a Benefit Cost Analysis were completed, and a public participation meeting was held. Ultimately, four alternatives were identified that met project goals including FEMA project funding requirements. Conceptual design (~15%) and engineer’s opinion of probable cost were developed for the four projects. Projects included storm drain improvements, drainage channel improvements and extensions and establishing various detention basins.

Three of the four projects identified for detailed analysis provided 100-year flood protection, and one provided 10 -year flood protection. Initial costs ranged from \$1M-\$2.7M. The number of structures protected ranged from 19-166. See Table 5 for a summary chart. (Carson Water Subconservancy District , 2020) Due to the length of the engineering report it is not included in the appendix to this report but is available for download on the CWSD website: [Flood Hazard Reduction Plans and Documents – Carson Water Subconservancy District \(cwsd.org\)](http://www.cwsd.org/Flood-Hazard-Reduction-Plans-and-Documents-Carson-Water-Subconservancy-District).

Table 5 North Carson Area Possible Mitigation projects

Project Type	Level of flood protection	Number of structures protected	Initial Cost
Basin	100-year	19	\$1,000,000
Basin	100-year	22	\$1,000,000
Tiered Basins	100-year	59	\$6,600,000
Storm Drain and Basins	10-year	166	\$2,700,000

Smelter Creek Regional Flood Control Project

The Smelter Creek project, in south Carson Valley, Douglas County, Nevada included a feasibility study conducted by engineering firm R.O. Anderson, in partnership with CWSD. The study included collecting USGS data, performing a field study and topographic survey, and modeling of storm and flooding events in the area.

Smelter Creek wash is usually dry, but can, and does, fill rapidly during storm events. During these storm events roadways have filled with water and sediment, cutting off access to or from resident’s homes. The area was found to lack an adequate conveyance system which resulted in an unstable flow path, overflowing of the streambed and shallow flooding of private properties downslope. FIRM maps indicate approximately 166 parcels and homeowners within this area are required to carry flood insurance.

The Smelter Creek flood mitigation project, sought to remove about 117 structures from the SFHA. Estimated peak flood flows were reviewed and four alternate flood control basin locations were considered. The feasibility analysis was performed and resulted in the selection of two potential locations for a regional flood control basin. An Engineer’s Preliminary Estimate of Probable Costs for the two alternatives were

developed. Costs were estimated at \$2,550,00 and \$3,170,000 which included allowances for construction contingencies, land acquisition, engineering design, permitting and construction services.

During the feasibility study, Representatives of Nevada Division of Water Resources, Bureau of Dam Safety were contacted to confirm design parameters to safely mitigate and control flood discharges from the watershed. The proposed structure was determined likely to be characterized as a High Hazard Dam. For the development of alternatives, the dam and reservoir were sized to detain the inflow from a 1%-annual chance (100-year) hydrologic event. Downstream floodplain impacts were evaluated. The detention basin and dam were designed to maximize the number of downstream structures reasonably protected from flooding. Ultimately, the project was found to be feasible, and further planning was recommended. (Douglas County , 2015) Due to the length of the engineering report it is not included in the Appendix to this report but is available for download on the CWSD website: [Flood Hazard Reduction Plans and Documents – Carson Water Subconservancy District \(cwsd.org\)](http://www.cwsd.org/Flood-Hazard-Reduction-Plans-and-Documents).

Stephanie Way Flood Control Project

Stephanie Way is a road located in rural Douglas County in the Carson Valley near the town of Minden. The project area is in a relatively small, unmapped watershed that has an area of approximately 0.65 square miles. The effective Flood Insurance Rate Maps (FIRMs) issued by FEMA, dated 2010, designate portions of the project area as being within a 0.2-percent annual chance flood zone. Revised maps were issued in 2016 and flooding potential in this area was still expected to be in the low to moderate range. However, the neighborhood has experienced repetitive flooding including heavy sediment deposition. Douglas County incurred more than \$2.31 million in cleanup costs resulting from flood-related damages to the area in 2015 alone.

A feasibility study was conducted by engineering firm R.O. Anderson, in partnership with CWSD, which explored the possible construction of a flood control facility on nearby BLM property with the intent to alleviate flood-induced recurring damages in the neighborhood. The feasibility study included collecting USGS data, performing a field study and creating a watershed map for the area based on hydrologic modeling. Preliminary design calculations, a FEMA Benefit-Cost Analysis and an engineer's estimate of probable construction costs were completed.

The area had no existing stormwater conveyance infrastructure. Representatives of Nevada Division of Water Resources, Bureau of Dam Safety were contacted to confirm the design parameters to safely mitigate and control flood discharges from this watershed. It was determined that the proposed flood control structure would likely be characterized as a High Hazard Dam by NDWR. The proposed flood control structure was recommended to be designed to limit the outflow from the structure to a maximum 10-year peak flow in current conditions. The outlet works and the dam were sized to detain the inflow for up to 4-percent annual chance (25-year) events. Outlet works constructed of reinforced concrete pipe connected to a concrete structure with an aluminum grate were designed. The conveyance structure was designed to be connected to a flood control reservoir. The identified potential location of the proposed flood control reservoir was on property managed by the United State Department of the Interior, Bureau of Land Management (BLM). The preliminary estimate of probable costs for construction of the proposed flood control structures was estimated to be \$1,337,600. (Carson Water Subconservancy District, 2016) Due to the length of the engineering report it is not include in the Appendix to this report but is available for download on the CWSD website: [Flood Hazard Reduction Plans and Documents – Carson Water Subconservancy District \(cwsd.org\)](http://www.cwsd.org/Flood-Hazard-Reduction-Plans-and-Documents).

Petaluma River Flood Management Project Denman Reach Phase 4

The Petaluma River Flood Management and Enhancement Project is in Sonoma County, California. The project was implemented by the Sonoma County Water Agency and was comprised of two components: the Denman Reach Enhancement and the Payran Reach Flood Reduction Improvements. The project began with scoping and feasibility studies. The objectives of the project were to manage stormwater runoff to reduce flood damage and, where feasible, provide other benefits including providing additional floodwater storage, restoring flow-carrying capacity, constructing a floodwall and other improvements.

Preliminary project alternatives were identified and evaluated. Flood mitigation project concepts included off-stream detention sites, in-stream detention of flood waters, floodplain and/or channel modification, floodwalls, bypass channels, bridge improvements, and low impact development. Other elements in this project included creation of a public access trail and acquisition of a flood prone parcel of land to create flood storage. Project goals also included creation of additional wetland and riparian habitat. Flood mitigation project concepts were prioritized, and top prioritized concepts were further evaluated. (Sonoma County Water Agency, 2012)

The project included calibrating and refining a hydrologic model using US Army Corps HEC-RAS software of the Upper Petaluma River Watershed. The model was used to identify tributaries and compare and contrast mitigation concepts. Model runs identified which potential mitigation concepts would be most effective at flood reduction in the project area. (City of Petaluma, 2019) The extensive modeling efforts provided the basis for identification of project alternatives. The Denman reach portion of the project included acquisition of a flood prone parcel, increased flood storage on that parcel, creation of a wetland and sediment removal and protection of a bridge.

7.0 REFERENCES

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APPENDIX A–REPORTS AND REFERENCES

1. My Hazard Report
2. FIS report
3. NRCS Soils Report
4. USFWS IPAC report
5. National Wetlands Inventory
6. California Scenic Highways
7. FEMA flood maps
8. FEMA Hazard Mitigation Assistance Funding Opportunities
9. FEMA floodplain management Administration guidelines, FEMA policy FP 201-079-01
10. Photographs of local flooding