

Chapter 5. Safety Element

The Safety Element addresses the natural and human-made hazards affecting the City of Chino Hills (City). These include seismic, geologic, flood and inundation, fire, hazardous materials, and climate change hazards. A discussion of Citywide emergency preparedness plan is included within this Element.

A. Purpose of This Element

The State of California requires all cities to include a general plan safety element to identify and, whenever possible, reduce the impact of natural and man-made hazards that may threaten the health, safety, and property of the City.

As required by §65302(g) of the California Government Code, this Safety Element addresses earthquakes and related ground failure hazards; subsidence; flooding; slope hazards; release of hazardous materials; aircraft hazards; wildland and urban fires; emergency planning (including hazard identification and risk assessment, hazard mitigation, and emergency response and action); and fire, police, and medical services. This Safety Element also incorporates climate adaptation strategies to reduce risk to buildings, infrastructure, natural resources, and communities.

B. Connection to Community Vision

The Safety Element supports the City’s vision to protect the community from unreasonable risks caused by natural and human-made hazards. Toward this end, the Safety Element focuses on implementing the following 7 of the City’s 20 Vision Statements. (Numbers in parenthesis reference numerical order of Vision Statements as

presented in the Vision section of this General Plan.)

1. A Chino Hills that supports healthy living. (V-7)
2. A Chino Hills that continues to provide a high level of public services and amenities for families and residents of all ages. (V-12)
3. A Chino Hills that continues to provide for adequate public utilities. (V-13)
4. A Chino Hills that supports regional targets for reductions in greenhouse gas emissions. (V-16)
5. A Chino Hills that endeavors to minimize risks from natural occurring hazards. (V-17)
6. A Chino Hills that endeavors to minimize risks from human-made hazards. (V-18)
7. A Chino Hills that supports environmental justice for all ethnic, racial, and socioeconomic community members. (V-20).

C. Relationship to Other General Plan Elements, Local Plans, and City Ordinances

The Safety Element identifies hazards and hazard abatement provisions to guide local decisions related to zoning, subdivisions, and land use entitlement permits. The natural and human-made hazards and risk reduction strategies addressed in this element are incorporated into related mapping and policy frameworks in the Land Use and Conservation Elements. Relationship to Other Local Regulatory Documents



Several City regulatory mechanisms are used to implement the General Plan Land Use Element on an on-going basis.

1. **Emergency Operations Plan (EOP):** The EOP addresses the City’s planned response to extraordinary emergencies associated with natural, environmental and human-made disasters. The plan does not address normal day-to-day emergencies or the well-established and routine procedures used in coping with such emergencies. Instead, the operational concepts reflected in this plan focus on potential large-scale disasters that can generate unique situations requiring unusual emergency responses.
2. **Hazard Mitigation Plan (HMP):** The City of Chino Hills HMP works in concert with the EOP to proactively identify potential local hazards and human-made disasters; to provide City emergency planners a rationale for prioritizing emergency preparedness actions for specific hazards; and to identify mitigation strategies. Emergencies or disasters may cause: death, leave people injured or displaced, significant damage to our communities, businesses, public infrastructure, and our environment. A disaster could result in tremendous amounts in terms of response and recovery dollars and economic loss.
3. **Storm Drain Master Plan:** The Storm Drain Master Plan identifies current storm drain deficiencies and plans to remedy these deficiencies. To assess deficiencies, the Storm Drain Master Plan divided the City into 12 drainage basins and analyzed each area to determine estimated storm water run-off based on 10, 25 and 100-year storm events. Based on this run-off information, a storm drain system improvement plan is provided that identifies preliminary sizing for future storm drains that will be constructed either by development projects or through the City Capital Improvement Program. Most of the planned storm drain facilities are designed to provide capacity for 100-year events.
4. **Chapter 8.16 of the Municipal Code – California Fire Code Adopted:** The City adopts the State of California Fire Code, currently the 2022 version, which regulates and governs the safeguarding of life and property from fire and explosion hazards, hazardous materials arising from the storage, handling and use of hazardous substances, materials and devices, and from conditions hazardous to life or property in the occupancy of buildings and premises.
5. **Chapter 13.16 of the Municipal Code – Storm Drain System:** The City prohibits all non-permitted discharges to the municipal storm drain system. This prohibition applies to the discharge to municipal storm drains from spills, dumping, or disposal of materials other than storm water. This regulation is intended to reduce pollutants in storm water discharges to the maximum extent practicable and to ensure compliance with National Pollutant Discharge Elimination System (NPDES) permits.
6. **Chapter 15.04 of the Municipal Code – California Building Code:** The City adopts the California Building Code, currently the 2022 Edition, as the building codes of the City for regulating the erection, construction, enlargement, alteration, repair, moving, removal, demolition, conversion, occupancy, equipment, use, height, area, and maintenance of all buildings and/or structures in the City.
7. **Chapter 15.12 of the Municipal Code – Floodplain Damage Prevention and Floodplain Management:** The City adopts floodplain management regulations that require protection against flood damage at the time of construction; restrict alteration of natural floodplains, stream channels, and natural protective barriers; control construction and development activities that may increase flood damage; and control of flood barriers that could unnaturally divert flood waters or increase flood hazards in other areas.



8. **Carbon Canyon Community Wildfire Protection Plan (CWPP):** The Carbon Canyon Fire Safe Council developed the Carbon Canyon Community Wildfire Protection Plan (CWPP) to identify and prioritize areas for hazardous fuel reduction treatments for Carbon Canyon.

D. Safety Element Issues

Numerous safety hazards within the City could affect life and property in future years. Safety hazards can be generally grouped into two categories: naturally occurring and human-made. In many instances, safety hazards are susceptible to natural and human-made risk factors. For example, flooding could occur naturally as a result of intense precipitation over a short duration, causing rivers, natural drainage courses, or flood plains to overflow. Human-made flooding could occur as a result of dam or levee failure, obstruction of and/or development within a natural drainage or flood plain, or fire hydrant damage from an automobile accident.

In accordance with Government Code Section 65302 (as amended by SB 379), The City prepared a Climate Change Vulnerability Assessment (CCVA) to identify the risks climate change poses to the City. The CCVA is included as an appendix to the Safety Element, Appendix 5-1, and is available on the City's website at the following link (X). To comply with Government Code Section 65302(g), the Safety Element includes a residential emergency evacuation route analysis, included in Appendix 5-1, and is available on the City's website at the following link (X).

The following section discusses the potential hazards that shape the Chino Hills Safety Plan and the goals, policies, and actions of this Safety Element.

1. Geologic Conditions

The City is located in the eastern Puente Hills, in the northern portion of the Peninsular Ranges geomorphic province. The Peninsular Ranges province is characterized by a series of northwest to southeast-oriented valleys, hills, and mountains separated by faults associated with and parallel to the San Andreas Fault System. Two of these faults, the Chino Fault and the Whittier Fault, are located in and near the City, respectively. These faults, and the bedrock and sediment types that occur in the Chino Hills area, control to a large extent the potential geologic impacts that could occur in the City.

The hilly portions of the City are underlain primarily by bedrock of the Puente Formation. This bedrock formation was deposited between 6 million and 11 million years ago during a period when the area was submerged under the ocean.

Approximately 2 to 3 million years ago, the continent began to rise and the ocean dropped, while a complex process of faulting and folding caused the uplift of the Puente Hills area and the City of Chino Hills. The bedrock materials of the Puente Formation have been folded and faulted within the Puente Hills such that bedding inclinations now range from gentle to steeply dipping (i.e., 10 to 70 degrees) with numerous folds of varying scales and axis orientations. In its entirety, the Puente Formation is estimated to be approximately 13,000 feet thick within the Chino Hills area.

The Puente Formation is divided into three members within the City: the Sycamore Canyon member, the Yorba member, and the Soquel member.¹ The Sycamore Canyon member of the Puente Formation, the youngest member, generally consists of thickly bedded sandstone and pebbly conglomerate with lesser amounts of siltstone and siliceous siltstone. The Yorba member generally consists of predominantly thinly bedded siltstone, sandy siltstone, and siliceous siltstone, with scattered to rare

¹ Morton and Miller, 2006.



claystone beds. The Soquel member, the oldest member of the formation, generally consists of well-bedded graded sandstone with interbedded siltstone.

The Topanga Formation is exposed within the southeastern portion of the City, adjacent to the Horseshoe Bend area of the Santa Ana River, within Chino Hills State Park. The Topanga Formation was deposited about 15 million years ago, and generally consists of massively bedded sandstone and conglomerate with interbeds of siltstone and minor claystone. In addition to outcropping in the southeastern portions of the City, the Topanga Formation generally underlies the Puente Formation in the Chino Hills area.

The Safety Element updates policies intended to reduce risks from seismic and geologic hazards.

2. Seismic Hazards

Earthquakes occur when planes of weakness, called faults, in the earth's crust move past one another. Southern California is located on a boundary of two tectonic plates, the North American Plate and the Pacific Plate, causing the area to be considered seismically active. Numerous faults considered active or potentially active have been mapped in Southern California, including in the vicinity of and within the City. Earthquakes on faults can trigger several geologic phenomena that can cause severe property damage and loss of life. These hazards include ground shaking, fault rupture, liquefaction and associated hazards, subsidence, and seiches (waves in enclosed bodies of water). Earthquakes can also cause a variety of localized, but not less destructive, hazards such as urban fires, dam failures, and release of toxic chemicals. The City could be impacted by any or all of these hazards.

Earthquakes are normally classified by the severity of their magnitude or their seismic intensity. "Magnitude" is defined as a measure of the amount of energy released when a fault ruptures. The intensity of seismic ground shaking

at any given site is a function of several factors, but primarily the magnitude of the earthquake, the distance from the epicenter to the area of concern, the type of geologic material between the epicenter and the site, and the topographic conditions of the site. The amount of damage is also controlled to a certain extent by the size, shape, age, and engineering characteristics of the affected structures. Most buildings in the City are of wood-frame construction, which while not immune to structural damage, is notably resilient to earthquake shaking, particularly when designed per current Building Codes.

The location of active and potentially active earthquake faults within or proximate to Chino Hills is illustrated in Figure 5-1 Active and Potentially Active Faults Affecting Chino Hills (page 5-6). The geologic and seismologic characteristics of these faults are discussed below.

a. Chino Fault

The Chino Fault is considered a northern splay of the Elsinore Fault Zone.²³ The Chino Fault extends approximately 21 kilometers southeast through the City toward the City of Corona where it joins the Elsinore Fault Zone near the southern terminus of Main Street in Corona. Available geologic mapping, paleoseismic studies, and oil well data indicate that the Chino Fault trends northwest to southeast and dips approximately 50 to 70 degrees toward the southwest. The sense of fault displacement along the Chino Fault is predominantly right-lateral, strike-slip; however, some early geologic mapping and recent paleoseismic studies suggest a reverse sense of movement at some locations.

Several recent geologic studies of the Chino Fault have revealed Holocene fault displacement (i.e., during the last 11,000 years). The California Geological Survey re-evaluated the Chino Fault in 2002 as a result of these recent findings and has zoned the Chino Fault as "active" pursuant to the guidelines of the Alquist-Priolo Earthquake Fault

² Treiman, 2002.



Zone Act. Two historic earthquakes are attributed to the Chino Fault: the February 16, 1989 magnitude 3.2 strike-slip earthquake that occurred at a depth of approximately 4.3 kilometers and the December 14, 2001 magnitude 3.9 strike-slip earthquake that occurred at a depth of approximately 13.8 kilometers.

b. Elsinore Fault Zone

The Elsinore Fault extends approximately 200 kilometers from near the border with Mexico to its northern terminus near Whittier Narrows, Figure 5-1 Active and Potentially Active Faults Affecting Chino Hills (page 5-6). The Uniform California Earthquake Rupture Forecast (UCERF2) and the Working Group on California Earthquake Probability (WGCEP 95) identify five fault segments within the Elsinore Fault Zone –Whittier, Glen Ivy, Temecula, Julian, and Coyote Mountains segments, from north to south. The Whittier segment exhibits a reverse, right-lateral oblique sense of movement, while the Glen Ivy, Temecula, Julian, and Coyote Mountains segments exhibit a right-lateral, strike-slip sense of movement.

c. San Jose Fault

The San Jose Fault is located north of the City and extends approximately 20 kilometers from the south side of the San Jose Hills northeast to near Claremont, Figure 5-1 Active and Potentially Active Faults Affecting Chino Hills (page 5-6). Available data suggests that the fault dips steeply to the north with a reverse sense of fault displacement (i.e., north side up). The California Department of Water Resources indicates that the San Jose Fault is well defined based on the presence of a groundwater barrier, and suggests that the San Jose Fault offsets “older alluvium” approximately 100 meters in the subsurface.

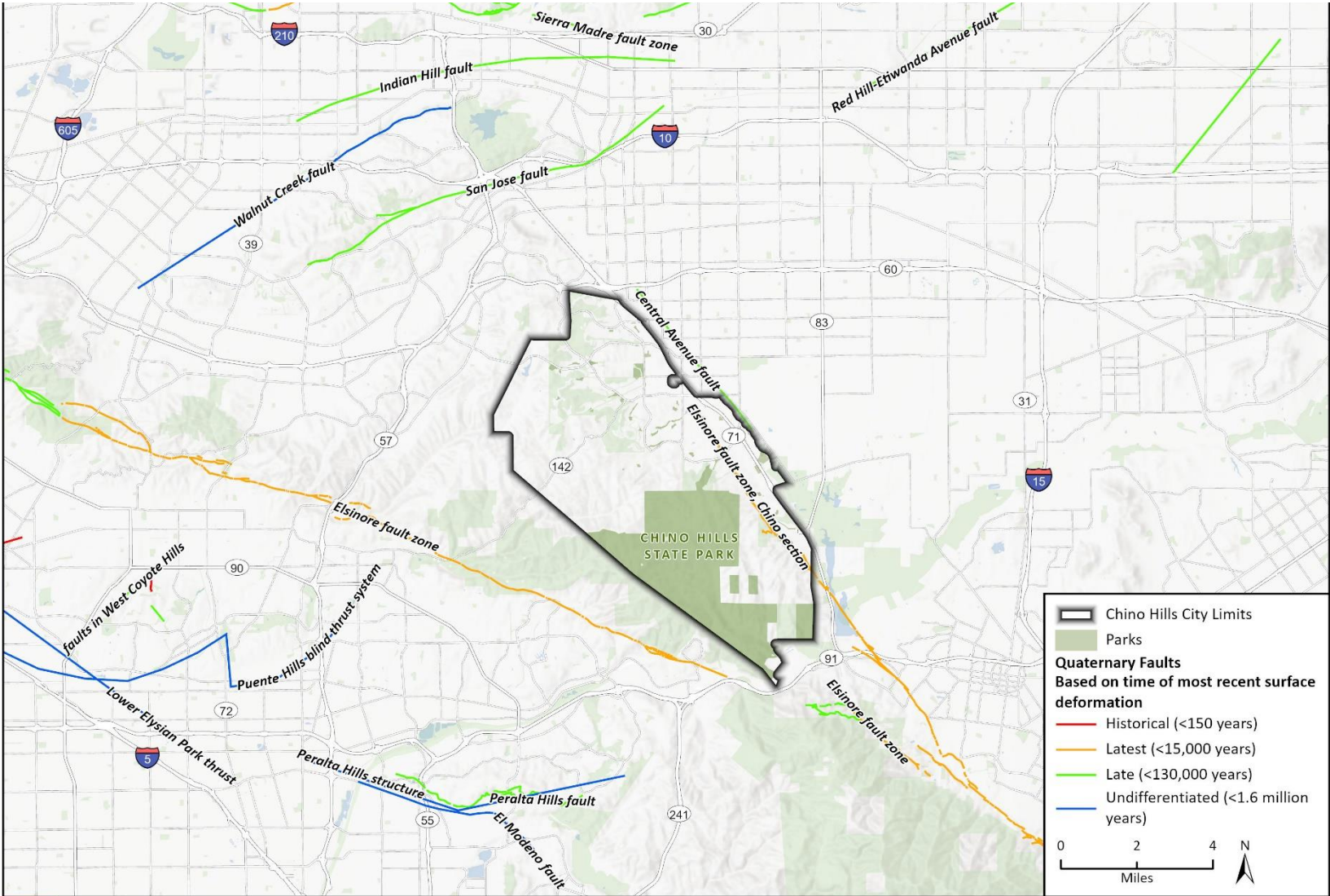
d. Puente Hills Blind Thrust

The Puente Hills Blind Thrust is a north-dipping thrust that extends approximately 40 kilometers east across the Los Angeles basin from downtown Los Angeles to Brea. A blind thrust fault is a

buried fault, the surface of which does not break the surface. The fault is manifested at the surface by series of folds above the fault surface including the Montebello Hills and west and east Coyote Hills. The fault is subdivided into three segments: Los Angeles, Santa Fe Springs, and Coyote Hills. At least four large earthquakes (i.e., magnitude 7.2 to 7.5) are believed to have occurred on the fault in the past 11,000 years. The 1987 Whittier Narrows earthquake occurred on the Puente Hills Blind Thrust.

e. Sierra Madre-Cucamonga Fault Zone

The Sierra Madre-Cucamonga Fault Zone is located along the boundary between the southern margin of the San Gabriel Mountains and the northern portions of the San Fernando and San Gabriel valleys, as shown in Figure 5-1 Active and Potentially Active Faults Affecting Chino Hills (page 5-6). The Sierra Madre-Cucamonga Fault Zone extends approximately 95 kilometers from near Interstate 405 in the San Fernando Valley to Lytle Creek. The Sierra Madre-Cucamonga Fault Zone is a major reverse fault in southern California. Historic fault rupture occurred along approximately 19 kilometers of the western portions of the Sierra Madre-Cucamonga Fault Zone between about Big Tujunga Canyon and Dunsmore Canyon during the February 9, 1971 (magnitude 6.4) San Fernando Earthquake.



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 Additional data provided by City of Chino Hills, 2024; NHD, 2024; CPAD, 2024; USGS, 2020.

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 Fig X Faults

Figure 5-1 - Active and Potentially Active Faults Affecting Chino Hills



f. San Jacinto Fault Zone

The San Jacinto Fault Zone is located east of the City and is one of the most seismically active faults in California. The fault zone extends approximately 250 kilometers from the area near Cajon Pass where the San Jacinto fault joins the San Andreas fault south to the Imperial Valley. This fault has a right-lateral, strike-slip sense of movement. The San Jacinto fault zone is divided into eight segments based on fault geometry, historical seismicity, and slip rate data. The segments of the San Jacinto Fault Zone are San Bernardino Valley, San Jacinto Valley, Anza/Clark, Coyote Creek, Borrego Mountain, and the sub-parallel Superstition Mountain and Superstition Hills segments.

g. San Andreas Fault Zone

The San Andreas Fault extends southeast from where the fault joins the Kings Range Thrust and Mendocino Fault Zone approximately 1,300 kilometers to the Gulf of California. The San Andreas Fault is one of the most active faults and has the highest measured slip rate in California. The San Andreas Fault is the only known source of Magnitude 8 earthquakes in southern California. The predominant sense of movement along the San Andreas Fault is right-lateral, strike-slip. The San Andreas Fault has been subdivided into the northern and southern sections. In southern California, the fault zone has been divided into 10 segments: Parkfield (PK), Cholame (CH), Carrizo (CC), Big Bend (BB), Mojave north (NM), Mojave south (SM), San Bernardino north (NSB), San Bernardino south (SSB), San Geronio-Garnet Hill (BG), and Coachella (CO). Only the southern nine fault segments from the Cholame segment south have a significant influence on seismic hazards in the City.

h. Ground Shaking

The active and potentially active faults discussed above are capable of generating moderate to strong ground motions during earthquakes. Moderate to strong ground motions could result

in damage to buildings and civil works within the City.

Earthquake shaking is likely the seismic hazard with the greatest potential risk to loss of life and/or property within the City. The loss of life and/or property can be reduced by designing projects in accordance with the most recent versions of building codes and standards like the California Building Code (CBC) and the American Society of Civil Engineers Standard (ASCE) No.7.

Although a great deal is known about where earthquakes are likely to occur, there is currently no reliable way to predict when an earthquake will occur in any specific location. Scientists study the past frequency of large earthquakes in order to determine the future likelihood of similar large earthquakes. Based on the number of historic earthquakes and known active faults in the vicinity of the City, ground shaking will affect the City again in the future. The eastern portion of the City is underlain by alluvial sediments that may be saturated. These sediments would likely be subject to ground amplification (ground shaking is typically less severe on rock than on alluvium) in the event of an earthquake occurring on one of the major active faults in the vicinity of the City, including the Elsinore, Chino, Puente Hills, San Jacinto, San Andreas, or Cucamonga faults.

The historic record of moderate to strong earthquakes in southern California extends back to the Mission era. There have been approximately 10 historic earthquakes with magnitudes greater than approximately 5 that have resulted in moderate to strong damaging earthquake ground motions in the vicinity of the City. These historical earthquakes include:

- 1812 Wrightwood Earthquake
- 1857 Fort Tejon Earthquake
- 1899 Cajon Pass Earthquake
- 1987 Whittier Narrows Earthquake
- 1988 and 1990 Upland Earthquakes
- 1991 Sierra Madre Earthquake
- 1992 Landers and Big Bear Earthquakes



- 1994 Northridge Earthquake
- 1999 Hector Mine Earthquake
- July 29, 2008 Unnamed Earthquake

i. Surface Fault Rupture

The potential for surface fault rupture in the City exists along the Chino Fault, which extends along the City's western boundary. Although the Chino Fault has not ruptured within historic time, geologic studies reveal the fault has experienced surface fault rupture within the Holocene period (i.e., approximately the last 11,000 years).

The California Geological Survey (CGS) established an Alquist–Priolo Earthquake Fault Zone around the Chino Fault on May 1, 2003. A generalized map illustrating the Chino Fault and the Alquist–Priolo Earthquake Fault Zone is presented on Figure 5–2 – Seismic Hazards Earthquake Rupture (page 5–10). The Alquist–Priolo Earthquake Fault Zone map for the Chino Fault is only intended to serve as a guide in determining the general location of earthquake fault zones and is not suitable for local planning and site selection. It should be noted that the CGS frequently updates the Alquist–Priolo Earthquake Fault Zone maps, and that Alquist–Priolo zones in the City should be verified as part of local planning efforts.

j. Liquefaction

Liquefaction is a soil strength and stiffness loss phenomenon that typically occurs in loose, saturated, cohesionless soils as a result of strong ground shaking during earthquakes. The potential for liquefaction at a site is usually determined based on the results of a subsurface geotechnical investigation and the groundwater conditions beneath the site. Hazards to buildings associated with liquefaction include bearing capacity failure, lateral spreading, and differential settlement of soils below foundations, which can contribute to structural damage or collapse.

The California State Legislature passed the Seismic Hazards Mapping Act (SHMA) in 1990 (*California Public Resources Code*, Division 2, Chapter 7.8) as a result of earthquake damage

caused by the 1987 Whittier Narrows earthquake and the 1989 Loma Prieta earthquake. The purpose of the SHMA is to protect public safety from the effects of strong ground shaking, liquefaction, landslides, or other ground failure, and other hazards caused by earthquakes. The site is not mapped within a seismic hazard zone based on review of currently published maps available on the CGS website. However, review of the CGS website indicates that seismic hazard zone mapping of the City of Chino Hills is planned in the future.

Portions of the City may be underlain by loose, saturated alluvial materials subject to liquefaction. Areas considered most susceptible to liquefaction include the low-lying areas in the eastern portion of the City within the Chino Basin and canyon areas in Chino and eastern Puente Hills, as shown on Figure 5–3 – Liquefaction Susceptibility Seismically-Induced Landslide Hazard Zones (page 5–11) delineated by the California Department of Conservation (2021), and Figure 5–4 – Canyons in the City of Chino Hills (page 5–12). Development of sites within these hazard zones should include site-specific liquefaction studies as part of a geotechnical engineering investigation.

1. Geologic Hazards

Surficial sediments overlie bedrock in the lower portions of the City, particularly within canyons and at the eastern base of the Chino Hills. These sediments include very old alluvial soils to recent alluvial soils, slopewash and channel deposits, as well as landslide deposits. These sediments have been deposited over the past 2 million years as ancient stream channels have eroded the Chino Hills to their current topographic expression. Generally, the older surficial deposits are semi-consolidated, and consist of sands and silts with some clay. Younger surficial deposits may consist of coarser materials and are generally unconsolidated. Landslide deposits are generally made up of the source materials that failed, such as bedrock or weak surficial soils on slopes. Areas in the City susceptible to landslides are shown in Figure 5–3 – Liquefaction Susceptibility



Seismically-Induced Landslide Hazard Zones (page 5-11).

a. Earthquake-Induced Landsliding

Earthquake-generated strong ground motions can worsen existing unstable slope conditions. Typical earthquake-induced landslides in the terrain of the Chino Hills area could include rotational slumps, rock falls, shallow slumps, and slides commonly associated with moderate to steep road cuts and natural slopes. If the slope materials become saturated, strong ground motions could also trigger mudslides and mudflows. Properly designed and constructed engineered slopes will generally perform well during an earthquake.

b. Storm-Induced Landsliding and Erosion

Heavy rainfall often triggers surficial sliding (debris flows and mudflows) along the sides of canyons and on steep slopes. Hill slopes composed of Puente Formation blanketed with topsoil and colluvium are more susceptible to erosion if not properly planted. Extreme precipitation events are expected to occur more frequently and more intensely as a result of climate change, which will increase the risk of landslides. Landslide events are also anticipated to occur more often and with greater magnitude due to extreme weather events.

The current California Building Code (2023) provides guidelines that may reduce the potential for erosion of cut and fill slopes, including appropriate plantings, slope maintenance, and construction of erosion control devices. Older hillside areas of the City developed prior to implementation of the current CBC may not have benefited from such protection, and consequently could experience a greater likelihood of storm damage.

Natural canyons and other hillside undeveloped areas may be susceptible to storm-induced landsliding and erosion. Downslope developments or those that may be impacted by

these events should be designed with appropriate erosion control and/or debris catchment devices in order to minimize damage to developments.

c. Subsidence from Groundwater Withdrawal

Ground subsidence resulting from groundwater extraction has been documented at several locations in California, including Chino-Riverside, Bunker Hill-Yucaipa, and Temecula. Subsidence in these regions has typically occurred over broad areas where groundwater levels have declined as much as 150 feet over a period of decades. Ground subsidence generally occurs where deep alluvial valleys exist. Alluvium-filled canyons in the Chino Hills area generally contain less than 200 feet of alluvium overlying consolidated bedrock of the Puente Formation. Therefore, future subsidence due to groundwater withdrawal is not anticipated to occur in the City of Chino.

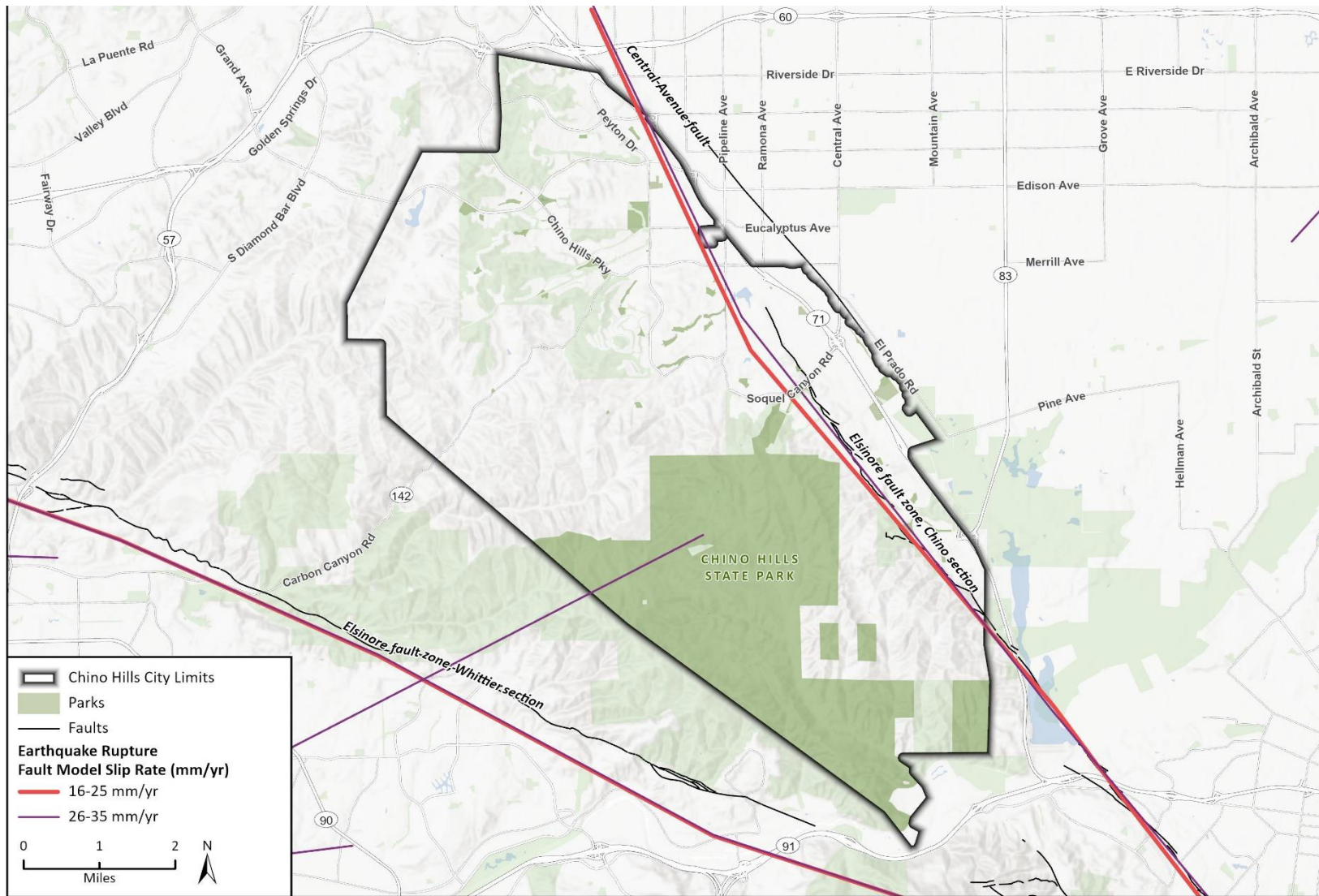
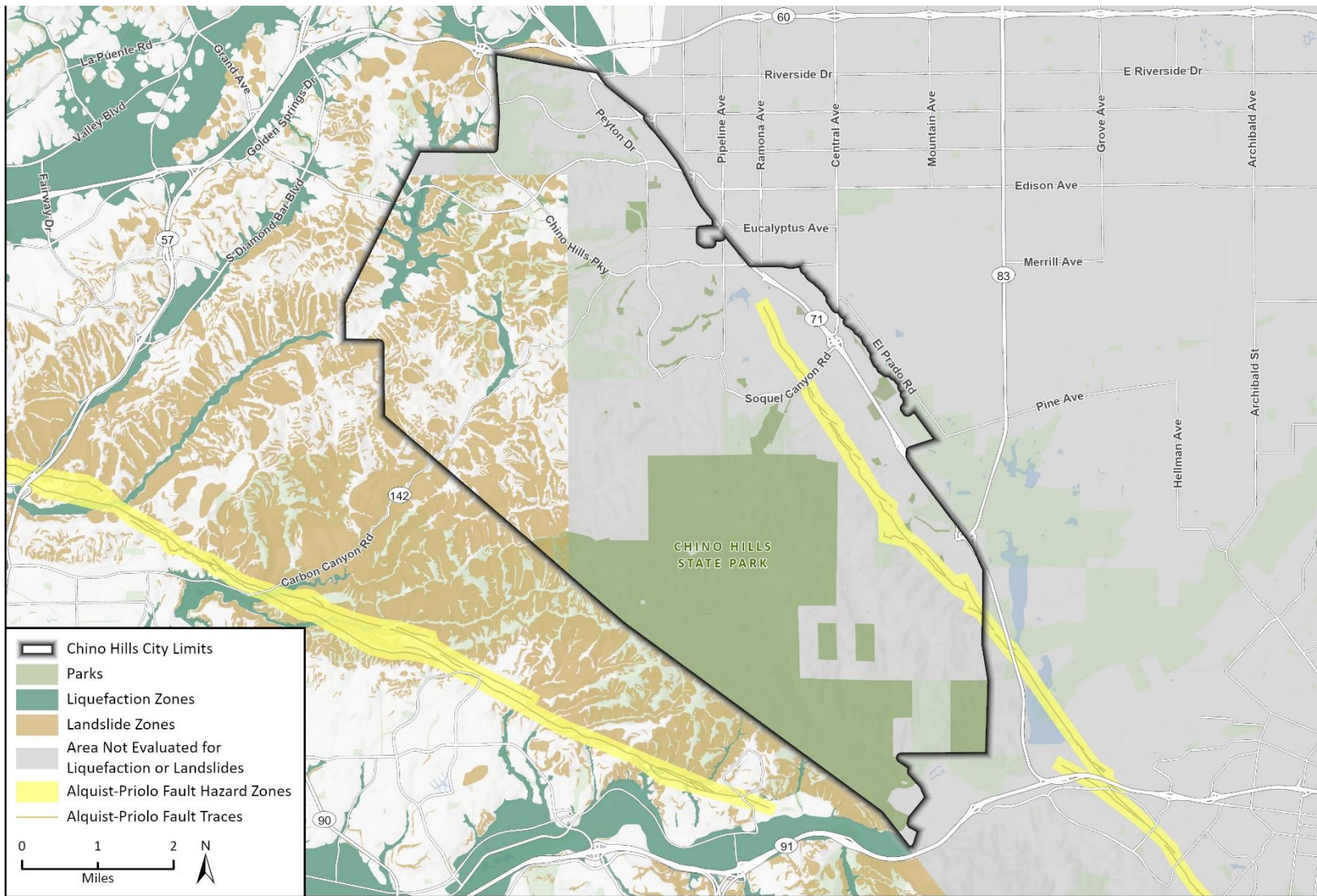


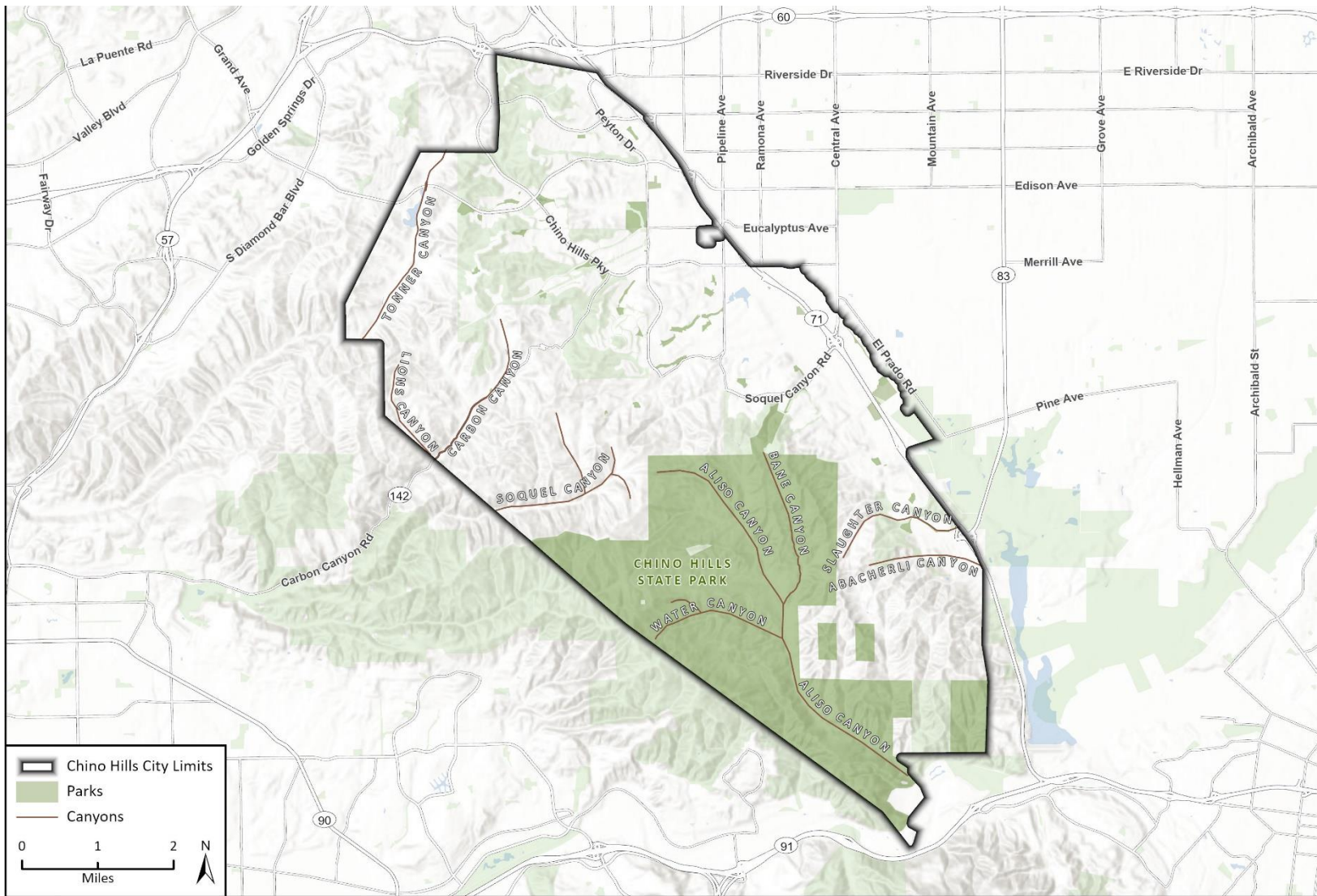
Figure 5-2 – Seismic Hazards Earthquake Rupture



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 Additional data provided by City of Chino Hills, 2024; NHD, 2024; CPAD, 2024; CGS, 2017.

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 Fig X Seismic Hazards

Figure 5-3 – Liquefaction Susceptibility Seismically-Induced Landslide Hazard Zones



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 Additional data provided by City of Chino Hills, 2024; NHD, 2024; CPAD, 2024.

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 Fig X Canyons

Figure 5-4- Canyons in the City of Chino Hills



d. Collapsible and Expansive Soil

Soils can collapse or expand for a variety of reasons, including the type of soil or presence of water. Low-density soils such as recently deposited river sediments can settle if subjected to the heavy loads associated with building foundations. These soils may also settle if compacted during an earthquake when water is extruded from the soil as a result of strong ground shaking, and the particles are compressed together.

Granular soils, such as sands and gravel held together by clay or another water-soluble binder, can compact or densify if the clay is washed away by infiltrating water. This process is called “hydro-compaction.” The change in volume that results when soils densify can cause extensive damage to building foundations, infrastructure (such as roads and bridges) and utilities.

The sandy alluvial deposits located within the major drainages traversing the City may be susceptible to consolidation and hydro-compaction. Bedrock of the Puente Formation generally has a low settlement potential.

Soil settlement can also occur in the eastern side of the City in the area where clay was previously mined. If the open pits left behind from the clay mining operation are backfilled with fill soils that are not compacted under the supervision of a geotechnical engineer, settlement could occur.

Expansive soils are soils with a significant amount of montmorillonitic clay, a mineral that has the ability to shrink and swell as the water content changes. When changes in the environment result in a change in the moisture content of these clays, the soils change volume. Changes in volume of these soils can be brought on by seasonal changes in rainfall or changes in irrigation. Vegetation, especially large trees planted near a foundation, can also cause significant changes in soil volume as the trees withdraw water from the surrounding soil. Poor drainage around a structure can also result in localized swelling. The change in soil volume

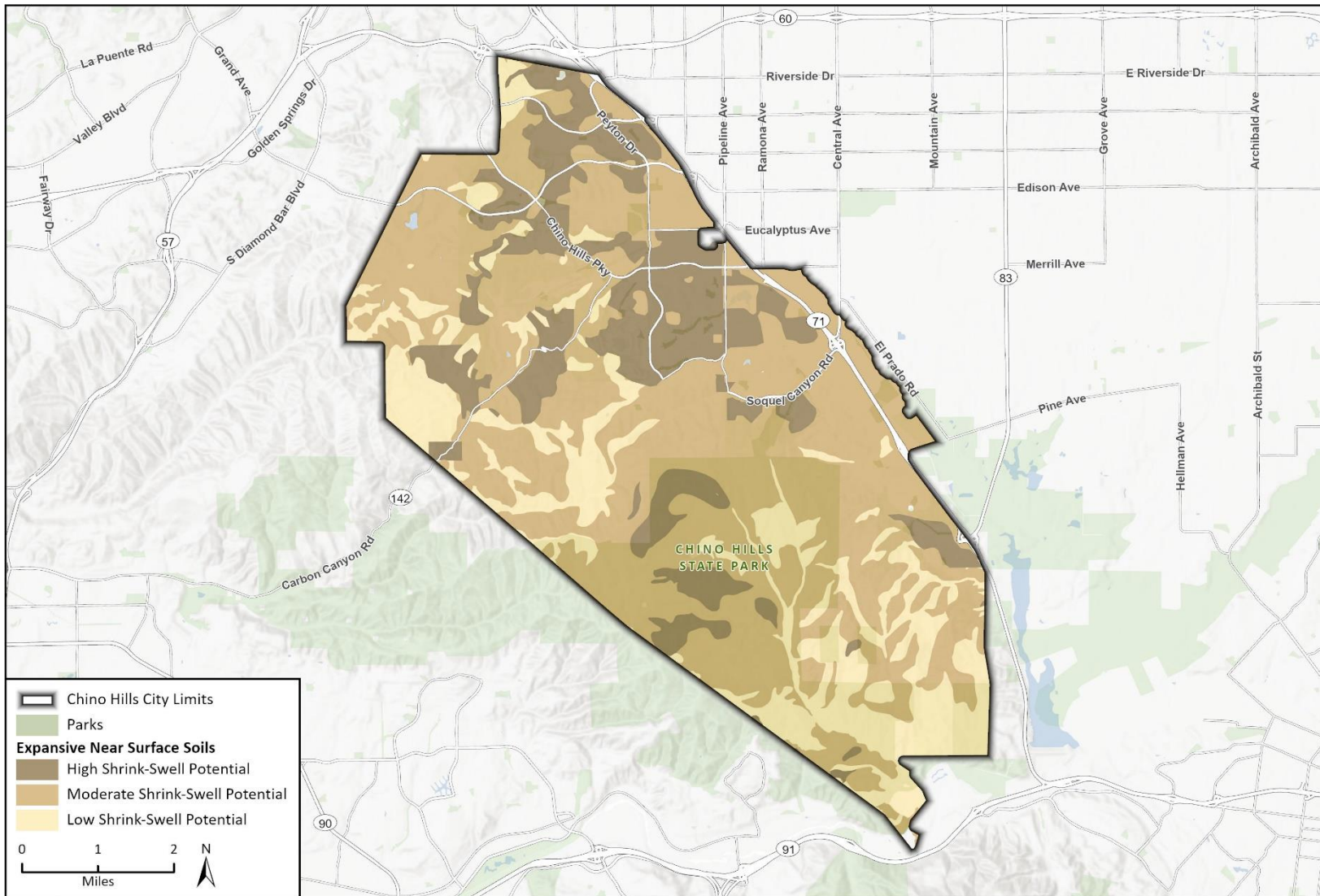
brought about by these processes can cause extensive damage to structures built over these soils. Differential expansion or settlement along the edges of a building foundation can also cause extensive structural damage. In the United States, expansive soils cause more damage in dollars to highways, streets, and buildings than other natural disasters such as earthquakes, floods, and tornadoes combined.

Most surface soils in the City have a moderate to low shrink-swell potential. However, some soils formed in place from weathering of clay-rich units of the Puente Formation have a high shrink-swell potential. The distribution of these surface soils in the City is shown on Figure 5-5 – Expansive Soils (page 5-14). The Puente Formation locally contains layers of volcanic ash that weather to highly expansive clays. These ash layers could be exposed during grading.

e. Reactive Soils

Reactive or corrosive soils have chemical properties that can disintegrate or corrode metal pipes and concrete. Corrosive soils include soils with low (less than 3) or high (greater than 9) pH values and low resistivity, and soils rich in sulfates. Soils with high concentrations of sodium, magnesium, or calcium sulfate can react chemically with the hydrated lime in cement and disintegrate permeable concretes that have a high water-to-cement ratio. Geotechnical engineers routinely conduct sulfate analyses of soils as part of geotechnical investigations. The impact of sulfate-rich soils on concrete can be mitigated by using special cement mixes that include additives to reduce the permeability of the concrete and by paying careful attention to the mix design, quality control, and curing of the concrete.

Soils in the Chino Hills area generally are potentially corrosive to ferrous metals and severely corrosive to concrete. The City currently requires a soils analysis for corrosion prior to installation of water lines, sewer mains, or storm drains. Special design and materials must be used where corrosive soils exist.



Basemap provided by Esri and its licensors © 2024.
 Additional data provided by City of Chino Hills, 2024; NHD, 2024; CPAD, 2024.
 Expansive Soils are approximate and were georeferenced and digitized.

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 Fig X Expansive Soils

Figure 5-5 - Expansive Soils



2. Flood and Inundation Hazards

California Government Code §65302(g) requires local governments to assess the potential impact that failure of a dam or other water retention structure may pose to the community. The Safety Element must also assess the impact of flooding from storm activity, such as 1% annual chance and 0.2% annual chance floods. Due to climate change, more frequent and more extreme rain events may cause localized flooding that can damage property and hinder emergency response activities, such as evacuation and fire department access to fire hydrants.

a. Storm Flooding

Most rainfall in the City area occurs in the winter months between December and March. Runoff from the City generally drains east and south, toward Chino Creek and Prado Flood Control Basin, and on to the Santa Ana River Basin. Canyons on the west side of the City, including Tonner Canyon, Carbon Canyon, Soquel Canyon, and Aliso Canyon drain westward toward Los Angeles and Orange Counties. With the exception of Tonner Canyon, which drains into the San Gabriel River watershed, the remaining canyons drain into the lower reaches of the Santa Ana River Basin. All the canyons in the City are prone to seasonal flooding.

Localized flooding has occurred historically in the Chino Hills area, generally when drainage facilities are too small to convey the storm flows generated from increased urbanization and paved surfaces in the area. In addition, storm drainage systems are usually not designed to manage the volume of stormwater generated during extreme precipitation events. These events are anticipated to occur more frequently due to climate change, which will overwhelm storm drainage systems in lower lying areas of the city, resulting in localized flooding.

Severe erosion along many natural channels, and debris-clogged drainages, compound the problem. Localized flooding has been known to occur in some areas of the City, notably the lowlands bounded by Pipeline, Eucalyptus and

Merrill Avenues and the Chino Creek Channel, also the section of Peyton Road between Eucalyptus Avenue and Carbon Canyon Road. Sheet flooding has occurred in the Los Serranos area north of the golf course and along portions of English Road.

Portions of the City have been mapped by the Federal Emergency Management Agency (FEMA) as part of the National Flood Insurance program. FEMA relies on historical data to calculate flood frequencies and flood extent. Climate change is expected to increase rates of precipitation and the frequency of extreme precipitation events, which could result in more frequent and severe riverine flooding that could impact properties within flood zones as well as emergency services, power, wastewater, and storm drainage infrastructure, exacerbating public health concerns. The Flood Insurance Rate Maps (FIRMs) show that most of the areas mapped were designated Zone X and Zone D. Zone X covers areas of minimal flooding. Zone D is identified as an area where flood hazards are undetermined but possible. Areas on both sides of Carbon Canyon Creek and Little Chino Creek have been classified into Zones A, AE and X. Zone A is an area with a 1% annual chance of flooding. Those portions of Zone A where the base flood elevations have been determined are classified as Zone AE. Zone X is defined as an area with an annual chance of flooding of between 1% and 0.2%; areas subject to a 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from the 1% annual chance flood. The basic flood Zones A, D and X mapped in the City of Chino Hills area are shown on Figure 5-6- Flooding and Inundation Zones (page 5-17) and Figure 5-7- FEMA Flood Map (page 5-18).

b. Private Drainage

Many of the soils in the Chino Hills area have a high erosion potential. Erosion is not only unsightly but can destabilize adjacent slopes. Channeling drainage away from slopes to maintained storm drains minimizes erosion potential on graded slopes.

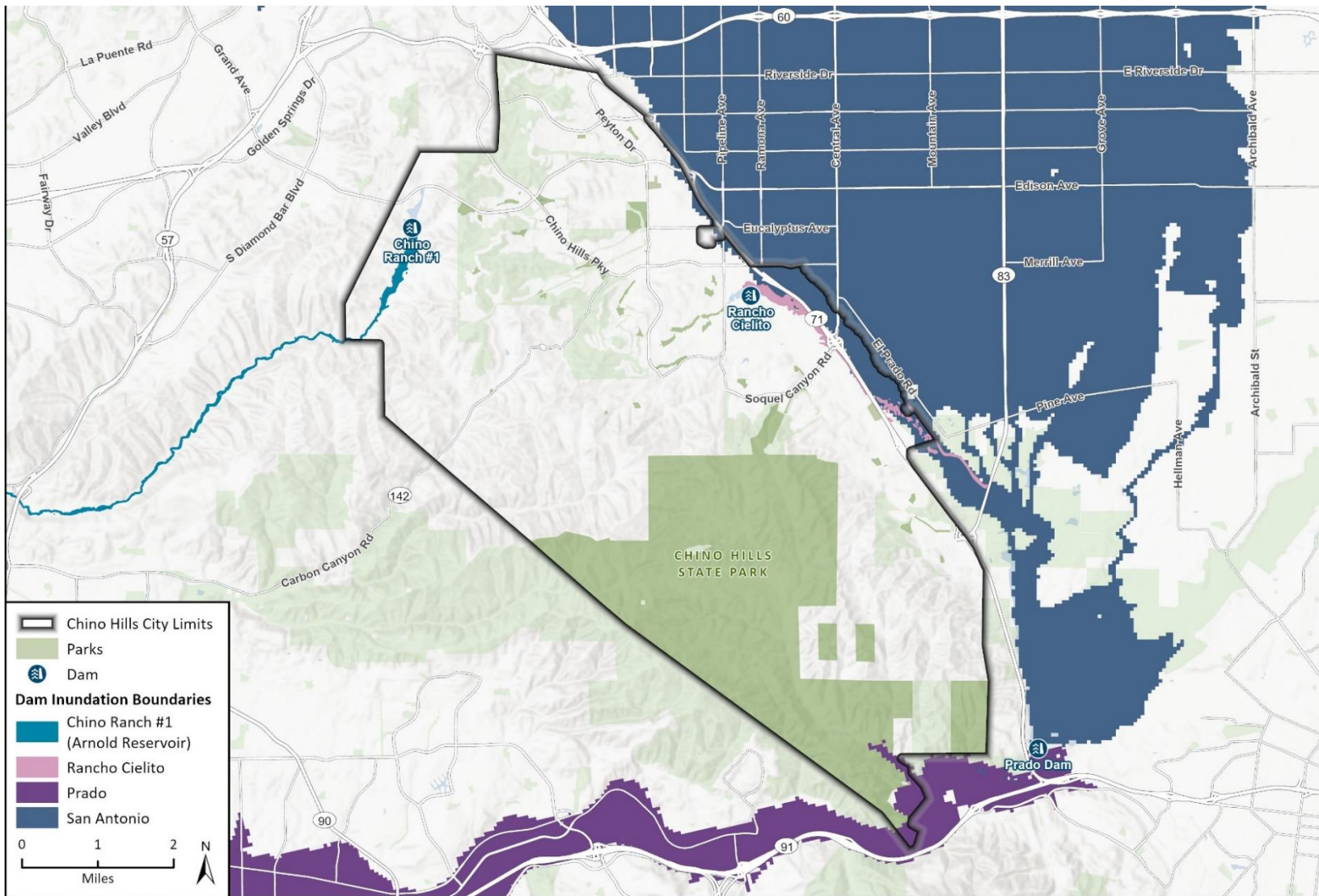


On private property, the individual property owners are often responsible for inspection of their down drains and removal of debris. Removal of debris on a regular basis prevents private drain systems from clogging or overflowing, which could channel water and mud downslope with the potential for damage to adjacent properties and structures.

Residential drainages often connect into the larger storm drain system, which empties into natural drainages such as canyon areas. Paved concrete channels or flood velocity reduction structures are sometimes necessary in natural drainages to prevent erosion caused by channeled runoff.

c. Erosion-Induced Flooding

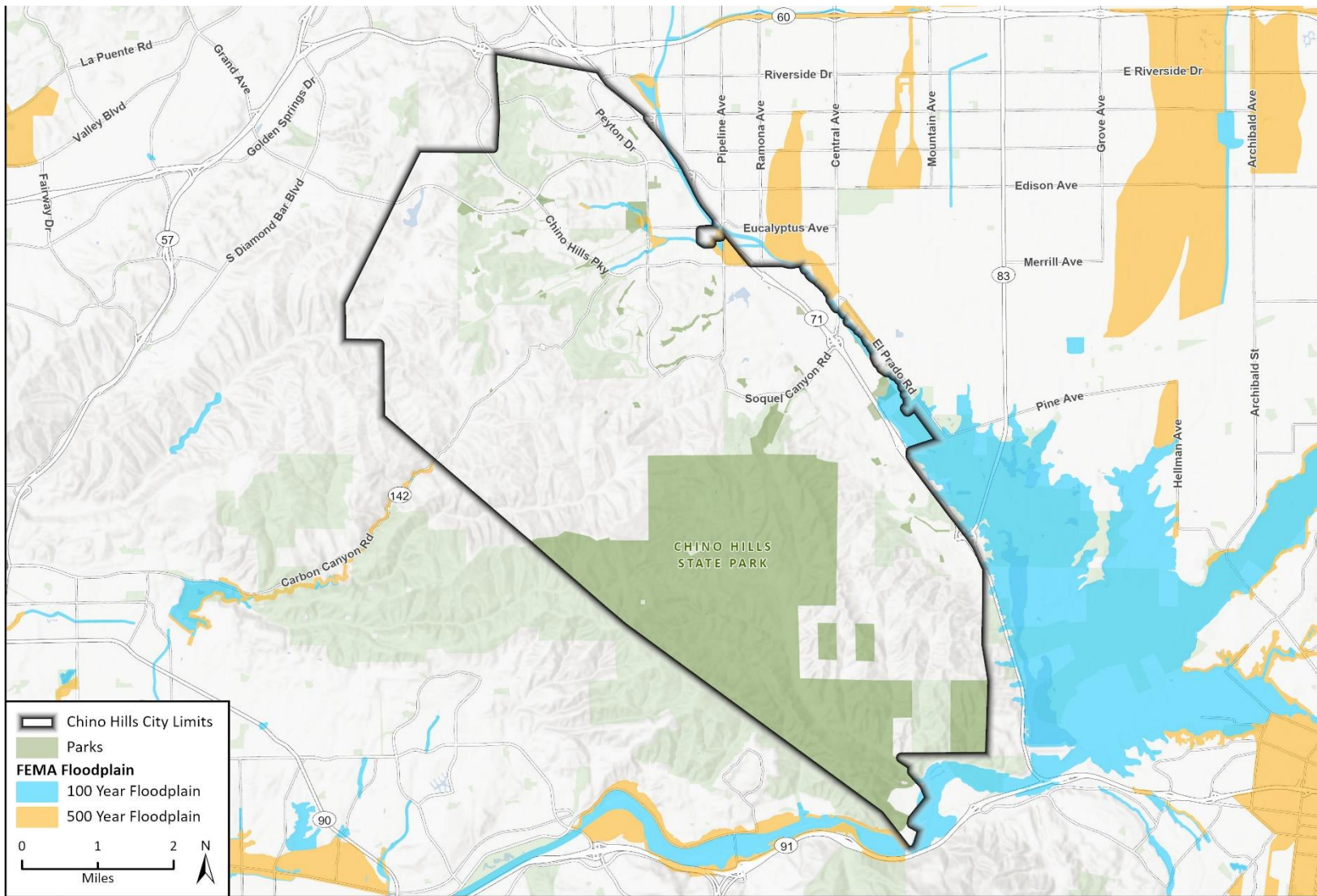
Significant hillside erosion can also occur following a wildland fire or extreme precipitation event. The city is likely to experience more frequent and larger loads of debris flow as a result of climate change. In October 2020, the Blue Ridge Fire burned close to 14,000 acres, mostly within the City of Chino Hills and Chino Hills State Park. Debris-laden floods emanating from recently burned slopes during rainstorms can result in large amounts of sediment deposited in the channels draining the area. To mitigate this hazard, runoff from unimproved areas should be controlled and channeled to adequate drainage facilities. Erosion on slopes can be minimized by covering them with drought-resistant vegetation. Other erosion control measures that can be used to control slope erosion include riprap, gabions and concrete lining. Locating structures in the flow path of hillside gullies or swales should be prohibited unless adequate drainage and debris protection is designed into the project.



Basemap provided by Esri and its licensors © 2024.
 Additional data provided by City of Chino Hills, 2024; NHD, 2024; CPAD, 2024; DWR, DSOD, 2023.

24-15594 EPS LHMP Update
 Fig X Dams and Dam Inundation

Figure 5-6- Flooding and Inundation Zones



Basemap provided by Esri and its licensors © 2024.
 Additional data provided by City of Chino Hills, 2024; NHD, 2024; CPAD, 2024; FEMA, 2021.

24-15594 EPS Safety Element
 Fig X FEMA Flood Hazards

Figure 5-7- FEMA Flood Map



Erosion on slopes can be minimized by covering them with drought-resistant vegetation. Other erosion control measures that can be used to control slope erosion include riprap, gabions, and concrete lining. Locating structures in the flow path of hillside gullies or swales should be prohibited unless adequate drainage and debris protection is designed into the project.

d. Seismically Induced Inundation

Seismically induced inundation refers to flooding as a result of water retention structures failing during an earthquake. There are two reservoirs within the City limits, Arnold Reservoir (Chino Ranch No. 1 Dam) and Los Serranos Lake, and two reservoirs adjacent to or upstream from the City that could fail during an earthquake and impact the City. In addition, culverts, levees, stock ponds, and other flood control structures may crack and suffer some structural damage during an earthquake, especially in areas susceptible to ground failure. These facilities could pose an inundation hazard if they contain water at the time of the seismic event, or if they are not repaired soon after an earthquake and prior to the next rain season.

e. Dam Inundation

California Government Code requires reservoir owners to develop and maintain an emergency plan to be implemented in the event that the dam is catastrophically breached. Each dam-specific emergency plan includes a map showing the potential limits of the flood that would result in the event of dam failure while the reservoir is at full capacity. These flooding maps show worst-case scenarios since most reservoirs and flood control structures in southern California are rarely filled to capacity. However, more frequent and severe extreme precipitation events resulting from climate change could increase the risk of dam failure. These events could result in dam overtopping or damage dam infrastructure, leading to dam failure. Reservoir owners are

required to regularly inspect their dams for safety under supervision from the Department of Water Resources, Division of Safety of Dams (DSOD). The possibility of inundation in the event of a catastrophic dam failure is therefore remote but may become more likely to occur due to climate change.

San Antonio Dam is located about 10 miles north of the City in San Antonio Canyon in the San Gabriel Mountains. If this dam failed while filled to capacity, the lowlands of the City could be impacted by flooding. A small portion of the City along the southeastern border would also be flooded if Prado Dam, located in the southeast of the City, failed catastrophically while full.

Within the City, there are two small dams : Los Serranos Lake (also known as Rancho Cielito Reservoir) and Chino Ranch No. 1 Dam that could cause localized flooding if damaged. These reservoirs are described below.

- Los Serranos Lake (or Rancho Cielito Reservoir) is an earthen dam located in the Los Serranos area. The dam was reportedly built between 1880 and 1901, although the Department of Water Resources lists it as having been completed in 1912. The 9-foot-high dam is owned by Rolling Ridge Ranch and was reportedly built to store well water for agricultural purposes. The reservoir has a capacity of 110 acre-feet (1 acre-foot is a measure of volume equal to 1 acre of land covered with water to a depth of 1 foot) and a dam crest elevation of 644.6 feet above Mean Sea Level (MSL).⁴ Water in the reservoir is generally kept to within 3 feet of the dam crest. In the past, the stored water has been used to irrigate the golf course at the Los Serranos Country Club. The dam is inspected yearly by the DSOD. At present, an inundation map has not

⁴ Department of Water Resources, 2010.



been prepared for this reservoir. In the event of a breach of the dam, the area down-gradient from the dam with an elevation below about 642 feet MSL could be inundated. Inundation waters would probably flow east to southeast toward the Chino Valley Freeway, where water would pond behind the freeway and flow southward to the closest storm drain. Ultimately, floodwaters would flow into Chino Creek and the Prado Dam Flood Control Basin. Inundation depths are predicted to be less than five feet.

- Arnold Reservoir is located behind the Chino Ranch No. 1 dam. This dam is located in Tonner Canyon, in the north-west corner of the City. The 22-foot-high dam was completed in 1918 with a crest elevation of 959.5 feet MSL and a storage capacity of 137 acre-feet. The dam is owned by the res Hermanos Conservation Authority (Authority), a joint powers agency with representatives from the cities of Chino Hills, Diamond Bar, and Industry, and the stored water is used for livestock. In the event of dam failure, portions of Tonner Canyon that are currently undeveloped would be inundated to depths of up to 10 feet.

f. Seiches

Seismically induced flooding can occur as a result of seiches. Strong ground motion generated by an earthquake may trigger standing wave oscillation, or seiches, in enclosed or semi-enclosed bodies of water, such as lakes or reservoirs. If these seiches generate large enough amplitude, water may overflow the body of water, causing localized flooding of adjacent or downslope areas. Seiches could occur within the two reservoirs within the

City, or in other enclosed bodies of water, such as swimming pools. In addition, small private reservoirs or ponds used for livestock water, wildlife management, and natural habitat preservation may be located within Chino Hills in the State Park or other ranching areas. These enclosed bodies of water may be susceptible to seiches, with resultant localized flooding.

g. Tank Reservoirs

There are currently 16 water tanks in the City used to store water for domestic purposes. These tanks vary in storage capacity between 0.25 and 5.0 million gallons. Five of these tanks are located within the Alquist-Priolo Special Studies Zone of the Chino Fault. If a moderate to strong earthquake were to occur on the Chino Fault or other nearby fault, these tanks could be damaged releasing the stored water and flooding adjacent developments downslope. Strong ground motions generated by earthquakes can cause water inside the tank to slosh back and forth with great force. Historically this has been known to lift water tanks off their foundations, causing the stored water to drain out of the tank in a matter of minutes and flood the downslope area.

Above-ground storage tanks should be adequately attached to the foundation and baffled to reduce the incidence of earthquake-induced structural damage. Water tanks should remain operational after an earthquake, as the stored water may be necessary to suppress earthquake-induced fires in the City. Residents may have to depend on the water stored in these tanks if the City water supply system is damaged.

3. Peakload Water Supply Requirement

The City of Chino Hills Urban Water Management Plan 2020⁵ (UWMP) provides a framework for long term water supply planning, including an assessment of current and projected peakload water demand. According to the UWMP, for year

⁵

https://www.chinohills.org/DocumentCenter/View/24021/UWMP_final-2; accessed February 23, 2023.



2021, total water demand in the City was 16,166 acre feet (ac/ft) and supplies were 29,526 ac/ft.

To assess the future reliability of the City water supply, the UWMP calculated future peakload requirements. For year 2045, City water demand will be 17,725 ac/ft and supply will be 33,684 ac/ft in a normal year. In a 5th consecutive dry year, demand would drop to 17,709 ac/ft, but supply would stay consistent at 33,684 ac/ft. As presented in the UWMP, the City has planned for adequate water supplies for existing and future demands. As a result of climate change, the City is likely to experience longer periods of drought which will impact the City’s water supply. Prolonged drought will disproportionately impact low-income households, as they are more likely to experience cost burden associated with increased water rates. Drought conditions can lead to water scarcity and individuals may need to rely on poor quality water supplies. In addition, all emergency services, and in particular firefighting, require adequate water supply for fire suppression. Longer periods of drought may cause service strain for emergency and medical services.

4. Fire Hazards

Fire hazards in the City include wildland, urban, and earthquake-related fire potential. A wildland fire is a “fire occurring in a suburban or rural area that contains uncultivated lands, timber, range, watershed, brush, or grasslands.”⁶ An urban fire is a fire that occurs in developed areas that may include structures and vehicles. An earthquake-induced fire is a widespread fire following an earthquake. The Safety Element updates policies intended to reduce risks from fire hazards.

a. Wildland Fires

Open space and canyon areas in the City are covered with chaparral, coastal sage scrub, deciduous woodlands, and grasslands. Introduced vegetation includes landscaping plants and

agricultural species. The chaparral and coastal sage plant communities are highly combustible due to volatile oils contained in the plant tissues.

Wildfires in the City pose a high threat to natural resources, structures, and human safety. The high risk posed by fires is due to the combined effects of:

- Climate (dry summers with drought and Santa Ana wind conditions);
- Steep, rugged terrain (limiting accessibility to fire-fighting vehicles and personnel);
- Vegetation (highly combustible chaparral and similar plant communities that contain high concentrations of volatile oils);
- Development patterns (wildland and urban areas intermixed in the foothills and near canyon bottoms where development is located adjacent to highly flammable vegetation.

Approximately 75% of Chino Hills is located within the City’s designated Fire Hazard District. (Figure 5-10 – City of Chino Hills Fire Hazard Overlay District, see page 5-26) Lands within the district include Chino Hills State Park, the Tres Hermanos area, the Carbon Canyon area, and the southern portion of the City generally west of Butterfield Ranch Road and south of Soquel Canyon Drive.

According to the California Department of Forestry and Fire Protection (CAL FIRE) 2018 Strategic Fire Plan for California, “since the turn of the century there has been a steep increase in structures lost compared to the 1990s.”⁷ This increase is due, in part to increasing housing and development, but more notably, to earth’s changing climate, with increasing temperatures and shifting wind and water patterns.

⁶ State of California General Plan Guidelines, Governor’s Office of Planning and Research, 2017.

⁷ Fire Hazard Planning Technical Advisory, Governor’s Office of Planning and Research, 2022.



To reduce wildfire risk, the City adopted a Fire Hazard Overlay District, and has established and enforces policies that are carried over in the Safety Element Goals, Policies, and Actions section (beginning on page 5–44) of this Safety Element. The Fire Hazard Overlay District covers a larger area of the city compared to the Very High Fire Hazard Severity Zones designated by CAL FIRE. The Very High Fire Hazard Severity Zones in the Local Responsibility Area (LRA) map for Chino Hills were adopted in 2008. CAL FIRE is currently in the process of updating the LRA maps. The updated LRA maps will include Moderate, High, and Very High Fire Hazard Severity Zones, whereas the current LRA maps show only Very High Fire Hazard Severity Zones.

b. Severity Zones.

CAL FIRE maintains maps of Fire Hazard Severity Zones (FHSZs) to assist with state and local planning for wildland fire protection. In State Responsibility Areas (SRAs), where the State of California is financially responsible for the prevention and suppression of wildfires, CAL FIRE identifies Moderate, High, and Very High Fire Hazard Severity Zones. In LRAs not under CAL FIRE’s jurisdiction, fire protection is provided by the local fire protection agency. The Chino Valley Fire District (CVFD) is the local fire protection agency responsible for fire protection in LRAs in Chino Hills.

Currently only Very High Fire Hazard Severity Zones (VHFHSZ) are identified in LRAs. The western and central portions of Chino Hills fall within the VHFHSZ (Figure 5–8). Within SRAs and LRAs outside of Chino Hills, VHFHSZs are located along the entire western boundary and most of the southeastern city boundaries, including portions of Chino Hills State Park, the eastern portion of Yorba Linda, Gypsum Canyon, and areas north and west of Corona Municipal Airport.

There are several critical facilities located within the VHFHSZ in Chino Hills. Critical facilities are those that provide essential products and services to the public, are necessary to preserve the welfare and quality of life in the city, or fulfill

important public safety, emergency response, and/or disaster recovery functions.

Historically, wildfires in or near Chino Hills have impacted areas within Chino Hills State Park, within the western portion of the city and west and south of the city boundaries, Figure 5–9 – Historic Fire Perimeters (page 5–25). The recorded wildfires in and near Chino Hills span from 1947 to 2024, as shown in Table 5–1 – Historic Fires In and Near Chino Hills (page 5–22).

Table 5-1 – Historic Fires In and Near Chino Hills

Wildfire Name	Year	Acres
Arnold No. 106 Fire	1947	1,907
Firestone Fire	1967	236
Serranos Fire	1973	304
Soquel Fire	1978	3,935
Los Serranos Fire	1979	172
Carbon Fire	1980	6,955
Owl Fire	1980	18,333
Hills Fire	1983	581
State Park Fire	1988	821
Carbon Canyon Fire	1990	4,978
Yorba Fire	1990	7,884
Evening Fire	2002	893
Yorba Linda Fire	2005	1,097
Freeway Fire	2008	30,307
Blue Ridge Fire	2020	13,695

Source: City of Chino Hills, 2024; NHD, 2024; CPAD, 2024, CAL FIRE FRAP, 2023

In addition to the Safety Element, there are several local plans that evaluate wildfire risk, outline mitigation to minimize wildfire risk, and allocate resources in the event of a wildfire.

The City of Chino Hills HMP was developed in accordance with the Disaster Mitigation Act of 2000 (DMA 2000) and followed FEMA’s Local Hazard Mitigation Plan guidance. The City of Chino Hills HMP 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, consistent with FEMA’s guidelines. The implementation of these mitigation actions, include both short and long-term strategies, involve planning, policy changes, programs, projects, and other activities. The current City of Chino Hills HMP is posted on the City’s website



and can be found at the following link:

<https://www.chinohills.org/1242/Local-Hazard-Mitigation-Plan-LHMP>.

The Carbon Canyon CWPP identifies wildfire risk in Carbon Canyon and recommends strategies to reduce fuel load and wildland ignitability. The CWPP identifies Carbon Canyon Road, two existing mobile home parks, existing institutional and industrial uses within Carbon Canyon, and existing vegetation as sources of ignition and fuel. The Plan recommends vegetation management projects, community education programs, and home hardening and building retrofits that will reduce wildfire risk within Carbon Canyon. The Carbon Canyon CWPP is available on the Carbon Canyon Fire Safe Council website

<https://www.carboncanyonfsc.org/cwpp.html>).

To address high fire risk in the Carbon Canyon area, the City will implement Policy S-8.2 through Policy S-8.3 and the associated actions.

c. Urban Fires

Urban fires are often caused by human activities, such as faulty electrical wiring, improper storage or handling of hazardous materials, industrial accidents, or the careless handling of matches or other fire-producing items.

To reduce the risk of urban fire, the City has adopted the California Fire Code, which regulates and governs the safeguarding of life and property from fire and explosion hazards, from hazardous materials arising from the storage, handling and use of hazardous substances, materials and devices, and from conditions hazardous to life or property in the occupancy of buildings and premises. The California Fire Code requires fire and life safety protection in the form of fire sprinklers for all new residential homes and the installation of smoke alarms. In addition to the requirements of the California Fire Code, the CVFD has amended fire sprinkler requirements for commercial and industrial properties, to require the installation of said systems in all new buildings 5,000 square feet or larger.

d. Earthquake-Induced Fires

With the numerous faults in and around the City, there is a risk of earthquake-induced fire in the community. These types of fires typically start in urban areas, where an earthquake causes a gas line to break, an electrical power line to be downed, or an open flame to catch fire. At the same time, an earthquake can cause damage to the water distribution and emergency communication systems, making fire suppression difficult.

Commonly affected are unanchored gas heaters or gas-fired hot water heaters, which tend to tip over and damage rigid gas line connections during strong ground shaking. Given the residential setting of Chino Hills, damaged gas line connections, overturned appliances, and damaged electrical circuitry will be the most likely causes of earthquake-induced fires in the City.

To reduce the risk of earthquake-induced fires, the City adopts the California Fire Code, which includes numerous regulations to reduce fire risks. These regulations include installation of earthquake-resistant water pumps and the clearing of vegetation under power lines. In addition, the City EOP describes the City's planned response to earthquakes, earthquake-induced fires, and other emergencies.

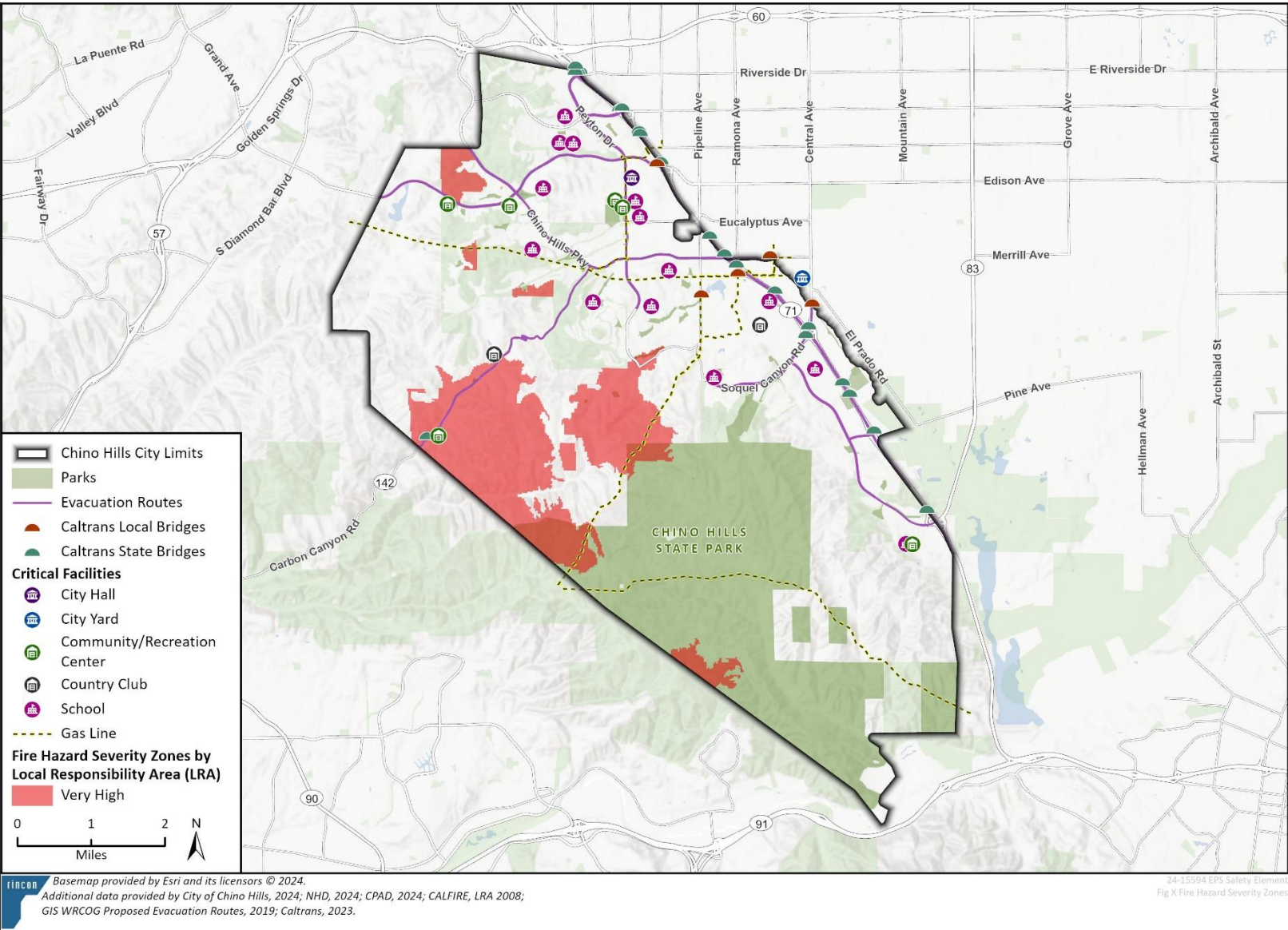


Figure 5-8 - CAL FIRE Fire Hazard Severity Zones and Critical Facilities

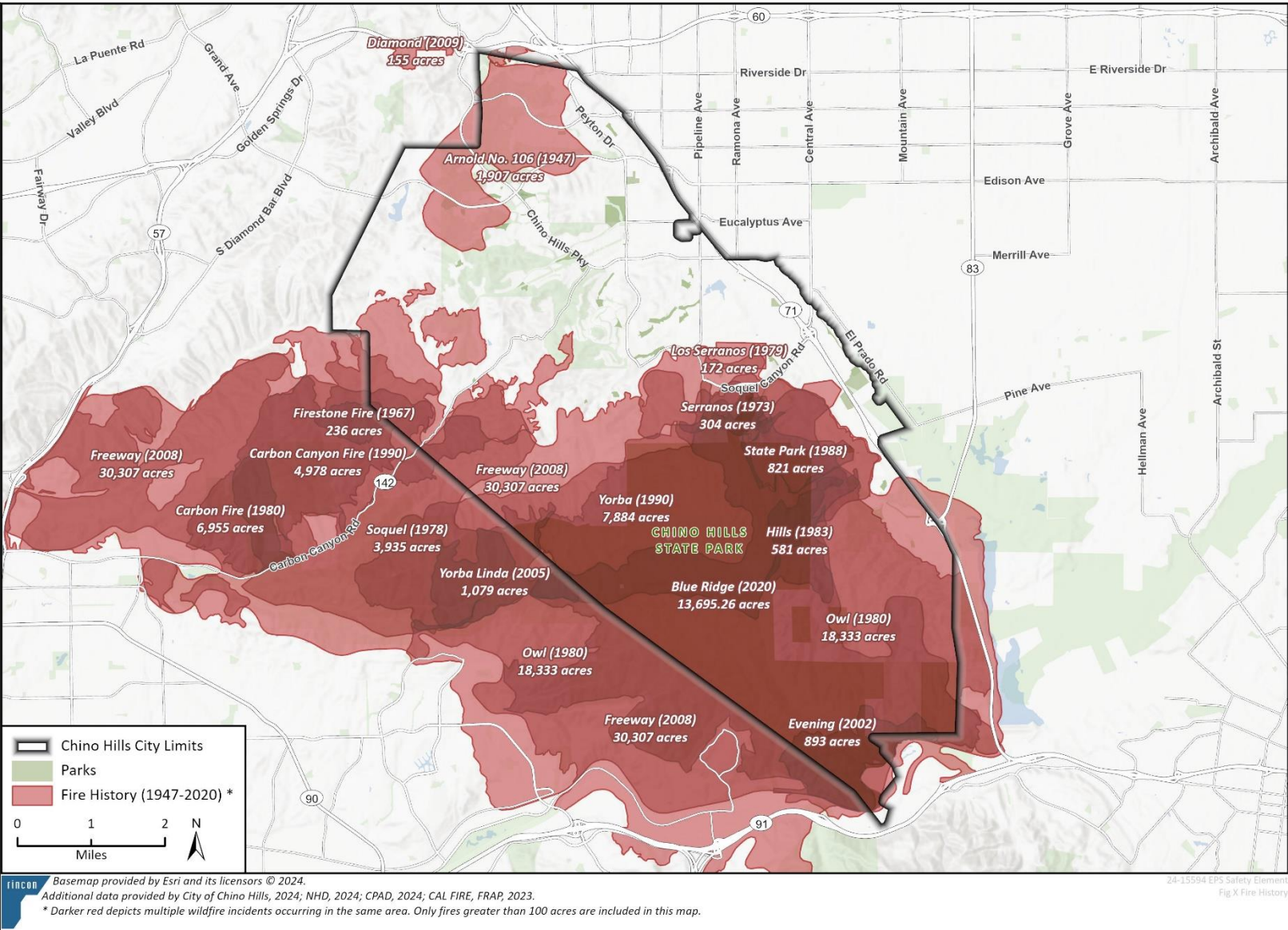


Figure 5-9 - Historic Fire Perimeters

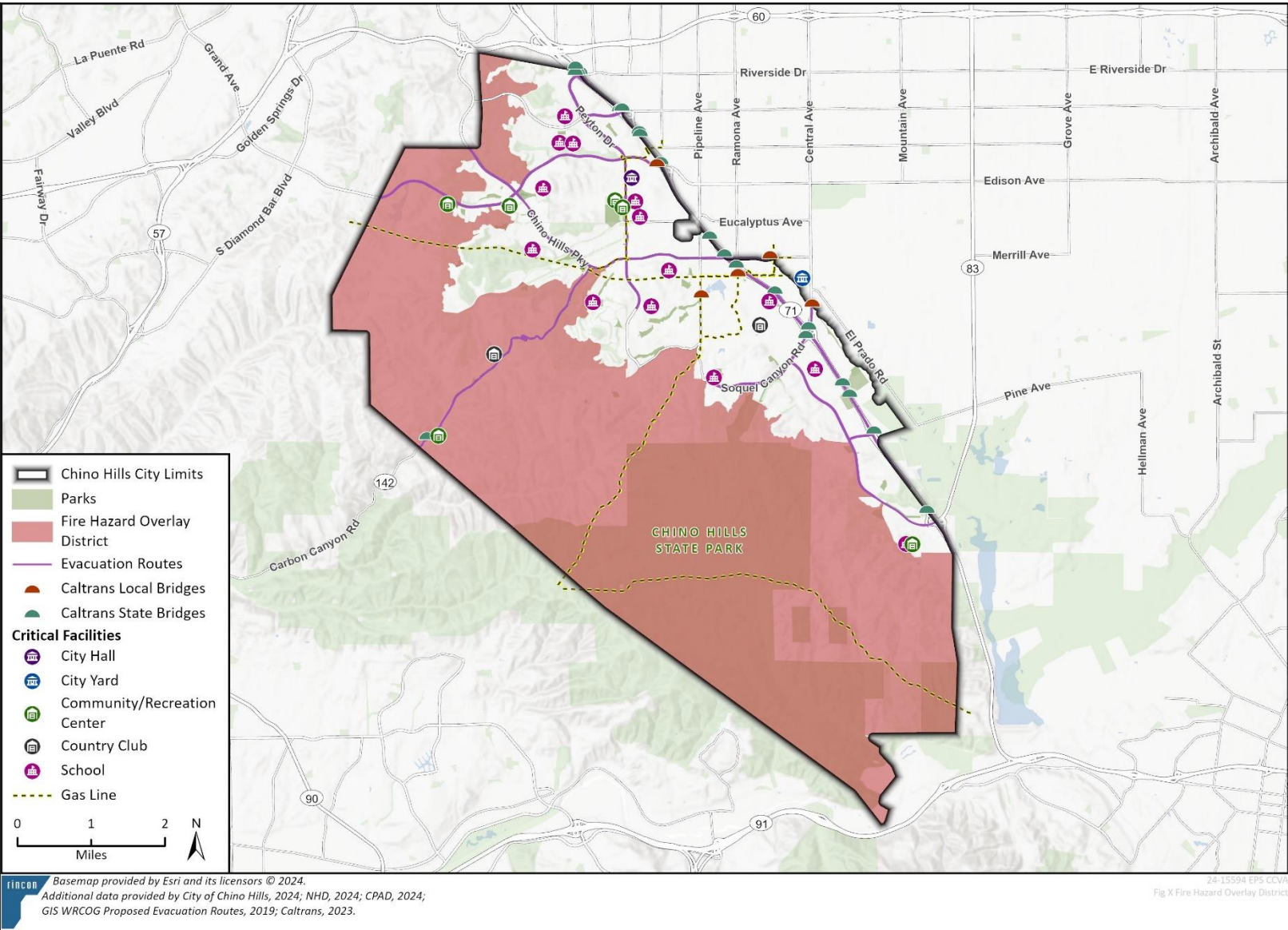


Figure 5-10 - City of Chino Hills Fire Hazard Overlay District



5. Climate Change and Adaptation

Climate change refers to any distinct change in measures of climate lasting for a long period of time, including major changes in temperature, rainfall, snow, or wind patterns. Climate change is caused by natural factors, such as slow changes in the Sun's energy, Earth's orbit around the Sun; and ocean circulation. But today, climate change is most notably affected and accelerated by human activities that change the atmosphere, such as burning fossil fuels, and alter the land surface, such as cutting down forests and covering earth with development.

The effects of climate change are varied: warmer and more varied weather patterns; melting ice caps; rising sea levels; increased flooding; increased wildfires; reduced air quality; reduced water supplies and natural resources; and inconsistent food supplies as these climate changes threaten agricultural production, fisheries and animal farming. Already, as noted in the City of Chino Hills HMP, over the past 15 years, climate change induced heat waves have claimed more lives in California than all other declared disaster events combined.

In response to climate change concerns, the state adopted Senate Bill (SB) 379, which amended GC § 65302(g)(4) to require that climate change adaptation and resilience be addressed in general plan safety elements. The law requires local agencies to incorporate the following into their climate adaptation and resiliency strategy:

- 1) A vulnerability assessment that identifies the risks that climate change poses to the local jurisdiction and the geographic areas at risk from climate change impacts, including, but not limited to, an assessment of how climate change may affect the risks associated with the natural hazards addressed in the safety element;
- 2) Information that may be available from federal, state, regional, and local agencies that will assist in developing the vulnerability

assessment and the adaptation policies and strategies required;

- 3) A set of adaptation and resilience goals, policies, and objectives based on the information specified in the vulnerability assessment, for the protection of the community; and,
- 4) A set of feasible implementation measures designed to carry out the goals, policies, and objectives identified.

The Intergovernmental Panel on Climate Change provides several GHG emissions scenarios used to describe possible future GHG emissions and associated changes to global climate patterns. The State recommends two Representative Concentration Pathways (RCPs) to assess the City's potential vulnerability to climate change. RCP 4.5 represents a "mitigation" scenario in which global emissions peak around 2040 and then decline at the end of the century. RCP 4.5 is an unlikely scenario due to ongoing global emissions.⁸ This scenario assumes global agreement and implementation of GHG reduction strategies. RCP 8.5 represents a "business as usual" scenario in which emissions continue to rise throughout the 21st century. The Safety Element shows climate projection data associated with both emission scenarios; however, policies were formulated based on the projections associated with the RCP 8.5 scenario.

As previously referenced in Section D, Safety Element Issues, the City prepared a CCVA to assess communities and assets in Chino Hills that are vulnerable to climate change, consistent with SB 379, included in Appendix 5-1.

a. Climate Hazards

According to the CCVA, the following changes to climate conditions and associated natural hazards are expected to affect Chino Hills:

Increasing temperatures. Average maximum temperatures in Chino Hills are expected to rise

⁸ <https://cal-adapt.org/help/faqs/which-rcp-scenarios-should-i-use-in-my-analysis/>



between 4.2° Fahrenheit (F) and 5.1°F by 2050 and between 5.3°F to 8.4°F by 2100.

Increasing intensity of precipitation events and longer dry periods. It is projected that the wettest day every year will increase up to 30% by the end of the century with more precipitation occurring during extreme events.

Extreme Heat. Chino Hills is projected to experience an increase in the annual number of extreme heat days in the coming decades. In Chino Hills, an extreme heat day occurs when the maximum temperature is above 99.8°F. The annual number of extreme heat days is projected to increase by as much as 31 days and the annual number of warm nights is projected to increase by as much as 68 nights. Both are qualified as days or nights in which the temperature exceeds the 98th percentile of historically observed temperatures.

Drought. The City is projected to experience increases in the length of dry spells. The average annual maximum length of dry spells is projected to increase by 19 days, from 145 days to 164 days.

Wildfire. The City is projected to experience an increase in high wildfire risk days, frequency, and potential area burned from wildfires. Chino Hills is expected to experience an increase in the annual number of days with extreme wildfire risk from 71 days to 174 days.

Landslides. Susceptibility to landslides in Chino Hills is projected to increase as precipitation variability increases and wildfires increase in frequency, area, and severity.

Flooding. Climate change may cause areas throughout Chino Hills to experience more frequent flooding. Stormwater systems may be overwhelmed more frequently as more extreme rain events occur, causing localized flooding, which could impact properties and leave roads temporarily unusable.

Air Quality. Air quality is projected to worsen in Chino Hills and throughout the region due in to an increase in wildfires and average maximum temperatures. Longer periods of drought will also contribute to worsening air quality.

b. Vulnerability

Certain populations within the community may be disproportionately harmed by the impacts of climate change. The City identified vulnerable populations using a variety of sources, including U.S. Census 2022 American Community Survey, Cal-Adapt, California’s Fourth Climate Change Assessment, the California Healthy Places Index, and CalEnviroScreen4.0, Tree Equity Score, and the City of Chino Hills HMP. Several factors influence sensitivity to climate hazards including an individual’s health, age, and ability, societal disadvantages, inequities in access to health care, economic opportunity, education and other resources, and inequities found in basic needs and exposure to environmental stressors. The following vulnerable populations have been identified in Chino Hills:

- **Individuals with High Outdoor Exposure.** Outdoor workers.
- **Under-Resourced Individuals.** Unemployed, households experiencing housing burden, individuals with educational attainment of less than 4 years of college.
- **Individuals Facing Societal Barriers.** Non-white communities, linguistically isolated.
- **Individuals with Chronic Health Conditions or Health Related Sensitivities.** Older adults, children, individuals with asthma, and individuals with cardiovascular disease.

In Chino Hills, vulnerable populations are concentrated in the Carbon Canyon region and Los Serranos neighborhood. These areas are comprised of a high percentage of lower-income households and have a higher percentage of children (under 18 years old) and seniors (65 years old and older) compared to the rest of the city.

Within Chino Hills there is a large array of infrastructure and critical services that are vulnerable to climate change. Assets within this category include water services, fire services, emergency services, medical services, schools, utilities and major utility corridors, public



transportation, roadways, and lifelines. Impacts to these assets can affect the service line ability to provide resources, by straining the existing capacity or creating conditions that prevent typical responses under normal conditions.

The CCVA included an analysis of the city’s Tree Equity Score, which measures the distribution of the benefits of trees by census block group. Trees provide a number of critical benefits to cities and residents including shade, improved air quality, increased rain interception and reduced stormwater runoff, and in great enough numbers trees can cool ambient temperatures and reduce the impact of climate change and extreme heat on public health. Low-income communities and communities of color are often disproportionately affected by environmental hazards, including extreme heat and pollution. In addition, low-income and communities of color often have less access to parks and open space and live in areas with fewer trees, compared to other communities.

Tree Equity Scores are based on a range of neighborhood characteristics including the existing tree canopy, population density, income, employment, surface temperature, racial demographics, age distributions, and health metrics to create a single tree equity score between 0 and 100. A score of 100 would indicate that a neighborhood has achieved tree equity.⁹

Of the 40 census block groups included in the Tree Equity Score Municipality Report for Chino Hills, 4 have a tree equity score below 75, 30 block groups have a score below 90, 8 block groups have a tree equity score of 90 or above, and 2 have a tree equity score of 100. It is estimated that 11,215 trees would need to be planted in the 13 block groups with the lowest scores to get all census block groups to a tree equity score of at least 80. This would increase the total tree canopy of Chino Hills by 1.2% and result in numerous other annual benefits including those listed below. In Chino Hills, areas with the lowest Tree Equity Scores are

concentrated in the eastern part of the city, along State Route 71 and near the city’s eastern boundary.

6. Hazardous Materials

The *California Health and Safety Code* defines a hazardous material as any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant potential hazard to human health and safety or to the environment if released into the work-place or environment. The State of California (Title 22) further defines a hazardous material as a substance that exhibits any of the following properties.

- Toxic – capable of producing injury, illness, or damage to humans, domestic livestock, or wildlife through ingestion, inhalation, or absorption through any body surface;
- Ignitable/Flammable – capable of being set afire, or of bursting into flame spontaneously or by interaction with another substance or material, and/or capable of burning with great rapidity;
- Reactive – having properties of explosivity or of chemical activity which can be a hazard to human health or the environment; or
- Corrosive – having the ability to destroy living tissue or steel surfaces by chemical action.

An extremely hazardous material is defined by Title 22 as a substance that is:

- Acutely toxic – having the ability to cause injury, illness, or damage to humans, animals, or other living organisms by a single exposure of a duration measured in seconds, minutes, hours or days, or in the case of oral ingestion, by a single dose;

⁹ Tree Equity Score. 2024.

<https://www.treeequityscore.org/map#11.24/33.9561/-117.7011>



- Chronically toxic – having the ability to cause injury, illness or damage to humans, animals or other living organisms by prolonged or repeated exposure or consumption over a period of days, weeks, months, or years;
- Carcinogenic – capable of producing cancer;
- Bioaccumulative – a toxic substance that concentrates in living organisms through direct assimilation or food chain accumulation;
- Persistent in the environment – a toxic substance that resists natural degradation or detoxification; or
- Water reactive – having properties of explosivity or of violent chemical activity when in contact with water which can be a hazard to human health or the environment.

Releases of hazardous materials can occur during a natural disaster, such as during an earthquake. Improperly stored containers of hazardous substances may overturn or break, pipelines may rupture, and storage tanks may fail. Containers may also explode if subjected to high temperatures, such as those generated by a fire. If two or more reactive chemicals come in contact as a result of a spill, the hazard may be compounded.

The *California Fire Code* includes a set of criteria designed to minimize the risk of an accident and to be followed when storing, using, or handling hazardous materials. These requirements include secondary containment of substances, segregation of chemicals to reduce reactivity during a release, sprinkler and alarm systems, monitoring, venting and auto shutoff equipment, and treatment requirements for toxic gas releases. Examples of hazardous materials include oil, paints, thinners, cleaning solvents, compressed gas, radioactive materials, refined petroleum products, and pesticides.

Within the City, identified potential sources of hazardous materials include Aerojet Chino Hills Facility, gas lines, chlorine stations, and oil and gas

wells. The Safety Element updates policies intended to reduce risks from hazardous materials.

a. Aerojet

The Aerojet Chino Hills Facility consists of about 800 acres located in a rural area in the southwestern portion of the City. It was a munitions assembly and test facility that operated from 1954 until the facility closed in November 1995. Aerojet has been working with the California Department of Toxic Substances Control (DTSC) to identify and remediate areas of the property and adjacent properties on which ballistics, toxics, or other hazardous materials are expected to occur. The most current update of Aerojet clean-up activities is provided on the DTSC website: <https://dtsc.ca.gov/aerojet-rocketdyne-chino-hills/>. The City continues to monitor remediation activities at the Aerojet Project Area.

b. Gas Lines

Four high-pressure natural gas transmission pipelines operated by Southern California Gas (SCG) Company extend across the City. Two of these pipes are 36 inches in diameter, and two are 30 inches in diameter. These pipes are fitted with automatically controlled valves so that, in the event of an emergency, the damaged section of pipe is shut off immediately and the pressure is diverted around the break. The natural gas distribution system, which includes the pipes that connect individual houses and structures to the street mains, is not fitted with automatic shut-off valves. However, all pipes in residential areas are controlled with a valve or a series of valves. In the event of an emergency, the SCG can isolate the area by closing these valves. Once the gas has been turned off, crews can make any needed repairs to the lines.

Within the City, SCG has implemented retrofit programs that replaced older copper pipes with flexible polyethylene pipe for gas mains, and increased use of seismically designed devices, such as mechanical couplings and flexible connections for piping. All new pipes installed in the City during the past two decades are made of plastic and less susceptible to failure.



c. Chlorination Storage

The City has a chlorination storage center located within the City limits. The station is located north of Eucalyptus Avenue and west of the Chino Valley Freeway, and the storage center is located on Eucalyptus Avenue. The storage center currently stores approximately 500 to 750 pounds of chlorine tablets used to treat pumped well water prior to its introduction into the City’s domestic water system.

Chlorine can be utilized in a liquid, solid, or gaseous state when used for water purification. The gas is noncombustible, but as a strong oxidizer it can react explosively if mixed with some common substances such as fuel gas, ammonia, or turpentine. If inhaled, chlorine can irritate the eyes and nose and mouth tissues, and cause headaches, nausea and vomiting, dizziness, and other respiratory symptoms. The tablet form of chlorine that is currently stored at the storage center is less susceptible than a liquid form to a chlorine release or dispersion that could occur during a strong seismic event or other disaster.

d. Oil and Gas Wells

Petroleum and natural gas have been produced from oil fields in the eastern Puente Hills since the late 1880s. The Chino–Soquel oil field is located in the rugged area around Soquel Canyon, to the east of Sleepy Hollow, as shown in Figure 5–11 – Oil Fields Map (page 5–33). The Mahala oil field is located south of the Butterfield Ranch development in the eastern portion of the city. The Well Finder Map issued by the California Geologic Energy Management Division (CalGEM) (accessed June 2024) indicate there are many plugged oil and gas wells in the City.

Most of these wells were likely not abandoned to current CalGEM regulations. If development is planned for an area known to have plugged and/or abandoned oil wells, these wells should be inspected and if necessary, re–abandoned to meet current regulations. If the property is planned for development, all wells must be slurry filled to minimize future problems. The City Planning Department is required to submit building permit

applications to the Long Beach office of CalGEM if an oil well is known to have occurred in the area planned for development. If according to the CalGEM records, the wells in the area were not abandoned properly, it is the responsibility of the property owner to do so. Most wells plugged after the late 1970s were abandoned to current standards. However, all applicable building permit applications still should be submitted to the CalGEM for review.

Geological investigations that address environmental issues associated with oil field operations should be conducted prior to such areas being developed. Hazards that may require remediation and mitigation could include venting of gases, petroleum–saturated soils and soils contaminated with diesel, heavy metals or other hazardous substances.

e. Airport Safety

Chino Airport is located at 7000 Merrill Avenue in Chino, just east of the City of Chino Hills. It is a general aviation airport that serves private, business, and corporate tenants from Southern California. The Chino Airport Comprehensive Land Use Plan (CACLUP) establishes three safety zones, each with a specific set of land use guidelines. Safety Zone 1 restricts residential and industrial development; Safety Zone 2 restricts uses that would result in more than 50 persons per assembly area being present; Safety Zone 3 places no restrictions on residential or other uses.

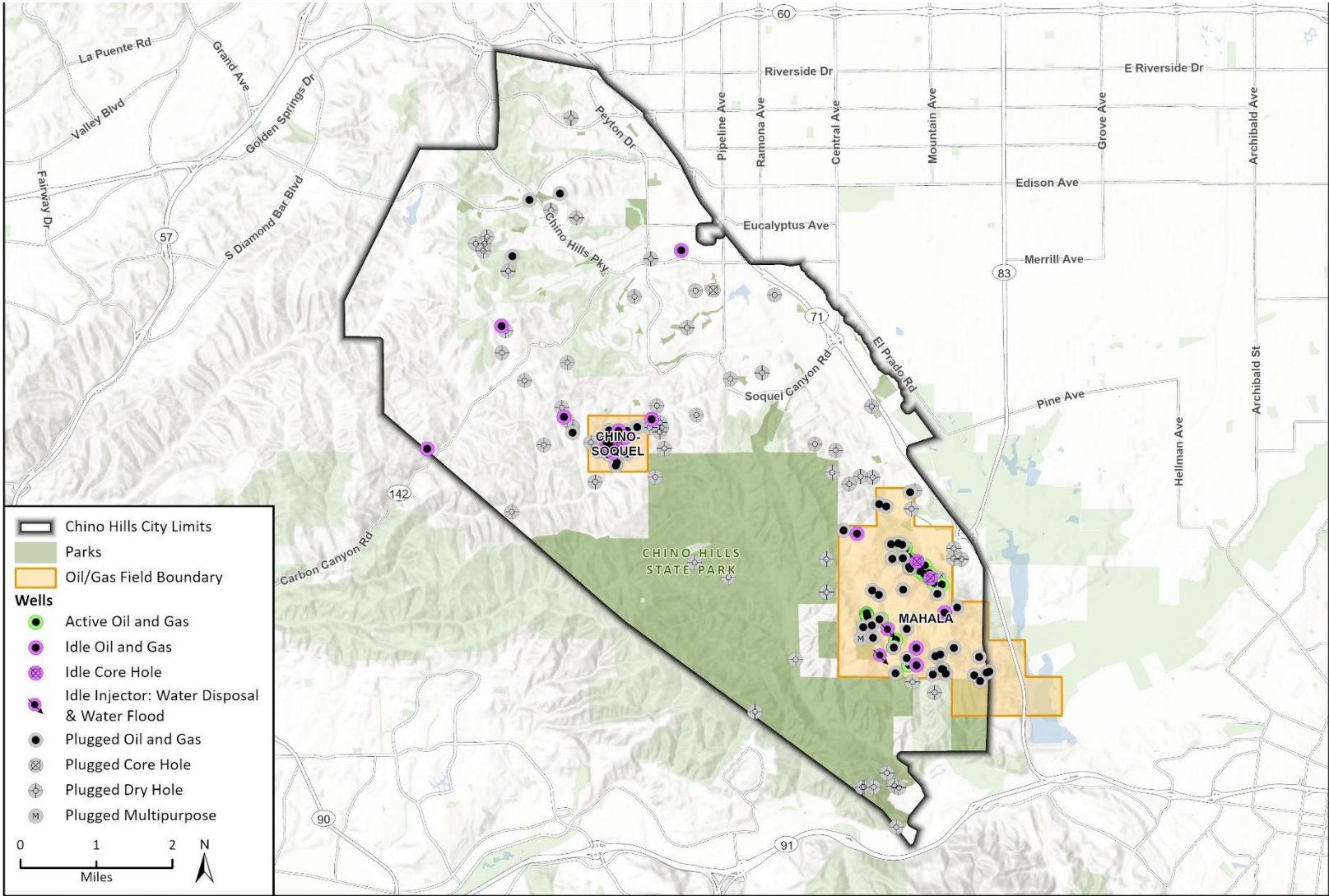
Portions of Safety Zone 2 and Safety Zone 3 cross into an area of the City that is located east of Fairfield Ranch Road, south of Kimball Avenue and north of Pine Avenue, as shown in Figure 5–12– Chino Airport Safety Zones (page 5–34) Within the Safety Zone 2 area of the City, most of the area is undeveloped and designated as Open Space in the Chino Hills Land Use Plan.

Within the Safety Zone 3 area of the City, most of the area is undeveloped and designated as Open Space in the Chino Hills Land Use Plan. The two exceptions are the Big League Dreams Sports Park, which is designated as Commercial Recreation



within the Chino Hills Land Use Plan, and a small sliver of medium-density housing designated as Medium Density Residential within the Chino Hills Land Use Plan.

Existing development within the City and the Chino Hills Land Use Plan are consistent with the CACLUP Safety Zones.



Basemap provided by Esri and its licensors © 2024.
 Additional data provided by City of Chino Hills, 2024; NHD, 2024; CPAD, 2024; CalGEM, Well Finder, 2024.

24-15294 EPS Safety Element
 Fig X Oil Fields and Wells

Figure 5-11 - Oil Fields Map

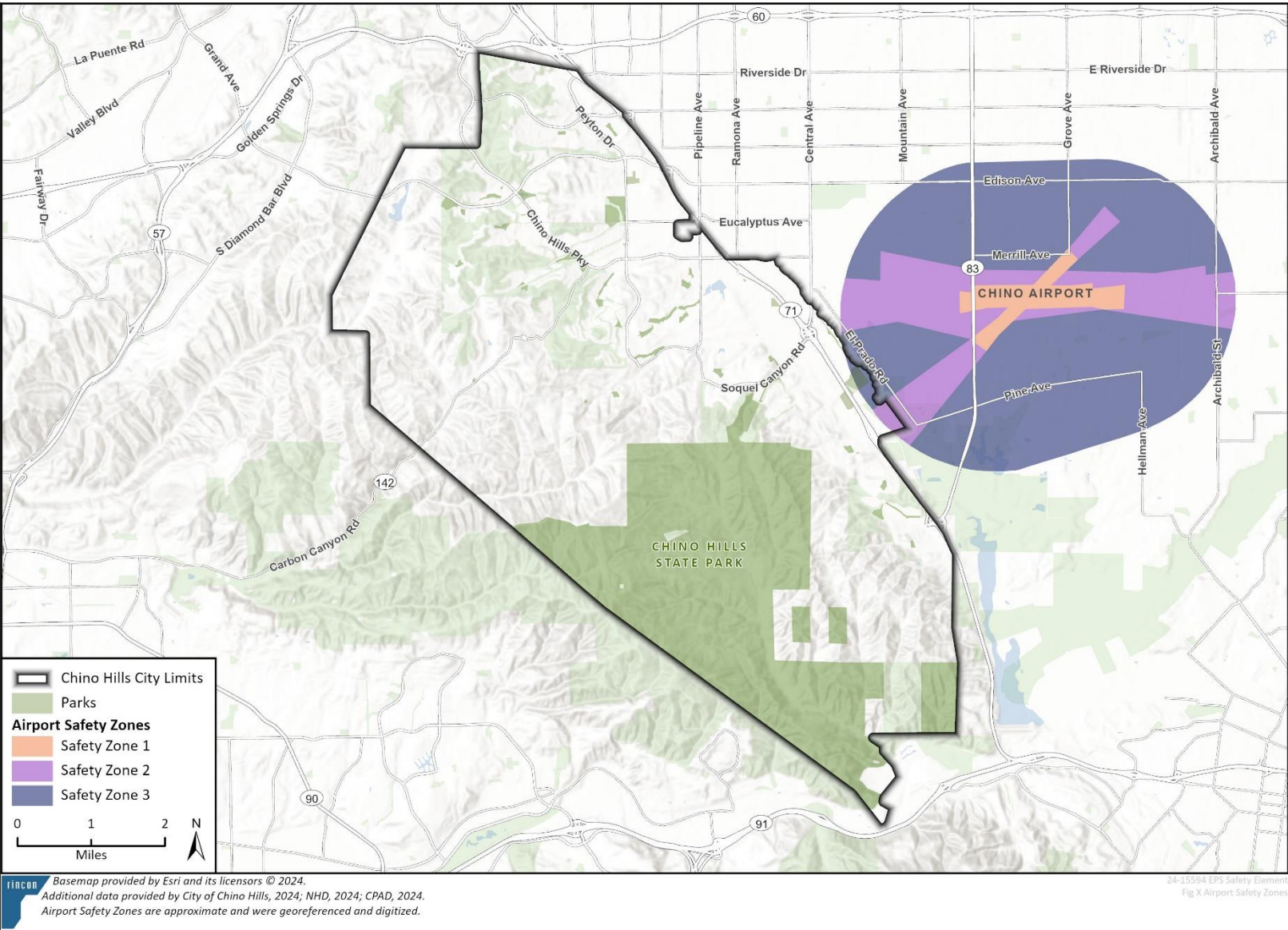


Figure 5-12 - Chino Airport Safety Zones



E. Safety Plan

This section of the Safety Element discusses the programs and services the City has in place to reduce risks from natural and human-made hazards to the community.

1. Emergency Operations Plan / Hazard Mitigation Plan

The City of Chino Hills Emergency Operations Plan (EOP) is updated periodically and addresses the City's planned response to emergencies associated with natural, environmental and human-made disasters. It provides guidance on the response to such emergencies as earthquakes, hazardous materials emergencies, flooding, and wildfires, and identifies city facilities for evacuation shelters.

The City of Chino Hills HMP, which is updated every five years, works in concert with the EOP to proactively identify and address risks from potential natural and human induced hazards. The City of Chino Hills HMP responds to the fact that emergencies or disasters may cause death, leave people injured or displaced; and inflict significant damage to our communities, businesses, public infrastructure, and our environment. A disaster could result in tremendous costs in terms of response and recovery dollars and economic loss.

Hazard mitigation identified in the City of Chino Hills HMP is intended to reduce or eliminate losses of life and property. After disasters, repairs and reconstruction are often completed in such a way as to simply restore areas to pre-disaster conditions. Such efforts expedite a return to normalcy, however, the replication of pre-disaster conditions results in a cycle of damage, reconstruction, and repeated damage. Mitigation is one of the primary phases of emergency management specifically dedicated to breaking the cycle of damage. Hazard mitigation is distinguished from other disaster management functions by measures that make the City

development and the natural environment safer and more disaster resilient. Mitigation generally involves alteration of physical environments, significantly reducing risks and vulnerability to hazards by altering the built environment so that life and property losses can be avoided or reduced.

Objectives of the EOP and HMP are to: 1) Significantly reduce loss of life and injuries; 2) Minimize damage to structures and property as well as disruption of essential services and human activities; 3) Increase the emergency management capability of the City; 4) Ensure that the City takes steps to mitigate the risk of a cyber-attack; 5) Protect the continuity of local government to ensure no significant disruption of services during or due to a natural or man-made disaster; 6) Improve community emergency preparedness, collaboration, and outreach with other agencies; 7) Develop and implement mitigation strategies that optimize public funds in an efficient and cost-effective way; 8) Protect the health, safety and general welfare of the citizens of the City of Chino Hills by ensuring that a reliable and adequate supply of water during drought conditions is available; 9) Protect the health, safety and welfare of the citizens of the City of Chino Hills from terrorist/active shooter situations.

Operation of the EOP and City of Chino Hills HMP is administered by a multijurisdictional Emergency Operations Team, which includes representatives from: the City, San Bernardino County Sheriff's Department, San Bernardino County Office of Emergency Services, CVFD, City of Chino, Chino Valley Unified School District, community members, local utility companies, and Chino Valley Chamber of Commerce.

2. Emergency Preparedness, Evacuation Routes and Emergency Facilities.

Successful implementation of EOP and City of Chino Hills HMP policies is accomplished through emergency preparedness activities, identification of evacuation routes and designation of



emergency facilities to shelter persons and animals during disaster events.

a. Emergency Preparedness

Extensive emergency preparedness information is provided to the community through the City website:

<https://www.chinohills.org/77/Emergency-Preparedness>. This information includes a user friendly description of the City Emergency Preparedness Program, which provides: Emergency preparedness training and information to City staff; Coordinates a community informational campaign regarding preparedness; Chino Hills Auxiliary Radio Team (CHART); Plans and implements disaster drills in conjunction with other agencies; Maintains Emergency Operations Center (EOC) preparedness; Maintains emergency shelter, food, water, and equipment supplies.

The website also provides valuable information on what to do before, during and after an emergency, with specific links for power outages, storm preparedness, flooding, earthquakes, extreme heat, high winds, gas leaks, hazardous material accidents, and wildfires.

Members of the community are encouraged to sign up for emergency alerts through the City e-notify program. E-notifications are sent out to inform the community of police alerts, natural and human induced emergencies, and major road closures.

b. Evacuation Routes

In response to increasing wildfire risk, the State adopted Senate Bill (SB) 99, which amended Government Code (GC) § 65302(g)(5) as follows: *“Upon the next revision of the housing element on or after January 1, 2020, the safety element shall be reviewed and updated as necessary to identify residential developments in any hazard area identified in the safety element that do not have at least two emergency evacuation routes”*.

The State also adopted Assembly Bill (AB) 747 and AB 1409, which amended GC § 65302.15 as follows: “(a) Upon the next revision of a local

hazard mitigation plan, adopted in accordance with the federal Disaster Mitigation Act of 2000 (Public Law 106–390), on or after January 1, 2022, or, if a local jurisdiction has not adopted a local hazard mitigation plan, beginning on or before January 1, 2022, the safety element adopted pursuant to subdivision (g) of Section 65302 shall be reviewed and updated as necessary to identify evacuation routes and their capacity, safety, and viability and evacuation locations under a range of emergency scenarios. A county or city that has adopted a local hazard mitigation plan, emergency operations plan, or other document that fulfills commensurate goals and objectives may use that information in the safety element to comply with this section and, in that event, shall summarize and incorporate into the safety element that other plan or document”.

To support these evacuation bills, the California Governor’s Office of Planning and Research (OPR) issued the Evacuation Planning Technical Advisory (TA) to guide cities and counties as they update their general plan safety element in accordance with evacuation requirements.

In accordance with SB 99, AB 747, AB 1409, and OPR’s Evacuation Planning Technical Advisory, the City conducted an evacuation capacity and emergency access analysis that identifies constraints during evacuations and potential impacts to the roadway network. The City consulted with the California Governor’s Office of Emergency Services (CAL OES), Department of Conservation (DOC) – California Geological Survey, State Board of Forestry and Fire Protection to inform the evacuation and emergency access analysis and develop strategies to ensure efficient and safe evacuation in the event of a disaster.

The City has designated evacuation routes to move residents out of an impacted area in a disaster or hazard event, as shown in Figure 5–13 – Evacuation Routes (page 5–39). The following highways serve as the City’s critical evacuation routes:

- State Route 71
- State Route 142 (Carbon Canyon Road)



In addition, the following local roads complement the highways as important evacuation routes:

- Peyton Drive
- Chino Avenue
- Chino Hills Parkway
- Grand Avenue
- Soquel Canyon Parkway
- Butterfield Ranch Road

The City identified potential shelter locations in the event of a disaster. Residents and visitors in need of shelter following a disaster are encouraged to report first to the shelter closest to them. If that shelter is full, closed, or otherwise unavailable, then residents would be referred to the next closest open shelter.

In compliance with SB 99 (Government Code Section 65302), the City identified residential developments with less than two evacuation routes located within any hazard zone defined in this Safety Element. There are seven neighborhoods in the city that have been identified as having only a single access route, as shown in Figure 5-3 – Single-Access Route Residential Neighborhoods (page 5-40). Policies S-5.2 and S-5.3 (page 5-48) address constraints associated with single access neighborhoods.

Pursuant to AB 747 and AB 1409 (Government Code Section 65302.15), the City conducted an emergency evacuation analysis to identify evacuation routes and their capacity, safety, and viability under a range of emergency scenarios. The City evaluated three different evacuation scenarios that included evacuation scenarios associated with 1) a wildfire igniting in Carbon Canyon, 2) a wildfire igniting outside of Carbon Canyon that spreads toward Chino Hills, and 3) an earthquake along the Chino Fault in the southeast area of Chino Hills. Evacuation scenarios included reliance on different evacuation routes, background commute traffic, and roadway capacity. During an actual emergency that necessitates evacuation, evacuation routes are selected based on conditions on the ground and the type of hazard event. In some cases, even

State Route 71 and State Route 142, which function as main evacuation routes in the City, may be unusable. The evacuation scenarios that were selected for analysis are described in greater detail in Appendix 5-2.

The evacuation analysis identified several major roads that are used for evacuation that are congested during peak travel times, even without an evacuation event:

- Grand Avenue between Diamond Bar and Pleasant Hill Drive, west of Chino Hills Parkway
- Carbon Canyon Road between Brea and the Western Hills Country Club
- Several off-ramps from SR 71

In the event of an emergency evacuation, these roads could be over capacity, increasing the time it takes community members to evacuate.

As Chino Hills continues to grow in population, the transportation network could be significantly impacted during a city-wide emergency evacuation, constraining the city's ability to evacuate in a timely manner. As further described in Appendix 5-2, major evacuation routes could be further pushed over capacity in the event of an emergency evacuation, including State Route 71 and State Route 142 (Carbon Canyon Road). Policy S-5.1 through Policy S-5.11 and the associated Actions seek to alleviate these potential evacuation constraints based on the results of the evacuation routes analysis.

When emergencies arise requiring evacuation, egress routes are identified by the City Emergency Operation Team, depending on the location and type of emergency. During the 2020 Blue Ridge Fire which burned approximately 14,000 acres in the southern portion of the city, residents were notified to evacuate through e-notify, police and fire neighborhood loud speakers, and door-to-door notification. This evacuation process was effective in protecting all lives and most property from damage. The City law enforcement is responsible for coordinating



evacuation procedures, including notifying community members of evacuation orders, communicating recommended evacuation routes, and staffing check points along evacuation routes.

Evacuations in the City are most challenging in the Carbon Canyon area, as identified in the emergency evacuation analysis, Appendix 5-2. This area contains varied topography of canyons and hills, some of the City's oldest housing stock, very narrow and winding streets built before the City's incorporation, and one major route in and out through State Highway 142, Carbon Canyon Road. Alternative ingress/egress for the Carbon Canyon area provide alternative routes for emergency access and evacuation to the east and west of Carbon Canyon, as shown in Figure 5-4 – Carbon Canyon Alternative Evacuation Routes (page 5-41). These alternative routes are controlled by locked gates but can be unlocked by the Chino Valley Fire District and Chino Hills Police Department via Knox boxes. In the event of an emergency requiring evacuation from Carbon Canyon using alternative routes, the City's law enforcement would unlock the gates to the alternative evacuation routes and facilitate evacuation procedures for Carbon Canyon.

The Carbon Canyon Fire Safe Council (CCFSC) is a collaborative group of community members and fire safety officials focused on reducing fire risk and assisting safe evacuation during emergencies. The CCFSC posts evacuation routes for the Carbon Canyon area and information on its website: [Evacuation Guides \(carboncanyonfsc.org\)](http://carboncanyonfsc.org).

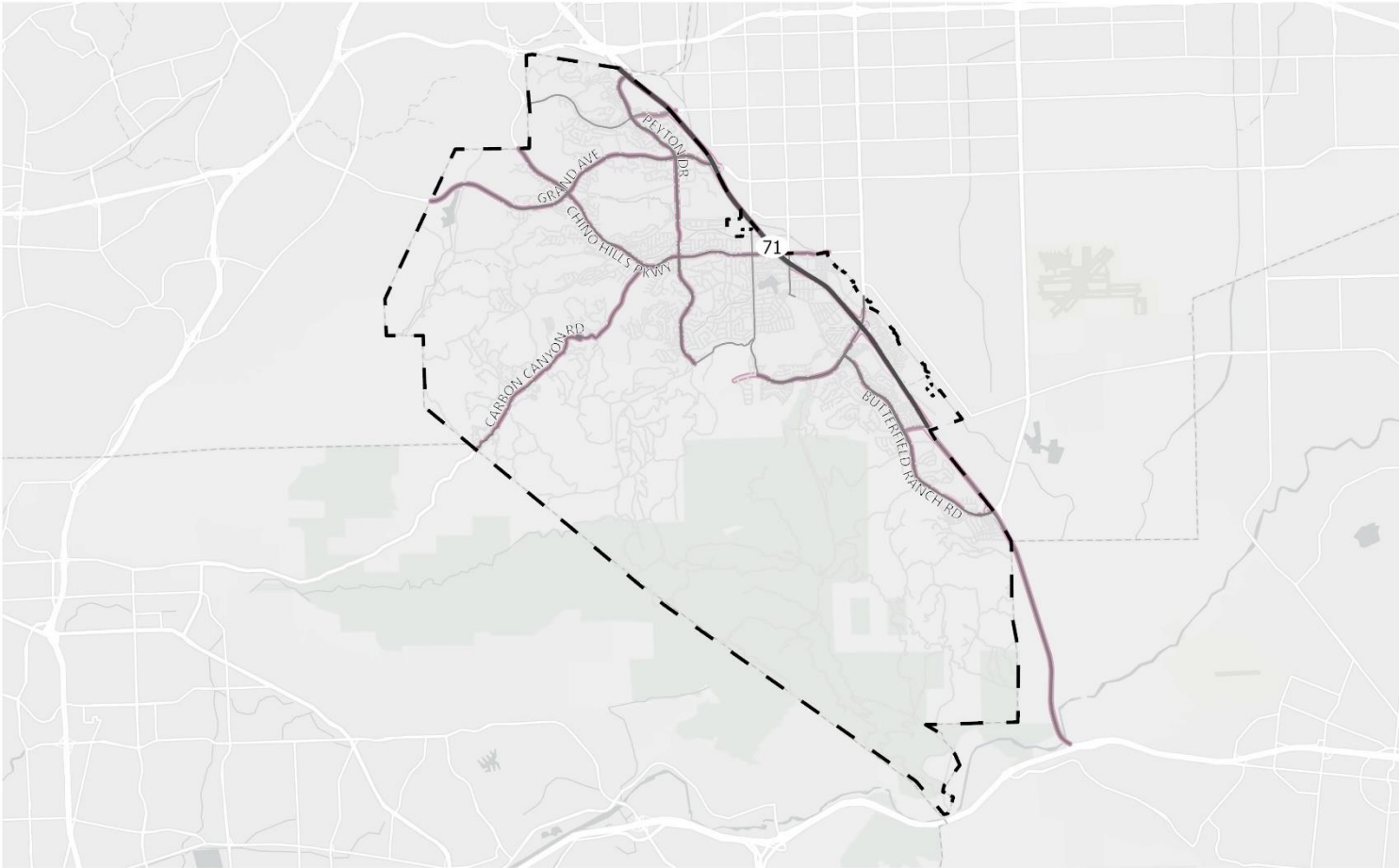
To ensure adequate emergency access, all new development in the City is reviewed by the CVFD. Fire access roads are required to comply with CVFD standards, which include the requirement to be constructed of an all-weather hard surface, such as asphalt or concrete, and be a minimum unobstructed width of 26 feet. The road grade shall not exceed twelve percent (12%) maximum, unless otherwise approved by the Fire District. An approved turn around shall be provided at the

end of each roadway in excess of 150 feet in length.

c. Subdivision Review

As required by SB 99, any residential developments in any hazard area that do not have at least two emergency evacuation routes must be identified in this Safety Element.

Assembly Bill (AB) 2911 added Section 4290.5 to the Public Resource Code, which requires the California Board of Forestry and Fire Protection (the Board), in consultation with the State Fire Marshal and the local jurisdiction to identify existing subdivisions with more than 30 dwelling units located in the SRA or LRA Very High Fire Hazard Severity Zone, identified pursuant to Section 51178 of the Government Code, without a secondary means of egress route that are at significant fire risk.



Roadway Functional Class

- State Route
- Arterials
- Collectors
- Local Roads

— Evacuation Route

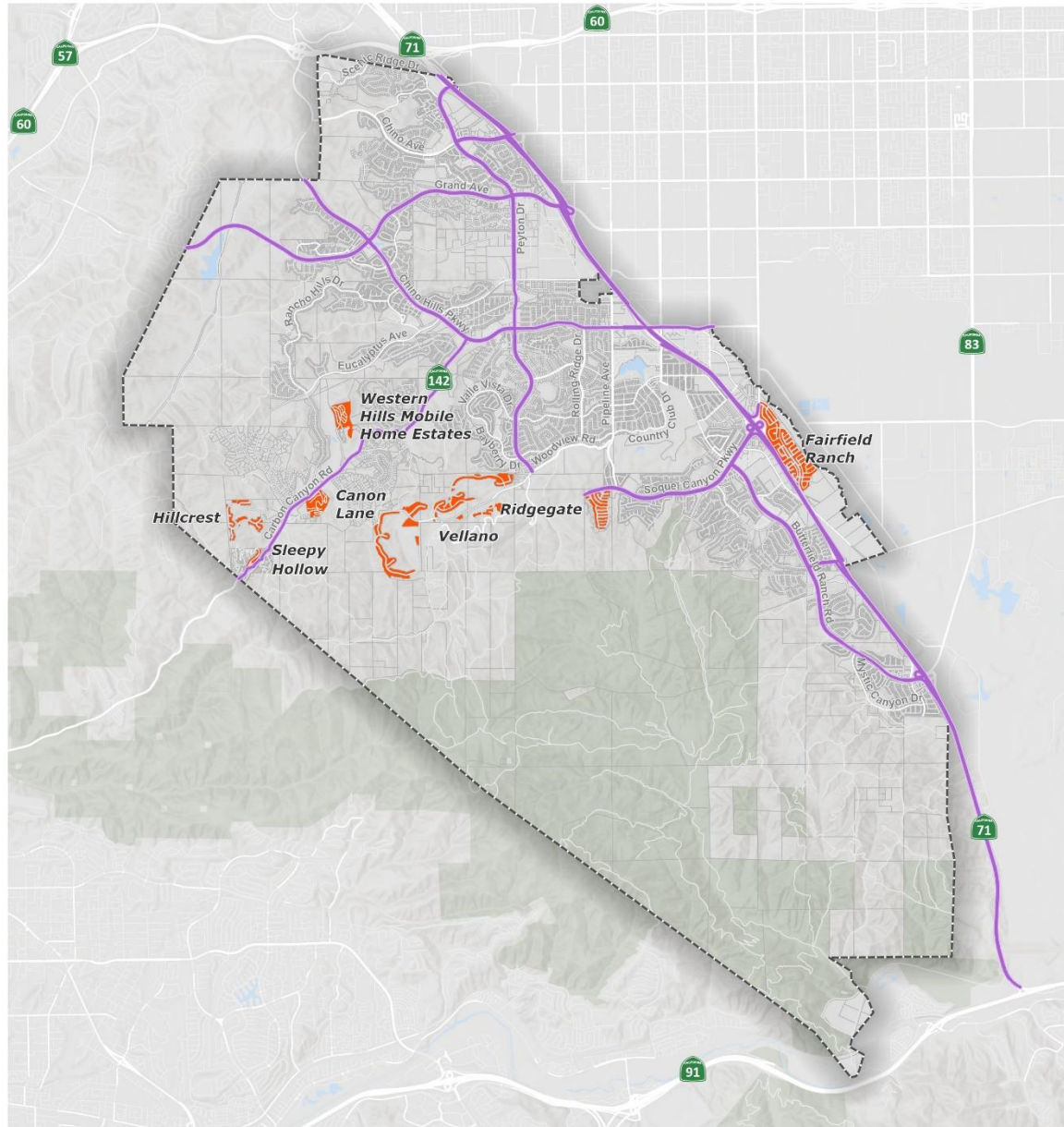
— City Boundary





0 1 2 3 Miles



Roadway Network and Evacuation Routes
Chino Hills Safety Element Update
Chino Hills, CA

Figure 5-2 - Evacuation Routes



-  Evacuation Routes
-  Parcels with One Egress Route
-  Parcels with Two or More Egress Routes
-  City Boundary



Neighborhoods with Single Access Points
Chino Hills Safety Element Update
Chino Hills, CA

Figure 5-3 – Single-Access Route Residential Neighborhoods

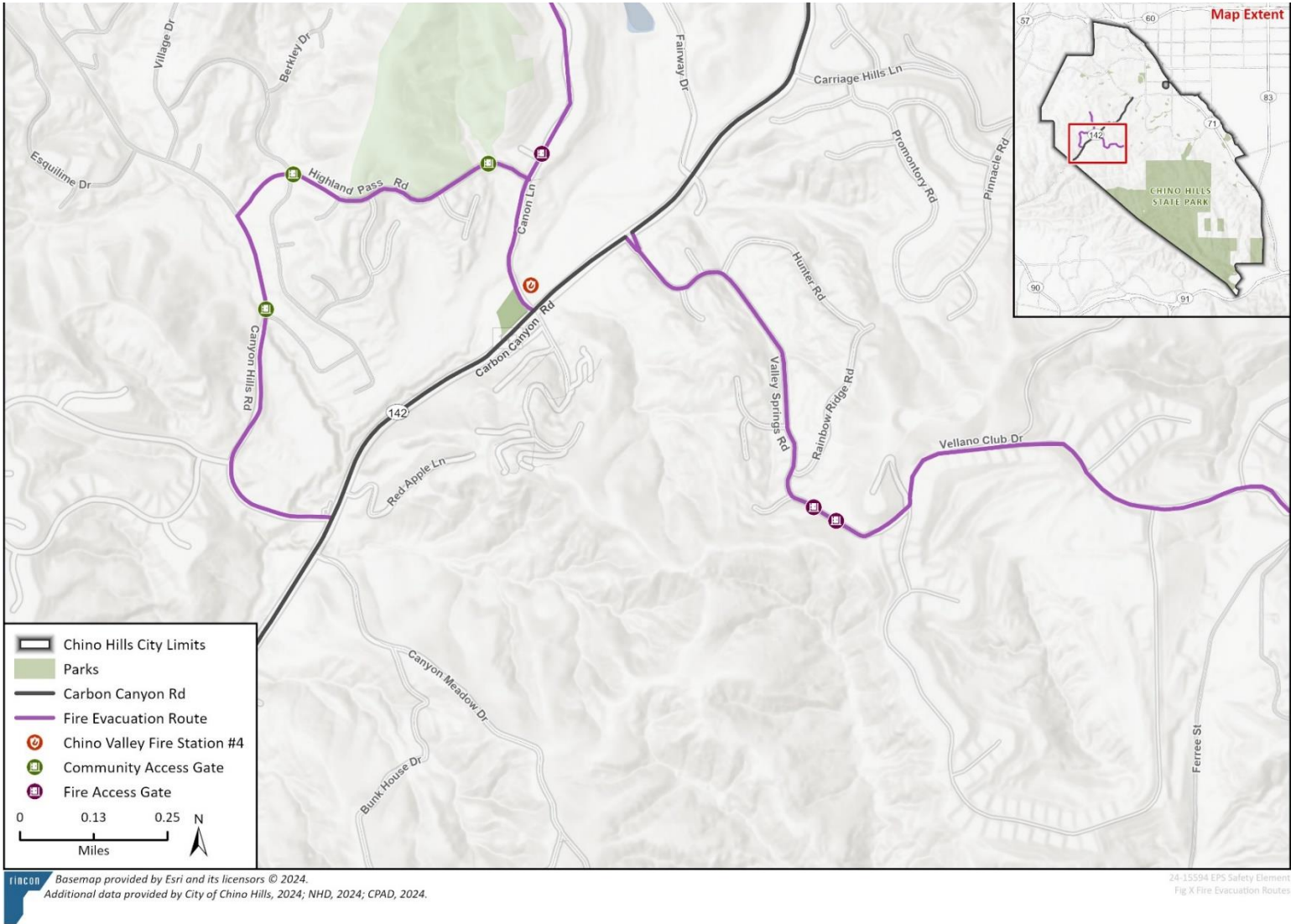


Figure 5-4 – Carbon Canyon Alternative Evacuation Routes



d. Emergency Facilities

Personnel from the Community Services Department are trained in shelter management and are prepared to manage shelters for both persons and animals. All of the City’s recreation centers and schools have been designated as shelters and are supported by the American Red Cross (ARC).

3. Geologic Hazard Overlay District

The Geologic Hazard Overlay district is created to provide greater public safety by establishing review procedures and setbacks for areas that are subject to potential geologic problems such as ground shaking, earthquake faults, liquefaction, and landsliding. The Geologic Hazard Overlay district applies to Chino Hills fault hazards, and areas prone to landslides, liquefaction hazards, and other geologic hazards. These geologic hazard areas are delineated in (page 5–6) Figure 5–1 Active and Potentially Active Faults Affecting Chino Hills, Figure 5–2 – Seismic Hazards Earthquake Rupture (page 5–10), Figure 5–3 – Liquefaction Susceptibility Seismically-Induced Landslide Hazard Zones (page 5–11), and Figure 5–4 – Canyons in the City of Chino Hills (page 5–12).

4. Flood Hazard Overlay District

The Flood Hazard Overlay district was created to provide greater public safety by establishing review procedures and setbacks for areas that are subject to potential flooding problems such as storm flooding and inundation areas. These flood hazard areas are delineated in Figure 5–6 – Flooding and Inundation Zones (page 5–17) and Figure 5–7 – FEMA Flood Map (page 5–18).

5. Fire Hazard Overlay District

Under State law (Government Code Sections 65302 and 65302.5), the City of Chino Hills General Plan must address the risk of fire in LRAs within the City’s jurisdiction. Consistent with State law, the City of Chino Hills has adopted a Fire Hazard Overlay Map that identifies areas in

the City subject to wildland fire hazards, as well as areas not subject to wildland fire hazard, shown in Figure 5–10 – City of Chino Hills Fire Hazard Overlay District (page 5–26).

Within the Fire Hazard Overlay district, the City establishes standards to protect structures and City residents from the potential hazards associated with wildland fires. These standards, which are promulgated in Chapter 16.22 “Fire Hazard Overlay District” of the Municipal Code, establish regulations for:

- Fuel modification areas are development projects
- Maintenance of fuel modification areas
- Construction requirements
- Building Separations

Vehicular access to accommodate firefighting vehicles and apparatus.

a. Fire Suppression Capabilities

As a fire authority for the City, the CVFD provides fire suppression, fire prevention, and paramedic services. The CVFD also provides fire services to the City of Chino and its sphere of influence. Within Chino Hills and Chino, the CVFD operates seven fire stations, a training facility, and administrative offices. In addition, an eighth fire station is currently in the planning process. A description of these facilities is provided in Table 5–2 – Chino Valley Independent Fire District Facilities (page 5–43).



Table 5-2 - Chino Valley Independent Fire District Facilities

Facility Name	Location	Description
Fire Administration	14011 City Center Dr. Chino Hills	The building houses the offices of the Fire Chief, Deputy Chief, Fire Marshal, Fire Prevention & Administrative Staff.
Station 61	5078 Schaefer Ave. Chino	The station covers the central portion of the Fire District service area. Currently, the station houses a Paramedic Engine Company staffed with four personnel.
Station 62	5551 Butterfield Ranch Rd. Chino Hills	Currently, the station houses one Paramedic Truck Company staffed with four personnel and one Battalion Chief.
Station 63	7550 Kimball Ave. Chino	The station serves the airport and the expanding Chino "Preserve" development in the eastern Chino area. The station houses a paramedic engine staffed with four personnel.
Station 64	16231 Canon Lane Chino Hills	The station houses a paramedic Engine, staffed with four personnel.
Station 65	12220 Ramona Ave. Chino	The station houses a Paramedic Engine Company staffed with four personnel. It provides service to the northern end of Chino.
Station 66	13707 Peyton Ave. Chino Hills	The station currently houses one Paramedic Engine Company staffed with four personnel. This station primarily responds to calls in the northwest portion of the Fire District.
Station 67	5980 Riverside Drive Chino	The station houses a Paramedic Engine staffed with four personnel.
Training Facility	5092 Shaefer Ave. Chino	The Training Facility serves as a centralized location to conduct training for all Fire District personnel.
Station 68 (Planned)	Soquel Canyon Parkway & Pipeline Avenue Chino Hills	This station is planned to be strategically located in the urban-wildland interface to facilitate a quicker response and deployment of resources during wildland fires. The addition of a fourth fire station in Chino Hills will also improve response times and provide needed resources to draw from during emergency incidents throughout the Chino Valley.

The CVFD participates in the State of California Master Mutual Aid System. In addition, CVFD has cooperative agreements with other local fire agencies.



6. Emergency Medical Services

The CVFD provides advanced life support (ALS) care to Chino Hills, as well as the City of Chino and its sphere of influence. CVFD paramedic facilities are identified in Table 5–2 above. Private ambulance companies also provide emergency transport to Chino Hills.

Nearby hospital facilities that provide emergency medical care on-site include Chino Valley Medical Center in Chino, Placentia–Linda Hospital in Placentia, Montclair Hospital in Montclair, Pomona Valley Hospital in Pomona, San Antonio Community Hospital in Upland, Citrus Valley Medical Center in West Covina, Canyon Ridge Hospital in Chino, and Ontario Medical Center in Ontario.

7. Police Services

Law enforcement services in the City are provided by the Chino Hills Police/Sheriff's Department through a contract with the County of San Bernardino Sherriff–Corona Department.

The Police/Sheriff's Department operates out of the Chino Hills Police Station, located at 14077 Peyton Drive in Chino Hills. Police efforts in the City are supported by a Neighborhood Watch program, which is a cooperative effort between the City, the Police/Sheriff's Department, community members, and Homeowners' Associations, where appropriate. Overall, the City has a low crime rate when compared to the County, the state, and the nation.

F. Safety Element Goals, Policies, and Actions

The following goals, policies, and actions support the City of Chino Hills Safety Plan and its vision to protect the community from unreasonable risks caused by natural and human-made hazards:

Additional policies related to mitigating natural and manmade hazards can be found in the Chino Hills Hazard Mitigation Plan.

Goal S–1: Provide Adequate Emergency Service.

Policy S–1.1: Ensure that new development has sufficient fire protection, police, and emergency medical services available.

Action S–1.1.1: Require the review of development proposals to determine impacts on emergency services and ensure developments meet appropriate safety standards.

Action S–1.1.2: Regularly assess emergency service response times to ensure a safe and secure environment for people and property in the community.

Action S–1.1.3: Require all safety personnel meet minimum training requirements set forth by state and federal guidelines.

Policy S–1.2: Maintain and update the City Emergency Operations Plan (EOP) and City of Chino Hills Hazard Mitigation Plan (HMP), as required, to respond to extraordinary emergency situations associated with natural disasters, man-made disasters, technological incidents, and national security emergencies.



Action S-1.2.1: Provide for effective life safety measures and reduce property loss.

Action S-1.2.2: Provide for the rapid resumption of impacted businesses and community services.

Action S-1.2.3: Provide for accurate documentation and records required for cost recovery efforts from federal, state, and any other appropriate agencies.

Action S-1.2.4: Utilize water reservoirs, other smaller ponds, and swimming pools in the City as water sources for fire-suppression, if necessary.

Action S-1.2.5: Educate residents on how to prepare for multiday (three days or more) power outages.

Action S-1.2.6: Provide information to residents about how to shut off domestic gas supply in cases of emergency.

Action S-1.2.7: Continue to provide current and extensive emergency preparedness information on internet, social media and other communication networks to maximize community outreach.

Action S-1.2.8: Collaborate with local, regional, and state emergency management, law enforcement, and fire agencies when updating the City's EOP, City of Chino Hills HMP, and other plans related to emergency preparedness and response.

Goal S-2: Educate at-risk and underserved communities

Policy S-2.1: Develop a targeted outreach program for vulnerable populations (including non-English speakers, outdoor workers, non-white communities, individuals with chronic health conditions, seniors, persons with a disability, and homeless individuals) to educate them on how to prepare for and recover from disasters and climate change effects.

Action S-2.1.1: Ensure emergency preparedness information, including printed material, radio broadcasts, video, websites, and other media, is available in all languages spoken by at least 5% of the population.

Action S-2.1.2: Develop and annually update a list of languages spoken by at least 5% of the population, using data provided by the United States Census Bureau American Community Survey.

Action S-2.1.3: Engage community organizations and community partners on an annual basis to educate and distribute emergency response and preparedness information (such as evacuation procedures, evacuation routes, emergency notification protocol, home hardening tactics, etc.) to underserved and at-risk populations.

Policy S-2.2: Develop an outreach strategy to inform the community on climate change impacts.

Action S-2.2.1: Include Alerts for High-heat Days in the City's Emergency Alerts, including instructions for location of resiliency hubs, cooling centers and self-care steps.

Action S-2.2.2: Educate those who use active transportation (bicycle and pedestrian), outdoor workers, low-income households, and seniors about heat illness prevention and treatment.



Action S-2.2.3: Partner with existing public health community outreach and engagement efforts to spread greater awareness of the impacts of climate change.

Goal S-3: Increase the City's climate resilience.

Policy S-3.1: Identify and implement strategies to reduce water demand and support community water saving measures.

Action S-3.1.1: Continue to implement water conservation provisions. Distribute educational outreach materials to spread awareness of the City's water saving programs and rebates.

Action S-3.1.2: Require the use of alternative sources of water, such as greywater, rainwater, air conditioning condensation, and foundation drainage for new development.

Policy S-3.2: Support greater resilience, redundancy, and reliability of local and regional infrastructure and services through collaboration, coordination, and implementation.

Action S-3.2.1: Assess critical facilities, including those for first responders and critical service providers to determine retrofits needed for long-term resilience to climate change-affected hazards including flooding and landslides, increased wind/storm events, an increase in high heat days, and/or wildfire.

Action S-3.2.2: Develop education and training resources for property owners and developers for implementing street trees, bioswales, understory planting, and green roofs, that provide shading, mitigate wind, tolerate drought, and resist fire, including fire resistant landscaping and street trees, and landscaped areas, as part of cooling and resilience strategies in public and private spaces. Require the addition of shade structures in public spaces.

Action S-3.2.3: Distribute information on climate change impacts to the community with adapted communications for vulnerable populations, including but not limited to actions residents can take to reduce exposure to unhealthy conditions associated with flood damaged properties, extreme heat, and poor air quality days.

Action S-3.2.4: Increase the capacity/resilience of vulnerable populations by ensuring they have a role in decision-making surrounding climate change in their communities, particularly within the Carbon Canyon and Los Serranos neighborhoods. Partner with community organizations to increase participation in community outreach events and planning efforts related to climate change planning and resilience.

Action S-3.2.5: Site new essential public facilities and infrastructure outside of High and Very High Fire Hazard Severity Zones and FEMA Flood Hazard Zones, when feasible.

Action S-3.2.6: Require alternatives to air conditioning for public facilities such as ceiling fans, air exchangers, increased insulation and low-solar-gain exterior materials to reduce peak electrical demands during high heat events to ensure reliability of the electrical grid.

Policy S-3.3: Protect energy infrastructure and increase redundancy of energy storage and distribution systems.



Action S-3.3.1: Pursue funds to establish sustainable power sources to provide redundancy and continued services for critical facilities during periods of high demand, such as extreme heat events.

Action S-3.3.2: Identify targeted and sustained funding sources to improve access to solar with battery backup to blackout –proof the homes of vulnerable populations.

Action S-3.3.3: Explore the feasibility of installing self-sufficient energy systems, such as microgrids, at city-owned facilities to minimize service disruptions during power outages triggered by a climate event.

Action S-3.3.4: Educate property owners on how to implement weatherization retrofits adequate cooling and air filtration and publicize available assistance programs.

Action S-3.3.5: Retrofit all critical facilities with adequate cooling and air filtration.

Policy S-3.4: Utilize natural and recreational open space and parks to reduce extreme heat and flood impacts.

Action S-3.4.1: Maintain the City's large contiguous greenspaces wherever possible for greater cooling magnitude and extent. Require expansion of these areas adjacent to large-scale development projects in compliance with the Land Use and Conservation Elements of the General Plan.

Action S-3.4.2: Identify opportunities to increase urban tree canopy and maintenance projects in coordination with existing efforts. Increase use of drought tolerant and native plants in landscaping.

Action S-3.4.3: Restore degraded ecosystems to enhance the natural adaptive capacity of biological communities that are vulnerable to the effects of climate change.

Action S-3.4.4: Develop an outreach program focused on vulnerable populations that provides information on staying healthy and safe before, during, and after climate hazard events.

Action S-3.4.5: Develop a program to increase tree canopy coverage in Chino Hills to contrast urban heat island effect and reduce heat inequality, focusing on areas with a tree equity score below 80, such as Los Serranos.

Policy S-3.5: Develop short-term and long-term strategies to address climate change impacts related to wildfire, extreme heat, flooding, and drought.

Action S-3.5.1: Develop a climate action plan that includes climate change projections and policies and programs to reduce impacts of climate change and address climate adaptation.

Action S-3.5.2: Incorporate climate change projections in future resource conservation plans and land use plans, including research and monitoring plans.

Action S-3.5.3: Use the most recent available data to assess climate change impacts that may affect the City, including wildfire, extreme heat, flooding, and drought.

Action S-3.5.4: Convene a climate change task force to strategize and support implementation of climate related programs.

**Goal S-4: Protect City infrastructure and facilities.**

Policy S-4.1: Continue to mitigate the risk of a cyber-attack and deter physical threats.

Action S-4.1.1: Authorize the City Information Technology Division to regularly update computer software and hardware to keep the network secure.

Action S-4.1.2: Authorize the City Facilities Division to strengthen the physical security at all City facilities by ensuring that only the proper personnel have access.

Goal S-5: Maintain a safe and efficient evacuation network.

Policy S-5.1: Ensure the Chino Valley Fire District has complete access to all locations in the city, including gated residential communities and critical infrastructure.

Action S-5.1.1: Require that all homes and businesses have visible street addressing and signage. Review the feasibility of adopting a standardized street-addressing system.

Action S-5.1.2: Ensure roads used for emergency access are properly maintained and free of obstructions.

Action S-5.1.3: Install lighting and clear signage on emergency access routes.

Action S-5.1.4: Require all gated communities and buildings to have a KNOX box or other emergency access system to ensure quick emergency response.

Policy S-5.2: Improve emergency access and evacuation capacity for neighborhoods that have a single ingress/egress.

Action S-5.2.1: Develop and deploy evacuation and/or alternative emergency access route alternatives for single-access neighborhoods.

Action S-5.2.2: Designate and publicize evacuation routes for individual neighborhoods; including existing pedestrian pathways.

Action S-5.2.3: Instruct residents to take only one or two vehicles (based on household size) to reduce the number of evacuating vehicles. Offer offsite parking facilities to safely store secondary vehicles in advance of an emergency event.

Action S-5.2.4: Implement early evacuations under high-risk conditions for vulnerable communities with limited egress routes, including single-access neighborhoods.

Policy S-5.3: Prioritize engagement with single access neighborhoods and high wildfire risk areas, including education on home retrofits, meeting current standards on structure hardening and road standards, proactively enforcing defensible space standards, and conducting emergency preparedness trainings.

Action S-5.3.1: Conduct targeted evacuation outreach and communication for single-access neighborhoods and neighborhoods in the Fire Hazard Overlay District to educate residents on their evacuation zone, nearby emergency shelters, and plan evacuation routes. Outreach and communication should include in-person, print, and digital outreach methods and should utilize



available neighborhood-specific communication methods, including homeowners associations, Nextdoor, Ring Neighborhoods, school notification systems, etc.).

Action S-5.3.2: Educate and inform residents in single-access communities to maintain emergency supplies for at least 3 – 10 days.

Action S-5.3.3: In coordination with the Chino Valley Fire District and Chino Hills Police Department/San Bernardino County Sheriff's Department, conduct regular evacuation trainings with single-access community homeowner associations and residents.

Action S-5.3.4: Maintain critical evacuation routes and emergency vehicle access.

Policy S-5.4: Increase evacuation capacity and efficiency throughout the city.

Action S-5.4.1: As part of updating and maintaining the Emergency Operations Plan, analyze the feasibility of implementing the following traffic management strategies to increase evacuation capacity and efficiency:

- Reverse one or more lanes of highway to accommodate an increased flow of traffic in one direction.
- Redirect all lanes of a designated evacuation route to accommodate rapid evacuation from a city or region.
- Temporarily close inbound travel lanes on selected unlimited access arterials (such as parkways and boulevards) to allow outbound traffic to utilize these lanes during evacuation.
- Close inbound lanes on highways utilized for evacuation routes to prevent drivers on these routes from entering the city while evacuation is underway.
- Minimize left-turn movements along evacuation routes and on roads leading to evacuation routes.
- Increase the green time and/or progression band for through movements leading out of an evacuation zone.
- Install signal battery backups in case signal operations need to be maintained during a power outage.
- Develop a plan for using channeling devices, static signs, and coning strategies to manage intersection flow during power outage if the signals lack power.
- Determine how to stage tow trucks at bottleneck locations along evacuation routes to help detect and clear minor crashes and maintain traffic flows.
- Prioritize adding additional access to communities which are currently served by only one or two access points.
- Develop transportation solutions such as the use of a bus system for evacuating individuals with special needs (such as those with mobility limitations) and/or evacuating larger groups of people in fewer vehicles.
- Establish traffic control points (i.e., locations along designated evacuation routes with emergency management personnel) to maintain a greater degree of evacuation



management. These locations could enhance the efficiency of an evacuation, reduce public confusion, and allow increased operational flexibility during an evacuation.

Policy S-5.5: Improve evacuation communication protocols among local agencies, organizations and the general public.

Action S-5.5.1: Strengthen and maintain communication among coordinating emergency event agencies. This could be achieved through systems such as the Public Information Emergency System and Emergency Satellite Communications.

Action S-5.5.2: Use variable message board equipment and targeted installation of permanent dynamic message signs on evacuation routes to improve communication and reduce public confusion.

Action S-5.5.3: Implement a traffic control center to coordinate all evacuation activities. This center would have up to the minute reports on traffic patterns and can communicate directly with emergency officers via broadcast media, social media, and other emergency communications channels (e.g., County Telephone Emergency Notification System and San Bernardino Ready App) to let drivers know about roadway congestion and conditions and direct them to alternate routes.

Action S-5.5.4: Install traffic counters and/or CCTV cameras on freeways, which can help assess traffic flow, volume of vehicles evacuating, and monitor incidents during emergency evacuation events.

Action S-5.5.5: Implement highway advisory radio to provide information regarding primary and secondary evacuation routes and incidents to the public.

Action S-5.5.6: Consider implementing a system of pre-defined evacuation zones. Pre-defined evacuation zones can provide a common reference system for first responders and the community.

Policy S-5.6: Maintain and update the City's Evacuation Plan, in conjunction with the Emergency Operations Plan, at minimum every eight years.

Action S-5.6.1: Establish minimum standards for evacuation and emergency vehicle access to and from new or planned development, including regulations for weight and vertical clearance, dead-end, one-way, and single-lane conditions.

Policy S-5.7: Ensure well-maintained evacuation routes that are clear of obstruction.

Action S-5.7.1: Prioritize Capital Improvement Program (CIP) projects for roadways that serve as evacuation routes or require roadway improvements to better function in the event of an evacuation.

Action S-5.7.2: Require new development to provide adequate access (ingress, egress) and a minimum of two roadways with widths and lengths in compliance with California Building Code Chapter 7A requirements.



Action S-5.7.3: Maintain evacuation roadways and shoulders to clear them of trees, vegetation, and debris that would block travel lanes and shoulders for evacuating and emergency operation vehicles.

Policy S-5.8: Coordinate with specialized organizations such as hospitals, medical associations, public service organizations, public health staff, and other providers or community groups to provide evacuation assistance to vulnerable populations.

Action S-5.8.1: Incorporate the following considerations that vulnerable populations may require during evacuation planning and outreach efforts:

- Tailor evacuation outreach and communication protocols for those who are visually or hearing impaired, taking in to consideration that people who are blind or partially sighted may depend on their guide dogs and/or others to lead them to safety and that people with hearing difficulties may require special arrangements to receive evacuation warnings, such as visual aids and maps.
- Partner with neighboring cities/private/non-profit agencies to provide adequate paratransit services for those who are mobility impaired.
- Publicize evacuation methods for people without vehicles, including emphasizing the importance of carpooling with neighbors or other community members and providing information on transit routes and transit stops.
- Provide bilingual or multilingual materials to support communication with non-English speaking populations during evacuation.
- Communicate in advance the location and availability of hospitals or facilities with emergency/life-sustaining medical equipment such as a dialysis machine.
- Arrange for food, shelter, and transportation for unhoused (homeless) population. Offer age-appropriate emergency and evacuation information to homeless children.

Action S-5.8.2: Identify areas of the city with a greater percentage of senior adults, persons with a disability, mobility impaired, and people with medical conditions, and people without vehicles.

Policy S-5.9: Develop and maintain a database of households with special evacuation needs. Ensure the database is accessible to emergency operation centers, including in the event of loss of internet or power.

Action S-5.9.1: Partner with Community Connect and other local service providers and advocacy organizations to help identify and document households with special evacuation needs.

Policy S-5.10: Coordinate with Chino Valley Unified School District on their evacuation plans and protocols.

Action S-5.10.1: Identify evacuation routes from school campuses to designated emergency centers.

Action S-5.10.2: Encourage regular evacuation trainings with School District personnel.

Action S-5.10.3: Update the City's Emergency Operations Plan to incorporate school evacuations into the City's evacuation plan.



Action S-5.10.4: Work with School District personnel to disseminate information on evacuation procedures and evacuation routes to students and their families.

Policy S-5.11: Establish evacuation procedures for households with large pets that include clear guidelines on when and how large animals should be evacuated in the event of a disaster.

Action S-5.11.1: Designate evacuation routes for large animals and identify facilities that can serve as temporary shelters for large animals.

Action S-5.11.2: Prepare mobile veterinary teams that can provide emergency care in the event of an emergency requiring evacuation

Action S-5.11.3: Develop a large animal registration system to distribute evacuation information and evacuation orders for large animal owners.

Goal S-6: Protect the Community from Geologic Hazards

Policy S-6.1: Regulate development in high-risk seismic, landslide and liquefaction hazard areas to avoid exposure to hazards.

Action S-6.1.1: Observe prudent land use planning in the Fault Hazard Zone delineated for the Chino Fault, restricting high occupancy and emergency operation facilities and limiting residential development.

Action S-6.1.2: Conduct site-specific studies on soils, seismicity, and groundwater conditions to evaluate the potential for liquefaction and related ground failure phenomena in canyon floors and the alluvial flatlands.

Action S-6.1.3: Regulate development of utility structures over 100 feet in height in geologic hazard areas adjacent to existing or planned sensitive land uses.

Action S-6.1.4: Continue to regularly update Building Codes to provide for seismic safety design.

Action S-6.1.5: Support and educate property owners on seismic retrofitting and strengthening of existing facilities to minimize damage in the event of seismic or geologic hazards.

Action S-6.1.6: Discourage any grading beyond that necessary to create adequate and stable building pads.

Action S-6.1.7: Require all development to conform to the grading guidelines contained in the City Development Code.

Action S-6.1.8: Require fault zones to be clearly identified on tract and parcel maps to increase public awareness of fault rupture hazards.

Action S-6.1.9: Within geologic hazard overlay areas, require developments to minimize landscape irrigation.

Action S-6.1.10: Require new development to minimize peak runoff as required by the Municipal Code.



Goal S-7: Goal S-3: Protect the Community from Flooding Hazards

Policy S-7.1: Restrict development in areas prone to flooding or within dam inundation areas.

Action S-7.1.1: Prohibit development of residential, commercial, industrial, and emergency facilities in the 100-year flood plain and on canyon floors.

Action S-7.1.2: Discourage development of emergency facilities in dam inundation areas.

Action S-7.1.3: Coordinate with the U.S. Army Corps of Engineers and the San Bernardino County Flood Control and Water Conservation District to keep current on Prado Dam Basin conditions and plans.

Action S-7.1.4: Provide accurate and up-to-date maps of areas exposed to 100-year and 500-year flood hazards, based on National Flood Insurance Program criteria.

Policy S-7.2: Maintain adequate flood control facilities.

Action S-7.2.1: Maintain and implement the City Master Drainage Plan.

Action S-7.2.2: Require that the potential environmental drainage impacts of new construction be assessed and mitigated, including impacts that privately owned and operated storm drains adjacent to slopes and canyon areas would have on City and County-maintained drains.

Action S-7.2.3: Review individual project designs to ensure that proposed drainage facilities will be properly linked with community-wide drainage facilities.

Action S-7.2.4: Action S-3.2.4: Coordinate the construction of a comprehensive storm drain system with individual projects in the General Plan area to ensure that all new development will be adequately protected from flooding prior to completion of the backbone system.

Action S-7.2.5: Maintain a schedule for funding of all flood control backbone facilities, including phasing.

Action S-7.2.6: Require property owners to install and maintain storm drains on their properties as necessary to address drainage related to their property

Action S-7.2.7: Strengthen storm drain maintenance district to prevent local flooding, and to prevent mud and debris flows from overtaxing storm drains during strong storms.

Action S-7.2.8: Require measures to be undertaken to control runoff from construction sites.

Action S-7.2.9: Require prompt revegetation and/or construction of newly graded sites to control erosion.

Action S-7.2.10: Limit grading operations during the rainy season.

Action S-7.2.11: Review individual project designs to ensure the stability of slopes adjacent to flood control facilities, which could be blocked due to slope failures.

Goal S-8: Minimize the Risk from Fire Hazards

Policy S-8.1: Actively collaborate with regional, state and federal fire agencies to coordinate and implement wildfire mitigation measures and fuel load modifications reduction zones, including load



clearing, prescribed burns, fire breaks, livestock grazing, and public and private road clearance and other mitigation activities for areas proximal to the city.

Policy S-8.2: Maintain the water distribution system to deliver the fire flow requirements set in the City adopted Fire Code.

Action S-8.2.1: Ensure adequate fire flow capabilities in the Los Serranos and Carbon Canyon areas, and other sections of the City where deficiencies may occur.

Action S-8.2.2: Replace and upgrade old cast-iron pipelines and/or inadequately sized water mains when street improvements are made.

Action S-8.2.3: Provide for redundant emergency distribution pipelines in areas of potential ground failure or where deemed necessary by the Fire District and City.

Policy S-8.3: Continue to reduce fire risk through City development and operation policies.

Action S-8.3.1: Continue to implement and enforce fuel modification zones.

Action S-8.3.2: Educate residents on how to plant and maintain fire-retardant slope cover to reduce the risk of brush fire in areas adjacent to canyons.

Action S-8.3.3: Continue to provide for public education programs to enhance public awareness of fire safety, including the storage of flammable materials, use of fire-retardant building materials, and vegetation management in the perimeter of structures.

Action S-8.3.4: Coordinate with the Fire District to maintain and update mutual aid agreements with fire agencies from adjacent cities and counties.

Action S-8.3.5: Work with the Fire District to enforce all existing codes and ordinances regarding fire protection, building inspection, and vegetation management.

Action S-8.3.6: Coordinate with Chino Valley Fire District and State Fire Marshall personnel to provide and maintain two points of emergency evacuation, as required by SB 99.

Action S-8.3.7: Coordinate with Southern California Edison to implement an electrical undergrounding plan with a focus on critical evacuation roadways and areas with highest wildfire risk.

Action S-8.3.8: Provide education and training on home hardening strategies and home retrofits to meet current building standards and road standards and proactively enforce defensible space standards.

Action S-8.3.9: Prohibit new and/or intensification of existing general assembly uses in Very High Fire Hazard Severity Zones unless it is determined that there is sufficient secondary egress and that adjoining major highways and street networks are sufficient for evacuation, as well as safe access for emergency responders under a range of emergency scenarios.

Action S-8.3.10: Establish fire-smart landscaping standards to increase wildfire resistance for landscaping, such as:



- Develop a list of approved fire-safe plants that can be used in landscaping in the Fire Hazard Overlay District, High and Very High Fire Hazard Severity Zones.
- Publish guidelines for strategic placement of fire-safe plants and vegetation maintenance to minimize fire risk.
- Develop vertical clearance standards for landscaping and street trees.

Action S-8.3.11: Develop fuel modification plans for all new developments in SRAs and VHFHSZs.

Action S-8.3.12: Support implementation of recommended projects in the Carbon Canyon CWPP.

Action S-8.3.13: Require fire protection plans for all new development in VHFHSZs.

Policy S-8.4: Conduct comprehensive post-wildfire assessments for fire-damaged areas to reevaluate redevelopment after a large fire.

Goal S-9: Goal S-5: Minimize the Risk from Hazardous Materials

Policy S-9.1: Minimize risk to life and property from production, use, and storage of hazardous materials and waste.

Action S-9.1.1: Continue to enforce Fire and Building Code provisions regarding secondary containment; segregation of chemicals to reduce reactivity during a release; sprinkler and alarm systems; and monitoring, venting, and automatic shut-off systems on all new developments.

Action S-9.1.2: Continue to require businesses that use, store, or generate hazardous materials to annually notify the San Bernardino County Department of Environmental Health Services or appropriate County agency, and to comply with applicable regulations.

Policy S-9.2: Control the transportation of toxic, explosive, and other hazardous materials.

Action S-9.2.1: Require business owners to follow designated hazardous materials transportation routes.

Action S-9.2.2: Coordinate with adjacent jurisdictions to maintain regional objectives for hazardous materials management.

Action S-9.2.3: Regulate and limit the transport of vehicles carrying hazardous materials through the City.

Action S-9.2.4: Support annual checks for leaks of high pressure fuel and natural gas transmission lines.

Policy S-9.3: Monitor and enforce regulations to ensure adequate clean-up of hazardous materials and waste.

Action S-9.3.1: Require all new developments occurring within areas previously utilized for oil production to mitigate any hazards associated with the oil fields.

Action S-9.3.2: Confirm that oil and gas wells in areas proposed for development are abandoned to current standards set by the State.



Action S-9.3.3: Confirm that existing toxics are contained, removed, and/or remediated as required by applicable federal and state standards.