

## 3.7 GEOLOGY AND SOILS

This section evaluates the potential impacts related to geology, seismicity, mineral resources, and paleontological resources resulting from adoption and implementation of the proposed CLUO, including issuance of Cannabis Use Permits pursuant to the adopted CLUO. In addition to regional geologic and seismic hazards, the potential effects related to local hazards, such as risks related to underlying geologic materials and soils, are also evaluated. The effects of erosion on water quality are addressed in Section 3.10, “Hydrology and Water Quality.”

The California Department of Food and Agriculture (CDFA) provided comments on the notice of preparation (NOP). These comments requested that the EIR evaluate the impacts of licensed commercial cannabis cultivation on geology and soils, as well as on the availability of known mineral resources of value locally, regionally, and to the state. These issues are addressed in this section. No comments on the NOP were received regarding paleontological resources. The reader is referred to Appendix A for NOP comment letters.

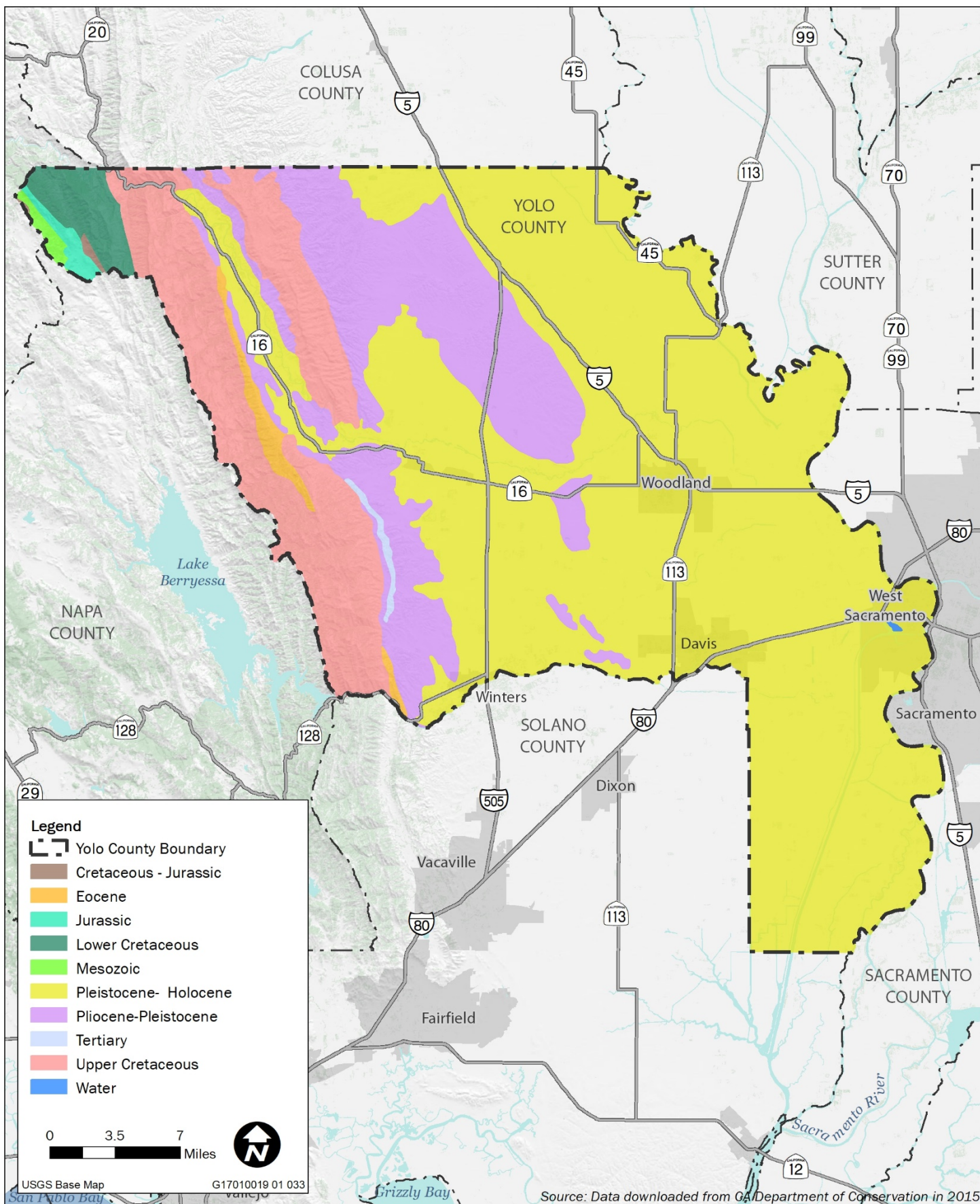
### 3.7.1 Environmental Setting

The following key sources of data and information were used in the preparation of this section:

- Maps and reports published by the California Geological Survey (CGS) and U.S. Department of Agriculture – Natural Resources Conservation Service,
- Report of Findings Land Subsidence from Groundwater Use in California (Water Resources Association of Yolo County 2018),
- Cache Creek Area Plan (1996) and Cache Creek Area Plan Update Project Draft EIR (2019),
- Yolo Habitat Conservation Plan/Natural Communities Conservation Plan EIS/EIR (Yolo Habitat Conservancy 2017),
- Yolo County 2030 Countywide General Plan (Yolo County 2009a),
- Yolo County 2030 Countywide General Plan EIR (Yolo County 2009b), and
- Background Report for the Yolo County General Plan Update (Yolo County 2005).

### REGIONAL GEOLOGY

Exhibit 3.7-1 shows the geologic formations within the County. The County spans two geomorphic provinces. Roughly 70 percent of the County is in the Great Valley geomorphic province that covers the central portion of the state. The western portion of the County includes the Coast Ranges geomorphic province, which is associated with mountains formed along the San Andreas Fault (CGS 2002).



**Exhibit 3.7-1**

**Yolo County Geologic Conditions**

The Great Valley geomorphic province, also called the Central Valley, is a nearly flat alluvial plain that extends from the Tehachapi Mountains in the south to the Klamath Mountains in the north, and from the Sierra Nevada in the east to the Coast Ranges in the west. The valley is approximately 450 miles long, with an average width of about 50 miles. Elevations of the alluvial plain are generally just a few hundred feet above mean sea level (MSL), with extremes ranging from a few feet below MSL to about 1,000 feet above MSL (Hackel 1966).

Geologically, the Great Valley geomorphic province is a large, elongated, northwest-trending asymmetric structural trough that has been filled with an extremely thick sequence of sediments ranging in age from Jurassic to Holocene. This asymmetric geosyncline has a stable eastern shelf supported by the subsurface continuation of the granitic Sierran slope and a short western flank expressed by the upturned edges of the basin sediments (Hackel 1966). Within the Great Valley geomorphic province, the unincorporated areas of the County are dominated by gently sloping to level alluvial areas. Geologic units in this part of the County generally consist of Quaternary-age alluvium and basin deposits, and the Quaternary Modesto and Riverbank Formations. Rolling terraces of the Tehama Formation (non-marine sandstone, siltstone, and volcaniclastic rocks) project into the valley area northwest of Woodland and form the Dunnigan Hills (Wagner et al. 1981).

The Coast Ranges geomorphic province includes many separate ranges; coalescing mountain masses; and several major structural valleys of sedimentary, igneous, and metamorphic origin. The northern Coast Range extends from the California/Oregon border south to the San Francisco Bay area, and the southern Coast Range extends from the San Francisco Bay area south to the northern edge of the Transverse Ranges geomorphic province. Both the northern and southern Coast Ranges generally extend to 50 to 75 miles inland from the coastline and parallel the Great Valley geomorphic province throughout their length, except for extreme northern California where the northern Coast Range is adjacent to the Klamath Mountains geomorphic province.

The Coast Ranges geomorphic province is characterized by the presence of two entirely different core complexes, one being a Jurassic-Cretaceous eugeosynclinal assemblage (the Franciscan rocks) and the other consisting of early Cretaceous granitic intrusives and older metamorphic rocks. The two unrelated, incompatible core complexes lie side by side, separated from each other by faults. A large sequence of Cretaceous and Cenozoic clastic deposits covers large parts of the province. The rocks in the province are characterized by many folds, thrust faults, reverse faults, and strike-slip faults that have developed as a consequence of Cenozoic deformation.

Within the Coast Ranges geomorphic province, unincorporated areas of the County consist of moderately sloping to very steep uplands and terraces and is characterized by parallel ridges and valleys that trend slightly west of north (U.S. Soil Conservation Service 1972). The rocks in the Coast Ranges part of the County consist of a number of Quaternary and Cretaceous geologic formations, including upturned marine sandstones, shales, mudstones, and conglomerates, with some volcaniclastic rocks (Wagner and Bortugno 1982). A small area of ultramafic rocks, one of which may be serpentinite, occurs along Little Blue Ridge, west of Rumsey (USGS and CGS 2011). Elevations in the Coast Ranges reach more than 3,000 feet above MSL.

## SEISMICITY

Seismic hazards include earthquake fault ground rupture and ground shaking (primary hazards), and liquefaction and earthquake-induced slope failure (secondary hazards). Localized ground shaking and liquefaction are the most significant seismic hazards in the County (Yolo County 2005).

## Surface Rupture and Faulting

The only fault in the County that is potentially subject to surface rupture is the Hunting Creek Fault (sometimes referred to as the Hunting Creek-Berryessa Fault) (Yolo County 2005). There is evidence of activity on this fault during the Holocene epoch (approximately the last 11,000 years), and the fault is associated with a Special Studies Zone. (Special Studies Zones are delineated by the State of California,

pursuant to the Alquist-Priolo Earthquake Fault Zoning Act, around potentially active faults. See Section 3.7.2, “Regulatory Setting,” below, for additional information.) The Hunting Creek Fault is a right-lateral fault and has an average slip rate of 6 millimeters per year. Its maximum expected Richter magnitude is 7.1 (CGS 2003: Appendix A). The fault is located in a sparsely inhabited part of the extreme northwestern corner of the County (Exhibit 3.7-2). Only a very short section of the fault occurs in the County; most of the trace extends through Lake and Napa Counties.

In addition to the Hunting Creek Fault, the Dunnigan Hills Fault, which extends between the town of Dunnigan and northwest of the town of Yolo west of Interstate 5, is potentially active (Yolo County 2005:3-5). There is evidence of displacement along the fault during the Holocene epoch (Jennings 1994); however, the Dunnigan Hills Fault is not within an Alquist-Priolo Earthquake Fault Zone (Hart and Bryant 1997), and surface fault rupture is considered unlikely.

There are also a number of pre-Quaternary faults (e.g., Capay, Sweitzer, and West Valley faults) in the western part of the County that show displacement more than 1.6 million years ago. These faults are considered inactive.

### **Ground Shaking Hazard**

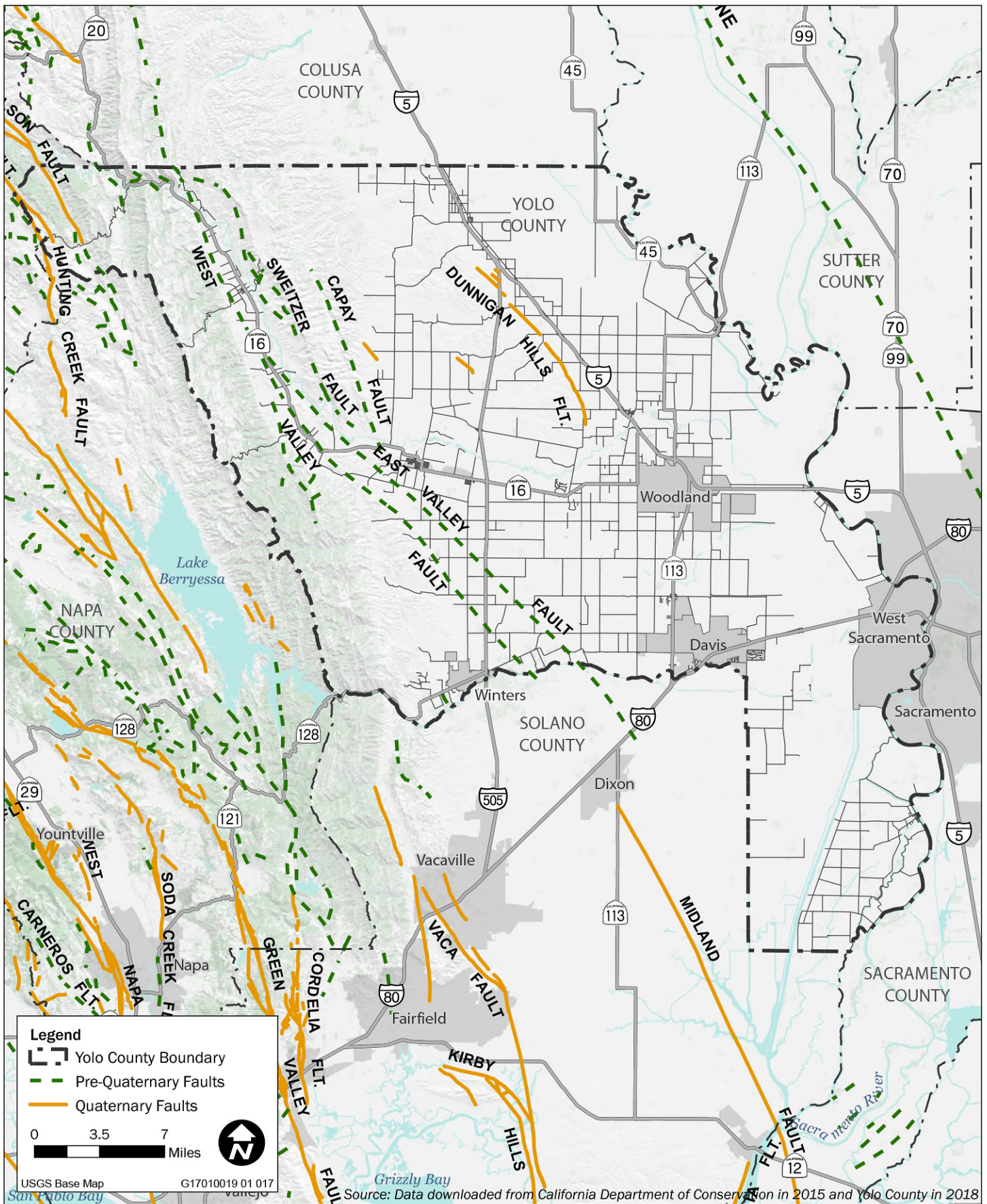
Earthquake energy, and therefore the potential for ground shaking, is most intense at the fault epicenter; with the potential for, and intensity of, ground shaking typically decreasing with distance from the epicenter. Estimates of the peak ground acceleration are based on probabilistic models that account for multiple seismic sources. Under these models, consideration of the probability of expected seismic events is incorporated into the determination of the level of ground shaking at a particular location. Yolo County is mapped by CGS as a region that is generally distant from known, active faults. As a result, the County is expected to experience lower levels of shaking less frequently. Earthquake hazard in the western portion of the County is moderate and lower in the alluvium in the eastern portion of the County (CGS 2016).

In addition to the Hunting Creek and Dunnigan Hills faults discussed above, major regional faults outside the County in the Coast Ranges and in the Sierra Nevada foothills are capable of producing strong ground shaking in the County. The Coast Range-Sierran Block Boundary, at the edge of the western side of the lower Sacramento Valley, is currently recognized as a potential seismic source capable of generating moderate earthquakes that could affect the ground-shaking hazard within the County (Yolo County 2009b).

### **Liquefaction and Related Hazards**

Liquefaction is a phenomenon in which the strength and stiffness of unconsolidated sediments are reduced by earthquake shaking or other rapid loading. Poorly consolidated, water-saturated fine sands and silts located within 50 feet of the surface typically are considered to be the most susceptible to liquefaction. Soils and sediments that are not water-saturated and that consist of coarser or finer materials are generally less susceptible to liquefaction (CGS 2008). The part of the County in the Coastal Ranges geomorphic province would generally be expected to have a low liquefaction hazard, except in the intermountain valleys underlain by alluvium and shallow groundwater. Liquefaction is expected to be a relatively greater hazard in the Great Valley portion of the County, particularly along the floodplains of streams where the sediments are generally sandier than other areas.

Two potential ground failure types associated with liquefaction are lateral spreading and differential settlement. Lateral spreading involves a layer of ground at the surface being carried on an underlying layer of liquefied material over a nearly level surface toward a river channel or other open face. Areas most prone to lateral spreading are those that consist of fill material that has been improperly engineered, that have steep, unstable banks, and that have high groundwater tables. The banks along the Deep Water Ship Channel and Turning Basin in West Sacramento may have such conditions. Damage caused by liquefaction and lateral spreading is generally most severe when liquefaction occurs within 15–20 feet of the ground surface (Yolo County 2005).



**Exhibit 3.7-2**

**Fault Locations in the Region**

Differential settlement can occur as soil compacts and consolidates to varying degrees after ground shaking ceases. Differential settlement results when the layers that liquefy are not of uniform thickness, a common problem when the liquefaction occurs in artificial fills. Settlement can range from 1 percent to 5 percent, depending on the cohesiveness of the sediments (Tokimatsu and Seed 1984). Although differential settlement generally occurs slowly enough that its effects are not dangerous to inhabitants, it can cause significant building damage over time. Portions of the County that contain loose or uncontrolled (non-engineered) fill may be susceptible to differential settlement.

## **SOIL AND SLOPE HAZARDS**

### **Land Subsidence**

Land subsidence (lowering of the land-surface elevation) occurs in three ways: as a result of compaction and oxidation of peat soils; hydrocompaction (i.e., a soil is saturated, then when the moisture is removed the soil particles consolidate more tightly than before saturation); and groundwater overdraft, which is the main mechanism for subsidence in the County. The primary hazards associated with subsidence are increased pressure on levees and damage to underground utilities. Other effects of subsidence include changes in the gradients of stormwater and sanitary sewer drainage systems in which the flow is gravity-driven. Specific to the County, land subsidence has damaged or reduced the integrity of highways, levees, irrigation canals, and wells (Yolo County 2009b).

Subsidence due to groundwater pumping has been detected in the northern Yolo-Zamora area of Yolo County between Zamora and Knights Landing, where subsidence is reported to be on the order of 5 feet, and the vicinity of the cities of Davis and Woodland, where subsidence is estimated at 2 or 3 feet (Water Resources Association of Yolo County 2018).

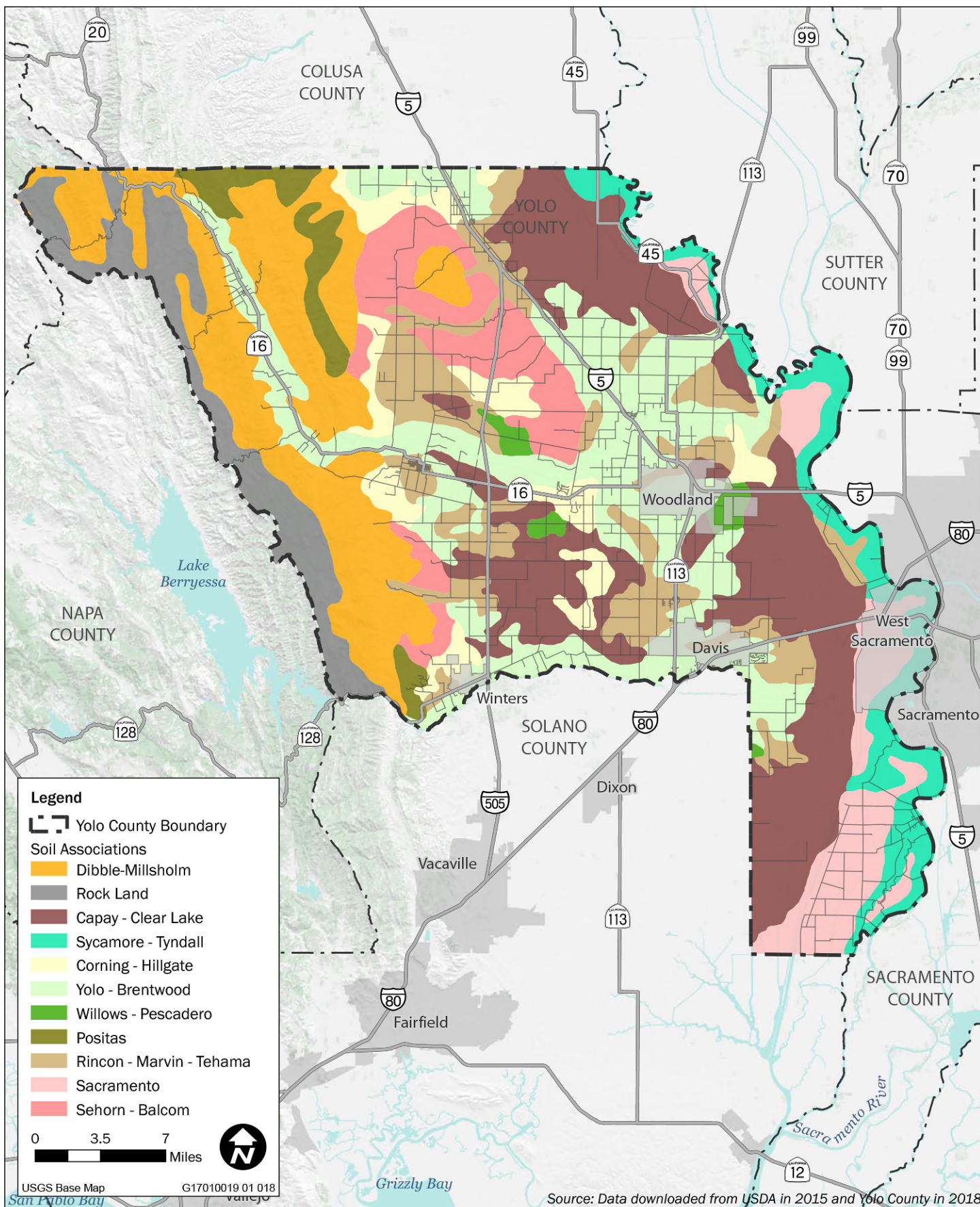
### **Landslides**

Landslides are commonly triggered by unusually high rainfall and the resulting soil saturation, by earthquakes, or a combination of these conditions. The general term “landslide” may include a wide range of slope failures, including but not limited to rock falls, deep failure of slopes, earthflows, and shallow debris flows. Some landslides occur as a result of human activities, such as timber harvest, undermining a slope, and improper drainage water management.

Steep slopes underlain by Cretaceous rocks along Cache Creek are susceptible to landslides, and numerous large and small landslides have been mapped in this area (Manson 1990). Areas in the northwestern portion of the County have high landslide susceptibility (CGS 2011). However, except for the communities of Guinda, Capay, Rumsey, and Brooks, landslides are generally not a significant hazard to life or property in the County, due in large part to the relatively flat topography in much of the County (Yolo County 2009b:Figure IV.L-6).

### **Soil Types**

Overlying the geologic units described above is a layer of soil. Soil types are important in describing engineering constraints such as erosion and runoff potential, corrosion risks, and various behaviors that affect structures, such as expansion and settlement (the nature of these constraints are described further below). Exhibit 3.7-3 depicts soil associations in Yolo County that have formed through landscape-level physical and chemical processes. Table 3.7-1 summarizes the soil associations' characteristics. The soil associations in the County can be grouped into an uplands group, a lowland alluvial fan group, and a lowland Colusa/Yolo Basin group.



**Exhibit 3.7-3**

**County Soil Associations**



**Table 3.7-1 Soil Associations for Yolo County**

Soil Association Name	Water Erosion Hazard	Expansive Soil Potential (shrink-swell)	Corrosivity (uncoated steel)	Soil Limitations for Septic Tank Filter Field
Yolo- Brentwood	None to slight	Yolo: Moderate Brentwood: High	Yolo: Low to Moderate Brentwood: High	Yolo: Moderate to Severe Brentwood: Severe
Rincon-Marvin- Tehema	None to slight	Rincon: Mod/High Marvin: Mod/High Tehema: Moderate	Rincon: Mod/High Marvin: High Tehema: Low/Moderate	Severe
Capay-Clear Lake	None to slight	High for most subtypes	High	Severe
Sycamore- Tyndall	None to slight	Moderate to High	Sycamore: High Tyndall: Low/Moderate	Severe for most subtypes
Sacramento	None to slight	Moderate to High	High	Severe
Willows- Pescadero	None to slight	Moderate to High	High	Severe
Capay- Sacramento	None to slight	High for most subtypes	High	Severe
Corning- Hillgate	None to slight	Low to High	Low to High	Severe
Sehorn-Balcom	Moderate to very high	Sehorn: High Balcom: Moderate	Sehorn: High Balcom: Moderate	Severe
Dibble- Millsolm	Moderate to very high	Dibble: High Millsolm: Moderate	Dibble: High Millsolm: Moderate	Severe
Positas	Moderate to very high	Low to High	Low to High	Severe
Rock Land	Very high	—	—	—

Source: USDA 2016

**Uplands Soil Group**

The uplands soils group consists of five soils associations: Rock Land, Dibble-Millsholm, Positas, Sehorn-Balcom, and Corning-Hillgate. The Rock Land association is located on sandstone of Franciscan complex and Great Valley sequence materials along the highest ridges of Little Blue Ridge and Blue Ridge. Typically, 50 to 90 percent of the land surface of Rock Land is exposed sandstone, shale, or serpentinized bedrock; the remainder is covered by a thin layer of sandy loam. Immediately below the Rock Land association on Blue Ridge and along the flanks of the Capay Hills is the Dibble-Millsholm association, which formed from Great Valley sequence materials. Exposed bedrock covers less than 10 percent of the surface of the Dibble-Millsholm association, which consequently has more soil development. Although it lacks similar parent material, an outlier of this association has been mapped on the highest areas of the northern Dunnigan Hills.

The patchy Positas association formed on terraces over the Red Bluff Formation in the southern end of the Blue Ridge and along the western and northern slopes of the Capay Hills. Its soils are gravelly loams. The Sehorn-Balcom association formed over the Tehama Formation, along the eastern toes of the Blue Ridge and Capay Hills, and along most of the Dunnigan Hills. The soils of this association consist of silty clays and clays. Adjacent terraces of the Red Bluff and Tehama Formations support the Corning-Hillgate association, which also extends along the Plainfield Ridge. The soils of this association are gravelly loams or loams. One outlier of this association has been mapped across the entire Cache Creek Settling Basin. Among the upland soils used for livestock grazing, soils in the Sehorn-Balcom and Dibble-Millsolm associations generally produce the greatest amounts of forage.

**Lowlands Alluvial Fan Group**

The lowland alluvial fan group consists of four soils associations: Yolo-Brentwood, Capay-Clear Lake, Rincon-Marvin-Tehama, and Willows-Pescadero. The Yolo-Brentwood association is most closely associated with alluvial floodplains and fans of Cache and Putah Creeks. In the Cache/Putah Basin, it forms the highest proportions of the basin rim at the mouths of the streams from the Blue Ridge and along the natural levee of

Putah Creek. Its soils are deep and well drained, and their textures range from silty loams to silty clay loams. Soils in the Yolo-Brentwood association are suited to a wide range of crops and are among the best arable soils in the County.

The soils of the Capay-Clear Lake association line the bottoms of portions of the Cache/Putah Basin and other lowland areas. These soils are generally poorly drained silty clays to clays. Their historic vegetation was primarily prairie/grassland, with some localized seasonal freshwater marsh. The Rincon-Marvin-Tehama association is found on the rim of the Cache/Putah Basin between the Yolo-Brentwood association and the Capay-Clear Lake association. On the eastern side of the Cache/Putah basin there is a patch of the Willows-Pescadero association that formed where groundwater was forced to the surface by the Dunnigan Hills/Plainfield anticline. The soils of this association are saline-alkaline silty clay loams to clays. These soil associations are also found east of the Dunnigan Hills/Plainfield Ridge anticline where salts that were transported eastward across the Putah/Cache alluvial fans accumulated at the basin rim interface between the alluvial fans and the Yolo and Colusa Basins.

#### **Lowland Colusa/Yolo Basin and Sacramento River Natural Levee Group**

The lowland Colusa/Yolo Basin and Sacramento River natural levee group consists of three soil associations: Sycamore-Tyndall, Sacramento, and Capay-Sacramento. The Sycamore-Tyndall association is found on the natural levees of the Sacramento River. Its soils are somewhat poorly drained very fine sandy loams to clay loams. Below the Sycamore-Tyndall association, in the rice lands of the Colusa Basin, is the Sacramento association. Its soils are poorly drained silty clay loams and clays. Finally, the Yolo Bypass and parts of the Colusa Basin contain the Capay-Sacramento association, with its moderately well-drained to poorly drained silty clay loams to clays.

### **Erosion Potential and Hazard Rating**

Natural rates of erosion vary depending on slope, soil type, and vegetative cover. Typically, soils with high amounts of silt are more easily eroded, while coarse-grained (sand and gravel) soils are less susceptible to erosion. Soil erosion can become problematic when human intervention causes rapid soil loss and the development of erosional features (such as incised channels, rills, and gullies) that undermine roads, buildings, or utilities. This is typically associated with vegetation clearing and earth moving, which reduces soil structure and cohesion. Many of the soils in the steeper, upland areas in the western part of the County have been subject to accelerated erosion, such that they have lost part, or all, of their original topsoil layer. This may be a result of past overuse of forage by grazing animals (Yolo County 2005).

The suitability of the soils for particular agricultural uses and their farmland classification (e.g., Prime Farmland) are described in more detail in Section 3.2, "Agricultural Resources."

#### **Expansive Soil Potential/Shrink-Swell Potential**

Expansive soils contain significant amounts of clay particles that have the ability to give up water (shrink) or take on water (swell). When these soils swell, the change in volume can exert significant pressure on loads that are placed on them, such as building and structure foundations or underground utilities, and can result in structural distress and/or damage. Often, grading, site preparations, and backfill operations associated with subsurface structures can eliminate the potential for expansion. The soils of the County generally have moderate to high shrink-swell potential and are classified as expansive soils (see Table 3.7-1).

#### **Corrosivity**

The corrosive potential of soil is a result of a combination of soil characteristics and environmental influences. Factors affecting corrosion potential include the amount of water in the soil, the conductivity of the soil solution, the pH of the soil solution, the oxygen concentration (aeration), and the activity of organisms capable of causing oxidation/reduction reactions. The estimation of corrosivity for untreated steel pipe is a common metric for describing corrosive potential and is commonly based on resistance to flow of electrical current, total acidity, soil drainage, soil texture, and conductivity of the saturation extract of the soil. The potential for soil conditions to result in deterioration of concrete is also considered and is

influenced by the amount of sulphates in the soil combined with soil texture and acidity. Soils in the County range from low to high corrosivity potential for uncoated steel.

#### **Liquefaction Potential**

The causes and effects of liquefaction, and the potential for liquefaction in the County are described above in the discussion of seismicity.

## **PALEONTOLOGICAL RESOURCES**

Significant vertebrate and invertebrate fossils and unique geologic units have been documented throughout California. The fossil yielding potential of a particular area is highly dependent on the geologic age and origin of the underlying rocks. Paleontological potential refers to the likelihood a rock unit will yield a unique or significant paleontological resource. All sedimentary rocks, some volcanic rocks, and some low-grade metamorphic rocks have potential to yield significant paleontological resources. Depending on location, the paleontological potential of subsurface materials generally increases with depth beneath the surface, as well as with proximity to known fossiliferous deposits.

The County's diverse geology spans 145 million years, from the Cretaceous Period through today. The western boundary of the County contains the Blue and Rocky ridges, a northwest-southeast trending range comprised of the Cretaceous Great Valley Sequence. The Great Valley Sequence formed when great quantities of mud, sand, and gravel accumulated as regularly bedded layers on the ocean floor of a deep trench along the margin of the North American continent. Seven geological formations have been identified in the Upper Cretaceous sediments; from oldest to youngest these are the Fiske Creek, Venado, Yolo, Sites, Funks, Guinda, and Forbes Formations. The units are exposed along a north-south axis, dipping below the surface steeply toward the east to form the hills on the west side of Yolo County. The Blue Ridge is bounded by two faults and is being uplifted on its eastern edge.

The geological units within the County are described below based on Yolo County 2030 Countywide General Plan EIR (Yolo County 2009b:527–529).

### **Holocene Alluvium**

Late Holocene alluvial deposits overlie older Pleistocene alluvium and/or the upper Tertiary bedrock formations in the southern and eastern portions of Yolo County. This alluvium consists of sand, silt, and gravel deposited in fan, valley fill, terrace, or basin environments. These alluvial deposits contain vertebrate and invertebrate fossils of extant, modern taxa, which are generally not considered paleontologically significant.

### **Pleistocene Alluvium**

The majority of alluvium in the Capay Valley and the southern portion of the County consist of the Pleistocene-age Modesto-Riverbank and Red Bluff formations. Vertebrate fossils in this alluvium are representative of the land mammal age, including mammoth, ground sloths, saber-toothed cats, dire wolves, rodents, birds, reptiles, and amphibians. Pleistocene alluvium is highly sensitive for paleontological resources.

Mammoth fossils have been collected from the unit mapped as the Modesto Riverbank Formations. In 2018, mammoth remains were uncovered during aggregate excavation at the CEMEX, Inc off-channel mining operation northeast of the community of Madison. In 1982, during in-channel aggregate excavations at the same general location, then operated by Solano Concrete, mammoth tusks, four to five molars, and a skull were collected in the bed of Cache Creek. In 1955, a large molar was collected about 3 miles downstream from the 1982 find (Yolo County 2019).

### **Tehama Formation**

The Tehama Formation is exposed in the western side of the County, on both sides of the Capay Valley and in the Dunnigan Hills, and in isolated outcrops in the southern portion of the County. This series of fluvial deposits is 2,000 feet thick on average and contains fragmentary vertebrate bones. The majority of fossil sites found in the County are in the Tehama Formation.

In September 2004, during aggregate excavations at the Granite Capay mining facility, the pelvis of a mammoth was discovered in the Tehama formation at the mouth of Capay Valley (Yolo County 2019).

### **Capay Formation**

The Capay Formation is exposed on the western side of the Capay Valley. The formation varies in thickness between 10 feet and 500 feet and consists of shale and sandstone that dates to the Eocene. The Capay Formation contains numerous invertebrate marine fossils, mostly consisting of shells and is considered to have high paleontological sensitivity.

### **Forbes Formation**

The Forbes Formation is in the hills east of Capay Valley and also comprises the Blue Ridge on the western edge of Yolo County. The Forbes Formation consists of massive beds of fine-to-coarse-grained sandstone, with shell fragments that grade into inter-bedded siltstone and shale. This unit contains Late Cretaceous amoeboid protists and may contain invertebrate marine fossils but is not considered paleontologically significant.

### **Guinda Formation**

The Guinda Formation is in the hills east of Capay Valley and the Blue Ridge on the western edge of Yolo County. This formation contains Late Cretaceous protozoa and amoeboid protists. There are no fossils recorded in the Guinda Formation in the County, but fossils from this formation are of paleontological significance.

### **Funks Formation**

The Funks Formation is in the hills east of Capay Valley and the Blue Ridge on the western edge of Yolo County. The Funks Formation consists of a tan weathering, gray, marine siltstone and mudstone. The Funks Formation shale beds contain Late Cretaceous amoeboid protists. This formation is not considered paleontologically significant.

### **Sites Formation**

The Sites Formation is found in the hills east of Capay Valley and the Blue Ridge on the western edge of Yolo County. The Sites Formation consists of thick bedded, laminated gray sandstone and thick beds of dark gray carbonaceous siltstone. This unit is up to 6,000 feet thick and has been attributed to the Late Cretaceous. No significant fossils have been found in this formation. This formation is not considered paleontologically significant.

### **Yolo Formation**

The Yolo Formation is found in the hills east of Capay Valley and the Blue Ridge on the western edge of Yolo County. The Yolo Formation is moderately thick-bedded, fine-to-coarse grained sandstone with local mudstone and siltstone. The unit contains Carbonaceous debris and the mudstone beds have Late Cretaceous protozoa and amoeboid protists. This formation is not considered paleontologically significant.

### **Venado Formation**

The Venado Formation is found in the hills east of Capay Valley and the Blue Ridge on the western edge of Yolo County and consists of more than 1,000 feet of massive sandstone, shale, and conglomerate. This unit may contain marine shells; however, the Venado Formation is not considered paleontological significant.

## **MINERAL RESOURCES**

A variety of minerals were once mined in the County (Yolo County 2005). In the past, small amounts of gold and silver were mined from Cache and Putah Creeks. The Barrick Gold Mining Company's McLaughlin Mine (also known as the Homestake Mining Company), which is no longer operational, was located in the northwestern corner of the County. The primary minerals presently mined are aggregate (sand and gravel) and natural gas. There are approximately 25 natural gas fields located within Yolo County. Aggregate mining is limited by the County to off-channel locations in the Lower Cache Creek, located generally between the town of Capay and the town of Yolo.

The State of California has mapped approximately 20,000 acres of significant aggregate resources along lower Cache Creek as three Mineral Resource Zones: MRZ-1 comprises 1,458 acres, MRZ-2 comprises 18,452 acres, and MRZ-3 comprises 8,220 acres (Yolo County 2009b) (see Exhibit 3.7-4). Aggregate mining in the County is regulated through the Cache Creek Area Plan (CCAP), which includes the Off-Channel Mining Plan (OCMP). The OCMP is an aggregate resources management plan that established a policy and regulatory framework that allows for controlled off-channel gravel mining no closer than 200 feet to the banks of Cache Creek, and it is implemented through several ordinances that control commercial mining and reclamation activities. Approximately 180 million tons of aggregate have been approved for excavation and approximately 72 million tons of aggregate have actually been excavated from 1996 through 2015 (Yolo County 2019). Current mining operations include Cemex (originally Solano Concrete), Granite Capay (formerly Cache Creek Aggregates [R.C. Collet]), Granite Esparto, Syar, Teichert Esparto, Teichert Woodland, and Teichert Schwarzgruber.

### 3.7.2 Regulatory Setting

#### FEDERAL

##### **National Earthquake Hazards Reduction Act**

In October 1977, the U.S. Congress passed the Earthquake Hazards Reduction Act to reduce the risks to life and property from future earthquakes in the United States. To accomplish this, the act established the National Earthquake Hazards Reduction Program. The mission of program includes improved understanding, characterization, and prediction of hazards and vulnerabilities; improved building codes and land use practices; risk reduction through post-earthquake investigations and education; development and improvement of design and construction techniques; improved mitigation capacity; and accelerated application of research results. The program designates the Federal Emergency Management Agency as the lead agency of the program and assigns several planning, coordinating, and reporting responsibilities.

#### STATE

##### **Alquist-Priolo Earthquake Fault Zoning Act**

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 (PRC Sections 2621–2630) intends to reduce the risk to life and property from surface fault rupture during earthquakes by regulating construction in active fault corridors, and by prohibiting the location of most types of structures intended for human occupancy across the traces of active faults. The act defines criteria for identifying active faults, giving legal support to terms such as active and inactive, and establishes a process for reviewing building proposals in Earthquake Fault Zones. Under the Alquist-Priolo Act, faults are zoned and construction along or across these zones is strictly regulated if they are “sufficiently active” and “well-defined.” A fault is considered sufficiently active if one or more of its segments or strands shows evidence of surface displacement during Holocene time (defined for purposes of the act as within the last 11,000 years). A fault is considered well defined if its trace can be clearly identified by a trained geologist at the ground surface or in the shallow subsurface, using standard professional techniques, criteria, and judgment. Before a project can be permitted in a designated Alquist-Priolo Earthquake Fault Zone, cities and counties must require a geologic investigation to demonstrate that proposed buildings would not be constructed across active faults. The law addresses only the hazard of surface fault rupture and is not directed toward other earthquake hazards.



## Seismic Hazards Mapping Act

The intention of the Seismic Hazards Mapping Act of 1990 (PRC Sections 2690–2699.6) is to reduce damage resulting from earthquakes. While the Alquist-Priolo Act addresses surface fault rupture, the Seismic Hazards Mapping Act addresses other earthquake-related hazards, including ground shaking, liquefaction, and seismically induced landslides. The act's provisions are similar in concept to those of the Alquist-Priolo Act: The state is charged with identifying and mapping areas at risk of strong ground shaking, liquefaction, landslides, and other corollary hazards, and cities and counties are required to regulate development within mapped Seismic Hazard Zones. Under the Seismic Hazards Mapping Act, permit review is the primary mechanism for local regulation of development.

## California Building Code

The California Building Code (CBC) (has been modified from the International Building Code for California conditions, with more detailed and/or more stringent regulations. Specific minimum seismic safety and structural design requirements are set forth in the CBC. Chapter 16 of the CBC identifies seismic factors that must be considered in structural design. Section 1613 (Earthquake Loads) requires structures, including nonstructural components that are permanently attached to structures and their supports and attachments, to be designed and constructed to resist the effects of earthquake motions in accordance with American Society of Certified Engineers 7 (Minimum Design Loads for Buildings and Other Structures), excluding Chapter 14 and Appendix 11A. The seismic design category for a structure is determined in accordance with Section 1613 or ASCE 7. Chapter 18 regulates the excavation of foundations and retaining walls., Appendix J of the CBC regulates grading activities, including drainage and erosion control.

## State Water Resources Control Board Regulations for Cannabis Cultivation

Permitting of waste discharges to surface waters from cannabis cultivation is regulated under the State Water Resources Control Board (SWRCB) Cannabis Policy under Order WQ 2019-0001-DWQ, General Waste Discharge Requirements and Waiver of Waste Discharge Requirements for Discharges of Waste Associated with Cannabis Cultivation Activities. A summary of erosion and sediment control requirements is provided below. The reader is referred to Section 3.10, "Hydrology and Water Quality," for additional details on this order.

The entire order is available for review at:

[https://www.waterboards.ca.gov/board\\_decisions/adopted\\_orders/water\\_quality/2019/wqo2019\\_0001\\_dwq.pdf](https://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2019/wqo2019_0001_dwq.pdf)

The Cannabis General Order provides a statewide tiered approach for permitting discharges and threatened discharges of waste from cannabis cultivation and associated activities. The tier structure consists of the following:

- Tier 1 outdoor commercial cultivation activities disturb an area equal to or greater than 2,000 square feet and less than 1 acre (43,560 square feet).
- Tier 2 outdoor commercial cultivation activities disturb an area equal to or greater than 1 acre.

For the purposes of this regulation, land disturbances refer to areas where natural conditions have been modified in a way that may result in an increase in turbidity in water discharged from the site. Land disturbance includes all activities whatsoever associated with developing or modifying land for cannabis cultivation related activities or access. Land disturbance activities include, but are not limited to, construction of roads, buildings, water storage areas and excavation, grading, and site clearing.

Tier 1 and Tier 2 enrollees must characterize the risk designation based on the slope of disturbed areas and the proximity to a water body. Applicants must comply with the riparian setback and slope limits and are classified as low, moderate, or high risk, as described below:

- **Low Risk:** A cannabis cultivation site is classified as low risk if no part of the disturbed area is located on a slope of 30 percent or greater. Such cannabis cultivators shall register as low risk and submit a Site Management Plan.
- **Moderate Risk:** A cannabis cultivation site is classified as moderate risk if any part of the disturbed area is located on a slope greater than 30 percent and less than 50 percent. Such cannabis cultivators shall register as moderate risk and submit a Site Erosion and Sediment Control Plan.
- **High Risk:** A cannabis cultivation site is classified as high risk if any part of the disturbed area exists within the riparian setback limits. Such cannabis cultivators shall register as high risk, submit a Disturbed Area Stabilization Plan, and shall address the compliance issue as described below. Because such cannabis cultivators pose a higher risk to water quality and will require a higher level of RWQCB oversight, they are subject to a higher application and annual fee. When the cannabis cultivation site is reconfigured to comply with the riparian setbacks, the cannabis cultivator can request the RWQCB reclassify the site to a lower risk level and allow a lower annual fee to be assessed.

To obtain coverage under the waiver or enroll under the general order, the discharger is required to submit an online application and application fee and relevant technical reports. Technical report requirements are based on tier and risk level. Pursuant to SWRCB Order WQ 2019-0001-DWQ moderate and high risk sites are required to provide the following plans to address soil erosion.

#### **Site Erosion and Sediment Control Plan**

A Site Erosion and Sediment Control Plan describes how the cannabis cultivator will implement the site erosion and sediment control requirements listed in Attachment A of the SWRCB Order WQ 2019-0001-DWQ. The report must include an analysis of slope stability and is subject to approval by RWQCB. When required, the Site Erosion and Sediment Control Plan is to be prepared by a qualified individual (i.e., a registered professional per the Cannabis Policy requirements).

#### **Disturbed Area Stabilization Plan**

A Disturbed Area Stabilization Plan describes how BPTC measures will be implemented to achieve the goal of stabilizing the disturbed area to minimize the discharge of sediment off-site and complying with the riparian setback requirements. The report must be approved by the RWQCB Executive Officer before implementation. When required, the Disturbed Area Stabilization Plan shall be prepared by a qualified professional.

### **Paleontological Resources**

Paleontological resources on private property are considered the property of the landowner and receive no particular legal protection unless otherwise addressed in the conditions of approval of a land development permit, as mitigation in an applicable CEQA document, or through local policy and/or regulation (see below). Paleontological resources on public lands are protected by state statute (PRC Chapter 1.7, Section 5097.5, Archeological, Paleontological, and Historical Sites and Appendix G). This statute states:

A person shall not knowingly and willfully excavate upon, or remove, destroy, injure, or deface, any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, rock art, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over the lands.

## LOCAL

### Yolo County 2030 Countywide General Plan

The 2030 Countywide General Plan contains policies and actions associated with geologic hazards, soils, and mineral resources. Policies and actions potentially relevant to the project are provided below.

- **Policy HS-1.1:** Regulate land development to avoid unreasonable exposure to geologic hazards.
- **Policy HS-1.2:** All development and construction proposals shall be reviewed by the County to ensure conformance to applicable building standards.
- **Policy HS-1.3:** Require environmental documents prepared in connection with CEQA to address seismic safety issues and to provide adequate mitigation for existing and potential hazards identified.
- **Action HS-A1:** Require a geotechnical analysis for construction in areas with potential geological hazards and/or for purposes of environmental analysis. Recommendations of the geotechnical analysis shall be implemented.
- **Action HS-A2:** Rely upon the most current and comprehensive geological hazard mapping available in the evaluation of potential seismic hazards associated with proposed new development.
- **Action HS-A3:** Continue to participate in the Yolo County Subsidence Network and implement its recommendations.
- **Policy CO-3.1:** Encourage the production and conservation of mineral resources, balanced by the consideration of important social values, including recreation, water, wildlife, agriculture, aesthetics, flood control, and other environmental factors.
- **Policy CO-3.5:** Preserve and protect the County's unique geologic and physical features, which include geologic or soil "type localities," and formations or outcrops of special interest.
- **Policy CO-5.1:** Coordinate with water purveyors and water users to manage supplies to avoid long-term overdraft, water quality degradation, land subsidence and other potential problems.
- **Action CO-A63:** Require cultural resources inventories of all new development projects in areas where a preliminary site survey indicates a medium or high potential for archaeological, historical, or paleontological resources. In addition, require a mitigation plan to protect the resource before the issuance of permits. Mitigation may include:
  - Having a qualified archaeologist or paleontologist present during initial grading or trenching;
  - Redesign of the project to avoid historic or paleontological resources;
  - Capping the site with a layer of fill; and/or
  - Excavation and removal of the historical or paleontological resources and curation in an appropriate facility under the direction of a qualified professional.
- **Action CO-A93:** Require the implementation of Best Management Practices (BMPs) to minimize erosion, sedimentation, and water quality degradation resulting from new development and increases in impervious surfaces.

## Cache Creek Area Plan

The CCAP is a rivershed management plan adopted by Yolo County in 1996 for 14.5 miles of lower Cache Creek, between the Capay Dam and the unincorporated community of Yolo. The CCAP consists of two distinct complementary plans governing different areas of the overall plan area: the Cache Creek Resources Management Plan and the Off-Channel Mining Plan. Both plans establish a number of goals to assist in this overall management, balancing issues and concerns within the overriding vision of enhancing the variety of resource needs for the region. The following are relevant objectives from the 1996 Off-Channel Mining Plan:

- **Objective 2.3-1:** Recognize that the aggregate deposits along Cache Creek are significant to the economy of Yolo County, as well as surrounding jurisdictions.
- **Objective 2.3-2:** Discourage the encroachment of incompatible land uses into areas designated for future off-channel surface mining operations.

The following are relevant performance standards from the 2002 Cache Creek Resources Management Plan:

- **Performance Standard 6.5-2:** If human skeletal remains are encountered during excavation, all work within seventy-five (75) feet shall immediately stop and the County Coroner shall be notified within twenty-four (24) hours. If the remains are of Native American origin, the appropriate Native American community identified by the Native American Heritage Commission shall be contacted, and an agreement for treating or disposing, with appropriate dignity, of the remains and associated grave goods shall be developed. If any cultural resources, such as chipped or ground stone, historic debris, building foundations, or paleontological materials are encountered during excavation, then all work within seventy-five (75) feet shall immediately stop and the Community Development Director shall be notified at once. Any cultural resources found on the site shall be examined by a qualified archaeologist and the information shall be submitted to the County.

Damaging effects on cultural resources shall be avoided whenever possible. If avoidance is not feasible, the importance of the site shall be evaluated by a qualified professional prior to the commencement of excavation operations. If a cultural resource is determined not to be important, both the resource and the effect on it shall be reported to the County, and the resource need not be considered further. If avoidance of an important cultural resource is not feasible, a mitigation plan shall be prepared and implemented. The mitigation plan shall explain the importance of the resource, describe the proposed approach to mitigate destruction of damage to the site, and demonstrate how the proposed mitigation would serve the public interest.

The CCAP includes regular mandatory updates to integrate the results of ongoing monitoring and by new relevant regulatory requirements. An update of the program is currently underway which includes new proposed recommendations for avoidance and documentation.

## Yolo County Code

Title 7 (Building Regulations) of the Yolo County Code defines the regulations, conditions, and circumstances requiring application for a building permit for projects within the County. In general, project buildings and structures that would need to comply with the CBC as amended under Title 7 of the County Code. There are various exceptions for certain structures dedicated to agricultural uses.

Grading associated with building construction is regulated under the CBC that was adopted and incorporated into Title 7 of the County Code. Grading permits are generally not required for the following works described below. However, a Development Permit would be required for any work being done in a FEMA-designated Special Flood Hazard Area. Normal agricultural activities, which do not include the construction of cannabis-related facilities, are also exempted from grading permit requirements.

- Earthwork as approved by the Building Official, such as grading in an isolated, self-contained area if there is no danger to private or public property.

- Excavation below the finished grade for basements and footings of a building, retaining wall or other structure if such structure is authorized by a valid building permit. This shall not exempt any fill or excavation having an unsupported height greater than 5 feet after the completion of such structure. (building permits required).
- Mining, quarrying, excavating, processing, stockpiling of rock, sand, gravel, aggregate or clay where established and provided for by law, provided such operations do not affect the lateral support or increase the stresses in or pressure upon any adjacent or contiguous property. (mining permit required).
- Exploratory excavations under the direction of soil engineers or engineering geologists.
- An excavation which is either less than 2 feet in depth, or which does not create a cut slope greater than 5 feet in height and steeper than 1.5 horizontal to 1.0 vertical.
- A fill less than 1 foot in depth and placed on natural terrain with a slope flatter than 5.0 horizontal to 1.0 vertical, or less than 3 feet in depth, not intended to support structures, which does not exceed 50 cubic yards on any one lot and does not obstruct a drainage course.

Title 10, Chapter 3 (Cache Creek Area Plan In-Channel Maintenance Mining Ordinance) of the Yolo County Code includes the following standards regarding paleontological resources under Section 10-3.404:

(a) If human skeletal remains are encountered during excavation, all work within seventy-five (75) feet shall immediately stop, and the County Coroner shall be notified within twenty-four (24) hours. If the remains are of Native American origin, the appropriate Native American community identified by the Native American Heritage Commission shall be contacted, and an agreement for treating or disposing, with appropriate dignity, of the remains and associated grave goods shall be developed. If any cultural resources, such as chipped or ground stone, historic debris, building foundations, or paleontological materials are encountered during excavation, then all work within seventy-five feet shall immediately stop and the Director shall be notified at once. A qualified archaeologist shall then examine any cultural resources found on the site and the information shall be submitted to the County.

(b) Damaging effects to cultural resources shall be avoided whenever possible. If avoidance is not feasible, the importance of the site shall be evaluated by a qualified archeologist prior to the commencement of excavation operations. If a cultural resource is determined not to be important, both the resource and the effect on it shall be reported to the County, and the resource need not be considered further. If avoidance of an important cultural resource is not feasible, a mitigation plan shall be prepared and implemented. The mitigation plan shall explain the importance of the resource, describe the proposed approach to mitigate destruction or damage to the site, and demonstrate how the proposed mitigation would serve the public interest.

### 3.7.3 Environmental Impacts and Mitigation Measures

#### METHODS AND ASSUMPTIONS

This program-level analysis is based upon current data available that consists of fault, geology, soils, paleontological resources, and mineral resource mapping and reports from the California Geological Survey, the U.S. Natural Resources Conservation Service, Yolo County, and other sources cited in Section 3.7.1, “Environmental Setting.” The impact analysis below evaluates to what extent adoption and implementation of the CLUO, including issuance of subsequent Cannabis Use Permits pursuant to the CLUO, may result in significant impacts on/to geologic, soil, paleontological, or mineral resources. The footprint and design details of site-specific cannabis projects are not known at this time. This analysis uses the extent and general locations of future cannabis uses assumed for each of the five alternatives as presented in Table 2-4 and Exhibits 2-4 through 2-8, provided in Chapter 2, “Description of Preferred Alternative and Equal Weight Alternatives,” to provide an assessment and comparison of reasonably foreseeable outcomes from different

regulatory scenarios. Exhibits 3.7-5 through 3.7-19 overlay the assumed locations of cannabis uses for each alternative on soils, geologic, and mineral resource mapping of the County. The analysis below examines whether significant adverse impacts would occur focusing primarily on areas where overlap would occur between the mapped resource, and the assumed cannabis locations.

Construction activities that may result in geologic, soil, paleontological, and mineral resource impacts are assumed for each alternative to take place within the entire activity footprint of cannabis cultivation and noncultivation sites for Alternatives 1, 2, 3, 4, and 5 described in Chapter 2, “Description of Preferred Alternative and Equal Weight Alternatives” (see Appendix D). Construction would consist of vegetation removal, grading and/or trenching for the creation of cultivation sites, building pads, parking areas, access roadways, infrastructure, and drainage improvements. The depth of excavation would vary depending on the specific cannabis use and site conditions. However, excavations are assumed not to occur more than 20 feet below the existing ground surface.

Operations for cannabis uses are assumed to be contained within the identified activity footprint for cultivation sites and noncultivation sites. Operational activities that could impact geologic and soil resources include the following, as identified in Appendix D:

- Cultivation uses: Activities related to the site preparation, planting, maintenance, and harvesting of cannabis (including both outdoors and in structures) through the use of staff, equipment, and vehicles on exposed soil conditions that disturb soil conditions resulting in wind and water erosion. Operation of new drainage facilities that could alter the volume and velocity of stormwater flows that results in erosion and transport of sediment off-site.
- Noncultivation uses: Employee vehicle, service/delivery vehicle, and customer vehicle and equipment use on driveways and parking areas that are not paved and disturb soil conditions that result in wind and water erosion. Operation of new drainage facilities that could alter the volume and velocity of stormwater flows that results in erosion and transport of sediment off-site.

The assumptions for the extent of cannabis site activity footprints identified in Table 2-4 in Chapter 2, “Description of Preferred Alternative and Equal Weight Alternatives,” were used in the impact analysis below.

Specific requirements of existing laws and regulations described in the regulatory setting as well as the proposed CLUO (see Appendix C) were assessed for their ability to avoid or reduce the exposure of people or structures to substantial adverse effects.

Chapter 4, “Cumulative Impacts and Overconcentration,” contains a separate detailed analysis of the potential for cumulative effects not otherwise identified in this section, and effects from concentrations or clusters of multiple cannabis uses located in distinct subregions of the County.

## THRESHOLDS OF SIGNIFICANCE

Thresholds of significance are based on Appendix G of the State CEQA Guidelines. These thresholds address geology, soil, paleontological, and mineral resources considered important by the state, CEQA, and Yolo County and address whether implementation of the CLUO could create an impact.

The project would result in a significant impact related to geology and soils if it would:

- result in substantial soil erosion or the loss of topsoil;
- be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;
- be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994, as updated), creating substantial direct or indirect risks to life or property;

- directly or indirectly destroy a unique paleontological resource or site or unique geologic feature;
- result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; or
- result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

No significant environmental impacts from seismic hazards and the operation of on-site wastewater (septic) systems by future cannabis uses permitted under the CLUO are expected. The reader is referred to Section 3.0, “Environmental Setting, Impacts, and Mitigation Measures,” for the analysis dismissing this issue from further evaluation.

## IMPACT ANALYSIS

### Impact GEO-1: Create Substantial Soil Erosion or Loss of Topsoil

Adoption and implementation of the proposed CLUO, including issuance of subsequent Cannabis Use Permits pursuant to the adopted CLUO, could expose individual operations to soil stability conditions subject to soil erosion and sedimentation. Compliance with existing building and other relevant regulations, and of the CLUO would ensure soil erosion and sedimentation is adequately addressed for all of the five alternatives. This impact would be **less than significant** for all alternatives.

Cannabis uses are assumed to be located on topography throughout the County consisting primarily of gentle slopes and valley floor but could result soil erosion that results in the loss of soils, and sedimentation of County waterways (e.g., Cache Creek and Putah Creek). As identified in Table 3.7-1 and Exhibit 3.7-3, the Dibble-Millsholm, Positas, Sehorn-Balcorn soil types have moderate to very high erosion potential.

As discussed above in Section 3.7.2, “Regulatory Setting,” and Section 3.10, “Hydrology and Water Quality,” the SWRCB Order WQ 2019-0001-DWQ contains requirements for cannabis cultivation that requires the use of soil erosion and sedimentation controls (best management practices [BMPs]) for soil stability and the implementation of a Site Erosion and Sediment Control Plan and Disturbed Area Stabilization Plan for higher risk sites. Examples of BMPs for soil erosion control that may be used include the use of ground cover vegetation (grasses), detention/water quality control basins, drainage control features that are rock lined and that reduce stormwater flow velocities, and other similar features. In addition, Section 8-2.1408(V) of the CLUO includes the following requirements and performance standards for all cannabis uses that would apply to all five alternatives that requires soil stabilization:

Grading/Land Clearing – No grading or land clearing for cannabis activities may occur without prior authorization pursuant to an approved Cannabis Use Permit, and a County Grading Permit if applicable. Grading or land clearing in advance of approved permits is grounds for denial/revocation of any County Cannabis Use Permit and/or County Cannabis License. Grading and drainage shall be implemented in a manner that prevent soil erosion, and the accumulation of water, except in areas intended for retention. Grading and/or land clearing requires the issuance of a County Grading Permit and must be conducted subject to a State construction storm water permit if applicable. CDFA licensees shall demonstrate compliance with the principles and guidelines for discharge and water quality contained in the Cannabis Cultivation Policy of the State Water Resources Control Board. Excessive grading and disturbance shall be avoided. Cannabis activities on slopes of ten percent or greater require review and approval by the County Engineer to ensure the application of appropriate environmental protections and best management practices to control for erosion, sedimentation, and water quality to acceptable levels. A geotechnical analysis by a licensed civil engineer in the State of California may be required at the County’s discretion, to minimize erosion, sedimentation, and water quality to acceptable levels.

Section 8-2.1408(F) of the CLUO also requires that design and construction of buildings and structures shall comply with all applicable County codes, standards, regulations, and guidelines. These provisions are consistent with General Plan Action CO-A93.

Alternatives 1, 2, 3, and 5 assume that personal use outdoor cultivation may occur in any zoning district. Personal use outdoor cultivation of up to six plants is assumed to occur within pots or garden areas of parcels developed with residences. Alternative 4 would limit personal use cultivation to indoor only. These activities would likely involve no more than 100 square feet of land area and would be required to be outside of front yard and side yard setback areas. Given the minor extent of this potential ground disturbance contained within existing developed parcels, no significant soil erosion impacts are expected.

**Alternative 1: Cultivation (Ancillary Nurseries and Processing Only) with Existing Limits (Existing Operations with CLUO) (CEQA Preferred Alternative)**

Soil types and existing and eligible cultivation sites for Alternative 1 are identified in Exhibit 3.7-5. As shown in Exhibit 3.7-5, there are cultivation sites within the Sehorn-Balcom and Dibble-Milsolm soil associations that have a moderate to very high water erosion hazard. Nine of the 78 existing and eligible cannabis cultivation sites are assumed to relocate under Alternative 1 due to zoning standards under the CLUO. While the total number of cultivation sites would not increase, assumed relocation activities could result in the construction of new cultivation sites that may involve 18 acres of grading activities (see Table 2-5), removal of ground cover potentially resulting in exposed soils at operating outdoor cultivation sites, and modifications to individual site drainage conditions that could result in soil erosion impacts. Existing and relocated cultivation sites would be subject to the requirements of SWRCB Order WQ 2019-0001-DWQ and CLUO Sections 8-2.1408(F) and 8-2.1408(V) would require that cultivation sites maintain soil stability and avoid soil erosion impacts.

This impact would be **less than significant** under Alternative 1.

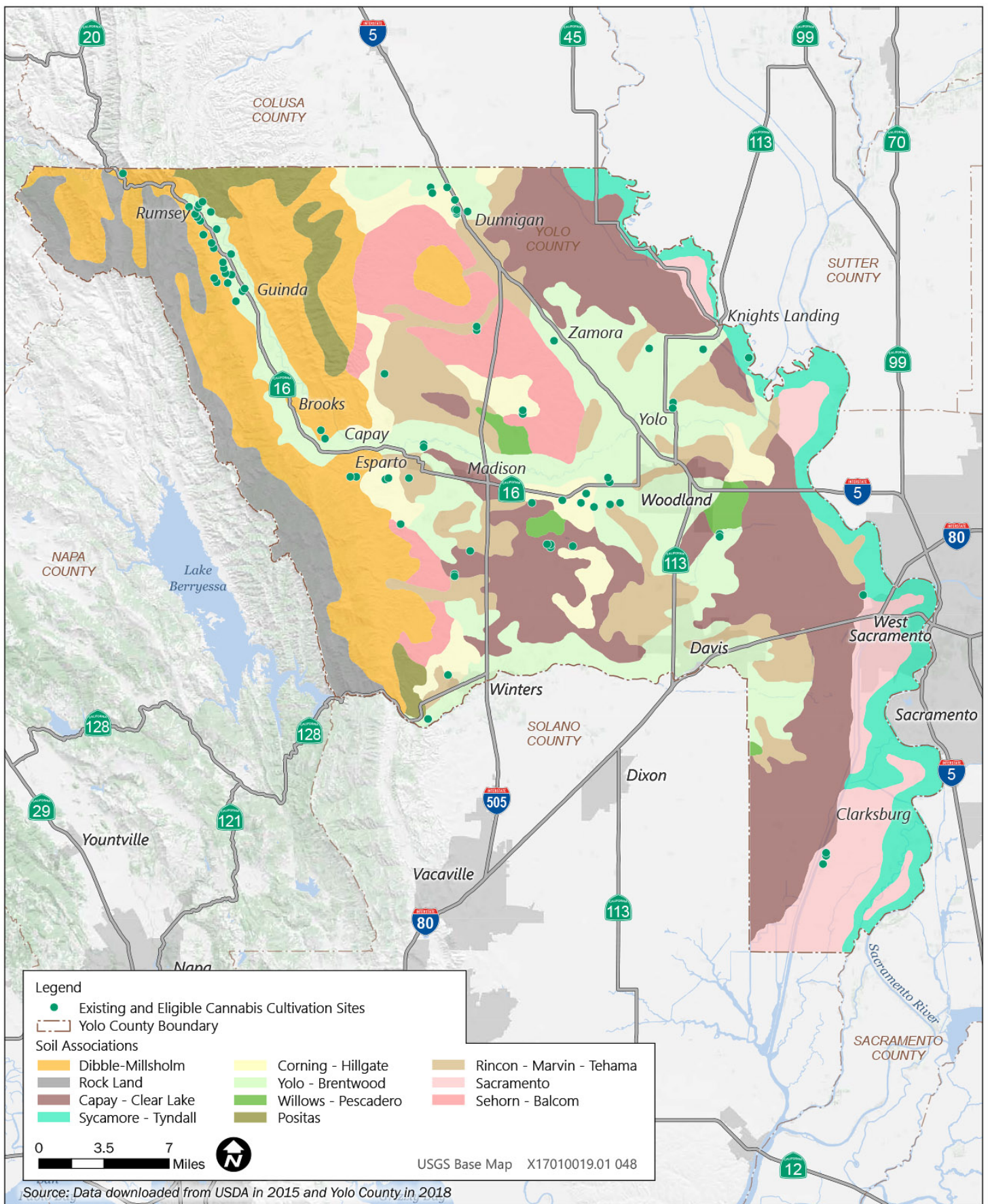
**Alternative 2: All License Types with Moderate Limits**

Exhibit 3.7-6 identifies the soil types associated with assumed locations of cannabis uses (cultivation and noncultivation) under Alternative 2. As shown in Exhibit 3.7-6, Alternative 2 could place 14 assumed new cannabis uses within the Sehorn-Balcom and Dibble-Milsolm soil associations that have a moderate to very high water erosion hazard. This alternative could also place 14 new cannabis uses near Cache Creek and three near Putah Creek that could result in sedimentation into these waterways. The potential construction activity for assumed new cannabis uses as well as the assumed relocation of 30 of the 78 existing and eligible cultivation sites pursuant to CLUO zoning and buffer standards could involve approximately 164 acres of grading activities countywide (see Table 2-5) that could create soil erosion impacts. Removal of ground cover could result in exposed soils at operating outdoor cultivation sites. Modifications to individual site drainage conditions for cannabis uses could also result in soil erosion impacts. Cultivation sites would be subject to the requirements of SWRCB Order WQ 2019-0001-DWQ and CLUO Sections 8-2.1408(F) and 8-2.1408(V) would require that cultivation sites maintain soil stability. While noncultivation sites would not be subject to SWRCB Order WQ 2019-0001-DWQ, these sites would be subject to CLUO Sections 8-2.1408(F) and 8-2.1408(V) that would require grading and drainage improvements to be implemented in a manner that prevent soil erosion.

This impact would be **less than significant** under Alternative 2.

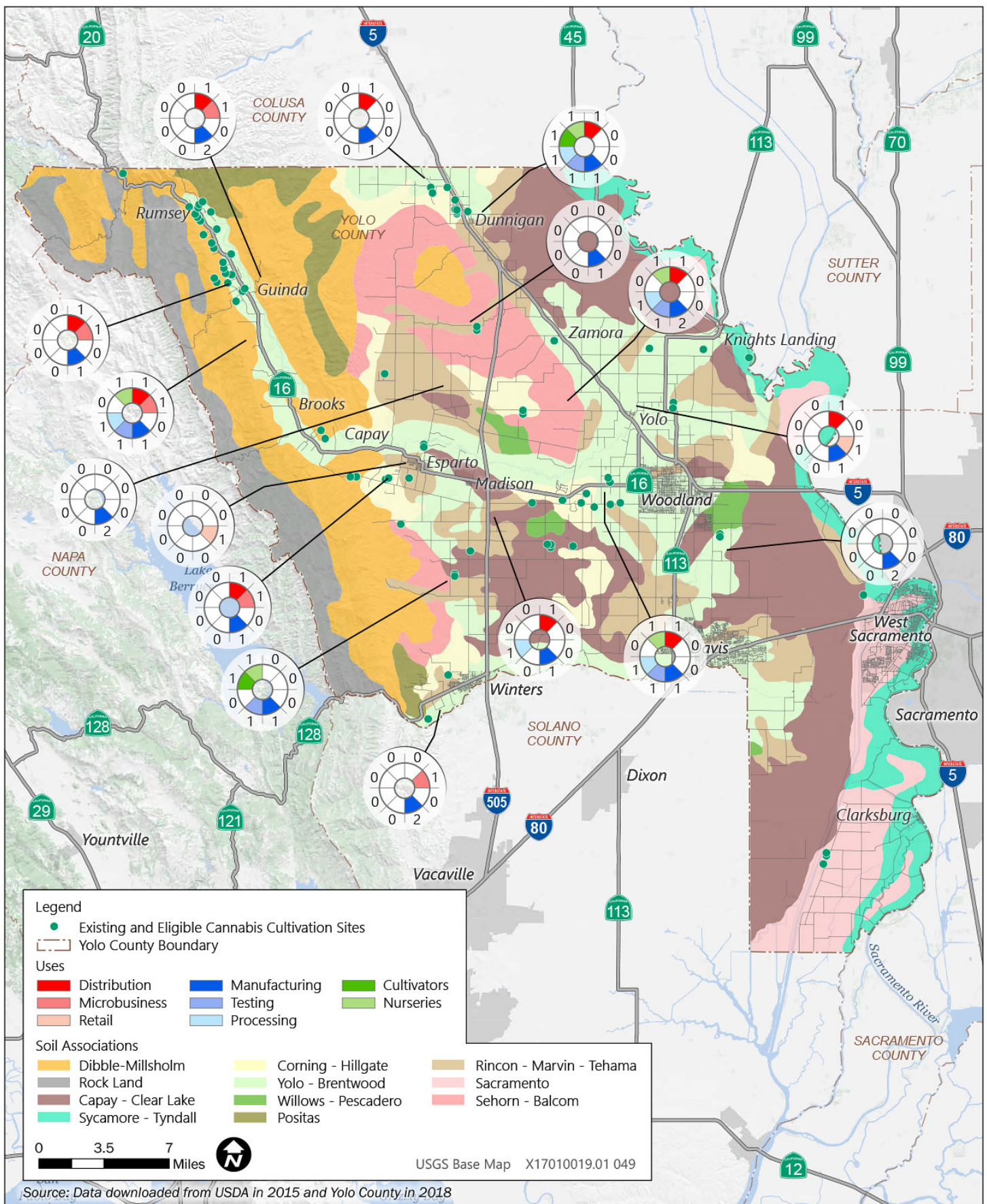
**Alternative 3: All License Types with High Limits**

The assumed locations of new cannabis uses under Alternative 3 (cultivation and noncultivation sites) shown in Exhibit 3.7-7 could place 24 new cannabis uses within the Sehorn-Balcom and Dibble-Milsolm soil associations that have a moderate to very high water erosion hazard. This alternative could also place 20 new cannabis uses near Cache Creek and four near Putah Creek that could result in sedimentation of these waterways. The potential construction activity for assumed new cannabis uses as well as the assumed relocation of nine of the 78 existing and eligible cultivation sites pursuant to CLUO zoning standards could involve approximately 379 acres of grading activities countywide (see Table 2-5) that could create soil



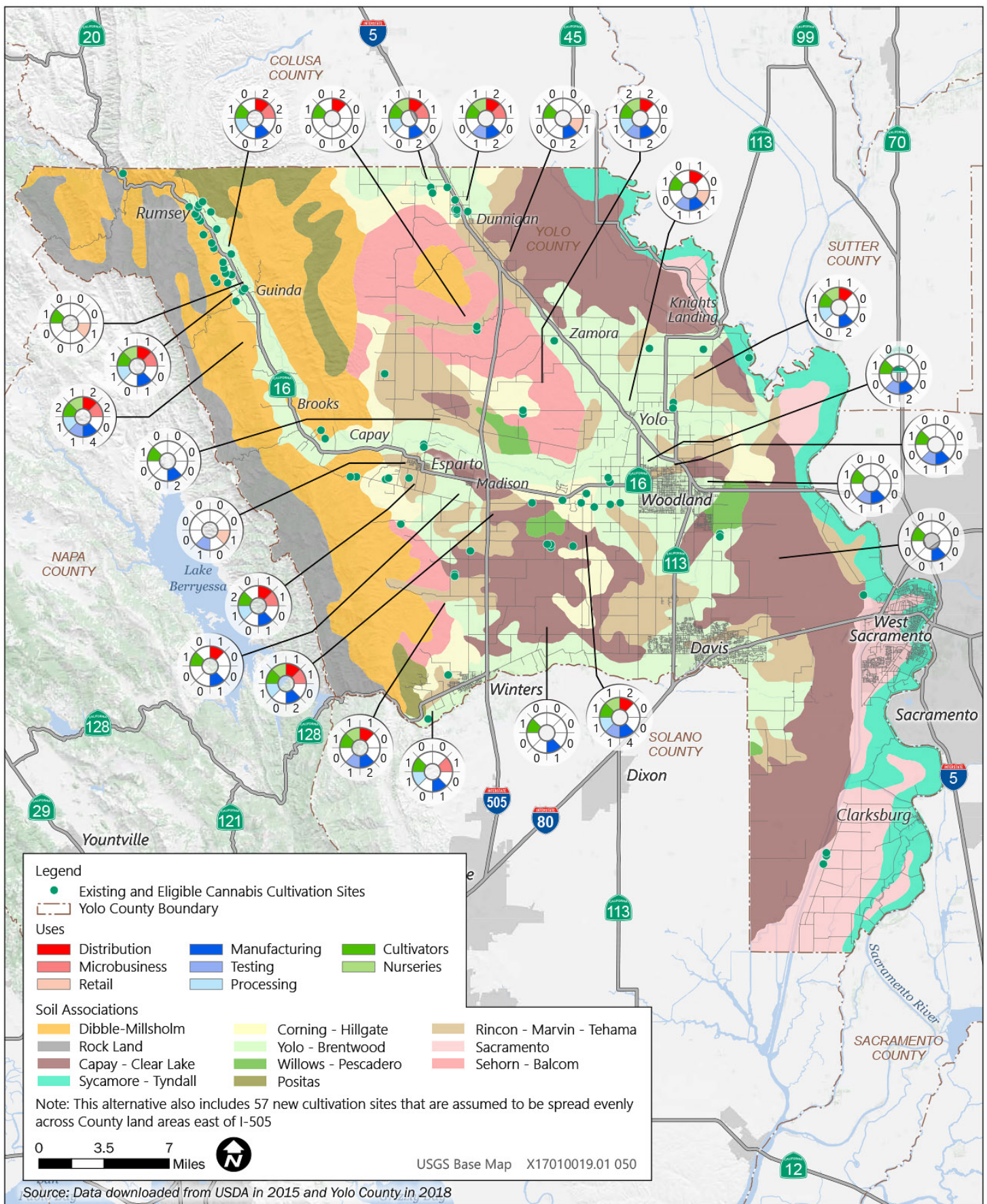
**Exhibit 3.7-5**

**Alternative 1 Cannabis Uses and Soil Associations**



**Exhibit 3.7-6**

**Alternative 2 Cannabis Uses and Soil Associations**



**Exhibit 3.7-7**

**Alternative 3 Cannabis Uses and Soil Associations**

erosion impacts. Lack of ground cover resulting in exposed soils at operating outdoor cultivation sites and modifications to individual site drainage conditions for cannabis uses could also result in soil erosion impacts. Cultivation sites would be subject to the requirements of SWRCB Order WQ 2019-0001-DWQ and CLUO Sections 8-2.1408(F) and 8-2.1408(V) would require that cultivation sites maintain soil stability. While noncultivation sites would not be subject to SWRCB Order WQ 2019-0001-DWQ, these sites would be subject to CLUO Sections 8-2.1408(F) and 8-2.1408(V) that would require grading and drainage improvements to be implemented in a manner that prevents soil erosion.

This impact would be **less than significant** under Alternative 3.

#### **Alternative 4: Mixed-Light/Indoor License Types Only with Moderate Limits, No Hoop Houses or Outdoor Types**

The assumed locations of Alternative 4 cannabis uses (cultivation and noncultivation sites) shown in Exhibit 3.7-8 could place 18 new cannabis uses within the Sehorn-Balcom and Dibble-Milsolm soil associations that have a moderate to very high water erosion hazard. This alternative would also place nine new cannabis uses near Cache Creek and two near Putah Creek that could result in sedimentation of these waterways. The potential construction activity for assumed cannabis uses (new, relocated, and conversion of outdoor cultivation to mixed-light or indoor cultivation) could involve approximately 122 acres of grading activities countywide that could create soil erosion impacts (see Table 2-5). Cultivation sites that involve buildings without a permanent floor would be subject to the requirements of SWRCB Order WQ 2019-0001-DWQ and CLUO Sections 8-2.1408(F) and 8-2.1408(V) would require that cultivation sites maintain soil stability. While cultivation sites within buildings with permanent floors and noncultivation sites would not be subject to SWRCB Order WQ 2019-0001-DWQ, these sites would be subject to CLUO Sections 8-2.1408(F) and 8-2.1408(V) that would require grading and drainage improvements to be implemented in a manner that prevents soil erosion.

This impact would be **less than significant** under Alternative 4.

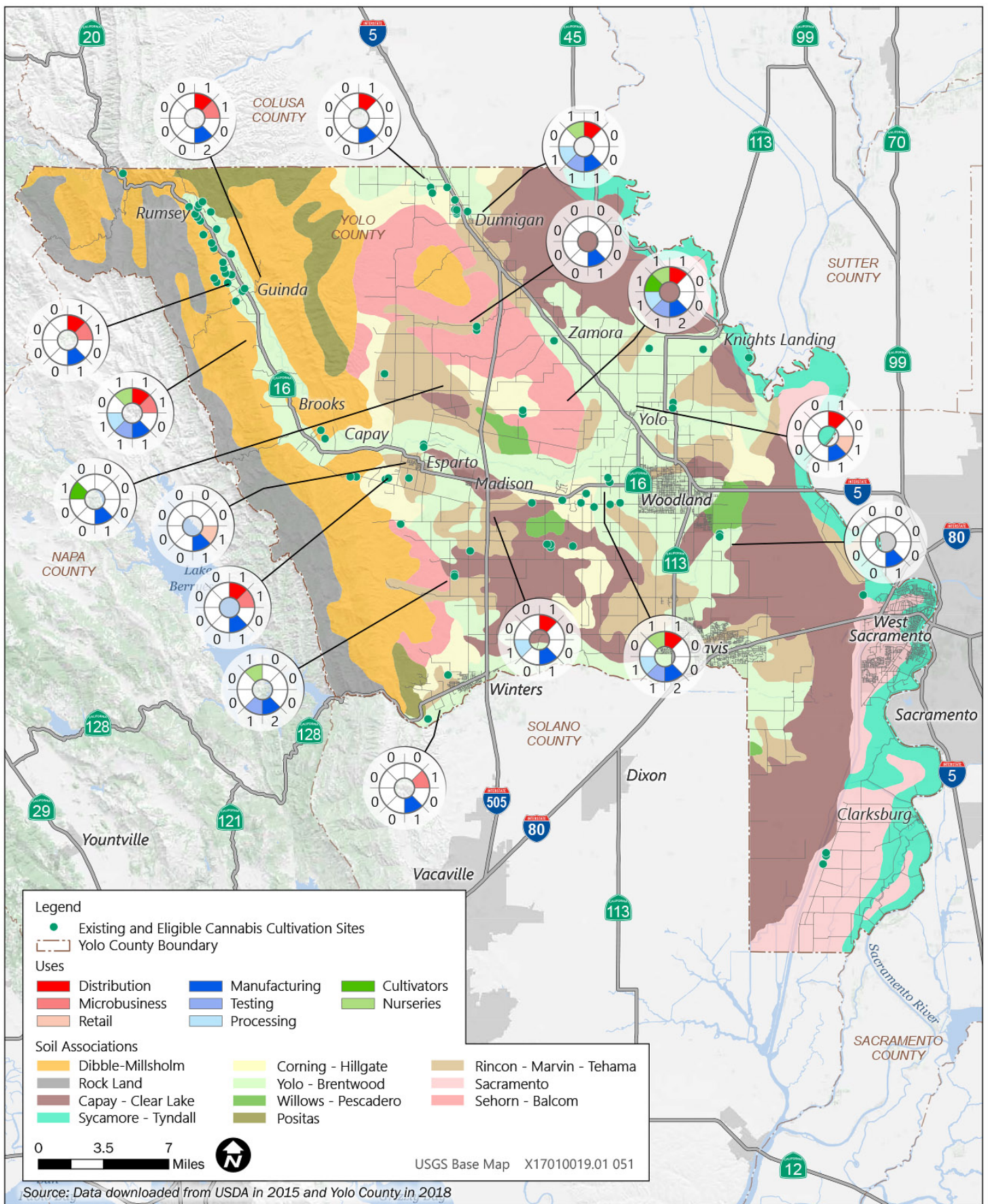
#### **Alternative 5: All License Types with Moderate Limits, within Agricultural Zones Only, No Retail**

The assumed locations of Alternative 5 cannabis uses (cultivation and noncultivation sites) shown in Exhibit 3.7-9 could place 23 new cannabis uses within the Sehorn-Balcom and Dibble-Milsolm soil associations that have a moderate to very high water erosion hazard. This alternative would also place seven new cannabis uses near Cache Creek and two near Putah Creek that could result in sedimentation of these waterways. The potential construction activity for assumed new cannabis uses as well as the assumed relocation of 30 of the 78 existing and eligible cultivation sites pursuant to CLUO zoning and buffer standards could involve approximately 163 acres of grading activities countywide that could create soil erosion impacts (see Table 2-5). Lack of ground cover resulting in exposed soils at operating outdoor cultivation sites and modifications to individual site drainage conditions for cannabis uses could also result in soil erosion impacts. Cultivation sites would be subject to the requirements of SWRCB Order WQ 2019-0001-DWQ and CLUO Sections 8-2.1408(F) and 8-2.1408(V) would require that cultivation sites maintain soil stability. While noncultivation sites would not be subject to SWRCB Order WQ 2019-0001-DWQ, these sites would be subject to CLUO Sections 8-2.1408(F) and 8-2.1408(V) that would require grading and drainage improvements to be implemented in a manner that prevents soil erosion.

This impact would be **less than significant** under Alternative 5.

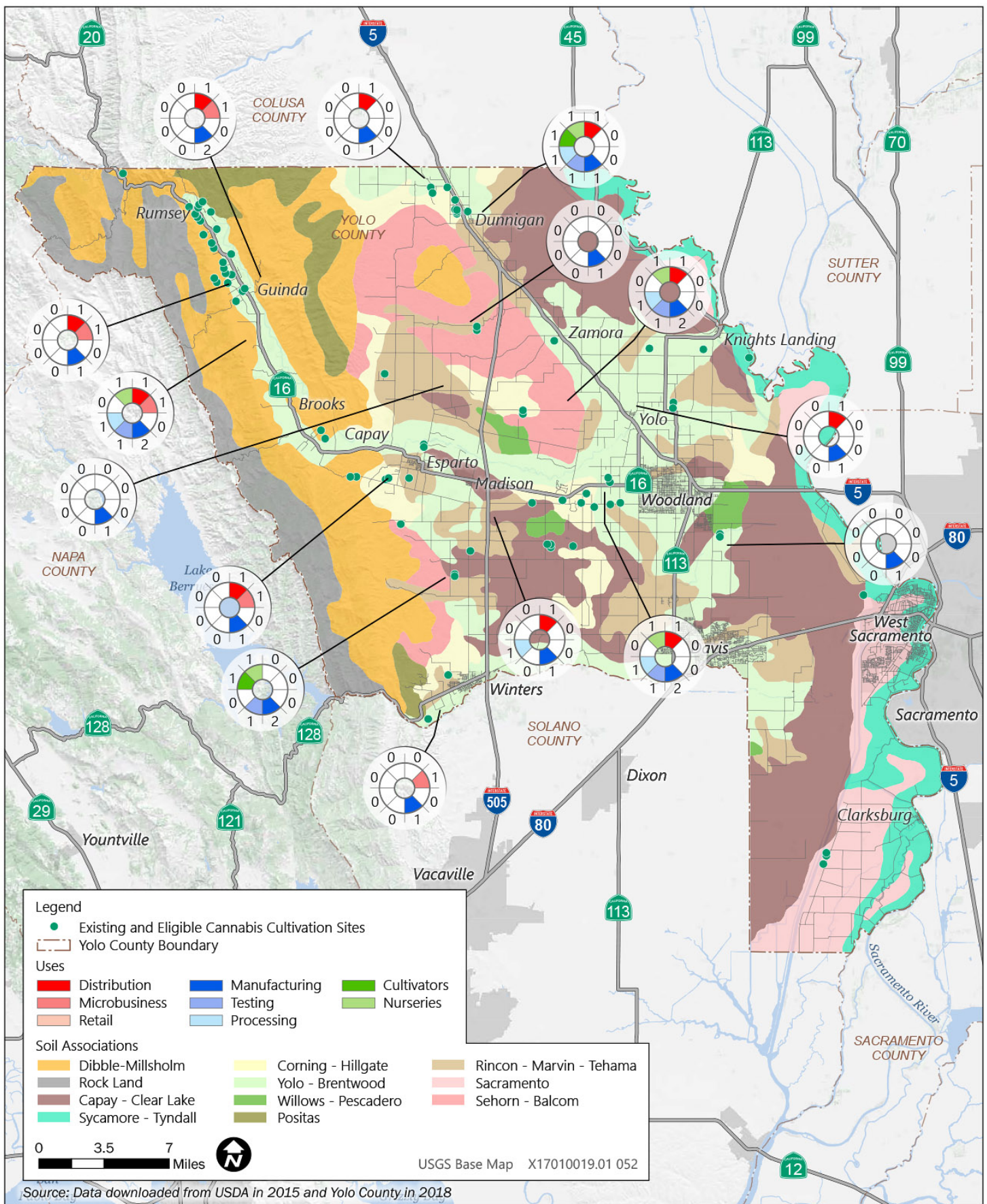
## **Mitigation Measures**

No mitigation is required for any of the alternatives.



**Exhibit 3.7-8**

**Alternative 4 Cannabis Uses and Soil Associations**



**Exhibit 3.7-9**

**Alternative 5 Cannabis Uses and Soil Associations**

## **Impact GEO-2: Be Located on a Geologic Unit or Soil That Is Unstable or Would Become Unstable as a Result of the Project or Be Located on Expansive Soil, Creating Direct or Indirect Risks to Life or Property**

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The majority of Yolo County is characterized by even topography and gentle slopes; however site-specific conditions may include steep slopes, expansive soils, and other related conditions that can result in soil stability hazards. Adoption and implementation of the proposed CLUO, including issuance of subsequent Cannabis Use Permits pursuant to the adopted CLUO, could expose individual operations to geologic and soil stability conditions that could adversely affected. Compliance with existing building and other relevant regulations, and implementation of Section 8-2.1408(V) of the CLUO that requires approval of a grading plan would ensure soil erosion and sedimentation is adequately addressed for all of the five alternatives. This impact would be **less than significant** for all alternatives.

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As noted in Section 3.7.1, “Environmental Setting,” the County is predominantly flat with gentle slopes; however, site-specific conditions related to topography, slope, and soils could result in geologic stability issues should grading and development be conducted without proper engineering and design. Cannabis uses are assumed to be located on topography throughout the County consisting primarily of gentle slopes and valley floor but could result in slope stability issues in areas such as Capay Valley. As identified in Table 3.7-1 and Exhibit 3.7-3, expansive soil conditions exist throughout the County and can damage foundations and roadways associated with cannabis uses.

As discussed above in Section 3.7.2, “Regulatory Setting,” and Section 3.10, “Hydrology and Water Quality,” the SWRCB Order WQ 2019-0001-DWQ contains requirements for cannabis cultivation that requires the use of soil stability controls (best management practices [BMPs]) for soil stability and the implementation of a Site Erosion and Sediment Control Plan and Disturbed Area Stabilization Plan for higher risk sites. Section 8-2.1408(V) of the CLUO requires that cannabis uses on slopes of ten percent or greater require review and approval by the County Engineer to ensure the application of appropriate environmental protections and best management practices to ensure site stability. Compliance may require provision of a geotechnical analysis by a licensed civil engineer in the State of California to demonstrate site stability.

Section 8-2.1408(F) of the CLUO also requires that design and construction of buildings and structures shall comply with all applicable County codes, standards, regulations, and guidelines. This would include building standards that address potential hazards associated with expansive soils, which could be addressed through soil treatments at foundations and roadbeds. These provisions are consistent the geologic hazard and soil erosion policy provisions in the General Plan (Policy HS-1.1 and Action CO-A93).

Subsidence due to groundwater pumping has been detected in the northern Yolo-Zamora area of Yolo County between Zamora and Knights Landing, where subsidence is reported to be on the order of 5 feet, and the vicinity of the cities of Davis and Woodland, where subsidence is estimated at 2 or 3 feet (Water Resources Association of Yolo County 2018). As further addressed in Section 3.10, “Hydrology and Water Quality,” none of the five alternatives would result in significant groundwater demands that would further exacerbate existing land subsidence conditions in the County.

Alternatives 1, 2, 3, and 5 assume that personal use outdoor cultivation may occur in any zoning district. Personal use outdoor cultivation of up to six plants is assumed to occur within pots or garden areas of parcels developed with residences. Alternative 4 would limit personal use cultivation to indoor only. These activities would likely involve no more than 100 square feet of land area and would be required to be outside of front yard and side yard setback areas. Given the minor extent of this potential ground disturbance contained within existing developed parcels, no significant soil stability impacts are expected.

**Alternative 1: Cultivation (Ancillary Nurseries and Processing Only) with Existing Limits (Existing Operations with CLUO) (CEQA Preferred Alternative)**

Geologic conditions at existing and eligible cultivation sites for Alternative 1 are shown in Exhibit 3.7-10 and includes cultivation on sloped sites. All soils in the County have moderate to high expansive soil potential that could damage foundations and roadways. Nine of the 78 existing and eligible cannabis cultivation sites are assumed to relocate under Alternative 1 due to zoning standards under the CLUO. While the total number of cultivation sites would not increase, relocation could result in the construction of new cultivation sites that may involve 18 acres of grading activities that could create geologic and soil stability issues (see Table 2-5).

Existing and relocated cultivation sites would be subject to the requirements of SWRCB Order WQ 2019-0001-DWQ and CLUO Sections 8-2.1408(F) and 8-2.1408(V) would require that cultivation sites maintain site stability.

This impact would be **less than significant** under Alternative 1.

**Alternative 2: All License Types with Moderate Limits**

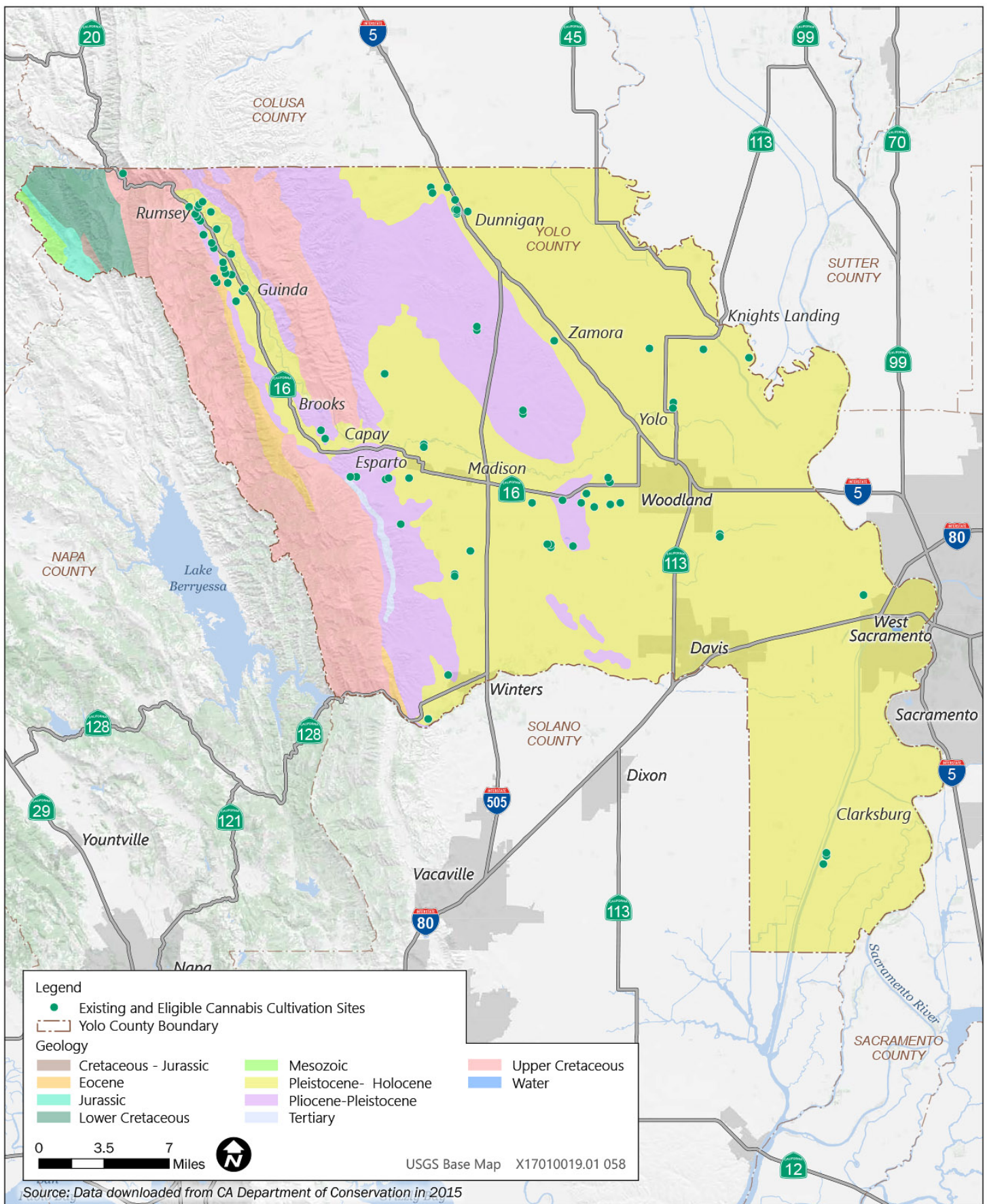
Exhibit 3.7-11 identifies the geologic conditions associated with assumed locations of cannabis uses (cultivation and noncultivation) under Alternative 2. Alternative 2 could place 18 assumed new cannabis uses within sloped conditions associated with Capay Valley and Dunnigan Hills. All soils in the County have moderate to high expansive soil potential that could damage foundations and roadways. The potential construction activity for assumed new cannabis uses as well as the assumed relocation of 30 of the 78 existing and eligible cultivation sites pursuant to CLUO zoning and buffer standards could involve approximately 164 acres of grading activities countywide (see Table 2-5). Cultivation sites would be subject to the requirements of SWRCB Order WQ 2019-0001-DWQ and CLUO Sections 8-2.1408(F) and 8-2.1408(V) would require that cultivation sites maintain soil and slope stability. While noncultivation sites would not be subject to SWRCB Order WQ 2019-0001-DWQ, these sites would be subject to CLUO Sections 8-2.1408(F) and 8-2.1408(V) that would require grading and drainage improvements to be implemented in a manner that prevent geologic and soil stability issues.

This impact would be **less than significant** under Alternative 2.

**Alternative 3: All License Types with High Limits**

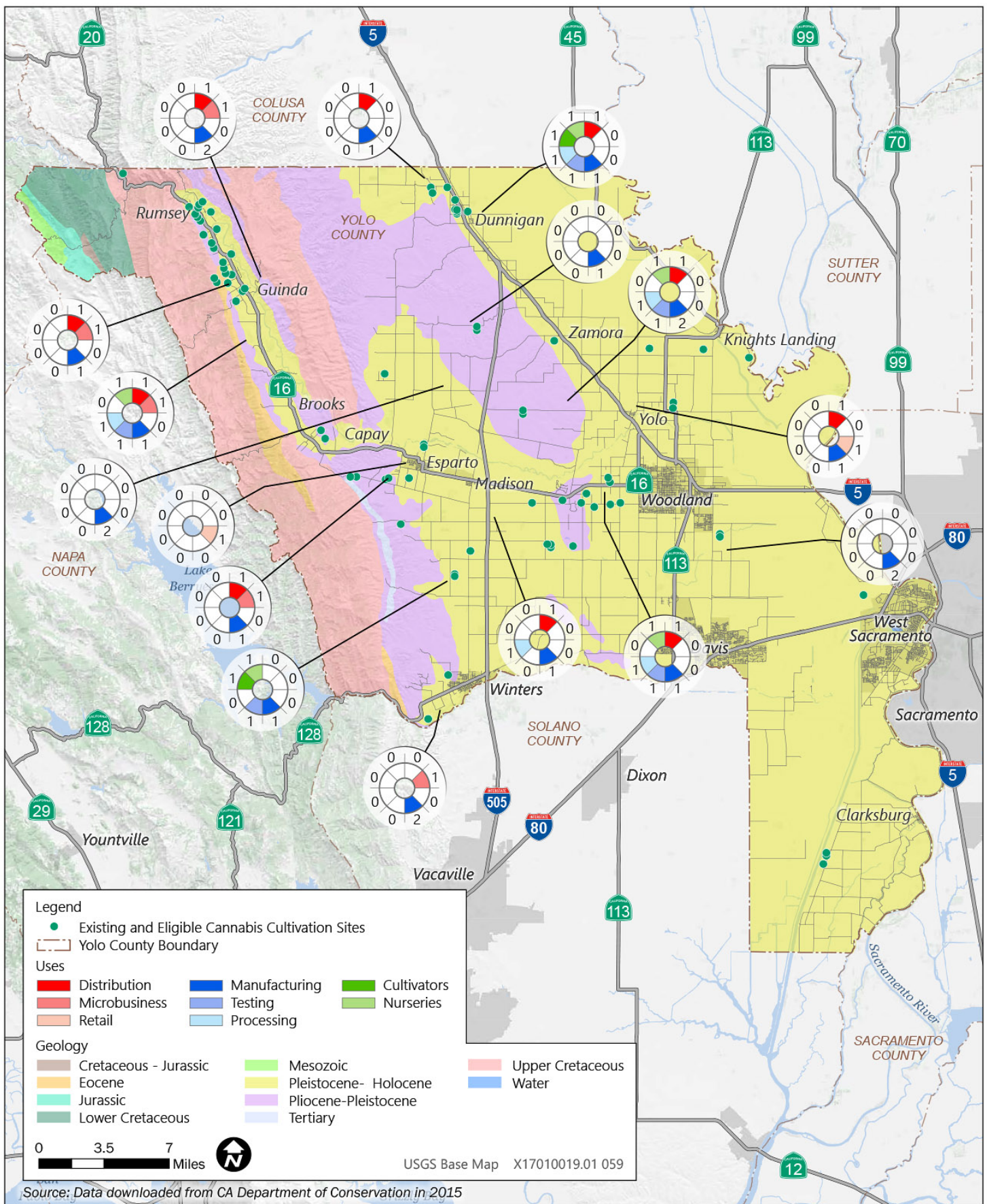
The assumed locations of Alternative 3 new cannabis uses (cultivation and noncultivation sites) in relation to geologic conditions is shown in Exhibit 3.7-12. This alternative could place 33 assumed new cannabis uses within sloped conditions associated with Capay Valley and Dunnigan Hills. All soils in the County have moderate to high expansive soil potential that could damage foundations and roadways. The potential construction activity for assumed new cannabis uses as well as the assumed relocation of nine of the 78 existing and eligible cultivation sites pursuant to CLUO zoning standards could involve approximately 379 acres of grading activities countywide (see Table 2-5). Cultivation sites would be subject to the requirements of SWRCB Order WQ 2019-0001-DWQ and CLUO Sections 8-2.1408(F) and 8-2.1408(V) would require that cultivation sites maintain soil and slope stability. While noncultivation sites would not be subject to SWRCB Order WQ 2019-0001-DWQ, these sites would be subject to CLUO Sections 8-2.1408(F) and 8-2.1408(V) that would require grading and drainage improvements to be implemented in a manner that prevent geologic and soil stability issues.

This impact would be **less than significant** under Alternative 3.



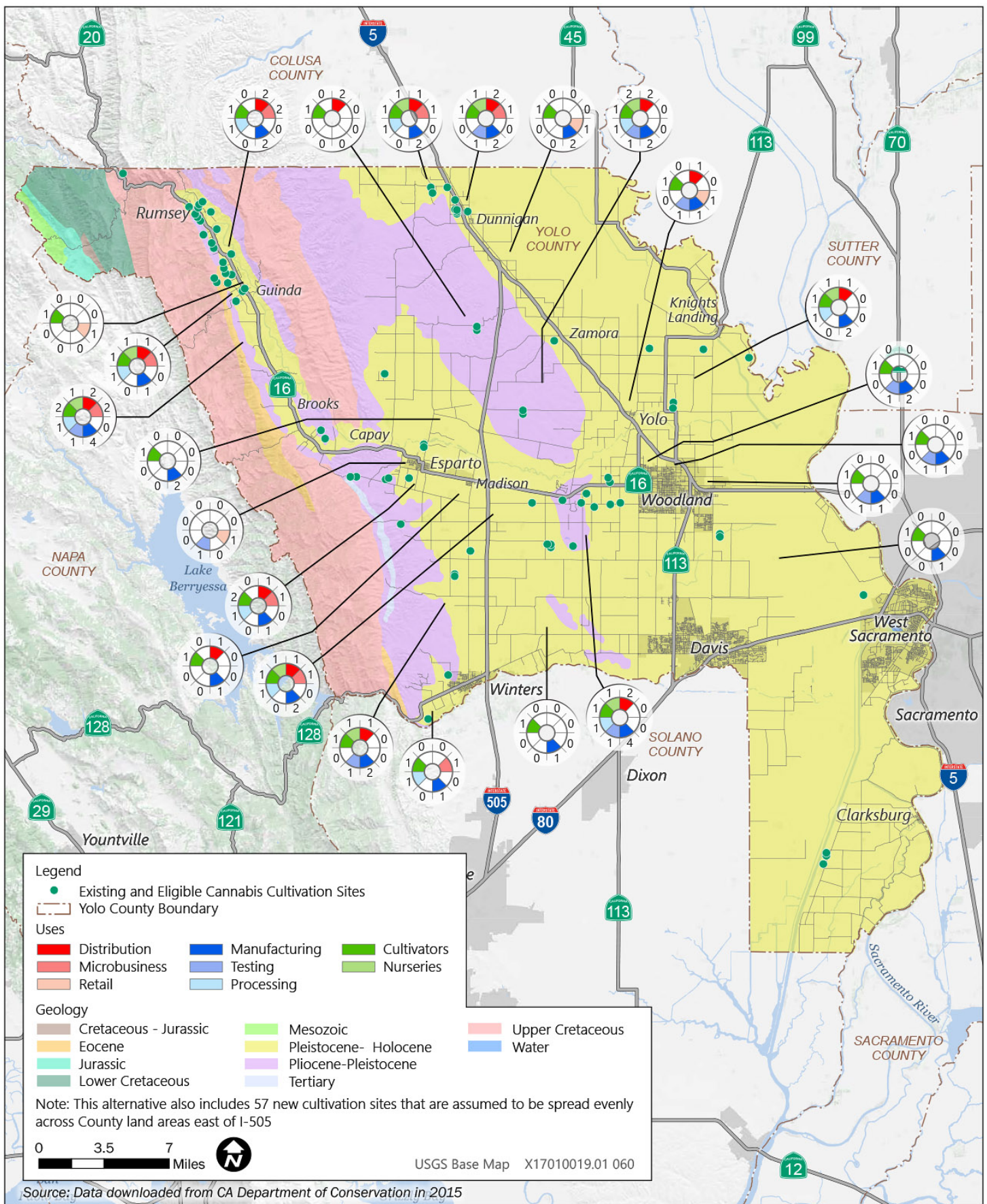
**Exhibit 3.7-10**

**Alternative 1 Cannabis Uses and Geologic Conditions**



**Exhibit 3.7-11**

**Alternative 2 Cannabis Uses and Geologic Conditions**



**Exhibit 3.7-12**

**Alternative 3 Cannabis Uses and Geologic Conditions**

**Alternative 4: Mixed-Light/Indoor License Types Only with Moderate Limits, No Hoop Houses or Outdoor Types**

The assumed locations of Alternative 4 cannabis uses (cultivation and noncultivation sites) in relation to geologic conditions is shown in Exhibit 3.7-13. This alternative could place 21 assumed new cannabis uses within sloped conditions associated with Capay Valley and Dunnigan Hills. All soils in the County have moderate to high expansive soil potential that could damage foundations and roadways. The potential construction activity for assumed cannabis uses (new, relocated, and conversion of outdoor cultivation to mixed-light or indoor cultivation) could involve approximately 122 acres of grading activities countywide that could create soil erosion impacts (see Table 2-5). Cultivation sites would be subject to the requirements of SWRCB Order WQ 2019-0001-DWQ and CLUO Sections 8-2.1408(F) and 8-2.1408(V) would require that cultivation sites maintain soil and slope stability. While noncultivation sites would not be subject to SWRCB Order WQ 2019-0001-DWQ, these sites would be subject to CLUO Sections 8-2.1408(F) and 8-2.1408(V) that would require grading and drainage improvements to be implemented in a manner that prevent geologic and soil stability issues.

This impact would be **less than significant** under Alternative 4.

**Alternative 5: All License Types with Moderate Limits, within Agricultural Zones Only, No Retail**

The assumed locations of Alternative 5 cannabis uses (cultivation and noncultivation sites) in relation to geologic conditions is shown in Exhibit 3.7-14. This alternative could place 21 assumed new cannabis uses within sloped conditions associated with Capay Valley and Dunnigan Hills. All soils in the County have moderate to high expansive soil potential that could damage foundations and roadways. The potential construction activity for assumed new cannabis uses as well as the assumed relocation of 30 of the 78 existing and eligible cultivation sites pursuant to CLUO zoning and buffer standards could involve approximately 163 acres of grading activities countywide (see Table 2-5). Cultivation sites would be subject to the requirements of SWRCB Order WQ 2019-0001-DWQ and CLUO Sections 8-2.1408(F) and 8-2.1408(V) would require that cultivation sites maintain soil and slope stability. While noncultivation sites would not be subject to SWRCB Order WQ 2019-0001-DWQ, these sites would be subject to CLUO Sections 8-2.1408(F) and 8-2.1408(V) that would require grading and drainage improvements to be implemented in a manner that prevent geologic and soil stability issues.

This impact would be **less than significant** under Alternative 5.

**Mitigation Measures**

No mitigation is required for any of the alternatives.

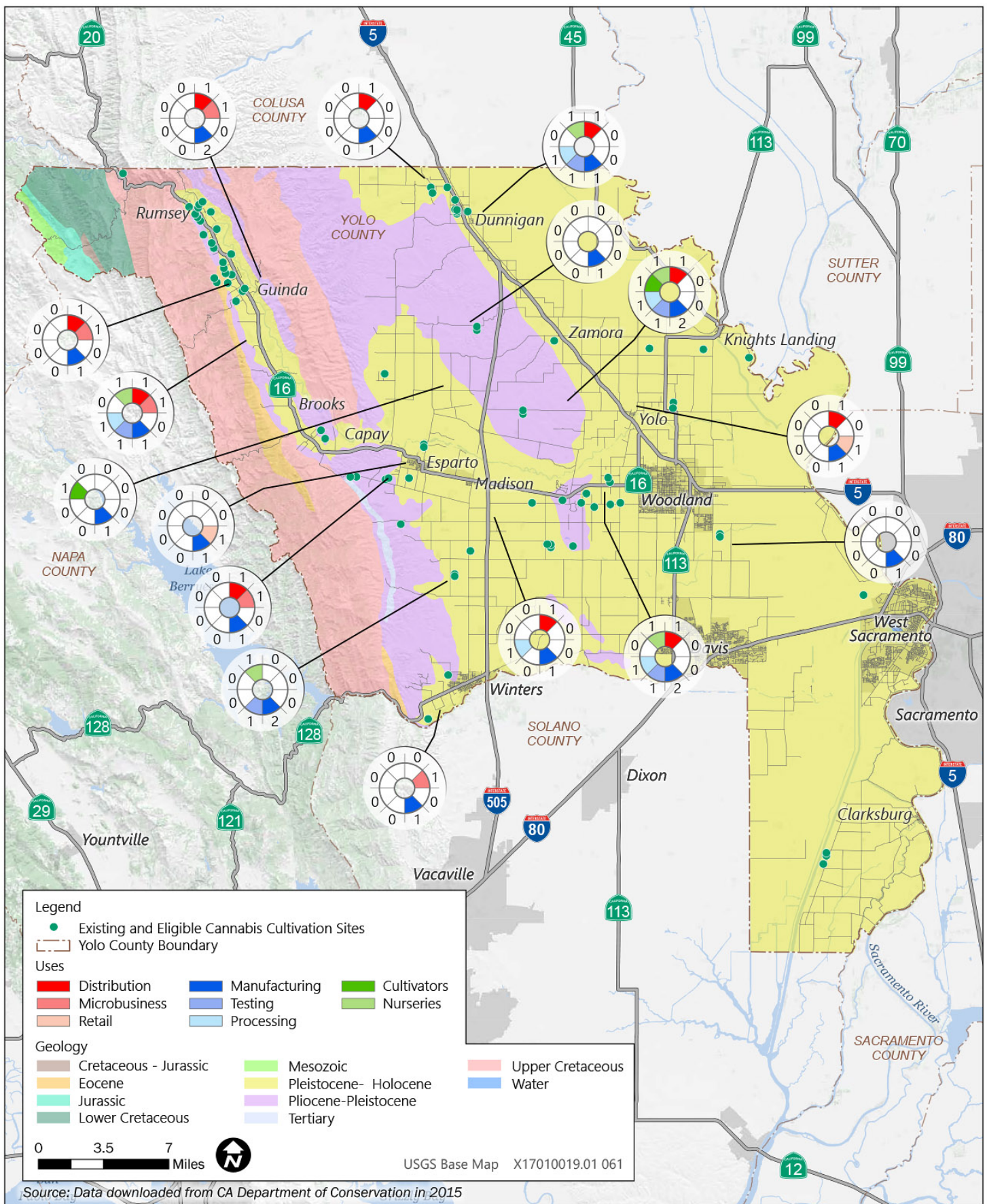
**Impact GEO-3: Destroy a Unique Paleontological Resource or Site or Unique Geologic Feature**

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Adoption and implementation of the proposed CLUO, including issuance of subsequent Cannabis Use Permits pursuant to the adopted CLUO, could result in discovery of previously unknown paleontological resources. Section 8-2.1408(H) of the CLUO would require that cannabis uses protect and mitigate discovered paleontological resources. This impact would be **less than significant** for all alternatives.

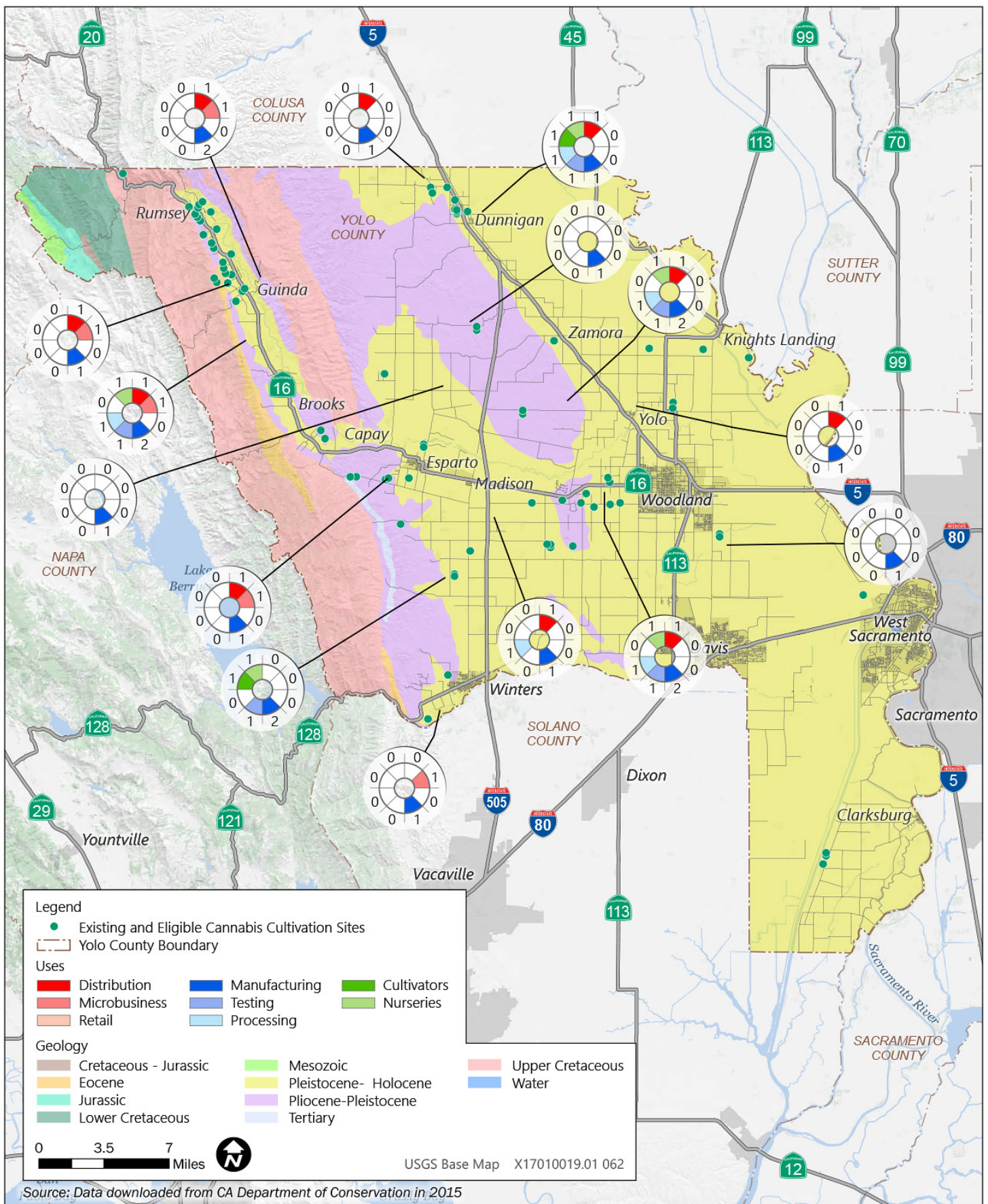
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As noted in Section 3.7.1, “Environmental Setting,” there are geologic features in the County that have potential to contain paleontological resources. These geologic features are located primarily in the western portion of the County near Capay Valley. Paleontological resources are classified as non-renewable scientific resources and are protected by state statute as well as by Yolo County General Plan Action CO-A63 that requires a cultural resources inventory for all new development projects.



**Exhibit 3.7-13**

**Alternative 4 Cannabis Uses and Geologic Conditions**



**Exhibit 3.7-14**

**Alternative 5 Cannabis Uses and Geologic Conditions**

Section 8-2.1408(H)(1) of the CLUO includes the following requirements and performance standards that addresses paleontological resources for all cannabis uses (cultivation and noncultivation) that would apply to all five alternatives:

In accordance with Policies CO-4.12 and CO-4.13, and Actions CO-A63 through CO-A66, of the Cultural Resources chapter of the Conservation and Open Space Element of the County General Plan, applicants shall submit a preliminary site survey to determine the potential for archeological, historical, or paleontological resources to be located on the project site. If the site has a low potential for this to occur, no further actions are necessary unless resources are encountered during construction or farming. If the site has a medium to high potential, a cultural resources inventory is required to be submitted as part of the application. If onsite resources are identified, a mitigation plan is required to protect identified resources in accordance with General Plan Actions CO-A63 and CO-A64 prior to issuance of permits. If cultural resources (archaeological, historic, paleontological) are encountered during construction, workers shall not alter the materials or their context until an appropriately trained cultural resource consultant has evaluated the find. Project personnel shall not collect cultural resources. Prehistoric resources include chert or obsidian flakes, projectile points, mortars, pestles, dark friable soil containing shell and bone dietary debris, heat-affected rock, or human burials. Historic resources include stone or adobe foundations or walls, structures and remains with square nails, and refuse deposits often in old wells and privies.

Section 8-2.1408(OO) of the CLUO also requires that site design demonstrates protection of paleontological resources and Section 8-2.14010(C)(1) requires that permittees submit a Cultural Resources Assessment that would also evaluate the potential for paleontological resources on the site as required by Section 8-2.1408(H). Compliance with these CLUO requirements would require the implementation of protection measures (e.g., halting of construction and careful removal of the discovered resource) and may require site plans to be redesigned to protect the identified paleontological resources.

Alternatives 1, 2, 3, and 5 assume that personal use outdoor cultivation may occur in any zoning district. Personal use outdoor cultivation of up to six plants is assumed to occur within pots or garden areas of parcels developed with residences. Alternative 4 would limit personal use cultivation to indoor only. These activities would likely involve no more than 100 square feet of land area and would be required to be outside of front yard and side yard setback areas. Given minimal size of the cultivation area and its location within a developed parcel, no significant paleontological resource impacts are expected.

**Alternative 1: Cultivation (Ancillary Nurseries and Processing Only) with Existing Limits (Existing Operations with CLUO) (CEQA Preferred Alternative)**

Nine of the 78 existing and eligible cannabis cultivation sites are assumed to relocate under Alternative 1 due to zoning standards under the CLUO. Assumed relocation activities would include closure and restoration of the existing cultivation sites and construction of new cultivation sites that is assumed to disturb approximately 18 acres that may contain paleontological resources (see Table 2-5).

One of these existing cultivation sites that are assumed to require relocation is located in the western portion of the County in areas containing geologic deposits that have potential for paleontological resources. Cannabis cultivation operators would be required to comply with Sections 8-2.1408(H)(1), 8-2.1408(OO), and 8-2.1410(C)(1) of the CLUO, which require a site survey to determine the potential for paleontological resources and development of a mitigation plan, if merited, to protect identified paleontological resources in accordance with General Plan Actions CO-A63 and CO-A64. Depending on the nature, extent, and importance of possible or discovered paleontological resources, actions could include project redesign, avoidance, removal, and/or documentation. This impact would be **less than significant** under Alternative 1.

**Alternative 2: All License Types with Moderate Limits**

Alternative 2 assumes the relocation of 30 sites of the 78 existing and eligible cannabis cultivation sites and the additional 54 new cannabis cultivation and noncultivation uses that could disturb approximately 164 acres that may contain paleontological resources (see Table 2-5).

There are existing and new cannabis sites assumed as a part of this alternative that are located in the western portion of the County on geologic deposits that have potential for paleontological resources. This alternative could result in 29 assumed new cannabis uses in these areas. Cannabis operators would be required to comply with Sections 8-2.1408(H)(1), 8-2.1408(OO), and 8-2.1410(C)(1) of the CLUO, which require a site survey to determine the potential for paleontological resources and development of a mitigation plan if merited, to protect identified paleontological resources in accordance with General Plan Actions CO-A63 and CO-A64. Depending on the nature, extent, and importance of possible or discovered paleontological resources, actions could include project redesign, avoidance, removal, and/or documentation. This impact would be **less than significant** under Alternative 2.

#### **Alternative 3: All License Types with High Limits**

Alternative 3 assumed that the relocation of nine sites of the 78 existing and eligible cannabis cultivation sites and the additional 186 new cannabis cultivation and noncultivation uses could disturb approximately 379 acres that may contain paleontological resources (see Table 2-5).

Some cannabis sites are located in the western portion of the County within geologic features that have potential for paleontological resources. This alternative could result in 58 assumed new cannabis uses in these areas. Cannabis operators would be required to comply with Sections 8-2.1408(H)(1), 8-2.1408(OO), and 8-2.1410(C)(1) of the CLUO, which require a site survey to determine the potential for paleontological resources and development of a mitigation plan if merited, to protect identified paleontological resources in accordance with General Plan Actions CO-A63 and CO-A64 before the issuance of permits that may require redesigning the site to avoid the paleontological resource, capping the paleontological resource site to avoid impacts, or properly removing and curating the resource. This section also requires protection of paleontological resources discovered during construction. This impact would be **less than significant** under Alternative 3.

#### **Alternative 4: Mixed-Light/Indoor License Types Only with Moderate Limits, No Hoop Houses or Outdoor Types**

Alternative 4 assumes the relocation of nine of the 78 existing and eligible cannabis cultivation sites. The alternative also assumes that 75 of the existing and eligible outdoor cannabis cultivation sites would convert entirely to indoor or mixed-light (greenhouse) cultivation. It also assumes the development of 54 new cannabis cultivation and noncultivation uses. These activities could disturb approximately 122 acres that may contain paleontological resources (see Table 2-5).

Some cannabis sites are located in the western portion of the County within geologic features that have potential for paleontological resources. This alternative could result in 29 assumed new cannabis uses and the conversion of existing outdoor cultivation sites to greenhouses and indoor buildings in these areas. Cannabis operators would be required to comply with Sections 8-2.1408(H)(1), 8-2.1408(OO), and 8-2.1410(C)(1) of the CLUO, which require a site survey to determine the potential for paleontological resources and development of a mitigation plan, if merited, to protect identified paleontological resources in accordance with General Plan Actions CO-A63 and CO-A64 before the issuance of permits that may require redesigning the site to avoid the paleontological resource, capping the paleontological resource site to avoid impacts, or properly removing and curating the resource. This section also requires protection of paleontological resources discovered during construction. This impact would be **less than significant** under Alternative 4.

#### **Alternative 5: All License Types with Moderate Limits, within Agricultural Zones Only, No Retail**

Alternative 5 assumes relocation of 30 sites of the 78 existing and eligible cannabis cultivation sites and the additional 52 new cannabis cultivation and noncultivation uses assumed under this alternative could disturb approximately 163 acres that may contain paleontological resources (see Table 2-5).

Some cannabis sites are located in the western portion of the County within geologic features that have potential for paleontological resources. This alternative could result in 28 assumed new cannabis uses in these areas. Cannabis operators would be required to comply with Sections 8-2.1408(H)(1), 8-2.1408(OO), and 8-2.1410(C)(1) of the CLUO, which requires a site survey to determine the potential for paleontological resources and development of a mitigation plan if merited, to protect identified paleontological resources in accordance with General Plan Actions CO-A63 and CO-A64 before the issuance of permits that may require

redesigning the site to avoid the paleontological resource, capping the paleontological resource site to avoid impacts, or properly removing and curating the resource. This section also requires protection of paleontological resources discovered during construction. This impact would be **less than significant** under Alternative 5.

## Mitigation Measures

No mitigation is required for any of the alternatives.

## Impact GEO-4: Result in the Loss of Availability of a Known Mineral Resource or Locally Important Mineral Resource Recovery Site

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Adoption and implementation of the proposed CLUO, including issuance of subsequent Cannabis Use Permits pursuant to the adopted CLUO, could result in cannabis uses that are located in the mineral resource zones associated with the CCAP. However, cannabis uses would be small in size and would not substantially obstruct access to mineral resources in the County. This impact would be **less than significant** for all alternatives.

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As shown in Exhibit 3.7-4, the state has mapped approximately 20,000 acres of significant aggregate resources along lower Cache Creek. Aggregate mining in the County is regulated through the CCAP, which includes the OCMP. Approximately 180 million tons of aggregate have been approved for excavation and approximately 72 million tons of aggregate have actually been excavated from 1996 through 2015 (Yolo County 2019). General Plan Policy CO-3.1 supports the continued production of mineral resources. CCAP Objective 2.3-1 identifies the economic significance of aggregate deposits along Cache Creek and Objective 2.3-2 discourages encroachment of incompatible land uses into areas designated for future surface mining.

### Alternative 1: Cultivation (Ancillary Nurseries and Processing Only) with Existing Limits (Existing Operations with CLUO) (CEQA Preferred Alternative)

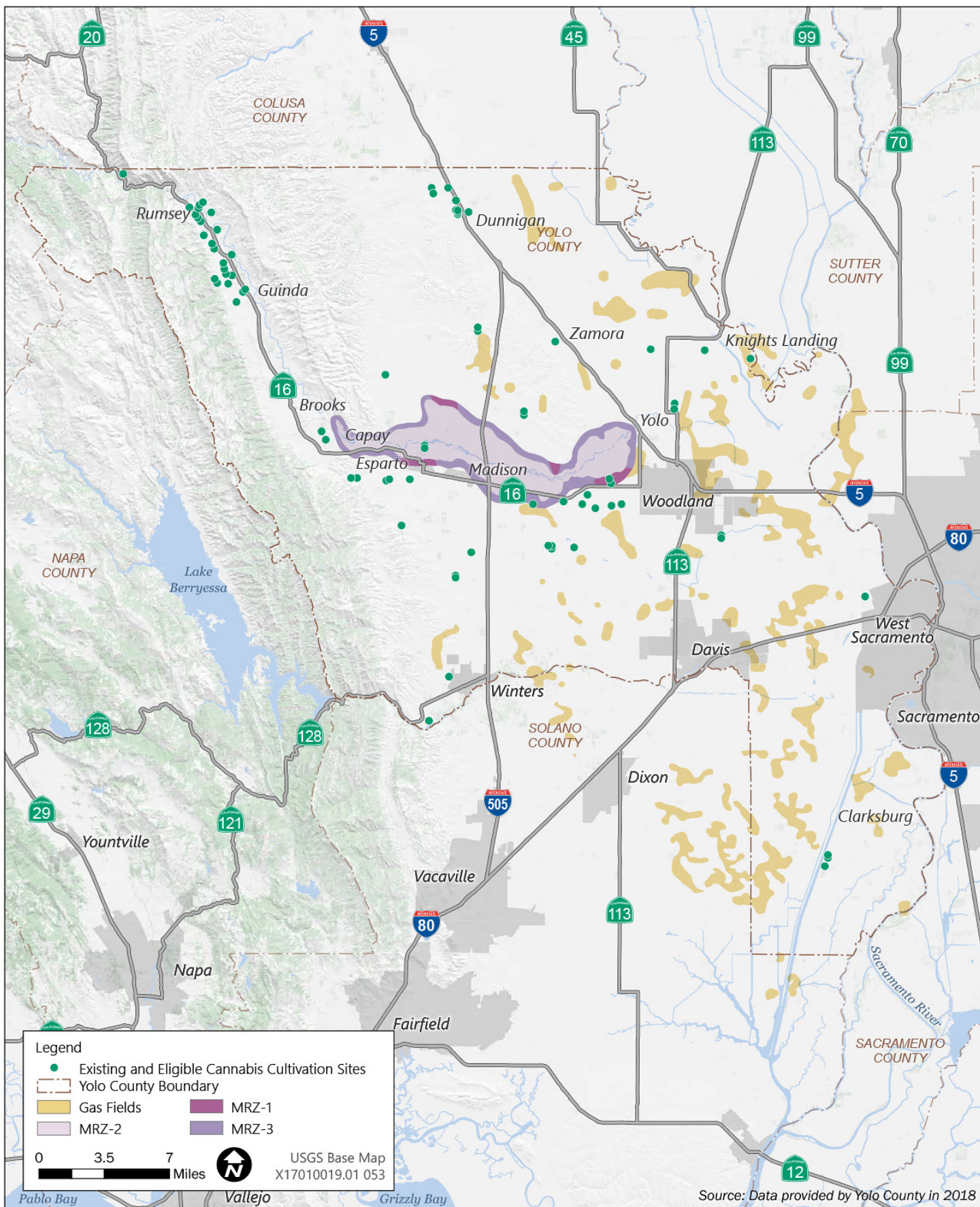
As shown in Exhibit 3.7-15, there are four existing cultivation sites within the boundary of the CCAP. Alternative 1 would retain the current extent of 78 existing and eligible cultivation sites in the County with no further expansion of cannabis uses. Three of these sites are outdoor cultivation, while the third site is a combination of outdoor and indoor cultivation operations. None of these sites are located on parcels that are identified for future planned or proposed aggregate mining areas (Yolo County 2019: Figure 3-4). These sites are assumed to consist of approximately 6 acres committed to cannabis cultivation operations (see Appendix D) and would not substantially obstruct continued aggregate mining of the 20,000-acre CCAP area. This impact would be **less than significant** under Alternative 1.

### Alternative 2: All License Types with Moderate Limits

As shown in Exhibit 3.7-16, Alternative 2 assumes one new cannabis use within the CCAP that would be located outside of future planned and proposed aggregate mining areas (Yolo County 2019: Figure 3-4), in addition to the existing three cultivation sites identified in Alternative 1, above, for a total of 7 acres committed to cannabis uses in the CCAP (see Table 2-4 and Appendix D for cannabis footprint assumptions). This extent of cannabis use would not substantially obstruct continued aggregate mining of the 20,000-acre CCAP area. This impact would be **less than significant** under Alternative 2.

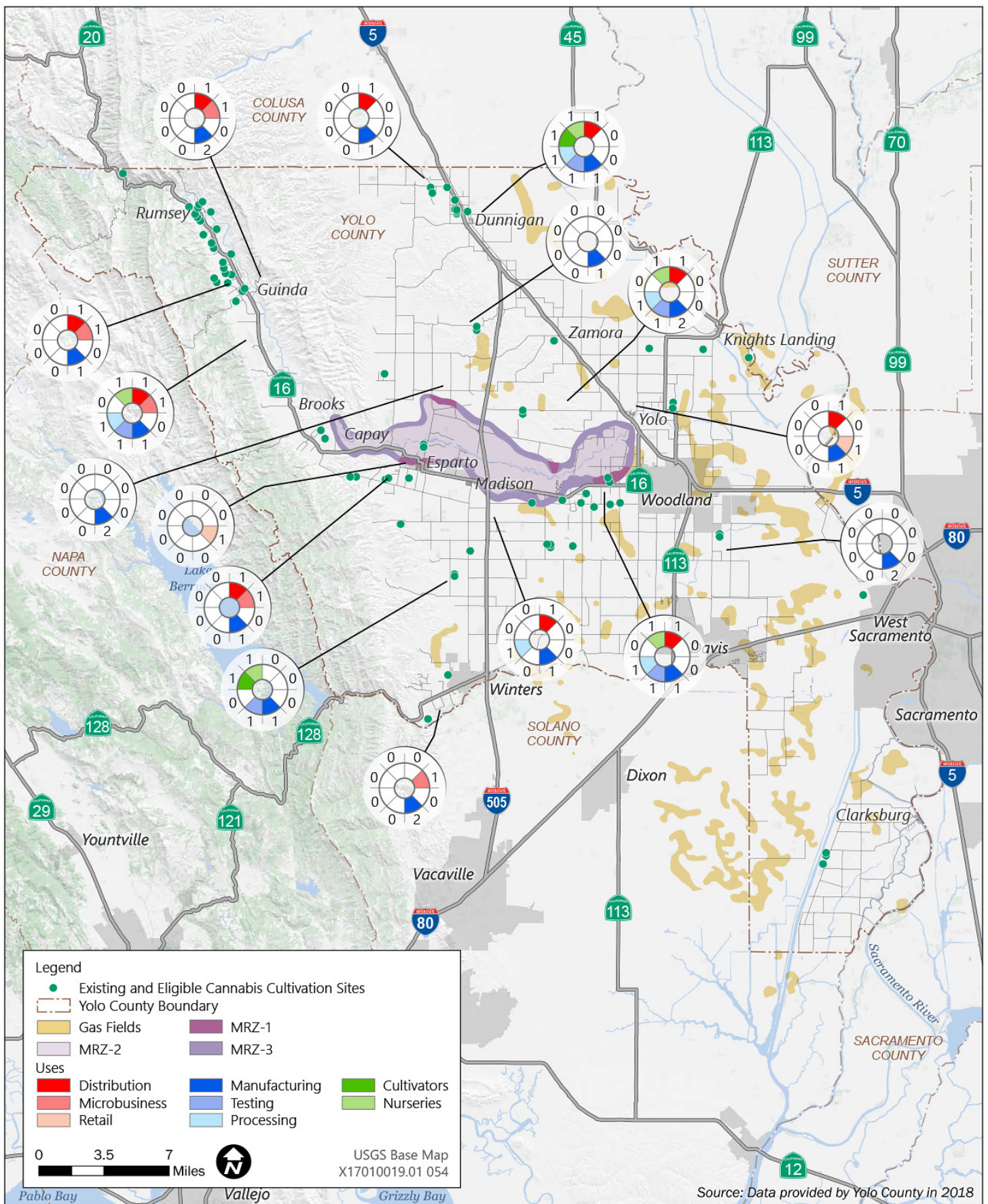
### Alternative 3: All License Types with High Limits

As shown in Exhibit 3.7-17, Alternative 3 assumes five new cannabis uses within the CCAP that would be located outside of future planned and proposed aggregate mining areas (Yolo County 2019: Figure 3-4) in addition to the existing three cultivation sites for a total of 12 acres committed to cannabis uses in the CCAP (see Table 2-4 and Appendix D for cannabis footprint assumptions). This extent of cannabis use would not substantially obstruct continued aggregate mining of the 20,000-acre CCAP area. This impact would be **less than significant** under Alternative 3.



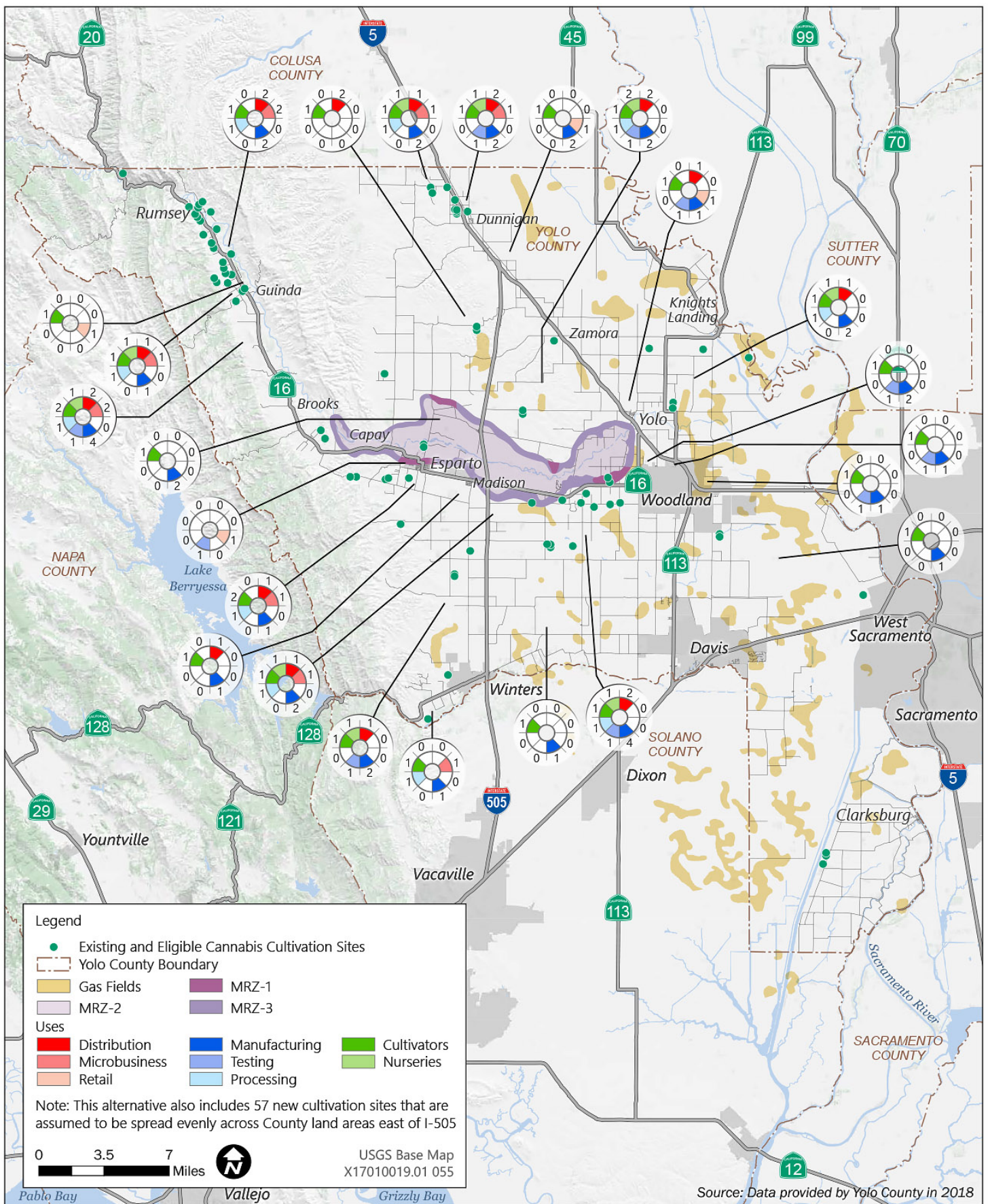
**Exhibit 3.7-15**

**Alternative 1 Cannabis Uses and Mineral and Gas Resources**



**Exhibit 3.7-16**

**Alternative 2 Cannabis Uses and Mineral and Gas Resources**



**Exhibit 3.7-17**

**Alternative 3 Cannabis Uses and Mineral and Gas Resources**

**Alternative 4: Mixed-Light/Indoor License Types Only with Moderate Limits, No Hoop Houses or Outdoor Types**

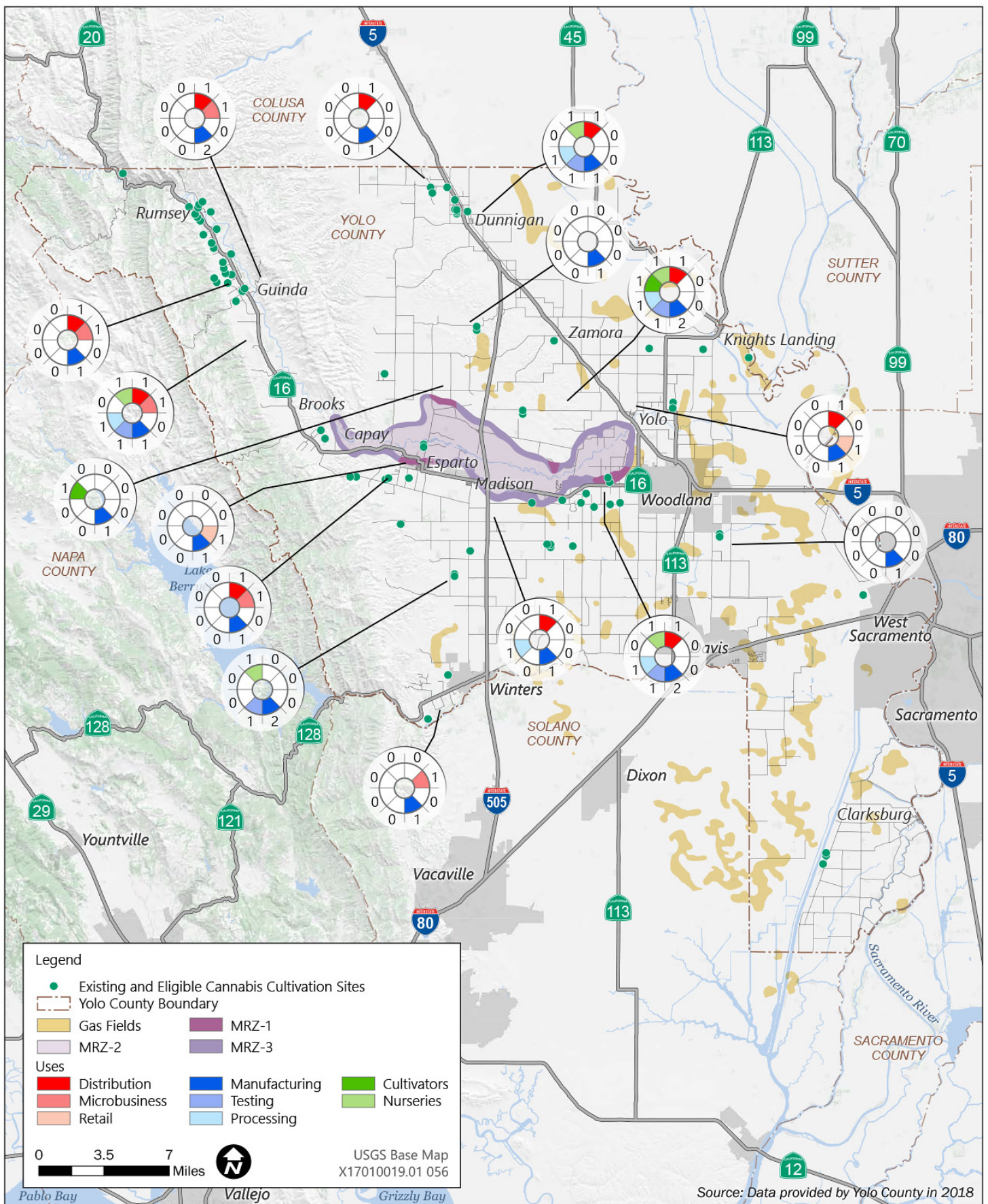
As shown in Exhibit 3.7-18, Alternative 4 assumes two new cannabis use within the CCAP that would be located outside of future planned and proposed aggregate mining areas (Yolo County 2019: Figure 3-4) in addition to the existing three cultivation sites for a total of 8 acres committed to cannabis uses in the CCAP (see Table 2-4 and Appendix D for cannabis footprint assumptions). This alternative would require the existing three cultivation sites to convert to mixed-light or indoor cultivation that would require the construction of greenhouses or indoor buildings. This extent of cannabis use would not substantially obstruct continued aggregate mining of the 20,000-acre CCAP area. This impact would be **less than significant** under Alternative 4.

**Alternative 5: All License Types with Moderate Limits, within Agricultural Zones Only, No Retail**

As shown in Exhibit 3.7-19, Alternative 5 assumes the retention of the existing three cultivation sites (6 acres of cannabis uses) and no new cannabis uses in the CCAP area. This extent of cannabis use would not substantially obstruct continued aggregate mining of the 20,000-acre CCAP area. This impact would be **less than significant** under Alternative 5.

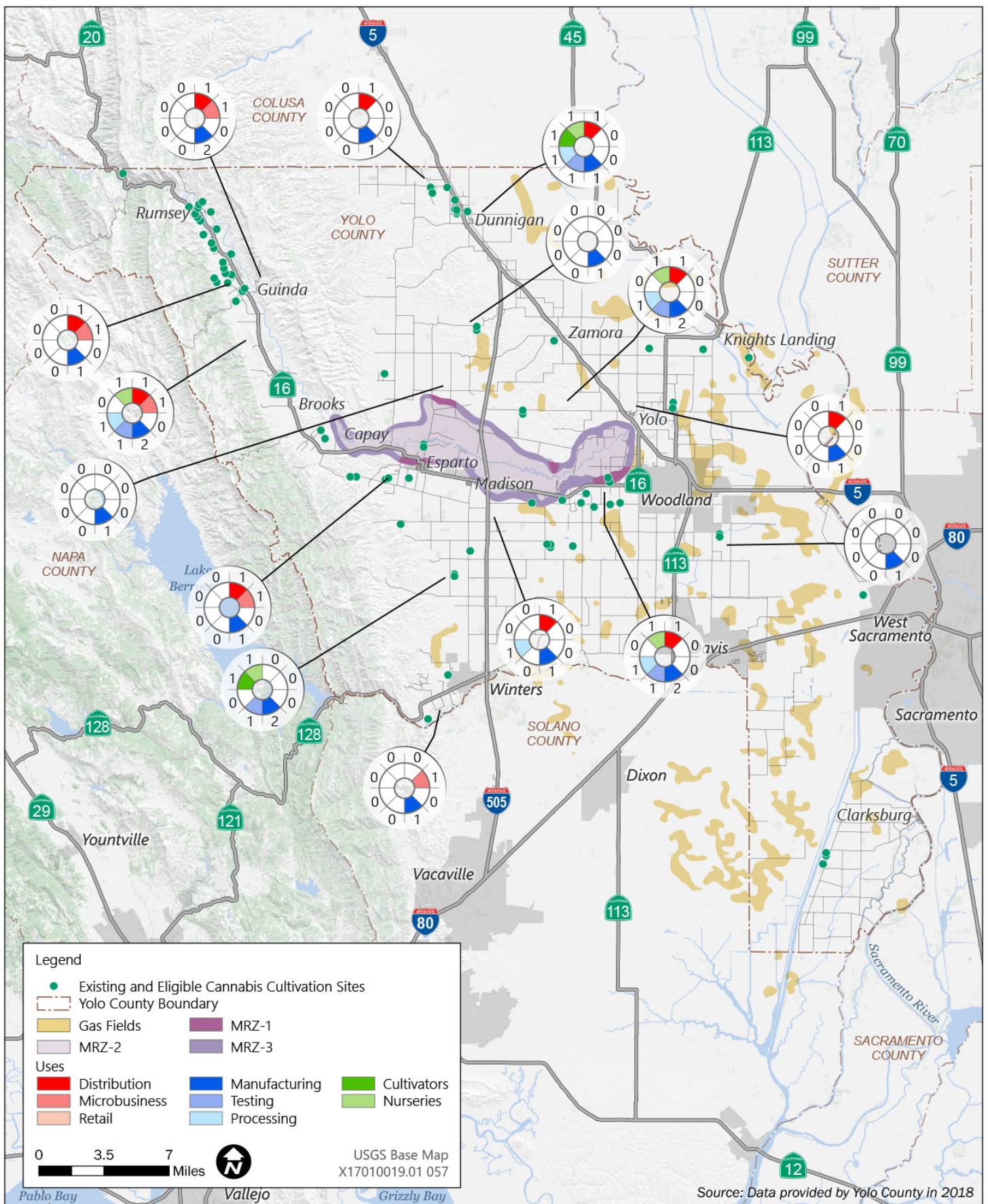
**Mitigation Measures**

No mitigation is required for any of the alternatives.



**Exhibit 3.7-18**

**Alternative 4 Cannabis Uses and Mineral and Gas Resources**



**Exhibit 3.7-19**

**Alternative 5 Cannabis Uses and Mineral and Gas Resources**