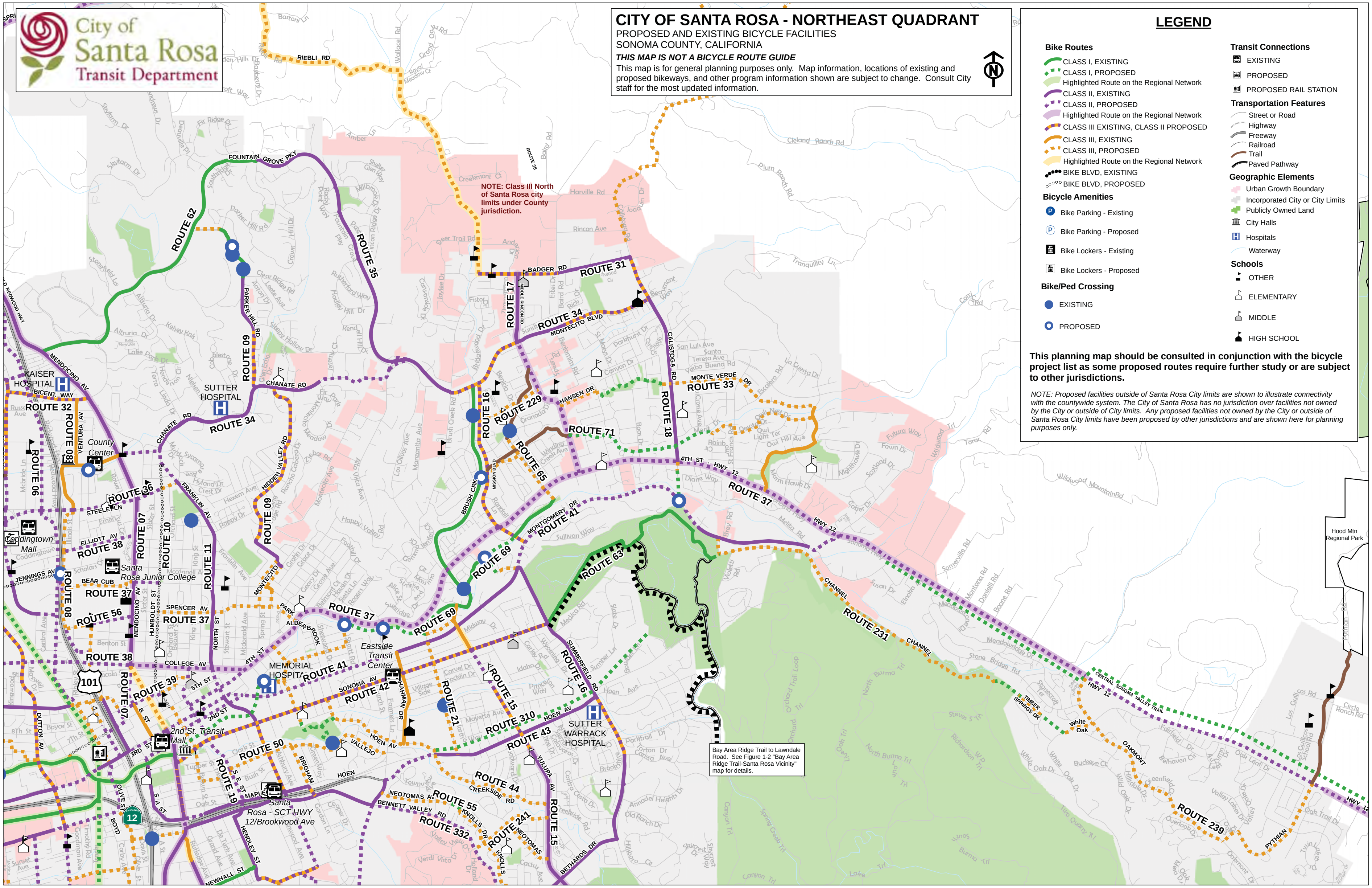
Southeast Greenway

Existing Conditions, Opportunities, and Constraints

Appendix

September 15, 2015

Figure 2-3B


City of Santa Rosa Transit Department
CITY OF SANTA ROSA - NORTHEAST QUADRANT
PROPOSED AND EXISTING BICYCLE FACILITIES
SONOMA COUNTY, CALIFORNIA
THIS MAP IS NOT A BICYCLE ROUTE GUIDE
This map is for general planning purposes only. Map information, locations of existing and proposed bikeways, and other program information shown are subject to change. Consult City staff for the most updated information.
N
LEGEND
Bike Routes
CLASS I, EXISTING
CLASS I, PROPOSED
Highlighted Route on the Regional Network
CLASS II, EXISTING
CLASS II, PROPOSED
Highlighted Route on the Regional Network
CLASS III EXISTING, CLASS II PROPOSED
CLASS III, EXISTING
CLASS III, PROPOSED
Highlighted Route on the Regional Network
BIKE BLVD, EXISTING
BIKE BLVD, PROPOSED
Bicycle Amenities
Bike Parking - Existing
Bike Parking - Proposed
Bike Lockers - Existing
Bike Lockers - Proposed
Bike/Ped Crossing
EXISTING
PROPOSED
Transit Connections
EXISTING
PROPOSED
PROPOSED RAIL STATION
Transportation Features
Street or Road
Highway
Freeway
Railroad
Trail
Paved Pathway
Geographic Elements
Urban Growth Boundary
Incorporated City or City Limits
Publicly Owned Land
City Halls
Hospitals
Waterway
Schools
OTHER
ELEMENTARY
MIDDLE
HIGH SCHOOL
This planning map should be consulted in conjunction with the bicycle project list as some proposed routes require further study or are subject to other jurisdictions.
NOTE: Proposed facilities outside of Santa Rosa City limits are shown to illustrate connectivity with the countywide system. The City of Santa Rosa has no jurisdiction over facilities not owned by the City or outside of City limits. Any proposed facilities not owned by the City or outside of Santa Rosa City limits have been proposed by other jurisdictions and are shown here for planning purposes only.
NOTE: Class III North of Santa Rosa city limits under County jurisdiction.
Bay Area Ridge Trail to Lawndale Road. See Figure 1-2 "Bay Area Ridge Trail-Santa Rosa Vicinity" map for details.
KAISER HOSPITAL
SUTTER HOSPITAL
MEMORIAL HOSPITAL
SUTTER WARRACK HOSPITAL
County Center
Coddingtown Mall
Santa Rosa Junior College
Eastside Transit Center
2nd St. Transit Mall
Santa Rosa - SCT HWY 12/Brookwood Ave
Hood Mtn Regional Park
ROUTE 62
ROUTE 35
ROUTE 09
ROUTE 34
ROUTE 31
ROUTE 17
ROUTE 16
ROUTE 18
ROUTE 33
ROUTE 229
ROUTE 71
ROUTE 65
ROUTE 37
ROUTE 41
ROUTE 69
ROUTE 63
ROUTE 231
ROUTE 32
ROUTE 08
ROUTE 06
ROUTE 36
ROUTE 38
ROUTE 07
ROUTE 10
ROUTE 11
ROUTE 56
ROUTE 39
ROUTE 42
ROUTE 50
ROUTE 19
ROUTE 21
ROUTE 15
ROUTE 310
ROUTE 43
ROUTE 44
ROUTE 55
ROUTE 332
ROUTE 241
ROUTE 239
FOUNTAIN GROVE PKY
RIEBLI RD
BADGER RD
MONTECITO BLVD
CHANATE RD
MONTE VERDE DR
HANSEN DR
4TH ST
HWY 12
CHANNEL
MONTGOMERY DR
SONOMA AV
COLLEGE AV
MENDOCINO AV
CALISTOGA RD
SUMMERFIELD RD
HOEN AV
VALLEJO
MAPLE
NEOTOMAS AV
BENNETT VALLEY RD
CREEKSIDE RD
KNOLLS DR
BETHARDS DR
OAKMONT
PYTHIAN
CENTRAL SONOMA VALLEY TRAIL
TIMBER SPRINGS DR
HENDLEY ST
NEWHALL ST
BRUSH CRK
101
12

Planning Watershed Area: Matanzas Creek

Creeks
- Natural
- Modified
- Modified-Natural
- Culvert
- R R Proposed Restoration
- ● ● Endpoints of Creek Reach

Ownership/Land Use
- City Properties
- Sonoma County Water Agency
- Other Public Entities
- School Properties
- Existing Parks/Open Space
- City Limits
- Urban Growth Boundary

Existing Access Roads/Trails
- Paved Trail
- Unpaved Access Road/Trail
- Dirt/Soft Surface
- Closed Access Road
- Existing Trail Bridge
- UC Existing Undercrossing
- Existing Off-Street Entry

Existing Bikeways
- Class 1 (Path separate from traffic)
- Class 2 (Lane painted on street)
- Class 3 (Signed route)

Proposed Trails and Connections
- Planned Street Extension
- Planned Paved Trail
- SMART Trail
- P P Pave Existing Access Road/Trail
- O O Open Currently Closed Access Road
- Planned Trail Bridge
- UC Planned Undercrossing
- Planned Off-Street Entry

Planned Open Space/Parks
- Planned Community Park
- Planned Neighborhood Park
- Potential Public Plaza and Gathering Space

This map is part of the City of Santa Rosa Citywide Creek Master Plan, 2013.

Based on data from the Citywide Creek Master Plan (2007). Updated in 2013.

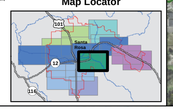
City of Santa Rosa GIS from Asset Management and Information Technology. 2011 Aerials are shown.

Map Produced by City of Santa Rosa, Stormwater and Creeks Division.
Date: 5/24/2013

N

0 1,000 2,000 Feet

Map Locator



Agenda Item#13.2
Meeting of: June 17, 2014

Mutual Letter of Intent
Southeast Greenway

This Mutual Letter of Intent ("Letter") is executed by the City of Santa Rosa, Sonoma County Water Agency, the Sonoma County Regional Parks Department, LandPaths and the Southeast Greenway Campaign Committee (hereinafter "Participants") on the dates specified below.

The purpose of this Letter is to communicate the intent of the Participants regarding the future transfer and land management of the Caltrans Highway 12 Right of Way, known as the Southeast Greenway ("Property"), in order to facilitate such activities. The Property extends from Farmers Lane to Spring Lake Park. The specific intentions of the Participants are described below.

City of Santa Rosa
The City of Santa Rosa intends to accept the land transfer if offered by Caltrans at no cost to the City for the portion of the Property between Farmers Lane and Summerfield Road. The City, through its Department of Community Development, intends to provide leadership regarding the general planning of future land uses on the entire Property, between Farmers Lane and Spring Lake Park. The City, through its Department of Recreation and Parks, intends to operate and manage the portion of the Property between Farmers Lane and Summerfield Road with the support of Landpaths as discussed below. The City intends to enter into an agreement with LandPaths to provide volunteers for day-to-day oversight and maintenance of this portion of the Property. The City also intends to negotiate in good faith with the Water Agency regarding the location of an easement for any future water pipeline on this portion of the Property and to coordinate with the Water Agency regarding future land use of this property to facilitate placement of the pipeline.

Sonoma County Water Agency
The Sonoma County Water Agency intends to accept the land transfer offered by Caltrans for the portion of the Property between Summerfield Road and Spring Lake Park. The Water Agency intends to enter into an agreement with the Sonoma County Regional Parks Department for day-to-day oversight and maintenance of this portion of the Property. The Water Agency is interested in securing an easement on and using the portion of the Property to be transferred to the City for a possible future water pipeline, and intends to negotiate and coordinate with the City regarding the placement of the pipeline on such Property.

Sonoma County Regional Parks Department
The Sonoma County Regional Parks Department intends to operate and manage the portion of the Property between Summerfield Road and Spring Lake Park pursuant to an agreement with the Sonoma County Water Agency. The Regional Parks Department intends to provide day-to-day oversight and maintenance of this portion of the Property pursuant to the agreement.

LandPaths
LandPaths intends to integrate the Southeast Greenway Campaign Committee into its organization to provide support for the future management of the Property in 2015/2016. LandPaths intends to enter into an agreement with the City to engage the community

with the Property between Farmers Lane and Summerfield Road. It is intended that this will include, but may not be limited to, managing and obtaining public input on possible uses of the Property and day-to-day oversight and maintenance of this portion of the Property.

Southeast Greenway Campaign Committee

The Committee intends to integrate with and become an ongoing part of LandPaths for this project in 2015. The Committee intends to develop strategy and advocacy for the Property's transfer and to manage and obtain public input on possible uses for the Property, and continue to be a catalyst for legislation, fundraising and community participation with respect to the Property.

This Letter expresses the present intention of the Participants and is not a legally binding instrument, and is being created to facilitate the acquisition and management activities described herein. Any final decisions will have to be approved by the respective boards or councils of the parties to this Letter. This Letter may be signed in counterparts.

The individuals executing this Letter have been authorized by their respective boards or authorizing agents to do so.

_____ _____
City of Santa Rosa Date

_____ _____
Sonoma County Water Agency Date

_____ _____
Sonoma County Regional Parks Date

_____ _____
LandPaths Date

_____ _____
Southeast Greenway Campaign Committee Date

Memorandum of Understanding
Between the California Department of Transportation,
Sonoma Land Trust and
The Southeast Greenway Community Partnership
Regarding a Proposal to Transfer Rescinded State Route 12 Land
For the Santa Rosa Southeast Greenway

This is a Memorandum of Understanding dated as of 8/5/, 2015 between the City of Santa Rosa ("City"), Sonoma County Water Agency ("Water Agency"), the Sonoma County Regional Parks Department, LandPaths, and the Southeast Greenway Campaign Committee (collectively, the "Partnership"), the California Department of Transportation ("the Department"), and Sonoma Land Trust ("SLT").

Purpose
The Department, Partnership, and SLT are entering into this Memorandum of Understanding to document the Parties' understandings, intentions and expectations with regard to transferring a 52-acre section of the rescinded State Route 12 land ("Southeast Greenway") from the Department to the City of Santa Rosa ("City") and the Sonoma County Water Agency ("Water Agency").

Background
In 2009, the Southeast Greenway Campaign initiated a community effort to envision a vibrant urban greenway on the two-mile long, 52-acre section of rescinded State Route 12 land that links Farmers Lane to Spring Lake Park in Santa Rosa. Based on community input, the proposed Santa Rosa Southeast Greenway would feature bicycle and pedestrian paths, restored and protected open space, parks, community gardens, and other public uses.

In July 2014, the City of Santa Rosa, the Water Agency, the Sonoma County Regional Parks Department, LandPaths, and the Southeast Greenway Campaign Committee (the Partnership) signed a Mutual Letter of Intent, which outlines each organization's role and responsibilities in a collaborative effort to facilitate and achieve the transfer of the Southeast Greenway for public uses. The Partnership intends to work together to plan, develop and manage the proposed Greenway should the property be acquired.

In August 2014, the California Transportation Commission rescinded the property's freeway designation, creating the opportunity for the Department to transfer the property for other public uses.

In late 2014, SLT joined with the Partnership to assist in completing transfer of the Southeast Greenway.

The Partnership, the Department, and SLT agree as follows:

1. The Partnership and SLT will collaborate with the Department toward development of an agreement to transfer the Southeast Greenway property with terms acceptable to all parties.

2. The Department will, if requested, offer the City of Santa Rosa and Water Agency first right of refusal to acquire the property prior to the land being offered on the open market.

3. The Department, the Partnership, and SLT will work together to determine the potential for environmental mitigation sites on the property.

4. The Department, the Partnership, and SLT will identify and agree on a process for establishing the property's value.

5. The Department will provide the Partnership and SLT adequate time, as periodically determined by mutual agreement of the parties, to perform due diligence, including a title review, Phase I and, if indicated, Phase II environmental assessment, environmental review, and appraisals of the property.

6. The Department will retain the Southeast Greenway property in its current and intact condition while the parties collaborate so that the following public uses of the land could be considered:

    a. Bicycle and pedestrian paths as part of a regional trail network.

    b. Restored and protected open space and natural habitat.

    c. Parks and community gardens.

    d. Water Agency water reliability pipeline.

    e. Groundwater development and recharge.

7. The City of Santa Rosa will prepare a Current Conditions, Constraints and Opportunities Analysis of the property available for the consideration of all parties. The Analysis will:

    a. Document the existing conditions on the property that are relevant to the use of the property.

    b. Identify constraints and opportunities on the property resulting from existing adopted plans and policies.

8. The Department will cooperate with the Partnership and SLT to facilitate the preparation of the Current Conditions, Constraints and Opportunities Analysis by disclosing known liens,

easements, encumbrances, leases, and deed restrictions, and by granting reasonable access to the property.

9. The Department will provide adequate time, as periodically determined by mutual agreement of the parties, for the Partnership and SLT to complete the fundraising required for the proposed transfer of the property to the City and Water Agency.

10. The Department will consider granting the Partnership and SLT access to the property at mutually agreed upon times for public educational outings and fundraising events. This may be accomplished through short-term leases of the property or portions of the property to the Southeast Greenway Campaign Committee or to other Southeast Greenway Community Partners.

11. This MOU shall continue in effect until such time as the parties may enter into a more formal agreement or there is close of escrow for acquisition of the Southeast Greenway, but in no event longer than five (5) years, whichever is the earlier to occur, unless otherwise mutually agreed by the parties.

IN WITNESS THEREOF, the parties hereto have executed this Memorandum of Understanding as of _____, 2015.

California Department of Transportation,

By: _____
Mark L. Weaver

Its: Deputy District Director, Right of Way & Land Surveys

City of Santa Rosa,

By: _____
Sean McGlynn

Its: City Manager

Sonoma County Water Agency,

By: _____
Grant Davis

Its: General Manager

easements, encumbrances, leases, and deed restrictions, and by granting reasonable access to the property.

9. The Department will provide adequate time, as periodically determined by mutual agreement of the parties, for the Partnership and SLT to complete the fundraising required for the proposed transfer of the property to the City and Water Agency.

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IN WITNESS THEREOF, the parties hereto have executed this Memorandum of Understanding as of _____, 2015.

California Department of Transportation,

By: _____
Mark L. Weaver

Its: Deputy District Director, Right of Way & Land Surveys

City of Santa Rosa,

APPROVED AS TO FORM
CITY ATTORNEY.
BY _____

By: _____
Sean McGlynn

Its: City Manager

Sonoma County Water Agency,

By: _____
Grant Davis

Its: General Manager

Southeast Greenway Campaign Committee,

By: Linda Proulx
Linda Proulx

By: Thea Hensel
Thea Hensel

Its: Campaign Co-chairs

LandPaths,

By: _____
Craig Anderson

Its: Executive Director

Sonoma County Regional Parks Department, a department of the County of Sonoma

By: _____
Caryl Hart

Its: Director

The Sonoma Land Trust, a California nonprofit public benefit corporation

By: _____
David Koehler

Its: Executive Director

Southeast Greenway Campaign Committee,

By: _____
Linda Proulx

By: _____
Thea Hensel

Its: Campaign Co-chairs

LandPaths,

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Craig Anderson

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Sonoma County Regional Parks Department, a department of the County of Sonoma

By: _____
Caryl Hart

Its: Director

The Sonoma Land Trust, a California nonprofit public benefit corporation

By: _____
David Koehler

Its: Executive Director

MEMORANDUM

Date: November 24, 2014
To: Erin Morris, Senior Planner
From: Sean McNeil, Environmental Specialist
Re: Environmental Study of the Highway 12 Right of Way Property from Farmers Lane to Summerfield Road

---

This memo is a review of the current site conditions on a property that has been a part of the Highway 12 expansion right-of-way. This site is part of a larger site known as the Southeast Greenway. The purpose of this study is to document the current conditions within the study area and identify any potentially environmentally sensitive areas.

Attached to this memo are:

- Attachment 1: Location and site maps
- Attachment 2: Soil Report
- Attachment 3: Photo Sheets

Location

The study area is a linear 1.4 mile stretch of undeveloped land that was part of the California Transportation Department's Right of Way for a planned expansion of Highway 12 in the Bennett Valley area of Santa Rosa, California. The study area is bounded on the west by Farmers Lane and Summerfield Road on the east. The property spans from Latitude 39.4371 and Longitude -122.6869 to Latitude 38.4444 and Longitude -122.6641. There is an additional part of the Highway 12 right-of-way east of Summerfield Road that was not evaluated for this report (see Attachment 1 for site map and location details). The site is bisected by four City Streets and three creeks and is surrounded by a mix of commercial and residential development. This property was part of the Highway 12 Right-of-way and has no Assessor Parcel Numbers (APNs) to provide description.

Non-Environmental Constraints

Within the study area there are a number of projects identified in the City of Santa Rosa's Citywide Creek Master Plan. These projects include a Class 1 bicycle/pedestrian path from Hoen Avenue to Summerfield Road with a trail bridge over Sierra Park Creek and creek restoration for all three creeks in the study area.

There are a number of water and sewer lines that cut across the project area and a large storm water pipe known as the Spring Creek Diversion that runs east to west from Summerfield Road to Franquette Avenue along the southern extent of the property.

State Listed and Species of Special Concern

The California Natural Diversity Database is a geographic information system (GIS) database that stores known locations for State of California and Federally Protected species. A query of this database was conducted for all of the known occurrences within two miles of the project area (see Table 1A for the list of animals and Table 1B for list of plants).

Soils

The study area has a diversity of soil types throughout the extent. Outside of the creek channels, the land is predominantly flat with soils of alluvium deposits derived from volcanic rock. The three most common soil types are Clear Lake clay with sandy substratum Yolo clay loam and Clear Lake clay loam. These soils are typically poorly drained that generate a high amount of runoff during storm events. In addition, these soils also are often associated with a high water table which could allow topographic depressions to become wetlands (see Attachment 2: Custom Soil Resource Report for a more detailed description of the soil types and locations in the study site).

Habitats

The property is primarily grassland with three creeks, numerous swales, potential wetlands and remnant walnut orchards. In general, the site has been neglected except for annual vegetation cutting to lower fire danger (see Photo Sheet, Figure 1). Trash has been allowed to accumulate throughout the study area (see Photo Sheet, Figure 3 and Figures 8-9) and appears to have been repeatedly chopped up and tilled into the soil through disking activities. In spite of the site conditions, the large undeveloped area provides habitat for many mammals, birds, fish and many different invertebrate animals.

Grasslands

The grasslands consist mostly of non-native grasses and herbs typical of abandoned agriculture fields or roadside habitats. These grasslands are maintained through regular disking, which disturbs the soil and most likely prevents the establishment of trees of shrubs within these areas. The grasslands are dominated by non-native grasses like Bermuda grass, harding grass and Mediterranean barley, but also have some common roadside forbs like bur clover, smooth cat's ear and bindweed. These plants are indicative of a regularly disturbed system. The site historically was known to be a "valley needlegrass grassland" dominated a great diversity of grasses and flowering plants. Another site disturbance is that there is a large soil stock pile that is located west of Yulupa Avenue. The origination of this stockpile will need to be determined and/or tested for potential contamination before it is moved or used onsite.

Orchards

The eastern-most section of the study area is a former walnut orchard with some surviving walnut trees, but many of the cultivars have died and left only the rootstocks of black walnuts. According to aerial imagery, this area has had orchards all the way back to 1942, but what type of orchard is not able to be determined from the photos. The understory of the walnut orchard has been disked like the grassland areas, but close to the walnut trees are native oak trees and poison oak vines (see Photo Sheet, Figure 2). The recruitment of these native plants under the protection of the walnut trees are evidence that this section of the study area could have been more of an oak woodland, where valley oaks may have been the more dominant trees.

Riparian

The study area has three highly modified creeks flowing through it, Matanzas Creek, Sierra Park Creek and Spring Creek. Matanzas Creek and its tributaries are known to have native salmonids living in the streams. While the creeks are constricted to engineered channels, there are quite a few native riparian plants present in these degraded habitats. Common trees include the coast live oak, black oak, Oregon ash and some California bay trees. The Citywide Creek Master Plan recommends restoration of all three creeks by removing non-native plant species and increasing the riparian vegetation into the existing

grasslands. The site has drainage ditches that collect water from the study area and move it into existing channels. Some of the ditches along the southern limits of the site also receive storm water runoff from the commercial and residential properties adjacent to the site.

Matanzas Creek

Matanzas Creek flows from the northern slopes of Sonoma Mountain through Bennett Valley eventually meeting Santa Rosa Creek just downstream of Santa Rosa Avenue. This is the largest creek that flows through the study area, and despite the high amount of English ivy along the banks there are many native plants existing within the riparian zone including. The channel is deeply cut with steep banks that have been supported with concrete retaining walls on the right bank in the study area.

Sierra Park Creek

Sierra Park Creek is a tributary to Matanzas Creek. Upstream of the study area Sierra Park Creek is relatively natural as it meanders through residential neighborhoods, but is highly modified within the study area. Most of the creek's flow is diverted into the Spring Creek Bypass, only in extreme weather events would the water continue downstream into its natural channel (see Photo Sheet, Figure 7). Local drainage within the study area feed into the creek downstream of the diversion and makeup the primary flow into the lower extent of Sierra Park Creek. Restoring the historic flow into this creek would require a hydraulics and hydrology study to determine how much of the high flow must be diverted into the Spring Creek Bypass to continue to provide flood protection for the neighborhood downstream of the project area.

Spring Creek

Spring Creek is one of the larger tributaries to Matanzas Creek, but its flow is highly modified. The headwaters of Spring Creek originate in Annadel State Park, but is partially diverted into Spring Lake and again diverted in a second underground structure located within the study area. These structures were designed, built and maintained by the Sonoma County Water Agency to prevent flooding in the residential areas downstream of the study area. The diversion in the study area was designed to have the creek's low flow water to continue into the historic channel and higher amounts to be diverted into a 72" culvert pipe that expands to a 96" pipe and travels south through the study area where it eventually reconnects with the original channel downstream of Farmers Lane (see Photo Sheet, Figure 5).

Within the study area the historic channel still has a native tree canopy, but the understory is dominated by Himalayan blackberry and non-native grasses. Sediment has accumulated within the channel and may impede the low flow passing through the diversion structure from entering the channel (see Photo Sheet, Figure 6).

Wetlands

Based on the high water table and impermeable clay soils throughout the study area there was likely historic seasonal wetlands. An official wetland delineation was not conducted for this survey, but locations of potential wetlands were identified. Some of the site drainage ditches may meet the wetland criteria as defined by the U.S. Army Corps of Engineers and one large area near the Montgomery High School football field, see Attachment 1 Site Area Maps for locations of these features.

Plant Survey

The study area's vegetation was surveyed using meandering transects, where the site was walked three times in late October and early November, 2014. All species that were able to be identified were recorded (see Table 1 for all species identified for this study). This survey is not intended to be an exhaustive list of the species present. If a more complete list of plants in the study site was required further surveys would need to be done in the spring and summer time to identify annual plants that bloom in the different seasons. The recent disking of the soil was an additional challenge to identifying the plants within the study area.

Results

The study area is dominated by non-native plants like Himalayan blackberry, Harding grass and annual grasses typically found in areas with a high level of disturbance. No species of special concern were identified within the study area.

Table 1. Species of special concern recorded in the California Natural Diversity Database and found within two miles of the study area. A) the animals and B) the plants.

1A. Animals			
Scientific Name	**Common Name**	**US LIST**	**California List**
Emys marmorata	western pond turtle	None	Species of special concern

1B. Plants			
Scientific Name	**Common Name**	**US LIST**	**California List**
Amsinckia lunaris	bent-flowered fiddleneck	None	Species of special concern
Arctostaphylos canescens ssp. sonomensis	Sonoma canescent manzanita	None	Species of special concern
Arctostaphylos stanfordiana ssp. decumbens	Rincon Ridge manzanita	None	Species of special concern
Brodiaea leptandra	narrow-anthered brodiaea	None	Species of special concern
Ceanothus confusus	Rincon Ridge ceanothus	None	Species of special concern
Ceanothus divergens	Calistoga ceanothus	None	Species of special concern
Ceanothus purpureus	holly-leaved ceanothus	None	Species of special concern
Ceanothus sonomensis	Sonoma ceanothus	None	Species of special concern
Fritillaria liliacea	fragrant fritillary	None	Species of special concern
Leptosiphon jepsonii	Jepson's leptosiphon	None	Species of special concern
Navarretia leucocephala ssp. bakeri	Baker's navarretia	None	Species of special concern
*Trifolium hydrophilum**	saline clover	None	Species of special concern
Triquetrella californica	coastal triquetrella	None	Species of special concern

Table 2. List of plants identified throughout the study area.

Scientific Name	Common Name	Plant Form	Plant Family
Aesculus californica	California buckeye	Tree	Sapindaceae
Fraxinus latifolia	Oregon ash	Tree	Oleaceae
Juglans species	walnut cultivars	Tree	Juglandaceae
Olea europaea	olive	Tree	Oleaceae
Prunus species	wild plum	Tree	Roseaceae
Pyrus species	pear tree	Tree	Roseaceae
Quercus agrifolia	live oak	Tree	Fagaceae
Quercus garryana	Garry oak	Tree	Fagaceae
Quercus kelogii	black oak	Tree	Fagaceae
Quercus lobata	valley oak	Tree	Fagaceae
Salix exigua	sandbar willow	Tree	Salicaceae
Salix lasiolepis var. lasiolepis	arroyo willow	Tree	Salicaceae
Sambucus mexicanus	blue elderberry	Tree	Roseaceae
Baccharis pilularis	coyote brush	Shrub	Asteraceae
Toxicodendron diversilobum	poison oak	Shrub	Anacardiaceae
Hedera helix	English ivy	Vine	Araliaceae
Rubus armeniacus	Himalayan blackberry	Vine	Roseaceae
Rubus canadensis	thornless blackberry	Vine	Roseaceae
Vitis species	grape cultivar	Vine	Vitaceae
Arundo donax	giant reed	Grass	Poaceae
Avena fatua	wild oat	Grass	Poaceae
Bromus diandrus	ripgut brome	Grass	Poaceae
Cynodon dactylon	Bermuda grass	Grass	Poaceae
Elymus triticoides	creeping wild rye	Grass	Poaceae
Hordeum marinum ssp gussoneanum	Mediterranean barley	Grass	Poaceae
Phalaris aquatica	Harding grass	Grass	Poaceae
Carex barbarae	Santa Barbara sedge	Grass-like	Cyperaceae
Juncus patens	spreading rush	Grass-like	Juncaceae
Convolvulus arvensis	bindweed	Herb	Convolvulaceae
Foeniculum vulgare	sweet fennel	Herb	Apiaceae
Helminthotheca echioides	bristly ox-tongue	Herb	Asteraceae
Hypochaeris glabra	smooth cat's ear	Herb	Asteraceae
Malva parviflora	cheeseweed	Herb	Malvaceae
Medicago polymorpha	bur clover	Herb	Fabaceae
Mentha pulgium	pennyroyal	Herb	Lamiaceae
Taraxacum officinale	dandelion	Herb	Asteraceae
Xanthium strumarium	cockle bur	Herb	Asteraceae

Data Sources:

The information in this memo was compiled from site visits and many different sources, including: online databases, planning documents, aerial imagery and citizen reports.

Citations:

Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken, editors. 2012. The Jepson Manual: vascular plants of California, second edition. University of California Press, Berkeley.

Barnhart, S. 2014. Southeast Greenway: restoration and mitigation potential for native habitat types. Unpublished technical report.

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U.S. Department of Agriculture, Natural Resource Conservation Service, 2009. Custom Soil Resoruce Report for Sonoma County, California. *Web Soil Survey.* Available online at http://websoilsurvey.nrcs.usda.gov/. Accessed November 2014.

vPhoto Sheets of the Highway 12 Right-of-way Study Area.

Figure 1: Typical grassland showing the furrowed ground from the disking activity.

Figure 2: The remnant walnut orchard showing other woody plants growing from underneath the canopy of the old walnut trees.

Figure 3: Local site drainage ditch that has collected trash.

Figure 4: One of the site's deeper drainage ditches that runs north south and has a sewer line adjacent to it.

Figure 5: The Spring Creek diversion structure is below this grate. The trees in the middle of the photo are in the old creek channel.

Figure 6: The outfall from the Spring Creek Diversion into the old creek channel note that the bottom of the culvert pipe is filled with sediment.

Figure 7: Sierra Park Creek diversion into the Spring Creek Diversion.

Figure 8: Trash along the study area border.

Figure 9: Trash from illegal dumping and an abandoned homeless camp.

Figure 10: Abandoned parking lot on the western most part of the study area.

MEMORANDUM

Date: May 1, 2015
To: Erin Morris, Senior Planner
From: Sean McNeil, Environmental Specialist
Re: Environmental Study of the Highway 12 Right of Way Property from Summerfield Road to Spring Lake Regional Park

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This memo is a review of the current site conditions on a property that has been a part of the Highway 12 expansion right-of-way. The purpose of this study is to document the current conditions within the study area and identify any potentially environmentally sensitive areas.

Attached to this memo are:

- Attachment 1: Site Map
- Attachment 2: Soil Report
- Attachment 3: Photo Sheets

Location

The study area is approximately 16 acres that is 2,600 foot from east to west with varying widths. This property is undeveloped land that was part of the California Transportation Department's Right of Way for a planned expansion of Highway 12 in the Bennett Valley area of Santa Rosa, California. The study area is bounded on the west by Summerfield Road and on the east by Spring Lake Regional Park. The property spans from Latitude 38.4444 and Longitude -122.6641 to Latitude 38.4495 and Longitude -122.6568. The elevation ranges from about 220 feet on the western edge to 350 feet along the eastern border (see Attachment 1 for site map and location details). The site is surrounded by a mix of residential densities and a park. This property was part of the Highway 12 Right-of-way and has no Assessor Parcel Numbers (APNs) to provide description.

State Listed and Species of Special Concern

The California Natural Diversity Database is a geographic information system (GIS) database that stores known locations for State of California and Federally Protected species. A query of this database was conducted for all of the known occurrences within two miles of the project area (see Table 1A for the list of animals and Table 1B for list of plants).

Soils

The study area has a diversity of soil types throughout the extent. The land is predominantly sloped facing the west with soils of alluvium deposits derived from volcanic rock. The two most common soil types are Pleasanton-Haire complex, 9 to 15 percent slopes and Spreckels loam, 9 to 15 percent slopes. These soils are moderately to well-drained soils made up of gravelly loam. Throughout the area there are rock outcrops with the most prevalent located at the eastern most sections (see Attachment 2 - Custom Soil Resource Report for a more detailed description of the soil types and locations in the study site).

Habitats

The property is primarily grassland with rocky outcrops, oak woodlands, a large potential wetland and a small remnant walnut orchard. Much of the site is managed by the use of horse grazing or mechanically mowed to remove dry biomass and lower fire danger (see Photo Sheet, Figures 1 and 2). This part of the Highway 12 right of way property is much more natural and supports a higher density and diversity of habitats and wildlife species, than the section west of Summerfield Road.

Grasslands

The grasslands consist mostly of non-native grasses and herbs typical of abandoned agriculture fields or roadside habitats. These grasslands are maintained by browsing and mowing (see Photo Sheet Figures 1 through 4 of the Photo sheets). The grasslands are dominated by non-native grasses like ripgut brome, Harding grass and orchardgrass, but also have some common roadside forbs like English plantain, dovesfoot cranebill, and prickly sow thistle. These plants are indicative of a regularly disturbed system. The site historically was known to be a "valley needlegrass grassland" dominated a great diversity of grasses and flowering plants. Throughout the grasslands there are many features that could meet the criteria for wetlands, further studies would need to be conducted to delineate these features (see Figures 8 and 9 in the Photo sheets). The westernmost meadow appears to be more of a wet meadow with basket sedge and Harding grass. There are also a series of horse paddocks within the grassland area, with barns, flat areas and fencing.

Oak Woodlands

There are oaks and other hardwoods spread throughout the property. This area is a transition zone, from the flat, clay-dominated soils dominated by valley oaks to the rocky hillslopes of Annadel where conifers mix in with hardwoods. Most of the oaks in the study area are older specimens, but along the fringes there is some evidence of some regeneration.

Orchards

The southwestern section of the study area is a former walnut orchard. The walnut trees appear to be cared for with many original trees still surviving. Near the orchard is an area with recently planted native trees.

Drainage Swales

The study area does not have any creeks, but there are a number of drainage swales that collect runoff from the property and some adjoining properties. These swales are ephemeral and may not meet the US Army Corps requirements as "Waters of the United States", but may meet the criteria for "Waters of the State."

Large Wetland

The site has a large more than a half-acre wetland, though the exact size would need to be determined through a wetland delineation. This feature is surrounded by Himalayan blackberry and the central part of the wetland was not accessed (See Figures 6 and 7).

Wetlands

Even though most of the soil is quick draining, there appears to be many pockets of small wetlands. It could be that there is an impermeable rock layer that traps water in these depressions. Further analysis

would need to be done on these areas to determine the number and extent of these wetland features (see Figures 8 and 9 of the Photo Sheets).

Plant Survey

The study area's vegetation was surveyed using meandering transects, where the site was walked in early March. All species that were able to be identified were recorded (see Table 2 for all species identified for this study). This survey is not intended to be an exhaustive list of the species present. If a more complete list of plants in the study site was required further surveys would need to be done later in the spring and summer time to identify annual plants that bloom in the different seasons.

Results

The property has a diversity of microclimates and has a diverse plant community. While this one day survey identified more than fifty species of plants, there are many more species that were unidentifiable due to the season and access into the wetland was impeded by Himalayan blackberry. The oak woodlands appear to be increasing in the eastern higher elevation sections, probably due to the fact that grazing is the primary weed control, while the western section gets disked with a tractor and has little oak recruitment. The grasslands are dominated by non-native plants like Harding grass, orchardgrass and rat-tail fescue.

The vegetation survey identified locations with specific plant species that are indicative of potential wetlands or wet meadows. These features provide a different habitat than the dominant grasslands, characterizes as having inundated soils in the winter and extended soil moisture into the dryer summer months. In the northwestern edge of the property there is a large stand of basket sedge which could indicate a higher water table or natural springs. In the grasslands west of the large wetland feature there are small depressions that appear to hold water long enough for algae to grow (see Figure 9). In these depressions there were wetland indicator plants like iris-leaved rush and curly dock, mixed with annual grasses like, ryegrass and little rattlesnake grass.

There were no species of special concern identified within the study area.

Wildlife Habitat

The mixture of grassland, large trees and a wetland makes this property suitable for a diversity of wildlife. The large size of the parcel, not bisected with roads, allows wildlife to travel freely through the property to the much larger Spring Lake Regional Park and to the low density suburban neighborhoods. The only impediments to free movement may be the fencing for the horse paddocks, but they are situated in a way to allow animals to pass by on the north or the south. A large herd of deer was observed on May 3, 2015 and a neighbor reported seeing a coyote on the property.

Table 1. *Species of special concern recorded in the California Natural Diversity Database and found within two miles of the study area. A) the animals and B) the plants.*

1A. Animals			
Scientific Name	**Common Name**	**US LIST**	**California List**
Emys marmorata	western pond turtle	None	Species of special concern

1B. Plants			
Scientific Name	**Common Name**	**US LIST**	**California List**
Amsinckia lunaris	bent-flowered fiddleneck	None	Species of special concern
Arctostaphylos canescens ssp. sonomensis	Sonoma canescent manzanita	None	Species of special concern
Arctostaphylos stanfordiana ssp. decumbens	Rincon Ridge manzanita	None	Species of special concern
Brodiaea leptandra	narrow-anthered brodiaea	None	Species of special concern
Ceanothus confusus	Rincon Ridge ceanothus	None	Species of special concern
Ceanothus divergens	Calistoga ceanothus	None	Species of special concern
Ceanothus purpureus	holly-leaved ceanothus	None	Species of special concern
Ceanothus sonomensis	Sonoma ceanothus	None	Species of special concern
Fritillaria liliacea	fragrant fritillary	None	Species of special concern
Leptosiphon jepsonii	Jepson's leptosiphon	None	Species of special concern
Navarretia leucocephala ssp. bakeri	Baker's navarretia	None	Species of special concern
*Trifolium hydrophilum**	saline clover	None	Species of special concern
Triquetrella californica	coastal triquetrella	None	Species of special concern

Table 2. *List of plants identified throughout the study area.*

2A. Gymnosperms

Scientific Name	**Common Name**	**Family**
Pinus radiata	Monterey pine	Pinaceae

2B. Angiosperms – Dicots

Scientific Name	**Common Name**	**Family**
Toxicodendron diversilobum	poison oak	Anacardiaceae
Conium maculatum	poison hemlock	Apiaceae
Foeniculum vulgare	sweet fennel	Apiaceae
Sanicula crassicaulis	Pacific blacksnakeroot	Apiaceae
Baccharis pilularis	coyote brush	Asteraceae
Carduus pycnocephalus	Italian thistle	Asteraceae
Cirsium vulgare	bull thistle	Asteraceae
Hypochaeris radicata	cats ear	Asteraceae
Silybum marinum	milk thistle	Asteraceae
Sonchus asper	prickly sow thistle	Asteraceae
Cynoglossum grande	Pacific hound's tongue	Boraginaceae
Medicago polymorpha	bur clover	Fabaceae
Trifolium spp	clover	Fabaceae
Vicia americana	purple vetch	Fabaceae
Quercus agrifolia	live oak	Fagaceae
Quercus garryana	Garry oak	Fagaceae
Quercus kelloggii	black oak	Fagaceae
Quercus x eplingii	hybrid oak	Fagaceae
Quercus lobata	Valley oak	Fagaceae
Erodium cicutarium	redstem filaree	Geraniaceae
Geranium dissectum	cut-leaved geranium	Geraniaceae
Geranium molle	dovesfoot cranesbill	Geraniaceae
Juglans hindsii	California walnut	Juglandaceae
Mentha pulgium	pennyroyal	Lamiaceae
Umbellularia californica	California bay laurel	Lauraceae
Claytonia perfoliata	miner's lettuce	Montiaceae
Anagallis arvensis	scarlet pimpernel	Myrsinaceae
Plantago lanceolata	English plantain	Plantaginaceae
Platanus racemosa	California sycamore	Platanaceae
Rumex crispus	curly dock	Polygonaceae
Ranunculus muricatus	prickle-fruited buttercup	Ranunculaceae
Prunus spp	wild plum	Roseaceae
Rubus armeniacus	Himalayan blackberry	Roseaceae
Parentucellia viscosa	yellow parentucellia	Scrophulariaceae
Salix sp	willow	Salicaceae
Sequoia sempervirens	redwood	Taxodiaceae
Vitis spp	grape cultivar	Vitaceae

2C. Angiosperms – Monocots

Scientific Name	**Common Name**	**Family**
Chlorogalum pomeridianum	soap plant	Agavaceae
Arum italicum	Italian arum	Araceae
Carex barbarae	basket sedge	Cyperaceae
Cyperus eragrostis ssp eragrostis	nut-grass	Cyperaceae
Juncus spp	rush	Juncaceae
Juncus xiphioides	iris leaved rush	Juncaceae
Dichelostemma capitatum	bluedicks	Liliaceae
Narcissus pseudonarcissus	Daffodil	Liliaceae
Briza minor	rattlesnake grass	Poaceae
Bromus dianddrus	ripgut brome	Poaceae
Bromus hordeaceus	soft chess	Poaceae
Cortadeira selloana	pampass-grass	Poaceae
Dactylis glomerata	orchardgrass	Poaceae
Festuca myuros	fescue	Poaceae
Festuca perennis	ryegrass	Poaceae
Hordeum brachyantherum ssp.brachyantherium	meadow barley	Poaceae
Phalaris aquatica	Harding grass	Poaceae

Data Sources:

The information in this memo was compiled from site visits and many different sources, including: online databases, planning documents, aerial imagery and citizen reports.

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Photo Sheets of the Highway 12 Right of Way East Subarea

Figure 1: Upper grassland with horse paddocks in the background.

Figure 2: Oak woodland surrounded by grassland.

Figure 3: Grassland showing volcanic rocks interspersed throughout.

Figure 4: Grassland area with low productivity.

Figure 5: Drainage swale along the southern border of the property. This swale drains into the large wetland feature on the property.

Figure 6: The large wetland feature is surrounded by Himalayan blackberry.

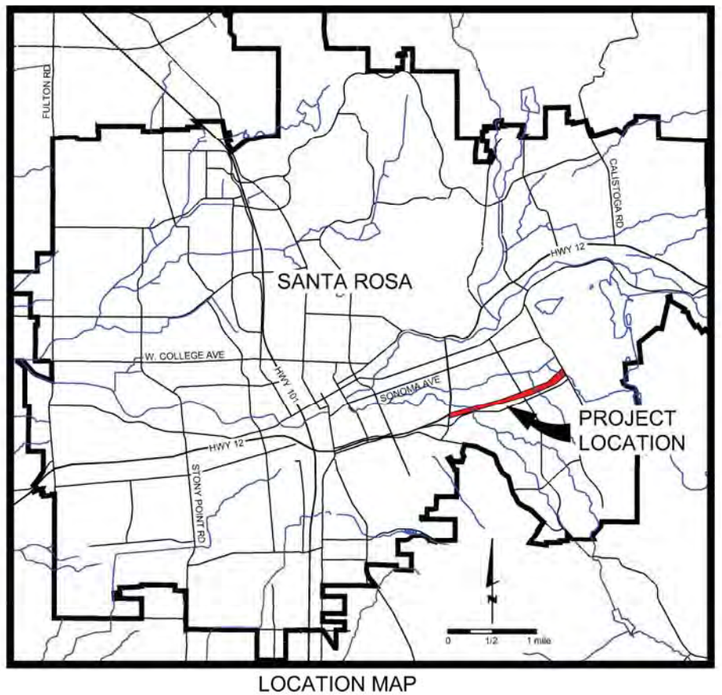
Figure 7: Outer edge of the large wetland.

Figure 8: Small pocket wetland near, but not connected to the property's large wetland.

Figure 9: Close-up of the pocket wetland showing algae growth.

MATCHLINE - SEE SHEET 2

2013 AERIAL



LOCATION MAP

LEGEND

- DRAINAGE SWALE
- RIPARIAN AREA
- WETLANDS
- STORM DRAIN
- SEWER MAIN
- WATER MAIN
- CREEK
- PROPERTY LINE
- OTHER

City of Santa Rosa

HIGHWAY 12 RIGHT-OF-WAY ENVIRONMENTAL REVIEW, FARMERS LN TO SUMMERFIELD RD

SHEET 1 OF 3

Exhibit 7a

2013 AERIAL

HIGHWAY 12 RIGHT-OF-WAY ENVIRONMENTAL REVIEW, FARMERS LN TO SUMMERFIELD RD

Exhibit 7b

MATCHLINE - SEE SHEET 2

YULUPA AVE

SIERRA PARK CREEK

96" SPRING CREEK DIVERSION PIPE

72" SPRING CREEK DIVERSION PIPE

SIERRA PARK CREEK
DIVERSION STRUCTURE

0 50' 100'

MATCHLINE - SEE BELOW

MATCHLINE - SEE ABOVE

SPRING CREEK

REMNANT WALNUT
GROVE

8" SEWER

12" SEWER

72" SPRING CREEK DIVERSION PIPE

SPRING CREEK
DIVERSION
STRUCTURE

SUMMERFIELD RD

0 50' 100'

HIGHWAY 12 RIGHT-OF-WAY ENVIRONMENTAL REVIEW, FARMERS LN TO SUMMERFIELD RD

2013 AERIAL

Exhibit 7c

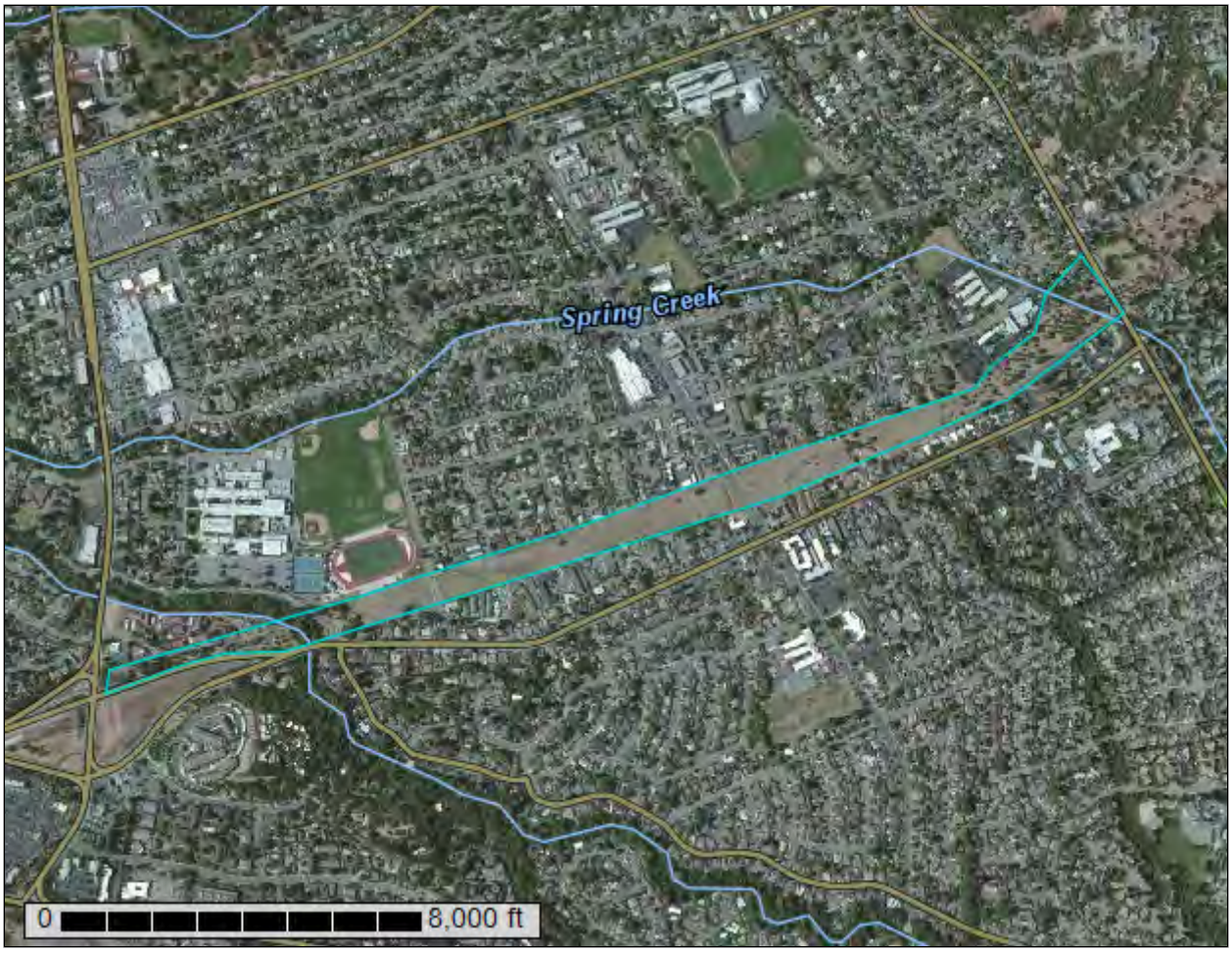
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Sonoma County, California



November 13, 2014

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Sonoma County, California
Survey Area Data: Version 8, Sep 25, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 2, 2010—Feb 17, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Sonoma County, California (CA097)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
CcA	Clear Lake clay loam, 0 to 2 percent slopes	4.1	11.2%
CeA	Clear Lake clay, sandy substratum, 0 to 2 percent slopes, MLRA 14	20.4	55.6%
PlD	Pleasanton-Haire complex, 9 to 15 percent slopes	0.3	0.9%
RnA	Riverwash	1.0	2.7%
TuE	Tuscan cobbly clay loam, 9 to 30 percent slopes	0.7	1.8%
YtA	Yolo clay loam, 0 to 2 percent slopes	6.8	18.5%
ZaA	Zamora silty clay loam, 0 to 2 percent slopes	3.4	9.3%
Totals for Area of Interest		**36.8**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with

some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Sonoma County, California

CcA—Clear Lake clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hfbh
Elevation: 20 to 1,500 feet
Mean annual precipitation: 10 to 35 inches
Mean annual air temperature: 57 to 63 degrees F
Frost-free period: 225 to 300 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Clear lake and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Clear Lake

Setting

Landform: Basin floors
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Typical profile

H1 - 0 to 13 inches: clay loam
H2 - 13 to 60 inches: clay

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 5 percent
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): 2s
Land capability classification (nonirrigated): 3s
Hydrologic Soil Group: C

Minor Components

Wright

Percent of map unit: 8 percent

Huichica
Percent of map unit: 7 percent

CeA—Clear Lake clay, sandy substratum, 0 to 2 percent slopes, MLRA 14

Map Unit Setting
National map unit symbol: 2vbsl
Elevation: 20 to 360 feet
Mean annual precipitation: 26 to 42 inches
Mean annual air temperature: 57 to 61 degrees F
Frost-free period: 225 to 300 days
Farmland classification: Prime farmland if irrigated and drained

Map Unit Composition
Clear lake, drained, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Clear Lake, Drained

Setting
Landform: Basin floors
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Basin alluvium derived from volcanic and sedimentary rock over fan alluvium derived from volcanic and sedimentary rock

Typical profile
Apg1 - 0 to 2 inches: clay
Apg2 - 2 to 8 inches: clay
Assg - 8 to 25 inches: clay
Bssg1 - 25 to 39 inches: clay
Bssg2 - 39 to 46 inches: clay
Bkssg - 46 to 52 inches: clay
2Bkg - 52 to 60 inches: clay loam
2Btg - 60 to 72 inches: fine sandy loam
2C - 72 to 84 inches: loamy coarse sand

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 36 to 60 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum in profile: 6 percent

Salinity, maximum in profile: Nonsaline to very slightly saline (0.5 to 3.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 8.0
Available water storage in profile: High (about 9.2 inches)

Interpretive groups

Land capability classification (irrigated): 2e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: D

Minor Components

Reyes

Percent of map unit: 5 percent
Landform: Salt marshes

Haire

Percent of map unit: 5 percent

Whight

Percent of map unit: 5 percent

PlD—Pleasanton-Haire complex, 9 to 15 percent slopes

Map Unit Setting

National map unit symbol: hfht
Elevation: 20 to 2,400 feet
Mean annual precipitation: 20 to 45 inches
Mean annual air temperature: 54 to 59 degrees F
Frost-free period: 260 to 280 days
Farmland classification: Not prime farmland

Map Unit Composition

Pleasanton and similar soils: 60 percent
Haire and similar soils: 30 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pleasanton

Setting

Landform: Alluvial fans, terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Convex, linear
Parent material: Alluvium derived from sedimentary rock

Typical profile

H1 - 0 to 27 inches: gravelly loam
H2 - 27 to 72 inches: gravelly clay loam

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C

Description of Haire

Setting

Landform: Terraces
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Typical profile

H1 - 0 to 12 inches: gravelly loam
H2 - 12 to 36 inches: clay
H3 - 36 to 60 inches: very gravelly clay loam

Properties and qualities

Slope: 9 to 15 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.06 to 0.20 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Moderate (about 6.5 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C

Minor Components

Unnamed

Percent of map unit: 10 percent

RnA—Riverwash

Map Unit Setting

National map unit symbol: hfj7
Elevation: 700 to 2,900 feet
Mean annual precipitation: 8 to 15 inches
Mean annual air temperature: 46 to 52 degrees F
Frost-free period: 110 to 180 days
Farmland classification: Not prime farmland

Map Unit Composition

Riverwash: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Riverwash

Setting

Landform: Flood plains
Parent material: Sandy and gravelly alluvium

Typical profile

H1 - 0 to 6 inches: very gravelly sand
H2 - 6 to 60 inches: stratified very gravelly coarse sand to very gravelly sand

Properties and qualities

Slope: 0 to 2 percent
Natural drainage class: Excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: Frequent
Available water storage in profile: Very low (about 1.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8

Minor Components

Unnamed

Percent of map unit: 15 percent

TuE—Tuscan cobbly clay loam, 9 to 30 percent slopes

Map Unit Setting

National map unit symbol: hfkj
Elevation: 200 to 1,000 feet
Mean annual precipitation: 30 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 225 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Tuscan and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tuscan

Setting

Landform: Terraces
Landform position (two-dimensional): Footslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from basic igneous rock

Typical profile

H1 - 0 to 8 inches: cobbly clay loam
H2 - 8 to 15 inches: very gravelly clay
H3 - 15 to 19 inches: indurated

Properties and qualities

Slope: 9 to 30 percent
Depth to restrictive feature: 10 to 20 inches to duripan
Natural drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: Very low (about 1.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: Shallow rocky (R015XD132CA)

Minor Components

Clough
Percent of map unit: 5 percent

Diablo
Percent of map unit: 5 percent

Goulding
Percent of map unit: 5 percent

YtA—Yolo clay loam, 0 to 2 percent slopes

Map Unit Setting
National map unit symbol: hfkx
Elevation: 30 to 400 feet
Mean annual precipitation: 16 to 22 inches
Mean annual air temperature: 61 degrees F
Frost-free period: 240 to 260 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition
Yolo and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Yolo

Setting
Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Typical profile
H1 - 0 to 8 inches: clay loam
H2 - 8 to 60 inches: loam

Properties and qualities
Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)

Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: B

Minor Components

Pleasanton

Percent of map unit: 5 percent

Zamora

Percent of map unit: 5 percent

Pajaro

Percent of map unit: 5 percent

ZaA—Zamora silty clay loam, 0 to 2 percent slopes

Map Unit Setting

National map unit symbol: hfl3
Elevation: 30 to 1,300 feet
Mean annual precipitation: 22 inches
Mean annual air temperature: 61 degrees F
Frost-free period: 250 to 330 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Zamora and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Zamora

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from sedimentary rock

Typical profile

H1 - 0 to 5 inches: silty clay loam
H2 - 5 to 29 inches: clay loam
H3 - 29 to 41 inches: clay loam
H4 - 41 to 55 inches: sandy clay loam
H5 - 55 to 60 inches: gravelly clay

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 10.0 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 3c
Hydrologic Soil Group: C

Minor Components

Yolo

Percent of map unit: 4 percent

Cole

Percent of map unit: 4 percent

Pajaro

Percent of map unit: 3 percent

Cortina

Percent of map unit: 3 percent

Unnamed

Percent of map unit: 1 percent
Landform: Depressions

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