

Appendix 1

LOCAL POLICIES AND STANDARDS

Appendix 1

Adopted Conservation Policies

Adopted Policies

General Plans are long-range comprehensive plans developed for cities and counties that govern growth and development. Typically, city and county general plans contain planning policies on water conservation and measures and ordinances are developed to implement the general plan policies.

Water Waste/ Non-Essential Use Policies

Water Waste ordinances promote water conservation and potable water use efficiency by prohibiting deliberate or unintentional waste when a reasonable alternative solution is available, and by prohibiting use of equipment that are wasteful. These ordinances typically identify and prohibit non-essential uses of water. Some examples include ordinances adopted by the City of Cotati (§13.30.060), City of Petaluma (§15.17.070), City of Rohnert Park (Ordinance 13.62), City of Santa Rosa (Ordinance 14.21), City of Sonoma (§ 13.10.060), and the Town of Windsor (§12.3.361).

In general, the water waste and non-essential use ordinances stipulate that water customers must comply with the following regulations and restrictions:

- prohibited actions:
 - direct hosing of sidewalks, walkways, driveways, parking lots and other hard-surfaced areas by direct hosing (except when preventing or eliminating materials dangerous to the public health and safety);
 - irrigating which results in excessive runoff of water or unreasonable over spray of irrigated areas;
 - washing vehicles and machinery directly with a hose not equipped with a shutoff nozzle;
 - using water for non-recycling decorative fountains (new or existing), or in new conveyor car wash systems or industrial clothes wash systems;
 - using water for single pass evaporative cooling systems for air conditioning in all new installations unless required for health or safety reasons;
- Leaks should reasonably be discovered and repaired - generally within a 72 hour period.

The City of Petaluma also prohibits dedicated irrigation accounts from exceeding their allocated water budgets by more than 20% in any billing period. Petaluma also requires the use of covers

for all outdoor pools and spas, as well as a pressure-regulating valve where the meter exceeds eighty pounds per square inch.

Exemptions

There are some exemptions to these regulations, including water associated with fire suppression, water quality flushing and sanitation purposes, and water supplied by private wells or from reclaimed water, grey water or rainwater utilization systems.

Enforcement

Depending on the extent of the water waste the municipalities may implement several actions to enforce these ordinances and notify customers in violation. These actions range from written notices, direct contact, installation of a flow-restricting device, penalties, fees and charges, and finally, termination of water service.

Landscaping Standards

Water efficient landscaping ordinances have been adopted by several cities in Sonoma County. Some examples include the City of Sonoma (Ordinance 14.32), City of Santa Rosa (Ordinance 20-34), City of Petaluma (§15.17.050), and the City of Rohnert Park (§17.34.070).

The purpose of these ordinances is to achieve water conservation through proper plant selection, installation, and maintenance practices. The following landscaping principles are common to these ordinances and serve as the primary means of achieving this water conservation. *(Note that the following information is intended to be a summary only, greater detail regarding specific policies can be found by contacting the appropriate agency)*

A. Appropriate planning and design

Prior to installation of the proposed landscape and/or irrigation project water customers are generally required to submit a set of the following plans:

- A landscape or planting plan which indicates the location and square footages of turf, type and quantity of high water use and low water use plants; hardscaped areas; and swimming pools, spas and water features.
- An irrigation plan which indicates the type and location of irrigation hardware that will be installed. The description should include the following: location, quantity and type of irrigation device(s) with manufacturer name and rated specifications of gallons per minute of each device; manufacturer's recommended operating pressure in pounds per square inch and precipitation rates for each device. This includes information for irrigation emission devices, backflow prevention devices, pressure reducing valves, and automatic irrigation controllers.
- If applicable, a grading and drainage plan indicating site elevations may also be required.

B. Limiting turf to locations where it provides functional benefits

A major portion of water demand used for landscape purposes is required for the irrigation of lawn areas. Portions of landscaped areas that have been customarily designed as lawns are generally being discouraged in favor of less water consuming designs.

Municipalities generally prohibit the installation of turf and other high-water-use plantings in areas that cannot be irrigated efficiently. This includes median strips, parking islands, narrow strips, severe slopes, and beds with sharply curved perimeters. Additionally, some municipalities limit the percentage of turf area allowed within the total developed landscape area. For instance, the City of Petaluma limits the combined turf and high-water use plant area to less than 20%.

However, landscapes that are irrigated with recycled water, or sites requiring large turf areas for their primary functions (e.g., cemeteries, golf courses, parks, playgrounds, schools, and sports fields) are generally exempt or have increased allowances.

C. Efficient irrigation systems

In order to ensure efficient irrigation of landscaped areas, installed automatic irrigation systems must meet the following requirements:

- Electric controller with multiple functions including repeat start time and multiple program potential, set for night or early morning irrigation. Some areas specify the use of automatic irrigation controllers labeled as ET controllers or smart controllers or otherwise have the ability to automatically adjust irrigation start-times, run-times and/or run days based on local or site specific soil moisture levels, weather and/or reference evapotranspiration data;
- Automatic rain shutoff unit for each controller;
- Precipitation rate sprinklerheads where slopes exceed ten percent;
- Efficient sprinklerhead layout and system design for minimum runoff and over-spray;
- Check valves where elevation differential between heads may cause low-head drainage;
- Matched precipitation rates within each valve circuit;
- Separate valves for turf areas, plantings with similar water needs, exposure variations, and slope variants; and
- Drip irrigation, low-flow point applicator or subsurface irrigation systems, where appropriate.

Overhead irrigation must meet the following additional requirements:

- Distance between spray heads on turf shall be between 50% and 55% of the spray diameter; i.e., spray heads on turf are placed for spray radius to achieve head to head coverage;
- Distance between spray heads for non-turf areas shall not exceed 70% of the spray diameter;
- Spray heads must be adjusted so spray radius is within the range of 75% to 100% of the manufacturer's rating for that nozzle and the specified operating pressure shown in the irrigation plans;
- Nozzle precipitation rates for all heads within each valve circuit must be matched to within 20% of one another; and
- Overhead irrigation is prohibited in median strips and parking islands less than five feet wide from curb to curb (stream bubblers will be allowed).

Many policies include provisions which specify that irrigation for decorative water features (e.g., fountains, ponds, pools) must include recirculating water systems.

Some municipalities require that a separate landscape water service meter must be installed for new or altered large-scale landscapes (those generally associated with commercial/industrial uses or multi-family landscapes). This dedicated irrigation meter shall separate all outdoor irrigation water use from all other water use. A water budget may be imposed on such non-residential water meters serving the landscape improvements.

D. The use of soil amendments and use of mulch to improve the structural characteristics of the soil

In order to encourage healthy growing conditions for low-water-use plant materials, site preparation may be needed such as:

- Scarifying of existing soil to a minimum depth of six inches;
- Amendment of existing soil with organic matter at a minimum rate of five cubic yards per one thousand square feet; and
- A minimum one-foot depth of non-mechanically compacted soil shall be available for water absorption and root growth in planted areas.
- Exposed soil surfaces of non-turf areas within the developed landscape area must be mulched with a minimum 2-3 inch deep layer of organic material (mulch).

E. The use of drought-tolerant plants

Properly managed non-grass landscape developments will typically be able to survive on a reduced water requirement and survive drought conditions better than lawn areas. Planting of

low-water-use plant materials and California native plants is highly encouraged. To achieve this, municipalities impose limits on the total area of high-water-use plants and decorative water features allowed.

F. Appropriate and timely maintenance

Landscaping should be maintained in a healthful and thriving condition at all times. This includes regular maintenance of irrigation systems and their components; aerating and dethatching turf areas; adding/replenishing mulch, fertilizer, and soil amendments; pruning; trimming; and weeding all landscaped areas.

Specific Policies

In addition to the above described policies that are common to many municipalities in Sonoma County, numerous additional policies exist that are specific to a particular community. Some examples are presented below.

Town of Windsor

Ordinance 12-3-310: Low Flush Toilets

This ordinance requires that all new construction or remodeling of existing structures, requiring the issuance of a building permit, must install "ultra low flush" (1.6 gallon per flush or less) toilet fixtures.

Ordinance 12-7-105: Recycled Water Service Policy

This policy establishes the Town's policy on the use and application of recycled water services. In general, the policy states that the Town will require the use of recycled water in lieu of potable water for residential and non-residential irrigation within the Town's recycled water service area, whenever feasible and consistent with legal requirements, preservation of public health, safety and welfare, and the environment. The use of recycled water can be achieved through an application process and fulfillment of permit conditions.

City of Cotati

§ 13.64.030: Conservation Devices--Required for New Construction

Under this ordinance, all toilets in any and all new construction and any project involving remodel of a bathroom(s) shall use no more than 1.6 gallons per flush and shall be a minimum "ultra-low flush". Those who install these ultra low flush toilets are eligible for a rebate of \$150 from the City following a post installation visit.

Ordinances 13.72 and 13.73: Ultra Low-Flow Toilet Retrofit

All existing toilet fixtures in pre-1992 residential and non-residential structures receiving water from the City's water system must be retrofitted, exclusively with an ultra low-flow toilet at the time of water service change. Once completed, a certificate of retrofit compliance will be placed on file with the City.

Generally, the property owner will have ninety days from the date of request for change of water service to certify compliance with this chapter. To enforce this ordinance, the City can implement a surcharge of 20% of the water bill per billing cycle until a certificate of retrofit compliance is filed with the City.

City of Sonoma

§ 14.32.100 Requirement for Separate Water Meters

In all new commercial development subject to the provisions of this chapter, a separate water meter is required for the purpose of landscaping. A separate water meter is also required for common areas associated with new residential condominiums and planned unit developments.

City of Rohnert Park

§ 13.62.040 Recycled Water Service

Under this ordinance, all new applicants for water service whose properties may be served by recycled water, must connect their property to recycled water service for those uses for which the use of potable domestic water would be deemed a waste or unreasonable use of water. Failure to do so may result in the termination of the customer's potable water service.

City of Petaluma

Chapter 15.17 of the Petaluma Municipal Code contains the City's Water Conservation Regulations Ordinance. This chapter promotes the efficient use and reuse of water by all City of Petaluma water service customers by requiring that all new construction projects and existing customers use water as efficiently as possible and comply with new development standards, landscape water use efficiency standards and water waste prohibition regulations. Below is a summary of these regulations.

§ 15.17.030 Development Standards

The development standards established in this section apply to all new commercial, industrial, institutional, agricultural, single-family and multifamily residential construction, including tenant improvements or a change in use requiring any city entitlement or permit for existing commercial, industrial and institutional accounts. The development standards are intended to ensure that all installed water using fixtures, appliances, irrigation systems, and any other water using devices apply water as efficiently as possible.

Indoor Water Use Development Standards—New Residential Construction. Any water using device installed in any new development shall meet the standards of the California Plumbing Code (Part 5, Title 24, California Code of Regulations), and the following.

- Single Family
 - Water closets must be an approved high efficiency toilet (HET) as designated on the City's list of qualifying HETs.

- Showerheads must not use more than two gallons per minute. Where more than one showerhead exits in a shower unit, each showerhead must be plumbed so that each showerhead can be turned on and off independently from each other.
- Any clothes washing machine provided with the residence must have a water factor of six or lower.
- Lavatory and/or bar faucets must not exceed 1.5 gallons per minute.
- Kitchen and/or utility sink faucets must not exceed 2.2 gallons per minute.
- All dishwashers must have the EPA’s Energy Star label.
- Multifamily Residential Dwellings
 - Water closets must be an approved high efficiency toilet (HET) as designated on the City’s list of qualifying HETs.
 - Showerheads must not use more than two gallons per minute. Where more than one showerhead exits in a shower unit, each showerhead must be plumbed so that each showerhead can be turned on and off independently from each other.
 - Any clothes washing machine installed on the premises must have a water factor of six or lower.
 - Lavatory and/or bar faucets must not exceed 1.5 gallons per minute.
 - Kitchen and/or utility sink faucets must not exceed 2.2 gallons per minute.
 - All dishwashers must have the EPA’s Energy Star label.
 - Each dwelling unit must be separately metered or sub-metered.

Standards for Commercial, Industrial, or Institutional (CII) Accounts that are new, undergoing renovations, improvements, or change in use must comply with the following:

- Toilets and/or urinals must be an approved high efficiency toilet (HET) as designated on the City’s list of qualifying CII HETs.
- Showerheads must not use more than two gallons per minute. Where more than one showerhead exits in a shower unit, each showerhead must be plumbed so that each showerhead can be turned on and off independently from each other.
- Commercial clothes washing machines shall have a water factor of 4.5 or lower.

- Lavatory faucets must be self-closing and not exceed 1.5 gallons per minute. All faucets must be equipped with an aeration device.
- Kitchen and/or utility sink faucets must not exceed 2.2 gallons per minute. All faucets must be equipped with an aeration device.
- Dishwashers must have the EPA's Energy Star and/or Water Sense designation and must recycle the final rinse into the next wash cycle.
- Pre-rinse hand-held dish-rinsing wands must not exceed 1.6 gpm and must utilize positive shut-off valves.
- Ice makers must be air-cooled.
- Any other water-using apparatus not mentioned above must use or reuse water as efficiently as possible and must be approved by the city prior to installation.

§ 15.17.040 Standards for New or Renovated Vehicle Wash Facilities

- Vehicle wash facilities using conveyORIZED, touchless, and/or rollover in-bay technology shall reuse a minimum of 50% of water from previous vehicle rinses in subsequent washes.
- Vehicle wash facilities using reverse osmosis to produce water rinse with a lower mineral content shall incorporate the unused concentrate in subsequent vehicle washes.
- Self-service spray wands shall emit no more than three gallons of water per minute.

§ 15.17.060 Water budgets for new and existing dedicated irrigation accounts.

Dedicated irrigation meter(s) will be provided with a landscape water budget. The water budget will be calculated by the City or its agent by measuring the total irrigated landscaped area and the plant type(s) that exist per water meter. Any account assigned a water budget may not exceed the water budget for that billing period by more than 20% during that billing period. Violators will be notified and corrective actions will be taken by the City.

References

City of Cotati municipal code

<http://www.municode.com/resources/gateway.asp?pid=16297&sid=5>

City of Rohnert Park municipal code

<http://www.municode.com/Resources/gateway.asp?pid=16586&sid=5>

City of Sonoma municipal code

<http://www.codepublishing.com/ca/Sonoma/index.html>

City of Petaluma municipal code

<http://www.codepublishing.com/CA/Petaluma.html>

Sonoma County. Sonoma County Code.

<http://www.municode.com/content/7735/16331/HTML/Level1/PRE.html>

Sonoma County Water Agency. 1998. Water Conservation Plan.

(http://www.scwa.ca.gov/water_conservation/documents/WaterConservationPlan_000.pdf)

USEPA. 2009a. History of Energy Star.

http://www.energystar.gov/index.cfm?c=about.ab_history

USEPA. 2009b. WaterSense. <http://www.epa.gov/WaterSense/partners/join/index.htm>

Appendix 2

CITY OF SONOMA RAINWATER HARVESTING & STORAGE SYSTEMS HANDOUT

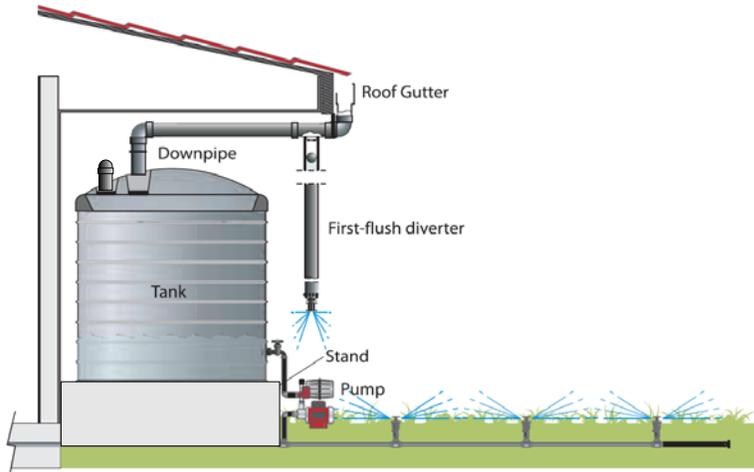


Rainwater Harvesting & Storage Systems

Handout No: 36
Revised: 9/22/09

Rainwater Harvesting

Rainwater harvesting is the capture, diversion and storage of rainwater for use in landscaping and other purposes. Collection of rainwater is usually from rooftops which is stored in catchment storage tanks. Stored water can be used for nonpotable purposes such as irrigating landscaping, washing cars or possibly even flushing toilets. Rainwater harvesting systems can range from a simple barrel at the bottom of a downspout to multiple large tanks with pumps and controls.



Rainwater Harvesting System Limitations

Most rainwater harvesting systems are used exclusively for landscaping irrigation purposes. A building permit is usually required for the installation of large storage tanks, distribution systems, pumps and backflow prevention devices associated with a rainwater harvesting system. A building permit is always required if the rainwater storage and distribution system is proposed for use inside of a building. Currently, the State of California has not adopted rainwater harvesting standards for use in buildings. Section 601.1 of the California Plumbing Code requires that plumbing fixtures including toilets, urinals washing machines and floor drains, be connected to an “adequate supply of potable running water” unless the City determines that it is not necessary for safety or sanitation reasons. Given that there are cities within the United States and other countries that have safely allowed the use



of rainwater for fixtures such as toilets, urinals, washing machines and trap primers in floor drains, the City of Sonoma Building Department will review and determine the acceptability of such requests on a case-by-case basis when designed by a licensed California Mechanical Engineer that specializes in plumbing or rainwater systems. The installation of a rainwater system within a building requires separate and identifiable piping systems for both the nonpotable rainwater system and the potable City water system to prevent contamination between them.

Requirements for Rainwater Harvesting and Storage Systems

Zoning. Rainwater storage barrels are containers with a volume of 80 gallons or less. Larger storage tanks are considered structures for the purposes of determining City zoning and setback requirements. The following enumerates some of the City's zoning requirements:

Setbacks for Residential Uses.



- A rainwater storage barrel with a volume of 80 gallons or less may be placed below downspouts around a building without considering front, side or rear yard building setback requirements. *[Planning Department Interpretation]*
- Rainwater storage tanks that do not exceed 8 feet in height above finished grade and do not exceed 120 square feet in area may be placed immediately adjacent to a side or rear property line. *[Sonoma Municipal Code Section 19.50.080.C.2.b.]*
- Rainwater storage tanks not exceeding 9 feet in height above grade that are separated from other buildings on the property by a 6 foot wide or more open yard may be placed as close as 5 feet to a side or rear property line. *[Sonoma Municipal Code Section 19.50.080.C.5. and 19.50.080.C.2.a.]*
- Aboveground storage tanks are prohibited in required front and street-side setbacks, and in designated creek setback areas. *[Sonoma Municipal Code Section 19.50.080.C.3.]*
- Aboveground rainwater storage tanks not meeting the above requirements must comply with the building setback requirements set forth in the Article III of the City's Development Code for the zoning district in which it is located. *[Sonoma Municipal Code Section 19.40.110.A.1]*

Setback and Design Review Requirements for Nonresidential Uses.

- A rainwater storage barrel with a volume of 80 gallons or less may be placed below downspouts around a building without considering front, side or rear yard building setback requirements. *[Planning Department Interpretation]*
- Rainwater storage tanks not meeting the above requirements must comply with the building setback requirements set forth in the Article III of the City's Development Code for the zoning district in which it is located. *[Sonoma Municipal Code Section 19.40.110.A.1]*
- Aboveground rainwater storage tanks for nonresidential uses are prohibited in required front and street-side setbacks, and in designated creek setback areas. *[Sonoma Municipal Code Section 19.40.110.A.3, 19.40.110.E. and 19.40.020.D.2]*
- Design Review Approval is required for aboveground rainwater storage tanks for which a building permit is required. *[Sonoma Municipal Code Section 19.54.080.B.2]*
- Design Review Approval is required for rainwater storage tanks located in public view. *[Sonoma Municipal Code Section 19.54.080.B.2]* EXCEPTION: Design Review Approval will not be required for single rainwater storage barrels with a volume of 80 gallons or less and placed below downspouts around a building. *[Planning Department Interpretation]*



Permits. A City building permit is required for rainwater harvesting and storage systems under any of the following circumstances:

- If the property is connected to the City’s water system and the total combined stored water capacity for the rainwater system exceeds 500 gallons. *[Installation and inspection of a cross-connection control device near the City water meter is required in accordance with Sonoma Municipal Code Section 13.20.030. and City Standard Plan #213]*
- If the storage tank is not supported directly by the ground or concrete slab or is supported by a raised platform or other structure. *[1997 Uniform Administrative Code – 301.2.1]*
- If the size of a water storage tank exceeds 5,000 gallons or the ratio of height to width of the tank exceeds 2:1. *[1997 Uniform Administrative Code – 301.2.1]*
- If electrical pumps, electrical valves or electrical controllers are installed, unless they are cord and plug connected or operate at less than 25 volts and not capable of supplying more than 50 watts. *[1997 Uniform Administrative Code – 301.2.3]*
- If any portion of the rainwater harvesting system is proposed to be used or located inside of a building or for supplying toilets, urinals, trap primers or washing machines. *[2007 California Plumbing Code 601.1]*
- If the rainwater storage tank will be installed below or partially below grade. *[2007 California Building Code Appendix J103.1.]*



Other Requirements and Considerations for Rainwater Harvesting Systems.

- Untreated rainwater may contain contaminants and is considered nonpotable water. Non potable water piping must be exposed to view and must be marked every 20 feet with a yellow identification band and labeled “CAUTION: NONPOTABLE WATER, DO NOT DRINK.” Discharge outlets must be exposed to view and must be labeled with the international symbol for nonpotable water and the words “CAUTION: NONPOTABLE WATER, DO NOT DRINK.” *[2007 California Plumbing Code 603.4.11 and 601.2.2]*
- Rainwater harvesting systems may not be directly connected to other potable water sources such as the City supplied domestic water system or a well serving the home or business. *[2007 California Plumbing Code 602.4]*



- For above-ground water storage tanks exceeding 5,000 gallons or if the ratio of height to width of a tank exceeds 2:1, an engineered pad base and adequate anchorage system must be provided. *[2007 California Building Code Chapter 16 and Section 1604.1]*
 - Rainwater storage tanks installed below grade must be adequately tied down and anchored to prevent lifting caused by groundwater.
 - Rainwater storage tanks must be provided with pressure relief mechanisms and tank overflows to prevent tank pressure build-up and to provide an overflow route should the tanks fill to capacity.
 - The rainwater harvesting system should be designed as an integrated solution incorporating collection, contaminant removal, pumping, control and reticulation. Rainwater tanks should be well sealed, maintainable and be provided with first-flush devices and filters to keep out leaves and other contaminants. Inlet and overflow screens should be provided to prevent access of mosquitoes and other insects and vermin. Provisions should be made for periodically draining and cleaning the rainwater storage tanks of siltation and other contaminants.
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- It is important that a rainwater harvesting system be designed to prevent growth of algae and other organisms in the system. Good aeration and circulation of water, no sunlight on water and keeping leaves and organic matter in the water to a minimum will help to reduce the growth of algae.
 - The rainwater harvesting system should be properly sized. Variables such as available capture area, storage availability, spring-time average rainfall and usage requirements must be considered to properly design a system.
 - For automated irrigation and distribution systems, consideration should be given to providing makeup water to the tank from sources other than rainwater (i.e. City or well water).

Rainwater Harvesting Resources

- San Francisco Public Utilities Commission Web Site:
http://sfwater.org/mto_main.cfm/mc_id/14/msc_id/361/mto_id/559
- American Rainwater Catchment Systems Association:
<http://www.arcsa.org/>

For further questions, please contact the City of Sonoma Building Department at 707-938-3681.

Appendix 3

PROJECT REVIEW CHECKLISTS

Checklist 1 – Water Conservation Checklist

This water conservation checklist is intended to support the local (city/county) review and approval process for proposed development projects in Sonoma County. This is the first of three checklists developed to provide guidance on implementation and tracking of the recommended water conservation, water reuse, and stormwater management actions presented in the Low Impact Development (LID) Guidebook. Evaluation of the content in all three checklists is recommended to ensure comprehensive evaluation of LID applicability for individual projects.

However, local entities are encouraged to develop their own specific checklists to achieve local LID objectives. These template checklists are provided as a reference for local communities to refine or further develop their own checklists.

The intended users of this checklist include developers, county and municipal planners, water agency staff, and regulatory personnel who may be engaged in project development or review capacities. Part A of the Checklist includes questions related to development site planning, while Part B is intended to document water conservation features incorporated into the project.

Part A. Development Site Planning			
Check the applicable box for each item listed below. For each topic, a brief statement should describe how or why these issues were considered (or not considered).			
	Yes	No	Explanation <i>(how, why or why not)</i>
<i>Development Site Planning</i>			
Is the proposed project consistent with the General Plan Land Use map?			
Is there available potable water supply available for this project?			
Is there available recycled water to supply this project?			
<i>Site Layout and Building Design</i>			
<u>Site Layout</u>			
Has the Stormwater Project Site Planning and Assessment checklist been completed (see Checklist 3)?			
Does the site layout consider sun aspect and other local climate factors and their effect on water use?			
Does site landscaping comply with the local Water Efficient Landscape Ordinance?			

Interior Design			
Is the plumbing designed to maximize water conservation (kitchens, bathrooms, laundry rooms located closest to the water heater)?			
What additional features are included in the site layout to conserve water beyond the minimum requirements?			
<i>Building Fixtures and Appliances</i>			
Does the project comply with state and local Building and Plumbing Codes standards related to water conservation?			
Are the most efficient water fixtures and appliances incorporated into the project?			
<i>Monitoring and Maintenance</i>			
What monitoring and maintenance features will be installed or implemented for the project to ensure proper function of water conserving devices?			
<ul style="list-style-type: none"> ▪ Interior monitoring and maintenance 			
<ul style="list-style-type: none"> ▪ Exterior (landscaping) monitoring and maintenance 			

This checklist is to be used in conjunction with Part A to document further details of water conserving components of the proposed project.

Part B. Project Water Conservation Checklist

This checklist presents water conserving fixtures and appliances for consideration in development projects. A more complete description of these features is provided in Chapter 2 of the LID guidebook. Check the applicable box for each item listed below. Provide a brief explanation of the fixtures and appliances incorporated in the project and how much water they might use. Incorporation of recycled water features should be documented on Checklist 2 *Water Reuse Checklist*.

	Considered for Project? (Y/N)	Number of Units Installed	Water Use per Unit	Comments
Interior				
Toilets 1.28 gpf or less				
Urinals 0.5 gpf or less				
Sink Faucets 1.5 gpm or less				
Shower Faucets 1.5 gpm or less				
Clothes Washing Machine 4.5 gallons per cycle per foot or less				
Dishwashers 4.5 gallons per cycle or less				
Commercial or Medical Appliances				
Other Interior Fixtures				
Exterior				
Smart Controllers				
Rain Sensors				
Water Budget				
Other				

Checklist 2 - Water Reuse Planning

The following checklists support the water reuse planning concepts described in Chapter 3 of the Low-Impact Development Guidebook. The intended users of this checklist includes developers, county and municipal planners, water agency staff, and regulatory personnel who may be engaged in project development or review capacities. There are two parts to this checklist: Part A *Consideration of Water Reuse in Project Planning* and Part B *Planned Water Sources for Demands Eligible for Water Reuse*.

A. Consideration of Water Reuse in Project Planning			
Check the applicable box for each item listed below. For each topic, a brief statement should describe how or why these issues were considered (or not considered)			
	Yes	No	Comments
Water Reuse (General)			
Most projects can incorporate some form of water reuse. The following questions regarding water reuse should be considered in project planning. These questions apply to all types of water reuse.			
(a) Demands for Non-Potable Water			
<ul style="list-style-type: none"> • Landscape Irrigation: Does the project include landscaping (plants) that need to be irrigated or decorative water features such as fountains or ponds? (<i>Landscape irrigation is the most common application of water reuse</i>) 			
<ul style="list-style-type: none"> • Toilet Flushing: Does the project include installation of or upgrades to restrooms? (<i>Under the right conditions, toilet flushing is an excellent application for water reuse</i>) 			
<ul style="list-style-type: none"> • Industrial Processes, Cooling Towers and Other Water Demands: Does the project include industrial processes, cooling towers, or other water demands that could be served by non-potable water? (<i>For example, a car washing facility could potentially use non-potable water</i>) 			
If the answer to any of these questions is “yes”, the project could potentially incorporate water reuse. The questions below will help to determine what types of water reuse might be suitable for a given project.			

	Yes	No	Comments
Rainwater Harvesting			
(a) Sources of Rainwater for Reuse			
<ul style="list-style-type: none"> Are existing buildings present on the project site or are new buildings planned as part of the project or are other impermeable areas included in the project? <i>(Roofs are the most common "catchment areas" uses in rainwater harvesting but other impermeable areas such as non-vehicular paved areas may be used as catchment areas)</i> 			
<ul style="list-style-type: none"> Can a rainwater storage tank be accommodated on the project site? <i>(Rainwater storage tanks vary in size from less than 50 gallons to more than 5,000 gallons and can be installed above or below ground so most sites have sufficient space for rainwater storage tanks)</i> 			
(b) Reuse Applications of Rainwater			
<ul style="list-style-type: none"> Landscape Irrigation: Does the project include landscape irrigation? <i>(Landscape irrigation is the most common way to use harvested rainwater)</i> 			
<ul style="list-style-type: none"> Toilet Flushing: Does the project include installation of or upgrades to restrooms? <i>(Systems that use rainwater for toilet flushing have been installed in several California areas. Check with local authorities for permitting requirements in your area)</i> 			
<ul style="list-style-type: none"> Industrial Processes, Cooling Towers and Other Water Demands: Does the project include industrial processes, cooling towers, or other water demands that could be served by rainwater? 			

	Yes	No	Comments
Graywater Use			
(a) Sources of Graywater for Reuse			
<ul style="list-style-type: none"> Does the project include laundry facilities? <i>(Some of the most straightforward graywater systems are residential “laundry-to-landscape” systems that direct water from clothes washers to suitable outdoor landscaped areas)</i> 			
<ul style="list-style-type: none"> Does the project include bathroom sinks and/or showers? <i>(The plumbing for a graywater system that collects water from sink and shower drains is generally more extensive than the plumbing for a “clothes washer” system?)</i> 			
<ul style="list-style-type: none"> Does the project include the use of water in industrial processes? <i>(Depending on the water quality, it may be feasible to collect and reuse industrial process water on-site)</i> 			
(b) Reuse Applications of Graywater			
<ul style="list-style-type: none"> Landscape Irrigation: Does the project include landscaping that can be irrigated with subsurface irrigation? <i>(Per the 2010 Graywater Standards, untreated graywater can only be used for landscape irrigation. The irrigation lines must be under at least 2 inches of cover.)</i> 			
<ul style="list-style-type: none"> Toilet Flushing: Can the project’s graywater be treated and used within the building to meet water demands such as toilet flushing? <i>(Check local guidelines for the requirements for treatment of graywater for indoor use)</i> 			
<ul style="list-style-type: none"> Industrial Processes, Cooling Towers and Other Water Demands: Does the project include industrial processes, cooling towers, or other water demands that could be served by treated or untreated graywater? 			

	Yes	No	Comments
Water Recycling (Municipal Recycled Water)			
(a) Sources of Municipal Recycled Water			
<ul style="list-style-type: none"> Is the project located near an existing or planned recycled water distribution pipeline? <i>(Check with local authorities to find out the locations of existing and planned recycled water pipelines)</i> 			
(b) Reuse Applications of Municipal Recycled Water			
<ul style="list-style-type: none"> Landscape Irrigation: Does the project include landscape irrigation? 			
<ul style="list-style-type: none"> Toilet Flushing: Does the project include installation of or upgrades to restrooms? <i>(Toilet flushing is an approved use of recycled under Title 22)</i> 			
<ul style="list-style-type: none"> Industrial Processes, Cooling Towers and Other Water Demands: Does the project include industrial processes, cooling towers, or other water demands that could be served by recycled water? 			

	Yes	No	Comments
On-Site Wastewater Treatment and Reuse			
(a) Sources of On-Site Recycled Water			
<ul style="list-style-type: none"> Does the project include larger buildings that generate wastewater and have sufficient space for an on-site wastewater treatment plant? 			
<ul style="list-style-type: none"> Are project buildings frequently occupied? (<i>On-site wastewater treatment plants need fairly consistent inflow in order to operate properly</i>) 			
(b) Reuse Applications of On-Site Recycled Water			
<ul style="list-style-type: none"> Landscape Irrigation: Does the project include landscape irrigation? 			
<ul style="list-style-type: none"> Toilet Flushing: Does the project include installation of or upgrades to restrooms? (<i>Toilet flushing is an approved use of recycled water under Title 22</i>) 			
<ul style="list-style-type: none"> Industrial Processes, Cooling Towers and Other Water Demands: Does the project include industrial processes, cooling towers, or other water demands that could be served by recycled water? 			

B. Planned Water Sources for Demands Eligible for Water Reuse

This form records the planned water sources for typical water demands that can be met through water reuse. Write the estimated volume or rate (e.g., gallons per day) of water reuse in the applicable box or boxes for each item listed below. A brief explanation of why a particular water source was selected for a particular demand should also be included.

	Rainwater	Graywater	Municipal Recycled Water	On-Site Recycled Water	Potable Water (Public system)	Groundwater (on-site well)	Explanation <i>(why this water source was chosen)</i>
Landscape Irrigation							
Toilet Flushing							
Industrial Processes, Cooling Towers and Other Water Demands							

Checklist 3 – Stormwater Management

These checklists support the planning process described in Chapter 4 of the Low-Impact Development Guidebook. The intended users of this checklist includes developers, county and municipal planners, water agency staff, and regulatory personnel who may be engaged in project development or review capacities. There are two parts to this checklist: Part A *Project Site Planning and Assessment* and Part B *Project LID BMPs Checklist*.

A. Project Site Planning and Assessment			
Check the applicable box for each item listed below. For each topic, a brief statement should describe how or why these issues were considered (or not considered).			
	Yes	No	Explanation <i>(how, why or why not)</i>
Site Assessment and Preliminary Site Plan			
Did the site assessment and planning process assess the following baseline conditions in terms of opportunities or constraints for LID applicability?			
(a) Topography and Drainage			
• Evaluation of slope and drainage as suitable for LID?			
• Evaluation of watershed setting: upper watershed, mid-watershed, or lower watershed and general depositional or erosional trends?			
• Areas of slope instability?			
• Areas in a seismic or liquefaction hazard zone?			
(b) Surface Hydrology:			
• Do you know the average annual precipitation at site and design precipitation amounts for a range of storm events, for example 30-min, 1-hr, and 24-hr rainfall amounts for 2-yr and 10-yr return intervals?			
• Mapping of existing on-site drainage features, site runoff patterns, areas of potential ponding, runoff delivered from elsewhere?			

	Yes	No	Explanation <i>(how, why or why not)</i>
(c) Soil and Infiltration			
<ul style="list-style-type: none"> • Soil types, structures, and texture? 			
<ul style="list-style-type: none"> • Hydrologic soil groups on-site? 			
<ul style="list-style-type: none"> • Known or measured infiltration capacity? 			
<ul style="list-style-type: none"> • Quality of existing top-soil? 			
(d) Groundwater			
<ul style="list-style-type: none"> • Depth to groundwater? (including consideration of seasonal variations) 			
<ul style="list-style-type: none"> • Evidence of features that rely on shallow groundwater levels (wetlands, pools, etc.)? 			
<ul style="list-style-type: none"> • Existing groundwater contamination or potential for proposed land use to influence groundwater quality? 			
<ul style="list-style-type: none"> • Groundwater recharge area on-site? 			
(e) Wetlands, Ponds, and Floodplains			
<ul style="list-style-type: none"> • Wetlands and/or ponds on-site? 			
<ul style="list-style-type: none"> • Wetland and/or pond water sources? 			
<ul style="list-style-type: none"> • Wetland and/or pond hydroperiod? 			
<ul style="list-style-type: none"> • Site located within a floodplain or channel migration zone? 			

	Yes	No	Explanation <i>(how, why or why not)</i>
(f) Vegetation, Riparian Resources, and Other Habitats			
<ul style="list-style-type: none"> Types and condition of vegetation on-site? 			
<ul style="list-style-type: none"> Special-status, invasive, or exotic vegetation? 			
<ul style="list-style-type: none"> Riparian habitat on-site? If so, what are the hydrologic pathways that support this habitat? 			
<ul style="list-style-type: none"> Habitat for species protected under the federal or state Endangered Species Acts? 			
(h) Water Quality			
<ul style="list-style-type: none"> If present, what are the <i>Beneficial Uses</i> of on-site or directly connected water bodies? And are any of them impaired? 			
<ul style="list-style-type: none"> Water quality data from those water bodies? 			
(g) Land Use			
<u>As described in the LID Guidebook, was consideration given to:</u>			
<ul style="list-style-type: none"> Existing or Prior Land Uses? 			
<ul style="list-style-type: none"> Surrounding Land Uses? 			
<ul style="list-style-type: none"> Clustered Development? 			
<ul style="list-style-type: none"> Footprint Minimization? 			
<ul style="list-style-type: none"> Site Disturbance Minimization? 			
<ul style="list-style-type: none"> Pedestrian-oriented Infrastructure? 			
<ul style="list-style-type: none"> Utilities/ Infrastructure Safety Requirements? 			
<ul style="list-style-type: none"> Easements? 			

• Setbacks?			
• Legacy soil or groundwater contamination?			
<u>Were any of the following conservation areas included in the site plan, and if so please explain how they were identified/developed:</u>			
• Common open space among or within developed sites?			
• Conservation areas on individual lots?			
• Conservation areas on individual lots that connect to adjacent lots or common conservation areas?			
• Riparian conservation or other habitat areas?			
<i>Preliminary Planting Plan</i> The following questions help to assess the suitability of selected species and vegetation placement for the development.			
	Yes	No	Explanation (how, why or why not)
<u>Does the plan consider:</u>			
Available growing space, growth rate, and life span of trees			
Type of soil and water availability for vegetation			
Evapotranspiration productivity during rainy season (Nov – April)			
Tolerance to drought, seasonally saturated soils, and poor soils			
Canopy spread and density			
Site-specific hazards (overhead wires; vehicle and pedestrian line of sight; proximity to paved areas, other plants, and buildings)			
Other considerations?			

B. Project LID BMPs Checklist

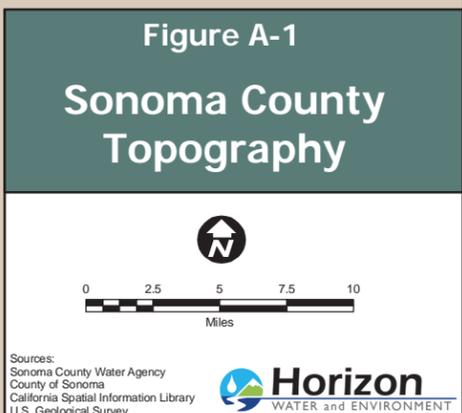
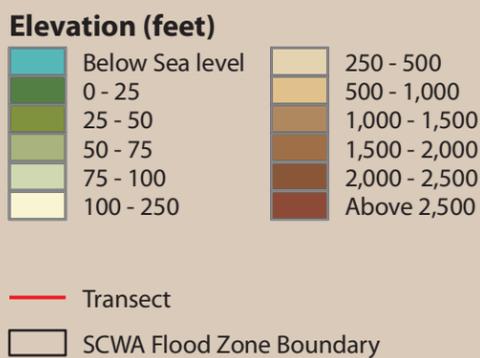
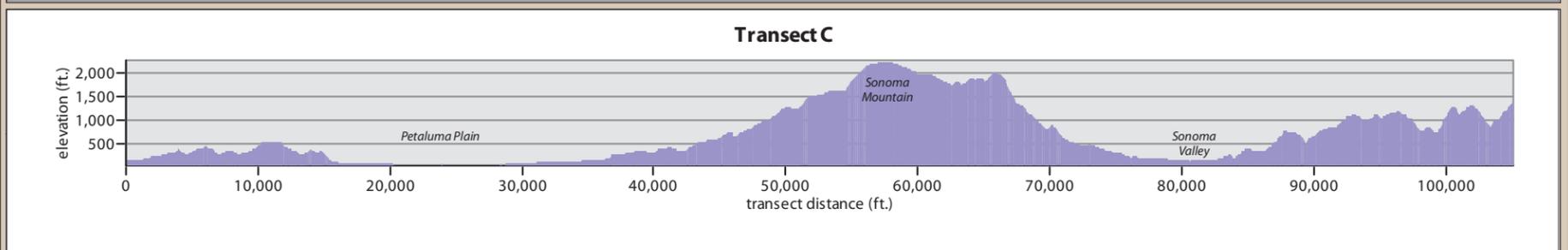
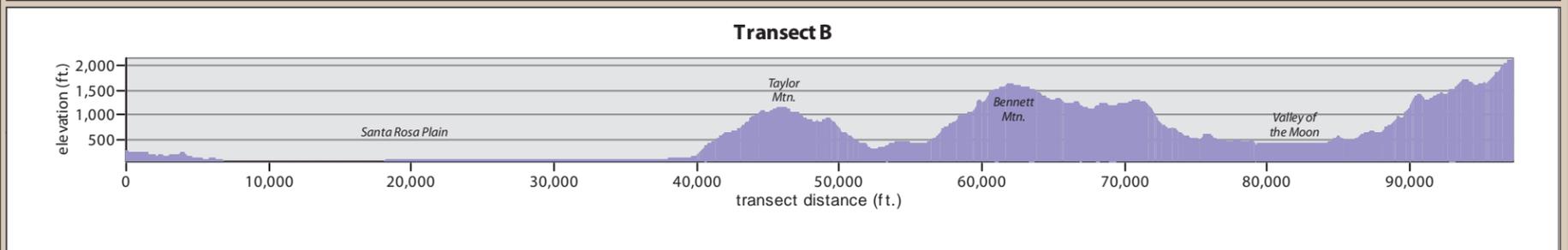
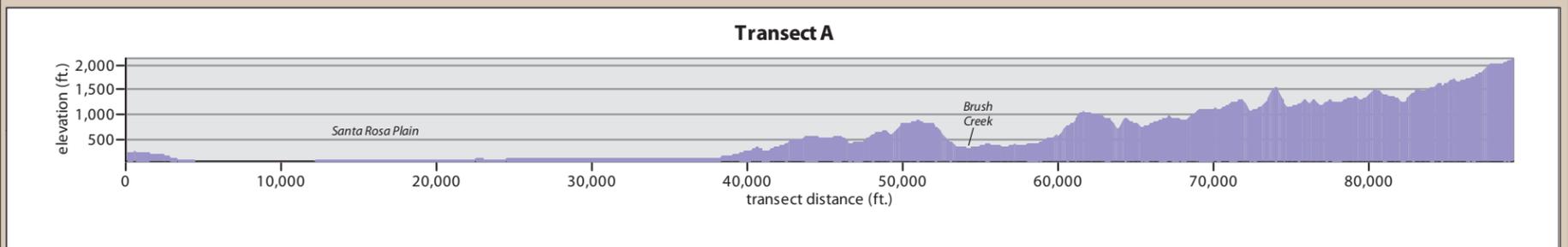
This checklist presents standard LID stormwater treatments that may be considered for project applicability. A more complete description of these BMPs is provided in the LID Fact Sheets contained in Chapter 5 of the LID Guidebook. Check the applicable box for each item listed below. A brief explanation of the BMP consideration and measures to be included in the project should also be included.

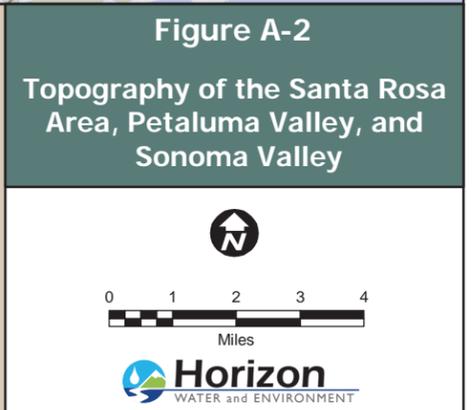
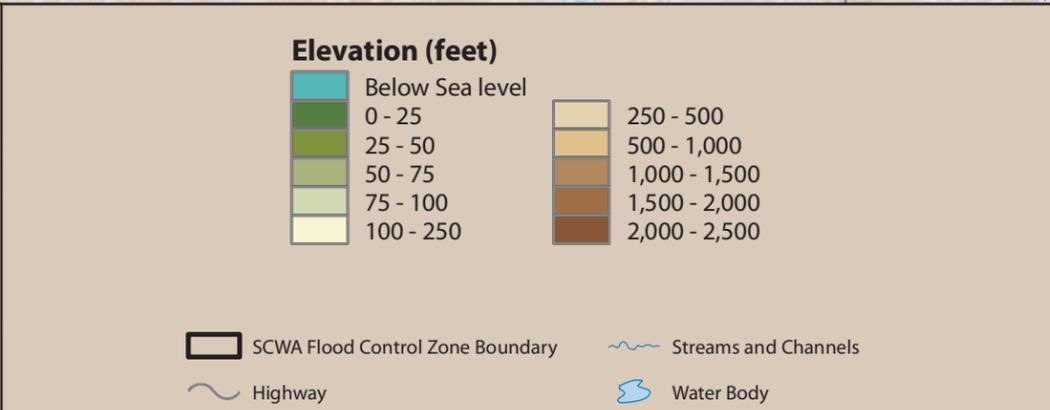
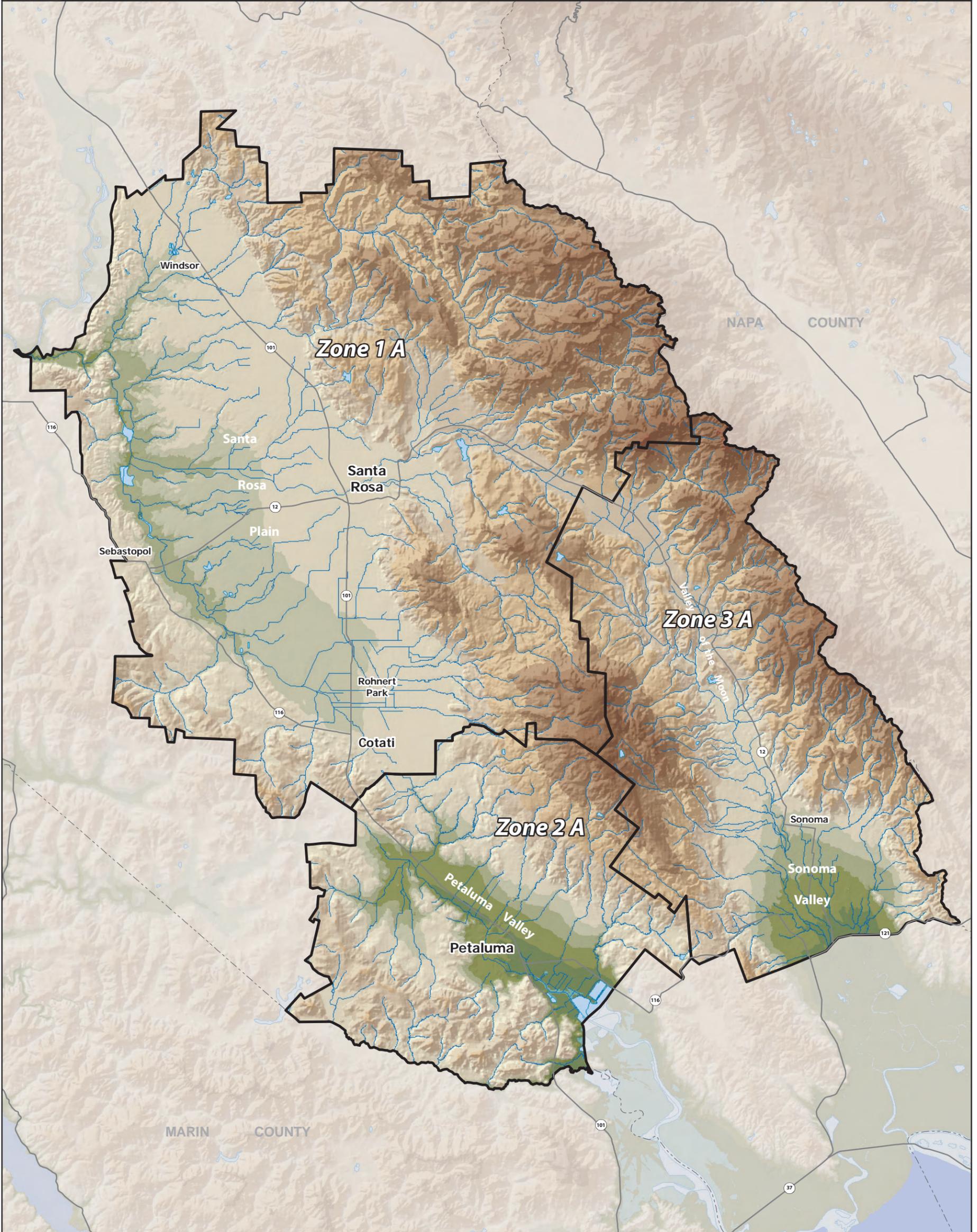
	Considered for Project	Not Considered for Project	Explanation <i>(how, why or why not)</i>
BioFilters			
Rain Gardens/ Bioretention Areas			
Flow-through Planters			
Vegetated Swales			
Vegetated Filter Strips			
Other			
Permeable Paving			
Permeable Concrete			
Permeable Asphalt			
Permeable Pavers			
Grass and Gravel Pavers			
Other			

	Considered for Project	Not Considered for Project	Explanation <i>(how, why or why not)</i>
Green Roofs			
Intensive			
Extensive			
Rainwater Harvesting			
			<i>If yes, describe type and storage capacity (gallons).</i>
Subsurface Strategies			
Infiltration Trenches			
Underground Infiltration Galleries			
Soil Amendments			
Other			

Appendix 4

REFERENCE MAPS

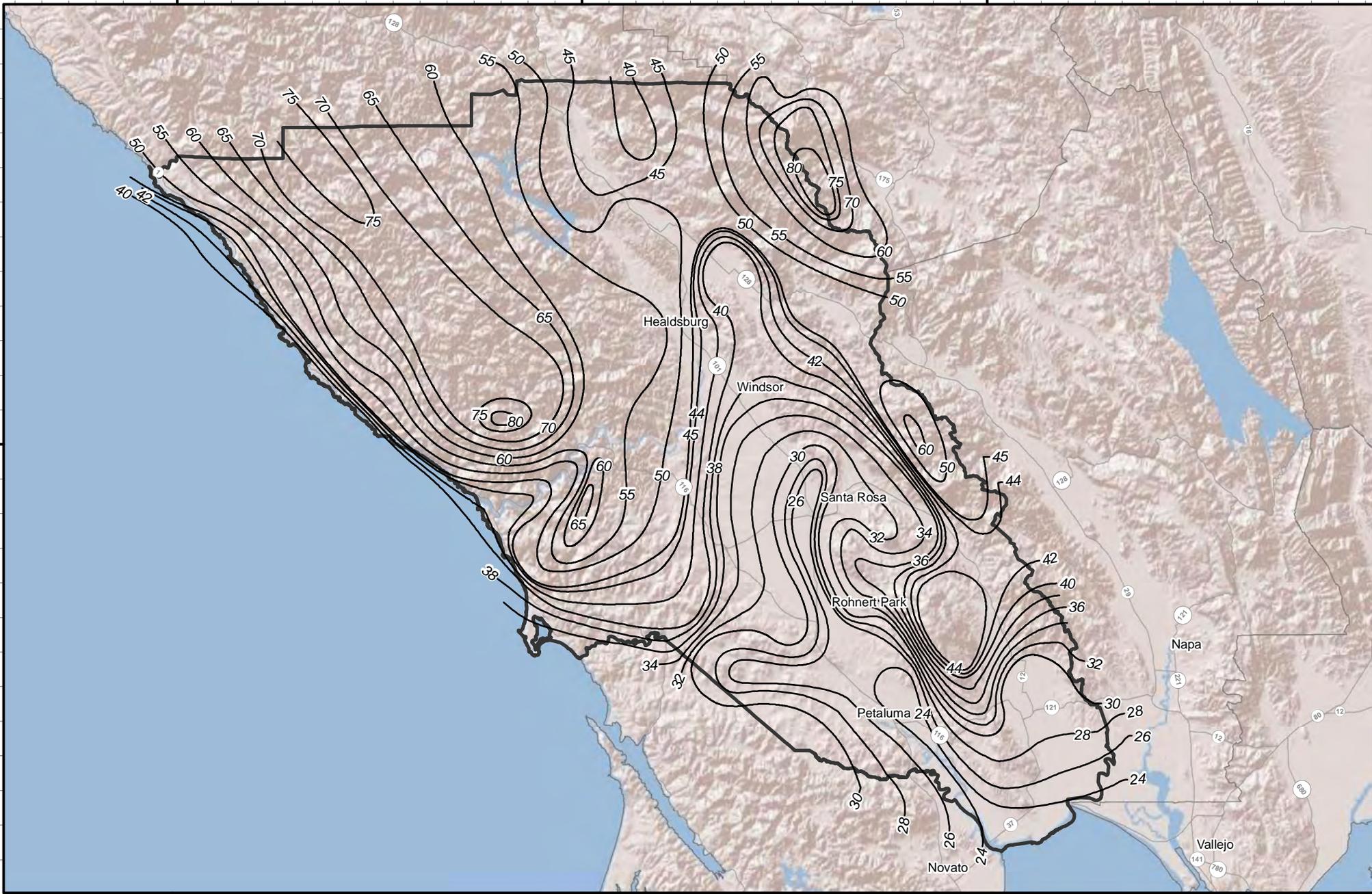




123°30'0"W

123°0'0"W

122°30'0"W



123°30'0"W

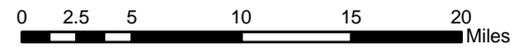
123°0'0"W

122°30'0"W

Figure A-3

Sonoma County Mean Annual Precipitation

PWA Ref# - 1969.00



— Rainfall Isohyetals (in)
 □ Sonoma County

filepath for mxd

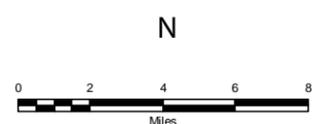


Geology

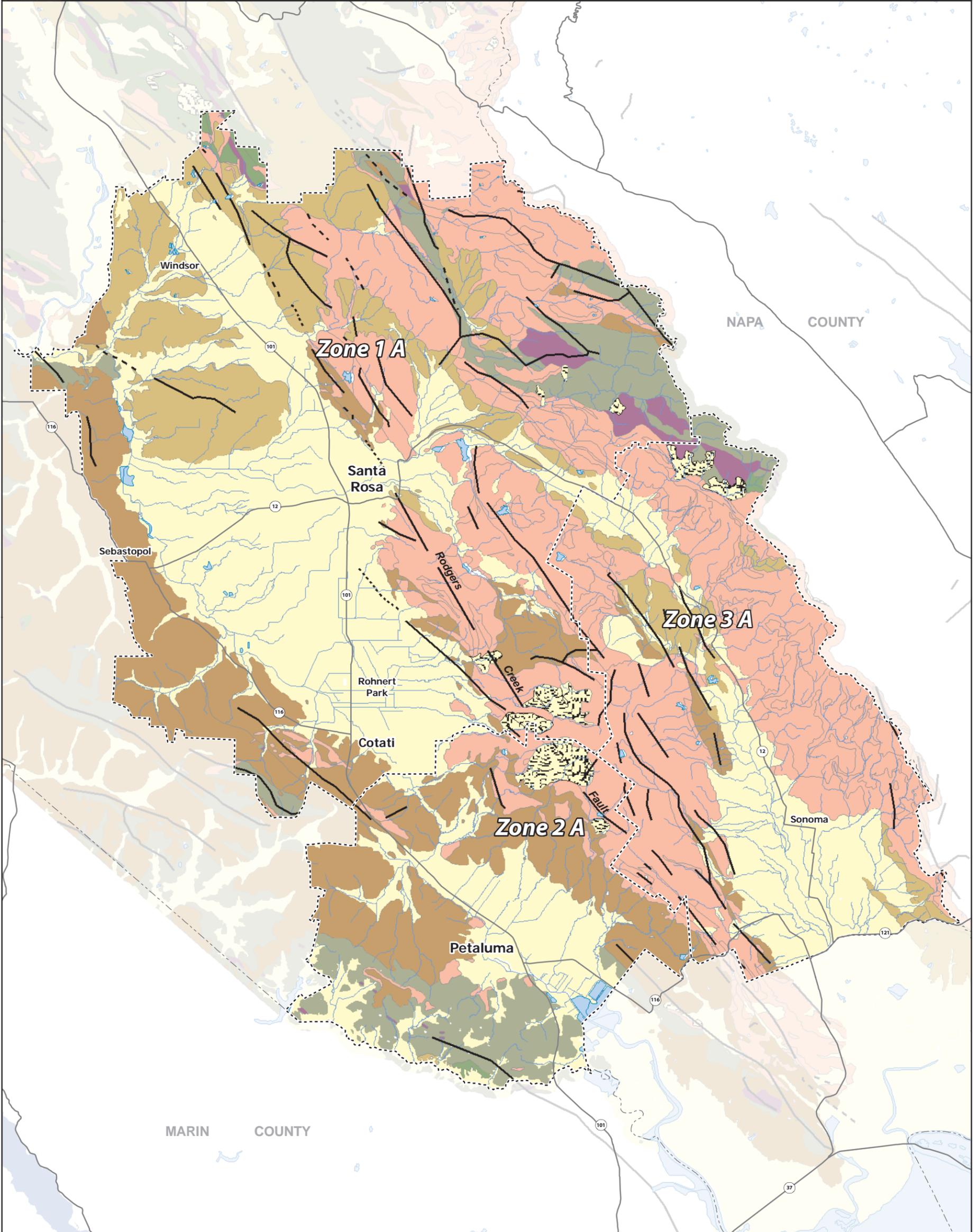
- | | | | |
|---|----------------------------------|---|-------------------------|
|  | Quaternary deposits |  | Tertiary volcanic rocks |
|  | Quaternary landslide deposits |  | Franciscan Complex |
|  | Quaternary sedimentary rocks |  | Great Valley Complex |
|  | Tertiary sedimentary rocks |  | Serpentine |
|  | Faults |  | Streams |
|  | SCWA Flood Control Zone Boundary |  | Highways |

Figure A-4

Geology of Sonoma County

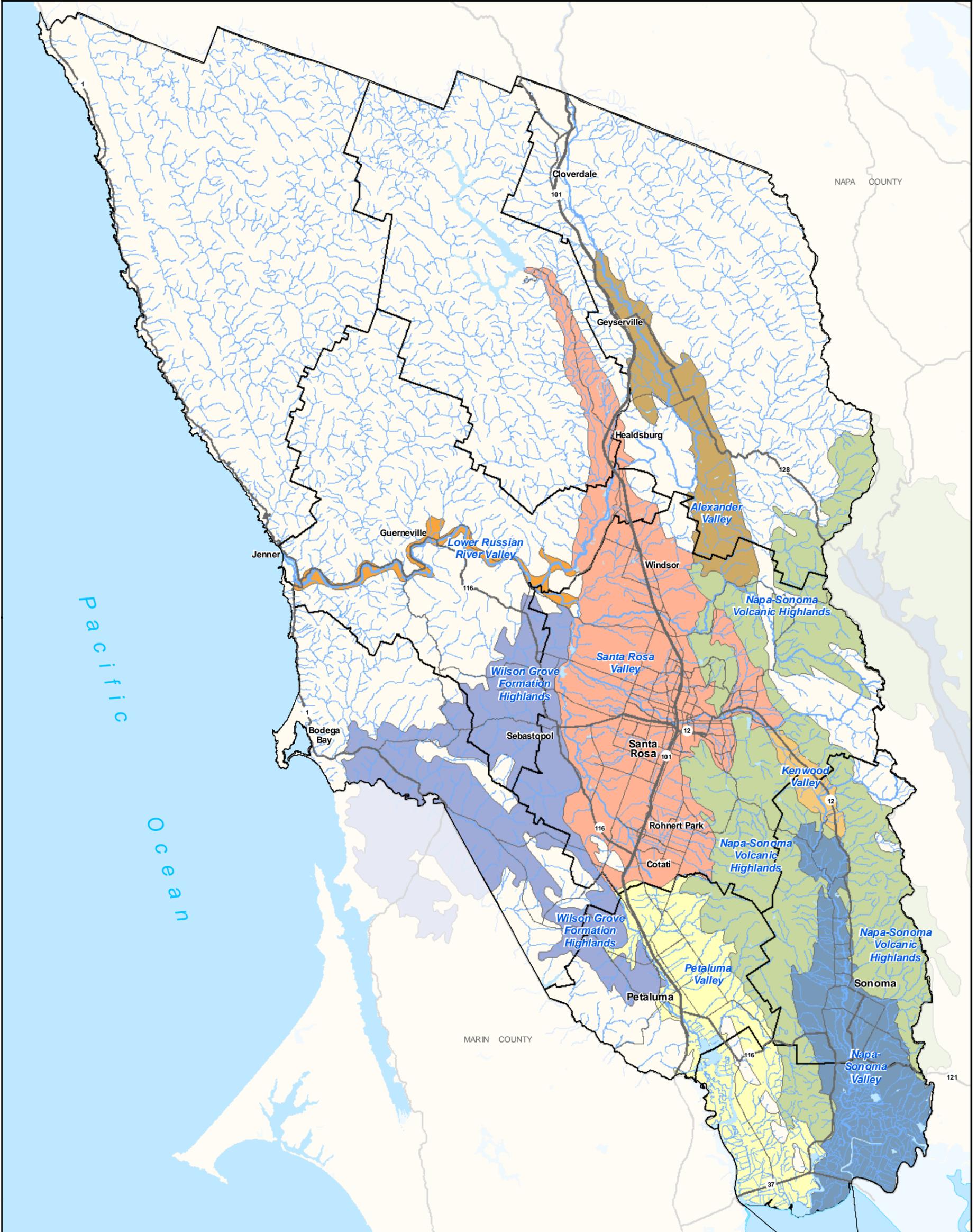


Sources:
 Sonoma County Water Agency
 County of Sonoma
 California Spatial Information Library
 U.S. Geological Survey
 Geografika Consulting



Geology	
Quaternary deposits	Tertiary volcanic rocks
Quaternary landslide deposits	Franciscan Complex
Quaternary sedimentary rocks	Great Valley Complex
Tertiary sedimentary rocks	Serpentinite
Faults	
SCWA Flood Control Zone Boundary	Streams and Channels
Highway	Water Bodies

Figure A-5
Geology of the Santa Rosa Area, Petaluma Valley, and Sonoma Valley



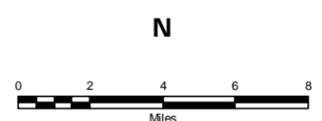
Groundwater Basins

- | | |
|----------------------------|----------------------------------|
| Alexander Valley | Napa-Sonoma Volcanic Highlands |
| Kenwood Valley | Petaluma Valley |
| Lower Russian River Valley | Santa Rosa Valley |
| Napa-Sonoma Valley | Wilson Grove Formation Highlands |

- | | |
|----------------------------------|---------|
| SCWA Flood Control Zone Boundary | Streams |
| Highways | |

Figure A-6

Groundwater Basins of Sonoma County



Sources:
 Sonoma County Water Agency
 County of Sonoma
 California Spatial Information Library
 U.S. Geological Survey
 Geografika Consulting

