1. SAFETY

Overview

The Safety Element provides the framework to reduce risks associated with a range of environmental and human-caused hazards that may pose a risk to life and property in Brentwood. Inclusion of the Safety Element in the General Plan is required by state law.

While the city's land, hillsides, and waterways are assets to the community, these features can present risks due to flood, geologic, and seismic hazards. In addition, human-caused risks, such as hazardous materials, can pose risks to community health and safety. Effective planning to prepare for and mitigate the adverse effects of these risks can help ensure that Brentwood maintains a high level of safety for its residents. The Safety Element includes goals, policies, and actions to protect residents, businesses, visitors, and land uses from hazards, and includes the following topics:

- Seismic and Geologic Hazards
- Flooding Hazards and Flood Protection
- Fire Hazards and Fire Protection
- Emergency Response and Disaster Preparedness
- Hazardous Materials
- Water Supply

Seismic and Geological Hazards

Diverse geological foundations, proximity to faults, and topographic differences are one of the many factors that can lead to a seismic and geological hazard occurring within the City. Brentwood is diverse geologically, as a result of the seismic setting of the surrounding region and the effects of climate. The geology of the region is controlled by major active faults in the Coast Range to the west and by the alluvial deposits and sediments from the Sacramento-San Joaquin River Delta to the north and east. Upper Cretaceous marine sedimentary rocks, Eocene marine sedimentary rocks, and Quaternary Marine/Alluvium make up the City's geological foundation.

While there are no known active faults located within City boundaries, there are numerous faults located in the regional vicinity, as seen in **Figure 1**. These faults include the Davis Fault and the Greenville-Marsh Creek Fault. The Davis Fault, also known as the Antioch Fault, is located along the western boundary of the City. The fault is classified as a Class A fault, which means that geologic evidence demonstrates the existence of a Quaternary fault. Quaternary faults are faults that have been recognized at the surface and that have moved in the past 1.6 million years. This does not necessarily mean that this fault is active. The Antioch fault was previously considered active and was zoned under the Alquist-Priolo Act as potentially capable of surface rupture. However, recent studies have indicated that the fault is not active and does not pose a surface-faulting hazard. The Greenville-Marsh Creek fault produced a moderate magnitude earthquake in 1980 and the recurrence interval is estimated to be about 550 years. This fault is located approximately eight miles south/southwest of Brentwood. The City's proximity to seismic faults makes it susceptible to geologic and seismic hazards, including expansive soils, subsidence, liquefaction, and landslides.

Seismic hazards include both rupture (surface and subsurface) along active faults and ground shaking, which can occur over wider areas. Ground shaking, produced by various tectonic phenomena, is the principal

source of seismic hazards in areas devoid of active faults. The Significant United States Earthquakes 1568-2009 data published by the USGS identified earthquakes that caused deaths, property damage, or geologic effects or were felt by populations near the epicenter. No significant earthquakes were documented in the region. The City could be subject to major earthquakes along currently inactive or unrecognized faults. For example, the 1983 Coalinga Quake was a 6.5 magnitude earthquake caused by an unknown fault.

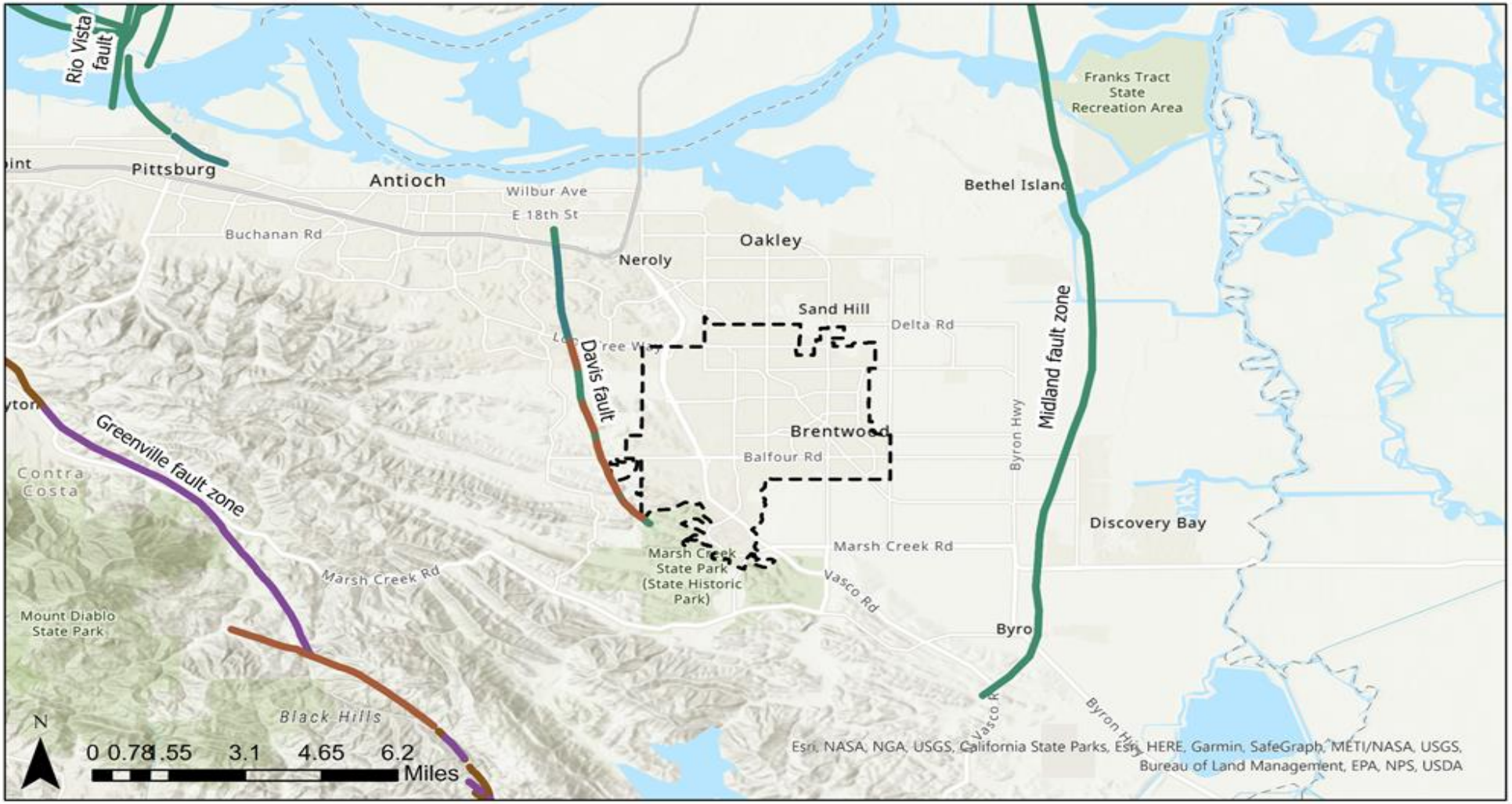
There are no Alquist-Priolo Earthquake Fault Zones within Brentwood. However, the Greenville-Marsh Creek fault, located eight miles south/southwest of the City, and the Calaveras fault, located 17 miles southwest, are designated as Alquist-Priolo Fault Zones. Due to region's overall seismic risk, the City takes precautions against seismic and geologic hazards as noted in the City's safety goals, policies, and actions.

Liquefaction and Landslide Hazards

Liquefaction is one of the most destructive secondary effects of seismic shaking. According to USGS, liquefaction takes place when loosely packed, water-logged sediments at or near the ground surface lose their strength in response to strong ground shaking. Liquefaction occurring beneath buildings and other structures can cause major damage during earthquakes. It occurs primarily on saturated and loose, fine to medium grained soils, in areas where the groundwater table is fifty feet or less below the surface. In general, according to the United States Department of Agriculture (USDA) Natural Resources Conservation Service, the City is predominately underlain by sediments and recent alluvium. The soils that make up the City are detailed in the General Plan Existing Conditions Report – Conservation and Natural Resources. According to USGS, liquefaction zones identify where the stability of foundation soils must be investigated, and countermeasures undertaken in the design and construction of buildings for human occupancy. **Figure 2** illustrates the liquefaction zones and area susceptibility within and around Brentwood. The City includes policies and actions that address safety and development for areas built in seismic and geologically hazardous zones, such as areas that are moderately, highly, or very highly susceptible to liquefaction.

Landslides are often associated with earthquakes, but other factors may also influence their occurrence, including slope, moisture content of the soil, and composition of the subsurface geology. The potential for landslides increases with vegetation loss from wildland fires or droughts. **Figure 3** shows areas that are more susceptible to landslides (landslide zones) according to the California Department of Conservation. The majority of landslide zones are located in areas of higher topography, such as Marsh Creek State Park. Heavy rains or improper grading may trigger a landslide. Given the relatively level slopes throughout the majority of the City, the landslide potential is low. The landslide potential increases in hilly terrain towards the west and south. Historical events of landslides and liquefaction can be found in the Contra Costa County Local Hazard Mitigation Plan (LHMP). The County's LHMP details events relevant to Brentwood, such as the mudslide event in 2017 that caused the Contra Costa Water District waterline to break.

Liquefaction and landslide hazards can be attributed to factors such as expansive soils and subsidence hazards. Expansive soils are soils that expand when exposed to water. Such expansion can cause structural damage to foundations and roads without properly maintained structural engineering. There are a variety of geotechnical strategies, such as groundwater management, surface water control, and development requirements that can be implemented to mitigate the potential for landslides and liquefaction.



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City of Brentwood

City Boundary

Fault Type

latest Quaternary Moderately Constrained

latest Quaternary Well Constrained

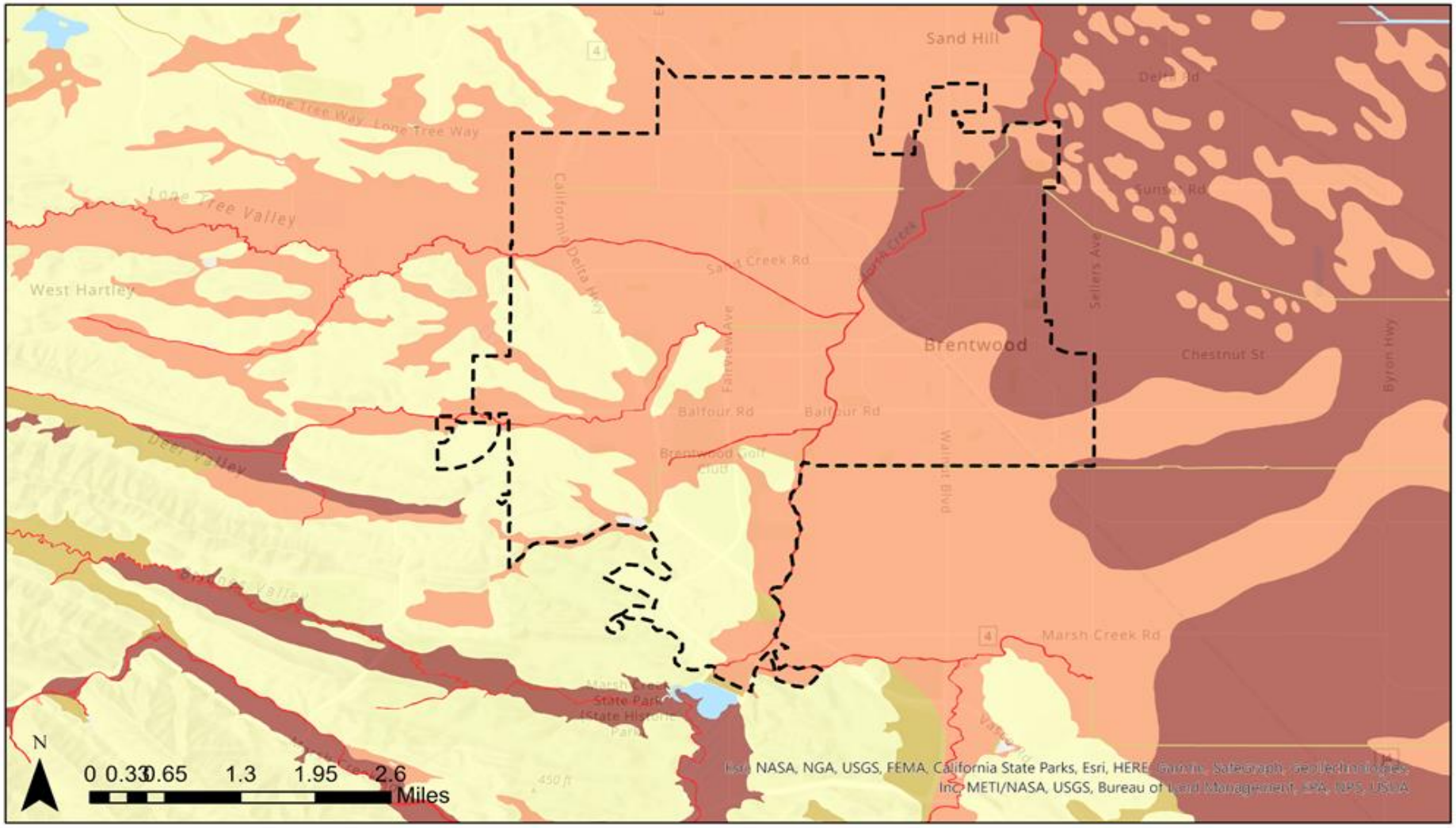
undifferentiated Quaternary Inferred

undifferentiated Quaternary Moderately Constrained

undifferentiated Quaternary Well Constrained

Figure 1 – Fault Map

Source: USGS Geologic Hazards Science Center



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City of Brentwood

City Boundary

USGS Liquefaction Susceptibility

Very high

High

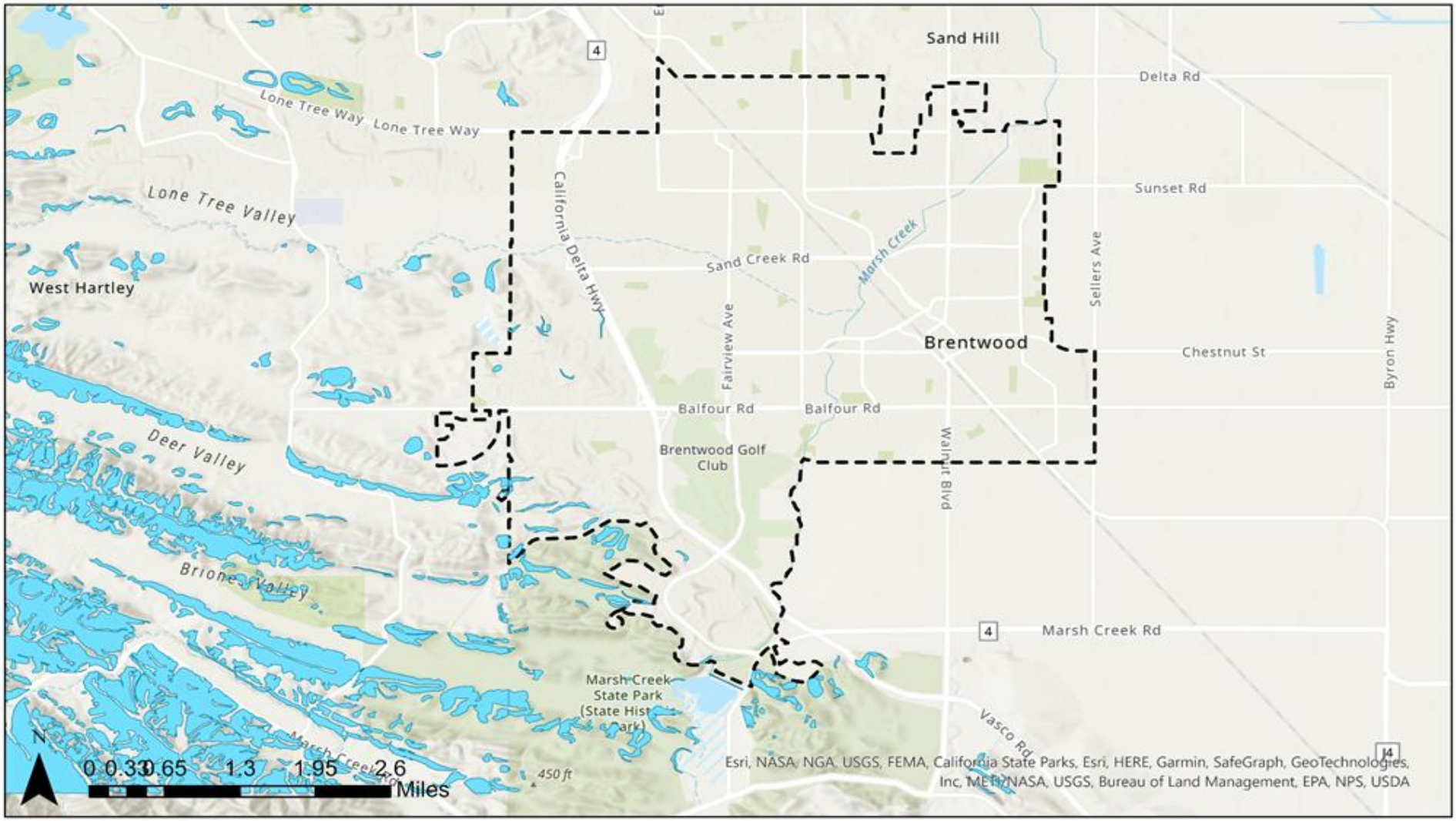
Moderate

Low

Very low

Figure 2 – Liquefaction Zones

Source: USGS, CA Department of Conservation – California Geological Survey



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City of Brentwood

City Boundary

CA Dept. of Conservation

Landslide Zones

Figure 3 – Landslide Zones

Source: USGS, CA Department of Conservation – California Geological Survey

Flood Hazards and Flood Protection

The Federal Emergency Management Agency (FEMA) defines flooding to be a general or temporary condition of partial or complete inundation of two or more acres of normally dry land or of two or more properties. Flooding can occur from an overflow of inland or tidal waters, unusual and rapid accumulation or runoff of surface waters, mudslides, and collapse or subsidence of land along a body of water as a result of erosion. Flash floods are an example of what results from large and intense rainfalls that occur over short periods of time. Brentwood is subject to flooding along natural creeks and drainages that traverse the City. Marsh Creek, Dry Creek, Deer Creek, and Sand Creek are prominent drainages that are prone to flooding. The 100-year flood plain is largely confined to the drainage channels along these creeks, except along Marsh Creek starting near Dainty Avenue and extending northeast towards city boundaries. In this area, the 100-year and 500-year flood plain extends onto properties that are located immediately adjacent to this drainage.

Historically, east Contra Costa County experienced flooding in the 1930s, 1940s, and 1950s. Many of the homes and farmlands in this area were built in low-lying areas and were significantly damaged in 1951. As a result, the Contra Costa County Flood and Water Conservation District ("District") was formed to provide flood protection to the region.

In the United States, the responsibility for managing flood risks is shared across federal, state, and local government agencies and the private sector. The Central Valley Flood Protection Board (CVFPB) is the state regulatory agency responsible for ensuring that appropriate standards are met for the construction, maintenance, and protection of the flood control system. CVFPB issues encroachment permits and works with other agencies to improve flood protection structure, enforces removal of problematic encroachments, and keeps watch over the flood management system. According to the CVFPB Best Available Maps tool, there are no CVFPB floodways within or in close proximity to the City.

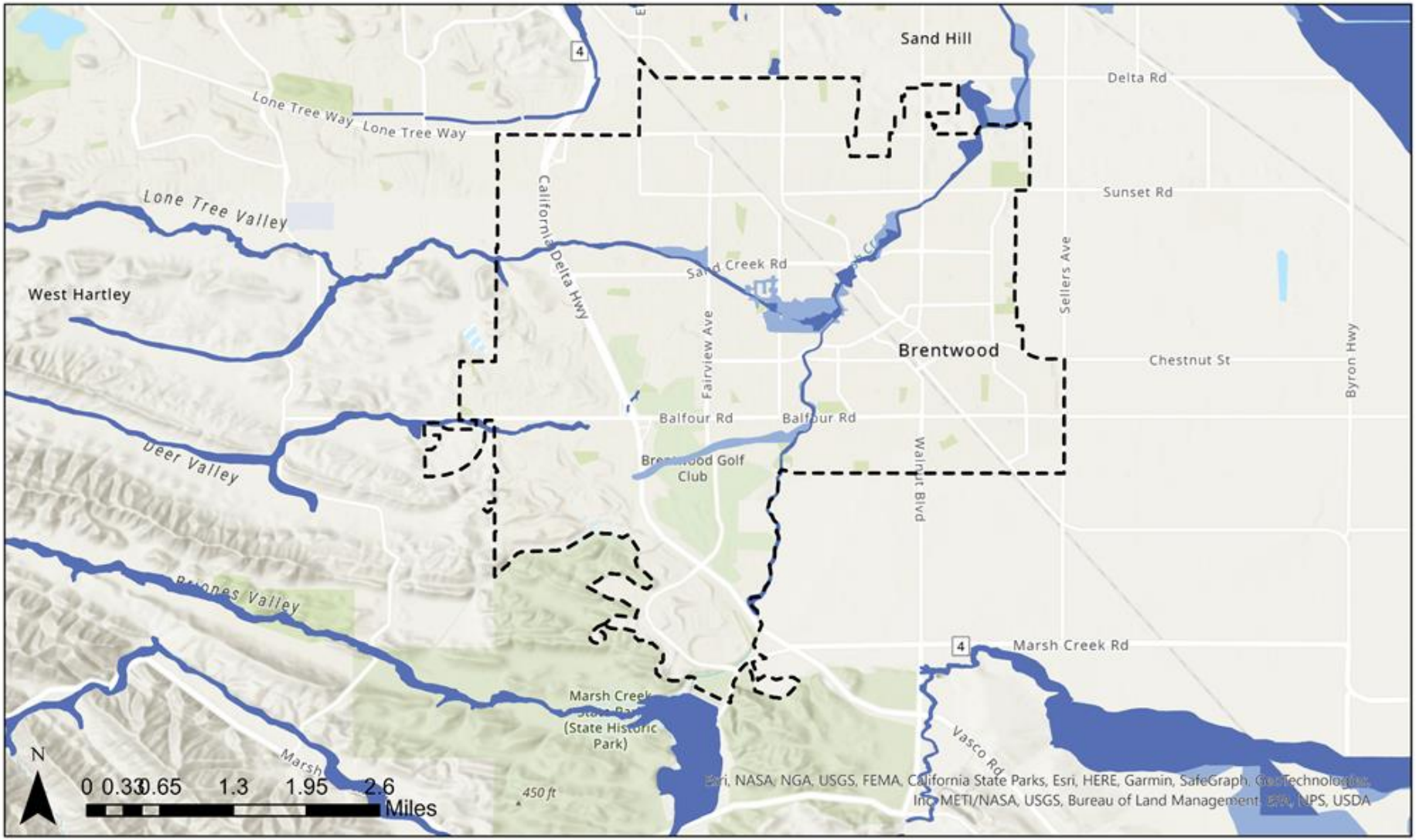
The U.S. Army Corps of Engineers (USACE) established the Flood Risk Management Program (FRMP), which provides current and accurate floodplain information by identifying and assessing flood hazards, improving public awareness and comprehension of flood hazards and risk, and integrating flood damage and flood hazard programs across federal, state, and local agencies. As part of the program, the National Flood Insurance Program, operated by the Federal Emergency Management Agency (FEMA), defines floodplain and floodway boundaries that are shown on Flood Insurance Rate Maps (FIRMs). Flood insurance rates are based on FEMA designations of flood zones. FEMA's website includes a Flood Map Service Center where residents can search what FIRM panel their address belongs to. The majority of Brentwood is located within the following FIRM panels: 06013C0353F, 06013C0354G, 06013C0361F, and 06013C0362G. Standard practice is to avoid or restrict construction within 100-year flood zones, or to engage in flood-proofing techniques such as elevating building pads or constructing walls, dams, and levees. Portions of the City of Brentwood are located within a 100-year flood plain, primarily in the parts of the City along Marsh Creek and Sand Creek. These areas are more prone to flooding. **Figure 4** shows the 100-year and 500-year flood zones in Brentwood. According to USACE, there are no 200-year floodplains located within the City. The closest 200-year floodplain is located at Sherman Island to the north. Therefore, there are no 200-year floodplain maps available for Brentwood.

Levee and Dam Inundation

Levees are man-made structures, usually earthen embankments, designed and constructed to contain, control, or divert a flow of water in order to protect land from peak flood levels or to protect land that is below sea level. Levee failures, also known as breaches, occur when part of a levee breaks away, leaving a large opening for water to flood the land protected by the levee. The State Department of Water Resources makes flood risk maps based on levees available online. Levee Flood Protection Zones estimate the maximum area that may be flooded if a state-federal levee fails at maximum capacity. According to the Levee Flood Protection Zone maps, Brentwood is not in a Levee Flood Protection Zone. Therefore, there are no Levee Flood Protection Zone Maps for the City. The U.S. Army Corps of Engineers operates, maintains, and evaluates flood protection levees. According to the County LHMP, there are two types of levees present in the Sacramento-San Joaquin River Delta area of Contra Costa County. This includes levees that are part of an authorized federal flood control project on the Sacramento-San Joaquin River Delta systems that deliver irrigation and drinking water. These are designated as "project" levees. All other levees in the Delta are "non-

project" or "local" levees, which are maintained by local reclamation districts.

A dam is an artificial barrier that has the ability to store water, wastewater, or liquid-borne materials for reasons such as flood control, human water supply, irrigation, energy generation, or pollution control. Dam failures typically occur when spillway capacity is inadequate and excess flow overtops the dam, or when internal erosion through the dam or foundation occurs. Dam failure may also result when water retention structures fail due causes such as earthquakes, rapidly rising floodwaters, and structural design flaws. Inundation, defined as flooding, can cause significant impact including loss of life and critical infrastructure. Since 1929, the state has regulated dams to prevent failure, safeguard life, and protect property. The California Water Code entrusts dam safety regulatory power to the Department of Water Resources – Division of Safety of Dams (DSOD). The DSOD provides oversight to the design, construction, and maintenance of over 1,200 jurisdictional dams in California. The Department of Water Resources has jurisdictional dam failure inundation maps and data available on the DSOD website. According to the Dam Breach Inundation Map Web Publisher, there are five dams with approved inundation boundaries in proximity to the City. Marsh Creek, Dry Creek, Deer Creek, Upper Sand Detention Basin, and Antioch Reservoir are located to the west of city boundaries. Marsh Creek runs through the City towards Marsh Creek Reservoir. Based on data from the DSOD, **Figure 5** illustrates the inundation potential if dams and levees in Contra Costa County were to fail. The City continues to work with state and local agencies, such as the Contra Costa County Flood Control and Water Conservation District to continue efforts to reduce flooding potential. Efforts include policies and actions that focus on adequate erosion control measures, flood control infrastructure maintenance, and flood hazard mitigation development standards.



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City of Brentwood

City Boundary

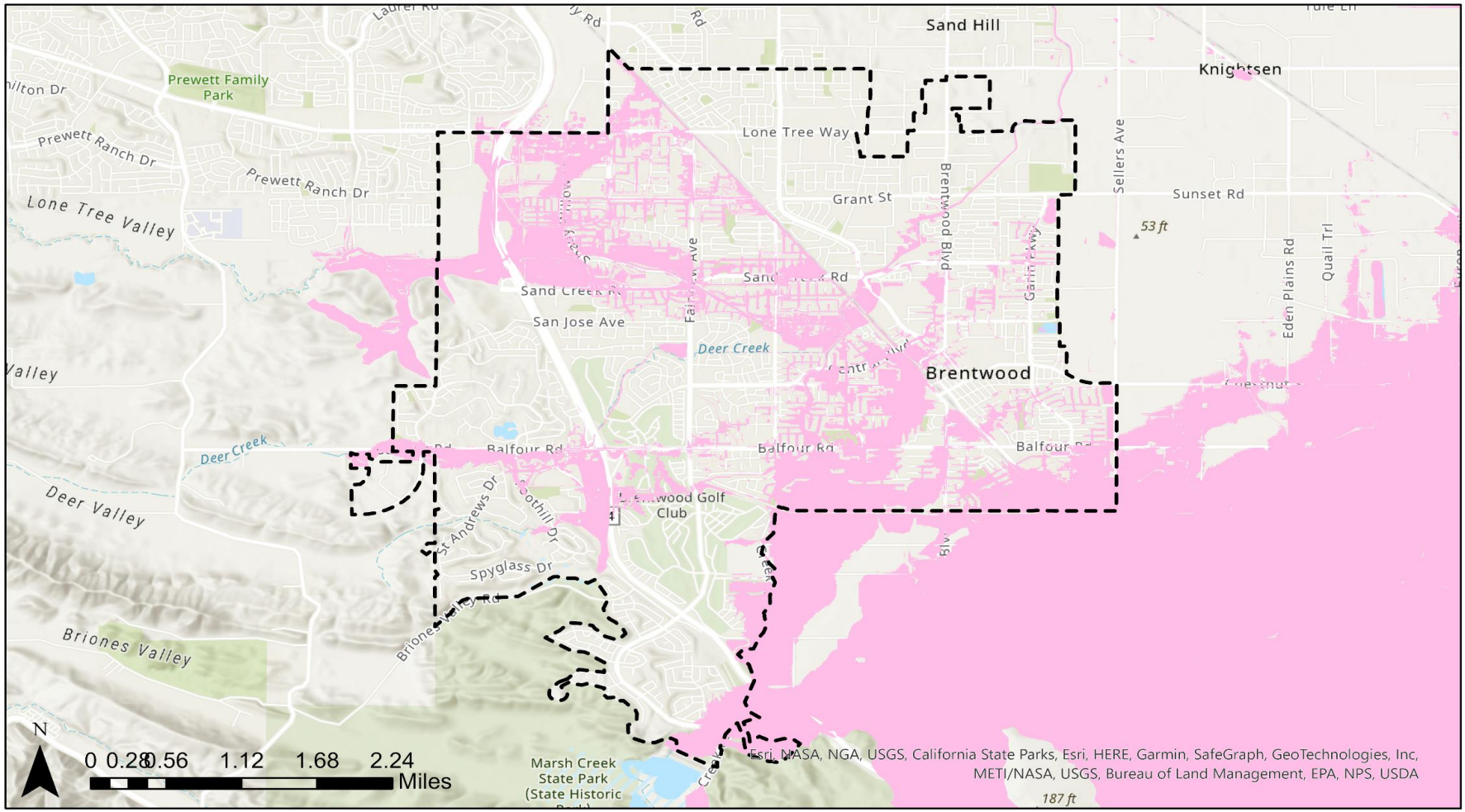
FEMA Flood Hazard Zones

100 Year

500 Year

Figure 4 – Flood Hazard Zones

Source: FEMA



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City of Brentwood

City Boundary

2023 Dept. of Water Resources

Inundation Potential

Figure 5 – Inundation Potential Hazard Zones
Source: Department of Water Resources

Fire Hazards and Fire Protection

Wildland Fires and Urban Fires

The County of Contra Costa defines a wildland fire as any uncontrolled fire occurring on undeveloped land that requires fire suppression. Wildland fires present a considerable hazard to life and property in areas of Brentwood that are built within or adjacent to hillsides and mountainous areas commonly referred to as the Wildland-Urban Interface (WUI). Because of their distance from firefighting resources, wildland fires can be difficult to contain and can cause lasting destruction. Short-term loss caused by a wildland fire can include the destruction of timber, wildlife habitat, structures, and watersheds. Long-term effects can include reduced access to affected recreational areas, and destruction of cultural and economic resources and community infrastructure. The City's WUI includes neighborhoods near rolling hills, native grasses, oak trees and fruit orchards, and golf courses. According to United States Geological Survey (USGS), wildland fires can significantly alter the hydrologic response of a watershed to the extent that even modest rainstorms can produce dangerous flash floods and debris flow, and water quality within and downstream from a burn area may be significantly impacted. To help predict and manage potential impacts burns may have, USGS has map tools, such as the Intterra National Fire Situation Map and the California Wildfire Perimeters and Prescribed Burns Map, available to the public.

Fires could also ignite in urbanized areas of the City because of a wildland fire, earthquake, or some other phenomena. A disruption in the water system, causing a reduction in hydrant pressures, could allow a normally controllable fire to escape containment by firefighting forces and spread to adjoining buildings; or a fire that starts in the flatlands in severe winds might cause spot fires with flying embers and ignite other buildings downwind by igniting wood roofs or vegetation.

Many factors contribute to an urban fire's severity and extent, but modern building codes and practices aim to reduce the impact of fires. Some examples are provided below:

- California Building Code Chapter 7A (Materials and Construction Methods for Exterior Wildfire Exposure): provides standards intended to prevent the ignition of structures from wildland fire exposure, including building standards related to roof assemblies and materials, windows, siding, decks, and eave vents.

- Contra Costa County Ordinance 2016-23, Chapter 3 (General Precautions Against Fires): provides for landscaping/vegetation management requirements to reduce and/or prevent the spread of wildland fires.

- Contra Costa County Ordinance 2019-37, Chapter 6 (Building Services and Systems): provides for use of spark arresters on chimneys when utilizing solid or liquid fuel in a fireplace or heating appliances.

CAL Fire lists major fire history by county on its website. According to CAL Fire, since 2016, Contra Costa County has had 33 fires that were at least 15 acres in size with the largest fire outbreak being Willow Fire at 370 acres burned in 2017. In 2022, Contra Costa County Fire Protection District (CCCFPD) responded to 2,080 exterior fires County-wide, 56 of which were located in the City of Brentwood. In 2023, CCCFPD responded to 2,072 exterior fires, 82 of which were located in the City of Brentwood, resulting in a 33% increase in call volume since 2021. This trend is expected to continue (49,929 calls in 2021, 61,133 calls in 2022, and 66,406 calls in 2023), where 46% of the total calls (30,561) were for rescue and EMS services. Local fire incident information is published on the CCCFPD website. The CCCFPD also includes an online public records request for more details on local fire incident reports.

Fire Responsibility

Fire Severity Zones

The entire City is located within a Local Responsibility Area (LRA), which is under local jurisdiction protection. CCCFPD is responsible for fire protection in Brentwood. Areas outside the City are within the State

Responsibility Area (SRA), which is under CAL Fire jurisdiction. In 2023, CAL Fire adopted updated Fire Hazard Severity Zone (FHSZ) maps for SRAs. These maps and related regulations were approved by the Office of Administrative Law. A FHSZ is a mapped area that designate zones based on factors such as fuel, slope, and fire weather. According to CAL Fire, FHSZ maps evaluate wildland fire hazards, which are physical conditions that create a likelihood that an area will burn over a 30-to-50-year period. Jurisdictions can fall under any of three Fire Hazard Severity Zones: Moderate, High, and Very High. These zones influence how people construct buildings and protect property to reduce risk associated with wildland fires and urban fires.

Per AB 337, local fire prevention authorities and CAL Fire are required to identify Very High Fire Hazard Severity Zones (VHFHSZ) in LRAs. Standards related to brush clearance and the use of fire-resistant materials in FHSZs are also established. The City adopted the 2022 California Building Code, which requires in Chapter 7A that buildings constructed in areas identified as VHFHSZ must be built using fire-resistive features to prevent the ignition of structures from wildland fire. The building standards relate to roof assemblies and materials, windows, sidings, decks, and eave vents, all of which are prone to ignition from burning embers. As depicted in **Figure 6**, there are no areas within Brentwood that are designated as a VHFHSZ. However, areas to the west of Brentwood have Moderate, High, or Very High designations. Areas such as Deer Valley, Black Diamond Mines Regional Park, and Mt Diablo are regions in proximity to the City that feature vegetation, slopes, and terrain that could lead to potential fire hazards for Brentwood residents. Changes in landscaping techniques, vegetation choices, defensible space initiatives, home hardening, and long-term maintenance can help reduce losses during wildland fire events. Even though the City does not have any VHFHSZs, the General Plan includes goals, policies, and actions related to fire hazards and protection. An example of a policy is the Fuel Modification Ordinance in which the City would work with the Fire Protection District to prepare a Fuel Modification Ordinance and require fire-resistant, native vegetation as buffers for developments in hillside, open space, and rural areas with moderate to high fire risk.

Fire Protection

The City's fire services are provided by CCCFPD. The CCCFPD is a professional, full-service fire department and is among the 13 largest metropolitan fire agencies in the State of California. It provides fire prevention, suppression, and emergency medical services (EMS) to 12 cities and the unincorporated areas of Contra Costa County with 34 fire stations.

Its telecommunications center provides dispatch services via contract to three (3) other fire agencies in the County. Staffing includes 420 uniformed personnel and 87 civilian personnel. All responding engines and trucks include a minimum of one (1) paramedic. Additional capabilities and resources include training, certification/personnel development, vehicle rescue, trench rescue, water rescue, hazardous material, high and low-angle rescue, building collapse, confined space rescue, fire/rescue boats, fire and arson investigations, code enforcement, building plan review, and public education, as well as Community Emergency Response Training (CERT).

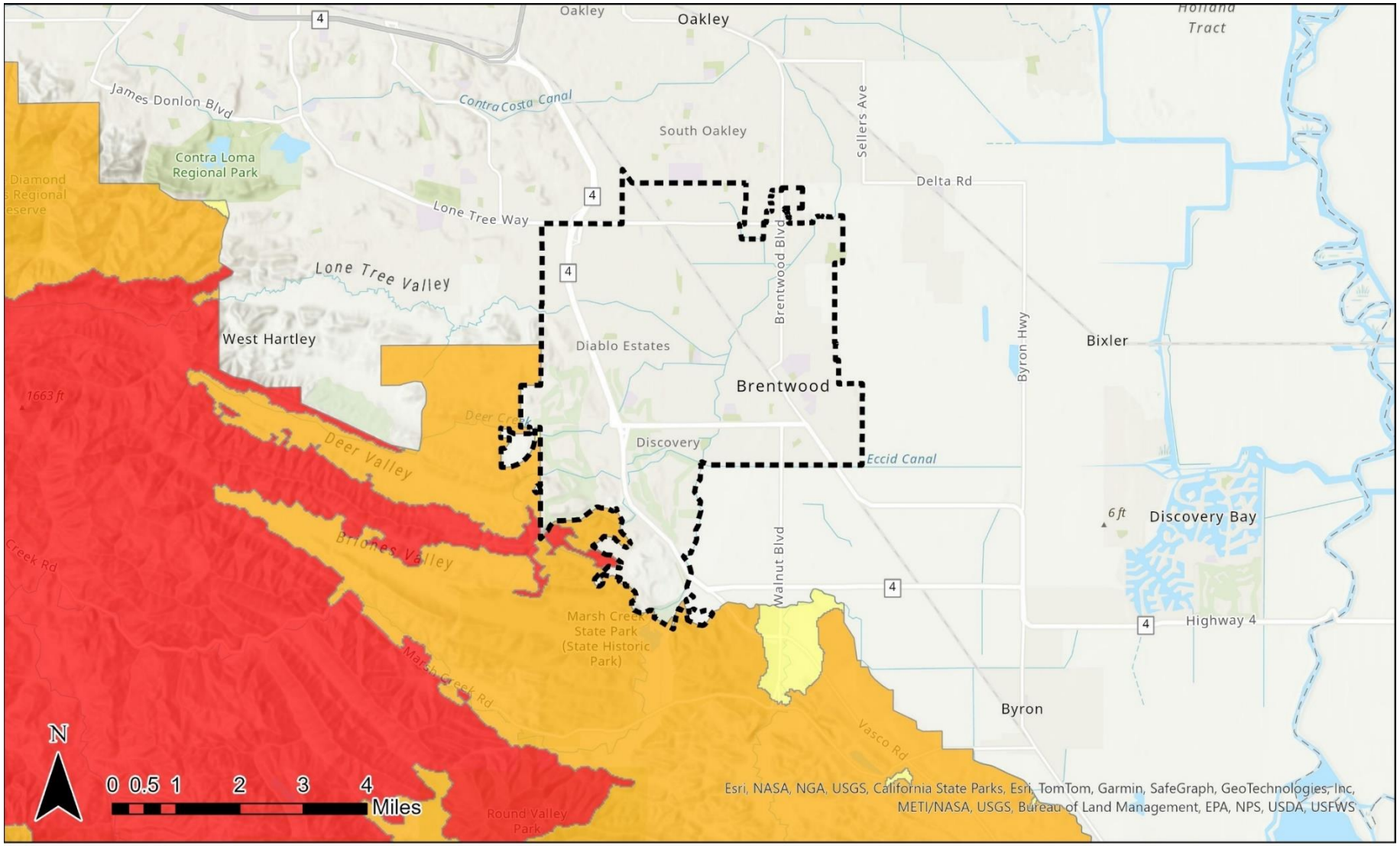
Effective July 1, 2022, the East Contra Costa Fire Protection District (ECCFPD), who had historically provided fire services to the City of Brentwood, was annexed with the CCCFPD. ECCFPD historically served the cities of Brentwood and Oakley and the townships of Discovery Bay, Bethel Island, Knightsen, Byron, Marsh Creek and Morgan Territory. CCCFPD is an independent special district and provides fire protection services in and around cities and unincorporated communities in Contra Costa County including Brentwood. The District is a full-service agency providing fire suppression, fire prevention, emergency medical, rescue, and ambulance transport. The District's service area spans over 555 square miles of rural, suburban and urban development. The CCCFPD has 34 fire stations dispersed throughout the district. Within the City of Brentwood, the District has two fire stations, Fire Station 92 and Fire Station 99. These stations provide 24-hour protection and response to the City of Brentwood's residents, businesses, and visitors. The department's primary goals are identified as follows:

- Ensure financial stability and sustainability;
- Reduce response times for emergency services throughout the District;
- Maintain a high-performing workforce;
- Modernize stations, apparatus, and equipment; and
- Develop a community risk reduction program.

Long-term goals of the District include:

- Prioritize safety elements as a part of the land use planning process.
- Identify hazards and mitigation actions necessary to increase the safety of community and decrease the overall impact of a natural or human-caused disaster.
- Utilize existing codes to improve education and outreach to the community for project review and permitting.
- Strengthen disaster preparedness planning and post-disaster recovery.
- Prioritize training of response personnel and equipment readiness to increase department resilience.

In 2021, ECCFPD received 8,481 calls for service, an 11 percent increase from 2020. Fire Station 92 had 4,059 “roll outs” in 2021, a 13 percent increase from 2020. Roll outs are how many times an engine company gets called for service. For example, a structure fire is counted as one call for the District, however all three engine companies need to respond, thus creating three roll outs for service for the incident. The ECCFPD’s average response time was 8:42 in 2021. Response times have improved with the annexation by CCCFPD in 2022. Other improvements since annexation include additional firefighting crew in Brentwood’s Fire Station 92 and availability of Advanced Life Support emergency medical service on all operational crews districtwide. CCCFPD is an all-risk department, which responds to all types of fires, medical emergencies, technical rescues, hazardous material incidents, and enforces the Fire Prevention Code. In the event of an emergency, residents can access evacuation maps made available online through the Genasys, previously known as Zonehaven, which is a live platform with evacuation zones. When the status of a zone changes, notes will be sent out with recommended evacuation routes and a zone’s designated temporary evacuation points and/or shelters. Automated calls can be made to residents who prefer emergency noticing via telephone. Residents can sign up for automated call with the Brentwood Office of Emergency Services.



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City of Brentwood
- City Boundaries

Local Responsibility Area
- Very High

State Responsibility Area
- Moderate
- High
- Very High

Note: This map utilizes recommended Very High Fire Hazard Severity Zones in Local Responsibility Areas (LRAs) from 2007-2011.

Figure 6 - Fire Hazard Severity Zones

Source: CalFire, 2023

Hazardous Materials and Waste

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

The City's General Plan also defines hazardous waste as the subset of hazardous materials that has been abandoned, discarded, or recycled and is not properly contained, including contaminated soil or groundwater with concentrations of chemicals, infectious agents, or toxic elements sufficiently high enough to increase human mortality or to destroy the ecological environment. Examples of hazardous materials include flammable and combustible materials, corrosives, explosives, oxidizers, poisons, materials that react violently with water, radioactive materials, and chemicals.

The City hosts hazardous waste drop-off events free to all east county residents. Residents are required to present a valid driver's license at the event. The hazardous waste drop-off events are hosted on an annual basis on various Saturdays throughout the year. For general information on the year-round hazardous waste drop-off facility, the City provides the contact information for Delta Diablo, a household hazardous waste facility open to residents, on the City website. The General Plan's Existing Conditions Report further provides information on hazardous waste facilities, underground storage tanks, and other facilities and regulations related to hazardous waste.

Emergency Preparedness

For purposes of preparing for and responding to the protection of people and property within the City in the event of an emergency, the Brentwood Municipal Code defines emergency as "the actual or threatened existence of conditions of disaster or of extreme peril to the safety of persons and property within the City caused by such conditions as air pollution, fire, flood, storm epidemic, riot, earthquake, or other conditions, including conditions resulting from war or imminent threat of war, but other than conditions resulting from a labor controversy, which conditions are or are likely to be beyond the control of the services, personnel, equipment and facilities of this city, requiring the combined forces of other political subdivisions to combat." (BMC Section 2.16.020) Advanced emergency planning and preparedness can greatly assist in responding to natural disasters such as earthquakes, fires and floods, as well as human-caused disasters such as hazardous materials releases. The City lists emergency preparedness information in its website under Police. The Brentwood Police Department sponsors Community Emergency Response Team training classes throughout the year that are open to all residents who sign up on the City website.

The City Council has created a Disaster Council in case of emergencies. The Disaster Council includes the mayor, Director of Emergency Services, Assistant Director of Emergency Services, those chiefs of emergency services provided for in the City's most current emergency plan, and representatives of organizations with official emergency responsibility who are appointed by the Director with the advice and consent of the City Council. The Disaster Council's focus is to develop and recommend for adoption by the City Council emergency and mutual aid plans and agreements, ordinances, resolutions, rules, and regulations necessary to implement those plans and agreements. The Disaster Council is also responsible for the development of the City's emergency plan, which details mobilization of all resources of City resources in response to an emergency event.

Essential public facilities, also known as critical facilities, include police stations, hospitals, and other public or semi-public buildings that house critical first-responders or emergency management personnel. This may include health care facilities, emergency shelters, fire stations, emergency command centers, and emergency communications facilities. Essential public facilities work together with the County, the City, emergency personnel, and residents in the event of an emergency. **Figure 7** displays essential public facilities throughout Brentwood according to the County LHMP.

Water Supply

The City's water supply is derived from a combination of surface water from the Delta and groundwater from existing wells in the East Contra Costa Subbasin, which is a part of the larger San Joaquin Valley Groundwater Basin. The City has nine permitted groundwater wells, five of which are active. The City also purchased a permanent capacity share of six million gallons per day (mgd) of water from the Randall-Bold Water Treatment Plan (RBWTP) in Oakley, California on an as-needed basis.

Goals, Policies, and Actions

Goal SA 1	Protect the Brentwood community from geologic and seismic hazards.

Policy SA 1-1: Regulate development in areas of seismic and geologic hazards to reduce risks to life and property associated with earthquakes, liquefaction, erosion, landslides, and expansive soils.

Policy SA 1-2: Where feasible, require new development to avoid unreasonable exposure to geologic hazards, including earthquake damage, subsidence, liquefaction, and expansive soils.

Policy SA 1-3: Ensure that all new development and construction is reviewed by the City to ensure conformance with applicable building standards related to geologic and seismic safety.

Policy SA 1-4: Require geotechnical investigations to be completed prior to approval of any public safety facilities, such as fire stations, in order to ensure that these critical facilities are constructed in a way that mitigates site- specific seismic and/or geologic hazards.

Policy SA 1-5: Ensure that critical facilities in Brentwood's Planning Area are designed and constructed to withstand the "maximum probable" earthquake and remain in service. Critical facilities include police stations, fire stations, hospitals, and other public or semi-public buildings that house critical first-responders or emergency management personnel.

Policy SA 1-6: Development in areas subject to liquefaction shall be reviewed by qualified soils engineers and geologists prior to development in order to ensure the safety and stability of all construction (see Figure 5.5-2 in the General Plan Existing Conditions Report).

Policy SA 1-7: Prevent land subsidence and maintain adequate groundwater supplies.

Policy SA 1-8: Where alterations such as grading and tree or vegetation removal are made to hillside sites, rendering slopes unstable, planting of vegetation or other engineering means shall be encouraged to protect structures at lower elevations.

Policy SA 1-9: The use of drought-tolerant plants for landscaping in hillside areas shall be encouraged as a means to eliminate the need for supplemental watering.

Policy SA 1-10: An erosion and sediment control plan prepared by a civil engineer, or other professional who is qualified to prepare such a plan, shall be submitted as part of any grading permit application for new development. The erosion and sediment control plan shall delineate measures to appropriately and effectively minimize soil erosion and sedimentation, and shall comply with the design standards and construction site control measures contained in Chapter 15.52 (Grading, Erosion and Sediment Control) of the

Brentwood Municipal Code.

Policy SA 1-11: All structures and building foundations located within areas containing expansive soils shall be designed and engineered to comply with the most current version of the California Code of Regulations (CCR), Title 24.

Actions in Support of Goal SA 1

Action SA 1a: *Require the submission of geologic and soils reports for all new developments. The geologic risk areas that are determined from these studies shall have standards established and recommendations shall be incorporated into development.*

Action SA 1b: *All building code requirements shall be adhered to so as to provide for maximum safety requirements. Inspections for compliance shall be made by the Community Development Department prior to approval for occupancy.*

Action SA 1c: *Require strict adherence to the requirements of the California Code of Regulations (CCR), Title 24 in all areas of the city and, during the development review process, ensure that public and critical use buildings shall not be located in areas susceptible to potential natural hazards.*

Seismic Hazards

Seismic and geologic hazards in Brentwood include those related to earthquakes, steep slopes and landslides, erosion, and soil subsidence. Detailed background materials related to these topics are located in Section 5.5 of the Brentwood General Plan Existing Conditions Report.

Action SA 1d: *Any critical use building shall meet earthquake codes and standards.*

Action SA 1e: *Regularly review the structural integrity of all existing City facilities and, if any facilities are found unsatisfactory, take steps to ensure structural integrity and safety.*

Action SA 1f: *As part of the development review process, ensure development applications incorporate drainage and erosion standards identified in the Brentwood Municipal Code. Inspections by the Community Development Department and the Public Works Department will ensure compliance.*

Action SA 1g: *When a change in natural grade or removal of existing vegetation is necessary, appropriate vegetative cover to stabilize slopes and reduce erosion shall be encouraged. This shall be accomplished through the development and design review process.*

Action SA 1h: *Annually review revisions to the California Code of Regulations (CCR), Title* 24 and consider adoption of updates that include new or revised measures to avoid or reduce the potential for damage to structures and facilities caused by seismic and other geologic hazards.

Action SA 1i: *As applications for building permits are received, identify and inspect seismically unsafe buildings and structures, including unreinforced masonry buildings.*

Action SA 1j: *Explore programs and funding sources that would encourage, assist, or provide incentives to property owners to retrofit their buildings for seismic safety, such as the Unreinforced Masonry (URM) program.*

Action SA 1k: *Monitor withdrawal of groundwater, oil, and gas, maintain land elevation records, and regulate overdraft to prevent subsidence.*

Action SA 1l: *Regulate abandoned wells and the removal of abandoned underground irrigation and drainage systems.*

Action SA 1m: *Maintain an inventory of all natural hazards, including active faults, Alquist-Priolo Special Study Zones, floodplains, and projected dam failure inundation areas.*

Goal SA 2 Reduce risks to human life, property, and public services associated with flooding.

Policy SA 2-1: Support and participate in planning efforts undertaken at the regional, state, and federal levels to improve flood management facilities throughout Contra Costa County.

Policy SA 2-2: Require all development projects to demonstrate how storm water runoff will be detained or retained on-site, treated, and/or conveyed to the nearest drainage facility as part of the development review process. Project applicants shall demonstrate that project implementation would not result in increases in the peak flow runoff to adjacent lands or drainage facilities that would exceed the design capacity of the drainage facility or result in an increased potential for off-site flooding.

Policy SA 2-3: Ensure that construction activities will not result in adverse impacts to existing flood control and drainage structures.

Policy SA 2-4: For properties located within a flood hazard zone, as identified on the most recent FEMA floodplain map or identified by the California Department of Water Resources, the City shall not enter into a development agreement, approve any discretionary entitlement, tentative parcel map, parcel map, final map, or any ministerial permit that would result in the construction of a new residence unless flood protection findings consistent with the requirements of California Government Code Sections 65865.5, 65962, 66474.5 can be made and documented.

Policy SA 2-5: All new development within an identified floodplain shall be built according to FEMA standards.

Policy SA 2-6: Unless otherwise mitigated, require new structures to be located outside of the 100-year floodplain to the greatest extent feasible.

Policy SA 2-7: Monitor ongoing efforts by federal and state agencies to update flood hazard maps within Brentwood and Contra Costa County.

Flood Zones

Flood zones are geographic areas that the Federal Emergency Management Agency (FEMA) has defined according to varying levels of flood risk and type of flooding. These zones are depicted on the published Flood Insurance Rate Map (FIRM) or Flood Hazard Boundary Map (FHBM).

Policy SA 2-8: Encourage and accommodate multipurpose flood control projects that incorporate recreation, resource conservation, preservation of natural riparian habitat, and scenic values of Brentwood's streams, creeks, and wetland/riparian areas. Where appropriate and feasible, the City shall also encourage the use of flood and/or storm water retention facilities for use as groundwater recharge facilities.

Policy SA 2-9: Encourage flood control measures that respect natural drainage features, vegetation, and natural waterways, while still providing for adequate flood control and protection.

Policy SA 2-10: Continue efforts to reduce flooding potential, by working with the Contra Costa County Flood Control & Water Conservation District in upgrading and expanding the storm drainage system.

Policy SA 2-11: Ensure that new development or governmental action does not compound the potential for flooding.

Policy SA 2-12: Ensure that adequate drainage and erosion control measures are provided during construction of all new development.

Policy SA 2-13: Maintain the structural and operational integrity of essential public facilities.

Actions in Support of Goal SA 2

Action SA 2a: *Develop a Flooding and Drainage Master Plan that addresses the following, at a minimum:*

- *Storm water and drainage improvements for all areas of the city that are needed to accommodate existing and planned growth;*
- *Standards for on and off-site storm water and flooding improvements to ensure no adverse impacts to adjacent or nearby properties;*
- *Standard measures to be used by new development to address localized flooding impacts;*
- *Identification of areas for stream channel or flood control conveyance system enlargement and/or stabilization;*
- *Operation, maintenance, and funding of flood control and drainage facilities; and*
- *Opportunities for multipurpose flood control projects that incorporate recreation, resource conservation, preservation of natural riparian habitat, and scenic values of the city's streams, creeks, and wetland/riparian areas.*

Action SA 2b: *During the annual preparation of the Capital Improvement Program (CIP), review the conditions of bridges, culverts, and other flood control and storm water conveyance infrastructure, and include necessary improvements within the CIP to ensure safety of persons in the city and adequate conveyance of flood waters.*

Action SA 2c: *Seek state and federal funding for flood control and drainage infrastructure improvements.*

Action SA 2d: *Review the Brentwood Municipal Code, including Chapter 15.07 (Floodplain Management), and revise as necessary to ensure that development standards are consistent with the requirements of state law, including Government Code Section 65007. Development and building standards shall require the following:*

1. *New structures proposed for location within the 100-year floodplain shall be elevated one (1) foot or more above the 100-year flood elevation;*
2. *New construction in the 100-year floodplain shall be designed and constructed so that it does not contribute to cumulative flooding problems that could pose a hazard to surrounding property owners or the public;*
3. *Discourage extensive areas of impermeable surfaces within the 100- year floodplain and promote the use of permeable materials for surfaces such as driveways and parking lots; and*
4. *Ensure that new development within the 100-year floodplain includes all-weather access roads or other measures to ensure adequate access during a flood event.*

Action SA 2e: *Maintain unimproved drainage channels on a periodic basis.*

Action SA 2f: *As part of the development review process, require developers to prepare hydrological studies as necessary. Studies shall encompass the project site as well as the entire drainage area.*

Goal SA 3: Protect the safety of life and property throughout the Brentwood community by providing high quality emergency services.

Policy SA 3-1: Continue to maintain and implement the Emergency Operations Plan.

Policy SA 3-2: Provide an effective communications system to properly respond to emergencies.

Policy SA 3-3: Keep emergency access routes free of traffic impediments.

Policy SA 3-4: Coordinate with the Contra Costa County Sheriff and the California Standardized Emergency Management System (SEMS) to ensure coordinated local and state-level responses in the event of an emergency.

Policy SA 3-5: Ensure that all areas of the city are accessible to emergency response providers.

Policy SA 3-6: Continue to promote public safety through public education programs.

Policy SA 3-7: Maintain effective mutual aid agreements for fire, police, medical response, mass care, heavy rescue, and other functions as appropriate.

Policy SA 3-8: Clearly communicate to the public the City's plans, procedures, and responsibilities in the event of a disaster or emergency.

Policy SA 3-9: Encourage residents and community leaders to participate in disaster training programs, such as the Community Emergency Response Team (CERT) program.

Emergency Preparedness

Advanced emergency planning and preparedness can greatly assist in responding to natural disasters such as earthquakes, fires and floods, as well as human-caused disasters such as hazardous materials releases.

Actions in Support of Goal SA 3

Action SA 3a: *Support regional earthquake preparedness activities such as strapping water heaters, organizing periodic citywide earthquake drills, providing first aid training and disaster preparedness classes to neighborhood groups, and encouraging residents and businesses to stockpile emergency food, water, and medical supplies.*

Action SA 3b: *Support regional disaster planning and emergency response planning efforts, including the Multi-Jurisdictional Local Government Hazard Mitigation Plans for the San Francisco Bay Area and the Contra Costa County Hazard Mitigation Plan.*

Action SA 3c: *Encourage schools, neighborhood associations, mobile home park associations, and other interested groups to teach first aid and disaster preparedness, including Community Emergency Response Team (CERT) programs, Map Your Neighborhood programs, and other tools available to neighborhood and community groups to improve disaster preparedness.*

Action SA 3d: *Provide opportunities for periodic and ongoing training, including refresher courses, for residents who have completed local community disaster preparedness training.*

Action SA 3e: *Periodically review, maintain, and repair City roadways and emergency access routes, and provide signage, where necessary, to clearly identify emergency access routes.*

Action SA 3f: *Seek funding from state, federal, and other sources to assist in emergency management planning, including community education and outreach describing public procedures and evacuation routes in the event of an emergency or natural disaster.*

Action SA 3g: *Develop and annually update an emergency contact list and emergency response information on the City's website. The information should include emergency access routes, available emergency resources, and contact information for emergency responders.*

Action SA 3h: *Develop a public information program which will provide all citizens with access to needed information concerning disaster preparedness and safety.*

Action SA 3i: *Conduct annual emergency response drills with key members of the City, local leaders, and emergency response personnel. The training should include the dissemination of information to the public regarding emergency response procedures, resources, and City responsibilities.*

Action SA 3j: *Establish procedures to allow local citizens and community groups to utilize City-owned facilities to conduct disaster training and preparedness training programs.*

Goal SA 4 Protect citizens from dangers related to the movement, storage, and manufacture of hazardous materials.

Policy SA 4-1: Encourage producers and users of hazardous materials to reduce the amounts of hazardous materials generated.

Policy SA 4-2: Require hazardous waste generated within the city limits of Brentwood to be disposed of in a safe manner, consistent with all applicable local, state, and federal laws.

Policy SA 4-3: Hazardous materials shall be stored in a safe manner, consistent with all applicable local, state, and federal laws.

Policy SA 4-4: Coordinate with the Contra Costa Fire Protection District to ensure that businesses in Brentwood which handle hazardous materials prepare and file a Hazardous Materials Business Plan (HMBP). The HMBP shall consist of general business information, basic information on the location, type, quantity, and health risks of hazardous materials, and emergency response and training plans.

Policy SA 4-5: Require compliance with Contra Costa County's Countywide Integrated Waste Management Plan as well as all of the Consolidated Unified Protection Agency (CUPA) program elements.

Actions in Support of Goal SA 4

Action SA 4a: *Provide educational opportunities for generators of small quantity, household, and agricultural waste products regarding their responsibilities for source reduction and proper and safe hazardous waste management and disposal.*

Action SA 4b: *Provide a convenient program for the local disposal of household hazardous wastes at Brentwood's Solid Waste Transfer Station on a routine basis. The availability of the program should be widely publicized throughout the community.*

Action SA 4c: *Work cooperatively with the Contra Costa Fire Protection District to train local police and fire personnel in the specialized handling and cleanup procedures that are required for radioactive, toxic, and hazardous substance spills.*

Hazardous Materials

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

Action SA 4d: *Prepare and maintain an inventory of environmentally contaminated sites to educate future property owners about contamination from previous uses. The City shall work directly with property owners in the cleanup of these sites, particularly in areas with redevelopment potential.*

Goal SA 5	Reduce risks to human life, property, and public services associated with fire hazards.

Policy SA 5-1: Support and participate in planning efforts undertaken at the regional, state, and federal levels to mitigate fire hazards throughout Contra Costa County.

Policy SA 5-2: Require new development in areas classified as VHFHSZ to comply with the most current version of the California Building Codes and California Fire Code.

Policy SA 5-3: Require fuel modification, such as vegetation clearance and defensible space requirements, for new development in VHFHSZs or SRAs, and encourage defensible space requirements for all of other new development throughout the City.

Policy SA 5-4: Require new development to have adequate visibility for home and street addressing.

Policy SA 5-5: Ensure areas in high fire zones to have adequate ingress and egress access.

Policy SA 5-6: Avoid or minimize the wildfire hazards associated with new uses of land in VHFHSZ.

Policy SA 5-7: Work cooperatively with public agencies with responsibility for fire protection.

Actions in Support of Goal SA 5

Action SA 5a: *Work with Contra Costa Fire Protection District to develop emergency evacuation routes in the event of a fire hazard.*

Action SA 5b: Promote public outreach about emergency evacuation routes and defensible space.

Action SA 5c: *Work with Contra Costa Fire Protection District to develop community emergency service training.*

Action SA 5d: *Work with local and state agencies to assess availability of water supplies after wildfire events to adjust fire prevention and suppression needs, as necessary, for both short- and long-term fire prevention.*

Action SA 5e: *Maintain private road and public road clearance for emergency vehicle access.*

Action SA 5f: *Locate, when feasible, new essential public facilities outside of high fire risk areas, including, but not limited to hospitals and health care facilities, emergency shelters, emergency command*

centers, and emergency communications facilities, or identifying construction methods or other methods to minimize damage if these facilities are located in an SRA or VHFHSZ.