

City of Red Bluff

GENERAL PLAN HAZARDS SAFETY AND NOISE

EXISTING CONDITIONS REPORT

PREPARED FOR THE
CITY OF RED BLUFF BY
DE NOVO PLANNING GROUP

De Novo Planning Group



A Land Use Planning, Design, and Environmental Firm

RPC 2(b)(i)

4.0 HAZARDS, SAFETY, AND NOISE

Issues and topics related to hazards, safety, and noise within the Planning Area are addressed in this chapter. Some of these hazards may be naturally induced, such as flood and wildfire hazards. Other hazards may be the result of natural hazards, which are exacerbated by human activity, such as development in areas prone to flooding. Additional hazards are entirely human-made, including airport crash hazards and exposure to hazardous materials. For additional information topics related to community services and facilities see Chapter 3.0 of this report. For additional information on emergency response and public safety see Section 3.6 (Public Safety Services). This chapter is divided into the following sections:

- 4.1 Hazards and Hazardous Materials
- 4.2 Air Traffic
- 4.3 Fire Hazards
- 4.4 Flooding
- 4.5 Noise

4.1 HAZARDS AND HAZARDOUS MATERIALS

A hazardous material is a substance or combination of substances which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may either (1) cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating irreversible illness; or (2) pose a substantial present or potential hazard to human health and safety or the environment when improperly treated, stored, transported, or disposed of. Hazardous materials are mainly present because of industries involving chemical byproducts from manufacturing, petrochemicals, and hazardous building materials.

Hazardous waste is the subset of hazardous materials that has been abandoned, discarded, or recycled and is not properly contained, including contaminated soil or groundwater with concentrations of chemicals, infectious agents, or toxic elements sufficiently high to increase human mortality or to destroy the ecological environment. If a hazardous material is spilled and cannot be effectively picked up and used as a product, it is considered to be hazardous waste. If a hazardous material site is unused, and it is obvious there is no realistic intent to use the material, it is also considered to be a hazardous waste. Examples of hazardous materials include flammable and combustible materials, corrosives, explosives, oxidizers, poisons, materials that react violently with water, radioactive materials, and chemicals.

REGULATORY FRAMEWORK

FEDERAL

Comprehensive Environmental Response, Compensation & Liability Act (CERCLA)

This act, commonly associated with the term “Superfund,” established:

- Regulations concerning closed and abandoned hazardous waste sites
- Liability of parties responsible for any releases of hazardous waste at these sites
- Funding for cleanup when responsible parties cannot be identified

Resource Conservation and Recovery Act (RCRA)

This act established EPA’s “cradle to grave” control (generation, transportation, treatment, storage, and disposal) over hazardous materials and wastes. In California, the Department of Toxic Substances Control (DTSC) has RCRA authorization.

Clean Air Act

In according with the Clean Air Act, the EPA has established National Emissions Standards for Hazardous Air Pollutants. Exceeding the emissions standard for a given air pollutant may cause an increase in illnesses and/or fatalities.

Clean Water Act (CWA)

The CWA, which amended the WPCA of 1972, sets forth the Section 404 program to regulate the discharge of dredged and fill material into Waters of the U.S. and the Section 402 National Pollutant Discharge Elimination System (NPDES) to regulate the discharge of pollutants into Waters of the U.S. The Section 401 Water Quality Certification program establishes a framework of water quality protection for activities requiring a variety of Federal permits and approvals (including CWA Section 404, CWA Section 402, FERC Hydropower and Section 10 Rivers and Harbors).

STATE

California Health & Safety Code

Division 20 of the Health and Safety Code establishes Department of Toxic Substances Control (DTSC) authority and sets forth hazardous waste and underground storage tank regulations. In addition, the division creates a State superfund framework that mirrors the Federal program.

Division 26 of the Health and Safety Code establishes California Air Resources Board (CARB) authority. The division designates CARB as the air pollution control agency per Federal regulations and charges the Board with meeting Clean Air Act requirements.

Food and Agriculture Code

Division 6 of the California Food and Agricultural Code (FAC) establishes pesticide application regulations. The division establishes training standards for pilots conducting aerial applications as well as permitting and certification requirements.

Water Code

Division 7 of the California Water Code, commonly referred to as the Porter-Cologne Water Quality Control Act, created the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCB). In addition, water quality responsibilities are established for the SWRCB and RWQCBs.

California Code of Regulations

Title 3 of the CCR pertains to the application of pesticides and related chemicals. Parties applying regulated substances must continuously evaluate application equipment, the weather, the treated lands and all surrounding properties. Title 3 prohibits any application that would:

- Contaminate persons not involved in the application
- Damage non-target crops or animals or any other public or private property
- Contaminate public or private property or create health hazards on said property

Title 8 of the CCR establishes California Occupational Safety and Health Administration (Cal OSHA) requirements related to public and worker protection. Topics addressed in Title 8 include materials exposure limits, equipment requirements, protective clothing, hazardous materials, and accident prevention. Construction safety and exposure standards for lead and asbestos are set forth in Title 8.

Title 14 of the CCR establishes minimum standards for solid waste handling and disposal.

Title 17 of the CCR establishes regulations relating to the use and disturbance of materials containing naturally occurring asbestos.

Title 22 of the CCR sets forth definitions of hazardous waste and special waste. The section also identifies hazardous waste criteria and establishes regulations pertaining to the storage, transport, and disposal of hazardous waste.

Title 26 of the CCR is a medley of State regulations pertaining to hazardous materials and waste that are presented in other regulatory sections. Title 26 mandates specific management criteria related to hazardous materials identification, packaging, and disposal. In addition, Title 26 establishes requirements for hazardous materials transport, containment, treatment, and disposal. Finally, staff training standards are set forth in Title 26.

Title 27 of the CCR sets forth a variety of regulations relating to the construction, operation and maintenance of the State's landfills. The title establishes a landfill classification system and categories of waste. Each class of landfill is constructed to contain specific types of waste (household, inert, special, and hazardous).

ENVIRONMENTAL SETTING

Envirostor Data Management System

The DTSC maintains the *Envirostor Data Management System*, which provides information on hazardous waste facilities (both permitted and corrective action) as well as any available site cleanup information. This site cleanup information includes: Federal Superfund Sites (NPL), State Response Sites, Voluntary Cleanup Sites, School Cleanup Sites, Corrective Action Sites, Tiered Permit Sites, and Evaluation / Investigation Sites. The hazardous waste facilities include: Permitted–Operating, Post-Closure Permitted, and Historical Non-Operating.

There are 31 locations listed within Red Bluff that are listed in the Envirostor database. One site is listed as active, 13 sites are referred to the RWQCB, 7 sites are referred to other agencies, 1 site is listed Inactive – Needs Evaluation, 1 site is listed Inactive – Withdrawn, 3 are listed as No Further Action, and 1 is listed with no further action required. Table 4.1-1 lists the Envirostor sites within the City of Red Bluff.

TABLE 4.1-1: RED BLUFF SITE CLEANUP AND HAZARDOUS FACILITIES LIST (ENVIROSTOR)

NAME	STATUS	ADDRESS	LISTED CITY
ALLEE OIL COMPANY	REFER: RWQCB	545 SOUTH MAIN STREET	RED BLUFF
BEN'S TRUCK REPAIR	REFER: RWQCB	2060 MONTGOMERY ROAD	RED BLUFF
CARDAN AIRCRAFT PAINTING	REFER: OTHER AGENCY	1965 AIRPORT BLVD	RED BLUFF
CROWN PLASTICS	REFER: OTHER AGENCY	1005 VISTA WAY	RED BLUFF
DANA CIRCUITS	INACTIVE - NEEDS EVALUATION	1825 BIDWELL STREET	RED BLUFF
DIAMOND LANDS CORPORATION	REFER: RWQCB	1 DIAMOND AVENUE	RED BLUFF
DIAMOND LANDS PLYWOOD MANUFACTURING PLNT	REFER: RWQCB	LAY AVENUE BY REEDS CREEK & SP RAILROAD	RED BLUFF
FIBER ERECTORS	REFER: OTHER AGENCY	1450 VISTA WAY	RED BLUFF
HESS BROTHERS AUTO WRECKING	REFER: OTHER AGENCY	3650 HESS ROAD	RED BLUFF
J & R METALS	REFER: OTHER AGENCY	20704 WALNUT STREET	RED BLUFF
LOUISIANA-PACIFIC CORP - RED BLUFF	REFER: RWQCB	READING & TYLER ROADS	RED BLUFF
MODERN DRY CLEANERS	ACTIVE	609 WALNUT STREET	RED BLUFF
MULBERRY AVENUE SCHOOL SITE	NO ACTION REQUIRED	MULBERRY AVENUE	RED BLUFF
NEW RED BLUFF ES	NO ACTION REQUIRED	2700 MONROE AVENUE	RED BLUFF
PACKAGING COMPANY OF CALIFORNIA	REFER: RWQCB	END OF DIAMOND AVENUE	RED BLUFF
PG&E FORMER RED BLUFF MGP	CERTIFIED O&M - LAND USE RESTRICTIONS ONLY - LAND USE RESTRICTIONS	600 RIO STREET	RED BLUFF
PG&E MANUFACTURED GAS PLANT SV-SH-RBL	INACTIVE - NEEDS EVALUATION	NW CORNER OF OAK & RIO STREETS	RED BLUFF
PHIL'S AG AIR	REFER: RWQCB	1494 VISTA WAY	RED BLUFF
PROPOSED COMMUNITY DAY SCHOOL	INACTIVE - WITHDRAWN	900 PALM STREET	RED BLUFF
PROPOSED NEW SCHOOL SITE	NO ACTION REQUIRED	1511 S. JACKSON ST.	RED BLUFF
RED BLUFF AIR FORCE STATION (J09CA0913)	REFER: RWQCB	1760 AIRPORT BLVD	RED BLUFF
RED BLUFF AIRPORT	REFER: OTHER AGENCY	1650 AIRPORT	RED BLUFF
RED BLUFF HSG ANNEX	NO FURTHER ACTION		RED BLUFF
RED BLUFF OIL COMPANY	REFER: RWQCB	402 PINE STREET	RED BLUFF
RED BLUFF PRODUCTS	REFER: RWQCB	2380 MINCH RD.	RED BLUFF
RED BLUFF SANITARY LANDFILL	REFER: RWQCB	PLYMIRE & SNOW COURT	RED BLUFF
SALISBURY HIGH SCHOOL	NO FURTHER ACTION	1050 KIMBALL ROAD	RED BLUFF
SCHAFFER FUEL OIL & BUTANE	REFER: RWQCB	412 MADISON STREET	RED BLUFF
SIGNAL OIL COMPANY	REFER: OTHER AGENCY	PHILBROOK & WILTSEY	RED BLUFF
WARNER PETROLEUM	REFER: RWQCB	2155 NORTH MAIN STREET	RED BLUFF
BEN'S TRUCK REPAIR	REFER: RWQCB	2060 MONTGOMERY ROAD	RED BLUFF

SOURCE: CALIFORNIA DEPARTMENT OF TOXIC SUBSTANCES CONTROL, ENVIROSTOR DATABASE, 2021.

Cortese List

The Hazardous Waste and Substances Sites (Cortese) List is a planning document used by the State, local agencies, and developers to comply with the California Environmental Quality Act requirements in providing information about the location of hazardous materials release sites. Government Code Section 65962.5 requires the California Environmental Protection Agency to develop at least annually an updated Cortese List. California Department of Toxic Substances Control (DTSC) is responsible for a portion of the information contained in the Cortese List. Other State and local government agencies are required to provide additional hazardous material release information for the Cortese List.

There is one active site within Red Bluff that is listed on the Cortese List. This includes the Modern Dry Cleaners, located within the City center along Walnut Street.

GeoTracker

GeoTracker is the California Water Resource Control Board's data management system for managing sites that impact groundwater, especially those that require groundwater cleanup (Underground Storage Tanks, Department of Defense, Site Cleanup Program) as well as permitted facilities such as operating USTs and land disposal sites.

LEAKING UNDERGROUND STORAGE TANKS (LUST)

There are 72 locations identified with a City of Red Bluff address that are listed in the GeoTracker database for Leaking Underground Storage Tanks (LUST). All of these locations have undergone LUST cleanup and the State has closed the cases. Table 4.1-2 lists the location of open and closed cases for LUSTs in Red Bluff.

TABLE 4.1-2: RED BLUFF LUST CLEANUP SITES

NAME	ACTIVITY	ADDRESS
<i>CLOSED CASES (CLEANUP COMPLETED)</i>		
ADOBE MARKET	COMPLETED - CASE CLOSED	2001 MAIN ST
ALSCO INC	COMPLETED - CASE CLOSED	535 ANTELOPE BLVD
ANTELOPE BEACON SS RED BLUFF	COMPLETED - CASE CLOSED	615 ANTELOPE BLVD
ANTELOPE LIQUORS	COMPLETED - CASE CLOSED	445 ANTELOPE BLVD
AT&T HOGSBACK	COMPLETED - CASE CLOSED	HOGSBACK RD
AT&T TUSCAN BUTTE RADIO RELAY	COMPLETED - CASE CLOSED	TUSCAN BUTTE RD
BAKER PROPERTY	COMPLETED - CASE CLOSED	RTE 2 BOX 2656
BEACON # 3679 (FORMER)	COMPLETED - CASE CLOSED	440 MAIN ST S
BIDWELL SCHOOL	COMPLETED - CASE CLOSED	1526 WALNUT ST
BOHANNAN THERON VACANT LOT	COMPLETED - CASE CLOSED	1710 MONTGOMERY RD
CA MILITARY OMS #23 RED BLUFF	COMPLETED - CASE CLOSED	2000 PROSPECT PARK AVE
CARLSON JAMES B	COMPLETED - CASE CLOSED	17535 HWY 36W
CDF RED BLUFF HEADQUARTERS	COMPLETED - CASE CLOSED	604 ANTELOPE BLVD
CHEVRON SS #9-0239 RED BLUFF	COMPLETED - CASE CLOSED	855 MAIN ST
CHEVRON SS #94336	COMPLETED - CASE CLOSED	75 BELLE MILL RD
CHP RED BLUFF	COMPLETED - CASE CLOSED	605 ANTELOPE BLVD
CLAY RESIDENCE	COMPLETED - CASE CLOSED	22295 BRENT RD
CUMPTON TRUCKING	COMPLETED - CASE CLOSED	13565 HWY 36E
DALES STATION	COMPLETED - CASE CLOSED	25860 HWY 36E

4.0 Hazards, Safety, and Noise

NAME	ACTIVITY	ADDRESS
DIAMOND LANDS CORPORATION	COMPLETED - CASE CLOSED	DIAMOND AVE
DIBBLE CREEK STORE	COMPLETED - CASE CLOSED	19485 HWY 36
DOWNTOWN SMOG & AUTO REPAIR	COMPLETED - CASE CLOSED	550 MAIN ST
ELLIOTS GARAGE RED BLUFF	COMPLETED - CASE CLOSED	1000 WALNUT ST
FAST WHEELS RED BLUFF	COMPLETED - CASE CLOSED	233 MAIN ST
FIRESTONE BEACON	COMPLETED - CASE CLOSED	449 MAIN ST
FIRST BAPTIST CHURCH	COMPLETED - CASE CLOSED	501 PINE
FISHER OIL COMPANY	COMPLETED - CASE CLOSED	535 MAIN ST S
FORMER CHEAPER #58	COMPLETED - CASE CLOSED	1705 WALNUT ST
FORMER CROWN PLASTICS	COMPLETED - CASE CLOSED	1005 VISTA WAY
FRIENDLY GAS MART	COMPLETED - CASE CLOSED	68 BELLE MILL RD
GAS 4 LESS	COMPLETED - CASE CLOSED	58 ANTELOPE BLVD
JIMS FOOD & LIQUOR, FORMER CHEAPER #152	COMPLETED - CASE CLOSED	15 ANTELOPE BLVD
MID VALLEY BANK RED BLUFF	COMPLETED - CASE CLOSED	950 MAIN ST
MOBIL SS #99-431 RED BLUFF	COMPLETED - CASE CLOSED	1020 MAIN ST
NOR CAL NURSERY	COMPLETED - CASE CLOSED	11810 HWY 99E
ONE STOP (CASE NO. 1)	COMPLETED - CASE CLOSED	714 WALNUT ST
ONE STOP (CASE NO. 2)	COMPLETED - CASE CLOSED	714 WALNUT ST
P J HELICOPTERS INC	COMPLETED - CASE CLOSED	1495 VISTA WAY
PACIFIC GAS & ELECTRIC COMPANY, RED BLUFF SERVICE CENTER	COMPLETED - CASE CLOSED	515 LUTHER ROAD
PAYLESS GAS STATION FORMER	COMPLETED - CASE CLOSED	205 ANTELOPE BLVD
PG&E RED BLUFF SERVICE CENTER	COMPLETED - CASE CLOSED	515 LUTHER
PNEUMATIC CONVEYING & MFG	COMPLETED - CASE CLOSED	205 KIMBALL RD
RAMELLIS SHELL	COMPLETED - CASE CLOSED	240 ANTELOPE BLVD
RED BLUFF 76 SERVICE STATION (FORMER EXXON FOOD MART)	COMPLETED - CASE CLOSED	1 SUTTER STREET
RED BLUFF CHRYSLER	COMPLETED - CASE CLOSED	1106 MAIN ST
RED BLUFF CITY WASHINGTON ST	COMPLETED - CASE CLOSED	555 WASHINGTON ST
RED BLUFF DISPOSAL	COMPLETED - CASE CLOSED	1375 MONTGOMERY RD
RED BLUFF HIGH SCHOOL	COMPLETED - CASE CLOSED	1260 UNION STREET
RED BLUFF MAINTENANCE YARD	COMPLETED - CASE CLOSED	1055 KIMBALL RD
RED BLUFF MUN AIRPORT, CASE 2	COMPLETED - CASE CLOSED	1760 AIRPORT BLVD
RED BLUFF PRODUCTS INC	COMPLETED - CASE CLOSED	2380 MINCH RD
RED BLUFF UNION HIGH SCHOOL -1 (USE CASE #520094)	COMPLETED - CASE CLOSED	1525 DOUGLAS ST
RED BLUFF UNION HIGH SCHOOL -2	COMPLETED - CASE CLOSED	1525 DOUGLAS ST
RED BLUFF VOR RED BLUFF AIRPT	COMPLETED - CASE CLOSED	1804 AIRPORT BLVD
RYAN LAND AND CATTLE COMPANY	COMPLETED - CASE CLOSED	ALTUBE AVE
SAFE HARBOR PAYNES CREEK	COMPLETED - CASE CLOSED	BOX 41 RTE 5
SKOOTERS MARKET	COMPLETED - CASE CLOSED	22777 ANTELOPE BLVD
SUN COUNTRY FAIRGROUNDS	COMPLETED - CASE CLOSED	600 ANTELOPE BLVD
SYCAMORE CENTER	COMPLETED - CASE CLOSED	220 SYCAMORE ST
TEHAMA CO DEPT OF EDUCATION	COMPLETED - CASE CLOSED	1135 LINCOLN ST

NAME	ACTIVITY	ADDRESS
TEHAMA CO ROAD DEPT RED BLUFF	COMPLETED - CASE CLOSED	WALNUT ST
TEHAMA CO SHERIFFS DEPT	COMPLETED - CASE CLOSED	502 OAK ST
TEHAMA TIRE	COMPLETED - CASE CLOSED	525 ANTELOPE BLVD
TOPS MINI MART	COMPLETED - CASE CLOSED	2370 MAIN ST
TUTTLE TRUCKING	COMPLETED - CASE CLOSED	22133 RIVERSIDE AVE
UNOCAL SS #5584	COMPLETED - CASE CLOSED	245 ANTELOPE BLVD
UNOCAL SS #5584 BILLS CASE 2	COMPLETED - CASE CLOSED	245 ANTELOPE BLVD
USA PETROLEUM CORPORATION #203	COMPLETED - CASE CLOSED	65 ANTELOPE BLVD
USDI RED BLUFF	COMPLETED - CASE CLOSED	22500 ALTUBE AVE
WARNER PETROLEUM INC	COMPLETED - CASE CLOSED	2155 MAIN ST N
ZIRKLE MD	COMPLETED - CASE CLOSED	407 KIMBALL RD
ZOE DELL NUTTER	COMPLETED - CASE CLOSED	22417 ADOBE RD

SOURCE: CALIFORNIA WATER RESOURCES CONTROL BOARD GeoTRACKER DATABASE, 2021.

PERMITTED UNDERGROUND STORAGE TANK (UST)

There are 14 locations with a listed Red Bluff address that have permitted Underground Storage Tanks (UST) that are permitted through the California Water Resources Control Board. Table 4.1-3 lists the location of the permitted USTs listed with a Red Bluff Address.

TABLE 4.1-3: RED BLUFF PERMITTED UST SITES

NAME	ADDRESS	CITY/AREA
ADOBE MINIMART	2370 MAIN ST	RED BLUFF
ANTELOPE LIQUORS & GAS	445 ANTELOPE BLVD	RED BLUFF
ANTELOPE VALERO	615 ANTELOPE BLVD	RED BLUFF
ARCO AM/PM	1080 S MAIN ST	RED BLUFF
CALIFORNIA HIGHWAY PATROL RED BLUFF AREA	2550 MAIN ST	RED BLUFF
CIRCLE 7 DAYS	1055 WALNUT ST	RED BLUFF
CITY OF RED BLUFF	1760 AIRPORT BLVD	RED BLUFF
FISHER OIL CO.	535 S MAIN ST	RED BLUFF
FOOD MART VALERO	1 SUTTER ST	RED BLUFF
JILL'S FRESHSTOP MARKET & DELI	11625 STATE HIGHWAY 99E	RED BLUFF
MORE FOR LESS #26	1715 WALNUT ST	RED BLUFF
ONE STOP GAS STATION INC.	714 WALNUT ST	RED BLUFF
RED BLUFF AM/PM	2800 MAIN ST	RED BLUFF
RED BLUFF FOOD MART	15 ANTELOPE BLVD	RED BLUFF

SOURCE: CALIFORNIA WATER RESOURCES CONTROL BOARD GeoTRACKER DATABASE, 2021.

Solid Waste Information System (SWIS)

FACILITY/SITE LISTING

The Solid Waste Information System (SWIS) is a database of solid waste facilities that is maintained by the California Integrated Waste Management Board (CIWMB). The SWIS database contains information on solid waste facilities, operations, and disposal sites throughout the State of California. The types of facilities found in this database include landfills, transfer stations, material recovery facilities, composting sites, transformation facilities, waste tire sites, and closed disposal sites. For each facility, the database contains information about location, owner, operator, facility type, regulatory and operational status, authorized waste types, local enforcement agency and inspection and enforcement records.

There are no solid waste facilities listed in the database within the City of Red Bluff. There are two active facilities near Red Bluff, of which one is an active Landfill and the other is a Transfer Station. The site details are listed in Table 4.1-4 below.

TABLE 4.1-4: CIWMB FACILITIES/SITES – RED BLUFF

NUMBER	NAME	ACTIVITY	REGULATORY	STATUS
52-AA-0001	Tehama County/Red Bluff Landfill	Landfill	Permitted	Active
52-AA-0003	Tehama-Los Molinos TS and SWDS	Transfer Station/Solid Waste Disposal Site	Permitted	Closed
52-AA-0004	Manton Transfer Station and SWDS	Transfer Station/Solid Waste Disposal Site	Notification	Closed
52-AA-0005	Mineral Transfer Station and SWDS	Transfer Station/Solid Waste Disposal Site	Permitted	Closed
52-AA-0006	Paynes Creek Transfer Station and SWDS	Transfer Station/Solid Waste Disposal Site	Notification	Active
52-AA-0007	Corning Solid Waste DS	Solid Waste Disposal Site	Permitted	Closed
52-AA-0008	Paskenta TS and SWDS	Transfer Station/Solid Waste Disposal	Permitted	Closed
52-AA-0009	Diamond Landfill	Landfill	Permitted	Closed
52-AA-0024	Bio Industries	Transfer/Processing	Surrendered	Closed
52-AA-0025	Rancho Tehama Reserve Transfer Station	Transfer Station	Notification	Active

SOURCE: CALIFORNIA DEPARTMENT OF RESOURCES RECYCLING AND RECOVERY, 2021.

REFERENCES

California Department of Resources Recycling and Recovery. 2021.

<http://www.calrecycle.ca.gov/SWFacilities/Directory/Search.aspx>.

California Department of Toxic Substances Control. 2021. Envirostor Database.

<http://www.envirostor.dtsc.ca.gov/public/>.

California Water Resources Control Board. 2021. <https://geotracker.waterboards.ca.gov/>.

4.2 AIR TRAFFIC

The State Division of Aeronautics has compiled extensive data regarding aircraft accidents around airports in California. According to the California Airport Land Use Planning Handbook (2002), prepared by the State Division of Aeronautics, 18.2% of general aviation accidents occur during takeoff and initial climb and 44.2% of general aviation accidents occur during approach and landing. The State Division of Aeronautics has plotted accidents during these phases at airports across the country and has determined certain theoretical areas of high accident probability.

Approach and Landing Accidents

As nearly half of all general aviation accidents occur in the approach and landing phases of flight, considerable work has been done to determine the approximate probability of such accidents. Nearly 77% of accidents during this phase of flight occur during touchdown onto the runway or during the roll-out. These accidents typically consist of hard or long landings, ground loops (where the aircraft spins out on the ground), departures from the runway surface, etc. These types of accidents are rarely fatal and often do not involve other aircraft or structures. Commonly these accidents occur due to loss of control on the part of the pilot and, to some extent, weather conditions. (California Division of Aeronautics, 2002).

The remaining 23% of accidents during the approach and landing phase of flight occur as the aircraft is maneuvered towards the runway for landing, in a portion of the airspace around the airport commonly called the traffic pattern. Common causes of approach accidents include the pilot's misjudging of the rate of descent, poor visibility, unexpected downdrafts, or tall objects beneath the final approach course. Improper use of rudder on an aircraft during the last turn toward the runway can sometimes result in a stall (a cross-control stall) and resultant spin, causing the aircraft to strike the ground directly below the aircraft. The types of events that lead to approach accidents tend to place the accident site fairly close to the extended runway centerline. The probability of accidents increases as the flight path nears the approach end of the runway. (California Division of Aeronautics, 2002).

According to aircraft accident plotting provided by the State Division of Aeronautics, most accidents that occur during the approach and landing phase of flight occur on the airport surface itself. The remainder of accidents that occur during this phase of flight are generally clustered along the extended centerline of the runway, where the aircraft is flying closest to the ground and with the lowest airspeed. (California Division of Aeronautics, 2002).

Takeoff and Departure Accidents

According to data collected by the State Division of Aeronautics, nearly 65% of all accidents during the takeoff and departure phase of flight occur during the initial climb phase, immediately after takeoff. This data is correlated by two physical constraints of general aviation aircraft:

- The takeoff and initial climb phase are times when the aircraft engine(s) is under maximum stress and is thus more susceptible to mechanical problems than at other phases of flight; and
- Average general aviation runways are not typically long enough to allow an aircraft that experiences a loss of power shortly after takeoff to land again and stop before the end of the runway.

While the majority of approach and landing accidents occur on or near to the centerline of the runway, accidents that occur during initial climb are more dispersed in their location as pilots are not attempting to get to any one specific point (such as a runway). Additionally, aircraft vary widely in payload, engine power, glide ratio, and several other factors that affect glide distance, handling characteristics after engine

loss, and general response to engine failure. This further disperses the accident pattern. However, while the pattern is more dispersed than that seen for approach and landing accidents, the departure pattern is still generally localized in the direction of departure and within proximity of the centerline. This is partially due to the fact that pilots are trained to fly straight ahead and avoid turns when experiencing a loss of power or engine failure. Turning flight causes the aircraft to sink faster and flying straight allows for more time to attempt to fix the problem. (California Division of Aeronautics, 2002).

REGULATORY FRAMEWORK

FEDERAL

Aviation Act of 1958

The Federal Aviation Act resulted in the creation of the Federal Aviation Administration (FAA). The FAA was charged with the creation and maintenance of a National Airspace System.

Federal Aviation Regulations (CFR, Title 14)

The Federal Aviation Regulations (FAR) establish regulations related to aircraft, aeronautics, and inspections and permitting.

STATE

Aeronautics Act (Public Utilities Code §21001)

The Caltrans Division of Aeronautics bases the majority of its aviation policies on the Aeronautics Act. Policies include permits and annual inspections for public airports and hospital heliports and recommendations for schools proposed within two miles of airport runways.

Airport Land Use Commission Law (Public Utilities Code §21670 et seq.)

The law, passed in 1967, authorized the creation of Airport Land Use Commissions (ALUC) in California. Per the Public Utilities Code, the purpose of an ALUC is to protect *public health, safety, and welfare by encouraging orderly expansion of airports and the adoption of land use measures that minimizes exposure to excessive noise and safety hazards within areas around public airports to the extent that these areas are not already devoted to incompatible uses* (§21670). Furthermore, each ALUC must prepare an Airport Land Use Compatibility Plan (ALUCP). Each ALUCP, which must be based on a twenty-year planning horizon, should focus on broadly defined noise and safety impacts.

The Airport Land Use Plan (ALUP) Master Plan was adopted in 2001 and amended December 2015 by the Tehama County Airport Land Use Commission (ALUC). The ALUCP will replace the existing Comprehensive Airport Land Use Plan for the City of Red Bluff and City of Corning's Airports. Requirements for creation of ALUCs were first established in 1967 under the California State Aeronautics Act (Pub. Util. Code S21670 et seq). Although the law has been amended numerous times since its enactment, the fundamental purpose of ALUCs has remained unchanged. The proposed project is the adoption of the Tehama County Airport Land Use Compatibility Plan.

The ALUC addresses three critical land use-planning concerns:

- 1) Compatibility of surrounding land uses with respect to airport noise levels;
- 2) Compatibility of surrounding land uses in terms of exposure of persons on the ground to crash hazards associated with aircraft; and

3) The need for appropriate height restrictions to protect the airspace used by aircraft.

The ALUC Airport Safety Map and Land Use Compatibility Guidelines for Safety, contained within the Airport Master Plan, regulate land uses and structure heights that may constitute a hazard to air navigation. Any proposed object or structure that would penetrate any of these imaginary surfaces as they apply to the Red Bluff Municipal Airport is considered by the Federal Aviation Administration (FAA) to be an obstruction to air navigation.

LOCAL

City of Red Bluff General Plan

LAND USE ELEMENT

The Red Bluff General Plan Land Use Element establishes objectives for development within the vicinity of the Municipal Airport.

Community Growth and Annexation

Objective A: Direct residential development adjacent to the freeways, railroads, arterial streets and the airport.

Industrial Development

Objective A: Industrial Development Phase appropriate future industrial development to the area south of the municipal airport.

Objective D: Discourage residential or other noise sensitive development on land subject to excessive noise resulting from airport, railroad, or industrial related activities.

LAND USE CLASSIFICATIONS

In addition to goals and objectives for development within the vicinity of the Municipal Airport, the Red Bluff General Plan Land Use Element establishes the following land use zone classifications.

AZ Approach Zone

Densities for residential land within the Red Bluff Municipal Airport Approach Zones will be limited to 3.5 units per acre. Further restrictions are included in the Comprehensive Airport Land Use Commission.

CZ Clear Zone

The Clear Zone overlay extends 1300 feet in a widening segment from the ends of the principal runway of the municipal airport. As discussed in the Comprehensive Airport Land Use Plan, all development within the Clear Zone is strictly limited. The overlay supersedes all underlying zoning districts.

City of Red Bluff Municipal Code

SECTION 25.116, AIRPORT RUNWAY PROTECTION ZONE COMBINING DISTRICT

Section 25.116, Airport Runway protection Zone Combining District, of the City's Municipal Code establishes the Airport Runway Protection zone. This combining district is intended to be applied to those properties shown within the clear zone or the runway protection zone of the municipal airport's land use

plan. Uses within the zone are required to comply with the land use guidelines specified for the clear zone or the runway protection zone safety area contained within the municipal airport’s land use plan.

ENVIRONMENTAL SETTING

Local Airport Facilities

There is one airport facility, Red Bluff Municipal Airport located within the Red Bluff Planning Area as described below. Figure 4.2-1 shows the Airport Overflight Safety Zone and Airport Runway Protection Zone located in the City of Red Bluff.

Red Bluff Airport: The Red Bluff Airport (RBL), is two miles south of Red Bluff located just off Interstate 5 in Tehama County. The airport covers 602 acres (244 ha) and has one asphalt runway: (15/33), 5,431 x 100 ft (1,655 x 30 m). The airport provides for the general aviation needs of the County including direct-by-air access to other airfields in the region.

Local airports in Tehama County, CA

Corning Airport: The Corning Municipal Airport (004) is owned and operated by the City of Corning. It is located at the northeastern corner of the City Limits at the intersection of Marguerite Avenue and Neva Avenue. Corning Municipal Airport is served by a single asphalt runway that is 2,699 feet in length and 60 feet wide. Corning Municipal Airport does not have an airport traffic control tower.

Local airports near Red Bluff

- 29 miles: Orland, CA (037) Haigh Field
- 35 miles: Chico, CA (CL56) Ranchoero Airport
- 43 Miles: Willows, CA (KWLW) Willows-Glenn County Airport
- 56 Miles: Oroville, CA (OVE) Oroville Airport
- 60 miles; Covelo, CA (009) Round Valley Airport

Major Regional Airport Facilities

Redding Municipal Airport: The Redding Municipal Airport (approximately 23 mile north of Red Bluff) is a full-service airport which provides commercial airline passenger service, rental car, parking, and transportation services, as well as aviation-related services and aircraft hangar facilities.

Chico Municipal Airport: The Chico Municipal Airport (CIC) was recently awarded a Federal Aviation Administration grant to assist with the return of commercial air service from the Chico Municipal Airport. Chico Municipal Airport is served by two asphalt runways that are 6,724 feet in length and 150 feet wide and 3,000 feet in length and 60 feet wide, respectively. The Chico Municipal Airport features an airport traffic control tower.

Sacramento International Airport (SMF): The Sacramento Airport (approximately 108 mile southeast of Red Bluff serves approximately 9 million passengers a day. SMF serves the Greater Sacramento Area, and it is run by the Sacramento County Airport System. The Airport covers approximately 6,000 acres and has two parallel runways, oriented north–south to align with prevailing winds. The airport has two terminals, terminal A and terminal B, with 32 gates.

National Transportation Safety Board Aviation Accident Database

The National Transportation Safety Board Aviation Accident Database identifies 3 aircraft accidents and 1 fatality within the vicinity of Red Bluff. (National Transportation Safety Board, 2021). Table 4.2-1 below details each identified aircraft incidents listed by the database within Red Bluff.

Airport-related hazards are generally associated with aircraft accidents, particularly during takeoffs and landings. Airport operation hazards include incompatible land uses, power transmission lines, wildlife hazards (e.g., bird strikes), and tall structures that penetrate the imaginary surfaces surrounding an airport.

TABLE 4.2-1: NATIONAL TRANSPORTATION SAFETY BOARD AVIATION ACCIDENTS WITHIN TEHAMA COUNTY

<i>EVENT DATE</i>	<i>LOCATION</i>	<i>MAKE/MODEL</i>	<i>EVENT SEVERITY</i>
06/18/2017	Red Bluff, CA	Piper PA18	Nonfatal
03/19/2015	Red Bluff, CA	Piper PA30	Nonfatal
07/29/2013	Red Bluff, CA	Airborne Windsports PTY LTD	Fatal

Source: National Transportation Safety Board Accident Database 2021

REFERENCES

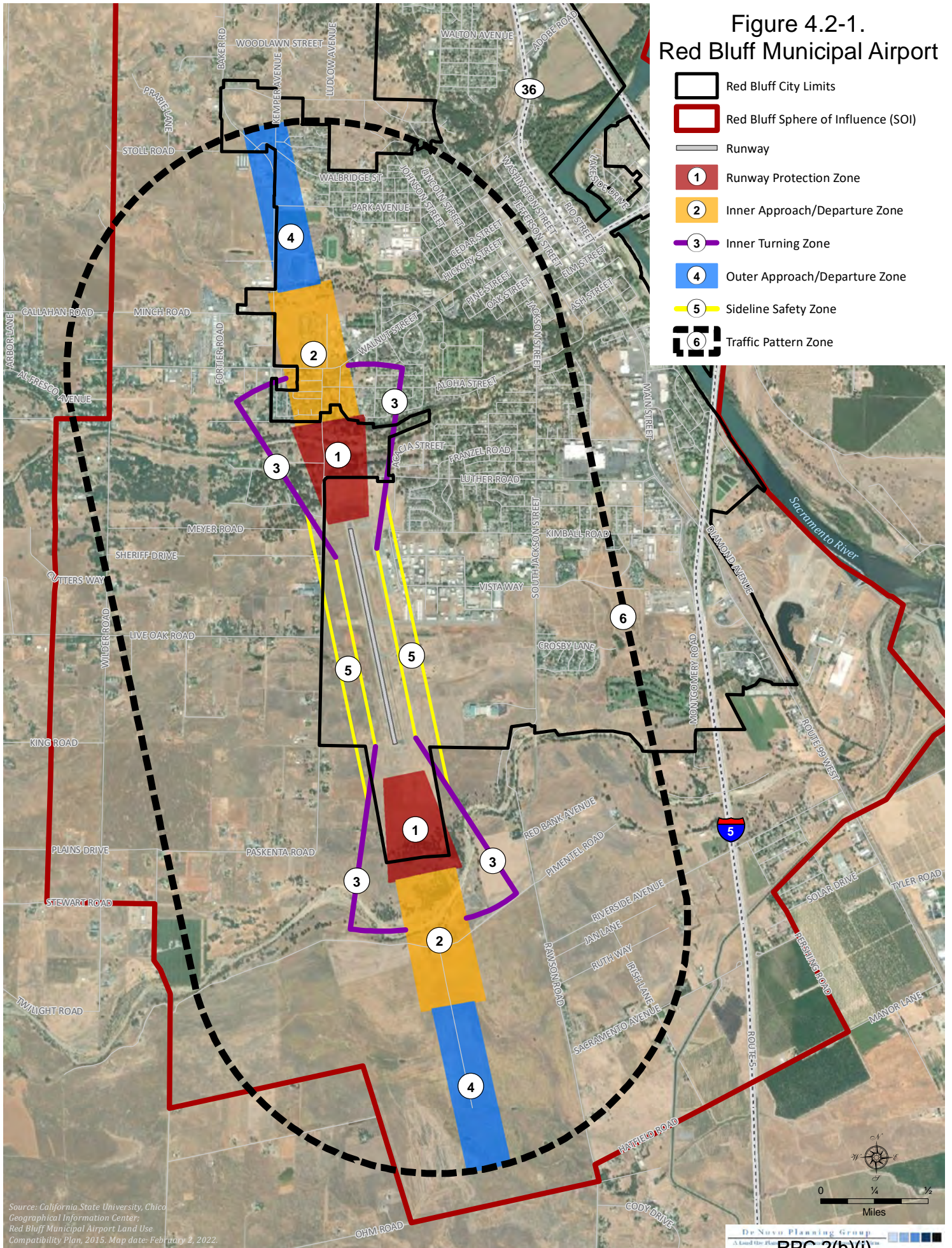
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Figure 4.2-1.
Red Bluff Municipal Airport



Source: California State University, Chico
Geographical Information Center,
Red Bluff Municipal Airport Land Use
Compatibility Plan, 2015. Map date: February 2, 2022.

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4.3 FIRE HAZARDS

This section addresses the hazards associated with wildfires in the Planning Area. The discussion of local public safety and fire suppression resources is located in the Community Services and Facilities (Section 3.0) of this report.

REGULATORY SETTING

FEDERAL

FY 2001 Appropriations Act

Title IV of the Appropriations Act required the identification of “Urban Wildland Interface Communities in the Vicinity of Federal Lands that are at High Risk from Wildfire” by the U.S. Departments of the Interior and Agriculture.

Disaster Mitigation Act (2000)

Section 104 of the Disaster Mitigation Act of 2000 (Public Law 106-390) enacted Section 322, Mitigation Planning of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, which created incentives for state and local entities to coordinate hazard mitigation planning and implementation efforts, and is an important source of funding for fuels mitigation efforts through hazard mitigation grants.

National Fire Plan (NFP) 2000

The summer of 2000 marked a historic milestone in wildland fire records for the United States. Dry conditions (across the western United States), led to destructive wildfire events on an estimated 7.2 million acres, nearly double the 10-year average. Costs in damages including fire suppression activities were approximately 2.1 billion dollars. Congressional direction called for substantial new appropriations for wildland fire management. This resulted in action plans, interagency strategies, and the Western Governor’s Association’s “A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment - A 10-Year Comprehensive Strategy - Implementation Plan”, which collectively became known as the National Fire Plan. This plan places a priority on collaborative work within communities to reduce their risk from large-scale wildfires.

Healthy Forest Initiative (HFI) 2002/Healthy Forest Restoration ACT (HFRA) 2003

In August 2002, the Healthy Forests Initiative (HFI) was launched with the intent to reduce the severe wildfires risks that threaten people, communities, and the environment. Congress then passed the Healthy Forests Restoration Act (HFRA) on December 3, 2003 to provide the additional administrative tools needed to implement the HFI. The HFRA strengthened efforts to restore healthy forest conditions near communities by authorizing measures such as expedited environmental assessments for hazardous fuels projects on federal land. This Act emphasized the need for federal agencies to work collaboratively with communities in developing hazardous fuel reduction projects and places priority on fuel treatments identified by communities themselves in their Community Wildfire Protection Plans.

Department of the Interior Department Manual Part 620

Wildland Fire Management. Part 620 of the Department of the Interior Departmental Manual pertains to wildland fire management policies, with the goal of providing an integrated approach to wildland fire management. The guiding principles of the plan emphasize the need for public health and safety considerations, risk management protocols, inter-agency collaboration, and economic feasibility of wildfire management practices, as well as the ecological role of wildfires.

STATE

California Government Code Section 65302

This section, which establishes standards for developing and updating General Plans, includes fire hazard assessment and Safety Element content requirements.

California Occupational Safety and Health Administration

In accordance with California Code of Regulations Title 8 Sections 1270 "Fire Prevention" and 6773 "Fire Protection and Fire Equipment" the California Occupational Safety and Health Administration (Cal/OSHA) has established minimum standards for fire suppression and emergency medical services. The standards include, but are not limited to, guidelines on the handling of highly combustible materials, fire hose sizing requirements, restrictions on the use of compressed air, access roads, and the testing, maintenance, and use of all firefighting and emergency medical equipment.

The State of California passed legislation authorizing the Office of Emergency Services (OES) to prepare a Standard Emergency Management System (SEMS) program, which sets forth measures by which a jurisdiction should handle emergency disasters. Non-compliance with SEMS could result in the State withholding disaster relief from the non-complying jurisdiction in the event of an emergency disaster.

Emergency Response/Evacuation Plans

The State of California passed legislation authorizing the Office of Emergency Services (OES) to prepare a Standard Emergency Management System (SEMS) program, which sets forth measures by which a jurisdiction should handle emergency disasters. Non-compliance with SEMS could result in the State withholding disaster relief from the non-complying jurisdiction in the event of an emergency disaster.

California Government Code

California Government Code Section 65302.5 requires the State Board of Forestry and Fire Protection (CAL FIRE) to provide recommendations for a local jurisdiction's General Plan fire safety element when the jurisdiction amends its general plan. While not a direct and binding fire prevention requirement for individuals, general plans that adopt the Board's recommendations will include goals and policies that provide for contemporary fire prevention standards for the jurisdiction. While the State Board of Forestry and Fire Protection has not specifically commented on the Proposed General Plan at the time that this EIR was written, the Proposed General Plan has been developed to include best practices to ensure contemporary fire prevention standards, as described in greater detail under the impact discussions below.

California Government Code Section 51175 defines Very High Fire Hazard Severity Zones and designates lands considered by the State to be a very high fire hazard.

California Government Code Section 51189 directs the Office of the State Fire Marshal to create building standards for wildland fire resistance. The code includes measures that increase the likelihood of a structure withstanding intrusion by fire (such as building design and construction requirements that use fire-resistant building materials) and provides protection of structure projections (such as porches, decks, balconies and eaves), and structure openings (such as attics, eave vents, and windows).

Assembly Bill 337

Per AB 337, local fire prevention authorities and the California Department of Forestry and Fire Protection (CAL FIRE) are required to identify “Very High Fire Hazard Severity Zones (VHFHSZ) in Local Responsibility Areas (LRA). Standards related to brush clearance and the use of fire resistant materials in fire hazard severity zones are also established.

California Public Resources Code

The State’s Fire Safe Regulations are set forth in Public Resources Code §4290, which include the establishment of State Responsibility Areas (SRA).

Public Resources Code §4291 sets forth defensible space requirements, which are applicable to anyone that *...owns, leases, controls, operates, or maintains a building or structure in, upon, or adjoining a mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or land that is covered with flammable material* (§4291(a)).

Assembly Bill 337

Per AB 337, local fire prevention authorities and CAL FIRE are required to identify Very High Fire Hazard Severity Zones (VHFHSZ) in LRAs. Standards related to brush clearance and the use of fire-resistant materials in fire hazard severity zones are also established.

Uniform Fire Code

The Uniform Fire Code (UFC) establishes standards related to the design, construction, and maintenance of buildings. The standards set forth in the UFC range from designing for access by firefighters and equipment and minimum requirements for automatic sprinklers and fire hydrants to the appropriate storage and use of combustible materials.

CA Code of Regulations Title 8

In accordance with CCR, Title 8, §1270 and §6773 (*Fire Prevention and Fire Protection and Fire Equipment*), the Occupational Safety and Health Administration (Cal OSHA) establishes fire suppression service standards. The standards range from fire hose size requirements to the design of emergency access roads.

CA Code of Regulations Title 14 (Natural Resources)

Division 1.5 (Department of Forestry and Fire Protection), Title 14 of the CCR establishes a variety of wildfire preparedness, prevention, and response regulations.

CA Code of Regulations Title 19 (Public Safety)

Title 19 of the CCR establishes a variety of emergency fire response, fire prevention, and construction and construction materials standards.

CA Code of Regulations Title 24 (CA Building Standards Code)

The California Fire Code is set forth in Part 9 of the Building Standards Code. The CA Fire Code, which is pre-assembled with the International Fire Code by the ICC, contains fire-safety building standards referenced in other parts of Title 24.

CA Health and Safety Code and UBC Section 13000 et seq.

State fire regulations are set forth in §13000 *et seq.* of the California Health and Safety Code, which is divided into “Fires and Fire Protection” and “Buildings Used by the Public.” The regulations provide for the enforcement of the UBC and mandate the abatement of fire hazards.

The code establishes broadly applicable regulations, such as standards for buildings and fire protection devices, in addition to regulations for specific land uses, such as childcare facilities and high-rise structures.

CA Health and Safety Code Division 11 (Explosives)

Division 11 of the Health and Safety Code establishes regulations related to a variety of explosive substances and devices, including high explosives and fireworks. Section 12000 *et seq.* establishes regulations related to explosives and explosive devices, including permitting, handling, storage, and transport (in quantities greater than 1,000 pounds).

CA Health and Safety Code Division 12.5 (Buildings Used by the Public)

This Division establishes requirements for buildings used by the public, including essential services buildings, earthquake hazard mitigation technologies, school buildings, and postsecondary buildings.

CA Vehicle Code §31600 (Transportation of Explosives)

Establishes requirements related to the transportation of explosives in quantities greater than 1,000 pounds, including licensing and route identification.

California Senate Bill No. 1241.

California Senate Bill No. 1241 requires that the Safety Element component of city or county general plans to incorporate fire risk related to SRAs and Very High Fire Hazard Severity Zones.

Strategic Fire Plan

Unit Strategic Fire Plan Tehama Glenn Unit: The goal of the TGU Strategic Fire Plan is to reduce losses and fire suppression costs from wildland fires within the Unit by protecting at risk assets. Focused pre-fire management prescriptions will increase initial attack success. The CAL FIRE (TGU) encompasses approximately 2,675,837 acres. CAL FIRE provides direct protection for 1,476,293 of those acres, except for four incorporated cities: Red Bluff, Corning, Orland, Willows, and small areas within the Local Responsibility Area (LRA) lands of Tehama and Glenn Counties. The plan is available at: <https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/pre-fire-planning>.

NFPA 1710

The NFPA 1710 Standards are applicable to urban areas and where staffing is comprised of career Firefighters. According to these guidelines, a career fire department needs to respond within six minutes, 90 percent of the time with a response time measured from the 911 call to the time of arrival of the first responder.

The standards are divided as follows:

- Dispatch time of one (1) minute or less for at least 90 percent of the alarms
- Turnout time of one (1) minute or less for EMS calls (80 seconds for fire and special operations response)
- Fire response travel time of four (4) minutes or less for the arrival of the first arriving engine company at a fire incident and eight (8) minutes or less travel time for the deployment of an initial full alarm assignment at a fire incident
- Eight (8) minutes or less travel time for the arrival of an advanced life support (ALS) (4 minutes or less if provided by the fire department)

LOCAL

City of Red Bluff Municipal Code

Chapter 8 Section 8.15 Fire Apparatus Access Roads

Chapter 8 Section 8.15 establishes requirements for fire apparatus access roads. These standards include:

- Fire apparatus access roads in residential areas, public or private, shall have an unobstructed minimum width of 40', curb-to-curb.
- Fire apparatus access roads within multi-family developments shall have an unobstructed minimum width of 30 feet.
- Cul-de-sac turning radius shall be 50', or 100' curb-to-curb minimum.

Chapter 8 Section 8.14 Open Burning, Recreational Fires, and Portable Outdoor Fireplaces

This section establishes regulations on burning, including open burning/residential, land clearing, and special events.

Chapter 8 Article III Weed Abatement

THIS ARTICLE SETS STANDARDS FOR WEED ABATEMENT IN THE CITY. IT STATES "PERSONS OWNING, LEASING, RENTING, IN LEGAL CONTROL OF THE PROPERTY; AND OPERATING OR MAINTAINING BUILDINGS OR STRUCTURES IN, UPON OR ADJOINING HAZARDOUS FIRE AREAS; AND PERSONS OWNING, LEASING OR CONTROLLING LAND ADJACENT TO SUCH BUILDINGS OR STRUCTURES, SHALL AT ALL TIMES MAINTAIN AN EFFECTIVE FIREBREAK, AS STIPULATED IN THIS CODE. WHEN PROPERTY LINES ARE ADJACENT TO ROADWAYS, THE HAZARD SHALL BE CLEARED TO THE CENTER OF THE ROADWAY."

Tehama County Local Hazard Mitigation Plan

The Tehama County Multi-Jurisdictional Local Hazard Mitigation Plan (LHMP) for the City of Red Bluff planning area was developed in accordance with the Disaster Mitigation Act of 2000 (DMA 2000) and followed FEMA’s Local Hazard Mitigation Plan guidance. The LHMP incorporates a process where hazards are identified and profiled, the people and facilities at risk are analyzed, and mitigation actions are developed to reduce or eliminate hazard risk. The implementation of these mitigation actions, which include both short and long-term strategies, involve planning, policy changes, programs, projects, and other activities. The Plan is available at: <https://mitigatehazards.com/tehama-county-hmp-documents/>.

LOCAL SETTING

Fuel Rank

Fuel rank is a ranking system developed by the Office of the State Fire Marshal (OSFM) CAL FIRE program that incorporates four wildfire factors: fuel model, slope, ladder index, and crown index.

The U.S. Forest Service has developed a series of fuel models, which categorize fuels based on burn characteristics. These fuel models help predict fire behavior. In addition to fuel characteristics, slope is an important contributor to fire hazard levels. A surface ranking system has been developed by CAL FIRE, which incorporates the applicable fuel models and slope data. The model categorizes slope into six ranges: 0-10%, 11-25%, 26-40%, 41-55%, 56-75% and >75%. The combined fuel model and slope data are organized into three categories, referred to as surface rank. Thus, surface rank is a reflection of the quantity and burn characteristics of the fuels and the topography in a given area.

The ladder index reflects the distance from the ground to the lowest leafy vegetation for tree and plant species. The crown index reflects the quantity of leafy vegetation present within individual specimens of a given species.

The surface rank, ladder index, and crown index for a given area are combined in order to establish a fuel rank of medium, high, or very high. Fuel rank is used by CAL FIRE to identify areas in the California Fire Plan where large, catastrophic fires are most likely.

Tehama County contains areas with “moderate” “High” “Very High” and “non-wildland fuel” ranks. Generally, the more developed areas within the city center are considered non-wildland with the fuel rank increasing in the northern and eastern foothill areas of the city. The areas warranting “moderate” to “Very High” fuel ranks possess combustible material in sufficient quantities combined with topographic characteristics that pose a wildfire risk.

Fire Hazard Severity Zones

The state has charged the California Department of Forestry and Fire Protection (CAL FIRE) Office of the State Fire Marshal (OSFM) program with the identification of Fire Hazard Severity Zones (FHSZ) within State Responsibility Areas (SRAs). In addition, CAL FIRE must recommend Very High Fire Hazard Severity Zones (VHFHSZ) identified within any Local Responsibility Areas (LRAs). The FHSZ maps are used by the State Fire Marshall as a basis for the adoption of applicable building code standards. Figures 4.3-1 and Figure 4.3-2 show the corresponding Fire Hazard Severity Zones for Local, State, and Federal Responsibility Areas within the City and Planning Area of Red Bluff. Fire Hazard Severity Zones are provided by the Office of the State Fire Marshal and are available at: **OSFM fire-hazard-severity-zones-maps**. Additionally, Fire Hazard Severity Zones are provided countywide at: **TehamaMaps**.

Fire Hazard Severity Zones – Local Responsibility Areas

The Red Bluff Planning Area is located within a Local Responsibility Area (LRA). CAL FIRE has determined that the City of Red Bluff contains Very High Fire Hazard Severity Zones (VHFHSZ) within Local Responsibility Areas within the northern portion of the City along I-5 and the Wilcox Oaks Golf Club. Figure 4.3-1 shows Fire Hazard Severity Zones for Local, State, and Federal Responsibility Areas.

Fire Hazard Severity Zones – State Responsibility Areas

There are numerous State Responsibility Areas (SRA) within the Red Bluff Planning Area. Specifically, there are High Fire Hazard Severity Zones in State Responsibility Areas along the western boundary of the City along Luther Road, along the eastern boundary of the City along I-5, and within the City's Sphere of Influence (SOI). In addition, there are Moderate Fire Hazard Severity Zones in State Responsibility Areas along the western boundary of the City along Brewery Creek and within the City's SOI west of I-5. The Planning Area also contains Very High Fire Hazard Severity Zones in State Responsibility Areas in the Northern portion of the City's SOI along Dibble Creek. State Responsibility Areas (SRAs) within the County generally are primarily located on the western half of Tehama County and portions of the eastern half of Tehama County. FHSZ within the SRAs range from "Moderate" to "Very High". Figure 4.3-2 shows Fire Hazard Severity Zones for State Responsibility Areas.

Federal Responsibility Areas

There are Federal Responsibility Areas within the Red Bluff Planning Area (included within the SOI), primarily along the Sacramento River at the Lake Red Bluff Recreation Area as shown on Figure 4.3-2.

Wildfire Threat to the City of Red Bluff

Wildfires continue to pose significant threat to most Northern California communities, including Red Bluff. Wildland fires are common in open space areas with vegetation that exhibits low fuel moisture. High winds can also contribute to the severity of the fire. Generally, the undeveloped portions of the City do not pose a high-risk due to existing vegetation management practices on the land. However, grass fires can occur particularly where there is native vegetation, such as the riparian corridors near local water courses and grazing land within the SOI. Fire hazards can also occur in urbanized areas of the City. Residential and commercial structure fires can occur particularly in older neighborhoods. Additionally, some industrial processes can include the use or storage of flammable liquids or farming bi-products.

According to the Tehama County Multi-Jurisdiction Hazard Mitigation Plan, CAL FIRE data suggests a trend toward increasing acres burned statewide, with particular increases in conifer vegetation types. This trend is supported in part by the fact that the three largest fire years in California since 1950 have all occurred within the last 10 years.

Most of the City is comprised of an urbanized landscape, which has a lower relative risk of wildfire compared to undeveloped areas surrounding the City. However, citizens may still be negatively affected by wildfires in the County or region, within the Red Bluff SOI, and in areas near the outskirts of the city limits near the wildland interface. Smoke and air pollution from wildfires can be a health hazard, especially for sensitive populations including children, the elderly and those with respiratory and cardiovascular diseases. Wildfire may also threaten the health and safety of those fighting the fires. First responders are exposed to the dangers from the initial incident and after-effects from smoke inhalation and heat stroke. In addition, wildfire can lead to ancillary impacts such as landslides in steep ravine areas and flooding due to the impacts of silt in local watersheds.

Wildfire is of greatest concern to populations residing in the moderate, high and very high fire hazard severity zones. U.S. Census Bureau block data was used to estimate populations within the Cal Fire identified hazard zones. When the Local Hazard Mitigation Plan was prepared in 2018, approximately 2,886 residents (20% of the total population) lived in areas considered to be of moderate risk to wildfires, 934 residents (7% of the total population) lived in areas considered to have high wildfire risk and 56 residents (.4% of the total population) lived in areas considered to have very high risk to wildfires.

Urbanization tends to alter the natural fire regime and can create the potential for the expansion of urbanized areas into wildland areas. The expansion of the wildland urban interface can be managed with strong land use and building codes.

Local Fire History

Figure 4.3-3 shows the historical fires that have affected the Planning Area of the City of Red Bluff. The latest fire was the Stoll Fire in 2018, which burned a total of 268 acres and destroyed 24 structures including residential, commercial, and other buildings near and within Red Bluff.

Assessed Uses and Housing Units within High and Very High Fire Hazard Severity Zones.

Figure 4.3-4 shows existing (assessed) uses within High and Very High Fire Hazard Severity Zones within the Planning Area and the number of residential units located within each assessed area. As is shown in the figure, and below in Table 4.3-1, approximately 88 residential units, are located within high and very high fire hazard severity zones according to the Tehama County Assessor.

Table 4.3-1: Assessed Uses and Housing Units within High and Very High Fire Hazard Severity Zones

Assessed Use Type	Units		Unit
	LRA Very High	SRA High	Total
Pasture (Dry Grazing)	0	3	3
Specialty Homes	0	1	1
Dairies	0	1	1
SFD	1	--	1
Rural Residence	1	81	82
Grand Total	2	86	88

Source: Tehama County Assessor’s Office Assessed Uses; CAL FIRE FHSZ SRA 2023; CAL FIRE LRA Map November 17, 2008.

As in shown in the figure, and detailed below in Table 4.3-2, the majority of uses by acreage within High and Very High Fire Hazard Severity Zones are rural residential, irrigated farm, and dry farm.

Table 4.3-2: Assessed Uses (Acres) within High and Very High Fire Hazard Severity Zones.

	LRA Very High (Acres)	SRA High (Acres)	Grand Total (Acres)
DRY FARM	--	496.64	496.64
Miscellaneous Land	--	1.91	1.91
Pasture (Dry Grazing)	--	494.74	494.74
INDUSTRIAL	9.97	--	9.97
Light Manufacturing	2.03	--	2.03
Vacant Industrial Land	5.74	--	5.74
Warehouse	2.19	--	2.19
INSTITUTIONAL	--	0.49	0.49
Specialty Homes	--	0.49	0.49
IRRIGATED FARM	--	109.71	109.71
Dairies	--	109.71	109.71
NO LUC	275.24	16.78	292.02
NO LUC	275.24	16.78	292.02
RESIDENTIAL - SINGLE FAMILY	2.15	--	2.15
SFD	2.15	--	2.15
RURAL RESIDENTIAL	10.83	267.27	278.10
Rural Residence	10.83	267.27	278.10
VACANT LAND	135.84	17.56	153.40
Vacant Land	135.84	17.56	153.40
Grand Total	434.02	908.45	1,342.48

source: Tehama County Assessor's Office Assessed Uses; CAL FIRE FHSZ SRA 2023; CAL FIRE LRA Map November 17, 2008.

Existing General Plan Land Use Designations within High and Very High Fire Hazard Severity Zones

Figure 4.3-5 shows Existing General Plan land use designations within High and Very High Fire Hazard Severity Zones throughout the Planning Areas. As in shown in the figure, and detailed below in Table 4.3-3, the majority of existing General Plan Land Uses in the City Limits within LRA Very High Fire Hazard Severity Zones are Residential - Low Density (217.62 acres), and Residential – Medium Density (105.75 acres). The majority of lands within the City's SOI in SRAs (included areas of High and Very High Fire Hazard Severity Zones) include County designations of County UR - (340.66 acres), and County RS (335.74 acres).

Table 4.3-3: Existing GP Designations within High and Very High Fire Hazard Severity Zones

Land Use	LRA Very High Acres	SRA High Acres	Total Acres
C- Commercial	18.93	--	18.93
County GC- General Commercial	--	121.72	121.72
County RS - Rural Small Lot	--	335.74	335.74
County SR - Suburban Residential	--	98.80	98.80
County UR - Urban	--	340.66	340.66
County VFA - Valley Floor Agriculture	--	11.54	11.54
I - Industrial	91.72	--	91.72
R-L - Residential - Low	217.62	--	217.62
R-M - Residential - Medium	105.75	--	105.75
Grand Total	434.02	908.45	1,342.48

Source: CAL FIRE FHSZ SRA 2023; CAL FIRE LRA Map November 17, 2008.

Proposed 2045 General Plan Land Use Designations within High and Very High Fire Hazard Severity Zones

Figure 4.3-6 shows the proposed 2045 General Plan land use designations within High and Very High Fire Hazard Severity Zones throughout the Planning Areas. As in shown in the figure, and detailed below in Table 4.3-4, the majority of 2045 General Plan Land Uses in the City Limits within LRA Very High Fire Hazard Severity Zones are also Residential - Low Density (217.62 acres), and Residential – Medium Density (105.75 acres). The majority of lands within the City’s SOI in SRAs (included areas of High and Very High Fire Hazard Severity Zones) include commercial, agricultural, and low and medium density residential land uses.

Table 4.3-4: Proposed 2045 General Plan Update Land Uses within High and Very High Fire Hazard Severity Zones

Sum of GIS_Ac Row Labels	LRA Very High Acres	SRA High Acres	Grand Total Acres
C- Commercial	18.93	121.72	140.65
County VFA- Valley Floor Agriculture	--	11.54	11.54
I - Industrial	91.72	--	91.72
R-L - Residential - Low	217.62	434.54	652.16
R-M - Residential - Medium	105.75	340.66	446.41
Grand Total	434.02	908.45	1,342.48

Source: CAL FIRE FHSZ SRA 2023; CAL FIRE LRA Map November 17, 2008.

Local Fire Protection Services

The Red Bluff Fire Department (Rbfd) provides fire suppression and emergency medical services to all areas within the city limits within an approximately 7.8 square mile service area and a population of approximately 14,000 residents. Red Bluff has a Cooperative Fire Protection Agreement with CAL FIRE for dispatch services. The CAL FIRE/Red Bluff Fire Dispatch Agreement is an annual contract between the Red Bluff Fire Department and CAL FIRE for the provision of emergency dispatch service to the City. Figure 4.3-7 shows community facilities located throughout the planning area including fire and police facilities.

Services provided by the Red Bluff Fire Department include fire suppression, emergency medical services (EMS), search and rescue (SAR), and extrication. The Fire department has a total of 30 employees, of that 4 of those are administrative staff members, 12 are full-time firefighters and 4 are firefighter reserve personnel members.

The RBFD station is located at 555 Washington Street. The RBFD currently has 3 structure engines, 1 brush engine, 1 ladder truck and one mobile breathing support unit.

The RBFD provides fire suppression, hazard materials first responder, rescue and basic life support services. RBFD goal of safeguarding the community from fire and environmental hazards is achieved through programs adhering to fire regulations as dictated by the California Fire Code and the Red Bluff Municipal Code. In addition to fire protection services, the RBFD also provides the following services:

- Checking plans for fire, life safety, and environmental requirements
- Issuing fire permits
- Conducting fire, life safety, and environmental inspections
- Conducting fire investigations
- Providing public education programs

The RBFD has a Training Division which oversees training and education programs with the goal to meet or exceed the requirements of Federal, State, and Local mandates.

ISO Rating

The Insurance Services Office (ISO) rating measures individual fire protection agencies against a national Fire Suppression Rating Schedule which includes such criteria as facilities and support for handling and dispatching fire alarms, first-alarm responses and initial attack, and adequacy of the local water supply for the fire suppression purposes. ISO ratings are on a scale of 1-10 with 1 being the highest rating.

An Insurance Services Office (ISO) rating is a collection of information on a community's public fire protection, which is determined by using a Fire Suppression Rating Schedule (FSRS). The FSRS is the manual that the ISO uses in reviewing the firefighting capabilities of individual communities. The schedule measures the major elements of a community's fire suppression system and develops a numerical grading called a Public Protection Classification (PPC). The FSRS determines a Public Protection Classification from 1 to 10. Class 1 represents the best public protection, and Class 10 indicates less than the minimum recognized protection. By classifying a community's ability to suppress fires, ISO helps the communities evaluate their public fire protection services.

In 2015, ISO came and reclassified Red Bluff Fire Department with an ISO rating of (Class) 2. This was an increase from our previous rating of ISO (Class) 5. In 2019, ISO came for reevaluation purposes and again rated RBFD an ISO rating of (Class) 2.

Wildland and Urban Fires and Climate Change

As California is expected to experience increased temperatures and reduced precipitation, there will likely be more frequent and intense wildfires and longer fire seasons. Fires spread more quickly on dry, windy days and move more easily in an uphill direction and in areas with higher-density vegetation. Wildfires are a natural and important part of the ecosystem but can become more intense and dangerous as a result of climate change and land management. Wildfires are unplanned, natural occurring fires and may be

caused by lightning, accidental human ignitions, arson, or escaped prescribed fires. Weather is one of the most significant factors in determining the severity of fires; natural fire patterns are driven by conditions such as drought, temperature, precipitation, and wind, and also by changes to vegetation structure and fuel (i.e., biomass) availability. Wildfires pose a great threat to life and property, particularly when they move from forest or rangeland into developed areas.

Climate change is projected to increase the frequency of wildfire events, the extent of burned areas across California, and the duration of wildfire seasons. Wildfire seasons are projected to begin earlier in the spring due to drier and warmer spring conditions on average, potentially requiring longer periods for firefighting services. Greater inter-annual variability in temperature and precipitation may also affect wildfire intensity. For example, multiple wet years can result in larger fuel buildup in landscapes. This may result in increasingly intense and frequent wildfires, if followed by drought years. Wildfire risk will also vary depending on population growth and land use characteristics, including rates of residential expansion and infrastructure into fire prone areas over the next century.

Local Exposure

In addition to High and VHFHSZs within the Red Bluff Planning Area, high fuel loads in the County, along with geographical and topographical features, create the potential for both natural and human-caused fires. Climate change further increases the risk of fires originating in Red Bluff or in surrounding areas. Fires in other locations could cause reduced air quality in Red Bluff, putting the health of sensitive populations at risk.

The frequency, severity, and impacts of wildfire are sensitive to climate change as well as many other factors, including development patterns, temperature increases, wind patterns, precipitation change, and pest infestations; therefore, it is more difficult to project exactly where and how fires will burn. Instead, climate models estimate increased risk to wildfires. One way to estimate the risk of wildfire is through the Keetch-Byram Drought Index (KBDI), which is a designed drought index specifically for fire potential assessment. The KBDI provides an estimate for how dry the soil and vegetative detritus is.¹

Table 4.3-5 projects the number of days with KBDI values greater than 600 over the next century in Red Bluff (i.e., number of days with extreme wildfire risk and increased wildfire occurrence, due to severe drought). As shown, the City is expected to have approximately 25 to 29 more days annually with extreme wildfire risk and increased wildfire occurrence, due to severe drought, during the middle of the century (2035-2064) compared to the Baseline; the end of century (2070-2099) is predicted to have approximately 30 to 46 more days annually with extreme wildfire risk and increased wildfire occurrence, due to severe drought.

¹ KBDI is cumulative. The KBDI values increase on dry and warm days and decrease during rainy periods. In California we would expect KBDI to increase from the end of the wet season (spring) into the dry season (summer & fall). KBDI values range from 0-800 and represent the following: a KBDI value of 0-200 represents high soil moisture and fuel moistures, therefore low wildfire risk; a value of 200-400 represents soil and fuels starting to dry, therefore average wildfire risk; a value of 400-600 represents the onset of drought with moderate to serious wildfire risk; and a value of 600-800 represents severe drought, therefore extreme wildfire risk and increased wildfire occurrence.

Table 4.3-5: Number of days in a year where Keetch-Byram Drought Index (KBDI) > 600, Red Bluff

Time Period	Scenario	30yr Average	30yr Range	Change from baseline
Baseline (1961-1990)	Modeled Historical	108 days*	93 - 124 days	--
Mid-Century (2035-2064)	Medium Emissions (RCP 4.5)	133 days	119 - 156 days	+25 days
	High Emissions (RCP 8.5)	137 days	122 - 150 days	+29 days
End of Century (2070-2099)	Medium Emissions (RCP 4.5)	138 days	116 - 158 days	+30 days
	High Emissions (RCP 8.5)	154 days	134 - 173 days	+46 days

SOURCE: CAL ADAPT, ACCESSED APRIL 25, 2022, [HTTPS://CAL-ADAPT.ORG/TOOLS/LOCAL-CLIMATE-CHANGE-SNAPSHOT/](https://cal-adapt.org/tools/local-climate-change-snapshot/).

*OBSERVED 30-YEAR AVERAGE FROM 1961 TO 1990: 118 DAYS.

Vulnerable Populations

Especially vulnerable people include people with pre-existing health conditions, such as asthma, who are more sensitive to hazardous air. The percentage of people diagnosed with asthma in Tehama County is slightly higher to the rates in California; approximately 18.1 percent of Tehama County residents have been diagnosed at some point in their lives, compared to 15.2 percent of all Californians (University of California Los Angeles Health Policy Center, 2018). Additionally, households without access to a car may have difficulty running errands, going outside, or evacuating when the air is hazardous. Individuals with physical disabilities or who live in isolation may have difficulty evacuating. Vulnerable infrastructure includes energy infrastructure (fires in other areas could cause damage to power plants or power lines causing blackouts), communications, water (water quality reduced due to ash, etc.) Natural habitats and plants and animals are extremely vulnerable to wildfires; Red Bluff's open spaces and urban forests provide homes to plant and animal species, which are susceptible to fire hazards.

Vulnerable populations also include those that live near the High and Very High Fire Hazard Severity Zones (Figures 4.3-1 and 4.3-2), generally located in the northern portion of City limits and surrounding area. Red Bluff's emergency preparedness services include the Emergency Operations Center, which is managed by the Tehama County Sheriff's Office of Emergency Services.

Multi-Jurisdictional Local Government Emergency Response

The Tehama County Sheriff's Office of Emergency Services (OES) primary responsibility is to coordinate response to disasters or other large-scale emergencies. The office is charged with providing the necessary planning, coordination, response support and communications with all agencies affected by large scale emergencies or disasters. OES works in a cooperative effort with other governmental jurisdictions within the county such as: law enforcement, fire, emergency medical services, state and federal agencies, utilities, private industry and volunteer groups in order to provide a coordinated response to disasters. The Emergency Services Coordinator also manages the County Emergency Operations Center (EOC) which is located in the Sheriff's Office and or Red Bluff Community Center. The EOC becomes the single focal point for centralized management and coordination of emergency response and recovery operations during a disaster or other emergency affecting the Tehama County Operational Area. The EOC will be

activated when an emergency situation occurs that exceeds local and/or in field capabilities to adequately respond to and mitigate the incident.

The Tehama County Sheriff's Office of Emergency Services (OES) is also responsible for the administration of the county emergency management program on a day to day basis.

Water Utility Providers and Capacities

As described in greater detail in Chapter 3.0 (Community Services and Facilities) , the City currently operates 14 wells, varying in depth from 250' to 625' and varying in capacity from 480 to 2,400 gallons per minute. The water supplied by the 14 wells is not altered or treated prior to distribution. The City currently has two 3 million gallon water storage facilities. Figure 3.1-1 shows the existing water facilities within the City of Red Bluff.

The City provides water service to approximately 4,865 residential, commercial, agricultural and industrial service connections from water supplies and 3,166 acre-feet of water volume. The City of Red Bluff owns, maintains, and operates water supply wells, storage tanks, and water lines throughout the city. The water supplied by the City of Red Bluff is not altered or treated prior to distribution. The City has two portable chlorination units that could be used to treat water on an emergency basis. The City manages and maintains over 80 miles of water lines spanning 4 to 24 inches in diameter, 13 active groundwater wells, and two 3 million gallon (MG) water storage facilities. The City of Red Bluff pumps and delivers water to its residential (including single-family residential and multi-family residential), commercial, industrial, and institutional customers within the service area.

Water Demands

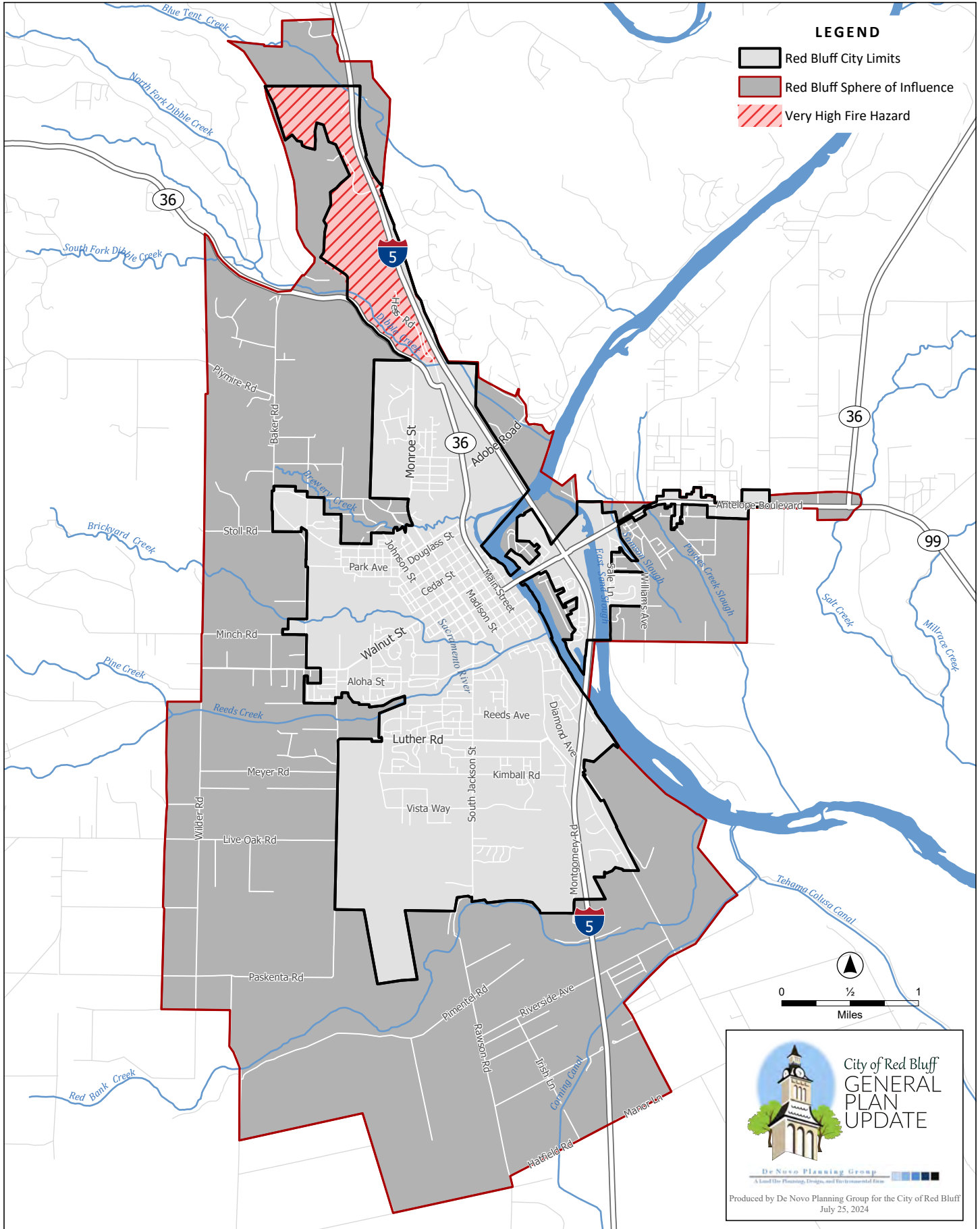
Water demands served by the City of Red Bluff are primarily residential (includes single-family residential and multi-family residential), commercial, industrial, and institutional, and landscape irrigation. All connections in the city are metered, with the exception of eight unmetered commercial/institutional connections. The City' policy is to accommodate potable water demands through groundwater pumping. The City requires development to demonstrate adequacy of facilities and water supplies. The City's existing water system can meet the additional 2045 growth however, the UWMP would need to be periodically updated to accommodate new and projected population growth, to ensure sufficient water supplies and infrastructure to support development.

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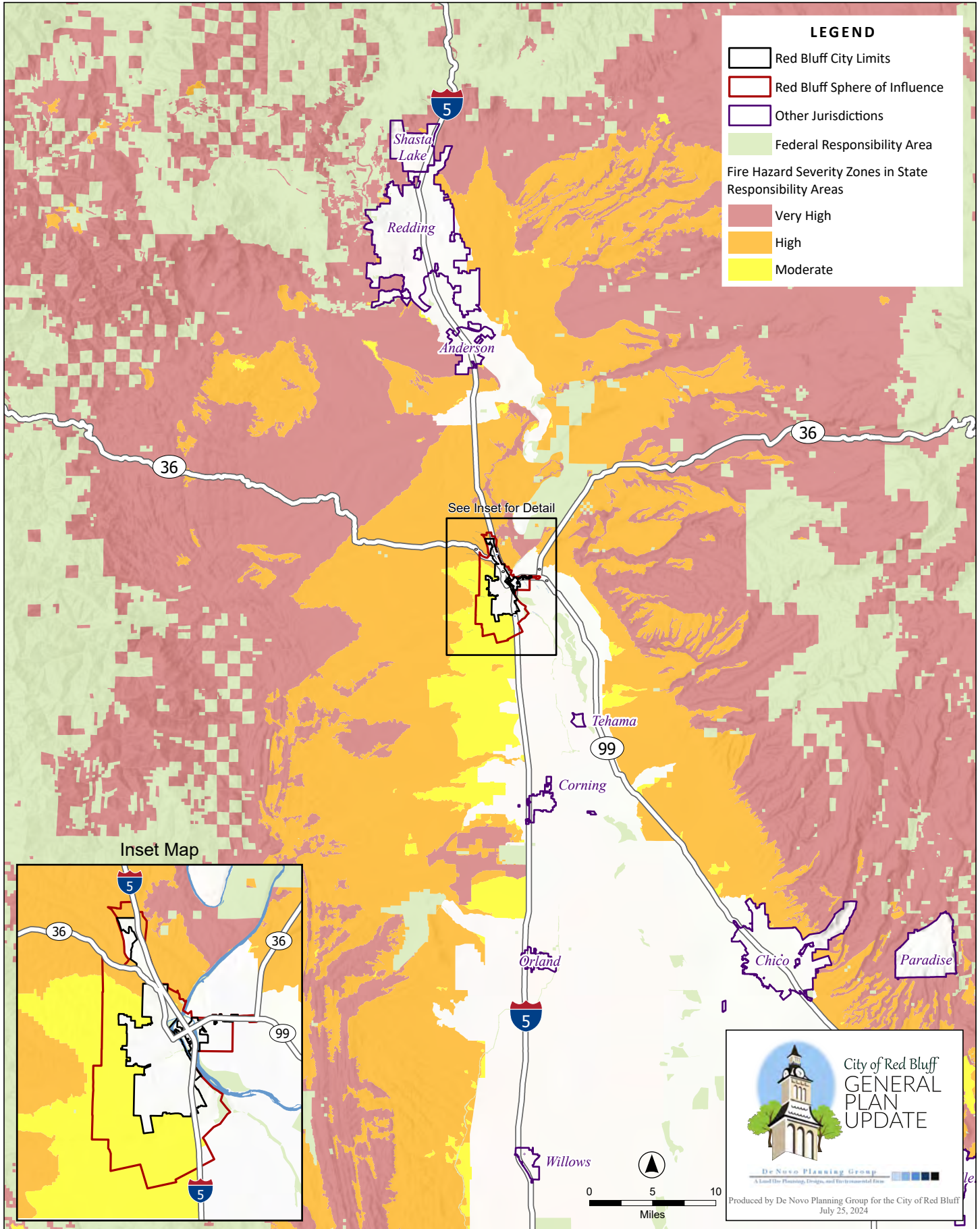
Figure 4.3-1. Fire Hazard Severity Zones in Local Responsibility Areas



Sources: State Office of the Fire Marshal/CAL FIRE FRAP, 2008; California State University, Chico Geographical Information Center; USGS National Hydrography Dataset.

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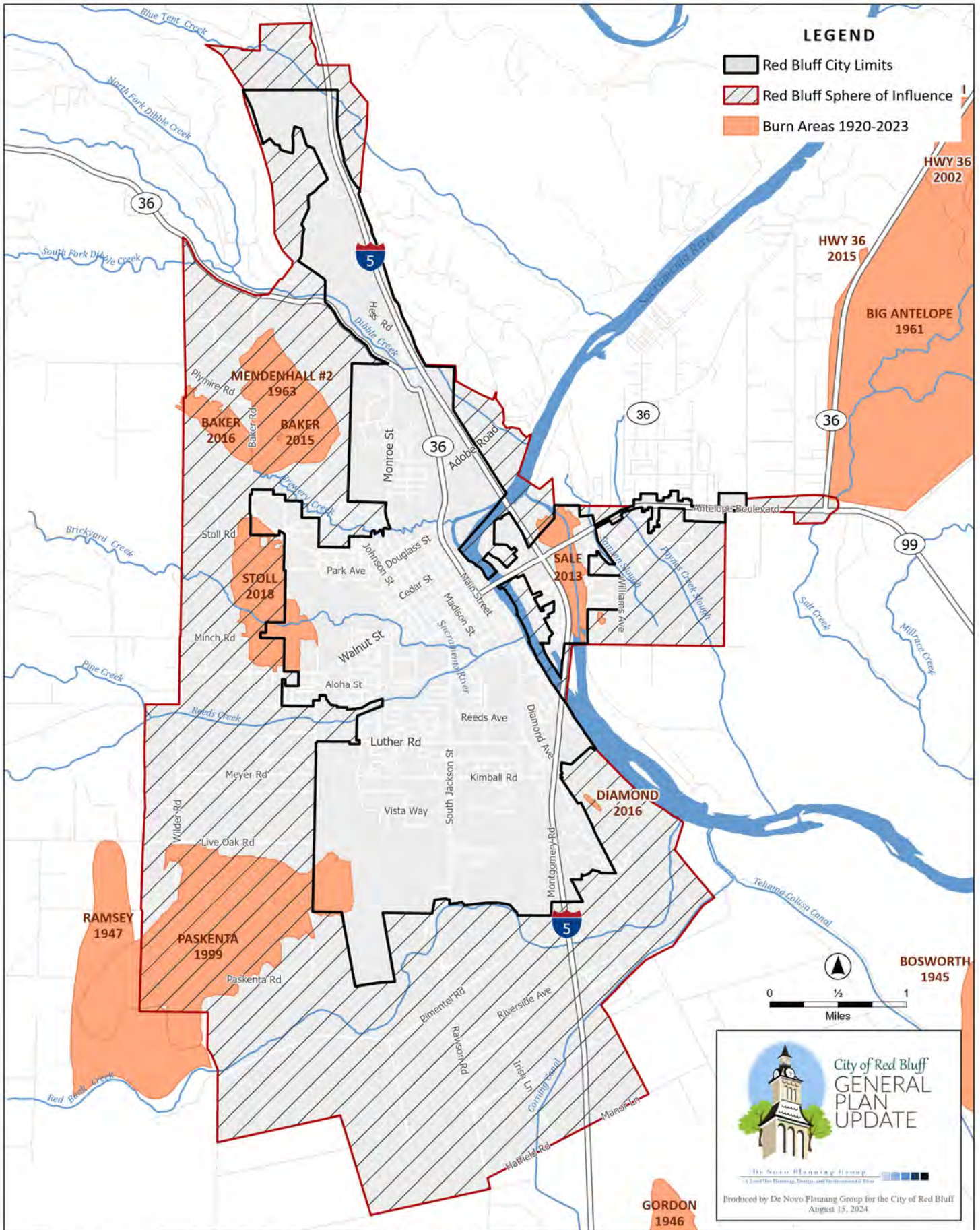
Figure 4.3-2. Fire Hazard Severity Zones in State Responsibility Areas



Sources: State Office of the Fire Marshal/CAL FIRE FRAP, April 1, 2024; California State University, Chico Geographical Information Center; USGS National Hydrography Dataset.

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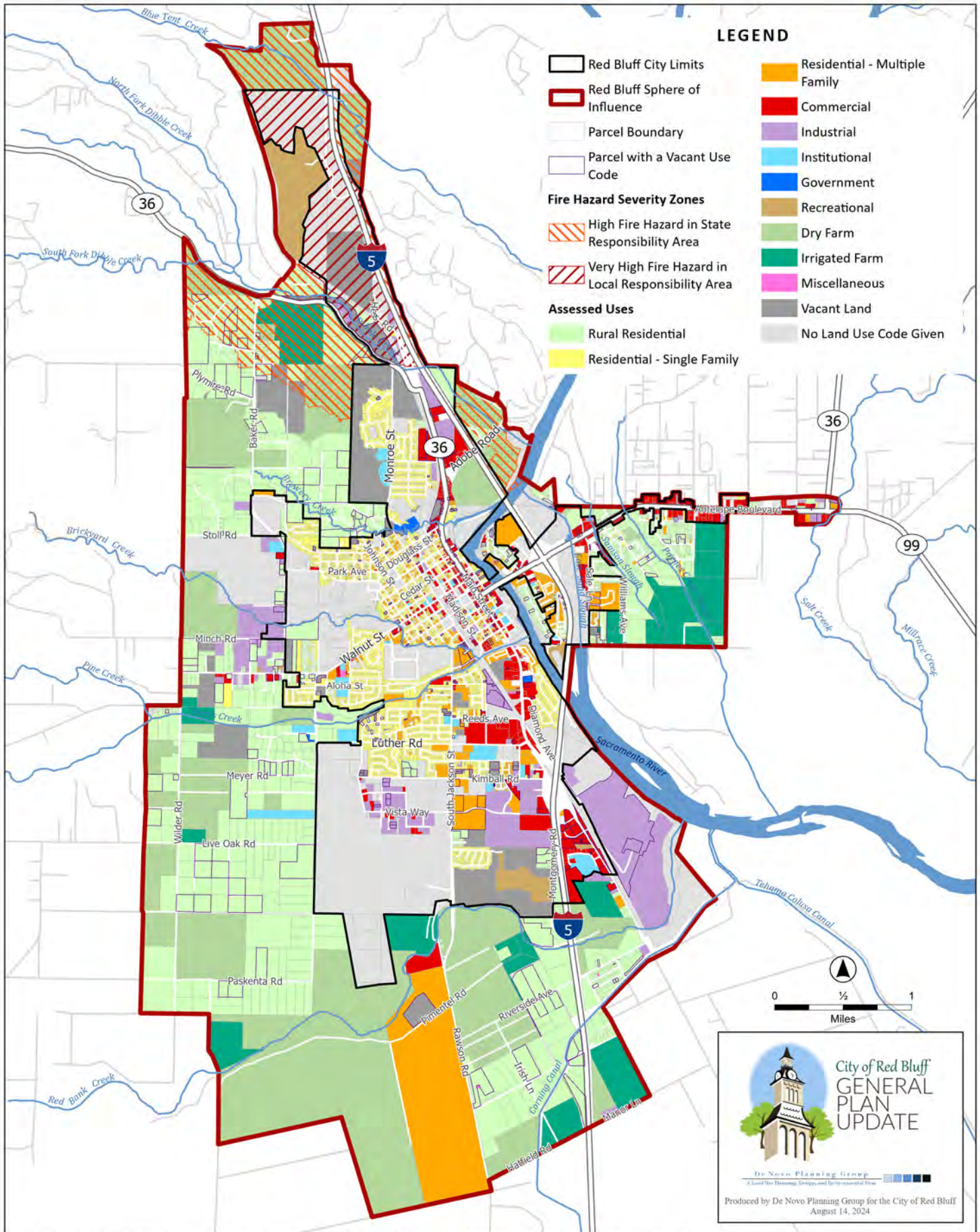
Figure 4.3-3. Historical Fires



Sources: California State University, Chico Geographical Information Center; USGS National Hydrography Dataset; CAL FIRE FRAP, Historical Fire Perimeters 2023

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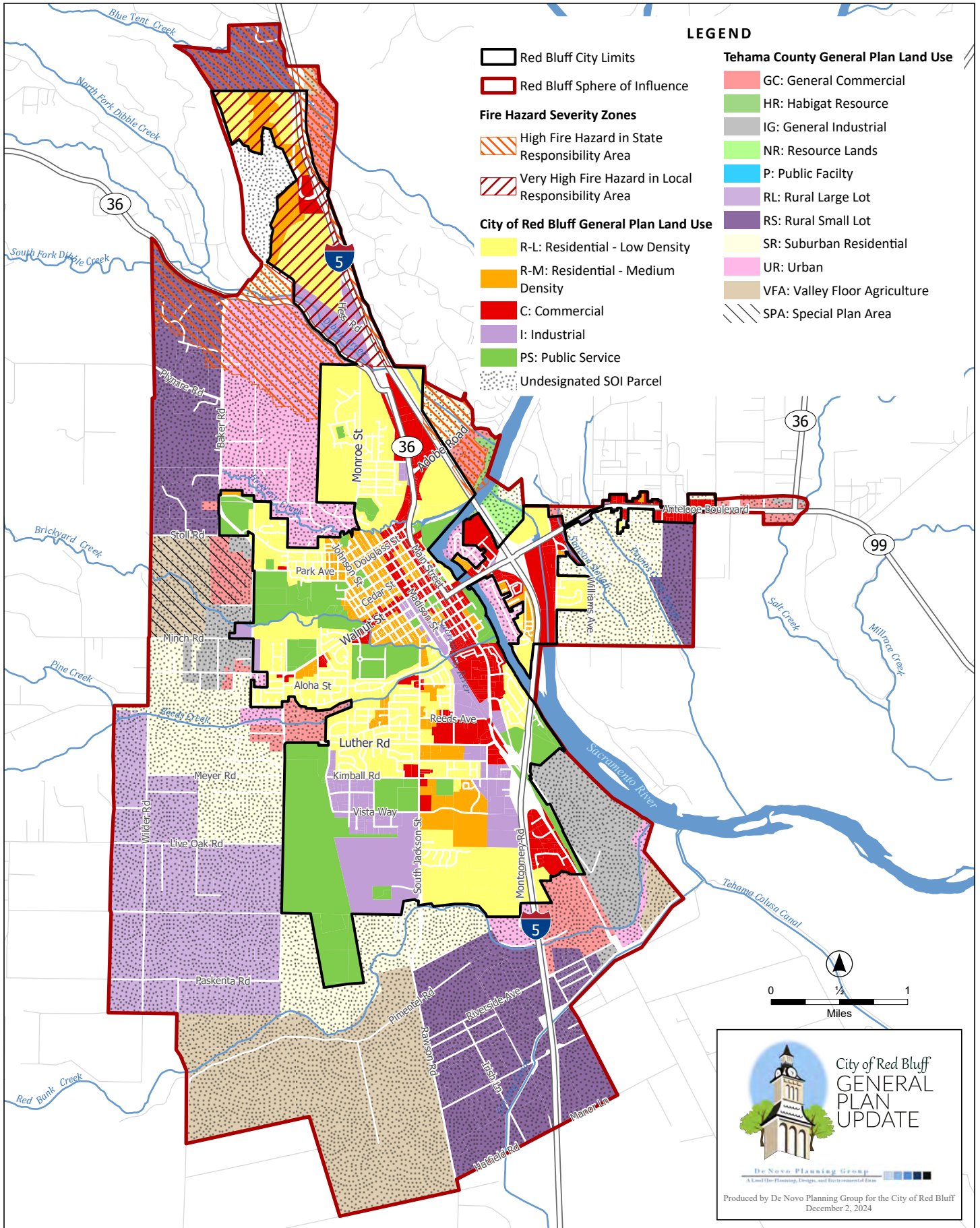
Figure 4.3-4. Assessed Uses within High and Very High Fire Hazard Severity Zones



Sources: California State University, Chico Geographical Information Center; State Office of the Fire Marshal/CAL FIRE FRAP, 2008 (LRA) and 2024 (SRA); Assessor Data November 2020.

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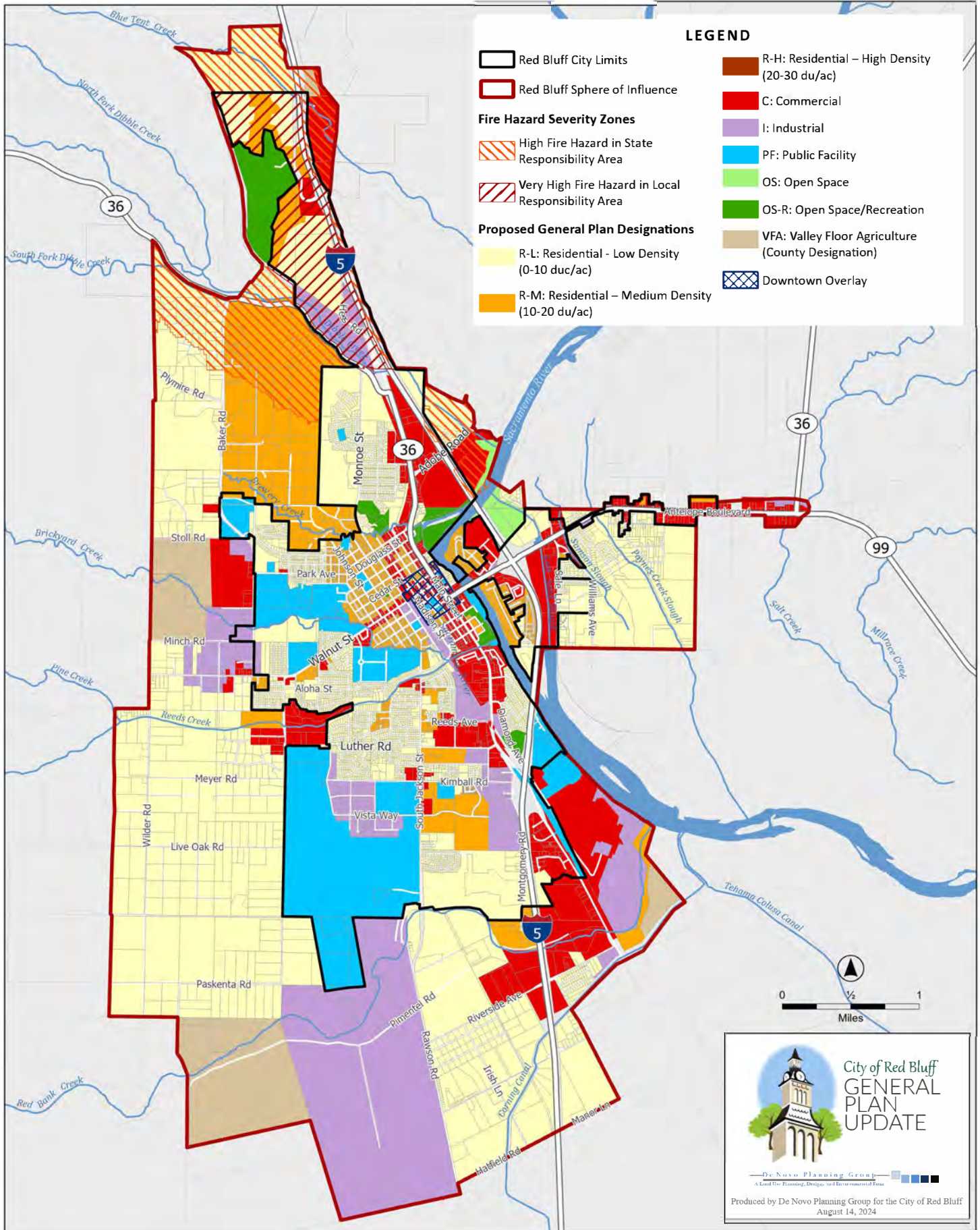
Figure 4.3-5. Existing General Plan Designations within High and Very High Fire Hazard Severity Zones



Sources: Sources: California State University, Chico Geographical Information Center; State Office of the Fire Marshal/CAL FIRE FRAP, 2008 (LRA) and 2024 (SRA); City of Red Bluff.

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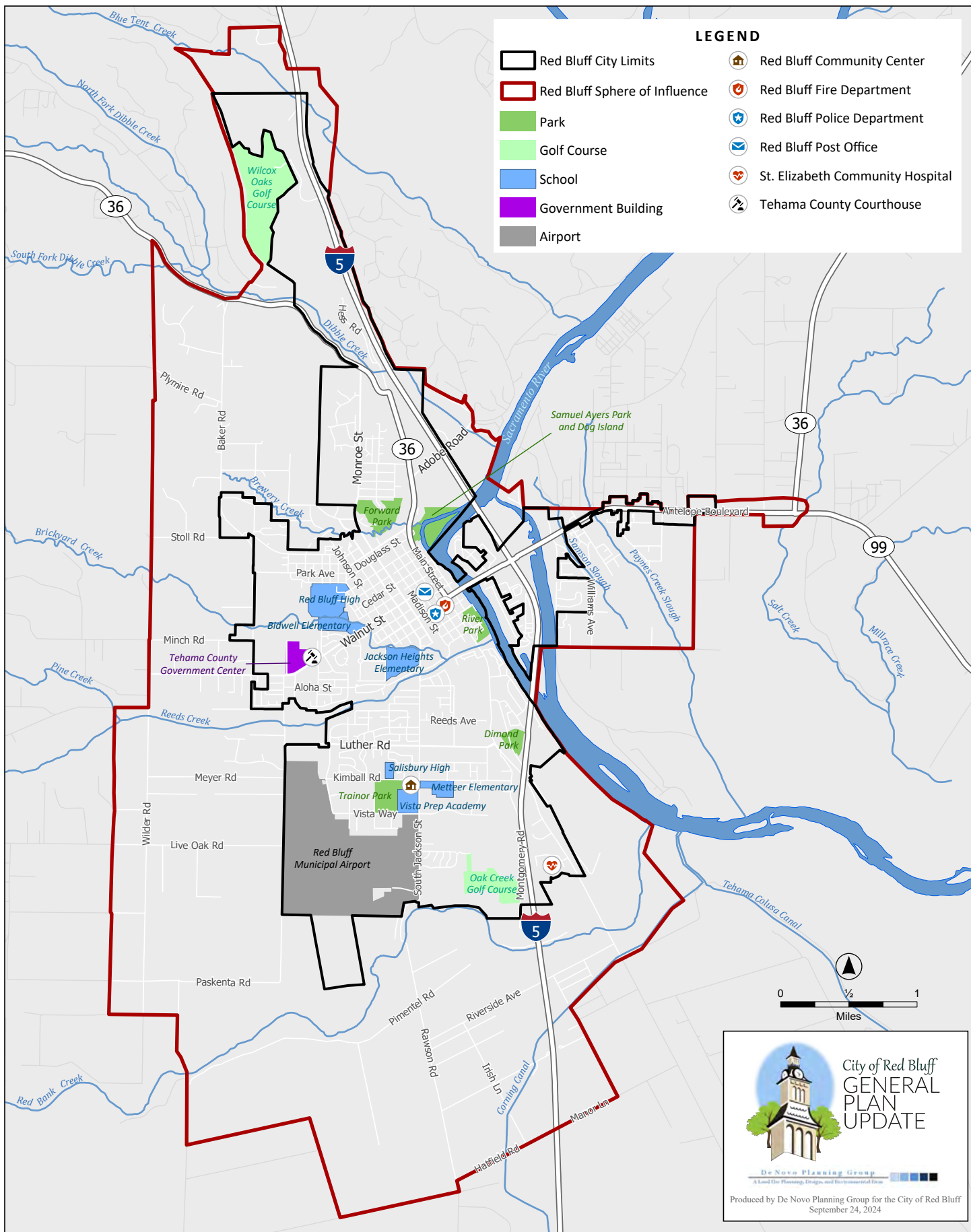
Figure 4.3-6. Proposed General Plan Designations within High and Very High Fire Hazard Severity Zones



Sources: Sources: California State University, Chico Geographical Information Center; State Office of the Fire Marshal/CAL FIRE FRAP; 2008 (LRA) and 2024 (SRA); City of Red Bluff.

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Figure 4.3-7. Community Facilities



Sources: Google Maps; City of Red Bluff; USGS National Hydrography Dataset; California State Geportal.

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Residential Emergency Evacuation Route Analysis

In coordination with its General Plan Update (2022), including the Safety Element, the City of Red Bluff has prepared an analysis consistent with Gov. Code § 65302(g)(5) to identify residential developments in high hazard zones that do not have at least two emergency evacuation routes. The analysis identified four (4) residential areas of concern in high hazard zones that warrant further study. These areas are concentrated along the Sacramento River (east of Main Street and west of I-5) and in the southeast of the City. The following is an explanation of the methodology used to map the evacuation routes.

Definitions & Data Sources

Residential Developments

As part of the Red Bluff General Plan Update, a parcel layer was developed that included information about the General Plan land use designations and the on-ground/assessed uses for each parcel. Parcels that had an assessed use of “Residential” and the following land use designations were considered residential developments:

- Residential - Multiple Family
- Residential - Single Family
- Rural Residential

High Hazard Zones

High Hazard Zones within the City of Red Bluff were defined as areas that are in one or more of the following pre-defined hazard zones:

1. FEMA’s 100-year flood zone (PRESENT)
2. California Geological Survey’s Map Sheet 58 Landslide Susceptibility classes 8, 9, or 10 (PRESENT)
3. California Geological Survey’s Potential Liquefaction areas, Potential Landslide areas, and Fault Zones, mapped as part of the California Seismic Hazard Zonation Program (NONE PRESENT)
4. CAL FIRE High and Very High Fire Threat Zones in State Responsibility Areas (PRESENT)
5. CAL FIRE Very High Fire Hazard Severity Zones in Local Responsibility Areas (PRESENT)

These high hazard zones were combined into one single “Combined Hazard Area” using ArcGIS merge and dissolve geoprocessing tools.

Evacuation Routes

Road data obtained from the Tehama County GIS Open Data Portal was utilized to identify points of exit from clusters (neighborhoods) of residential parcels. Road centerlines were divided into three main classes:

1. **State Highway/Interstate Highway** – State Route 36 and I-5
2. **Arterial Roadway** – Antelope Boulevard, Jackson Street, Luther Road, Main Street, Montgomery Road, N Main Street, Oak Street, Paskenta Road, S Jackson Street, S Main Street, and Walnut Street.
3. **Minor or Local Road** – All other roads not considered “Arterial Roadway”. These roads are generally the first roads a resident will encounter when departing their residence.

Assumptions & Methodology

Identification of Residential Developments in High Hazard Zones

Using ArcGIS, Residential Areas in High Hazard Zones were identified by running a location query to find the parcels with residential General Plan designations and assessed use type that intersect the single Combined Hazard Area.

Identification of Residential Area Exit Points

The goal of this analysis was to find at least two separate points of exit from residential areas by following a rudimentary roadway network in which vehicles move from Minor or Local Roads to Arterial Roadways, and eventually to a State Highway/Interstate Highway. The following assumptions apply:

- Residential areas have immediate access to Minor or Local Roads, but are distant from State Route 36 and I-5
- Arterial Roadways connect Minor or Local Roads to State Route 36 and I-5
- Residential exit points are the points where Minor or Local Roads intersect Arterial Roadways thereby providing access to State Route 36 and I-5

Analysis & Results

Analysis

Upon visual analysis, residential parcels were assigned to one of four categories:

1. One Exit Point with and distance to a Single Arterial
2. One Exit Point directly onto a Single Arterial
3. Multiple Exit Points with access to a single Arterial
4. Multiple Exit Points with access to multiple Arterials

Results

A total of 730 unique parcels were identified as Residential AND within the Combined Hazard Area. No existing Residential Uses (as designated by the County Assessor's office) within VHFHSZs were identified as having only One Exit Point.

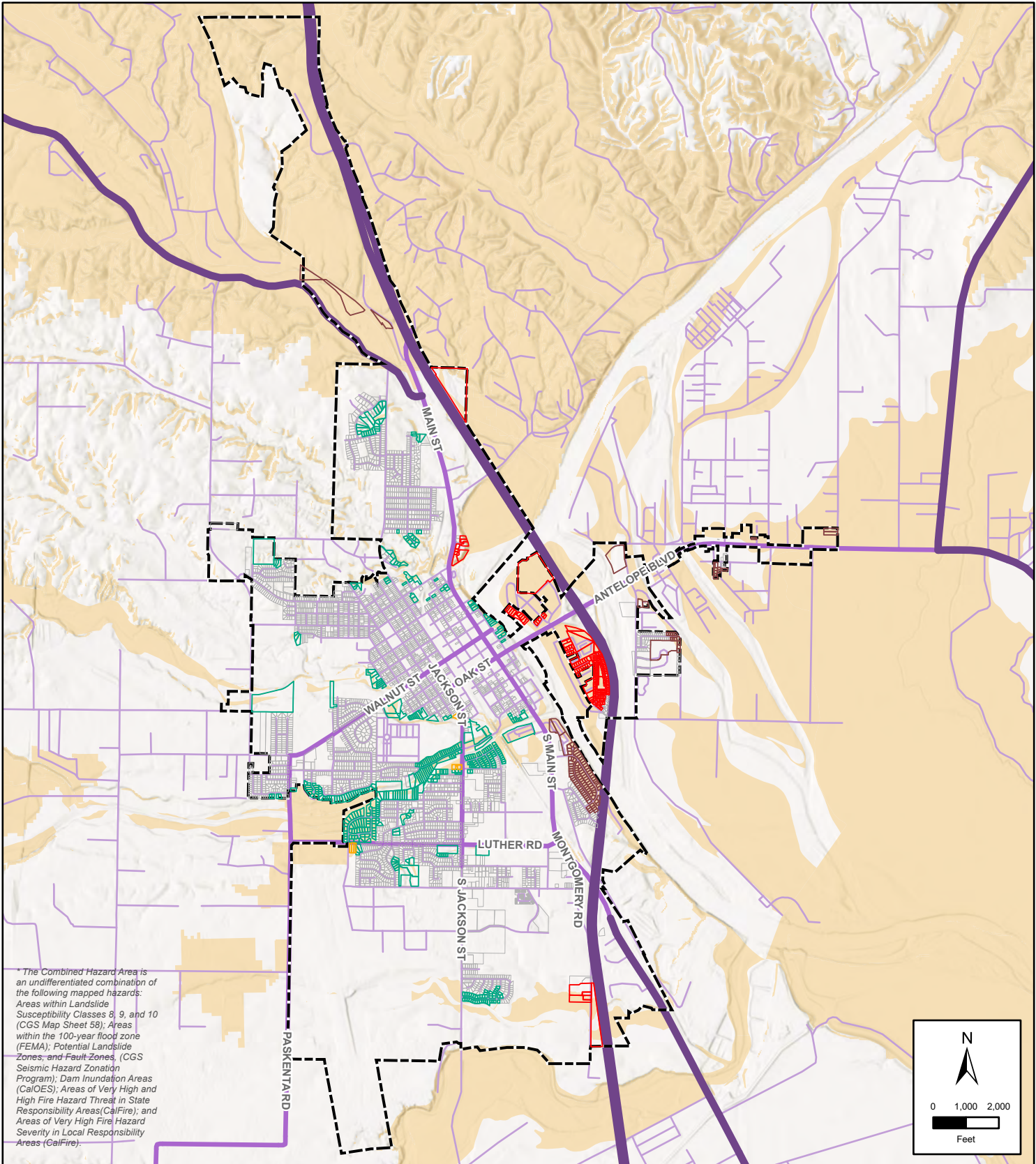
Figure 4-3-8 shows the results and access to arterials from residential areas in identified High Hazard Zones.

Of these:

1. 432 parcels have multiple exit points with access to multiple arterials (GREEN ON THE MAP). A large portion of these parcels is located along the Reeds Creek.
2. 119 parcels have multiple exit points with access to a single arterial (i.e., sit on a loop road). A large portion of these parcels is located to the west of Sacramento River to the east of S Main Street. There are some of these parcels scattered to the east of Sacramento River near the City Limits (BROWN ON THE MAP).
3. 171 parcels have one exit point with access to a single arterial. The majority of these parcels are located to the west of I-5 in the eastern part of the City (RED ON THE MAP).
4. 8 parcels have one exit point directly onto a single arterial (ORANGE ON THE MAP).

The following neighborhoods should be prioritized for adequate exit strategies:

1. One neighborhood with 16 residential parcels impacted (Lakeside Drive area) must all exit the neighborhood via Antelope Boulevard to reach I-5.
2. One neighborhood with 141 residential parcels impacted (Gilmore Road area) must all exit the neighborhood via Antelope Boulevard to reach I-5.
3. One neighborhood with 8 residential parcels impacted (Duncan Road area) must all exit the neighborhood via Duncan Road to reach I-5.
4. One neighborhood with 5 residential parcels impacted (Montgomery Road area) must all exit the neighborhood via S Main Street to reach I-5.



* The Combined Hazard Area is an undifferentiated combination of the following mapped hazards: Areas within Landslide Susceptibility Classes 8, 9, and 10 (CGS Map Sheet 58); Areas within the 100-year flood zone (FEMA); Potential Landslide Zones; and Fault Zones, (CGS Seismic Hazard Zonation Program); Dam Inundation Areas (CalOES); Areas of Very High and High Fire Hazard Threat in State Responsibility Areas (CalFire); and Areas of Very High Fire Hazard Severity in Local Responsibility Areas (CalFire).

LEGEND

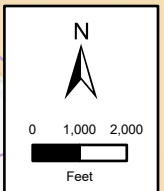
- Combined Hazard Area
- Red Bluff City Limits
- State Highway/Interstate Highway
- Arterial Roadway
- Local Road

Residential Parcels In Hazard Areas

- Multiple Exit Points with Access to Multiple Arterials
- Multiple Exit Points with Access to a Single Arterial
- One Exit Point directly onto a Single Arterial
- One Exit Point with Access to Single Arterial
- Other Residential Parcels NOT within Hazard Areas

CITY OF RED BLUFF

Figure 4.3-8: Access to Arterials from Residential Areas in High Hazard Zones



Sources: Tehama County GIS; CGS; CAL FIRE; FEMA; USGS National Transportation Dataset. Map date: July 18, 2024.

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Tehama County Safety, Secondary Access, Community Planning & Evacuation Planning Study

The Tehama County Safety, Secondary Access, Community Planning and Evacuation Routing Study, is a comprehensive analysis conducted to identify locations and communities within Tehama County that are at a high risk of experiencing wildfires, flooding, or hazardous materials exposure. Throughout the County, evacuation improvements have been identified by utilizing strategies aimed at ascertaining communities with insufficient ingress and egress evacuation routes, addressing local community fire evacuation concerns, and enhancing evacuation operations with improved communication tactics.

Tehama County worked in collaboration with the California Department of Forestry and Fire Protection (CAL FIRE), the California Governor's Office of Emergency Services (Cal OES), and the Tehama County Sheriff's Office, with assistance from transportation planners, engineers, and evacuation consultants including Green DOT Transportation Solutions, Deer Creek Resources, and Headway Transportation to design and implement this study. The study is available at: <https://tehamartpa.org/wp-content/uploads/2024/07/Tehama-Secondary-Access-Evacuation-Routing-Study.pdf>.

Below includes key local evacuation issues that are identified within the Red Bluff Planning Area and are documented in this study:

Key Evacuation Route Considerations for Red Bluff:

- High number of access points per population
- Several key evacuation routes serve as the only access with lower-rated pavement conditions

Roadways Identified That May Be Pinch Points in an Evacuation:

- Main Street
- Belle Mill Road
- Oak Street
- SR 36
- Antelope Boulevard
- Sale Lane
- Breckenridge Street
- Crittenden Street

Potential Pinch Points Where Evacuation Routes Converge Include:

- Beegum Road / Main Street
- Paskenta Road / Walnut Street
- Adobe Road / I-5
- Walton Avenue / Main Street
- Main Street / Adobe Road
- Breckenridge Street / Main Street
- Walnut Street / Jackson Street
- Madison Street / Walnut Street
- Madison Street / Oak Street
- Walnut Street / Main Street
- Oak Street / Main Street

- Jackson Street / Main Street
- Center Street / Oak Street
- Oak Street / I-5
- SR36 / Sale Lane
- Sale Lane / Belle Mill Road
- Kaer Avenue / Belle Mill Road
- SR36 / Chestnut Avenue
- Jackson Street / Madison Street
- Main Street / Diamond Avenue
- Main Street / Luther Avenue
- Main Street / I-5 interchange.

4.4 FLOODING

This section addresses the hazards associated with flooding in the Planning Area. The discussion of storm drainage and infrastructure is located in Chapter 3.0 (Community Services and Facilities) of this report.

REGULATORY FRAMEWORK

FEDERAL

Federal Emergency Management Agency (FEMA)

FEMA operates the National Flood Insurance Program (NFIP). Participants in the NFIP must satisfy certain mandated floodplain management criteria. The National Flood Insurance Act of 1968 has adopted as a desired level of protection, an expectation that developments should be protected from floodwater damage of the Intermediate Regional Flood (IRF). The IRF is defined as a flood that has an average frequency of occurrence on the order of once in 100 years, although such a flood may occur in any given year. Communities are occasionally audited by the California Department of Water Resources to insure the proper implementation of FEMA floodplain management regulations.

Rivers and Harbors Appropriation Act of 1899

One of the country's first environmental laws, this Act established a regulatory program to address activities that could affect navigation in Waters of the United States.

Water Pollution Control Act of 1972

The Water Pollution Control Act (WPCA) established a program to regulate activities that result in the discharge of pollutants to waters of the United States

Clean Water Act of 1977

The CWA, which amended the WPCA of 1972, sets forth the §404 program to regulate the discharge of dredged and fill material into Waters of the U.S. and the §402 National Pollutant Discharge Elimination System (NPDES) to regulate the discharge of pollutants into Waters of the U.S. The §401 Water Quality Certification program establishes a framework of water quality protection for activities requiring a variety of Federal permits and approvals (including CWA §404, CWA §402, FERC Hydropower and §10 Rivers and Harbors).

Flood Control Act

The Flood Control Act (1917) established survey and cost estimate requirements for flood hazards in the Sacramento Valley. All levees and structures constructed per the Act were to be maintained locally but controlled federally. All rights of way necessary for the construction of flood control infrastructure were to be provided to the Federal government at no cost.

Federal involvement in the construction of flood control infrastructure, primarily dams and levees, became more pronounced upon passage of the Flood Control Act of 1936.

National Flood Insurance Program (NFIP)

Per the National Flood Insurance Act of 1968, the NFIP has three fundamental purposes:

Better indemnify individuals for flood losses through insurance; Reduce future flood damages through State and community floodplain management regulations; and Reduce Federal expenditures for disaster assistance and flood control.

While the Act provided for subsidized flood insurance for existing structures, the provision of flood insurance by FEMA became contingent on the adoption of floodplain regulations at the local level.

Flood Disaster Protection Act (FDPA)

The FDPA of 1973 was a response to the shortcomings of the NFIP, which were experienced during the flood season of 1972. The FDPA prohibited Federal assistance, including acquisition, construction, and financial assistance, within delineated floodplains in non-participating NFIP communities. Furthermore, all Federal agencies and/or federally insured and federally regulated lenders must require flood insurance for all acquisitions or developments in designated Special Flood Hazard Areas (SFHAs) in communities that participate in the NFIP.

Improvements, construction, and developments within SFHAs are generally subject to the following standards:

- All new construction and substantial improvements of residential buildings must have the lowest floor (including basement) elevated to or above the base flood elevation (BFE).
- All new construction and substantial improvements of non-residential buildings must either have the lowest floor (including basement) elevated to or above the BFE or dry-floodproofed to the BFE.
- Buildings can be elevated to or above the BFE using fill, or they can be elevated on extended foundation walls or other enclosure walls, on piles, or on columns.
- Extended foundation or other enclosure walls must be designed and constructed to withstand hydrostatic pressure and be constructed with flood-resistant materials and contain openings that will permit the automatic entry and exit of floodwaters. Any enclosed area below the BFE can only be used for the parking of vehicles, building access, or storage.

STATE

Assembly Bill 162

This bill requires a general plan's land use element to identify and annually review those areas covered by the general plan that are subject to flooding as identified by flood plain mapping prepared by the Federal Emergency Management Agency (FEMA) or the Department of Water Resources (DWR). The bill also requires, upon the next revision of the housing element, on or after January 1, 2009, the conservation element of the general plan to identify rivers, creeks, streams, flood corridors, riparian habitat, and land that may accommodate floodwater for purposes of groundwater recharge and stormwater management. By imposing new duties on local public officials, the bill creates a State-mandated local program.

This bill also requires, upon the next revision of the housing element, on or after January 1, 2009, the safety element to identify, among other things, information regarding flood hazards and to establish a set of comprehensive goals, policies, and objectives, based on specified information for the protection of the community from, among other things, the unreasonable risks of flooding.

Assembly Bill 70

This bill provides that a city or county may be required to contribute its fair and reasonable share of the property damage caused by a flood to the extent that it has increased the State's exposure to liability for property damage by unreasonably approving, as defined, new development in a previously undeveloped

area, as defined, that is protected by a State flood control project, unless the city or county meets specified requirements.

Senate Bill 5

Both State policy and recently enacted State legislation (Senate Bill 5) call for 200-year (0.5% annual chance) flood protection to be the minimum level of protection for urban and urbanizing areas in the Central Valley. Senate Bill 5 (SB5) requires that the 200-year protection be consistent with criteria used or developed by the Department of Water Resources. SB 5 requires all urban and urbanizing areas in the Sacramento and San Joaquin Valleys to achieve 200-year Urban Level of flood protection (or a finding of adequate progress toward 200-year flood protection) in order to approve development.

"Urban area" means a developed area in which there are 10,000 residents or more.

"Urbanizing area" means a developed area or an area outside a developed area that is planned or anticipated to have 10,000 residents or more within the next 10 years.

CA Government Code

The Senate and Assembly bills identified above have resulted in various changes and additions to the California Government Code. Key sections related to the above referenced bills are identified below.

SECTION 65302

Revised safety elements must include maps of any 200-year flood plains and levee protection zones within the Planning Area.

SECTION 65584.04

Any land having inadequate flood protection, as determined by FEMA or DWR, must be excluded from land identified as suitable for urban development within the planning area.

SECTION 8589.4

California Government Code §8589.4, commonly referred to as the Potential Flooding-Dam Inundation Act, requires owners of dams to prepare maps showing potential inundation areas in the event of dam failure. A dam failure inundation zone is different from a flood hazard zone under the National Flood Insurance Program (NFIP). NFIP flood zones are areas along streams or coasts where storm flooding is possible from a "100-year flood." In contrast, a dam failure inundation zone is the area downstream from a dam that could be flooded in the event of dam failure due to an earthquake or other catastrophe. Dam failure inundation maps are reviewed and approved by the California Office of Emergency Services (OES). Sellers of real estate within inundation zones are required to disclose this information to prospective buyers.

SECTION 8609

The State Central Valley Flood Protection Board, under Section 8609 of the Water Code, has the authority to designate floodways in the Central Valley. California Code of Regulations, Title 23, Waters, provide further details of the Board's regulatory authority. Specifically, Title 23, Article 5, Section 107 regulates uses in Designated Floodways.

*LOCAL***Red Bluff Floodway Overlay Zone**

The Red Bluff General Plan establishes a Floodway Overlay Zone to protect life and property from hazards associated with flooding. No use, development or alteration of the Floodway (FW) overlay zone is allowed without prior City approval. Prior to granting approval to use, develop or alter land within an FW overlay area, the City shall make findings that the proposed use, development or alteration of the floodway conforms to the City's Flood Damage Prevention Regulations and applicable Federal (FEMA) regulations.

Chapter 25.110 of the Red Bluff Municipal Code includes the Floodplain Combining District (FP). This combining district is intended to be applied to those properties or portions thereof that appear within a "special flood hazard area inundated by 100-year flood," but outside the "floodway" on the flood insurance rate maps prepared by the Federal Emergency Management Agency. This combining district implements the floodplain overlay district recommended in the land use element of the General Plan.

Chapter 25.111 of the Red Bluff Municipal Code includes the Floodway Combining District (FW). This combining district is intended to be applied to those properties or portions thereof that appear within a "floodway" on the flood insurance rate maps prepared by the Federal Emergency Management Agency. This combining district implements the floodway overlay district recommended in the safety element of the City's General Plan.

Tehama County Multi-Hazard Mitigation Plan

The Tehama County Multi-Hazard Mitigation Plan provides an explanation of prevalent hazards within the County and how hazards may affect population and property differently across the County. The plan also contains information on natural hazard threats within Tehama County which identifies risks to vulnerable assets (people and property). Most importantly the mitigation strategy presented in this plan responds to the particular vulnerabilities and provides prescriptions or actions to achieve the greatest reduction of vulnerability, which results in saved lives, reduced injuries, reduced property damage, and protection for the environment in the event of a natural hazard. Red Bluff is a participating agency in the County's hazard mitigation plan.

City of Red Bluff Municipal Code Chapter 26, Flood Damage Prevention

The purpose of Chapter 26, Flood Damage Prevention of the City's Municipal Code is to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in the City of Red Bluff. This is accomplished by provisions designed to restrict or prohibit uses which are dangerous to health, safety and property due to water or erosion hazards; require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage; control the alteration of natural floodplains, stream channels and natural protective barriers, which help accommodate or channel flood waters; control filling, grading, dredging and other development which may increase flood damage; and prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

ENVIRONMENTAL SETTING

The Sacramento River causes the major flood problems in Red Bluff. As the water level rises, Paynes Creek Slough, Samson Slough, and East Sand Slough start flowing, causing flooding to residential areas along their lengths. Several roads that cross through these sloughs become closed during flooding. Flooding threat in the City of Red Bluff is most notable along Red Bank, Grasshopper, Reeds, Brickyard, Brewery, Dibble, and Blue Tent Creeks. The main stream flowing into Lake Red Bluff causes flooding of the east-side lowland areas and the City of Red Bluff parks on the western side, along with erosion of the high bluffs.

FEMA Flood Zones

FEMA mapping provides important guidance for cities and counties planning for flooding events and regulating development within identified flood hazard areas. FEMA's National Flood Insurance Program (NFIP) is intended to encourage State and local governments to adopt responsible floodplain management programs and flood measures. As part of the program, the NFIP defines floodplain and floodway boundaries that are shown on Flood Insurance Rate Maps (FIRMs). The FEMA FIRM for the Planning Area shows that a major portion of the city is within the 100-year flood plain, 500-year flood plain, and Regulatory Floodway. The floodplain bounds the eastern border of the most developed portion of the City and stretches out in most directions from there, including along Red Bank Creek, Reeds Creek, Brickyard Creek, and Dibble Creek. The FEMA floodplain for the Planning Area, as mapped for the City of Red Bluff, is shown on Figure 4.4-1.

SB 5 Flood Zones

Both State policy and recently enacted State legislation (Senate Bill 5) call for 200-year (0.5% annual chance) flood protection to be the minimum level of protection for urban and urbanizing areas in the Central Valley. Senate Bill 5 (SB5) requires that the 200-year protection be consistent with criteria used or developed by the Department of Water Resources. SB 5 requires all urban and urbanizing areas in the Sacramento and San Joaquin Valleys to achieve 200-year Urban Level of flood protection (or a finding of adequate progress toward 200-year flood protection) in order to approve development. With a population over 10,000 residents, the City of Red Bluff meets the standard to be considered an urban area. Currently, there are no areas within the Planning Area designated a 200-year floodplain, however, as noted above, the City of Red Bluff designates portions of the Planning Area within the 100-year and 500-year floodplains.

Dam Inundation

Earthquakes centered close to a dam are typically the most likely cause of dam failure. Dam Inundation maps have been required in California since 1972, following the 1971 San Fernando Earthquake and near failure of the Lower Van Norman Dam. A major dam failure event has not occurred in the Red Bluff Planning Area or within Tehama County. A catastrophic failure of various dams in the region would have a significant impact on Tehama County. According to the California Department of Water Resources, the Shasta and Whiskeytown Dams are located up gradient from the city along the Sacramento River and the City of Red Bluff is located in the Shasta Dam Inundation area and the Whiskeytown Dam Inundation area that could potentially be subject to inundation in the event of dam failure.

Section 8589.5 of the California Government Code requires local jurisdictions to adopt emergency procedures for the evacuation of populated inundation areas identified by dam owners. The local Office of Emergency Services has prepared a Dam Failure Plan. This plan includes a description of dams, direction of floodwaters, responsibilities of local jurisdictions, and evacuation plans. Figure 4.4-3 shows Dam Inundation areas within the Planning Area.

Floodways

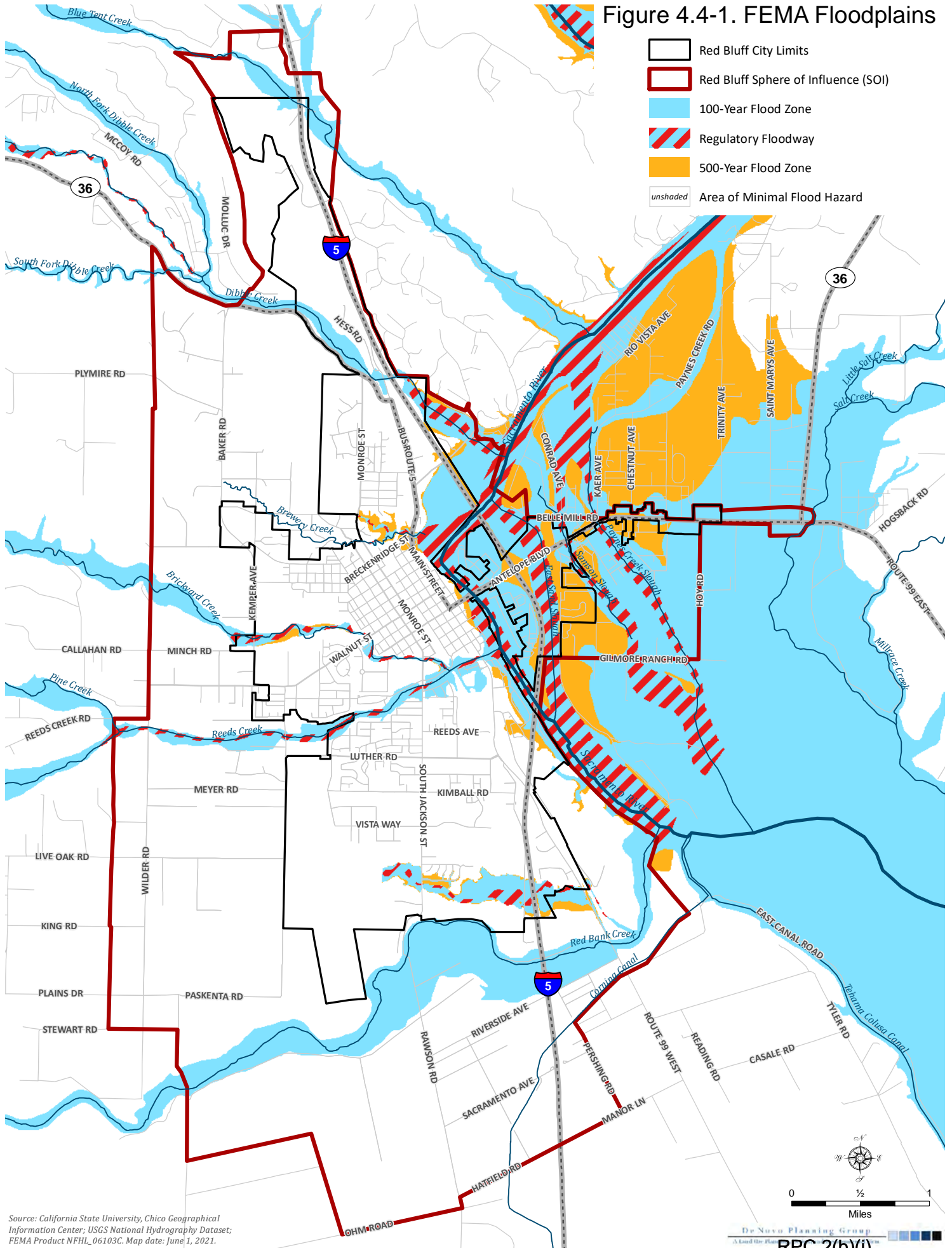
Designated Floodway refers to the channel of the stream and that portion of the adjoining floodplain reasonably required providing for the passage of a design flood; it is also the floodway between existing levees as adopted by the Central Valley Flood Protection Board (formerly the Reclamation Board) or the Legislature. The State Central Valley Flood Protection Board (CVFPB), under Section 8609 of the Water Code, designates floodways in the Central Valley. Regulatory floodways for the Planning Area, as mapped for the City of Red Bluff, are shown on Figure 4.4-1. As shown in the figure, regulatory floodways are shown primarily through the center of the Planning Area along the Sacramento River, Samson Slough, Reeds Creek, Brickyard Creek, and the Paynes Creek Slough.

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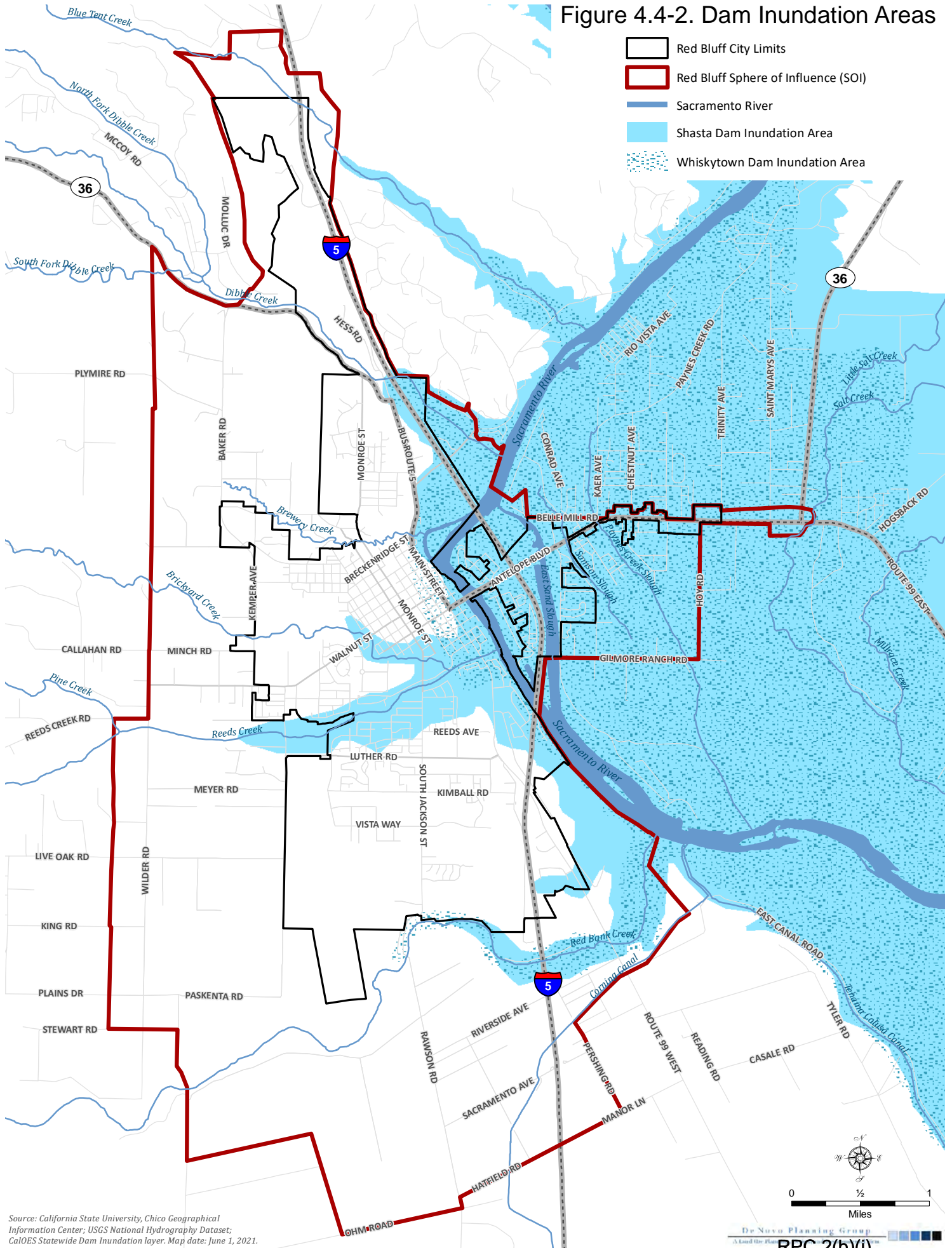
Figure 4.4-1. FEMA Floodplains



Source: California State University, Chico Geographical Information Center; USGS National Hydrography Dataset; FEMA Product NFHL_06103C. Map date: June 1, 2021.

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Figure 4.4-2. Dam Inundation Areas



Source: California State University, Chico Geographical Information Center; USGS National Hydrography Dataset; CalOES Statewide Dam Inundation layer. Map date: June 1, 2021.

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4.5 NOISE

This section provides a discussion of the regulatory setting and a general description of existing noise sources in Jackson. The information in this section was prepared with assistance from Saxelby Acoustics.

KEY TERMS

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given area consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of noise.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 p.m. - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.
Decibel or dB	Fundamental unit of sound, defined as ten times the logarithm of the ratio of the sound pressure squared over the reference pressure squared.
Frequency	The measure of the rapidity of alterations of a periodic acoustic signal, expressed in cycles per second or Hertz.
Impulsive	Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.
L_{dn}	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
L_{eq}	Equivalent or energy-averaged sound level.
L_{max}	The highest root-mean-square (RMS) sound level measured over a given period of time.
L_(n)	The sound level exceeded as a described percentile over a measurement period. For instance, an hourly L ₅₀ is the sound level exceeded 50 percent of the time during the one-hour period.
Loudness	A subjective term for the sensation of the magnitude of sound.
Noise	Unwanted sound.
SEL	A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy into a one-second event

FUNDAMENTALS OF ACOUSTICS

Acoustics is the science of sound. Sound may be thought of as mechanical energy of a vibrating object transmitted by pressure waves through a medium to human (or animal) ears. If the pressure variations occur frequently enough (at least 20 times per second), then they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound and is expressed as cycles per second or Hertz (Hz).

Noise is a subjective reaction to different types of sounds. Noise is typically defined as (airborne) sound that is loud, unpleasant, unexpected, or undesired, and may therefore be classified as a more specific group of sounds. Perceptions of sound and noise are highly subjective from person to person.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold (20 micropascals) as a point of reference, defined as 0 dB. Other sound pressures are then compared to this reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB, and changes in levels (dB) correspond closely to human perception of relative loudness.

The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by A-weighted sound levels. There is a strong correlation between A-weighted sound levels (expressed as dBA) and the way the human ear perceives sound. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels, but are expressed as dB, unless otherwise noted.

The decibel scale is logarithmic, not linear. In other words, two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted, an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70 dBA sound is half as loud as an 80 dBA sound, and twice as loud as a 60 dBA sound.

Community noise is commonly described in terms of the ambient noise level, which is defined as the all-encompassing noise level associated with a given environment. A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (L_{eq}), which corresponds to a steady-state A-weighted sound level containing the same total energy as a time varying signal over a given time period (usually one hour). The L_{eq} is the foundation of the composite noise descriptor, L_{dn} , and shows very good correlation with community response to noise.

The day/night average level (L_{dn}) is based upon the average noise level over a 24-hour day, with a +10-decibel weighing applied to noise occurring during nighttime (10:00 p.m. to 7:00 a.m.) hours. The nighttime penalty is based upon the assumption that people react to nighttime noise exposures as though they were twice as loud as daytime exposures. Because L_{dn} represents a 24-hour average, it tends to disguise short-term variations in the noise environment. CNEL is similar to L_{dn} but includes a +3 dB penalty for evening noise. Table 4.5-1 lists several examples of the noise levels associated with common situations.

TABLE 4.5-1: TYPICAL NOISE LEVELS

COMMON OUTDOOR ACTIVITIES	NOISE LEVEL (dBA)	COMMON INDOOR ACTIVITIES
	--110--	Rock Band
Jet Fly-over at 300 m (1,000 ft)	--100--	
Gas Lawn Mower at 1 m (3 ft)	--90--	
Diesel Truck at 15 m (50 ft), at 80 km/hr (50 mph)	--80--	Food Blender at 1 m (3 ft) Garbage Disposal at 1 m (3 ft)
Noisy Urban Area, Daytime Gas Lawn Mower, 30 m (100 ft)	--70--	Vacuum Cleaner at 3 m (10 ft)
Commercial Area Heavy Traffic at 90 m (300 ft)	--60--	Normal Speech at 1 m (3 ft)
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall (Background)
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

SOURCE: CALTRANS, TECHNICAL NOISE SUPPLEMENT, TRAFFIC NOISE ANALYSIS PROTOCOL. SEPTEMBER 2013.

EFFECTS OF NOISE ON PEOPLE

The effects of noise on people can be placed in three categories:

- Subjective effects of annoyance, nuisance, and dissatisfaction;
- Interference with activities such as speech, sleep, and learning; and
- Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers in industrial plants can experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise or the corresponding reactions of annoyance and dissatisfaction. A wide variation in individual thresholds of annoyance exists and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so-called ambient noise level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it.

With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10 dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

Stationary point sources of noise – including stationary mobile sources such as idling vehicles – attenuate (lessen) at a rate of approximately 6 dB per doubling of distance from the source, depending on environmental conditions (i.e., atmospheric conditions and either vegetative or manufactured noise barriers, etc.). Widely distributed noises, such as a large industrial facility spread over many acres, or a street with moving vehicles, would typically attenuate at a lower rate.

REGULATORY FRAMEWORK

FEDERAL

Federal Highway Administration (FHWA)

The FHWA has developed noise abatement criteria that are used for Federally funded roadway projects or projects that require Federal review. These criteria are discussed in detail in Title 23 Part 772 of the Federal Code of Regulations (23CFR772).

Environmental Protection Agency (EPA)

The EPA has identified the relationship between noise levels and human response. The EPA has determined that over a 24-hour period, an L_{eq} of 70 dBA will result in some hearing loss. Interference with activity and annoyance will not occur if exterior levels are maintained at an L_{eq} of 55 dBA and interior levels at or below 45 dBA. Although these levels are relevant for planning and design and useful for informational purposes, they are not land use planning criteria because they do not consider economic cost, technical feasibility, or the needs of the community.

The EPA has set 55 dBA L_{dn} as the basic goal for residential environments. However, other Federal agencies, in consideration of their own program requirements and goals, as well as difficulty of actually achieving a goal of 55 dBA L_{dn} , have generally agreed on the 65 dBA L_{dn} level as being appropriate for residential uses. At 65 dBA L_{dn} activity interference is kept to a minimum, and annoyance levels are still low. It is also a level that can realistically be achieved.

The U.S. Department of Housing and Urban Development (HUD) was established in response to the Urban Development Act of 1965 (Public Law 90-448). HUD was tasked by the Act (Public Law 89-117) “to determine feasible methods of reducing the economic loss and hardships suffered by homeowners as a result of the depreciation in the value of their properties following the construction of airports in the vicinity of their homes.”

HUD first issued formal requirements related specifically to noise in 1971 (HUD Circular 1390.2). These requirements contained standards for exterior noise levels along with policies for approving HUD-supported or assisted housing projects in high noise areas. In general, these requirements established the following three zones:

- 65 dBA L_{dn} or less - an acceptable zone where all projects could be approved.
- Exceeding 65 dBA L_{dn} but not exceeding 75 dBA L_{dn} - a normally unacceptable zone where mitigation measures would be required and each project would have to be individually evaluated for approval or denial. These measures must provide 5 dBA of attenuation above the attenuation provided by standard construction required in a 65 to 70 dBA L_{dn} area and 10 dBA of attenuation in a 70 to 75 dBA L_{dn} area.
- Exceeding 75 dBA L_{dn} - an unacceptable zone in which projects would not, as a rule, be approved.

HUD's regulations do not include interior noise standards. Rather a goal of 45 dBA L_{dn} is set forth and attenuation requirements are geared towards achieving that goal. HUD assumes that using standard construction techniques, any building will provide sufficient attenuation so that if the exterior level is 65 dBA L_{dn} or less, the interior level will be 45 dBA L_{dn} or less. Thus, structural attenuation is assumed at 20 dBA. However, HUD regulations were promulgated solely for residential development requiring government funding and are not related to the operation of schools or churches.

The Federal government regulates occupational noise exposure common in the workplace through the Occupational Health and Safety Administration (OSHA) under the EPA. Noise exposure of this type is dependent on work conditions and is addressed through a facility's or construction contractor's health and safety plan. With the exception of construction workers involved in facility construction, occupational noise is irrelevant to this study and is not addressed further in this document.

STATE

California Department of Transportation (Caltrans)

Caltrans has adopted policy and guidelines relating to traffic noise as outlined in the Traffic Noise Analysis Protocol (Caltrans 1998b). The noise abatement criteria specified in the protocol are the same as those specified by FHWA.

Governor's Office of Planning and Research (OPR)

OPR has developed guidelines for the preparation of general plans. The guidelines include land use compatibility guidelines for noise exposure.

LOCAL

City of Red Bluff General Plan

The Red Bluff General Plan Noise Element establishes goals and policies, as well as criteria for evaluating the compatibility of individual land uses with respect to noise exposure.

Goals

- N-1: Reduce outdoor noise levels in existing residential areas where economically and aesthetically feasible.
- N-2: Ensure that new development conforms to City noise level standards.
- N-3: Locate new noise sensitive land uses away from noise sources unless mitigation measures are included in development plans.
- N-4: Correct or prevent point source noises that have been demonstrated to be annoying to nearby residents.
- N-5: Plan and design new streets or other public facilities to minimize noise in adjacent areas.
- N-6: Follow policies and noise mitigation measures contained in the Airport Land Uses Master Plan adopted by the Tehama County Airport Land Use Commission.

Policies

- N-1: Establish buffer areas between sensitive land uses and noise sources.
- N-2: Establish buffers where necessary to ensure that residential, hospital, retirement care and recreational areas are not particularly subject to excessive noise levels.
- N-3: Require noise mitigation measures when new residences are built in proximity to major transportation.
- N-4: Adopt and implement section III D (page 58) of the Red Bluff Land Development Policies in the Land Use Element to set noise buffering standards within the noise corridors.
- N-5: Require environmental impact reports and/or project initial studies to include a thorough noise analysis for residential projects and all other projects involving other projects involving other sensitive receptors such as schools and health care facilities. All new projects within the noise overlay zones shall also require a project level noise analysis.
- N-6: Encourage and plan for airport development and discourage noise-sensitive activities near the municipal airport.
- N-7: Locate recreational activities that have a potential to cause excessive noise away from noise sensitive land uses.

Implementing Programs for Noise

- N-1: Adopt and enforce an appropriate noise ordinance
- The City of Red Bluff is considering the adoption of a noise ordinance to regulate noise sources located on private property. The ordinance prohibits the generation of noise levels that increase background 15-minute L_{eq} values by more than 5 dBA on adjoining residential property, or by more than 8 dBA on adjoining commercial or industrial property. The ordinance also prohibits noise sources on public property if background 15-minute L_{eq} values are increased by more than 15 dBA at a distance of 25 feet from the noise source. The ordinance contains several exemptions for alarms and warning devices, daytime construction activities, emergencies, public safety activities and related situations. The ordinance also provides a permit procedure to authorize exemptions for special events or situations where it is impractical to comply with ordinance provisions.
- N-2: Utilize the noise corridor overlays as designated in the Land Use Element of the Red Bluff General Plan and delineated on Appendix A of this Noise Element.
- A noise corridor overlay is proposed to be designated for all residential districts through which freeway, state highway or active railway right-of-ways are present. The corridor overlay shall require, at the discretion of the Planning Commission, a noise buffer between the noise source and occupied structures within the proposed development area. Use of the buffer zone maybe required to comply with Title 24 criteria for multifamily dwellings and for the

community noise level standards set forth in this General Plan Noise Element. The criterion for the overlay is as follows:

- A. Buffer Zone Width - The following distances from the edge of the roadway to the nearest occupied structure, without a noise attenuation barrier at the edge of the right-of-way or at the occupied structure property boundary, may be required: Freeway corridor – 450 feet, Railroad Corridor – 600 feet, State highways and urban arterials – 100 feet. These distances can be greatly reduced with the construction of noise barriers as close to the noise source as possible. These standards reflect worst-case predictions of future noise impacts from transportation sources. See Appendix A for a more accurate delineation of noise contours and the requirements of barriers or other mitigations may be modified after analysis by a qualified professional.
- B. Barrier specification - Noise mitigation barriers should be constructed as specified in item 3 below.
- C. Buffer Zone Uses - Vegetation and land contours should be retained whenever possible in the buffer zone. Only accessory structures and fencing are recommended for occupancy of the buffer zones.
- D. Density Transfer - Transfers of residential densities to accommodate noise buffer zones may be permitted in accordance with the character of the development site and by means of the approach given in Section III (B) of the Land Development Policies in the Land Use Element.

N-3: Implement staff and Planning Commission review of potential noise issues in new project location and design features.

- By taking advantage of the natural shape and terrain of a site, it is often possible to arrange buildings and other uses in ways that will reduce or eliminate noise impacts. Site planning techniques include increasing the distance between the noise source and the receiver; placing non-noise sensitive land uses such as parking lots, maintenance facilities, and utility areas between the source and the receiver; using non-noise sensitive structures such as garages to shield noise sensitive area; and orienting buildings to shield outdoor spaces from a noise source.
- In many cases, noise reduction can be attained by careful layout of noise sensitive spaces. Bedrooms, for example, should be placed away from busy roadways. Quiet outdoor spaces can be provided next to a noisy highway by creating a U-shaped development that faces away from the highway.
- Noise barriers or walls are commonly used to reduce noise levels from ground transportation noise sources. Noise barriers serve a dual purpose in that they can reduce both outdoor and indoor noise levels. To be effective, a noise barrier must be large enough to prevent significant noise transmission through it. It also must be high and long enough to shield the receiver from the noise source. A safe minimum surface weight for a noise barrier is 3.5 pounds per square foot of masonry or similar construction. The barrier must be constructed so that there are no creaks or openings in it. To be effective, a barrier must intercept the line of noise between the noise source and the receiver.
- An important and often overlooked consideration in the design of noise barriers is the phenomenon of 'flanking'. This is a term used to describe the manner by which a noise barrier's effectiveness is compromised by noise passing around the end of a barrier. Short barriers, regardless of height, provide little reduction in overall noise level. The effects of flanking can be minimized by blending the wall away from the noise source at the ends of the

barrier.

- If site planning, architectural layout, noise barriers, or a combination of these measures do not achieve the required noise reduction, walls, roofs, ceilings, doors, windows, and other structural features of buildings may need modified.

N-4: Implement staff and Planning Commission analysis of potential noise problems in proposed rezoning and general plan amendments.

- Where land use changes are being considered, it is appropriate to evaluate the potential for one land use to conflict with another through direct generation of noise or through generation of traffic, which may, in turn, generate additional noise. New or revisions of City zoning and land use map designations should include requirement for distance buffers or constructed barriers between incompatible land uses before the proposed land use change is approved. It should not be the City's policy or procedure to approve land use changes that may create noise problems with the expectation that new development applicants will mitigate those problems.

N-5: Incorporate the noise mitigations identified in initial studies and EIRs for new projects as conditions for approval.

- Examples of such mitigations or conditions are:
 - A. Development plans shall include features that will mitigate noise impacts originating from project development that will exceed General Plan Noise Element guidelines.
 - B. Development plans shall include mitigation in the form of shielding or building insulation from offsite noises that exceed General Plan Noise Element Standards on site.
 - C. The owner shall retain a Certified Planner, Acoustical Engineer, or other qualified professional to design noise attenuation features for projects that present special acoustical problems.
 - D. Construction activities shall be limited to daylight hours. Construction equipment shall be in good working condition and shall incorporate abatement measures shown in Figure 10 where deemed feasible by City Staff.
 - E. Acoustical Screening shall be provided around mechanical equipment in a manner approved by City Staff.

N-6: For properties otherwise approved for development within one half mile of the municipal airport, within the Airport Land use Planning Area delineated by the Tehama County Airport Land Use Commission and under the Air Traffic Pattern adopted by the City, a grant of aviation easement shall be required.

- Such agreements should contain perpetual easement and right-of-way for the unobstructed passage of all aircraft in the airspace above the property and the right to cause in all airspace about the surface of the property such noise or other effects that may be caused by the operation of aircraft landing at, or taking off from, or operating at or on the Red Bluff Municipal Airport.

CHART 4.5-1: RED BLUFF GENERAL PLAN NOISE AND LAND USE COMPATIBILITY GUIDELINES

AIRPORT/LAND USE NOISE COMPATIBILITY CRITERIA

LAND USE CATEGORY	CNEL or LDN, DBA (1)				
	50-55	55-60	60-65	65-70	70-75
<u>Residential</u>					
Single-Family Detached & Duplexes	+	0	--	---	---
Multi-Family & Transient Lodging	++	+	0	--	---
Mobile Homes	+	--	--	---	---
<u>Public</u>					
Schools, Libraries, Hospitals & Nursing Homes	+	0	--	--	---
Churches, Auditoriums & Concert Halls	+	0	0	--	---
Transportation, Parking & Cemeteries	++	++	++	+	0
<u>Commercial & Industrial</u>					
Office & Retail Trades	++	+	0	0	--
Commercial/Wholesale Trade Service & Warehousing, Light Industrial	++	++	+	0	0
General Manufacturing, Utilities & Extractive Industry	++	++	++	+	+
<u>Agricultural and Recreational</u>					
Cropland	++	++	++	++	+
Livestock Breeding	++	+	0	0	--
Parks, Playgrounds, Zoos	++	+	+	0	--
Golf Courses, Riding Stables & Water Recreation	++	++	+	0	0
Outdoor Spectator Sports	++	+	+	0	--
Amphitheaters	+	0	-	---	---

(1) See Figure 4 for location of contours.

AIRPORT/LAND USE NOISE COMPATIBILITY CRITERIA

LAND USE ACCEPTABILITY		INTERPRETATION/CONDITIONS
++	Clearly Acceptable	The activities associated with the specified land use can be carried out with essentially no interference from the noise exposure.
+	Normally Acceptable	Noise is a factor to be considered in that slight interference with outdoor activities may occur. Conventional construction methods will eliminate most noise intrusions upon indoor activities.
0	Marginally Acceptable	The indicated noise exposure will cause moderate interference with outdoor activities and with indoor activities when windows are open. The Land Use is acceptable on the conditions that outdoor activities are minimal and construction features, which provide sufficient noise attenuation, are used (e.g., installation of air conditioning so that windows can be kept closed). Under other circumstances, the Land Use should be discouraged.
--	Normally Unacceptable	Noise will create substantial interference with both outdoor and indoor activities. Noise intrusion upon indoor activities can be mitigated by requiring special noise insulation construction. Land uses, which have conventionally constructed structures and/or involve outdoor activities, which would be disrupted by noise should generally be avoided.
-- --	Clearly Unacceptable	Unacceptable noise intrusion upon Land Use activities will occur. Adequate structural noise insulation is not practical under most circumstances. The indicated land use should be avoided unless strong overriding factors prevail and it should be prohibited if outdoor activities are involved.

EXISTING NOISE LEVELS

Traffic Noise Levels

The FHWA Highway Traffic Noise Prediction Model (FHWA-RD 77-108) was used to develop L_{dn} (24-hour average) noise contours for all highways and major roadways in the Planning Area. The model is based upon the CALVENO noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver and the acoustical characteristics of the site. The FHWA Model predicts hourly L_{eq} values for free-flowing traffic

conditions and is generally considered to be accurate within 1.5 dB. To predict L_{dn} values, it is necessary to determine the hourly distribution of traffic for a typical 24-hour period.

Existing traffic volumes were obtained from the traffic modeling performed for the Planning Area. Day/night traffic distributions were based upon continuous hourly noise measurement data and Saxelby Acoustics file data for similar roadways. Caltrans vehicle truck counts were obtained for SRT-4. Using these data sources and the FHWA traffic noise prediction methodology, traffic noise levels were calculated for existing conditions. Table 4.5-2 shows the results of this analysis. The traffic noise modeling results are included in Appendix A.

TABLE 4.5-2: PREDICTED EXISTING TRAFFIC NOISE LEVELS

ROADWAY	SEGMENT	NOISE LEVEL AT CLOSEST RECEPTORS (dB, L_{DN}) ¹	DISTANCES TO TRAFFIC NOISE CONTOURS, L_{DN} (FEET)		
			70 DB	65 DB	60 DB
Baker Rd.	Beegum Rd. to Estel Ln.	64.2	23	48	104
Baker Rd.	Estel Ln. to Walnut St.	61.4	16	35	75
Jackson St.	Walnut St. to Luther Rd.	67.1	22	48	103
Jackson St.	Luther Rd. to Vista Wy.	65.5	20	43	92
Monroe St.	Beegum Rd. to Walnut St.	61.5	11	23	50
Main St. (SR 36)	Beegum Rd. to Adobe Rd.	62.8	30	64	138
Main St. (SR 36)	Adobe Rd. to Union St.	60.8	18	39	85
Main St. (SR 36)	Union St. to Walnut St.	64.8	18	39	83
Main St. (SR 36)	Walnut St. to Oak St.	65.6	20	44	95
Main St.	Oak Ave. to I-5	64.2	27	57	124
Diamond Ave.	S. Main St. to I-5	57.4	8	17	37
Sale Ln.	Antelope Blvd. to Gilmore Ranch Rd.	60.4	12	25	53
Beegum Rd.	Baker Rd. to Main St.	60.7	27	57	123
Adobe Rd.	Main St. to I-5	59.9	20	43	93
Walnut St.	Main St. to Baker Rd.	59.8	11	25	53
Oak St.	Jackson St. to Main St.	63.2	11	23	49
Antelope Blvd. (SR 36)	Main St. to I-5	66.2	44	95	206
Antelope Blvd. (SR 36)	I-5 to SR 99	68.0	55	119	256
SR 99	East of SR 36	67.2	56	120	258
Luther Rd.	Paskenta Rd. to S. Main St.	64.7	18	38	82

NOTES: DISTANCES TO TRAFFIC NOISE CONTOURS ARE MEASURED IN FEET FROM THE CENTERLINES OF THE ROADWAYS.

¹ TRAFFIC NOISE LEVELS ARE PREDICTED AT THE CLOSEST SENSITIVE RECEPTORS OR AT A DISTANCE OF 100 FEET IN COMMERCIAL/RETAIL AREAS.

SOURCE: TJKM, CALTRANS, SAXELBY ACOUSTICS, 2021.

Traffic noise levels are predicted at the sensitive receptors located at the closest typical setback distance along each Planning Area roadway segment. In some locations, sensitive receptors may be located at distances which vary from the assumed calculation distance and may experience shielding from intervening barriers or sound walls. However, the traffic noise analysis is believed to be representative of

the majority of sensitive receptors located closest to the Planning Area roadway segments analyzed in this report.

The actual distances to noise level contours may vary from the distances predicted by the FHWA model due to roadway curvature, grade, shielding from local topography or structures, elevated roadways, or elevated receivers. The distances reported in Table 4.5-2 are generally considered to be conservative estimates of noise exposure along roadways in the City of Red Bluff.

Fixed Noise Sources

The production of noise is a result of many industrial processes, even when the best available noise control technology is applied. Noise exposures within industrial facilities are controlled by Federal and State employee health and safety regulations (OSHA and Cal-OSHA), but exterior noise levels may exceed locally acceptable standards. Commercial, recreational, and public service facility activities can also produce noise which affects adjacent sensitive land uses. These noise sources can be continuous and may contain tonal components which have a potential to annoy individuals who live nearby. In addition, noise generation from fixed noise sources may vary based upon climatic conditions, time of day, and existing ambient noise levels.

In Red Bluff, fixed noise sources typically include parking lots, loading docks, parks, schools, and other commercial/retail use noise sources (HVAC, exhaust fans, etc.)

From a land use planning perspective, fixed-source noise control issues focus upon two goals:

1. To prevent the introduction of new noise-producing uses in noise-sensitive areas, and
2. To prevent encroachment of noise sensitive uses upon existing noise-producing facilities.

The first goal can be achieved by applying noise level performance standards to proposed new noise-producing uses. The second goal can be met by requiring that new noise-sensitive uses in near proximity to noise-producing facilities include mitigation measures that would ensure compliance with noise performance standards.

Fixed noise sources which are typically of concern include but are not limited to the following:

- HVAC Systems
- Pump Stations
- Steam Valves
- Generators
- Air Compressors
- Conveyor Systems
- Pile Drivers
- Drill Rigs
- Welders
- Outdoor Speakers
- Chippers
- Loading Docks
- Cooling Towers/Evaporative Condensers
- Lift Stations
- Steam Turbines
- Fans
- Heavy Equipment
- Transformers
- Grinders
- Gas or Diesel Motors
- Cutting Equipment
- Blowers
- Cutting Equipment
- Amplified Music and Voice

The types of uses which may typically produce the noise sources described above include, but are not limited to: wood processing facilities, pump stations, industrial/agricultural facilities, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car

washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, and special events such as concerts and athletic fields. Typical noise levels associated with various types of stationary noise sources are shown in Table 4.5-3.

TABLE 4.5-3: TYPICAL STATIONARY SOURCE NOISE LEVELS

USE	NOISE LEVEL AT 100 FEET, LEQ 1	DISTANCE TO NOISE CONTOURS, FEET			
		50 DB LEQ (NO SHIELDING)	45 DB LEQ (NO SHIELDING)	50 DB LEQ (WITH 5 DB SHIELDING)	45 DB LEQ (WITH 5 DB SHIELDING)
Auto Body Shop	56 dB	200	355	112	200
Auto Repair (Light)	53 dB	141	251	79	141
Busy Parking Lot	54 dB	158	281	89	158
Cabinet Shop	62 dB	398	708	224	398
Car Wash	63 dB	446	792	251	446
Cooling Tower	69 dB	889	1,581	500	889
Loading Dock	66 dB	596	1,059	335	596
Lumber Yard	68 dB	794	1,413	447	794
Maintenance Yard	68 dB	794	1,413	447	794
Outdoor Music Venue	90 dB	10,000	17,783	5,623	10,000
Paint Booth Exhaust	61 dB	355	631	200	355
School Playground/ Neighborhood Park	54 dB	158	281	89	158
Skate Park	60 dB	316	562	178	316
Truck Circulation	48 dB	84	149	47	84
Vendor Deliveries	58 dB	251	446	141	251

¹ ANALYSIS ASSUMES A SOURCE-RECEIVER DISTANCE OF APPROXIMATELY 100 FEET, NO SHIELDING, AND FLAT TOPOGRAPHY. ACTUAL NOISE LEVELS WILL VARY DEPENDING ON SITE CONDITIONS AND INTENSITY OF THE USE. THIS INFORMATION IS INTENDED AS A GENERAL RULE ONLY, AND IS NOT SUITABLE FOR FINAL SITE-SPECIFIC NOISE STUDIES.

SOURCE: J.C. BRENNAN & ASSOCIATES, INC. 2017

Community Noise Survey

A community noise survey was conducted to document ambient noise levels at various locations throughout the city. Short-term noise measurements were conducted at six locations throughout the city on July 16th and July 21st, 2021. In addition, four continuous 24-hour noise monitoring sites were also conducted to record day-night statistical noise level trends on July 20th, 2021. The data collected included the hourly average (L_{eq}), median (L_{50}), and the maximum level (L_{max}) during the measurement period.

Figure 4.5-1 shows the locations of the noise monitoring sites. Detailed results of noise monitoring can be found in Appendix B.

TABLE 4.5-4: EXISTING CONTINUOUS 24-HOUR AMBIENT NOISE MONITORING RESULTS

SITE	LOCATION	L _{DN} (dBA)	MEASURED HOURLY NOISE LEVELS, DBA LOW-HIGH (AVERAGE)					
			DAYTIME (7:00 AM - 10:00 PM)			NIGHTTIME (10:00 PM - 7:00 AM)		
			L _{EQ}	L ₅₀	L _{MAX}	L _{EQ}	L ₅₀	L _{MAX}
LT-1	Highway 36 East Red Bluff	7/20/2021	73	70	68	85	66	55
LT-2	I-5 at Holiday Inn Express	7/20/2021	73	71	70	81	66	63
LT-3	Union Pacific Railroad	7/20/2021	59	57	46	70	52	43
LT-4	Red Bluff Municipal Airport	7/20/2021	52	50	44	67	44	39

SOURCE: SAXELBY ACOUSTICS, 2019.

TABLE 4.5-5: EXISTING SHORT-TERM COMMUNITY NOISE MONITORING RESULTS

Site	Location	Time ¹	Measured Sound Level, dB			Notes
			L _{eq}	L ₅₀	L _{max}	
ST-1	John R. Trainor Park	7/16/202 1 – 1:43 p.m.	43	40	54	Background noise is traffic, industrial uses, aircraft noise from airfield and helicopter pad. Some semitrucks and service load industries.
ST-2	Luther Road	7/16/202 1 – 2:31 p.m.	66	61	81	Main noise source is from traffic on Luther Road.
ST-3	Red Bluff Elementary School	7/16/202 1 – 2:52 p.m.	70	67	87	Primary noise source is Walnut Street. Elementary school was not in session at the time of the study.
ST-4	Red Bluff High School	7/16/202 1 – 3:12 p.m.	43	43	53	Noise source is wind, as well as some residential and commercial HVAC. Occasional vehicle passby serves as background noise.
ST-5	Dog Island Park	7/21/202 1 – 11:52 a.m.	62	63	69	Primary noise source is traffic on Main Street. Secondary noise source is circulation from the parking lot.
ST-6	Forward Park	7/21/202 1 – 12:21 p.m.	63	42	79	Primary noise source is traffic on Monroe Avenue and circulation in the parking lot. Secondary noise source is park activity.

¹ - ALL COMMUNITY NOISE MEASUREMENT SITES HAVE TEST DURATIONS OF 10:00 MINUTES.

SOURCE: SAXELBY ACOUSTICS, 2021.

Community noise monitoring equipment included Larson Davis Laboratories (LDL) Model 812, 820, and 831 precision integrating sound level meters equipped with LDL ½" microphones. The measurement systems were calibrated using an LDL Model CAL200 acoustical calibrator before and after testing. The

measurement equipment meets all the pertinent requirements of the American National Standards Institute (ANSI) for Type 1 (precision) sound level meters.

The results of the community noise survey shown in Tables 4.5-6 and 4.5-7 indicate that existing transportation noise sources were the major contributor of noise observed during daytime hours, especially during vehicle passbys.

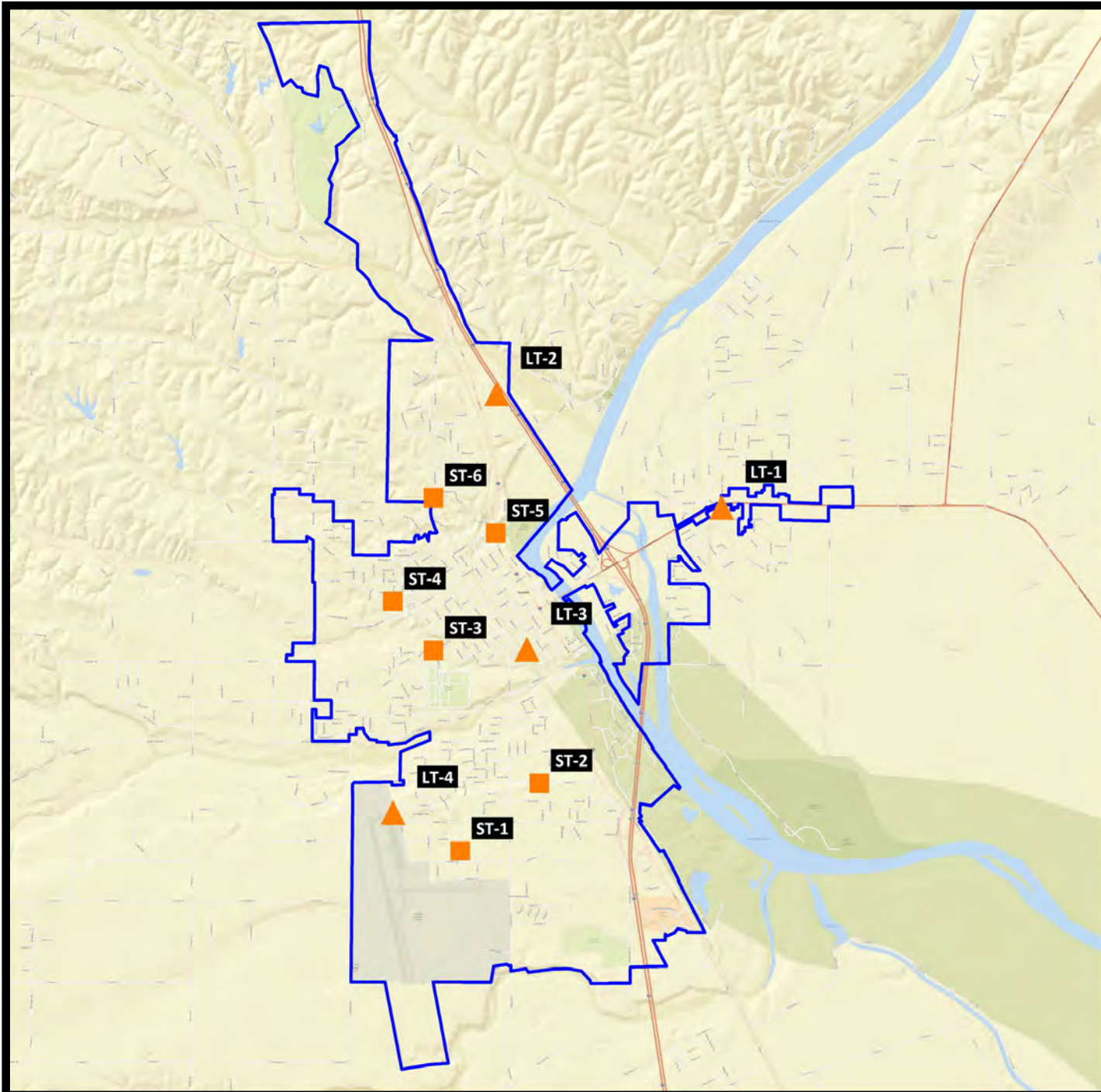
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Red Bluff General Plan Update




City of Red Bluff, California

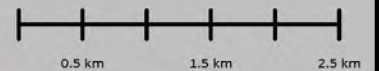
Figure 4.5-1

Noise Measurement Sites



Legend

-  City Limits
-  Noise Measurement Site - Long Term
-  Noise Measurement Site - Short Term



Projection: UTM Zone 10 / WGS84 / meters
Rev. Date: 07/22/2021



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